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SAR Test Report

Report Number: M141025R_FCC_EM7355_SAR_GSM-UMTS
This report is a replacement for the M141025_FCC_EM7355_SAR_GSM-UMTS report

Test Sample:	Sierra WWAN Module EM7355
Radio Modules Under Test:	WWAN EM7355, WLAN/Bluetooth Combo
Host PC Model:	Fujitsu Lifebook T725
WWAN FCC ID:	EJE-EM7355D
WWAN IC:	337J-EM7355D
Date of Issue:	4th December 2014

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SAR TEST REPORT

Report Number: M141025R_FCC_EM7355_SAR_GSM-UMTS
WWAN FCC ID: EJE-EM7355D Canada IC: 337J-EM7355D

1.0 GENERAL INFORMATION

Test Sample:	Portable Notebook Computer with Intel or Atheros WLAN Modules
Radio Module Under Test:	EM7355
Interface Type:	Mini-PCI Module
Device Category:	Portable Transmitter
Test Device:	Pre-Production Unit
Host PC model:	Lifebook T725
WWAN FCC ID:	EJE-EM7355D
WWAN IC:	337J-EM7355D
RF exposure Category:	General Population/Uncontrolled
Manufacturer:	Fujitsu Limited

Test Standard/s:

1. 447498 D01 General RF Exposure Guidance v05r02
   616217 D04 SAR for laptop and tablets v01r01
   941225 D01 SAR test for 3G devices v03
   941225 D05 SAR for LTE Devices v02r03
   865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03
   865664 D02 RF Exposure Reporting v01r01
2. Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) RSS-102
3. **EN 62209-2:2010**
   Human exposure to radio frequency fields from hand-held and bodymounted wireless communication devices. Human models, instrumentation, and procedures.
   Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)
4. **IEEE 1528: 2013**
   Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head Due to Wireless Communications Devices: Measurement Techniques.

Statement Of Compliance: The Fujitsu Notebook Computer Lifebook T725 with Sierra Wireless GSM/UMTS/LTE Module EM7355 complied with the FCC General public/uncontrolled RF exposure limits of 1.6mW/g per requirements of 47CFR2.1093(d). It also complied with IC RSS-102 requirements.

Highest Reported SAR: 850 MHz GSM Band - **1.404** mW/g mW/g

Test Dates: 29th October to 26th November 2014

Test Officer:

Peter Jakubiec	**Emad Mansour**	**Mahan Ghassempouri**

Authorised Signature:

Chris Zombolas
Technical Director

SAR TEST REPORT
Portable Notebook Computer
Model: Lifebook T725
Report Number: M141025R_FCC_EM7355_SAR_GSM-UMTS

2.0 INTRODUCTION

Testing was performed on the Fujitsu Notebook PC, Model: Lifebook T725 with SIERRA Mini-PCI Wireless WAN Module Model: EM7355, with INTEL Mini-PCI Wireless LAN/Bluetooth combo Module (Stone Peak 802.11a/b/g/n/ac), Model: 7265NGW. The EM7355 module is an OEM product. The Mini-PCI Wireless WAN (WWAN) was tested in the dedicated host – Model Lifebook T725. The system tested will be referred to as the DUT throughout this report.

3.0 TEST SAMPLE TECHNICAL INFORMATION

(Information supplied by the client)

3.1 WWAN Details

Transmitter:	Mini-Card Wireless WAN Module
FCC ID:	EJE-EM7355D
IC:	337J-EM7355D
Wireless Module:	WWAN (UMTS/EVDO/LTE combo)
Model Number:	EM7355
Manufacturer:	SIERRA WIRELESS INC
Modulation Type:	TDMA for GSM/GPRS QPSK and QAM for UMTS QPSK and 16-QAM for LTE CDMA for 1xRTT, QPSK and 8-PSK for EvDo
GSM Frequency Bands:	850 / 1900 MHz
UMTS Frequency Bands:	Band II (1900MHz)/Band IV (1700MHz)/Band V (835MHz)
CDMA bands:	Band BC0 (850 MHz)/Band BC10 (850 MHz)/Band BC1 (1900 MHz)
LTE bands:	Band IV (1700MHz)/ Band XIII (750MHz)/Band XVII (700MHz)/ Band XXV (1900MHz)
Antenna type:	Main: Monopole, AUX: PIFA
Antenna Manufacturer:	NISSEI ELECTRIC CO. LTD.
Antenna Part Number:	Main: CP519214, AUX: CP519215
Output Power:	32.5 ± 1 dBm in 850 MHz GPRS/27 ± 1 dBm in 850 MHz EGPRS 29.5 ± 1 dBm in 1900 MHz GPRS/26 ± 1 dBm in 1900 MHz EGPRS 23 ± 1 dBm in UMTS bands 24 +0.5/-1 dBm in CDMA bands 23 ± 1 dBm in LTE bands

3.2 Test Signal, Frequency and Output Power

The DUT was provided by Fujitsu Limited It was put into operation using a Rohde & Schwarz CMU200 and Agilent PXT E6621A (LTE) Radio Communication Testers. The channels utilised in the measurements were the traffic channels shown in the table below. The power level was set to Class 4 for 850 MHz and Class 1 for 1900 MHz GSM bands, class 3 for 850, 1700 and 1900 MHz UMTS bands, Power Class 3 for the 850 MHz (BC0/BC10) Power Class 2 1900 MHz (BC1) CDMA bands and class 3 for 700, 750, 1700 and 1900 MHz LTE bands.

Channels and Output power:

Table 1

Channel and Mode	Frequency MHz	Average Output Power dBm
GPRS Mode		
Channels 128, 190 and 251	824.2, 836.6 and 848.8	32.5 (+/- 1dB)
Channels 512, 661 and 810	1850.2, 1880 and1909.8	29.5 (+/- 1dB)
UMTS Mode		
Channels 4132, 4183 and 4233	826.4, 836.6 and 846.6	23 (+/- 1dB)
Channels 1312, 1427 and 1513	1712.4, 1735.4 and 1752.6	23 (+/- 1dB)
Channels 9262, 9400 and 9538	1852.4, 1880 and 1907.6	23 (+/- 1dB)
CDMA Mode		
Channels 1013, 384 and 777	824.7, 836.52 and 848.31	24 (+0.5/-1dB)
Channels 476, 560 and 684	817.9, 820 and 823.1	24 (+0.5/-1dB)
Channels 25, 600 and 1175	1851.25, 1880 and 1908.75	24 (+0.5/-1dB)
LTE Mode		
Channels 23780, 23790 and 23800	709, 710 and 711	23 (+/- 1dB)
Channels 23230	782	23 (+/- 1dB)
Channels 20050, 20175 and 20300	1720, 1732.5 and 1745	23 (+/- 1dB)
Channels 26140, 26365 and 26590	1860, 1882.5 and 1905	23 (+/- 1dB)

3.3 DUT (Notebook PC) Details

DUT:	LIFEBOOK T series
Model Name:	T725
Serial Number:	Pre-production Sample
Manufacturer:	FUJITSU LIMITED
CPU Type and Speed:	Core i7 2.6GHz
LCD	12.5"HD+(1366x768) : LP125WH2
Graphics chip	None
Wired LAN:	Intel 218LM : 10 Base-T/100 Base-TX/1000Base-T
Modem:	None
Port Replicator Model:	FPCPR213
AC Adapter Model:	90W: A13-090P1A(Chicony), A13-090P2A (Chicony) ADP-90BE D(Delta), ADP-90BE C(Delta) 80W: ADP-80SB A(Delta), ADP-80SB B(Delta) 65W: ADP-65MD B(Delta), ADP-65MD C(Delta) A13-065N2A(Chicony), A13-065N3A(Chicony)
Voltage:	19 V
Current Specs:	4.74A / 4.22A / 3.42A
Watts:	90W / 80W / 65W

3.4 WLAN Details

Transmitter:	M.2 Wireless LAN Module (WLAN parts)
Wireless Module:	Intel Dual Band Wireless-AC 7265 (Stone Peak) (11ac/abgn)
Model Number:	7265NGW
Manufacturer:	Intel Corporation
Wi-Fi standard	802.11ac 2x2
Wi-Fi TX/RX chains	2x2 chains
Supported Bands	2.4GHz, 5GHz
Antenna Allocation	Main: Wi-Fi only, Aux: Shared Wi-Fi, BT
Wi-Fi TX/RX Throughput	867Mbps
Bluetooth Core	Bluetooth 4.0
Antenna Types:	Nissei Inverted F antenna
Power Supply:	3.3 VDC from PCI bus

3.5 Test sample Accessories

3.5.1 Battery Types

One type of Fujitsu Lithium Ion battery is used to power the DUT.

Standard Battery

Model	FPCBP446
V/mAh	11.25V/6000mAh

4.0 TEST SIGNAL, FREQUENCY AND OUTPUT POWER

For the SAR measurements the DUT was operating at full transmit power. The fixed frequency channels used in the testing are shown in Table Below.

The frequency span of the WWAN bands was more than 10MHz consequently; the SAR levels of the test sample were measured for lowest, centre and highest channels in the applicable modes. There were no wires or other connections to the DUT during the SAR measurements.
At the beginning of the SAR tests, the conducted power of the DUT was measured after temporary modification of antenna connector inside the DUT's TX RX compartment. Measurements were performed with a calibrated Power Meter. The results of this measurement are listed in tables below. Burst Average power was used to calculate the Frame Average power (100% Duty Cycle) which determines the worst case Multislot Class.

EM7355 - IMEI – 356196050042429

Conducted Power Measurement CDMA 2000 1xRTT 810/850/1900 MHz

Configuration:
Network > System Parameters > System ID = 2004; Network Identity > Network ID Number = 65535

Service cfg > Primary Service Class > Selected Service = Loopback Service; Primary Service Class > Loopback Service > Selected Service Option = Service Option x (x - 2, 9 or 55); Service Option x (x - 2, 9 or 55) > FCH Config > Frames > Frame Rate = Full; Selected Service Option > Service Option 55 > FCH Config > FCH > F-FCH-MO = 0001hex (Fundamental Channel Test Mode 1) or 0002hex (Fundamental Channel Test Mode 2)

Service cfg > Primary Service Class > Selected Service = Test Data Service; Primary Service Class > Test Data Service > Selected Service Option = Service Option 32; Test Data Service Option 32 > FCCH & SCH Config > SCH0 Enable = Off (or On); Test Data Service Option 32 > FCCH & SCH Config > SCH1 Enable = Off (or On); Test Data Service Option 32 > FCCH & SCH Config > SCH0 Config > Data Rate = 9.6 kbps; FCCH & SCH Config > SCH1 Config > Data Rate = 9.6 kbps

BS Signal > RF Settings > RF Power > CDMA Power = -104 dBm/1.23MHz (RF > External attenuation IN/OUT as per cable losses); RF Settings > RF Channel [BC0] = 384; RF Settings >RF Channel [BC10] = 560; RF Settings > RF Channel [BC1] = 325; BS Signal > RF Settings > RF Power > PICH Level = -7dB; BS Signal > FCH > FCH Level = -7.4 dB
BS Signal > Power Control > Power Ctrl. Bits = All Up (Service Options 2,9 and 55)
BS Signal > Power Control > Power Ctrl. Bits = Hold (Service Options 32)

Table 2

Cellular Band

Fundamental Channel Test Mode	Supplemental Code Channel Test Mode	Loopback Service Option	Test Data Service Option	SCHn	Result (dBm)		
					Ch. 1013	Ch. 384	Ch.777
1	N/A	SO 2	N/A	N/A	23.97	**24.06**	23.69
1	N/A	SO 55	N/A	N/A	23.79	24.03	23.61
2	N/A	SO 9	N/A	N/A	23.88	24.05	23.69
2	N/A	SO 55	N/A	N/A	23.87	23.89	23.69
N/A	3	N/A	SO 32	OFF	23.76	23.95	23.65
N/A	3	N/A	SO 32	ON	23.75*	24.03*	23.68*

*SCH1 Enable – rejected by DUT

Table 3

PCS Band

Fundamental Channel Test Mode	Supplemental Code Channel Test Mode	Loopback Service Option	Test Data Service Option	SCHn	Result (dBm)		
					Ch. 25	Ch. 600	Ch.1175
1	N/A	SO 2	N/A	N/A	23.02	22.89	**23.25**
1	N/A	SO 55	N/A	N/A	23.00	22.79	23.14
2	N/A	SO 9	N/A	N/A	22.98	22.54	23.21
2	N/A	SO 55	N/A	N/A	22.95	22.41	23.23
N/A	3	N/A	SO 32	OFF	23.01	22.74	23.19
N/A	3	N/A	SO 32	ON	23.00*	22.44*	23.23*

*SCH1 Enable – rejected by DUT

Table 4

BC10 Band

Fundamental Channel Test Mode	Supplemental Code Channel Test Mode	Loopback Service Option	Test Data Service Option	SCHn	Result (dBm)		
					Ch. 476	Ch. 560	Ch.684
1	N/A	SO 2	N/A	N/A	24.04	24.11	**24.25**
1	N/A	SO 55	N/A	N/A	24.03	24.16	24.23
2	N/A	SO 9	N/A	N/A	24.12	24.05	24.16
2	N/A	SO 55	N/A	N/A	24.12	24.10	24.21
N/A	3	N/A	SO 32	OFF	24.10	24.21	24.20
N/A	3	N/A	SO 32	ON	24.13*	24.07*	24.23*

*SCH1 Enable – rejected by DUT

Conducted Power Measurement 1xEvDo Revision 0 850/1900 MHz

Configuration:
Network > Network Release = Release 0; Network > System ID = 2004; Access Probes > Initial Adjust (Probe Initial Adjust) = 15 dBm; Probe Increment (Power Step) = 7.5 dB/step; Open Loop Adjust (BC0) = -81 dB (US cellular); Open Loop Adjust (BC1) = -84 dB (N.American PCS)
AN Signal > Sector > Format = Manual; Sector ID = 00800580 00000000 00000000 00000000; RF Settings > RF Power > 1xEv-Do Power = -105.5 dBm/1.23MHz (RF > External attenuation IN/OUT as per cable losses); RF Settings > RF Channel [BC0] = 283; RF Settings >RF Channel [BC10] = 560; RF Settings > RF Channel [BC1] = 150; Power Control > Power control bits = All Up
Layer > Application Layer > Test Applications > FTAP Cfg > DRC > ACK Ch Fixed Mode = Ack.Always; DRC > Fixed Rate = 4 (307.2 kbps, 2-slots); Test Applications > RTAP Cfg > Data > Min. Rate = 5 (153.6 kbps); Data > Min. Rate = 5 (153.6 kbps)

Table 5

Cellular Band

Release 0 Subtype	Open Loop Adjust (BC0)	Result (dBm)		
		Ch. 1013	Ch. 384	Ch.777
0	-81 dB	23.85	23.96	23.63

Table 6

PCS Band

Release 0 Subtype	Open Loop Adjust (BC1)	Result (dBm)		
		Ch. 25	Ch. 600	Ch.1175
0	-84 dB	22.91	22.87	23.15

Table 7

BC10 Band

Release 0 Subtype	Open Loop Adjust (BC10)	Result (dBm)		
		Ch. 476	Ch. 560	Ch.684
0	-84 dB	23.95	24.02	24.12

Conducted Power Measurement 1xEvDo Revision A 850/1900 MHz

Configuration:
Network > Network Release = Release A; Network > System ID = 2004; Access Probes > Initial Adjust (Probe Initial Adjust) = 15 dBm; Probe Increment (Power Step) = 7.5 dB/step; Open Loop Adjust (BC0) = -81 dB (US cellular); Open Loop Adjust (BC1) = -84 dB (N.American PCS)
AN Signal > Sector > Format = Manual; Sector ID = 00800580 00000000 00000000 00000000; RF Settings > RF Power > 1xEv-Do Power = -60 dBm/1.23MHz (RF > External attenuation IN/OUT as per cable losses); RF Settings > RF Channel [BC0] = 283; RF Settings >RF Channel [BC10] = 560; RF Settings > RF Channel [BC1] = 150; Power Control > Power control bits = All Up
Subtype 0:
Layer > Protocol View Filter = Release 0 Settings; Layer > Application Layer > Test Applications > FTAP Cfg > DRC > ACK Ch Fixed Mode = Ack.Always; DRC > Fixed Rate = 4 (307.2 kbps, 2-slots); Test Applications > RTAP Cfg > Data > Min. Rate = 5 (153.6 kbps); Data > Max. Rate = 5 (153.6 kbps)
Subtype 2:
Layer > Protocol View Filter = Release A Settings; Layer > Application Layer > Test Applications > FTAP Cfg > DRC > ACK Ch Fixed Mode = Ack.Always; DRC > Rate = 16 (307.2 kbps, 2-slots); Test Applications > RTAP Cfg > Data > Min. Packet Size = 9 (4096 bits); Data > Max. Packet Size = 9 (4096 bits);

Table 8

Cellular Band

Release 0 Subtype	Open Loop Adjust (BC0)	Result (dBm)		
		Ch. 1013	Ch. 384	Ch.777
0	-81 dB	23.87	24.01	23.59
2	-81 dB	23.86	23.99	23.63

Table 9

PCS Band

Release 0 Subtype	Open Loop Adjust (BC1)	Result (dBm)		
		Ch. 25	Ch. 600	Ch.1175
0	-84 dB	22.50	22.25	22.82
2	-84 dB	22.95	22.87	23.01

Table 10

BC10 Band

Release 0 Subtype	Open Loop Adjust (BC10)	Result (dBm)		
		Ch. 476	Ch. 560	Ch.684
0	-84 dB	24.09	24.10	24.14
2	-84 dB	23.94	23.97	24.06

Conducted Power Measurement LTE

Configuration (Agilent PTX E6621A):
Band selection: Frequency key (setup group) > Setting Method = EARFCN, > Band = 13, and > UL EARFCN = 23230 (UL channel number)
For QPSK: Mode Setup key (measurement/function group) > More soft key > PHY Settings soft key > Uplink Resource Allocation soft key > I_MCS = 5
For 16-QAM: Mode Setup key (measurement/function group) > More soft key > PHY Settings soft key > Uplink Resource Allocation soft key > I_MCS = 15
Resource Block settings: Mode Setup key (measurement/function group) > More soft key > PHY Settings soft key > Uplink Resource Allocation soft key > RB Size and RB Start
Channel Bandwidth: Mode Setup key (measurement/function group) > Ch Bandwidth
TTI configuration: Mode Setup key (measurement/function group) > More soft key > PHY Settings soft key > Uplink Resource Allocation soft key > RCT > UL Tx Pattern to ALL (to ensure that all available sub-frames are active and transmitting)
Mode Setup key> More 2/2 soft key>RRC Settings soft key> More 3/3 soft key> Additional Spectrum Emission = 1 (to ensure that Additional Maximum Power Reduction (A-MPR) is switched off)

Table 11

Band 4 Channel Bandwidth – 1.4 MHz

Modulation scheme	Resource Block size	Resource Block start (offset)	Result (dBm)		
			Ch. 19957	Ch. 20175	Ch.20393
QPSK	1	0	22.2	22.42	22.49
16-QAM	1	0	21.22	21.43	21.50
QPSK	1	3	22.14	22.48	22.47
16-QAM	1	3	21.23	21.38	21.50
QPSK	1	5	22.19	22.49	22.48
16-QAM	1	5	21.18	21.47	21.66
QPSK	3	0	22.17	22.45	22.49
16-QAM	3	0	21.3	21.54	21.6
QPSK	3	1	22.16	22.41	22.45
16-QAM	3	1	21.28	21.54	21.58
QPSK	3	3	22.21	22.46	22.5
16-QAM	3	3	21.26	21.52	21.57
QPSK	6	0	21.27	21.5	21.50
16-QAM	6	0	20.32	20.56	20.68

Table 12

Band 4 Channel Bandwidth – 3 MHz

Modulation scheme	Resource Block size	Resource Block start (offset)	Result (dBm)		
			Ch. 19965	Ch. 20175	Ch.20385
QPSK	1	0	22.27	22.47	22.56
16-QAM	1	0	21.27	21.48	21.52
QPSK	1	8	22.24	22.52	22.53
16-QAM	1	8	21.25	21.49	21.56
QPSK	1	14	22.23	22.52	22.50
16-QAM	1	14	21.25	21.68	21.50
QPSK	8	0	21.24	21.51	21.55
16-QAM	8	0	20.25	20.52	20.62
QPSK	8	4	21.25	21.53	21.00
16-QAM	8	4	20.26	20.49	19.92
QPSK	8	7	21.27	21.57	21.75
16-QAM	8	7	20.26	20.58	20.87
QPSK	15	0	21.2	21.43	21.42
16-QAM	15	0	20.26	20.55	20.60

Table 13

Band 4 Channel Bandwidth - 5 MHz

Modulation scheme	Resource Block size	Resource Block start (offset)	Result (dBm)		
			Ch. 19975	Ch. 20175	Ch.20375
QPSK	1	0	22.37	22.42	22.51
16-QAM	1	0	21.35	21.44	21.66
QPSK	1	12	22.3	22.47	22.51
16-QAM	1	12	21.31	21.62	21.52
QPSK	1	24	22.3	22.54	22.52
16-QAM	1	24	21.31	21.75	21.54
QPSK	12	0	21.25	21.47	21.48
16-QAM	12	0	20.3	20.5	20.53
QPSK	12	6	21.31	21.49	21.50
16-QAM	12	6	20.32	20.51	20.59
QPSK	12	13	21.22	21.52	21.44
16-QAM	12	13	20.26	20.52	20.56
QPSK	25	0	21.12	21.39	21.46
16-QAM	25	0	20.24	20.51	20.53

Table 14

Band 4 Channel Bandwidth - 10 MHz

Modulation scheme	Resource Block size	Resource Block start (offset)	Result (dBm)		
			Ch. 20000	Ch. 20175	Ch. 20350
QPSK	1	0	22.17	22.36	22.52
16-QAM	1	0	21.23	21.38	21.69
QPSK	1	25	22.25	22.5	22.49
16-QAM	1	25	21.23	21.37	21.51
QPSK	1	49	22.29	22.48	22.49
16-QAM	1	49	21.3	21.66	21.53
QPSK	25	0	21.18	21.28	21.07
16-QAM	25	0	20.18	20.37	20.46
QPSK	25	12	21.15	21.44	21.42
16-QAM	25	12	20.16	20.46	20.51
QPSK	25	25	21.21	21.39	21.40
16-QAM	25	25	20.21	20.49	20.46
QPSK	50	0	21.02	21.32	21.28
16-QAM	50	0	20.06	20.31	20.37

Table 15

Band 4 Channel Bandwidth – 15 MHz

Modulation scheme	Resource Block size	Resource Block start (offset)	Result (dBm)		
			Ch. 20025	Ch. 20175	Ch.20325
QPSK	1	0	22.24	22.39	22.59
16-QAM	1	0	21.27	21.31	21.83
QPSK	1	36	22.25	22.49	22.55
16-QAM	1	36	21.26	21.48	21.56
QPSK	1	74	22.36	22.56	22.49
16-QAM	1	74	21.27	21.56	21.68
QPSK	36	0	21.09	21.19	21.45
16-QAM	36	0	20.08	20.22	20.47
QPSK	36	19	21.08	21.27	21.21
16-QAM	36	19	20.08	20.33	20.29
QPSK	36	39	21.12	21.4	21.29
16-QAM	36	39	20.13	20.42	20.34
QPSK	75	0	21.09	21.32	21.32
16-QAM	75	0	20.07	20.3	20.36

Table 16

Band 4 Channel Bandwidth – 20 MHz

Modulation scheme	Resource Block size	Resource Block start (offset)	Result (dBm)		
			Ch. 20050	Ch. 20175	Ch.20300
QPSK	1	0	22.21	22.35	22.45
16-QAM	1	0	21.22	21.36	21.59
QPSK	1	50	22.23	22.49	22.49
16-QAM	1	50	21.26	21.37	21.69
QPSK	1	99	*22.36*	***22.63***	*22.50*
16-QAM	1	99	21.38	21.65	21.50
QPSK	50	0	21.04	21.20	***21.40***
16-QAM	50	0	20.03	20.17	20.38
QPSK	50	24	*21.14*	*21.30*	21.32
16-QAM	50	24	20.1	20.30	20.35
QPSK	50	50	21.04	21.30	21.29
16-QAM	50	50	20.10	20.31	20.34
QPSK	100	0	21.09	21.32	21.28
16-QAM	100	0	20.14	20.33	20.32

Table 17

Band 13 Channel Bandwidth - 5 MHz

Modulation scheme	Resource Block size	Resource Block start (offset)	Result (dBm)		
			Ch. 23205	Ch. 23230	Ch.23255
QPSK	1	0	23.51	23.48	23.58
16-QAM	1	0	22.48	22.45	22.51
QPSK	1	12	23.49	23.64	23.32
16-QAM	1	12	22.46	22.69	22.35
QPSK	1	24	23.61	23.51	23.27
16-QAM	1	24	22.60	22.47	22.31
QPSK	12	0	22.54	22.54	22.46
16-QAM	12	0	21.59	21.62	21.50
QPSK	12	6	22.45	22.55	22.47
16-QAM	12	6	21.51	21.69	21.46
QPSK	12	13	22.47	22.52	22.35
16-QAM	12	13	21.57	21.56	21.33
QPSK	25	0	22.49	22.50	22.31
16-QAM	25	0	21.50	21.57	21.28

Table 18

Band 13 Channel Bandwidth - 10 MHz

Modulation scheme	Resource Block size	Resource Block start (offset)	Result (dBm)		
			Ch. 23230	Ch. 23230	Ch. 23230
QPSK	1	0	-	23.39	-
16-QAM	1	0	-	22.43	-
QPSK	1	25	-	***23.66***	-
16-QAM	1	25	-	22.70	-
QPSK	1	49	-	23.31	-
16-QAM	1	49	-	22.36	-
QPSK	25	0	-	22.48	-
16-QAM	25	0	-	21.51	-
QPSK	25	12	-	***22.60***	-
16-QAM	25	12	-	21.53	-
QPSK	25	25	-	22.46	-
16-QAM	25	25	-	21.54	-
QPSK	50	0	-	22.35	-
16-QAM	50	0	-	21.43	-

Table 19

Band 17 Channel Bandwidth - 5 MHz

Modulation scheme	Resource Block size	Resource Block start (offset)	Result (dBm)		
			Ch. 23755	Ch. 23790	Ch.23825
QPSK	1	0	23.66	24.10	23.68
16-QAM	1	0	22.63	23.07	22.73
QPSK	1	12	23.96	23.85	23.18
16-QAM	1	12	22.93	22.84	22.39
QPSK	1	24	23.95	23.34	23.17
16-QAM	1	24	23.00	22.32	22.15
QPSK	12	0	22.79	22.96	22.37
16-QAM	12	0	21.87	21.98	21.43
QPSK	12	6	22.94	22.85	22.25
16-QAM	12	6	21.99	21.88	21.27
QPSK	12	13	23.03	21.66	22.18
16-QAM	12	13	22.00	21.71	21.21
QPSK	25	0	22.91	22.68	22.17
16-QAM	25	0	21.19	21.77	21.23

Table 20

Band 17 Channel Bandwidth - 10 MHz

Modulation scheme	Resource Block size	Resource Block start (offset)	Result (dBm)		
			Ch. 23780	Ch. 23790	Ch. 23800
QPSK	1	0	23.72	*23.82*	***23.95***
16-QAM	1	0	22.71	22.81	22.93
QPSK	1	25	*23.91*	23.82	23.54
16-QAM	1	25	22.91	22.72	22.56
QPSK	1	49	23.19	23.18	23.06
16-QAM	1	49	22.09	22.19	22.04
QPSK	25	0	22.81	***22.85***	*22.80*
16-QAM	25	0	21.81	21.88	21.83
QPSK	25	12	*22.84*	22.84	22.77
16-QAM	25	12	21.89	21.91	21.75
QPSK	25	25	22.53	22.48	22.24
16-QAM	25	25	21.59	21.54	21.36
QPSK	50	0	22.69	22.60	22.52
16-QAM	50	0	21.63	21.55	21.52

Table 21

Band 25 Channel Bandwidth – 1.4 MHz

Modulation scheme	Resource Block size	Resource Block start (offset)	Result (dBm)		
			Ch. 26047	Ch. 26365	Ch.26683
QPSK	1	0	22.07	22.07	22.27
16-QAM	1	0	21.03	21.03	21.28
QPSK	1	3	21.94	21.93	22.30
16-QAM	1	3	20.95	20.99	21.30
QPSK	1	5	21.98	21.90	22.27
16-QAM	1	5	20.97	20.93	21.25
QPSK	3	0	21.94	22.02	22.25
16-QAM	3	0	21.01	21.15	21.35
QPSK	3	1	21.97	21.85	22.25
16-QAM	3	1	21.02	21.03	21.33
QPSK	3	3	21.98	21.85	22.19
16-QAM	3	3	21.01	21.02	21.30
QPSK	6	0	20.99	20.98	21.33
16-QAM	6	0	20.12	20.03	20.39

Table 22

Band 25 Channel Bandwidth – 3 MHz

Modulation scheme	Resource Block size	Resource Block start (offset)	Result (dBm)		
			Ch. 26055	Ch. 26365	Ch.26675
QPSK	1	0	22.10	22.12	22.30
16-QAM	1	0	21.03	21.07	21.29
QPSK	1	8	21.94	21.95	22.30
16-QAM	1	8	20.98	20.96	21.28
QPSK	1	14	21.98	21.91	22.32
16-QAM	1	14	21.02	20.86	21.29
QPSK	8	0	21.05	21.07	21.23
16-QAM	8	0	20.01	20.05	20.22
QPSK	8	4	20.92	21.05	21.27
16-QAM	8	4	19.95	19.96	20.27
QPSK	8	7	21.01	21.00	21.29
16-QAM	8	7	19.99	19.97	20.25
QPSK	15	0	20.92	20.96	21.28
16-QAM	15	0	20.02	21.09	20.32

Table 23

Band 25 Channel Bandwidth - 5 MHz

Modulation scheme	Resource Block size	Resource Block start (offset)	Result (dBm)		
			Ch. 26065	Ch. 26365	Ch.26665
QPSK	1	0	22.02	22.11	22.18
16-QAM	1	0	20.99	21.14	21.21
QPSK	1	12	21.95	21.94	22.33
16-QAM	1	12	20.99	21.00	21.31
QPSK	1	24	22.06	21.92	22.26
16-QAM	1	24	21.03	20.94	21.26
QPSK	12	0	21.01	21.08	21.22
16-QAM	12	0	20.05	20.11	20.21
QPSK	12	6	20.95	21.01	21.26
16-QAM	12	6	20.01	20.02	20.30
QPSK	12	13	21.00	20.91	21.27
16-QAM	12	13	19.99	19.95	20.30
QPSK	25	0	20.83	20.95	21.26
16-QAM	25	0	19.93	19.93	20.26

Table 24

Band 25 Channel Bandwidth - 10 MHz

Modulation scheme	Resource Block size	Resource Block start (offset)	Result (dBm)		
			Ch. 26090	Ch. 26365	Ch. 26640
QPSK	1	0	22.18	22.14	22.10
16-QAM	1	0	21.16	21.14	21.11
QPSK	1	25	22.20	21.99	22.28
16-QAM	1	25	21.18	21.02	21.27
QPSK	1	49	22.22	21.94	22.29
16-QAM	1	49	21.19	20.95	21.34
QPSK	25	0	20.98	21.02	21.17
16-QAM	25	0	20.02	20.09	20.20
QPSK	25	12	21.00	20.97	21.19
16-QAM	25	12	20.12	19.98	20.23
QPSK	25	25	21.07	20.95	21.26
16-QAM	25	25	20.09	19.97	20.26
QPSK	50	0	20.95	20.90	21.11
16-QAM	50	0	20.03	19.95	20.13

Table 25

Band 25 Channel Bandwidth – 15 MHz

Modulation scheme	Resource Block size	Resource Block start (offset)	Result (dBm)		
			Ch. 26115	Ch. 26365	Ch.26615
QPSK	1	0	22.13	22.18	22.01
16-QAM	1	0	21.11	21.18	21.00
QPSK	1	36	22.16	22.14	22.18
16-QAM	1	36	21.14	21.16	21.15
QPSK	1	71	22.25	21.89	22.41
16-QAM	1	71	21.24	20.89	21.37
QPSK	36	0	21.12	20.86	20.90
16-QAM	36	0	20.10	19.88	19.91
QPSK	36	19	20.96	20.86	21.06
16-QAM	36	19	20.00	19.95	20.10
QPSK	36	39	20.95	20.87	21.24
16-QAM	36	39	20.01	19.90	20.20
QPSK	75	0	20.95	20.84	20.95
16-QAM	75	0	19.97	19.90	19.98

Table 26

Band 25 Channel Bandwidth – 20 MHz

Modulation scheme	Resource Block size	Resource Block start (offset)	Result (dBm)		
			Ch. 26140	Ch. 26365	Ch.26590
QPSK	1	0	22.14	*22.25*	21.90
16-QAM	1	0	21.16	21.24	20.89
QPSK	1	50	22.20	21.97	22.04
16-QAM	1	50	21.17	21.02	21.06
QPSK	1	99	*22.29*	21.91	***22.39***
16-QAM	1	99	21.30	20.92	21.38
QPSK	50	0	20.98	21.00	20.74
16-QAM	50	0	20.06	20.02	19.78
QPSK	50	24	21.03	*21.02*	20.89
16-QAM	50	24	20.08	19.90	19.92
QPSK	50	50	***21.12***	20.76	*21.09*
16-QAM	50	50	20.10	19.85	20.08
QPSK	100	0	21.07	20.79	20.93
16-QAM	100	0	20.04	19.86	19.98

Table: Frequency and Conducted Power Results GSM

Table 27

Coding Scheme	GPRS Multislot Class	RF Channel	Measured Power Burst Average (dBm)	Calculated Power Frame Average (100% Duty Cycle) (dBm)
CS1	10	128	**32.40**	26.22
CS1	10	190	32.35	26.17
CS1	10	251	32.26	26.08
CS1	11	128	N/A	N/A
CS1	11	190	N/A	N/A
CS1	11	251	N/A	N/A
CS1	12	128	N/A	N/A
CS1	12	190	N/A	N/A
CS1	12	251	N/A	N/A

Table 28

Coding Scheme	EGPRS Multislot Class	RF Channel	Measured Power Burst Avarage (dBm)	Calculated Power Frame Avarage (100% Duty Cycle) (dBm)
MCS5	10	128	27.08	20.90
MCS5	10	190	26.80	20.62
MCS5	10	251	26.79	20.61
MCS5	11	128	26.45	22.03
MCS5	11	190	26.28	21.86
MCS5	11	251	26.27	21.85
MCS5	12	128	26.30	23.13
MCS5	12	190	26.14	22.97
MCS5	12	251	26.05	22.88

Table 29

Coding Scheme	GPRS Multislot Class	RF Channel	Measured Power Burst Avarage (dBm)	Calculated Power Frame Avarage (100% Duty Cycle) (dBm)
CS1	10	512	27.91	21.73
CS1	10	661	**28.15**	21.97
CS1	10	810	28.02	21.84
CS1	11	512	N/A	N/A
CS1	11	661	N/A	N/A
CS1	11	810	N/A	N/A
CS1	12	512	N/A	N/A
CS1	12	661	N/A	N/A
CS1	12	810	N/A	N/A

Table 30

Coding Scheme	EGPRS Multislot Class	RF Channel	Measured Power Burst Avarage (dBm)	Calculated Power Frame Avarage (100% Duty Cycle) (dBm)
MCS5	10	512	23.93	17.75
MCS5	10	661	23.88	17.70
MCS5	10	810	23.93	17.75
MCS5	11	512	23.58	19.16
MCS5	11	661	23.49	19.07
MCS5	11	810	23.67	19.25
MCS5	12	512	23.45	20.28
MCS5	12	661	23.42	20.25
MCS5	12	810	23.54	20.37

*DUT has no GPRS/EGPRS Multislot Class 11 and 12 capabilities

Conducted Power Measurement UMTS 850 MHz

Configuration:
12.2 kbps RMC
Test Loop Mode 1
βc = 8, βd = 15 (3GPP default)
TPC (Transmit Power Control) = All 1s

Table 31

Channel No.	βc	βd	Result (dBm)
4132	8	15	23.15
4183	8	15	**23.29**
4233	8	15	23.12

Conducted Power Measurement UMTS + HSDPA 850 MHz

Configuration:
Device HSDPA Category 6 (Downlink 3.6 Mbps and Uplink 384 kbps)
H-Set = 1
QPSK in H-Set (1)
CQI Fidback Cycle = 4ms; CQI Repetition Rate = 2ms

Table 32

Sub Test No.	βc	βd	ΔAKN	ΔNAKN	ΔCQI	Result (dBm)			MPR (dB)
						4132	4183	4233	
1	2	15	8	8	8	22.73	22.92	22.69	0.0
2	12	15	8	8	8	22.36	22.45	22.34	0.0
3	15	8	8	8	8	22.27	22.35	22.10	0.5
4	15	4	8	8	8	22.23	22.35	22.14	0.5

Conducted Power Measurement UMTS + HSDPA + HSUPA 850 MHz

Configuration:
Device HSUPA Release 6 (5.7 Mbps)
RMC 12.2 kbps + HSPA 34.108 with loop mode 1
HS-DPCCH, E-DPCCH, E-DPDCH Enabled
DPCH Channel Code {βd (SF)} = 64
Power Control – TPC algorithm 2
3GPP default HS-DPCCH power offset parameters Δ_{AKN} = 5; Δ_{NAKN} = 5; Δ_{CQI} = 2
E-TFCI table index = 0
E-DCH minimum set E-TFCI = 9
PLnon-max = 0.84
Maximum Channelisation Code {βed (SF) and βed (codes)} – Subtests 1,2,4,5 = SF4; Subtest 3 = 2xSF4
Initial Serving Grant Value = Off
Δ HARQ =0
Number of Ref.E-TFCIs – Subtests 1,2,4,5 = 5; Subtest 3 = 2
Set1 Patern Type = Closed Loop

Table 33

Sub Test	βc	βd	Δ AKN	Δ NAKN	Δ CQI	Δ E-DPCCH	βed (SF)	βed (codes)	AG Index	Result (dBm)			MPR (dB)
										4132	4183	4233	
1	10	15	8	8	8	6	4	1	20	22.48	22.53	22.05	0.0
2	6	15	8	8	8	8	4	1	12	20.81	20.77	20.82	2.0
3	15	9	8	8	8	8	4	2	15	21.57	21.30	21.41	1.0
4	2	15	8	8	8	5	4	1	17	21.13	20.64	21.17	2.0
5	15	15	8	8	8	7	4	1	21	22.56	22.74	22.76	0.0

HSPA+ : Since 16QAM is not used for uplink, the uplink Category and release is same as HSUPA, i.e., CAT 6 Rel 6

Conducted Power Measurement UMTS 1700 MHz

Configuration:
12.2 kbps RMC
Test Loop Mode 1
βc = 8, βd = 15 (3GPP default)
TPC (Transmit Power Control) = All 1s

Table 34

Channel No.	βc	βd	Result (dBm)
1312	8	15	22.28
1427	8	15	**22.43**
1513	8	15	22.42

Conducted Power Measurement UMTS + HSDPA 1700 MHz

Configuration:
Device HSDPA Category 6 (Downlink 3.6 Mbps and Uplink 384 kbps)
H-Set = 1
QPSK in H-Set (1)
CQI Fidback Cycle = 4ms; CQI Repetition Rate = 2ms
3GPP default HS-DPCCH power offset parameters Δ_{AKN} = 5; Δ_{NAKN} = 5; Δ_{CQI} = 2

Table 35

Sub Test No.	βc	βd	ΔAKN	ΔNAKN	ΔCQI	Result (dBm)			MPR (dB)
						1312	1427	1513	
1	2	15	8	8	8	21.74	22.02	21.95	0.0
2	12	15	8	8	8	21.45	21.68	21.62	0.0
3	15	8	8	8	8	21.23	21.43	21.4	0.5
4	15	4	8	8	8	21.24	21.46	21.41	0.5

Conducted Power Measurement UMTS + HSDPA + HSUPA 1700 MHz

Configuration:
Device HSUPA Release 6 (5.7 Mbps)
RMC 12.2 kbps + HSPA 34.108 with loop mode 1
HS-DPCCH, E-DPCCH, E-DPDCH Enabled
DPCH Channel Code {βd (SF)} = 64
Power Control – TPC algorithm 2
3GPP default HS-DPCCH power offset parameters Δ_{AKN} = 5; Δ_{NAKN} = 5; Δ_{CQI} = 2
E-TFCI table index = 0
E-DCH minimum set E-TFCI = 9
PLnon-max = 0.84
Maximum Channelisation Code {βed (SF) and βed (codes)} – Subtests 1,2,4,5 = SF4; Subtest 3 = 2xSF4
Initial Serving Grant Value = Off
Δ HARQ =0
Number of Ref.E-TFCIs – Subtests 1,2,4,5 = 5; Subtest 3 = 2
Set1 Patern Type = Closed Loop

Table 36

Sub Test	βc	βd	Δ AKN	Δ NAKN	Δ CQI	Δ E-DPCCH	βed (SF)	βed (codes)	AG Index	Result (dBm)			MPR (dB)
										1312	1427	1513	
1	10	15	8	8	8	6	4	1	20	21.01	21.03	21.38	0.0
2	6	15	8	8	8	8	4	1	12	19.37	19.51	19.74	2.0
3	15	9	8	8	8	8	4	2	15	20.09	20.36	20.41	1.0
4	2	15	8	8	8	5	4	1	17	19.39	19.5	20.04	2.0
5	15	15	8	8	8	7	4	1	21	21.07	21.15	21.39	0.0

HSPA+ : Since 16QAM is not used for uplink, the uplink Category and release is same as HSUPA, i.e., CAT 6 Rel 6

Conducted Power Measurement UMTS 1900 MHz
Configuration:
12.2 kbps RMC
Test Loop Mode 1
βc = 8, βd = 15 (3GPP default)
TPC (Transmit Power Control) = All 1s

Table 37

Channel No.	βc	βd	Result (dBm)
9262	8	15	21.94
9400	8	15	21.96
9538	8	15	**22.08**

Conducted Power Measurement UMTS + HSDPA 1900 MHz

Configuration:
Device HSDPA Category 6 (Downlink 3.6 Mbps and Uplink 384 kbps)
H-Set = 1
QPSK in H-Set (1)
CQI Fidback Cycle = 4ms; CQI Repetition Rate = 2ms
3GPP default HS-DPCCH power offset parameters Δ_{AKN} = 5; Δ_{NAKN} = 5; Δ_{CQI} = 2

Table 38

Sub Test No.	βc	βd	ΔAKN	ΔNAKN	ΔCQI	Result (dBm)			MPR (dB)
						9262	9400	9538	
1	2	15	8	8	8	21.43	21.52	21.70	0.0
2	12	15	8	8	8	21.05	21.20	21.38	0.0
3	15	8	8	8	8	20.87	20.94	21.06	0.5
4	15	4	8	8	8	20.98	21.05	21.20	0.5

Conducted Power Measurement UMTS + HSDPA + HSUPA 1900 MHz

Configuration:
Device HSUPA Release 6 (5.7 Mbps)
RMC 12.2 kbps + HSPA 34.108 with loop mode 1
HS-DPCCH, E-DPCCH, E-DPDCH Enabled
DPCH Channel Code {βd (SF)} = 64
Power Control – TPC algorithm 2
3GPP default HS-DPCCH power offset parameters Δ_{AKN} = 5; Δ_{NAKN} = 5; Δ_{CQI} = 2
E-TFCI table index = 0
E-DCH minimum set E-TFCI = 9
PLnon-max = 0.84
Maximum Channelisation Code {βed (SF) and βed (codes)} – Subtests 1,2,4,5 = SF4; Subtest 3 = 2xSF4
Initial Serving Grant Value = Off
Δ HARQ =0
Number of Ref.E-TFCIs – Subtests 1,2,4,5 = 5; Subtest 3 = 2
Set1 Patern Type = Closed Loop

Table 39

Sub Test	βc	βd	Δ AKN	Δ NAKN	Δ CQI	Δ E-DPCCH	βed (SF)	βed (codes)	AG Index	Result (dBm)			MPR (dB)
										9262	9400	9538	
1	10	15	8	8	8	6	4	1	20	21.02	21.06	21.04	0.0
2	6	15	8	8	8	8	4	1	12	19.54	18.95	19.25	2.0
3	15	9	8	8	8	8	4	2	15	20.14	19.99	20.12	1.0
4	2	15	8	8	8	5	4	1	17	19.44	19.32	19.63	2.0
5	15	15	8	8	8	7	4	1	21	21.12	21.17	20.95	0.0

HSPA+ : Since 16QAM is not used for uplink, the uplink Category and release is same as HSUPA, i.e., CAT 6 Rel 6

4.1 Battery Status

The DUT battery was fully charged prior to commencement of measurement. Each SAR test was completed within 30 minutes. The battery condition was monitored by measuring the RF field at a defined position inside the phantom before the commencement of each test and again after the completion of the test. It was not possible to perform conducted power measurements at the output of the DUT, at the beginning and end of each scan due to lack of a suitable antenna port. The uncertainty associated with the power drift was less than 5% and was assessed in the uncertainty budget.

5.0 DETAILS OF TEST LABORATORY

5.1 Location

EMC Technologies Pty Ltd
176 Harrick Road
Keilor Park, (Melbourne) Victoria
Australia 3042

Telephone: +61 3 9365 1000
Facsimile: +61 3 9331 7455
email: melb@emctech.com.au
website: www.emctech.com.au

5.2 Accreditations

EMC Technologies Pty. Ltd. is accredited by the National Association of Testing Authorities, Australia (NATA).
NATA Accredited Laboratory Number: 5292

EMC Technologies Pty Ltd is NATA accredited for the following standards:

Table 40

AS/NZS 2772.2 2011:	RF and microwave radiation hazard measurement
ACMA:	Radio communications (Electromagnetic Radiation - Human Exposure) Standard 2003
EN 50360: 2001	Product standard to demonstrate the compliance of mobile phones with the basic restrictions related to human exposure to electromagnetic fields (300 MHz – 3 GHz)
EN 62209-1: 2006	Human Exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models instrumentation and procedures. **Part 1:** Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (300 MHz to 3 GHz)
EN 62209-2:2010	Human Exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models instrumentation and procedures **Part 2**: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz
IEEE 1528: 2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head Due to Wireless Communications Devices: Measurement Techniques.

Refer to NATA website www.nata.asn.au for the full scope of accreditation.

5.3 Environmental Factors

The measurements were performed in a shielded room with no background RF signals. The temperature in the laboratory was controlled to within 21±1°C, the humidity was in the range 42% to 52%. The liquid parameters are measured daily prior to the commencement of each test. Tests were performed to check that reflections within the environment did not influence the SAR measurements. The noise floor of the DASY5 SAR measurement system using the SN1380 probe was less than 5μV in both air and liquid mediums.

6.0 DESCRIPTION OF SAR MEASUREMENT SYSTEM

Table 41

Applicable Head Configurations	: None
Applicable Body Configurations	: Lap Held Position : Edge On Position : Bystander

6.1 Probe Positioning System

The measurements were performed with the state-of-the-art automated near-field scanning system **DASY5 Version 52** from Schmid & Partner Engineering AG (SPEAG). The DASY5 fully complies with the IEEE 1528 and EN62209-1 and EN62209-2 SAR measurement requirements.

6.2 E-Field Probe Type and Performance

The SAR measurements were conducted with SPEAG dosimetric probe ET3DV6 Serial: 1380. Please refer to appendix C for detailed information.

6.3 System Verification

6.3.1 System Verification Results (750 MHz, 900 MHz, 1800 MHz and 1950 MHz)

The following tables lists the dielectric properties of the tissue simulating liquid measured prior to SAR System Verification. The results of the System Verification are listed in columns 4 and 5. The forward power into the reference dipole for SAR System Verification was adjusted to 250 mW.

Table: System Verification Results

Table 42

1. System Verification Date	2. Frequency (MHz)	3. ∈r (measured)	4. σ (mho/m) (measured)	5. Measured SAR 1g	6. Measured SAR 10g	7. Last Validation Date
28th Oct. 14	900	54.5	1.07	2.89	1.89	16th Apr. 14
29th Oct. 14	900	54.9	1.06	2.91	1.90	16th Apr. 14
30th Oct. 14	900	56.2	1.07	2.93	1.91	16th Apr. 14
31st Oct. 14	750	55.8	0.96	2.01	1.34	16th Apr. 14
21st Nov. 14	1800	50.8	1.56	9.64	5.15	22nd Apr. 14
24th Nov. 14	1800	50.8	1.55	9.52	5.07	22nd Apr. 14
24th Nov. 14	1950	53.6	1.58	10.1	5.21	22nd Apr. 14
25th Nov. 14	1950	51.4	1.60	10.3	5.34	22nd Apr. 14
26th Nov. 14	1950	51.6	1.57	10.1	5.22	22nd Apr. 14

6.3.2 Deviation from reference validation values

The reference SAR values are derived using a reference dipole and flat section of the SAM phantom suitable for a centre frequency of 750, 900, 1800, and 1950 MHz. These reference SAR values are obtained from the IEEE Std 1528-2013 and are normalized to 1W.

The SPEAG calibration reference SAR value is the SAR validation result obtained in a specific dielectric liquid using the validation dipole during calibration. The measured one-gram SAR should be within 10% of the expected target reference values shown in table below.

Table: Deviation from reference validation values @ (750, 900, 1800 MHz and 1950 MHz)

Table 43

Frequency and Date	Measured SAR 1g (mW/g)	Measured SAR 1g (Normalized to 1W)	SPEAG Calibration reference SAR Value 1g (mW/g)	Deviation From SPEAG Reference 1g (%)
900 MHz 28th Oct. 14	2.89	11.56	11.1	4.14
900 MHz 29th Oct. 14	2.91	11.64	11.1	4.86
900 MHz 30th Oct. 14	2.93	11.72	11.1	5.59
750 Mhz 31st Oct. 14	2.01	8.04	8.72	-7.80
1800 MHz 21st Nov. 14	9.64	38.56	38.7	-0.36
1800 MHz 24th Nov. 14	9.52	38.08	38.7	-1.60
1950 MHz 24th Nov. 14	10.1	40.40	38.6	4.66
1950 MHz 25th Nov. 14	10.3	41.20	38.6	6.74
1950 MHz 26th Nov. 14	10.1	40.40	38.6	4.66

NOTE: All reference validation values are referenced to 1W input power.

6.3.3 Liquid Depth 15cm

During the SAR measurement process the liquid level was maintained to a level of 15cm with a tolerance of 0.5cm.

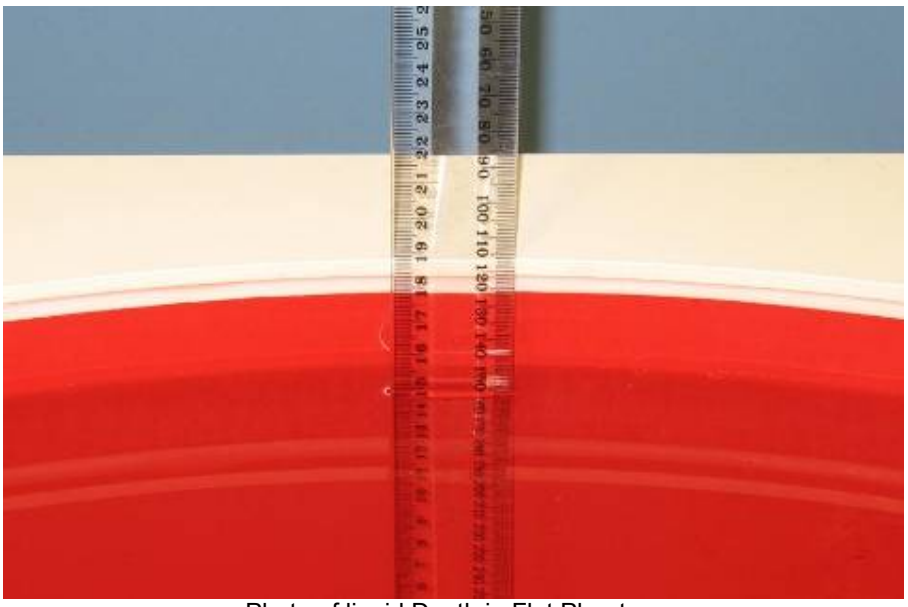

Photo of liquid Depth in Flat Phantom

6.4 Phantom Properties

The phantoms used during the testing comply with the IEEE 1528 and EN62209-1 and EN62209-2 SAR measurement requirements.

Table 44 Phantom Properties

Phantom Properties	
Depth of Phantom	19 cm
Width of flat section	40 cm
Length of flat section	60 cm
Thickness of flat section	2.0mm +/-0.2mm (flat section)
Dielectric Constant	<5.0
Loss Tangent	<0.05

6.5 Tissue Material Properties

The dielectric parameters of the human tissue simulating liquid were measured prior to SAR assessment using the HP85070A dielectric probe kit and HP8753ES Network Analyser. The target dielectric parameters are shown in the following table.

Table: Measured Body Simulating Liquid Dielectric Values at 750MHz

Table 45

Frequency Band	∈r (target)	σ (target)	ρ kg/m^3
709 MHz Body	55.4 ±5%	0.96 ±5%	1000
710 MHz Body	55.4 ±5%	0.96 ±5%	1000
711 MHz Body	55.4 ±5%	0.96 ±5%	1000
782 MHz Body	55.4 ±5%	0.96 ±5%	1000

NOTE: The body liquid parameters were within the required tolerances of ±5%.

Table: Measured Body Simulating Liquid Dielectric Values at 850MHz

Table 46

Frequency Band	∈r (target)	σ (target)	ρ kg/m^3
825 MHz Body	55.2 ±5%	0.97 ±5%	1000
835 MHz Body	55.2 ±5%	0.97 ±5%	1000
850 MHz Body	55.2 ±5%	0.97 ±5%	1000

Note: The body liquid parameters were within the required tolerances of ±5%.

Table: Measured Body Simulating Liquid Dielectric Values at 1750MHz

Table 47

Frequency Band	∈r (target)	σ (target)	ρ kg/m^3
1710 MHz Body	53.3 ±5%	1.49 ±5%	1000
1747 MHz Body	53.3 ±5%	1.49 ±5%	1000
1785 MHz Body	53.3 ±5%	1.49 ±5%	1000

Note: The body liquid parameters were within the required tolerances of ±5%.

Table: Measured Body Simulating Liquid Dielectric Values at 1880MHz

Table 48

Frequency Band	∈r (target)	σ (target)	ρ kg/m^3
1850 MHz Body	53.3 ±5%	1.52 ±5%	1000
1880.0 MHz Body	53.3 ±5%	1.52 ±5%	1000
1910 MHz Body	53.3 ±5%	1.52 ±5%	1000

Note: The body liquid parameters were within the required tolerances of ±5%.

6.6 Liquid Temperature and Humidity

The humidity and dielectric/ambient temperatures were recorded during the assessment of the tissue material dielectric parameters. The difference between the ambient temperature of the liquid during the dielectric measurement and the temperature during tests was less than |2|°C.

Table: Temperature and Humidity recorded for each day

Table 49

Date	Ambient Temperature (°C)	Liquid Temperature (°C)	Humidity (%)
28th Oct. 14	20.7	20.4	50
29th Oct. 14	20.3	20.0	45
30th Oct. 14	20.4	20.2	46
31st Oct. 14	20.2	19.8	47
21st Nov. 14	20.0	19.6	43
24th Nov. 14	20.3	20.0	52
25th Nov. 14	20.5	20.1	52
26th Nov. 14	20.5	20.2	47

6.7 Simulated Tissue Composition Used for SAR Test

The tissue simulating liquids are created prior to the SAR evaluation and often require slight modification each day to obtain the correct dielectric parameters.

Table: Tissue Type: Body @ 850/900MHz
Volume of Liquid: 30 Litres

Table 50

Approximate Composition	% By Weight
Distilled Water	56
Salt	0.76
Sugar	41.76
HEC	1.21
Bactericide	0.27

Table: Tissue Type: Body @ 1800/1950MHz MHz
Volume of Liquid: 30 Litres

Approximate Composition	% By Weight
Distilled Water	40.4
Salt	0.5
Sugar	58
HEC	1
Bactericide	0.1

6.8 Device Holder for Laptops and P 10.1 Phantom

A low loss clamp was used to position the DUT underneath the phantom surface.

Refer to Appendix A for photographs of device positioning

7.0 SAR MEASUREMENT PROCEDURE USING DASY5

The SAR evaluation was performed with the SPEAG DASY5 system. A summary of the procedure follows:

a) A measurement of the SAR value at a fixed location is used as a reference value for assessing the power drop of the DUT. The SAR at this point is measured at the start of the test, and then again at the end of the test.

b) The SAR distribution at the exposed flat section of the flat phantom is measured at a distance of 4 mm from the inner surface of the shell. The area covers the entire dimension of the DUT and the horizontal grid spacing is 15 mm x 15 mm. The actual largest Area Scan has dimensions of 165 mm x 90 mm surrounding the test device. Based on this data, the area of the maximum absorption is determined by Spline interpolation.

c) Around this point, a volume of 32 mm x 32 mm x 30 mm is assessed by measuring 5 x 5 x 8 points. On the basis of this data set, the spatial peak SAR value is evaluated with the following procedure:

   (i) The data at the surface are extrapolated, since the centre of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 4 mm. The extrapolation is based on a least square algorithm. A polynomial of the fourth order is calculated through the points in z-axes. This polynomial is then used to evaluate the points between the surface and the probe tip.

   (ii) The maximum interpolated value is searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g and 10 g) are computed using the 3D-Spline interpolation algorithm. The 3D-Spline is composed of three one-dimensional splines with the “Not a knot”- condition (in x, y and z-direction). The volume is integrated with the trapezoidal – algorithm. One thousand points (10 x 10 x 10) are interpolated to calculate the averages.

   (iii) All neighbouring volumes are evaluated until no neighbouring volume with a higher average value is found.

   (iv) The SAR value at the same location as in Step (a) is again measured to evaluate the actual power drift.

8.0 MEASUREMENT UNCERTAINTY

The uncertainty analysis is based on the template listed in the IEEE Std 1528-2013 for both Handset SAR tests and System Verification uncertainty. The measurement uncertainty of a specific device is evaluated independently and the total uncertainty for both evaluations (95% confidence level) must be less than 30%.

Table 51: Uncertainty Budget for DASY5 Version 52 – DUT SAR

Error Description	Uncert. Value	Prob. Dist.	Div.	C_i (1g)	C_i (10g)	1g u_i	10g u_i	v_i
Measurement System								
Probe Calibration	6	N	1.00	1	1	6.00	6.00	∞
Axial Isotropy	4.7	R	1.73	0.7	0.7	1.90	1.90	∞
Hemispherical Isotropy	9.6	R	1.73	0.7	0.7	3.88	3.88	∞
Boundary Effects	1	R	1.73	1	1	0.58	0.58	∞
Linearity	4.7	R	1.73	1	1	2.71	2.71	∞
System Detection Limits	1	R	1.73	1	1	0.58	0.58	∞
Modulation response	2.4	R	1.73	1	1	1.39	1.39	∞
Readout Electronics	0.3	N	1.00	1	1	0.30	0.30	∞
Response Time	0.8	R	1.73	1	1	0.46	0.46	∞
Integration Time	2.6	R	1.73	1	1	1.50	1.50	∞
RF Ambient Noise	3	R	1.73	1	1	1.73	1.73	∞
RF Ambient Reflections	3	R	1.73	1	1	1.73	1.73	∞
Probe Positioner	0.4	R	1.73	1	1	0.23	0.23	∞
Probe Positioning	2.9	R	1.73	1	1	1.67	1.67	∞
Post Processing	2	R	1.73	1	1	1.15	1.15	∞
Test Sample Related								
Power Scaling	0	R	1.73	1	1	0.00	0.00	∞
Test Sample Positioning	2.9	N	1.00	1	1	2.90	2.90	145
Device Holder Uncertainty	3.6	N	1.00	1	1	3.60	3.60	5
Output Power Variation – SAR Drift Measurement	4.72	R	1.73	1	1	2.73	2.73	∞
Phantom and Setup								
Phantom Uncertainty	7.6	R	1.73	1	1	4.39	4.39	∞
SAR Correction	1.9	R	1.73	1	0.84	1.10	0.92	∞
Liquid Conductivity – Measurement uncertainty	2.5	N	1.00	0.64	0.71	1.60	1.78	∞
Liquid Permittivity – Measurement uncertainty	2.5	N	1.00	0.6	0.26	1.50	0.65	∞
Temp.unc. - Conductivity	3.4	R	1.73	0.78	0.71	0.77	0.70	∞
Temp. unc. - Permittivity	0.4	R	1.73	0.23	0.26	0.04	0.05	∞
Combined standard Uncertainty (u_c)						11.49	11.42	
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k= 2			22.98	22.83	

Estimated total measurement uncertainty for the DASY5 measurement system was ±11.49%. The extended uncertainty (K = 2) was assessed to be ±22.98% based on 95% confidence level. The uncertainty is not added to the measurement result.

Table 52: Uncertainty Budget for DASY5 Version 52 – DUT SAR IEC62209-2 Uncertainty Budget

Error Description	Uncert. Value	Prob. Dist.	Div.	C_i (1g)	C_i (10g)	1g u_i	10g u_i	v_i
Measurement System								
Probe Calibration	6	N	1.00	1	1	6.00	6.00	∞
Axial Isotropy	4.7	R	1.73	0.7	0.7	1.90	1.90	∞
Hemispherical Isotropy	9.6	R	1.73	0.7	0.7	3.88	3.88	∞
Boundary Effects	1	R	1.73	1	1	0.58	0.58	∞
Linearity	4.7	R	1.73	1	1	2.71	2.71	∞
System Detection Limits	1	R	1.73	1	1	0.58	0.58	∞
Modulation response	2.4	R	1.73	1	1	1.39	1.39	∞
Readout Electronics	0.3	N	1.00	1	1	0.30	0.30	∞
Response Time	0.8	R	1.73	1	1	0.46	0.46	∞
Integration Time	2.6	R	1.73	1	1	1.50	1.50	∞
RF Ambient Noise	3	R	1.73	1	1	1.73	1.73	∞
RF Ambient Reflections	3	R	1.73	1	1	1.73	1.73	∞
Probe Positioner	0.4	R	1.73	1	1	0.23	0.23	∞
Probe Positioning	2.9	R	1.73	1	1	1.67	1.67	∞
Post Processing	2	R	1.73	1	1	1.15	1.15	∞
Test Sample Related								
Power Scaling	0	R	1.73	1	1	0.00	0.00	∞
Test Sample Positioning	2.9	N	1.00	1	1	2.90	2.90	145
Device Holder Uncertainty	3.6	N	1.00	1	1	3.60	3.60	∞
Output Power Variation – SAR Drift Measurement	4.72	R	1.73	1	1	2.73	2.73	∞
Phantom and Setup								
Phantom Uncertainty	7.6	R	1.73	1	1	4.39	4.39	∞
Liquid Conductivity – Deviation from target values	5	R	1.73	0.64	0.43	1.85	1.24	∞
Liquid Permittivity – Deviation from target values	5	R	1.73	0.6	0.49	1.73	1.41	∞
Liquid Conductivity – Measurement uncertainty	2.5	N	1.00	0.64	0.43	1.60	1.08	∞
Liquid Permittivity – Measurement uncertainty	2.5	N	1.00	0.6	0.49	1.50	1.23	∞
Temp.unc. - Conductivity	3.4	R	1.73	0.78	0.71	1.53	1.39	∞
Temp. unc. - Permittivity	0.4	R	1.73	0.23	0.26	0.05	0.06	∞
Combined standard Uncertainty (u_c)						11.79	11.56	
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k= 2			23.58	23.11	

Estimated total measurement uncertainty for the DASY5 measurement system was ±11.79%. The extended uncertainty (K = 2) was assessed to be ±23.58% based on 95% confidence level. The uncertainty is not added to the measurement result.

Table 53: Uncertainty Budget for DASY5 Version 52 – System Verification

Error Description	Uncert. Value	Prob. Dist.	Div.	C_i (1g)	C_i (10g)	1g u_i	10g u_i	v_i
Measurement System								
Probe Calibration	6	N	1.00	1	1	6.00	6.00	∞
Axial Isotropy	4.7	R	1.73	1	1	2.71	2.71	∞
Hemispherical Isotropy	9.6	R	1.73	0	0	0.00	0.00	∞
Boundary Effects	1	R	1.73	1	1	0.58	0.58	∞
Linearity	4.7	R	1.73	1	1	2.71	2.71	∞
System Detection Limits	1	R	1.73	1	1	0.58	0.58	∞
Modulation response	0	R	1.73	1	1	0.00	0.00	∞
Readout Electronics	0.3	N	1.00	1	1	0.30	0.30	∞
Response Time	0	R	1.73	1	1	0.00	0.00	∞
Integration Time	0	R	1.73	1	1	0.00	0.00	∞
RF Ambient Noise	1	R	1.73	1	1	0.58	0.58	∞
RF Ambient Reflections	1	R	1.73	1	1	0.58	0.58	∞
Probe Positioner	0.8	R	1.73	1	1	0.46	0.46	∞
Probe Positioning	6.7	R	1.73	1	1	3.87	3.87	∞
Post Processing	2	R	1.73	1	1	1.15	1.15	∞
Dipole Related								
Deviation of exp. dipole	5.5	R	1.73	1	1	3.18	3.18	##
Dipole Axis to Liquid Dist.	2	R	1.73	1	1	1.15	1.15	##
Input power & SAR drift	3.40	R	1.73	1	1	1.96	1.96	∞
Phantom and Setup								
Phantom Uncertainty	4	R	1.73	1	1	2.31	2.31	∞
Liquid Conductivity – Deviation from target values	5	R	1.73	0.64	0.43	1.85	1.24	∞
Liquid Permittivity – Deviation from target values	5	R	1.73	0.6	0.49	1.73	1.41	∞
Liquid Conductivity – Measurement uncertainty	2.5	N	1.00	0.78	0.71	1.95	1.78	∞
Liquid Permittivity – Measurement uncertainty	2.5	N	1.00	0.26	0.26	0.65	0.65	∞
Temp.unc. - Conductivity	3.4	R	1.73	0.78	0.71	0.77	0.70	∞
Temp. unc. - Permittivity	0.4	R	1.73	0.23	0.26	0.04	0.05	∞
Combined standard Uncertainty (u_c)						10.02	9.84	
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=	2		20.05	19.68	

Estimated total measurement uncertainty for the DASY5 measurement system was ±10.02%. The extended uncertainty (K = 2) was assessed to be ±20.05% based on 95% confidence level. The uncertainty is not added to the System Verification measurement result.

9.0 EQUIPMENT LIST AND CALIBRATION DETAILS

Table 54: SPEAG DASY5 Version 52

Equipment Type	Manufacturer	Model Number	Serial Number	Calibration Due	Used For this Test?
Robot - Six Axes	Staubli	RX90BL	N/A	Not applicable	✓
Robot Remote Control	SPEAG	CS7MB	RX90B	Not applicable	✓
SAM Phantom	SPEAG	N/A	1260	Not applicable	
SAM Phantom	SPEAG	N/A	1060	Not applicable	
Flat Phantom	AndreT	10.1	P 10.1	Not Applicable	
Flat Phantom	AndreT	9.1	P 9.1	Not Applicable	
Flat Phantom	SPEAG	ELI 4.0	1101	Not Applicable	✓
Data Acquisition Electronics	SPEAG	DAE3 V1	359	06-June-2015	
Data Acquisition Electronics	SPEAG	DAE3 V1	442	10-Dec-2014	✓
Probe E-Field - Dummy	SPEAG	DP1	N/A	Not applicable	
Probe E-Field	SPEAG	ET3DV6	1380	13-Dec-2014	✓
Probe E-Field	SPEAG	ET3DV6	1377	10-June-2015	
Probe E-Field	SPEAG	ES3DV6	3029	Not Used	
Probe E-Field	SPEAG	EX3DV4	3956	13-June-2015	
Probe E-Field	SPEAG	EX3DV4	3657	17-Dec-2014	
Validation Source 150 MHz	SPEAG	CLA150	4003	3-Dec-2016	
Antenna Dipole 300 MHz	SPEAG	D300V3	1012	11-Dec-2015	
Antenna Dipole 450 MHz	SPEAG	D450V3	1074	11-Dec-2015	
Antenna Dipole 750 MHz	SPEAG	D750V2	1051	13-Dec-2016	✓
Antenna Dipole 900 MHz	SPEAG	D900V2	047	22-June-2015	✓
Antenna Dipole 1640 MHz	SPEAG	D1640V2	314	20-June-2015	
Antenna Dipole 1800 MHz	SPEAG	D1800V2	242	20-June-2015	✓
Antenna Dipole 1950 MHz	SPEAG	D1950V3	1113	6-Dec -2015	
Antenna Dipole 2300 MHz	SPEAG	D2300V2	1032	22-Aug-2016	
Antenna Dipole 2450 MHz	SPEAG	D2450V2	724	04-Dec-2015	
Antenna Dipole 2600 MHz	SPEAG	D2600V2	1044	13-Dec-2016	
Antenna Dipole 3500 MHz	SPEAG	D3500V2	1002	13-July-2013	
Antenna Dipole 5600 MHz	SPEAG	D5GHzV2	1008	16-Dec-2014	
RF Amplifier	EIN	603L	N/A	*In test	
RF Amplifier	Mini-Circuits	ZHL-42	N/A	*In test	✓
RF Amplifier	Mini-Circuits	ZVE-8G	N/A	*In test	
Synthesized signal generator	Hewlett Packard	86630A	3250A00328	*In test	✓
RF Power Meter	Hewlett Packard	437B	3125012786	28-Aug-2014	✓
RF Power Sensor 0.01 - 18 GHz	Hewlett Packard	8481H	1545A01634	29-Aug-2014	✓
RF Power Meter	Rohde & Schwarz	NRP	101415	18-Sept-2014	
RF Power Sensor	Rohde & Schwarz	NRP - Z81	100174	18-Sept-2014	
RF Power Meter Dual	Hewlett Packard	435A	1733A05847	*In test	✓
RF Power Sensor	Hewlett Packard	8482A	2349A10114	*In test	✓
Network Analyser	Hewlett Packard	8714B	GB3510035	14-Oct-2015	✓
Network Analyser	Hewlett Packard	8753ES	JP39240130	10-Nov-2015	✓
Dual Directional Coupler	Hewlett Packard	778D	1144 04700	*In test	
Dual Directional Coupler	NARDA	3022	75453	*In test	✓
Radio Communication Test Set	Rohde & Schwarz	CMU200	101573	Not Applicable	✓
Radio Communication Test Set	Anritsu	MT8820A	6200240559	Not Applicable	✓
Radio Communication Test Set	Agilent	PXT E6621A	MY51100168	Not Applicable	✓

* Calibrated during the test for the relevant parameters.

10.0 TEST METHODOLOGY

Notebooks should be evaluated in normal use positions, typical for lap-held bottom-face only. However the number of positions will depend on the number of configurations the laptop can be operated in. The "LIFEBOOK T series" can be used in either a conventional laptop position (see Appendix A) or a Tablet configuration. The antenna location in the "LIFEBOOK T series" is closest to the top of the screen when used in a conventional laptop configuration and due to the separation distances involved between the phantom and the laptop antenna, testing is not required in this position.

10.1 Positions

10.1.1 "Lap Held" Position Definition (0mm spacing)

The DUT was tested in the 2.00 mm flat section of the ELI4 Flat phantom for the "Lap Held" position. The Transceiver was placed at the bottom of the phantom and suspended in such way that the back of the DUT was touching the phantom. This device orientation simulates the PC's normal use – being held on the lap of the user. A spacing of 0mm ensures that the SAR results are conservative and represent a worst-case position.

10.1.2 "Edge On" Position

The DUT was tested in the (2.00 mm) flat section of the ELI4 Flat phantom for the "Edge On" position. The Antenna edge of the Transceiver was placed underneath the flat section of the phantom and suspended until the edge touched the phantom. *Refer to Appendix A for photos of measurement positions.*

10.1.3 "Bystander" Position (25mm spacing)

The DUT was tested in the 2.00 mm flat section of the ELI4 Flat phantom for the "Bystander" position. The Transceiver was placed at the bottom of the phantom and suspended in such way that the back of its LCD screen was parallel to phantom and at 25mm distance. This orientation simulates use of the device in a way that allows occasional RF exposure of the nearby person (Bystander).

10.2 List of All Test Cases (Antenna In/Out, Test Frequencies, User Modes)

The DUT has a fixed antenna. Depending on the measured SAR level up to three test channels with the test sample operating at maximum power were recorded. The following table represents the matrix used to determine what testing was required. All relevant provisions of KDB 447498 and KDB 941225 are applied for SAR measurements of the host system.

Table: Testing configurations

Table 55

Phantom Configuration	Device Mode WWAN Band Name	Test Configurations		
		Channel (Low)	Channel (Middle)	Channel (High)
Lap Held/ Edge On/ Bystander	GPRS 850 MHz		x	
	GPRS 1900 MHz		x	
	EGPRS 850 MHz		x	
	EGPRS 1900 MHz		x	
	WCDMA 850 MHz		x	
	WCDMA 1700 MHz		x	
	WCDMA 1900 MHz		x	
	WCDMA + HSDPA 850 MHz		x	
	WCDMA + HSDPA 1700 MHz		x	
	WCDMA + HSDPA 1900 MHz		x	
	LTE 700 MHz		x	
	LTE 750 MHz		x	
	LTE 1700 MHz		x	
	LTE 1950 MHz		x	

Legend

X	Testing Required in this configuration
	Testing required in this configuration only if SAR of middle channel is more than 3dB below the SAR limit or it is the worst case.
X	Additional SAR measurement for the HSDPA and HSUPA modes

11.0 SAR MEASUREMENT RESULTS

The SAR values averaged over 1g tissue masses were determined for the sample DUT for all test configurations listed in section 10.2.

11.1 SAR Results

Tables below displays the SAR results.

Table: SAR MEASUREMENT RESULTS – 850MHz GPRS

Table 56

Test Position	Plot No.	Test Mode	Test Ch.	Test Freq. (MHz)	SAR (1g) mW/g	Drift (dB)	∈r (target 55.2 ±5% 52.4 to 58.0)	σ (target 0.97 ±5% 0.92 to 1.02)	Tune –Up SAR (W/kg)
Bystander 25mm Spacing Antenna IN 29-10-14	-	GPRS Class 10 (0)	128	824.2	Noise Floor	N/A	55.58	0.9798	N/A
Bystander 25mm Spacing Antenna OUT 29-10-14	1.	GPRS Class 10 (0)	128	824.2	0.557	0.01	55.58	0.9798	0.718
Bystander 25mm Spacing Antenna OUT 29-10-14	2.	GPRS Class 10 (0)	190	836.6	0.535	0.05	55.47	0.9917	0.697
Bystander 25mm Spacing Antenna OUT 29-10-14	3.	GPRS Class 10 (0)	251	848.6	0.462	-0.04	55.33	1.005	0.615
Lap Held Antenna IN 29-10-14	-	GPRS Class 10 (0)	128	824.2	Noise Floor	N/A	55.58	0.9798	N/A
Lap Held Antenna OUT 29-10-14	4.	GPRS Class 10 (0)	128	824.2	1.03	0.07	55.58	0.9798	1.327
Lap Held Antenna OUT 29-10-14	5.	GPRS Class 10 (0)	190	836.6	0.993	-0.02	55.47	0.9917	1.294
Lap Held Antenna OUT 29-10-14	6.	GPRS Class 10 (0)	251	848.6	0.852	0	55.33	1.005	1.134
Lap Held Antenna OUT 29-10-14 Variability	7.	GPRS Class 10 (0)	128	824.2	1.09	-0.21	55.58	0.9798	**1.404**
Edge 2 Antenna IN 29-10-14	8.	GPRS Class 10 (0)	128	824.2	0.377	-0.18	55.58	0.9798	0.486
Edge 2 Antenna IN 29-10-14	9.	GPRS Class 10 (0)	190	836.6	0.285	-0.19	55.47	0.9917	0.371
Edge 2 Antenna IN 29-10-14	10.	GPRS Class 10 (0)	251	848.6	0.252	-0.14	55.33	1.005	0.335
Edge 3 Antenna IN 29-10-14	-	GPRS Class 10 (0)	128	824.2	Noise Floor	N/A	55.58	0.9798	N/A
Edge 3 Antenna OUT 29-10-14	11.	GPRS Class 10 (0)	128	824.2	0.168	-0.02	55.58	0.9798	0.216
Edge 3 Antenna OUT 29-10-14	12.	GPRS Class 10 (0)	190	836.6	0.188	0.06	55.47	0.9917	0.245
Edge 3 Antenna OUT 29-10-14	13.	GPRS Class 10 (0)	251	848.6	0.185	0.02	55.33	1.005	0.246
System Check 29-10-14	14.	CW	1	900	2.91	0	54.87	1.056	N/A

NOTE: The measurement uncertainty of 22.98% was not added to the result.

Table: SAR MEASUREMENT RESULTS – 1900MHz GPRS

Table 57

Test Position	Plot No.	Test Mode	Test Ch.	Test Freq. (MHz)	SAR (1g) mW/g	Drift (dB)	∈r (target 53.3 ±5% 50.6 to 56.0)	σ (target 1.52 ±5% 1.44 to 1.60)	Tune –Up SAR (W/kg)
Bystander 25mm Spacing Antenna IN 25-11-14	-	GPRS Class 10 (0)	661	1880	Noise floor	N/A	51.68	1.558	N/A
Bystander 25mm Spacing Antenna OUT 25-11-14	15.	GPRS Class 10 (0)	512	1850	0.209	0.11	51.83	1.537	0.379
Bystander 25mm Spacing Antenna OUT 25-11-14	16.	GPRS Class 10 (0)	661	1880	0.198	-0.12	51.68	1.558	0.340
Bystander 25mm Spacing Antenna OUT 25-11-14	17.	GPRS Class 10 (0)	810	1910	0.215	-0.1	51.57	1.578	0.381
Lap Held Antenna IN 25-11-14	-	GPRS Class 10 (0)	661	1880	Noise floor	N/A	51.68	1.558	N/A
Lap Held Antenna OUT 25-11-14	18.	GPRS Class 10 (0)	512	1850	0.39	0.01	51.83	1.537	0.708
Lap Held Antenna OUT 25-11-14	19.	GPRS Class 10 (0)	661	1880	0.357	-0.03	51.68	1.558	0.613
Lap Held Antenna OUT 25-11-14	20.	GPRS Class 10 (0)	810	1910	0.363	-0.1	51.57	1.578	0.643
Edge 2 Antenna IN 25-11-14	21.	GPRS Class 10 (0)	512	1850	0.525	0.09	51.83	1.537	0.953
Edge 2 Antenna IN 25-11-14	22.	GPRS Class 10 (0)	661	1880	0.512	0.12	51.68	1.558	0.880
Edge 2 Antenna IN 25-11-14	23.	GPRS Class 10 (0)	810	1910	0.518	-0.05	51.57	1.578	0.917
Edge 3 Antenna IN 25-11-14	-	GPRS Class 10 (0)	661	1880	Noise floor	N/A	51.68	1.558	N/A
Edge 3 Antenna OUT 25-11-14	24.	GPRS Class 10 (0)	512	1850	0.343	-0.03	51.83	1.537	0.623
Edge 3 Antenna OUT 25-11-14	25.	GPRS Class 10 (0)	661	1880	0.267	-0.06	51.68	1.558	0.459
Edge 3 Antenna OUT 25-11-14	26.	GPRS Class 10 (0)	810	1910	0.284	-0.15	51.57	1.578	0.284

NOTE: The measurement uncertainty of 22.98% was not added to the result.

Table: SAR MEASUREMENT RESULTS – 850MHz UMTS

Table 58

Test Position	Plot No.	Test Mode	Test Ch.	Test Freq. (MHz)	SAR (1g) mW/g	Drift (dB)	∈r (target 55.2 ±5% 52.4 to 58.0)	σ (target 0.97 ±5% 0.92 to 1.02)	Tune – Up SAR (W/kg)
Bystander 25mm Spacing Antenna IN 28-10-14	-	WCDMA - UMTS (0)	4183	836.6	Noise Floor	N/A	55.04	1.002	N/A
Bystander 25mm Spacing Antenna OUT 28-10-14	27.	WCDMA - UMTS (0)	4132	826.4	0.483	0.05	55.14	0.991	0.587
Bystander 25mm Spacing Antenna OUT 28-10-14	28.	WCDMA - UMTS (0)	4183	836.6	0.479	0.01	55.04	1.002	0.564
Bystander 25mm Spacing Antenna OUT 28-10-14	29.	WCDMA - UMTS (0)	4233	846.6	0.446	0.02	54.96	1.013	0.546
Lap Held Antenna IN 28-10-14	-	WCDMA - UMTS (0)	4183	836.6	Noise Floor	N/A	55.04	1.002	N/A
Lap Held Antenna OUT 28-10-14	30.	WCDMA - UMTS (0)	4132	826.4	0.481	0.02	55.14	0.991	0.585
Lap Held Antenna OUT 28-10-14	31.	WCDMA - UMTS (0)	4183	836.6	0.476	-0.19	55.04	1.002	0.561
Lap Held Antenna OUT 28-10-14	32.	WCDMA - UMTS (0)	4233	846.6	0.451	0.1	54.96	1.013	0.552
Edge 2 Antenna IN 28-10-14	33.	WCDMA - UMTS (0)	4132	826.4	0.191	0.1	55.14	0.991	0.232
Edge 2 Antenna IN 28-10-14	34.	WCDMA - UMTS (0)	4183	836.6	0.199	-0.05	55.04	1.002	0.234
Edge 2 Antenna IN 28-10-14	35.	WCDMA - UMTS (0)	4233	846.6	0.207	-0.03	54.96	1.013	0.253
Edge 3 Antenna IN 28-10-14	-	WCDMA - UMTS (0)	4183	836.6	Noise Floor	N/A	55.04	1.002	N/A
Edge 3 Antenna OUT 28-10-14	-	WCDMA - UMTS (0)	4183	836.6	Noise Floor	N/A	55.04	1.002	N/A
System Check 28-10-14	36.	CW	1	900	2.89	-0.01	54.46	1.066	N/A

NOTE: The measurement uncertainty of 22.98% was not added to the result.

Table: SAR MEASUREMENT RESULTS – 1700MHz UMTS

Table 59

Test Position	Plot No.	Test Mode	Test Ch.	Test Freq. (MHz)	SAR (1g) mW/g	Drift (dB)	∈r (target 53.3 ±5% 50.6 to 56.0)	σ (target 1.52 ±5% 1.44 to 1.60)	Tune – Up SAR (W/kg)
Bystander 25mm Spacing Antenna IN 21-11-14	-	WCDMA - UMTS (0)	1427	1735	Noise Floor	N/A	51.08	1.511	N/A
Bystander 25mm Spacing Antenna OUT 21-11-14	37.	WCDMA - UMTS (0)	1312	1712	0.131	-0.13	51.14	1.493	0.195
Bystander 25mm Spacing Antenna OUT 21-11-14	38.	WCDMA - UMTS (0)	1427	1735	0.151	-0.06	51.08	1.511	0.217
Bystander 25mm Spacing Antenna OUT 21-11-14	39.	WCDMA - UMTS (0)	1513	1753	0.162	-0.01	51.02	1.522	0.233
Lap Held Antenna IN 21-11-14	-	WCDMA - UMTS (0)	1427	1735	Noise Floor	N/A	51.08	1.511	N/A
Lap Held Antenna OUT 21-11-14	40.	WCDMA - UMTS (0)	1312	1712	0.359	0	51.14	1.493	0.533
Lap Held Antenna OUT 21-11-14	41.	WCDMA - UMTS (0)	1427	1735	0.388	-0.13	51.08	1.511	0.557
Lap Held Antenna OUT 21-11-14	42.	WCDMA - UMTS (0)	1513	1753	0.39	-0.07	51.02	1.522	0.561
Edge 2 Antenna IN 21-11-14	43.	WCDMA - UMTS (0)	1312	1712	0.76	0.06	51.14	1.493	1.129
Edge 2 Antenna IN 21-11-14	44.	WCDMA - UMTS (0)	1427	1735	0.712	-0.06	51.08	1.511	1.022
Edge 2 Antenna IN 21-11-14	45.	WCDMA - UMTS (0)	1513	1753	0.698	-0.08	51.02	1.522	1.004
Edge 3 Antenna IN 21-11-14	-	WCDMA - UMTS (0)	1427	1735	Noise Floor	N/A	51.08	1.511	N/A
Edge 3 Antenna OUT 21-11-14	46.	WCDMA - UMTS (0)	1312	1712	0.305	-0.02	51.14	1.493	0.453
Edge 3 Antenna OUT 21-11-14	47.	WCDMA - UMTS (0)	1427	1735	0.343	-0.04	51.08	1.511	0.492
Edge 3 Antenna OUT 21-11-14	48.	WCDMA - UMTS (0)	1513	1753	0.357	-0.07	51.02	1.522	0.514
System Check 21-11-14	49.	CW (0)	1	1800	9.64	-0.06	50.8	1.555	9.640

NOTE: The measurement uncertainty of 22.98% was not added to the result.

Table: SAR MEASUREMENT RESULTS – 1900MHz UMTS

Table 60

Test Position	Plot No.	Test Mode	Test Ch.	Test Freq. (MHz)	SAR (1g) mW/g	Drift (dB)	∈r (target 53.3 ±5% 50.6 to 56.0)	σ (target 1.52 ±5% 1.44 to 1.60)	Tune –Up SAR (W/kg)
Bystander 25mm Spacing Antenna IN 24-11-14	-	WCDMA - UMTS (0)	9538	1908	Noise floor	N/A	53.65	1.564	N/A
Bystander 25mm Spacing Antenna OUT 24-11-14	50.	WCDMA - UMTS (0)	9262	1852	0.228	0.06	53.88	1.536	0.366
Bystander 25mm Spacing Antenna OUT 24-11-14	51.	WCDMA - UMTS (0)	9400	1880	0.234	-0.1	53.76	1.552	0.374
Bystander 25mm Spacing Antenna OUT 24-11-14	52.	WCDMA - UMTS (0)	9538	1908	0.258	0.03	53.65	1.564	0.401
Lap Held Antenna IN 24-11-14	-	WCDMA - UMTS (0)	9538	1908	Noise floor	N/A	53.65	1.564	N/A
Lap Held Antenna OUT 24-11-14	53.	WCDMA - UMTS (0)	9262	1852	0.37	-0.13	53.88	1.536	0.595
Lap Held Antenna OUT 24-11-14	54.	WCDMA - UMTS (0)	9400	1880	0.366	-0.01	53.76	1.552	0.585
Lap Held Antenna OUT 24-11-14	55.	WCDMA - UMTS (0)	9538	1908	0.36	-0.1	53.65	1.564	0.560
Edge 2 Antenna IN 24-11-14	56.	WCDMA - UMTS (0)	9262	1852	0.675	-0.19	53.88	1.536	1.085
Edge 2 Antenna IN 24-11-14	57.	WCDMA - UMTS (0)	9400	1880	0.577	-0.21	53.76	1.552	0.923
Edge 2 Antenna IN 24-11-14	58.	WCDMA - UMTS (0)	9538	1908	0.623	-0.03	53.65	1.564	0.969
Edge 3 Antenna IN 24-11-14	-	WCDMA - UMTS (0)	9538	1908	Noise floor	N/A	53.65	1.564	N/A
Edge 3 Antenna OUT 24-11-14	59.	WCDMA - UMTS (0)	9262	1852	0.328	0.02	53.88	1.536	0.527
Edge 3 Antenna OUT 24-11-14	60.	WCDMA - UMTS (0)	9400	1880	0.294	-0.06	53.76	1.552	0.470
Edge 3 Antenna OUT 24-11-14	61.	WCDMA - UMTS (0)	9538	1908	0.279	-0.04	53.65	1.564	0.434
System Check 24-11-14	62.	CW (0)	1	1950	10.1	0	53.56	1.578	10.100

NOTE: The measurement uncertainty of 22.98% was not added to the result.

Table: SAR MEASUREMENT RESULTS – 850MHz CDMA BC0

Table 61

Test Position	Plot No.	Test Mode	Test Ch.	Test Freq. (MHz)	SAR (1g) mW/g	Drift (dB)	∈r (target 53.3 ±5% 50.6 to 56.0)	σ (target 1.52 ±5% 1.44 to 1.60)	Tune – Up SAR (W/kg)
Bystander 25mm Spacing Antenna IN 29-10-14	-	CDMA2000	384	836.5	Noise Floor	N/A	56.79	0.9996	N/A
Bystander 25mm Spacing Antenna OUT 29-10-14	63.	CDMA2000	1013	824.7	0.397	-0.04	56.94	0.9882	0.449
Bystander 25mm Spacing Antenna OUT 29-10-14	64.	CDMA2000	384	836.5	0.401	-0.02	56.79	0.9996	0.444
Bystander 25mm Spacing Antenna OUT 29-10-14	65.	CDMA2000	777	848.3	0.353	0	56.67	1.013	0.425
Lap Held Antenna IN 29-10-14	-	CDMA2000	384	836.5	Noise Floor	N/A	56.79	0.9996	N/A
Lap Held Antenna OUT 29-10-14	66.	CDMA2000	1013	824.7	0.578	-0.1	56.94	0.9882	0.653
Lap Held Antenna OUT 29-10-14	67.	CDMA2000	384	836.5	0.588	-0.02	56.79	0.9996	0.651
Lap Held Antenna OUT 29-10-14	68.	CDMA2000	777	848.3	0.524	-0.01	56.67	1.013	0.631
Edge 2 Antenna IN 29-10-14	69.	CDMA2000	1013	824.7	0.178	-0.1	56.94	0.9882	0.201
Edge 2 Antenna IN 29-10-14	70.	CDMA2000	384	836.5	0.186	-0.01	56.79	0.9996	0.206
Edge 2 Antenna IN 29-10-14	71.	CDMA2000	777	848.3	0.178	0.15	56.67	1.013	0.214
Edge 3 Antenna IN 29-10-14	-	CDMA2000	384	836.5	Noise Floor	N/A	56.79	0.9996	N/A
Edge 3 Antenna OUT 29-10-14	72.	CDMA2000	1013	824.7	0.101	0	56.94	0.9882	0.114
Edge 3 Antenna OUT 29-10-14	73.	CDMA2000	384	836.5	0.114	0.05	56.79	0.9996	0.126
Edge 3 Antenna OUT 29-10-14	74.	CDMA2000	777	848.3	0.109	0.02	56.67	1.013	0.131

NOTE: The measurement uncertainty of 22.98% was not added to the result.

Table: SAR MEASUREMENT RESULTS – 850MHz CDMA BC10

Table 62

Test Position	Plot No.	Test Mode	Test Ch.	Test Freq. (MHz)	SAR (1g) mW/g	Drift (dB)	∈r (target 53.3 ±5% 50.6 to 56.0)	σ (target 1.52 ±5% 1.44 to 1.60)	Tune – Up SAR (W/kg)
Bystander 25mm Spacing Antenna IN 29-10-14	-	CDMA2000	684	823.1	Noise Floor	N/A	56.94	0.9858	N/A
Bystander 25mm Spacing Antenna OUT 29-10-14	75.	CDMA2000	476	817.9	0.408	0	57.02	0.9818	0.454
Bystander 25mm Spacing Antenna OUT 29-10-14	76.	CDMA2000	560	820	0.411	0.01	56.99	0.984	0.450
Bystander 25mm Spacing Antenna OUT 29-10-14	77.	CDMA2000	684	823.1	0.404	0.07	56.94	0.9858	0.428
Lap Held Antenna IN 29-10-14	-	CDMA2000	684	823.1	Noise Floor	N/A	56.94	0.9858	N/A
Lap Held Antenna OUT 29-10-14	78.	CDMA2000	476	817.9	0.625	-0.01	57.02	0.9818	0.695
Lap Held Antenna OUT 29-10-14	79.	CDMA2000	560	820	0.63	-0.05	56.99	0.984	0.689
Lap Held Antenna OUT 29-10-14	80.	CDMA2000	684	823.1	0.615	-0.2	56.94	0.9858	0.651
Edge 2 Antenna IN 29-10-14	81.	CDMA2000	476	817.9	0.147	0.19	57.02	0.9818	0.163
Edge 2 Antenna IN 29-10-14	82.	CDMA2000	560	820	0.146	-0.01	56.99	0.984	0.160
Edge 2 Antenna IN 29-10-14	83.	CDMA2000	684	823.1	0.138	-0.09	56.94	0.9858	0.146
Edge 3 Antenna IN 29-10-14	-	CDMA2000	684	823.1	Noise Floor	N/A	56.94	0.9858	N/A
Edge 3 Antenna OUT 29-10-14	84.	CDMA2000	476	817.9	0.124	-0.04	57.02	0.9818	0.138
Edge 3 Antenna OUT 29-10-14	85.	CDMA2000	560	820	0.126	-0.03	56.99	0.984	0.138
Edge 3 Antenna OUT 29-10-14	86.	CDMA2000	684	823.1	0.128	0.11	56.94	0.9858	0.136
System Check	87.	CW	1	900	2.93	0	56.16	1.065	N/A

NOTE: The measurement uncertainty of 22.98% was not added to the result.

Table: SAR MEASUREMENT RESULTS – 1900MHz CDMA BC1

Table 63

Test Position	Plot No.	Test Mode	Test Ch.	Test Freq. (MHz)	SAR (1g) mW/g	Drift (dB)	∈r (target 53.3 ±5% 50.6 to 56.0)	σ (target 1.52 ±5% 1.44 to 1.60)	Tune – Up SAR (W/kg)
Bystander 25mm Spacing Antenna IN 25-11-14	-	CDMA2000	1175	1909	Noise Floor	N/A	51.58	1.577	N/A
Bystander 25mm Spacing Antenna OUT 25-11-14	88.	CDMA2000	25	1851	0.196	-0.09	51.83	1.536	0.276
Bystander 25mm Spacing Antenna OUT 25-11-14	89.	CDMA2000	600	1880	0.197	-0.11	51.68	1.558	0.285
Bystander 25mm Spacing Antenna OUT 25-11-14	90.	CDMA2000	1175	1909	0.226	0	51.58	1.577	0.301
Lap Held Antenna IN 25-11-14	-	CDMA2000	1175	1909	Noise Floor	N/A	51.58	1.577	N/A
Lap Held Antenna OUT 25-11-14	91.	CDMA2000	25	1851	0.465	-0.18	51.83	1.536	0.654
Lap Held Antenna OUT 25-11-14	92.	CDMA2000	600	1880	0.425	-0.16	51.68	1.558	0.616
Lap Held Antenna OUT 25-11-14	93.	CDMA2000	1175	1909	0.501	0.02	51.58	1.577	0.668
Edge 2 Antenna IN 25-11-14	94.	CDMA2000	25	1851	0.705	-0.18	51.83	1.536	0.991
Edge 2 Antenna IN 25-11-14	95.	CDMA2000	600	1880	0.419	0.02	51.68	1.558	0.607
Edge 2 Antenna IN 25-11-14	96.	CDMA2000	1175	1909	0.709	-0.02	51.58	1.577	0.945
Edge 3 Antenna IN 25-11-14	-	CDMA2000	1175	1909	Noise Floor	N/A	51.58	1.577	N/A
Edge 3 Antenna OUT 25-11-14	97.	CDMA2000	25	1851	0.416	-0.01	51.83	1.536	0.585
Edge 3 Antenna OUT 25-11-14	98.	CDMA2000	600	1880	0.343	-0.16	51.68	1.558	0.497
Edge 3 Antenna OUT 25-11-14	99.	CDMA2000	1175	1909	0.387	-0.07	51.58	1.577	0.516
System Check 25-11-14	100.	CDMA2000	1	1950	10.3	0.02	51.43	1.599	N/A

NOTE: The measurement uncertainty of 22.98% was not added to the result.

Table: SAR MEASUREMENT RESULTS – 700MHz LTE

Table 64

Test Position	Plot No.	Test Mode	Test Ch.	Test Freq. (MHz)	SAR (1g) mW/g	Drift (dB)	∈r (target 53.3 ±5% 50.6 to 56.0)	σ (target 1.52 ±5% 1.44 to 1.60)	Tune – Up SAR (W/kg)
Bystander 25mm Spacing Antenna IN 1RB 31-10-14	-	LTE FDD 10MHz QPSK (1RB Low) (0)	23800	711	Noise Floor	N/A	56.28	0.9223	N/A
Bystander 25mm Spacing Antenna OUT 1RB 31-10-14	101.	LTE FDD 10MHz QPSK (1RB Mid) (0)	23780	709	0.125	-0.06	56.36	0.9193	0.133
Bystander 25mm Spacing Antenna OUT 1RB 31-10-14	102.	LTE FDD 10MHz QPSK (1RB Low) (0)	23790	710	0.129	-0.02	56.34	0.9219	0.134
Bystander 25mm Spacing Antenna OUT 1RB 31-10-14	103.	LTE FDD 10MHz QPSK (1RB Low) (0)	23800	711	0.126	-0.07	56.28	0.9223	0.127
Bystander 25mm Spacing Antenna OUT 25RB 31-10-14	104.	LTE FDD 10MHz QPSK (25RB Mid) (0)	23780	709	0.107	0	56.36	0.9193	0.140
Bystander 25mm Spacing Antenna OUT 25RB 31-10-14	105.	LTE FDD 10MHz QPSK (25RB Low) (0)	23790	710	0.106	-0.11	56.34	0.9219	0.138
Bystander 25mm Spacing Antenna OUT 25RB 31-10-14	106.	LTE FDD 10MHz QPSK (25RB Low) (0)	23800	711	0.109	-0.01	56.28	0.9223	0.144
Lap Held Antenna IN 1RB 31-10-14	-	LTE FDD 10MHz QPSK (1RB Low) (0)	23800	711	Noise Floor	N/A	56.28	0.9223	N/A
Lap Held Antenna OUT 1RB 31-10-14	107.	LTE FDD 10MHz QPSK (1RB Mid) (0)	23780	709	0.359	0.08	56.36	0.9193	0.383
Lap Held Antenna OUT 1RB 31-10-14	108.	LTE FDD 10MHz QPSK (1RB Low) (0)	23790	710	0.466	-0.02	56.34	0.9219	0.486
Lap Held Antenna OUT 1RB 31-10-14	109.	LTE FDD 10MHz QPSK (1RB Low) (0)	23800	711	0.375	-0.11	56.28	0.9223	0.379
Lap Held Antenna OUT 25RB 31-10-14	110.	LTE FDD 10MHz QPSK (25RB Mid) (0)	23780	709	0.33	0.03	56.36	0.9193	0.431
Lap Held Antenna OUT 25RB 31-10-14	111.	LTE FDD 10MHz QPSK (25RB Low) (0)	23790	710	0.38	-0.07	56.34	0.9219	0.495
Lap Held Antenna OUT 25RB 31-10-14	112.	LTE FDD 10MHz QPSK (25RB Low) (0)	23800	711	0.298	-0.07	56.28	0.9223	0.393
Edge 2 Antenna IN 1RB 31-10-14	113.	LTE FDD 10MHz QPSK (1RB Mid) (0)	23780	709	0.279	0.03	56.36	0.9193	0.298
Edge 2 Antenna IN 1RB 31-10-14	114.	LTE FDD 10MHz QPSK (1RB Low) (0)	23790	710	0.276	0	56.34	0.9219	0.288
Edge 2 Antenna IN 1RB 31-10-14	115.	LTE FDD 10MHz QPSK (1RB Low) (0)	23800	711	0.223	0.1	56.28	0.9223	0.226
Edge 2 Antenna IN 25RB 31-10-14	116.	LTE FDD 10MHz QPSK (25RB Mid) (0)	23780	709	0.217	-0.05	56.36	0.9193	0.283
Edge 2 Antenna IN 25RB 31-10-14	117.	LTE FDD 10MHz QPSK (25RB Low) (0)	23790	710	0.216	0.06	56.34	0.9219	0.281

Edge 2 Antenna IN 25RB 31-10-14	118.	LTE FDD 10MHz QPSK (25RB Low) (0)	23800	711	0.171	-0.07	56.28	0.9223	0.225
Edge 3 Antenna IN 1 RB 31-10-14	-	LTE FDD 10MHz QPSK (1RB Low) (0)	23800	711	Noise Floor	N/A	56.28	0.9223	N/A
Edge 3 Antenna OUT 1RB 31-10-14	119.	LTE FDD 10MHz QPSK (1RB Mid) (0)	23780	709	0.119	0.04	56.36	0.9193	0.127
Edge 3 Antenna OUT 1RB 31-10-14	120.	LTE FDD 10MHz QPSK (1RB Low) (0)	23790	710	0.123	0.03	56.34	0.9219	0.128
Edge 3 Antenna OUT 1RB 31-10-14	121.	LTE FDD 10MHz QPSK (1RB Low) (0)	23800	711	0.131	0.05	56.28	0.9223	0.133
Edge 3 Antenna OUT 25RB 31-10-14	122.	LTE FDD 10MHz QPSK (25RB Mid) (0)	23780	709	0.106	0.04	56.36	0.9193	0.138
Edge 3 Antenna OUT 25RB 31-10-14	123.	LTE FDD 10MHz QPSK (25RB Low) (0)	23790	710	0.103	-0.02	56.34	0.9219	0.134
Edge 3 Antenna OUT 25RB 31-10-14	124.	LTE FDD 10MHz QPSK (25RB Low) (0)	23800	711	0.107	0.07	56.28	0.9223	0.141

NOTE: The measurement uncertainty of 22.98% was not added to the result.

Table: SAR MEASUREMENT RESULTS – 750MHz LTE

Table 65

Test Position	Plot No.	Test Mode	Test Ch.	Test Freq. (MHz)	SAR (1g) mW/g	Drift (dB)	∈r (target 53.3 ±5% 50.6 to 56.0)	σ (target 1.52 ±5% 1.44 to 1.60)	Tune – Up SAR (W/kg)
Bystander 25mm Spacing Antenna IN 1RB 31-10-14	-	LTE FDD 10MHz QPSK (1RB Mid) (0)	23230	782	Noise Floor	N/A	55.46	0.9898	N/A
Bystander 25mm Spacing Antenna OUT 1RB 31-10-14	125.	LTE FDD 10MHz QPSK (1RB Mid) (0)	23230	782	0.282	-0.06	55.46	0.9898	0.305
Bystander 25mm Spacing Antenna OUT 25RB 31-10-14	126.	LTE FDD 10MHz QPSK (25RB Mid) (0)	23230	782	0.214	-0.01	55.46	0.9898	0.295
Lap Held Antenna IN 1RB 31-10-14	-	LTE FDD 10MHz QPSK (1RB Mid) (0)	23230	782	Noise Floor	N/A	55.46	0.9898	N/A
Lap Held Antenna OUT 1RB 31-10-14	127.	LTE FDD 10MHz QPSK (1RB Mid) (0)	23230	782	0.555	-0.16	55.46	0.9898	0.600
Lap Held Antenna OUT 25RB 31-10-14	128.	LTE FDD 10MHz QPSK (25RB Mid) (0)	23230	782	0.425	-0.03	55.46	0.9898	0.587
Edge 2 Antenna IN 1RB 31-10-14	129.	LTE FDD 10MHz QPSK (1RB Mid) (0)	23230	782	0.295	-0.08	55.46	0.9898	0.319
Edge 2 Antenna IN 25RB 31-10-14	130.	LTE FDD 10MHz QPSK (25RB Mid) (0)	23230	782	0.221	-0.03	55.46	0.9898	0.305
Edge 3 Antenna IN 1RB 31-10-14	-	LTE FDD 10MHz QPSK (1RB Mid) (0)	23230	782	Noise Floor	N/A	55.46	0.9898	N/A
Edge 3 Antenna OUT 1RB 31-10-14	131.	LTE FDD 10MHz QPSK (1RB Mid) (0)	23230	782	0.0791	-0.05	55.46	0.9898	0.086
Edge 3 Antenna OUT 25RB 31-10-14	132.	LTE FDD 10MHz QPSK (25RB Mid) (0)	23230	782	0.0608	-0.14	55.46	0.9898	0.084
System Check 31-10--14	133.	CW (0)	1	750	2.01	-0.03	55.81	0.9571	N/A

NOTE: The measurement uncertainty of 22.98% was not added to the result.

Table: SAR MEASUREMENT RESULTS – 1700MHz LTE

Table 66

Test Position	Plot No.	Test Mode	Test Ch.	Test Freq. (MHz)	SAR (1g) mW/g	Drift (dB)	∈r (target 53.3 ±5% 50.6 to 56.0)	σ (target 1.52 ±5% 1.44 to 1.60)	Tune – Up SAR (W/kg)
Bystander 25mm Spacing Antenna IN 1RB 21-11-14	-	LTE FDD 20MHz QPSK (1RB High) (0)	20175	1733	Noise Floor	N/A	51.09	1.509	N/A
Bystander 25mm Spacing Antenna OUT 1RB 21-11-14	134.	LTE FDD 20MHz QPSK (1RB High) (0)	20050	1720	0.161	-0.13	51.11	1.5	0.235
Bystander 25mm Spacing Antenna OUT 1RB 21-11-14	135.	LTE FDD 20MHz QPSK (1RB High) (0)	20175	1733	0.17	-0.03	51.09	1.509	0.233
Bystander 25mm Spacing Antenna OUT 1RB 21-11-14	136.	LTE FDD 20MHz QPSK (1RB High) (0)	20300	1745	0.168	-0.04	51.02	1.517	0.237
Bystander 25mm Spacing Antenna OUT 50RB 21-11-14	137.	LTE FDD 20MHz QPSK (50RB Mid) (0)	20050	1720	0.121	-0.02	51.11	1.5	0.234
Bystander 25mm Spacing Antenna OUT 50RB 21-11-14	138.	LTE FDD 20MHz QPSK (50RB Mid) (0)	20175	1733	0.127	-0.06	51.09	1.509	0.236
Bystander 25mm Spacing Antenna OUT 50RB 21-11-14	139.	LTE FDD 20MHz QPSK (50RB Low) (0)	20300	1745	0.13	-0.06	51.02	1.517	0.237
Lap Held Antenna IN 1RB 21-11-14	-	LTE FDD 20MHz QPSK (1RB High) (0)	20175	1733	Noise Floor	N/A	52.8	1.52	N/A
Lap Held Antenna OUT 1RB 21-11-14	140.	LTE FDD 20MHz QPSK (1RB High) (0)	20050	1720	0.419	0.13	52.83	1.509	0.611
Lap Held Antenna OUT 1RB 21-11-14	141.	LTE FDD 20MHz QPSK (1RB High) (0)	20175	1733	0.448	-0.04	52.8	1.52	0.614
Lap Held Antenna OUT 1RB 21-11-14	142.	LTE FDD 20MHz QPSK (1RB High) (0)	20300	1745	0.419	0.09	52.73	1.53	0.592
Lap Held Antenna OUT 50RB 21-11-14	143.	LTE FDD 20MHz QPSK (50RB Mid) (0)	20050	1720	0.317	-0.03	52.83	1.509	0.612
Lap Held Antenna OUT 50RB 24-11-14	144.	LTE FDD 20MHz QPSK (50RB Mid) (0)	20175	1733	0.295	-0.08	51.08	1.506	0.549
Lap Held Antenna OUT 50RB 24-11-14	145.	LTE FDD 20MHz QPSK (50RB Low) (0)	20300	1745	0.302	0.01	51.05	1.513	0.550
Edge 2 Antenna IN 1RB 24-11-14	146.	LTE FDD 20MHz QPSK (1RB High) (0)	20050	1720	0.615	-0.2	51.11	1.495	0.897
Edge 2 Antenna IN 1RB 24-11-14	147.	LTE FDD 20MHz QPSK (1RB High) (0)	20175	1733	0.629	-0.03	51.08	1.506	0.862
Edge 2 Antenna IN 1RB 24-11-14	148.	LTE FDD 20MHz QPSK (1RB High) (0)	20300	1745	0.611	-0.09	51.05	1.513	0.863
Edge 2 Antenna IN 50RB 24-11-14	149.	LTE FDD 20MHz QPSK (50RB Mid) (0)	20050	1720	0.494	0.04	51.11	1.495	0.954
Edge 2 Antenna IN 50RB 24-11-14	150.	LTE FDD 20MHz QPSK (50RB Mid) (0)	20175	1733	0.486	-0.08	51.08	1.506	0.905
Edge 2 Antenna IN 50RB 24-11-14	151.	LTE FDD 20MHz QPSK (50RB Low) (0)	20300	1745	0.483	-0.05	51.05	1.513	0.879

Edge 3 Antenna IN 1RB 24-11-14	-	LTE FDD 20MHz QPSK (1RB High) (0)	20175	1733	Noise Floor	N/A	51.08	1.506	N/A
Edge 3 Antenna OUT 1RB 24-11-14	152.	LTE FDD 20MHz QPSK (1RB High) (0)	20050	1720	0.352	-0.06	51.11	1.495	0.514
Edge 3 Antenna OUT 1RB 24-11-14	153.	LTE FDD 20MHz QPSK (1RB High) (0)	20175	1733	0.379	-0.06	51.08	1.506	0.520
Edge 3 Antenna OUT 1RB 24-11-14	154.	LTE FDD 20MHz QPSK (1RB High) (0)	20300	1745	0.375	-0.03	51.05	1.513	0.530
Edge 3 Antenna OUT 50RB 24-11-14	155.	LTE FDD 20MHz QPSK (50RB Mid) (0)	20050	1720	0.256	-0.01	51.11	1.495	0.495
Edge 3 Antenna OUT 50RB 24-11-14	156.	LTE FDD 20MHz QPSK (50RB Mid) (0)	20175	1733	0.279	-0.04	51.08	1.506	0.520
Edge 3 Antenna OUT 50RB 24-11-14	157.	LTE FDD 20MHz QPSK (50RB Low) (0)	20300	1745	0.29	0.04	51.05	1.513	0.528
System Check 24-11-14	158.	CW (0)	1	1800	9.52	-0.03	50.83	1.552	N/A

NOTE: The measurement uncertainty of 22.98% was not added to the result.

Table: SAR MEASUREMENT RESULTS – 1900MHz LTE

Table 67

Test Position	Plot No.	Test Mode	Test Ch.	Test Freq. (MHz)	SAR (1g) mW/g	Drift (dB)	∈r (target 53.3 ±5% 50.6 to 56.0)	σ (target 1.52 ±5% 1.44 to 1.60)	Tune – Up SAR (W/kg)
Bystander 25mm Spacing Antenna IN 1RB 26-11-14	-	LTE FDD 20MHz QPSK (1RB High) (0)	26590	1905	Noise Floor	N/A	51.77	1.549	N/A
Bystander 25mm Spacing Antenna OUT 1RB 26-11-14	159.	LTE FDD 20MHz QPSK (1RB High) (0)	26140	1860	0.168	0.1	51.95	1.52	0.249
Bystander 25mm Spacing Antenna OUT 1RB 26-11-14	160.	LTE FDD 20MHz QPSK (1RB Low) (0)	26365	1883	0.154	-0.19	51.85	1.536	0.230
Bystander 25mm Spacing Antenna OUT 1RB 26-11-14	161.	LTE FDD 20MHz QPSK (1RB High) (0)	26590	1905	0.188	-0.2	51.77	1.549	0.272
Bystander 25mm Spacing Antenna OUT 50RB 26-11-14	162.	LTE FDD 20MHz QPSK (50RB High) (0)	26140	1860	0.13	-0.09	51.95	1.52	0.252
Bystander 25mm Spacing Antenna OUT 50RB 26-11-14	163.	LTE FDD 20MHz QPSK (50RB Mid) (0)	26365	1883	0.13	-0.02	51.85	1.536	0.258
Bystander 25mm Spacing Antenna OUT 50RB 26-11-14	164.	LTE FDD 20MHz QPSK (50RB High) (0)	26590	1905	0.142	0.01	51.77	1.549	0.278
Lap Held Antenna IN 1RB 26-11-14	-	LTE FDD 20MHz QPSK (1RB High) (0)	26590	1905	Noise Floor	N/A	51.77	1.549	N/A
Lap Held Antenna OUT 1RB 26-11-14	165.	LTE FDD 20MHz QPSK (1RB High) (0)	26140	1860	0.395	0.16	51.95	1.52	0.586
Lap Held Antenna OUT 1RB 26-11-14	166.	LTE FDD 20MHz QPSK (1RB Low) (0)	26365	1883	0.317	-0.21	51.85	1.536	0.474
Lap Held Antenna OUT 1RB 26-11-14	167.	LTE FDD 20MHz QPSK (1RB High) (0)	26590	1905	0.384	-0.04	51.77	1.549	0.556
Lap Held Antenna OUT 50RB 26-11-14	168.	LTE FDD 20MHz QPSK (50RB High) (0)	26140	1860	0.317	-0.04	51.95	1.52	0.615
Lap Held Antenna OUT 50RB 26-11-14	169.	LTE FDD 20MHz QPSK (50RB Mid) (0)	26365	1883	0.307	-0.05	51.85	1.536	0.610
Lap Held Antenna OUT 50RB 26-11-14	170.	LTE FDD 20MHz QPSK (50RB High) (0)	26590	1905	0.322	-0.07	51.77	1.549	0.629
Edge 2 Antenna IN 1RB 26-11-14	171.	LTE FDD 20MHz QPSK (1RB High) (0)	26140	1860	0.714	-0.06	51.95	1.52	1.059
Edge 2 Antenna IN 1RB 26-11-14	172.	LTE FDD 20MHz QPSK (1RB Low) (0)	26365	1883	0.363	-0.17	51.85	1.536	0.543
Edge 2 Antenna IN 1RB 26-11-14	173.	LTE FDD 20MHz QPSK (1RB High) (0)	26590	1905	0.377	-0.12	51.77	1.549	0.546
Edge 2 Antenna IN 50RB 26-11-14	174.	LTE FDD 20MHz QPSK (50RB High) (0)	26140	1860	0.43	-0.15	51.95	1.52	0.835
Edge 2 Antenna IN 50RB 26-11-14	175.	LTE FDD 20MHz QPSK (50RB Mid) (0)	26365	1883	0.387	-0.08	51.85	1.536	0.769

Edge 2 Antenna IN 50RB 26-11-14	176.	LTE FDD 20MHz QPSK (50RB High) (0)	26590	1905	0.415	-0.02	51.77	1.549	0.811
Edge 3 Antenna IN 1RB 26-11-14	-	LTE FDD 20MHz QPSK (1RB High) (0)	26590	1905	Noise Floor	N/A	51.77	1.549	N/A
Edge 3 Antenna OUT 1RB 26-11-14	177.	LTE FDD 20MHz QPSK (1RB High) (0)	26140	1860	0.436	-0.09	51.95	1.52	0.646
Edge 3 Antenna OUT 1RB 26-11-14	178.	LTE FDD 20MHz QPSK (1RB Low) (0)	26365	1883	0.305	-0.05	51.85	1.536	0.456
Edge 3 Antenna OUT 1RB 26-11-14	179.	LTE FDD 20MHz QPSK (1RB High) (0)	26590	1905	0.312	0.02	51.77	1.549	0.452
Edge 3 Antenna OUT 50RB 26-11-14	180.	LTE FDD 20MHz QPSK (50RB High) (0)	26140	1860	0.277	0.01	51.95	1.52	0.538
Edge 3 Antenna OUT 50RB 26-11-14	181.	LTE FDD 20MHz QPSK (50RB Mid) (0)	26365	1883	0.24	-0.11	51.85	1.536	0.477
Edge 3 Antenna OUT 50RB 26-11-14	182.	LTE FDD 20MHz QPSK (50RB High) (0)	26590	1905	0.266	0.01	51.77	1.549	0.520
System Check 26-11-14	183.	CW (0)	1	1950	10.1	0.03	51.63	1.568	N/A

NOTE: The measurement uncertainty of 22.98% was not added to the result.

12.0 COMPLIANCE STATEMENT

The Fujitsu Convertable Tablet PC, Model: Lifebook T725 with SIERRA WIRELESS Mini-PCI Wireless WAN Module Model: EM7355 was found to comply with the FCC and RSS-102 SAR requirements.

The highest SAR level recorded was 1.09 mW/g for a 1g cube. The manufacturer's tune up power is stated to be 2238 mW Burst Average Power. Scaling the SAR value, the maximum SAR value is **1.404 mW/g.** This value was measured at 824.2 MHz (channel 128) in the "Lap Held Antenna OUT " position in GPRS Class 10 transmission multislot mode. This was below the limit of 1.6 mW/g for uncontrolled exposure, but was within the band of measurement uncertainty around the limit.

The SAR test Variability checks were conducted and the repeated results are included in the SAR results tables.

13.0 MULTIBAND EVALUATION CONSIDERATIONS

According to the FCC SAR evaluation procedures mentioned in KDB447498, when the sum of SAR results (simultaneously transmitting antennas WLAN and WWAN) is > 1.6mW/g, and "the aggregate 1-g SAR is scaled by the sum of the differences between maximum tune-up and tested power of each transmitter - [(SAR1 +SAR2) * (Pdiff1 + Pdiff2)]", simultaneous transmission SAR evaluation is required.

Host System #2:
Multiband evaluation was not required for WWAN (**EM7355**) and WIFI (**7265NGW**) because the above mentioned sum (and the aggregate) of the worst case SAR results for simultaneusly transmitting antennas was found to be lower than SAR limit of 1.6 mW/g (WLAN SAR testing was conducted at Tune-up power level):

SAR WWAN + SAR WLAN Antenna A Lap Held configuration FCC:
1.404 mW/g + Noise Floor = 1.404 mW/g (Including Tune Up scaling)

SAR WWAN + SAR WLAN Antenna A Lap Held configuration IC:
1.404 mW/g + 0.068 = 1.472 mW/g (Including Tune Up scaling)

SAR WWAN + SAR WLAN Antenna A Edge 3 configuration FCC/IC:
0.646 mW/g + Noise Floor = 0.646 mW/g (Including Tune Up scaling)

SAR WWAN + SAR WLAN Antenna A Bystander 25mm Spacing configuration IC:
0.718 mW/g + 0.031 mW/g = 0.749 mW/g (Including Tune Up scaling)

SAR WWAN + SAR WLAN Antenna A Edge 2 configuration FCC/IC:
1.129 mW/g + 0.331 mW/g = 1.46 mW/g (Including Tune Up scaling)

Diagram Showing Antenna Positions (provided by client)