



Report No.: SUCR240400008403

Rev.: 01

Page: 1 of 76

FCC SAR TEST REPORT

Application No.: SUCR2404000084IT
Applicant: Wuxi iData Technology Company Ltd.
Manufacturer: Wuxi iData Technology Company Ltd.
Product Name: New Mobile Computer
Model No.(EUT): iData T3 Pro
Trade Mark: iData
FCC ID: 2ADE3IDATAT3PRO
Standards: FCC 47CFR §2.1093
Date of Receipt: 2023-10-23 (for report SEWM2309000380RG08)
Date of Test: 2023-10-25 to 2023-12-01 (for report SEWM2309000380RG08)
Date of Issue: 2024-04-10
Test conclusion: **PASS ***

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:

Well Wei

Well Wei

Wireless Laboratory Manager



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Report No.: SUCR240400008403
Rev.: 01
Page: 2 of 76

REVISION HISTORY

Report Number	Revision	Description	Issue Date
SUCR240400008403	01	Original	2024-04-10



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Report No.: SUCR240400008403

Rev.: 01

Page: 3 of 76

TEST SUMMARY

Frequency Band	Maximum Reported SAR(W/kg)			
	Head	Body-worn	Hotspot	Product specific 10g SAR
GSM850	0.44	0.81	0.81	/
GSM1900	0.19	0.39	0.39	/
WCDMA Band II	0.24	0.50	0.50	/
WCDMA Band V	0.18	0.39	0.39	/
LTE Band 5	0.16	0.36	0.36	/
LTE Band 7	0.13	1.41	1.41	1.09
WI-FI (2.4GHz)	0.69	0.16	0.30	/
WI-FI (5GHz)	0.84	1.10	1.10	0.36
BT	0.62	0.10	0.21	/
SAR Limited(W/kg)	1.6			4.0
Maximum Simultaneous Transmission SAR (W/kg)				
Scenario	Head	Body-worn	Hotspot	Product specific 10g SAR
Sum SAR	1.56	1.59	1.59	1.44
SPLSR	/	0.04	0.04	/
SPLSR Limited	0.04			0.1

Note:

1) According to TCB workshop October,2014 RF Exposure Procedures Update (Overlapping Bands): SAR for LTE Band 4 (Frequency range:1710 - 1755 MHz)/ LTE Band 17 (Frequency range:704-716 MHz) is respectively covered by LTE Band 66 (Frequency range:1710 - 1780 MHz)/ LTE Band 12 (Frequency range:699-716 MHz) due to similar frequency range, same maximum tune up limit and same channel bandwidth.

2) For LTE band 4/5/12/13/17 that do not support at least three non-overlapping channels in certain channel bandwidths, test the available non-overlapping channels instead. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Remark:

This test report (Report No.: SUCR240400008403 issue on 2024/04/10) is based on the original test report (Report No.: SEWM2309000380RG08 issue on 2023/12/04). Review this report and original report, this report just removed the LTE Band38/41 by software.

Therefore in this report all items do not need to retest and all test data in this report are based on the previous report with report number SUCR240400008403 issue on 2023/12/04.

Reviewed by

Nick Hu

Nick Hu

Prepared by

Leon Xu

Leon Xu

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.
Wireless Laboratory

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CONTENTS

1	GENERAL INFORMATION	6
1.1	DETAILS OF CLIENT	6
1.2	TEST LOCATION	6
1.3	TEST FACILITY	7
1.4	GENERAL DESCRIPTION OF EUT	8
1.4.1	DUT Antenna Locations (Back View)	10
1.5	TEST SPECIFICATION	11
1.6	RF EXPOSURE LIMITS	12
2	LABORATORY ENVIRONMENT	13
3	SAR MEASUREMENTS SYSTEM CONFIGURATION	14
3.1	THE SAR MEASUREMENT SYSTEM	14
3.2	ISOTROPIC E-FIELD PROBE EX3DV4	15
3.3	DATA ACQUISITION ELECTRONICS (DAE)	16
3.4	SAM TWIN PHANTOM	16
3.5	ELI PHANTOM	17
3.6	DEVICE HOLDER FOR TRANSMITTERS	18
3.7	MEASUREMENT PROCEDURE	19
3.7.1	Scanning procedure	19
3.7.2	Data Storage	21
3.7.3	Data Evaluation by SEMCAD	21
4	SAR MEASUREMENT VARIABILITY AND UNCERTAINTY	23
4.1	SAR MEASUREMENT VARIABILITY	23
4.2	SAR MEASUREMENT UNCERTAINTY	23
5	DESCRIPTION OF TEST POSITION	24
5.1	HEAD EXPOSURE CONDITION	24
5.1.1	SAM Phantom Shape	24
5.1.2	EUT constructions	25
5.1.3	Definition of the “cheek” position	25
5.1.4	Definition of the “tilted” position	26
5.2	BODY EXPOSURE CONDITION	27
5.2.1	Body-worn accessory exposure conditions	27
5.2.2	Wireless Router exposure conditions	28
5.3	EXTREMITY EXPOSURE CONDITIONS	28
6	SAR SYSTEM VERIFICATION PROCEDURE	29
6.1	TISSUE SIMULATE LIQUID	29
6.1.1	Recipes for Tissue Simulate Liquid	29
6.1.2	Measurement for Tissue Simulate Liquid	30
6.2	SAR SYSTEM CHECK	31
6.2.1	Justification for Extended SAR Dipole Calibrations	32



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Report No.: SUCR240400008403
Rev.: 01
Page: 5 of 76

6.2.2 SAR measurement uncertainty.....	33
6.2.3 Summary System Check Result(s).....	34
6.2.4 Detailed System Check Results.....	34
7 TEST CONFIGURATION.....	35
7.1 3G SAR TEST REDUCTION PROCEDURE.....	35
7.2 OPERATION CONFIGURATIONS.....	35
7.2.1 GSM Test Configuration.....	35
7.2.2 WCDMA Test Configuration.....	36
7.2.3 WiFi Test Configuration.....	42
7.2.4 LTE Test Configuration.....	47
8 TEST RESULT	50
8.1 MEASUREMENT OF RF CONDUCTED POWER	50
8.1.1 Measurement Conducted Power of GSM850.....	52
8.1.2 Measurement Conducted Power of GSM1900.....	52
8.1.3 Measurement Conducted Power of WCDMA II.....	53
8.1.4 Measurement Conducted Power of WCDMA V.....	53
8.1.5 Measurement Conducted Power of LTE Band 5.....	54
8.1.6 Measurement Conducted Power of LTE Band 7.....	56
8.1.7 Measurement Conducted Power of WIFI2.4G.....	58
8.1.8 Measurement Conducted Power of WIFI5G.....	58
8.1.9 Measurement Conducted Power of Bluetooth.....	61
8.2 MEASUREMENT OF SAR DATA.....	62
8.2.1 SAR Result of GSM850.....	63
8.2.2 SAR Result of GSM1900.....	63
8.2.3 SAR Result of WCDMA Band II.....	64
8.2.4 SAR Result of WCDMA Band V.....	64
8.2.5 SAR Result of LTE Band 5.....	65
8.2.6 SAR Result of LTE Band 7.....	66
8.2.7 SAR Result of WIFI 2.4G.....	67
8.2.8 SAR Result of WIFI 5G.....	68
8.2.9 SAR Result of BT.....	70
8.3 MULTIPLE TRANSMITTER EVALUATION	71
8.3.1 Simultaneous SAR SAR test evaluation	71
8.3.2 Simultaneous Transmission SAR Summation Scenario.....	72
9 EQUIPMENT LIST.....	75
10 CALIBRATION CERTIFICATE.....	76
11 PHOTOGRAPHS.....	76
APPENDIX A: DETAILED SYSTEM CHECK RESULTS	76
APPENDIX B: DETAILED TEST RESULTS	76
APPENDIX C: CALIBRATION CERTIFICATE.....	76
APPENDIX D: PHOTOGRAPHS.....	76



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Report No.: SUCR240400008403

Rev.: 01

Page: 6 of 76

1 General Information

1.1 Details of Client

Applicant:	Wuxi iData Technology Company Ltd.
Address:	Floor 11,Building B1.Wuxi Binhu National Sensing Information Center,No.999 Gaolang East Road,Wuxi,China
Manufacturer:	Wuxi iData Technology Company Ltd.
Address:	Floor 11,Building B1.Wuxi Binhu National Sensing Information Center,No.999 Gaolang East Road,Wuxi,China

1.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.
Address:	South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone
Post code:	215000
Test Engineer:	Alan Zhang



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Report No.: SUCR240400008403

Rev.: 01

Page: 7 of 76

1.3 Test Facility

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- **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

- **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327



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Report No.: SUCR240400008403

Rev.: 01

Page: 8 of 76

1.4 General Description of EUT

Device Type :	portable device		
Exposure Category:	uncontrolled environment / general population		
Product Name:	New Mobile Computer		
Model No.(EUT):	iData T3 Pro		
FCC ID:	2ADE3IDATAT3PRO		
Trade Mark:	iData		
IMEI:	1#:866185060736933/866185065718175 2#:866185060736362/866185065717607		
Hardware Version:	H2110Z0-V06		
Software Version:	12.00.001		
Device Operating Configurations :			
Modulation Mode:	GSM: GMSK; WCDMA: QPSK;		
	LTE: QPSK,16QAM,64QAM;		
	WIFI: DSSS, OFDM; BT: GFSK, $\pi/4$ DQPSK,8DPSK		
Device Class:	B		
GPRS Multi-slots Class:	12	EGPRS Multi-slots Class:	12
HSDPA UE Category:	24	HSUPA UE Category	7
Power Class	4,tested with power level 5(GSM850)		
	1,tested with power level 0(GSM1900)		
	3, tested with power control “All 1”(WCDMA Band)		
	3, tested with power control Max Power(LTE Band)		
Frequency Bands:	Band	Tx (MHz)	Rx (MHz)
	GSM850	824-849	869-894
	GSM1900	1850-1910	1930-1990
	WCDMA Band II	1850-1910	1930-1990
	WCDMA Band V	824-849	869-894
	LTE Band 5	824-849	869-894
	LTE Band 7	2500-2570	2620-2690
	Bluetooth	2400~2483.5	2400~2483.5
	Wi-Fi 2.4G	2412~2462	2412~2462
	Wi-Fi 5G	5150~5250	5150~5250
		5250~5350	5250~5350
		5470~5725	5470~5725
5725~5850		5725~5850	
RF Cable:	Provided by the aplicant	Provided by the laboratory	
1# Battery Information:	Model:	SF01	
	Normal Voltage:	3.85V	
	Typical capacity:	5000mAh	



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Report No.: SUCR240400008403

Rev.: 01

Page: 9 of 76

Manufacturer:	Shenzhen Cholipower Technology Co.,Ltd.
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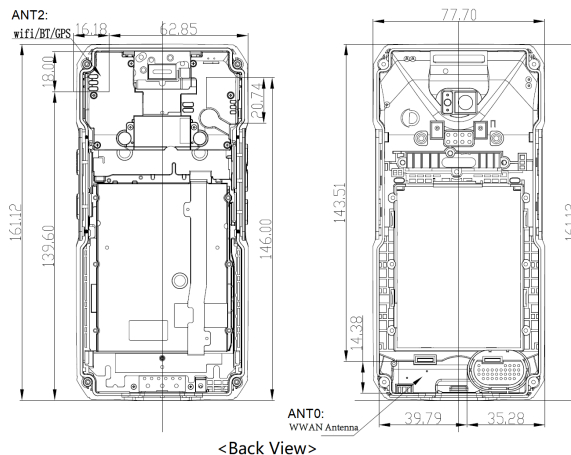
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Report No.: SUCR240400008403

Rev.: 01

Page: 10 of 76

1.4.1 DUT Antenna Locations (Back View)



<Back View>

Note:

According to the distance between LTE/WCDMA/GSM&WIFI&BT antennas and the sides of the EUT we can draw the conclusion that:

EUT Sides for SAR Testing							
Mode	Exposure Condition	Front	Back	Left	Right	Top	Bottom
Ant 0	Hotspot/Product specific 10g SAR	Yes	Yes	Yes	Yes	No	Yes
Ant 2	Hotspot/Product specific 10g SAR	Yes	Yes	No	Yes	Yes	No

Table 1: EUT Sides for SAR Testing

Note:

1) When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.



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1.5 Test Specification

Identity	Document Title
FCC 47CFR §2.1093	Radiofrequency Radiation Exposure Evaluation: Portable Devices
ANSI/IEEE C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.
IEEE 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
IEC/IEEE 62209-1528:2020	Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Part 1528: Human models, instrumentation, and procedures (Frequency range of 4 MHz to 10 GHz)
KDB 941225 D01	3G SAR Measurement Procedures v03r01
KDB 941225 D05	SAR for LTE Devices v02r05
KDB 941225 D05A	LTE Rel.10 KDB Inquiry Sheet v01r02
KDB 941225 D06	Hotspot Mode SAR v02r01
KDB 248227 D01	SAR Guidance for IEEE 802.11 Wi-Fi SAR v02r02
KDB 648474 D04	Handset SAR v01r03
KDB 447498 D01	General RF Exposure Guidance v06
KDB 865664 D01	SAR Measurement 100 MHz to 6 GHz v01r04
KDB 865664 D02	RF Exposure Reporting v01r02
KDB 690783 D01	SAR Listings on Grants v01r03



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1.6 RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain*Trunk)	1.60 mW/g	8.00 mW/g
Spatial Average SAR** (Whole Body)	0.08 mW/g	0.40 mW/g
Spatial Peak SAR*** (Hands/Feet/Ankle/Wrist)	4.00 mW/g	20.00 mW/g

Notes:

* The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time

** The Spatial Average value of the SAR averaged over the whole body.

*** The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation.)



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Report No.: SUCR240400008403

Rev.: 01

Page: 13 of 76

2 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
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.	

Table 2: The Ambient Conditions



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3 SAR Measurements System Configuration

3.1 The SAR Measurement System

This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY5 professional system). A E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation $SAR = \sigma (|E|^2) / \rho$ where σ and ρ are the conductivity and mass density of the tissue-Simulate.

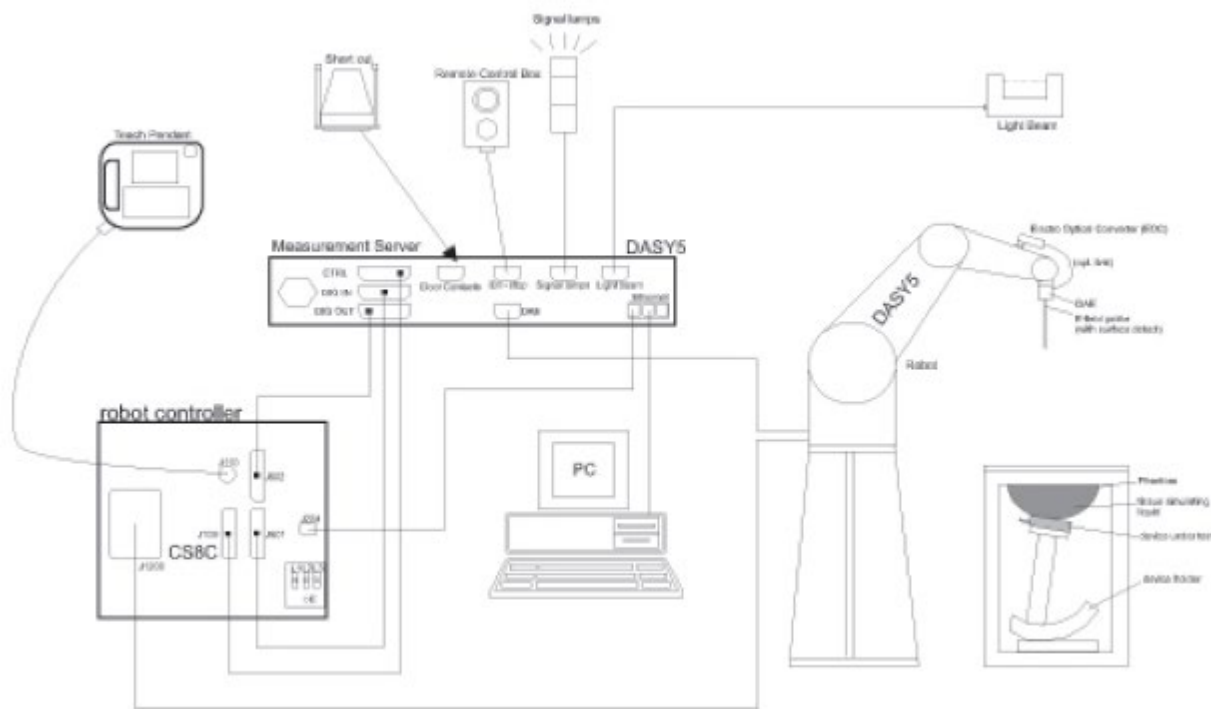
The DASY5 system for performing compliance tests consists of the following items:

A standard high precision 6-axis robot (Stabile RX family) with controller, teach pendant and software .An arm extension for accommodation the data acquisition electronics (DAE).

A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.



F-1. SAR Measurement System Configuration



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Report No.: SUCR240400008403
 Rev.: 01
 Page: 15 of 76

- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 7.
- DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand, right-hand and Body Worn usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validating the proper functioning of the system.

3.2 Isotropic E-field Probe EX3DV4

	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 μ W/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI



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3.3 Data Acquisition Electronics (DAE)

Model	DAE
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY4/5 embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV,400mV)
Input Offset Voltage	< 5 μ V (with auto zero)
Input Bias Current	< 50 f A
Dimensions	60 x 60 x 68 mm



3.4 SAM Twin Phantom


Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2 \pm 0.2 mm (6 \pm 0.2 mm at ear point)
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet
Filling Volume	approx. 25 liters
Wooden Support	SPEAG standard phantom table



The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. 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 evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.

Twin SAM V5.0 has the same shell geometry and is manufactured from the same material as Twin SAM V4.0, but has reinforced top structure.

3.5 ELI Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)	
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	
Wooden Support	SPEAG standard phantom table	

The ELI phantom is used for compliance testing of handheld and body-mounted wireless devices in the frequency range of 4 MHz to 10 GHz. ELI is fully compatible with the IEC/IEEE 62209-1528 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all of SPEAG's dosimetric probes and dipoles.

ELI V5.0 and higher has the same shell geometry and is manufactured from the same material as ELI V4.0 but has a reinforced top structure.

3.6 Device Holder for Transmitters



F-2. Device Holder for Transmitters

- The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centres for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.
- The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity $\epsilon=3$ and loss tangent $\delta=0.02$. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

3.7 Measurement procedure

3.7.1 Scanning procedure

Step 1: Power reference measurement

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure.

Step 2: Area scan

The SAR distribution at the exposed side of the head was measured at a distance of 4mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15mm*15mm or 12mm*12mm or 10mm*10mm. Based on the area scan data, the area of the maximum absorption was determined by spline interpolation.

Step 3: Zoom scan

Around this point, a volume of 32mm*32mm*30mm ($f \leq 2\text{GHz}$), 30mm*30mm*30mm (f for 2-3GHz) and 24mm*24mm*22mm (f for 5-6GHz) was assessed by measuring 5x5x7 points ($f \leq 2\text{GHz}$), 7x7x7 points (f for 2-3GHz) and 7x7x12 points (f for 5-6GHz). On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

The data at the surface was extrapolated, since the centre of the dipoles is 2.0mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. (This can be variable. Refer to the probe specification). 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. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The volume was integrated with the trapezoidal algorithm. One thousand points were interpolated to calculate the average. All neighbouring volumes were evaluated until no neighboring volume with a higher average value was found.

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements. Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std. 1528-2013.



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		$\leq 3 \text{ GHz}$	$> 3 \text{ GHz}$
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface		$5 \pm 1 \text{ mm}$	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5 \text{ mm}$
Maximum probe angle from probe axis to phantom surface normal at the measurement location		$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
Maximum area scan spatial resolution: $\Delta x_{\text{Area}}, \Delta y_{\text{Area}}$		$\leq 2 \text{ GHz: } \leq 15 \text{ mm}$ $2 - 3 \text{ GHz: } \leq 12 \text{ mm}$	$3 - 4 \text{ GHz: } \leq 12 \text{ mm}$ $4 - 6 \text{ GHz: } \leq 10 \text{ mm}$
		When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be \leq the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$		$\leq 2 \text{ GHz: } \leq 8 \text{ mm}$ $2 - 3 \text{ GHz: } \leq 5 \text{ mm}^*$	$3 - 4 \text{ GHz: } \leq 5 \text{ mm}^*$ $4 - 6 \text{ GHz: } \leq 4 \text{ mm}^*$
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{\text{Zoom}}(n)$	$\leq 5 \text{ mm}$	$3 - 4 \text{ GHz: } \leq 4 \text{ mm}$ $4 - 5 \text{ GHz: } \leq 3 \text{ mm}$ $5 - 6 \text{ GHz: } \leq 2 \text{ mm}$
	graded grid $\Delta z_{\text{Zoom}}(1)$: between 1 st two points closest to phantom surface	$\leq 4 \text{ mm}$	$3 - 4 \text{ GHz: } \leq 3 \text{ mm}$ $4 - 5 \text{ GHz: } \leq 2.5 \text{ mm}$ $5 - 6 \text{ GHz: } \leq 2 \text{ mm}$
	$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$	
Minimum zoom scan volume	x, y, z	$\geq 30 \text{ mm}$	$3 - 4 \text{ GHz: } \geq 28 \text{ mm}$ $4 - 5 \text{ GHz: } \geq 25 \text{ mm}$ $5 - 6 \text{ GHz: } \geq 22 \text{ mm}$

Step 4: Power reference measurement (drift)

The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job within the same procedure, and with the same settings. The indicated drift is mainly the variation of the DUT's output power and should vary max. $\pm 5 \%$



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3.7.2 Data Storage

The DASY software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DAE4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated. The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [m W/g], [m W/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

3.7.3 Data Evaluation by SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	- Sensitivity	Normi, ai0, ai1, ai2
	- Conversion factor	ConvFi
	- Diode compression point	Dcpi
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	ε
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot cf / dcpi$$

With V_i = compensated signal of channel i (i = x, y, z)

U_i = input signal of channel i (i = x, y, z)

cf = crest factor of exciting field (DASY parameter)

dcpi = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes:

$$E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$$



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H-field probes:

$$H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1}f + a_{i2}f^2) / f$$

With V_i = compensated signal of channel i ($i = x, y, z$)

Normi = sensor sensitivity of channel i ($i = x, y, z$)

[mV/(V/m)²] for E-field Probes

ConvF = sensitivity enhancement in solution

a_{ij} = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

E_i = electric field strength of channel i in V/m

H_i = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = (E_x^2 + E_y^2 + E_z^2)^{1/2}$$

The primary field data are used to calculate the derived field units.

$$SAR = (E_{tot}^2 \cdot \sigma) / (\epsilon \cdot 1000)$$

with SAR = local specific absorption rate in mW/g

E_{tot} = total field strength in V/m

σ = conductivity in [mho/m] or [Siemens/m]

ϵ = equivalent tissue density in g/cm³

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = E_{tot}^2 / 3770 \text{ or } P_{pwe} = H_{tot}^2 \cdot 37.7$$

with P_{pwe} = equivalent power density of a plane wave in mW/cm²

E_{tot} = total electric field strength in V/m

H_{tot} = total magnetic field strength in A/m



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4 SAR measurement variability and uncertainty

4.1 SAR measurement variability

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r04, SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. The additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

- 1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
 - 2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
 - 3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).
 - 4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .
- The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

4.2 SAR measurement uncertainty

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.



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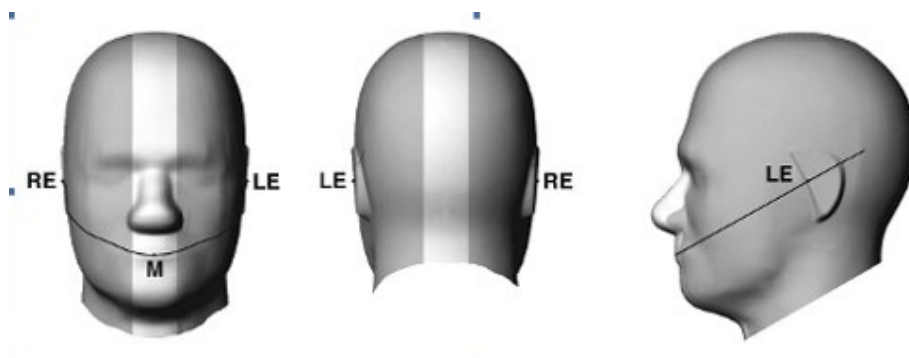
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5 Description of Test Position

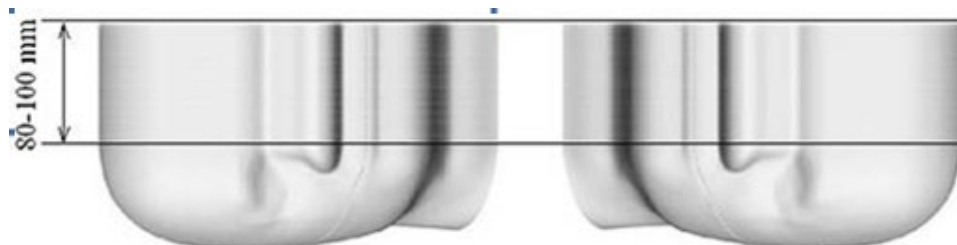
5.1 Head Exposure Condition

5.1.1 SAM Phantom Shape

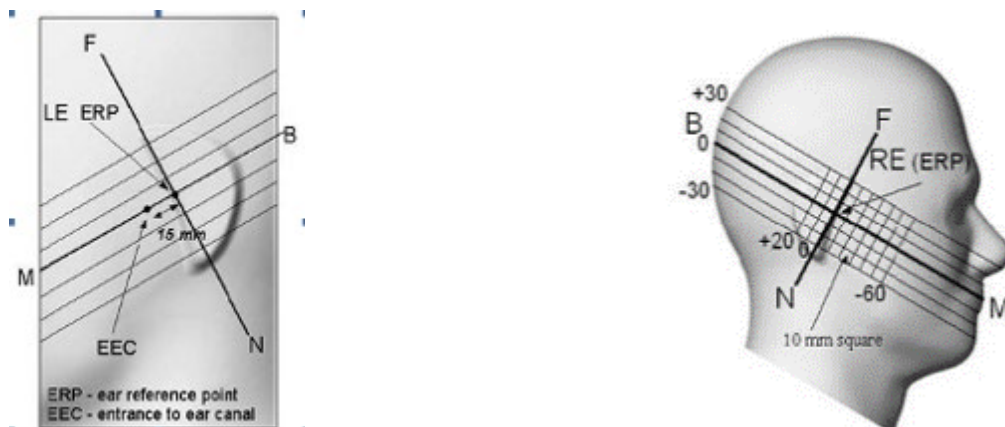


F-3. Front, back, and side views of SAM (model for the phantom shell). Full-head model is for illustration purposes only-procedures in this recommended practice are intended primarily for the phantom setup.

Note: The centre strip including the nose region has a different thickness tolerance.



F-4. Sagittally bisected phantom with extended perimeter (shown placed on its side as used for SAR measurements)



Report No.: SUCR240400008403

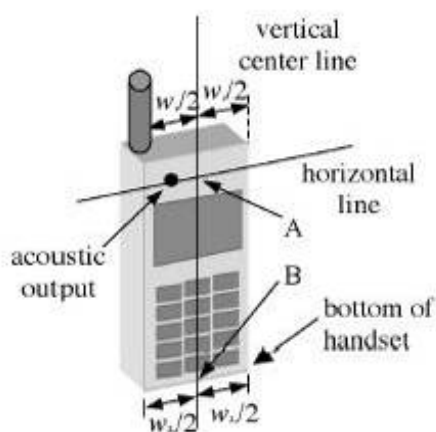
Rev.: 01

Page: 25 of 76

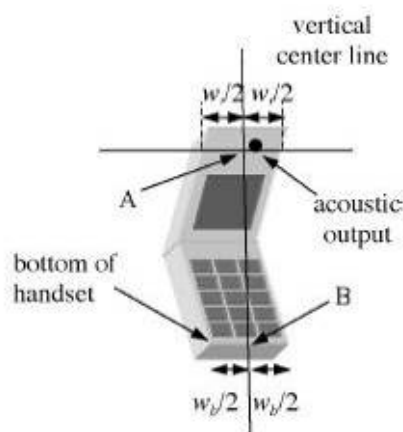
F-5. Close-up side view of phantom, showing the ear region, N-F and B-M lines, and seven cross-sectional plane locations

F-6. Side view of the phantom showing relevant markings and seven cross-sectional plane locations

5.1.2 EUT constructions



F-7. Handset vertical and horizontal reference lines—"fixed case"



F-8. Handset vertical and horizontal reference lines—"clam-shell case"

5.1.3 Definition of the "cheek" position

- Position the device with the vertical centre line of the body of the device and the horizontal line crossing the centre of the ear piece in a plane parallel to the sagittal plane of the phantom ("initial position"). While maintaining the device in this plane, align the vertical centre line with the reference plane containing the three ear and mouth reference points (M, RE and LE) and align the centre of the ear piece with the line RE-LE.
- Translate the mobile phone box towards the phantom with the ear piece aligned with the line LE-RE until telephone touches the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the box until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost.



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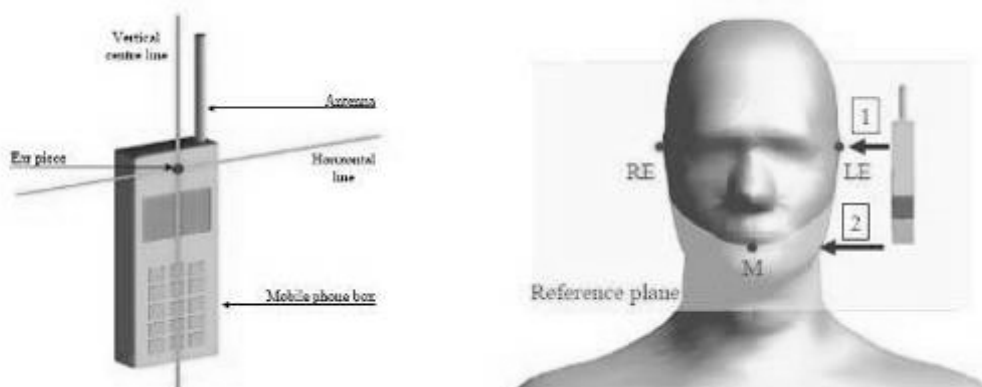
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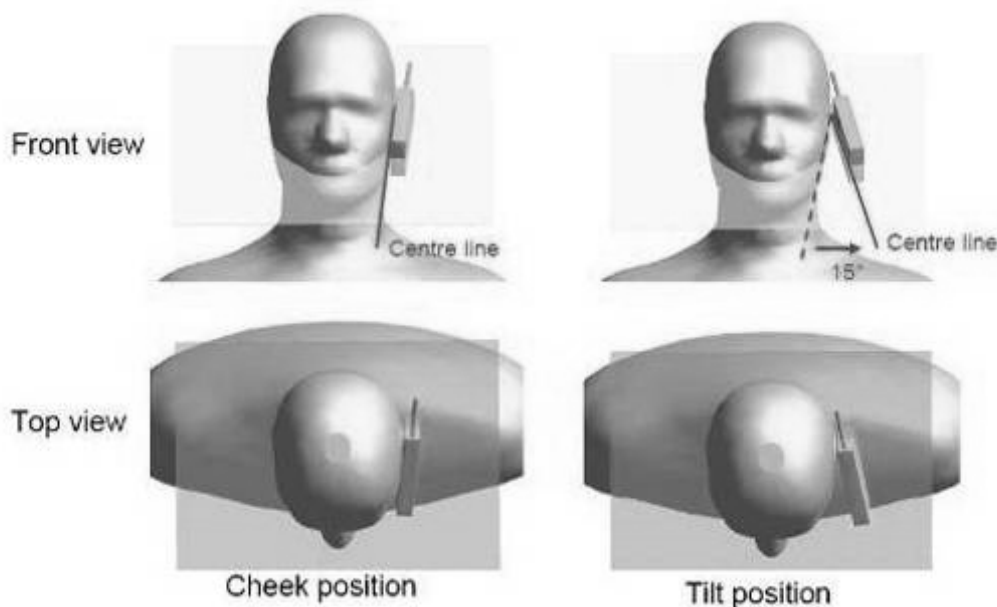
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5.1.4 Definition of the “tilted” position

- Position the device in the “cheek” position described above;
- While maintaining the device in the reference plane described above and pivoting against the ear, move it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost.



F-9. Definition of the reference lines and points, on the phone and on the phantom and initial position



F-10. “Cheek” and “tilt” positions of the mobile phone on the left side

5.2 Body Exposure Condition

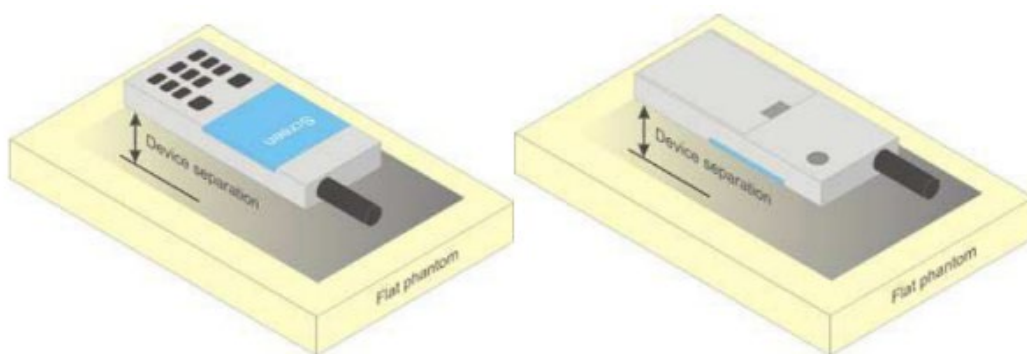
5.2.1 Body-worn accessory exposure conditions

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations.

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. Per FCC KDB Publication 648474 D04, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is $> 1.2 \text{ W/kg}$, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented. Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.



F-11. Test positions for body-worn devices



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Report No.: SUCR240400008403

Rev.: 01

Page: 28 of 76

5.2.2 Wireless Router exposure conditions

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 where SAR test considerations for handsets ($L \times W \geq 9 \text{ cm} \times 5 \text{ cm}$) are based on a composite test separation distance of 10 mm from the front, back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. For devices with form factors smaller than $9 \text{ cm} \times 5 \text{ cm}$, a test separation distance of 5 mm is required.

5.3 Extremity exposure conditions

Per FCC KDB 648474 D04, for smart phones with a display diagonal dimension $> 15.0 \text{ cm}$ or an overall diagonal dimension $> 16.0 \text{ cm}$ that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, the device is marketed as "Phablet". The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at $\leq 25 \text{ mm}$ from that surface or edge, in direct contact with a flat phantom, for Product Specific 10-g SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, Product Specific 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR $> 1.2 \text{ W/kg}$; however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.

Due to the SAR result, hotspot power levels, and product specific 10g SAR power levels are the same, no frequency bands need to test with 0mm for the Product Specific 10-g SAR are not required.



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6 SAR System Verification Procedure

6.1 Tissue Simulate Liquid

6.1.1 Recipes for Tissue Simulate Liquid

The following tables give the recipes for tissue simulating liquids to be used in different frequency bands:

Ingredients (% by weight)	Frequency (MHz)				
	450	700-900	1750-2000	2300-2500	2500-2700
Water	38.56	40.30	55.24	55.00	54.92
Salt (NaCl)	3.95	1.38	0.31	0.2	0.23
Sucrose	56.32	57.90	0	0	0
HEC	0.98	0.24	0	0	0
Bactericide	0.19	0.18	0	0	0
Tween	0	0	44.45	44.80	44.85
Salt: 99+% Pure Sodium Chloride Sucrose: 98+% Pure Sucrose Water: De-ionized, 16 MΩ ⁺ resistivity HEC: Hydroxyethyl Cellulose Tween: Polyoxyethylene (20) sorbitan monolaurate					
HSL13MHz is composed of the following ingredients: Water: 50-90% Non-ionic detergents: 5-50% NaCl: 0-2% Preservative: 0.03-0.1% HSL5GHz is composed of the following ingredients: Water: 50-65% Mineral oil: 10-30% Emulsifiers: 8-25% Sodium salt: 0-1.5%					

Table 3: Recipe of Tissue Simulate Liquid



Report No.: SUCR240400008403

Rev.: 01

Page: 30 of 76

6.1.2 Measurement for Tissue Simulate Liquid

The Conductivity (σ) and Permittivity (ρ) are listed in bellow table. For the SAR measurement given in this report. The temperature variation of the Tissue Simulate Liquids was $22\pm 2^{\circ}\text{C}$.

Measurement for Tissue Simulate Liquid							
Tissue Type	Measured Frequency (MHz)	Target Tissue ($\pm 5\%$)		Measured Tissue		Liquid Temp. ($^{\circ}\text{C}$)	Test Date
		ϵ_r	$\sigma(\text{S/m})$	ϵ_r	$\sigma(\text{S/m})$		
835 Head	835	41.5 (39.43~43.58)	0.90 (0.86~0.95)	43.100	0.885	22.6	2023/10/25
835 Head	835	41.5 (39.43~43.58)	0.90 (0.86~0.95)	43.000	0.930	22.6	2023/10/28
1950 Head	1900	40.0 (38.00~42.00)	1.40 (1.33~1.47)	40.100	1.380	22.6	2023/10/31
2450 Head	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	38.200	1.810	22.7	2023/11/7
2600 Head	2600	39.0 (37.05~40.95)	1.96 (1.86~2.06)	37.700	1.970	22.5	2023/11/16
5250 Head	5250	35.9 (34.11~37.70)	4.66 (4.47~4.95)	36.200	4.780	22.5	2023/11/9
5600 Head	5600	35.5 (33.73~37.30)	5.07 (4.82~5.32)	35.300	5.170	22.5	2023/11/10
5750 Head	5750	35.4 (33.63~37.17)	5.22 (4.96~5.48)	35.100	5.360	22.5	2023/11/11

Table 4: Measurement result of Tissue electric parameters.



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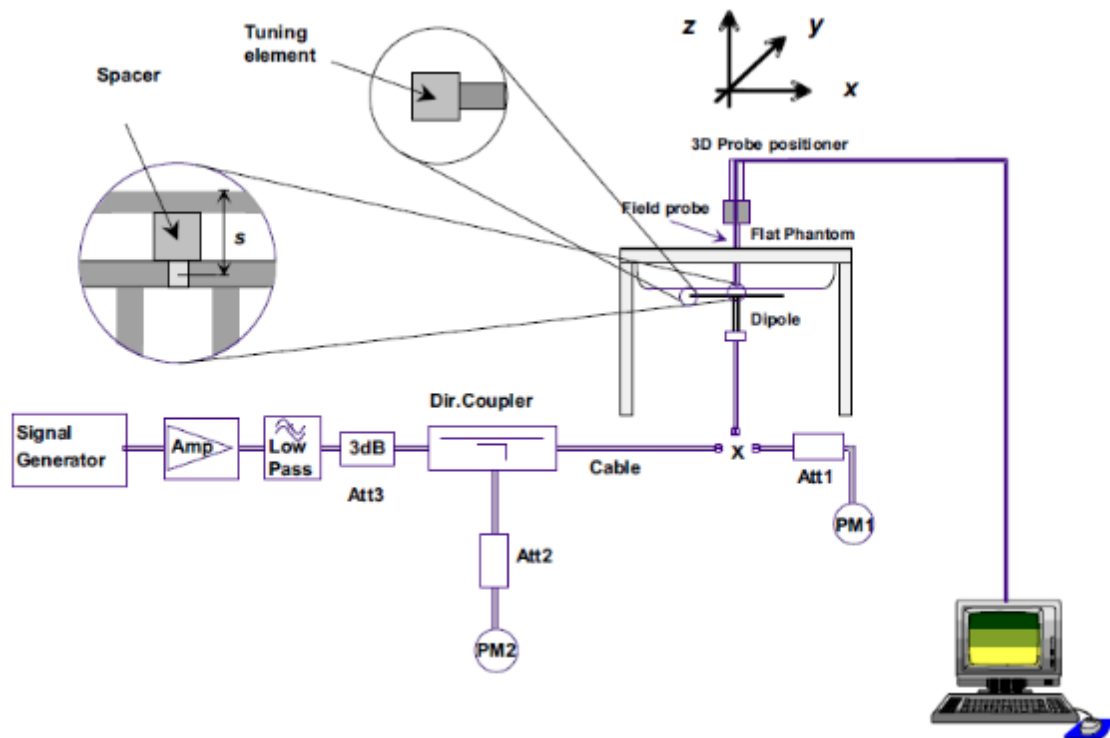
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6.2 SAR System Check

The microwave circuit arrangement for system Check is sketched in F-12. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within $\pm 10\%$ from the target SAR values. The tests were conducted on the same days as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the following table (A power level of 250mW (below 3GHz) or 100mW (3-6GHz) was input to the dipole antenna). During the tests, the ambient temperature of the laboratory was in the range $22\pm 2^{\circ}\text{C}$, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above $15\pm 0.5\text{ cm}$ in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.



F-12. the microwave circuit arrangement used for SAR system check

Report No.: SUCR240400008403

Rev.: 01

Page: 32 of 76

6.2.1 Justification for Extended SAR Dipole Calibrations

1) Referring to KDB865664 D01 requirements for dipole calibration, instead of the typical annual calibration recommended by measurement standards, longer calibration intervals of up to three years may be considered when it is demonstrated that the SAR target, impedance and return loss of a dipole have remain stable according to the following requirements. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.

- a) There is no physical damage on the dipole;
- b) System check with specific dipole is within 10% of calibrated value;
- c) Return-loss is within 10% of calibrated measurement;
- d) Impedance is within 5Ω from the previous measurement.

2) Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.



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6.2.2 SAR measurement uncertainty

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

Measurements and results are all in compliance with the standards listed. All measurements and results are recorded and maintained at the laboratory performing the tests and measurement uncertainties are taken into account when comparing measurements to pass/ fail criteria. The expanded uncertainty (95% CONFIDENCE INTERVAL) is **23.01%**.

a	b	c	d = f(d,k)	F	i = C*g/e	K
Uncertainty Component	Tol (%)	Prob.Dist.	Div.	Ci (1g)	1g _{ui} (%)	Vi(Veff)
Probe calibration	6.65	N	1	1	6.65	∞
Axial isotropy	0.5	R	√3	1	0.29	∞
hemispherical isotropy	2.6	R	√3	1	1.50	∞
Linearity	0.6	R	√3	1	0.35	∞
Probe modulation response	0	R	√3	1	0.00	∞
Detection limits	0.25	R	√3	1	0.14	∞
Boundary effect	1.0	R	√3	1	0.58	∞
Readout electronics	0.3	N	1	1	0.30	∞
Response time	0	R	√3	1	0.00	∞
Integration time	2.6	R	√3	1	1.50	∞
RF ambient conditions – noise	3	R	√3	1	1.73	∞
RF ambient conditions – reflections	3	R	√3	1	1.73	∞
Probe positioner mech. restrictions	1.5	R	√3	1	0.87	∞
Probe positioning with respect to phantom shell	2.9	R	√3	1	1.67	∞
Post-processing	1	R	√3	1	0.58	∞
Device holder uncertainty	3.6	N	1	1	3.60	∞
Test sample positioning	3.7	N	1	1	3.70	9
Power scaling	5.0	R	√3	1	2.89	∞
Drift of output power (measured SAR drift)	5	R	√3	1	2.89	∞
Phantom uncertainty (shape and thickness tolerances)	4	R	√3	1	2.31	∞
Algorithm for correcting SAR for deviations in permittivity and conductivity	1.9	N	1	1	1.90	∞
Liquid conductivity (meas.)	5.78	N	1	0.78	4.51	4
Liquid permittivity (meas.)	0.62	N	1	0.23	0.14	5
Liquid permittivity –temperature uncertainty	0.2	R	√3	0.78	0.09	∞
Liquid conductivity –temperature uncertainty	5.37	R	√3	0.23	071	∞
Combined standard uncertainty RSS					11.51	417
Expanded uncertainty (95% CONFIDENCE INTERVAL) k=2					23.01	

Table 1: Measurement Uncertainty.



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Report No.: SUCR240400008403

Rev.: 01

Page: 34 of 76

6.2.3 Summary System Check Result(s)

Validation Kit		Measured SAR 250mW	Measured SAR 250mW	Measured SAR (normalized to 1W)	Measured SAR (normalized to 1W)	Target SAR (normalized to 1W)	Target SAR (normalized to 1W)	Deviation (Within $\pm 10\%$)		Liquid Temp. (°C)	Test Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)	1-g(W/kg)	10-g(W/kg)		
D835V2	Head	2.30	1.49	9.20	5.96	9.52	6.17	-3.36%	-3.40%	22.6	2023/10/25
D835V2	Head	2.41	1.57	9.64	6.28	9.52	6.17	1.26%	1.78%	22.6	2023/10/28
D1950V2	Head	9.30	4.82	37.20	19.28	40.40	20.80	-7.92%	-7.31%	22.6	2023/10/31
D2450V2	Head	12.50	5.86	50.00	23.44	52.20	24.50	-4.21%	-4.33%	22.7	2023/11/7
D2600V2	Head	13.80	6.44	55.20	25.76	57.10	25.40	-3.33%	1.42%	22.5	2023/11/16
Validation Kit		Measured SAR 100mW	Measured SAR 100mW	Measured SAR (normalized to 1W)	Measured SAR (normalized to 1W)	Target SAR (normalized to 1W)	Target SAR (normalized to 1W)	Deviation (Within $\pm 10\%$)		Liquid Temp. (°C)	Test Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)	1-g(W/kg)	10-g(W/kg)		
D5GHzV2	Head(5.25GHz)	7.49	2.16	74.90	21.60	78.00	21.80	-3.97%	-0.92%	22.5	2023/11/9
	Head(5.6GHz)	8.39	2.38	83.90	23.80	79.90	22.50	5.01%	5.78%	22.5	2023/11/10
	Head(5.75GHz)	7.56	2.16	75.60	21.60	76.40	21.20	-1.05%	1.89%	22.5	2023/11/11

Table 5: SAR System Check Result.

6.2.4 Detailed System Check Results

Please see the Appendix A



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7 Test Configuration

7.1 3G SAR Test Reduction Procedure

According to KDB 941225D01, in the following procedures, the mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as "otherwise" in the applicable procedures; SAR measurement is required for the secondary mode.

7.2 Operation Configurations

7.2.1 GSM Test Configuration

SAR tests for GSM 850 and GSM 1900, a communication link is set up with a base station by air link. Using CMW500 the power lever is set to "5" and "0" in SAR of GSM 850 and GSM 1900. The tests in the band of GSM 850 and GSM 1900 are performed in the mode of GPRS/EGPRS function. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 5 timeslots in downlink, the maximum total timeslot is 6. The EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink, and at most 5 timeslots in downlink, the maximum total timeslot is 6.

SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

When SAR tests for EGPRS mode is necessary, GMSK modulation should be used to minimize SAR measurement error due to higher peak-to-average power (PAR) ratios inherent in 8-PSK.

The 3G SAR test reduction procedure is applied to 8-PSK EDGE with GMSK GPRS/EDGE as the primary mode



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7.2.2 WCDMA Test Configuration

1) . Output Power Verification

Maximum output power is verified on the high, middle and low channels according to procedures described in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all "1's" for WCDMA/HSDPA or by applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HSDPA, HSPA) are required in the SAR report. All configurations that are not supported by the handset or cannot be measured due to technical or equipment limitations must be clearly identified.

2) . Head SAR

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for 12.2 kbps AMR in 3.4 kbps SRB (signaling radio bearer) using the highest reported SAR configuration in 12.2 kbps RMC for head exposure

3) . Body SAR

SAR for body configurations is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". The 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCHn configurations supported by the handset with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured using an applicable RMC configuration with the corresponding spreading code or DPDCHn, for the highest reported body-worn accessory exposure SAR configuration in 12.2 kbps RMC. When more than 2 DPDCHn are supported by the handset, it may be necessary to configure additional DPDCHn using FTM (Factory Test Mode) or other chipset based test approaches with parameters similar to those used in 384 kbps and 768 kbps RMC.

4) . HSDPA / HSUPA / DC-HSDPA

According to KDB 941225 D01v03, RMC 12.2kbps setting is used to evaluate SAR. If the maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is $\leq \frac{1}{4}$ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA

a) HSDPA

HSDPA is configured according to the applicable UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms and a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors (β_c , β_d), and HS-DPCCH power offset parameters (Δ_{ACK} , Δ_{NACK} , Δ_{CQI}) are set according to values indicated in the following table. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.



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Report No.: SUCR240400008403

Rev.: 01

Page: 37 of 76

Sub-test	β_c	Bd	$\beta_d(\text{SF})$	β_c/β_d	β_{hs}	CM(dB)	MPR (dB)
1	2/15	15/15	64	2/15	4/15	0.0	0
2	12/15(3)	15/15(3)	64	12/15(3)	24/15	1.0	0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note1: ΔACK , ΔNACK and $\Delta\text{CQI} = 8$ Ahs = $\beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$
Note2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1.A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, ΔACK and $\Delta\text{NACK} = 8$ (Ahs = 30/15) with $\beta_{hs} = 30/15 * \beta_c$, and $\Delta\text{CQI} = 7$ (Ahs = 24/15) with $\beta_{hs} = 24/15 * \beta_c$.
Note3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

The measurements were performed with a Fixed Reference Channel (FRC) and H-Set 1 QPSK.

Parameter	Value
Nominal average inf. bit rate	534 kbit/s
Inter-TTI Distance	3 TTI's
Number of HARQ Processes	2 Processes
Information Bit Payload	3202 Bits
MAC-d PDU size	336 Bits
Number Code Blocks	1 Block
Binary Channel Bits Per TTI	4800 Bits
Total Available SMLs in UE	19200 SMLs
Number of SMLs per HARQ Process	9600 SMLs
Coding Rate	0.67
Number of Physical Channel Codes	5

Table 6: settings of required H-Set 1 QPSK acc. to 3GPP 34.121



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HS-DSCH Category	Maximum HS-DSCH Codes Received	Minimum Inter-TTI Interval	Maximum HS-DSCH Transport Block Bits/HS-DSCH TTI	Total Soft Channel Bits
1	5	3	7298	19200
2	5	3	7298	28800
3	5	2	7298	28800
4	5	2	7298	38400
5	5	1	7298	57600
6	5	1	7298	67200
7	10	1	14411	115200
8	10	1	14411	134400
9	15	1	25251	172800
10	15	1	27952	172800
11	5	2	3630	14400
12	5	1	3630	28800
13	15	1	34800	259200
14	15	1	42196	259200
15	15	1	23370	345600
16	15	1	27952	345600

Table 7: HSDPA UE category

b) HSUPA

Due to inner loop power control requirements in HSUPA, a commercial communication test set should be used for the output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSUPA should be configured according to the values indicated below as well as other applicable procedures described in the „WCDMA Handset“ and „Release 5 HSUPA Data Device“ sections of 3G device.



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Report No.: SUCR240400008403

Rev.: 01

Page: 39 of 76

Sub-test ¹	β_c ²	β_d ²	β_d (SF) ³	β_c/β_d ²	β_{hs} ¹	β_{ec} ²	β_{ed} ²	β_c (SF) ²	β_{ed} (code) ²	CM ² (dB) ²	MP R ² (dB) ²	AG ⁴ Inde ²	E-TFC I ²
1 ²	11/15 ⁽³⁾	15/15 ⁽³⁾	64 ²	11/15 ⁽³⁾	22/15 ²	209/225 ²	1039/225 ²	4 ²	1 ²	1.0 ²	0.0 ²	20 ²	75 ²
2 ²	6/15 ²	15/15 ²	64 ²	6/15 ²	12/15 ²	12/15 ²	94/75 ²	4 ²	1 ²	3.0 ²	2.0 ²	12 ²	67 ²
3 ²	15/15 ²	9/15 ²	64 ²	15/9 ²	30/15 ²	30/15 ²	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	4 ²	2 ²	2.0 ²	1.0 ²	15 ²	92 ²
4 ²	2/15 ²	15/15 ²	64 ²	2/15 ²	4/15 ²	2/15 ²	56/75 ²	4 ²	1 ²	3.0 ²	2.0 ²	17 ²	71 ²
5 ²	15/15 ⁽⁴⁾	15/15 ⁽⁴⁾	64 ²	15/15 ⁽⁴⁾	30/15 ²	24/15 ²	134/15 ²	4 ²	1 ²	1.0 ²	0.0 ²	21 ²	81 ²
Note 1: ΔACK , $\Delta NACK$ and $\Delta CQI = 8$ $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$ Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference ² Note 3 : For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$ ² Note 4 : For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$ ² Note 5 : Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g ² Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value. ²													

Table 8: Subtests for UMTS Release 6 HSUPA

UE E-DCH Category	Maximum E-DCH Codes Transmitted	Number of HARQ Processes	E-DCH TTI(ms)	Minimum Spreading Factor	Maximum E-DCH Transport Block Bits	Max Rate (Mbps)
1	1	4	10	4	7110	0.7296
2	2	8	2	4	2798	1.4592
	2	4	10	4	14484	
3	2	4	10	4	14484	1.4592
4	2	8	2	2	5772	2.9185
	2	4	10	2	20000	2.00
5	2	4	10	2	20000	2.00
6 (No DPDCH)	4	8	10	2SF2&2SF	11484	5.76
	4	4	2	4	20000	2.00
7 (No DPDCH)	4	8	2	2SF2&2SF	22996	?
	4	4	10	4	20000	?
NOTE: When 4 codes are transmitted in parallel, two codes shall be transmitted with SF2 and two with SF4. UE categories 1 to 6 support QPSK only. UE category 7 supports QPSK and 16QAM. (TS25.306-7.3.0).						

Table 9: HSUPA UE category



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c) DC-HSDPA

SAR is required for Rel. 8 DC-HSDPA when SAR is required for Rel. 5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a Second serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS 34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

Table E.5.0: Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13.

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

The measurements were performed with a Fixed Reference Channel (FRC) H-Set 12 with QPSK.

Parameter	Value
Nominal average inf. bit rate	60 kbit/s
Inter-TTI Distance	1 TTI's
Number of HARQ Processes	6 Processes
Information Bit Payload	120 Bits
Number Code Blocks	1 Block
Binary Channel Bits Per TTI	960 Bits
Total Available SMLs in UE	19200 SMLs
Number of SMLs per HARQ Process	3200 SMLs
Coding Rate	0.15
Number of Physical Channel Codes	1

Table 10: settings of required H-Set 12 QPSK acc. to 3GPP 34.121

Note:

1. The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table above.
2. Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.



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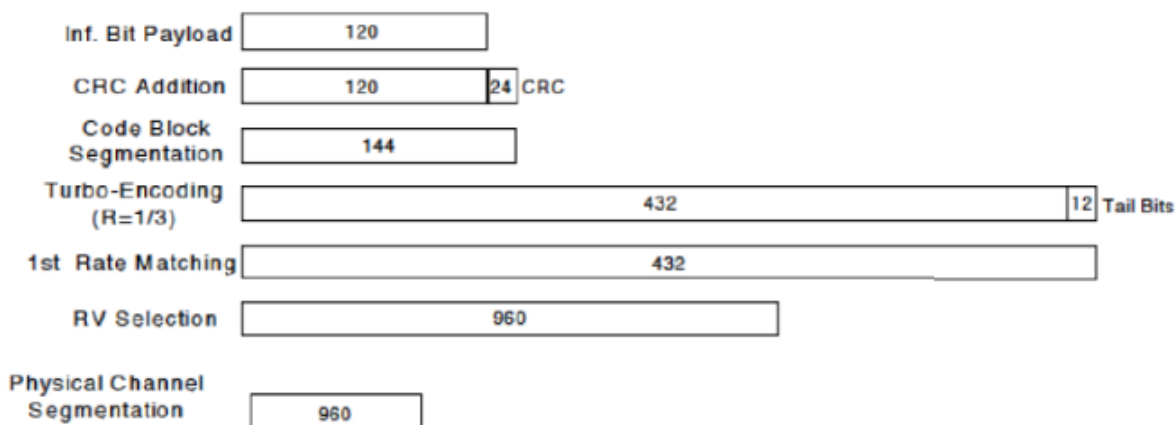
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The following 4 Sub-tests for HSDPA were completed according to Release 5 procedures. A summary of subtest settings are illustrated below:

Sub-test ^o	β_c ^o	β_d ^o	β_d (SF) ^o	β_c/β_d ^o	$\beta_{hs}(1)$ ^o	CM(dB)(2) ^o	MPR ^o (dB) ^o
1 ^o	2/15 ^o	15/15 ^o	64 ^o	2/15 ^o	4/15 ^o	0.0 ^o	0 ^o
2 ^o	12/15(3) ^o	15/15(3) ^o	64 ^o	12/15(3) ^o	24/15 ^o	1.0 ^o	0 ^o
3 ^o	15/15 ^o	8/15 ^o	64 ^o	15/8 ^o	30/15 ^o	1.5 ^o	0.5 ^o
4 ^o	15/15 ^o	4/15 ^o	64 ^o	15/4 ^o	30/15 ^o	1.5 ^o	0.5 ^o

Note1: Δ ACK, Δ NACK and Δ CQI=8 $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$
 Note2: CM=1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.
 Note3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$

Up commands are set continuously to set the UE to Max power.

Note:

1. The Dual Carriers transmission only applies to HSDPA physical channels
2. The Dual Carriers belong to the same Node and are on adjacent carriers.
3. The Dual Carriers do not support MIMO to serve UEs configured for dual cell operation
4. The Dual Carriers operate in the same frequency band.
5. The device doesn't support the modulation of 16QAM in uplink but 64QAM in downlink for DC-HSDPA mode.
6. The device doesn't support carrier aggregation for it just can operate in Release 8.



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Report No.: SUCR240400008403

Rev.: 01

Page: 42 of 76

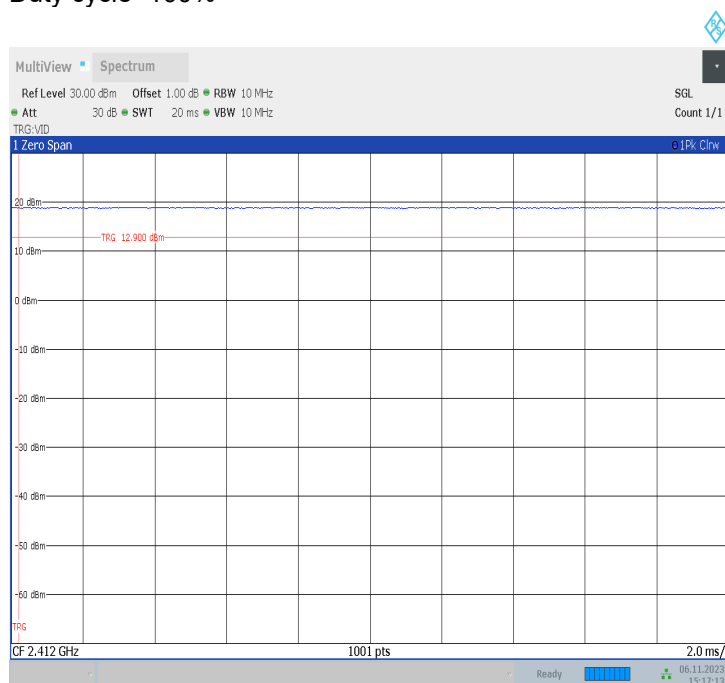
7.2.3 WiFi Test Configuration

A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement.

7.2.3.1. Duty cycle

Wi-Fi 2.4GHz 802.11b :

Duty cycle=100%



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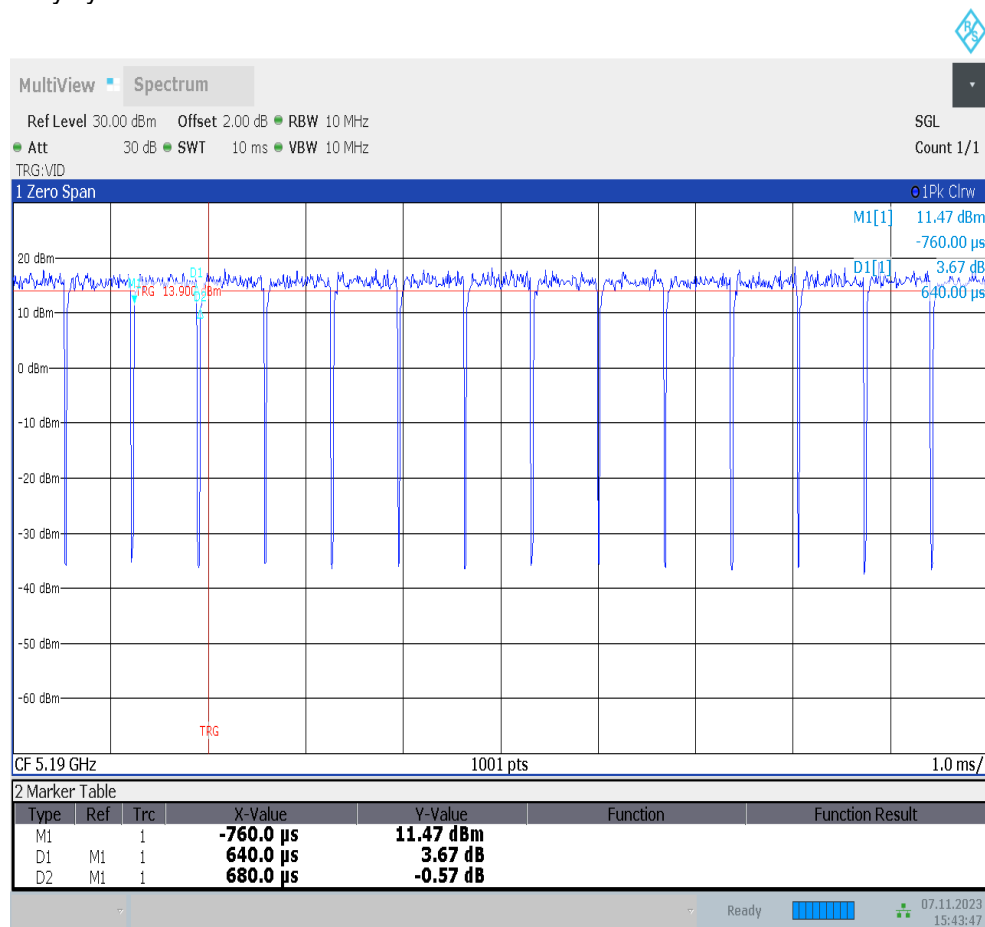
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Report No.: SUCR240400008403

Rev.: 01

Page: 43 of 76

Wi-Fi 5GHz 802.11n 40M :
Duty cycle=94.12%



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7.2.3.2. Initial Test Position SAR Test Reduction Procedure

DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures. The initial test position procedure is described in the following:

- 1) . When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band. SAR is also not required for that exposure configuration in the subsequent test configuration(s).
- 2) . When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest extrapolated or estimated 1-g SAR conditions determined by area scans or next closest/smallest test separation distance and maximum RF coupling test positions based on manufacturer justification, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions (left, right, touch, tilt or subsequent surfaces and edges) are tested.
- 3) . For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested. a) Additional power measurements may be required for this step, which should be limited to those necessary for identifying the subsequent highest output power channels.

7.2.3.3. Initial Test Configuration Procedures

An initial test configuration is determined for OFDM transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. SAR is measured using the highest measured maximum output power channel. For configurations with the same specified or measured maximum output power, additional transmission mode and test channel selection procedures are required. SAR test reduction for subsequent highest output test channels is determined according to *reported* SAR of the initial test configuration. For next to the ear, hotspot mode and UMC mini-tablet exposure configurations where multiple test positions are required, the initial test position procedure is applied to minimize the number of test positions required for SAR measurement using the initial test configuration transmission mode. For fixed exposure conditions that do not have multiple SAR test positions, SAR is measured in the transmission mode determined by the initial test configuration.

When the *reported* SAR of the initial test configuration is > 0.8 W/kg, SAR measurement is required for subsequent next highest measured output power channel(s) in the initial test configuration until *reported* SAR is ≤ 1.2 W/kg or all required channels are tested.

7.2.3.4. Subsequent Test Configuration Procedures

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. The initial test position procedure is applied to next to the ear, UMPC mini-tablet and hotspot mode configurations. When the same maximum output power is specified for multiple transmission modes, additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. The subsequent test configuration and SAR measurement procedures are described in the following.

- 1) . When SAR test exclusion provisions of KDB Publication 447498 are applicable and SAR measurement is not required for the initial test configuration, SAR is also not required for the next highest maximum output power transmission mode subsequent test configuration(s) in that frequency band or aggregated



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Report No.: SUCR240400008403

Rev.: 01

Page: 45 of 76

band and exposure configuration.

- 2) . When the highest *reported* SAR for the initial test configuration (when applicable, include subsequent highest output channels), according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.
- 3) . The number of channels in the initial test configuration and subsequent test configuration can be different due to differences in channel bandwidth. When SAR measurement is required for a subsequent test configuration and the channel bandwidth is smaller than that in the initial test configuration, all channels in the subsequent test configuration that overlap with the larger bandwidth channel tested in the initial test configuration should be used to determine the highest maximum output power channel. This step requires additional power measurement to identify the highest maximum output power channel in the subsequent test configuration to determine SAR test reduction.
 - a) SAR should first be measured for the channel with highest measured output power in the subsequent test configuration.
 - b) SAR for subsequent highest measured maximum output power channels in the subsequent test configuration is required only when the *reported* SAR of the preceding higher maximum output power channel(s) in the subsequent test configuration is > 1.2 W/kg or until all required channels are tested. i) For channels with the same measured maximum output power, SAR should be measured using the channel closest to the center frequency of the larger channel bandwidth channel in the initial test configuration.
- 4) . SAR measurements for the remaining highest specified maximum output power OFDM transmission mode configurations that have not been tested in the initial test configuration (highest maximum output) or subsequent test configuration(s) (subsequent next highest maximum output power) is determined by recursively applying the subsequent test configuration procedures in this section to the remaining configurations according to the following:
 - a) replace "subsequent test configuration" with "next subsequent test configuration" (i.e., subsequent next highest specified maximum output power configuration)
 - b) replace "initial test configuration" with "all tested higher output power configurations"



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7. 2. 3. 5. 2.4 GHz WiFi SAR Procedures

Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions. When SAR measurement is required for an OFDM configuration, the initial test configuration, subsequent test configuration and initial test position procedures are applied. The SAR test exclusion requirements for 802.11g/n OFDM configurations are described in following.

• 802.11b DSSS SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

- 1) . When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- 2) . When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

• 2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3, including sub-sections). SAR is not required for the following 2.4 GHz OFDM conditions.

- 1) . When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
- 2) . When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

• SAR Test Requirements for OFDM configurations

When SAR measurement is required for 802.11 g/n OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.



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7.2.4 LTE Test Configuration

LTE modes were tested according to FCC KDB 941225 D05 publication. Please see notes after the tabulated SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The Anritsu MT8820C was used for LTE output power measurements and SAR testing. Max power control was used so the UE transmits with maximum output power during SAR testing. SAR must be measured with the maximum TTI (transmit time interval) supported by the device in each LTE configuration.

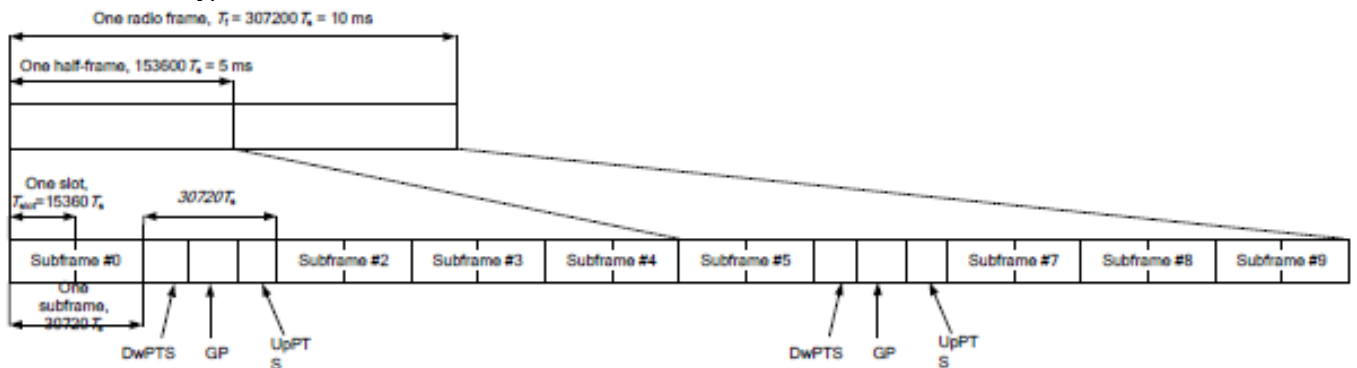
TDD LTE test consideration

For Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

SAR was tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special subframe configuration 7.

LTE TDD Band support 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

Frame structure type 2:



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Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	6592.Ts	2192.Ts	2560.Ts	7680.Ts	2192.Ts	2560.Ts
1	19760.Ts			20480.Ts		
2	21952.Ts			23040.Ts		
3	24144.Ts			25600.Ts		
4	26336.Ts			7680.Ts		
5	6592.Ts	4384.Ts	5120.Ts	20480.Ts	4384.Ts	5120.Ts
6	19760.Ts			23040.Ts		
7	21952.Ts			25600.Ts		
8	24144.Ts			-		
9	13168.Ts			-		

Uplink-downlink configurations.

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Calculated Duty Cycle=[Extended cyclic prefix in uplink x (Ts) x # of S + # of U]/10ms

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-point Periodicity	Subframe Number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33



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A) Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

B) MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3

C) A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

D) Largest channel bandwidth standalone SAR test requirements

1) QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

2) QPSK with 50% RB allocation

The procedures required for 1 RB allocation in 1) are applied to measure the SAR for QPSK with 50% RB allocation.

3) QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 1) and 2) are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

4) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

E) Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.



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8 Test Result

8.1 Measurement of RF conducted Power

Note:

- 1) . For GSM SAR the time based average power is relevant. The difference in between depends on the duty cycle of the TDMA signal:

No. of timeslots	1	2	3	4
Duty Cycle	1:8.3	1:4.15	1:2.77	1:2.075
Time based avg. power compared to slotted avg. power	-9.19	-6.18	-4.42	-3.17

- 2) . The frame-averaged power is linearly proportion to the slot number configured and it is linearly scaled the maximum burst-averaged power based on time slots. The calculated method is shown as below:
Frame-averaged power = 10 x log (Burst-averaged power mW x Slot used / 8
- 3) . When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used
- 4) . According to FCC guidance, the output power with uplink CA active was measured for the high / middle / low channel configuration with the highest reported SAR for each exposure condition, the power was measured with wideband signal integration over both component carriers.
- 5) . In applying the power measurement procedures of KDB 941225 D05A for DL CA to qualify for UL SAR test exclusion, power measurement is required only for the subset in each row with the largest combination of frequency bands and CCs.
- 6) . Maximum output power measurement is required for each UL CA configuration for the required test channels described in KDB 941225 D05.
- 7) . Conducted power measurement results of downlink LTE carrier aggregation are provided to quantify downlink only carrier aggregation SAR test exclusion per KDB 941225 D05A. Uplink maximum output power is measured with downlink carrier aggregation active, using the channel with highest measured maximum output power when downlink carrier aggregation is inactive, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive, therefore SAR evaluation with downlink carrier aggregation can be excluded.
The possible downlink LTE CA combinations supported by this device are as below tables per 3GPP TS 36.101 V15.4.0. The detailed conducted power measurement results of downlink LTE CA are provided in the SAR report per 3GPP TS 36.521-1 V14.4.0. According to KDB 941225 D05A, the downlink only carrier aggregation conditions for this device can be excluded from SAR testing.
The conducted power measurement results of downlink LTE CA Conducted Power are as Appendix E conducted RF output power, so the downlink only carrier aggregation conditions for this device can be excluded from SAR testing
- 8) . For conducted power of WIFI must be measured at each transmit antenna port according to the DSSS and OFDM transmission configurations in each standalone and aggregated frequency band. For each transmission mode configuration, power must be measured for the highest and lowest channels; and at the mid-band channel(s) when there are at least 3 channels. For configurations with multiple mid-band channels, due to an even number of channels, both channels should be measured. Power measurement is required for the transmission mode configuration with the highest maximum output power specified for production units.
- 1) When the same highest maximum output power specification applies to multiple transmission modes, the largest channel bandwidth configuration with the lowest order modulation and lowest data rate is measured.



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Report No.: SUCR240400008403

Rev.: 01

Page: 51 of 76

2) When the same highest maximum output power is specified for multiple largest channel bandwidth configurations with the same lowest order modulation or lowest order modulation and lowest data rate, power measurement is required for all equivalent 802.11 configurations with the same maximum output power.

9) . The conducted power of BT is measured with RMS detector.

BT DH5 Duty Cycle=76.80%



10:00:06 06.11.2023



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8.1.1 Measurement Conducted Power of GSM850

GSM 850										
Burst Output Power(dBm)					Tune up	Division Factors	Frame-Average Output Power(dBm)			Tune up
Channel		128	190	251			128	190	251	
GSM(GMSK)	GSM	32.74	32.73	32.66	34.00	-9.19	23.55	23.54	23.47	24.81
GPRS (GMSK)	1 TX Slot	32.70	32.69	32.74	34.00	-9.19	23.51	23.50	23.55	24.81
	2 TX Slots	31.87	31.94	31.86	32.00	-6.18	25.69	25.76	25.68	25.82
	3 TX Slots	29.77	29.85	29.78	30.00	-4.42	25.35	25.43	25.36	25.58
	4 TX Slots	28.71	28.75	28.67	29.00	-3.17	25.54	25.58	25.50	25.83
EGPRS (GMSK)	1 TX Slot	32.69	32.72	32.67	34.00	-9.19	23.50	23.53	23.48	24.81
	2 TX Slots	31.95	31.91	31.86	32.00	-6.18	25.77	25.73	25.68	25.82
	3 TX Slots	29.83	29.80	29.81	30.00	-4.42	25.41	25.38	25.39	25.58
	4 TX Slots	28.67	28.66	28.68	29.00	-3.17	25.50	25.49	25.51	25.83
EGPRS (8PSK)	1 TX Slot	25.90	25.92	25.90	27.00	-9.19	16.71	16.73	16.71	17.81
	2 TX Slots	24.82	24.77	24.83	26.00	-6.18	18.64	18.59	18.65	19.82
	3 TX Slots	22.49	22.41	22.45	23.50	-4.42	18.07	17.99	18.03	19.08
	4 TX Slots	20.82	20.80	20.83	22.00	-3.17	17.65	17.63	17.66	18.83

Table 11: Measurement Conducted Power of GSM850.

8.1.2 Measurement Conducted Power of GSM1900

GSM 1900										
Burst Output Power(dBm)					Tune up	Division Factors	Frame-Average Output Power(dBm)			Tune up
Channel		512	661	810			512	661	810	
GSM(GMSK)	GSM	30.17	30.20	30.21	31.00	-9.19	20.98	21.01	21.02	21.81
GPRS (GMSK)	1 TX Slot	30.18	30.23	30.20	31.00	-9.19	20.99	21.04	21.01	21.81
	2 TX Slots	29.16	29.21	29.14	30.00	-6.18	22.98	23.03	22.96	23.82
	3 TX Slots	27.25	27.23	27.26	28.00	-4.42	22.83	22.81	22.84	23.58
	4 TX Slots	26.16	26.18	26.13	27.00	-3.17	22.99	23.01	22.96	23.83
EGPRS (GMSK)	1 TX Slot	30.17	30.24	30.21	31.00	-9.19	20.98	21.05	21.02	21.81
	2 TX Slots	29.17	29.14	29.17	30.00	-6.18	22.99	22.96	22.99	23.82
	3 TX Slots	27.24	27.24	27.24	28.00	-4.42	22.82	22.82	22.82	23.58
	4 TX Slots	26.14	26.16	26.14	27.00	-3.17	22.97	22.99	22.97	23.83
EGPRS (8PSK)	1 TX Slot	25.17	25.09	25.18	26.00	-9.19	15.98	15.90	15.99	16.81
	2 TX Slots	24.06	24.07	24.08	25.00	-6.18	17.88	17.89	17.90	18.82
	3 TX Slots	22.55	22.56	22.59	23.50	-4.42	18.13	18.14	18.17	19.08
	4 TX Slots	20.24	20.26	20.28	21.00	-3.17	17.07	17.09	17.11	17.83

Table 12: Measurement Conducted Power of GSM1900.



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8.1.3 Measurement Conducted Power of WCDMA II

WCDMA Band II					
Average Conducted Power(dBm)					
Channel		9262	9400	9538	Tune up
WCDMA	12.2kbps RMC	22.63	22.73	22.69	23.50
	12.2kbps AMR	22.50	22.61	22.47	23.50
HSDPA	Subtest 1	21.67	21.63	21.73	22.50
	Subtest 2	21.64	21.71	21.67	22.50
	Subtest 3	21.17	21.19	21.16	22.00
	Subtest 4	21.10	21.09	21.14	22.00
HSUPA	Subtest 1	20.13	20.13	20.08	21.00
	Subtest 2	19.61	19.42	19.66	20.50
	Subtest 3	20.60	20.58	20.57	21.50
	Subtest 4	19.54	19.46	19.68	20.50
	Subtest 5	20.61	20.59	20.55	21.50

Table 13: Measurement Conducted Power of WCDMA II.

8.1.4 Measurement Conducted Power of WCDMA V

WCDMA Band V					
Average Conducted Power(dBm)					
Channel		4132	4182	4233	Tune up
WCDMA	12.2kbps RMC	22.76	22.82	22.71	23.50
	12.2kbps AMR	22.65	22.66	22.50	23.50
HSDPA	Subtest 1	21.85	21.79	21.83	22.50
	Subtest 2	21.72	21.82	21.81	22.50
	Subtest 3	21.21	21.23	21.25	22.00
	Subtest 4	21.23	21.20	21.29	22.00
HSUPA	Subtest 1	20.16	20.24	20.11	21.00
	Subtest 2	19.72	19.56	19.76	20.50
	Subtest 3	20.72	20.67	20.63	21.50
	Subtest 4	19.65	19.51	19.75	20.50
	Subtest 5	20.68	20.74	20.65	21.50

Table 14: Measurement Conducted Power of WCDMA V.



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Report No.: SUCR240400008403

Rev.: 01

Page: 54 of 76

8.1.5 Measurement Conducted Power of LTE Band 5

LTE Band 5				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20407	20525	20643	
1.4MHz	QPSK	1	0	22.50	22.57	22.50	23.00
		1	2	22.39	22.44	22.48	23.00
		1	5	22.45	22.50	22.58	23.00
		3	0	22.45	22.46	22.57	23.00
		3	2	22.44	22.45	22.58	23.00
		3	3	22.47	22.51	22.58	23.00
		6	0	21.36	21.40	21.42	22.00
	16QAM	1	0	21.50	21.43	21.36	22.00
		1	2	21.46	21.44	21.35	22.00
		1	5	21.56	21.46	21.39	22.00
		3	0	21.55	21.47	21.41	22.00
		3	2	21.53	21.46	21.36	22.00
		3	3	21.54	21.47	21.34	22.00
		6	0	20.47	20.56	20.52	21.00
	64QAM	1	0	20.36	20.36	20.30	21.00
		1	2	20.21	20.21	20.23	21.00
		1	5	20.34	20.38	20.22	21.00
		3	0	20.40	20.42	20.24	21.00
		3	2	20.36	20.43	20.26	21.00
		3	3	20.41	20.42	20.29	21.00
		6	0	19.49	19.49	19.44	20.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20415	20525	20635	
3MHz	QPSK	1	0	22.78	22.87	22.79	23.00
		1	7	22.74	22.68	22.73	23.00
		1	14	22.76	22.79	22.82	23.00
		8	0	21.71	21.75	21.69	22.00
		8	4	21.63	21.75	21.70	22.00
		8	7	21.65	21.75	21.74	22.00
		15	0	21.65	21.74	21.70	22.00
	16QAM	1	0	21.80	21.80	21.69	22.00
		1	7	21.74	21.75	21.70	22.00
		1	14	21.81	21.75	21.67	22.00
		8	0	20.90	20.86	20.76	21.00
		8	4	20.87	20.87	20.90	21.00
		8	7	20.88	20.67	20.70	21.00
		15	0	20.82	20.80	20.77	21.00
	64QAM	1	0	20.60	20.67	20.66	21.00
		1	7	20.53	20.52	20.60	21.00
		1	14	20.65	20.74	20.54	21.00
		8	0	19.93	19.92	19.83	20.00
		8	4	19.84	19.88	19.69	20.00
		8	7	19.86	19.78	19.78	20.00



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Report No.: SUCR240400008403

Rev.: 01

Page: 55 of 76

		15	0	19.79	19.73	19.77	20.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20425	20525	20625	
5MHz	QPSK	1	0	22.79	22.81	22.80	23.00
		1	13	22.71	22.72	22.79	23.00
		1	24	22.72	22.75	22.82	23.00
		12	0	21.76	21.79	21.71	22.00
		12	6	21.64	21.75	21.73	22.00
		12	13	21.65	21.75	21.71	22.00
		25	0	21.65	21.70	21.73	22.00
	16QAM	1	0	21.79	21.77	21.69	22.00
		1	13	21.74	21.76	21.69	22.00
		1	24	21.82	21.72	21.68	22.00
		12	0	20.85	20.89	20.78	21.00
		12	6	20.86	20.94	20.92	21.00
		12	13	20.83	20.73	20.73	21.00
		25	0	20.77	20.84	20.79	21.00
	64QAM	1	0	20.62	20.63	20.65	21.00
		1	13	20.46	20.56	20.56	21.00
		1	24	20.65	20.72	20.58	21.00
		12	0	19.96	19.94	19.81	20.00
		12	6	19.79	19.87	19.67	20.00
		12	13	19.82	19.85	19.83	20.00
		25	0	19.79	19.77	19.69	20.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20450	20525	20600	
10MHz	QPSK	1	0	22.81	22.89	22.78	23.00
		1	25	22.75	22.67	22.74	23.00
		1	49	22.75	22.77	22.85	23.00
		25	0	21.75	21.86	21.73	22.00
		25	13	21.61	21.72	21.68	22.00
		25	25	21.67	21.70	21.79	22.00
		50	0	21.64	21.70	21.74	22.00
	16QAM	1	0	21.83	21.79	21.72	22.00
		1	25	21.77	21.72	21.66	22.00
		1	49	21.82	21.78	21.65	22.00
		25	0	20.88	20.87	20.76	21.00
		25	13	20.84	20.93	20.93	21.00
		25	25	20.81	20.70	20.72	21.00
		50	0	20.81	20.81	20.83	21.00
	64QAM	1	0	20.62	20.64	20.66	21.00
		1	25	20.52	20.51	20.53	21.00
		1	49	20.70	20.69	20.54	21.00
		25	0	19.92	19.92	19.82	20.00
		25	13	19.85	19.85	19.74	20.00
		25	25	19.88	19.84	19.84	20.00
		50	0	19.81	19.73	19.71	20.00

Table 15: Measurement Conducted Power of LTE Band 5.



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8.1.6 Measurement Conducted Power of LTE Band 7

LTE Band 7				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20775	21100	21425	
5MHz	QPSK	1	0	20.79	20.82	20.84	22.00
		1	13	20.67	20.70	20.78	22.00
		1	24	20.64	20.84	20.85	22.00
		12	0	19.73	19.74	19.68	21.00
		12	6	19.60	19.74	19.80	21.00
		12	13	19.65	19.63	19.88	21.00
		25	0	19.69	19.67	19.70	21.00
	16QAM	1	0	19.77	19.78	19.66	21.00
		1	13	19.82	19.77	19.74	21.00
		1	24	19.85	19.68	19.70	21.00
		12	0	18.88	18.92	18.69	20.00
		12	6	18.87	18.93	18.98	20.00
		12	13	18.89	18.62	18.80	20.00
		25	0	18.89	18.91	18.83	20.00
	64QAM	1	0	18.60	18.69	18.74	20.00
		1	13	18.47	18.49	18.51	20.00
		1	24	18.76	18.73	18.54	20.00
		12	0	17.99	17.84	17.84	19.00
		12	6	17.85	17.88	17.77	19.00
		12	13	17.93	17.81	17.87	19.00
		25	0	17.82	17.89	17.74	19.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20800	21100	21400	
10MHz	QPSK	1	0	20.85	20.83	20.88	22.00
		1	25	20.77	20.70	20.83	22.00
		1	49	20.71	20.89	20.85	22.00
		25	0	19.71	19.76	19.72	21.00
		25	13	19.63	19.74	19.78	21.00
		25	25	19.61	19.71	19.82	21.00
		50	0	19.75	19.78	19.72	21.00
	16QAM	1	0	19.81	19.82	19.68	21.00
		1	25	19.74	19.75	19.69	21.00
		1	49	19.78	19.70	19.64	21.00
		25	0	18.92	18.93	18.79	20.00
		25	13	18.88	18.85	18.90	20.00
		25	25	18.90	18.66	18.75	20.00
		50	0	18.81	18.85	18.80	20.00
	64QAM	1	0	18.65	18.68	18.72	20.00
		1	25	18.51	18.58	18.62	20.00
		1	49	18.68	18.78	18.55	20.00
		25	0	17.90	17.93	17.85	19.00
		25	13	17.78	17.97	17.69	19.00
		25	25	17.89	17.86	17.82	19.00



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Report No.: SUCR240400008403

Rev.: 01

Page: 57 of 76

		50	0	17.81	17.85	17.74	19.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20825	21100	21375	
15MHz	QPSK	1	0	20.78	20.85	20.86	22.00
		1	38	20.77	20.75	20.78	22.00
		1	74	20.67	20.80	20.77	22.00
		36	0	19.67	19.79	19.77	21.00
		36	18	19.64	19.77	19.83	21.00
		36	39	19.69	19.75	19.86	21.00
		75	0	19.69	19.69	19.70	21.00
	16QAM	1	0	19.85	19.84	19.69	21.00
		1	38	19.78	19.82	19.65	21.00
		1	74	19.76	19.74	19.71	21.00
		36	0	18.97	18.83	18.68	20.00
		36	18	18.81	18.89	18.93	20.00
		36	39	18.96	18.71	18.71	20.00
		75	0	18.85	18.90	18.74	20.00
	64QAM	1	0	18.59	18.75	18.76	20.00
		1	38	18.48	18.59	18.63	20.00
		1	74	18.74	18.80	18.59	20.00
		36	0	17.99	17.96	17.82	19.00
		36	18	17.86	17.90	17.67	19.00
		36	39	17.96	17.86	17.86	19.00
		75	0	17.84	17.84	17.80	19.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20850	21100	21350	
20MHz	QPSK	1	0	20.78	20.90	20.83	22.00
		1	50	20.72	20.63	20.80	22.00
		1	99	20.83	20.80	20.85	22.00
		50	0	19.73	19.88	19.83	21.00
		50	25	19.70	19.81	19.70	21.00
		50	50	19.67	19.66	19.82	21.00
		100	0	19.64	19.72	19.72	21.00
	16QAM	1	0	19.83	19.77	19.68	21.00
		1	50	19.84	19.73	19.70	21.00
		1	99	19.90	19.81	19.71	21.00
		50	0	19.00	18.90	18.83	20.00
		50	25	18.87	18.88	18.93	20.00
		50	50	18.80	18.74	18.69	20.00
		100	0	18.85	18.77	18.82	20.00
	64QAM	1	0	18.69	18.64	18.64	20.00
		1	50	18.42	18.59	18.67	20.00
		1	99	18.68	18.70	18.58	20.00
		50	0	17.96	17.95	17.94	19.00
		50	25	17.82	17.96	17.68	19.00
		50	50	17.87	17.82	17.84	19.00
		100	0	17.81	17.86	17.77	19.00

Table 16: Measurement Conducted Power of LTE Band 7.



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Report No.: SUCR240400008403

Rev.: 01

Page: 58 of 76

8.1.7 Measurement Conducted Power of WIFI2.4G

WIFI 2.4G					
Mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up
802.11b	1	2412	1	16.28	17.50
	6	2437		16.56	17.50
	11	2462		16.38	17.50
802.11g	1	2412	6	15.23	16.50
	6	2437		15.28	16.50
	11	2462		15.53	16.50
802.11n HT20	1	2412	6.5	15.13	16.50
	6	2437		15.19	16.50
	11	2462		15.43	16.50
802.11n HT40	3	2422	13.5	14.76	16.50
	6	2437		14.98	16.50
	9	2452		15.03	16.50

Table 17: Measurement Conducted Power of WIFI2.4G.

8.1.8 Measurement Conducted Power of WIFI5G

WIFI 5G						
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up
802.11a	U-NII-1	36	5180	6	15.03	16.50
		40	5200		15.01	16.50
		44	5220		15.00	16.50
		48	5240		15.06	16.50
	U-NII-2A	52	5260		15.32	16.50
		56	5280		15.36	16.50
		60	5300		15.36	16.50
		64	5320		15.43	16.50
	U-NII-2C	100	5500		15.41	16.50
		104	5520		15.32	16.50
		108	5540		15.21	16.50
		112	5560		15.36	16.50
		116	5580		15.31	16.50
		120	5600		15.22	16.50
		124	5620		15.16	16.50
		128	5640		15.23	16.50
		132	5660		15.31	16.50
		136	5680		15.36	16.50
		140	5700		15.38	16.50
		144	5720		15.41	16.50



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Report No.: SUCR240400008403

Rev.: 01

Page: 59 of 76

		149	5745		15.31	16.50
		153	5765		15.28	16.50
		157	5785		15.31	16.50
		161	5805		15.28	16.50
		165	5825		15.26	16.50
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up
802.11n-HT20	U-NII-1	36	5180	MCS0	15.13	16.50
		40	5200		15.10	16.50
		44	5220		15.09	16.50
		48	5240		15.16	16.50
	U-NII-2A	52	5260		15.20	16.50
		56	5280		15.23	16.50
		60	5300		15.26	16.50
		64	5320		15.21	16.50
	U-NII-2C	100	5500		15.32	16.50
		104	5520		15.31	16.50
		108	5540		15.22	16.50
		112	5560		15.36	16.50
		116	5580		15.28	16.50
		120	5600		15.32	16.50
		124	5620		15.21	16.50
		128	5640		15.23	16.50
		132	5660		15.26	16.50
		136	5680		15.22	16.50
		140	5700		15.19	16.50
		144	5720		15.21	16.50
	U-NII-3	149	5745		15.26	16.50
		153	5765		15.21	16.50
		157	5785		15.23	16.50
		161	5805		15.19	16.50
		165	5825		15.28	16.50
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up
802.11n-HT40	U-NII-1	38	5190	MCS0	15.16	16.50
		46	5230		15.12	16.50
	U-NII-2A	54	5270		15.21	16.50
		62	5310		15.23	16.50
	U-NII-2C	102	5510		15.21	16.50
		110	5550		15.26	16.50
		118	5590		15.23	16.50
		126	5630		15.32	16.50



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Report No.: SUCR240400008403

Rev.: 01

Page: 60 of 76

		134	5670		15.31	16.50
		142	5710		15.29	16.50
	U-NII-3	151	5755		15.31	16.50
		159	5795		15.34	16.50
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up
802.11ac-20	U-NII-1	36	5180	MCS0	13.29	15.00
		40	5200		13.32	15.00
		44	5220		13.37	15.00
		48	5240		13.46	15.00
	U-NII-2A	52	5260		13.52	15.00
		56	5280		13.56	15.00
		60	5300		13.59	15.00
		64	5320		13.67	15.00
	U-NII-2C	100	5500		13.74	15.00
		104	5520		13.71	15.00
		108	5540		13.79	15.00
		112	5560		13.82	15.00
		116	5580		13.77	15.00
		120	5600		13.81	15.00
		124	5620		13.74	15.00
		128	5640		13.75	15.00
		132	5660		13.80	15.00
		136	5680		13.86	15.00
		140	5700		13.84	15.00
		144	5720		13.77	15.00
	U-NII-3	149	5745		13.73	15.00
		153	5765		13.76	15.00
		157	5785		13.81	15.00
		161	5805		13.74	15.00
		165	5825		13.83	15.00
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up
802.11ac-40	U-NII-1	38	5190	MCS0	13.36	15.00
		46	5230		13.47	15.00
	U-NII-2A	54	5270		13.43	15.00
		62	5310		13.52	15.00
	U-NII-2C	102	5510		13.71	15.00
		110	5550		13.67	15.00
		118	5590		13.69	15.00
		126	5630		13.73	15.00
		134	5670		13.74	15.00



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Report No.: SUCR240400008403

Rev.: 01

Page: 61 of 76

		142	5710		13.67	15.00
	U-NII-3	151	5755		13.80	15.00
		159	5795		13.83	15.00
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up
802.11ac 80M	U-NII-1	42	5210	MCS0	13.32	15.00
	U-NII-2A	58	5290		13.51	15.00
	U-NII-2C	106	5530		13.61	15.00
		122	5610		13.74	15.00
		138	5690		13.70	15.00
	U-NII-3	155	5775		13.67	15.00

Table 18: Measurement Conducted Power of WIFI5G.

8.1.9 Measurement Conducted Power of Bluetooth

BT		Average Conducted Power(dBm)			
Band	Channel	0	39	78	Tune up
BT	GFSK	14.47	14.01	14.42	15.50
	$\pi/4$ DQPSK	11.62	11.03	11.53	12.00
	8DPSK	11.57	11.00	11.49	12.00
Band	Channel	0	19	39	Tune up
BLE 1M	GFSK	-1.78	-1.64	-2.03	0.00
BLE 2M	GFSK	-1.81	-1.79	-2.01	0.00

Table 19: Measurement Conducted Power of Bluetooth.



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8.2 Measurement of SAR Data

Note:

- 1) The maximum Scaled SAR value is select the worst presentation of the original report SEWM2304000137RG09 and this report. Graph results refer to Appendix B.
- 2) Per KDB447498 D01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - $\leq 0.8\text{W/kg}$ for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is $\leq 100\text{MHz}$.
 - $\leq 0.6\text{ W/kg}$ or 1.5 W/kg , for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
 - $\leq 0.4\text{ W/kg}$ or 1.0 W/kg , for 1-g or 10-g respectively, when the transmission band is $\geq 200\text{ MHz}$.
- 3) Maximum bandwidth does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

WiFi 2.4G:

- 1) When the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is $\leq 1.2\text{ W/kg}$, SAR test for the other 802.11 modes are not required.

WiFi 5G:

- 1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. As the highest reported SAR for a test configuration is $\leq 1.2\text{ W/kg}$, SAR is not required for U-NII-1 band for that configuration.
- 2) For Wi-Fi 5G, U-NII-2A (5250-5350 MHz) and U-NII-2C (5470-5725 MHz) bands does not support hotspot function.
- 3) When the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is $\leq 1.2\text{ W/kg}$, SAR test for the other 802.11 modes are not required.

NFC:

- 1) NFC SAR is measured for all edges and surfaces of the device.
- 2) NFC 13.56MHz antenna port is not available on the device to support conducted power measurement, therefore the measured results are referred to as reported SAR.
- 3) NFC SAR test tissue-simulating liquid parameter refer to IEC/IEEE 62209-1528 2020.



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Report No.: SUCR240400008403

Rev.: 01

Page: 63 of 76

8.2.1 SAR Result of GSM850

GSM850 SAR Test Record										
Ant 0 Test Record										
Test position	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(℃)
Head Test Data										
Left cheek	GPRS 4TS	190/836.6	1:2.075	0.384	-0.16	28.75	29.00	1.059	0.407	22.6
Left tilted	GPRS 4TS	190/836.6	1:2.075	0.304	0.08	28.75	29.00	1.059	0.322	22.6
Right cheek	GPRS 4TS	190/836.6	1:2.075	0.412	-0.02	28.75	29.00	1.059	0.436	22.6
Right cheek-2rd	GPRS 4TS	190/836.6	1:2.075	0.269	-0.06	28.75	29.00	1.059	0.285	22.6
Right tilted	GPRS 4TS	190/836.6	1:2.075	0.245	0.07	28.75	29.00	1.059	0.260	22.6
Hotspot Test data(Separate 10mm)										
Front side	GPRS 4TS	190/836.6	1:2.075	0.405	0.17	28.75	29.00	1.059	0.429	22.6
Back side	GPRS 4TS	190/836.6	1:2.075	0.766	-0.04	28.75	29.00	1.059	0.811	22.6
Back side-2rd	GPRS 4TS	190/836.6	1:2.075	0.750	0.05	28.75	29.00	1.059	0.794	22.6
Back side	GPRS 4TS	128/824.2	1:2.075	0.747	-0.02	28.71	29.00	1.069	0.799	22.6
Back side	GPRS 4TS	251/848.8	1:2.075	0.698	-0.16	28.67	29.00	1.079	0.753	22.6
Left side	GPRS 4TS	190/836.6	1:2.075	0.367	0.09	28.75	29.00	1.059	0.389	22.6
Right side	GPRS 4TS	190/836.6	1:2.075	0.444	-0.06	28.75	29.00	1.059	0.470	22.6
Bottom side	GPRS 4TS	190/836.6	1:2.075	0.437	0.18	28.75	29.00	1.059	0.463	22.6

Table 20: SAR of GSM850 for Head and Body.

8.2.2 SAR Result of GSM1900

GSM1900 SAR Test Record										
Ant 0 Test Record										
Test position	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(℃)
Head Test Data										
Left cheek	GPRS 4TS	661/1880	1:2.075	0.160	-0.12	26.18	27.00	1.208	0.193	22.6
Left cheek-2rd	GPRS 4TS	661/1880	1:2.075	0.109	-0.09	26.18	27.00	1.208	0.132	22.6
Left tilted	GPRS 4TS	661/1880	1:2.075	0.071	-0.16	26.18	27.00	1.208	0.086	22.6
Right cheek	GPRS 4TS	661/1880	1:2.075	0.089	-0.03	26.18	27.00	1.208	0.107	22.6
Right tilted	GPRS 4TS	661/1880	1:2.075	0.118	0.06	26.18	27.00	1.208	0.143	22.6
Hotspot Test data(Separate 10mm)										
Front side	GPRS 4TS	661/1880	1:2.075	0.216	0.17	26.18	27.00	1.208	0.261	22.6
Back side	GPRS 4TS	661/1880	1:2.075	0.325	-0.02	26.18	27.00	1.208	0.393	22.6



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Report No.: SUCR240400008403

Rev.: 01

Page: 64 of 76

Back side-2rd	GPRS 4TS	661/1880	1:2.075	0.320	0.05	26.18	27.00	1.208	0.387	22.6
Left side	GPRS 4TS	661/1880	1:2.075	0.270	-0.08	26.18	27.00	1.208	0.326	22.6
Right side	GPRS 4TS	661/1880	1:2.075	0.076	0.08	26.18	27.00	1.208	0.092	22.6
Bottom side	GPRS 4TS	661/1880	1:2.075	0.240	-0.07	26.18	27.00	1.208	0.290	22.6

Table 21: SAR of GSM1900 for Head and Body.

8.2.3 SAR Result of WCDMA Band II

WCDMA II SAR Test Record										
Ant 0 Test Record										
Test position	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data										
Left cheek	RMC	9400/1880	1:1	0.202	0.03	22.73	23.50	1.194	0.241	22.6
Left cheek-2rd	RMC	9400/1880	1:1	0.146	-0.15	22.73	23.50	1.194	0.174	22.6
Left tilted	RMC	9400/1880	1:1	0.135	-0.05	22.73	23.50	1.194	0.161	22.6
Right cheek	RMC	9400/1880	1:1	0.143	0.09	22.73	23.50	1.194	0.171	22.6
Right tilted	RMC	9400/1880	1:1	0.187	-0.10	22.73	23.50	1.194	0.223	22.6
Hotspot Test data(Separate 10mm)										
Front side	RMC	9400/1880	1:1	0.259	0.12	22.73	23.50	1.194	0.309	22.6
Back side	RMC	9400/1880	1:1	0.419	-0.05	22.73	23.50	1.194	0.500	22.6
Back side-2rd	RMC	9400/1880	1:1	0.386	-0.10	22.73	23.50	1.194	0.461	22.6
Left side	RMC	9400/1880	1:1	0.326	-0.04	22.73	23.50	1.194	0.389	22.6
Right side	RMC	9400/1880	1:1	0.091	0.08	22.73	23.50	1.194	0.109	22.6
Bottom side	RMC	9400/1880	1:1	0.283	0.02	22.73	23.50	1.194	0.338	22.6

Table 22: SAR of WCDMA Band II for Head and Body.

8.2.4 SAR Result of WCDMA Band V

WCDMA V SAR Test Record										
Ant 0 Test Record										
Test position	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data										
Left cheek	RMC	4182/836.4	1:1	0.140	-0.18	22.82	23.50	1.169	0.164	22.6
Left tilted	RMC	4182/836.4	1:1	0.106	0.09	22.82	23.50	1.169	0.124	22.6
Right cheek	RMC	4182/836.4	1:1	0.157	-0.03	22.82	23.50	1.169	0.184	22.6
Right cheek-2rd	RMC	4182/836.4	1:1	0.109	-0.13	22.82	23.50	1.169	0.127	22.6
Right tilted	RMC	4182/836.4	1:1	0.090	-0.13	22.82	23.50	1.169	0.105	22.6
Hotspot Test data(Separate 10mm)										



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Report No.: SUCR240400008403

Rev.: 01

Page: 65 of 76

Front side	RMC	4182/836.4	1:1	0.144	-0.07	22.82	23.50	1.169	0.168	22.6
Back side	RMC	4182/836.4	1:1	0.330	0.03	22.82	23.50	1.169	0.386	22.6
Back side-2rd	RMC	4182/836.4	1:1	0.320	0.10	22.82	23.50	1.169	0.374	22.6
Left side	RMC	4182/836.4	1:1	0.164	-0.04	22.82	23.50	1.169	0.192	22.6
Right side	RMC	4182/836.4	1:1	0.142	0.10	22.82	23.50	1.169	0.166	22.6
Bottom side	RMC	4182/836.4	1:1	0.166	0.16	22.82	23.50	1.169	0.194	22.6

Table 23: SAR of WCDMA Band V for Head and Body.

8.2.5 SAR Result of LTE Band 5

LTE Band 5 SAR Test Record											
Ant 0 Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data(1RB)											
Left cheek	10	QPSK 1_0	20525/836.5	1:1	0.151	0.01	22.89	23.00	1.026	0.155	22.6
Left tilted	10	QPSK 1_0	20525/836.5	1:1	0.110	0.13	22.89	23.00	1.026	0.113	22.6
Right cheek	10	QPSK 1_0	20525/836.5	1:1	0.158	-0.01	22.89	23.00	1.026	0.162	22.6
Right cheek-2rd	10	QPSK 1_0	20525/836.5	1:1	0.118	-0.07	22.89	23.00	1.026	0.121	22.6
Right tilted	10	QPSK 1_0	20525/836.5	1:1	0.099	-0.14	22.89	23.00	1.026	0.102	22.6
Head Test Data(50%RB)											
Left cheek	10	QPSK 25_0	20525/836.5	1:1	0.118	-0.10	21.86	22.00	1.033	0.122	22.6
Left tilted	10	QPSK 25_0	20525/836.5	1:1	0.091	-0.11	21.86	22.00	1.033	0.094	22.6
Right cheek	10	QPSK 25_0	20525/836.5	1:1	0.130	0.16	21.86	22.00	1.033	0.134	22.6
Right tilted	10	QPSK 25_0	20525/836.5	1:1	0.082	0.11	21.86	22.00	1.033	0.085	22.6
Hotspot Test data(Separate 10mm 1RB)											
Front side	10	QPSK 1_0	20525/836.5	1:1	0.159	0.00	22.89	23.00	1.026	0.163	22.6
Back side	10	QPSK 1_0	20525/836.5	1:1	0.347	0.01	22.89	23.00	1.026	0.356	22.6
Back side-2rd	10	QPSK 1_0	20525/836.5	1:1	0.339	0.04	22.89	23.00	1.026	0.348	22.6
Left side	10	QPSK 1_0	20525/836.5	1:1	0.137	-0.09	22.89	23.00	1.026	0.141	22.6
Right side	10	QPSK 1_0	20525/836.5	1:1	0.160	-0.15	22.89	23.00	1.026	0.164	22.6
Bottom side	10	QPSK 1_0	20525/836.5	1:1	0.173	-0.01	22.89	23.00	1.026	0.177	22.6
Hotspot Test data(Separate 10mm 50%RB)											
Front side	10	QPSK 25_0	20525/836.5	1:1	0.127	0.00	21.86	22.00	1.033	0.131	22.6
Back side	10	QPSK 25_0	20525/836.5	1:1	0.275	-0.12	21.86	22.00	1.033	0.284	22.6
Left side	10	QPSK 25_0	20525/836.5	1:1	0.107	0.17	21.86	22.00	1.033	0.111	22.6
Right side	10	QPSK 25_0	20525/836.5	1:1	0.127	-0.17	21.86	22.00	1.033	0.131	22.6
Bottom side	10	QPSK 25_0	20525/836.5	1:1	0.134	0.01	21.86	22.00	1.033	0.138	22.6

Table 24: SAR of LTE Band 5 for Head and Body.



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Report No.: SUCR240400008403

Rev.: 01

Page: 66 of 76

8.2.6 SAR Result of LTE Band 7

LTE Band 7 SAR Test Record											
Ant 0 Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test Data(1RB)											
Left cheek	20	QPSK 1_0	21100/2535	1:1	0.098	0.16	20.90	22.00	1.288	0.126	22.6
Left cheek-2rd	20	QPSK 1_0	21100/2535	1:1	0.062	0.02	20.90	22.00	1.288	0.080	22.6
Left tilted	20	QPSK 1_0	21100/2535	1:1	0.027	-0.04	20.90	22.00	1.288	0.035	22.6
Right cheek	20	QPSK 1_0	21100/2535	1:1	0.055	0.11	20.90	22.00	1.288	0.071	22.6
Right tilted	20	QPSK 1_0	21100/2535	1:1	0.042	0.16	20.90	22.00	1.288	0.054	22.6
Head Test Data(50%RB)											
Left cheek	20	QPSK 50_0	21100/2535	1:1	0.089	-0.13	19.88	21.00	1.294	0.115	22.6
Left tilted	20	QPSK 50_0	21100/2535	1:1	0.021	0.03	19.88	21.00	1.294	0.027	22.6
Right cheek	20	QPSK 50_0	21100/2535	1:1	0.047	-0.11	19.88	21.00	1.294	0.061	22.6
Right tilted	20	QPSK 50_0	21100/2535	1:1	0.037	0.17	19.88	21.00	1.294	0.048	22.6
Hotspot Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1_0	21100/2535	1:1	0.126	0.09	20.90	22.00	1.288	0.162	22.6
Back side	20	QPSK 1_0	21100/2535	1:1	0.970	-0.06	20.90	22.00	1.288	1.250	22.6
Back side	20	QPSK 1_0	20850/2510	1:1	0.991	-0.09	20.78	22.00	1.324	1.312	22.6
Back side	20	QPSK 1_0	21350/2560	1:1	1.080	-0.01	20.83	22.00	1.309	1.414	22.6
Back side-Repeat SAR	20	QPSK 1_0	21350/2560	1:1	1.060	0.05	20.83	22.00	1.309	1.388	22.6
Back side-2rd	20	QPSK 1_0	21350/2560	1:1	0.981	0.02	20.83	22.00	1.309	1.284	22.6
Left side	20	QPSK 1_0	21100/2535	1:1	0.168	0.11	20.90	22.00	1.288	0.216	22.6
Right side	20	QPSK 1_0	21100/2535	1:1	0.029	0.04	20.90	22.00	1.288	0.037	22.6
Bottom side	20	QPSK 1_0	21100/2535	1:1	0.475	-0.04	20.90	22.00	1.288	0.612	22.6
Hotspot Test data(Separate 10mm 50%RB)											
Front side	20	QPSK 50_0	21100/2535	1:1	0.105	-0.08	19.88	21.00	1.294	0.136	22.6
Back side	20	QPSK 50_0	21100/2535	1:1	0.776	-0.15	19.88	21.00	1.294	1.004	22.6
Left side	20	QPSK 50_0	21100/2535	1:1	0.136	-0.04	19.88	21.00	1.294	0.176	22.6
Right side	20	QPSK 50_0	21100/2535	1:1	0.023	-0.03	19.88	21.00	1.294	0.030	22.6
Bottom side	20	QPSK 50_0	21100/2535	1:1	0.411	-0.10	19.88	21.00	1.294	0.532	22.6
Hotspot Test data(Separate 10mm 100%RB)											
Back side	20	QPSK 100_0	21100/2535	1:1	0.745	0.02	19.72	21.00	1.343	1.000	22.6
Test position	BW.	Test mode	Test Ch./Freq.	Duty Cycle	SAR (W/kg)10-g	Power Drift(dB)	Conducted power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled 10-g SAR(W/kg)	Liquid Temp.
Product specific 10g SAR Test data(Separate 0mm 1RB)											
Back side	20	QPSK 1_0	21100/2535	1:1	0.842	-0.04	20.90	22.00	1.288	1.085	22.6
Back side-2rd	20	QPSK 1_0	21100/2535	1:1	0.699	0.03	20.90	22.00	1.288	0.900	22.6
Product specific 10g SAR Test data (Separate 0mm 50%RB)											
Back side	20	QPSK 50_0	21100/2535	1:1	0.749	-0.05	19.88	21.00	1.294	0.969	22.6

Table 25: SAR of LTE Band 7 for Head and Body.

Test Position	Channel/ Frequency	Measured SAR (1g)	1 st Repeated	Ratio	2 nd Repeated	3 rd Repeated
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Report No.: SUCR240400008403

Rev.: 01

Page: 67 of 76

	(MHz)		SAR (1g)		SAR (1g)	SAR (1g)
Back side	21350/2560	1.08	1.06	1.018867925	N/A	N/A
Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.						
2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).						
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .						
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg						

8.2.7 SAR Result of WIFI 2.4G

Wi-Fi 2.4G SAR Test Record											
Ant2 Test Record chain0											
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test data											
Left cheek	802.11b	6/2437	100.00%	1.000	0.467	-0.08	16.56	17.50	1.242	0.580	22.7
Left cheek-2rd	802.11b	6/2437	100.00%	1.000	0.554	-0.08	16.56	17.50	1.242	0.688	22.7
Left tilted	802.11b	6/2437	100.00%	1.000	0.358	0.08	16.56	17.50	1.242	0.445	22.7
Right cheek	802.11b	6/2437	100.00%	1.000	0.273	-0.10	16.56	17.50	1.242	0.339	22.7
Right tilted	802.11b	6/2437	100.00%	1.000	0.243	0.11	16.56	17.50	1.242	0.302	22.7
Hotspot Test data (Separate 10mm)											
Front side	802.11b	6/2437	100.00%	1.000	0.093	-0.06	16.56	17.50	1.242	0.115	22.7
Back side	802.11b	6/2437	100.00%	1.000	0.127	-0.18	16.56	17.50	1.242	0.158	22.7
Right side	802.11b	6/2437	100.00%	1.000	0.134	0.19	16.56	17.50	1.242	0.166	22.7
Top side	802.11b	6/2437	100.00%	1.000	0.143	-0.07	16.56	17.50	1.242	0.178	22.7
Top side-2rd	802.11b	6/2437	100.00%	1.000	0.240	0.03	16.56	17.50	1.242	0.298	22.7

Table 26: SAR of WIFI 2.4G for Head and Body.

Note: When the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR test for the other 802.11 modes are not required.



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Report No.: SUCR240400008403

Rev.: 01

Page: 68 of 76

8.2.8 SAR Result of WIFI 5G

Wi-Fi 5G SAR Test Record											
Ant2 Test Record chain0											
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test data of U-NII-2A											
Left cheek	802.11n-HT40	62/5310	94.12%	1.062	0.207	-0.02	15.23	16.50	1.340	0.295	22.5
Left tilted	802.11n-HT40	62/5310	94.12%	1.062	0.227	0.01	15.23	16.50	1.340	0.323	22.5
Left tilted-2rd	802.11n-HT40	62/5310	94.12%	1.062	0.592	0.18	15.23	16.50	1.340	0.843	22.5
Left tilted-2rd	802.11n-HT40	54/5270	94.12%	1.062	0.566	0.01	15.21	16.50	1.346	0.809	22.5
Right cheek	802.11n-HT40	62/5310	94.12%	1.062	0.097	0.17	15.23	16.50	1.340	0.138	22.5
Right tilted	802.11n-HT40	62/5310	94.12%	1.062	0.114	0.13	15.23	16.50	1.340	0.162	22.5
Head Test data of U-NII-2C											
Left cheek	802.11n-HT40	126/5630	94.12%	1.062	0.383	-0.13	15.32	16.50	1.312	0.534	22.5
Left tilted	802.11n-HT40	126/5630	94.12%	1.062	0.477	0.17	15.32	16.50	1.312	0.665	22.5
Left tilted-2rd	802.11n-HT40	126/5630	94.12%	1.062	0.580	0.10	15.32	16.50	1.312	0.809	22.5
Left tilted-2rd	802.11n-HT40	134/5670	94.12%	1.062	0.556	0.08	15.31	16.50	1.315	0.777	22.5
Right cheek	802.11n-HT40	126/5630	94.12%	1.062	0.275	-0.09	15.32	16.50	1.312	0.383	22.5
Right tilted	802.11n-HT40	126/5630	94.12%	1.062	0.383	0.04	15.32	16.50	1.312	0.534	22.5
Head Test data of U-NII-3											
Left cheek	802.11n-HT40	159/5795	94.12%	1.062	0.148	-0.12	15.34	16.50	1.306	0.205	22.5
Left tilted	802.11n-HT40	159/5795	94.12%	1.062	0.174	-0.01	15.34	16.50	1.306	0.241	22.5
Left tilted-2rd	802.11n-HT40	159/5795	94.12%	1.062	0.482	-0.09	15.34	16.50	1.306	0.669	22.5
Right cheek	802.11n-HT40	159/5795	94.12%	1.062	0.108	0.01	15.34	16.50	1.306	0.150	22.5
Right tilted	802.11n-HT40	159/5795	94.12%	1.062	0.116	-0.02	15.34	16.50	1.306	0.161	22.5
Body worn Test data of U-NII-2A(Separate 10mm)											
Front side	802.11n-HT40	62/5310	94.12%	1.062	0.101	0.01	15.23	16.50	1.340	0.144	22.5
Back side	802.11n-HT40	62/5310	94.12%	1.062	0.302	0.17	15.23	16.50	1.340	0.430	22.5
Back side-2rd	802.11n-HT40	62/5310	94.12%	1.062	0.419	0.07	15.23	16.50	1.340	0.596	22.5
Body worn Test data of U-NII-2C(Separate 10mm)											
Front side	802.11n-HT40	126/5630	94.12%	1.062	0.123	-0.15	15.32	16.50	1.312	0.171	22.5
Back side	802.11n-HT40	126/5630	94.12%	1.062	0.544	0.01	15.32	16.50	1.312	0.758	22.5
Back side-2rd	802.11n-HT40	126/5630	94.12%	1.062	0.607	0.03	15.32	16.50	1.312	0.846	22.5
Hotspot Test data of U-NII-1(Separate 10mm)											
Front side	802.11n-HT40	38/5190	94.12%	1.062	0.121	0.12	15.16	16.50	1.361	0.175	22.5
Back side	802.11n-HT40	38/5190	94.12%	1.062	0.357	-0.18	15.16	16.50	1.361	0.516	22.5
Back side-2rd	802.11n-HT40	38/5190	94.12%	1.062	0.420	-0.08	15.16	16.50	1.361	0.608	22.5
Right side	802.11n-HT40	38/5190	94.12%	1.062	0.248	0.02	15.16	16.50	1.361	0.359	22.5
Top side	802.11n-HT40	38/5190	94.12%	1.062	0.142	0.01	15.16	16.50	1.361	0.205	22.5
Hotspot Test data of U-NII-3(Separate 10mm)											
Front side	802.11n-HT40	159/5795	94.12%	1.062	0.138	0.01	15.34	16.50	1.306	0.192	22.5
Back side	802.11n-HT40	159/5795	94.12%	1.062	0.641	-0.10	15.34	16.50	1.306	0.890	22.5
Back side	802.11n-HT40	151/5755	94.12%	1.062	0.555	0.01	15.31	16.50	1.315	0.776	22.5
Back side-2rd	802.11n-HT40	159/5795	94.12%	1.062	0.792	-0.07	15.34	16.50	1.306	1.099	22.5
Back side-2rd	802.11n-HT40	151/5755	94.12%	1.062	0.737	0.17	15.31	16.50	1.315	1.030	22.5
Right side	802.11n-HT40	159/5795	94.12%	1.062	0.254	0.04	15.34	16.50	1.306	0.352	22.5
Top side	802.11n-HT40	159/5795	94.12%	1.062	0.403	0.15	15.34	16.50	1.306	0.559	22.5
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(°C)
Product specific 10gSAR Test data of U-NII-2A(Separate 0mm)											



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Report No.: SUCR240400008403

Rev.: 01

Page: 69 of 76

Front side	802.11n-HT40	62/5310	94.12%	1.062	0.074	-0.18	15.23	16.50	1.340	0.105	22.5
Back side	802.11n-HT40	62/5310	94.12%	1.062	0.137	-0.01	15.23	16.50	1.340	0.195	22.5
Back side-2rd	802.11n-HT40	62/5310	94.12%	1.062	0.162	-0.08	15.23	16.50	1.340	0.231	22.5
Right side	802.11n-HT40	62/5310	94.12%	1.062	0.124	-0.05	15.23	16.50	1.340	0.176	22.5
Top side	802.11n-HT40	62/5310	94.12%	1.062	0.102	0.11	15.23	16.50	1.340	0.145	22.5
Product specific 10gSAR Test data of U-NII-2C(Separate 0mm)											
Front side	802.11n-HT40	126/5630	94.12%	1.062	0.089	-0.12	15.32	16.50	1.312	0.124	22.5
Back side	802.11n-HT40	126/5630	94.12%	1.062	0.194	-0.08	15.32	16.50	1.312	0.270	22.5
Back side-2rd	802.11n-HT40	126/5630	94.12%	1.062	0.256	0.01	15.32	16.50	1.312	0.357	22.5
Right side	802.11n-HT40	126/5630	94.12%	1.062	0.135	-0.16	15.32	16.50	1.312	0.188	22.5
Top side	802.11n-HT40	126/5630	94.12%	1.062	0.106	0.08	15.32	16.50	1.312	0.148	22.5

Table 27: SAR of WIFI 5G for Head and Body.

Note:

- 1) As the 802.11a highest reported SAR is smaller than 1.2 W/kg, and the tune-up of the other 802.11 modes are not higher than 802.11a, therefore the adjusted SAR is ≤ 1.2 W/kg for other 802.11 modes, SAR test for the other 802.11 modes are not required. For Product specific 10gSAR the highest reported SAR is smaller than 3.0 W/kg, SAR test for the other 802.11 modes are also not required.



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Report No.: SUCR240400008403

Rev.: 01

Page: 70 of 76

8.2.9 SAR Result of BT

Bluetooth SAR Test Record											
Ant2 Test Record											
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Head Test data											
Left cheek	DH5	0/2402	76.80%	1.302	0.293	0.09	14.47	15.50	1.268	0.484	22.7
Left cheek-2rd	DH5	0/2402	76.80%	1.302	0.376	-0.01	14.47	15.50	1.268	0.621	22.7
Left tilted	DH5	0/2402	76.80%	1.302	0.231	0.11	14.47	15.50	1.268	0.381	22.7
Right cheek	DH5	0/2402	76.80%	1.302	0.150	-0.05	14.47	15.50	1.268	0.248	22.7
Right tilted	DH5	0/2402	76.80%	1.302	0.142	0.17	14.47	15.50	1.268	0.234	22.7
Hotspot Test data (Separate 10mm)											
Front side	DH5	0/2402	76.80%	1.302	0.039	-0.08	14.47	15.50	1.268	0.064	22.7
Back side	DH5	0/2402	76.80%	1.302	0.060	-0.01	14.47	15.50	1.268	0.099	22.7
Right side	DH5	0/2402	76.80%	1.302	0.081	0.10	14.47	15.50	1.268	0.134	22.7
Top side	DH5	0/2402	76.80%	1.302	0.086	0.03	14.47	15.50	1.268	0.142	22.7
Top side-2rd	DH5	0/2402	76.80%	1.302	0.128	0.03	14.47	15.50	1.268	0.211	22.7

Table 28: SAR of BT for Head and Body.



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8.3 Multiple Transmitter Evaluation

8.3.1 Simultaneous SAR SAR test evaluation

Simultaneous Transmission Possibilities

NO	Simultaneous Tx Combination	Head	Body- worn	Hotspot	Product Specific 10-g (0mm)
1	WWAN + WIFI2.4G	Y	Y	Y	Y
2	WWAN + WIFI5G + BT	Y	Y	Y	Y

Note:

- 1) The device support DTM function.
- 2) For Wi-Fi 5G, U-NII-2A (5250-5350 MHz) and U-NII-2C (5470-5725 MHz) bands does not support hotspot function.
- 3) NFC is different from the working scenario of WWAN/WIFI(Head/Body-worn/Hotspot) and does not participate in the simultaneous transmission.
- 4) Per FCC KDB Publication 648474 D04 Handset SAR, Phablet SAR tests were not required it wireless router 1g SAR(Scaled to the maximum output power ,including tolerance) < 1.2 W/Kg. Therefore, no further analysis beyond tables included in this section was required to determine that possible Simultaneous transmission scenarios would not exceed the SAR limit.



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8.3.2 Simultaneous Transmission SAR Summation Scenario

Simultaneous Transmission SAR Summation Scenario for WLAN Head:

Test position		SARmax (W/kg)				Summed SAR	
		Main Ant0	WiFi 2.4G Ant2	WiFi 5G Ant2	BT		
		1	2	3	4	1+2	1+3+4
GSM850	Left cheek	0.407	0.688	0.534	0.621	1.095	1.562
	Left tilted	0.322	0.445	0.843	0.381	0.767	1.546
	Right cheek	0.436	0.339	0.383	0.248	0.775	1.067
	Right tilted	0.260	0.302	0.534	0.234	0.562	1.028
GSM1900	Left cheek	0.193	0.688	0.534	0.621	0.881	1.348
	Left tilted	0.086	0.445	0.843	0.381	0.531	1.310
	Right cheek	0.107	0.339	0.383	0.248	0.446	0.738
	Right tilted	0.143	0.302	0.534	0.234	0.445	0.911
WCDMA II	Left cheek	0.241	0.688	0.534	0.621	0.929	1.396
	Left tilted	0.161	0.445	0.843	0.381	0.606	1.385
	Right cheek	0.171	0.339	0.383	0.248	0.510	0.802
	Right tilted	0.223	0.302	0.534	0.234	0.525	0.991
WCDMA V	Left cheek	0.164	0.688	0.534	0.621	0.852	1.319
	Left tilted	0.124	0.445	0.843	0.381	0.569	1.348
	Right cheek	0.184	0.339	0.383	0.248	0.523	0.815
	Right tilted	0.105	0.302	0.534	0.234	0.407	0.873
LTE Band 5	Left cheek	0.155	0.688	0.534	0.621	0.843	1.310
	Left tilted	0.113	0.445	0.843	0.381	0.558	1.337
	Right cheek	0.162	0.339	0.383	0.248	0.501	0.793
	Right tilted	0.102	0.302	0.534	0.234	0.404	0.870
LTE Band 7	Left cheek	0.126	0.688	0.534	0.621	0.814	1.281
	Left tilted	0.035	0.445	0.843	0.381	0.480	1.259
	Right cheek	0.071	0.339	0.383	0.248	0.410	0.702
	Right tilted	0.054	0.302	0.534	0.234	0.356	0.822

Simultaneous Transmission SAR Summation Scenario for WLAN Body:

Body-worn:

Test position		SARmax (W/kg)				Summed SAR	
		Main Ant0	WiFi 2.4G Ant2	WiFi 5G Ant2	BT		
		1	2	3	4	1+2	1+3+4
GSM850	Front side	0.429	0.115	0.192	0.064	0.544	0.685
	Back side	0.811	0.158	1.099	0.099	0.969	2.009
GSM1900	Front side	0.261	0.115	0.192	0.064	0.376	0.517
	Back side	0.393	0.158	1.099	0.099	0.551	1.591
WCDMA II	Front side	0.309	0.115	0.192	0.064	0.424	0.565
	Back side	0.500	0.158	1.099	0.099	0.658	1.698
WCDMA V	Front side	0.168	0.115	0.192	0.064	0.283	0.424
	Back side	0.386	0.158	1.099	0.099	0.544	1.584
LTE Band5	Front side	0.163	0.115	0.192	0.064	0.278	0.419
	Back side	0.356	0.158	1.099	0.099	0.514	1.554
LTE Band7	Front side	0.162	0.115	0.192	0.064	0.277	0.418
	Back side	1.414	0.158	1.099	0.099	1.572	2.612



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Report No.: SUCR240400008403

Rev.: 01

Page: 73 of 76

Hotspot:

Test position		SARmax (W/kg)				Summed SAR	
		Main Ant0	WiFi 2.4G Ant2	WiFi 5G Ant2	BT		
		1	2	3	4	1+2	1+3+4
GSM850	Front side	0.429	0.115	0.192	0.064	0.544	0.685
	Back side	0.811	0.158	1.099	0.099	0.969	2.009
	Left side	0.389	0.000	0.000	0.000	0.389	0.389
	Right side	0.470	0.166	0.359	0.134	0.636	0.963
	Top side	0.000	0.298	0.559	0.211	0.298	0.770
	Bottom side	0.463	0.000	0.000	0.000	0.463	0.463
GSM1900	Front side	0.261	0.115	0.192	0.064	0.376	0.517
	Back side	0.393	0.158	1.099	0.099	0.551	1.591
	Left side	0.326	0.000	0.000	0.000	0.326	0.326
	Right side	0.092	0.166	0.359	0.134	0.258	0.585
	Top side	0.000	0.298	0.559	0.211	0.298	0.770
	Bottom side	0.290	0.000	0.000	0.000	0.290	0.290
WCDMA II	Front side	0.309	0.115	0.192	0.064	0.424	0.565
	Back side	0.500	0.158	1.099	0.099	0.658	1.698
	Left side	0.389	0.000	0.000	0.000	0.389	0.389
	Right side	0.109	0.166	0.359	0.134	0.275	0.602
	Top side	0.000	0.298	0.559	0.211	0.298	0.770
	Bottom side	0.338	0.000	0.000	0.000	0.338	0.338
WCDMA V	Front side	0.168	0.115	0.192	0.064	0.283	0.424
	Back side	0.386	0.158	1.099	0.099	0.544	1.584
	Left side	0.192	0.000	0.000	0.000	0.192	0.192
	Right side	0.166	0.166	0.359	0.134	0.332	0.659
	Top side	0.000	0.298	0.559	0.211	0.298	0.770
	Bottom side	0.194	0.000	0.000	0.000	0.194	0.194
LTE Band5	Front side	0.163	0.115	0.192	0.064	0.278	0.419
	Back side	0.356	0.158	1.099	0.099	0.514	1.554
	Left side	0.141	0.000	0.000	0.000	0.141	0.141
	Right side	0.164	0.166	0.359	0.134	0.330	0.657
	Top side	0.000	0.298	0.559	0.211	0.298	0.770
	Bottom side	0.177	0.000	0.000	0.000	0.177	0.177
LTE Band7	Front side	0.162	0.115	0.192	0.064	0.277	0.418
	Back side	1.414	0.158	1.099	0.099	1.572	2.612
	Left side	0.216	0.000	0.000	0.000	0.216	0.216
	Right side	0.037	0.166	0.359	0.134	0.203	0.530
	Top side	0.000	0.298	0.559	0.211	0.298	0.770
	Bottom side	0.612	0.000	0.000	0.000	0.612	0.612



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Report No.: SUCR240400008403

Rev.: 01

Page: 74 of 76

0mm:

Test position		SARmax (W/kg)		Summed SAR
		Main Ant0	WiFi 5G Ant2	
		1	2	
LTE Band7	Front side	0.000	0.124	0.124
	Back side	1.085	0.357	1.442
	Right side	0.000	0.188	0.188
	Top side	0.000	0.148	0.148
LTE Band41	Front side	0.000	0.124	0.124
	Back side	0.579	0.357	0.936
	Right side	0.000	0.188	0.188
	Top side	0.000	0.148	0.148

SPLSR SAR:

Case 1	Band	Position	SAR (W/kg)	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 1	GSM850	Back side	0.811	10	-31	13.5	-204	59.6	1.91	0.04	Not required
	WIFI 5G		1.099	10	-55	68	-204				
	GSM850	Back side	0.811	10	-31	13.5	-204	56.8	0.91	0.02	Not required
	BT		0.099	10	-37	70	-204				
Case 2	Band	Position	SAR (W/kg)	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 2	WCDMA II	Back side	0.5	10	2	-42	-204	123.9	1.60	0.02	Not required
	WIFI 5G		1.099	10	-55	68	-204				
	WCDMA II	Back side	0.5	10	2	-42	-204	118.6	0.60	0.00	Not required
	BT		0.099	10	-37	70	-204				
Case 3	Band	Position	SAR (W/kg)	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 3	LTE Band 7	Back side	1.154	10	-14	-70	-204	144.0	2.25	0.02	Not required
	WIFI 5G		1.099	10	-55	68	-204				
	LTE Band 7	Back side	1.154	10	-14	-70	-204	141.9	1.25	0.01	Not required
	BT		0.099	10	-37	70	-204				



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Report No.: SUCR240400008403

Rev.: 01

Page: 75 of 76

9 Equipment list

Test Platform		SPEAG DASY8 Professional				
Description		SAR Test System (Frequency range 10MHz-10GHz)				
Software Reference		DASY8 Module SAR V16.2.0.1425				
Hardware Reference						
Equipment		Manufacturer	Model	Serial Number	Calibration Date	Due date of calibration
<input checked="" type="checkbox"/>	Twin Phantom	SPEAG	Twin-SAM V8.0	2103	NCR	NCR
<input checked="" type="checkbox"/>	DAE	SPEAG	DAE4	1484	2023-06-05	2024-06-04
<input checked="" type="checkbox"/>	E-Field Probe	SPEAG	EX3DV4	7636	2023-06-05	2024-06-04
<input checked="" type="checkbox"/>	Validation Kits	SPEAG	D835V2	4d161	2023-08-25	2024-08-24
<input checked="" type="checkbox"/>	Validation Kits	SPEAG	D1950V3	1218	2023-05-04	2024-05-03
<input checked="" type="checkbox"/>	Validation Kits	SPEAG	D2450V2	922	2023-08-28	2024-08-27
<input checked="" type="checkbox"/>	Validation Kits	SPEAG	D2600V2	1180	2021-05-12	2024-05-11
<input checked="" type="checkbox"/>	Validation Kits	SPEAG	D5GHzV2	1313	2022-01-25	2025-01-24
<input checked="" type="checkbox"/>	Dielectric parameter probes	SPEAG	DAKS-3.5	1120	2023-06-06	2024-06-05
<input checked="" type="checkbox"/>	Vector Network Analyzer and Vector Reflectometer	SPEAG	DAKS_VNA R140	0050920	2023-06-06	2024-06-05
<input checked="" type="checkbox"/>	Universal Radio Communication Tester	R&S	CMW500	111637	2023-09-13	2024-09-12
<input checked="" type="checkbox"/>	RF Bi-Directional Coupler	Agilent	86205-60001	MY31400031	NCR	NCR
<input checked="" type="checkbox"/>	Signal Generator	R&S	SMB100A	182393	2023-02-06	2024-02-05
<input checked="" type="checkbox"/>	Preamplifier	Qiji	YX28980933	202104001	NCR	NCR
<input checked="" type="checkbox"/>	Power Sensor	Keysight	U2002H	MY48200110	2022-12-23	2023-12-22
<input checked="" type="checkbox"/>	Attenuator	SHX	TS2-3dB	30704	NCR	NCR
<input checked="" type="checkbox"/>	Coaxial low pass filter	Mini-Circuits	VLF-2500(+)	NA	NCR	NCR
<input checked="" type="checkbox"/>	Coaxial low pass filter	Microlab Fxr	LA-F13	NA	NCR	NCR
<input checked="" type="checkbox"/>	DC POWER SUPPLY	SAKO	SK1730SL5A	NA	NCR	NCR
<input checked="" type="checkbox"/>	Speed reading thermometer	LKM	DTM3000	SUW201-19-02	2023-09-15	2024-09-14
<input checked="" type="checkbox"/>	Humidity and Temperature Indicator	MingGao	MingGao	NA	2023-09-15	2024-09-14

Note: All the equipments are within the valid period when the tests are performed.



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Report No.: SUCR240400008403

Rev.: 01

Page: 76 of 76

10 Calibration certificate

Please see the Appendix C

11 Photographs

Please see the Appendix D

Appendix A: Detailed System Check Results

Appendix B: Detailed Test Results

Appendix C: Calibration certificate

Appendix D: Photographs

---END---



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