



SAR EVALUATION REPORT

**FCC 47 CFR § 2.1093
IEEE Std 1528-2013**

For
GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, GPS & NFC

FCC ID: PY7-30637Z

**Report Number: 16J23633Y-S1V2
Issue Date: 9/22/2016**

Prepared for
**SONY MOBILE COMMUNICATIONS INC.
4-12-3 HIGASHI-SHINAGAWA
SHINAGAWA-KU, TOKYO, 140-0002, JAPAN**

Prepared by
**UL VERIFICATION SERVICES INC.
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888**



NVLAP LAB CODE 200065-0

Revision History

Rev.	Date	Revisions	Revised By
V1	9/15/2016	Initial Issue	--
V2	9/22/2016	Section 6.6.3: Updated Results Section 6.6.4: Updated reference report number Section 9: Updated Power Tables Updated Appendices A/C/F to Version 2	Vanessa Moestopo

Table of Contents

1.	Attestation of Test Results	5
2.	Test Specification, Methods and Procedures.....	6
3.	Facilities and Accreditation	6
4.	SAR Measurement System & Test Equipment	7
4.1.	<i>SAR Measurement System.....</i>	<i>7</i>
4.2.	<i>SAR Scan Procedures.....</i>	<i>8</i>
4.3.	<i>Test Equipment.....</i>	<i>10</i>
5.	Measurement Uncertainty.....	11
6.	Device Under Test (DUT) Information	12
6.1.	<i>DUT Description</i>	<i>12</i>
6.2.	<i>Wireless Technologies.....</i>	<i>13</i>
6.3.	<i>Maximum Output Power from Tune-up Procedure</i>	<i>14</i>
6.3.1.	<i>GSM</i>	<i>14</i>
6.3.2.	<i>W-CDMA</i>	<i>14</i>
6.3.3.	<i>LTE.....</i>	<i>15</i>
6.3.4.	<i>WLAN and Bluetooth</i>	<i>15</i>
6.4.	<i>General LTE SAR Test and Reporting Considerations.....</i>	<i>16</i>
6.5.	<i>LTE (TDD) Considerations.....</i>	<i>18</i>
6.6.	<i>Re-use of Test Data.....</i>	<i>19</i>
6.6.1.	<i>Introduction.....</i>	<i>19</i>
6.6.2.	<i>Device Differences.....</i>	<i>19</i>
6.6.3.	<i>Spot Check Verification.....</i>	<i>19</i>
6.6.4.	<i>Reference Detail.....</i>	<i>20</i>
7.	RF Exposure Conditions (Test Configurations).....	21
8.	Dielectric Property Measurements & System Check	22
8.1.	<i>Dielectric Property Measurements</i>	<i>22</i>
8.2.	<i>System Check.....</i>	<i>24</i>
9.	Conducted Output Power Measurements.....	25
9.1.	<i>GSM</i>	<i>25</i>
9.2.	<i>W-CDMA</i>	<i>28</i>
9.3.	<i>LTE.....</i>	<i>32</i>
9.4.	<i>LTE Carrier Aggregation</i>	<i>42</i>
9.5.	<i>WLAN and Bluetooth</i>	<i>42</i>

10. Measured and Reported (Scaled) SAR Results..... 43

10.1. GSM850..... 44

10.2. GSM1900..... 44

10.3. W-CDMA Band II..... 44

10.4. W-CDMA Band IV 45

10.5. LTE Band 2 (20MHz Bandwidth) 45

10.6. LTE Band 4 (20MHz Bandwidth) 46

10.7. LTE Band 12 (10MHz Bandwidth) 46

10.8. LTE Band 17 (10MHz Bandwidth) 47

10.9. LTE Band 41 (20MHz Bandwidth) 47

10.10. WLAN and Bluetooth..... 47

11. SAR Measurement Variability..... 48

12. Simultaneous Transmission SAR Analysis..... 49

12.1. Sum of the SAR for GSM850 & Wi-Fi & BT 50

12.2. Sum of the SAR for GSM1900 & Wi-Fi & BT 50

12.3. Sum of the SAR for WCDMA Band II & Wi-Fi & BT 50

12.4. Sum of the SAR for WCDMA Band IV & Wi-Fi & BT 50

12.5. Sum of the SAR for LTE Band 2 & Wi-Fi & BT 51

12.6. Sum of the SAR for LTE Band 4 & Wi-Fi & BT 51

12.7. Sum of the SAR for LTE Band 12 & Wi-Fi & BT 51

12.8. Sum of the SAR for LTE Band 41 & Wi-Fi & BT 52

Appendixes 53

16J23633Y -S1V2 SAR_App A Setup Photos and Ant locations 53

16J23633Y -S1V1 SAR_App B System Check Plots..... 53

16J23633Y -S1V2 SAR_App C Highest Test Plots..... 53

16J23633Y -S1V1 SAR_App D Tissue Ingredients 53

16J23633Y -S1V1 SAR_App E Probe Cal. Certificates 53

16J23633Y -S1V2 SAR_App F Dipole Cal. Certificates..... 53

1. Attestation of Test Results



Applicant Name	SONY MOBILE COMMUNICATIONS INC.			
FCC ID	PY7-30637Z			
Applicable Standards	FCC 47 CFR § 2.1093 Published RF exposure KDB procedures IEEE Std 1528-2013			
Exposure Category	SAR Limits (W/Kg)			
	Peak spatial-average(1g of tissue)	Extremities (hands, wrists, ankles, etc.) (10g of tissue)		
General population / Uncontrolled exposure	1.6	4		
RF Exposure Conditions	Equipment Class - Highest Reported SAR (W/kg)			
	PCE	DTS	NII	DSS
Head	0.330	0.529	0.810	N/A
Body-worn*	0.312	0.055	0.039	
Hotspot	0.587	0.125	N/A	
Extremity	N/A	N/A	0.251	
Simultaneous Tx	1.442			0.687
Date Tested	8/22/2016 to 9/6/2016			
Test Results	Pass			

Note: According to the manufacturer attestation letter, FCC ID: PY7-29752M and FCC ID: PY7-30637Z unlicensed radios (WLAN/BT/BLE) are electronically identical. They share the same chipset, same power and same antenna performance including antenna gain. Therefore, FCC ID: PY7-30637Z is able to leverage test data from FCC ID: PY7-29752M.

The applicant takes full responsibility that the test data, as referenced in this section; represents compliance for this FCC ID: PY7-30637Z.

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government (NIST Handbook 150, Annex A). This report is written to support regulatory compliance of the applicable standards stated above.

Approved & Released By: 	Prepared By: 
Devin Chang Senior Engineer UL Verification Services Inc.	Florencio Pesigan Laboratory Technician UL Verification Services Inc.

2. Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IEEE STD 1528-2013, the following FCC Published RF exposure [KDB](#) procedures:

- 447498 D01 General RF Exposure Guidance v06
- 447498 D03 Supplement C Cross-Reference v01
- 648474 D04 Handset SAR v01r03
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- 865664 D02 RF Exposure Reporting v01r02
- 941225 D01 3G SAR Procedures v03r01
- 941225 D05 SAR for LTE Devices v02r05
- 941225 D05A LTE Rel.10 KDB Inquiry Sheet v01r02
- 941225 D06 Hotspot Mode v02r01
- 941225 D07 UMPC Mini Tablet v01r02

In addition to the above, the following information was used:

- [TCB workshop](#) October, 2014; Page 36, RF Exposure Procedures Update (Overlapping LTE Bands)
- [TCB workshop](#) October, 2014; Page 37, LTE Considerations (LTE Band 41 Test Channels)
- TEST DATA RE-USE GUIDANCE, FCC OET Laboratory Division, May 23, 2016 r04

3. Facilities and Accreditation

The test sites and measurement facilities used to collect data are located at

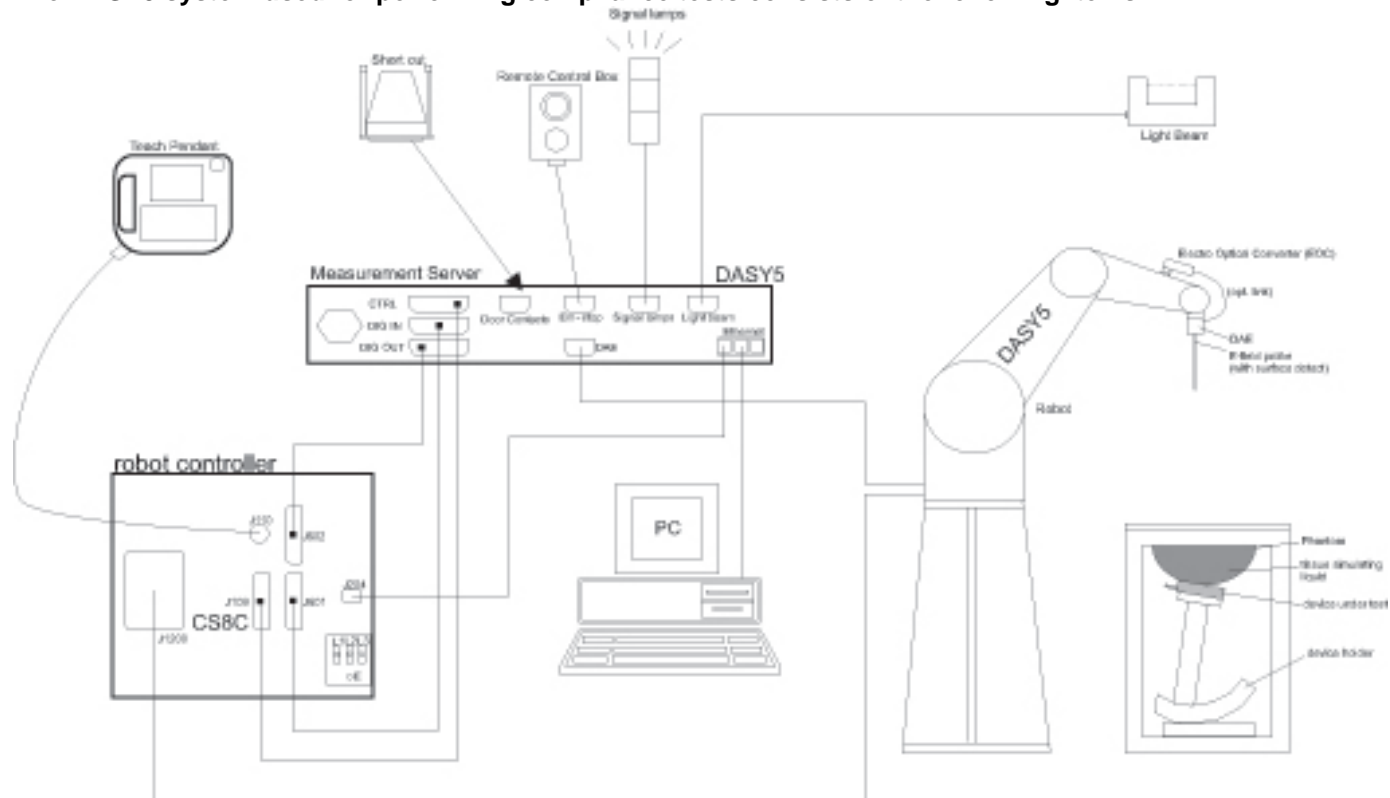
47173 Benicia Street	47266 Benicia Street
SAR Lab A	SAR Lab 1
SAR Lab B	SAR Lab 2
SAR Lab C	SAR Lab 3
SAR Lab D	SAR Lab 4
SAR Lab E	SAR Lab 5
SAR Lab F	
SAR Lab G	
SAR Lab H	

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

4. SAR Measurement System & Test Equipment

4.1. SAR Measurement System

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



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- 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 from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- 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.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

4.2. SAR Scan Procedures

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ 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: Δx_{Area} , Δy_{Area}	≤ 2 GHz: ≤ 15 mm $2 - 3$ GHz: ≤ 12 mm	$3 - 4$ GHz: ≤ 12 mm $4 - 6$ GHz: ≤ 10 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.	

Step 3: Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

		≤ 3 GHz	> 3 GHz	
Maximum zoom scan spatial resolution: $\Delta x_{Zoom}, \Delta y_{Zoom}$		≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*	
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$	≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm	
	graded grid	$\Delta z_{Zoom}(1)$: between 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z	≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm	
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.				
* When zoom scan is required and the <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

Step 5: Z-Scan (FCC only)

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not be larger than the step size in Z-direction.

4.3. Test Equipment

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers' recommendations, and is traceable to recognized national standards.

Dielectric Property Measurements

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
PNA Network Analyzer	Keysight	N5227A	US51270480	7/22/2017
Dielectric Probe kit	SPEAG	DAK-3.5	1087	11/10/2016
Shorting block	SPEAG	DAK-3.5 Short	SM DAK 200 BA	11/10/2016
Thermometer	Fisher Scientific	Traceable	140493798	5/13/2017

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Synthesized Signal Generator	Agilent	N5181A	MY50140610	5/9/2017
Power Meter	Agilent	N1912A	MY55196008	5/3/2017
Power Sensor	Agilent	E9323A	MY52200012	10/10/2016
Power Sensor	Agilent	E9323A	MY52270022	12/17/2016
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1795093	N/A
Directional coupler	Werlatone	C8060-102	2149	N/A
DC Power Supply	BK PRECISION	1611	215-02293	N/A
Power Meter	HP	437B	3125U09516	9/17/2016
Power Sensor	HP	8481A	3318A95392	9/16/2016
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1795092	N/A
Directional coupler	Werlatone	C8000-102	2710	N/A
DC Power Supply	HP	E3610A	141210	N/A

Lab Equipment

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
E-Field Probe (SAR Lab 1)	SPEAG	EX3DV4	3929	3/22/2017
E-Field Probe (SAR Lab 4)	SPEAG	EX3DV4	3773	4/19/2017
E-Field Probe (SAR Lab 5)	SPEAG	EX3DV4	7356	4/20/2017
Data Acquisition Electronics (SAR Lab 1)	SPEAG	DAE4	1434	4/15/2017
Data Acquisition Electronics (SAR Lab 4)	SPEAG	DAE4	1239	4/14/2017
Data Acquisition Electronics (SAR Lab 5)	SPEAG	DAE4	1258	5/10/2017
System Validation Dipole	SPEAG	D750V3	1071	11/12/2016
System Validation Dipole	SPEAG	D835V2	4d142	9/23/2016
System Validation Dipole	SPEAG	D900V2	1d143	9/17/2016
System Validation Dipole	SPEAG	D1750V2	1050	4/13/2017
System Validation Dipole	SPEAG	D1900V2	5d163	9/21/2016
System Validation Dipole	SPEAG	D2600V2	1006	9/21/2016
System Validation Dipole	SPEAG	D2600V2	1036	3/18/2017
Thermometer (SAR Lab 1)	EXTECH	445703	CCS-205	3/24/2017
Thermometer (SAR Lab 4)	EXTECH	445703	CCS-238	6/6/2017
Thermometer (SAR Lab 5)	EXTECH	445703	CCS-239	6/13/2017

Other

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Power Meter	Agilent	N1912A	MY50001018	10/19/2017
Power Sensor	Agilent	N1921A	MY52260009	12/17/2016
Base Station Simulator	R & S	CMW500	135384	6/21/2017
Base Station Simulator	R & S	CMW500	134853	7/12/2017
Base Station Simulator	R & S	CMW500	135390	4/13/2017
Base Station Simulator	R & S	CMW500	125236	2/11/2017
Base Station Simulator	R & S	CMW500	134855	5/26/2017
Base Station Simulator	Agilent	8960	MY53211024	9/16/2017

5. Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

6. Device Under Test (DUT) Information

6.1. DUT Description

Device Dimension	Overall (Length x Width): 146.4 mm x 71.9 mm Overall Diagonal: 162.4 mm Display Diagonal: 131 mm																																																			
Back Cover	<input checked="" type="checkbox"/> The rechargeable battery is not user accessible.																																																			
Battery Options	<input checked="" type="checkbox"/> The rechargeable battery is not user accessible.																																																			
Accessory	Headset																																																			
Wireless Router (Hotspot)	Wi-Fi Hotspot mode permits the device to share its cellular data connection with other Wi-Fi-enabled devices. <input checked="" type="checkbox"/> Mobile Hotspot (Wi-Fi 2.4 GHz) <input type="checkbox"/> Mobile Hotspot (Wi-Fi 5 GHz)																																																			
Wi-Fi Direct	Wi-Fi Direct enabled devices transfer data directly between each other <input checked="" type="checkbox"/> Wi-Fi Direct (Wi-Fi 2.4 GHz) <input type="checkbox"/> Wi-Fi Direct (Wi-Fi 5 GHz)																																																			
Test sample information	<table border="1"> <thead> <tr> <th>S/N</th> <th>IMEI</th> <th>Notes</th> </tr> </thead> <tbody> <tr><td>CB512B01N3</td><td>00440245-640867-7</td><td>SAR_GSM_#1</td></tr> <tr><td>CB512B02FZ</td><td>00440245-640865-1</td><td>SAR_GSM_#2</td></tr> <tr><td>CB512B01FL</td><td>00440245-640847-9</td><td>SAR_UMTS_#1</td></tr> <tr><td>CB512B01HR</td><td>00440245-640857-8</td><td>SAR_UMTS_#2</td></tr> <tr><td>CB512B01FF</td><td>00440245-640872-7</td><td>SAR_LTE_L-Band_#1</td></tr> <tr><td>CB512B01C8</td><td>00440245-640874-3</td><td>SAR_LTE_L-Band_#2</td></tr> <tr><td>CB512B01FT</td><td>00440245-640837-0</td><td>SAR_LTE_MH-Band_#1</td></tr> <tr><td>CB512B01L6</td><td>00440245-640846-1</td><td>SAR_LTE_MH-Band_#2</td></tr> <tr><td>CB512B01HP</td><td>00440245-640869-3</td><td>SAR_5mm_LTE_#1</td></tr> <tr><td>CB512B01FG</td><td>00440245-640838-8</td><td>SAR_5mm_LTE_#2</td></tr> <tr><td>CB512B01LC</td><td>00440245-640875-0</td><td>SAR_5mm_UMTS/GSM_#1</td></tr> <tr><td>CB512B01G9</td><td>00440245-640871-9</td><td>SAR_5mm_UMTS/GSM_#2</td></tr> <tr><td>CB512B01NC</td><td>00440245-640860-2</td><td>SAR_WLAN_2.4G_#1</td></tr> <tr><td>CB512B01B9</td><td>00440245-640850-3</td><td>SAR_WLAN_2.4G_#2</td></tr> <tr><td>CB512B01FS</td><td>00440245-640863-6</td><td>SAR_WLAN_5G_#1</td></tr> <tr><td>CB512B01J3</td><td>00440245-640855-2</td><td>SAR_WLAN_5G_#2</td></tr> </tbody> </table>	S/N	IMEI	Notes	CB512B01N3	00440245-640867-7	SAR_GSM_#1	CB512B02FZ	00440245-640865-1	SAR_GSM_#2	CB512B01FL	00440245-640847-9	SAR_UMTS_#1	CB512B01HR	00440245-640857-8	SAR_UMTS_#2	CB512B01FF	00440245-640872-7	SAR_LTE_L-Band_#1	CB512B01C8	00440245-640874-3	SAR_LTE_L-Band_#2	CB512B01FT	00440245-640837-0	SAR_LTE_MH-Band_#1	CB512B01L6	00440245-640846-1	SAR_LTE_MH-Band_#2	CB512B01HP	00440245-640869-3	SAR_5mm_LTE_#1	CB512B01FG	00440245-640838-8	SAR_5mm_LTE_#2	CB512B01LC	00440245-640875-0	SAR_5mm_UMTS/GSM_#1	CB512B01G9	00440245-640871-9	SAR_5mm_UMTS/GSM_#2	CB512B01NC	00440245-640860-2	SAR_WLAN_2.4G_#1	CB512B01B9	00440245-640850-3	SAR_WLAN_2.4G_#2	CB512B01FS	00440245-640863-6	SAR_WLAN_5G_#1	CB512B01J3	00440245-640855-2	SAR_WLAN_5G_#2
S/N	IMEI	Notes																																																		
CB512B01N3	00440245-640867-7	SAR_GSM_#1																																																		
CB512B02FZ	00440245-640865-1	SAR_GSM_#2																																																		
CB512B01FL	00440245-640847-9	SAR_UMTS_#1																																																		
CB512B01HR	00440245-640857-8	SAR_UMTS_#2																																																		
CB512B01FF	00440245-640872-7	SAR_LTE_L-Band_#1																																																		
CB512B01C8	00440245-640874-3	SAR_LTE_L-Band_#2																																																		
CB512B01FT	00440245-640837-0	SAR_LTE_MH-Band_#1																																																		
CB512B01L6	00440245-640846-1	SAR_LTE_MH-Band_#2																																																		
CB512B01HP	00440245-640869-3	SAR_5mm_LTE_#1																																																		
CB512B01FG	00440245-640838-8	SAR_5mm_LTE_#2																																																		
CB512B01LC	00440245-640875-0	SAR_5mm_UMTS/GSM_#1																																																		
CB512B01G9	00440245-640871-9	SAR_5mm_UMTS/GSM_#2																																																		
CB512B01NC	00440245-640860-2	SAR_WLAN_2.4G_#1																																																		
CB512B01B9	00440245-640850-3	SAR_WLAN_2.4G_#2																																																		
CB512B01FS	00440245-640863-6	SAR_WLAN_5G_#1																																																		
CB512B01J3	00440245-640855-2	SAR_WLAN_5G_#2																																																		
Hardware Version	A																																																			
Software Version	0.161																																																			

6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode		Duty Cycle used for SAR testing
GSM	850 1900	Voice (GMSK)	GPRS Multi-Slot Class:	GSM Voice: 12.5% (E)GPRS: 1 Slot: 12.5% 2 Slots: 25% 3 Slots: 37.5% 4 Slots: 50%
		GPRS (GMSK)	<input type="checkbox"/> Class 8 - 1 Up, 4 Down	
		EGPRS (8PSK)	<input type="checkbox"/> Class 10 - 2 Up, 4 Down	
			<input type="checkbox"/> Class 12 - 4 Up, 4 Down	
			<input checked="" type="checkbox"/> Class 33 - 4 Up, 5 Down	
Does this device support DTM (Dual Transfer Mode)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
W-CDMA (UMTS)	Band II Band IV	UMTS Rel. 99 (Voice & Data) HSDPA (Rel. 5) HSUPA (Rel. 6) HSPA+ (Rel. 7)		100%
LTE	FDD Band 2 FDD Band 4 FDD Band 12 FDD Band 17 TDD Band 41	QPSK 16QAM <input checked="" type="checkbox"/> Rel. 11 Carrier Aggregation (1 Uplinks and 3 Downlinks) (Carrier Aggregation is only supported for downlink and not for uplink.)		100% (FDD) 63.3% (TDD)
	Does this device support SV-LTE (1xRTT-LTE)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Wi-Fi	2.4 GHz	802.11b 802.11g 802.11n (HT20)		100%
	5 GHz	802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ac (VHT80)		100%
		Does this device support bands 5.60 ~ 5.65 GHz? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Does this device support Band gap channel(s)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Bluetooth	2.4 GHz	Version 4.2 LE		N/A

6.3. Maximum Output Power from Tune-up Procedure

KDB 447498 sec.4.1.(3) at the maximum rated output power and within the tune-up tolerance range specified for the product, but not more than 2 dB lower than the maximum tune-up tolerance limit

6.3.1. GSM

RF Air Interface		GPRS									
		Voice/Tx 1 Slot		Tx 2 Slots		Tx 3 Slots		Tx 4 Slots			
		Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]		
GSM 850		31.5	-1.3~+0.7	30.5	-1.3~+0.7	28.5	-1.3~+0.7	27.5	-1.3~+0.7		
GSM 1900		28.0	-1.3~+0.7	26.5	-1.3~+0.7	24.5	-1.3~+0.7	23.5	-1.3~+0.7		
RF Air Interface		EGPRS 8PSK Modulation (MCS5-9)									
		Voice/Tx 1 Slot		Tx 2 Slots		Tx 3 Slots		Tx 4 Slots			
		Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]		
GSM 850		27.0	-2.0~+1.0	25.5	-2.0~+1.0	23.5	-2.0~+1.0	22.5	-2.0~+1.0		
GSM 1900		26.0	-2.0~+1.0	24.5	-2.0~+1.0	22.5	-2.0~+1.0	21.5	-2.0~+1.0		
RF Air Interface		CS Only		GPRS DTM GMSK							
		Tx 1 Slot		CS + TX 2 Slots			CS + TX 3 Slots				
		CS GMSK		CS GMSK		PS GMSK		CS GMSK		PS GMSK	
Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]		
GSM 850		31.5	-1.3~+0.7	30.5	-1.3~+0.7	30.5	-1.3~+0.7	28.5	-1.3~+0.7	28.5	-1.3~+0.7
GSM 1900		28.0	-1.3~+0.7	26.5	-1.3~+0.7	26.5	-1.3~+0.7	24.5	-1.3~+0.7	24.5	-1.3~+0.7
RF Air Interface		CS Only		EGPRS DTM 8PSK Modulation (MCS5-9)							
		Tx 1 Slot		CS + TX 2 Slots			CS + TX 3 Slots				
		CS GMSK		CS GMSK		PS 8PSK		CS GMSK		PS 8PSK	
Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]		
GSM 850		31.5	-1.3~+0.7	30.5	-1.3~+0.7	25.5	-2.0~+1.0	28.5	-1.3~+0.7	23.5	-2.0~+1.0
GSM 1900		28.0	-1.3~+0.7	26.5	-1.3~+0.7	24.5	-2.0~+1.0	24.5	-1.3~+0.7	22.5	-2.0~+1.0

6.3.2. W-CDMA

RF Air Interface		CS		HSDPSA				HSUPA					
		Subtest 1/2		Subtest 3/4		Subtest 1/5		Subtest 2/4		Subtest 3			
		Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]
FDD 2	Low Mid High	19.5	-1.5~+0.5	18.5	-2~+1.0	18.0	-2~+1.0	18.0	-2~+1.0	16.5	-2~+1.0	17.5	-2~+1.0
FDD 4	Low Mid High	20.0	-1.5~+0.5	19.0	-2~+1.0	18.5	-2~+1.0	18.5	-2~+1.0	17.0	-2~+1.0	18.0	-2~+1.0

6.3.3. LTE

RF Air Interface	LTE			Data				
				QPSK		16QAM		
	Band	BW	CH	RB Config	Target [dBm]	Tolerance +/-[dB]	Target [dBm]	Tolerance +/-[dB]
LTE B2	1.4MHz	Low	1RB	19.0	-1.5~+1.0	18.0	-1.5~+1.0	
		Mid	50% RB	19.0	-1.5~+1.0	18.0	-1.5~+1.0	
		High	100% RB	18.0	-1.5~+1.0	17.0	-1.5~+1.0	
	3MHz 5MHz, 10MHz 15MHz, 20MHz	Low	1RB	19.0	-1.5~+1.0	18.0	-1.5~+1.0	
		Mid	50% RB	18.0	-1.5~+1.0	17.0	-1.5~+1.0	
		High	100% RB	18.0	-1.5~+1.0	17.0	-1.5~+1.0	
	LTE B4	1.4MHz	Low	1RB	20.0	-1.5~+1.0	19.0	-1.5~+1.0
			Mid	50% RB	20.0	-1.5~+1.0	19.0	-1.5~+1.0
			High	100% RB	19.0	-1.5~+1.0	18.0	-1.5~+1.0
3MHz 5MHz, 10MHz		Low	1RB	20.0	-1.5~+1.0	19.0	-1.5~+1.0	
		Mid	50% RB	19.0	-1.5~+1.0	18.0	-1.5~+1.0	
		High	100% RB	19.0	-1.5~+1.0	18.0	-1.5~+1.0	
LTE B12		1.4MHz	Low	1RB	23.5	-1.5~+1.0	22.5	-1.5~+1.0
			Mid	50% RB	23.5	-1.5~+1.0	22.5	-1.5~+1.0
			High	100% RB	22.5	-1.5~+1.0	21.5	-1.5~+1.0
	3MHz 5MHz, 10MHz	Low	1RB	23.5	-1.5~+1.0	22.5	-1.5~+1.0	
		Mid	50% RB	22.5	-1.5~+1.0	21.5	-1.5~+1.0	
		High	100% RB	22.5	-1.5~+1.0	21.5	-1.5~+1.0	
	LTE B17	5MHz, 10MHz	Low	1RB	23.5	-1.5~+1.0	22.5	-1.5~+1.0
			Mid	50% RB	22.5	-1.5~+1.0	21.5	-1.5~+1.0
			High	100% RB	22.5	-1.5~+1.0	21.5	-1.5~+1.0
LTE B41	5MHz, 10MHz, 15MHz, 20MHz	Low	1RB	20.5	-1.5~+1.0	19.5	-1.5~+1.0	
		Mid	50% RB	19.5	-1.5~+1.0	18.5	-1.5~+1.0	
		High	100% RB	19.5	-1.5~+1.0	18.5	-1.5~+1.0	

6.3.4. WLAN and Bluetooth

The model FCC ID: PY7-29752M shares the same tune up power targets as model FCC ID: PY7-30637Z for WLAN and Bluetooth operations. For this reason the SAR data for the WLAN and Bluetooth operations for FCC ID: PY7-29752M is considered representative for FCC ID: PY7-30637Z. Refer to §6.6 for Re-use of Test Data

6.4. General LTE SAR Test and Reporting Considerations

Item	Description						
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 2	Frequency range: 1850 - 1910 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	18700 /1860	18675/ 1857.5	18650/ 1855	18625/ 1852.5	18615/ 1851.5	18607/ 1850.7
	Mid	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880
	High	19100/ 1900	19125/ 1902.5	19150/ 1905	19175/ 1907.5	19185/ 1908.5	19193/ 1909.3
	Band 4	Frequency range: 1710 - 1755 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	20050/ 1720	20025/ 1717.5	20000/ 1715	19975/ 1712.5	19965/ 1711.5	19957/ 1710.7
	Mid	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5
	High	20300/ 1745	20325/ 1747.5	20350/ 1750	20375/ 1752.5	20385/ 1753.5	20393/ 1754.3
	Band 12	Frequency range: 699 – 716 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low			23060/ 704	23035/ 701.5	23025/ 700.5	23017/ 699.7
	Mid			23095/ 707.5	23095/ 707.5	23095/ 707.5	23095/ 707.5
	High			23130/ 711	23155/ 713.5	23165/ 714.5	23173/ 715.3
	Band 17	Frequency range: 704 - 716 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low			23780/ 709	23755/ 706.5		
	Mid			23790/ 710	23790/ 710		
	High			23800/ 711	23825/ 713.5		
	Band 41	Frequency range: 2496 - 2690 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
Low	39750 / 2506.0						
Low-Mid	40185 / 2549.5						
Mid	40620 / 2593.0						
Mid-High	41055 / 2636.5						
High	41490 / 2680.0						

General LTE SAR Test and Reporting Considerations (Continued)

LTE transmitter and antenna implementation	Refer to Appendix A.																																						
Maximum power reduction (MPR)	<p align="center">Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3</p> <table border="1"> <thead> <tr> <th rowspan="2">Modulation</th> <th colspan="6">Channel bandwidth / Transmission bandwidth (RB)</th> <th rowspan="2">MPR (dB)</th> </tr> <tr> <th>1.4 MHz</th> <th>3.0 MHz</th> <th>5 MHz</th> <th>10 MHz</th> <th>15 MHz</th> <th>20 MHz</th> </tr> </thead> <tbody> <tr> <td>QPSK</td> <td>> 5</td> <td>> 4</td> <td>> 8</td> <td>> 12</td> <td>> 16</td> <td>> 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>> 5</td> <td>> 4</td> <td>> 8</td> <td>> 12</td> <td>> 16</td> <td>> 18</td> <td>≤ 2</td> </tr> </tbody> </table> <p>MPR Built-in by design The manufacturer MPR values are always within the 3GPP maximum MPR allowance but may not follow the default MPR values. A-MPR (additional MPR) was disabled during SAR testing</p>	Modulation	Channel bandwidth / Transmission bandwidth (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	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
Modulation	Channel bandwidth / Transmission bandwidth (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																																
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2																																
Power reduction	No																																						
Spectrum plots for RB configurations	A properly configured base station simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																						

Release 11 Carrier Aggregation (CA) Combinations:

Combination	CA configuration	Carrier 1						Carrier 2						
		20	15	10	5	3	1.4	20	15	10	5	3	1.4	
Intra-Band contiguous	41C				√			√						
				√				√						
			√					√	√					
		√						√	√	√	√			
Intra-Band non-contiguous	41A-41A	√	√	√				√	√	√				

Notes:

For supported channels, please refer to the table above.

6.5. LTE (TDD) Considerations

According to KDB 941225 D05 SAR for LTE Devices, 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.

This device supports uplink-downlink configurations 0-6. The configuration with highest duty cycle was used for SAR Testing — configuration 0 at 63.3% duty cycle and Special subframe 7.

LTE TDD Bands 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.

Table 4.2-1: 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	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$		
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-		
9	$13168 \cdot T_s$			-		

Calculated Duty Cycle

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

Calculated Duty Cycle = Extended cyclic prefix in uplink x (T_s) x # of S + # of U

Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:

Calculated Duty Cycle = $5120 \times [1/(15000 \times 2048)] \times 2 + 6 \text{ ms} = 63.33\%$

where

$T_s = 1/(15000 \times 2048)$ seconds

Note(s):

This device supports uplink-downlink configurations 0-6. The configuration with highest duty cycle was used-configuration 0 at 63.3% duty cycle.

6.6. Re-use of Test Data

6.6.1. Introduction

According to the manufacturer attestation letter, FCC ID: PY7-29752M and FCC ID: PY7-30637Z unlicensed radios (WLAN/BT/BLE) are electronically identical. They share the same chipset, same power and same antenna performance including antenna gain. Therefore, FCC ID: PY7-30637Z is able to leverage test data from FCC ID: PY7-29752M.

The applicant takes full responsibility that the test data, as referenced in this section; represents compliance for this FCC ID PY7-30637Z.

6.6.2. Device Differences

Difference between FCC ID: PY7-29752M and FCC ID: PY7-30637Z:

Various components were removed from FCC ID: PY7-29752M to establish FCC ID: PY7-30637Z, such components are related only to the cellular part and no change in the non-cellular (WLAN/Bluetooth/NFC) parts, which are electronically identical.

6.6.3. Spot Check Verification

Spot check verification has been done on device FCC ID: PY7-30637Z for each wireless mode on the Worst-case position of FCC ID: PY7-29752M . Test results were consistent with FCC ID: PY7-29752M.

Frequency Band	Mode	Antenna	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		Measured 1-g SAR (W/kg)		Delta
								Tune-up limit	Meas.	PY7-29752M	PY7-30637Z	
2.4 GHz DTS	802.11b 1 Mbps	Chain 0	Head	0	Left Touch	6	2437	14.2	13.0	0.401	0.459	14%
			Hotspot	10	Edge 2	6	2437	14.2	13.0	0.095	0.098	3%

Frequency Band	Mode	Antenna	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		Measured 1-g SAR (W/kg)		Delta
								Tune-up limit	Meas.	PY7-29752M	PY7-30637Z	
5.2 GHz U-NII 1	802.11ac VHT80	Chain 0	Head	0	Left Touch	42	5210	11.9	11.2	0.370	0.361	-2%
			Body	15	Front	42	5210	11.9	11.2	0.023	0.017	-26%
5.5 GHz U-NII 2C	802.11n HT40	Chain 0	Head	0	Left Touch	102	5510	10.6	9.8	0.680	0.580	-15%
			Body	15	Front	102	5510	10.6	9.8	0.033	0.037	12%
5.8 GHz U-NII 3	802.11n HT40	Chain 0	Head	0	Left Touch	151	5755	11.2	10.5	0.386	0.295	-24%
			Body	15	Front	151	5755	11.2	10.5	0.016	0.016	0%

Frequency Band	Mode	Antenna	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		Measured 10-g SAR (W/kg)		Delta (%)
								Tune-up limit	Meas.	PY7-29752M	PY7-30637Z	
5.2 GHz U-NII 1	802.11ac VHT80	Chain 0	Extremity	0	Front	42	5210	11.9	11.2	0.158	0.090	-43%
5.5 GHz U-NII 2C	802.11n HT40	Chain 0	Extremity	0	Front	102	5510	10.6	9.8	0.211	0.172	-18%
5.8 GHz U-NII 3	802.11n HT40	Chain 0	Extremity	0	Front	151	5755	11.2	10.5	0.091	0.084	-8%

6.6.4. Reference Detail

Equipment Class	Reference FCC ID	Report Title	Report Section(s)
DTS (WLAN)	PY7-29752M	16J23633A-S1V3	§6.3.4, 9.5, 10.16 & 10.18
NII (WLAN)	PY7-29752M	16J23633A-S1V3	§6.3.5, 9.6, 10.17 & 10.18
DSS (BT)	PY7-29752M	16J23633A-S1V3	§6.3.6, 9.7 & 10.18

7. RF Exposure Conditions (Test Configurations)

Refer to "Setup Photos and Ant locations" Appendix for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

Wireless technologies	RF Exposure Conditions	DUT-to-User Separation	Test Position	Antenna-to-edge/surface	SAR Required	Note
WWAN	Head	0 mm	Left Touch	N/A	Yes	
			Left Tilt (15°)	N/A	Yes	
			Right Touch	N/A	Yes	
			Right Tilt (15°)	N/A	Yes	
	Body	15 mm	Rear	N/A	Yes	
			Front	N/A	Yes	
	Hotspot	10 mm	Rear	< 25 mm	Yes	
			Front	< 25 mm	Yes	
			Edge 1 (Top)	> 25 mm	No	1
			Edge 2 (Right)	< 25 mm	Yes	
			Edge 3 (Bottom)	< 25 mm	Yes	
	Extremity	0 mm	Edge 4 (Left)	< 25 mm	Yes	
			Rear	< 25 mm	Yes	2
			Front	< 25 mm	Yes	2
			Edge 1 (Top)	> 25 mm	No	1
			Edge 2 (Right)	< 25 mm	Yes	2
Edge 3 (Bottom)			< 25 mm	Yes	2	
			Edge 4 (Left)	<. 25 mm	Yes	2

Notes:

- SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR.
- When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg per KDB 648474 D04 Handset SAR.

8. Dielectric Property Measurements & System Check

8.1. Dielectric Property Measurements

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within $\pm 2^\circ\text{C}$ of the temperature when the tissue parameters are characterized.

The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.

Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.

For SAR measurement systems that have implemented the SAR error compensation algorithms documented in IEEE Std 1528-2013, to automatically compensate the measured SAR results for deviations between the measured and required tissue dielectric parameters, the tolerance for ϵ_r and σ may be relaxed to $\pm 10\%$. This is limited to frequencies ≤ 3 GHz.

Tissue Dielectric Parameters

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

Target Frequency (MHz)	Head		Body	
	ϵ_r	σ (S/m)	ϵ_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5000	36.2	4.45	49.3	5.07
5100	36.1	4.55	49.1	5.18
5200	36.0	4.66	49.0	5.30
5300	35.9	4.76	48.9	5.42
5400	35.8	4.86	48.7	5.53
5500	35.6	4.96	48.6	5.65
5600	35.5	5.07	48.5	5.77
5700	35.4	5.17	48.3	5.88
5800	35.3	5.27	48.2	6.00

IEEE Std 1528-2013

Refer to Table 3 within the IEEE Std 1528-2013

Dielectric Property Measurements Results:

SAR Room	Date	Tissue Type	Band (MHz)	Frequency (MHz)	Relative Permittivity (ϵ_r)			Conductivity (σ)		
					Measured	Target	Delta $\pm 5\%$	Measured	Target	Delta $\pm 5\%$
1	8/24/2016	Head	2600	2600	37.66	39.01	-3.46	1.97	1.96	0.60
				2495	38.03	39.14	-2.84	1.86	1.85	0.67
				2690	37.29	38.90	-4.13	2.07	2.06	0.27
1	8/26/2016	Body	2600	2600	50.90	52.51	-3.07	2.24	2.16	3.43
				2495	51.52	52.64	-2.13	2.07	2.01	2.62
				2690	50.74	52.40	-3.16	2.33	2.29	1.82
1	8/31/2016	Body	1900	1900	52.34	53.30	-1.80	1.57	1.52	3.29
				1850	52.45	53.30	-1.59	1.51	1.52	-0.99
				1920	52.15	53.30	-2.16	1.59	1.52	4.67
1	9/2/2016	Body	835	835	57.40	55.20	3.99	0.97	0.97	-0.27
				805	57.69	55.33	4.26	0.95	0.97	-1.56
				905	57.03	55.00	3.69	1.04	1.05	-1.66
4	8/24/2016	Head	1750	1750	40.09	40.08	0.01	1.40	1.37	2.49
				1710	40.15	40.15	0.01	1.38	1.35	2.79
				1755	40.06	40.08	-0.04	1.41	1.37	2.49
4	8/29/2016	Body	1750	1750	52.53	53.44	-1.70	1.47	1.49	-1.02
				1710	52.51	53.54	-1.93	1.42	1.46	-2.64
				1755	52.45	53.43	-1.83	1.47	1.49	-1.02
4	8/29/2016	Head	1900	1900	40.00	40.00	0.00	1.40	1.40	0.21
				1850	40.04	40.00	0.10	1.38	1.40	-1.71
				1920	39.83	40.00	-0.43	1.40	1.40	0.21
4	9/2/2016	Body	1900	1900	51.04	53.30	-4.24	1.58	1.52	4.08
				1850	51.15	53.30	-4.03	1.54	1.52	1.12
				1920	51.00	53.30	-4.32	1.59	1.52	4.87
5	8/26/2016	Head	835	835	41.13	41.50	-0.89	0.92	0.90	2.63
				805	41.43	41.68	-0.60	0.89	0.90	-1.12
				905	40.24	41.50	-3.04	1.00	0.97	2.54
5	8/26/2016	Body	835	835	53.89	55.20	-2.37	1.02	0.97	4.74
				805	54.03	55.33	-2.36	0.99	0.97	2.12
				905	53.00	55.00	-3.64	1.08	1.05	2.99
5	8/29/2016	Head	750	750	42.54	41.96	1.38	0.94	0.89	4.81
				695	43.26	42.24	2.41	0.88	0.89	-0.83
				790	41.81	41.76	0.13	0.96	0.90	7.36
5	8/29/2016	Body	750	750	52.85	55.55	-4.85	0.96	0.96	-0.80
				695	53.43	55.76	-4.17	0.91	0.96	-5.20
				790	52.29	55.39	-5.60	0.99	0.97	2.34

8.2. System Check

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are re-measured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

System Performance Check Measurement Conditions:

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ±0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
- The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm for SAR measurements ≤ 3 GHz and ≥ 10.0 cm for measurements > 3 GHz.
- The DASY system with an E-Field Probe was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10 mm (above 1 GHz) and 15 mm (below 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 15 mm was aligned with the dipole.
For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.
- Special 7x7x7 (below 3 GHz) and/or 8x8x7 (above 3 GHz) fine cube was chosen for the cube.
- Distance between probe sensors and phantom surface was set to 3 mm.
For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.5 mm
- The dipole input power (forward power) was 100 mW.
- The results are normalized to 1 W input power.

System Check Results

The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within 10% of the manufacturer calibrated dipole SAR target.

SAR Room	Date	Tissue Type	Dipole Type _Serial #	Dipole Cal. Due Data	Measured Results for 1g SAR				Measured Results for 10g SAR				Plot No.
					Zoom Scan to 100 mW	Normalize to 1 W	Target (Ref. Value)	Delta ±10 %	Zoom Scan to 100 mW	Normalize to 1 W	Target (Ref. Value)	Delta ±10 %	
1	8/24/2016	Head	D2600V2 SN:1006	9/21/2016	5.910	59.10	56.90	3.87	2.580	25.80	25.50	1.18	1,2
1	8/26/2016	Body	D2600V2 SN:1006	9/21/2016	5.440	54.40	55.30	-1.63	2.380	23.80	24.80	-4.03	
1	8/31/2016	Body	D1900V2 SN:5d163	9/21/2016	3.880	38.80	39.90	-2.76	2.010	20.10	21.00	-4.29	3,4
1	9/2/2016	Body	D835V2 SN:4d142	9/23/2016	0.959	9.59	9.41	1.91	0.635	6.35	6.18	2.75	5,6
4	8/24/2016	Head	D1750V2 SN:1050	4/13/2017	3.560	35.60	35.90	-0.84	1.880	18.80	19.00	-1.05	
4	8/29/2016	Body	D1750V2 SN:1050	4/13/2017	3.540	35.40	36.20	-2.21	1.870	18.70	19.30	-3.11	7,8
4	8/29/2016	Head	D1900V2 SN:5d163	9/21/2016	3.880	38.80	40.10	-3.24	1.980	19.80	21.00	-5.71	
4	9/2/2016	Body	D1900V2 SN:5d163	9/21/2016	3.830	38.30	39.90	-4.01	1.970	19.70	21.00	-6.19	9,10
5	8/26/2016	Head	D835V2 SN:4d142	9/23/2016	0.951	9.51	9.27	2.59	0.624	6.24	6.01	3.83	
5	8/26/2016	Body	D835V2 SN:4d142	9/23/2016	0.991	9.91	9.41	5.31	0.652	6.52	6.18	5.50	11,12
5	8/29/2016	Head	D750V3 SN:1071	11/12/2016	0.752	7.52	8.21	-8.40	0.493	4.93	5.38	-8.36	
5	8/29/2016	Body	D750V3 SN:1071	11/12/2016	0.792	7.92	8.74	-9.38	0.527	5.27	5.81	-9.29	13,14

9. Conducted Output Power Measurements

9.1. GSM

Per KDB 941225 D01 3G SAR Procedures:

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.

GSM850 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Max. Pwr		Frame Pwr Maximum
						Burst (dBm)	Frame (dBm)	
850	GPRS (GMSK)	CS4	1	128	824.2	31.6	22.5	23.2
				190	836.6	31.6	22.6	
				251	848.8	31.2	22.1	
			2	128	824.2	30.5	24.5	25.2
				190	836.6	30.6	24.6	
				251	848.8	30.7	24.7	
			3	128	824.2	29.1	24.8	24.9
				190	836.6	28.7	24.4	
				251	848.8	28.7	24.4	
			4	128	824.2	27.6	24.5	25.2
				190	836.6	27.7	24.6	
				251	848.8	27.6	24.6	
	EGPRS (8PSK)	MCS9	1	128	824.2	27.0	18.0	19.0
				190	836.6	27.0	18.0	
				251	848.8	27.0	18.0	
			2	128	824.2	25.6	19.6	20.5
				190	836.6	25.8	19.8	
				251	848.8	25.8	19.8	
			3	128	824.2	23.9	19.6	20.2
				190	836.6	23.9	19.6	
				251	848.8	23.9	19.6	
			4	128	824.2	22.1	19.1	20.5
				190	836.6	22.1	19.1	
				251	848.8	22.2	19.1	

Notes:

The worst-case configuration and mode for SAR testing is determined to be as follows:

- GMSK (GPRS) mode with 4 time slots, based on the Tune-up Procedure.
- SAR is not required for EGPRS (8PSK) mode because its output power is less than that of GPRS Mode

GSM1900 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Max. Pwr		Frame Pwr Maximum
						Burst (dBm)	Frame (dBm)	
1900	GPRS (GMSK)	CS4	1	512	1850.2	28.2	19.2	19.7
				661	1880.0	28.3	19.3	
				810	1909.8	28.2	19.2	
			2	512	1850.2	26.6	20.6	21.2
				661	1880.0	26.8	20.7	
				810	1909.8	26.5	20.5	
			3	512	1850.2	24.6	20.4	20.9
				661	1880.0	24.7	20.5	
				810	1909.8	24.6	20.3	
			4	512	1850.2	23.6	20.5	21.2
				661	1880.0	23.6	20.6	
				810	1909.8	23.5	20.5	
	EGPRS (8PSK)	MCS9	1	512	1850.2	25.9	16.9	18.0
				661	1880.0	26.0	16.9	
				810	1909.8	25.9	16.8	
			2	512	1850.2	24.5	18.5	19.5
				661	1880.0	24.5	18.5	
				810	1909.8	24.4	18.3	
			3	512	1850.2	22.8	18.5	19.2
				661	1880.0	22.9	18.6	
				810	1909.8	22.7	18.4	
			4	512	1850.2	21.8	18.7	19.5
				661	1880.0	21.9	18.9	
				810	1909.8	21.7	18.7	

Notes:

The worst-case configuration and mode for SAR testing is determined to be as follows:

- GMSK (GPRS) mode with 4 time slots, based on the Tune-up Procedure.
- SAR is not required for EGPRS (8PSK) mode because its output power is less than that of GPRS Mode

GSM850 DTM Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Max. Pwr				Frame Pwr Maximum
						CS		PS		
						Burst (dBm)	Frame (dBm)	Burst (dBm)	Frame (dBm)	
850	GSM(Voice) + GPRS(GMSK)	CS4	1	128	824.2	31.6	22.5			
				190	836.6	31.6	22.6			
				251	848.8	31.2	22.1			
			2	128	824.2	29.5	23.4	29.6	23.5	25.2
				190	836.6	29.6	23.6	29.6	23.6	
				251	848.8	29.7	23.7	29.8	23.7	
			3	128	824.2	27.5	23.2	27.5	23.3	24.9
				190	836.6	27.5	23.3	27.6	23.3	
				251	848.8	27.5	23.3	27.7	23.4	
	GSM(Voice) + EGPRS(8PSK)	MCS9	1	128	824.2	31.6	22.5			
				190	836.6	31.6	22.6			
				251	848.8	31.2	22.1			
			2	128	824.2	30.5	24.5	25.4	19.4	25.5
				190	836.6	30.6	24.6	25.5	19.5	
				251	848.8	30.8	24.8	25.6	19.6	
			3	128	824.2	28.4	24.2	23.5	19.2	25.2
				190	836.6	28.1	23.9	23.5	19.3	
				251	848.8	28.2	23.9	23.5	19.2	

Notes:

The worst-case configuration and mode for SAR testing is determined to be as follows:

- GSM (Voice) + GMSK (GPRS) mode with 1 time slots, based on the Tune-up Procedure.
- SAR is not required for GSM(Voice) + EGPRS (8PSK) mode because its output power is less than that of GSM (Voice) + GMSK (GPRS) mode.

GSM1900 DTM Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Max. Pwr				Frame Pwr Maximum
						CS		PS		
						Burst (dBm)	Frame (dBm)	Burst (dBm)	Frame (dBm)	
1900	GSM(Voice) + GPRS(GMSK)	CS4	1	512	1850.2	28.2	19.2			
				661	1880.0	28.3	19.3			
				810	1909.8	28.2	19.2			
			2	512	1850.2	26.4	20.3	26.4	20.4	21.2
				661	1880.0	26.4	20.4	26.5	20.5	
				810	1909.8	26.3	20.3	26.4	20.4	
			3	512	1850.2	24.4	20.1	24.5	20.2	20.9
				661	1880.0	24.4	20.1	24.5	20.3	
				810	1909.8	24.4	20.1	24.5	20.2	
	GSM(Voice) + EGPRS(8PSK)	MCS9	1	512	1850.2	28.2	19.2			
				661	1880.0	28.3	19.3			
				810	1909.8	28.2	19.2			
			2	512	1850.2	26.4	20.4	24.5	18.5	21.2
				661	1880.0	26.4	20.4	24.5	18.5	
				810	1909.8	26.3	20.3	24.4	18.4	
			3	512	1850.2	24.4	20.1	22.6	18.3	20.9
				661	1880.0	24.3	20.1	22.6	18.3	
				810	1909.8	24.3	20.0	22.6	18.3	

Notes:

The worst-case configuration and mode for SAR testing is determined to be as follows:

- GSM (Voice) + GMSK (GPRS) mode with 1 time slots, based on the Tune-up Procedure.
- SAR is not required for GSM(Voice) + EGPRS (8PSK) mode because its output power is less than that of GSM (Voice) + GMSK (GPRS) mode.

9.2. W-CDMA

Release 99 Setup Procedures used to establish the test signals

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 2
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

HSDPA Setup Procedures used to establish the test signals

The following 4 Sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm 2			
	β_c	2/15	11/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	11/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
MPR (dB)	0	0	0.5	0.5	
HSDPA Specific Settings	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
$A_{hs}=\beta_{hs}/\beta_c$	30/15				

HSPA (HSDPA & HSUPA) Setup Procedures used to establish the test signals

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSPA				
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2 kbps RMC				
	HSDPA FRC	H-Set 1				
	HSUPA Test	HSPA				
	Power Control Algorithm	Algorithm 2				Algorithm 1
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	0
	β_{ec}	209/225	12/15	30/15	2/15	5/15
	β_c/β_d	11/15	6/15	15/9	2/15	15/1
	β_{hs}	22/15	12/15	30/15	4/15	5/15
	β_{ed}	1309/225	94/75	47/15	56/75	47/15
CM (dB)	1	3	2	3	1	
MPR (dB)	0	2	1	2	0	
HSDPA Specific Settings	DACK	8				0
	DNAK	8				0
	DCQI	8				0
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
A _{hs} = β_{hs}/β_c	30/15					
HSUPA Specific Settings	E-DPDCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E-TFCIs	5	5	2	5	1
	Reference E-TFCI	11	11	11	11	67
	Reference E-TFCI PO	4	4	4	4	18
	Reference E-TFCI	67	67	92	67	67
	Reference E-TFCI PO	18	18	18	18	18
	Reference E-TFCI	71	71	71	71	71
	Reference E-TFCI PO	23	23	23	23	23
	Reference E-TFCI	75	75	75	75	75
	Reference E-TFCI PO	26	26	26	26	26
	Reference E-TFCI	81	81	81	81	81
Reference E-TFCI PO	27	27	27	27	27	
Maximum Channelization Codes	2xSF2				SF4	

HSPA+

Since 16QAM is not used for uplink, the uplink Category and release is same as HSUPA, i.e., Rel. 7 Therefore, the RF conducted power is not measured.

W-CDMA Band II Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Max. Pwr (dBm)
W-CDMA Band II	Rel 99	RMC, 12.2 kbps	9262	1852.4	N/A	19.9
			9400	1880.0	N/A	20.0
			9538	1907.6	N/A	19.9
	HSDPA	Subtest 1	9262	1852.4	0	18.2
			9400	1880.0	0	18.5
			9538	1907.6	0	18.3
		Subtest 2	9262	1852.4	0	18.0
			9400	1880.0	0	18.3
			9538	1907.6	0	18.2
		Subtest 3	9262	1852.4	0.5	18.0
			9400	1880.0	0.5	18.2
			9538	1907.6	0.5	18.1
		Subtest 4	9262	1852.4	0.5	18.0
			9400	1880.0	0.5	18.2
			9538	1907.6	0.5	18.1
	HSUPA	Subtest 1	9262	1852.4	0	18.7
			9400	1880.0	0	18.6
			9538	1880.0	0	18.5
		Subtest 2	9262	1880.0	2	16.9
			9400	1880.0	2	16.8
			9538	1880.0	2	16.8
		Subtest 3	9262	1880.0	1	17.7
			9400	1880.0	1	17.8
			9538	1880.0	1	17.7
		Subtest 4	9262	1880.0	2	16.7
			9400	1880.0	2	16.7
			9538	1880.0	2	16.8
Subtest 5		9262	1880.0	0	18.2	
		9400	1880.0	0	18.6	
		9538	1880.0	0	18.4	

W-CDMA Band IV Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Max. Pwr (dBm)	
W-CDMA Band IV	Rel 99	RMC, 12.2 kbps	1312	1712.4	N/A	20.4	
			1413	1732.6	N/A	20.4	
			1513	1752.6	N/A	20.5	
	HSDPA	Subtest 1	1312	1712.4	0	18.9	
			1413	1732.6	0	19.0	
			1513	1752.6	0	19.0	
		Subtest 2	1312	1712.4	0	18.6	
			1413	1732.6	0	18.7	
			1513	1752.6	0	18.7	
		Subtest 3	1312	1712.4	0.5	18.6	
			1413	1732.6	0.5	18.7	
			1513	1752.6	0.5	18.7	
		Subtest 4	1312	1712.4	0.5	18.5	
			1413	1732.6	0.5	18.7	
			1513	1752.6	0.5	18.7	
		HSUPA	Subtest 1	1312	1712.4	0	18.9
				1413	1732.6	0	19.0
				1513	1752.6	0	19.0
	Subtest 2		1312	1712.4	2	17.4	
			1413	1732.6	2	17.5	
			1513	1752.6	2	17.5	
	Subtest 3		1312	1712.4	1	17.9	
			1413	1732.6	1	18.0	
			1513	1752.6	1	18.0	
	Subtest 4		1312	1712.4	2	17.4	
			1413	1732.6	2	17.4	
			1513	1752.6	2	17.5	
	Subtest 5		1312	1712.4	0	18.9	
			1413	1732.6	0	19.0	
			1513	1752.6	0	19.0	

9.3. LTE

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (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
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 ¹	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

LTE Band 2 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						1860 MHz	1880 MHz	1900 MHz
LTE Band 2	20	QPSK	1	0	0	19.1	19.3	19.1
			1	49	0	19.0	19.2	19.1
			1	99	0	19.3	19.3	19.3
			50	0	1	18.1	18.2	18.2
			50	24	1	18.2	18.3	18.2
			50	50	1	18.4	18.3	18.4
		16QAM	100	0	1	18.1	18.3	18.2
			1	0	1	18.6	18.7	18.4
			1	49	1	18.7	18.6	18.5
			1	99	1	18.9	18.7	18.8
			50	0	2	17.2	17.3	17.2
			50	24	2	17.3	17.4	17.2
			50	50	2	17.4	17.4	17.4
			100	0	2	17.3	17.4	17.3
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						1857.5 MHz	1880 MHz	1902.5 MHz
LTE Band 2	15	QPSK	1	0	0	19.2	19.1	19.2
			1	37	0	19.2	19.1	19.0
			1	74	0	19.2	19.2	19.0
			36	0	1	18.0	18.1	18.1
			36	20	1	18.0	18.1	18.0
			36	39	1	18.0	18.1	18.2
		16QAM	75	0	1	17.9	18.1	18.0
			1	0	1	18.2	18.1	18.4
			1	37	1	18.1	17.9	18.3
			1	74	1	18.3	18.0	18.4
			36	0	2	17.1	17.2	17.2
			36	20	2	17.0	17.2	17.1
			36	39	2	17.1	17.2	17.2
			75	0	2	17.0	17.2	17.1
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						1855 MHz	1880 MHz	1905 MHz
LTE Band 2	10	QPSK	1	0	0	19.0	19.1	19.0
			1	25	0	19.0	19.0	19.0
			1	49	0	19.2	19.0	19.1
			25	0	1	18.0	18.1	17.9
			25	12	1	18.0	18.0	18.1
			25	25	1	18.0	17.9	18.0
		16QAM	50	0	1	18.0	18.0	18.1
			1	0	1	18.0	18.4	17.9
			1	25	1	17.8	18.4	17.9
			1	49	1	17.9	18.4	18.1
			25	0	2	17.0	17.1	17.1
			25	12	2	17.1	17.1	17.2
			25	25	2	17.1	17.0	17.1
			50	0	2	17.0	17.1	17.1

LTE Band 2 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						1852.5 MHz	1880 MHz	1907.5 MHz
LTE Band 2	5	QPSK	1	0	0	19.1	19.0	19.0
			1	12	0	19.0	18.9	18.9
			1	24	0	19.1	18.8	19.0
			12	0	1	18.1	17.9	18.0
			12	7	1	18.1	18.0	17.9
			12	13	1	18.1	17.9	17.9
		16QAM	25	0	1	18.1	17.9	17.9
			1	0	1	18.3	18.2	18.4
			1	12	1	18.3	18.1	18.3
			1	24	1	18.3	18.1	18.4
			12	0	2	17.2	17.0	17.1
			12	7	2	17.2	17.1	17.1
			12	13	2	17.2	17.0	17.1
			25	0	2	17.1	17.0	17.0
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						1851.5 MHz	1880 MHz	1908.5 MHz
LTE Band 2	3	QPSK	1	0	0	19.0	18.9	18.8
			1	8	0	19.3	19.1	19.0
			1	14	0	19.1	18.7	18.8
			8	0	1	18.1	17.9	17.9
			8	4	1	18.2	18.0	17.9
			8	7	1	18.1	18.0	18.0
		16QAM	15	0	1	18.2	18.0	17.8
			1	0	1	17.9	18.2	17.9
			1	8	1	18.1	18.4	18.0
			1	14	1	17.8	18.0	17.8
			8	0	2	17.2	16.8	17.1
			8	4	2	17.3	16.9	17.2
			8	7	2	17.2	16.9	17.2
			15	0	2	17.1	17.0	16.9
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						1850.7 MHz	1880 MHz	1909.3 MHz
LTE Band 2	1.4	QPSK	1	0	0	19.0	18.9	18.7
			1	3	0	18.9	19.0	18.8
			1	5	0	18.9	18.9	18.7
			3	0	0	18.8	19.0	18.8
			3	1	0	19.0	19.0	18.8
			3	3	0	18.9	19.0	18.8
		16QAM	6	0	1	17.8	18.0	17.7
			1	0	1	18.0	18.3	17.7
			1	3	1	18.0	18.4	17.8
			1	5	1	17.9	18.3	17.8
			3	0	1	17.8	18.2	17.9
			3	1	1	18.2	18.2	17.9
			3	3	1	18.1	18.2	18.0
			6	0	2	17.0	16.9	16.9

LTE Band 4 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						1732.5 MHz		
LTE Band 4	20	QPSK	1	0	0	20.1		
			1	49	0	20.2		
			1	99	0	20.1		
			50	0	1	19.1		
			50	24	1	19.1		
			50	50	1	19.1		
		16QAM	100	0	1	19.1		
			1	0	1	19.5		
			1	49	1	19.5		
			1	99	1	19.5		
			50	0	2	18.2		
			50	24	2	18.2		
			50	50	2	18.2		
			100	0	2	18.2		

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						1717.5 MHz	1732.5 MHz	1747.5 MHz
LTE Band 4	15	QPSK	1	0	0	20.2	20.0	20.0
			1	37	0	20.1	20.2	20.0
			1	74	0	20.1	19.8	20.1
			36	0	1	19.0	19.0	18.8
			36	20	1	18.9	19.0	18.9
			36	39	1	19.0	19.0	18.9
		16QAM	75	0	1	19.0	19.0	18.9
			1	0	1	19.5	19.0	19.3
			1	37	1	19.3	18.9	19.1
			1	74	1	19.4	18.8	19.4
			36	0	2	18.1	18.1	18.0
			36	20	2	18.0	18.1	18.0
			36	39	2	18.1	18.0	18.0
			75	0	2	18.1	18.0	18.0

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						1715 MHz	1732.5 MHz	1750 MHz
LTE Band 4	10	QPSK	1	0	0	20.4	20.2	20.2
			1	25	0	20.3	20.1	20.1
			1	49	0	20.4	20.1	20.3
			25	0	1	19.3	19.1	19.1
			25	12	1	19.3	19.2	19.2
			25	25	1	19.2	19.0	19.2
		16QAM	50	0	1	19.3	19.0	19.1
			1	0	1	19.3	19.2	19.5
			1	25	1	19.3	19.1	19.5
			1	49	1	19.3	19.0	19.7
			25	0	2	18.5	18.2	18.2
			25	12	2	18.4	18.2	18.2
			25	25	2	18.4	18.1	18.3
			50	0	2	18.4	18.1	18.2

Note(s):
 20 MHz Bandwidths 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 per KDB 941225 D05 SAR for LTE Devices

LTE Band 4 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						1712.5 MHz	1732.5 MHz	1752.5 MHz
LTE Band 4	5	QPSK	1	0	0	20.2	20.1	20.1
			1	12	0	20.3	20.1	20.2
			1	24	0	20.3	20.0	20.3
			12	0	1	19.3	19.1	19.1
			12	7	1	19.4	19.2	19.2
			12	13	1	19.3	19.1	19.1
		25	0	1	19.3	19.1	19.2	
		16QAM	1	0	1	19.4	19.4	19.6
			1	12	1	19.4	19.4	19.7
			1	24	1	19.4	19.2	19.8
			12	0	2	18.4	18.3	18.3
			12	7	2	18.5	18.3	18.4
			12	13	2	18.4	18.2	18.4
			25	0	2	18.3	18.2	18.3
25	0		2	18.3	18.2	18.3		
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						1711.5 MHz	1732.5 MHz	1753.5 MHz
LTE Band 4	3	QPSK	1	0	0	20.2	20.1	20.1
			1	8	0	20.4	20.2	20.3
			1	14	0	20.1	19.9	20.1
			8	0	1	19.2	19.1	19.1
			8	4	1	19.2	19.1	19.2
			8	7	1	19.2	19.0	19.2
		15	0	1	19.2	19.1	19.1	
		16QAM	1	0	1	19.2	19.0	19.5
			1	8	1	19.4	19.1	19.6
			1	14	1	19.2	18.8	19.5
			8	0	2	18.4	18.2	18.1
			8	4	2	18.5	18.3	18.1
			8	7	2	18.5	18.2	18.1
			15	0	2	18.2	18.1	18.2
15	0		2	18.2	18.1	18.2		
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						1710.7 MHz	1732.5 MHz	1754.3 MHz
LTE Band 4	1.4	QPSK	1	0	0	20.2	19.9	20.0
			1	3	0	20.2	19.9	20.0
			1	5	0	20.2	19.9	20.0
			3	0	0	20.2	19.8	20.0
			3	1	0	20.2	19.9	20.0
			3	3	0	20.3	19.9	20.0
		6	0	1	19.1	18.8	18.9	
		16QAM	1	0	1	19.3	19.2	19.0
			1	3	1	19.4	19.3	19.1
			1	5	1	19.3	19.3	19.1
			3	0	1	19.2	19.1	19.2
			3	1	1	19.3	19.1	19.2
			3	3	1	19.3	19.1	19.3
			6	0	2	18.3	17.8	18.2
6	0		2	18.3	17.8	18.2		

LTE Band 12 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						704 MHz	707.5 MHz	711 MHz
LTE Band 12	10	QPSK	1	0	0	24.2	24.0	23.9
			1	25	0	23.8	23.7	23.7
			1	49	0	23.9	23.8	23.8
			25	0	1	22.9	22.8	22.8
			25	12	1	22.8	22.8	22.8
			25	25	1	22.7	22.8	22.8
			50	0	1	22.8	22.8	22.8
		16QAM	1	0	1	23.2	22.7	22.9
			1	25	1	22.9	22.5	22.8
			1	49	1	23.0	22.5	22.8
			25	0	2	21.6	21.6	21.8
			25	12	2	21.5	21.5	21.8
			25	25	2	21.5	21.6	21.9
			50	0	2	21.6	21.5	21.7
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						701.5 MHz	707.5 MHz	713.5 MHz
LTE Band 12	5	QPSK	1	0	0	23.5	23.5	23.6
			1	12	0	23.5	23.5	23.6
			1	24	0	23.4	23.5	23.6
			12	0	1	22.5	22.4	22.5
			12	7	1	22.5	22.5	22.6
			12	13	1	22.4	22.5	22.5
			25	0	1	22.5	22.4	22.5
		16QAM	1	0	1	22.7	23.0	22.6
			1	12	1	22.7	23.0	22.6
			1	24	1	22.6	23.0	22.6
			12	0	2	21.6	21.5	21.6
			12	7	2	21.6	21.6	21.6
			12	13	2	21.5	21.6	21.5
			25	0	2	21.5	21.5	21.5
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						700.5 MHz	707.5 MHz	714.5 MHz
LTE Band 12	3	QPSK	1	0	0	23.5	23.5	23.5
			1	8	0	23.5	23.6	23.5
			1	14	0	23.3	23.5	23.4
			8	0	1	22.5	22.5	22.5
			8	4	1	22.5	22.5	22.5
			8	7	1	22.5	22.5	22.5
			15	0	1	22.6	22.5	22.5
		16QAM	1	0	1	22.3	22.8	22.5
			1	8	1	22.4	22.9	22.6
			1	14	1	22.2	22.9	22.5
			8	0	2	21.6	21.3	21.7
			8	4	2	21.6	21.3	21.7
			8	7	2	21.6	21.4	21.7
			15	0	2	21.6	21.5	21.4

LTE Band 12 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						699.7 MHz	707.5 MHz	715.3 MHz
LTE Band 12	1.4	QPSK	1	0	0	22.9	22.9	22.9
			1	3	0	22.9	22.9	23.0
			1	5	0	22.9	22.9	22.9
			3	0	0	23.5	23.4	23.5
			3	1	0	23.5	23.5	23.6
			3	3	0	23.5	23.5	23.6
			6	0	1	22.4	22.4	22.5
		16QAM	1	0	1	22.5	22.8	22.4
			1	3	1	22.6	22.8	22.5
			1	5	1	22.4	22.7	22.4
			3	0	1	22.5	22.5	22.6
			3	1	1	22.6	22.6	22.7
			3	3	1	22.6	22.6	22.7
			6	0	2	21.6	21.3	21.6

LTE Band 17 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)
						782 MHz
LTE Band 17	10	QPSK	1	0	0	23.7
			1	25	0	23.4
			1	49	0	23.5
			25	0	1	22.6
			25	12	1	22.5
			25	25	1	22.4
			50	0	1	22.6
		16QAM	1	0	1	22.9
			1	25	1	22.4
			1	49	1	22.5
			25	0	2	21.7
			25	12	2	21.5
			25	25	2	21.5
			50	0	2	21.6
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)
						782 MHz
LTE Band 17	5	QPSK	1	0	0	23.7
			1	12	0	23.5
			1	24	0	23.6
			12	0	1	22.6
			12	7	1	22.6
			12	13	1	22.6
			25	0	1	22.6
		16QAM	1	0	1	22.9
			1	12	1	22.8
			1	24	1	22.8
			12	0	2	21.7
			12	7	2	21.7
			12	13	2	21.6
			25	0	2	21.6

Note(s):

10/5 MHz Bandwidths 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 per KDB 941225 D05 SAR for LTE Devices

LTE Band 41 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)				
						2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz
LTE Band 41	20	QPSK	1	0	0	20.4	20.1	20.1	20.1	20.3
			1	49	0	20.1	19.8	20.1	20.1	20.0
			1	99	0	20.4	20.1	20.1	20.4	20.0
			50	0	1	19.2	18.9	20.1	19.0	19.1
			50	24	1	19.2	18.9	20.1	19.1	19.1
			50	50	1	19.2	19.0	20.1	19.2	19.0
		16QAM	100	0	1	19.2	19.0	20.1	19.1	19.1
			1	0	1	19.6	19.3	20.1	19.0	19.3
			1	49	1	19.3	19.0	20.1	18.9	19.0
			1	99	1	19.6	19.3	20.1	19.3	18.9
			50	0	2	18.2	17.9	20.1	18.0	18.1
			50	24	2	18.2	17.9	20.1	18.0	18.1
			50	50	2	18.3	18.0	20.1	18.1	18.0
			100	0	2	18.2	17.9	17.9	18.1	18.1
LTE Band 41	15	QPSK	1	0	0	20.0	19.8	19.7	19.8	20.0
			1	37	0	19.8	19.5	19.6	19.8	19.8
			1	74	0	19.8	19.6	19.5	19.8	19.5
			36	0	1	19.1	18.9	18.9	18.9	18.9
			36	20	1	19.0	18.8	18.7	18.9	18.9
			36	39	1	19.0	18.8	18.7	18.9	18.7
		16QAM	75	0	1	19.0	18.8	18.7	18.9	18.9
			1	0	1	19.2	19.0	18.8	18.9	18.9
			1	37	1	19.0	18.8	18.7	18.9	18.7
			1	74	1	18.9	18.7	18.6	18.8	18.5
			36	0	2	18.1	17.9	17.8	17.9	17.9
			36	20	2	18.1	17.7	17.6	17.9	17.8
			36	39	2	18.0	17.8	17.6	17.9	17.7
			75	0	2	18.1	17.7	17.7	17.9	17.8
LTE Band 41	10	QPSK	1	0	0	20.4	20.4	19.9	20.1	20.3
			1	25	0	20.3	20.3	19.8	20.1	20.2
			1	49	0	20.4	20.4	19.8	20.2	20.1
			25	0	1	19.4	19.4	18.8	19.1	19.2
			25	12	1	19.3	19.4	18.9	19.2	19.1
			25	25	1	19.4	19.4	18.9	19.2	19.0
		16QAM	50	0	1	19.3	19.3	18.9	19.2	19.1
			1	0	1	19.4	19.4	18.8	19.0	19.1
			1	25	1	19.3	19.4	18.7	19.0	19.0
			1	49	1	19.4	19.5	18.7	19.1	18.9
			25	0	2	18.3	18.4	17.8	18.1	18.2
			25	12	2	18.3	18.3	17.8	18.1	18.1
			25	25	2	18.3	18.4	17.8	18.1	18.0
			50	0	2	18.4	18.3	17.8	18.2	18.1

LTE Band 41 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)				
						2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz
LTE Band 41	5	QPSK	1	0	0	20.5	20.5	19.9	20.3	20.1
			1	12	0	20.5	20.5	20.0	20.4	20.2
			1	24	0	20.4	20.5	19.9	20.2	20.0
			12	0	1	19.3	19.3	18.8	19.1	19.0
			12	7	1	19.3	19.3	18.9	19.2	19.0
			12	13	1	19.3	19.3	18.8	19.2	19.0
			25	0	1	19.3	19.3	18.8	19.1	18.9
		16QAM	1	0	1	19.2	19.2	18.7	19.0	19.2
			1	12	1	19.1	19.2	18.9	19.2	19.2
			1	24	1	19.2	19.3	18.8	19.1	19.1
			12	0	2	18.3	18.3	17.7	18.1	18.0
			12	7	2	18.3	18.3	17.8	18.1	18.1
			12	13	2	18.2	18.3	17.8	18.1	18.1
			25	0	2	18.3	18.3	17.8	18.1	18.0

9.4. LTE Carrier Aggregation

PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	PCC UL# RB/Offset	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	LTE Rel 8 Tx. Power [dBm]	LTE Rel 11 Tx. Power [dBm]
Band 41	20	41055	2636.5	RB 1/99	Band 41	20	40620	2593.0	20.42	20.20
Band 41	20	39750	2506.0	RB 1/99	Band 41	20	39948	2525.8	20.40	20.17

Note:

Per KDB 941225 D05A LTE Rel. 10 KDB Inquiry Sheet: SAR is excluded for Carrier Aggregation when measured power does not exceed LTE Release 8 by more than a $\frac{1}{4}$ dBm

9.5. WLAN and Bluetooth

The model FCC ID: PY7-29752M shares the same tune up power targets as model FCC ID: PY7-30637Z for WLAN and Bluetooth operations. For this reason the SAR data for the WLAN and Bluetooth operations for FCC ID: PY7-29752M is considered representative for FCC ID: PY7-30637Z. Refer to §6.6 for Re-use of Test Data.

10. Measured and Reported (Scaled) SAR Results

SAR Test Reduction criteria are as follows:

KDB 447498 D01 General RF Exposure Guidance:

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:

- ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
- ≤ 0.6 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
- ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

KDB 648474 D04 Handset SAR:

With headset attached, when the reported SAR for body-worn accessory, measured without a headset connected to the handset, is > 1.2 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.

KDB 648474 D04 Handset SAR (Phablet Only):

When Hotspot Mode is not supported, 10-g Extremity SAR is required for all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions.

When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

KDB 941225 D01 SAR test for 3G devices:

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

KDB 941225 D05 SAR for LTE Devices:

SAR test reduction is applied using the following criteria:

- Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% RB allocation, using the RB offset and required test channel combination with the highest maximum output power among 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 for other Channels is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
- Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are > 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
- Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
- Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.
- For LTE bands 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; therefore, the requirement for H, M and L channels may not fully apply.

10.1. GSM850

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	GPRS 4 Slots	0	Left Touch	190	836.6	28.2	27.7	0.225	0.255	1
			Left Tilt	190	836.6	28.2	27.7	0.139	0.158	
			Right Touch	190	836.6	28.2	27.7	0.222	0.252	
			Right Tilt	190	836.6	28.2	27.7	0.139	0.158	
Body-worn	GPRS 4 Slots	15	Rear	190	836.6	28.2	27.7	0.230	0.261	2
			Front	190	836.6	28.2	27.7	0.200	0.227	
Hotspot	GPRS 4 Slots	10	Rear	190	836.6	28.2	27.7	0.259	0.294	
			Front	190	836.6	28.2	27.7	0.241	0.274	
			Edge 2	190	836.6	28.2	27.7	0.144	0.163	
			Edge 3	190	836.6	28.2	27.7	0.186	0.211	
			Edge 4	190	836.6	28.2	27.7	0.183	0.208	
Hotspot	DTM (CS+1slot)	10	Rear	190	836.6	31.2	29.6	0.250	0.360	
			Front	190	836.6	31.2	29.6	0.221	0.318	
			Edge 2	190	836.6	31.2	29.6	0.149	0.214	
			Edge 3	190	836.6	31.2	29.6	0.201	0.289	
			Edge 4	190	836.6	31.2	29.6	0.252	0.363	3

10.2. GSM1900

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	GPRS 4 Slots	0	Left Touch	661	1880.0	24.2	23.6	0.054	0.061	
			Left Tilt	661	1880.0	24.2	23.6	0.024	0.027	
			Right Touch	661	1880.0	24.2	23.6	0.074	0.084	4
			Right Tilt	661	1880.0	24.2	23.6	0.029	0.033	
Body-worn	GPRS 4 Slots	15	Rear	661	1880.0	24.2	23.6	0.212	0.241	5
			Front	661	1880.0	24.2	23.6	0.160	0.182	
Hotspot	GPRS 4 Slots	10	Rear	661	1880.0	24.2	23.6	0.458	0.521	
			Front	661	1880.0	24.2	23.6	0.344	0.391	
			Edge 2	661	1880.0	24.2	23.6	0.045	0.051	
			Edge 3	661	1880.0	24.2	23.6	0.392	0.446	
			Edge 4	661	1880.0	24.2	23.6	0.106	0.121	
Hotspot	DTM (CS+1slot)	10	Rear	661	1880.0	27.0	26.5	0.502	0.565	6
			Front	661	1880.0	27.0	26.5	0.309	0.348	
			Edge 2	661	1880.0	27.0	26.5	0.046	0.052	
			Edge 3	661	1880.0	27.0	26.5	0.396	0.445	
			Edge 4	661	1880.0	27.0	26.5	0.106	0.119	

10.3. W-CDMA Band II

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Rel 99 RMC	0	Left Touch	9400	1880.0	20.0	20.0	0.062	0.062	
			Left Tilt	9400	1880.0	20.0	20.0	0.033	0.033	
			Right Touch	9400	1880.0	20.0	20.0	0.094	0.094	7
			Right Tilt	9400	1880.0	20.0	20.0	0.030	0.030	
Body-worn	Rel 99 RMC	15	Rear	9400	1880.0	20.0	20.0	0.216	0.216	8
			Front	9400	1880.0	20.0	20.0	0.155	0.155	
Hotspot	Rel 99 RMC	10	Rear	9400	1880.0	20.0	20.0	0.490	0.490	9
			Front	9400	1880.0	20.0	20.0	0.347	0.347	
			Edge 2	9400	1880.0	20.0	20.0	0.042	0.042	
			Edge 3	9400	1880.0	20.0	20.0	0.381	0.381	
			Edge 4	9400	1880.0	20.0	20.0	0.102	0.102	

10.4. W-CDMA Band IV

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Rel 99 RMC	0	Left Touch	1413	1732.6	20.5	20.4	0.057	0.058	
			Left Tilt	1413	1732.6	20.5	20.4	0.024	0.024	
			Right Touch	1413	1732.6	20.5	20.4	0.079	0.080	10
			Right Tilt	1413	1732.6	20.5	20.4	0.016	0.016	
Body-worn	Rel 99 RMC	15	Rear	1413	1732.6	20.5	20.4	0.217	0.220	11
			Front	1413	1732.6	20.5	20.4	0.174	0.176	
Hotspot	Rel 99 RMC	10	Rear	1413	1732.6	20.5	20.4	0.484	0.491	12
			Front	1413	1732.6	20.5	20.4	0.401	0.407	
			Edge 2	1413	1732.6	20.5	20.4	0.029	0.030	
			Edge 3	1413	1732.6	20.5	20.4	0.445	0.451	
			Edge 4	1413	1732.6	20.5	20.4	0.116	0.118	

10.5. LTE Band 2 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	18900	1880.0	1	99	20.0	19.3	0.041	0.048	
						50	24	19.0	18.3	0.030	0.035	
			Left Tilt	18900	1880.0	1	99	20.0	19.3	0.021	0.025	
						50	24	19.0	18.3	0.015	0.018	
			Right Touch	18900	1880.0	1	99	20.0	19.3	0.054	0.063	13
						50	24	19.0	18.3	0.044	0.052	
			Right Tilt	18900	1880.0	1	99	20.0	19.3	0.019	0.022	
						50	24	19.0	18.3	0.016	0.019	
Body-worn	QPSK	15	Rear	18900	1880.0	1	99	20.0	19.3	0.192	0.226	14
						50	24	19.0	18.3	0.148	0.174	
			Front	18900	1880.0	1	99	20.0	19.3	0.160	0.188	
						50	24	19.0	18.3	0.114	0.134	
Hotspot	QPSK	10	Rear	18900	1880.0	1	99	20.0	19.3	0.433	0.509	15
						50	24	19.0	18.3	0.322	0.378	
			Front	18900	1880.0	1	99	20.0	19.3	0.312	0.367	
						50	24	19.0	18.3	0.247	0.290	
			Edge 2	18900	1880.0	1	99	20.0	19.3	0.043	0.051	
						50	24	19.0	18.3	0.030	0.035	
			Edge 3	18900	1880.0	1	99	20.0	19.3	0.326	0.383	
						50	24	19.0	18.3	0.250	0.293	
			Edge 4	18900	1880.0	1	99	20.0	19.3	0.090	0.106	
						50	24	19.0	18.3	0.062	0.073	

10.6. LTE Band 4 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	20175	1732.5	1	49	21.0	20.2	0.047	0.057	
						50	24	20.0	19.1	0.040	0.049	
			Left Tilt	20175	1732.5	1	49	21.0	20.2	0.018	0.022	
						50	24	20.0	19.1	0.012	0.015	
			Right Touch	20175	1732.5	1	49	21.0	20.2	0.061	0.074	16
						50	24	20.0	19.1	0.052	0.063	
Right Tilt	20175	1732.5	1	49	21.0	20.2	0.015	0.018				
			50	24	20.0	19.1	0.011	0.013				
Body-worn	QPSK	15	Rear	20175	1732.5	1	49	21.0	20.2	0.257	0.312	17
						50	24	20.0	19.1	0.174	0.212	
			Front	20175	1732.5	1	49	21.0	20.2	0.224	0.272	
						50	24	20.0	19.1	0.152	0.185	
Hotspot	QPSK	10	Rear	20175	1732.5	1	49	21.0	20.2	0.430	0.522	
						50	24	20.0	19.1	0.349	0.425	
			Front	20175	1732.5	1	49	21.0	20.2	0.362	0.439	
						50	24	20.0	19.1	0.296	0.361	
			Edge 2	20175	1732.5	1	49	21.0	20.2	0.030	0.036	
						50	24	20.0	19.1	0.024	0.029	
			Edge 3	20175	1732.5	1	49	21.0	20.2	0.484	0.587	18
						50	24	20.0	19.1	0.392	0.478	
			Edge 4	20175	1732.5	1	49	21.0	20.2	0.119	0.144	
						50	24	20.0	19.1	0.097	0.118	

10.7. LTE Band 12 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	23095	707.5	1	0	24.5	24.0	0.082	0.092	19
						25	0	23.5	22.8	0.063	0.074	
			Left Tilt	23095	707.5	1	0	24.5	24.0	0.045	0.050	
						25	0	23.5	22.8	0.034	0.040	
			Right Touch	23095	707.5	1	0	24.5	24.0	0.065	0.073	
						25	0	23.5	22.8	0.051	0.060	
Right Tilt	23095	707.5	1	0	24.5	24.0	0.038	0.043				
			25	0	23.5	22.8	0.030	0.035				
Body-worn	QPSK	15	Rear	23095	707.5	1	0	24.5	24.0	0.130	0.146	20
						25	0	23.5	22.8	0.099	0.116	
			Front	23095	707.5	1	0	24.5	24.0	0.127	0.142	
						25	0	23.5	22.8	0.094	0.111	
Hotspot	QPSK	10	Rear	23095	707.5	1	0	24.5	24.0	0.140	0.157	
						25	0	23.5	22.8	0.107	0.126	
			Front	23095	707.5	1	0	24.5	24.0	0.138	0.155	
						25	0	23.5	22.8	0.101	0.119	
			Edge 2	23095	707.5	1	0	24.5	24.0	0.092	0.103	
						25	0	23.5	22.8	0.076	0.089	
			Edge 3	23095	707.5	1	0	24.5	24.0	0.052	0.058	
						25	0	23.5	22.8	0.042	0.049	
			Edge 4	23095	707.5	1	0	24.5	24.0	0.217	0.243	21
						25	0	23.5	22.8	0.181	0.213	

10.8. LTE Band 17 (10MHz Bandwidth)

SAR for LTE Band 17 (Frequency range: 704-716 MHz) is covered by LTE Band 12 (Frequency range: 699-716 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

10.9. LTE Band 41 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	40620	2593.0	1	0	21.5	20.1	0.116	0.159	
						50	0	20.5	18.9	0.079	0.113	
			Left Tilt	40620	2593.0	1	0	21.5	20.1	0.052	0.071	
						50	0	20.5	18.9	0.041	0.059	
			Right Touch	40620	2593.0	1	0	21.5	20.1	0.241	0.330	22
						50	0	20.5	18.9	0.182	0.261	
			Right Tilt	40620	2593.0	1	0	21.5	20.1	0.046	0.063	
						50	0	20.5	18.9	0.036	0.052	
Body-worn	QPSK	15	Rear	40620	2593.0	1	0	21.5	20.1	0.115	0.158	
						50	0	20.5	18.9	0.087	0.125	
			Front	40620	2593.0	1	0	21.5	20.1	0.122	0.167	23
						50	0	20.5	18.9	0.091	0.131	
Hotspot	QPSK	10	Rear	40620	2593.0	1	0	21.5	20.1	0.239	0.328	
						50	0	20.5	18.9	0.183	0.263	
			Front	26865	831.5	1	0	21.5	20.1	0.287	0.393	24
						36	0	20.5	18.9	0.218	0.313	
			Edge 2	40620	2593.0	1	0	21.5	20.1	0.116	0.159	
						50	0	20.5	18.9	0.089	0.127	
			Edge 3	40620	2593.0	1	0	21.5	20.1	0.071	0.097	
						50	0	20.5	18.9	0.054	0.078	
			Edge 4	40620	2593.0	1	0	21.5	20.1	0.023	0.032	
						50	0	20.5	18.9	0.011	0.016	

10.10. WLAN and Bluetooth

According to the manufacturer attestation letter, FCC ID: PY7-29752M and FCC ID: PY7-30637Z unlicensed radios (WLAN/BT/BLE) are electronically identical. They share the same chipset, same power and same antenna performance including antenna gain. Therefore, FCC ID: PY7-30637Z is able to leverage test data from FCC ID: PY7-29752M. Refer to §6.6 for Re-use of Test Data.

The Wi-Fi and Bluetooth results (measured or estimated) from the original filling are used for Simultaneous Transmission Analysis purposes.

11. SAR Measurement Variability

In accordance with published RF Exposure KDB 865664 D01 SAR measurement 100 MHz to 6 GHz. These 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 <0.8 or 2 W/kg (1-g or 10-g respectively); steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is ≥ 0.8 or 2 W/kg (1-g or 10-g respectively), 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 3 (1-g or 10-g respectively) or when the original or repeated measurement is ≥ 1.45 or 3.6 W/kg ($\sim 10\%$ from the 1-g or 10-g respective SAR limit).
- 4) Perform a third repeated measurement only if the original, first, or second repeated measurement is ≥ 1.5 or 3.75 W/kg (1-g or 10-g respectively) and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 or 3 (1-g or 10-g respectively).

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)
700	LTE Band 12	Hotspot	Edge 4	No	0.243
850	GSM 850	Hotspot	Rear	No	0.259
1700	LTE Band 4	Hotspot	Edge 3	No	0.484
	WCDMA Band IV	Hotspot	Rear	No	0.484
1900	GSM 1900	Hotspot	Rear	No	0.502
	WCDMA Band II	Hotspot	Rear	No	0.490
	LTE Band 2	Hotspot	Rear	No	0.509
2600	LTE Band 41	Hotspot	Front	No	0.287

Note(s):

Repeated measurement is not required when the original highest measured SAR is <0.8 (1-g).

12. Simultaneous Transmission SAR Analysis

Simultaneous Transmission Condition

Case	Cellular	WLAN/BT Main	WLAN/BT Sub	Note
1		BT/BLE	(None)	
2	GSM/GPRS/EDGE	WLAN 2.4G	WLAN 2.4G	
3		WLAN 5G	WLAN 5G	
4		BT/BLE	(None)	
5	UMTS/HSPA	WLAN 2.4G	WLAN 2.4G	
6		WLAN 5G	WLAN 5G	
7		BT/BLE	(None)	
8	LTE	WLAN 2.4G	WLAN 2.4G	
9		WLAN 5G	WLAN 5G	
10	(None)	BT/BLE WLAN 5G	WLAN 5G	
11	GSM/GPRS/EDGE	BT/BLE WLAN 5G	WLAN 5G	
12	UMTS/HSPA	BT/BLE WLAN 5G	WLAN 5G	
13	LTE	BT/BLE WLAN 5G	WLAN 5G	
14	GSM/GPRS/EDGE	WLAN 2.4G	WLAN 5G	
15		WLAN 5G	WLAN 2.4G	
16	UMTS/HSPA	WLAN 2.4G	WLAN 5G	
17		WLAN 5G	WLAN 2.4G	
18	LTE	WLAN 2.4G	WLAN 5G	
19		WLAN 5G	WLAN 2.4G	

All Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR test report 16J23633A-S1V3, submitted under FCC ID: PY7-29752M. Refer to §6.6.4 for Reference Details.

12.1. Sum of the SAR for GSM850 & Wi-Fi & BT

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						Σ 1-g SAR (W/kg)						
		WWAN		DTS		U-NII		BT	WWAN + DTS	WWAN + U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+U-NII+BT	WWAN+DTS+U-NII+BT
		①	Chain 0 ②	Chain 1 ③	Chain 0 ④	Chain 1 ⑤	⑥	①+②+③	①+④+⑤	①+②+⑤	①+③+④	①+④+⑤+⑥	①+③+④+⑥	
Head	Left Touch	0.255	0.629	0.377	0.810	0.322		1.261	1.387	1.206	1.442			
	Left Tilt	0.158	0.629	0.377	0.810	0.322		1.164	1.290	1.109	1.345			
	Right Touch	0.252	0.196	0.377	0.166	0.322		0.825	0.740	0.770	0.795			
	Right Tilt	0.158	0.196	0.377	0.166	0.322		0.731	0.646	0.676	0.701			
Body-worn	Rear	0.261	0.055	0.126	0.039	0.107	0.210	0.442	0.407	0.423	0.426	0.617	0.636	
	Front	0.227	0.055	0.126	0.039	0.107	0.210	0.408	0.373	0.389	0.392	0.583	0.602	
Hotspot	Rear	0.360	0.125	0.189				0.674	0.360	0.485	0.549			
	Front	0.318	0.125	0.189				0.632	0.318	0.443	0.507			
	Edge 1		0.125	0.189				0.314		0.125	0.189			
	Edge 2	0.214	0.125	0.189				0.528	0.214	0.339	0.403			
	Edge 3	0.289						0.289	0.289	0.289	0.289			
	Edge 4	0.363						0.363	0.363	0.363	0.363			

12.2. Sum of the SAR for GSM1900 & Wi-Fi & BT

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						Σ 1-g SAR (W/kg)						
		WWAN		DTS		U-NII		BT	WWAN + DTS	WWAN + U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+U-NII+BT	WWAN+DTS+U-NII+BT
		①	Chain 0 ②	Chain 1 ③	Chain 0 ④	Chain 1 ⑤	⑥	①+②+③	①+④+⑤	①+②+⑤	①+③+④	①+④+⑤+⑥	①+③+④+⑥	
Head	Left Touch	0.061	0.629	0.377	0.810	0.322		1.067	1.193	1.012	1.248			
	Left Tilt	0.027	0.629	0.377	0.810	0.322		1.033	1.159	0.978	1.214			
	Right Touch	0.084	0.196	0.377	0.166	0.322		0.657	0.572	0.602	0.627			
	Right Tilt	0.033	0.196	0.377	0.166	0.322		0.606	0.521	0.551	0.576			
Body-worn	Rear	0.241	0.055	0.126	0.039	0.107	0.210	0.422	0.387	0.403	0.406	0.597	0.616	
	Front	0.182	0.055	0.126	0.039	0.107	0.210	0.363	0.328	0.344	0.347	0.538	0.557	
Hotspot	Rear	0.565	0.125	0.189				0.879	0.565	0.690	0.754			
	Front	0.348	0.125	0.189				0.662	0.348	0.473	0.537			
	Edge 1		0.125	0.189				0.314		0.125	0.189			
	Edge 2	0.052	0.125	0.189				0.366	0.052	0.177	0.241			
	Edge 3	0.445						0.445	0.445	0.445	0.445			
	Edge 4	0.119						0.119	0.119	0.119	0.119			

12.3. Sum of the SAR for WCDMA Band II & Wi-Fi & BT

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						Σ 1-g SAR (W/kg)						
		WWAN		DTS		U-NII		BT	WWAN + DTS	WWAN + U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+U-NII+BT	WWAN+DTS+U-NII+BT
		①	Chain 0 ②	Chain 1 ③	Chain 0 ④	Chain 1 ⑤	⑥	①+②+③	①+④+⑤	①+②+⑤	①+③+④	①+④+⑤+⑥	①+③+④+⑥	
Head	Left Touch	0.062	0.629	0.377	0.810	0.322		1.068	1.194	1.013	1.249			
	Left Tilt	0.033	0.629	0.377	0.810	0.322		1.039	1.165	0.984	1.220			
	Right Touch	0.094	0.196	0.377	0.166	0.322		0.667	0.582	0.612	0.637			
	Right Tilt	0.030	0.196	0.377	0.166	0.322		0.603	0.518	0.548	0.573			
Body-worn	Rear	0.216	0.055	0.126	0.039	0.107	0.210	0.397	0.362	0.378	0.381	0.572	0.591	
	Front	0.155	0.055	0.126	0.039	0.107	0.210	0.336	0.301	0.317	0.320	0.511	0.530	
Hotspot	Rear	0.490	0.125	0.189				0.804	0.490	0.615	0.679			
	Front	0.347	0.125	0.189				0.661	0.347	0.472	0.536			
	Edge 1		0.125	0.189				0.314		0.125	0.189			
	Edge 2	0.042	0.125	0.189				0.356	0.042	0.167	0.231			
	Edge 3	0.381						0.381	0.381	0.381	0.381			
	Edge 4	0.102						0.102	0.102	0.102	0.102			

12.4. Sum of the SAR for WCDMA Band IV & Wi-Fi & BT

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						Σ 1-g SAR (W/kg)						
		WWAN		DTS		U-NII		BT	WWAN + DTS	WWAN + U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+U-NII+BT	WWAN+DTS+U-NII+BT
		①	Chain 0 ②	Chain 1 ③	Chain 0 ④	Chain 1 ⑤	⑥	①+②+③	①+④+⑤	①+②+⑤	①+③+④	①+④+⑤+⑥	①+③+④+⑥	
Head	Left Touch	0.058	0.629	0.377	0.810	0.322		1.064	1.190	1.009	1.245			
	Left Tilt	0.024	0.629	0.377	0.810	0.322		1.030	1.156	0.975	1.211			
	Right Touch	0.080	0.196	0.377	0.166	0.322		0.653	0.568	0.598	0.623			
	Right Tilt	0.016	0.196	0.377	0.166	0.322		0.589	0.504	0.534	0.559			
Body-worn	Rear	0.220	0.055	0.126	0.039	0.107	0.210	0.401	0.366	0.382	0.385	0.576	0.595	
	Front	0.176	0.055	0.126	0.039	0.107	0.210	0.357	0.322	0.338	0.341	0.532	0.551	
Hotspot	Rear	0.491	0.125	0.189				0.805	0.491	0.616	0.680			
	Front	0.407	0.125	0.189				0.721	0.407	0.532	0.596			
	Edge 1		0.125	0.189				0.314		0.125	0.189			
	Edge 2	0.030	0.125	0.189				0.344	0.030	0.155	0.219			
	Edge 3	0.451						0.451	0.451	0.451	0.451			
	Edge 4	0.118						0.118	0.118	0.118	0.118			

12.5. Sum of the SAR for LTE Band 2 & Wi-Fi & BT

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						Σ 1-g SAR (W/kg)					
		WWAN	DTS		U-NII		BT	WWAN + DTS	WWAN + U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+U-NII+BT	WWAN+DTS+U-NII+BT
		①	Chain 0 ②	Chain 1 ③	Chain 0 ④	Chain 1 ⑤	⑥	①+②+③	①+④+⑤	①+②+⑤	①+③+④	①+④+⑤+⑥	①+③+④+⑥
Head	Left Touch	0.048	0.629	0.377	0.810	0.322		1.054	1.180	0.999	1.235		
	Left Tilt	0.025	0.629	0.377	0.810	0.322		1.031	1.157	0.976	1.212		
	Right Touch	0.063	0.196	0.377	0.166	0.322		0.636	0.551	0.581	0.606		
	Right Tilt	0.022	0.196	0.377	0.166	0.322		0.595	0.510	0.540	0.565		
Body-worn	Rear	0.226	0.055	0.126	0.039	0.107	0.210	0.407	0.372	0.388	0.391	0.582	0.601
	Front	0.188	0.055	0.126	0.039	0.107	0.210	0.369	0.334	0.350	0.353	0.544	0.563
Hotspot	Rear	0.509	0.125	0.189				0.823	0.509	0.634	0.698		
	Front	0.367	0.125	0.189				0.681	0.367	0.492	0.556		
	Edge 1		0.125	0.189				0.314		0.125	0.189		
	Edge 2	0.051	0.125	0.189				0.365	0.051	0.176	0.240		
	Edge 3	0.383						0.383	0.383	0.383	0.383		
	Edge 4	0.106						0.106	0.106	0.106	0.106		

12.6. Sum of the SAR for LTE Band 4 & Wi-Fi & BT

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						Σ 1-g SAR (W/kg)					
		WWAN	DTS		U-NII		BT	WWAN + DTS	WWAN + U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+U-NII+BT	WWAN+DTS+U-NII+BT
		①	Chain 0 ②	Chain 1 ③	Chain 0 ④	Chain 1 ⑤	⑥	①+②+③	①+④+⑤	①+②+⑤	①+③+④	①+④+⑤+⑥	①+③+④+⑥
Head	Left Touch	0.057	0.629	0.377	0.810	0.322		1.063	1.189	1.008	1.244		
	Left Tilt	0.022	0.629	0.377	0.810	0.322		1.028	1.154	0.973	1.209		
	Right Touch	0.074	0.196	0.377	0.166	0.322		0.647	0.562	0.592	0.617		
	Right Tilt	0.018	0.196	0.377	0.166	0.322		0.591	0.506	0.536	0.561		
Body-worn	Rear	0.312	0.055	0.126	0.039	0.107	0.210	0.493	0.458	0.474	0.477	0.668	0.687
	Front	0.272	0.055	0.126	0.039	0.107	0.210	0.453	0.418	0.434	0.437	0.628	0.647
Hotspot	Rear	0.522	0.125	0.189				0.836	0.522	0.647	0.711		
	Front	0.439	0.125	0.189				0.753	0.439	0.564	0.628		
	Edge 1		0.125	0.189				0.314		0.125	0.189		
	Edge 2	0.036	0.125	0.189				0.350	0.036	0.161	0.225		
	Edge 3	0.587						0.587	0.587	0.587	0.587		
	Edge 4	0.144						0.144	0.144	0.144	0.144		

12.7. Sum of the SAR for LTE Band 12 & Wi-Fi & BT

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						Σ 1-g SAR (W/kg)					
		WWAN	DTS		U-NII		BT	WWAN + DTS	WWAN + U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+U-NII+BT	WWAN+DTS+U-NII+BT
		①	Chain 0 ②	Chain 1 ③	Chain 0 ④	Chain 1 ⑤	⑥	①+②+③	①+④+⑤	①+②+⑤	①+③+④	①+④+⑤+⑥	①+③+④+⑥
Head	Left Touch	0.092	0.629	0.377	0.810	0.322		1.098	1.224	1.043	1.279		
	Left Tilt	0.050	0.629	0.377	0.810	0.322		1.056	1.182	1.001	1.237		
	Right Touch	0.073	0.196	0.377	0.166	0.322		0.646	0.561	0.591	0.616		
	Right Tilt	0.043	0.196	0.377	0.166	0.322		0.616	0.531	0.561	0.586		
Body-worn	Rear	0.146	0.055	0.126	0.039	0.107	0.210	0.327	0.292	0.308	0.311	0.502	0.521
	Front	0.142	0.055	0.126	0.039	0.107	0.210	0.323	0.288	0.304	0.307	0.498	0.517
Hotspot	Rear	0.157	0.125	0.189				0.471	0.157	0.282	0.346		
	Front	0.155	0.125	0.189				0.469	0.155	0.280	0.344		
	Edge 1		0.125	0.189				0.314		0.125	0.189		
	Edge 2	0.103	0.125	0.189				0.417	0.103	0.228	0.292		
	Edge 3	0.058						0.058	0.058	0.058	0.058		
	Edge 4	0.243						0.243	0.243	0.243	0.243		

12.8. Sum of the SAR for LTE Band 41 & Wi-Fi & BT

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						Σ 1-g SAR (W/kg)					
		WWAN	DTS		U-NII		BT	WWAN + DTS	WWAN + U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+U-NII+BT	WWAN+DTS+U-NII+BT
		①	Chain 0 ②	Chain 1 ③	Chain 0 ④	Chain 1 ⑤	⑥	① + ② + ③	① + ④ + ⑤	① + ② + ⑤	① + ③ + ④	① + ④ + ⑤ + ⑥	① + ③ + ④ + ⑥
Head	Left Touch	0.159	0.629	0.377	0.810	0.322		1.165	1.291	1.110	1.346		
	Left Tilt	0.071	0.629	0.377	0.810	0.322		1.077	1.203	1.022	1.258		
	Right Touch	0.330	0.196	0.377	0.166	0.322		0.903	0.818	0.848	0.873		
	Right Tilt	0.063	0.196	0.377	0.166	0.322		0.636	0.551	0.581	0.606		
Body-worn	Rear	0.158	0.055	0.126	0.039	0.107	0.210	0.339	0.304	0.320	0.323	0.514	0.533
	Front	0.167	0.055	0.126	0.039	0.107	0.210	0.348	0.313	0.329	0.332	0.523	0.542
Hotspot	Rear	0.328	0.125	0.189				0.642	0.328	0.453	0.517		
	Front	0.393	0.125	0.189				0.707	0.393	0.518	0.582		
	Edge 1		0.125	0.189				0.314		0.125	0.189		
	Edge 2	0.159	0.125	0.189				0.473	0.159	0.284	0.348		
	Edge 3	0.097						0.097	0.097	0.097	0.097		
	Edge 4	0.032						0.032	0.032	0.032	0.032		

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because either the sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is ≤ 0.04 for all circumstances that require SPLSR calculation.

Appendixes

Refer to separated files for the following appendixes.

16J23633Y -S1V2 SAR_App A Setup Photos and Ant locations

16J23633Y -S1V1 SAR_App B System Check Plots

16J23633Y -S1V2 SAR_App C Highest Test Plots

16J23633Y -S1V1 SAR_App D Tissue Ingredients

16J23633Y -S1V1 SAR_App E Probe Cal. Certificates

16J23633Y -S1V2 SAR_App F Dipole Cal. Certificates

END OF REPORT