SAR TEST REPORT

No. 2010EEE00967

For

HUAWEI Technologies Co., Ltd.

4G Mobile USB Series H

Model Name: BM328c, FWH-USB0328

With

Hardware Version: BM32WAUG

Software Version: V100R001

FCC ID: QISBM328C

Issued Date: 2010-06-03

No. **DGA-PL-114/01-02**

CNAS L0442

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

Test Laboratory:

TMC Beijing, Telecommunication Metrology Center of MIIT

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TABLE OF CONTENT

1 Test Laboratory

1.1 Testing Location

Company Name:	TMC Beijing, Telecommunication Metrology Center of MIIT
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Telephone:	+86-10-62304633
Fax:	+86-10-62304793

1.2 Testing Environment

Temperature:	18°C~25 °C,
Relative humidity:	30%~ 70%
Ground system resistance:	< 0.5 Ω

Ambient noise is checked and found very low and in compliance with requirement of standards.
Reflection of surrounding objects is minimized and in compliance with requirement of standards.

1.3 Project Data

Project Leader:	Qi Dianyuan
Test Engineer:	Lin Xiaojun
Testing Start Date:	May 24, 2010
Testing End Date:	May 25, 2010

1.4 Signature

Lin Xiaojun

(Prepared this test report)

Qi Dianyuan

(Reviewed this test report)

Xiao Li

Deputy Director of the laboratory

(Approved this test report)

2 Client Information

2.1 Applicant Information

Company Name:	HUAWEI Technologies Co., Ltd.
Address /Post:	Huawei Base, Bantian, Longgang District, Shenzhen, P.R. China
City:	Shenzhen
Postal Code:	518129
Country:	China
Telephone:	029-68584381
Fax:	029-68584314

2.2 Manufacturer Information

Company Name:	HUAWEI Technologies Co., Ltd.
Address /Post:	Huawei Base, Bantian, Longgang District, Shenzhen, P.R. China
City:	Shenzhen
Postal Code:	518129
Country:	China
Telephone:	029-68584381
Fax:	029-68584314

3 Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1 Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	/	BM32WAUG	V100R001

*EUT ID: is used to identify the test sample in the lab internally.

3.2 About EUT

Description:	4G Mobile USB Series H
Model Name:	BM328c, FWH-USB0328
Frequency Band:	2496MHz ~ 2690MHz
Bandwidth:	5M, 10M
Modulation:	Up-Link: QPSK, 16QAM Down-Link: QPSK, 16QAM, 64QAM
Modulation Technology:	OFDMA
Duplex Method	TDD
UL Zone Type	PUSC
Power Supply	5.0Vdc from host equipment
Data Cable	NA
Interface	USB
Associated Devices	NA
Test device Production information:	Production unit

Note:

1. The EUT can supports different UL / DL ratio, max transmit ratio is up to 18(UL):29(DL).
2. The EUT gets two model names, BM328c is the huawei model, FWH-USB0328 is a model for a specifically client.
3. There are two antennas provided to this EUT, please refer to the following table:

No.	Brand	Model No.	Net Gain (dBi)	Antenna Type	Connector	Frequency range
1	SkyCross	NA	2 max	iMAT	NA	2.496GHz~2.690GHz
2	SkyCross	NA	2 max	iMAT	NA	2.496GHz~2.690GHz

4. For the EUT Modulation type and coding rate:

Up Link		Down Link	
Modulation	**Coding rate**	**Modulation**	**Coding rate**
QPSK	1/2	QPSK	1/2
	3/4		3/4
16QAM	1/2	16QAM	1/2
	3/4		3/4
		64QAM	1/2
			2/3
			3/4
			5/6

5. There are two coding rates (1/2 and 3/4) for QPSK and 16QAM. The lower coding rate 1/2 is only tested in this report according to the April 2010 TCB workshop slides.

6. The above EUT information was declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or User's Manual.
7. Per KDB 615223 "FCC WIMAX SAR Guidance", below are required "Device and System Operating Parameters" specified in Table 1.

Table 1: 802.16e/Wimax device and system operating parameters

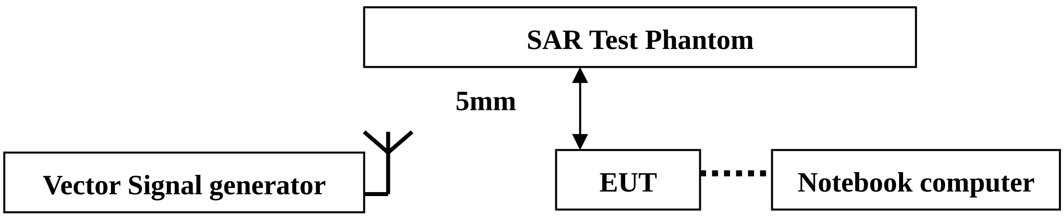
Description	Parameter		Comment
FCC ID	QISBM328C		identify all related FCC ID
Radio Service	Part 27 subpart C&M		Rule parts
Transmit Frequency Range (MHz)	2496MHz-2690MHz		System parameter
System/Channel Bandwidth (MHz)	5MHz	10MHz	System parameter
System Profile	Revision 1.7.0		Defined by WiMAX Forum
Modulation Schemes	QPSK,16QAM for uplink		Identify all applicable UL modulations
Sampling Factor	28/25		System parameter
Sampling Frequency (MHz)	5.6MHz	11.2MHz	Fs
Sampling Time(MHz)	178.581ns	89.3ns	1/Fs
FFT Size	512	1024	NFFT
Sub-Carrier Spacing(KHz)	10.9375kHz		△f
Useful Symbol time (μs)	91.43us		Tb=1/△f
Guard time	11.43us		Ts=Tb/cp;cp=cyclic prefix
OFDMA Symbol time(μs)	102.86us		Ts=Tb+Tg
Frame Size (ms)	5ms		System parameter
TTG + RTG (μs or number of symbols)	165.7143us		Idle time, system parameter
Number of DL OFDMA Symbols per Frame	29		Identify the allowed & maximum symbols, including both traffic & control symbols
Number of UL OFDMA Symbols per Frame	18		
DL:UL Symbol Ratio	29:18		For determining UL duty factor
Power Class (dBm)	Power Class 2, 23±1dBm for QPSK, 21±1dBm for 16QAM		Identify power class and tolerance
Wave1 / Wave2	Wave2,2 antenna with receive MRC DL MIMO matrix A and B.		Describe antenna diversity info and MIMO requirements separately
UL Zone Types (FUSC, PUSC, OFUSC, OPUSC, AMC, TUSC1, TUSC2)	Segmented PUSC Unsegmented PUSC		Describe separately the symbol and sub-carrier/sub-channel structures applicable to each zone type
Maximum Number of UL Sub-Carriers	409	841	
UL Burst Maximum Average Power	5M:23.25dBm	10M:23.22dBm	

<table>
<tr><td>Number and type of UL Control Symbols</td><td colspan="2">3 PUSC symbols (used for ranging, CQICH and ACK/NACK)</td><td rowspan="2"></td></tr>
<tr><td>UL Control Symbol Maximum Average Power</td><td>5M:62.161mW</td><td>10M:29.98mW</td></tr>
<tr><td>UL Burst Peak-to-Average Power Ratio (PAR)</td><td colspan="2">PAR measured by Agilent is 8.75-12.76dB,details refer to §3.2.3</td><td>Identify the expected range and measured/tested PAR; explain separately the methods used / to be used to address SAR probe calibration and measurement error issues</td></tr>
<tr><td>Frame Averaged UL Transmission Duty Factor (%)
Show</td><td colspan="2">Duty cycle measured by Agilent,details refer to §3.2.4, the theoretical Duty Cycle=15x102.86us/5000us=15/48=30.858%, cf=1/(0.30858)=3.24 is used during SAR test.</td><td>Show calculation separately and explain how the applicable CF (crest factor) used / to be use in the SAR measurements is derived and how the control symbols are accounted for</td></tr>
</table>

3.2.1 Test Setup, Protocol Simulator

Test Setup

SAR Test Setup is shown in the following diagram; the EUT (FCC ID: QISBM328C) is plugged into the notebook and configured exactly as it is in the normal network.



Link up by the air

A BECEEM test tool will be used on the Note PC, it is a specific tool provided by the BECEEM, which can control the device (FCC ID: QISBM328C) to transmit at a specific channel, the maximum output power, and channel bandwidth.

Agilent E4438C vector signal generator is used in the test set, waveform is loaded into E4438C that produces a WiMAX frame output signal, the device (FCC ID: QISBM328C) detects the signal by the antenna and begins to transmit, and the SAR measurements are then taken on the device (FCC ID: QISBM328C), the E4438C gets the below options:

a. N7613A:Signal Studio for 802.16-2004 WiMAX
b. N7615B:Signal Studio for 802.16 WiMAX

The device (FCC ID: QISBM328C) is a 2.5GHz WiMAX USB Stick using the USA Beceem Chipset, which supports 1Tx2Rx and TxD, TxD means Tx Switching Diversity that Tx should be switched

between the two Antennas, the antenna with a more stronger downlink signal will be selected. Both the uplink and downlink are capable of 5MHz and 10MHz Bandwidth.
The device (FCC ID: QISBM328C) supports PUSC zone type only for UL. The AMC, FUSC or other zone type can't be transmitted for uplink. The maximum DL/UL symbol ratio is determined according to PUSC parameters, because in each 5ms frame time, it is allowed up to 48 OFDMA symbols for DL and UL symbols to transmit, and the TTG and RTG are also included in each 5ms frame as gaps, so there are only 47 symbols allowed to transmit per frame, the maximum DL/UL symbol ratio of device (FCC ID: QISBM328C) PUSC allowed is 29:18.

For PUSC zone type, the 10MHz Bandwidth has 35 sub-channels structured by 1024 sub-carriers. 183 are used as spare/safeguard sub-carriers and 1 as DC; leaving 840 are available for transmission. From this, 560 sub-carriers for data transmission with 280 sub-carriers intended for pilot use.
5MHz Bandwidth has 17 sub-channels structured by 512 sub-carriers. 103 are used as spare/safeguard sub-carriers and 1 as DC, 272 for data transmission with 136 sub-carriers for pilot use.

E4438C Protocol Simulator
E4438C produces a downlink DL burst every 5mS which simulates the transmission of a Base Station operating under normal mode. This DL burst instructs the device (FCC ID: QISBM328C) to transmit for 15 symbols in the UL data zone. This UL transmission is repeated every 5mS. The TX power of device (FCC ID: QISBM328C) is set to maximum power. The E4438C and device (FCC ID: QISBM328C) use the same frequency. The power of E4438C is much less than device's TX power (About 40dB less than the MS power) and so it will not affect the SAR readings. Since both the E4438C (BS) and the device (FCC ID: QISBM328C) are working in TDD mode, co-operation under same frequency is not an issue.

The E4438C is loaded with a Base Station DL signal which is 29:18 (DL/UL). The EUT synchronizes to the signal from the E4438C in frequency and time and then demodulates two maps contained in the ESG DL frame. The first map, called the DL map, specifies the number of DL symbols (29). The second map, called the UL map, specifies the number of UL symbols (18). The UL map also tells BM328c to transmit a burst which occupies all data symbols and all sub-channels. No control channel transmissions are requested by the E4438C. Measurement were taken in this configuration with EUT transmitting using 29:18 ratio, but since there was no energy in the control symbols, the effective power is only across 15 symbols.

As mentioned above the DL/UL frame is specified in the DL and UL maps respectively. There is no ranging present when there is data traffic. The other types of control traffic are HARQ ACK/NACK, CQICH (CINR reporting) and bandwidth BW requests. Since the BW requests are shared across the control symbols (traffic versus non-traffic modes) the control traffic that is relevant to the SAR calculation is CQICH and HARQ ACK/NACK. The maximum power for this control traffic is 29.98mW (5/35 of 209.894mW) for 10MHz and 62.161mW (5/17 of 211.349mW) for 5MHz.
In the test mode, the UL operates in PUSC with all data sub-channels (All 35 sub-channels for 10MHz) occupied with data. During normal operation BM328c will transmit on all sub-channels

when maximum UL throughput is required. It is possible for device (FCC ID: QISBM328C) to transmit with fewer sub-channels. The sub-channels consist of tones that are distributed over the entire signal BW and a jump every three symbols so that the spectral density and hence SAR for the fractional sub-channel case will be similar to the full sub-channel case that is tested. (Note: in the 802.16e, a sub-channel consists of tones that are spread across the occupied bandwidth. After every three symbols, the tones that make up the sub-channel switch to a new set of frequencies spread across the band. This "jumping" is called sub-channel rotation and helps to give the sub-channel frequency diversity.)

3.2.2 Scaling Factor

Calculation method of Scaling Factor

SAR testing was done at 29:18(DL: UL) ratio, which is the max DL: UL ratio for device (FCC ID: QISBM328C) (refer to huawei declaration). The 29 is the number of downlink (from the Base Station) symbols and the 18 is the number of uplink (from the Mobile Station) symbols. Inside uplink, 15 symbols are used for data and other 3 symbols are used for sending control information to the network. During the SAR testing, the control symbols contained no information, so did not contribute to the total energy. To compensate for the maximum energy which may be presented in the 3 control symbols, following scheme is used for the up scaling:

Scaled Factor for 5MHz Bandwidth, QPSK

Maximum rated output power of 5MHz QPSK=23.25dBm=211.349mW (Refer to §3.2.3)
Maximum control traffic power of 5MHz QPSK=62.161mW (5/17 of maximum rated output power)
Scaled Factor of 5MHz Bandwidth, QPSK
= (max control power*3+max rated power*15)/ (actual power*18)
= (max control power*3+max rated power*15)/ (0mW*3+ actual power*15)
= (62.161mW*3+211.349mW*15)/ (0mW*3+ actual power*15)
=3356.718/ (0mW*3+ actual power*15)
=3356.718/ (actual power*15)

Scaled Factor for 5MHz Bandwidth, 16QAM

Maximum rated output power of 5MHz 16QAM=21.62dBm=145.211mW (Refer to §3.2.3)
Maximum control traffic power of 5MHz 16QAM=42.709mW (5/17 of maximum rated output power)
Scaled Factor of 5MHz Bandwidth, 16QAM
= (max control power*3+max rated power*15)/ (actual power*18)
= (max control power*3+max rated power*15)/ (0mW*3+ actual power*15)
= (42.709mW*3+145.211mW*15)/ (0mW*3+ actual power*15)
=2306.292/ (0mW*3+ actual power*15)
=2306.292/ (actual power*15)

For example:
Scaling Factor for antenna 1 QPSK1/2 low channel
=3356.718/ (210.378*15) =1.064

Note: actual power of ant 1 QPSK1/2 low channel=23.23dBm=210.378mW

Bandwidth (MHz)	Modulation	Frequency (MHz)	Actual output power (dBm)		Scaling Factor	
			Ant 1	Ant 2	Ant 1	Ant 2
5MHz	QPSK1/2	2498.5	23.23	23.14	1.064	1.086
		2593	23.11	23.22	1.093	1.066
		2687.5	23.22	23.25	1.066	1.059
	QPSK3/4	2498.5	23.21	23.19	1.069	1.073
		2593	23.19	23.22	1.073	1.066
		2687.5	23.14	23.13	1.086	1.088
	16QAM1/2	2498.5	21.50	21.45	1.088	1.101
		2593	21.45	21.62	1.101	1.059
		2687.5	21.30	21.23	1.139	1.158
	16QAM3/4	2498.5	21.46	21.59	1.098	1.066
		2593	21.38	21.46	1.118	1.098
		2687.5	21.18	21.12	1.172	1.188

Scaled Factor for 10MHz Bandwidth, QPSK

Maximum rated output power of 10MHz QPSK=23.22dBm=209.894mW (Refer to §3.2.3)

Maximum control traffic power of 10MHz QPSK=29.98mW (5/35 of maximum rated output power)

Scaled Factor of 10MHz Bandwidth, QPSK

= (max control power*3+max rated power*15)/ (actual power*18)

= (max control power*3+max rated power*15)/ (0mW*3+ actual power*15)

= (29.89mW*3+209.894*15)/ (0mW*3+ actual power*15)

=3238.08/ (actual power*15)

Scaled Factor for 10MHz Bandwidth, 16QAM

Maximum rated output power of 10MHz 16QAM=21.67dBm=146.893mW (Refer to §3.2.3)

Maximum control traffic power of 10MHz 16QAM=20.985mW (5/35 of maximum rated output power)

Scaled Factor of 10MHz Bandwidth, 16QAM

= (max control power*3+max rated power*15)/ (actual power*18)

= (max control power*3+max rated power*15)/ (0mW*3+ actual power*15)

= (20.985mW*3+146.893*15)/ (0mW*3+ actual power*15)

=2266.350/ (actual power*15)

For example:

Scaling Factor for antenna 1 QPSK1/2 low channel

=3238.08/ (192.752*15) =1.120

Note: actual power of ant 1 QPSK1/2 low channel=22.85dBm=192.752mW

Bandwidth (MHz)	Modulation	Frequency (MHz)	Actual output power (dBm)		Scaling Factor	
			Ant 1	Ant 2	Ant 1	Ant 2

10MHz	QPSK1/2	2501	22.85	23.22	1.120	1.028
		2593	23.08	23.12	1.062	1.052
		2685	23.11	23.07	1.055	1.065
	QPSK3/4	2501	23.21	23.22	1.031	1.028
		2593	23.22	23.26	1.028	1.025
		2685	23.11	22.96	1.055	1.091
	16QAM1/2	2501	21.21	21.17	1.143	1.154
		2593	21.26	21.67	1.130	1.028
		2685	20.91	20.95	1.225	1.214
	16QAM3/4	2501	21.20	21.01	1.146	1.197
		2593	21.65	21.52	1.033	1.064
		2685	20.99	21.01	1.202	1.197

Note1:”0mW*3”above is due to the reason that the actual output power didn’t transmit any power in the first 3 control symbols.
Note2:16QAM above has the lower power class, whose scaling factor should be calculated by the max rated power of 16QAM itself.

3.2.3 Conducted power and PAR

The conducted power and PAR is test with DL:UL=29:18 PUSC zone configure.

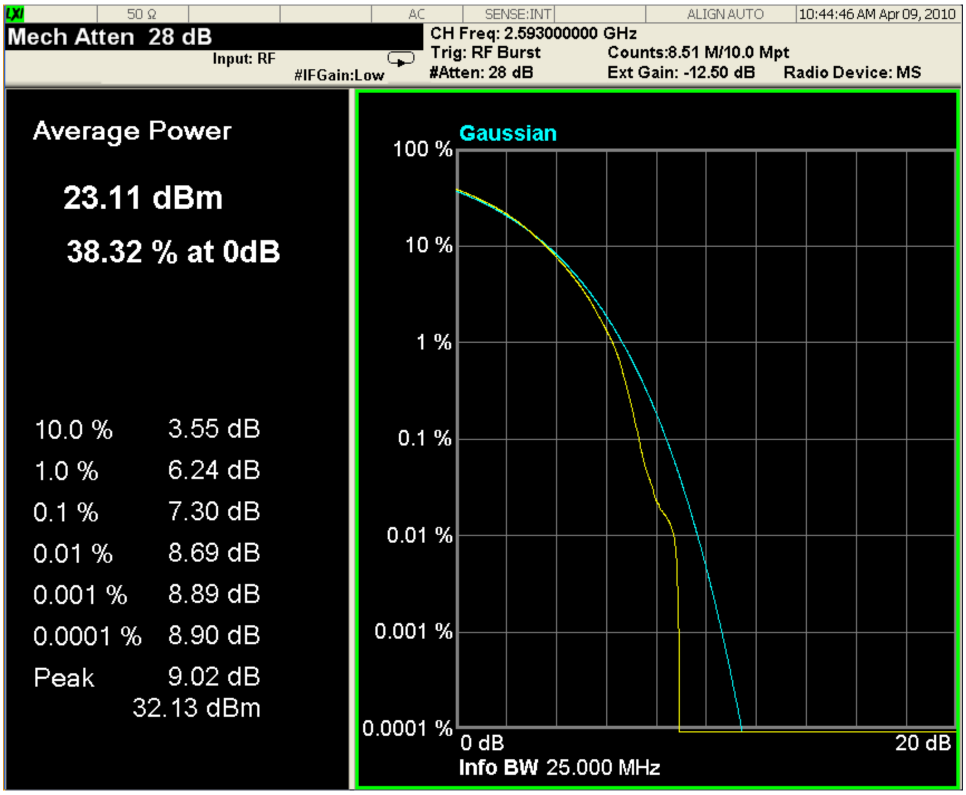
Antenna 1

Bandwidth (MHz)	Frequency (MHz)	Modulation	Average (dBm)	Peak (dBm)	Peak to Average
5MHz	2498.5	QPSK1/2	23.23	32.34	9.11
		QPSK3/4	23.21	32.33	9.31
		16QAM1/2	21.50	32.19	10.69
		16QAM3/4	21.46	32.28	10.82
	2593	QPSK1/2	23.11	32.13	9.02
		QPSK3/4	23.19	31.99	8.80
		16QAM1/2	21.45	31.43	9.98
		16QAM3/4	21.38	32.05	10.67
	2687.5	QPSK1/2	23.22	31.97	8.75
		QPSK3/4	23.14	31.93	8.79
		16QAM1/2	21.30	32.27	10.97
		16QAM3/4	21.18	33.69	12.51

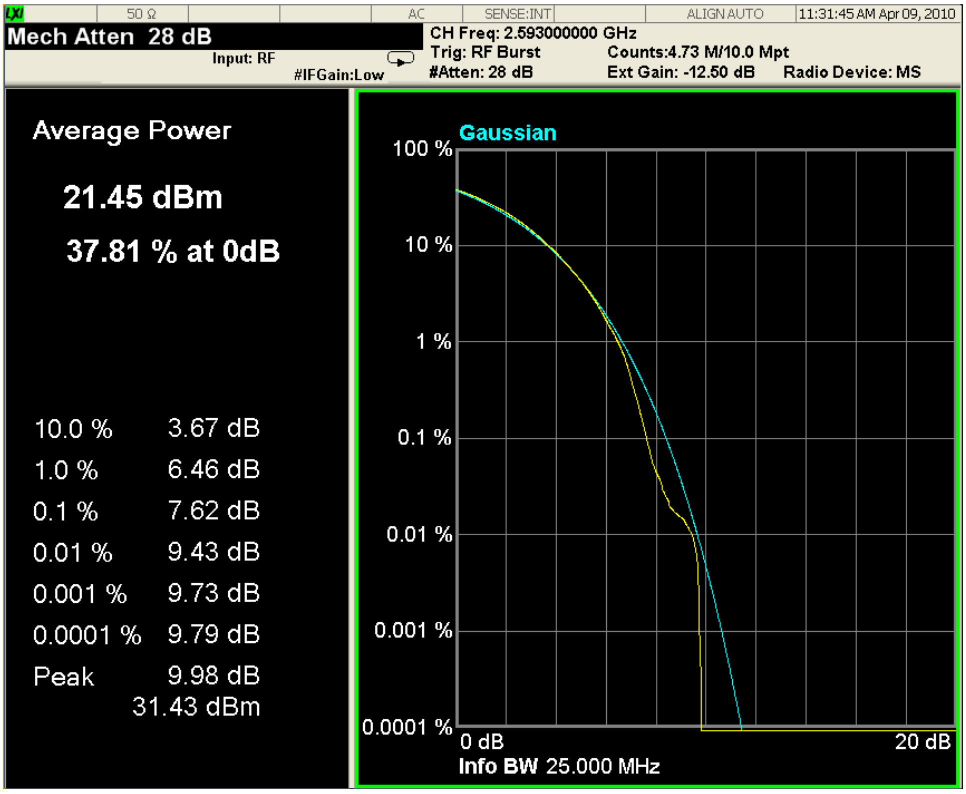
10MHz	2501	QPSK1/2	22.85	32.99	10.14
		QPSK3/4	23.21	31.97	8.77
		16QAM1/2	21.21	31.56	10.35
		16QAM3/4	21.10	31.33	10.23
	2593	QPSK1/2	23.08	33.54	10.46
		QPSK3/4	23.22	31.95	8.73
		16QAM1/2	21.26	31.23	9.97
		16QAM3/4	21.65	31.26	9.61
	2685	QPSK1/2	23.11	32.43	9.32
		QPSK3/4	23.11	32.17	9.06
		16QAM1/2	20.91	33.67	12.76
		16QAM3/4	20.99	33.72	12.73

Note: following are the plots of middle channel for Bandwidth 5MHz and 10 MHz for example; plots of high or low channel are available, thanks.

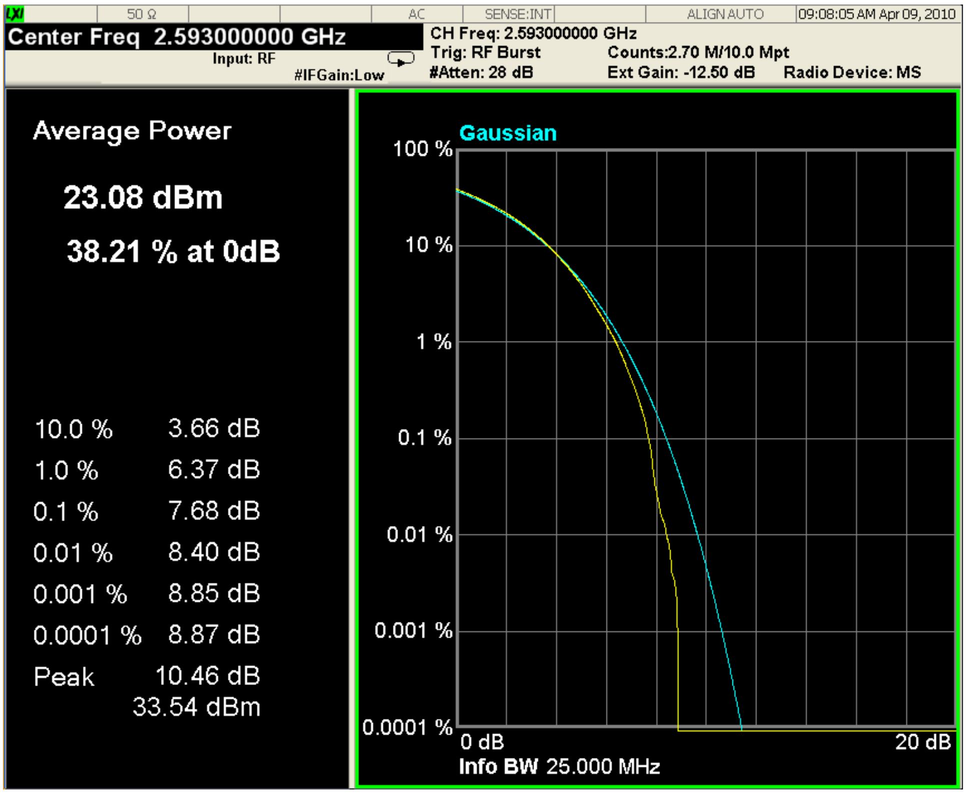
Bandwidth=5MHz, Modulation=QPSK1/2, Frequency=2593MHz



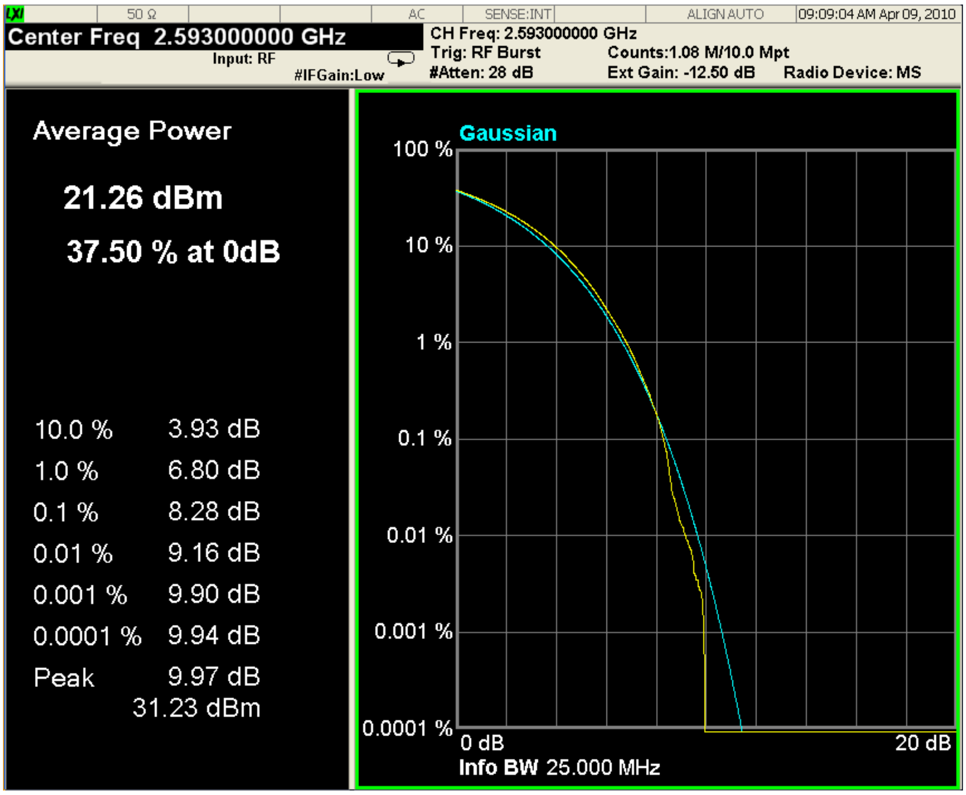
Bandwidth=5MHz, Modulation=16QAM1/2, Frequency=2593MHz



Bandwidth=10MHz, Modulation=QPSK1/2, Frequency=2593MHz



Bandwidth=10MHz, Modulation=16QAM1/2, Frequency=2593MHz



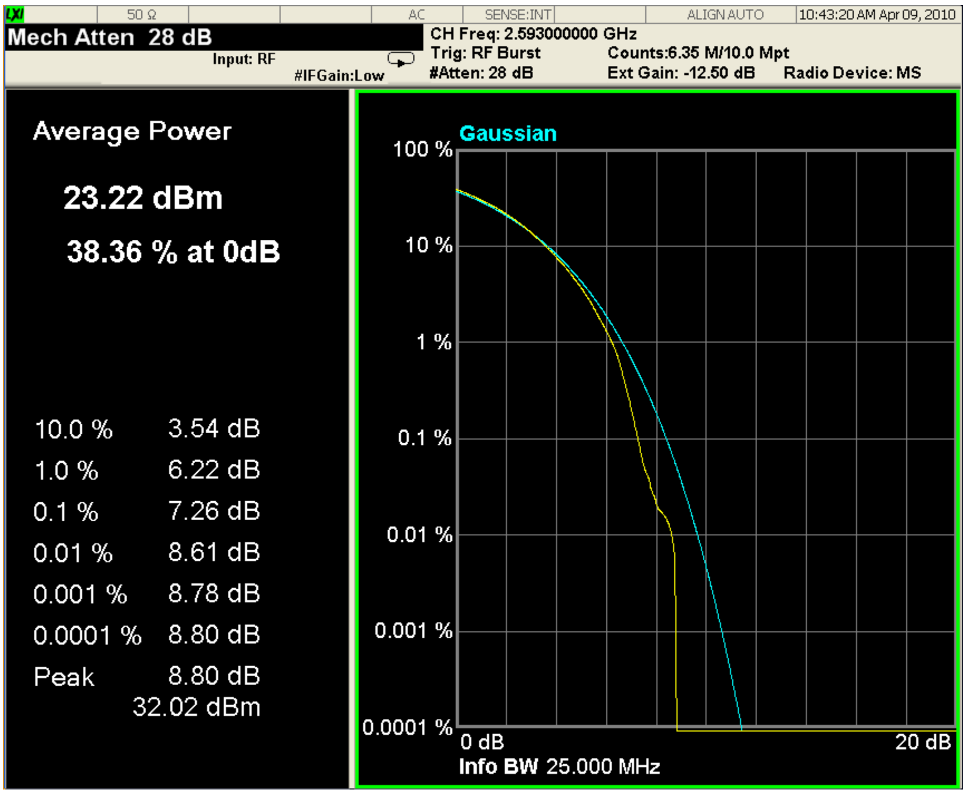
Antenna 2

Bandwidth (MHz)	Frequency (MHz)	Modulation	Average (dBm)	Peak (dBm)	Peak to Average
5MHz	2498.5	QPSK1/2	23.14	32.07	8.93
		QPSK3/4	23.19	32.28	9.09
		16QAM1/2	21.45	32.26	10.81
		16QAM3/4	21.59	31.88	10.29
	2593	QPSK1/2	23.22	32.02	8.80
		QPSK3/4	23.22	32.03	8.81
		16QAM1/2	21.62	31.22	9.60
		16QAM3/4	21.46	32.13	10.67
	2687.5	QPSK1/2	23.25	32.01	8.76
		QPSK3/4	23.13	31.92	8.79
		16QAM1/2	21.23	31.78	10.55
		16QAM3/4	21.12	33.64	12.52

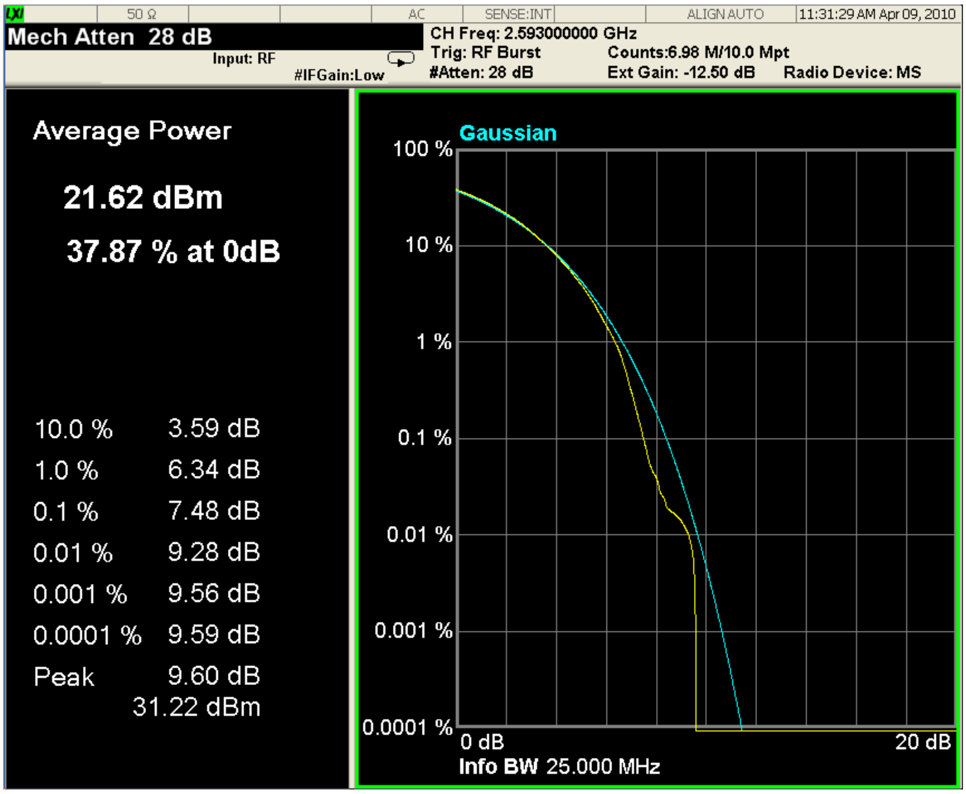
10MHz	2501	QPSK1/2	23.22	31.98	8.76
		QPSK3/4	23.22	32.12	8.91
		16QAM1/2	21.17	31.49	10.32
		16QAM3/4	21.01	31.99	10.98
	2593	QPSK1/2	23.12	34.81	11.69
		QPSK3/4	23.26	32.00	8.74
		16QAM1/2	21.67	31.45	9.78
		16QAM3/4	21.52	31.38	9.86
	2685	QPSK1/2	23.07	32.51	9.44
		QPSK3/4	22.96	32.26	9.30
		16QAM1/2	20.95	33.69	12.74
		16QAM3/4	21.01	33.69	12.68

Note: following are the plots of middle channel for Bandwidth 5MHz and 10 MHz for example; plots of high or low channel are available, thanks.

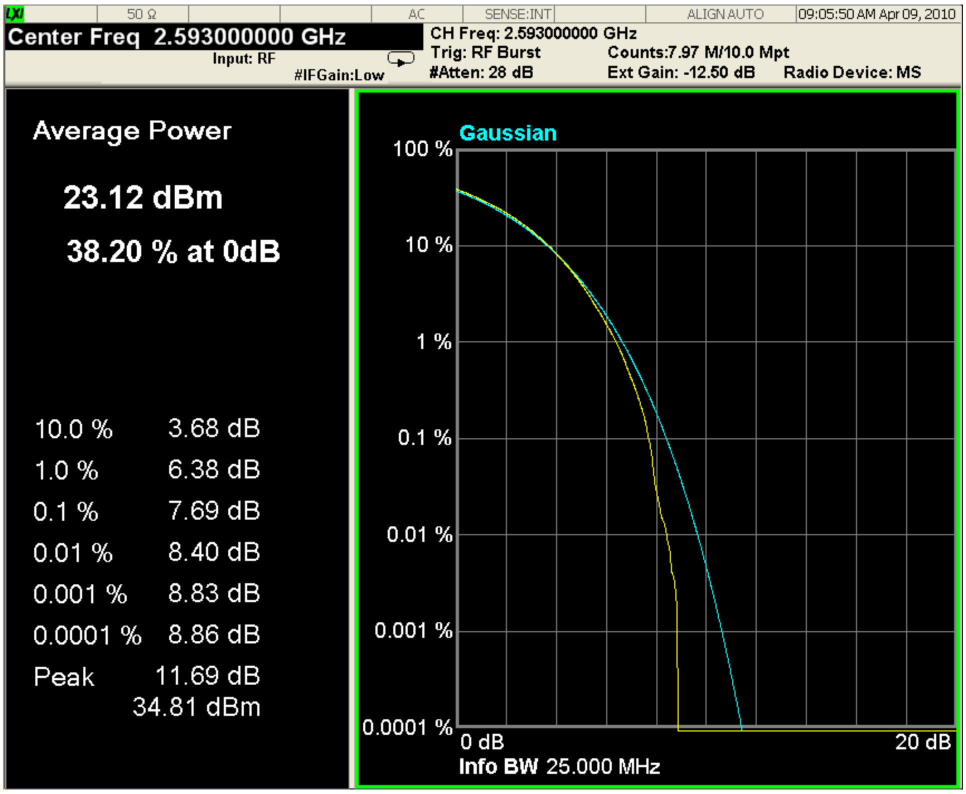
Bandwidth=5MHz, Modulation=QPSK1/2, Frequency=2593MHz



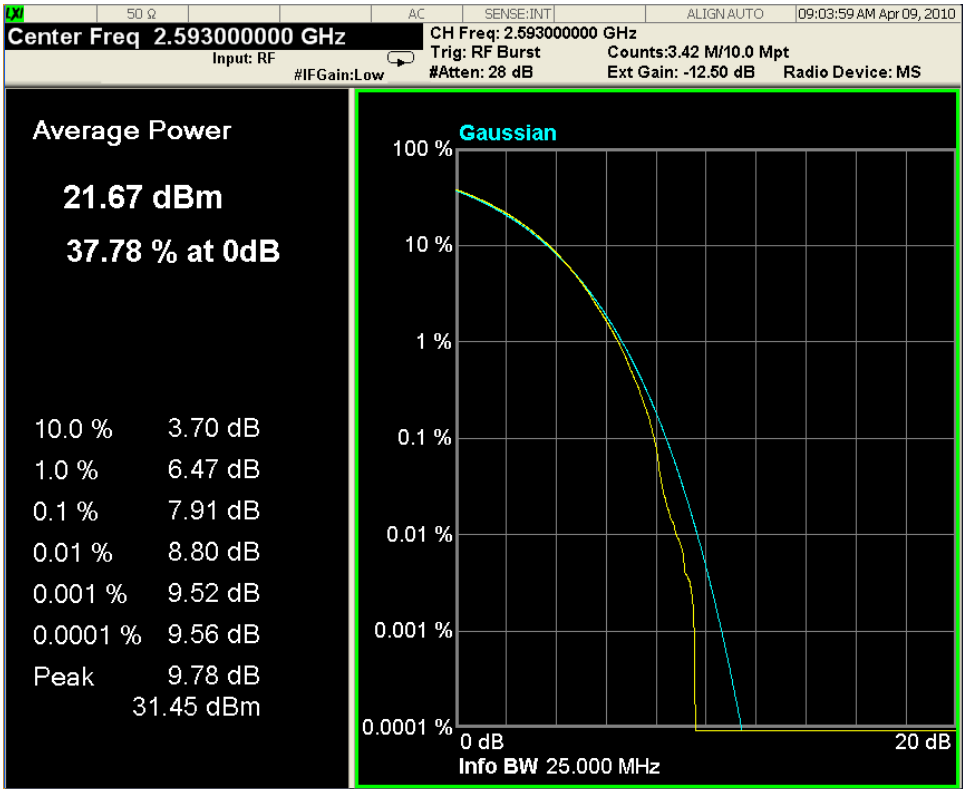
Bandwidth=5MHz, Modulation=16QAM1/2, Frequency=2593MHz



Bandwidth=10MHz, Modulation=QPSK1/2, Frequency=2593MHz



Bandwidth=10MHz, Modulation=16QAM1/2, Frequency=2593MHz



3.2.4 Duty Cycle

Calculation method of Duty cycle

Burst length =Mark4-Mark1

First 3 symbols time of UL=Mark2-Mark1

15 symbols time of UL =Mark3-Mark2

Duty Cycle=15 symbols time of UL/Frame length*100%

For example:

Calculation the Duty cycle, Bandwidth=5MHz, Modulation=QPSK1/2, on antenna 1

Duty Cycle= (5.483-3.917)/ (8.583-3.583)*100%

=1.566/5*100%

=31.32%

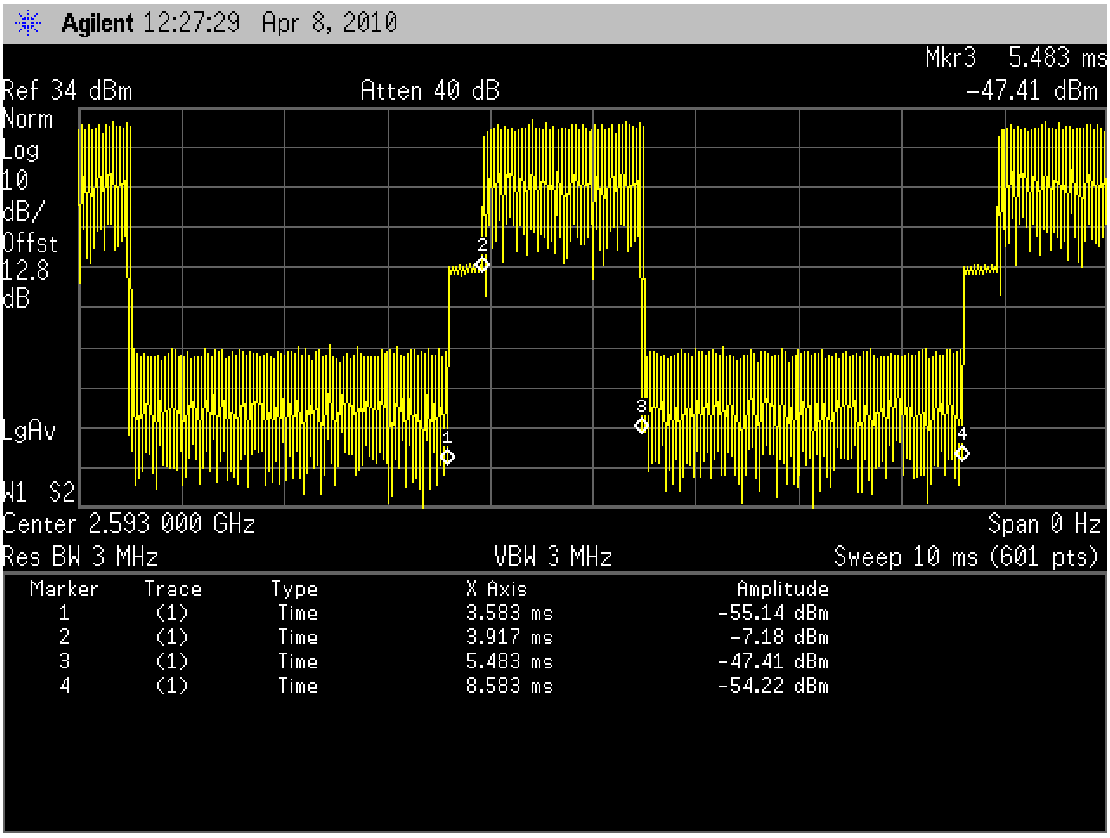
Duty Cycle of device (FCC ID: QISBM328C) on antenna 1

Bandwidth=5MHz, Frequency=2593MHz							
Modulation	Mark Information(ms)				15 symbols time of UL (ms)	Burst length (ms)	Duty Cycle
	Mark1	Mark2	Mark3	Mark4			
QPSK1/2	3.583	3.917	5.483	8.583	1.566	5	31.32%
16QAM1/2	2.85	3.183	4.75	7.85	1.567	5	31.34%

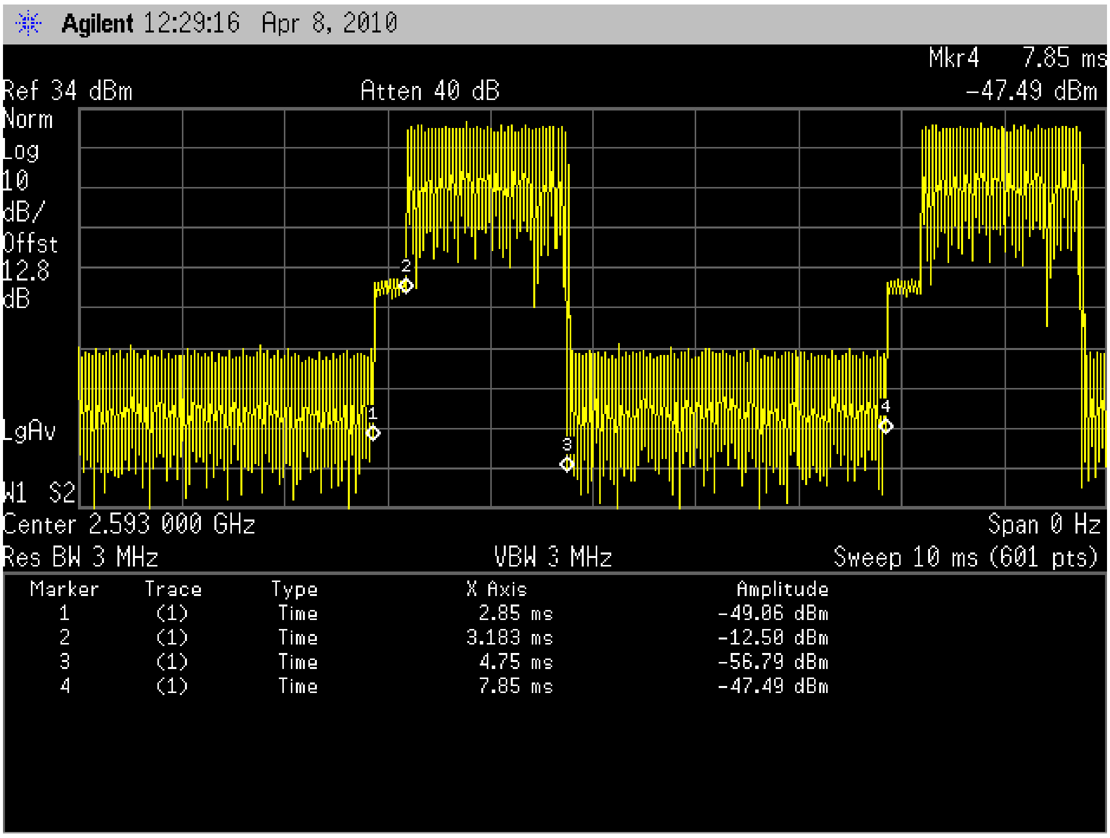
Bandwidth=10MHz, Frequency=2593MHz							
Modulation	Mark Information(ms)				15 symbols time of UL (ms)	Burst length (ms)	Duty Cycle
	Mark1	Mark2	Mark3	Mark4			
QPSK1/2	2.417	2.75	4.317	7.417	1.567	5	31.34％
16QAM1/2	3.083	3.45	5.017	8.083	1.567	5	31.34％

Note: following are the plots of middle channel for Bandwidth 5MHz and 10 MHz for example; plots of high or low channel are available, thanks.

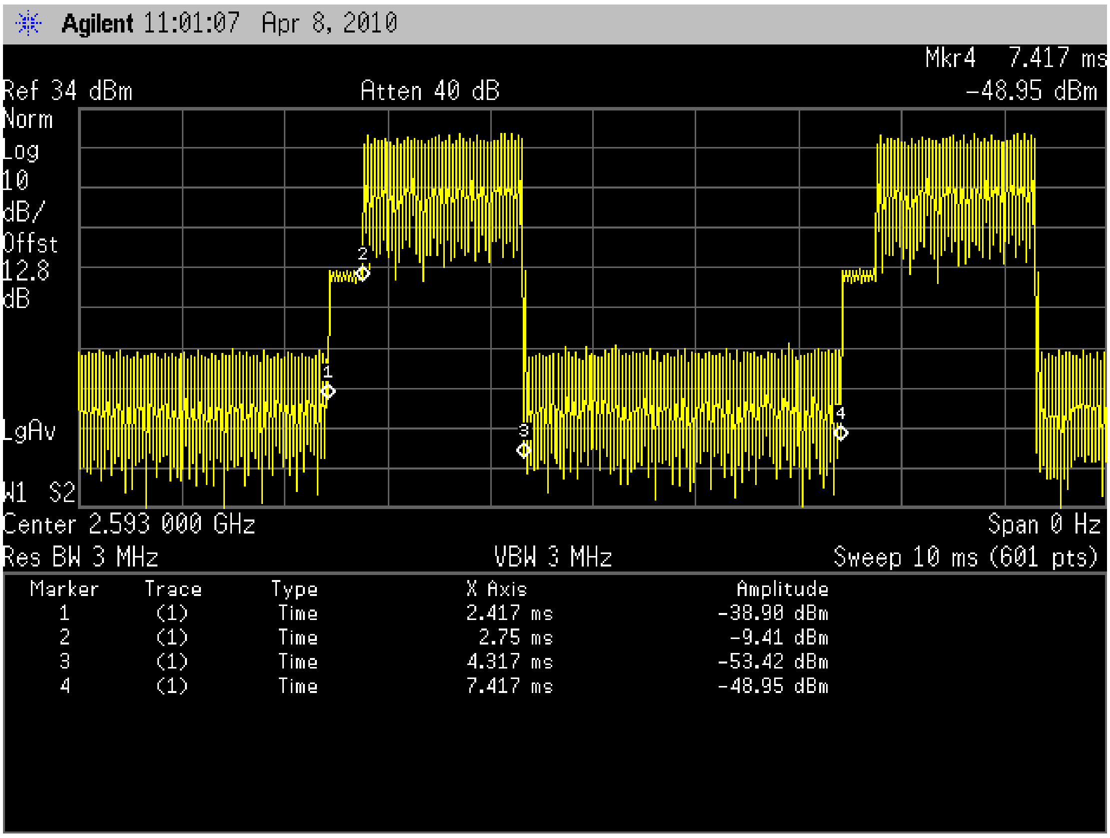
Bandwidth=5MHz, Frequency=2593MHz, Modulation=QPSK1/2



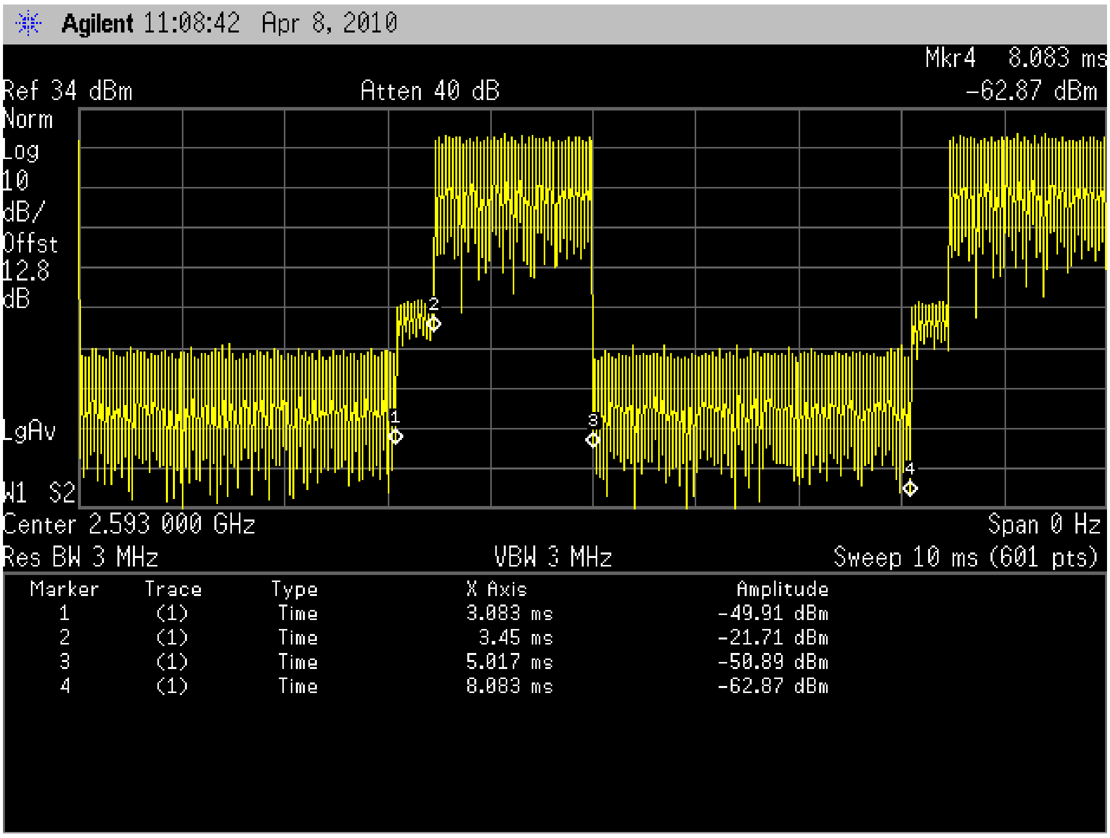
Bandwidth=5MHz, Frequency=2593MHz, Modulation=16QAM1/2



Bandwidth=10MHz, Frequency=2593MHz, Modulation=QPSK1/2



Bandwidth=10MHz, Frequency=2593MHz, Modulation=16QAM1/2

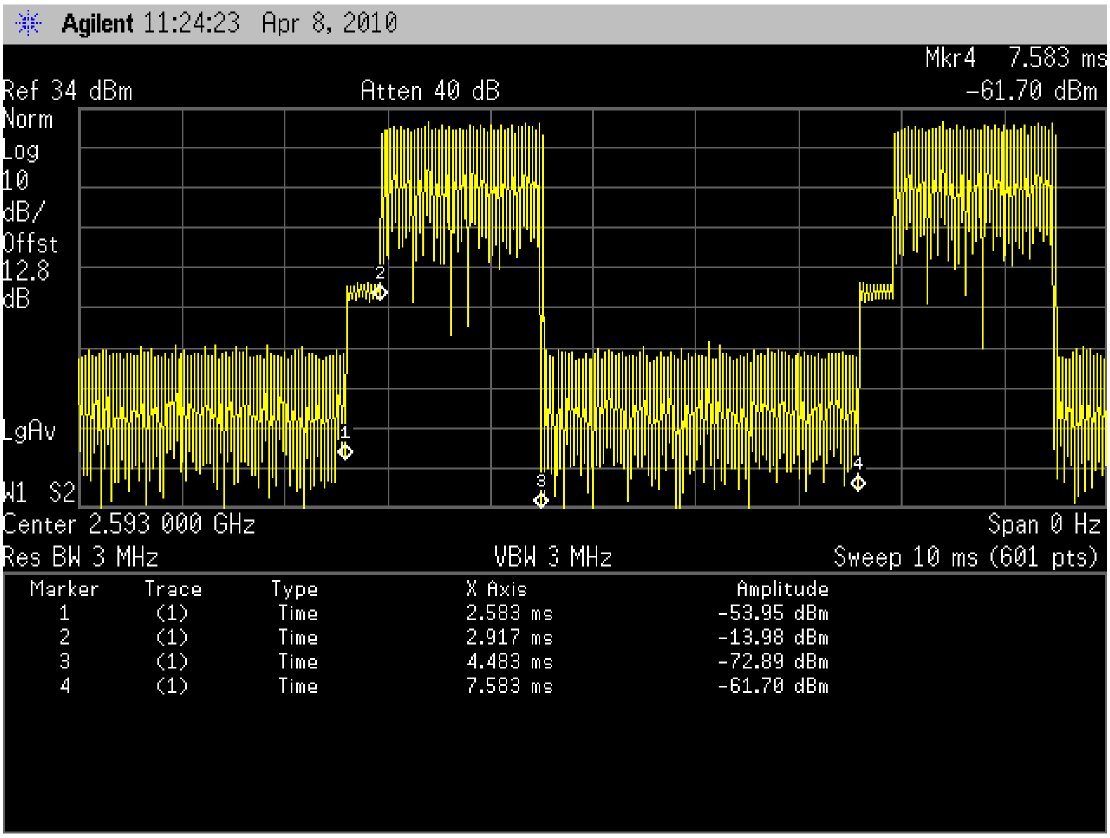


Duty Cycle of device (FCC ID: QISBM328C) on antenna 2

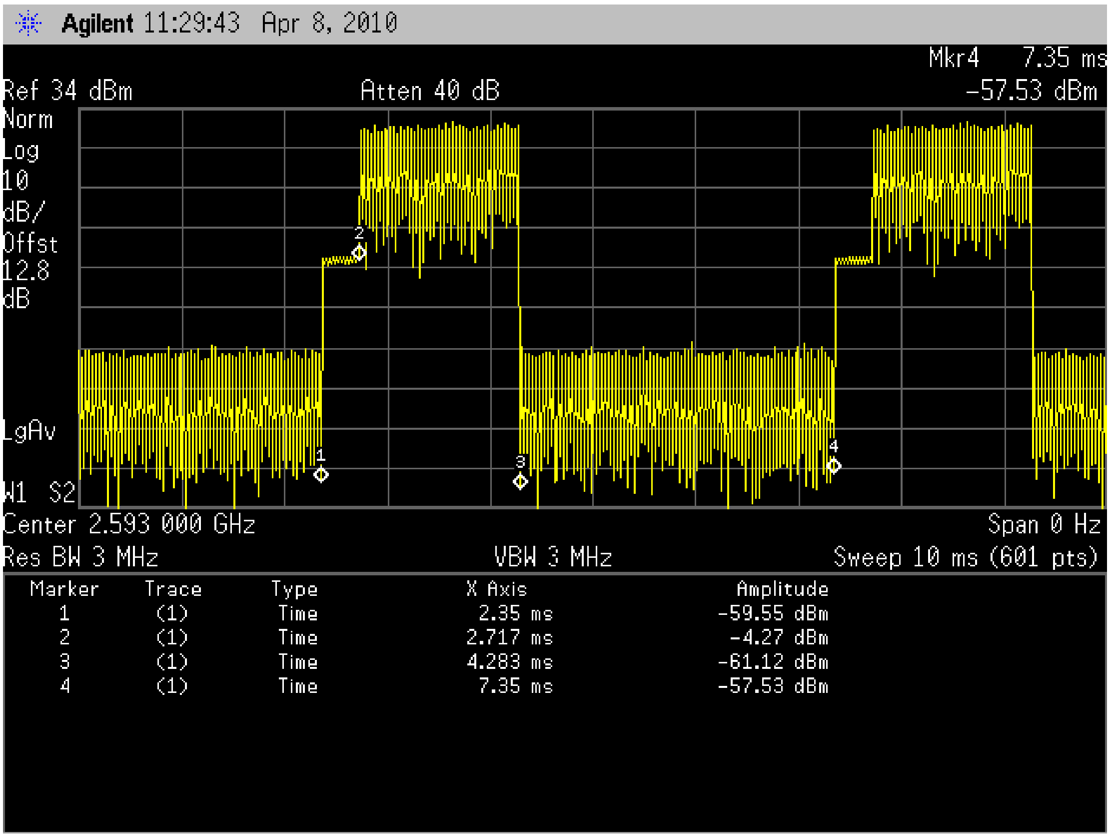
Bandwidth=5MHz, Frequency=2593MHz							
Modulation	Mark Information(ms)				15 symbols time of UL (ms)	Burst length (ms)	Duty Cycle
	Mark1	Mark2	Mark3	Mark4			
QPSK1/2	2.583	2.917	4.483	7.583	1.566	5	31.32%
16QAM1/2	2.35	2.717	4.283	7.35	1.566	5	31.32%
Bandwidth=10MHz, Frequency=2593MHz							
Modulation	Mark Information(ms)				15 symbols time of UL (ms)	Burst length (ms)	Duty Cycle
	Mark1	Mark2	Mark3	Mark4			
QPSK1/2	3.217	3.583	5.15	8.217	1.567	5	31.34%
16QAM1/2	2.45	2.817	4.383	7.45	1.566	5	31.32%

Note: following are the plots of middle channel for Bandwidth 5MHz and 10 MHz for example; plots of high or low channel are available, thanks.

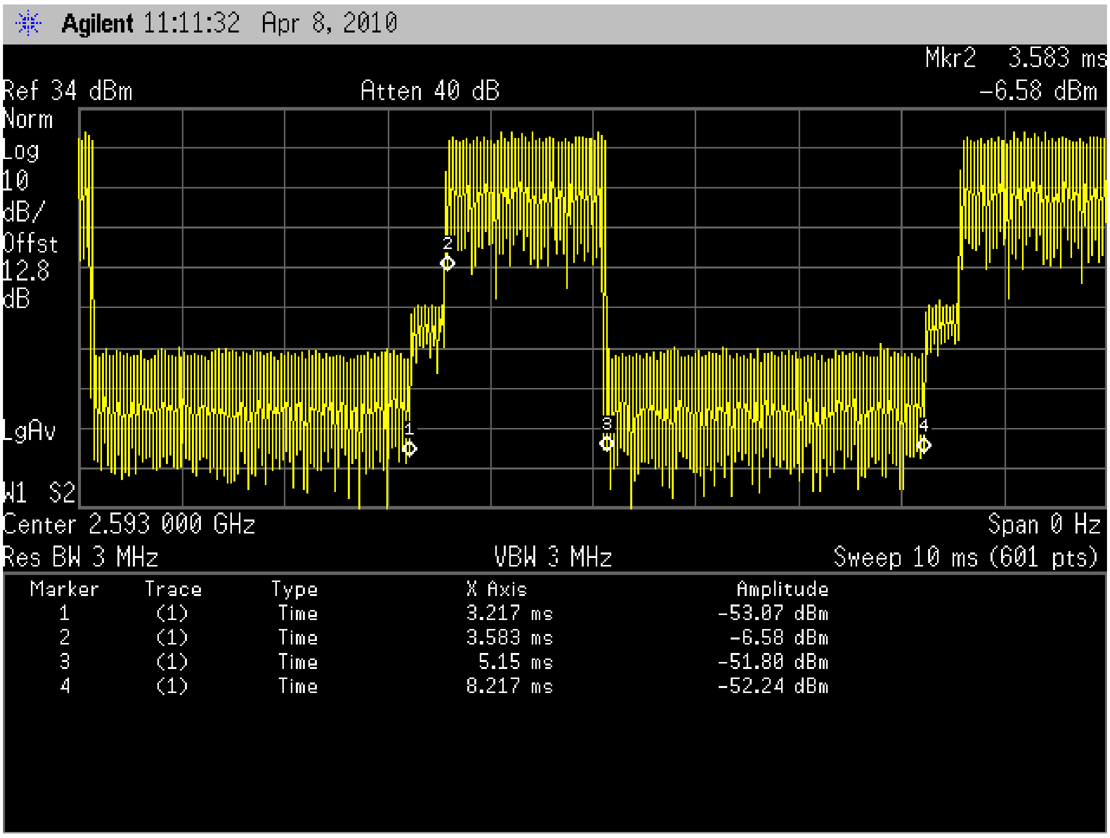
Bandwidth=5MHz, Frequency=2593MHz, Modulation=QPSK1/2



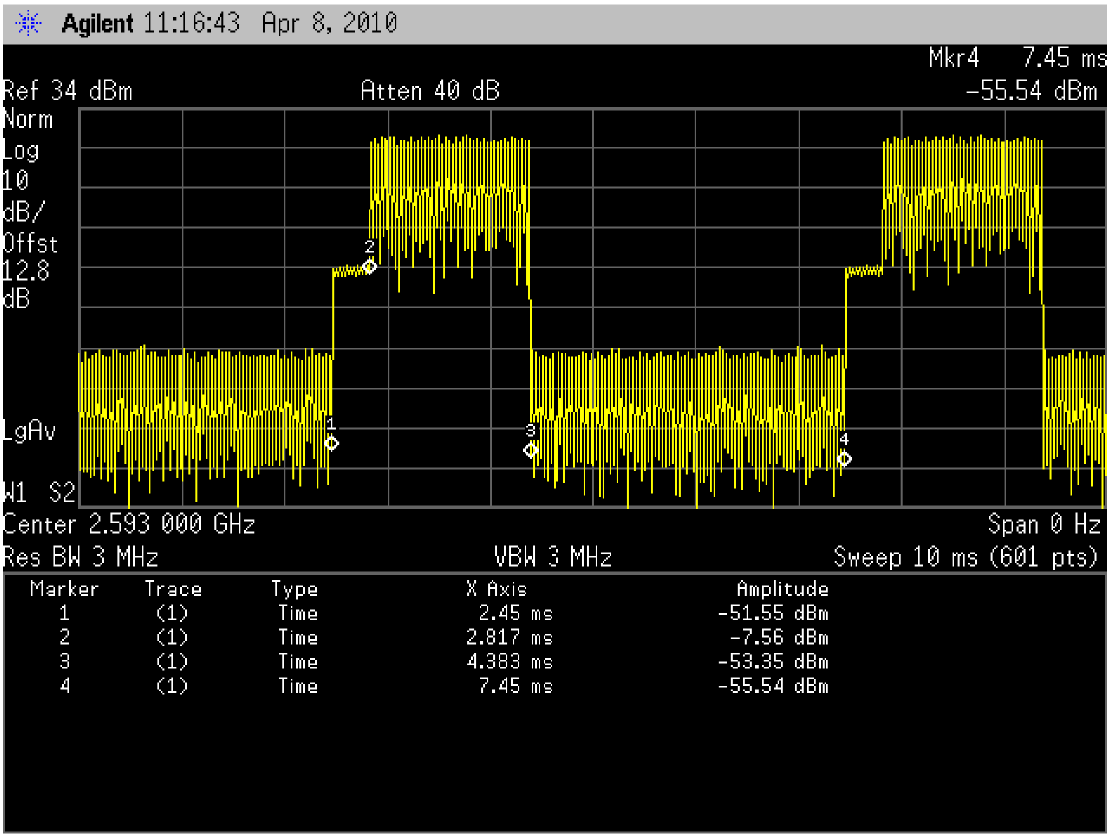
Bandwidth=5MHz, Frequency=2593MHz, Modulation=16QAM1/2



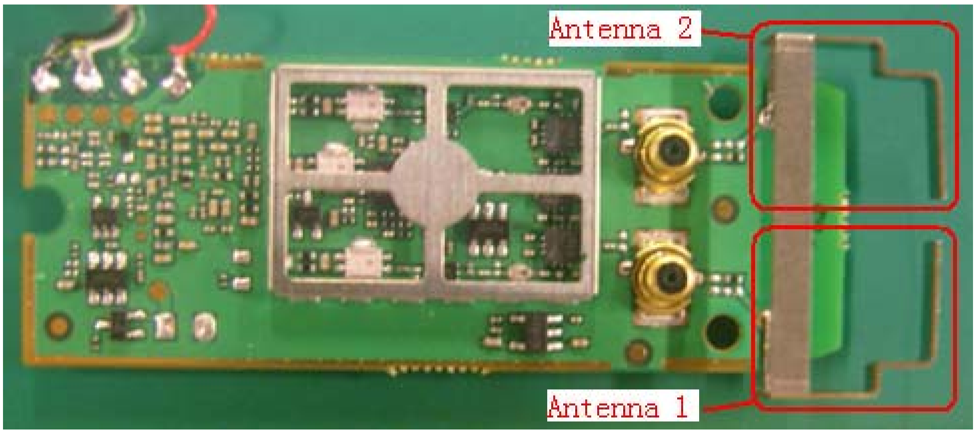
Bandwidth=10MHz, Frequency=2593MHz, Modulation=QPSK1/2



Bandwidth=10MHz, Frequency=2593MHz, Modulation=16QAM1/2



3.2.5 Description of Antenna Location



Antenna 1 and Antenna 2 are for 1Tx2Rx

Antenna 1 and Antenna 2 supports Tx diversity, that means only one Antenna is transmitting every time.

3.2.6 SAR, POWER Linearity Plot

This SAR response plot is done with the distance 5mm between phantom and the bottom of EUT. The BECEEM tool controls the EUT to transmit various average powers, then performs single point peak SAR test at the specified power level. The reported power is average conducted power measured during burst-on period by trigger and gating.

Test condition

Zone Type	PUSC	
DL/UL Ratio	29:18	
Modulation	QPSK1/2 and 16QAM1/2	
Bandwidth	5MHz	10MHz
Frequency	2498.5MHz	2501MHz
Position	Test Position 2, Horizontal down, 5mm	
Antenna	Antenna 1 and Antenna 2	

Note: This is the same setup with the normal SAR measurement which produce the highest raw 1g SAR for 5M and 10M configuration.

Note: For 16QAM modulation, the maximum value of its various powers is 126mW (21dBm maximum rated output power).

Reference line is based on measured SAR value of 12.5 and 0mW.

For 5MHz QPSK1/2 Antenna 1

WiMAX Average output power(mW)	X axis	0	12.5
Measured SAR(mW/g)	Y axis	0	0.0591

Calculation method:

1. Get the slope of the 2 points (0, 0), (12.5, 0.0591)

Slope=M= (0.0591-0)/ (12.5-0) =0.0047

2. Fit the linear equation

Linear equation, Y=M*X+A, A=Y-M*X=0.0591-0.0047*12.5=0

Therefore, Y=M*X, Y is the reference SAR value.

For Example:

If we want to get the reference SAR value of 25mW, only change the "X" of linear equation then the calculated value is the reference SAR value:

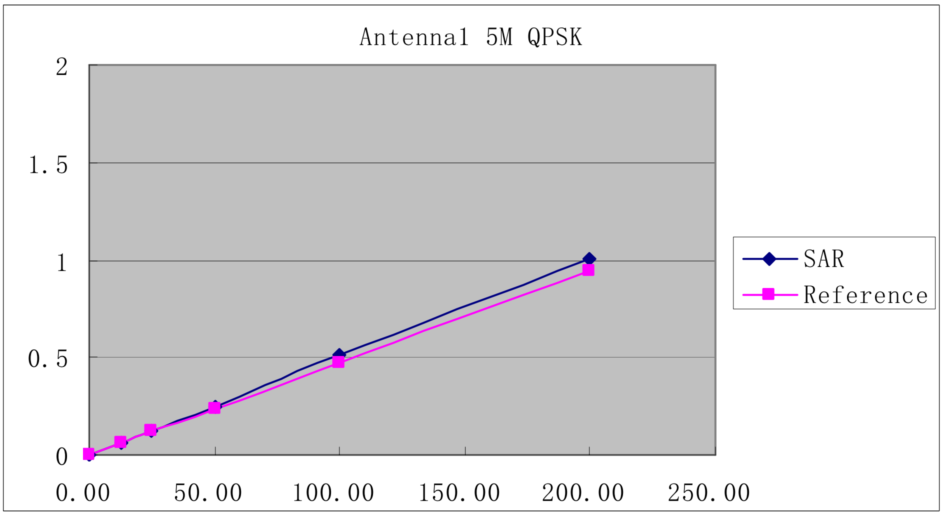
Y=0.0047*25=0.118

SAR value for various output power

Antenna 1

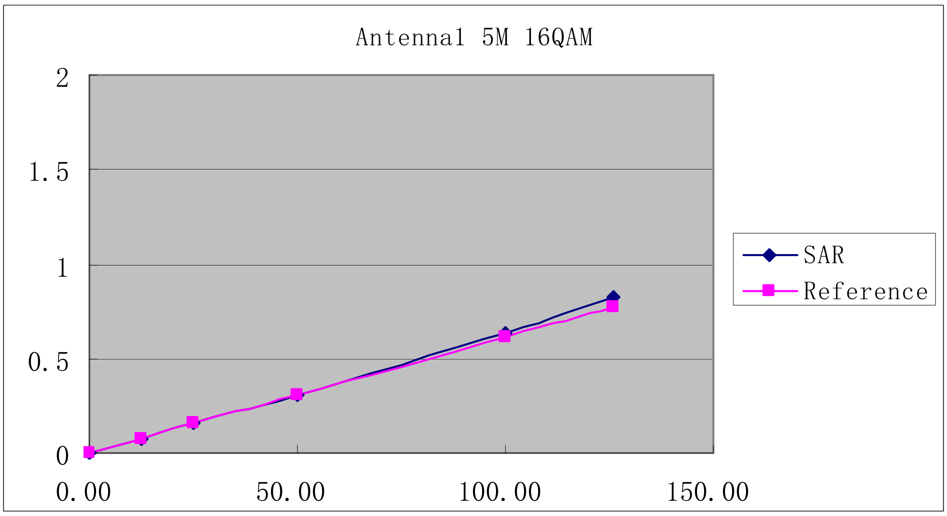
PUSC 5M QPSK1/2

Average power (mW)	12.5	25	50	100	200
Measured Point SAR (mW/g)	0.0591	0.120	0.245	0.509	1.03
Linear Line (SAR)	0.0591	0.1182	0.2364	0.4728	0.9456
Difference (%)	0	1.52	3.64	7.66	8.92



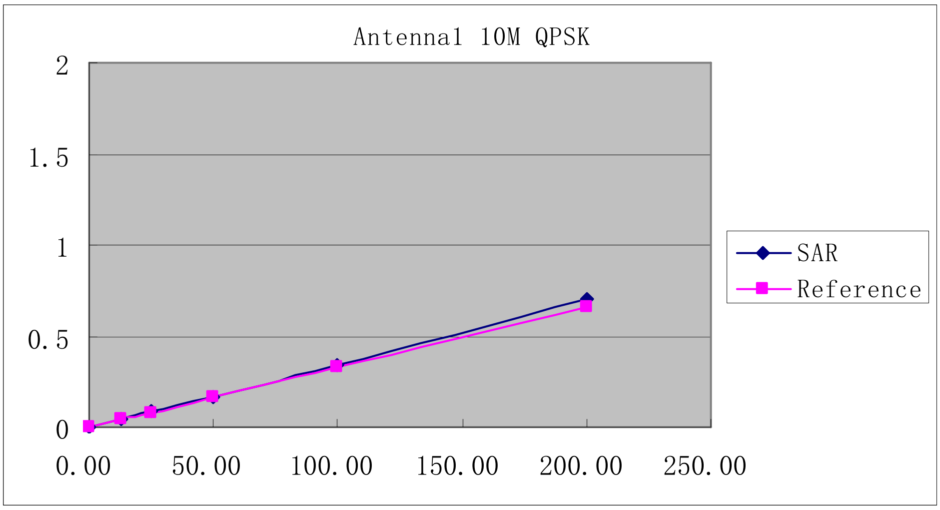
PUSC 5M 16QAM1/2

Average power (mW)	12.5	25	50	100	126
Measured Point SAR (mW/g)	0.0768	0.155	0.311	0.636	0.823
Linear Line (SAR)	0.0768	0.1536	0.3072	0.6144	0.7741
Difference (%)	0	0.91	1.24	3.52	6.36



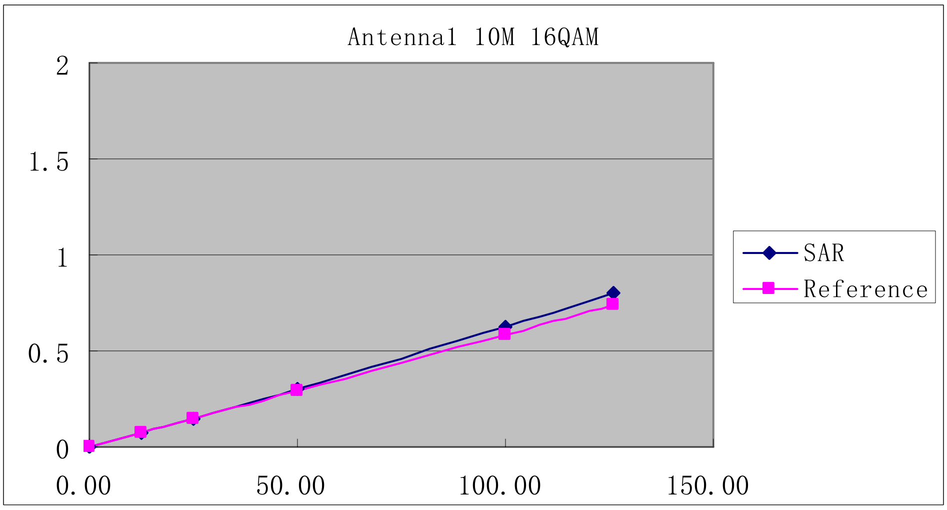
PUSC 10M QPSK1/2

Average power (mW)	12.5	25	50	100	200
Measured Point SAR (mW/g)	0.0409	0.083	0.169	0.342	0.701
Linear Line (SAR)	0.0409	0.0818	0.1636	0.3272	0.6544
Difference (%)	0	1.49	3.02	4.51	7.04



PUSC 10M 16QAM1/2

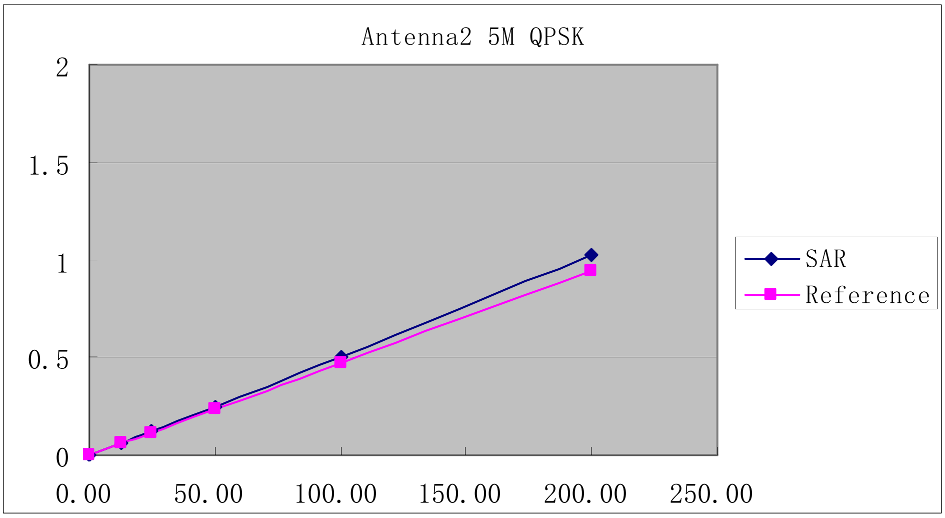
Average power (mW)	12.5	25	50	100	126
Measured Point SAR (mW/g)	0.0732	0.149	0.304	0.623	0.805
Linear Line (SAR)	0.0732	0.1464	0.2928	0.5856	0.7379
Difference (%)	0	1.59	3.9	6.33	9.09



Antenna 2

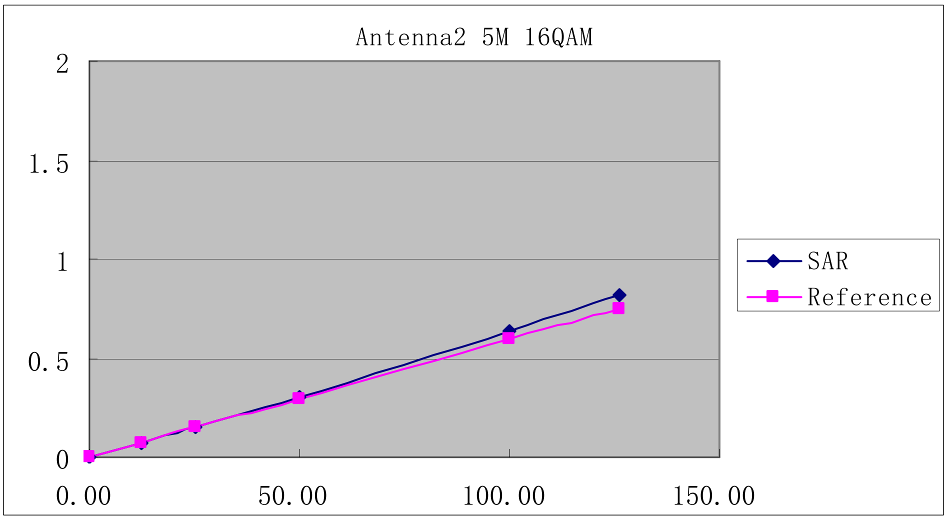
PUSC 5M QPSK1/2

Average power (mW)	12.5	25	50	100	200
Measured Point SAR (mW/g)	0.0587	0.120	0.245	0.504	1.03
Linear Line (SAR)	0.0587	0.1174	0.2348	0.4696	0.9392
Difference (%)	0	2.05	4.18	7.22	9.67



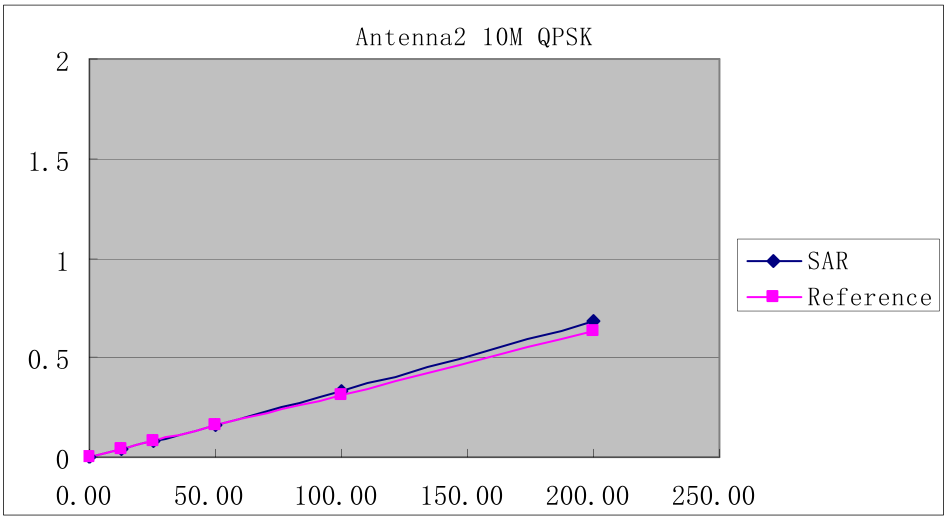
PUSC 5M 16QAM1/2

Average power (mW)	12.5	25	50	100	126
Measured Point SAR (mW/g)	0.0742	0.152	0.308	0.637	0.817
Linear Line (SAR)	0.0742	0.1484	0.2968	0.5936	0.7479
Difference (%)	0	1.90	3.85	7.27	9.24



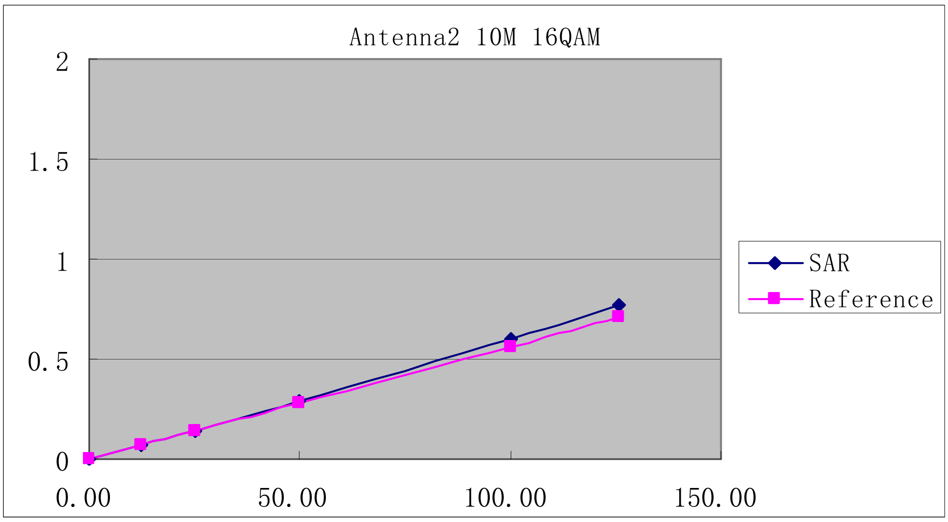
PUSC 10M QPSK1/2

Average power (mW)	12.5	25	50	100	200
Measured Point SAR (mW/g)	0.0395	0.0796	0.163	0.334	0.685
Linear Line (SAR)	0.0395	0.079	0.158	0.316	0.632
Difference (%)	0	0.76	2.99	5.63	8.39



PUSC 10M 16QAM1/2

Average power (mW)	12.5	25	50	100	126
Measured Point SAR (mW/g)	0.07	0.144	0.293	0.601	0.771
Linear Line (SAR)	0.07	0.14	0.28	0.56	0.7056
Difference (%)	0	2.57	4.48	7.30	9.27



Conclusion:

From the above evaluation, it suggests that the SAR result is about 0.76% to 9.67% over estimated depends on the Bandwidth and modulation type.

3.2.7 Worst Orientation Determination

With EUT hold on the worst modulation with on any change in settings, 5 scans with different degrees are performed to evaluate the impact on the orientation.
The measurement result reveal that 180° is the worst orientation as show below:

Test Condition		Horizontal-down
TX Antenna		ANT 2
Modulation Type		QPSK 1/2
SAR Value (W/kg)		
Channel Bandwidth		5MHz
Test Frequency (MHz)		2687.5
Angle	90°	0.213
	135°	0.232
	180°	0.926
	225°	0.12
	270°	0.098

4 CHARACTERISTICS OF THE TEST

4.1 Applicable Limit Regulations

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
It specifies the maximum exposure limit of **1.6 W/kg** as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

4.2 Applicable Measurement Standards

KDB 447498 D01: Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies v03r02

KDB 447498 D02: SAR Measurement Procedures for USB Dongle Transmitters

802.16e/WiMAX SAR Measurement Guidance November 2009（KDB 615223）
They specify the measurement method for demonstration of compliance with the SAR limits for such equipments.

Per lab KDB tracking No: **499162**, following procedure was proposed to and agreed by the commission.

Per lab KDB tracking No: **153646**, following procedure was proposed to and agreed by the commission for USB dongle with a swivel USB connector.

5 OPERATIONAL CONDITIONS DURING TEST

5.1 Schematic Test Configuration

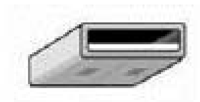
During SAR test of the EUT, it is in continuous emission Mode (Channel Allocated) at Normal Voltage Condition. A communication link is set up with the test mode software, and the EUT is commanded to operate at 23dBm for QPSK and 21dBm for 16QAM (transmitting power). And the EUT has two antennas which can be controlled to transmit by the software also. The two antennas are tested separately for all the cases.

According to the KDB447498 D01 (where the transmission band corresponding to all channels is <200MHz, when the SAR procedures require multiple channels to be tested and the 1-g SAR for the highest output channel is less than 0.4W/Kg, testing for other channels is not required.)
Per LAB KDB tracking number 499162, all the uplink modulation (QPSK and 16QAM), antennas and positions are tested.

<u>Test positions and host laptops</u>
The EUT is tested at the following 5 test positions all with the distance = 5mm between the EUT and the phantom bottom (the pictures are showed in the additional document: 2010EEE00967_Picture):

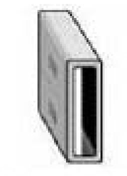
<u>Horizontal-up</u>

Picture 2-a: Test position 1



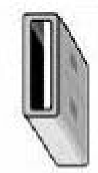
<u>Horizontal-down</u>

Picture 2-b: Test position 2



<u>Vertical-Front</u>

Picture 2-c: Test position 3



<u>Vertical-Back</u>

Picture 2-d: Test position 4

<u>Dongle-Tail</u>

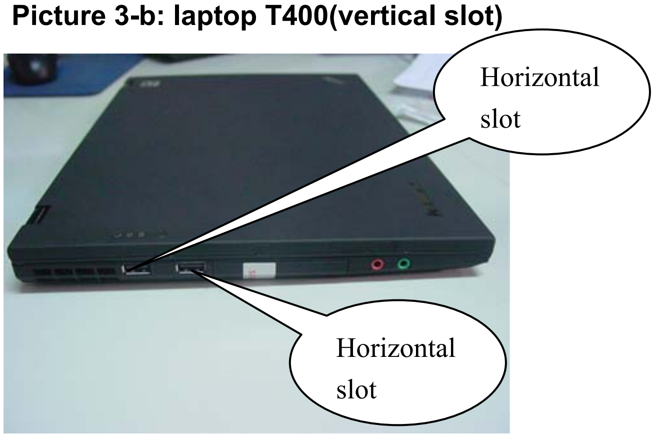
Picture 2-e: Test position 5

The following host laptop are used during the tests: IBM T400's vertical USB slot is used to test the 2 vertical orientations, and Lenovo X301's 2 horizontal USB slots are used to test the 2 horizontal orientations separately.

Picture 3-a: laptop T400

Picture 3-b: laptop T400(vertical slot)

Picture 3-c: laptop X301

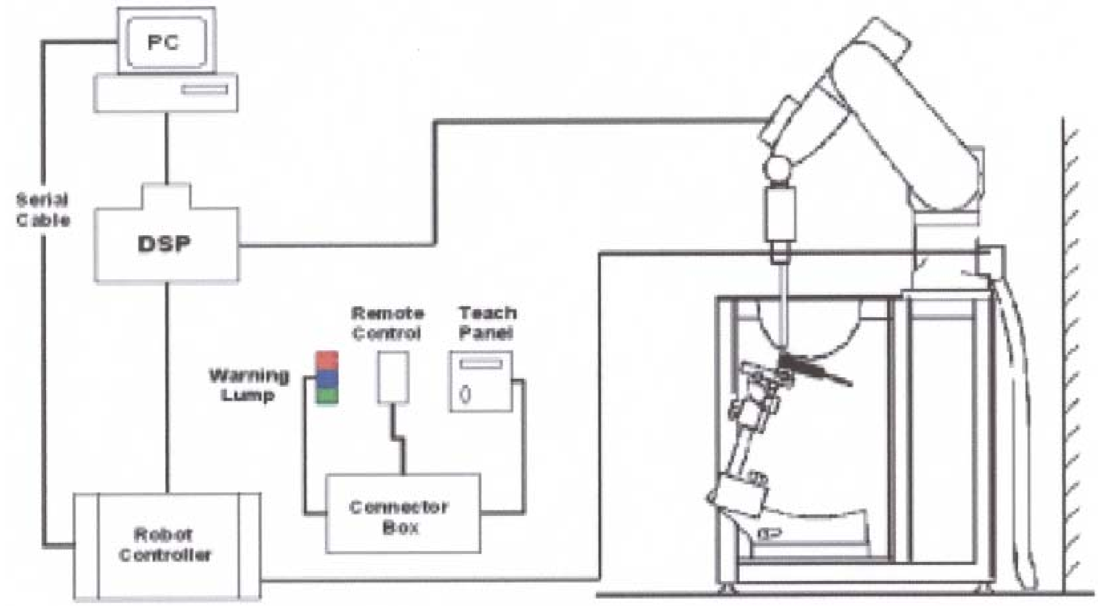


Picture 3-d: laptop (2 horizontal slots)

5.2 SAR Measurement Set-up

These measurements were performed with the automated near-field scanning system DASY4 Professional from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9m), which positions the probes with a positional repeatability of better than ± 0.02mm. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines (length =300mm) to the data acquisition unit.

A cell controller system contains the power supply, robot controller, teaches pendant (Joystick), and remote control, is used to drive the robot motors. The PC consists of the Micron Pentium III 800 MHz computer with Windows 2000 system and SAR Measurement Software DASY4 Professional, A/D interface card, monitor, mouse, and keyboard. The Stäubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.



Picture 4: SAR Lab Test Measurement Set-up

The DAE consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.

5.3 Dasy4 E-field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the standard procedure with an accuracy of better than ± 10%. The spherical isotropy was evaluated and found to be better than ± 0.25dB. The version number of DASY4 software is Version 4.7, Build 80.

EX3DV4 Probe Specification

Construction	Symmetrical design with triangular core
	Interleaved sensors
	Built-in shielding against static charges
	PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Basic Broad Band Calibration in air
	Conversion Factors (CF) for HSL 2450 and HSL 2600
	Additional CF for other liquids and frequencies upon request
Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)

Picture 5: EX3DV4 E-field

Directivity	± 0.2 dB in HSL (rotation around probe axis)
	± 0.3 dB in tissue material (rotation normal to probe axis)
Dynamic Range	5 μW/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 10 mm)
	Tip diameter: 2.5 mm (Body: 10 mm)
	Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz
	Dosimetry in strong gradient fields
	Compliance tests of mobile phones

Picture6:EX3DV4 E-field probe

5.4 E-field Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure with accuracy better than ± 10%. The spherical isotropy was evaluated and found to be better than ± 0.25dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.
The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies bellow 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

Where: Δt = Exposure time (30 seconds),
C = Heat capacity of tissue (brain or muscle),
ΔT = Temperature increase due to RF exposure.

Or

$$SAR = \frac{|E|^2 \sigma}{\rho}$$

Where:
σ = Simulated tissue conductivity,
ρ = Tissue density (kg/m^3).

Picture 7: Device Holder

5.5 Other Test Equipment

5.5.1 Device Holder for Transmitters

In combination with the Generic Twin Phantom V3.0, the Mounting Device (POM) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatable positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

5.5.2 Phantom

The Generic Twin Phantom is constructed of a fiberglass shell integrated in a wooden table. The shape of the shell is based on data from an anatomical study designed to determine the maximum exposure in at least 90% of all users. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents the evaporation of the liquid. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot.

Shell Thickness	2±0. l mm
Filling Volume	Approx. 20 liters
Dimensions	810 x l000 x 500 mm (H x L x W)
Available	Special

Picture 8: Generic Twin Phantom

5.6 Equivalent Tissues

The liquid used for the frequency range of 30-6000 MHz consisted of water, sugar, salt and Cellulose. The liquid has been previously proven to be suited for worst-case. The Table 1 shows the detail solution. It’s satisfying the latest tissue dielectric parameters requirements proposed by the IEC 62209-2(Draft).

Table 2: Composition of the Body Tissue Equivalent Matter

MIXTURE %	FREQUENCY 2600MHz
Water	72.37
Glycol monobutyl	27.55
Salt	0.08
Dielectric Parameters Target Value	f=2600MHz ε=52.5 σ=2.16

5.7 System Specifications

Specifications

Positioner: Stäubli Unimation Corp. Robot Model: RX90L

Repeatability: ±0.02 mm

No. of Axis: 6

Data Acquisition Electronic (DAE) System

Cell Controller

Processor: Pentium III

Clock Speed: 800 MHz

Operating System: Windows 2000

Data Converter

Features: Signal Amplifier, multiplexer, A/D converter, and control logic

Software: DASY4 software

Connecting Lines: Optical downlink for data and status info.
Optical uplink for commands and clock

Dipole

2450MHz: IndexSAR IXD-245 SN: 40102

2600MHz: SPEAG D2600V2 SN: 1012

The Dipoles have been calibrated. Please reference "ANNEX G" for the Calibtation Certification Report.

6 TEST RESULTS

All the measurements are performed with the liquid of Body 2600MHz in this report, because the liquid of Body 2600MHz is applicable for 2450MHz and 2600MHz simultaneity.

6.1 Dielectric Performance

Table 3: Dielectric Performance of Body Tissue Simulating Liquid

Measurement is made at temperature 23.3 °C and relative humidity 40%.
Liquid temperature during the test: 22.5°C

/	**Frequency**	**Permittivity ε**	**Conductivity σ (S/m)**
Target value	2450 MHz	52.7	1.95
	2600 MHz	52.5	2.16
Measurement value (Average of 10 tests)	2450 MHz (2010-5-24)	52.1	1.93
	Deviation	-1.14%	-1.03%
	Limit of Deviation	**5%**	**5%**
	2600 MHz (2010-5-24)	51.7	2.12
	Deviation	-1.52%	-1.85%
	Limit of Deviation	**5%**	**5%**
	2450 MHz (2010-5-25)	52.1	1.94

	Deviation	-1.14%	-0.51%
	Limit of Deviation	**5%**	**5%**
	2600 MHz (2010-5-25)	51.7	2.13
	Deviation	-1.52%	-1.39%
	Limit of Deviation	**5%**	**5%**

6.2 System Validation

Table 4: System Validation of Body

Measurement is made at temperature 23.3 °C and relative humidity 40%.
Liquid temperature during the test: 22.5°C

Liquid parameters	Dipole calibration Target value	**Frequency**		**Permittivity ε**		**Conductivity σ (S/m)**	
		2450 MHz		51.8		1.93	
		2600 MHz		51.5		2.13	
	Actual Measurement value	2450 MHz (2010-5-24)		52.1		1.93	
		Deviation		0.58%		0%	
		Limit of Deviation		**5%**		**5%**	
		2600 MHz (2010-5-24)		51.7		2.12	
		Deviation		0.39%		-0.47%	
		Limit of Deviation		**5%**		**5%**	
		2450 MHz (2010-5-25)		52.1		1.94	
		Deviation		0.58%		0.52%	
		Limit of Deviation		**5%**		**5%**	
		2600 MHz (2010-5-25)		51.7		2.13	
		Deviation		0.39%		0%	
		Limit of Deviation		**5%**		**5%**	
Verification results (normalized to 1W)	**Frequency**	**Target value (W/kg)**		**Measured value (W/kg)**		**Deviation**	
		10 g Average	**1 g Average**	**10 g Average**	**1 g Average**	**10 g Average**	**1 g Average**
	2450 MHz (2010-5-24)	23.28	51.13	23.72	53.2	1.89%	4.05%
	2600 MHz (2010-5-24)	26.8	59.6	26	57.6	-2.99%	-3.36%

	2450 MHz (2010-5-25)	23.28	51.13	23.92	52.8	2.75%	3.27%
	2600 MHz (2010-5-25)	26.8	59.6	26.1	58	-2.61%	-2.68%

Note：Target values are the data of the dipole validation results, please check Annex G for the Dipole Calibration Certificate.

6.3 Summary of Measurement Results

Table 5: SAR Values (5MHz -Antenna 1)

Limit of SAR (W/kg)		**10 g Average**	**1 g Average**	**10 g Average**	**1 g Average**
		2.0	1.6	2.0	1.6
Test Case		**Measurement Result (W/kg)**		**Scaled Result (W/kg)**	
		10 g Average	**1 g Average**	**10 g Average**	**1 g Average**
QPSK 1/2	Position 1, Top frequency (See Figure 1)	0.524	1.03	0.559	1.10
	Position 1, Mid frequency (See Figure 2)	0.493	0.982	0.539	1.07
	Position 1, Bottom frequency (See Figure 3)	0.505	1	0.537	1.06
	Position 2, Top frequency (See Figure 4)	0.385	0.833	0.410	0.8888
	Position 2, Mid frequency (See Figure 5)	0.464	0.994	0.507	1.09
	Position 2, Bottom frequency (See Figure 6)	0.531	1.15	0.565	1.22
	Position 3, Bottom frequency (See Figure 7)	0.125	0.240	0.133	0.255
	Position 4, Bottom frequency (See Figure 8)	0.099	0.181	0.105	0.193
	Position 5, Bottom frequency (See Figure 9)	0.138	0.292	0.147	0.311
16QAM 1/2	Position 1, Top frequency (See Figure 10)	0.471	0.898	0.537	1.02
	Position 1, Mid frequency (See Figure 11)	0.499	0.989	0.549	1.09
	Position 1, Bottom frequency (See Figure 12)	0.438	0.867	0.477	0.943
	Position 2, Top frequency (See Figure 13)	0.364	0.753	0.415	0.858
	Position 2, Mid frequency (See Figure 14)	0.451	0.940	0.497	1.03
	Position 2, Bottom frequency (See Figure 15)	0.423	0.875	0.460	0.952
	Position 3, Bottom frequency (See Figure 16)	0.122	0.233	0.133	0.254
	Position 4, Bottom frequency (See Figure 17)	0.105	0.193	0.114	0.210
	Position 5, Bottom frequency (See Figure 18)	0.140	0.293	0.152	0.319

Table 6: SAR Values (5MHz -Antenna 2)

Limit of SAR (W/kg)		10 g Average	1 g Average	10 g Average	1 g Average
		2.0	1.6	2.0	1.6
Test Case		Measurement Result (W/kg)		Scaled Result (W/kg)	
		10 g Average	1 g Average	10 g Average	1 g Average
QPSK 1/2	Position 1, Top frequency (See Figure 19)	0.527	1.02	0.558	1.08
	Position 1, Mid frequency (See Figure 20)	0.527	1.05	0.562	1.12
	Position 1, Bottom frequency (See Figure 21)	0.538	1.06	0.584	1.15
	Position 2, Top frequency (See Figure 22)	0.432	0.926	0.458	0.981
	Position 2, Mid frequency (See Figure 23)	0.495	1.05	0.528	1.12
	Position 2, Bottom frequency (See Figure 24)	0.534	1.14	0.580	1.24
	Position 3, Top frequency (See Figure 25)	0.099	0.199	0.105	0.211
	Position 4, Top frequency (See Figure 26)	0.316	0.628	0.335	0.665
	Position 4, Mid frequency (See Figure 27)	0.202	0.389	0.215	0.415
	Position 4, Bottom frequency (See Figure 28)	0.104	0.199	0.113	0.216
	Position 5, Top frequency (See Figure 29)	0.144	0.306	0.153	0.324
16QAM 1/2	Position 1, Top frequency (See Figure 30)	0.478	0.963	0.554	1.12
	Position 1, Mid frequency (See Figure 31)	0.543	1.09	0.575	1.15
	Position 1, Bottom frequency (See Figure 32)	0.437	0.854	0.481	0.940
	Position 2, Top frequency (See Figure 33)	0.408	0.860	0.473	0.996
	Position 2, Mid frequency (See Figure 34)	0.460	0.972	0.487	1.03
	Position 2, Bottom frequency (See Figure 35)	0.435	0.922	0.479	1.02
	Position 3, Mid frequency (See Figure 36)	0.140	0.265	0.148	0.281
	Position 4, Top frequency (See Figure 37)	0.319	0.631	0.369	0.731
	Position 4, Mid frequency (See Figure 38)	0.207	0.401	0.219	0.425
	Position 4, Bottom frequency (See Figure 39)	0.104	0.200	0.115	0.220
	Position 5, Mid frequency (See Figure 40)	0.151	0.321	0.160	0.340

Table 7: SAR Values (10MHz -Antenna 1)

Limit of SAR (W/kg)		10 g Average	1 g Average	10 g Average	1 g Average
		2.0	1.6	2.0	1.6
Test Case		Measurement Result (W/kg)		Scaled Result (W/kg)	
		10 g Average	1 g Average	10 g Average	1 g Average
QPSK 1/2	Position 1, Top frequency (See Figure 41)	0.334	0.667	0.352	0.704
	Position 1, Mid frequency (See Figure 42)	0.319	0.619	0.339	0.657
	Position 1, Bottom frequency (See Figure 43)	0.327	0.639	0.366	0.716
	Position 2, Top frequency (See Figure 44)	0.268	0.586	0.283	0.618

	Position 2, Mid frequency (See Figure 45)	0.322	0.691	0.342	0.734
	Position 2, Bottom frequency (See Figure 46)	0.368	0.807	0.412	0.904
	Position 3, Top frequency (See Figure 47)	0.312	0.615	0.329	0.649
	Position 3, Mid frequency (See Figure 48)	0.191	0.363	0.203	0.386
	Position 3, Bottom frequency (See Figure 49)	0.098	0.185	0.110	0.207
	Position 4, Top frequency (See Figure 50)	0.078	0.150	0.082	0.158
	Position 5, Top frequency (See Figure 51)	0.103	0.229	0.109	0.242
16QAM 1/2	Position 1, Top frequency (See Figure 52)	0.413	0.809	0.506	0.991
	Position 1, Mid frequency (See Figure 53)	0.405	0.795	0.458	0.898
	Position 1, Bottom frequency (See Figure 54)	0.387	0.765	0.442	0.874
	Position 2, Top frequency (See Figure 55)	0.324	0.676	0.397	0.828
	Position 2, Mid frequency (See Figure 56)	0.417	0.883	0.471	0.998
	Position 2, Bottom frequency (See Figure 57)	0.427	0.901	0.488	1.03
	Position 3, Mid frequency (See Figure 58)	0.205	0.392	0.232	0.443
	Position 4, Mid frequency (See Figure 59)	0.102	0.188	0.115	0.212
	Position 5, Mid frequency (See Figure 60)	0.127	0.268	0.144	0.303

Table 8: SAR Values (10MHz -Antenna 2)

Limit of SAR (W/kg)		**10 g Average**	**1 g Average**	**10 g Average**	**1 g Average**
		2.0	1.6	2.0	1.6
Test Case		**Measurement Result (W/kg)**		**Scaled Result (W/kg)**	
		10 g Average	**1 g Average**	**10 g Average**	**1 g Average**
QPSK 1/2	Position 1, Top frequency (See Figure 61)	0.334	0.651	0.356	0.693
	Position 1, Mid frequency (See Figure 62)	0.337	0.670	0.355	0.705
	Position 1, Bottom frequency (See Figure 63)	0.344	0.676	0.354	0.695
	Position 2, Top frequency (See Figure 64)	0.300	0.651	0.320	0.693
	Position 2, Mid frequency (See Figure 65)	0.344	0.736	0.362	0.774
	Position 2, Bottom frequency (See Figure 66)	0.359	0.778	0.369	0.800
	Position 3, Bottom frequency (See Figure 67)	0.085	0.160	0.087	0.164
	Position 4, Bottom frequency (See Figure 68)	0.112	0.208	0.115	0.214
	Position 5, Bottom frequency (See Figure 69)	0.137	0.290	0.141	0.298
16QAM 1/2	Position 1, Top frequency (See Figure 70)	0.417	0.843	0.506	1.02
	Position 1, Mid frequency (See Figure 71)	0.484	0.973	0.498	1.00
	Position 1, Bottom frequency (See Figure 72)	0.410	0.803	0.473	0.927
	Position 2, Top frequency (See Figure 73)	0.352	0.742	0.427	0.901
	Position 2, Mid frequency (See Figure 74)	0.443	0.941	0.455	0.967
	Position 2, Bottom frequency (See Figure 75)	0.408	0.872	0.471	1.01
	Position 3, Mid frequency (See Figure 76)	0.120	0.226	0.123	0.232
	Position 4, Mid frequency (See Figure 77)	0.174	0.337	0.179	0.346
	Position 5, Mid frequency (See Figure 78)	0.135	0.285	0.139	0.294

6.4 Enhanced energy coupling at increased separation distances

From the 6.3 measurement results, the maximum measurement SAR is at the case of Antenna 1 5MHz QPSK Position 2 Bottom Frequency (Table 5), and the maximum scaled SAR is at the case of Antenna 2 5MHz QPSK Position 2 Bottom Frequency (Table 6), both of them are evaluated for the enhanced energy coupling.

Table 9: SAR Values (5MHz, QPSK1/2, Antenna 1)

Different Test Position	Distance of EUT to Phantom	Channel	Measurement Result (W/kg)	50% of initial position SAR (W/kg)	125% of initial position SAR (W/kg)
Test Position 2	Initial position	Bottom	1.10	0.55	1.375
	10mm		0.456		

Table 10: SAR Values (5MHz, QPSK1/2, Antenna 2)

Different Test Position	Distance of EUT to Phantom	Channel	Measurement Result (W/kg)	50% of initial position SAR (W/kg)	125% of initial position SAR (W/kg)
Test Position 2	Initial position	Bottom	1.20	0.600	1.50
	10mm		0.500		

Note:

1. The probe tip location is fixed at the distance of 2mm from the phantom surface.
2. When the device position with the highest point SAR is > 25% of that measured at the initial position, a complete 1-g SAR evaluation is required for this configuration.
3. A single point SAR is measured for each of these device positions until the SAR is less than 50% of that measured at the initial position.

6.5 Conclusion

Localized Specific Absorption Rate (SAR) of this portable wireless device has been measured in all cases requested by the relevant standards cited in Clause 4.2 of this report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 4.1 of this test report.

The maximum measurement SAR value is **1.15** W/Kg obtained at the case of **Antenna 1 5MHz QPSK Position 2 Bottom frequency (Table 5)**, and the maximum scaled SAR value is **1.24**W/Kg obtained at the case of **Antenna 2 5MHz QPSK Position 2 Bottom frequency (Table 6)**.

7 Measurement Uncertainty

7.1 System Validation Uncertainties

In the table below, the system validation uncertainty with respect to the analytically assessed SAR value of a dipole source as given in the IEEE 1528 standard is given. This uncertainty is smaller than the expected uncertainty for mobile phone measurements due to the simplified setup and the symmetric field distribution.

No.	Error Description	Type	Tolerance (±%)	Probability Distribution	Divisor	c_i	Standard Uncertainty (±%) u_i'	Degree of freedom V_{eff} or v_i
	Measurement system							
1	－Probe calibration	B	5.9	N	1	1	5.9	∞
2	－Axial isotropy of the probe	B	4.7	R	$\sqrt{3}$	0.5	1.4	∞
3	－Hemisphere isotropy of the probe	B	9.4	R	$\sqrt{3}$	0.5	2.7	∞
4	－Boundary effect	B	1.0	R	$\sqrt{3}$	1	0.58	∞
5	－Probe linearity	B	4.7	R	$\sqrt{3}$	1	2.7	∞
6	－Detection limit	B	1.0	R	$\sqrt{3}$	1	0.58	∞
7	－Readout electronics	B	0.3	N	1	1	0.30	∞
8	－Response time	B	0.8	R	$\sqrt{3}$	1	0.46	∞
9	－Integration time	B	0.625	R	$\sqrt{3}$	1	0.36	∞
10	－RF Ambient Noise	B	3.0	R	$\sqrt{3}$	1	1.73	∞
11	－RF Ambient Reflections	B	3.0	R	$\sqrt{3}$	1	1.73	∞
12	－Probe Positioner Mechanical Tolerance	B	0.4	R	$\sqrt{3}$	1	0.23	∞
13	－ Probe Positioning with respect to Phantom Shell	B	2.9	R	$\sqrt{3}$	1	1.7	∞

14	— Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	B	3.9	R	$\sqrt{3}$	1	2.3	∞
	Dipole Related							
15	—Dipole Axis to Liquid Distance	B	2.0	R	$\sqrt{3}$	1	1.2	∞
16	—Input Power Drift	B	5.0	R	$\sqrt{3}$	1	2.9	∞
	Phantom and Tissue Parameters							
17	—Phantom Uncertainty (shape and thickness tolerances)	B	4.0	R	$\sqrt{3}$	1	2.3	∞
18	— liquid conductivity (deviation from target)	B	5.0	R	$\sqrt{3}$	0.64	1.8	∞
19	— liquid conductivity (measurement error)	A	3.3	N	1	0.64	2.1	9
20	-liquid permittivity (deviation from target)	B	5.0	R	$\sqrt{3}$	0.6	1.7	∞
21	— liquid permittivity (measurement error)	A	3.6	N	1	0.6	2.2	9
Combined standard uncertainty		$u_c^{'} = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$		/			9.86	/
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$		N	k=2		19.72	/

7.2 Measurement SAR Procedure Uncertainties

The assessment of spatial peak SAR of the hand handheld devices is according to IEEE 1528 / EN 62209-1. All testing shall comply with following requirements.

- The system is used by an experienced engineer who follows the manual and the guidelines taught during the training provided by SPEAG.
- The probe has been calibrated including probe modulation response parameters for the systems under test within the required period and the stated uncertainty for the relevant frequency bands does not exceed 5.5%(k=1).
- The validation dipole has been calibrated within the required period and the system performance check has been successful.
- The DAE unit has been calibrated within the required period.
- The minimum distance between the probe sensor and inner phantom shell is follow the FCC SAR measurement guidance.

- The operational mode of the DUT is WiMAX and the measurement/integration time per point is >500 ms.
- The dielectric parameters of the liquid have been assessed using Agilent 85070D dielectric probe kit.
- The dielectric parameters are within 5% of the target values.

No.	Error Description	Type	Tolerance (±%)	Probability Distribution	Divisor	c_i	Standard Uncertainty $(\pm\%)\ u_i^{'}$	Degree of freedom V_{eff} or v_i
	Measurement system							
1	—Probe calibration	B	5.9	N	1	1	5.9	∞
2	—Axial isotropy of the probe	B	4.7	R	$\sqrt{3}$	0.5	1.4	∞
3	— Hemisphere isotropy of the probe	B	9.4	R	$\sqrt{3}$	0.5	2.7	∞
4	—Boundary effect	B	1.0	R	$\sqrt{3}$	1	0.58	∞
5	—Probe linearity	B	4.7	R	$\sqrt{3}$	1	2.7	∞
6	—Detection limit	B	1.0	R	$\sqrt{3}$	1	0.58	∞
7	—Readout electronics	B	0.3	N	1	1	0.30	∞
8	—Response time	B	0.8	R	$\sqrt{3}$	1	0.46	∞
9	—Integration time	B	0.625	R	$\sqrt{3}$	1	0.36	∞
10	—RF Ambient Noise	B	3.0	R	$\sqrt{3}$	1	1.73	∞
11	—RF Ambient Reflections	B	3.0	R	$\sqrt{3}$	1	1.73	∞
12	—Probe Positioner Mechanical Tolerance	B	0.4	R	$\sqrt{3}$	1	0.23	∞
13	— Probe Positioning with respect to Phantom Shell	B	2.9	R	$\sqrt{3}$	1	1.7	∞
14	— Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	B	3.9	R	$\sqrt{3}$	1	2.3	∞

	Test sample Related							
15	–Test Sample Positioning	A	3.3	N	1	1	3.3	5
16	–Device Holder	A	4.1	N	1	1	4.1	5
17	–Output Power Variation - SAR drift measurement	B	5.0	R	$\sqrt{3}$	1	2.9	∞
	Phantom and Tissue Parameters							
18	–Phantom Uncertainty (shape and thickness tolerances)	B	4.0	R	$\sqrt{3}$	1	2.3	∞
19	–liquid conductivity (deviation from target)	B	5.0	R	$\sqrt{3}$	0.64	1.8	∞
20	– liquid conductivity (measurement error)	A	3.3	N	1	0.64	2.1	9
21	-liquid permittivity (deviation from target)	B	5.0	R	$\sqrt{3}$	0.6	1.7	∞
22	– liquid permittivity (measurement error)	A	3.6	N	1	0.6	2.2	9
Combined standard uncertainty		$u_c^{'} = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$		/			11.1	/
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$		N	k=2		22.2	/

8 MAIN TEST INSTRUMENTS

Table 11: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	HP 8753E	US38433212	August 29,2009	One year
02	Power meter	NRVD	101253	June 19, 2009	One year
03	Power sensor	NRV-Z5	100333		
04	Power sensor	NRV-Z6	100011	September 1, 2009	One year
05	Signal Generator	E4438C	MY45092879	June 19, 2009	One Year
06	Amplifier	VTL5400	0505	No Calibration Requested	
07	E-field Probe	SPEAG EX3DV4	3617	July 9, 2009	One year
08	DAE	SPEAG DAE4	771	November 19, 2009	One year
09	Dipole Validation Kit	SPEAG D2600V2	1012	December 15, 2009	Two years
10	Dipole Validation Kit	IndexSAR IXD-245	40102	October, 2008	Two years

9 INFORMATION ON THE TESTING LABORATORIES

Telecommunication Metrology Center of Ministry of Industry and Information Technology is a test laboratory accredited by **CNAS** for the tests indicated in the Certificate No.**L0442**, and accredited by **DATech** for the tests indicated in the Certificate No.**DGA-PL-114/01-02**.

The laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.
FCC 2.948 Listed: **733176**

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END OF REPORT BODY

ANNEX A MEASUREMENT PROCESS

The evaluation was performed with the following procedure:

Step 1: Measurement of the SAR value at a fixed location above the reference point was measured and was used as a reference value for assessing the power drop.

Step 2: The SAR distribution at the exposed side of the phantom was measured at a distance of 3.9 mm from the inner surface of the shell. The area covered the entire dimension of the flat phantom and the horizontal grid spacing was 10 mm x 10 mm. Based on this data, the area of the maximum absorption was determined by spline interpolation.

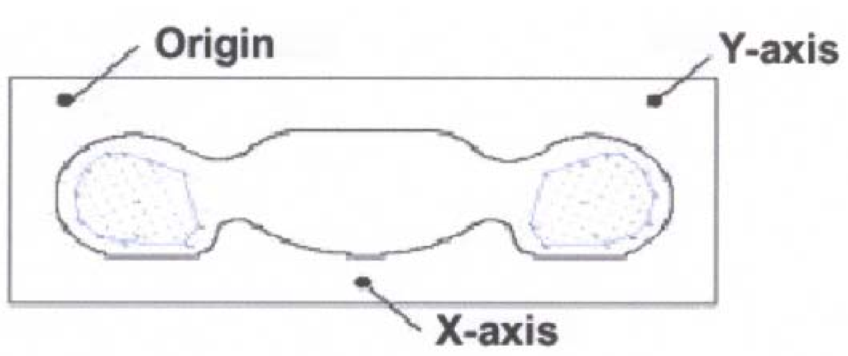
Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7 x 7x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

a. The data at the surface were extrapolated, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

b. The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot"-condition (in x ~ y and z-directions). The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

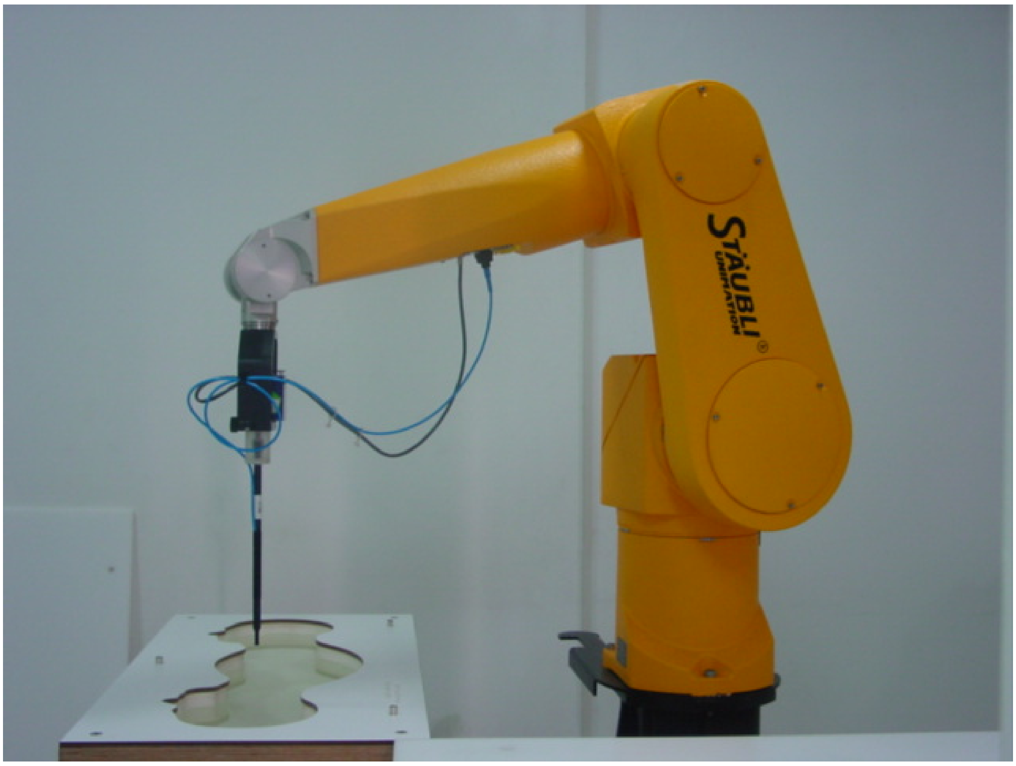
c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Step 4: Re-measurement the SAR value at the same location as in Step 1. If the value changed by more than 5%, the evaluation is repeated.

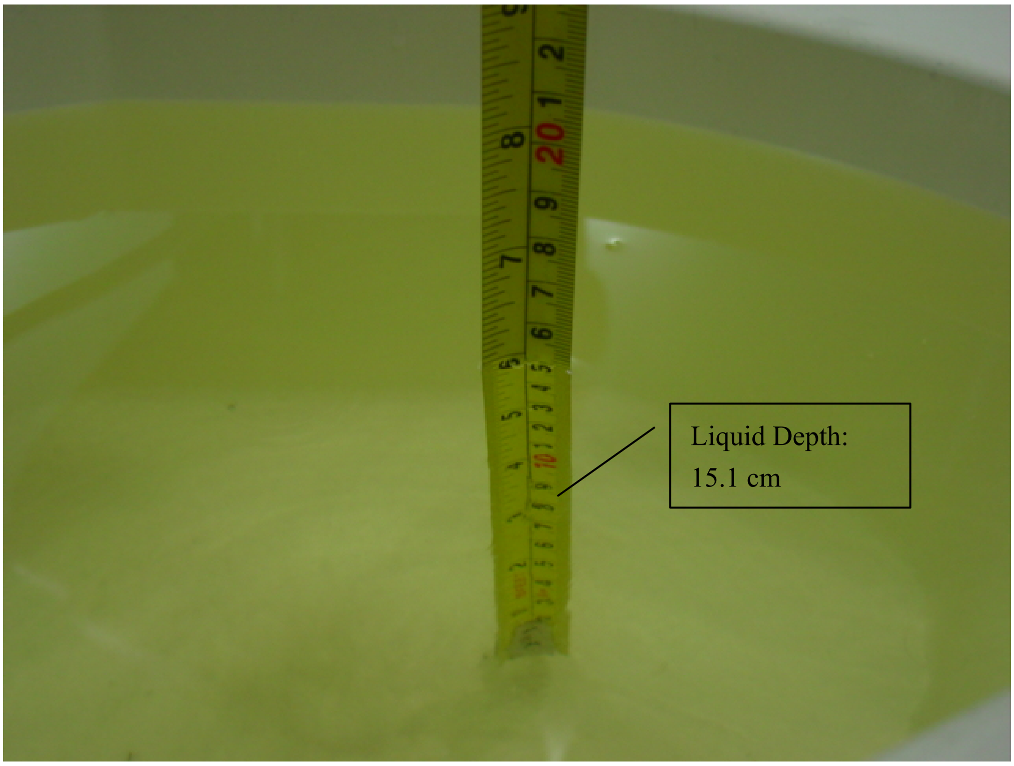


Picture A: SAR Measurement Points in Area Scan

ANNEX B TEST LAYOUT



Picture B1: Specific Absorption Rate Test Layout



Picture B2 Liquid depth in the Flat Phantom (2600MHz)

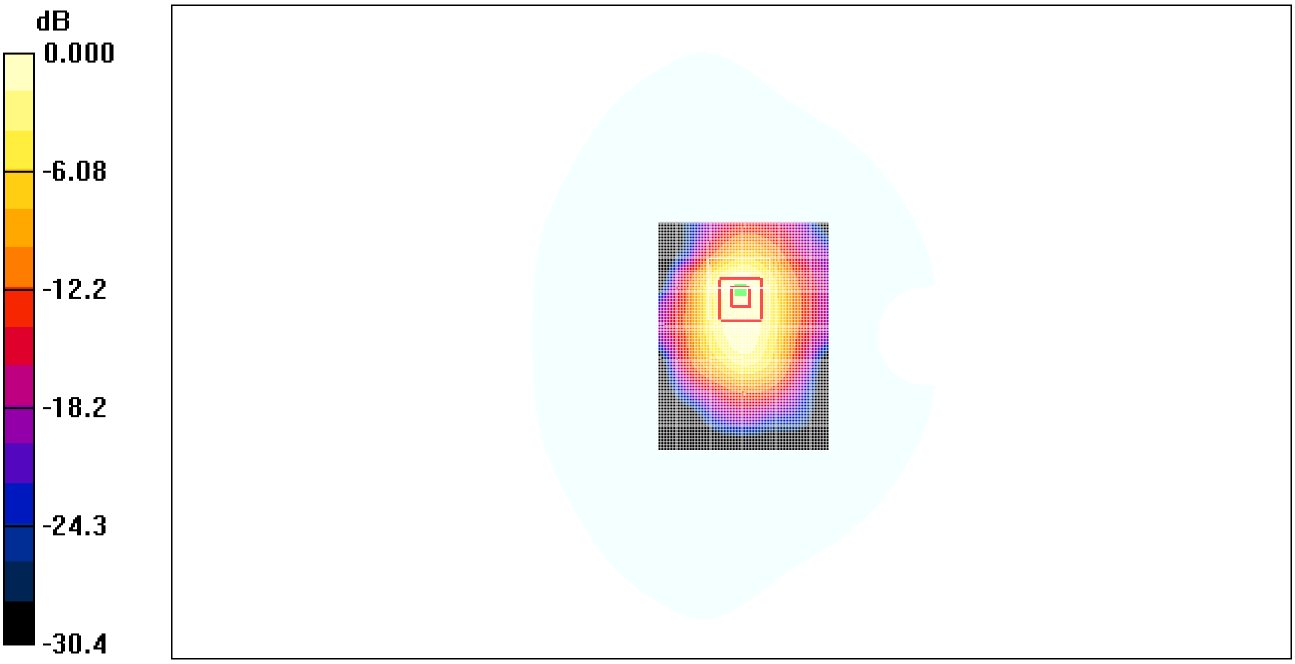
ANNEX C GRAPH RESULTS

5MHz QPSK Test Position 1 High - Antenna 1

Date/Time: 2010-5-24 8:23:56
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.23 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2687.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.21 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.1 V/m; Power Drift = -0.093 dB
Peak SAR (extrapolated) = 1.97 W/kg
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.524 mW/g
Maximum value of SAR (measured) = 1.10 mW/g



0 dB = 1.10mW/g

Fig.1 5MHz QPSK Test Position 1

5MHz QPSK Test Position 1 Middle - Antenna 1

Date/Time: 2010-5-24 8:39:20

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2593 MHz; σ = 2.11 mho/m; εr = 51.7; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.13 mW/g

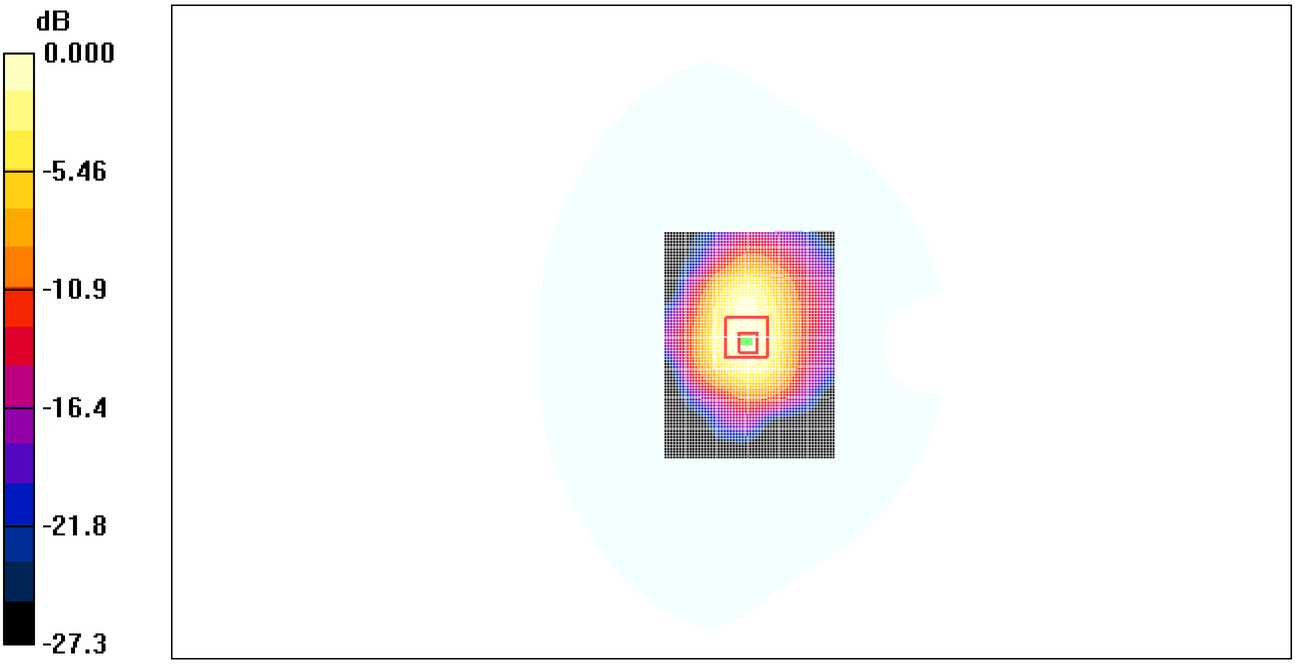
Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 22.0 V/m; Power Drift = -0.033 dB

Peak SAR (extrapolated) = 2.00 W/kg

SAR(1 g) = 0.982 mW/g; SAR(10 g) = 0.493 mW/g

Maximum value of SAR (measured) = 1.06 mW/g



0 dB = 1.06mW/g

Fig.2 5MHz QPSK Test Position 1

5MHz QPSK Test Position 1 Low - Antenna 1

Date/Time: 2010-5-24 8:08:23

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2498.5 MHz; σ = 1.99 mho/m; εr = 51.9; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2498.5 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

Test Position 1 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.17 mW/g

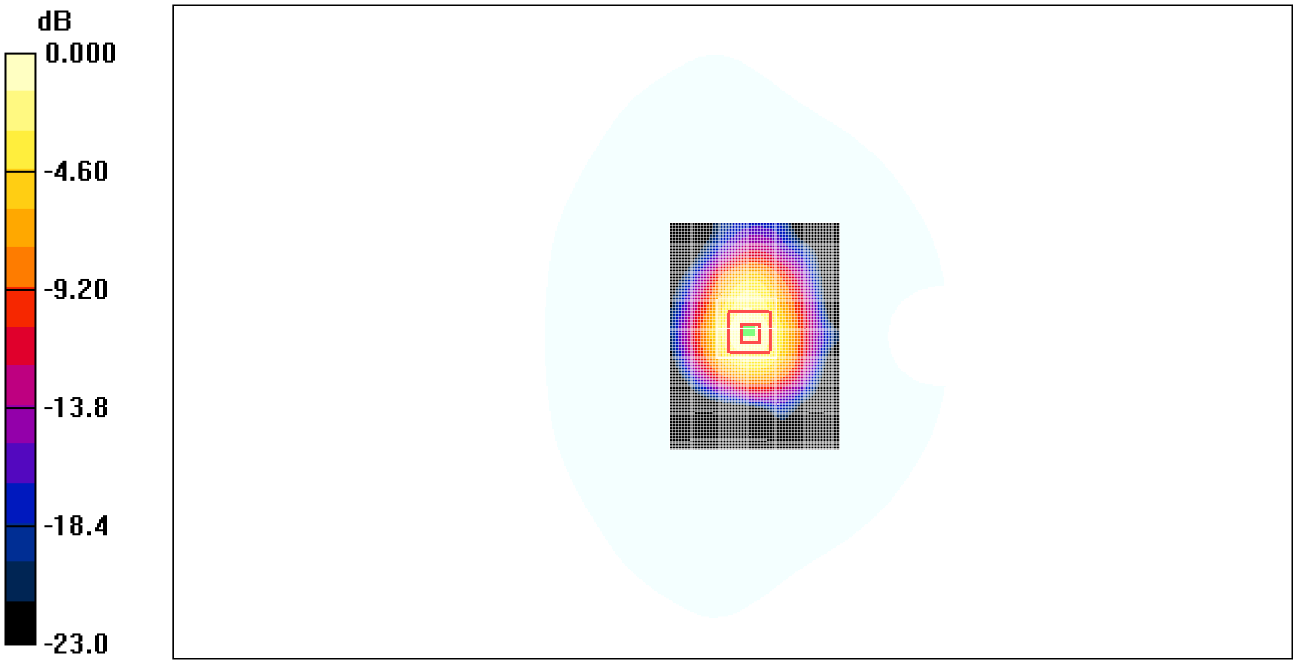
Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 23.4 V/m; Power Drift = -0.017 dB

Peak SAR (extrapolated) = 1.98 W/kg

SAR(1 g) = 1 mW/g; SAR(10 g) = 0.505 mW/g

Maximum value of SAR (measured) = 1.07 mW/g



0 dB = 1.07mW/g

Fig.3 5MHz QPSK Test Position 1

5MHz QPSK Test Position 2 High - Antenna 1

Date/Time: 2010-5-24 9:11:19

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.23 mho/m; εr = 51.4; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2687.5 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.00 mW/g

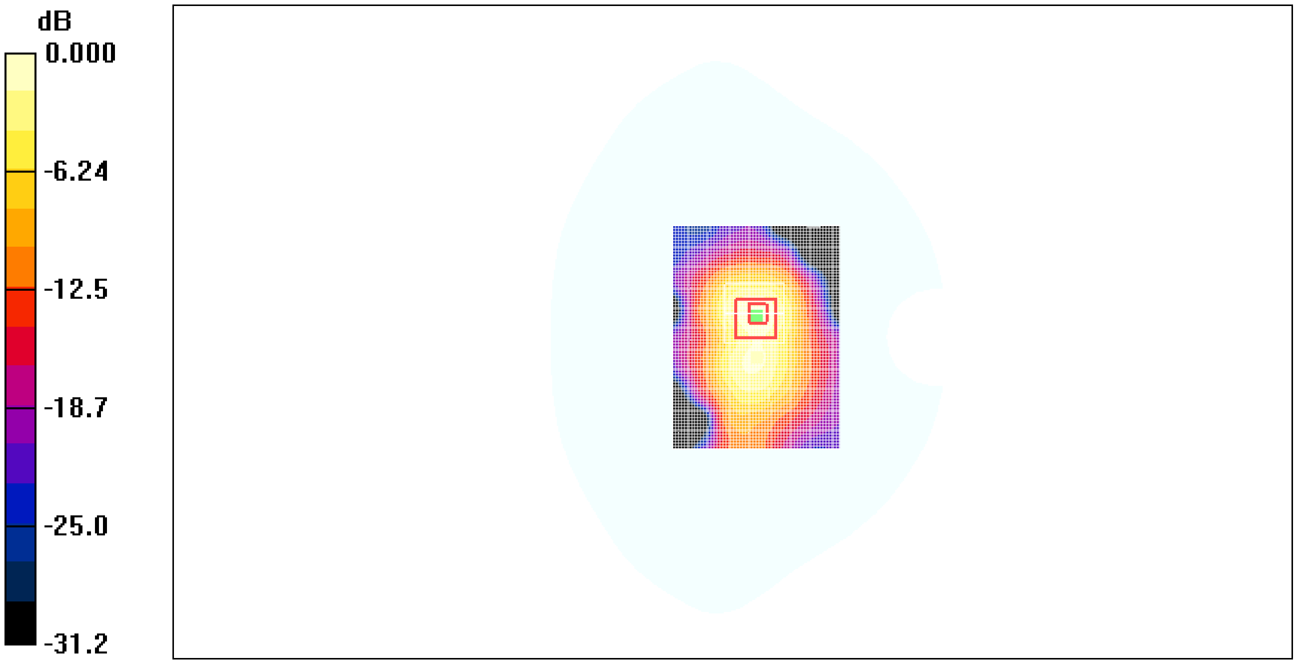
Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.5 V/m; Power Drift = 0.017 dB

Peak SAR (extrapolated) = 1.86 W/kg

SAR(1 g) = 0.833 mW/g; SAR(10 g) = 0.385 mW/g

Maximum value of SAR (measured) = 0.942 mW/g



0 dB = 0.942mW/g

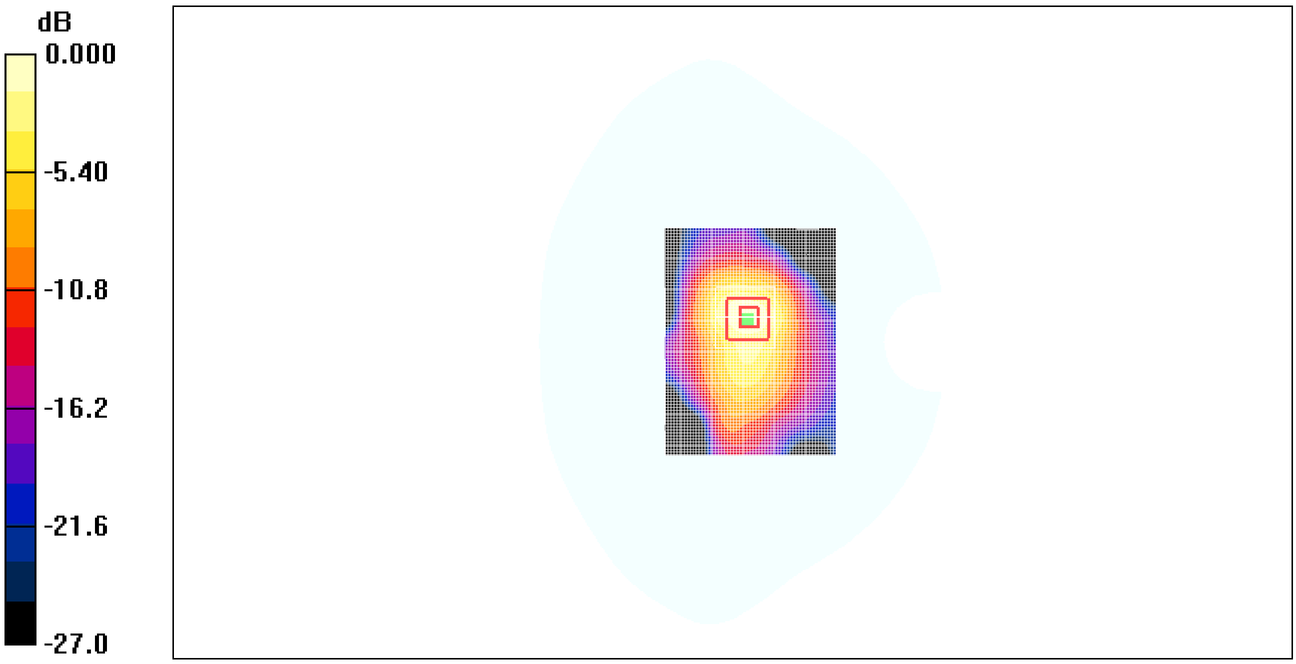
Fig.4 5MHz QPSK Test Position 2

5MHz QPSK Test Position 2 Middle - Antenna 1

Date/Time: 2010-5-24 9:26:37
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.11 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.17 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.6 V/m; Power Drift = 0.048 dB
Peak SAR (extrapolated) = 2.20 W/kg
SAR(1 g) = 0.994 mW/g; SAR(10 g) = 0.464 mW/g
Maximum value of SAR (measured) = 1.12 mW/g



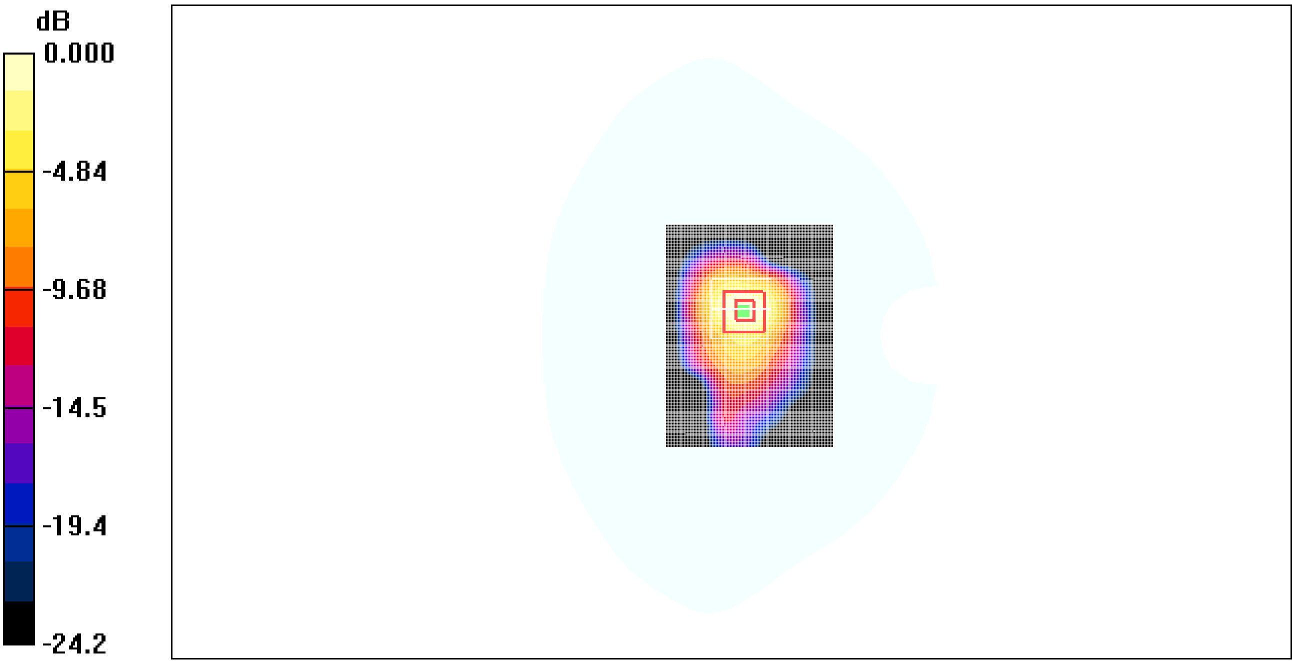
0 dB = 1.12mW/g

Fig.5 5MHz QPSK Test Position 2

5MHz QPSK Test Position 2 Low - Antenna 1
Date/Time: 2010-5-24 8:56:03
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2498.5 MHz; σ = 1.99 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2498.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

Test Position 2 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.39 mW/g

Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.5 V/m; Power Drift = 0.019 dB
Peak SAR (extrapolated) = 2.53 W/kg
SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.531 mW/g
Maximum value of SAR (measured) = 1.30 mW/g



0 dB = 1.30mW/g

Fig.6 5MHz QPSK Test Position 2

5MHz QPSK Test Position 3 Low - Antenna 1

Date/Time: 2010-5-24 9:42:05

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2498.5 MHz; σ = 1.99 mho/m; εr = 51.9; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2498.5 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

Test Position 3 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.270 mW/g

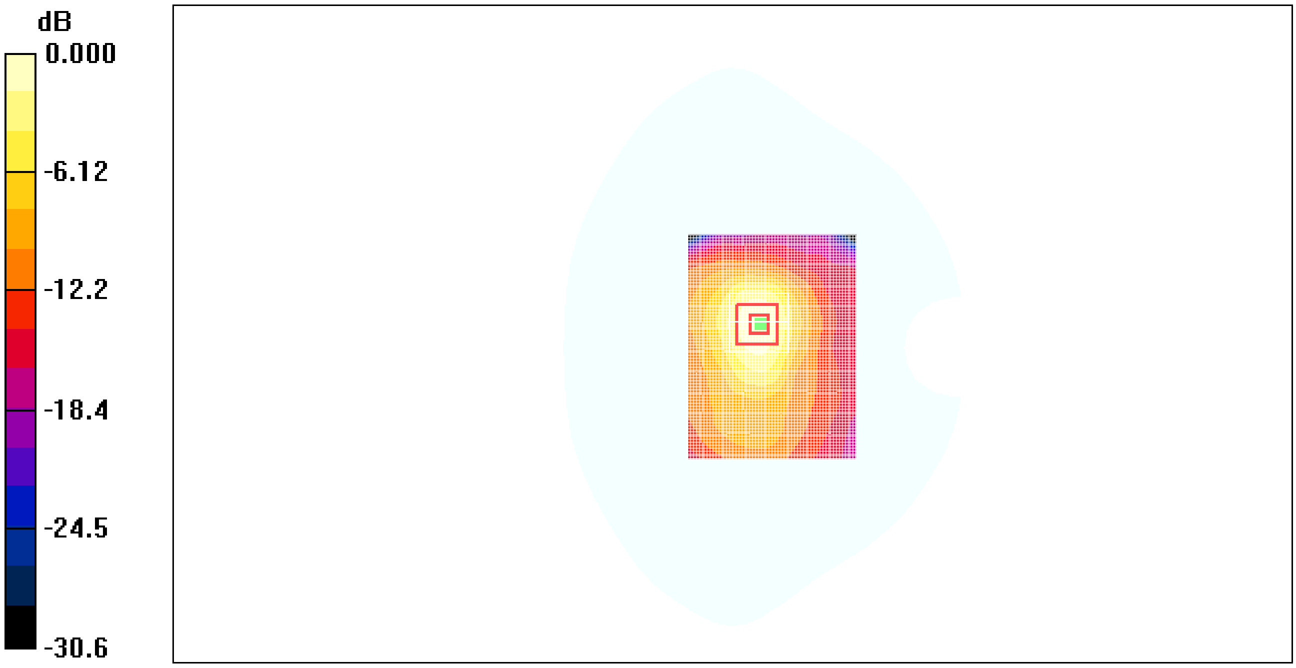
Test Position 3 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.3 V/m; Power Drift = -0.081 dB

Peak SAR (extrapolated) = 0.436 W/kg

SAR(1 g) = 0.240 mW/g; SAR(10 g) = 0.125 mW/g

Maximum value of SAR (measured) = 0.269 mW/g



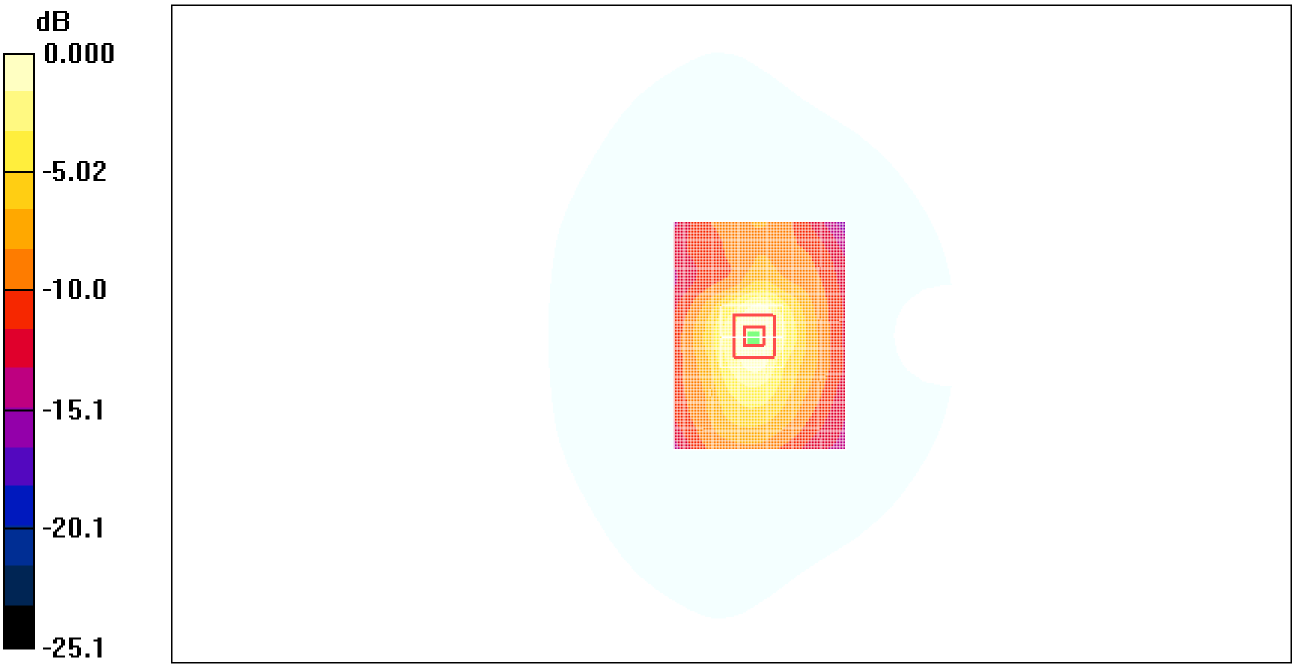
0 dB = 0.269mW/g

Fig.7 5MHz QPSK Test Position 3

5MHz QPSK Test Position 4 Low - Antenna 1
Date/Time: 2010-5-24 9:57:41
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2498.5 MHz; σ = 1.99 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2498.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

Test Position 4 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.208 mW/g

Test Position 4 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.4 V/m; Power Drift = -0.188 dB
Peak SAR (extrapolated) = 0.324 W/kg
SAR(1 g) = 0.181 mW/g; SAR(10 g) = 0.099 mW/g
Maximum value of SAR (measured) = 0.197 mW/g



0 dB = 0.197mW/g

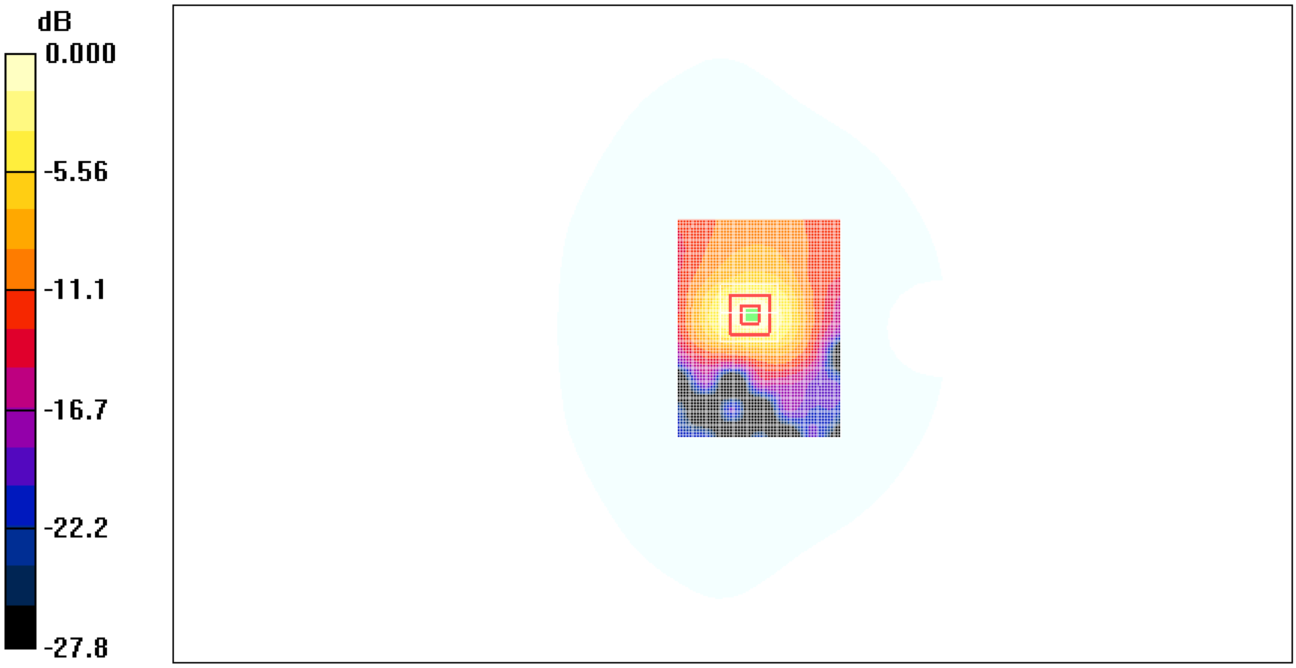
Fig.8 5MHz QPSK Test Position 4

5MHz QPSK Test Position 5 Low - Antenna 1

Date/Time: 2010-5-24 10:13:22
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2498.5 MHz; σ = 1.99 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2498.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

Test Position 5 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.311 mW/g

Test Position 5 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.2 V/m; Power Drift = -0.006 dB
Peak SAR (extrapolated) = 0.581 W/kg
SAR(1 g) = 0.292 mW/g; SAR(10 g) = 0.138 mW/g
Maximum value of SAR (measured) = 0.334 mW/g



0 dB = 0.334mW/g

Fig.9 5MHz QPSK Test Position 5

5MHz 16QAM Test Position 1 High - Antenna 1

Date/Time: 2010-5-24 10:46:25

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.23 mho/m; εr = 51.4; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2687.5 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.08 mW/g

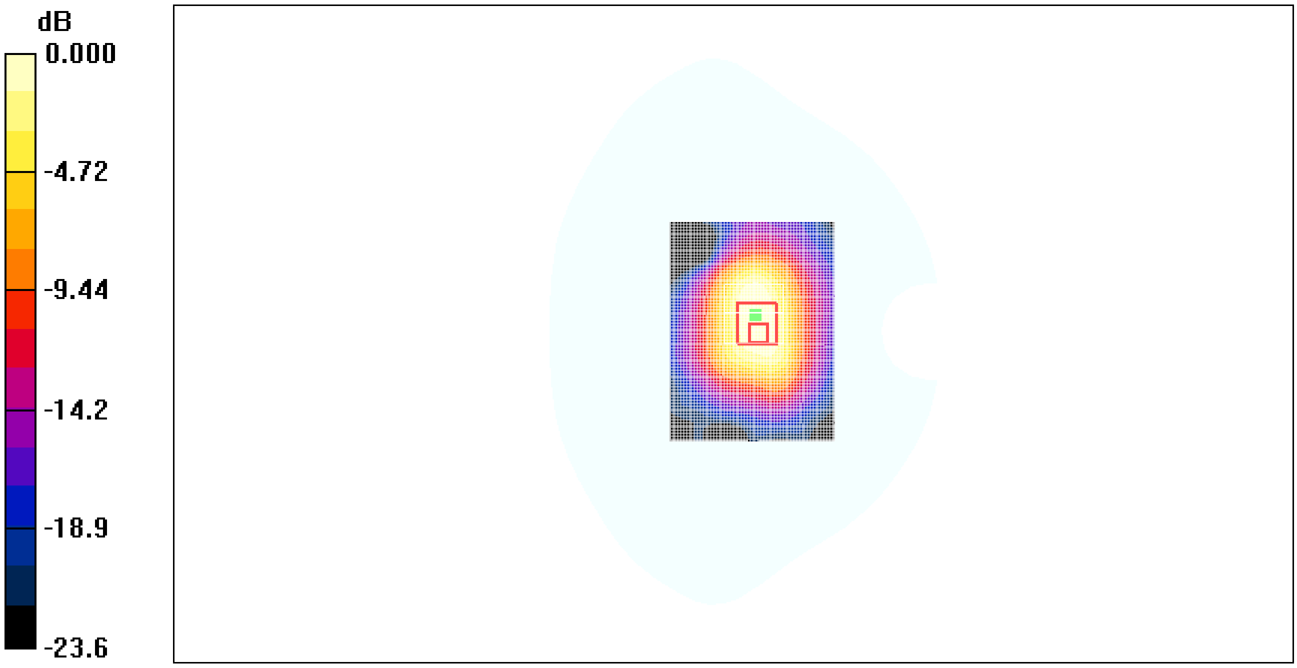
Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.6 V/m; Power Drift = -0.066 dB

Peak SAR (extrapolated) = 1.84 W/kg

SAR(1 g) = 0.898 mW/g; SAR(10 g) = 0.471 mW/g

Maximum value of SAR (measured) = 0.953 mW/g



0 dB = 0.953mW/g

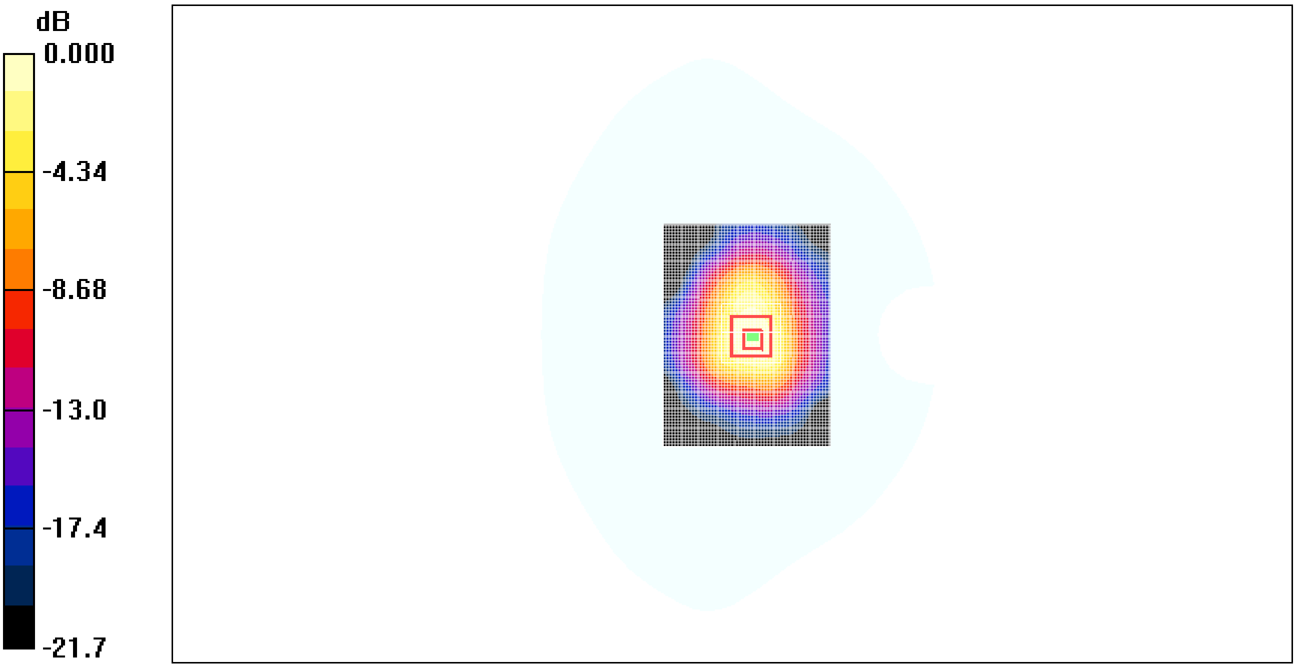
Fig.10 5MHz 16QAM Test Position 1

5MHz 16QAM Test Position 1 Middle - Antenna 1

Date/Time: 2010-5-24 11:01:44
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.11 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.08 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.4 V/m; Power Drift = -0.018 dB
Peak SAR (extrapolated) = 1.99 W/kg
SAR(1 g) = 0.989 mW/g; SAR(10 g) = 0.499 mW/g
Maximum value of SAR (measured) = 1.04 mW/g



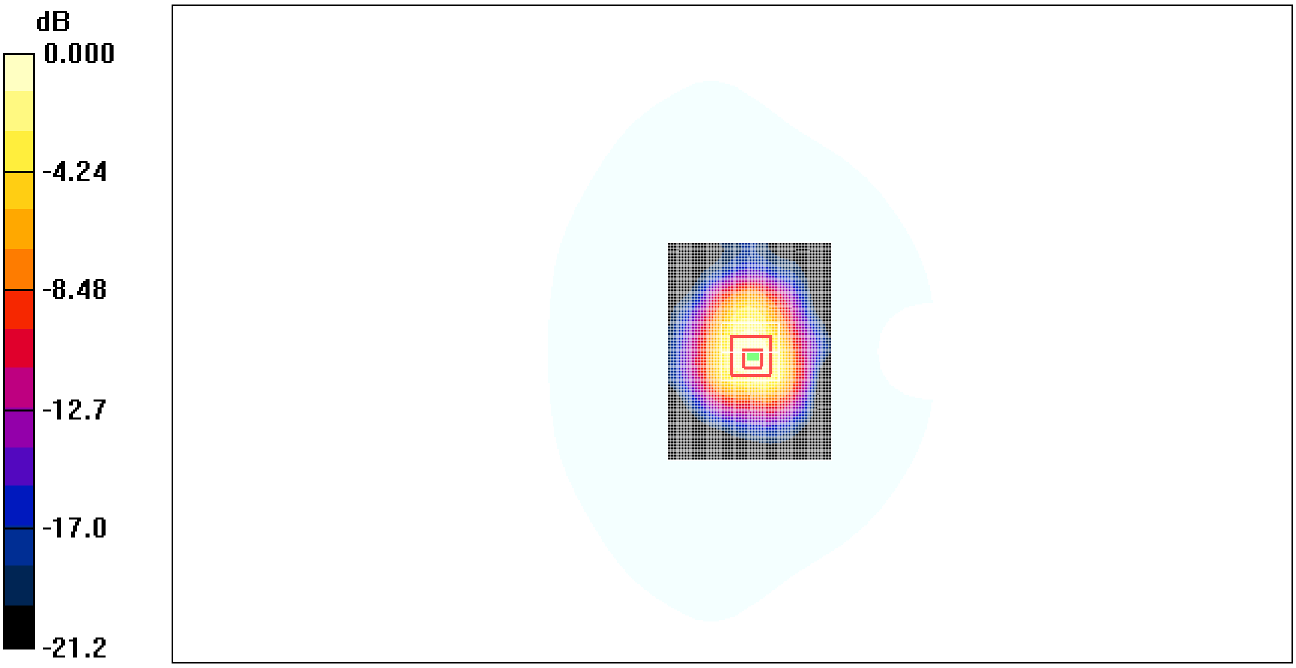
0 dB = 1.04mW/g

Fig.11 5MHz 16QAM Test Position 1

5MHz 16QAM Test Position 1 Low - Antenna 1
Date/Time: 2010-5-24 10:31:09
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2498.5 MHz; σ = 1.99 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2498.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

Test Position 1 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.936 mW/g

Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.5 V/m; Power Drift = -0.078 dB
Peak SAR (extrapolated) = 1.71 W/kg
SAR(1 g) = 0.867 mW/g; SAR(10 g) = 0.438 mW/g
Maximum value of SAR (measured) = 0.924 mW/g



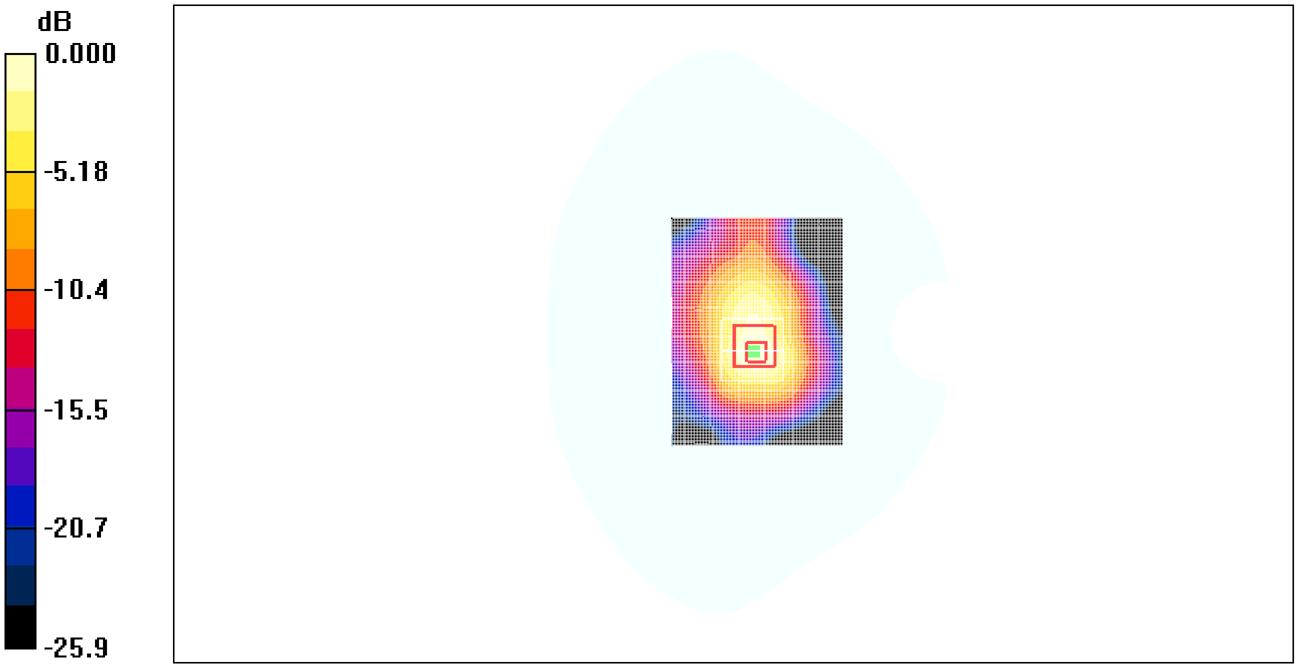
0 dB = 0.924mW/g

Fig.12 5MHz 16QAM Test Position 1

5MHz 16QAM Test Position 2 High - Antenna 1
Date/Time: 2010-5-24 11:33:28
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.23 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2687.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.840 mW/g

Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.6 V/m; Power Drift = 0.036 dB
Peak SAR (extrapolated) = 1.59 W/kg
SAR(1 g) = 0.753 mW/g; SAR(10 g) = 0.364 mW/g
Maximum value of SAR (measured) = 0.837 mW/g



0 dB = 0.837mW/g

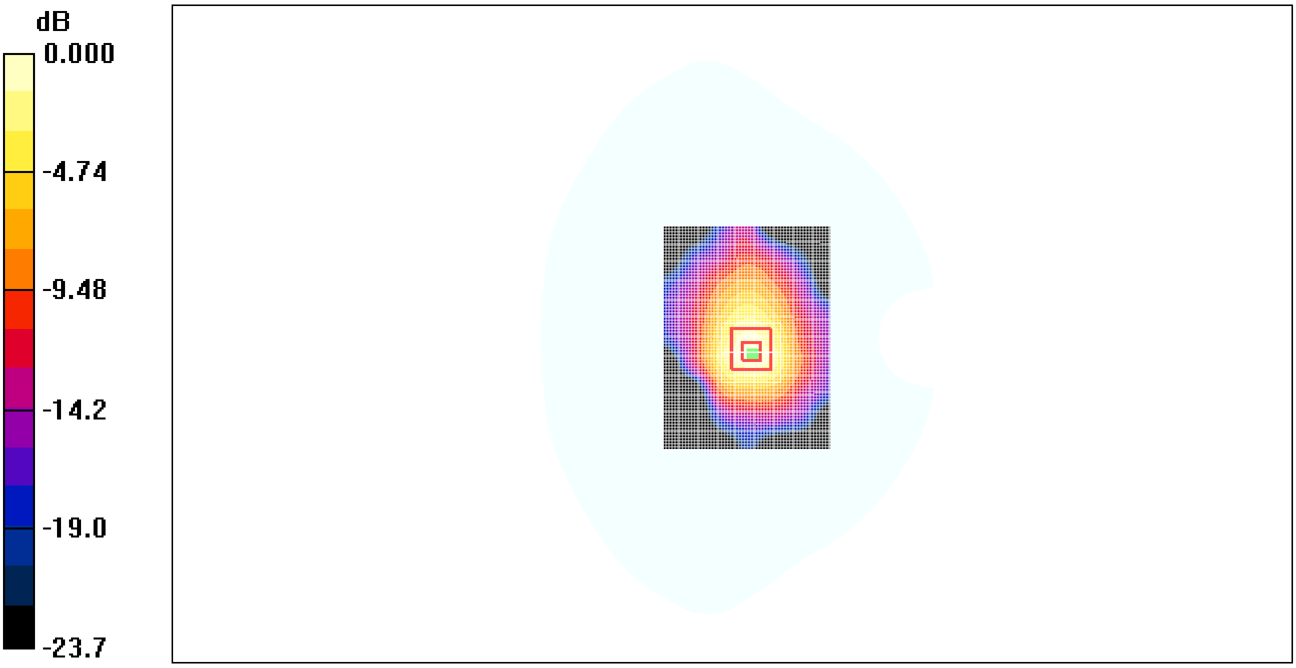
Fig.13 5MHz 16QAM Test Position 2

5MHz 16QAM Test Position 2 Middle - Antenna 1

Date/Time: 2010-5-24 11:48:40
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.11 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.01 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.5 V/m; Power Drift = 0.033 dB
Peak SAR (extrapolated) = 1.98 W/kg
SAR(1 g) = 0.940 mW/g; SAR(10 g) = 0.451 mW/g
Maximum value of SAR (measured) = 1.07 mW/g



0 dB = 1.07mW/g

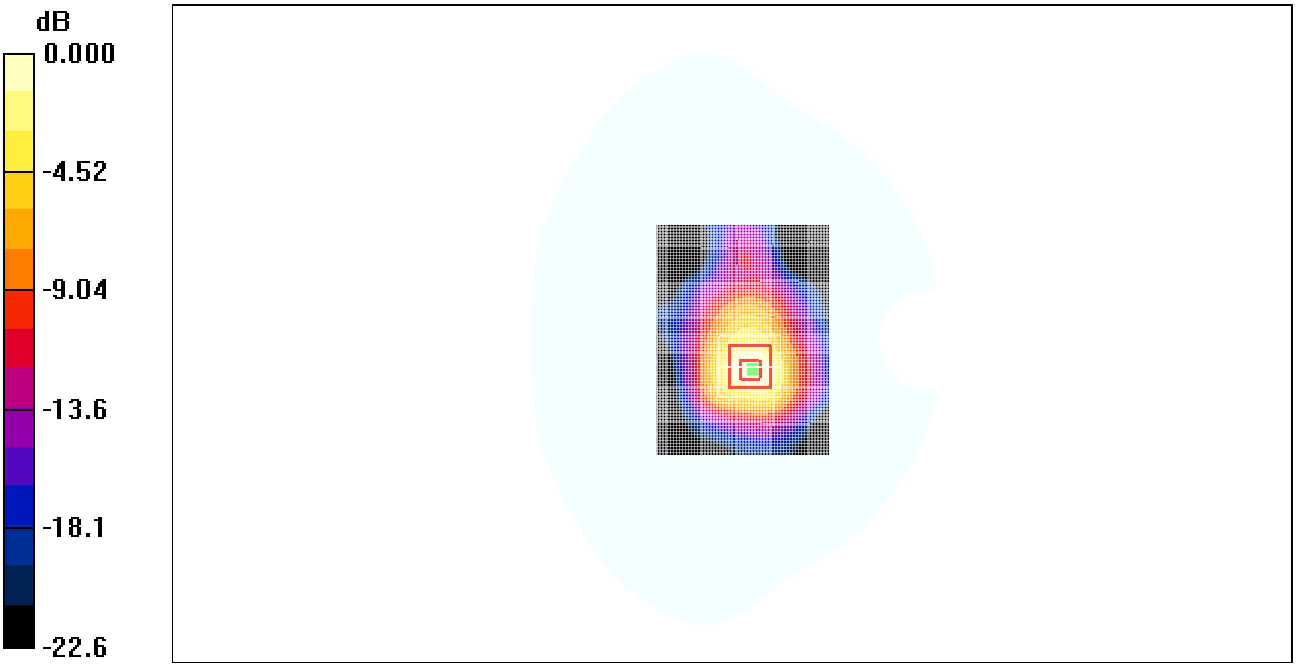
Fig.14 5MHz 16QAM Test Position 2

5MHz 16QAM Test Position 2 Low - Antenna 1

Date/Time: 2010-5-24 11:18:10
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2498.5 MHz; σ = 1.99 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2498.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

Test Position 2 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.07 mW/g

Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.8 V/m; Power Drift = -0.146 dB
Peak SAR (extrapolated) = 1.78 W/kg
SAR(1 g) = 0.875 mW/g; SAR(10 g) = 0.423 mW/g
Maximum value of SAR (measured) = 0.986 mW/g



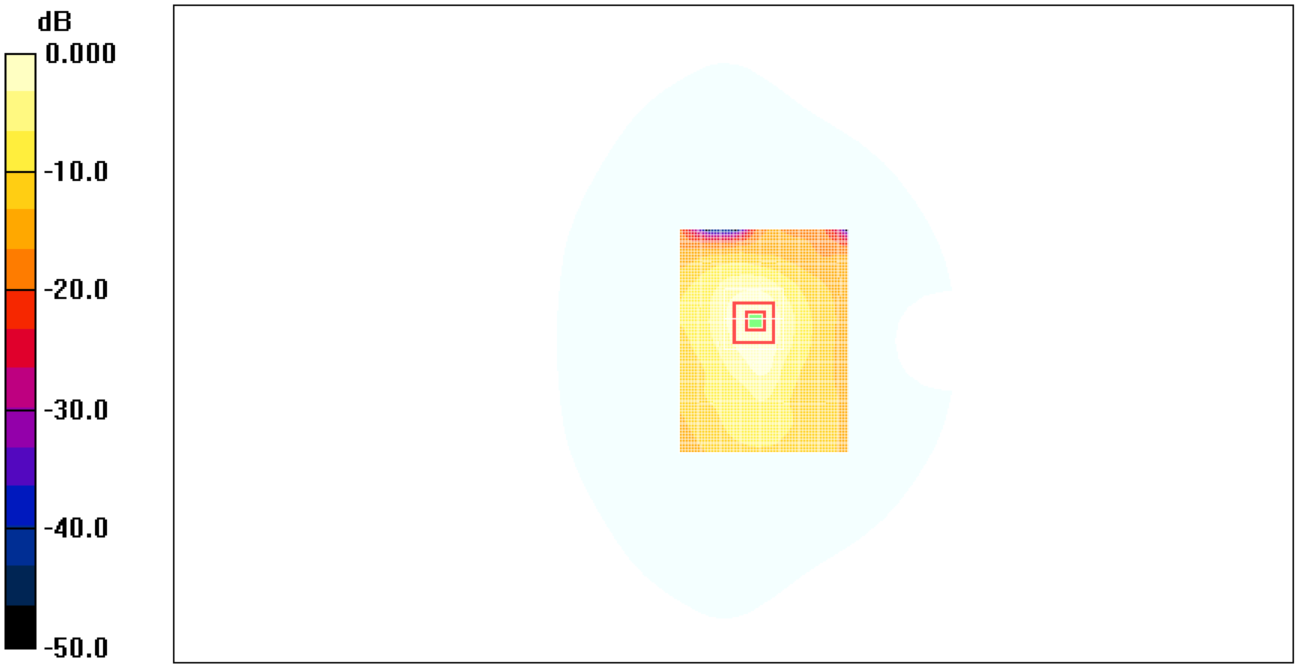
0 dB = 0.986mW/g

Fig.15 5MHz 16QAM Test Position 2

5MHz 16QAM Test Position 3 Low - Antenna 1
Date/Time: 2010-5-24 12:04:18
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2498.5 MHz; σ = 1.99 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2498.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

Test Position 3 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.276 mW/g

Test Position 3 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.5 V/m; Power Drift = 0.104 dB
Peak SAR (extrapolated) = 0.433 W/kg
SAR(1 g) = 0.233 mW/g; SAR(10 g) = 0.122 mW/g
Maximum value of SAR (measured) = 0.262 mW/g



0 dB = 0.262mW/g

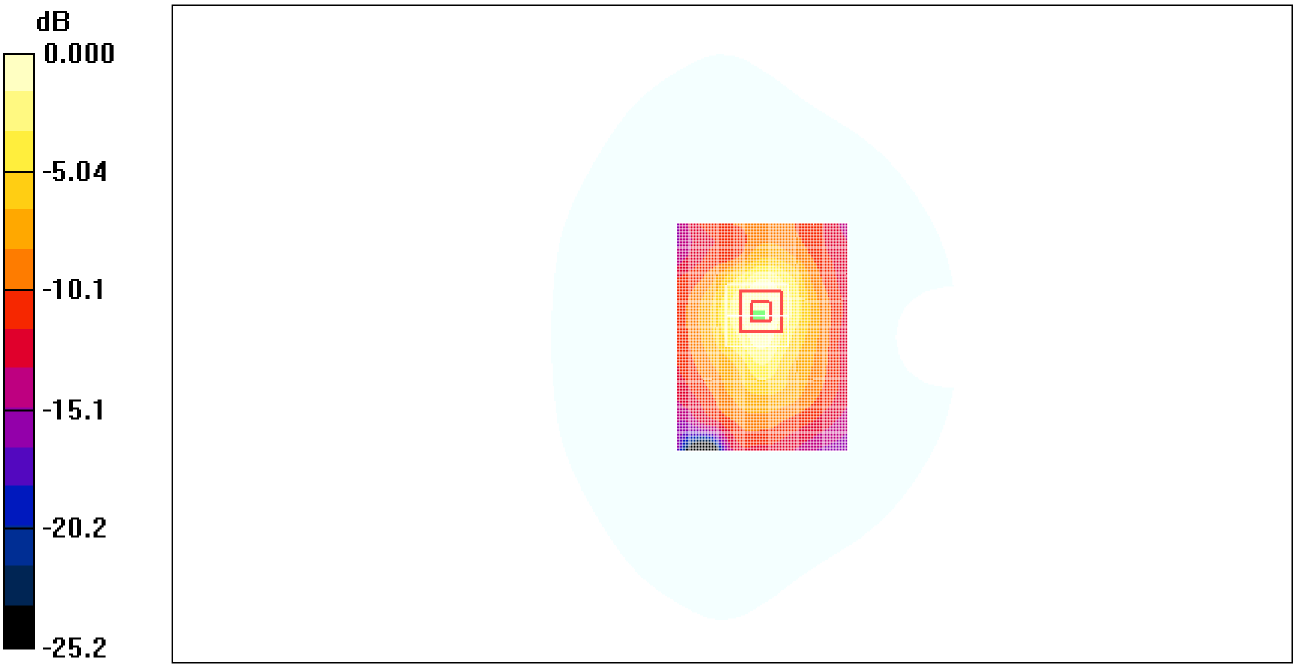
Fig.16 5MHz 16QAM Test Position 3

5MHz 16QAM Test Position 4 Low - Antenna 1

Date/Time: 2010-5-24 12:20:32
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2498.5 MHz; σ = 1.99 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2498.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

Test Position 4 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.219 mW/g

Test Position 4 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.29 V/m; Power Drift = 0.138 dB
Peak SAR (extrapolated) = 0.349 W/kg
SAR(1 g) = 0.193 mW/g; SAR(10 g) = 0.105 mW/g
Maximum value of SAR (measured) = 0.209 mW/g



0 dB = 0.209mW/g

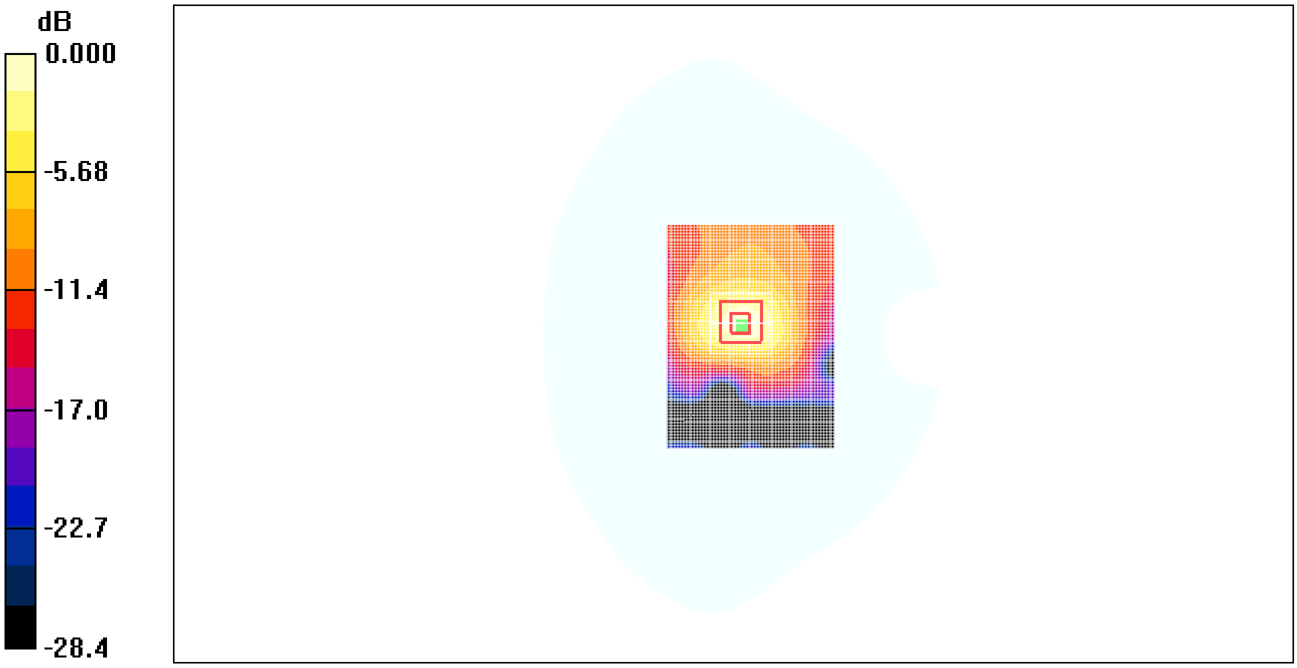
Fig.17 5MHz 16QAM Test Position 4

5MHz 16QAM Test Position 5 Low - Antenna 1

Date/Time: 2010-5-24 12:36:47
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2498.5 MHz; σ = 1.99 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2498.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

Test Position 5 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.308 mW/g

Test Position 5 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.3 V/m; Power Drift = 0.029 dB
Peak SAR (extrapolated) = 0.595 W/kg
SAR(1 g) = 0.293 mW/g; SAR(10 g) = 0.140 mW/g
Maximum value of SAR (measured) = 0.336 mW/g



0 dB = 0.336mW/g

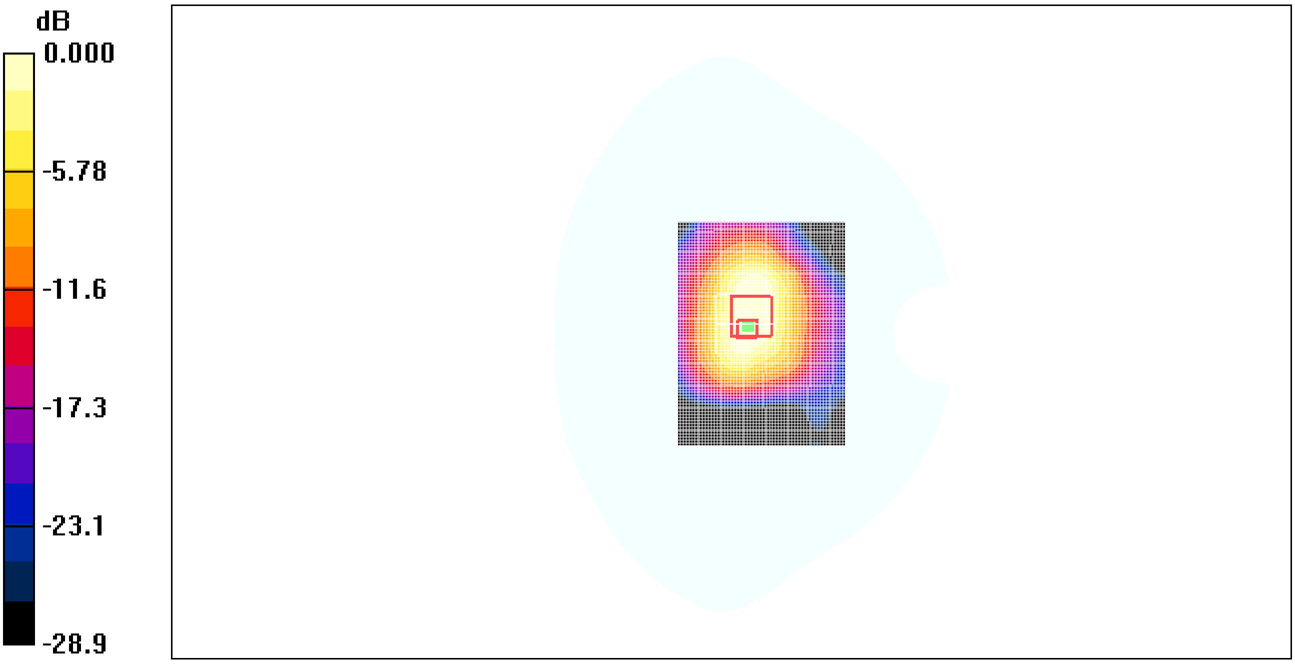
Fig.18 5MHz 16QAM Test Position 5

5MHz QPSK Test Position 1 High - Antenna 2

Date/Time: 2010-5-24 13:16:30
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.23 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2687.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.28 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.4 V/m; Power Drift = -0.075 dB
Peak SAR (extrapolated) = 2.11 W/kg
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.527 mW/g
Maximum value of SAR (measured) = 1.10 mW/g



0 dB = 1.10mW/g

Fig.19 5MHz QPSK Test Position 1

5MHz QPSK Test Position 1 Middle - Antenna 2

Date/Time: 2010-5-24 13:31:49

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2593 MHz; σ = 2.11 mho/m; εr = 51.7; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.27 mW/g

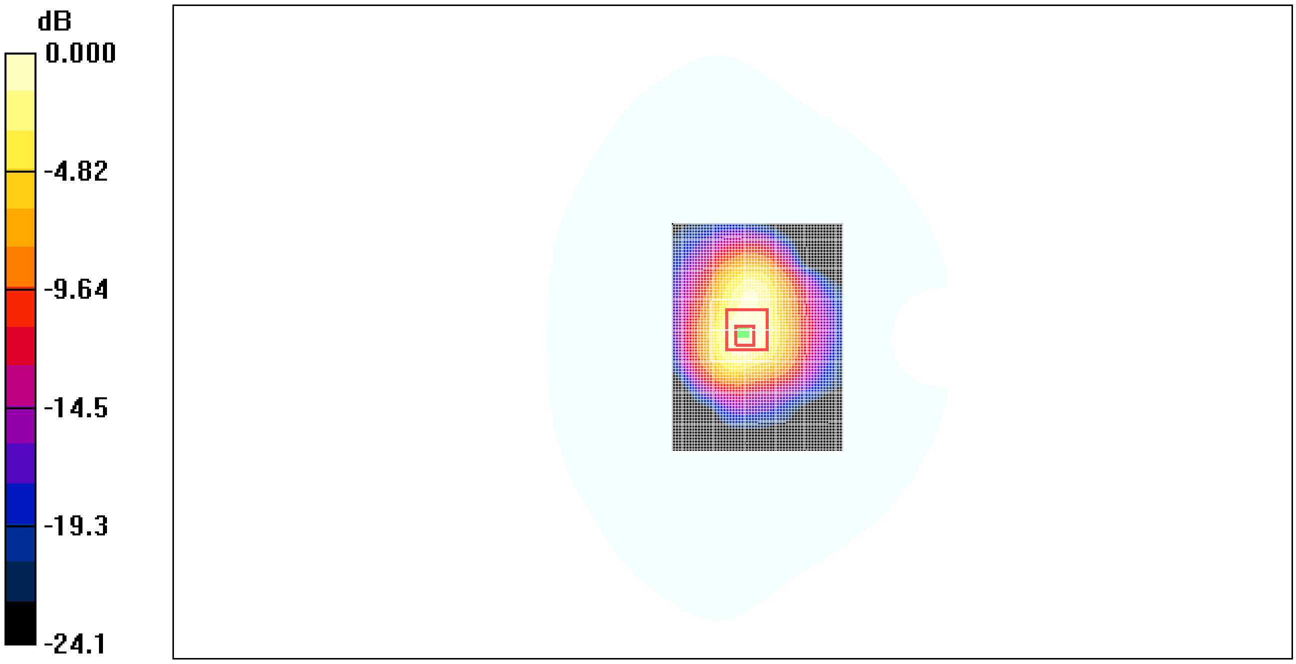
Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 23.5 V/m; Power Drift = -0.030 dB

Peak SAR (extrapolated) = 2.11 W/kg

SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.527 mW/g

Maximum value of SAR (measured) = 1.12 mW/g



0 dB = 1.12mW/g

Fig.20 5MHz QPSK Test Position 1

5MHz QPSK Test Position 1 Low - Antenna 2

Date/Time: 2010-5-24 13:47:06

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2498.5 MHz; σ = 1.99 mho/m; εr = 51.9; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2498.5 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

Test Position 1 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.27 mW/g

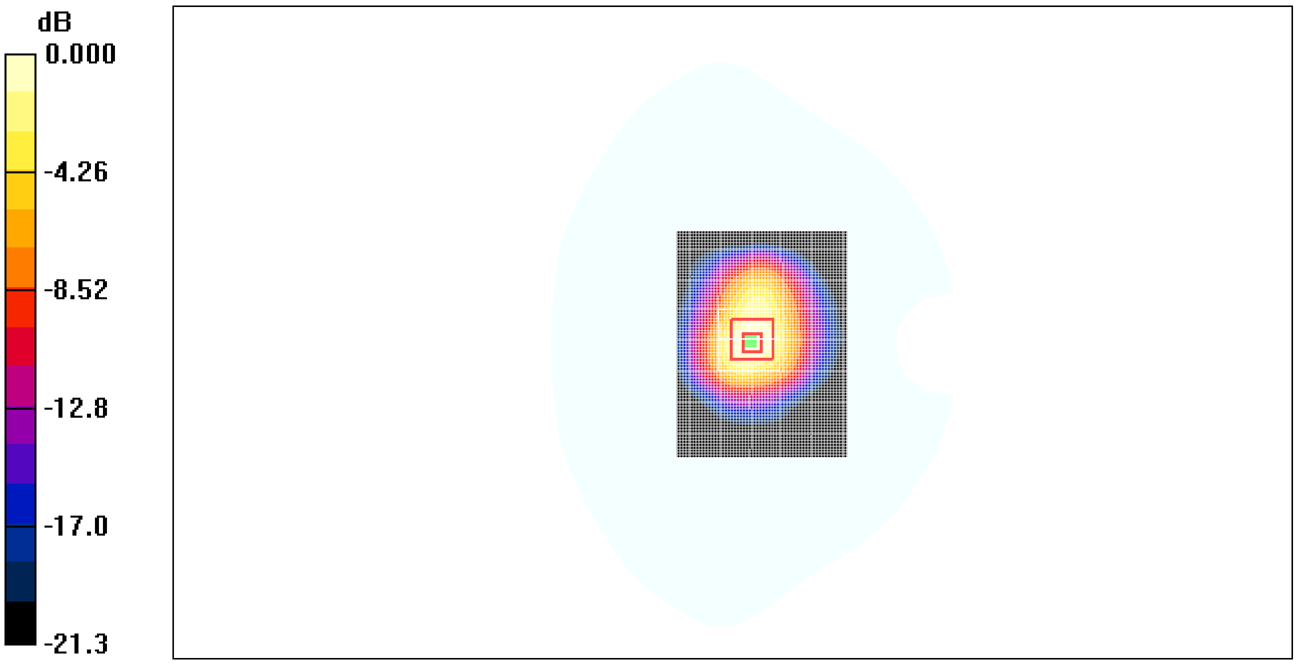
Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 24.4 V/m; Power Drift = -0.011 dB

Peak SAR (extrapolated) = 2.08 W/kg

SAR(1 g) = 1.06 mW/g; SAR(10 g) = 0.538 mW/g

Maximum value of SAR (measured) = 1.15 mW/g



0 dB = 1.15mW/g

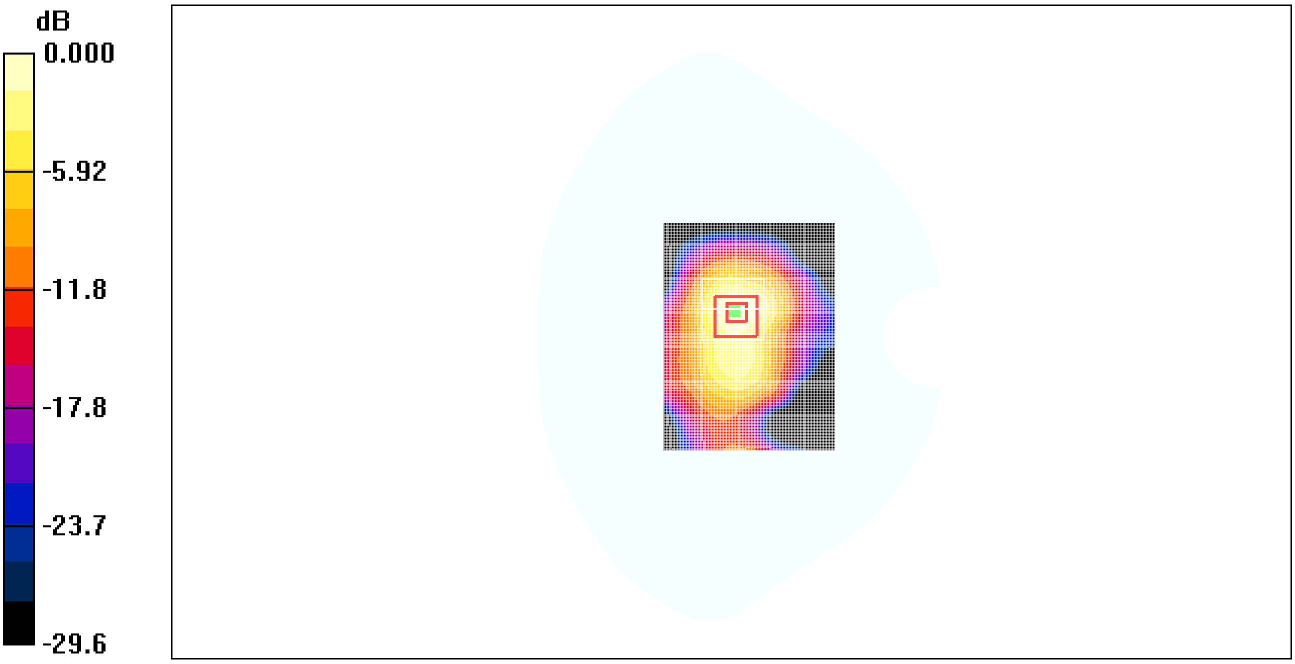
Fig.21 5MHz QPSK Test Position 1

5MHz QPSK Test Position 2 High - Antenna 2

Date/Time: 2010-5-24 14:03:38
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.23 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2687.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.13 mW/g

Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.6 V/m; Power Drift = 0.063 dB
Peak SAR (extrapolated) = 2.02 W/kg
SAR(1 g) = 0.926 mW/g; SAR(10 g) = 0.432 mW/g
Maximum value of SAR (measured) = 1.03 mW/g



0 dB = 1.03mW/g

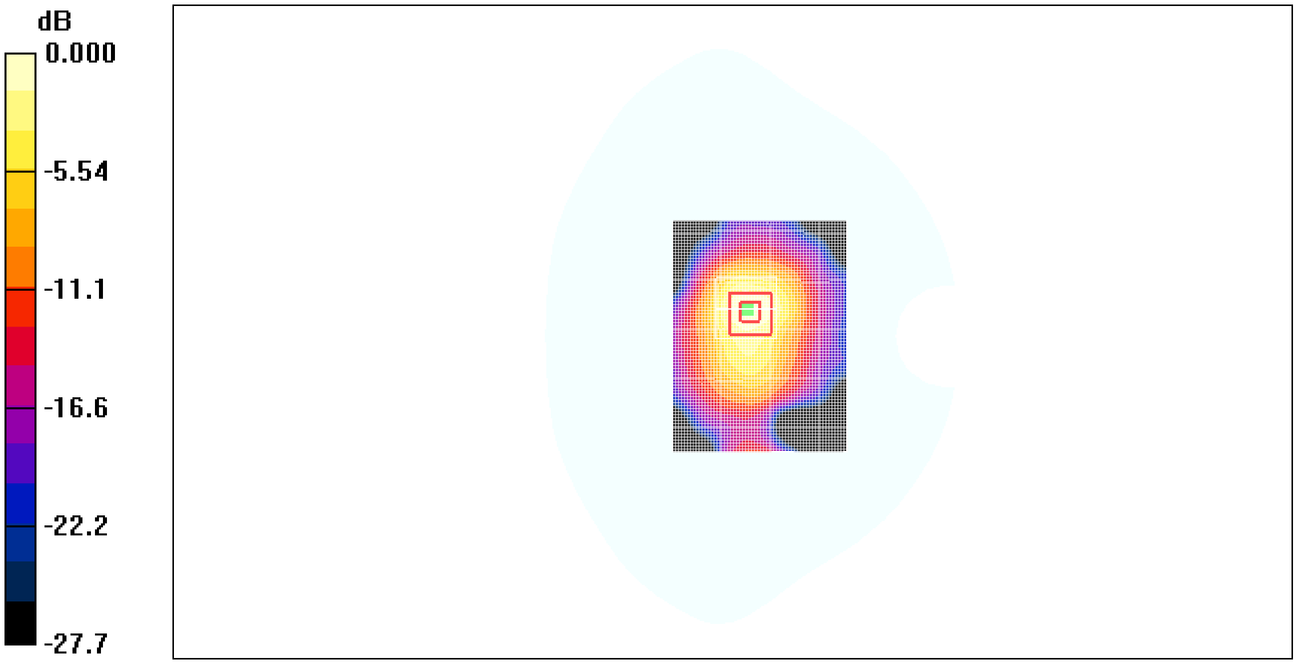
Fig.22 5MHz QPSK Test Position 2

5MHz QPSK Test Position 2 Middle - Antenna 2

Date/Time: 2010-5-24 14:18:52
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.11 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.26 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.5 V/m; Power Drift = 0.055 dB
Peak SAR (extrapolated) = 2.30 W/kg
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.495 mW/g
Maximum value of SAR (measured) = 1.17 mW/g



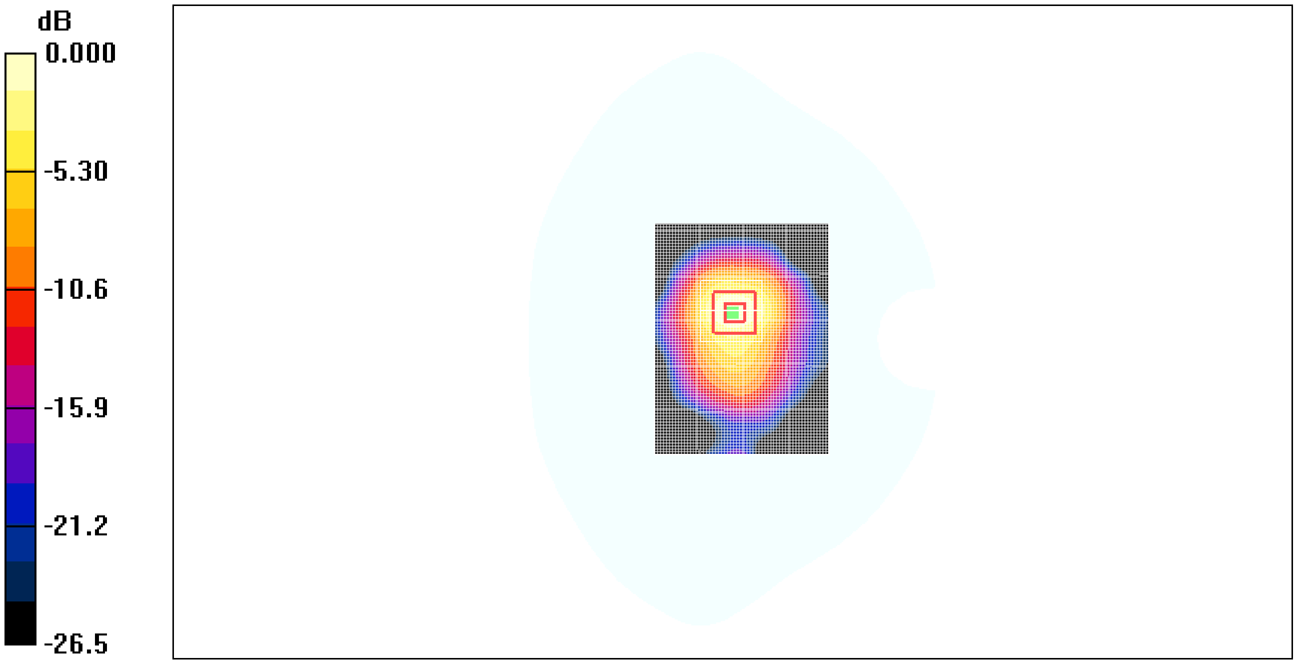
0 dB = 1.17mW/g

Fig.23 5MHz QPSK Test Position 2

5MHz QPSK Test Position 2 Low - Antenna 2
Date/Time: 2010-5-24 14:34:15
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2498.5 MHz; σ = 1.99 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2498.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

Test Position 2 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.40 mW/g

Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.3 V/m; Power Drift = -0.135 dB
Peak SAR (extrapolated) = 2.48 W/kg
SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.534 mW/g
Maximum value of SAR (measured) = 1.30 mW/g



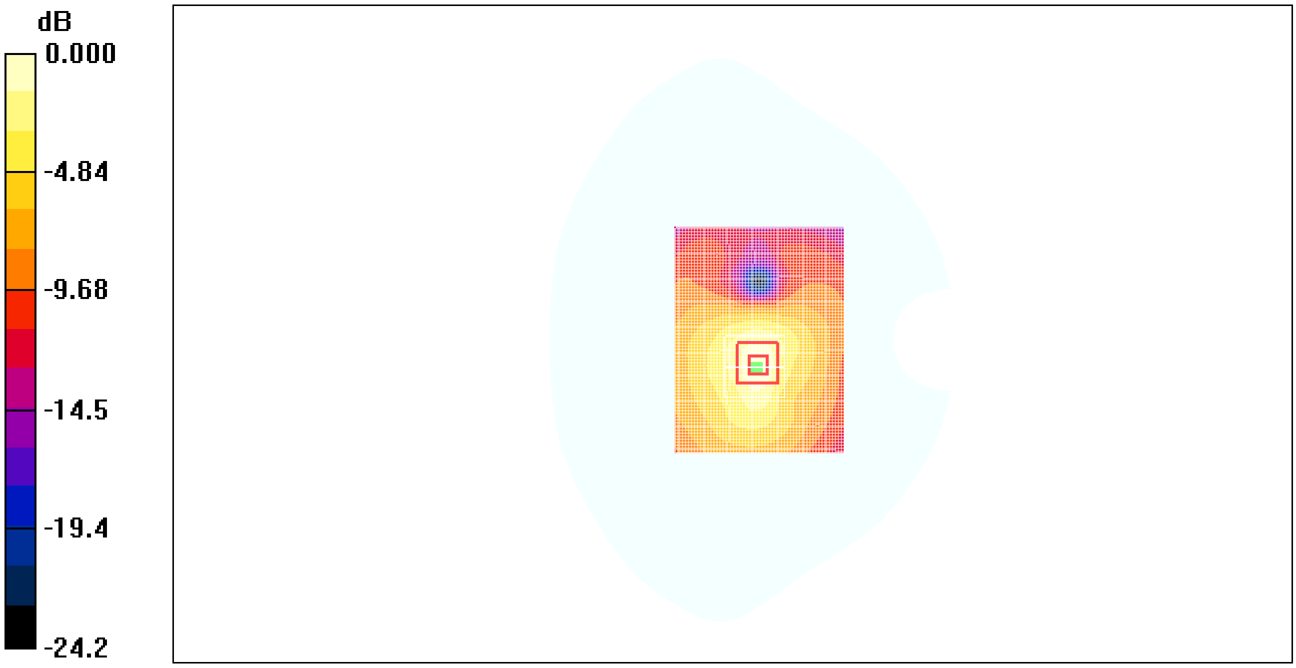
0 dB = 1.30mW/g

Fig.24 5MHz QPSK Test Position 2

5MHz QPSK Test Position 3 High - Antenna 2
Date/Time: 2010-5-24 14:50:41
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.23 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2687.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 3 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.236 mW/g

Test Position 3 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.06 V/m; Power Drift = 0.136 dB
Peak SAR (extrapolated) = 0.378 W/kg
SAR(1 g) = 0.199 mW/g; SAR(10 g) = 0.099 mW/g
Maximum value of SAR (measured) = 0.225 mW/g



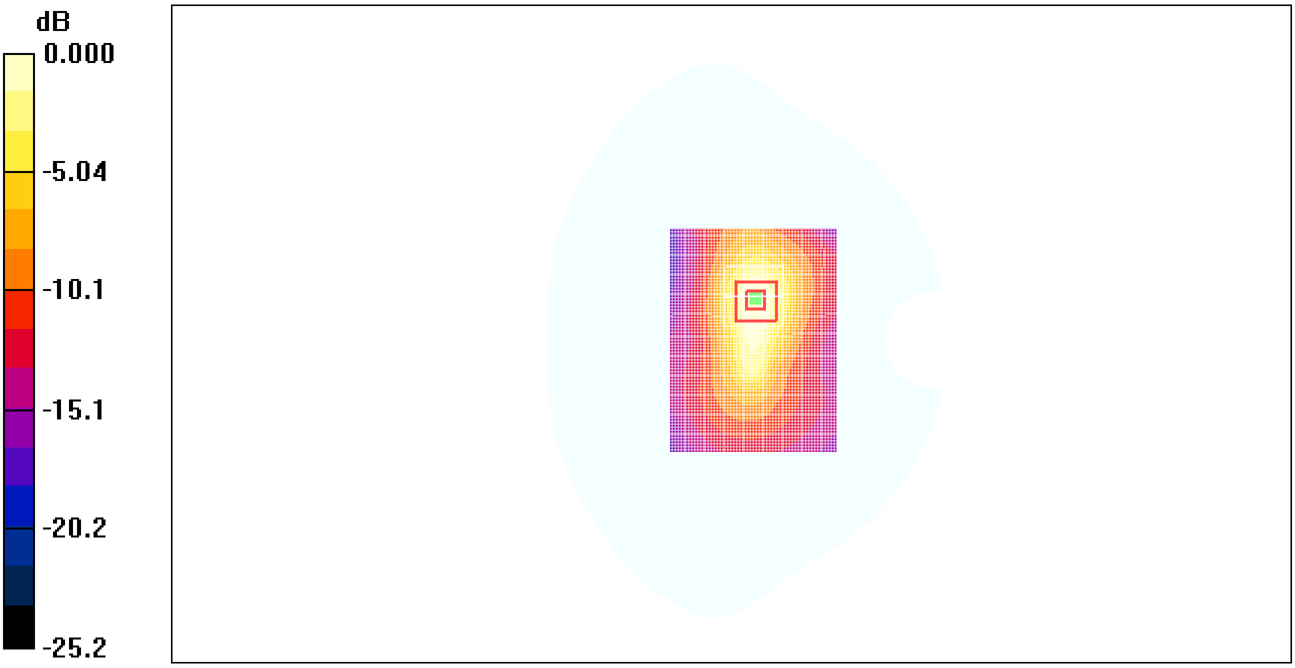
0 dB = 0.225mW/g

Fig.25 5MHz QPSK Test Position 3

5MHz QPSK Test Position 4 High - Antenna 2
Date/Time: 2010-5-24 15:07:11
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.23 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2687.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 4 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.741 mW/g

Test Position 4 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.5 V/m; Power Drift = -0.114 dB
Peak SAR (extrapolated) = 1.20 W/kg
SAR(1 g) = 0.628 mW/g; SAR(10 g) = 0.316 mW/g
Maximum value of SAR (measured) = 0.700 mW/g



0 dB = 0.700mW/g

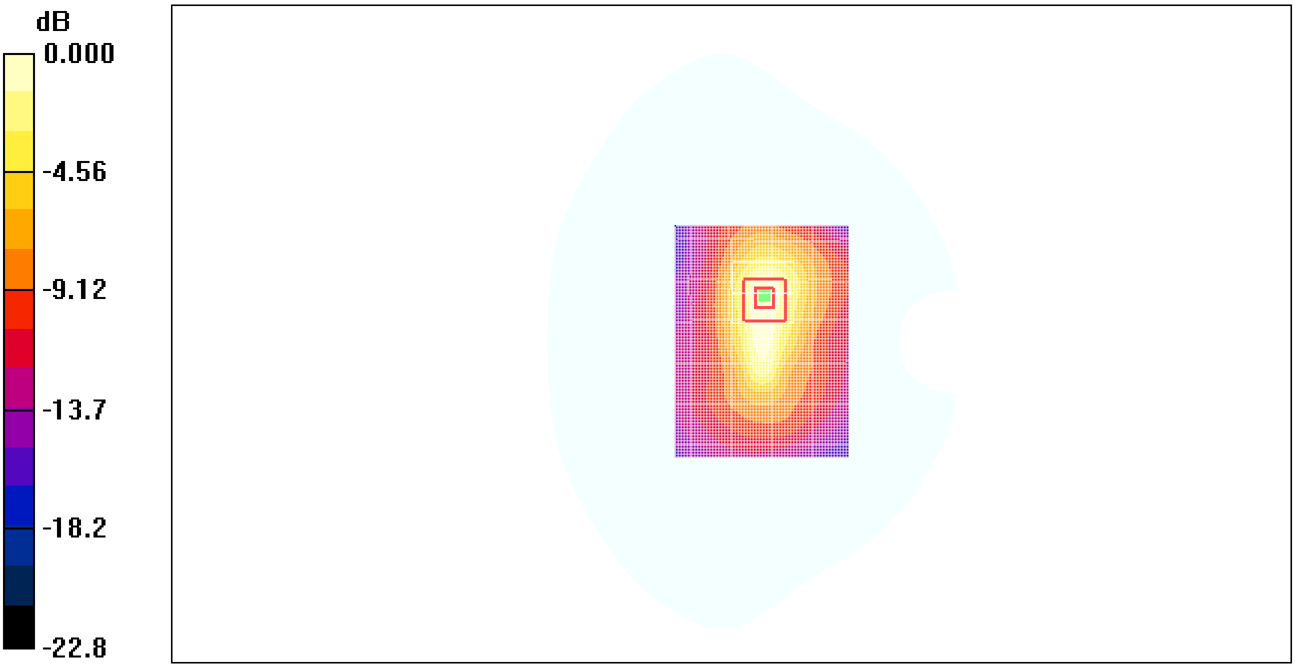
Fig.26 5MHz QPSK Test Position 4

5MHz QPSK Test Position 4 Middle - Antenna 2

Date/Time: 2010-5-24 15:22:30
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.11 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 4 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.442 mW/g

Test Position 4 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.2 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 0.723 W/kg
SAR(1 g) = 0.389 mW/g; SAR(10 g) = 0.202 mW/g
Maximum value of SAR (measured) = 0.426 mW/g



0 dB = 0.426mW/g

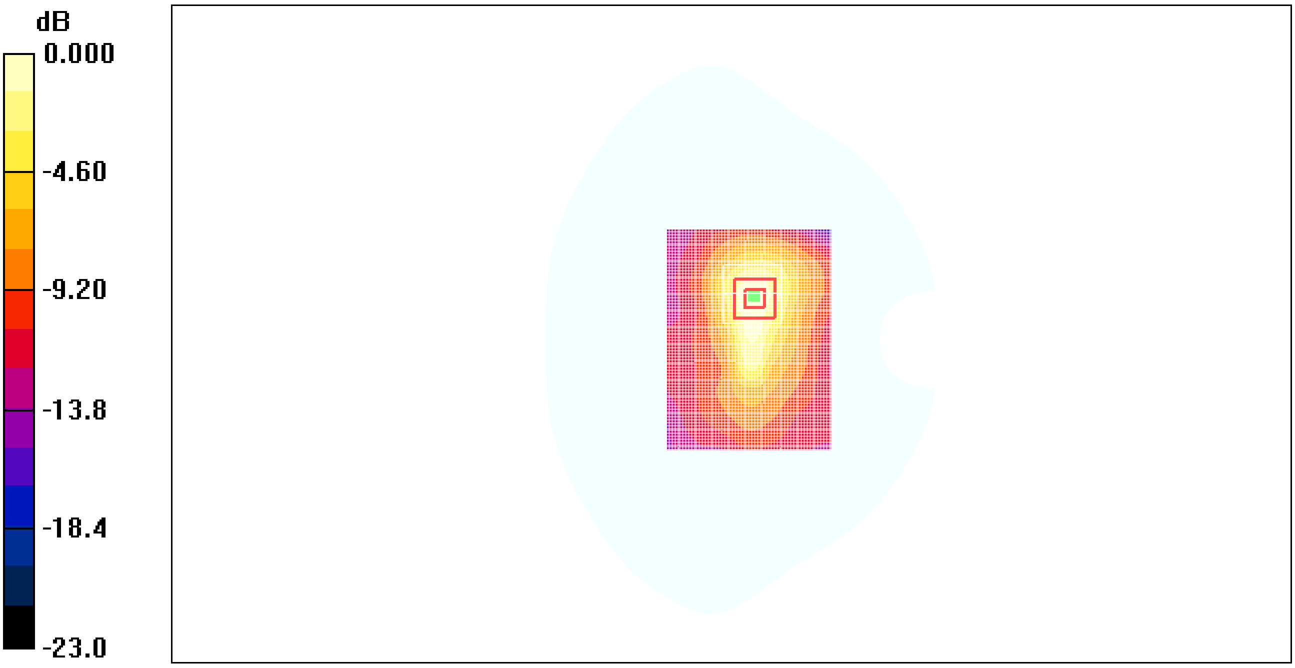
Fig.27 5MHz QPSK Test Position 4

5MHz QPSK Test Position 4 Low - Antenna 2

Date/Time: 2010-5-24 15:37:53
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2498.5 MHz; σ = 1.99 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2498.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

Test Position 4 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.235 mW/g

Test Position 4 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.19 V/m; Power Drift = -0.131 dB
Peak SAR (extrapolated) = 0.365 W/kg
SAR(1 g) = 0.199 mW/g; SAR(10 g) = 0.104 mW/g
Maximum value of SAR (measured) = 0.220 mW/g



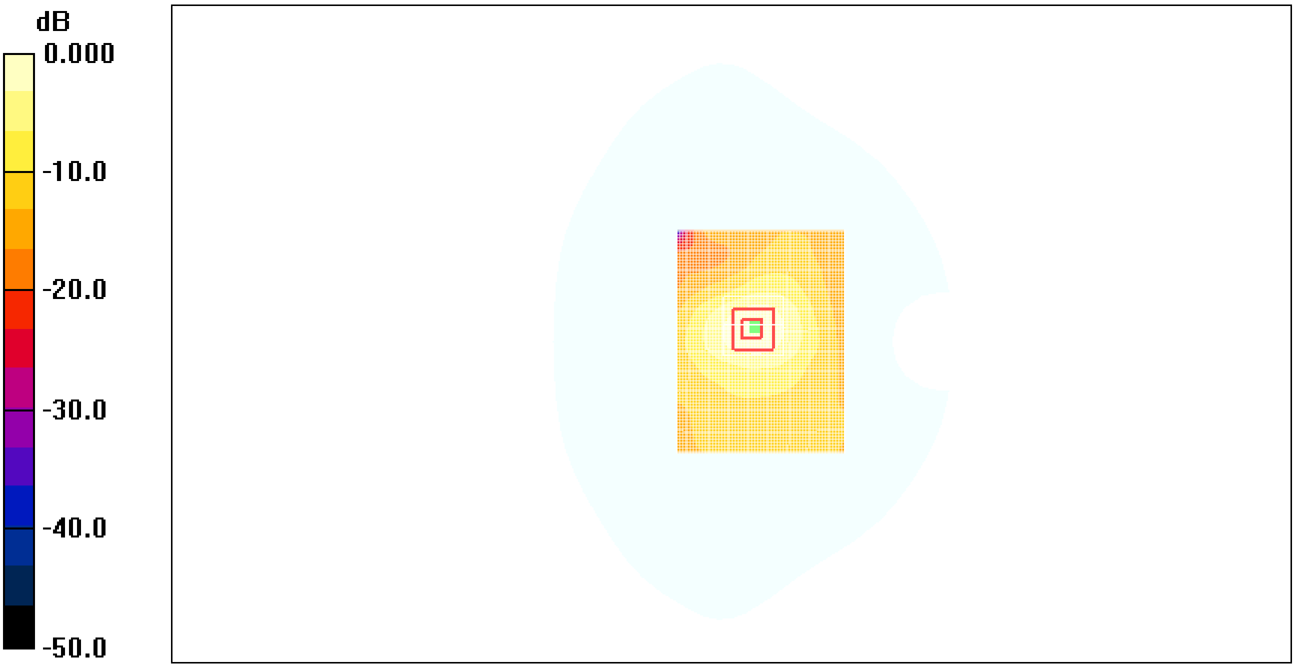
0 dB = 0.220mW/g

Fig.28 5MHz QPSK Test Position 4

5MHz QPSK Test Position 5 High - Antenna 2
Date/Time: 2010-5-24 15:54:12
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.23 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 ^{o}C   Liquid Temperature: 22.5 ^{o}C
Communication System: WiMax 2600 Frequency: 2687.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 5 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.324 mW/g

Test Position 5 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.0 V/m; Power Drift = -0.185 dB
Peak SAR (extrapolated) = 0.629 W/kg
SAR(1 g) = 0.306 mW/g; SAR(10 g) = 0.144 mW/g
Maximum value of SAR (measured) = 0.340 mW/g



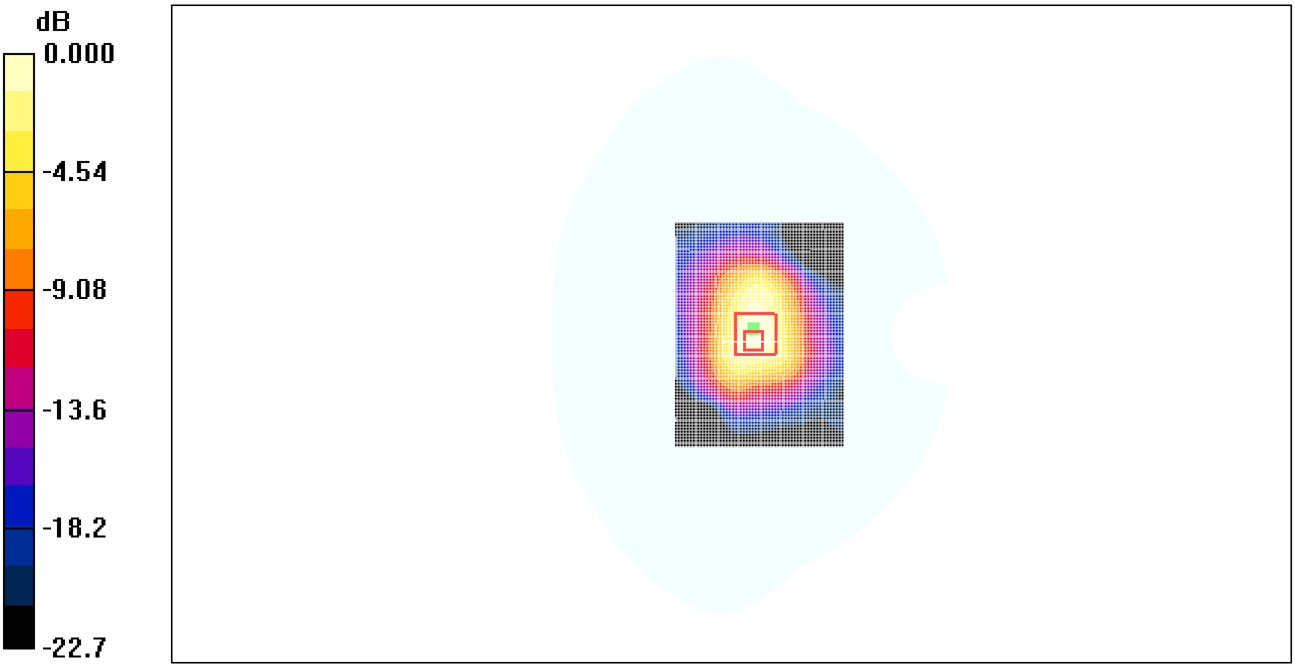
0 dB = 0.340mW/g

Fig.29 5MHz QPSK Test Position 5

5MHz 16QAM Test Position 1 High - Antenna 2
Date/Time: 2010-5-24 16:27:28
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.23 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 ^{o}C Liquid Temperature: 22.5 ^{o}C
Communication System: WiMax 2600 Frequency: 2687.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.06 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.5 V/m; Power Drift = -0.082 dB
Peak SAR (extrapolated) = 1.99 W/kg
SAR(1 g) = 0.963 mW/g; SAR(10 g) = 0.478 mW/g
Maximum value of SAR (measured) = 1.07 mW/g



0 dB = 1.07mW/g

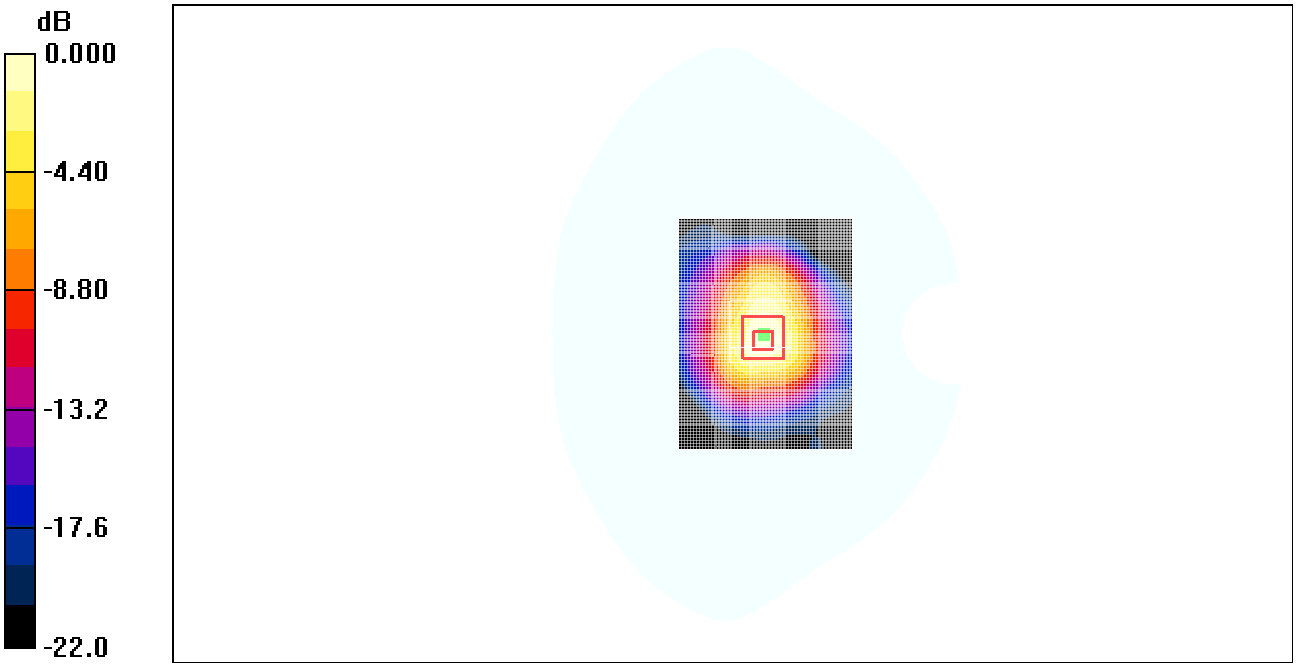
Fig.30 5MHz 16QAM Test Position 1

5MHz 16QAM Test Position 1 Middle - Antenna 2

Date/Time: 2010-5-24 16:12:15
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.11 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.15 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.7 V/m; Power Drift = 0.030 dB
Peak SAR (extrapolated) = 2.21 W/kg
SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.543 mW/g
Maximum value of SAR (measured) = 1.17 mW/g



0 dB = 1.17mW/g

Fig.31 5MHz 16QAM Test Position 1

5MHz 16QAM Test Position 1 Low - Antenna 2

Date/Time: 2010-5-24 16:42:40

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2498.5 MHz; σ = 1.99 mho/m; εr = 51.9; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2498.5 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

Test Position 1 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.942 mW/g

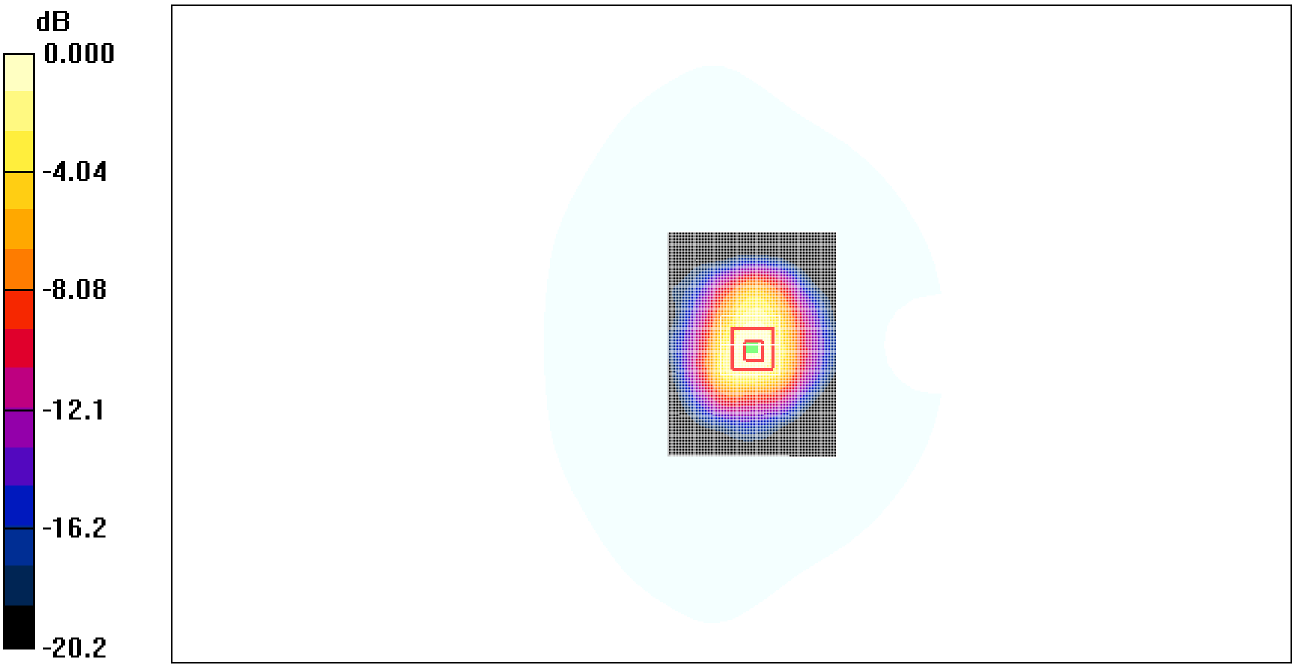
Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 20.3 V/m; Power Drift = 0.000 dB

Peak SAR (extrapolated) = 1.65 W/kg

SAR(1 g) = 0.854 mW/g; SAR(10 g) = 0.437 mW/g

Maximum value of SAR (measured) = 0.902 mW/g



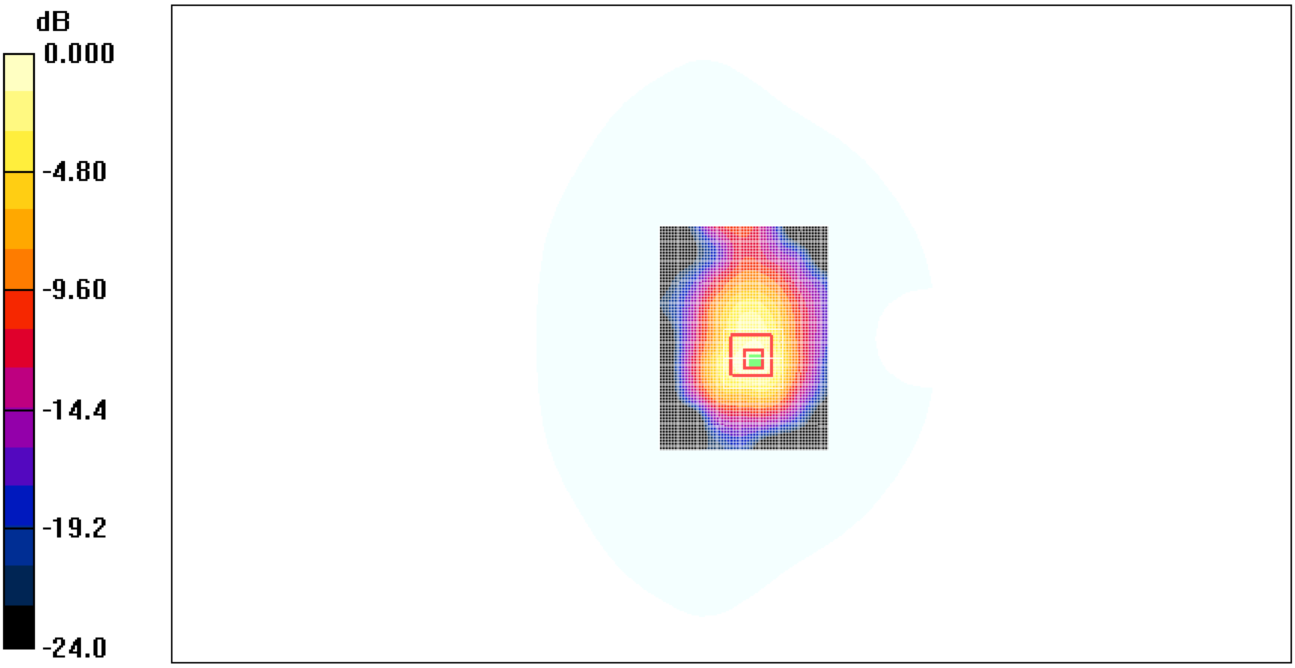
0 dB = 0.902mW/g

Fig.32 5MHz 16QAM Test Position 1

5MHz 16QAM Test Position 2 High - Antenna 2
Date/Time: 2010-5-24 17:15:00
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.23 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2687.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.994 mW/g

Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.6 V/m; Power Drift = -0.061 dB
Peak SAR (extrapolated) = 1.85 W/kg
SAR(1 g) = 0.860 mW/g; SAR(10 g) = 0.408 mW/g
Maximum value of SAR (measured) = 0.982 mW/g



0 dB = 0.982mW/g

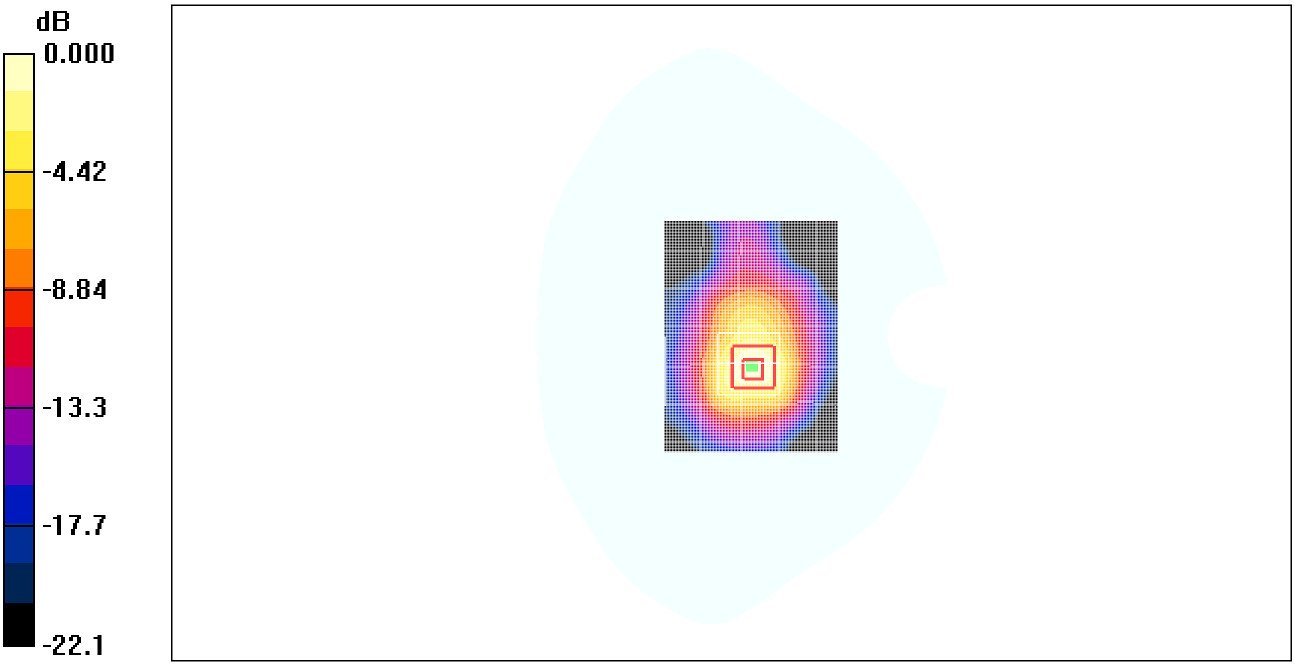
Fig.33 5MHz 16QAM Test Position 2

5MHz 16QAM Test Position 2 Middle - Antenna 2

Date/Time: 2010-5-24 16:59:36
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.11 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.08 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.9 V/m; Power Drift = -0.036 dB
Peak SAR (extrapolated) = 2.07 W/kg
SAR(1 g) = 0.972 mW/g; SAR(10 g) = 0.460 mW/g
Maximum value of SAR (measured) = 1.04 mW/g



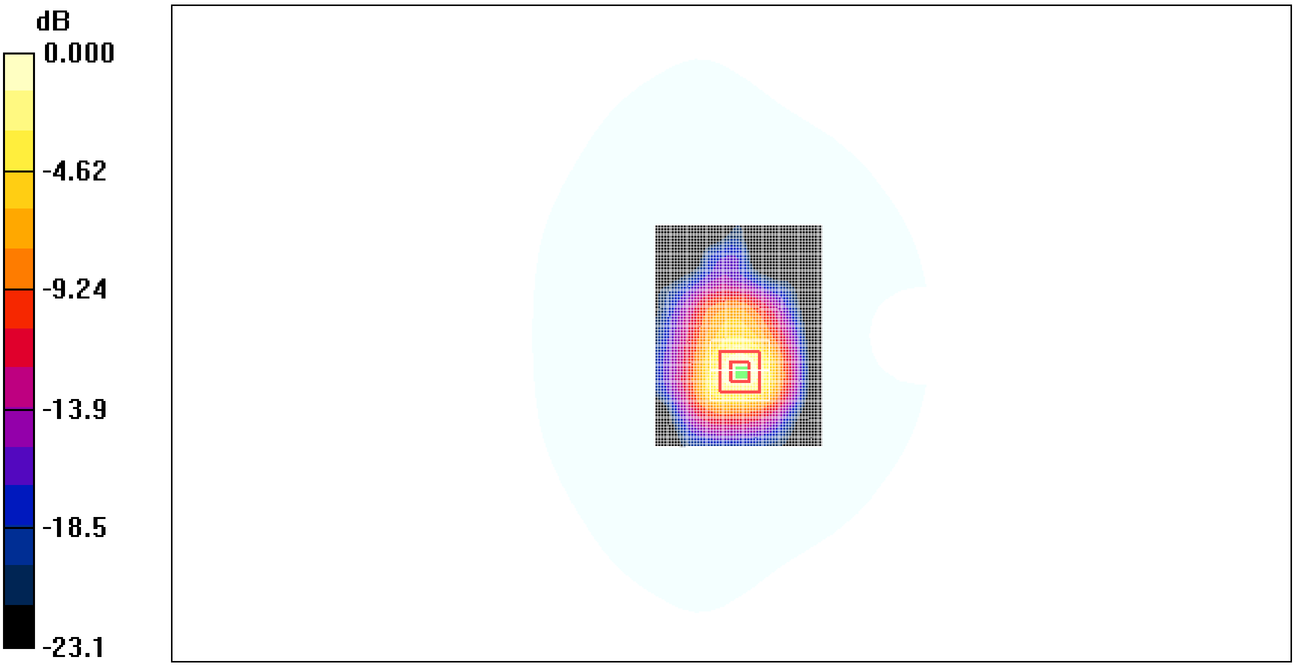
0 dB = 1.04mW/g

Fig.34 5MHz 16QAM Test Position 2

5MHz 16QAM Test Position 2 Low - Antenna 2
Date/Time: 2010-5-24 17:30:18
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2498.5 MHz; σ = 1.99 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2498.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

Test Position 2 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.986 mW/g

Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.3 V/m; Power Drift = -0.065 dB
Peak SAR (extrapolated) = 1.95 W/kg
SAR(1 g) = 0.922 mW/g; SAR(10 g) = 0.435 mW/g
Maximum value of SAR (measured) = 1.04 mW/g



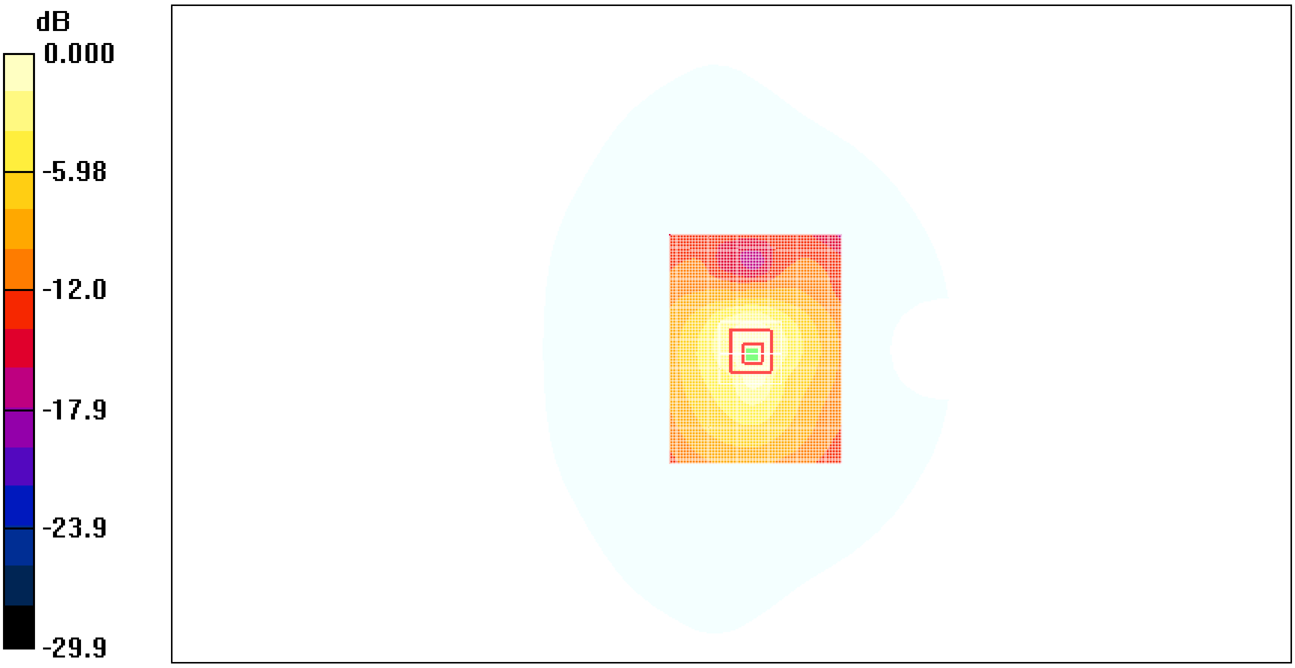
0 dB = 1.04mW/g

Fig.35 5MHz 16QAM Test Position 2

5MHz 16QAM Test Position 3 Middle - Antenna 2
Date/Time: 2010-5-24 17:47:04
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.11 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 3 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.293 mW/g

Test Position 3 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.7 V/m; Power Drift = -0.111 dB
Peak SAR (extrapolated) = 0.483 W/kg
SAR(1 g) = 0.265 mW/g; SAR(10 g) = 0.140 mW/g
Maximum value of SAR (measured) = 0.296 mW/g



0 dB = 0.296mW/g

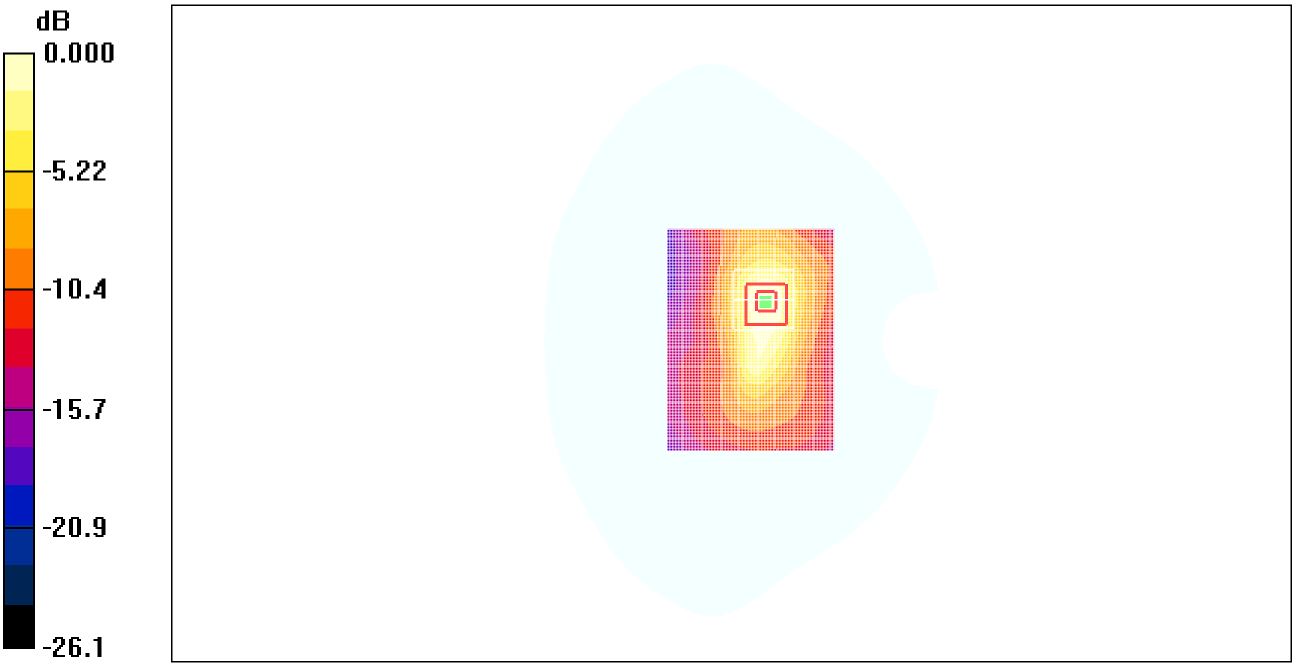
Fig.36 5MHz 16QAM Test Position 3

5MHz 16QAM Test Position 4 High - Antenna 2

Date/Time: 2010-5-24 18:19:30
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.23 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2687.5 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 4 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.710 mW/g

Test Position 4 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.7 V/m; Power Drift = 0.041 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.631 mW/g; SAR(10 g) = 0.319 mW/g
Maximum value of SAR (measured) = 0.700 mW/g



0 dB = 0.700mW/g

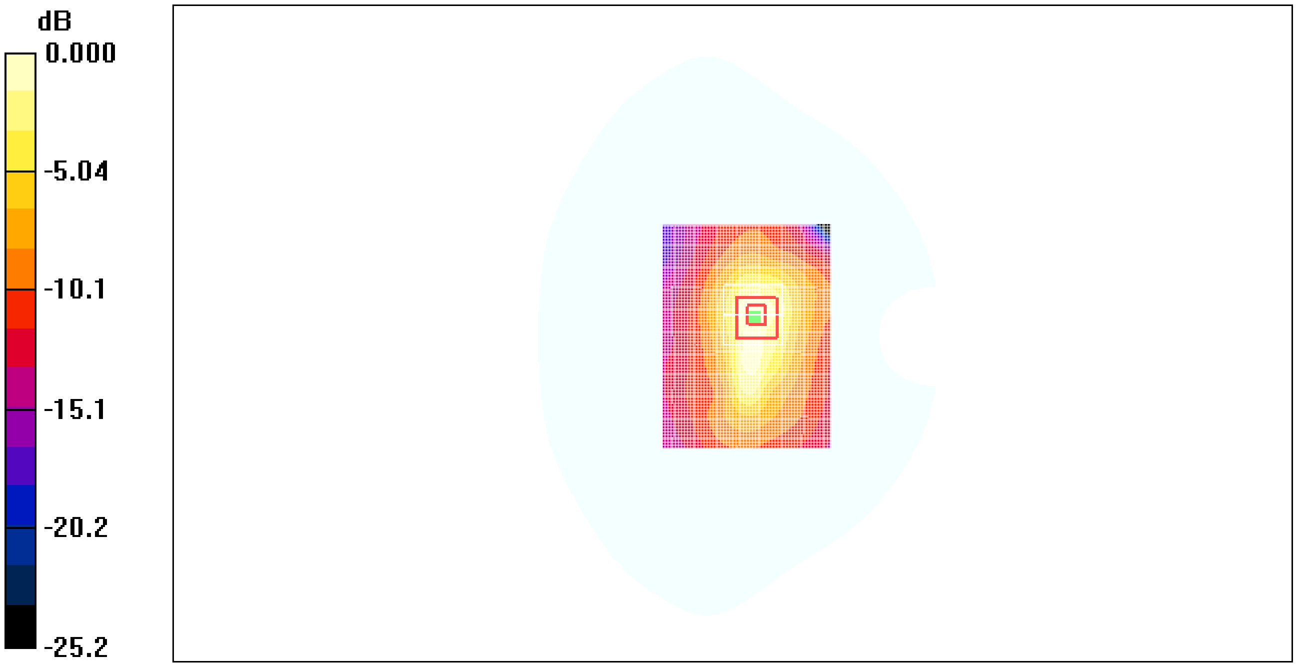
Fig.37 5MHz 16QAM Test Position 4

5MHz 16QAM Test Position 4 Middle - Antenna 2

Date/Time: 2010-5-24 18:04:12
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.11 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 4 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.443 mW/g

Test Position 4 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.6 V/m; Power Drift = 0.031 dB
Peak SAR (extrapolated) = 0.747 W/kg
SAR(1 g) = 0.401 mW/g; SAR(10 g) = 0.207 mW/g
Maximum value of SAR (measured) = 0.443 mW/g



0 dB = 0.443mW/g

Fig.38 5MHz 16QAM Test Position 4

5MHz 16QAM Test Position 4 Low - Antenna 2

Date/Time: 2010-5-24 18:34:46

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2498.5 MHz; σ = 1.99 mho/m; εr = 51.9; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2498.5 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

Test Position 4 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.216 mW/g

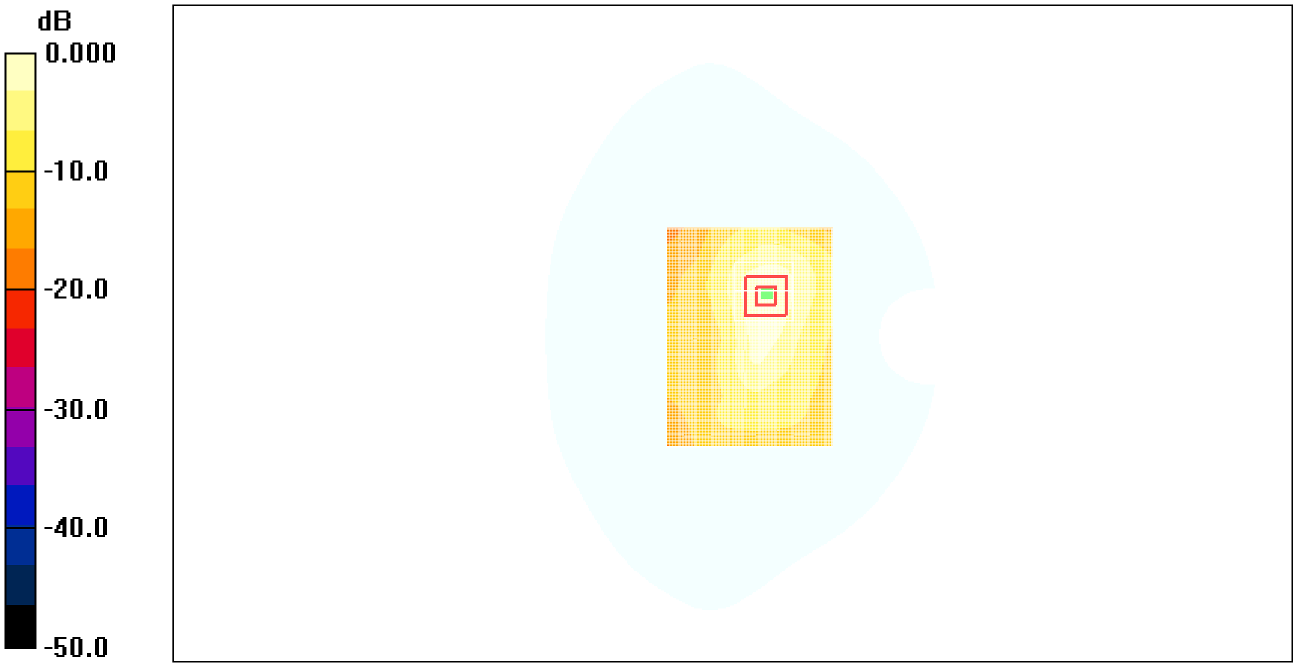
Test Position 4 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.57 V/m; Power Drift = -0.003 dB

Peak SAR (extrapolated) = 0.368 W/kg

SAR(1 g) = 0.200 mW/g; SAR(10 g) = 0.104 mW/g

Maximum value of SAR (measured) = 0.220 mW/g



0 dB = 0.220mW/g

Fig.39 5MHz 16QAM Test Position 4

5MHz 16QAM Test Position 5 Middle - Antenna 2

Date/Time: 2010-5-24 18:52:01

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2593 MHz; σ = 2.11 mho/m; εr = 51.7; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 5 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.335 mW/g

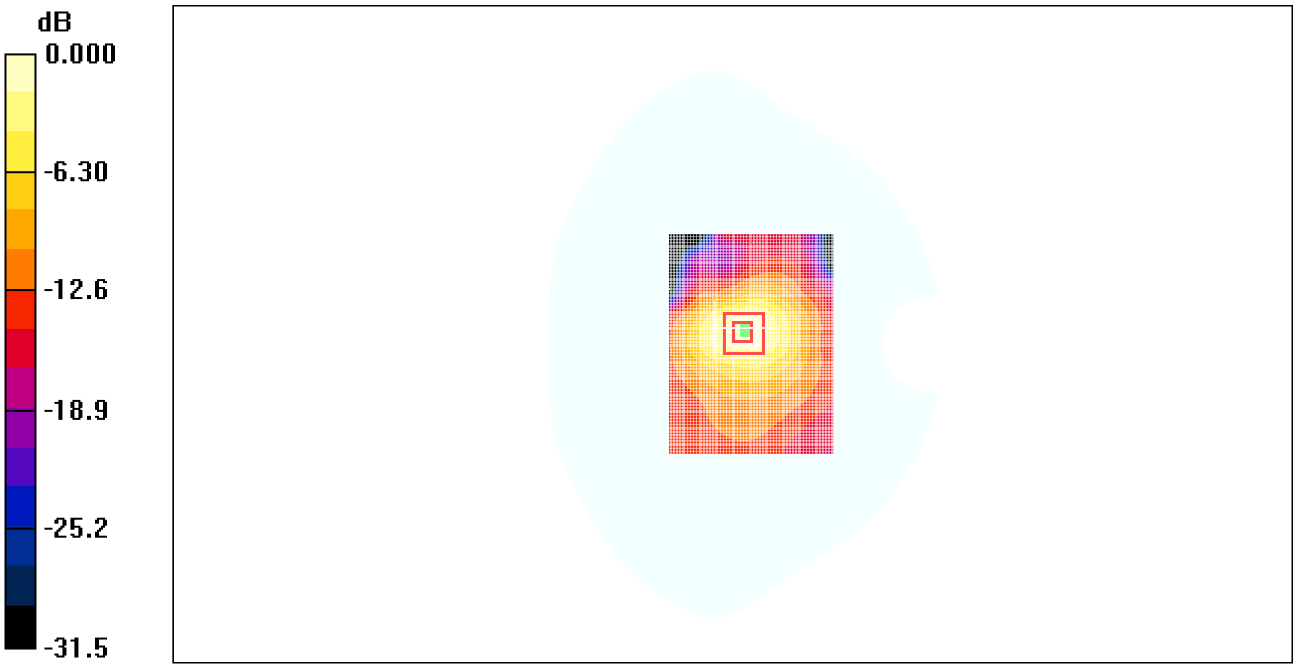
Test Position 5 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.2 V/m; Power Drift = -0.150 dB

Peak SAR (extrapolated) = 0.662 W/kg

SAR(1 g) = 0.321 mW/g; SAR(10 g) = 0.151 mW/g

Maximum value of SAR (measured) = 0.364 mW/g



0 dB = 0.364mW/g

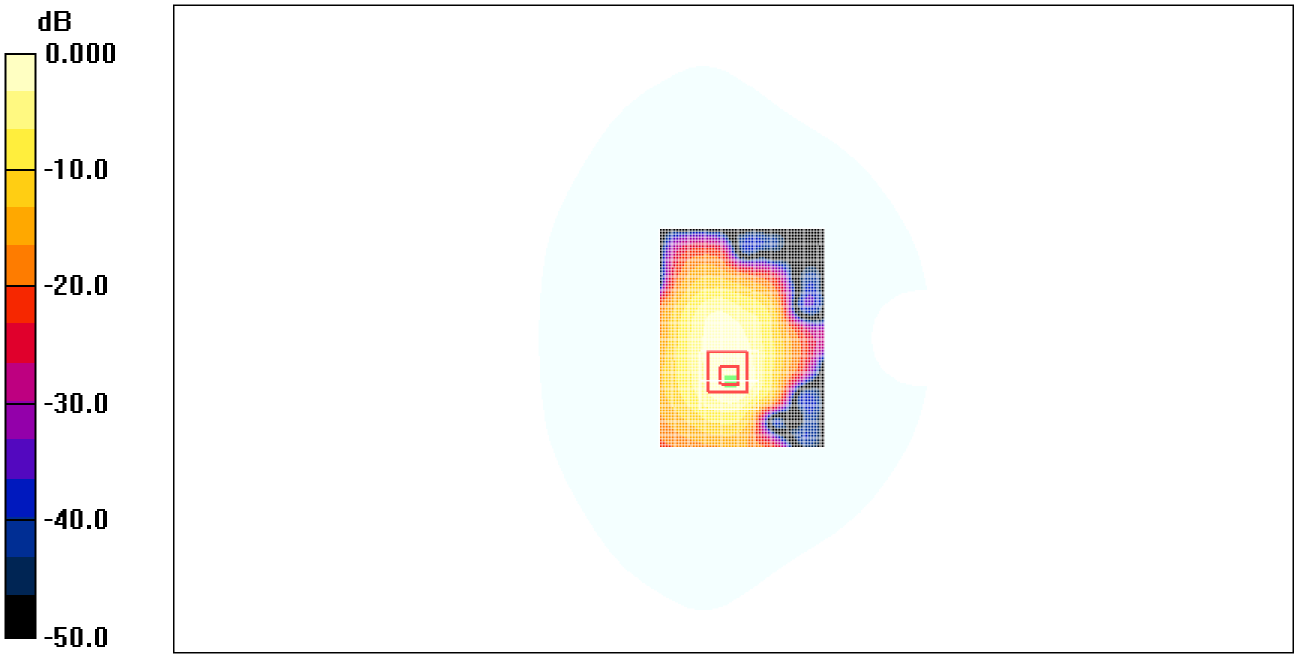
Fig.40 5MHz 16QAM Test Position 5

10MHz QPSK Test Position 1 High - Antenna 1

Date/Time: 2010-5-25 8:09:27
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2685 MHz; σ = 2.24 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2685 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.852 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.3 V/m; Power Drift = 0.039 dB
Peak SAR (extrapolated) = 1.31 W/kg
SAR(1 g) = 0.667 mW/g; SAR(10 g) = 0.334 mW/g
Maximum value of SAR (measured) = 0.731 mW/g



0 dB = 0.731mW/g

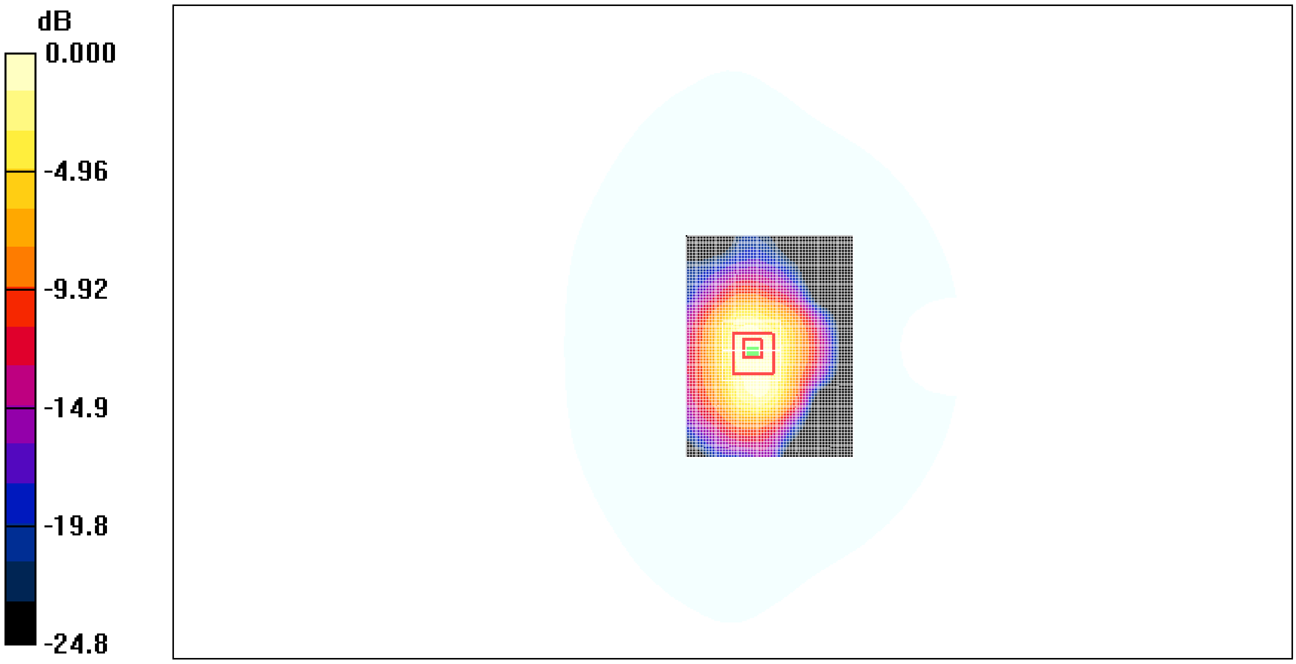
Fig.41 10MHz QPSK Test Position 1

10MHz QPSK Test Position 1 Middle - Antenna 1

Date/Time: 2010-5-25 8:24:40
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.12 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.738 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.5 V/m; Power Drift = -0.102 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.619 mW/g; SAR(10 g) = 0.319 mW/g
Maximum value of SAR (measured) = 0.676 mW/g



0 dB = 0.676mW/g

Fig.42 10MHz QPSK Test Position 1

10MHz QPSK Test Position 1 Low - Antenna 1

Date/Time: 2010-5-25 8:39:58

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2501 MHz; σ = 2.00 mho/m; εr = 51.9; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2501 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.761 mW/g

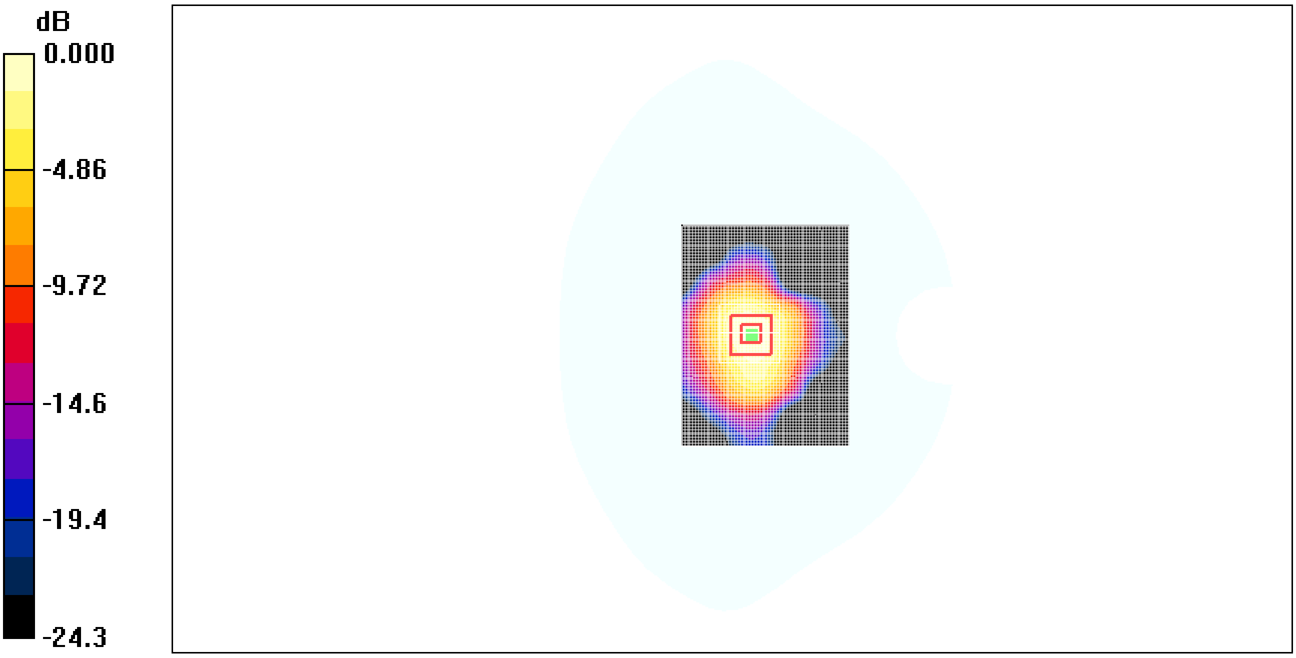
Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.7 V/m; Power Drift = -0.026 dB

Peak SAR (extrapolated) = 1.25 W/kg

SAR(1 g) = 0.639 mW/g; SAR(10 g) = 0.327 mW/g

Maximum value of SAR (measured) = 0.703 mW/g



0 dB = 0.703mW/g

Fig.43 10MHz QPSK Test Position 1

10MHz QPSK Test Position 2 High - Antenna 1

Date/Time: 2010-5-25 8:56:13

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2685 MHz; σ = 2.24 mho/m; εr = 51.4; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2685 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.638 mW/g

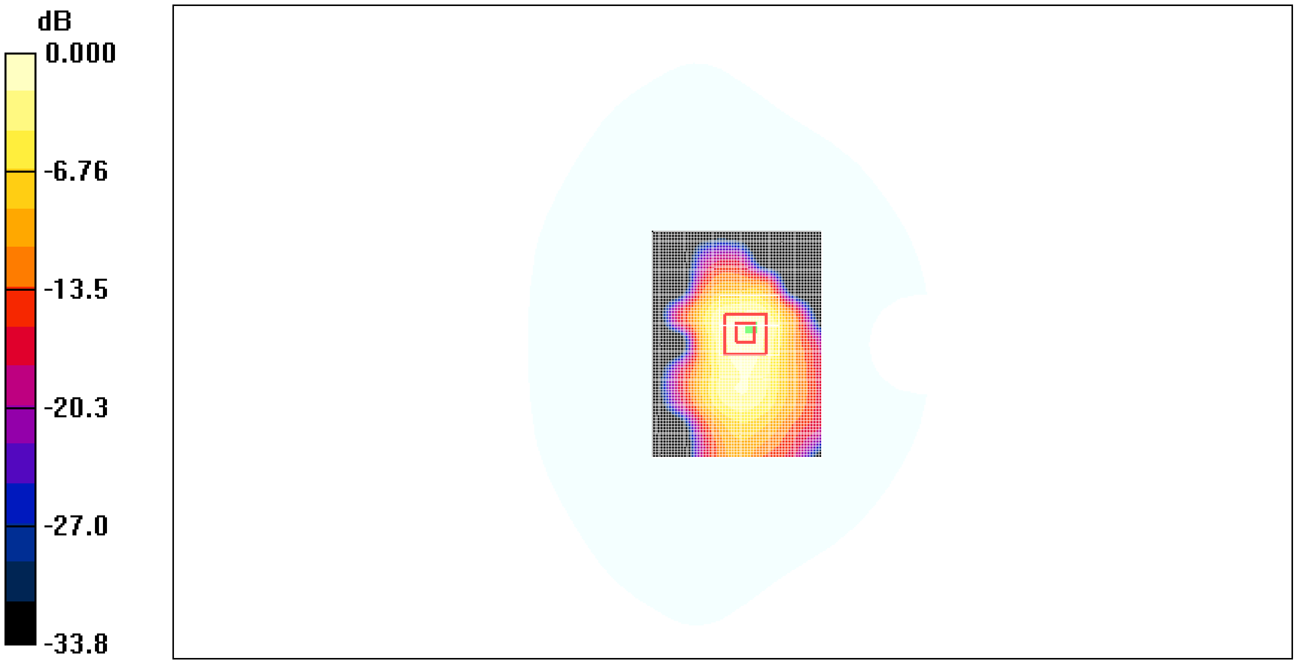
Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.9 V/m; Power Drift = -0.024 dB

Peak SAR (extrapolated) = 1.31 W/kg

SAR(1 g) = 0.586 mW/g; SAR(10 g) = 0.268 mW/g

Maximum value of SAR (measured) = 0.636 mW/g



0 dB = 0.636mW/g

Fig.44 10MHz QPSK Test Position 2

10MHz QPSK Test Position 2 Middle - Antenna 1

Date/Time: 2010-5-25 9:11:32

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2593 MHz; σ = 2.12 mho/m; εr = 51.7; ρ = 1000 kg/m3

Ambient Temperature:23.3 ^{o}C Liquid Temperature: 22.5 ^{o}C

Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.810 mW/g

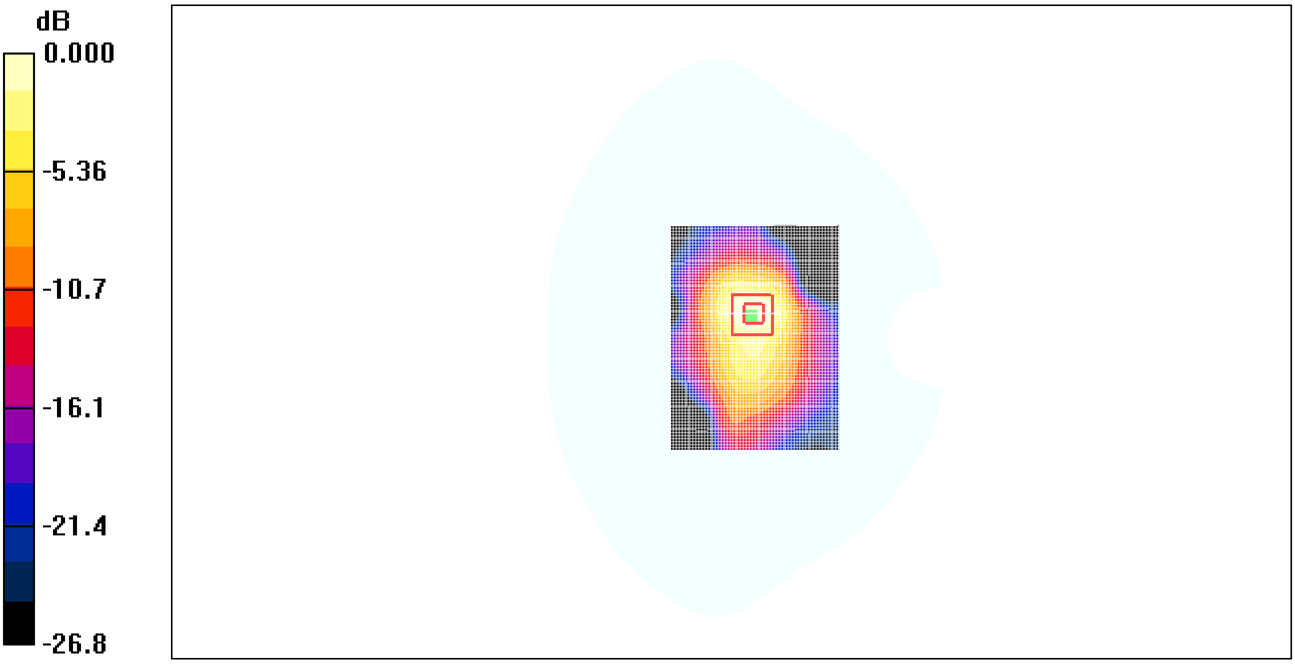
Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.9 V/m; Power Drift = 0.033 dB

Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 0.691 mW/g; SAR(10 g) = 0.322 mW/g

Maximum value of SAR (measured) = 0.778 mW/g



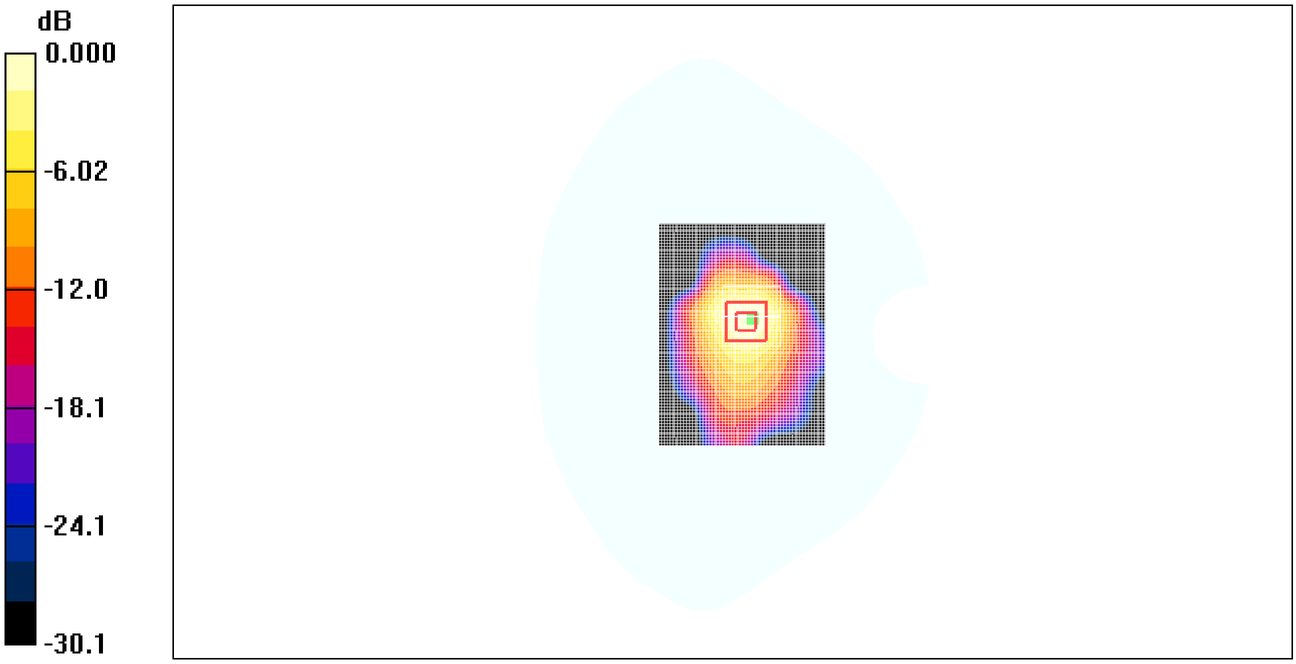
0 dB = 0.778mW/g

Fig.45 10MHz QPSK Test Position 2

10MHz QPSK Test Position 2 Low - Antenna 1
Date/Time: 2010-5-25 9:26:49
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.00 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2501 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.875 mW/g

Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.0 V/m; Power Drift = 0.080 dB
Peak SAR (extrapolated) = 1.79 W/kg
SAR(1 g) = 0.807 mW/g; SAR(10 g) = 0.368 mW/g
Maximum value of SAR (measured) = 0.877 mW/g



0 dB = 0.877mW/g

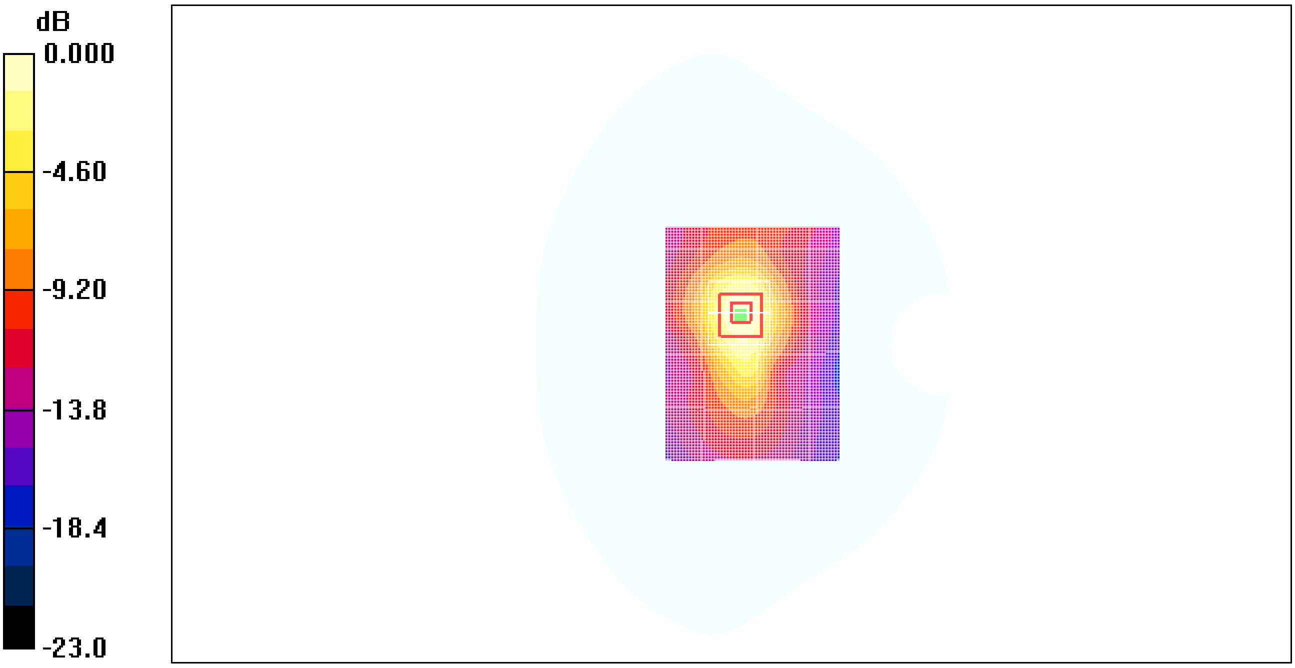
Fig.46 10MHz QPSK Test Position 2

10MHz QPSK Test Position 3 High - Antenna 1

Date/Time: 2010-5-25 9:43:11
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2685 MHz; σ = 2.24 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2685 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 3 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.706 mW/g

Test Position 3 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.9 V/m; Power Drift = 0.000 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.615 mW/g; SAR(10 g) = 0.312 mW/g
Maximum value of SAR (measured) = 0.689 mW/g



0 dB = 0.689mW/g

Fig.47 10MHz QPSK Test Position 3

10MHz QPSK Test Position 3 Middle - Antenna 1

Date/Time: 2010-5-25 9:58:29

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2593 MHz; σ = 2.12 mho/m; εr = 51.7; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 3 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.412 mW/g

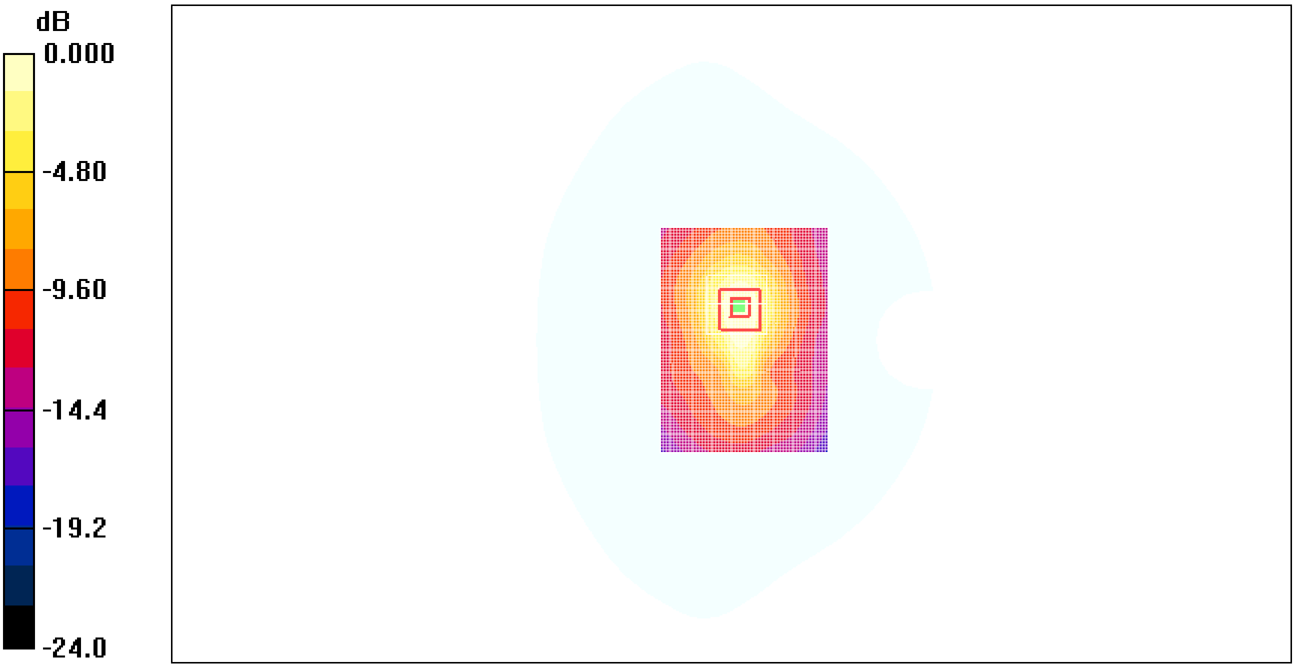
Test Position 3 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.2 V/m; Power Drift = -0.140 dB

Peak SAR (extrapolated) = 0.673 W/kg

SAR(1 g) = 0.363 mW/g; SAR(10 g) = 0.191 mW/g

Maximum value of SAR (measured) = 0.400 mW/g



0 dB = 0.400mW/g

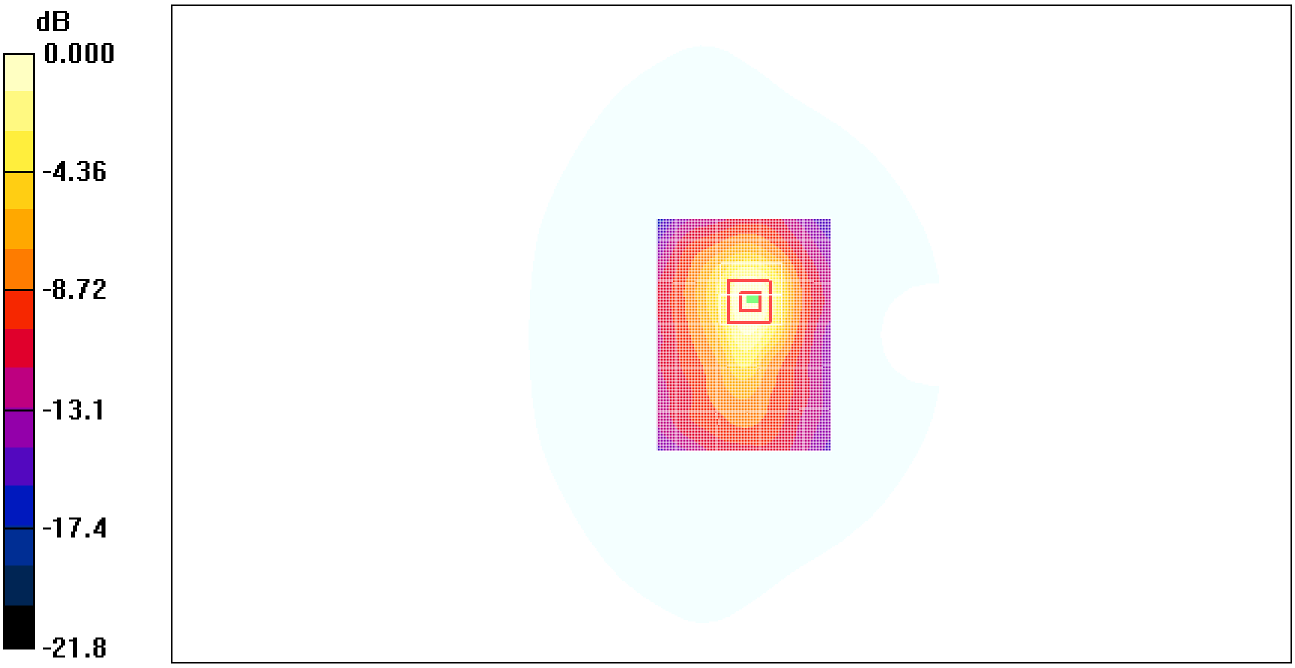
Fig.48 10MHz QPSK Test Position 3

10MHz QPSK Test Position 3 Low - Antenna 1

Date/Time: 2010-5-25 10:13:43
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.00 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2501 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 3 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.212 mW/g

Test Position 3 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.36 V/m; Power Drift = 0.142 dB
Peak SAR (extrapolated) = 0.326 W/kg
SAR(1 g) = 0.185 mW/g; SAR(10 g) = 0.098 mW/g
Maximum value of SAR (measured) = 0.202 mW/g



0 dB = 0.202mW/g

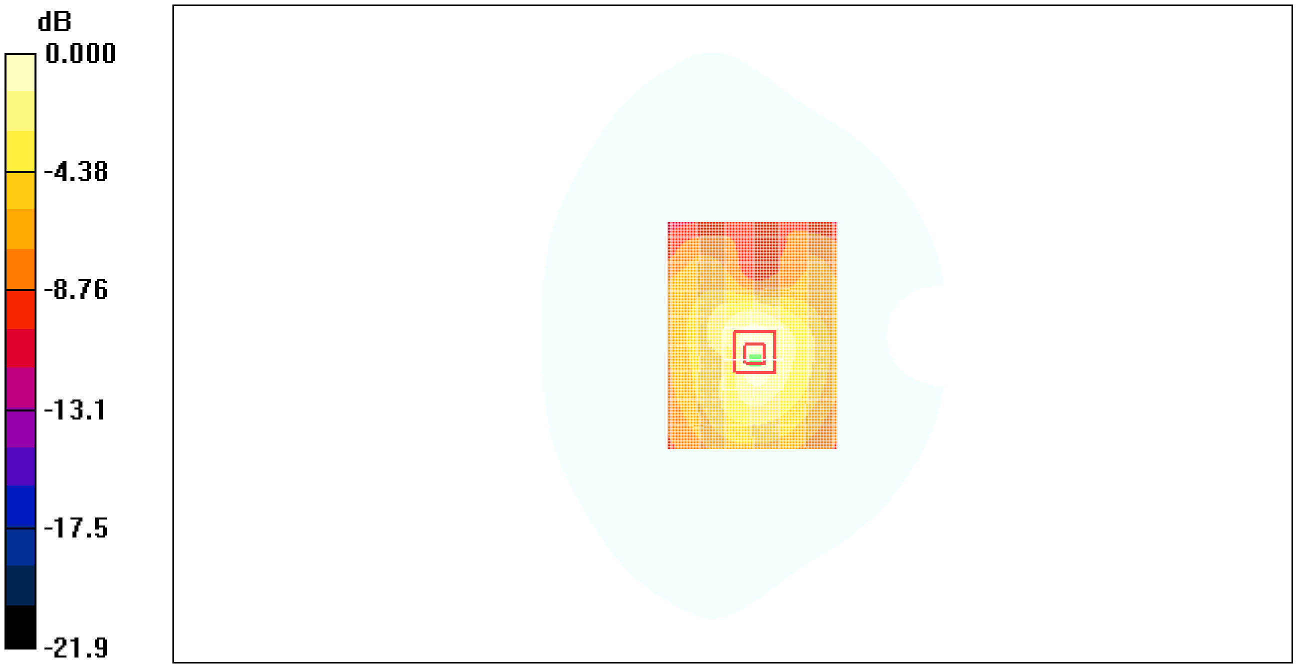
Fig.49 10MHz QPSK Test Position 3

10MHz QPSK Test Position 4 High - Antenna 1

Date/Time: 2010-5-25 10:30:08
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2685 MHz; σ = 2.24 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2685 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 4 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.190 mW/g

Test Position 4 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.04 V/m; Power Drift = -0.160 dB
Peak SAR (extrapolated) = 0.277 W/kg
SAR(1 g) = 0.150 mW/g; SAR(10 g) = 0.078 mW/g
Maximum value of SAR (measured) = 0.174 mW/g



0 dB = 0.174mW/g

Fig.50 10MHz QPSK Test Position 4

10MHz QPSK Test Position 5 High - Antenna 1

Date/Time: 2010-5-25 10:46:49

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2685 MHz; σ = 2.24 mho/m; εr = 51.4; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2685 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 5 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.268 mW/g

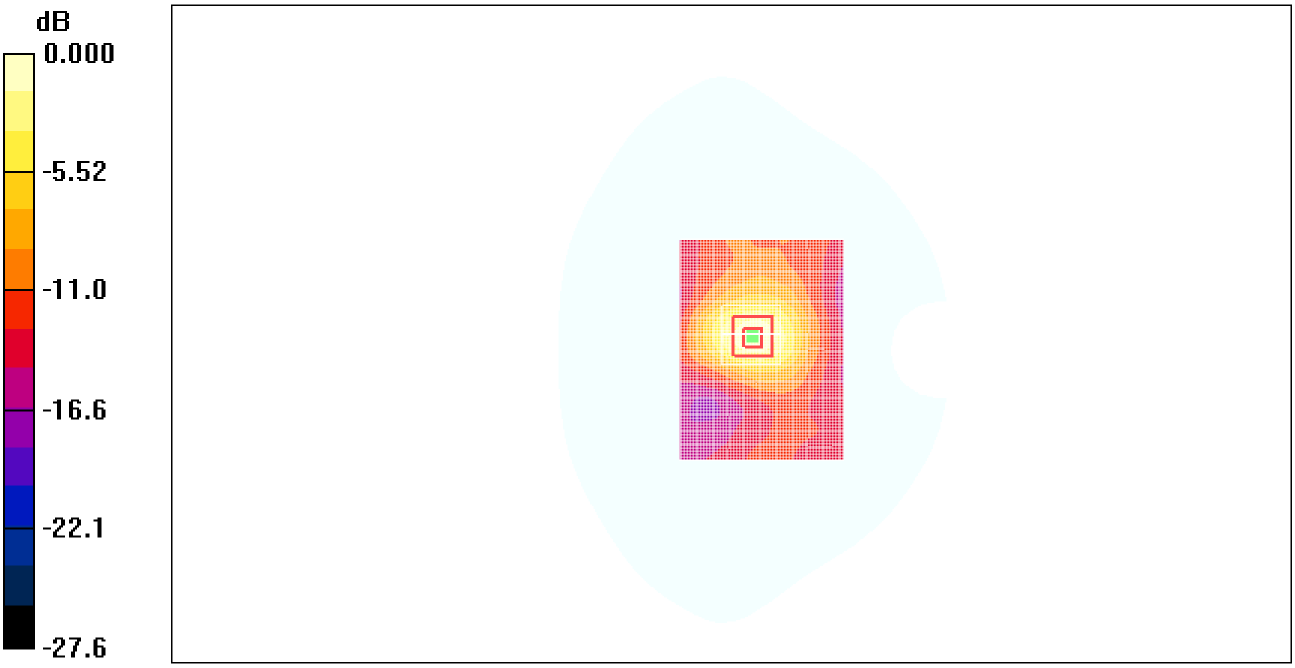
Test Position 5 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.72 V/m; Power Drift = -0.186 dB

Peak SAR (extrapolated) = 0.429 W/kg

SAR(1 g) = 0.229 mW/g; SAR(10 g) = 0.103 mW/g

Maximum value of SAR (measured) = 0.276 mW/g



0 dB = 0.276mW/g

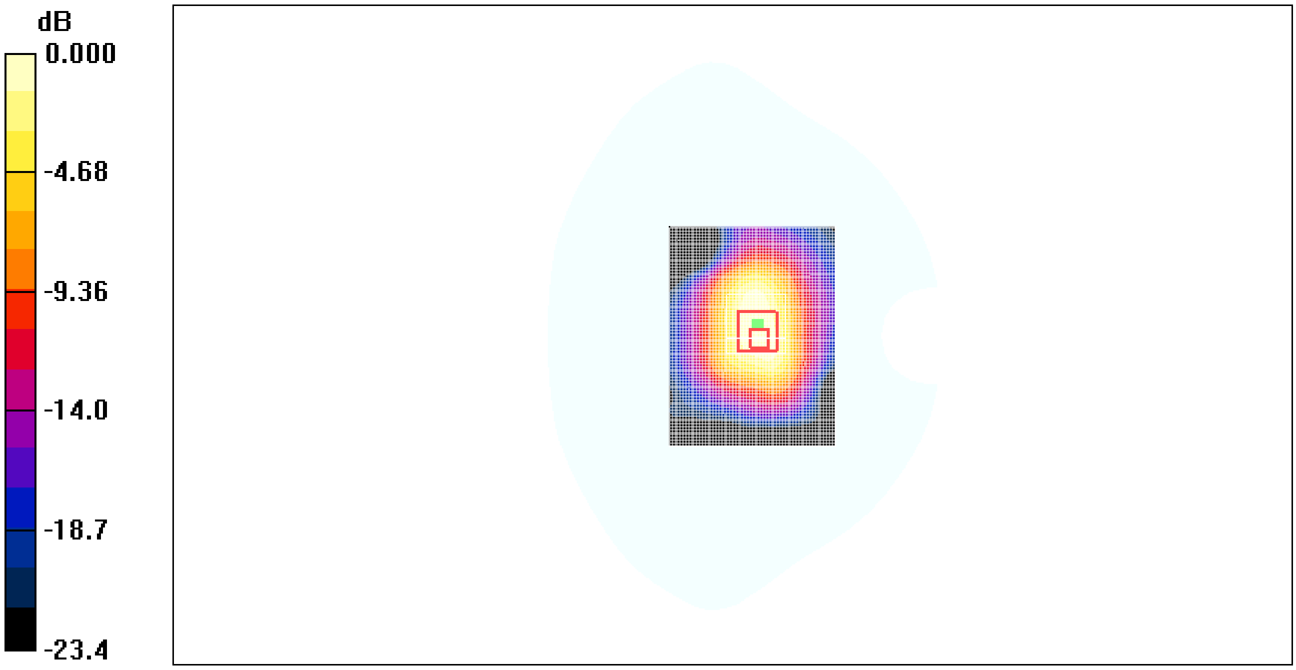
Fig.51 10MHz QPSK Test Position 5

10MHz 16QAM Test Position 1 High - Antenna 1

Date/Time: 2010-5-25 11:19:54
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2685 MHz; σ = 2.24 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2685 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.946 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.6 V/m; Power Drift = -0.111 dB
Peak SAR (extrapolated) = 1.61 W/kg
SAR(1 g) = 0.809 mW/g; SAR(10 g) = 0.413 mW/g
Maximum value of SAR (measured) = 0.890 mW/g



0 dB = 0.890mW/g

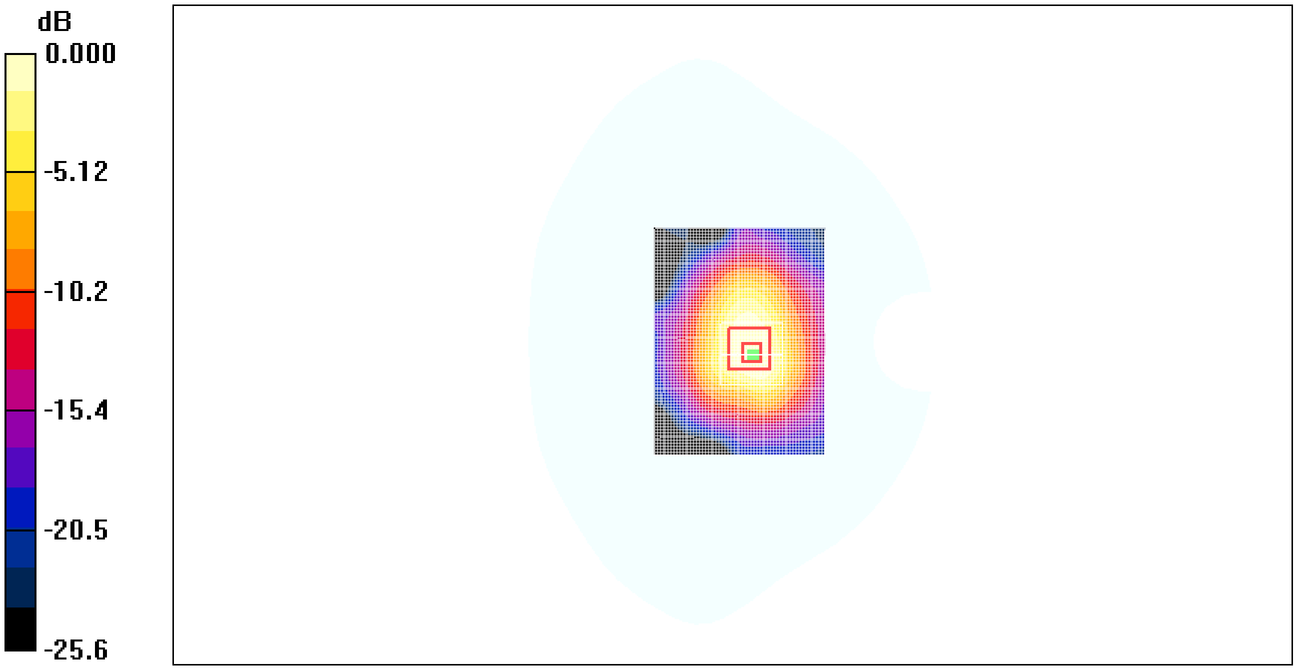
Fig.52 10MHz 16QAM Test Position 1

10MHz 16QAM Test Position 1 Middle - Antenna 1

Date/Time: 2010-5-25 11:04:37
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.12 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.04 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.9 V/m; Power Drift = -0.196 dB
Peak SAR (extrapolated) = 1.58 W/kg
SAR(1 g) = 0.795 mW/g; SAR(10 g) = 0.405 mW/g
Maximum value of SAR (measured) = 0.884 mW/g



0 dB = 0.884mW/g

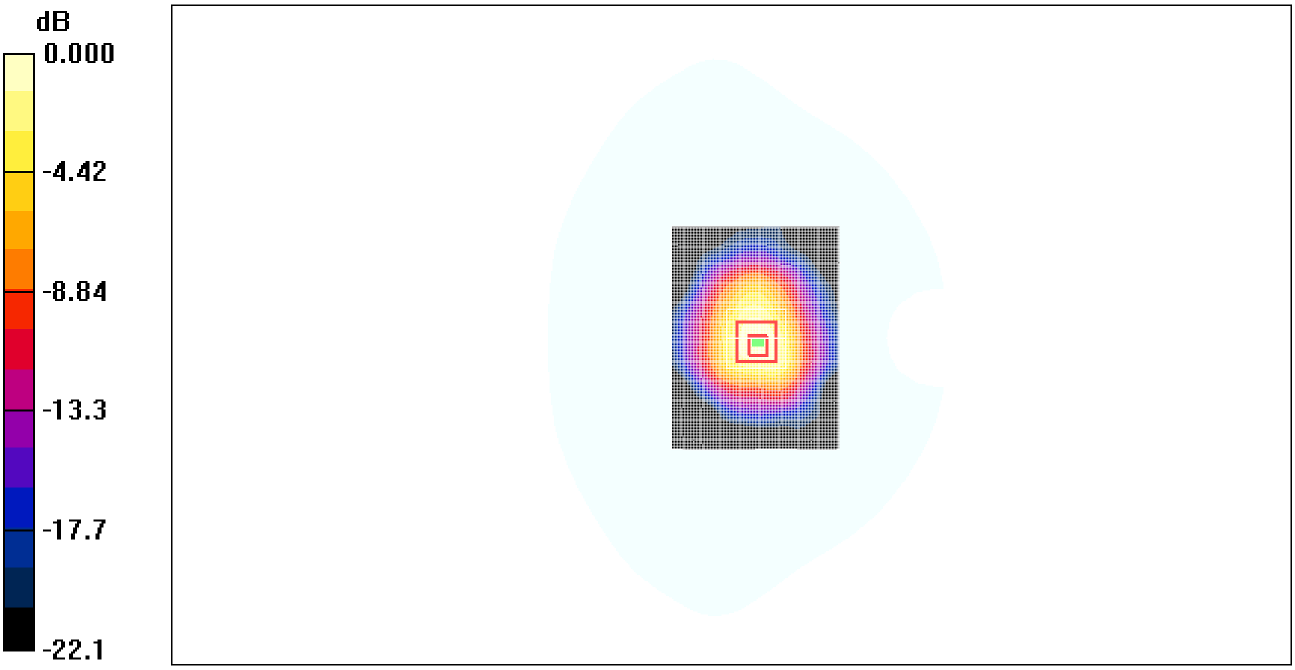
Fig.53 10MHz 16QAM Test Position 1

10MHz 16QAM Test Position 1 Low - Antenna 1

Date/Time: 2010-5-25 11:35:16
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.00 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2501 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.801 mW/g

Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.5 V/m; Power Drift = -0.192 dB
Peak SAR (extrapolated) = 1.49 W/kg
SAR(1 g) = 0.765 mW/g; SAR(10 g) = 0.387 mW/g
Maximum value of SAR (measured) = 0.812 mW/g



0 dB = 0.812mW/g

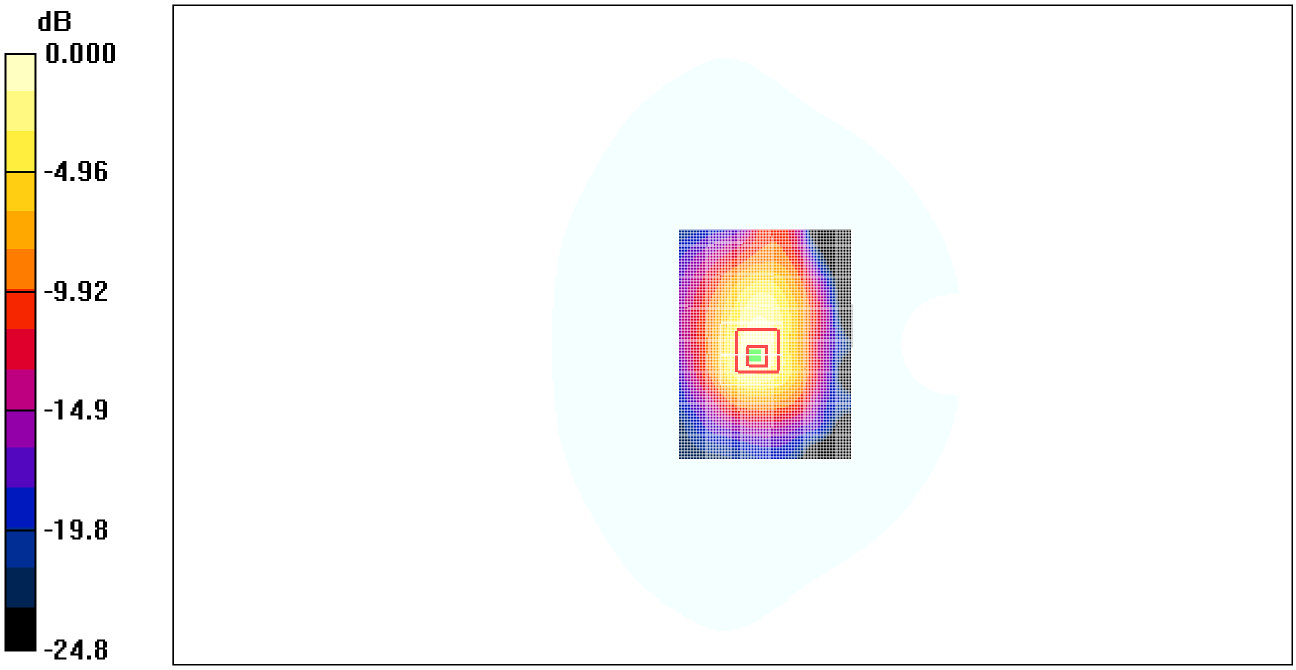
Fig.54 10MHz 16QAM Test Position 1

10MHz 16QAM Test Position 2 High - Antenna 1

Date/Time: 2010-5-25 12:07:10
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2685 MHz; σ = 2.24 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2685 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.723 mW/g

Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.7 V/m; Power Drift = -0.078 dB
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.676 mW/g; SAR(10 g) = 0.324 mW/g
Maximum value of SAR (measured) = 0.741 mW/g



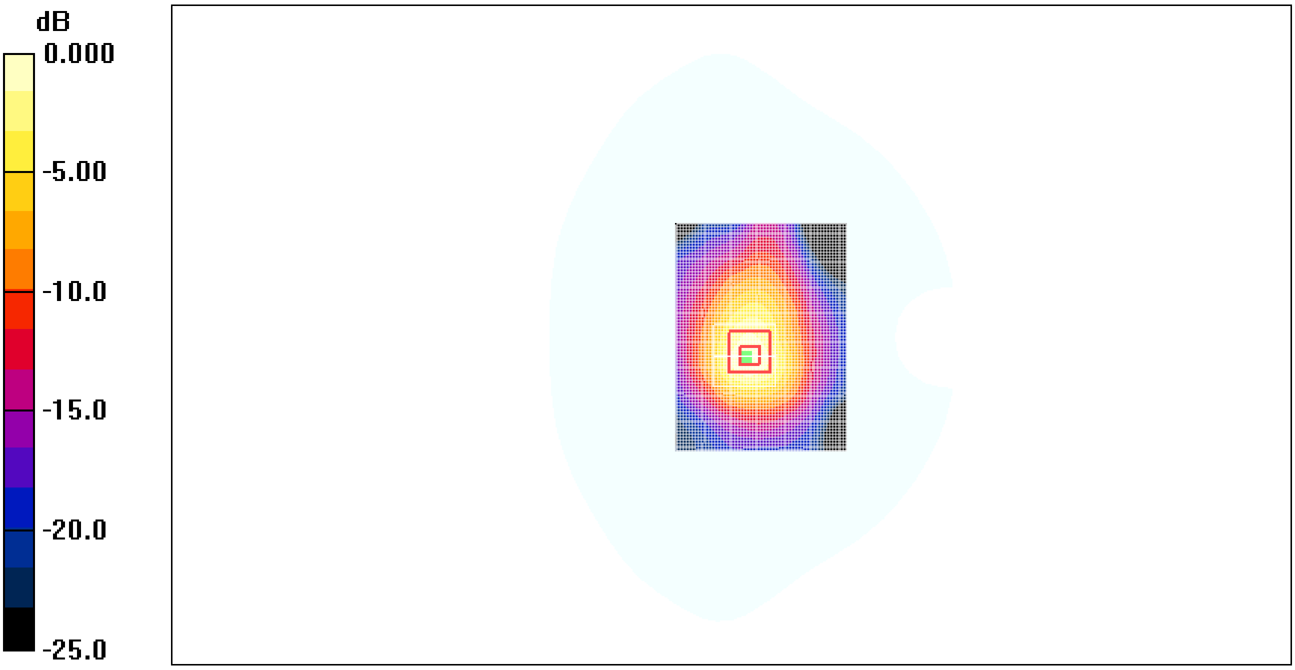
0 dB = 0.741mW/g

Fig.55 10MHz 16QAM Test Position 2

10MHz 16QAM Test Position 2 Middle - Antenna 1
Date/Time: 2010-5-25 11:51:44
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.12 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.02 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.3 V/m; Power Drift = 0.058 dB
Peak SAR (extrapolated) = 1.90 W/kg
SAR(1 g) = 0.883 mW/g; SAR(10 g) = 0.417 mW/g
Maximum value of SAR (measured) = 0.985 mW/g



0 dB = 0.985mW/g

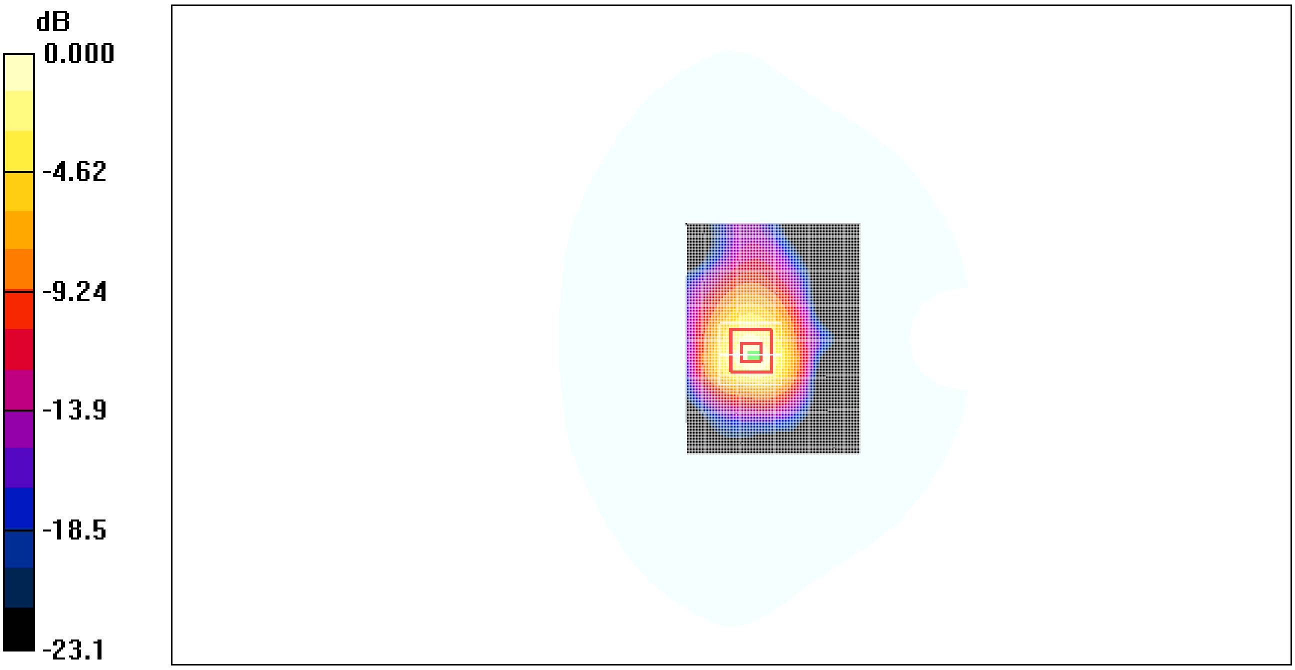
Fig.56 10MHz 16QAM Test Position 2

10MHz 16QAM Test Position 2 Low - Antenna 1

Date/Time: 2010-5-25 12:22:28
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.00 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2501 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.997 mW/g

Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.4 V/m; Power Drift = -0.115 dB
Peak SAR (extrapolated) = 1.91 W/kg
SAR(1 g) = 0.901 mW/g; SAR(10 g) = 0.427 mW/g
Maximum value of SAR (measured) = 1.02 mW/g



0 dB = 1.02mW/g

Fig.57 10MHz 16QAM Test Position 2

10MHz 16QAM Test Position 3 Middle - Antenna 1

Date/Time: 2010-5-25 12:38:59

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2593 MHz; σ = 2.12 mho/m; εr = 51.7; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 3 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.458 mW/g

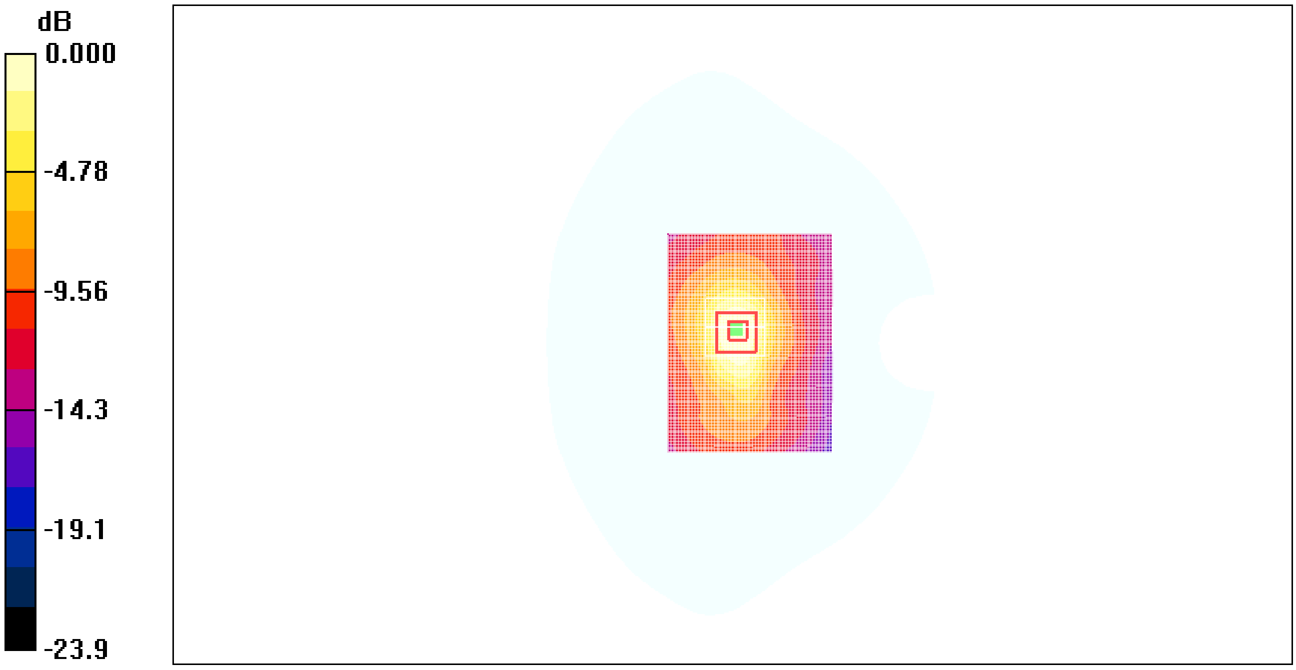
Test Position 3 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.9 V/m; Power Drift = 0.019 dB

Peak SAR (extrapolated) = 0.723 W/kg

SAR(1 g) = 0.392 mW/g; SAR(10 g) = 0.205 mW/g

Maximum value of SAR (measured) = 0.431 mW/g



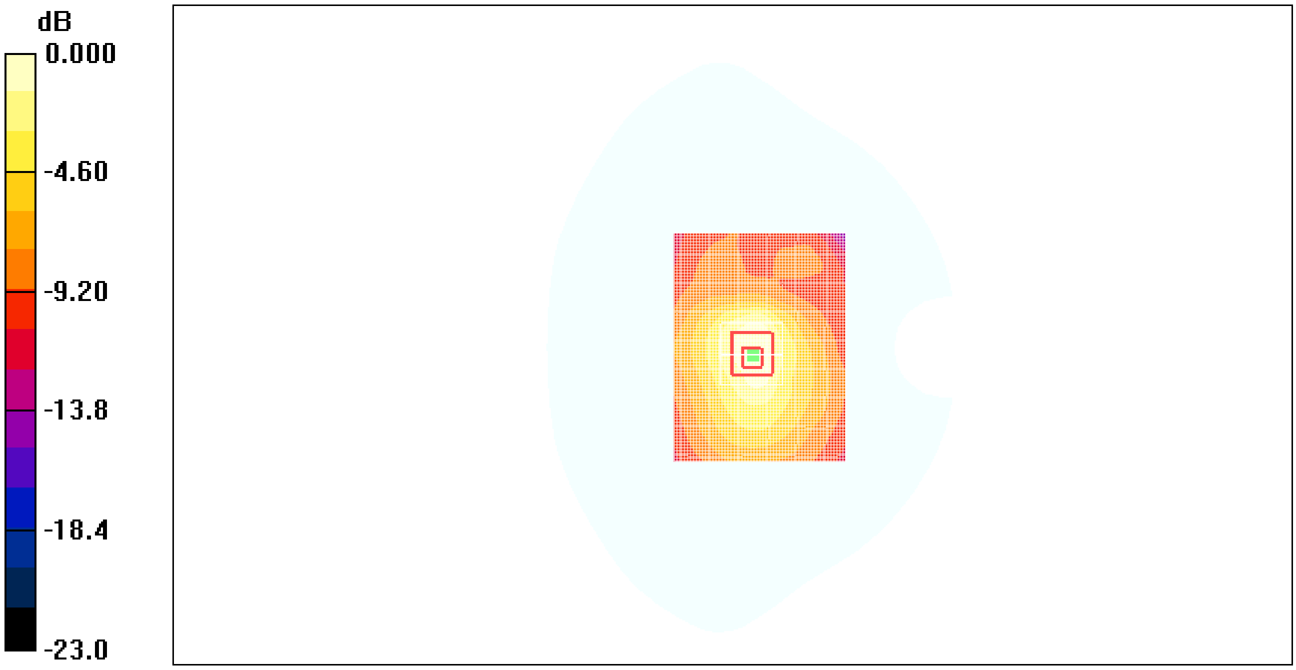
0 dB = 0.431mW/g

Fig.58 10MHz 16QAM Test Position 3

10MHz 16QAM Test Position 4 Middle - Antenna 1
Date/Time: 2010-5-25 12:55:23
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.12 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 ^{o}C Liquid Temperature: 22.5 ^{o}C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 4 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.210 mW/g

Test Position 4 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.62 V/m; Power Drift = 0.198 dB
Peak SAR (extrapolated) = 0.335 W/kg
SAR(1 g) = 0.188 mW/g; SAR(10 g) = 0.102 mW/g
Maximum value of SAR (measured) = 0.207 mW/g



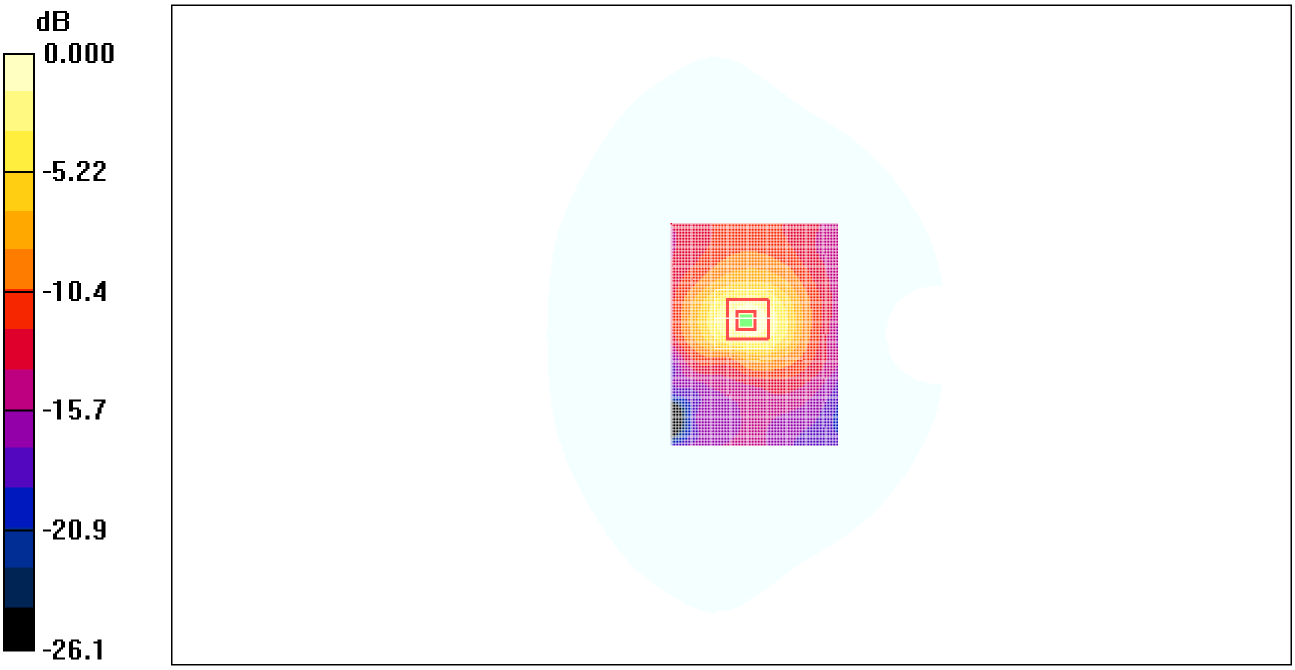
0 dB = 0.207mW/g

Fig.59 10MHz 16QAM Test Position 4

10MHz 16QAM Test Position 5 Middle - Antenna 1
Date/Time: 2010-5-25 13:12:44
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.12 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 5 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.282 mW/g

Test Position 5 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.2 V/m; Power Drift = 0.129 dB
Peak SAR (extrapolated) = 0.550 W/kg
SAR(1 g) = 0.268 mW/g; SAR(10 g) = 0.127 mW/g
Maximum value of SAR (measured) = 0.304 mW/g



0 dB = 0.304mW/g

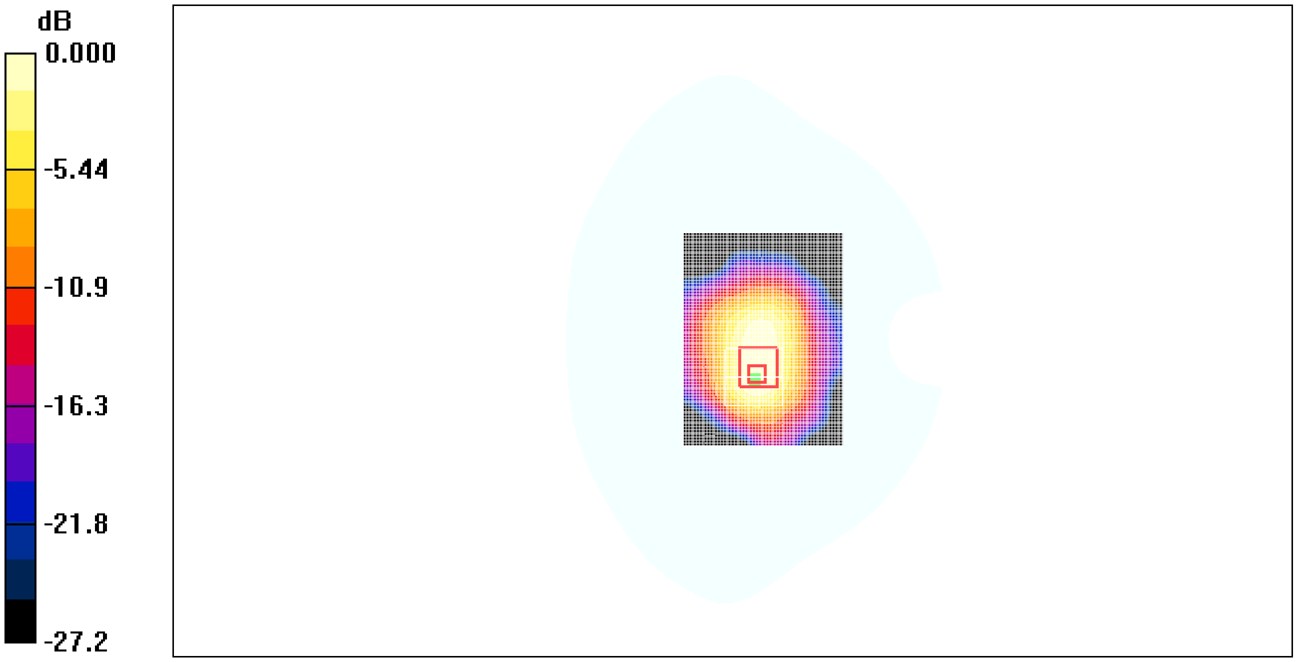
Fig.60 10MHz 16QAM Test Position 5

10MHz QPSK Test Position 1 High - Antenna 2

Date/Time: 2010-5-25 13:56:22
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2685 MHz; σ = 2.24 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2685 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.772 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.0 V/m; Power Drift = -0.037 dB
Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 0.651 mW/g; SAR(10 g) = 0.334 mW/g
Maximum value of SAR (measured) = 0.710 mW/g



0 dB = 0.710mW/g

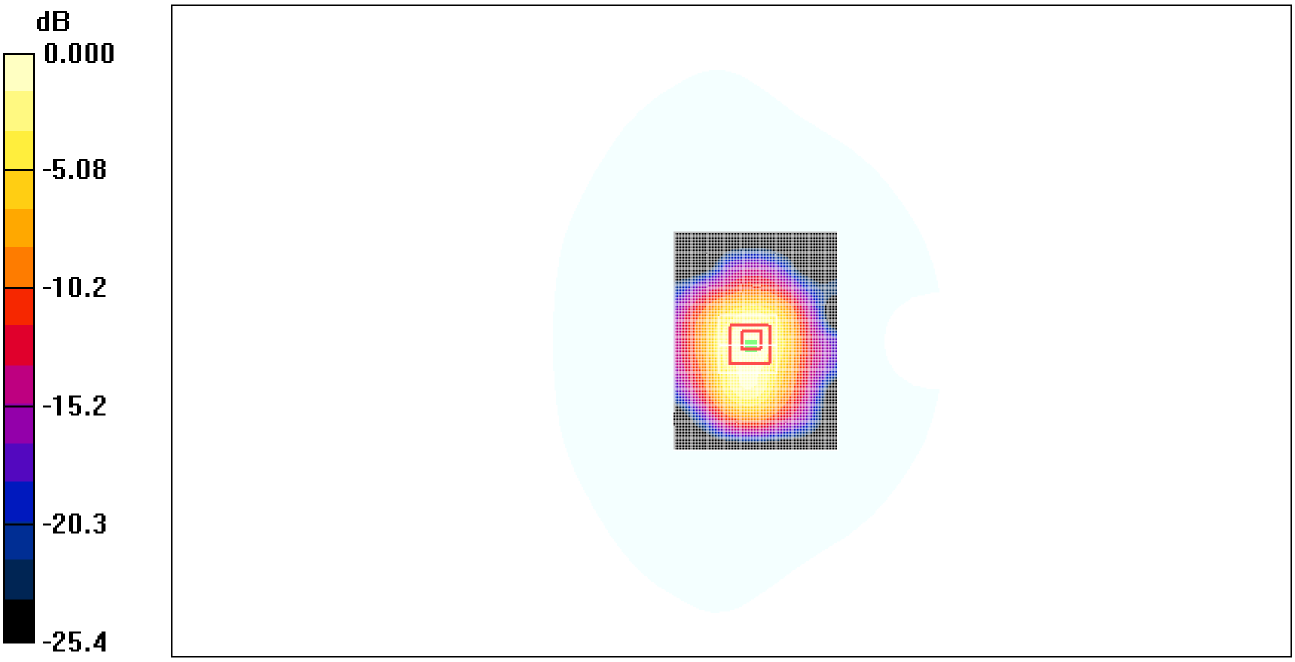
Fig.61 10MHz QPSK Test Position 1

10MHz QPSK Test Position 1 Middle - Antenna 2

Date/Time: 2010-5-25 14:11:38
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.12 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.791 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.6 V/m; Power Drift = -0.052 dB
Peak SAR (extrapolated) = 1.39 W/kg
SAR(1 g) = 0.670 mW/g; SAR(10 g) = 0.337 mW/g
Maximum value of SAR (measured) = 0.720 mW/g



0 dB = 0.720mW/g

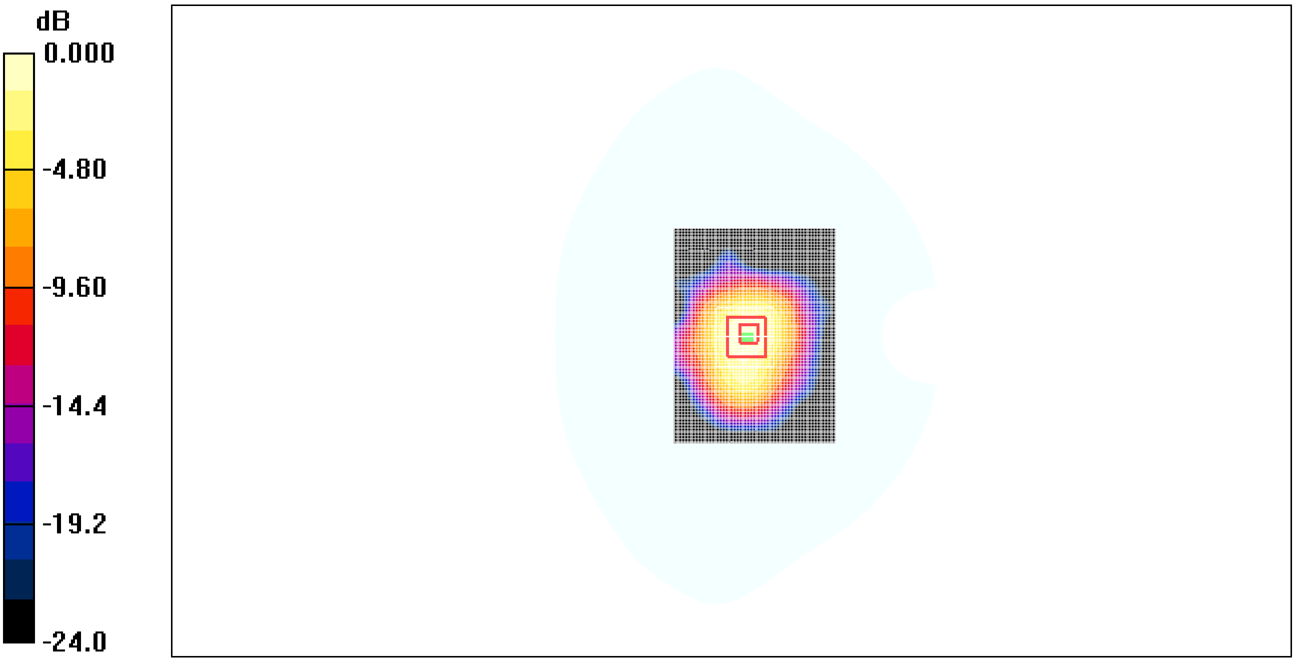
Fig.62 10MHz QPSK Test Position 1

10MHz QPSK Test Position 1 Low - Antenna 2

Date/Time: 2010-5-25 13:41:05
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.00 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2501 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.788 mW/g

Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.4 V/m; Power Drift = -0.018 dB
Peak SAR (extrapolated) = 1.34 W/kg
SAR(1 g) = 0.676 mW/g; SAR(10 g) = 0.344 mW/g
Maximum value of SAR (measured) = 0.732 mW/g



0 dB = 0.732mW/g

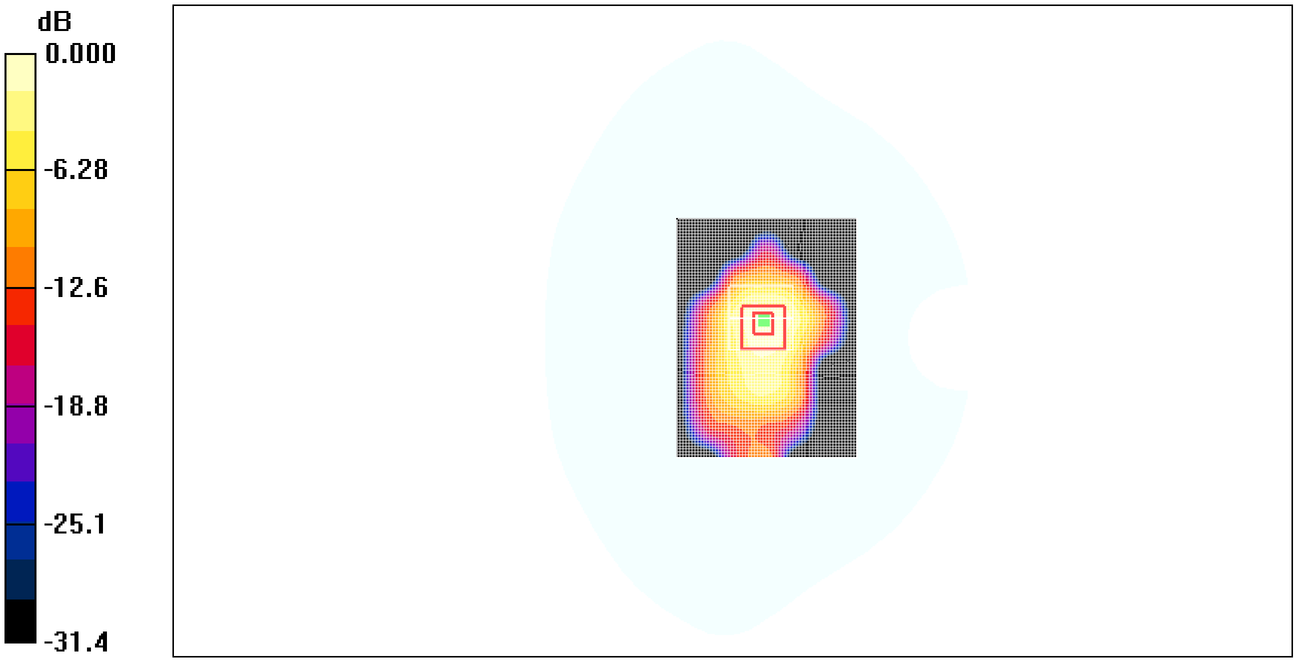
Fig.63 10MHz QPSK Test Position 1

10MHz QPSK Test Position 2 High - Antenna 2

Date/Time: 2010-5-25 14:43:20
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2685 MHz; σ = 2.24 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2685 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.668 mW/g

Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.1 V/m; Power Drift = -0.013 dB
Peak SAR (extrapolated) = 1.45 W/kg
SAR(1 g) = 0.651 mW/g; SAR(10 g) = 0.300 mW/g
Maximum value of SAR (measured) = 0.707 mW/g



0 dB = 0.707mW/g

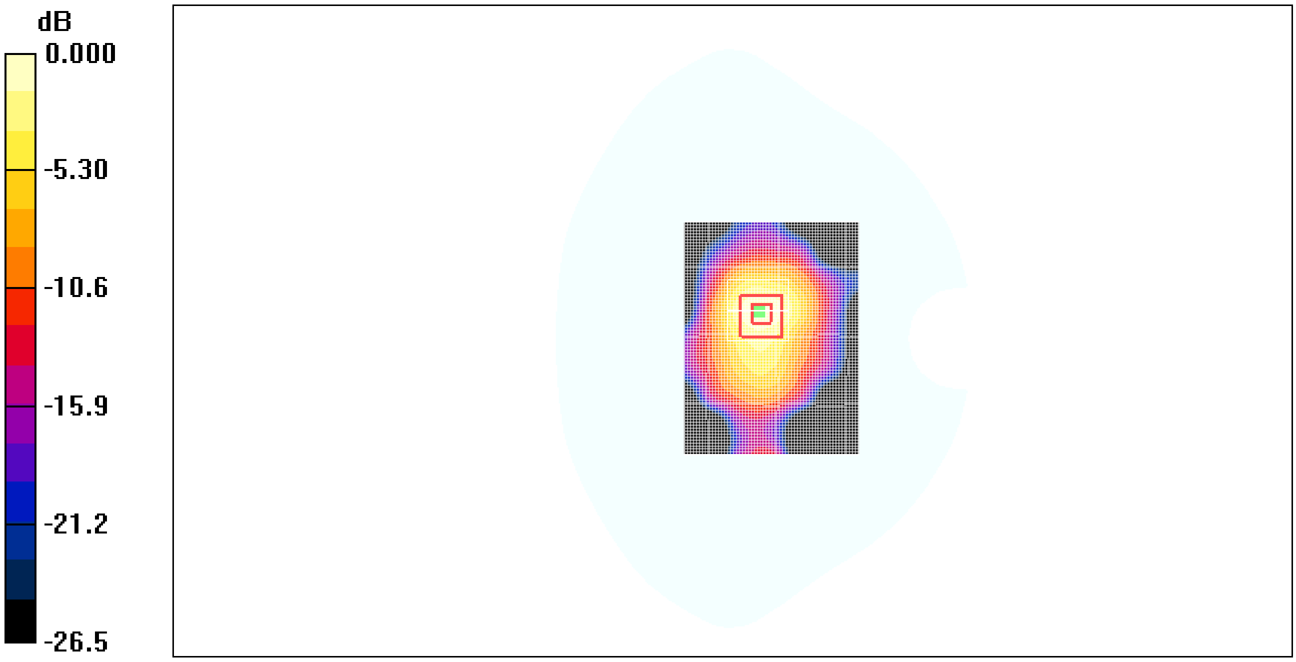
Fig.64 10MHz QPSK Test Position 2

10MHz QPSK Test Position 2 Middle - Antenna 2

Date/Time: 2010-5-25 14:58:41
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.12 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.867 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.4 V/m; Power Drift = 0.176 dB
Peak SAR (extrapolated) = 1.61 W/kg
SAR(1 g) = 0.736 mW/g; SAR(10 g) = 0.344 mW/g
Maximum value of SAR (measured) = 0.828 mW/g



0 dB = 0.828mW/g

Fig.65 10MHz QPSK Test Position 2

10MHz QPSK Test Position 2 Low - Antenna 2

Date/Time: 2010-5-25 14:28:01

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2501 MHz; σ = 2.00 mho/m; εr = 51.9; ρ = 1000 kg/m3

Ambient Temperature:23.3 ^{o}C Liquid Temperature: 22.5 ^{o}C

Communication System: WiMax 2600 Frequency: 2501 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.846 mW/g

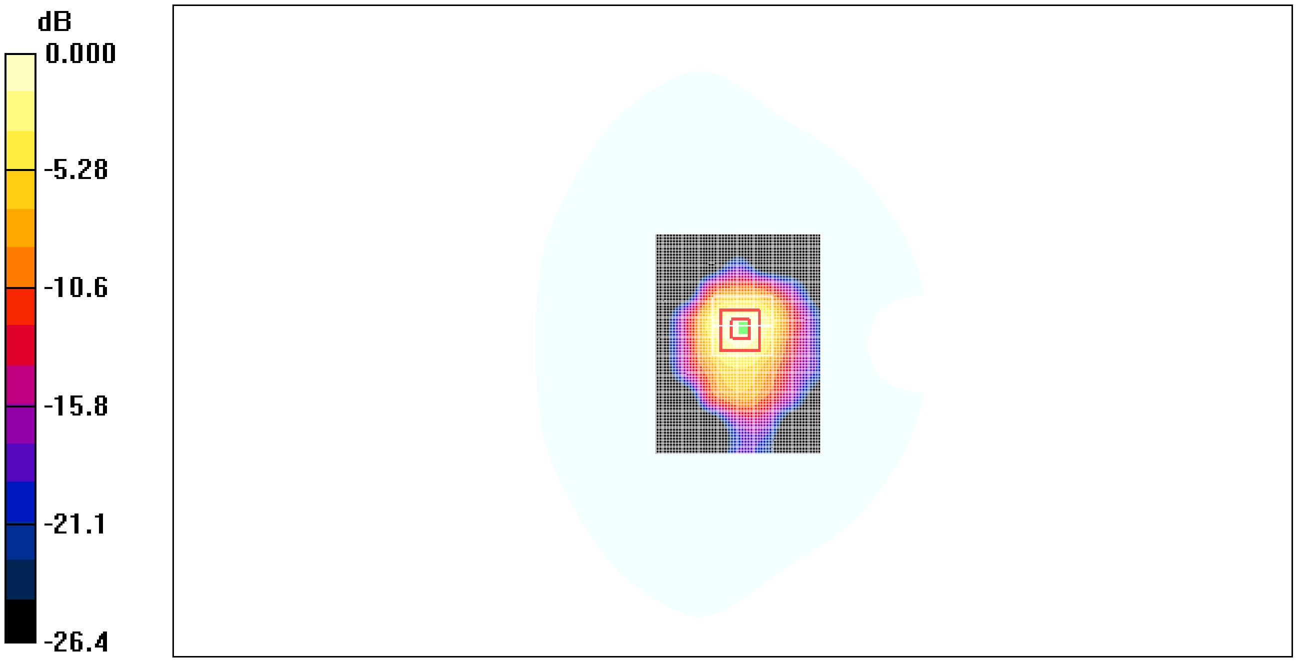
Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16.8 V/m; Power Drift = -0.001 dB

Peak SAR (extrapolated) = 1.71 W/kg

SAR(1 g) = 0.778 mW/g; SAR(10 g) = 0.359 mW/g

Maximum value of SAR (measured) = 0.859 mW/g



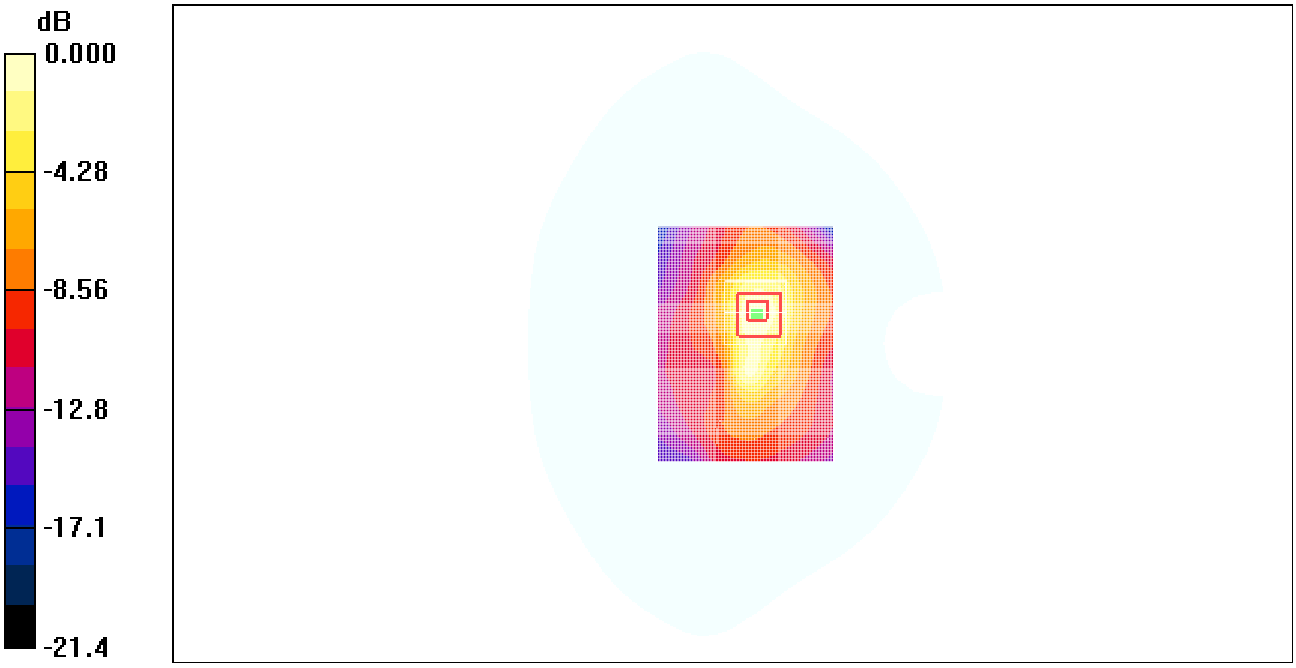
0 dB = 0.859mW/g

Fig.66 10MHz QPSK Test Position 2

10MHz QPSK Test Position 3 Low - Antenna 2
Date/Time: 2010-5-25 15:15:32
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.00 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2501 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 3 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.177 mW/g

Test Position 3 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.68 V/m; Power Drift = 0.008 dB
Peak SAR (extrapolated) = 0.290 W/kg
SAR(1 g) = 0.160 mW/g; SAR(10 g) = 0.085 mW/g
Maximum value of SAR (measured) = 0.180 mW/g



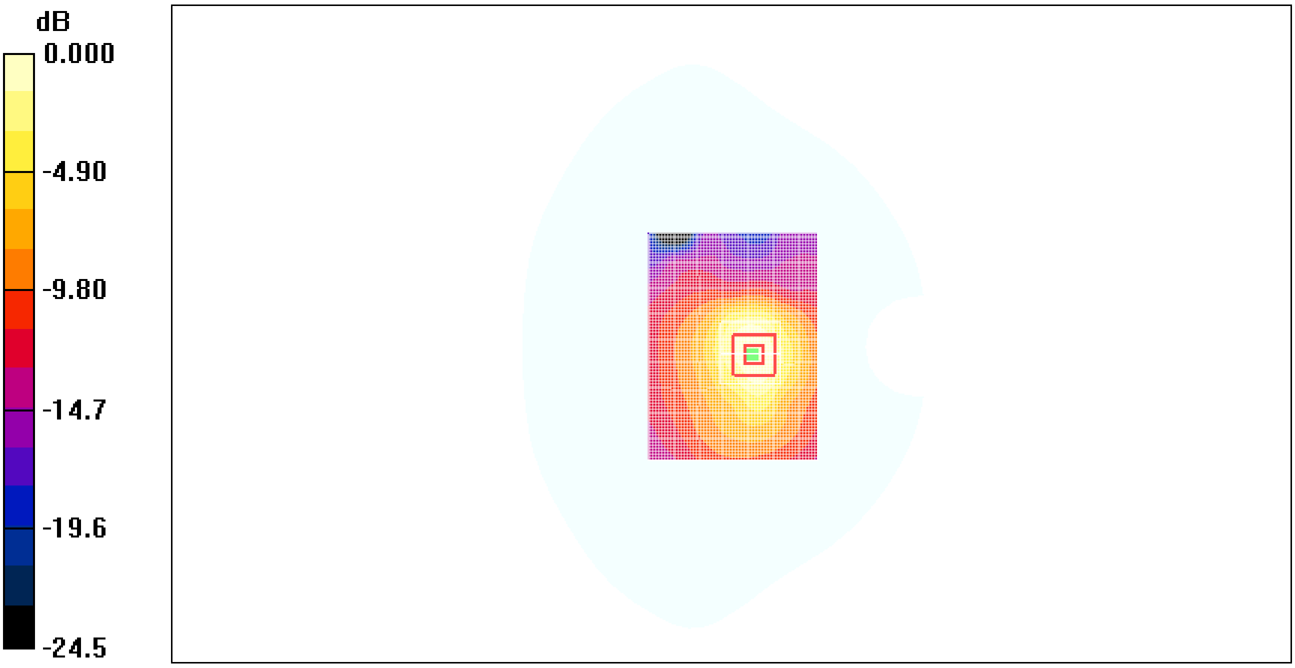
0 dB = 0.180mW/g

Fig.67 10MHz QPSK Test Position 3

10MHz QPSK Test Position 4 Low - Antenna 2
Date/Time: 2010-5-25 15:32:50
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.00 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2501 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 4 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.232 mW/g

Test Position 4 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.53 V/m; Power Drift = -0.005 dB
Peak SAR (extrapolated) = 0.372 W/kg
SAR(1 g) = 0.208 mW/g; SAR(10 g) = 0.112 mW/g
Maximum value of SAR (measured) = 0.227 mW/g



0 dB = 0.227mW/g

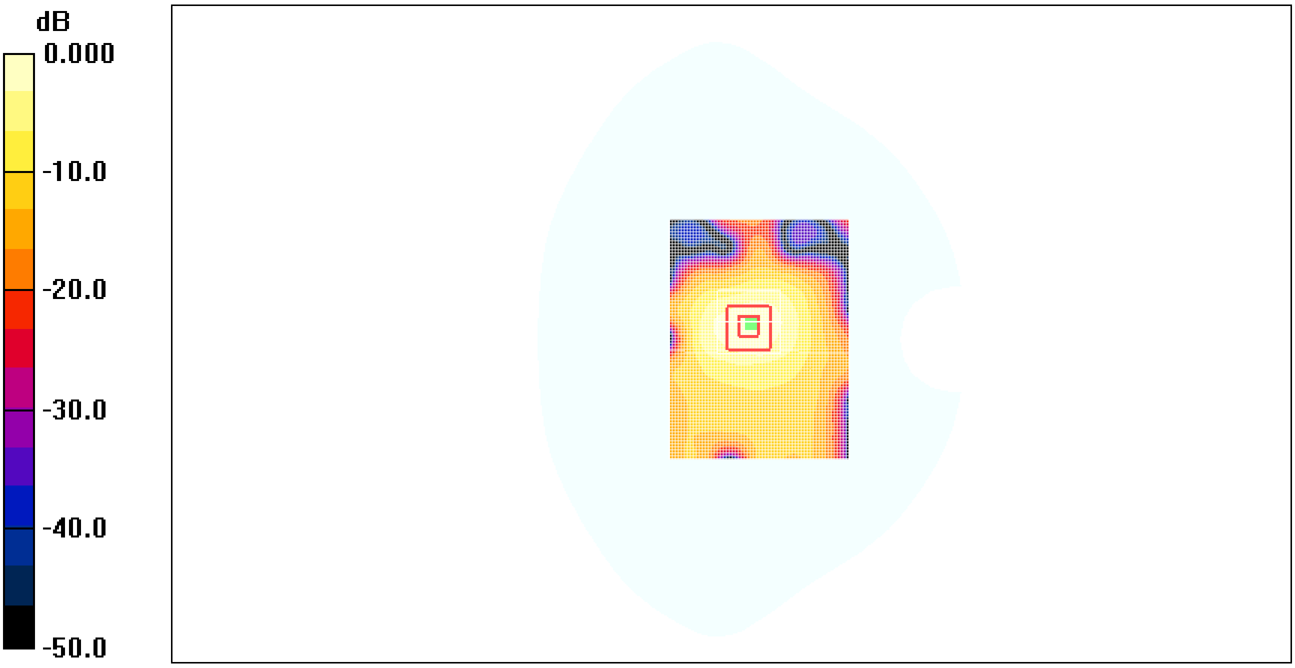
Fig.68 10MHz QPSK Test Position 4

10MHz QPSK Test Position 5 Low - Antenna 2

Date/Time: 2010-5-25 15:50:08
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.00 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2501 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 5 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.294 mW/g

Test Position 5 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.2 V/m; Power Drift = 0.124 dB
Peak SAR (extrapolated) = 0.581 W/kg
SAR(1 g) = 0.290 mW/g; SAR(10 g) = 0.137 mW/g
Maximum value of SAR (measured) = 0.330 mW/g



0 dB = 0.330mW/g

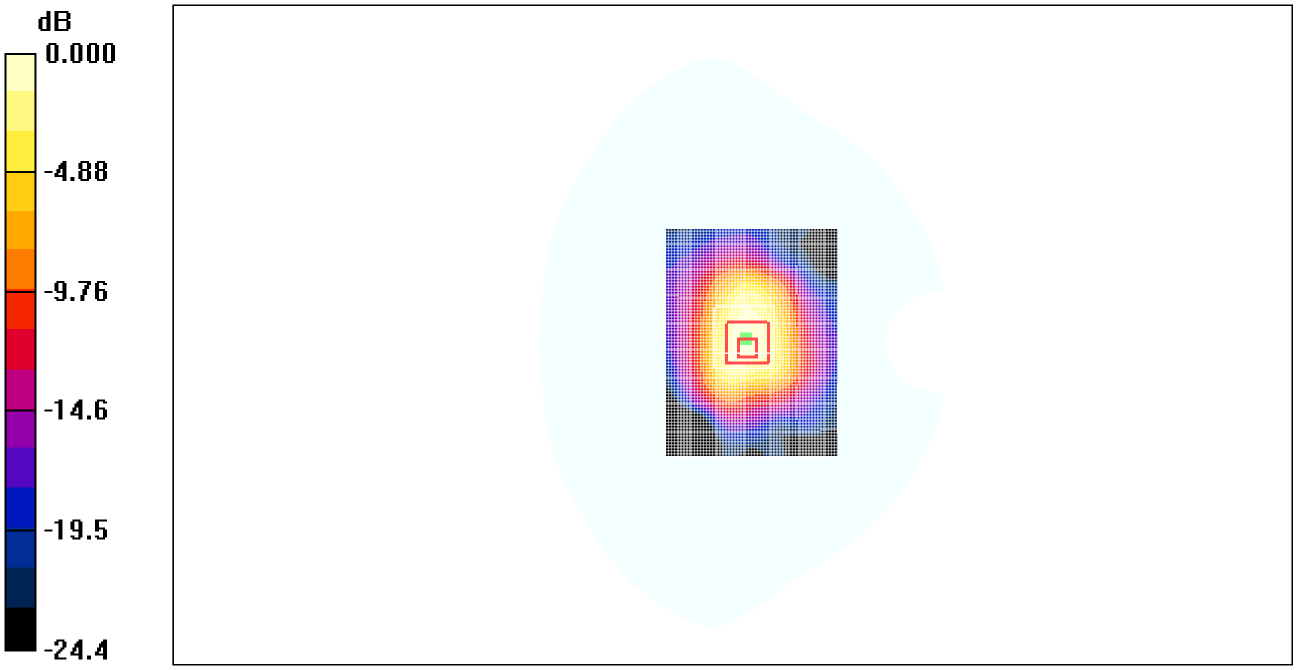
Fig.69 10MHz QPSK Test Position 5

10MHz 16QAM Test Position 1 High - Antenna 2

Date/Time: 2010-5-25 16:34:42
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2685 MHz; σ = 2.24 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2685 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.934 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.0 V/m; Power Drift = -0.066 dB
Peak SAR (extrapolated) = 1.74 W/kg
SAR(1 g) = 0.843 mW/g; SAR(10 g) = 0.417 mW/g
Maximum value of SAR (measured) = 0.930 mW/g



0 dB = 0.930mW/g

Fig.70 10MHz 16QAM Test Position 1

10MHz 16QAM Test Position 1 Middle - Antenna 2

Date/Time: 2010-5-25 16:19:21

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2593 MHz; σ = 2.12 mho/m; εr = 51.7; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.03 mW/g

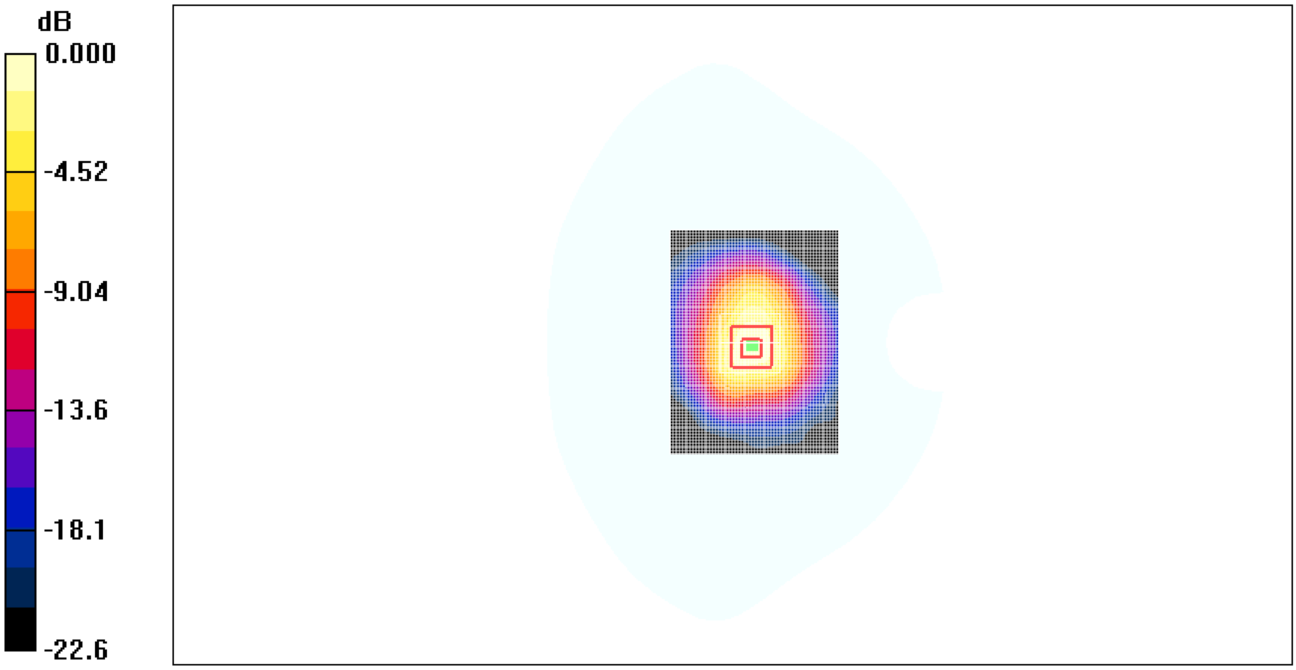
Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 21.7 V/m; Power Drift = -0.088 dB

Peak SAR (extrapolated) = 1.97 W/kg

SAR(1 g) = 0.973 mW/g; SAR(10 g) = 0.484 mW/g

Maximum value of SAR (measured) = 1.03 mW/g



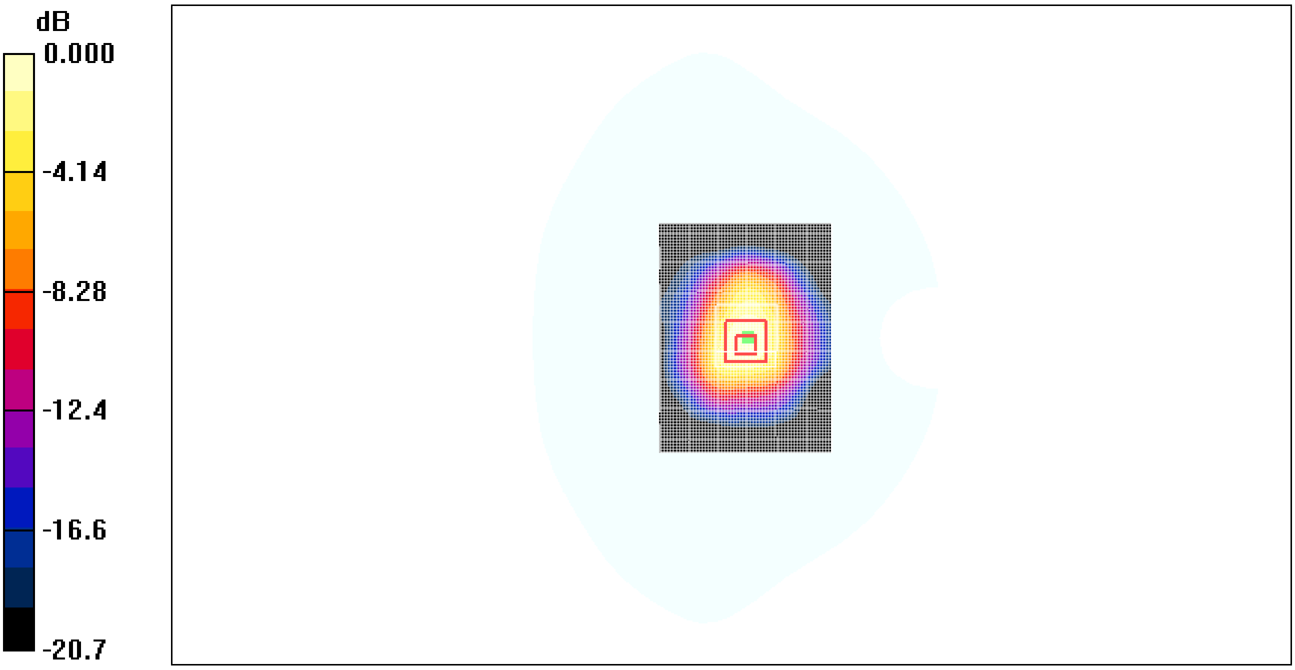
0 dB = 1.03mW/g

Fig.71 10MHz 16QAM Test Position 1

10MHz 16QAM Test Position 1 Low - Antenna 2
Date/Time: 2010-5-25 16:50:09
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.00 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2501 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.870 mW/g

Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.7 V/m; Power Drift = -0.119 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 0.803 mW/g; SAR(10 g) = 0.410 mW/g
Maximum value of SAR (measured) = 0.857 mW/g



0 dB = 0.857mW/g

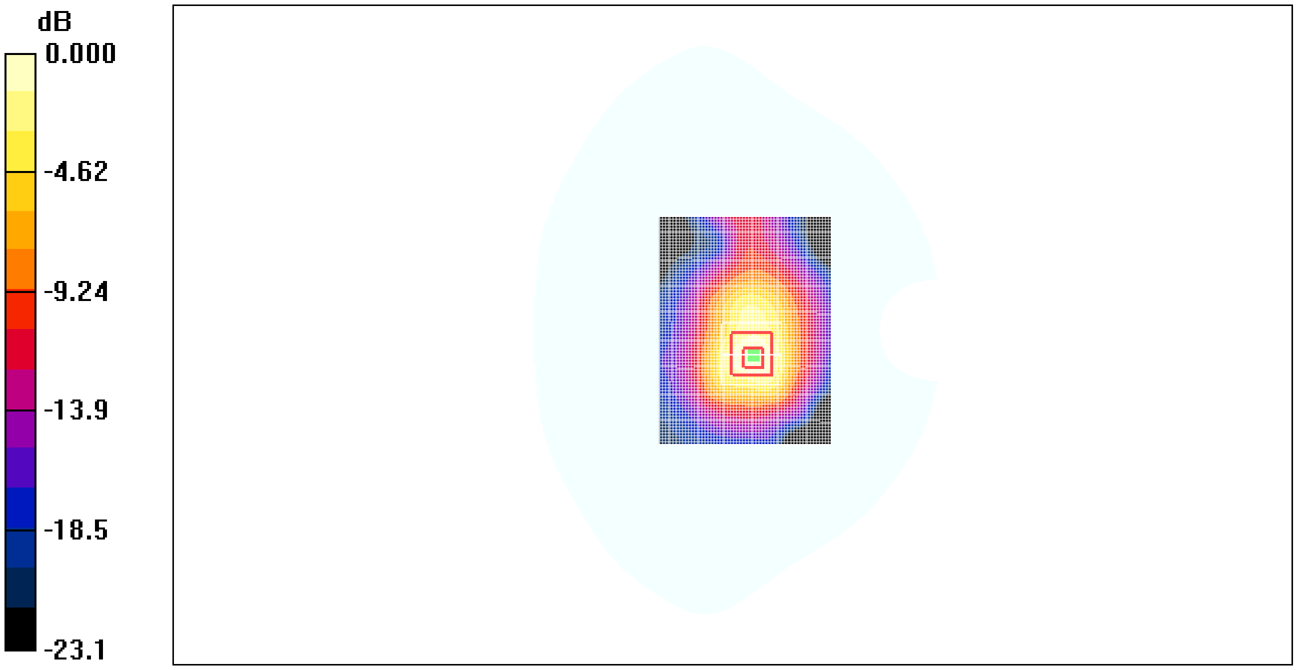
Fig.72 10MHz 16QAM Test Position 1

10MHz 16QAM Test Position 2 High - Antenna 2

Date/Time: 2010-5-25 17:22:10
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2685 MHz; σ = 2.24 mho/m; εr = 51.4; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2685 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 High/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.880 mW/g

Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.4 V/m; Power Drift = -0.125 dB
Peak SAR (extrapolated) = 1.62 W/kg
SAR(1 g) = 0.742 mW/g; SAR(10 g) = 0.352 mW/g
Maximum value of SAR (measured) = 0.819 mW/g



0 dB = 0.819mW/g

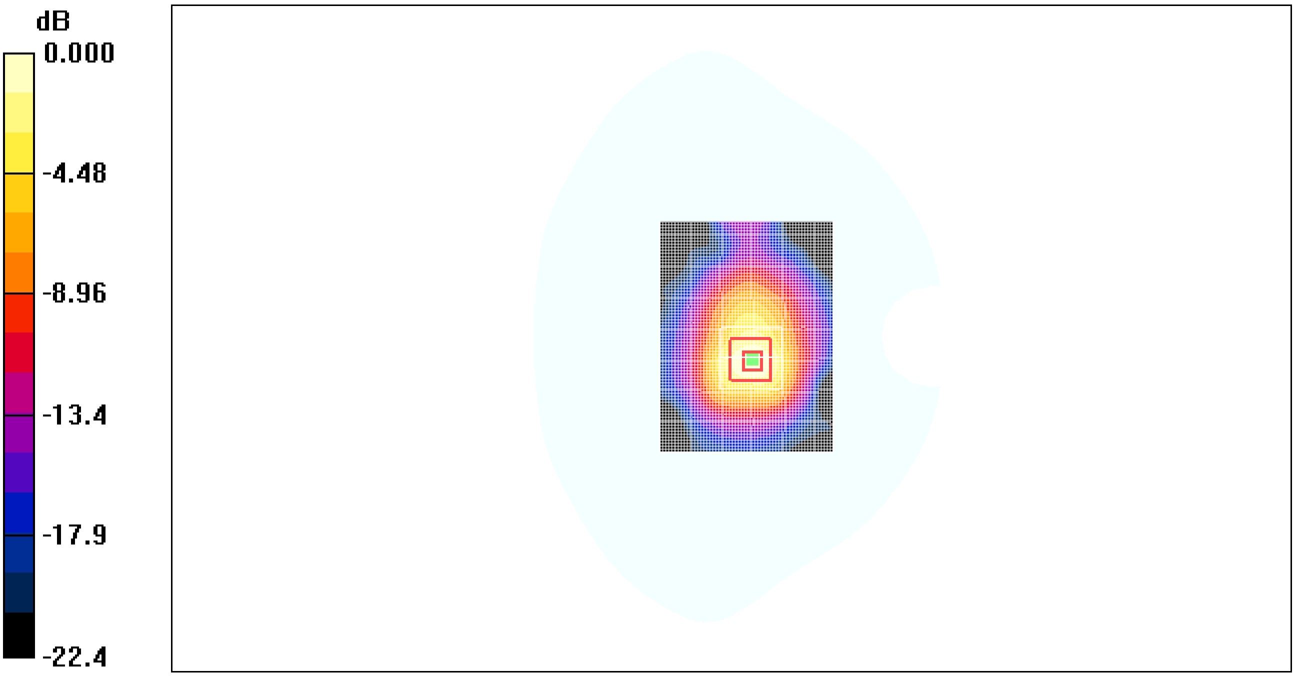
Fig.73 10MHz 16QAM Test Position 2

10MHz 16QAM Test Position 2 Middle - Antenna 2

Date/Time: 2010-5-25 17:06:48
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.12 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.08 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.6 V/m; Power Drift = -0.072 dB
Peak SAR (extrapolated) = 2.04 W/kg
SAR(1 g) = 0.941 mW/g; SAR(10 g) = 0.443 mW/g
Maximum value of SAR (measured) = 1.05 mW/g



0 dB = 1.05mW/g

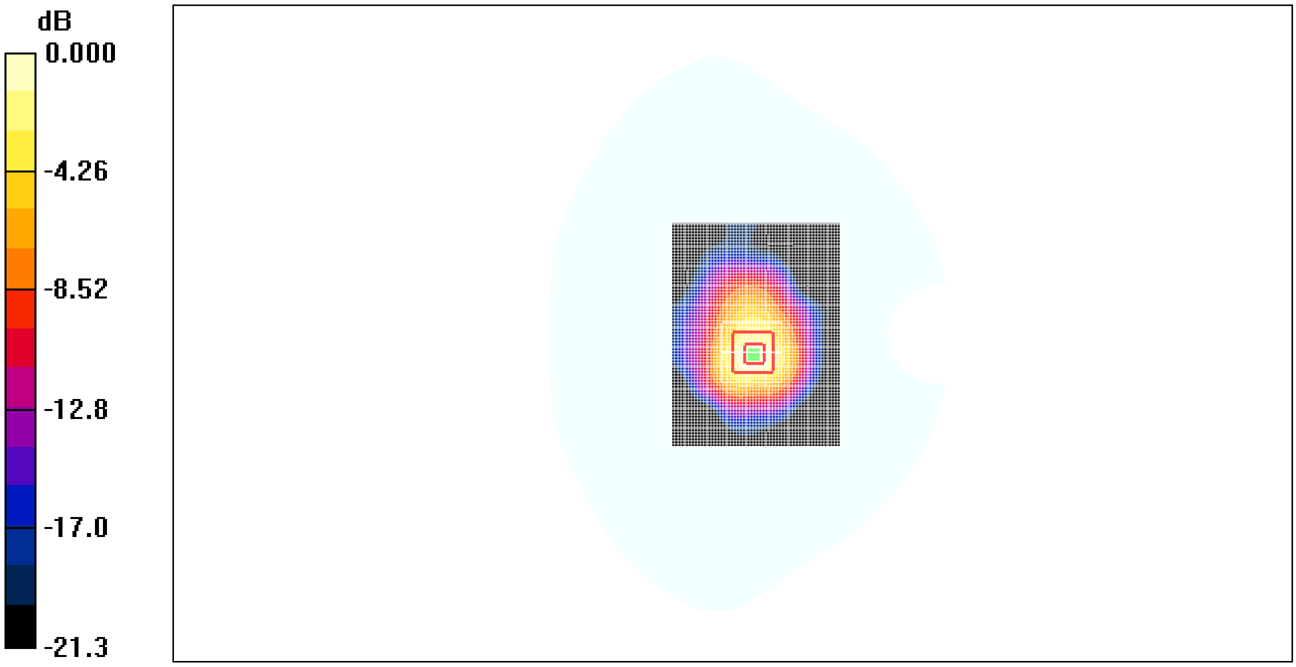
Fig.74 10MHz 16QAM Test Position 2

10MHz 16QAM Test Position 2 Low - Antenna 2

Date/Time: 2010-5-25 17:37:36
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.00 mho/m; εr = 51.9; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2501 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2 Low/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.977 mW/g

Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.8 V/m; Power Drift = 0.001 dB
Peak SAR (extrapolated) = 1.87 W/kg
SAR(1 g) = 0.872 mW/g; SAR(10 g) = 0.408 mW/g
Maximum value of SAR (measured) = 0.971 mW/g



0 dB = 0.971mW/g

Fig.75 10MHz 16QAM Test Position 2

10MHz 16QAM Test Position 3 Middle - Antenna 2

Date/Time: 2010-5-25 17:54:05

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2593 MHz; σ = 2.12 mho/m; εr = 51.7; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 3 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.258 mW/g

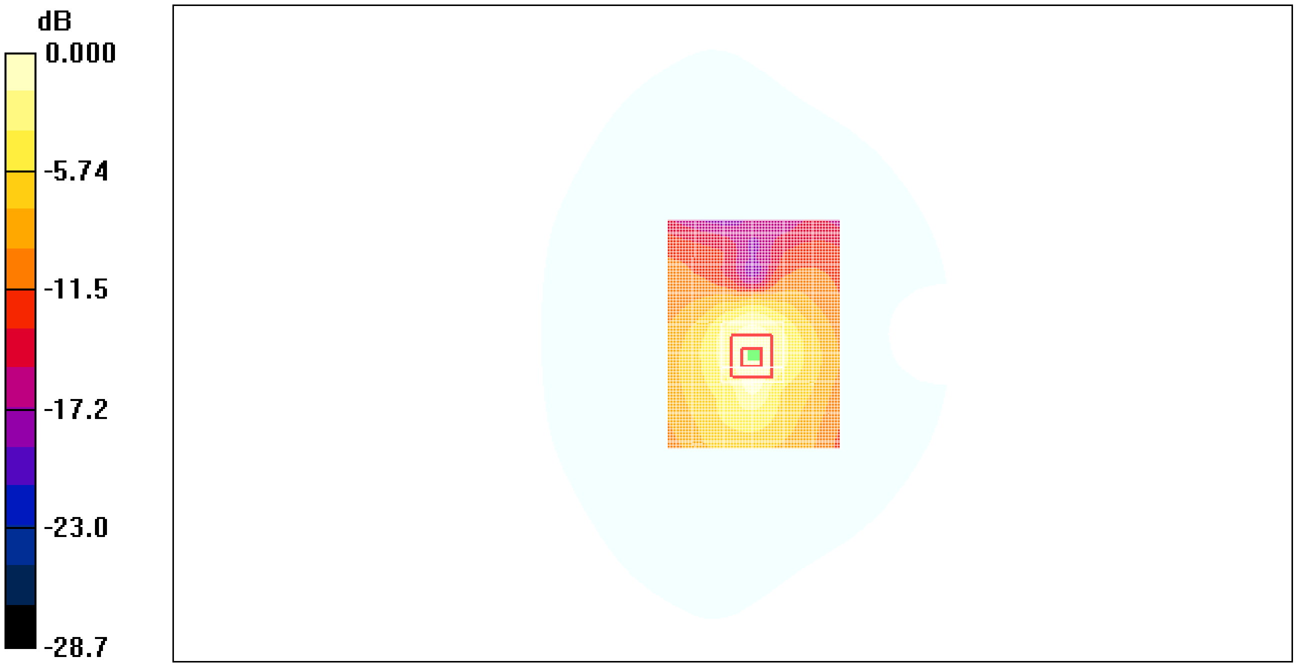
Test Position 3 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.67 V/m; Power Drift = 0.080 dB

Peak SAR (extrapolated) = 0.412 W/kg

SAR(1 g) = 0.226 mW/g; SAR(10 g) = 0.120 mW/g

Maximum value of SAR (measured) = 0.247 mW/g



0 dB = 0.247mW/g

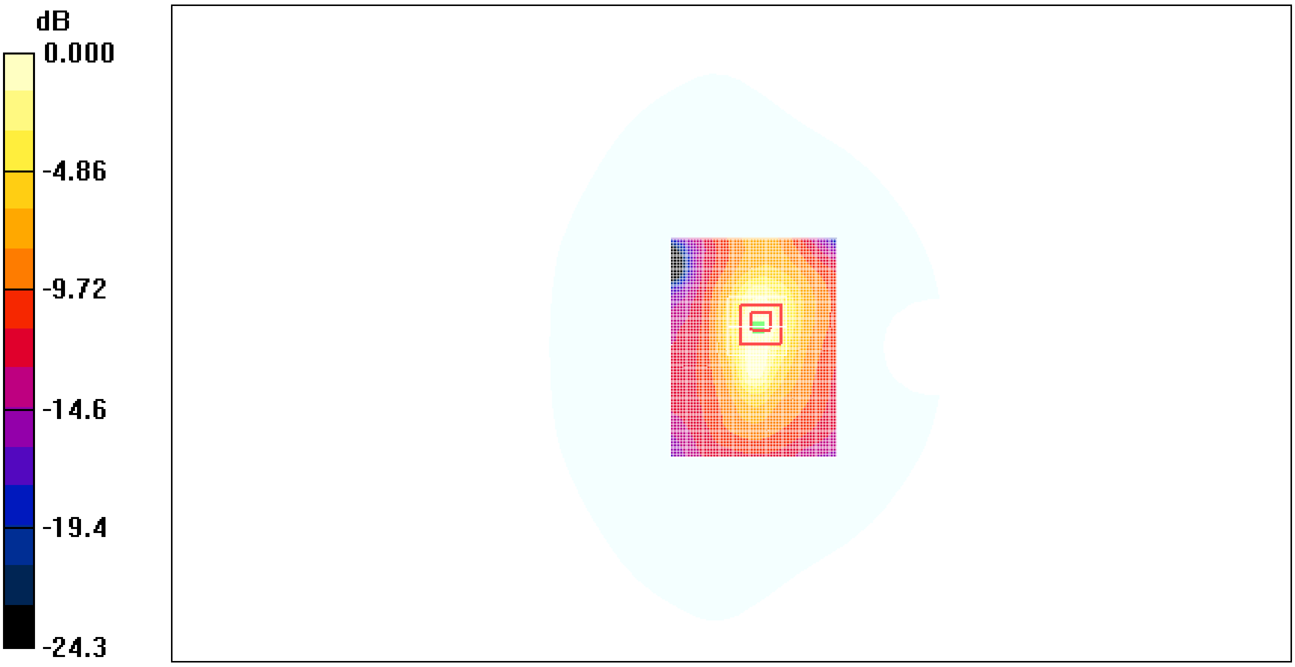
Fig.76 10MHz 16QAM Test Position 3

10MHz 16QAM Test Position 4 Middle - Antenna 2

Date/Time: 2010-5-25 18:11:22
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.12 mho/m; εr = 51.7; ρ = 1000 kg/m3
Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C
Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 4 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.394 mW/g

Test Position 4 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.4 V/m; Power Drift = -0.170 dB
Peak SAR (extrapolated) = 0.638 W/kg
SAR(1 g) = 0.337 mW/g; SAR(10 g) = 0.174 mW/g
Maximum value of SAR (measured) = 0.372 mW/g



0 dB = 0.372mW/g

Fig.77 10MHz 16QAM Test Position 4

10MHz 16QAM Test Position 5 Middle - Antenna 2

Date/Time: 2010-5-25 18:28:40

Electronics: DAE4 Sn771

Medium: Body 2.6GHz

Medium parameters used (interpolated): f = 2593 MHz; σ = 2.12 mho/m; εr = 51.7; ρ = 1000 kg/m3

Ambient Temperature:23.3 °C   Liquid Temperature: 22.5 °C

Communication System: WiMax 2600 Frequency: 2593 MHz Duty Cycle: 1:3.24

Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 5 Middle/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.304 mW/g

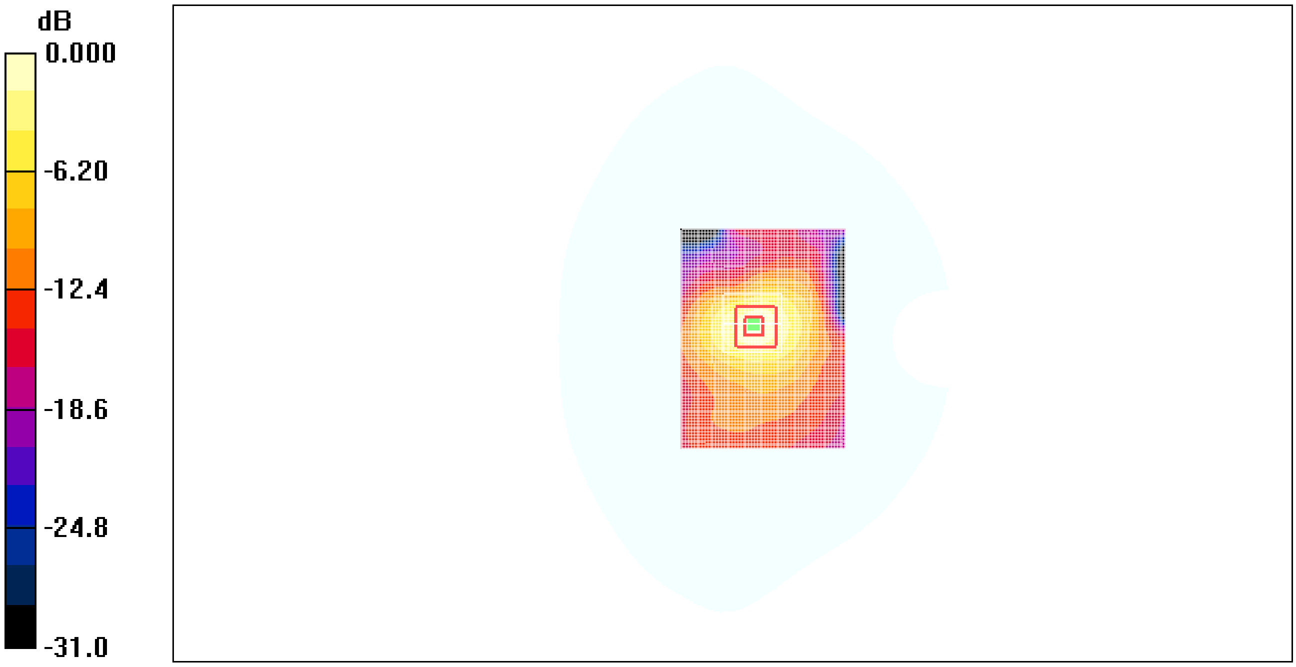
Test Position 5 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.2 V/m; Power Drift = -0.061 dB

Peak SAR (extrapolated) = 0.587 W/kg

SAR(1 g) = 0.285 mW/g; SAR(10 g) = 0.135 mW/g

Maximum value of SAR (measured) = 0.321 mW/g



0 dB = 0.321mW/g

Fig.78 10MHz 16QAM Test Position 5

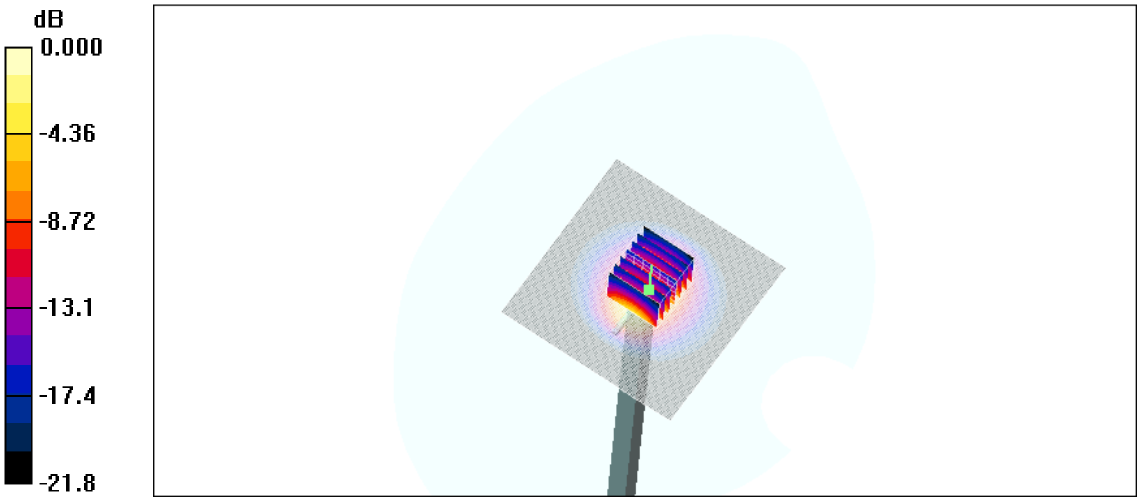
ANNEX D SYSTEM VALIDATION RESULTS

2450MHz

Date/Time: 2010-5-24 7:33:12
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used: f = 2450 MHz; σ = 1.93 mho/m; ε_r = 52.1; ρ = 1000 kg/m^3
Ambient Temperature:23.3^{o}C Liquid Temperature: 22.5^{o}C
Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

System Validation/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 15.9 mW/g

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 82.9 V/m; Power Drift = 0.048 dB
Peak SAR (extrapolated) = 24.5 W/kg
SAR(1 g) = 13.3 mW/g; SAR(10 g) = 5.93 mW/g
Maximum value of SAR (measured) = 15.0 mW/g



0 dB = 15.0mW/g

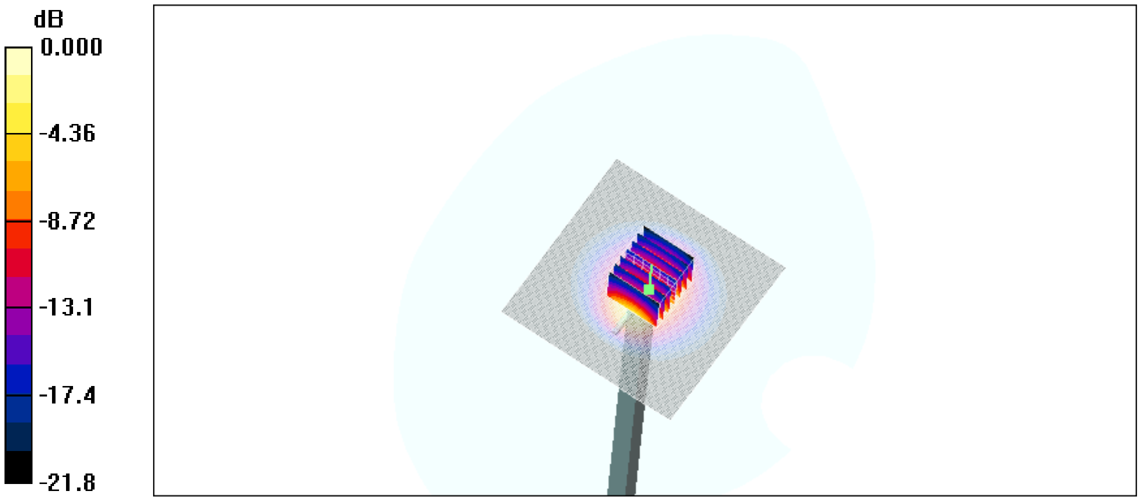
Fig.79 validation 2450MHz 250mW

2600MHz

Date/Time: 2010-5-24 7:16:35
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used: f = 2600 MHz; σ = 2.12 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 2600 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

System Validation/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 16.9 mW/g

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 86.2 V/m; Power Drift = 0.065 dB
Peak SAR (extrapolated) = 28.1 W/kg
SAR(1 g) = 14.4 mW/g; SAR(10 g) = 6.50 mW/g
Maximum value of SAR (measured) = 16.3 mW/g



0 dB = 16.3mW/g

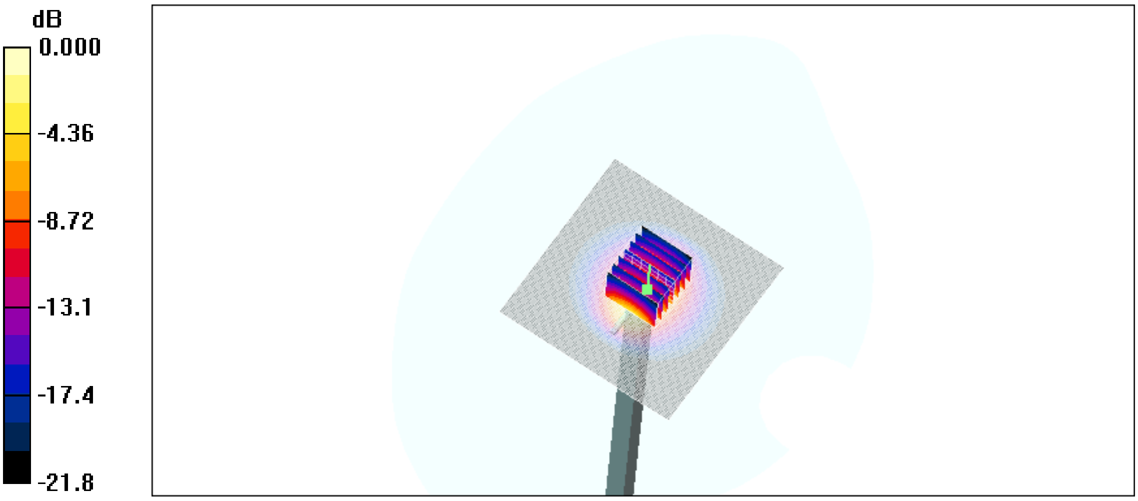
Fig.80 validation 2600MHz 250mW

2450MHz

Date/Time: 2010-5-25 7:36:53
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used: f = 2450 MHz; σ = 1.94 mho/m; ε_r = 52.1; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.88, 6.88, 6.88)

System Validation/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 15.6 mW/g

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 81.6 V/m; Power Drift = 0.079 dB
Peak SAR (extrapolated) = 24.3 W/kg
SAR(1 g) = 13.2 mW/g; SAR(10 g) = 5.98 mW/g
Maximum value of SAR (measured) = 14.8 mW/g



0 dB = 14.8mW/g

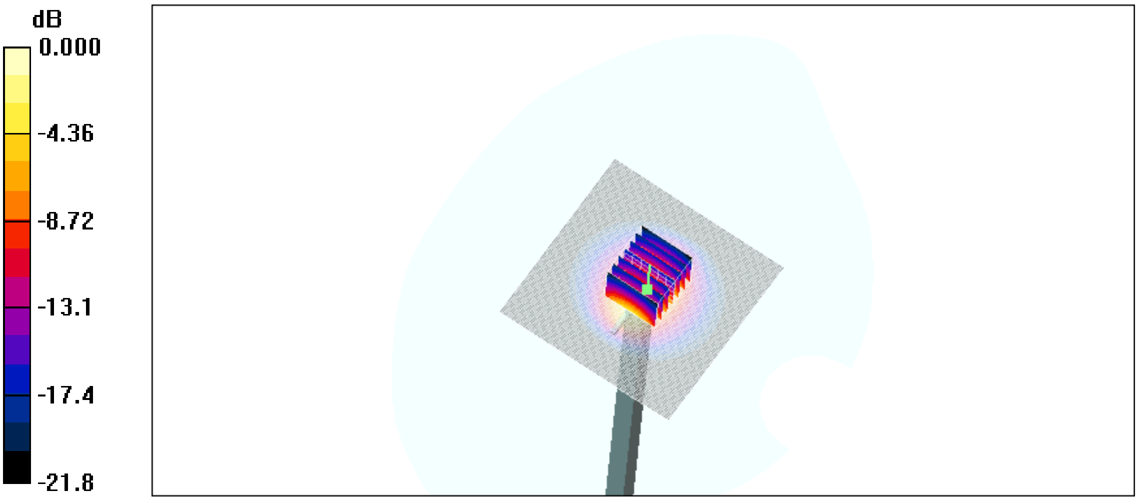
Fig.81 validation 2450MHz 250mW

2600MHz

Date/Time: 2010-5-25 7:17:45
Electronics: DAE4 Sn771
Medium: Body 2.6GHz
Medium parameters used: f = 2600 MHz; σ = 2.13 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 2600 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

System Validation/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 17.0 mW/g

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 87.5 V/m; Power Drift = -0.040 dB
Peak SAR (extrapolated) = 28.2 W/kg
SAR(1 g) = 14.5 mW/g; SAR(10 g) = 6.53 mW/g
Maximum value of SAR (measured) = 16.3 mW/g



0 dB = 16.3mW/g

Fig.81 validation 2600MHz 250mW

ANNEX F PROBE CALIBRATION CERTIFICATE

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client TMC China

Certificate No: EX3DV4-3617_Jul09

CALIBRATION CERTIFICATE

Object	**EX3DV4-SN: 3617**
Calibration procedure(s)	**QA CAL-01.v6** **Calibration procedure for dosimetric E-field probes**
Calibration date:	**July 9, 2009**
Condition of the calibrated item	**In Tolerance**

This calibration certify documents the traceability to national standards, which realize the physical units of measurements(SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.
All calibrations have been conducted at an environment temperature (22±3)°C and humidity<70%

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Data (Calibrated by, Certification NO.)	Scheduled Calibration
Power meter E4419B	GB41293874	6-May-09 (METAS, NO. 251-00388)	May-10
Power sensor E4412A	MY41495277	6-May-09 (METAS, NO. 251-00388)	May-10
Reference 3 dB Attenuator	SN:S5054 (3c)	12-Aug-08 (METAS, NO. 251-00403)	Aug-09
Reference 20 dB Attenuator	SN:S5086 (20b)	4-May-09 (METAS, NO. 251-00389)	May-10
Reference 30 dB Attenuator	SN:S5129 (30b)	12-Aug-08 (METAS, NO. 251-00404)	Aug-09
DAE4	SN:617	11-Jun-09 (SPEAG, NO.DAE4-907_Jun08)	Jun-10
Reference Probe ES3DV2	SN: 3013	13-Jan-09 (SPEAG, NO. ES3-3013_Jan08)	Jan-10

Secondary Standards	ID#	Check Data (in house)	Scheduled Calibration
RF generator HP8648C	US3642U01700	4-Aug-99(SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01(SPEAG, in house check Nov-07)	In house check: Nov-09

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: July 9, 2009

This calibration certificate shall not be reported except in full without written approval of the laboratory.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe EX3DV4

SN: 3617

Manufactured: May 3, 2007

Calibrated: July 9, 2009

Calibrated for DASY4 System

DASY – Parameters of Probe: EX3DV4 SN:3617

Sensitivity in Free Space[A]

NormX	0.420±10.1%	$\mu V/(V/m)^2$
NormY	0.440±10.1%	$\mu V/(V/m)^2$
NormZ	0.310±10.1%	$\mu V/(V/m)^2$

Diode Compression[B]

DCP X	89mV
DCP Y	88mV
DCP Z	91mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)
Please see Page 8

Boundary Effect

TSL 2450MHz Typical SAR gradient: 11% per mm

Sensor Center to Phantom Surface Distance		2.0 mm	3.0 mm
SARbe[%]	Without Correction Algorithm	3.7	1.8
SARbe[%]	With Correction Algorithm	0.1	0.0

TSL 5200MHz Typical SAR gradient: 25% per mm

Sensor Center to Phantom Surface Distance		2.0 mm	3.0 mm
SARbe[%]	Without Correction Algorithm	10.1	3.7
SARbe[%]	With Correction Algorithm	0.2	0.1

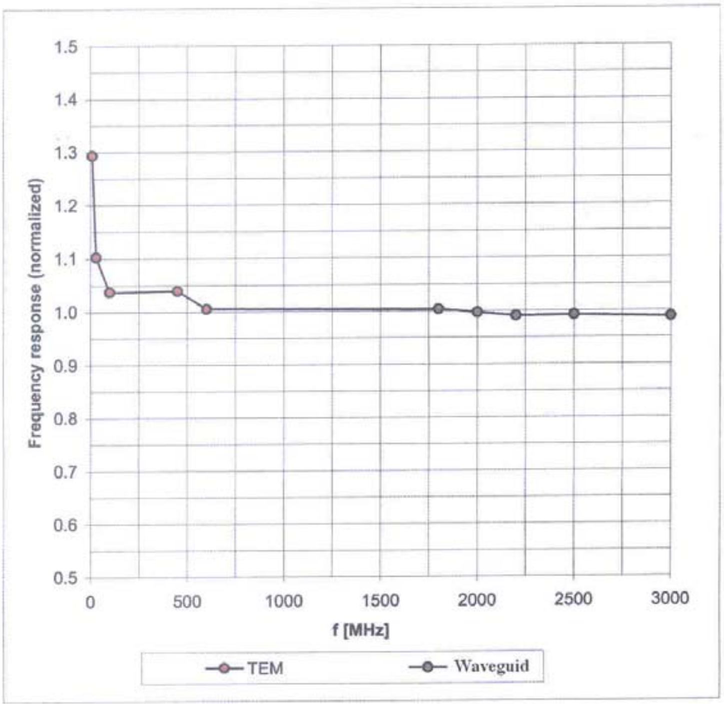
Sensor Offset

Probe Tip to Sensor Center 1.0 mm

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2,which for a normal distributio Corresponds to a coverage probability of approximately 95%.

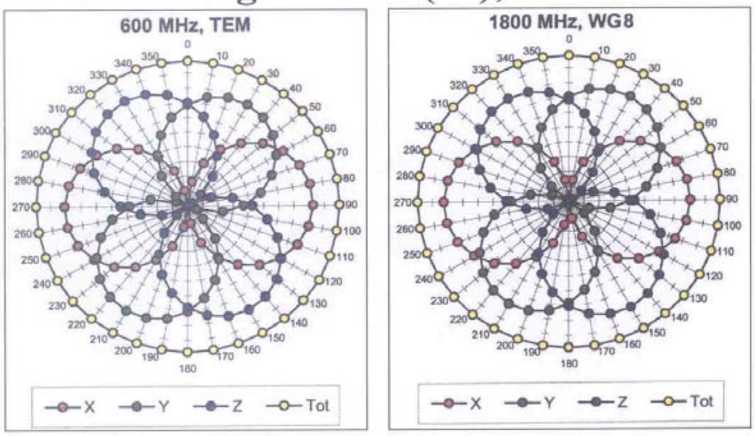
[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).
[B] Numerical linearization parameter: uncertainty not required.

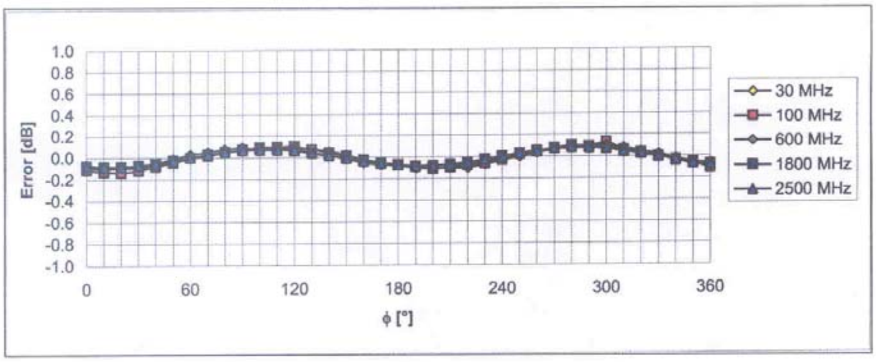
Frequency Response of E-Field



Uncertainty of Frequency Response of E-field: ±6.3% (k=2)

Receiving Pattern (Φ), $\theta = 0°$

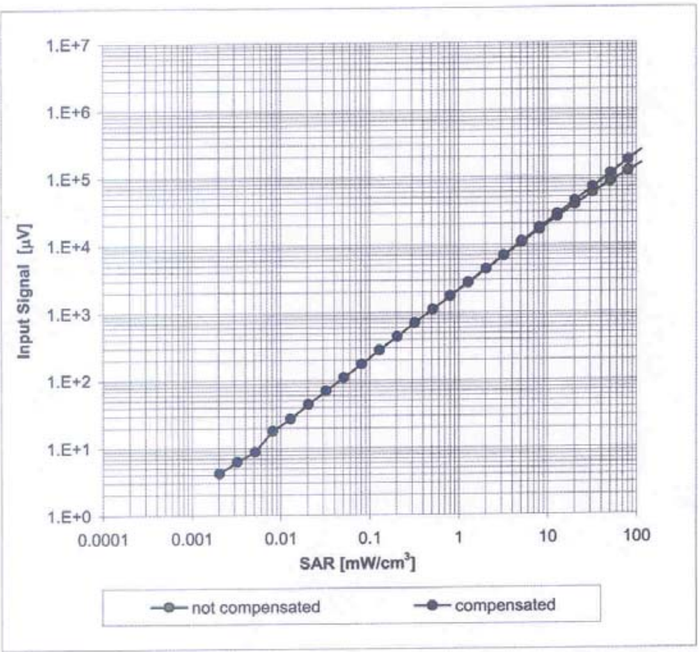


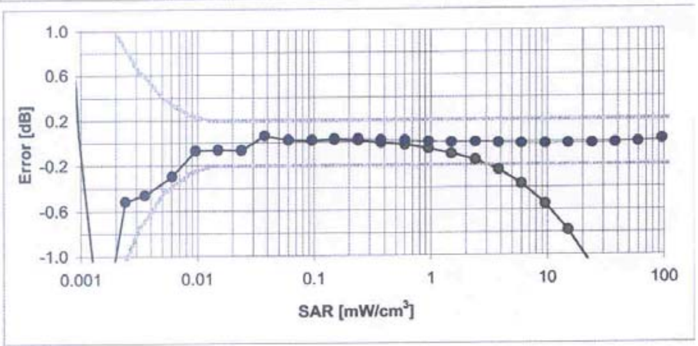


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)

Dynamic Range f(SAR_{head})

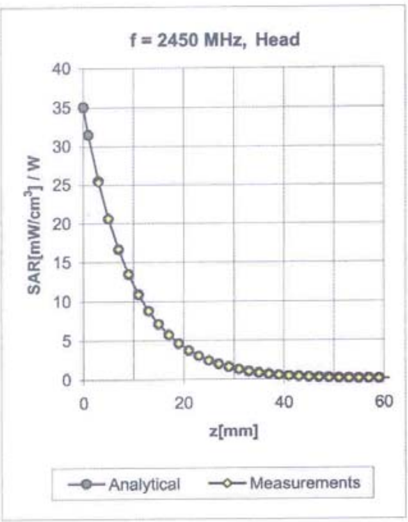
(Waveguide: WG8, f = 1800 MHz)

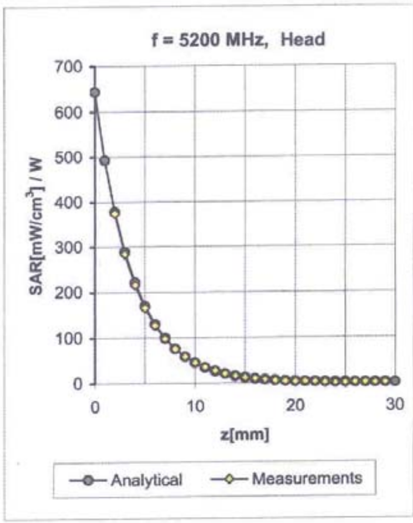




Uncertainty of Linearity Assessment: ±0.6% (k=2)

Conversion Factor Assessment



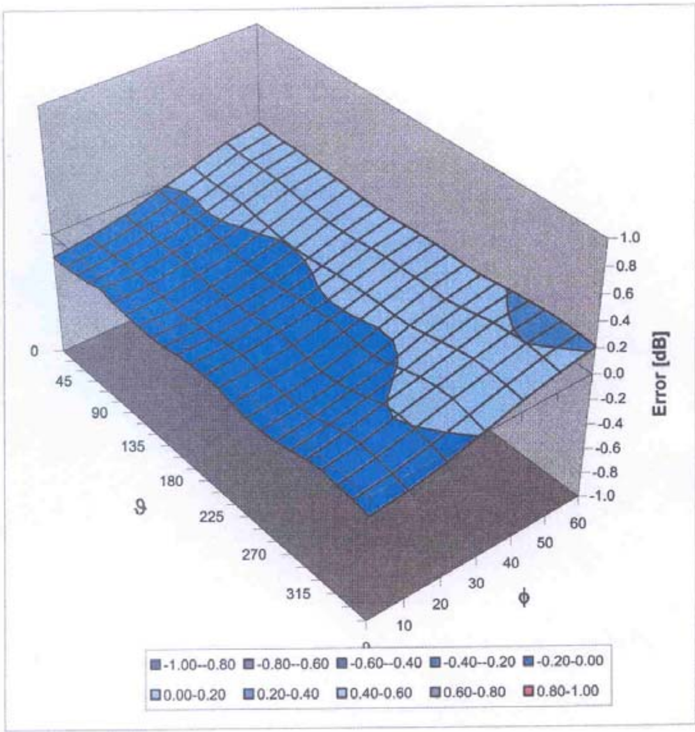


f[MHz]	Validity[MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF	Uncertainty
2450	±50 / ±100	Head	39.2 ± 5%	1.80 ± 5%	0.33	1.00	7.19	± 11.8% (k=2)
2600	±50 / ±100	Head	39.0 ± 5%	1.96 ± 5%	0.36	1.21	7.16	± 11.8% (k=2)
5200	±50 / ±100	Head	36.0 ± 5%	4.66 ± 5%	0.35	1.60	5.33	± 13.1% (k=2)
5800	±50 / ±100	Head	35.3 ± 5%	5.27 ± 5%	0.35	1.60	4.69	± 13.1% (k=2)
2450	±50 / ±100	Body	52.7 ± 5%	1.95 ± 5%	0.36	1.00	6.88	± 11.8% (k=2)
2600	±50 / ±100	Body	52.5 ± 5%	2.16 ± 5%	0.36	1.05	6.84	± 11.8% (k=2)
5200	±50 / ±100	Body	49.0 ± 5%	5.30 ± 5%	0.35	1.70	4.64	± 13.1% (k=2)
5800	±50 / ±100	Body	48.2 ± 5%	6.00 ± 5%	0.30	1.70	4.53	± 13.1% (k=2)

[C] The validity of ±100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

Deviation from Isotropy

Error (ϕ , θ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ±2.6% (k=2)

ANNEX G DIPOLE CALIBRATION CERTIFICATE

2600 MHz Dipole Calibration Certificate

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client TMC

Certificate No: D2600V2-1012_Dec09

CALIBRATION CERTIFICATE

Object	**D2600V2-SN: 1012**
Calibration procedure(s)	**QA CAL-05.v7** **Calibration procedure for dipole validation kits**
Calibration date:	**December 15, 2009**
Condition of the calibrated item	**In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements(SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted at an environment temperature (22±3)^{0}C and humidity<70%

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Data (Calibrated by, Certification NO.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	02-Oct-09 (METAS, NO. 217-00736)	Oct-10
Power sensor 8481A	US37292783	02-Oct-09 (METAS, NO. 217-00736)	Oct-10
Reference 20 dB Attenuator	SN:5086 (20g)	06-Aug-09 (METAS, NO. 217-00718)	Aug-10
Reference 10 dB Attenuator	SN:5047_2 (10r)	06-Aug-09 (METAS, NO. 217-00718)	Aug-10
DAE4	SN:601	28-Jan-09 (SPEAG, NO.DAE4-601_Jan09)	Jan-10
Reference Probe ET3DV6 (HF)	SN: 1507	16-Oct-09 (SPEAG, NO. ET3-1507_Oct09)	Oct-10
Secondary Standards	**ID#**	**Check Data (in house)**	**Scheduled Calibration**
Power sensor HP 8481A	MY41092317	18-Oct-02(SPEAG, in house check Oct-09)	In house check: Oct-11
RF generator Aglient E4421B	MY41000676	11-May-05(SPEAG, in house check Nov-09)	In house check: Nov -11
Network Analyzer HP 8753E	US37390585S4206	18-Oct-01(SPEAG, in house check Oct-09)	In house check: Oct -10

	Name	Function	Signature
Calibrated by:	Mike Meili	Laboratory Technician	[signature]
Approved by:	Katja Pokovic	Technical Director	[signature]

Issued: December 15, 2009

This calibration certificate shall not be reported except in full without written approval of the laboratory.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2600 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.4 ± 6 %	1.96 mho/m ± 6 %
Head TSL temperature during test	(21.0 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	14.5 mW / g
SAR normalized	normalized to 1W	58.0 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**57.6 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	6.63 mW / g
SAR normalized	normalized to 1W	26.5 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**26.4 mW /g ± 16.5 % (k=2)**

[1] Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.5	2.16 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.5 ± 6%	2.13 mho/m ± 6 %
Body TSL temperature during test	(21.8 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	14.9 mW / g
SAR normalized	normalized to 1W	59.6 mW / g
SAR for nominal Body TSL parameters [2]	normalized to 1W	**59.4 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	6.69 mW / g
SAR normalized	normalized to 1W	26.8 mW / g
SAR for nominal Body TSL parameters [2]	normalized to 1W	**26.7 mW /g ± 16.5 % (k=2)**

[2] Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	46.6Ω - 5.3 jΩ
Return Loss	- 23.7dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.0Ω - 5.8 jΩ
Return Loss	- 24.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.153 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	October 30, 2007

DASY4 Validation Report for Head TSL

Date/Time: 15.12.2009 10:12:45

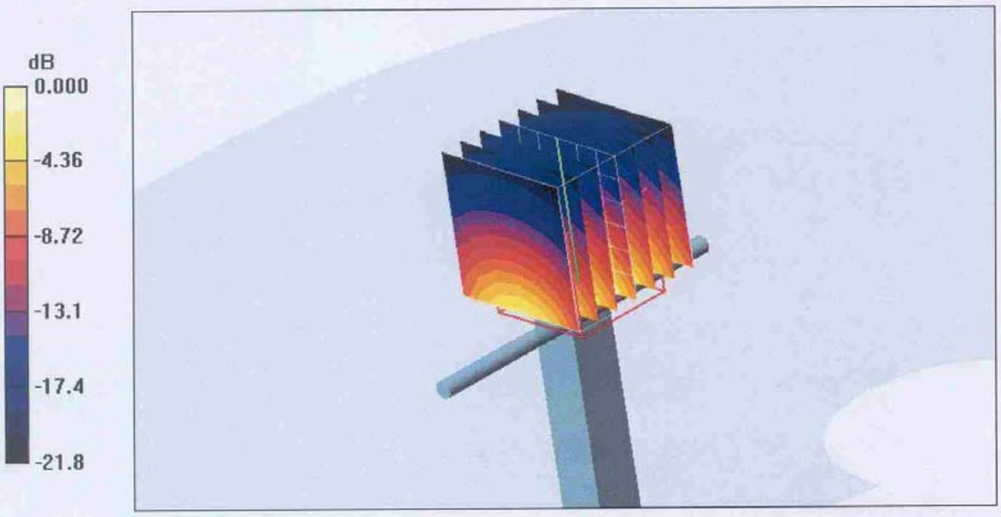
Test laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2600 MHz; Type: D2600V2; serial: D2600V2-SN: 1012

Communication System: CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: HSL 2600 MHz;
Medium parameters used: f=2600 MHz; σ=1.96 mho/m; ε_r=38.4; ρ= 1000kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)
DASY4 Configuration:

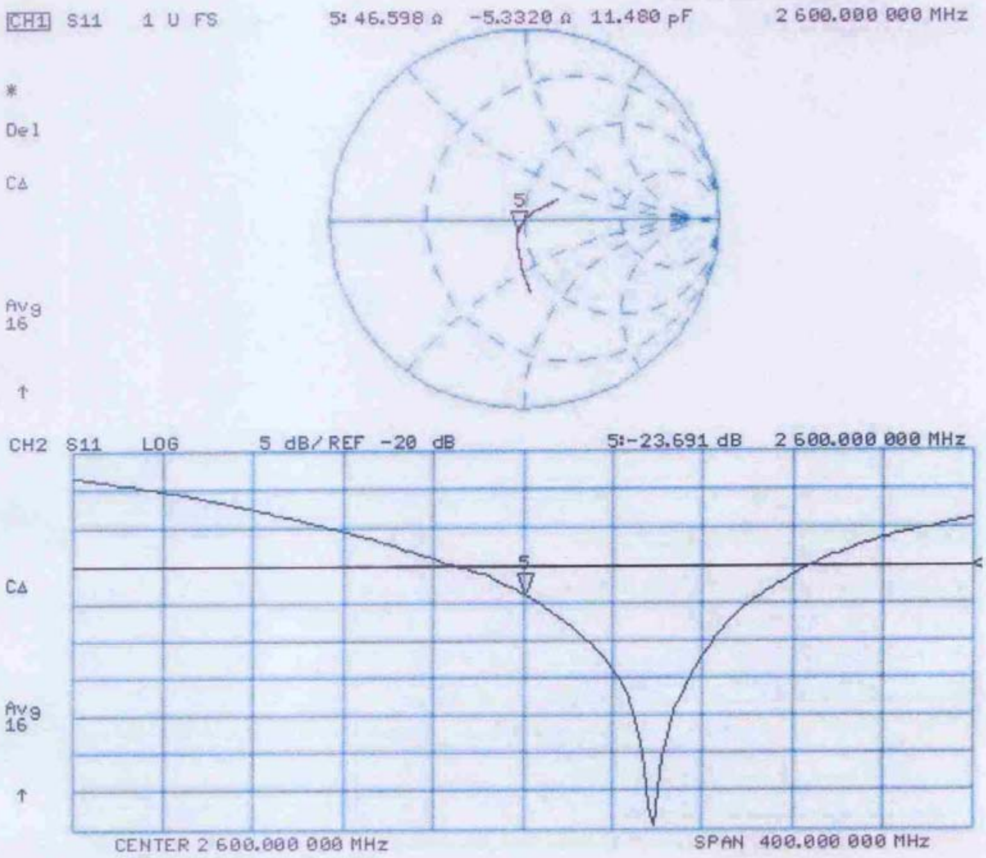
- Probe: ET3DV6-SN1507(HF); ConvF(4.99, 4.99, 4.99); Calibrated: 16.10.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.1_2009
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA;
- Measurement SW: DASY, V4.7 Build 55; Post processing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.2 V/m; Power Drift = 0.019 dB
Peak SAR (extrapolated) = 30.2 W/kg
SAR(1 g) = 14.5 mW/g; SAR(10 g) = 6.63 mW/g
Maximum value of SAR (measured) = 19.4 mW/g



0 dB = 19.4mW/g

Impedance measurement Plot for Head TSL



DASY4 Validation Report for Head TSL

Date/Time: 15.12.2009 10:49:23

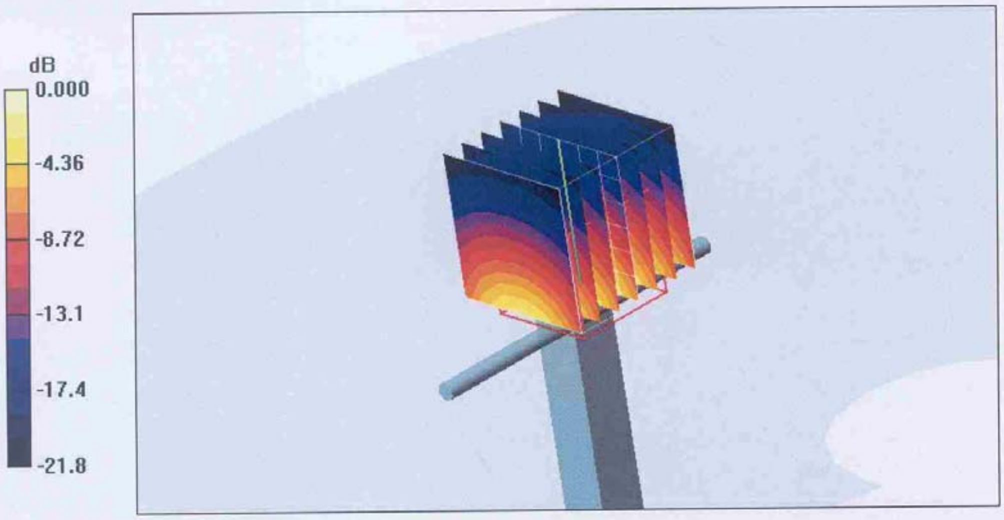
Test laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2600 MHz; Type: D2600V2; serial: D2600V2-SN: 1012

Communication System: CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: HSL 2600 MHz;
Medium parameters used: f=2600 MHz; σ=2.13 mho/m; ε_r=51.5; ρ= 1000kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)
DASY4 Configuration:

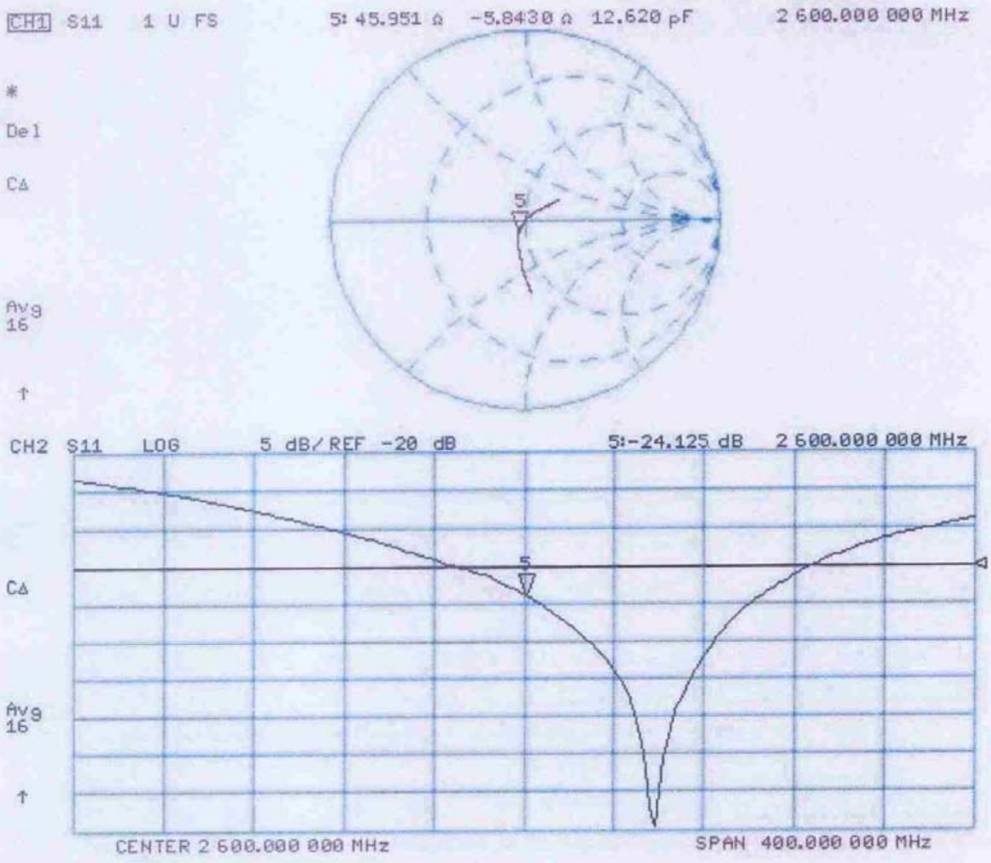
- Probe: ET3DV6-SN1507(HF); ConvF(4.99, 4.99, 4.99); Calibrated: 16.10.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.1_2009
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA;
- Measurement SW: DASY, V4.7 Build 55; Post processing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.2 V/m; Power Drift = 0.041 dB
Peak SAR (extrapolated) = 32.9 W/kg
SAR(1 g) = 14.9 mW/g; SAR(10 g) = 6.69 mW/g
Maximum value of SAR (measured) = 20.3 mW/g



0 dB = 20.3mW/g

Impedance measurement Plot for Head TSL



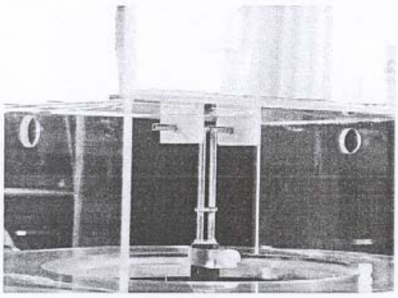
2450 MHz Dipole Calibration Certificate

Report No. SN0102_2450
October 2008

INDEXSAR
2450MHz validation Dipole
Type IXD-245 **S/N 0102**

Performance measurements

MI Manning



Indexsar, Oakfield House, Cudworth Lane,
Newdigate, Surrey RH5 5BG. UK.
Tel: +44 (0) 1306 633870 Fax: +44 (0) 1306 631834
e-mail: enquiries@indexsar.com

1. Measurement Conditions

Measurements were performed using a box-shaped phantom made of PMMA with dimensions designed to meet the accuracy criteria for reasonably-sized phantoms that do not have liquid capacities substantially in excess of the volume of liquid required to fill the Indexsar upright SAM phantoms used for SAR testing of handsets against the ear.

An HP 8753B vector network analyser was used for the return loss measurements. The dipole was placed in a special holder made of low-permittivity, low-loss materials. This holder enables the dipole to be positioned accurately in the centre of the base of the Indexsar box-phantom used for flat-surface testing and validation checks.

The validation dipoles are supplied with special spacers made from a low-permittivity, low-loss foam material. These spacers are fitted to the dipole arms to ensure that, when the dipole is offered up to the phantom surface, the spacing between the dipole and the liquid surface is accurately aligned according to the guidance in the relevant standards documentation. The spacers are rectangular with a central hole equal to the dipole arm diameter and dimensioned so that the longer side can be used to ensure a spacing of 15mm from the liquid in the phantom (for tests at 900MHz and below) and the shorter side can be used for tests at 1800MHz and above to ensure a spacing of 10mm from the liquid in the phantom. The spacers are made on a CNC milling machine with an accuracy of 1/40th mm but they may suffer wear and tear and need to be replaced periodically. The material used is Rohacell, which has a relative permittivity of approx. 1.05 and a negligible loss tangent.

The apparatus supplied by Indexsar for dipole validation tests thus includes:

Balanced dipoles for each frequency required are dimensioned according to the guidelines given in IEEE 1528 [1]. The dipoles are made from semi-rigid 50 Ohm co-ax, which is joined by soldering and is gold-plated subsequently. The constructed dipoles are easily deformed, if mis-handled, and periodic checks need to be made of their symmetry.

Rohacell foam spacers designed for presenting the dipoles to 2mm thick PMMA box phantoms. These components also suffer wear and tear and should be replaced when the central hole is a loose-fit on the dipole arms or if the edges are too worn to ensure accurate alignment. The standard spacers are dimensioned for use with 2mm wall thickness (additional spacers are available for 4mm wall thickness).

2. Typical SAR Measurement

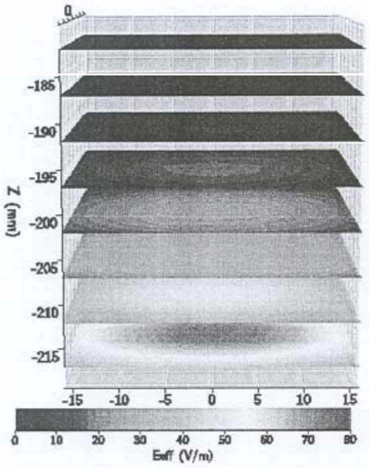
A SAR validation check is performed with the box-phantom located on the SARA2 phantom support base on the SARA2 robot system. Tests are then conducted at a feed power level of approx. 0.25W. The actual power level is recorded and used to normalise the results obtained to the standard input power conditions of 1W (forward power). The ambient temperature is 22°C +/- 1°C and the relative humidity is around 40% during the measurements.

The phantom is filled with a 2450MHz brain liquid using a recipe from [1], which has the following electrical parameters (measured using an Indexsar DiLine kit) at 2450MHz:

Relative Permittivity	**40.5**
Conductivity	**1.85 S/m**

The SARA2 software version 2.2 VPM is used with an Indexsar probe previously calibrated using waveguides.

The 3D measurements made using the dipole at the bottom of the phantom box is shown below:



The results, normalised to an input power of 1W (forward power) are typically:

Averaged over 1 cm3 (1g) of tissue	**52.26 W/kg**
Averaged over 10cm3 (10g) of tissue	**23.65 W/kg**

These results can be compared with Table 8.1 in [1]. The agreement is within 10%.

3. Typical SAR Measurement

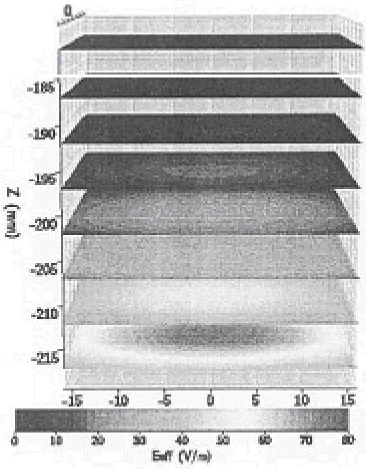
A SAR validation check is performed with the box-phantom located on the SARA2 phantom support base on the SARA2 robot system. Tests are then conducted at a feed power level of approx. 0.25W. The actual power level is recorded and used to normalise the results obtained to the standard input power conditions of 1W (forward power). The ambient temperature is 22°C +/- 1°C and the relative humidity is around 40% during the measurements.

The phantom is filled with a 2450MHz body liquid using a recipe from [1], which has the following electrical parameters (measured using an Indexsar DiLine kit) at 2450MHz:

Relative Permittivity	51.8
Conductivity	1.93 S/m

The SARA2 software version 2.2 VPM is used with an Indexsar probe previously calibrated using waveguides.

The 3D measurements made using the dipole at the bottom of the phantom box is shown below:



The results, normalised to an input power of 1W (forward power) are typically:

Averaged over 1 cm3 (1g) of tissue	51.13 W/kg
Averaged over 10cm3 (10g) of tissue	23.28 W/kg

These results can be compared with Table 8.1 in [1]. The agreement is within 10%.

4. Dipole handling

The dipoles are made from standard, copper-sheathed coaxial cable. In assembly, the sections are joined using ordinary soft-soldering. This is necessary to avoid excessive heat input in manufacture, which would destroy the polythene dielectric used for the cable. The consequence of the construction material and the assembly technique is that the dipoles are fragile and can be deformed by rough handling. Conversely, they can be straightened quite easily as described in this report.

If a dipole is suspected of being deformed, a normal workshop lathe can be used as an alignment jig to restore the symmetry. To do this, the dipole is first placed in the headstock of the lathe (centred on the plastic or brass spacers) and the headstock is rotated by hand (do NOT use the motor). A marker (lathe tool or similar) is brought up close to the end of one dipole arm and then the headstock is rotated by 0.5 rev. to check the opposing arm. If they are not balanced, judicious deformation of the arms can be used to restore the symmetry.

If a dipole has a failed solder joint, the dipole can be fixed down in such a way that the arms are co-linear and the joint re-soldered with a reasonably-powerful electrical soldering iron. Do not use gas soldering irons. After such a repair, electrical tests must be performed as described below.

Please note that, because of their construction, the dipoles are short-circuited for DC signals.

5. Tuning the dipole

The dipole dimensions are based on calculations that assumed specific liquid dielectric properties. If the liquid dielectric properties are somewhat different, the dipole tuning will also vary. A pragmatic way of accounting for variations in liquid properties is to 'tune' the dipole (by applying minor variations to its effective length). For this purpose, Indexsar can supply short brass tube lengths to extend the length of the dipole and thus 'tune' the dipole. It cannot be made shorter without removing a bit from the arm. An alternative way to tune the dipole is to use copper shielding tape to extend the effective length of the dipole. Do both arms equally.

It should be possible to tune a dipole as described, whilst in place in the measurement position as long as the user has access to a VNA for determining the return loss.

6. References

[1] Draft recommended practice for determining the peak spatial-average specific absorption rate (SAR) in the human body due to wireless communications devices: Experimental Techniques.