

FCC Test Report

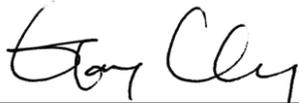
Equipment : Personal Computer
Brand Name : SONY
Model No. : SVF15NA1GL
FCC ID : AK8SVF15NA1GL
Standard : 47 CFR FCC Part 15.247
Operating Band : 2400 MHz – 2483.5 MHz
FCC Classification : DTS
Applicant : Sony Corporation
1-7-1 Konan, Minato-ku, Tokyo 108-0075, Japan
Manufacturer : Sony Corporation
1-7-1 Konan, Minato-ku, Tokyo 108-0075, Japan

This report only contains LE mode test result.

The product sample received on Jul. 26, 2013 and completely tested on Oct. 03, 2013. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:



Gary Chang / Manager





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Summary of Test Result

Conformance Test Specifications					
Report Clause	Ref. Std. Clause	Description	Measured	Limit	Result
1.1.2	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	[dBuV]: 0.1965370MHz 38.22 (Margin 15.54dB) - AV 56.55 (Margin 7.21dB) - QP	FCC 15.207	Complied
3.2	15.247(a)	6dB Bandwidth	665.22 kHz	≥500kHz	Complied
3.3	15.247(b)	RF Output Power (Maximum Peak Conducted Output Power)	Power [dBm] 5.84	Power [dBm]: 30	Complied
3.4	15.247(d)	Power Spectral Density	PSD [dBm/3kHz] -9.34	PSD [dBm/3kHz]: 8	Complied
3.5	15.247(c)	Emissions in Non-Restricted Frequency Bands	Meet the requirement of limit	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied
3.6	15.247(c)	Transmitter Radiated Unwanted Emissions	Restricted Bands [dBuV/m at 3m]:2499.00MHz 46.95 (Margin 7.05dB) – AV	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information				
Frequency Range (MHz)	Bluetooth Version	Ch. Frequency (MHz)	Channel Number	Co-location
2400-2483.5	v4.0 LE	2402-2480	0-39 [40]	YES
Note 1: Bluetooth LE (Low Energy) using GFSK modulation for DTS digital modulation. Note 2: RF output power specifies that Maximum Peak Conducted Output Power. Note 3: Co-location, Co-location is generally defined as simultaneously transmitting (co-transmitting) antennas within 20 cm of each other. (i.e., EUT has simultaneously co-transmitting that operating 2.4GHz and 5GHz.)				

1.1.2 Antenna Information

Antenna Category	
<input type="checkbox"/>	Equipment placed on the market without antennas
<input type="checkbox"/>	Integral antenna (antenna permanently attached)
<input type="checkbox"/>	Temporary RF connector provided
<input type="checkbox"/>	No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path.
<input checked="" type="checkbox"/>	External antenna (dedicated antennas)
<input checked="" type="checkbox"/>	RF connector provided
<input checked="" type="checkbox"/>	Unique antenna connector. (e.g., MMCX, U.FL, IPX, and RP-SMA, RP-N type...)
<input type="checkbox"/>	Standard antenna connector. (e.g., SMA, N, BNC, and TNC type...)

Antenna General Information				
Antenna Pair S/N	Ant. Cat.	Ant. Type	Gain (dBi) of Antenna 1	Gain (dBi) of Antenna 2
SONY_IRX-7690(B)	Integral	PIFA	0.77	-0.62

Note: Antenna 2 is selected for final test since only antenna 2 will be used for Bluetooth function.



1.1.3 Type of EUT

Identify EUT	
EUT Serial Number	N/A
Presentation of Equipment	<input type="checkbox"/> Production ; <input checked="" type="checkbox"/> Pre-Production ; <input type="checkbox"/> Prototype
Type of EUT	
<input checked="" type="checkbox"/>	Stand-alone
<input type="checkbox"/>	Combined (EUT where the radio part is fully integrated within another device) Combined Equipment - Brand Name / Model No.: ...
<input type="checkbox"/>	Plug-in radio (EUT intended for a variety of host systems) Host System - Brand Name / Model No.: ...
<input type="checkbox"/>	Other:

1.1.4 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle	
<input checked="" type="checkbox"/> Operated test mode for worst duty cycle	
Test Signal Duty Cycle (x)	Power Duty Factor [dB] – (10 log 1/x)
<input checked="" type="checkbox"/> 65.09% - test mode single channel - LE	1.86

1.1.5 EUT Operational Condition

Supply Voltage	<input checked="" type="checkbox"/> AC mains	<input checked="" type="checkbox"/> DC	
Type of DC Source	<input type="checkbox"/> Internal DC supply	<input type="checkbox"/> External DC adapter	<input checked="" type="checkbox"/> Battery

1.2 Accessories and Support Equipment

No.	Equipment	Brand Name	Model Name	Remarks
1	AC Adapter	SONY	VGP-AC19V75	I/P: 100-240Vac, 1.2A, 50/60Hz O/P: 19.5Vdc, 2.3A 0.8m non-shielded cable w/o core
2	Battery	SONY	VGP-BPS40	15Vdc, 3170mAh, 48Wh

Support Equipment				
No.	Equipment	Brand Name	Model Name	Remarks
1	iPod Nano	Apple	A1199	---
2	Mouse (USB)	Microsoft	1004	---
3	NFC Card	SONY	RC-S640/IC	---
4	AP	ASUS	RT-AC66U	---
5	Bluetooth Headset	Sony Ericsson	Z354	---

1.3 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ◆ 47 CFR FCC Part 15
- ◆ ANSI C63.10-2009
- ◆ FCC KDB 558074 v03r01
- ◆ FCC KDB 412172 v01

Testing Location				
<input checked="" type="checkbox"/>	Sporton Lab	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.		
		TEL : 886-3-327-3456	FAX : 886-3-318-0055	
<input checked="" type="checkbox"/>	ICC Lab	ADD : No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsein 333, Taiwan (R.O.C.)		
		TEL : 886-3-271-8666	FAX : 886-3-318-0155	
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH01-HY	Aaron Liang	22.6°C / 61.4%	Oct. 03, 2013
AC Conduction	CO04-HY	Skys Huang	23°C / 68%	Oct. 02 2013
Radiated Emission Below 1GHz	03CH03-HY	Skys Huang	25.2°C / 51.2%	Oct. 01, 2013
*Radiated Emission Above 1GHz	03CH02-WS	Skys Huang	24°C / 64%	Oct. 01 ~ Oct. 02, 2013
Test site registered number [643075] with FCC. (Test site: 03CH03-HY) Test site registered number [4086B-1] with IC. (Test site: 03CH03-HY) Test site registered number [657002] with FCC. (Test site: 03CH02-WS) Test site registered number [10807A-2] with IC. (Test site: 03CH02-WS)				

Note: * Sporton Lab subcontracts this test item to ICC lab (TAF: 2732).

ICC lab is a TAF accreditation test firm and also is an approved provider of Sporton lab.

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Measurement Uncertainty			
Test Item		Uncertainty	Limit
AC power-line conducted emissions		±2.26 dB	N/A
Emission bandwidth, 6dB bandwidth		±1.42 %	N/A
RF output power, conducted		±0.63 dB	N/A
Power density, conducted		±0.81 dB	N/A
All emissions, radiated	30 – 1000 MHz	±3.9 dB	N/A
	Above 1GHz	±4.2 dB	N/A
Temperature		±0.8 °C	N/A
Humidity		±3 %	N/A
DC and low frequency voltages		±3 %	N/A
Time		±1.42 %	N/A
Duty Cycle		±1.42 %	N/A

2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration

Worst Modulation Used for Conformance Testing				
Bluetooth Version	Transmit Chains (N _{TX})	Data Rate	Modulation Mode	RF Output Power (dBm)
v4.0 LE	1	1 Mbps	LE-1Mbps	5.84

2.2 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration	
Bluetooth Mode	Test Channel Frequencies (MHz)
LE	2402-(F1), 2440-(F2), 2480-(F3)

2.3 The Worst Case Power Setting Parameter

The Worst Case Power Setting Parameter			
Test Software Version	DRTU		
Modulation Mode	2402 MHz	2440 MHz	2480 MHz
LE, 1Mbps	DEFAULT	DEFAULT	DEFAULT

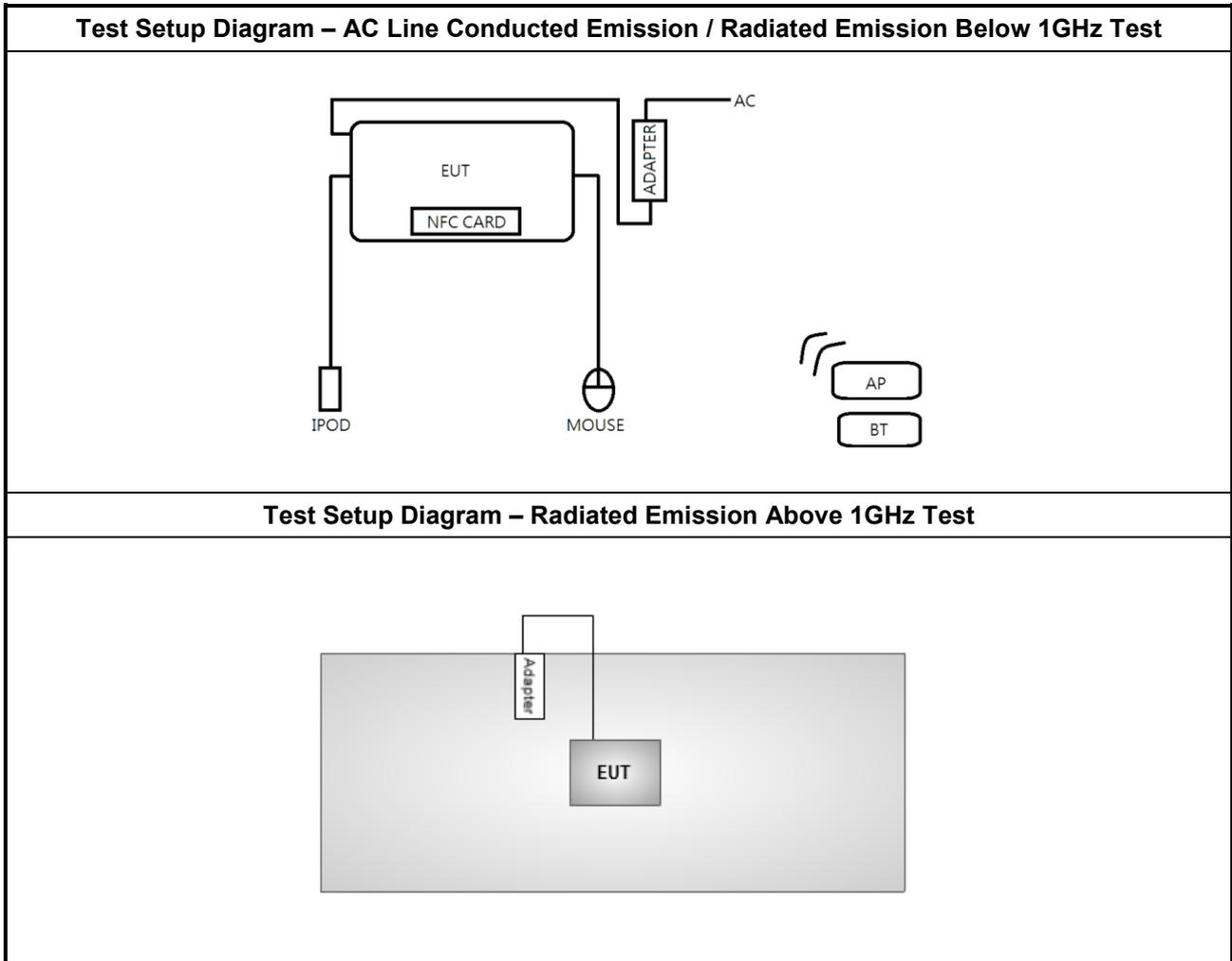
2.4 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	Operating Mode Description
1	Normal Link

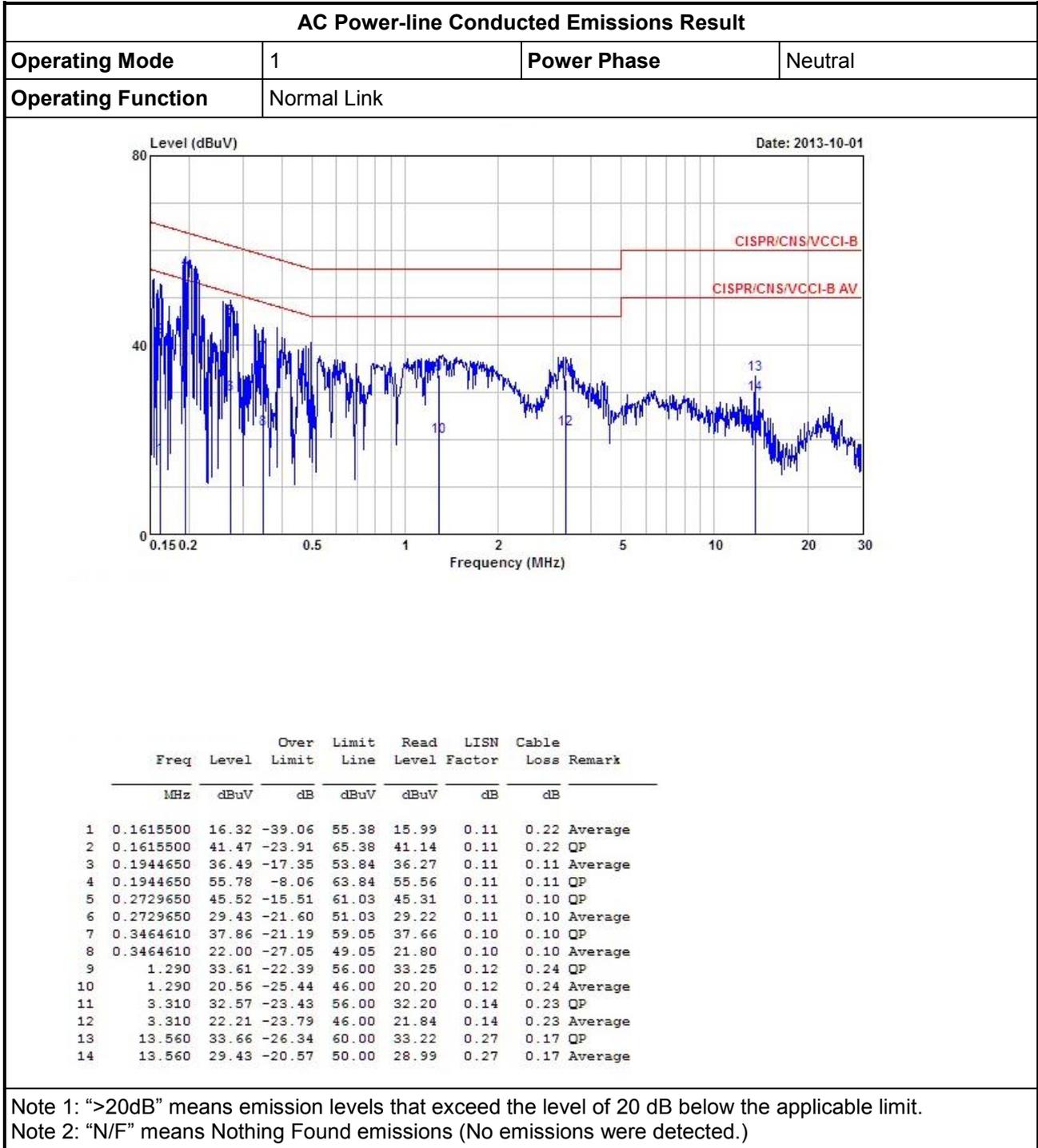
The Worst Case Mode for Following Conformance Tests	
Tests Item	RF Output Power, Power Spectral Density, 6 dB Bandwidth
Test Condition	Conducted measurement at transmit chains
Modulation Mode	LE-1Mbps
Operating Mode	Operating Mode Description
1	Transmit

The Worst Case Mode for Following Conformance Tests			
Tests Item	Transmitter Radiated Unwanted Emissions Emissions in Non-Restricted Frequency Bands		
Test Condition	Radiated measurement		
User Position	<input type="checkbox"/> EUT will be placed in fixed position.		
	<input type="checkbox"/> EUT will be placed in mobile position and operating multiple positions. EUT shall be performed two orthogonal planes. The worst planes is X.		
	<input checked="" type="checkbox"/> EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions. EUT shall be performed three orthogonal planes. The worst planes is Z.		
Pretesting Mode	<input checked="" type="checkbox"/> 1. Transmit		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			

2.5 Test Setup Diagram

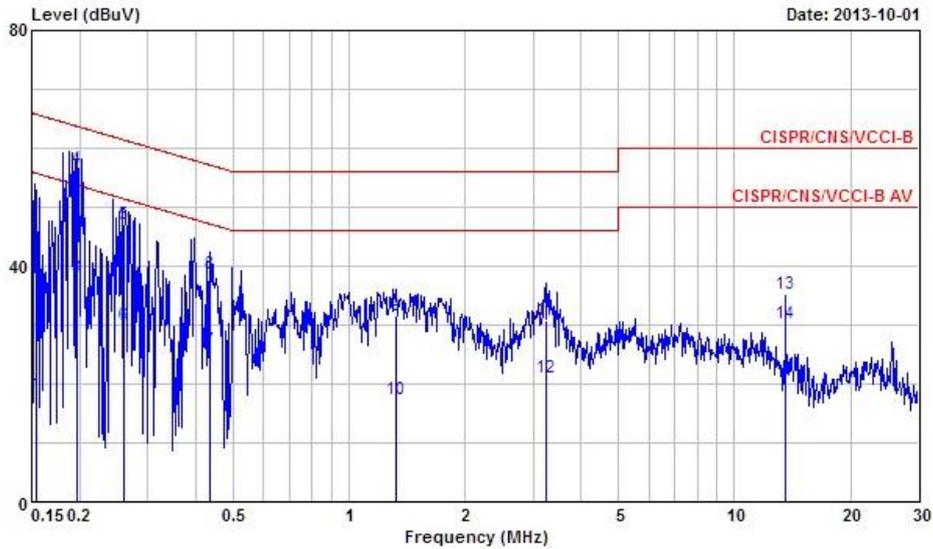


3.1.5 Test Result of AC Power-line Conducted Emissions



AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Line
Operating Function	Normal Link		



	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.1540270	18.26	-37.52	55.78	17.77	0.24	0.25	Average
2	0.1540270	42.38	-23.40	65.78	41.89	0.24	0.25	QP
3	0.1965370	38.22	-15.54	53.76	37.88	0.23	0.11	Average
4	0.1965370	56.55	-7.21	63.76	56.21	0.23	0.11	QP
5	0.2602550	47.15	-14.27	61.42	46.82	0.23	0.10	QP
6	0.2602550	29.93	-21.49	51.42	29.60	0.23	0.10	Average
7	0.4351090	25.79	-21.36	47.15	25.46	0.22	0.11	Average
8	0.4351090	38.60	-18.55	57.15	38.27	0.22	0.11	QP
9	1.320	31.50	-24.50	56.00	31.02	0.24	0.24	QP
10	1.320	17.42	-28.58	46.00	16.94	0.24	0.24	Average
11	3.240	30.73	-25.27	56.00	30.22	0.28	0.23	QP
12	3.240	21.14	-24.86	46.00	20.63	0.28	0.23	Average
13	13.560	35.33	-24.67	60.00	34.68	0.48	0.17	QP
14	13.560	30.18	-19.82	50.00	29.53	0.48	0.17	Average

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

3.2 6dB Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit	
Systems using digital modulation techniques:	
<input checked="" type="checkbox"/>	6 dB bandwidth \geq 500 kHz.

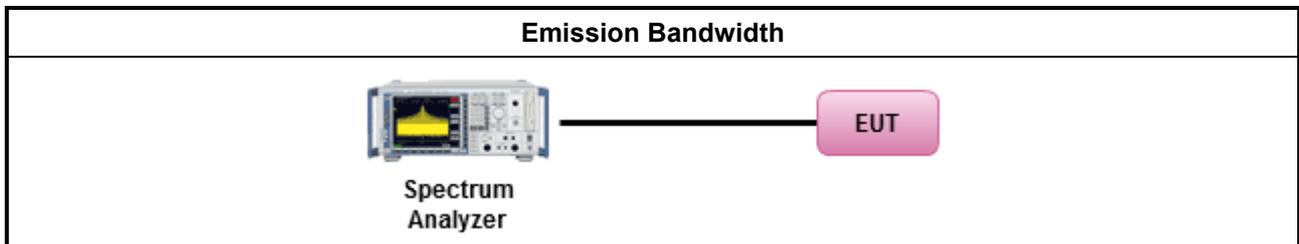
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

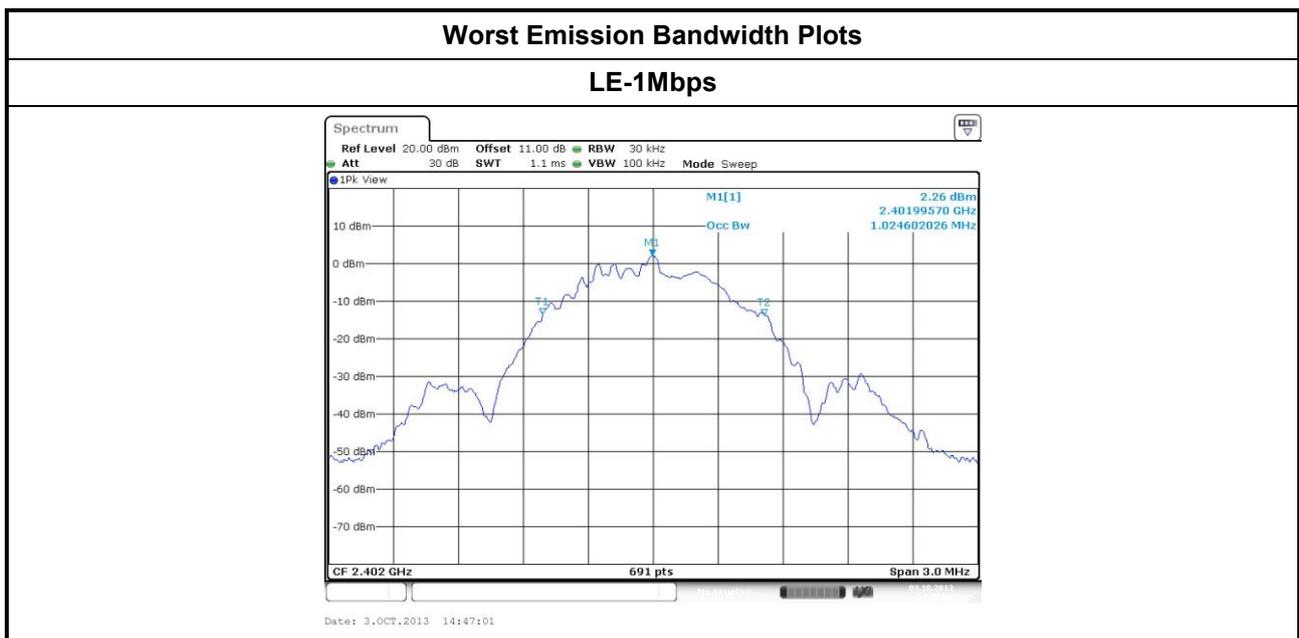
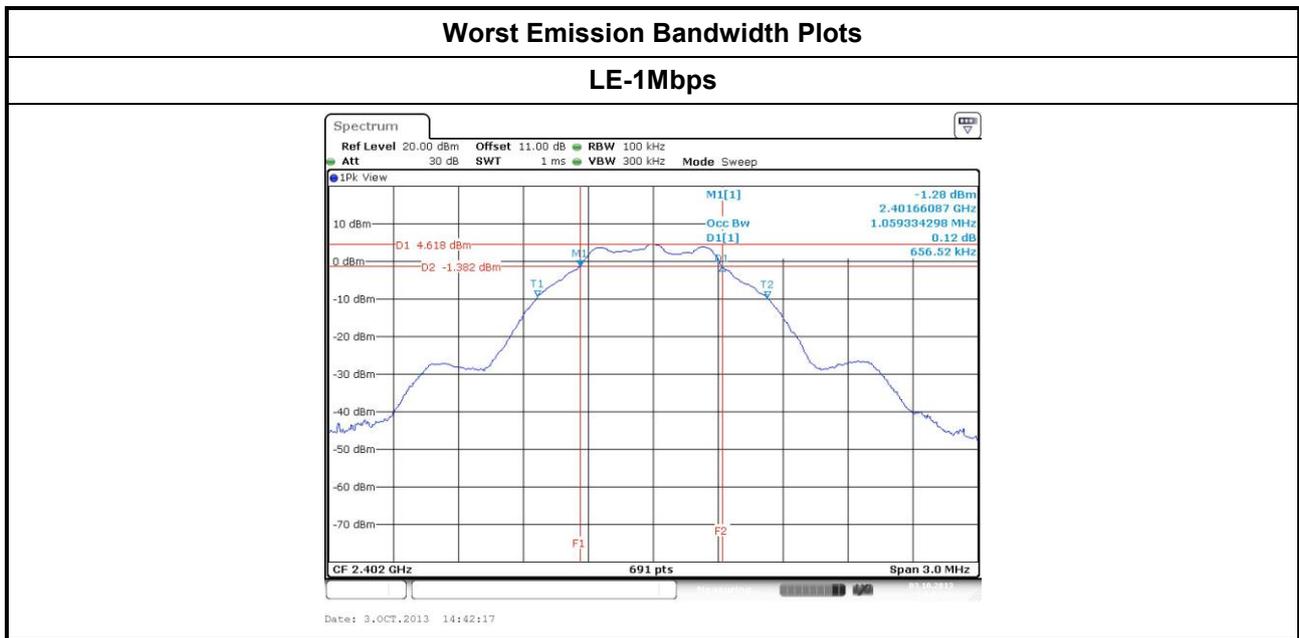
Test Method	
<input checked="" type="checkbox"/>	For the emission bandwidth shall be measured using one of the options below:
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074 v03r01, clause 7.1 Option 1 for 6 dB bandwidth measurement.
<input type="checkbox"/>	Refer as FCC KDB 558074 v03r01, clause 7.2 Option 2 for 6 dB bandwidth measurement.
<input type="checkbox"/>	Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.
<input checked="" type="checkbox"/>	For conducted measurement.
<input checked="" type="checkbox"/>	The EUT supports single transmit chain and measurements performed on this transmit chain.
<input type="checkbox"/>	The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Emission Bandwidth Result			
Modulation Mode	Freq. (MHz)	99% Bandwidth (kHz)	6dB Bandwidth (kHz)
LE-1Mbps	2402	1024.60	656.52
LE-1Mbps	2440	1020.26	656.52
LE-1Mbps	2480	1015.92	665.22
Limit		N/A	≥500 kHz
Result		Complied	





3.3 RF Output Power

3.3.1 RF Output Power Limit

RF Output Power Limit for Digital Modulation Systems	
Maximum Peak Conducted Output Power or Maximum Conducted Output Power Limit	
<input checked="" type="checkbox"/>	2400-2483.5 MHz Band:
<input checked="" type="checkbox"/>	If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)
<input type="checkbox"/>	Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm
e.i.r.p. Power Limit:	
<input checked="" type="checkbox"/>	2400-2483.5 MHz Band
<input checked="" type="checkbox"/>	Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W)
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi. P_{eirp} = e.i.r.p. Power in dBm.	

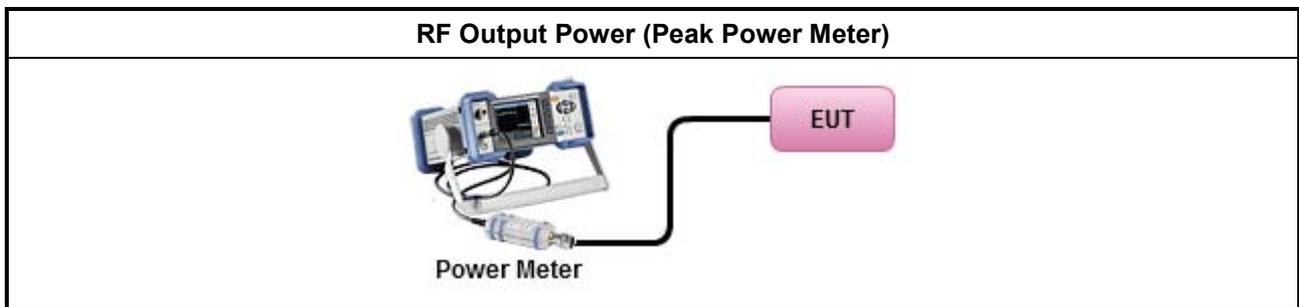
3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	Maximum Peak Conducted Output Power
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.10.2.1 a) for peak power meter.
<input type="checkbox"/>	Refer as ANSI C63.10, clause 6.10.2.1 a) for spectrum analyzer - (RBW ≥ EBW).
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074 v03r01, clause 2 for conducted measurement.
<input checked="" type="checkbox"/>	The EUT supports single transmit chain and measurements performed on this transmit chain.
<input type="checkbox"/>	The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.

3.3.4 Test Setup



3.3.5 Test Result of Maximum Peak Conducted Output Power

Maximum Peak Conducted Output Power Result						
Condition		RF Output Power (dBm)				
Modulation Mode	Freq. (MHz)	RF Output Power	Power Limit	Antenna Gain (dBi)	EIRP Power	EIRP Limit
LE-1Mbps	2402	4.66	30	-0.62	4.04	36
LE-1Mbps	2440	5.53	30	-0.62	4.91	36
LE-1Mbps	2480	5.84	30	-0.62	5.22	36
Result		Complied				

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

Power Spectral Density Limit
<input checked="" type="checkbox"/> Power Spectral Density (PSD) \leq 8 dBm/3kHz

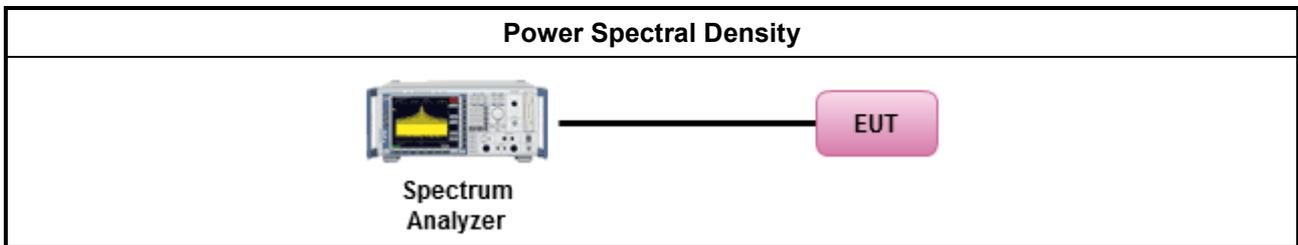
3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

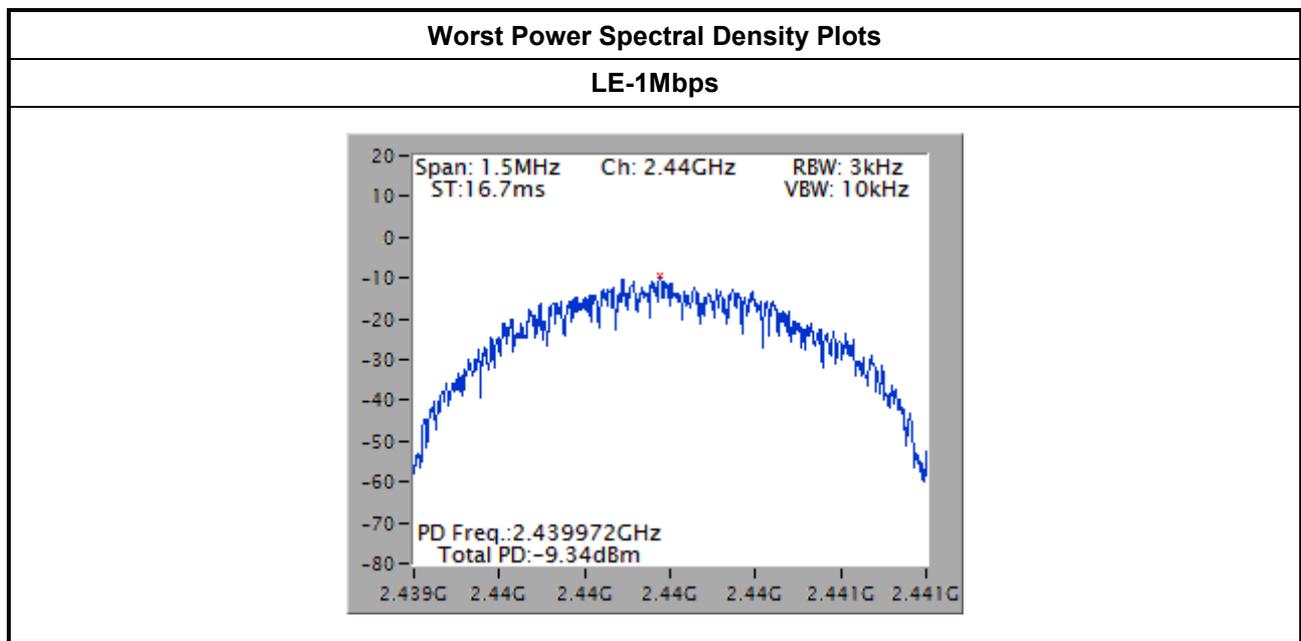
Test Method
<input checked="" type="checkbox"/> Power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the power spectral density. In addition, the use of a peak PSD procedure will always result in a "worst-case" measured level for comparison to the limit. Therefore, whenever the DTS bandwidth exceeds 500 kHz, it is acceptable to utilize the peak PSD procedure to demonstrate compliance to the PSD limit, regardless of how the fundamental output power was measured. For the power spectral density shall be measured using below options:
<input checked="" type="checkbox"/> Refer as FCC KDB 558074 v03r01, clause 9.1 Option 1 - (RBW \geq 3kHz; sweep=auto, detector=peak).
<input type="checkbox"/> Refer as FCC KDB 558074 v03r01, clause 9.2 Option 2 - (RBW \geq 3kHz; sweep=auto, average=100).
<input type="checkbox"/> Refer as FCC KDB 558074 v03r01, clause 9.3 Option 3 - (RBW \geq 3kHz; slow sweep speed).
<input type="checkbox"/> Refer as FCC KDB 558074 v03r01, clause 9.4 Alternative 1 (average PSD; Add 10log (1/duty cycle)).
<input type="checkbox"/> RBW>3kHz, add the bandwidth correction factor (BWCF) adjusting in PSD per 3kHz.
<input checked="" type="checkbox"/> Refer as FCC KDB 558074 v03r01, clause 2 for conducted measurement.
<input checked="" type="checkbox"/> The EUT supports single transmit chain and measurements performed on this transmit chain.
<input type="checkbox"/> The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.

3.4.4 Test Setup



3.4.5 Test Result of Power Spectral Density

Power Spectral Density Result (dBm/3kHz)			
Modulation Mode	Freq. (MHz)	PSD	PSD Limit
LE-1Mbps	2402	-10.73	8
LE-1Mbps	2440	-9.34	8
LE-1Mbps	2480	-9.48	8
Result		Complied	



3.5 Emissions in Non-Restricted Frequency Bands

3.5.1 Emissions in Non-Restricted Frequency Bands Limit

Peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz

3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

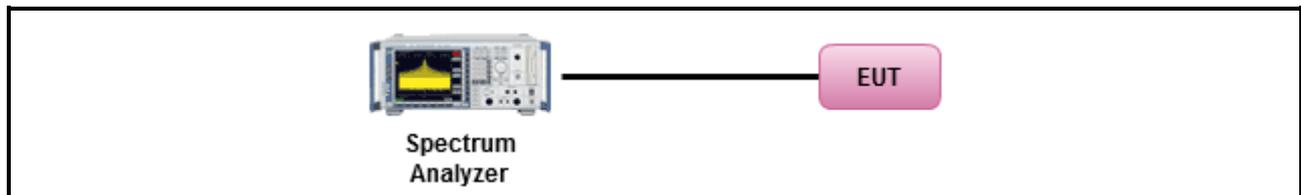
Reference level measurement

1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Use the peak marker function to determine the maximum PSD level

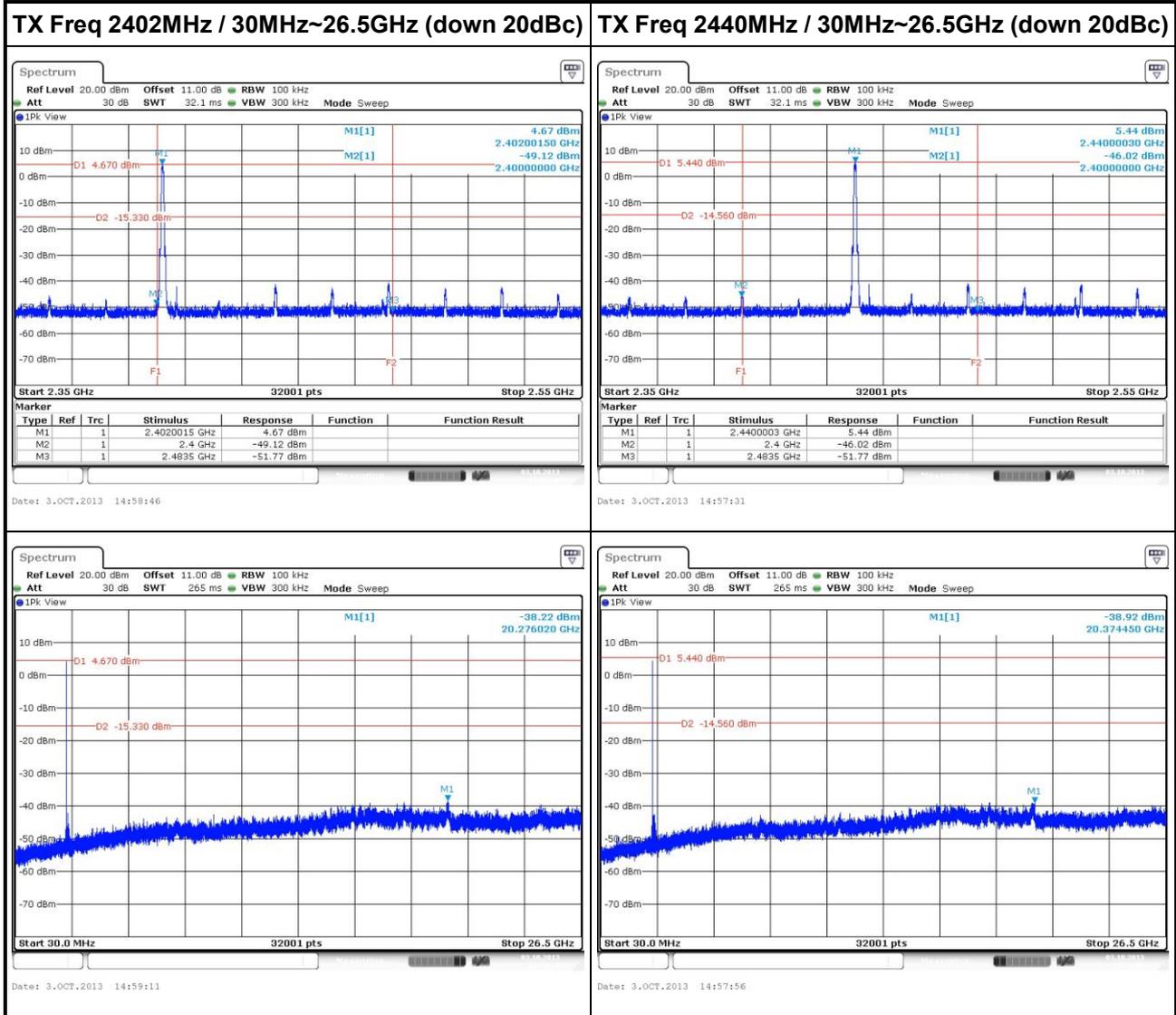
Emission level measurement

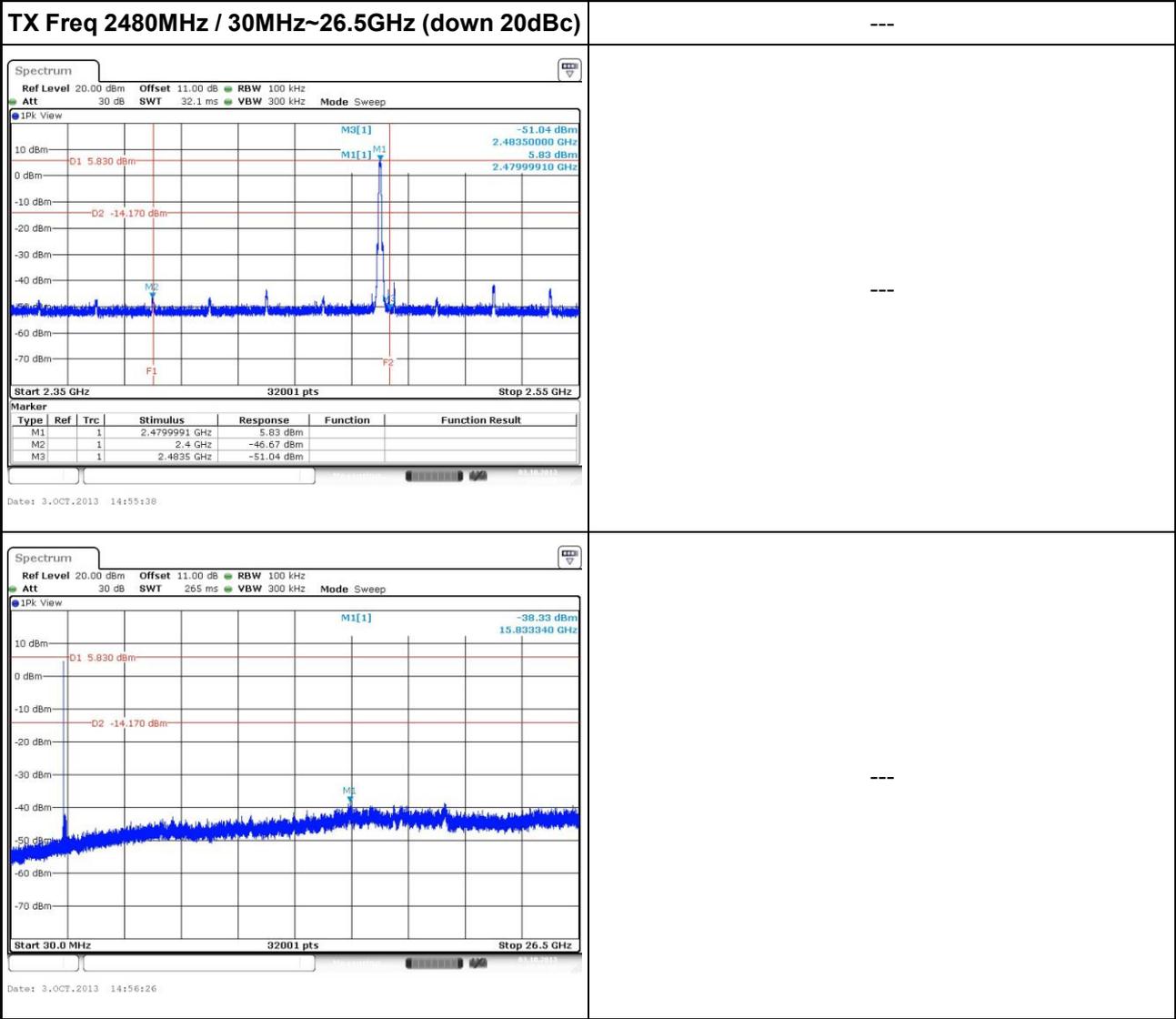
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 26.5GHz
4. Use the peak marker function to determine the maximum amplitude level

3.5.4 Test Setup



3.5.5 Test Result of Emissions in Non-Restricted Frequency Bands





3.6 Transmitter Radiated Unwanted Emissions

3.6.1 Transmitter Radiated Unwanted Emissions Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Un-restricted Band Emissions Limit	
RF output power procedure	Limit (dB)
Peak output power procedure	20
Average output power procedure	30

Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

3.6.2 Measuring Instruments

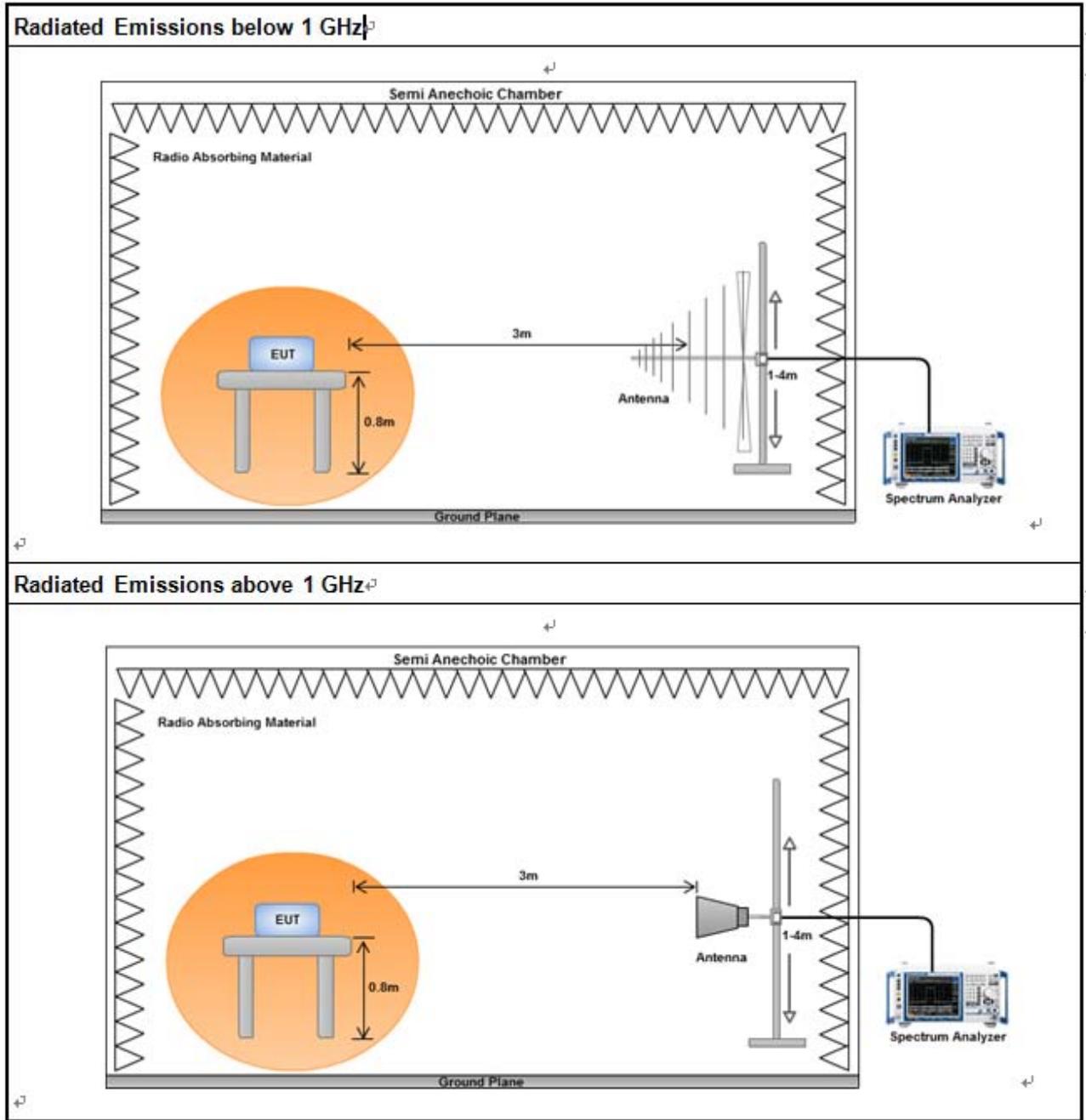
Refer a test equipment and calibration data table in this test report.



3.6.3 Test Procedures

Test Method – General Information	
<input checked="" type="checkbox"/>	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
<input checked="" type="checkbox"/>	For the transmitter unwanted emissions shall be measured using following options below:
<input checked="" type="checkbox"/>	For unwanted emissions into non-restricted bands. Peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.
<input checked="" type="checkbox"/>	For unwanted emissions into restricted bands.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). $VBW \geq 1/T$, where T is pulse time.
<input type="checkbox"/>	Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit.
<input checked="" type="checkbox"/>	For radiated measurement.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1000 MHz.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.6 for radiated emissions from above 1 GHz.

3.6.4 Test Setup



3.6.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.



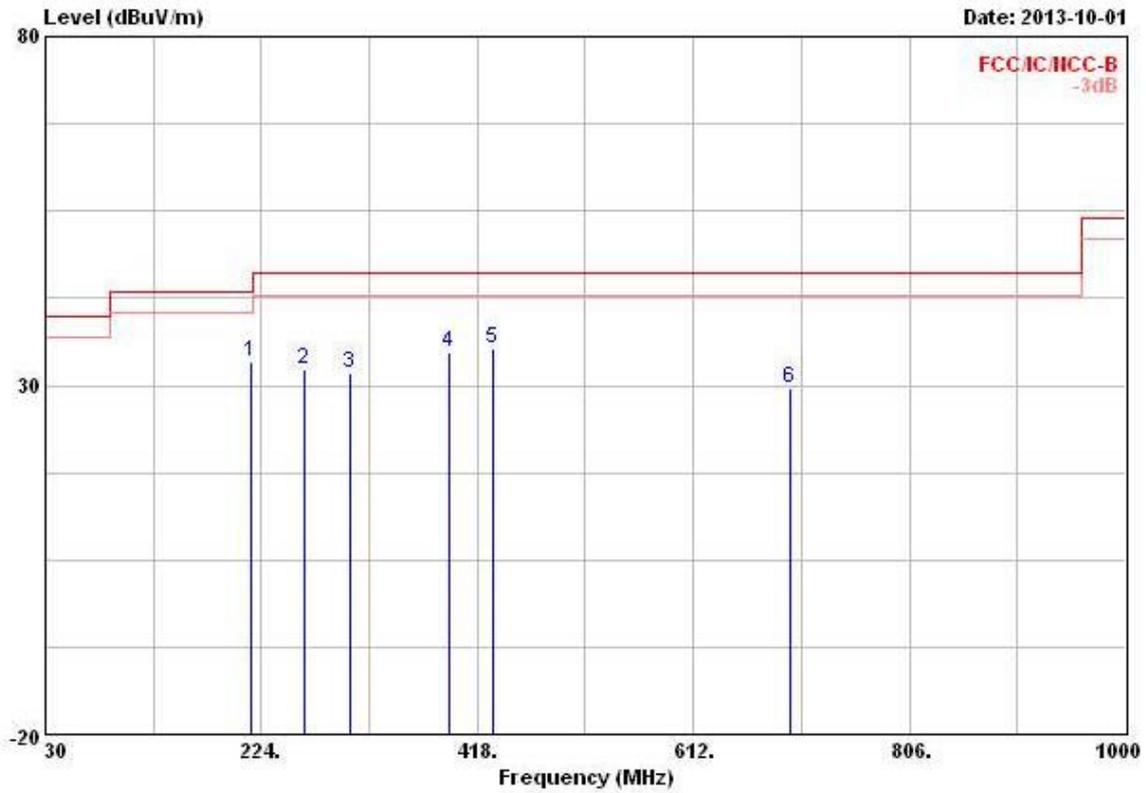
3.6.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)





Radiated Emissions (Below 1GHz)

Modulation Mode	LE	Test Freq. (MHz)	2480
Operating Function	Transmit	Polarization	V



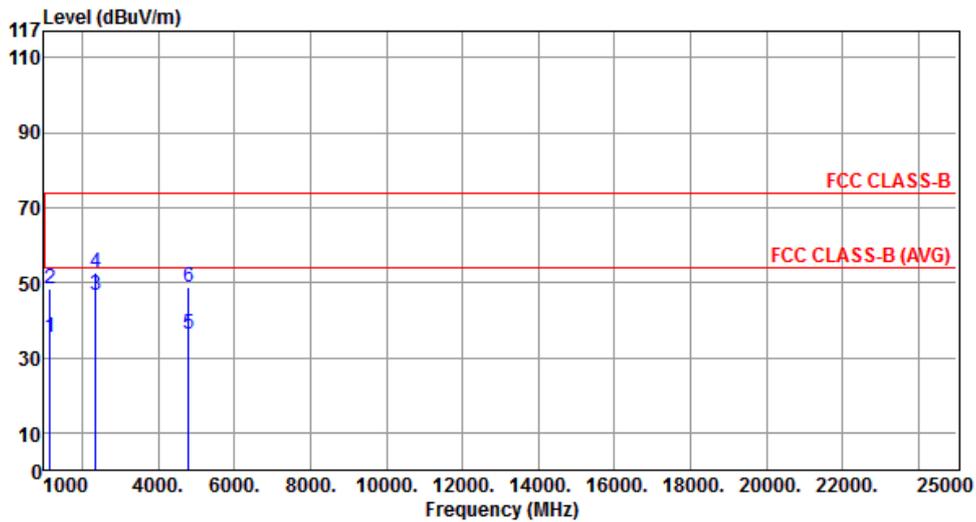
Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	215.270	33.39	-10.11	43.50	48.68	9.51	2.15	26.95 Peak	---	---
2	261.830	32.34	-13.66	46.00	43.10	13.66	2.37	26.79 Peak	---	---
3	303.540	31.82	-14.18	46.00	42.58	13.32	2.59	26.67 Peak	---	---
4	392.780	34.61	-11.39	46.00	43.61	15.35	2.94	27.29 Peak	---	---
5	431.580	35.20	-10.80	46.00	43.29	16.32	3.10	27.51 Peak	---	---
6	699.300	29.62	-16.38	46.00	34.77	18.81	3.98	27.94 Peak	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)



3.6.7 Transmitter Radiated Unwanted Emissions (Above 1GHz)

Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	LE-1Mbps	Test Freq. (FX)	2402
Operating Mode	1	Polarization	H

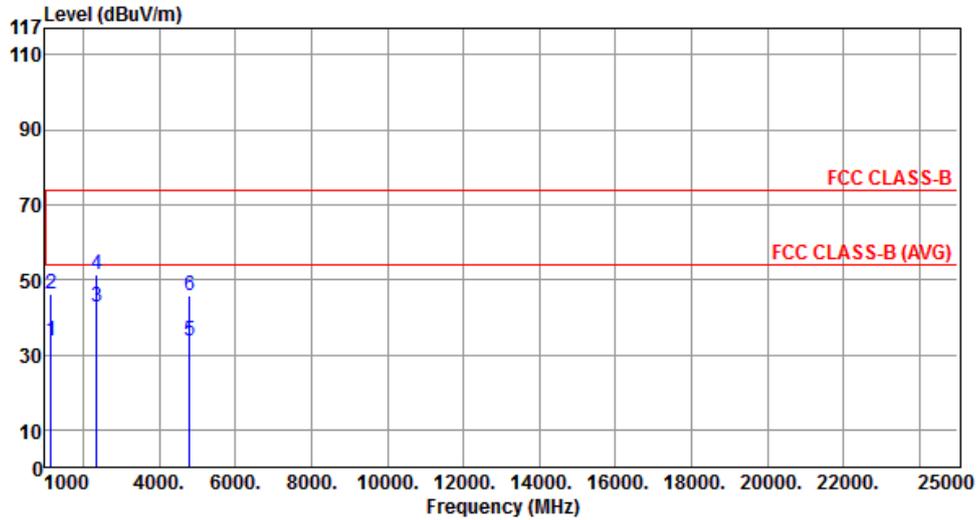


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1160.00	35.59	54.00	-18.41	44.41	-8.82	Average	---	---
2	1160.00	48.49	74.00	-25.51	57.31	-8.82	Peak	---	---
3	2362.00	46.42	54.00	-7.58	49.46	-3.04	Average	---	---
4	2362.00	52.76	74.00	-21.24	55.80	-3.04	Peak	---	---
5	4804.00	36.25	54.00	-17.75	31.60	4.65	Average	---	---
6	4804.00	48.85	74.00	-25.15	44.20	4.65	Peak	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 3: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
 Note 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.
 Note 5: Average emission setting: RBW=1MHz; VBW ≥ 1/T, where T is "Pulse On Time", e.g., LE VBW≥1/625us, VBW=3kHz.



Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	LE-1Mbps	Test Freq. (FX)	2402
Operating Mode	1	Polarization	V



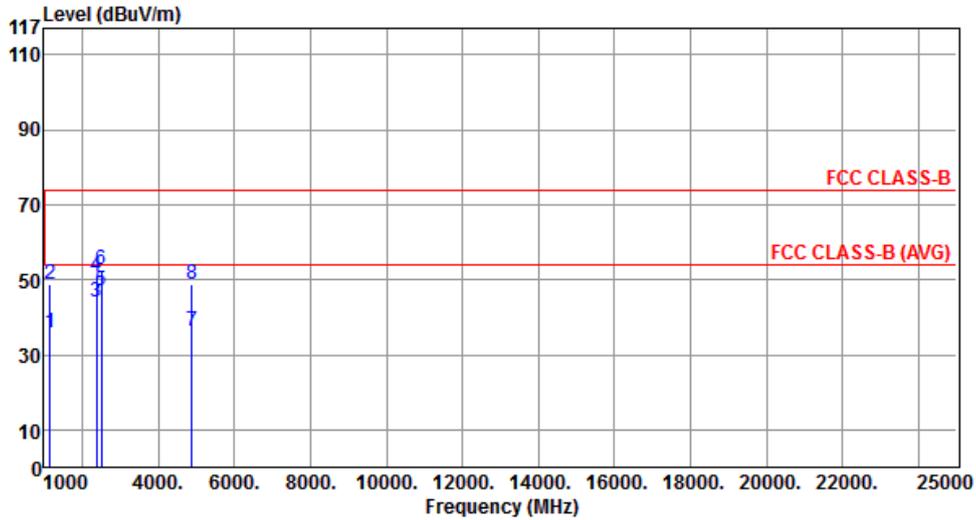
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1160.00	33.56	54.00	-20.44	42.38	-8.82	Average	---	---
2	1160.00	46.29	74.00	-27.71	55.11	-8.82	Peak	---	---
3	2362.00	42.60	54.00	-11.40	45.64	-3.04	Average	---	---
4	2362.00	51.26	74.00	-22.74	54.30	-3.04	Peak	---	---
5	4804.00	33.57	54.00	-20.43	28.92	4.65	Average	---	---
6	4804.00	45.58	74.00	-28.42	40.93	4.65	Peak	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 3: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
 Note 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.
 Note 5: Average emission setting: RBW=1MHz; VBW ≥ 1/T, where T is "Pulse On Time", e.g., LE VBW≥1/625us, VBW=3kHz.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	LE-1Mbps	Test Freq. (FX)	2440
Operating Mode	1	Polarization	H



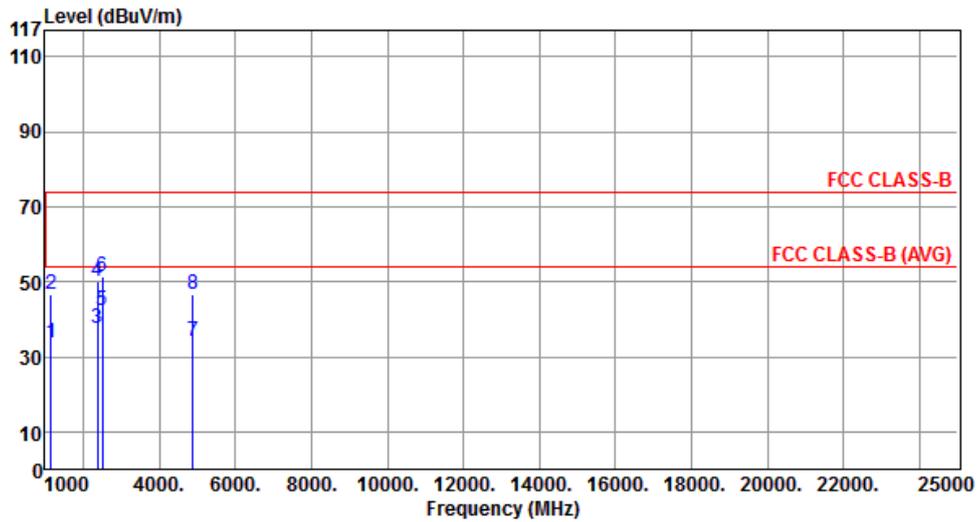
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1160.00	35.82	54.00	-18.18	44.64	-8.82	Average	---	---
2	1160.00	48.93	74.00	-25.07	57.75	-8.82	Peak	---	---
3	2379.00	43.85	54.00	-10.15	46.79	-2.94	Average	---	---
4	2379.00	50.85	74.00	-23.15	53.79	-2.94	Peak	---	---
5	2499.00	46.95	54.00	-7.05	49.29	-2.34	Average	---	---
6	2499.00	52.85	74.00	-21.15	55.19	-2.34	Peak	---	---
7	4880.00	36.18	54.00	-17.82	31.40	4.78	Average	---	---
8	4880.00	48.68	74.00	-25.32	43.90	4.78	Peak	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 3: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
 Note 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.
 Note 5: Average emission setting: RBW=1MHz; VBW ≥ 1/T, where T is "Pulse On Time", e.g., LE VBW≥1/625us, VBW=3kHz.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation Mode	LE-1Mbps	Test Freq. (FX)	2440
Operating Mode	1	Polarization	V



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1160.00	33.78	54.00	-20.22	42.60	-8.82	Average	---	---
2	1160.00	46.52	74.00	-27.48	55.34	-8.82	Peak	---	---
3	2379.00	37.75	54.00	-16.25	40.69	-2.94	Average	---	---
4	2379.00	49.95	74.00	-24.05	52.89	-2.94	Peak	---	---
5	2499.00	42.45	54.00	-11.55	44.79	-2.34	Average	---	---
6	2499.00	51.35	74.00	-22.65	53.69	-2.34	Peak	---	---
7	4880.00	34.05	54.00	-19.95	29.27	4.78	Average	---	---
8	4880.00	46.45	74.00	-27.55	41.67	4.78	Peak	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 3: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
 Note 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.
 Note 5: Average emission setting: RBW=1MHz; VBW ≥ 1/T, where T is "Pulse On Time", e.g., LE VBW≥1/625us, VBW=3kHz.



Transmitter Radiated Unwanted Emissions (Above 1GHz)									
Modulation Mode	LE-1Mbps		Test Freq. (FX)	2480					
Operating Mode	1		Polarization	H					
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	1160.00	35.42	54.00	-18.58	44.24	-8.82	Average	---	---
2	1160.00	48.70	74.00	-25.30	57.52	-8.82	Peak	---	---
3	2360.00	42.94	54.00	-11.06	45.98	-3.04	Average	---	---
4	2360.00	49.95	74.00	-24.05	52.99	-3.04	Peak	---	---
5	2499.00	42.35	54.00	-11.65	44.69	-2.34	Average	---	---
6	2499.00	54.85	74.00	-19.15	57.19	-2.34	Peak	---	---
7	4960.00	36.42	54.00	-17.58	31.51	4.91	Average	---	---
8	4960.00	49.10	74.00	-24.90	44.19	4.91	Peak	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 3: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
 Note 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.
 Note 5: Average emission setting: RBW=1MHz; VBW ≥ 1/T, where T is "Pulse On Time", e.g., LE VBW≥1/625us, VBW=3kHz.



Transmitter Radiated Unwanted Emissions (Above 1GHz)									
Modulation Mode	LE-1Mbps		Test Freq. (FX)	2480					
Operating Mode	1		Polarization	V					
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	1160.00	33.25	54.00	-20.75	42.07	-8.82	Average	---	---
2	1160.00	46.18	74.00	-27.82	55.00	-8.82	Peak	---	---
3	2360.00	38.93	54.00	-15.07	41.97	-3.04	Average	---	---
4	2360.00	46.92	74.00	-27.08	49.96	-3.04	Peak	---	---
5	2499.00	40.85	54.00	-13.15	43.19	-2.34	Average	---	---
6	2499.00	52.55	74.00	-21.45	54.89	-2.34	Peak	---	---
7	4960.00	34.39	54.00	-19.61	29.48	4.91	Average	---	---
8	4960.00	46.71	74.00	-27.29	41.80	4.91	Peak	---	---
<p>Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.</p> <p>Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)</p> <p>Note 3: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.</p> <p>Note 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.</p> <p>Note 5: Average emission setting: RBW=1MHz; VBW ≥ 1/T, where T is "Pulse On Time", e.g., LE VBW≥1/625us, VBW=3kHz.</p>									



4 Test Equipment and Calibration Data

Test Item	Conducted Emission				
Test Site	Conduction room 4 / (CO04-HY)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
EMC Receiver	R&S	ESCS 30	100174	Mar. 26, 2013	Mar. 25, 2014
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	Jan. 21, 2013	Jan. 20, 2014
RF Cable-CON	HUBER+SUHNER	RG213/U	7.61183201e+012	Nov. 09, 2012	Nov. 08, 2013
EMI Filter	LINDGREN	LRE-2030	2651	N/A	N/A
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission below 1GHz				
Test Site	966 chamber 2 / (03CH03-HY)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	Dec. 01, 2012	Nov. 30, 2013
Amplifier	HP	8447D	2944A08033	May 03, 2013	May 02, 2014
Spectrum	R&S	FSP30	100023	Jul. 20, 2013	Jul. 19, 2014
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	Sep. 21, 2013	Sep. 20, 2014
RF Cable-R03m	Jye Bao	RG142	CB021	Jan. 17, 2013	Jan. 16, 2014
Turn Table	EM Electronics	EM Electronics	060615	N/A	N/A
Antenna Mast	MF	MF-7802	MF780208179	N/A	N/A
Loop Antenna	TESEQ	HLA 6120	31244	Dec. 02, 2012	Dec. 01, 2013
Note: Calibration Interval of instruments listed above is one year.					



Test Item	Radiated Emission above 1GHz				
Test Site	966 chamber 2 / (03CH02-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
3m semi-anechoic chamber	CHAMPRO	SAC-03	03CH02-WS	Jan. 02, 2013	Jan. 01, 2014
Spectrum Analyzer	R&S	FSV40	101499	Jan. 28, 2013	Jan. 27, 2014
Receiver	R&S	ESR3	101657	Jan. 30,2013	Jan. 29, 2014
Bilog Antenna	Schwarzbeck	VULB9168	VULB9168-524	Jan. 11, 2013	Jan. 10, 2014
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120D	BBHA 9120 D 1095	Jan. 29, 2013	Jan. 28,2014
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Jan. 14, 2013	Jan. 13, 2014
Amplifier	Burgeon	BPA-530	100218	Dec. 14, 2012	Dec. 13, 2013
Amplifier	Agilent	83017A	MY39501309	Dec. 18, 2012	Dec. 17, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16140/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16018/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16015/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R03m	Woken	CFD400NL-LW	CFD400NL-003	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R10m	Woken	CFD400NL-LW	CFD400NL-004	Dec. 25, 2012	Dec. 24, 2013
control	EM Electronics	EM1000	060608	N/A	N/A
Note: Calibration Interval of instruments listed above is one year.					

Loop Antenna	R&S	HFH2-Z2	100330	Nov. 15, 2012	Nov. 14, 2014
Amplifier	MITEQ	AMF-6F-260400	9121372	Apr. 19, 2013	Apr. 18, 2015
Note: Calibration Interval of instruments listed above is two year.					

Test Item	RF Conducted				
Test Site	TH01-HY				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV 40	101063	Feb. 18, 2013	Feb. 17, 2014
Spectrum Analyzer	R&S	FSP 40	100305	Mar. 20, 2013	Mar. 19, 2014
Temp. and Humidity Chamber	Giant Force	GTH-225-20-SP-SD	MAA1112-007	Nov. 21, 2012	Nov. 20, 2013
Signal Generator	R&S	SMB100A	175727	Jan. 14, 2013	Jan. 14, 2014
Power Sensor	Anritsu	MA2411B	0917017	Feb. 02, 2013	Feb. 01, 2014
Power Meter	Anritsu	ML2495A	0949003	Feb. 02, 2013	Feb. 01, 2014
Note: Calibration Interval of instruments listed above is one year.					