Intel Corporation

WSBUB-SDS

SAR Evaluation Report #: INTE5478

WWAN Evaluated to the following SAR Specification:

FCC 2.1093:2014

Report Prepared By Northwest EMC Inc.

NORTHWEST EMC – (888) 364-2378 – www.nwemc.com

California – Minnesota – Oregon – New York – Washington

CERTIFICATE OF TEST

Last Date of Test: August 28, 2014
Intel Corporation
Model: WSBUB-SDS

WWAN Radio

Applicable Standard

Test Description	Specification	Test Method	Pass/Fail
SAR Evaluation	FCC 2.1093:2014	IEEE Std 1528:2003	Pass
		FCC KDB 447498 D01 v05r02	
		FCC KDB 941225 D01 v02, D03 v01 and D05 v02r03	
		FCC KDB 616217 D04 v01r01	
		FCC KDB 865664 D01 v01r03 and D02 v01r01	

Highest Reported SAR Values

Frequency Bands	Body (W/kg)	Limit (W/kg)	Exposure Environment
	1g	1g	
CLR 850	1.23	**1.6**	**General Population**
PCS 1900	1.16	**1.6**	**General Population**
AWS 1700	1.14	**1.6**	**General Population**
LTE 2	1.21	**1.6**	**General Population**
LTE 4	1.37	**1.6**	**General Population**
LTE 5	1.16	**1.6**	**General Population**
LTE 7	0.98	**1.6**	**General Population**
LTE 13	1.38	**1.6**	**General Population**
LTE 17	1.34	**1.6**	**General Population**

Deviations From Test Standards

None

Approved By:

Don Facteau, IS Manager

NVLAP Lab Code: 200630-0

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.

NORTHWEST EMC
REV 2012.08.02

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

NORTHWEST EMC

REV 2012.05.24

ACCREDITATIONS AND AUTHORIZATIONS

United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC Guide 65 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

IC - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

European Union

European Commission – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

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Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Hong Kong

OFTA – Recognized by OFTA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

Russia

GOST – Accredited by Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC to perform EMC and Hygienic testing for Information Technology products to GOST standards.

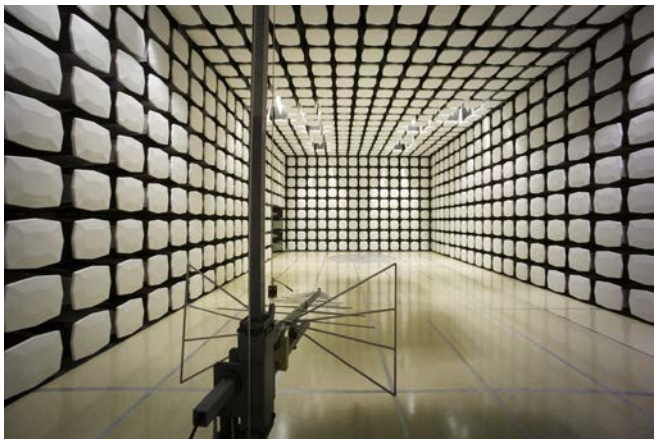
SCOPE

For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/accreditations/

FACILITIES

REV 2013.01.07

Oregon Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	**California** Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	**New York** Labs WA01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	**Minnesota** Labs MN01-08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	**Washington** Labs NC01-05,SU02,SU07 19201 120th Ave. NE Bothell, WA 98011 (425) 984-6600
VCCI				
A-0108	A-0029		A-0109	A-0110
Industry Canada				
2834D-1, 2834D-*2*	2834B-1, 2834B-2, 2834B-3		2834E-1	2834C-1



PRODUCT DESCRIPTION

WTD 12.5.23

Client and Equipment Under Test (EUT) Information

Company Name:	Intel Corporation
Address:	5200 NE Elam Young Pkwy
City, State, Zip:	Hillsboro, OR 97124
Test Requested By:	Mike Lowe/Bill Jones
Model:	WSBUB-SDS
First Date of Test:	May 2, 2014
Last Date of Test:	August 28, 2014
Receipt Date of Samples:	May 2, 2014
Equipment Design Stage:	Production
Equipment Condition:	No Damage

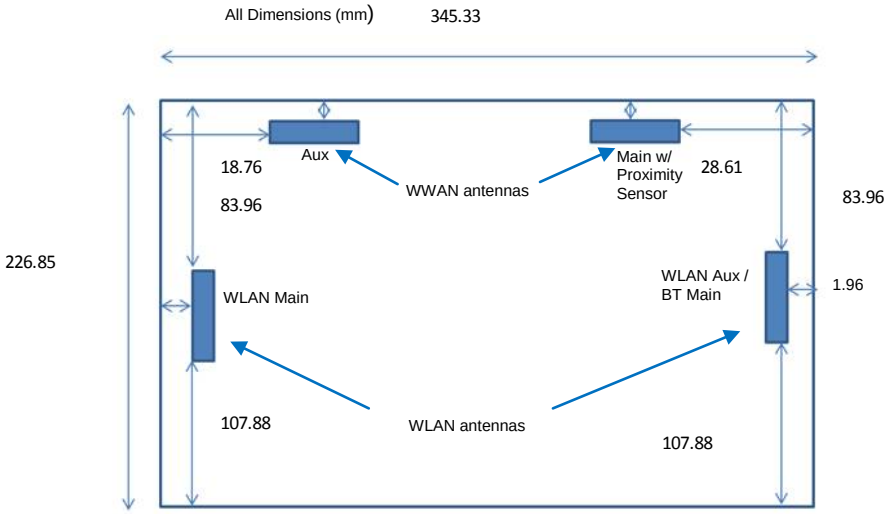
Information Provided by the Party Requesting the Test

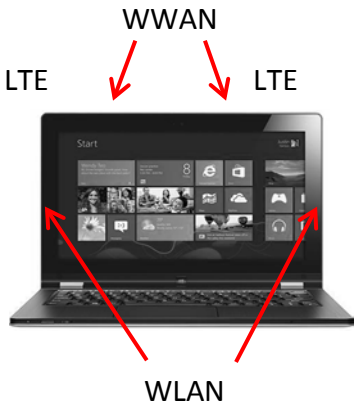
Functional Description of the EUT (Equipment Under Test):

The EUT is the Model WSBUB-SDS laptop / tablet convertible computer containing a NFC radio. Previously certified WWAN (FCC ID: RYQ-NF2) and WLAN / Bluetooth (FCC ID: PD97265NG) modular radios are installed. The WWAN radio is the subject of this SAR evaluation.

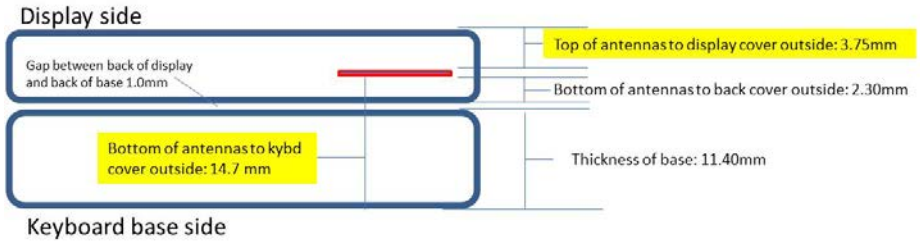
The WWAN radio is 3G / 4G device operating in the CLR 850, PCS 1900, and AWS 1700 bands; and LTE 2, 4, 5, 7, 13, and 17 bands.

The WWAN antennas are Inverted F antennas that are integral to the computer. The main antenna can transmit and receive and has a peak gain of 4.5 dBi below 1 GHz, and 3 dBi above 1 GHz. The auxiliary antenna can only receive. The main antenna is co-located with a proximity sensor. Once the sensor is triggered, the output power is lowered for all WWAN bands.





WSB Tablet Mode
Z stack up antenna placement



Usage Scenarios

WWAN Ants Toward user or away depending on orientation.

tablet

Laptop with external display and keybd / mouse

WWAN Ants

Ext Monitor

Keyboard /Mouse

WWAN Ants

notebook

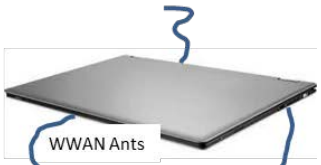
WWAN Ants

easel

WWAN Ants

tent

Ext Monitor



WWAN Ants

Keyboard /Mouse

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Testing Requirements

Test Locations

After a review of the usage scenarios displayed above, any of the edges or the back side could be placed in contact with the user's torso during normal operation. This is true with the keyboard folded under the display ("tablet mode") or extended away from the display ("tent mode").

The diagonal screen size is greater than 20cm (7.9) inches therefore KDB 941225 is not applicable; instead, KDB 616217 is applicable.

There is no usage model for operation near the head. There are no authorized accessories to wear the device on the body. When used in "tablet mode", only the tablet configurations anticipated by KDB 616217 are applicable. Testing was done with 0 cm spacing to the phantom.

KDB 447498 D01 General RF Exposure Guidance v05r02 is the FCC's starting point for RF exposure policy. Section 4.3.1, Item #1 provides the SAR test exclusion thresholds for test separation distances ≤ 50mm:

> [(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] * [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where
>
> - f(GHz) is the RF channel transmit frequency in GHz
> - Power and distance are rounded to the nearest mW and mm before calculation
> - The result is rounded to one decimal place for comparison
> - 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below
>
> The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

Using the formula above, sides or edges with greater than 201 mm (7.9 inches) separation from the antenna are excluded from stand-alone SAR testing.

Conducted Output Power[1]		Duty Cycle	Exclusion Threshold	Transmit Frequency	Minimum Test Separation	Minimum Test Separation
(dBm)	(mW)			(GHz)	(mm)	(inches)
20.22	105	1	3	0.71	30	1.16
22.23	167	1	3	0.78	49	1.94
28.2	661	1	3	0.835	201	7.92
15.8	38	1	3	1.73	17	0.66
23.2	209	1	3	1.88	95	3.76
13.09	20	1	3	2.52	11	0.42

Note 1: Output power values are found in the conducted output power section of this report. They are for the low (triggered) power levels.

The WWAN Main antenna is closest to the right side of the display. The back side of the display can be used next to the torso. Since they are all closer than 201 mm to the antennas, the top and right edges as well as the back side adjacent to the antenna were tested. Each of these positions were tested with the keyboard folded under the display ("tablet mode") or extended away from the display ("tent mode"). Please see the discussion above regarding usage scenarios.

The bottom edge has greater than 201 mm separation from the antenna and is excluded from SAR testing. The front surface of the tablet is excluded from SAR testing per Section 4.3 of KDB 616217 D04 v01r01.

Simultaneous Transmission SAR Test Exclusion

All the radios subject to FCC 2.1093 RF exposure requirements can transmit simultaneously. KDB 447498 D01 v05r02, Section 4.3.2 provides the guidance for determining SAR test exclusion thresholds for simultaneous transmission conditions:

> "When the sum of 1-g or 10-g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration. When the sum is greater than the SAR limit, the SAR to peak location separation ratio procedures described below may be applied to determine if simultaneous transmission SAR test exclusion applies."

The sum of the 1-g SAR from the simultaneous transmitting WWAN and WLAN antennas is greater than the SAR limit. Therefore, the SAR to peak location separation ratio procedures must be followed. First the estimated standalone SAR must be calculated for those radios that were excluded per section 4.3.1. In this case, the Bluetooth radio was excluded from standalone SAR:

> "(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)/x] W/kg for test separation distances ≤ 50 mm;
>
> where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR."

Using the formula above, the estimated stand-alone SAR for the Bluetooth radio was calculated:

Radio	Conducted Output Power[1] (mW)	Maximum Duty Cycle	Test Separation (mm)	Transmit Frequency (GHz)	Estimated Standalone SAR (W/kg)
Bluetooth BR/EDR	3	0.77	2.30	2.45	0.210
Bluetooth LE	2	1	2.30	2.45	0.181

Note 1: Output power values are found in the AT4 Wireless Reports # 41273RRF.001 and # 41273RRF.002

KDB 447498 D01 v05r02, Section 4.3.2 states:

> " The simultaneous transmitting antennas in each operating mode and exposure condition combination must be considered one pair at a time to determine the SAR to peak location separation ratio to qualify for test exclusion. The ratio is determined by (SAR1 + SAR2)1.5/Ri, rounded to two decimal digits, and must be ≤ 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion….SAR1 and SAR2 are the highest reported or estimated SAR for each antenna in the pair, and Ri is the separation distance between the peak SAR locations for the antenna pair in mm. The antennas in all antenna pairs that do not qualify for simultaneous transmission SAR test exclusion must be tested for SAR compliance according to the enlarged zoom scan and volume scan post-processing procedures in KDB 865664"

KDB 616217 D04 v01r01, Section 4.3 states:

> "SAR test exclusion must be determined separately for the back surface and each edge, according to the simultaneous transmission requirements for each exposure position, which may involve antennas transmitting simultaneously on adjacent or multiple edges. When antennas on adjacent edges are considered for SAR to peak location separation ratio test exclusion, the peak SAR locations reported by

the SAR measurement system referencing different physical phantom and device locations should not be used. The peak location separation must be determined manually with respect to a common origin on the device; for example, with respect to the same physical edge location of the tablet and reference point on the phantom."

The highest SAR for both the WLAN and WWAN radios was measured on the back positions in the "tent mode". This also provided the closest spacing between the phantom and the antennas. The back position was used as the common origin on the device for the following simultaneous SAR test exclusion calculations:

Antenna Pair (Ant 1, Ant 2)	SAR from Ant 1 (W/kg)	SAR from Ant 2 (W/kg)	Separation Distance (mm)	Exclusion Threshold	Spec
WLAN Ant Main[1], WWAN	1.43	1.38	319	0.01	<=0.04
WLAN Ant Aux[1], WWAN	1.49	1.38	110	0.04	<=0.04
BT Ant, WWAN	0.21	1.38	110	0.02	<=0.04

Note 1: SAR values for the WLAN radio are found in NWEMC Test Report # INTE5434

The WLAN and WWAN antennas are excluded from simultaneous SAR testing.

Testing Objective:

To demonstrate compliance with the SAR requirements of FCC 2.1093.

Scope

The stand-alone SAR evaluation and proximity sensor testing documented in this report is for the WWAN portion of the EUT.

CONFIGURATIONS

Configuration INTE5453- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop/Tablet Convertible Computer	Intel Corporation	WSBUB-SDS	008

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC Adapter	Delta Electronics, Inc.	ADP-45BE AA	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Power	No	1.5m	PA	AC Adapter	Tablet Computer
AC Power	No	0.65m	No	AC Mains	AC Adapter
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Configuration INTE5478- 1

Software/Firmware Running during test	
Description	**Version**
Windows	8.1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop/Tablet Convertible	Intel Corporation	WSBUB-SDS	FZWC41000237

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC Adapter	Delta Electronics	ADP-45BEAA	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Headphones	No	1.29m	No	Laptop/Tablet Convertible	Un Terminated
HDMI	No	1.55m	No	Laptop/Tablet Convertible	Un Terminated
Ethernet	No	1.04m	No	Laptop/Tablet Convertible	Un Terminated
USB Cable	No	1.02m	No	Laptop/Tablet Convertible	Un Terminated
USB Cable	No	1m	No	Laptop/Tablet Convertible	Un Terminated
AC Power	No	0.5m	No	AC Mains	AC Adapter
DC Power	No	1.5m	Unknown	AC Adapter	Laptop/Tablet Convertible
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATIONS

WTD 12.5.23

Configuration INTE5485- 1

Software/Firmware Running during test	
Description	**Version**
Windows	8.1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop/Tablet Convertible	Intel Corporation	WSBUB-SDS	FZWC41000237

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC Adapter	Delta Electronics	ADP-45BEAA	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	0.5m	No	AC Mains	AC Adapter
DC Power	No	1.5m	Unknown	AC Adapter	Laptop/Tablet Convertible
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

MODIFICATIONS

WTD 12.5.23

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	5/02/2014	SAR Evaluation	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test
2	8/28/2014	SAR Evaluation	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

TISSUE – EQUIVALENT LIQUID

Characterization of tissue-equivalent liquid dielectric properties

Per IEEE 1528: 2003, Section 5.2.2, the permittivity and conductivity of the tissue material should be measured at least within 24 hours of any full-compliance test. The measured values must be within +/- 5% of the target values. The temperature variation in the liquid during SAR measurements must be within +/- 2 degrees C of that recorded when the dielectric properties were measured.

The dielectric parameters of the tissue-equivalent liquids were measured within 24 hours of the start of testing using the HP85070E dielectric probe kit. The dielectric measurements were made across the frequency range of the liquid. The attached data sheets show that the dielectric parameters of the liquid were within the required 5% tolerances.

Target values of dielectric parameters

Per KDB 865664 D01 v01r01, Appendix A.1:

"The head tissue dielectric parameters recommended by IEEE Std 1528-2003 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in 1528 are derived from tissue dielectric parameters computed from the 4-Cole-Cole equations described above and extrapolated according to the head parameters specified in 1528."

Target Frequency	Head		Body	
(MHz)	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
5800	35.3	5.27	48.2	6.00

(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)

TISSUE – EQUIVALENT LIQUID

Composition of Ingredients for Liquid Tissue Phantoms

Northwest EMC uses tissue-equivalent liquids prepared by SPEAG and confirmed by them to be within +/- 5% from the target values. Their recipes are based upon the following formulations as found in IEEE 1528: 2003, Annex C:

"The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation."

Ingredients (% by weight)	**Frequency (MHz)**									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

Salt: 99^{+}% Pure Sodium Chloride Sugar: 98^{+}% Pure Sucrose
Water: De-ionized, 16 MΩ^{+} resistivity HEC: Hydroxyethyl Cellulose
DGBE: 99^{+}% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]
Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether

TISSUE – EQUIVALENT LIQUID

WSTE.2013.09.09

Date:	05/05/2014	Temperature:	23.4°C
Tissue:	Body, MSL1900, 1900MHz	Liquid Temperature:	22.2°C
Tested By:	Ethan Schoonover	Relative Humidity:	38.6%
Job Site:	EV08	Bar. Pressure:	1016 mb

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 865664 D01 v01r03 and D02 v01r01

RESULTS

	Actual Values		Target Values		Deviation (%)	
Frequency (MHz)	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
1900	53.12	1.584	53.3	1.52	0.34	-4.21

Frequency (MHz)	Relative Permittivity	Conductivity
1000	56.52	0.658
1035	56.48	0.675
1070	56.22	0.704
1110	56.25	0.74
1145	56.07	0.771
1185	55.88	0.811
1220	55.71	0.838
1255	55.66	0.869
1295	55.56	0.914
1330	55.29	0.947
1370	55.13	0.985
1405	55.02	1.02
1440	54.93	1.062
1480	54.85	1.097
1515	54.73	1.137
1555	54.54	1.174
1590	54.38	1.209
1625	54.25	1.241
1665	54.11	1.285
1700	53.96	1.329
1740	53.75	1.374
1775	53.49	1.415
1810	53.38	1.461
1850	53.27	1.516
1885	53.06	1.567
1900	53.12	1.584
1925	53.08	1.603
1960	53.02	1.659
2000	52.9	1.7

TISSUE – EQUIVALENT LIQUID

WSTE.2013.09.09

Date:	05/07/2014	Temperature:	23.1°C
Tissue:	Body, MSL900, 900MHz	Liquid Temperature:	21.8°C
Tested By:	Ethan Schoonover	Relative Humidity:	28.7%
Job Site:	EV08	Bar. Pressure:	1015 mb

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 865664 D01 v01r03 and D02 v01r01

RESULTS

	Actual Values		Target Values		Deviation (%)	
Frequency (MHz)	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
900	53.13	1.048	55.0	1.05	3.4	0.19

Frequency (MHz)	Relative Permittivity	Conductivity
400	59.31	0.59
420	59.11	0.609
440	58.76	0.616
465	58.42	0.634
485	58.18	0.655
510	57.6	0.678
530	57.27	0.695
555	57.01	0.713
575	56.64	0.734
595	56.75	0.753
620	55.98	0.772
640	55.7	0.79
665	55.65	0.808
685	55.3	0.831
710	55.15	0.855
730	54.98	0.875
755	54.7	0.899
775	54.47	0.918
795	54.26	0.939
820	53.94	0.962
840	53.74	0.983
865	53.51	1.009
885	53.34	1.026
900	53.13	1.048
910	53.07	1.053
930	52.89	1.072
955	52.65	1.096
975	52.46	1.114
995	52.31	1.137

TISSUE – EQUIVALENT LIQUID

WSTE.2013.09.09

Date:	05/08/2014	Temperature:	22.9°C
Tissue:	Body, MSL750, 750MHz	Liquid Temperature:	21.9°C
Tested By:	Ethan Schoonover	Relative Humidity:	32.6%
Job Site:	EV08	Bar. Pressure:	1018 mb

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 865664 D01 v01r03 and D02 v01r01

RESULTS

	Actual Values		Target Values		Deviation (%)	
Frequency (MHz)	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
750	56.75	0.949	55.531	0.963	-2.2	1.45

Frequency (MHz)	Relative Permittivity	Conductivity
400	60.82	0.638
420	60.56	0.658
440	60.33	0.667
465	59.85	0.685
485	59.67	0.704
510	59.36	0.729
530	59.12	0.747
555	58.87	0.767
575	58.49	0.79
595	58.28	0.808
620	57.56	0.83
640	57.83	0.845
665	57.47	0.858
685	57.32	0.887
710	57.14	0.91
730	56.95	0.93
750	56.75	0.949
755	56.74	0.955
775	56.52	0.972
795	56.28	0.995
820	56.02	1.019
840	55.89	1.038
865	55.61	1.064
885	55.47	1.081
910	55.15	1.115
930	54.93	1.13
955	54.72	1.156
975	54.52	1.176
995	54.33	1.198

TISSUE – EQUIVALENT LIQUID

WSTE.2013.09.09

Date:	05/08/2014	Temperature:	23.2°C
Tissue:	Body, MSL1750, 1800MHz	Liquid Temperature:	22°C
Tested By:	Ethan Schoonover	Relative Humidity:	32.1%
Job Site:	EV08	Bar. Pressure:	1018 mb

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 865664 D01 v01r03 and D02 v01r01

RESULTS

	Actual Values		Target Values		Deviation (%)	
Frequency (MHz)	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
1800	54.96	1.588	53.3	1.52	-3.11	-4.47

Frequency (MHz)	Relative Permittivity	Conductivity
1000	58.36	0.784
1035	58.29	0.81
1070	58.16	0.847
1110	57.9	0.882
1145	57.84	0.91
1185	57.68	0.94
1220	57.72	0.973
1255	57.35	1.014
1295	57.18	1.038
1330	56.9	1.088
1370	56.67	1.113
1405	56.65	1.153
1440	56.52	1.193
1480	56.38	1.242
1515	56.3	1.279
1555	56.17	1.318
1590	56.08	1.352
1625	55.97	1.397
1665	55.7	1.441
1700	55.45	1.477
1740	55.24	1.517
1775	55.16	1.567
1800	54.96	1.588
1810	54.89	1.605
1850	54.76	1.658
1885	54.67	1.704
1925	54.65	1.755
1960	54.58	1.794
2000	54.53	1.841

TISSUE – EQUIVALENT LIQUID

WSTE.2013.09.09

Date:	05/09/2014	Temperature:	23.1°C
Tissue:	Body, MSL1900, 1900MHz	Liquid Temperature:	22.1°C
Tested By:	Ethan Schoonover	Relative Humidity:	38.8%
Job Site:	EV08	Bar. Pressure:	1017 mb

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 865664 D01 v01r03 and D02 v01r01

RESULTS

	Actual Values		Target Values		Deviation (%)	
Frequency (MHz)	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
1900	53.43	1.571	53.3	1.52	-0.24	-3.36

Frequency (MHz)	Relative Permittivity	Conductivity
1000	57.2	0.633
1035	57.12	0.661
1070	56.93	0.697
1110	56.74	0.73
1145	56.72	0.758
1185	56.59	0.79
1220	56.71	0.822
1255	56.2	0.873
1295	56.03	0.894
1330	55.67	0.936
1370	55.37	0.964
1405	55.34	1.002
1440	55.29	1.051
1480	55.17	1.095
1515	55.13	1.134
1555	55.06	1.17
1590	55	1.206
1625	54.88	1.246
1665	54.57	1.29
1700	54.33	1.325
1740	54.05	1.359
1775	53.8	1.407
1810	53.59	1.451
1850	53.49	1.5
1885	53.42	1.55
1900	53.43	1.571
1925	53.56	1.603
1960	53.49	1.645
2000	53.52	1.698

TISSUE – EQUIVALENT LIQUID

WSTE.2013.09.09

Date:	05/12/2014	Temperature:	23.3°C
Tissue:	Body, MSL750, 750MHz	Liquid Temperature:	22.2°C
Tested By:	Ethan Schoonover	Relative Humidity:	39.2%
Job Site:	EV08	Bar. Pressure:	1017 mb

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 865664 D01 v01r03 and D02 v01r01

RESULTS

	Actual Values		Target Values		Deviation (%)	
Frequency (MHz)	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
750	56.79	0.97	55.531	0.963	-2.27	-0.73

Frequency (MHz)	Relative Permittivity	Conductivity
400	61.59	0.659
420	61.33	0.683
440	61.04	0.696
465	60.64	0.705
485	60.24	0.73
510	59.83	0.748
530	59.44	0.768
555	59.13	0.788
575	58.86	0.808
595	58.63	0.823
620	58.24	0.85
640	58.15	0.86
665	57.64	0.895
685	57.38	0.904
710	57.23	0.928
730	57.04	0.95
750	56.79	0.97
755	56.75	0.975
775	56.5	0.993
795	56.29	1.016
820	56.04	1.038
840	55.93	1.056
865	55.72	1.085
885	55.41	1.103
910	55.16	1.127
930	54.99	1.148
955	54.78	1.171
975	54.53	1.191
995	54.38	1.213

TISSUE – EQUIVALENT LIQUID

WSTE.2013.09.09

Date:	05/14/2014	Temperature:	22.8°C
Tissue:	Body, MSL900, 900MHz	Liquid Temperature:	21.8°C
Tested By:	Ethan Schoonover	Relative Humidity:	36.2%
Job Site:	EV08	Bar. Pressure:	1020 mb

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 865664 D01 v01r03 and D02 v01r01

RESULTS

	Actual Values		Target Values		Deviation (%)	
Frequency (MHz)	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
900	54.28	1.072	55.0	1.05	1.31	-2.1

Frequency (MHz)	Relative Permittivity	Conductivity
400	60.58	0.605
420	60.36	0.623
440	60.13	0.636
465	59.65	0.65
485	59.51	0.671
510	58.95	0.693
530	58.64	0.712
555	58.29	0.733
575	58.01	0.754
595	57.82	0.778
620	57.34	0.789
640	56.99	0.81
665	57.08	0.826
685	56.56	0.849
710	56.34	0.874
730	56.09	0.896
755	55.86	0.918
775	55.59	0.94
795	55.35	0.961
820	55.08	0.986
840	54.87	1.005
865	54.67	1.033
885	54.45	1.05
900	54.28	1.072
910	54.16	1.079
930	53.94	1.098
955	53.73	1.124
975	53.52	1.142
995	53.4	1.162

TISSUE – EQUIVALENT LIQUID

WSTE.2013.09.09

Date:	05/16/2014	Temperature:	23.3°C
Tissue:	Body, MSL1900, 1900MHz	Liquid Temperature:	21.8°C
Tested By:	Ethan Schoonover	Relative Humidity:	36.5%
Job Site:	EV08	Bar. Pressure:	1019 mb

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 865664 D01 v01r03 and D02 v01r01

RESULTS

	Actual Values		Target Values		Deviation (%)	
Frequency (MHz)	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
1900	54.95	1.575	53.3	1.52	-3.1	-3.62

Frequency (MHz)	Relative Permittivity	Conductivity
1000	57.87	0.636
1035	57.71	0.672
1070	57.67	0.696
1110	57.51	0.729
1145	57.4	0.76
1185	57.32	0.793
1220	57.21	0.813
1255	57.15	0.854
1295	56.91	0.901
1330	56.78	0.926
1370	56.69	0.967
1405	56.65	1.007
1440	56.56	1.045
1480	56.37	1.087
1515	56.24	1.121
1555	56.1	1.162
1590	55.96	1.203
1625	55.84	1.243
1665	55.68	1.282
1700	55.59	1.324
1740	55.44	1.375
1775	55.36	1.409
1810	55.2	1.448
1850	55.06	1.507
1885	54.94	1.547
1900	54.95	1.575
1925	54.9	1.591
1960	54.67	1.637
2000	54.58	1.69

TISSUE – EQUIVALENT LIQUID

WSTE.2013.09.09

Date:	05/16/2014	Temperature:	23.3°C
Tissue:	Body, MSL1750, 1800MHz	Liquid Temperature:	22.1°C
Tested By:	Ethan Schoonover	Relative Humidity:	36.5%
Job Site:	EV08	Bar. Pressure:	1019 mb

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 865664 D01 v01r03 and D02 v01r01

RESULTS

	Actual Values		Target Values		Deviation (%)	
Frequency (MHz)	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
1800	51.49	1.569	53.3	1.52	3.4	-3.22

Frequency (MHz)	Relative Permittivity	Conductivity
1000	54.3	0.806
1035	54.26	0.834
1070	54.16	0.855
1110	54.13	0.891
1145	53.92	0.92
1185	53.78	0.954
1220	53.62	0.981
1255	53.59	1.019
1295	53.39	1.056
1330	53.13	1.084
1370	53.07	1.122
1405	52.89	1.159
1440	52.74	1.19
1480	52.65	1.229
1515	52.5	1.263
1555	52.29	1.305
1590	52.17	1.339
1625	52.08	1.372
1665	52.02	1.412
1700	51.9	1.458
1740	51.73	1.507
1775	51.53	1.547
1800	51.49	1.569
1810	51.41	1.583
1850	51.26	1.629
1885	51.07	1.677
1925	51.02	1.709
1960	50.84	1.752
2000	50.61	1.8

TISSUE – EQUIVALENT LIQUID

WSTE.2013.09.09

Date:	08/19/2014	Temperature:	22.9°C
Tissue:	Body, MSL900, 900MHz	Liquid Temperature:	20.9°C
Tested By:	Carl Engholm	Relative Humidity:	38%
Job Site:	EV08	Bar. Pressure:	1010 mb

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 865664 D01 v01r03 and D02 v01r01

RESULTS

	Actual Values		Target Values		Deviation (%)	
Frequency (MHz)	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
900	54.54	1.071	55.0	1.05	0.84	-2

Frequency (MHz)	Relative Permittivity	Conductivity
400	61.1	0.591
420	60.81	0.612
440	60.6	0.622
465	60.15	0.643
485	59.7	0.665
510	59.21	0.684
530	58.89	0.703
555	58.5	0.726
575	58.17	0.748
595	57.95	0.758
620	57.31	0.785
640	57.45	0.803
665	56.97	0.821
685	56.62	0.848
710	56.43	0.872
730	56.22	0.892
755	55.96	0.919
775	55.75	0.938
795	55.53	0.963
820	55.26	0.985
840	55.17	1.008
865	54.89	1.034
885	54.67	1.056
900	54.54	1.071
910	54.32	1.078
930	54.1	1.097
955	53.87	1.124
975	53.61	1.143
995	53.39	1.165

TISSUE – EQUIVALENT LIQUID

WSTE.2013.09.09

Date:	08/19/2014	Temperature:	24.7°C
Tissue:	Body, MSL750, 750MHz	Liquid Temperature:	21.4°C
Tested By:	Carl Engholm	Relative Humidity:	45%
Job Site:	EV08	Bar. Pressure:	1010 mb

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 865664 D01 v01r03 and D02 v01r01

RESULTS

	Actual Values		Target Values		Deviation (%)	
Frequency (MHz)	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
750	56.59	0.942	55.531	0.963	-1.91	2.18

Frequency (MHz)	Relative Permittivity	Conductivity
400	60.58	0.627
420	60.33	0.646
440	60.16	0.66
465	59.64	0.676
485	59.35	0.696
510	59.04	0.716
530	58.91	0.737
555	58.72	0.757
575	58.27	0.783
595	58.1	0.797
620	57.83	0.825
640	57.56	0.838
665	57.56	0.863
685	57.11	0.879
710	56.92	0.903
730	56.73	0.923
750	56.59	0.942
755	56.55	0.946
775	56.33	0.966
795	56.14	0.987
820	55.91	1.011
840	55.69	1.031
865	55.5	1.056
885	55.23	1.076
910	54.96	1.103
930	54.85	1.121
955	54.57	1.15
975	54.31	1.168
995	54.08	1.188

TISSUE – EQUIVALENT LIQUID

WSTE.2013.09.09

Date:	08/20/2014	Temperature:	23.5°C
Tissue:	Body, MSL1750, 1800MHz	Liquid Temperature:	22°C
Tested By:	Ethan Schoonover	Relative Humidity:	44%
Job Site:	EV08	Bar. Pressure:	1015 mb

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 865664 D01 v01r03 and D02 v01r01

RESULTS

	Actual Values		Target Values		Deviation (%)	
Frequency (MHz)	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
1800	52.7	1.585	53.3	1.52	1.13	-4.28

Frequency (MHz)	Relative Permittivity	Conductivity
1000	56.29	0.769
1035	56.14	0.798
1070	55.99	0.832
1110	55.61	0.871
1145	55.45	0.896
1185	55.28	0.929
1220	55.21	0.96
1255	54.89	1.007
1295	54.84	1.024
1330	54.45	1.076
1370	54.59	1.107
1405	54.58	1.144
1440	54.39	1.186
1480	54.23	1.232
1515	54.05	1.272
1555	53.94	1.309
1590	53.79	1.348
1625	53.68	1.391
1665	53.4	1.437
1700	53.19	1.471
1740	52.99	1.509
1775	52.88	1.563
1800	52.7	1.585
1810	52.62	1.594
1850	52.41	1.653
1885	52.24	1.7
1925	52.18	1.751
1960	52.03	1.789
2000	52.04	1.845

TISSUE – EQUIVALENT LIQUID

WSTE.2013.09.09

Date:	08/20/2014	Temperature:	24.1°C
Tissue:	Body, MSL1900, 1900MHz	Liquid Temperature:	21.1°C
Tested By:	Carl Engholm	Relative Humidity:	41%
Job Site:	EV08	Bar. Pressure:	1015 mb

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 865664 D01 v01r03 and D02 v01r01

RESULTS

	Actual Values		Target Values		Deviation (%)	
Frequency (MHz)	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
1900	51.64	1.595	53.3	1.52	3.11	-4.93

Frequency (MHz)	Relative Permittivity	Conductivity
1000	55.68	0.642
1035	55.5	0.67
1070	55.29	0.704
1110	55.09	0.742
1145	54.76	0.774
1185	54.6	0.805
1220	54.65	0.84
1255	54.24	0.879
1295	54.29	0.907
1330	53.78	0.953
1370	53.97	0.979
1405	53.95	1.02
1440	53.86	1.061
1480	53.64	1.11
1515	53.51	1.147
1555	53.36	1.186
1590	53.19	1.222
1625	53.06	1.267
1665	52.8	1.309
1700	52.57	1.344
1740	52.38	1.384
1775	52.29	1.44
1810	52.04	1.477
1850	51.82	1.529
1885	51.67	1.575
1900	51.64	1.595
1925	51.59	1.625
1960	51.5	1.674
2000	51.44	1.722

TISSUE – EQUIVALENT LIQUID

Date:	08/21/2014	Temperature:	23.4°C
Tissue:	Body, MSL2600, 2600MHz	Liquid Temperature:	22°C
Tested By:	Carl Engholm	Relative Humidity:	39%
Job Site:	EV08	Bar. Pressure:	1017 mb

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 865664 D01 v01r03 and D02 v01r01

RESULTS

	Actual Values		Target Values		Deviation (%)	
Frequency (MHz)	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
2600	50.01	2.219	52.47	2.21	4.69	-0.41

Frequency (MHz)	Relative Permittivity	Conductivity
2000	52.27	1.478
2035	52.21	1.516
2070	52.13	1.559
2110	52	1.591
2145	51.87	1.624
2185	51.6	1.671
2220	51.45	1.712
2255	51.21	1.758
2295	50.93	1.823
2330	50.72	1.892
2370	50.62	1.942
2405	50.53	1.994
2440	50.54	2.05
2480	50.36	2.089
2515	50.3	2.124
2555	50.22	2.165
2590	50.17	2.211
2600	50.01	2.219
2625	49.94	2.252
2665	49.77	2.308
2700	49.96	2.396
2740	49.71	2.454
2775	49.51	2.519
2810	49.36	2.571
2850	49.22	2.629
2885	49.1	2.685
2925	49.01	2.741
2960	48.88	2.781
3000	48.78	2.835

TISSUE – EQUIVALENT LIQUID

WSTE.2013.09.09

Date:	08/28/2014	Temperature:	24.7°C
Tissue:	Body, MSL1750, 1800MHz	Liquid Temperature:	20.6°C
Tested By:	Carl Engholm	Relative Humidity:	40%
Job Site:	EV08	Bar. Pressure:	1019 mb

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 865664 D01 v01r03 and D02 v01r01

RESULTS

	Actual Values		Target Values		Deviation (%)	
Frequency (MHz)	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity	Relative Permittivity	Conductivity
1800	51.36	1.585	53.3	1.52	3.64	-4.28

Frequency (MHz)	Relative Permittivity	Conductivity
1000	55.69	0.758
1035	55.64	0.785
1070	55.27	0.831
1110	55	0.859
1145	54.97	0.892
1185	54.75	0.923
1220	54.6	0.952
1255	54.33	1.002
1295	54.08	1.028
1330	53.86	1.08
1370	53.48	1.102
1405	53.45	1.147
1440	53.4	1.198
1480	53.29	1.243
1515	53.2	1.284
1555	53.15	1.321
1590	53.03	1.359
1625	52.87	1.402
1665	52.51	1.44
1700	52.21	1.471
1740	51.9	1.506
1775	51.52	1.555
1800	51.36	1.585
1810	51.29	1.594
1850	51.11	1.659
1885	51.03	1.711
1925	51.17	1.777
1960	51.19	1.815
2000	51.29	1.867

SAR SYSTEM VERIFICATION

REQUIREMENT

Per IEEE 1528, Section 8.2.1, “System checks are performed prior to compliance tests and the results must always be within ± 10% of the target value corresponding to the test frequency, liquid, and the source used. The target values are 1 g or 10 g averaged SAR values measured on systems having current system validation and calibration status, and using the system check setup as shown in Figure 14. These target values should be determined using a standard source.”

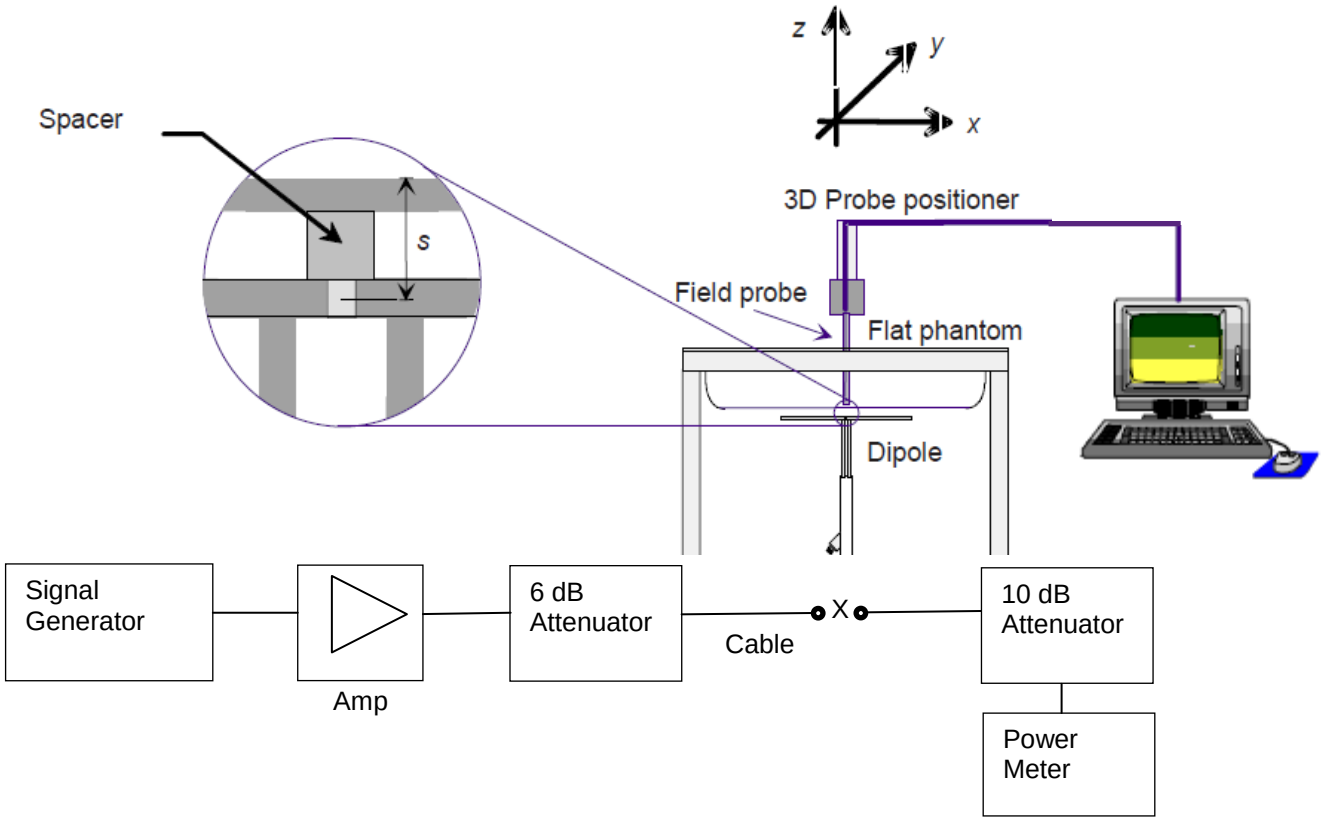
TEST DESCRIPTION

Within 24 hours of a measurement, then every 72 hours thereafter, Northwest EMC used the system validation kit (calibrated reference dipole) to test whether the system was operating within its specifications. The validation was performed in the indicated bands by making SAR measurements of the reference dipole with the phantom filled with the tissue-equivalent liquid. First, a signal generator and power amplifier were used to produce a 100mW level as measured with a power meter at the antenna terminals of the dipole (X). Then, the reference dipole was positioned below the bottom of the phantom and centered with its axis parallel to the longest side of the phantom. A low loss and low relative permittivity spacer was used to establish the correct distance between the center axis of the reference dipole and the liquid.

For the reference dipoles, the spacing distance s is given by:

s = 15mm, +/- 0.2mm for 300MHz ≤ f ≥ 1000 MHz:
s = 10mm, +/- 0.2mm for 1000MHz ≤ f ≥ 6000MHz

The measured 1 g and 10 g spatial average SAR values were normalized to a 1W dipole input power for comparison to the calibration data. The results are summarized in the attached table. The deviation is less than 10% in all cases, indicating that the system performance check was within tolerance.



SAR SYSTEM VERIFICATION

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 865664 D01 v01r03 and D02 v01r01

RESULTS

Date	Liquid part number and frequency	Conducted Power into the Dipole (dBm)	Correction Factor	Measured		Normalized to 1W		Target (Normalized to 1W) Get from Dipole Calibration Certificate		% Difference	
				1g	10g	1g	10g	1g	10g	1g	10g
5/5/2014	MSL 1900 (1900 MHz)	21.00	7.94	5.20	2.76	41.29	21.91	40.50	21.40	1.95	2.38
5/7/2014	MSL 900 (900 MHz)	20.00	10.00	1.14	0.74	11.40	7.38	10.70	6.87	6.54	7.42
5/8/2014	MSL 750(835 MHz)	20.00	10.00	0.90	0.60	8.99	6.00	8.85	5.88	1.58	2.04
5/8/2014	MSL 1750(1750 MHz)	20.00	10.00	3.76	2.01	37.60	20.10	37.60	20.20	0.00	-0.50
5/9/2014	MSL 2600(2600 MHz)	19.91	10.21	5.61	2.55	57.28	26.04	56.00	24.90	2.29	4.58
8/19/2014	MSL 900 (900 MHz)	19.98	10.05	1.10	0.71	11.06	7.16	10.90	7.04	1.47	1.70
8/19/2014	MSL 750(750 MHz)	19.99	10.02	0.88	0.59	8.85	5.89	8.85	5.88	0.00	0.17
8/20/2014	MSL 1750(1750 MHz)	20.01	9.98	3.85	2.06	38.42	20.56	37.60	20.20	2.18	1.78
8/20/2014	MSL 1900 (1900 MHz)	20.02	9.95	4.35	2.29	43.28	22.79	40.50	21.40	6.86	6.50
8/21/2014	MSL 2600(2600 MHz)	19.99	10.02	5.67	2.55	56.81	25.55	56.00	24.90	1.45	2.61
8/27/2014	MSL 900 (835 MHz)	20.30	9.33	1.07	0.71	9.98	6.61	9.42	6.25	5.94	5.76
8/27/2014	MSL 1900 (1900 MHz)	20.01	9.98	4.33	2.27	43.21	22.65	40.50	21.40	6.69	5.84
8/28/2014	MSL 1750(1750 MHz)	20.02	9.95	3.85	2.05	38.31	20.40	37.60	20.20	1.89	0.99

SAR SYSTEM VERIFICATION

Tested By:	Ethan Schoonover	Room Temperature (°C):	23.2
Date:	5/5/2014	Liquid Temperature (°C):	21.9
Configuration:	Body	Humidity (%RH):	31.5
		Bar. Pressure (mb):	1016

MSL1900 System Check 5-5-14
DUT: Dipole 1900 MHz D1900V2; Type: D1900V2; Serial: ADO
Communication System: UID 10000, CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1900 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 1900 MHz; σ = 1.584 S/m; ε_r = 53.124; ρ = 1000 kg/m^3 , Medium parameters used: σ = 0 S/m, ε_r = 1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY Configuration:

- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

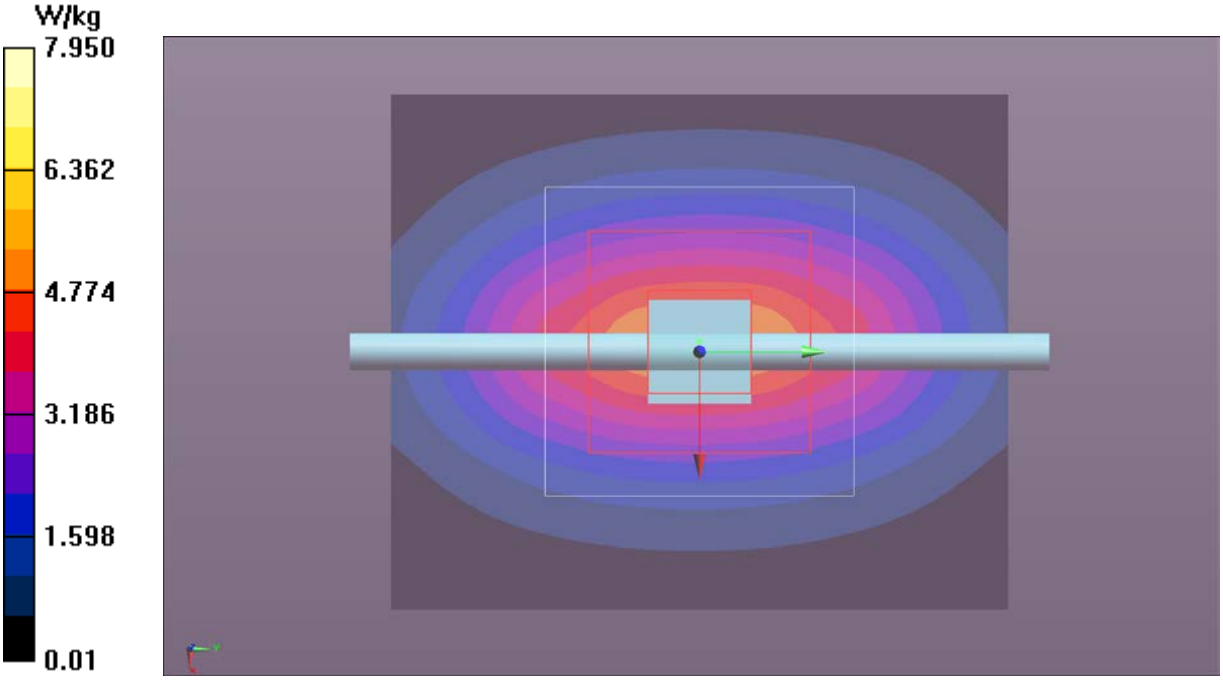
System Check/System Check/Area Scan (51x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 5.34 W/kg

System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.930 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 9.36 W/kg
SAR(1 g) = 5.2 W/kg; SAR(10 g) = 2.76 W/kg
Maximum value of SAR (measured) = 5.24 W/kg

System Check/System Check/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 70.85 V/m
Maximum value of SAR (measured) = 7.95 W/kg

Approved By

MSL1900 System Check 5-5-14



SAR SYSTEM VERIFICATION

Tested By:	Ethan Schoonover	Room Temperature (°C):	23.4°C
Date:	5/7/2014	Liquid Temperature (°C):	22.2°C
Configuration:	Body	Humidity (%RH):	23.5%
		Bar. Pressure (mb):	1011 mb

MSL900 System Check 5-7-14
DUT: Dipole 900 MHz D900V2; Type: D900V2; Serial: ADP
Communication System: UID 0, CW (0); Communication System Band: D900 (900.0 MHz); Frequency: 900 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: σ = 0 S/m, ε_r = 1; ρ = 1000 kg/m^3 , Medium parameters used: f = 900 MHz; σ = 1.048 S/m; ε_r = 53.135; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY Configuration:

- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

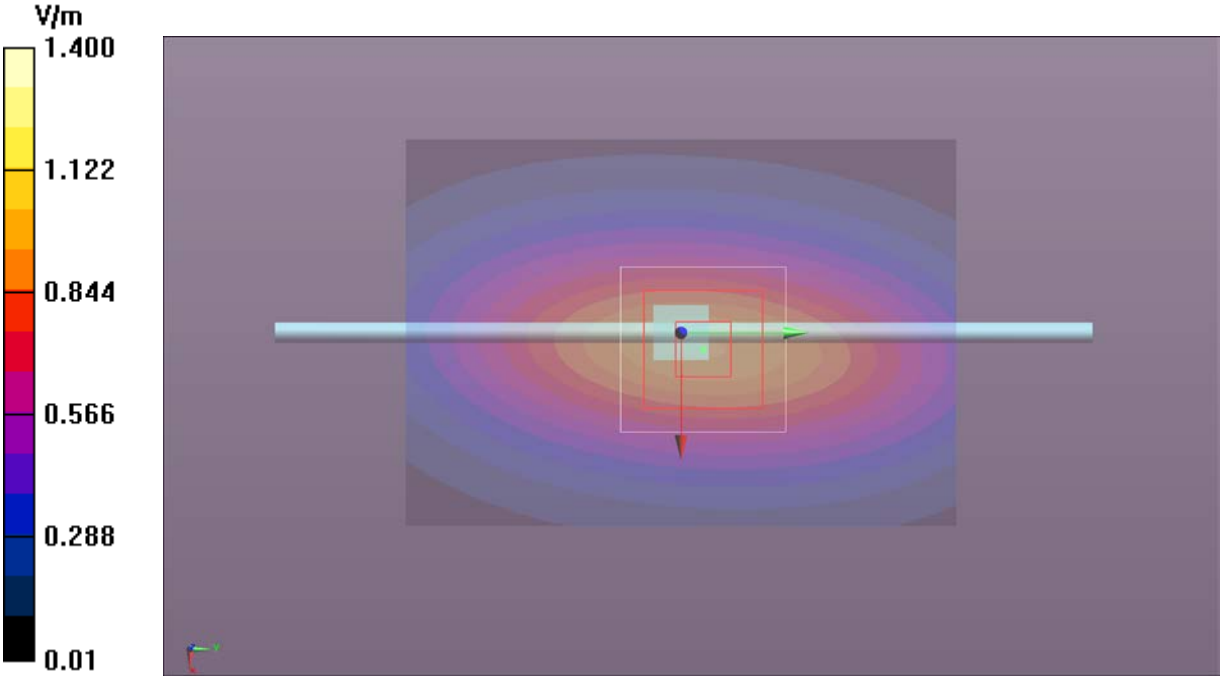
System Check/System Check/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 31.79 V/m

System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.633 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.70 W/kg
SAR(1 g) = 1.14 W/kg; SAR(10 g) = 0.738 W/kg
Maximum value of SAR (measured) = 1.14 W/kg

System Check/System Check/Area Scan (71x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.13 W/kg
Maximum value of SAR (measured) = 1.06 W/kg

Approved By

MSL900 System Check 5-7-14



SAR SYSTEM VERIFICATION

Tested By:	Ethan Schoonover	Room Temperature (°C):	23.1°C
Date:	5/8/2014	Liquid Temperature (°C):	22.2°C
Configuration:	Body	Humidity (%RH):	32.2%
		Bar. Pressure (mb):	1016 mb

MSL7500 System Check 5-8-14
DUT: Dipole 750 MHz D750V3; Type: D750V3; Serial: ADQ
Communication System: UID 10000, CW; Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: σ = 0 S/m, ε_r = 1; ρ = 1000 kg/m^3 , Medium parameters used: f = 835 MHz; σ = 1.032 S/m; ε_r = 55.87; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY Configuration:

- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

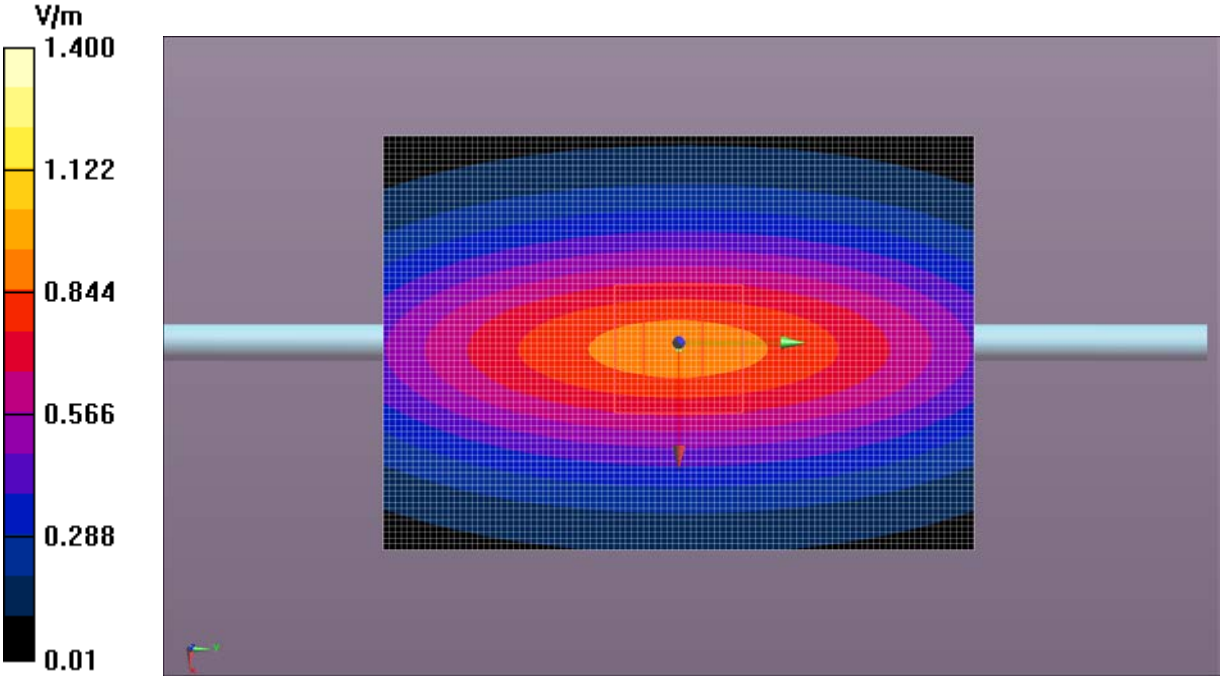
System Check/System Check/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 32.72 V/m

System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.831 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.31 W/kg
SAR(1 g) = 0.899 W/kg; SAR(10 g) = 0.600 W/kg
Maximum value of SAR (measured) = 0.900 W/kg

System Check/System Check/Area Scan (71x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.899 W/kg
Maximum value of SAR (measured) = 1.11 W/kg

Approved By

MSL7500 System Check 5-8-14



SAR SYSTEM VERIFICATION

Tested By:	Ethan Schoonover	Room Temperature (°C):	23.4°C
Date:	5/8/2014	Liquid Temperature (°C):	21.4°C
Configuration:	Body	Humidity (%RH):	40%
		Bar. Pressure (mb):	1018 mb

MSL1750 System Check 5-8-14
DUT: Dipole 1750 MHz D1750V2; Type: D1750V2; Serial: ADN
Communication System: UID 0, CW (0); Communication System Band: D1750 (1750.0 MHz); Frequency: 1750 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: σ = 0 S/m, ε_r = 1; ρ = 1000 kg/m^3 , Medium parameters used: f = 1750 MHz; σ = 1.525 S/m; ε_r = 55.239; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY Configuration:

- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

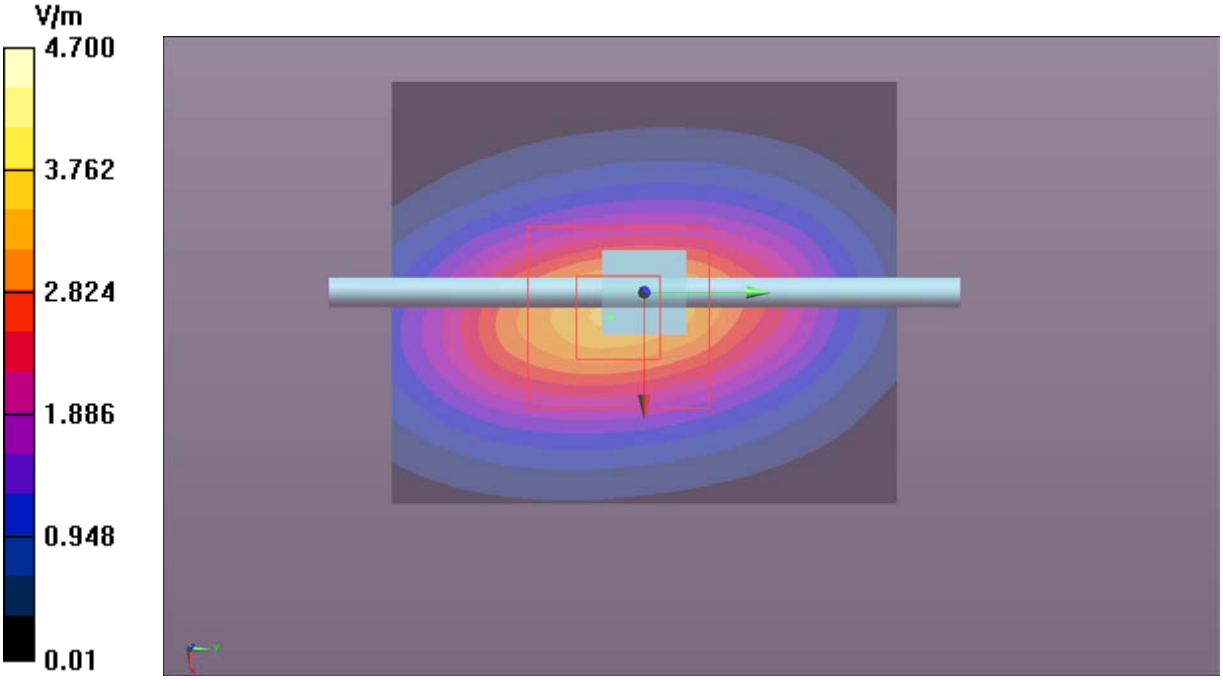
System Check/System Check/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 49.38 V/m

System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 49.062 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 6.74 W/kg
SAR(1 g) = 3.76 W/kg; SAR(10 g) = 2.01 W/kg
Maximum value of SAR (measured) = 3.79 W/kg

System Check/System Check/Area Scan (51x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 3.82 W/kg
Maximum value of SAR (measured) = 3.72 W/kg

Approved By

MSL1750 System Check 5-8-14



SAR SYSTEM VERIFICATION

Tested By:	Carl Engholm	Room Temperature (°C):	22.9°C
Date:	5/9/2014	Liquid Temperature (°C):	22.3°C
Configuration:	Body	Humidity (%RH):	40%
		Bar. Pressure (mb):	1015 mb

MSL2600 System Check, 5-9-14b
DUT: Dipole 2600 MHz D2600V2; Type: D2600V2; Serial: ADR
Communication System: UID 0, CW (0); Communication System Band: D2600 (2600.0 MHz); Frequency: 2600 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 2600 MHz; σ = 2.191 S/m; ε_r = 50.874; ρ = 1000 kg/m^3 , Medium parameters used: σ = 0 S/m, ε_r = 1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY Configuration:

- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

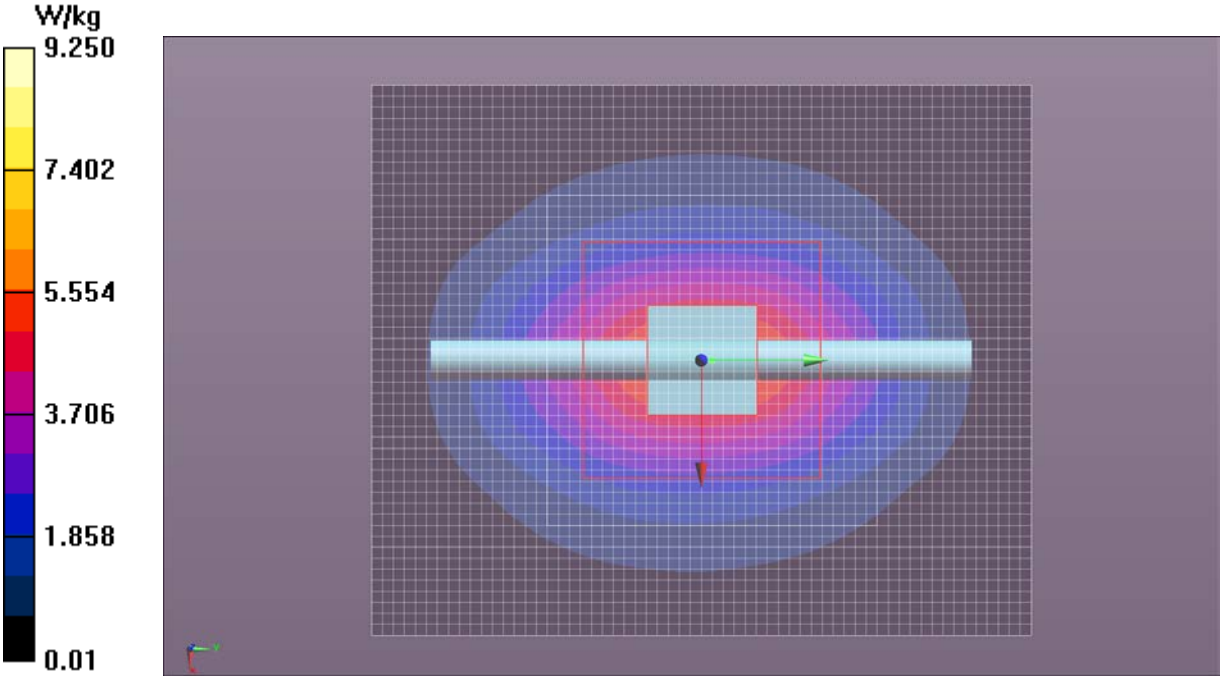
System Check/System Check/Area Scan (51x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 6.04 W/kg

System Check/System Check/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 64.98 V/m

System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 51.561 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 11.5 W/kg
SAR(1 g) = 5.61 W/kg; SAR(10 g) = 2.55 W/kg
Maximum value of SAR (measured) = 5.67 W/kg
Maximum value of SAR (measured) = 9.25 W/kg

Approved By

MSL2600 System Check, 5-9-14b



SAR SYSTEM VERIFICATION

WSSV.2013.09.09

Tested By:	Carl Engholm	Room Temperature (°C):	21.8°C
Date:	8/19/2014	Liquid Temperature (°C):	20.5°C
Configuration:	Body	Humidity (%RH):	40%
		Bar. Pressure (mb):	1010 mb

MSL900 System Check_900MHz, 8-19-14c
DUT: Dipole 900 MHz D900V2; Type: D900V2; Serial: D900V2 - SN:ADP
Communication System: UID 0, CW (0); Communication System Band: D900 (900.0 MHz); Frequency: 900 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: σ = 0 S/m, ε_r = 1; ρ = 1000 kg/m^3 , Medium parameters used: f = 900 MHz; σ = 1.071 S/m; ε_r = 54.545; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY Configuration:

- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

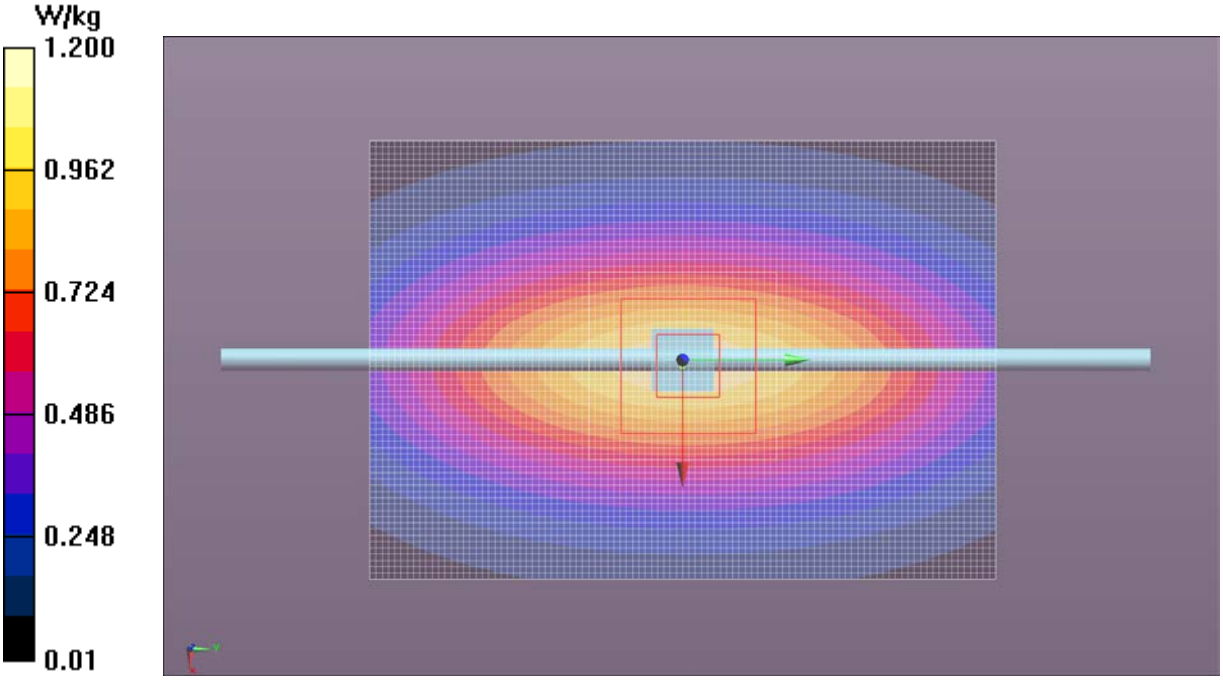
System Check/System Check/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 32.36 V/m

System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.88 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 1.65 W/kg
SAR(1 g) = 1.1 W/kg; SAR(10 g) = 0.712 W/kg
Maximum value of SAR (measured) = 1.10 W/kg

System Check/System Check/Area Scan (71x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.10 W/kg
Maximum value of SAR (measured) = 1.12 W/kg

Approved By

MSL900 System Check_900MHz, 8-19-14c



SAR SYSTEM VERIFICATION

WSSV.2013.09.09

Tested By:	Carl Engholm	Room Temperature (°C):	25.3°C
Date:	8/19/2014	Liquid Temperature (°C):	21.2°C
Configuration:	Body	Humidity (%RH):	47%
		Bar. Pressure (mb):	1010 mb

MSL750 System Check, 8-19-14
DUT: Dipole 750 MHz D750V3; Type: D750V3; Serial: D750V3 - SN:ADQ
Communication System: UID 0, CW (0); Communication System Band: D750 (750.0 MHz); Frequency: 750 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: σ = 0 S/m, ε_r = 1; ρ = 1000 kg/m^3 , Medium parameters used: f = 750 MHz; σ = 0.942 S/m; ε_r = 56.589; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY Configuration:

- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

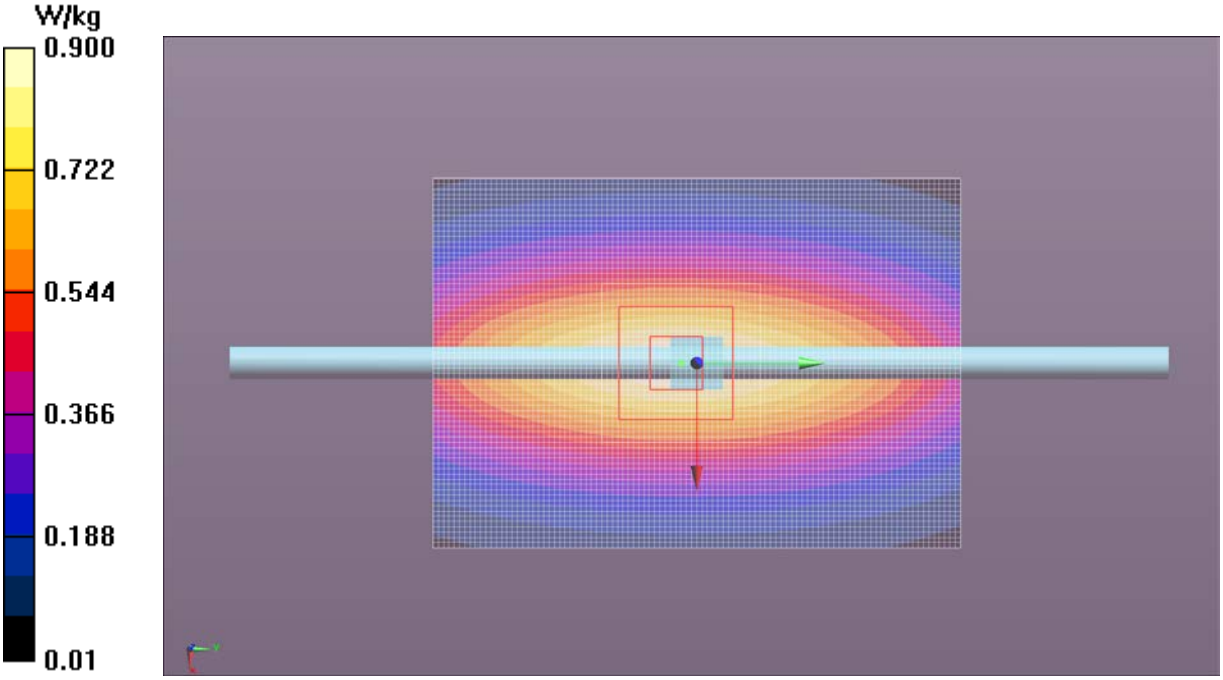
System Check/System Check/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 31.39 V/m

System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.71 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.883 W/kg; SAR(10 g) = 0.588 W/kg
Maximum value of SAR (measured) = 0.882 W/kg

System Check/System Check/Area Scan (71x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.884 W/kg
Maximum value of SAR (measured) = 0.929 W/kg

Approved By

MSL750 System Check, 8-19-14



SAR SYSTEM VERIFICATION

WSSV.2013.09.09

Tested By:	Carl Engholm	Room Temperature (°C):	23.3°C
Date:	8/20/2014	Liquid Temperature (°C):	21.3°C
Configuration:	Body	Humidity (%RH):	39%
		Bar. Pressure (mb):	1015 mb

MSL1750 System Check, 8-20-14
DUT: Dipole 1750 MHz D1750V2; Type: D1750V2; Serial: D1750V2 - SN:ADN
Communication System: UID 0, CW (0); Communication System Band: D1750 (1750.0 MHz); Frequency: 1750 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: σ = 0 S/m, ε_r = 1; ρ = 1000 kg/m^3 , Medium parameters used: f = 1750 MHz; σ = 1.526 S/m; ε_r = 52.989; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY Configuration:

- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

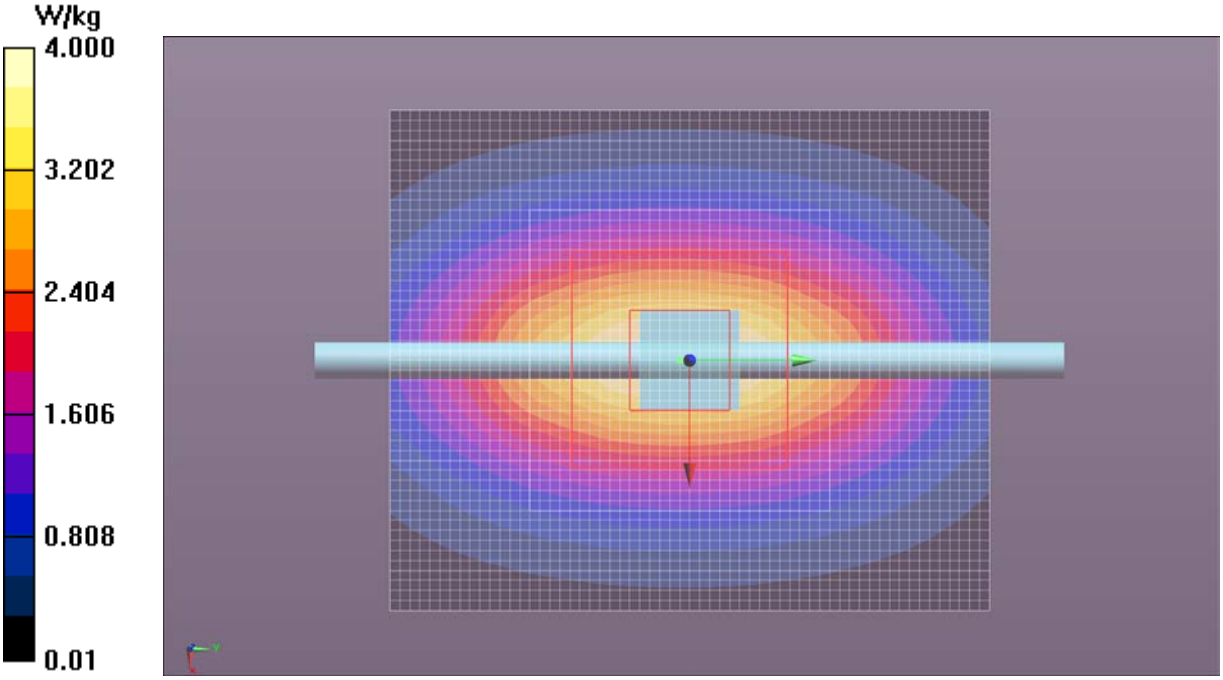
System Check/System Check/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 53.02 V/m

System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.70 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 6.96 W/kg
SAR(1 g) = 3.85 W/kg; SAR(10 g) = 2.06 W/kg
Maximum value of SAR (measured) = 3.88 W/kg

System Check/System Check/Area Scan (51x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 3.91 W/kg
Maximum value of SAR (measured) = 4.29 W/kg

Approved By

MSL1750 System Check, 8-20-14



SAR SYSTEM VERIFICATION

WSSV.2013.09.09

Tested By:	Carl Engholm	Room Temperature (°C):	24.1°C
Date:	8/20/2014	Liquid Temperature (°C):	21.5°C
Configuration:	Body	Humidity (%RH):	39%
		Bar. Pressure (mb):	1015 mb

MSL1900 System Check, 8-20-14
DUT: Dipole 1900 MHz D1900V2; Type: D1900V2; Serial: D1900V2 - SN:ADO
Communication System: UID 10000, CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1900 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 1900 MHz; σ = 1.595 S/m; ε_r = 51.642; ρ = 1000 kg/m^3 , Medium parameters used: σ = 0 S/m, ε_r = 1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY Configuration:

- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

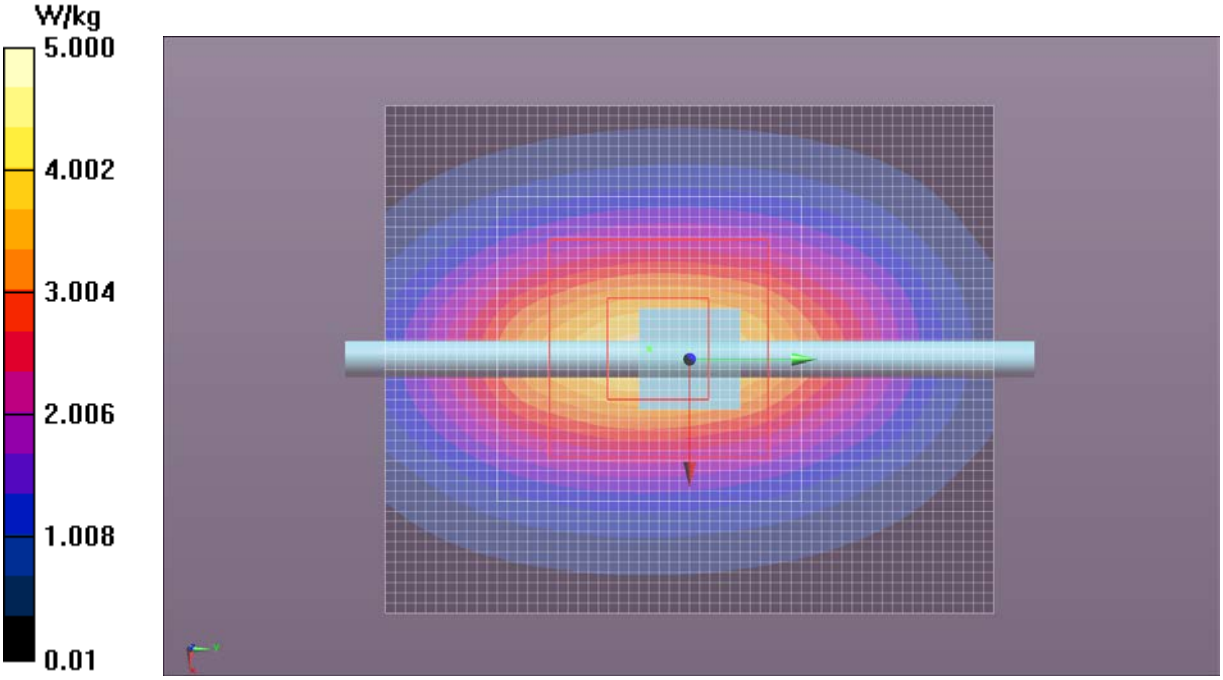
System Check/System Check/Area Scan (51x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 4.47 W/kg

System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.44 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 7.86 W/kg
SAR(1 g) = 4.35 W/kg; SAR(10 g) = 2.29 W/kg
Maximum value of SAR (measured) = 4.39 W/kg

System Check/System Check/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 53.60 V/m
Maximum value of SAR (measured) = 4.58 W/kg

Approved By

MSL1900 System Check, 8-20-14



SAR SYSTEM VERIFICATION

Tested By:	Carl Engholm	Room Temperature (°C):	23.6°C
Date:	8/21/2014	Liquid Temperature (°C):	21.99°C
Configuration:	Body	Humidity (%RH):	38%
		Bar. Pressure (mb):	1017 mb

MSL2600 System Check, 8-21-14
DUT: Dipole 2600 MHz D2600V2; Type: D2600V2; Serial: D2600V2 - SN:ADR
Communication System: UID 0, CW (0); Communication System Band: D2600 (2600.0 MHz); Frequency: 2600 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 2600 MHz; σ = 2.219 S/m; ε_r = 50.01; ρ = 1000 kg/m^3 , Medium parameters used: σ = 0 S/m, ε_r = 1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY Configuration:

- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

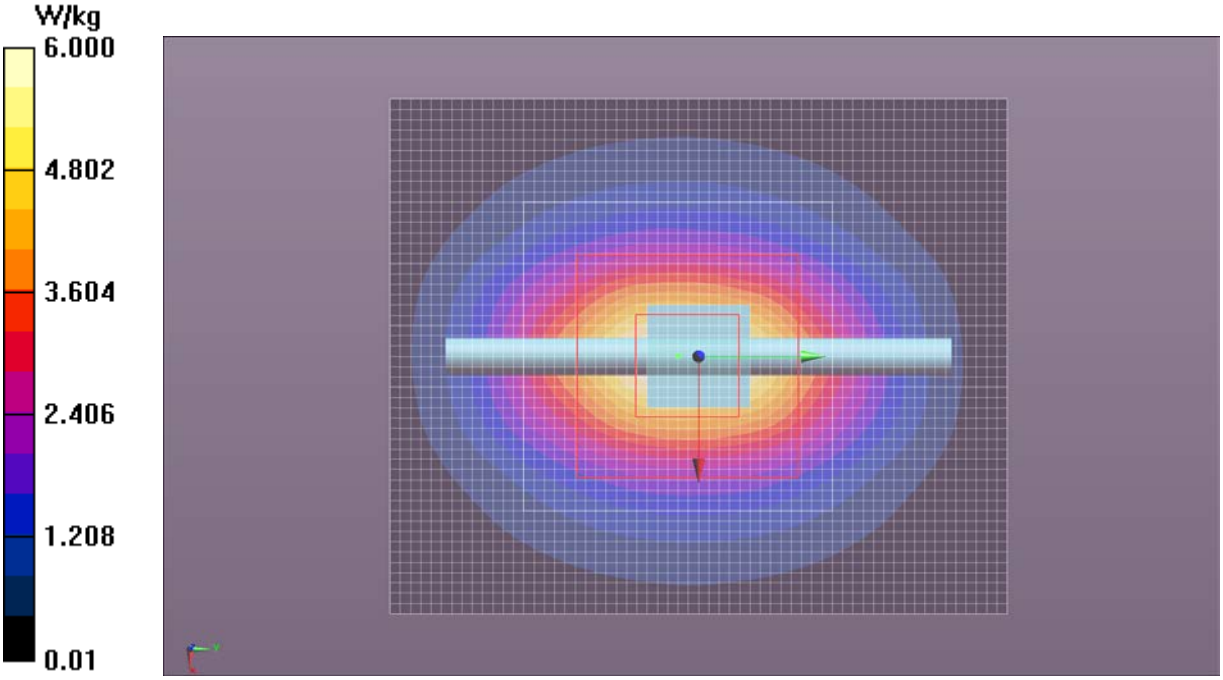
System Check/System Check/Area Scan (51x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 6.10 W/kg

System Check/System Check/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 65.86 V/m

System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.55 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 11.8 W/kg
SAR(1 g) = 5.67 W/kg; SAR(10 g) = 2.55 W/kg
Maximum value of SAR (measured) = 5.65 W/kg
Maximum value of SAR (measured) = 9.62 W/kg

Approved By

MSL2600 System Check, 8-21-14



SAR SYSTEM VERIFICATION

WSSV.2013.09.09

Tested By:	Carl Engholm	Room Temperature (°C):	24.2°C
Date:	8/27/2014	Liquid Temperature (°C):	20.9°C
Configuration:	Body	Humidity (%RH):	44%
		Bar. Pressure (mb):	1015 mb

MSL900 System Check_835MHz, 8-27-14
DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: D835V2 - SN:ADK
Communication System: UID 10000, CW; Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: σ = 0 S/m, ε_r = 1; ρ = 1000 kg/m^3 , Medium parameters used: f = 835 MHz; σ = 1.002 S/m; ε_r = 55.128; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY Configuration:

- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

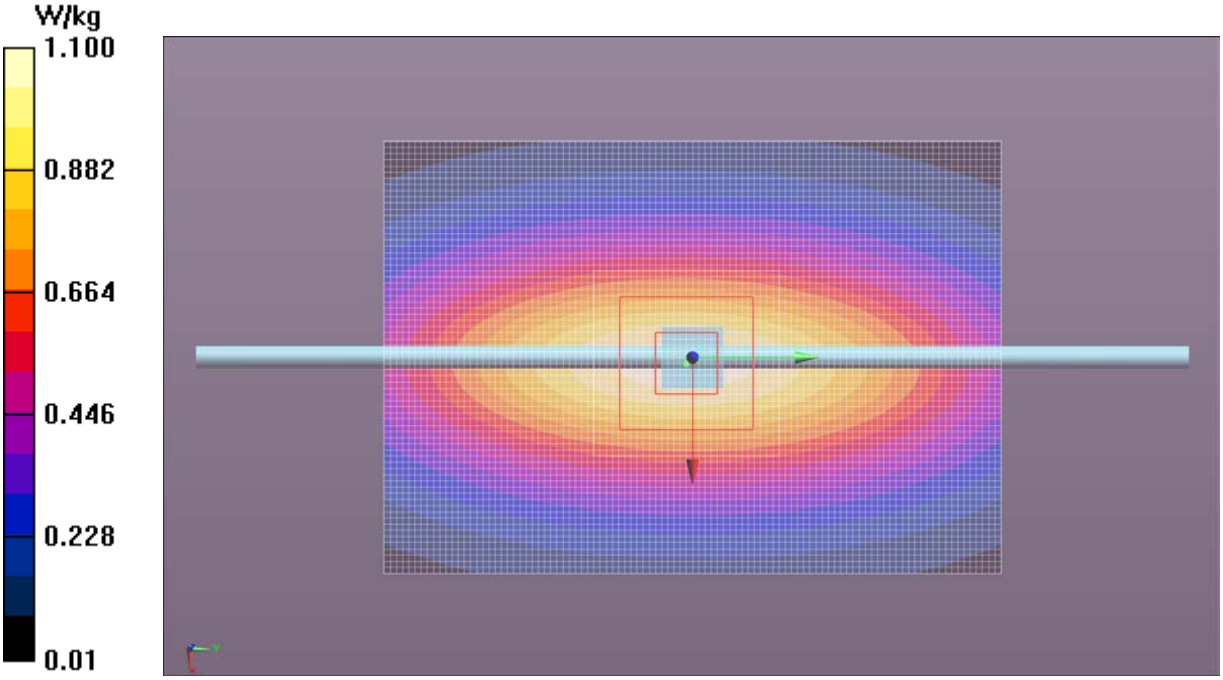
System Check/System Check/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 33.05 V/m

System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.88 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.55 W/kg
SAR(1 g) = 1.07 W/kg; SAR(10 g) = 0.709 W/kg
Maximum value of SAR (measured) = 1.07 W/kg

System Check/System Check/Area Scan (71x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.07 W/kg
Maximum value of SAR (measured) = 1.09 W/kg

Approved By

MSL900 System Check_835MHz, 8-27-14



SAR SYSTEM VERIFICATION

WSSV.2013.09.09

Tested By:	Carl Engholm	Room Temperature (°C):	23.7°C
Date:	8/27/2014	Liquid Temperature (°C):	20.6°C
Configuration:		Humidity (%RH):	42%
		Bar. Pressure (mb):	1015 mb

MSL1900 System Check, 8-27-14
DUT: Dipole 1900 MHz D1900V2; Type: D1900V2; Serial: D1900V2 - SN:ADO
Communication System: UID 10000, CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1900 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 1900 MHz; σ = 1.595 S/m; ε_r = 51.642; ρ = 1000 kg/m^3 , Medium parameters used: σ = 0 S/m, ε_r = 1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY Configuration:

- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

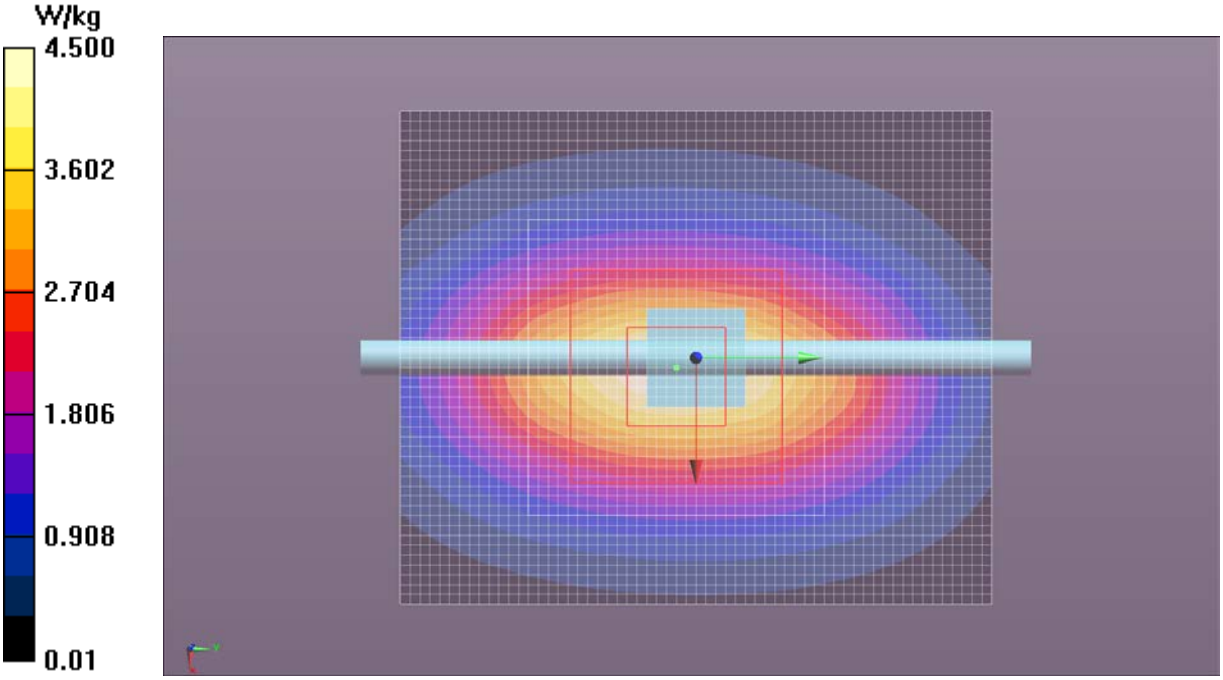
System Check/System Check/Area Scan (51x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 4.42 W/kg

System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.31 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 7.89 W/kg
SAR(1 g) = 4.33 W/kg; SAR(10 g) = 2.27 W/kg
Maximum value of SAR (measured) = 4.35 W/kg

System Check/System Check/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 55.56 V/m
Maximum value of SAR (measured) = 4.92 W/kg

Approved By

MSL1900 System Check, 8-27-14



SAR SYSTEM VERIFICATION

WSSV.2013.09.09

Tested By:	Carl Engholm	Room Temperature (°C):	25.2°C
Date:	8/28/2014	Liquid Temperature (°C):	20.7°C
Configuration:	Body	Humidity (%RH):	39%
		Bar. Pressure (mb):	1019 mb

MSL1750 System Check, 8-28-14
DUT: Dipole 1750 MHz D1750V2; Type: D1750V2; Serial: D1750V2 - SN:ADN
Communication System: UID 0, CW (0); Communication System Band: D1750 (1750.0 MHz); Frequency: 1750 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: σ = 0 S/m, ε_r = 1; ρ = 1000 kg/m^3 , Medium parameters used: f = 1750 MHz; σ = 1.513 S/m; ε_r = 51.834; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY Configuration:

- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

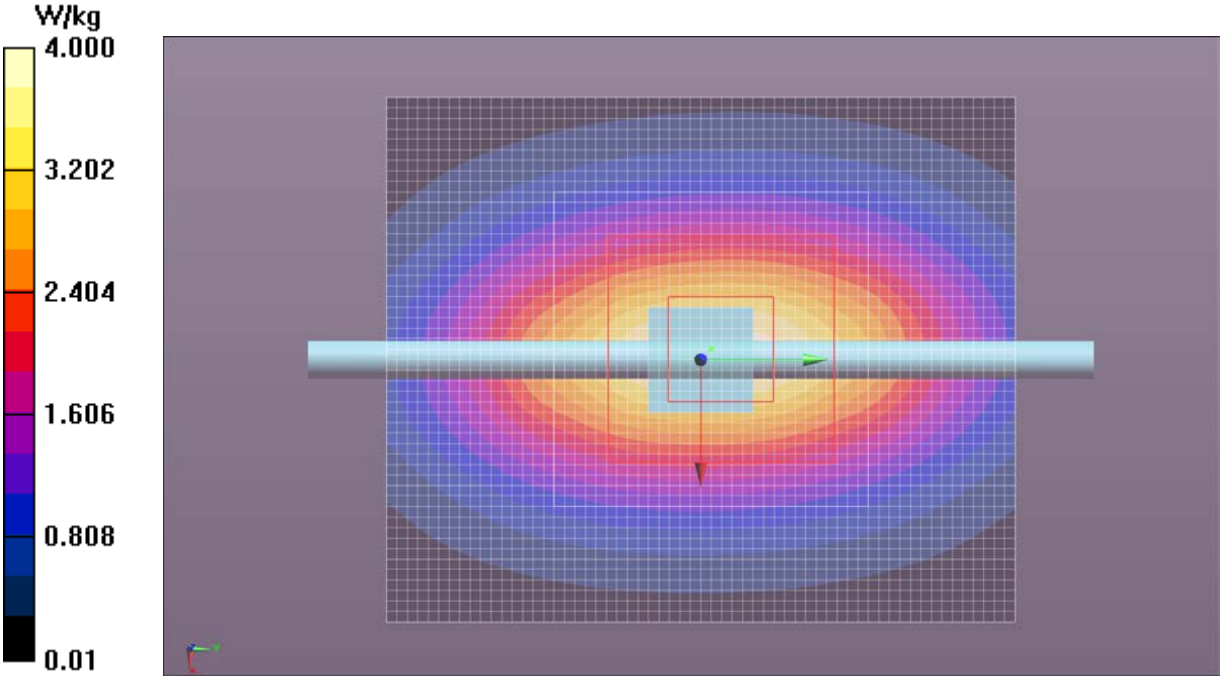
System Check/System Check/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of Total (measured) = 54.92 V/m

System Check/System Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.83 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 6.97 W/kg
SAR(1 g) = 3.85 W/kg; SAR(10 g) = 2.05 W/kg
Maximum value of SAR (measured) = 3.88 W/kg

System Check/System Check/Area Scan (51x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 3.90 W/kg
Maximum value of SAR (measured) = 4.56 W/kg

Approved By

MSL1750 System Check, 8-28-14



Output Power

The conducted output power was measured for all frequency bands as described below. The transmit antenna is co-located with a proximity sensor. Once the sensor is triggered, the output power is lowered for all bands. Conducted output power measurements were made for both the low power and normal full power (high power) conditions.

GPRS and EDGE

Per FCC KDB 941225 D03 v01, the conducted output power was measured at the low, middle and high channels in each band. An Agilent 8960 test set, Model E5515C, was used to control the EUT. The following applications were installed on the test set: GSM/GPRS Mobile Test A.13.12 and WCDMA Mobile Test A.17.10. This provided all the necessary tools to operate the EUT in the prescribed manner without any difficulties or equipment limitations.

Per FCC KDB 941225 D03 v01, among the channels required for normal testing, SAR must be measured on the highest conducted output channel (highlighted in the following pages). When the SAR measured on the highest output channel is < 0.8 W/kg, SAR evaluation for the other required channels is unnecessary.

Per FCC KDB 941225 D03, "SAR must be measured according to these maximum output conditions"

- Maximum output power is verified on the High, Middle, and Low channels
- When multiple slots can be used, the device should be tested to account for the maximum source-based time-averaged output power. Measure GMSK and 8PSK modulations for both one and two time slots.
- When measuring EDGE or EGPRS modes, GMSK modulation should be used to minimize measurement error due to higher peak-to-average power (PAR) ratios inherent in 8-PSK

The results of the output power measurements are tabulated on the following pages.

WCDMA, HSDPA, HSUPA

Per FCC KDB 941225 D01v02 , the conducted output power was measured at the low, middle and high channels in each band. An Agilent 8960 test set, Model E5515C, was used to control the EUT. The following applications were installed on the test set: GSM/GPRS Mobile Test A.13.12 and WCDMA Mobile Test A.17.10. This provided all the necessary tools to operate the EUT in the prescribed manner without any difficulties or equipment limitations.

Per FCC KDB 941225 D01v02, among the channels required for normal testing, SAR must be measured on the highest conducted output channel (highlighted in the following pages). When the SAR measured on the highest output channel is < 0.8 W/kg, SAR evaluation for the other required channels is unnecessary.

Per FCC KDB 941225 D01 V02, measurements for WCDMA, HSDPA, and HSUPA were made according to the procedures in section section 5.2 of 3GPP2 TS 34.121.

- Maximum output power is verified on the High, Middle, and Low channels
- Use the appropriate RMC or AMR with TPC (transmit power control) set to all "1"s for WCDMA/HSDPA or applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Maximum output power for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HSDPA, HSPA) should be measured
- Voice mode is measured using a 12.2 kbps RMC with TPC bits configured to all "1"s.
- 12.2 kbps AMR is measured with a 3.4 kbps SRB (signaling radio bearer)

- HSPA is measured with HS-DPCCH, E-DPCCH and E-DPDCH all enabled and a 12.2 kbps RMC. FRC is configured according to HS-DPCCH Sub-Test 1 using H-set 1 and QPSK.

The Agilent 8960 test set was configured as follows:

WCDMA Rel99

- Set a Test Mode 1 loop back with a 12.2 kbps Reference Measurement Channel (RMC).
- Set and send continuously Up power control commands to the EUT.

HSDPA Rel 6

- Use the "34.121 Preset Call Configs" within the Agilent 8960 which provide the required settings per the defined tables.
- Establish a Test Mode 1 loop back with both 12.2 kbps RMC channel and a Fixed Reference Channel (FRC) using H-Set 1 and QPSK
- Send continuously Up power control commands to the EUT.
- Repeat measurements for HSDPA Subtest 2, 3 and 4

HSUPA Rel 6

- Use the "34.121 Preset Call Configs" within the Agilent 8960 which provide the required settings per the defined tables.
- Use UL RMC 12.2 kbps and FRC H-Set 1 and QPSK, Test Mode 1 loop back.
- Set the Absolute Grant for HSPA Subtest 1 according to the defined tables.
- Set the EUT power to be at least 5 dB lower than the maximum output power
- Send power control bits to give one TPC_cmd = +1 command to the EUT. If the EUT doesn't send any E-DPCH data with decreased E-TFCI within 500 ms, then repeat this process until the decreased E-TFCI is reported.
- Confirm that the E-TFCI transmitted by the EUT is equal to the target E-TFCI in the defined table. If the E-TFCI transmitted by the EUT is not equal to the target E-TFCI, then send power control bits to give one TPC_cmd = -1 command to the EUT. If the EUT sends any E-DPCH data with decreased E-TFCI within 500ms, send new power control bits to give one TPC_cmd = -1 command to the EUT. Then confirm that the E-TFCI transmitted by the EUT is equal to the target E-TFCI in the defined table
- Repeat measurements for HSUPA Subtest 2, 3, 4 and 5.

The results of the output power measurements are tabulated on the following pages.

LTE

Per FCC KDB 941225 D05 v02r03 the conducted output power was measured at the low, middle and high channels in each LTE band. An Anritsu test set, Model MT8820C, was used to control the EUT. The following applications were installed on the test set: "LTE 22.54 #009". This provided all the necessary tools to operate the EUT in the prescribed manner without any difficulties or equipment limitations.

Per FCC KDB 941225 D05 v02r03, among the channels required for normal testing, SAR must be measured on the highest conducted output channel (highlighted in the following pages). Section 4.2 specifies when SAR evaluation for the other required channels is necessary.

Output Power

Per FCC KDB 941225 D05 v02r03, conducted output power measurements for LTE were made according to the procedures in section 4.1.

- All available channel bandwidths are to be measured (1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz)
- Maximum output power was verified on the High, Middle, and Low channels
- QPSK measurements were taken with
    - QPSK with 1 resource block allocation made at the low, middle, and upper offsets
    - QPSK with 50% resource blocks made in the low, middle, and upper offsets
    - QPSK with 100% resource blocks
- Higher order modulation(s (16-QAM) were measured with
    - 1 resource block allocation made at the low, middle, and upper offsets
    - 50% resource blocks made in the low, middle, and upper offsets
    - 100% resource blocks

The Anritsu MT8820C test set was configured as follows:

- The maximum power was set by selecting one of the following protocols
    - Max power QPSK 1 RB
    - Max power QPSK Partial RB
    - Max power QPSK Full RB
    - Max power 16QAM 1 RB
    - Max power 16QAM Partial RB
    - Max power 16QAM Full RB

The results of the output power measurements are tabulated on the following pages.

OUTPUT POWER

EUT:	WSBUB-SDS	Work Order:	INTE5453
Serial Number:	008	Date:	06/03/2014
Customer:	Intel Corporation	Temperature:	22.3°C
Attendees:	Mike Lowe, Bill Jones	Relative Humidity:	32.1%
Customer Project:	None	Bar. Pressure:	1014 mb
Tested By:	Jared Ison	Job Site:	EV06
Power:	110VAC/60Hz	Configuration:	INTE5453-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 447498 D01 v05r02 FCC KDB 941225 D01 v02, D03 v01 and D05 v02r03 FCC KDB 616217 D04 v01r01 FCC KDB 865664 D01 v01r03 and D02 v01r01

COMMENTS

Low (triggered) output power level

EUT OPERATING MODES

Transmitting, see table for modulation scheme.

DEVIATIONS FROM TEST STANDARD

None

RESULTS

GPRS / 1 slot / GMSK (CS-4)		
Band	**Channel**	**Power BAP**
Cellular GSM850	128	28.20
	190	28.10
	251	26.80
PCS 1900	512	23.00
	661	23.20
	810	23.10

GPRS / 2 slot / GMSK (CS-4)		
Band	**Channel**	**Power BAP**
Cellular GSM850	128	28.20
	190	28.10
	251	26.80
PCS 1900	512	23.00
	661	23.20
	810	23.10

E-GPRS / 1 slot / GMSK (MCS-4)		
Band	**Channel**	**Power BAP**
Cellular GSM850	128	28.20
	190	28.10
	251	27.80
PCS 1900	512	23.00
	661	23.20
	810	23.00

E-GPRS / 2 slot / GMSK (MCS-4)		
Band	**Channel**	**Power BAP**
Cellular GSM850	128	28.20
	190	28.10
	251	27.80
PCS 1900	512	23.00
	661	23.20
	810	23.10

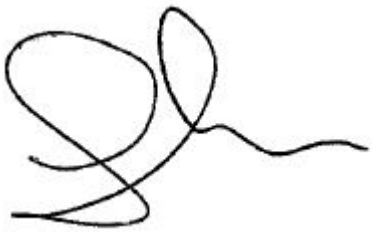
OUTPUT POWER

3GPP Release Version	Mode	Cellular Band V, MAP (dBm)		
		4132	4183	4233
99	WCDMA	19.20	19.60	19.60
6	HSDPA	19.40	19.80	19.80
6		19.40	19.80	19.80
6		19.40	19.80	19.80
6		19.40	19.80	19.80
6	HSUPA	18.00	18.30	18.30
6		18.60	19.00	19.00
6		17.80	18.60	18.50
6		18.30	18.70	18.80
6		19.30	19.70	19.60

3GPP Release Version	Mode	PCS Band II, MAP (dBm)		
		9262	9400	9538
99	WCDMA	16.00	15.90	15.70
6	HSDPA	16.10	16.00	15.80
6		16.20	16.00	15.80
6		16.10	16.00	15.80
6		16.10	16.00	15.80
6	HSUPA	15.30	15.10	14.60
6		14.70	14.60	14.40
6		14.70	14.30	14.00
6		15.00	15.00	14.70
6		16.00	15.90	15.70

OUTPUT POWER

3GPP Release Version	Mode	AWS Band IV, MAP (dBm)		
		1312	1427	1513
99	WCDMA	15.60	15.70	15.40
6	HSDPA	15.80	15.80	15.60
6		15.80	15.80	15.60
6		15.80	15.80	15.60
6		15.80	15.80	15.60
6	HSUPA	14.70	14.80	15.00
6		15.40	15.10	15.10
6		14.90	14.50	14.90
6		14.60	14.70	14.50
6		15.60	15.70	15.70



Tested By

OUTPUT POWER

WTD.2012.10.24

EUT:	WSBUB-SDS	Work Order:	INTE5478
Serial Number:	FZWZ42600237	Date:	08/07/2014
Customer:	Intel Corporation	Temperature:	22.3°C
Attendees:	Mike Lowe	Relative Humidity:	32.1%
Customer Project:	None	Bar. Pressure:	1014 mb
Tested By:	Brandon Hobbs	Job Site:	EV06
Power:	110VAC/60Hz	Configuration:	INTE5478-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 248227 D01 v01r02

COMMENTS

Normal full output power. Radio was operated by customer.

DEVIATIONS FROM TEST STANDARD

None

RESULTS

Tested By

OUTPUT POWER

GPRS / 1 slot / GMSK (CS-4)		
Band	**Channel**	**Power BAP**
Cellular GSM850	128	30.27
	190	30.39
	251	30.96
PCS 1900	512	27.47
	661	28.18
	810	28.19

GPRS / 2 slot / GMSK (CS-4)		
Band	**Channel**	**Power BAP**
Cellular GSM850	128	30.22
	190	30.34
	251	30.90
PCS 1900	512	27.47
	661	28.11
	810	28.15

E-GPRS / 1 slot / GMSK (MCS-4)		
Band	**Channel**	**Power BAP**
Cellular GSM850	128	30.27
	190	30.42
	251	30.97
PCS 1900	512	27.50
	661	28.09
	810	28.16

E-GPRS / 2 slot / GMSK (MCS-4)		
Band	**Channel**	**Power BAP**
Cellular GSM850	128	30.17
	190	30.32
	251	30.92
PCS 1900	512	27.42
	661	28.10
	810	28.16

OUTPUT POWER

3GPP Release Version	Mode	Cellular Band V, MAP (dBm)		
		4132	4183	4233
99	WCDMA	23.25	22.78	23.27
6	HSDPA	22.63	22.55	23.07
6		22.64	22.57	23.14
6		21.77	22.61	23.13
6		22.63	22.58	23.11
6	HSUPA	22.02	21.98	22.57
6		21.19	21.13	21.67
6		22.04	21.97	22.55
6		21.38	21.37	21.90
6		22.75	22.76	23.27

3GPP Release Version	Mode	PCS Band II, MAP (dBm)		
		9262	9400	9538
99	WCDMA	21.00	21.63	21.55
6	HSDPA	20.04	21.47	21.34
6		20.82	20.62	20.61
6		20.80	21.42	21.37
6		20.80	21.47	20.62
6	HSUPA	20.26	20.84	20.79
6		19.48	20.10	19.28
6		20.26	20.86	20.77
6		19.77	20.33	20.25
6		21.00	21.63	21.55

3GPP Release Version	Mode	AWS Band IV, MAP (dBm)		
		1312	1427	1513
99	WCDMA	21.99	21.74	21.84
6	HSDPA	20.90	20.69	20.75
6		20.91	20.70	20.70
6		20.91	20.70	20.76
6		20.90	20.67	20.73
6	HSUPA	21.15	20.90	20.99
6		20.32	20.12	20.10
6		20.39	20.87	20.90
6		20.56	20.30	20.31
6		21.99	21.75	21.31

OUTPUT POWER

WTD.2012.10.24

EUT:	WSBUB-SDS	Work Order:	INTE5453
Serial Number:	008	Date:	05/06/2014
Customer:	Intel Corporation	Temperature:	22.3°C
Attendees:	Mike Lowe, Bill Jones	Relative Humidity:	32.1%
Customer Project:	None	Bar. Pressure:	1014 mb
Tested By:	Jared Ison	Job Site:	EV06
Power:	110VAC/60Hz	Configuration:	INTE5453-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 447498 D01 v05r02 FCC KDB 941225 D01 v02, D03 v01 and D05 v02r03 FCC KDB 616217 D04 v01r01 FCC KDB 865664 D01 v01r03 and D02 v01r01

COMMENTS

Low (triggered) output power level. Radio was operated by customer.

DEVIATIONS FROM TEST STANDARD

None

RESULTS

Tested By

OUTPUT POWER

Band 2 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
20 MHz	Low (18700)	1860	QPSK	1	0	15.99
				1	49	15.53
				1	99	15.59
				50	0	14.89
				50	24	14.66
				50	49	14.72
				100	0	14.8
			16-QAM	1	0	15.21
				1	49	14.73
				1	99	14.77
				50	0	13.85
				50	24	13.61
				50	49	13.66
				100	0	13.74
	Mid (18900)	1880	QPSK	1	0	15.94
				1	49	15.5
				1	99	15.2
				50	0	14.88
				50	24	14.6
				50	49	14.5
				100	0	14.66
			16-QAM	1	0	15.13
				1	49	14.69
				1	99	14.34
				50	0	13.83
				50	24	13.5
				50	49	13.41
				100	0	13.59
	High (19100)	1900	QPSK	1	0	15.83
				1	49	15.48
				1	99	15.29
				50	0	14.82
				50	24	14.59
				50	49	14.56
				100	0	14.7
			16-QAM	1	0	14.96
				1	49	14.71
				1	99	14.47
				50	0	13.79
				50	24	13.54
				50	49	13.5
				100	0	13.63

OUTPUT POWER

Band 2 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
15 MHz	Low (18675)	1857.5	QPSK	1	0	15.93
				1	37	15.68
				1	74	15.69
				36	0	14.79
				36	18	14.71
				36	37	14.72
				75	0	14.77
			16-QAM	1	0	15.14
				1	37	14.82
				1	74	14.89
				36	0	13.74
				36	18	13.65
				36	37	13.66
				75	0	13.72
	Mid (18900)	1880	QPSK	1	0	16.25
				1	37	15.54
				1	74	15.7
				36	0	14.98
				36	18	14.74
				36	37	14.72
				75	0	14.86
			16-QAM	1	0	15.46
				1	37	14.84
				1	74	14.9
				36	0	13.94
				36	18	13.67
				36	37	13.66
				75	0	13.8
	High (19125)	1902.5	QPSK	1	0	16
				1	37	15.64
				1	74	15.56
				36	0	14.84
				36	18	14.65
				36	37	14.61
				75	0	14.73
			16-QAM	1	0	15.19
				1	37	14.83
				1	74	14.79
				36	0	13.82
				36	18	13.63
				36	37	13.58
				75	0	13.67

OUTPUT POWER

Band 2 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
10 MHz	Low (18650)	1855	QPSK	1	0	15.73
				1	24	15.62
				1	49	15.59
				25	0	14.66
				25	12	14.6
				25	24	14.58
				50	0	14.6
			16-QAM	1	0	14.85
				1	24	14.69
				1	49	14.67
				25	0	13.63
				25	12	13.53
				25	24	13.56
				50	0	13.55
	Mid (18900)	1880	QPSK	1	0	15.93
				1	24	15.65
				1	49	15.57
				25	0	14.78
				25	12	14.63
				25	24	14.66
				50	0	14.71
			16-QAM	1	0	15.18
				1	24	14.78
				1	49	14.76
				25	0	13.78
				25	12	13.63
				25	24	13.59
				50	0	13.69
	High (19150)	1905	QPSK	1	0	15.87
				1	24	15.66
				1	49	15.59
				25	0	14.78
				25	12	14.66
				25	24	14.64
				50	0	14.69
			16-QAM	1	0	14.99
				1	24	14.73
				1	49	14.7
				25	0	13.72
				25	12	13.63
				25	24	13.59
				50	0	13.67

OUTPUT POWER

Band 2 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
5 MHz	Low (18625)	1852.5	QPSK	1	0	15.6
				1	12	15.54
				1	24	15.52
				12	0	14.57
				12	6	14.52
				12	11	14.53
				25	0	14.55
			16-QAM	1	0	14.68
				1	12	14.64
				1	24	14.6
				12	0	13.56
				12	6	13.49
				12	11	13.52
				25	0	13.54
	Mid 18900)	1880	QPSK	1	0	15.78
				1	12	15.61
				1	24	15.6
				12	0	14.73
				12	6	14.61
				12	11	14.61
				25	0	14.67
			16-QAM	1	0	15.01
				1	12	14.93
				1	24	14.81
				12	0	13.75
				12	6	13.64
				12	11	13.65
				25	0	13.65
	High (19195)	1909.5	QPSK	1	0	15.73
				1	12	15.7
				1	24	15.6
				12	0	14.71
				12	6	14.63
				12	11	14.63
				25	0	14.65
			16-QAM	1	0	14.79
				1	12	14.71
				1	24	14.62
				12	0	13.61
				12	6	13.57
				12	11	13.57
				25	0	13.61

OUTPUT POWER

Band 2 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
3 MHz	Low (18615)	1851.5	QPSK	1	0	15.58
				1	7	15.49
				1	14	15.55
				8	0	14.57
				8	4	14.58
				8	7	14.55
				15	0	14.55
			16-QAM	1	0	14.69
				1	7	14.67
				1	14	14.62
				8	0	13.6
				8	4	13.56
				8	7	13.56
				15	0	13.54
	Mid (18900)	1880	QPSK	1	0	15.73
				1	7	15.6
				1	14	15.62
				8	0	14.69
				8	4	14.66
				8	7	14.63
				15	0	14.67
			16-QAM	1	0	14.8
				1	7	14.76
				1	14	14.71
				8	0	13.69
				8	4	13.65
				8	7	13.65
				15	0	13.66
	High (19185)	1908.5	QPSK	1	0	15.66
				1	7	15.61
				1	14	15.58
				8	0	14.69
				8	4	14.65
				8	7	14.63
				15	0	14.66
			16-QAM	1	0	14.78
				1	7	14.74
				1	14	14.67
				8	0	13.67
				8	4	13.64
				8	7	13.62
				15	0	13.63

OUTPUT POWER

Band 2 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
1.4MHz	Low (18607)	1850.7	QPSK	1	0	15.61
				1	2	15.59
				1	5	15.61
				3	0	15.65
				3	1	15.63
				3	2	15.61
				6	0	14.59
			16-QAM	1	0	14.69
				1	2	1.62
				1	5	14.67
				3	0	14.59
				3	1	14.55
				3	2	14.56
				6	0	13.51
	Mid (18900)	1880	QPSK	1	0	15.74
				1	2	15.71
				1	5	15.72
				3	0	15.77
				3	1	15.79
				3	2	15.72
				6	0	14.73
			16-QAM	1	0	14.8
				1	2	14.76
				1	5	14.77
				3	0	14.74
				3	1	14.69
				3	2	14.69
				6	0	13.65
	High (19193)	1909.3	QPSK	1	0	15.69
				1	2	15.68
				1	5	15.67
				3	0	15.74
				3	1	15.72
				3	2	15.73
				6	0	14.62
			16-QAM	1	0	14.78
				1	2	14.71
				1	5	14.72
				3	0	14.69
				3	1	14.72
				3	2	14.72
				6	0	13.59

OUTPUT POWER

Band 4 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
20 MHz	Low (20050)	1720	QPSK	1	0	16.18
				1	49	15.7
				1	99	15.57
				50	0	15.11
				50	24	14.83
				50	49	14.8
				100	0	14.95
			16-QAM	1	0	15.33
				1	49	14.89
				1	99	14.78
				50	0	14.05
				50	24	13.78
				50	49	13.71
				100	0	13.87
	Mid (20175)	1732.5	QPSK	1	0	16.46
				1	49	16.69
				1	99	15.81
				50	0	15.24
				50	24	14.86
				50	49	14.88
				100	0	15.03
			16-QAM	1	0	15.67
				1	49	14.93
				1	99	15
				50	0	14.17
				50	24	13.8
				50	49	13.87
				100	0	13.97
	High (20300)	1745	QPSK	1	0	16.23
				1	49	15.55
				1	99	15.48
				50	0	15.04
				50	24	14.7
				50	49	14.66
				100	0	14.89
			16-QAM	1	0	15.43
				1	49	14.72
				1	99	15.55
				50	0	14.96
				50	24	13.62
				50	49	13.59
				100	0	13.78

OUTPUT POWER

Band 4 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
15 MHz	Low (20025)	1717.5	QPSK	1	0	16.44
				1	37	16.02
				1	74	16
				36	0	15.22
				36	18	14.99
				36	37	14.96
				75	0	15.09
			16-QAM	1	0	15.59
				1	37	15.07
				1	74	15.2
				36	0	14.16
				36	18	13.93
				36	37	13.92
				75	0	14.01
	Mid (20175)	1732.5	QPSK	1	0	16.35
				1	37	15.91
				1	74	15.85
				36	0	15.12
				36	18	14.92
				36	37	14.89
				75	0	15
			16-QAM	1	0	15.54
				1	37	15.14
				1	74	15.07
				36	0	14.09
				36	18	13.86
				36	37	13.82
				75	0	13.91
	High (20325)	1747.5	QPSK	1	0	16.17
				1	37	15.67
				1	74	15.66
				36	0	15.01
				36	18	14.77
				36	37	14.71
				75	0	14.87
			16-QAM	1	0	15.38
				1	37	14.79
				1	74	14.83
				36	0	13.92
				36	18	13.71
				36	37	13.65
				75	0	13.81

OUTPUT POWER

Band 4 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
10 MHz	Low (20000)	1715	QPSK	1	0	16.22
				1	24	15.96
				1	49	15.87
				25	0	15.05
				25	12	14.92
				25	24	14.89
				50	0	14.97
			16-QAM	1	0	15.26
				1	24	15.01
				1	49	15.01
				25	0	14.03
				25	12	13.9
				25	24	13.86
				50	0	13.95
	Mid (20175)	1732.5	QPSK	1	0	16.16
				1	24	15.91
				1	49	15.89
				25	0	15.01
				25	12	14.88
				25	24	14.85
				50	0	14.94
			16-QAM	1	0	15.27
				1	24	14.98
				1	49	14.96
				25	0	13.96
				25	12	13.84
				25	24	13.82
				50	0	13.88
	High (20350)	1750	QPSK	1	0	16.03
				1	24	15.69
				1	49	15.7
				25	0	14.85
				25	12	14.71
				25	24	14.68
				50	0	14.76
			16-QAM	1	0	15.08
				1	24	14.78
				1	49	14.78
				25	0	13.81
				25	12	13.67
				25	24	13.65
				50	0	13.74

OUTPUT POWER

Band 4 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
5 MHz	Low (19975)	1712.5	QPSK	1	0	16.01
				1	12	16.07
				1	24	15.88
				12	0	15.02
				12	6	14.93
				12	11	14.91
				25	0	14.91
			16-QAM	1	0	15.05
				1	12	15
				1	24	14.9
				12	0	13.92
				12	6	13.86
				12	11	13.86
				25	0	13.89
	Mid (20175)	1732.5	QPSK	1	0	15.94
				1	12	15.9
				1	24	15.82
				12	0	14.9
				12	6	14.85
				12	11	14.82
				25	0	14.85
			16-QAM	1	0	15.05
				1	12	15.02
				1	24	14.93
				12	0	13.92
				12	6	13.85
				12	11	13.8
				25	0	13.85
	High (20375)	1752.5	QPSK	1	0	15.75
				1	12	15.79
				1	24	15.62
				12	0	14.74
				12	6	14.67
				12	11	14.67
				25	0	14.67
			16-QAM	1	0	14.81
				1	12	14.73
				1	24	14.7
				12	0	13.7
				12	6	13.67
				12	11	13.65
				25	0	13.69

OUTPUT POWER

Band 4 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
3 MHz	Low (19965)	1711.5	QPSK	1	0	16.02
				1	7	16.08
				1	14	15.95
				8	0	15
				8	4	14.96
				8	7	14.95
				15	0	15
			16-QAM	1	0	15.09
				1	7	15.09
				1	14	15
				8	0	14.02
				8	4	13.96
				8	7	13.96
				15	0	13.97
	Mid (20175)	1732.5	QPSK	1	0	15.97
				1	7	15.96
				1	14	15.88
				8	0	14.91
				8	4	14.92
				8	7	14.89
				15	0	14.89
			16-QAM	1	0	15.05
				1	7	15.01
				1	14	14.95
				8	0	13.94
				8	4	13.87
				8	7	13.91
				15	0	13.9
	High (20384)	1753.4	QPSK	1	0	15.69
				1	7	15.72
				1	14	15.6
				8	0	14.7
				8	4	14.66
				8	7	14.68
				15	0	14.69
			16-QAM	1	0	14.78
				1	7	14.7
				1	14	14.72
				8	0	13.72
				8	4	13.69
				8	7	13.71
				15	0	13.71

OUTPUT POWER

Band 4 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
1.4MHz	Low (19957)	1710.7	QPSK	1	0	16.03
				1	2	16
				1	5	16
				3	0	16.1
				3	1	16.06
				3	2	16.08
				6	0	14.94
			16-QAM	1	0	15.09
				1	2	15.05
				1	5	15.06
				3	0	15.04
				3	1	15.08
				3	2	15.1
				6	0	13.95
	Mid (20175)	1732.5	QPSK	1	0	15.96
				1	2	15.93
				1	5	15.91
				3	0	15.96
				3	1	15.97
				3	2	15.95
				6	0	14.89
			16-QAM	1	0	15.01
				1	2	14.97
				1	5	14.97
				3	0	14.93
				3	1	14.88
				3	2	14.84
				6	0	13.88
	High (20392)	1754.2	QPSK	1	0	15.71
				1	2	15.7
				1	5	15.7
				3	0	15.79
				3	1	15.75
				3	2	15.79
				6	0	14.62
			16-QAM	1	0	14.76
				1	2	14.73
				1	5	14.75
				3	0	14.71
				3	1	14.74
				3	2	14.73
				6	0	13.65

OUTPUT POWER

Band 5 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
10 MHz	Low (20450)	829	QPSK	1	0	19.41
				1	24	19.35
				1	49	19.17
				25	0	18.46
				25	12	18.38
				25	24	18.32
				50	0	18.4
			16-QAM	1	0	18.55
				1	24	18.47
				1	49	18.28
				25	0	17.44
				25	12	17.36
				25	24	17.31
				50	0	17.37
	Mid (20525)	836.5	QPSK	1	0	19.3
				1	24	19.19
				1	49	18.94
				25	0	18.34
				25	12	18.27
				25	24	18.2
				50	0	18.28
			16-QAM	1	0	18.42
				1	24	18.3
				1	49	18.11
				25	0	17.31
				25	12	17.24
				25	24	17.16
				50	0	17.24
	High (20600)	844	QPSK	1	0	19.13
				1	24	19.02
				1	49	18.98
				25	0	18.18
				25	12	18.12
				25	24	18.14
				50	0	18.19
			16-QAM	1	0	18.33
				1	24	18.22
				1	49	18.14
				25	0	17.2
				25	12	17.12
				25	24	17.13
				50	0	17.16

OUTPUT POWER

Band 5 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
5 MHz	Low (20425)	826.5	QPSK	1	0	19.36
				1	12	19.43
				1	24	19.28
				12	0	18.46
				12	6	18.41
				12	11	18.4
				25	0	18.42
			16-QAM	1	0	18.63
				1	12	18.62
				1	24	18.51
				12	0	17.49
				12	6	17.47
				12	11	17.45
				25	0	17.39
	Mid (20525)	836.5	QPSK	1	0	19.21
				1	12	19.15
				1	24	19.03
				12	0	18.32
				12	6	18.26
				12	11	18.25
				25	0	18.28
			16-QAM	1	0	18.37
				1	12	18.33
				1	24	18.19
				12	0	17.27
				12	6	17.2
				12	11	17.2
				25	0	17.23
	High (20625)	846.5	QPSK	1	0	19.06
				1	12	19.12
				1	24	12.03
				12	0	18.19
				12	6	18.16
				12	11	18.17
				25	0	18.16
			16-QAM	1	0	18.19
				1	12	18.21
				1	24	18.16
				12	0	17.11
				12	6	17.11
				12	11	17.1
				25	0	17.13

OUTPUT POWER

Band 5 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
3 MHz	Low (20415)	825.6	QPSK	1	0	19.4
				1	7	19.41
				1	14	19.34
				8	0	18.51
				8	4	18.47
				8	7	18.45
				15	0	18.48
			16-QAM	1	0	18.51
				1	7	18.54
				1	14	18.46
				8	0	17.46
				8	4	17.43
				8	7	17.42
				15	0	17.4
	Mid (20525)	836.5	QPSK	1	0	19.2
				1	7	19.18
				1	14	19.11
				8	0	18.3
				8	4	18.28
				8	7	18.26
				15	0	18.26
			16-QAM	1	0	18.35
				1	7	18.36
				1	14	18.25
				8	0	17.29
				8	4	17.23
				8	7	17.21
				15	0	17.25
	High (20635)	847.5	QPSK	1	0	19.08
				1	7	19.09
				1	14	19.1
				8	0	18.2
				8	4	18.18
				8	7	18.2
				15	0	18.2
			16-QAM	1	0	18.2
				1	7	18.23
				1	14	18.23
				8	0	17.17
				8	4	17.13
				8	7	17.16
				15	0	17.14

OUTPUT POWER

Band 5 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
1.4MHz	Low (20407)	824.7	QPSK	1	0	19.46
				1	2	19.44
				1	5	19.43
				3	0	19.5
				3	1	19.5
				3	2	19.49
				6	0	18.49
			16-QAM	1	0	1856
				1	2	18.55
				1	5	18.54
				3	0	18.48
				3	1	18.48
				3	2	18.5
				6	0	17.43
	Mid (20525)	836.5	QPSK	1	0	19.25
				1	2	19.22
				1	5	19.23
				3	0	19.29
				3	1	19.29
				3	2	19.27
				6	0	19.33
			16-QAM	1	0	18.36
				1	2	18.35
				1	5	18.33
				3	0	18.3
				3	1	18.26
				3	2	18.26
				6	0	17.26
	High (20643)	848.3	QPSK	1	0	19.16
				1	2	19.14
				1	5	19.16
				3	0	19.18
				3	1	19.18
				3	2	19.17
				6	0	18.2
			16-QAM	1	0	18.26
				1	2	18.24
				1	5	18.28
				3	0	18.24
				3	1	18.23
				3	2	18.21
				6	0	17.15

OUTPUT POWER

Band 7 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
20 MHz	Low (20890)	2514	QPSK	1	0	12.95
				1	49	12.08
				1	99	12.2
				50	0	11.68
				50	24	11.28
				50	49	11.36
				100	0	11.49
			16-QAM	1	0	12.24
				1	49	11.42
				1	99	11.48
				50	0	10.58
				50	24	10.13
				50	49	10.21
				100	0	10.36
	Mid (21020)	2527	QPSK	1	0	12.87
				1	49	12.48
				1	99	12.7
				50	0	11.81
				50	24	11.6
				50	49	11.76
				100	0	11.75
			16-QAM	1	0	12.18
				1	49	11.78
				1	99	11.98
				50	0	10.67
				50	24	10.49
				50	49	10.63
				100	0	10.65

OUTPUT POWER

Band 7 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
15 MHz	Low (20865)	2511.5	QPSK	1	0	13.09
				1	37	12.17
				1	74	12.41
				36	0	11.71
				36	18	11.35
				36	37	11.36
				75	0	11.5
			16-QAM	1	0	12.3
				1	37	11.45
				1	74	11.47
				36	0	10.56
				36	18	10.12
				36	37	10.19
				75	0	10.34
	Mid (21045)	2529.5	QPSK	1	0	13.06
				1	37	12.6
				1	74	12.98
				36	0	11.9
				36	18	11.72
				36	37	11.85
				75	0	11.9
			16-QAM	1	0	12.35
				1	37	11.85
				1	74	12.26
				36	0	10.78
				36	18	10.59
				36	37	10.69
				75	0	10.77
	High (21375)	2562.5	QPSK	1	0	13.05
				1	37	12.33
				1	74	12.69
				36	0	11.72
				36	18	11.5
				36	37	11.59
				75	0	11.68
			16-QAM	1	0	12.28
				1	37	11.57
				1	74	12
				36	0	10.63
				36	18	10.34
				36	37	10.48
				75	0	10.52

OUTPUT POWER

Band 7 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
10 MHz	Low (20840)	2509	QPSK	1	0	12.69
				1	24	12.28
				1	49	12.17
				25	0	11.5
				25	12	11.26
				25	24	11.21
				50	0	11.23
			16-QAM	1	0	11.8
				1	24	11.5
				1	49	11.34
				25	0	10.4
				25	12	10.2
				25	24	10.25
				50	0	10.32
	Mid (21070)	2532	QPSK	1	0	12.94
				1	24	12.81
				1	49	12.87
				25	0	11.91
				25	12	11.82
				25	24	11.84
				50	0	11.86
			16-QAM	1	0	12.1
				1	24	11.98
				1	49	12.01
				25	0	10.84
				25	12	10.66
				25	24	10.77
				50	0	10.79
	High (21400)	2565	QPSK	1	0	12.73
				1	24	12.53
				1	49	12.6
				25	0	11.6
				25	12	11.51
				25	24	11.56
				50	0	11.62
			16-QAM	1	0	11.87
				1	24	11.67
				1	49	11.74
				25	0	10.52
				25	12	10.42
				25	24	10.43
				50	0	10.51

OUTPUT POWER

Band 7 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
5 MHz	Low (20815)	2506.5	QPSK	1	0	12.41
				1	12	12.31
				1	24	12.15
				12	0	11.45
				12	6	11.28
				12	11	11.27
				25	0	11.35
			16-QAM	1	0	11.73
				1	12	11.62
				1	24	11.42
				12	0	10.39
				12	6	10.32
				12	11	10.24
				25	0	10.27
	Mid (21095)	2534.5	QPSK	1	0	12.81
				1	12	12.79
				1	24	12.68
				12	0	11.83
				12	6	11.72
				12	11	11.78
				25	0	11.78
			16-QAM	1	0	11.91
				1	12	11.87
				1	24	11.81
				12	0	10.72
				12	6	10.69
				12	11	10.68
				25	0	10.77
	High (21425)	2567.5	QPSK	1	0	12.45
				1	12	12.49
				1	24	12.5
				12	0	11.56
				12	6	11.49
				12	11	11.52
				25	0	11.57
			16-QAM	1	0	11.79
				1	12	11.79
				1	24	11.77
				12	0	10.52
				12	6	10.49
				12	11	10.47
				25	0	10.51

OUTPUT POWER

Band 13 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
10 MHz	Mid (23230)	782	QPSK	1	0	21.91
				1	24	22.02
				1	49	21.55
				25	0	21.32
				25	12	21.25
				25	24	21.27
				50	0	21.27
			16-QAM	1	0	20.99
				1	24	21.12
				1	49	20.61
				25	0	20.34
				25	12	20.25
				25	24	20.28
				50	0	20.28

OUTPUT POWER

Band 13 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
5 MHz	Low (23205)	779.5	QPSK	1	0	22.15
				1	12	22.15
				1	24	22.15
				12	0	21.26
				12	6	21.22
				12	11	21.22
				25	0	21.22
			16-QAM	1	0	21.21
				1	12	21.28
				1	24	21.18
				12	0	20.23
				12	6	20.2
				12	11	20.23
				25	0	20.24
	Mid (23230)	782	QPSK	1	0	22.18
				1	12	22.22
				1	24	22.12
				12	0	21.27
				12	6	21.23
				12	11	21.22
				25	0	21.23
			16-QAM	1	0	21.24
				1	12	21.26
				1	24	21.18
				12	0	20.28
				12	6	20.26
				12	11	20.25
				25	0	20.25
	High (23255)	784.5	QPSK	1	0	22.19
				1	12	22.23
				1	24	22.09
				12	0	21.26
				12	6	21.22
				12	11	21.2
				25	0	21.2
			16-QAM	1	0	21.39
				1	12	21.39
				1	24	21.28
				12	0	20.35
				12	6	20.3
				12	11	20.29
				25	0	20.23

OUTPUT POWER

Band 17 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
10 MHz	Low (23780)	709	QPSK	1	0	20.22
				1	24	20.13
				1	49	20.01
				25	0	19.41
				25	12	19.35
				25	24	19.29
				50	0	19.35
			16-QAM	1	0	19.37
				1	24	19.4
				1	49	19.3
				25	0	18.52
				25	12	18.42
				25	24	18.4
				50	0	18.45
	Mid (23790)	710	QPSK	1	0	20.21
				1	24	20.14
				1	49	20
				25	0	19.42
				25	12	19.35
				25	24	19.31
				50	0	19.36
			16-QAM	1	0	19.46
				1	24	19.4
				1	49	19.24
				25	0	18.49
				25	12	18.42
				25	24	18.39
				50	0	18.44
	High (23800)	711	QPSK	1	0	20.07
				1	24	20.09
				1	49	19.86
				25	0	19.33
				25	12	19.3
				25	24	19.2
				50	0	19.26
			16-QAM	1	0	19.33
				1	24	19.33
				1	49	19.12
				25	0	18.39
				25	12	18.35
				25	24	18.29
				50	0	18.34

OUTPUT POWER

Band 17 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
5 MHz	Low (23755)	706.5	QPSK	1	0	20.17
				1	12	20.21
				1	24	20.08
				12	0	19.42
				12	6	19.39
				12	11	19.38
				25	0	19.39
			16-QAM	1	0	19.54
				1	12	19.57
				1	24	19.48
				12	0	18.57
				12	6	18.54
				12	11	18.52
				25	0	18.48
	Midn (23790)	710	QPSK	1	0	20.16
				1	12	20.11
				1	24	20.05
				12	0	19.39
				12	6	19.34
				12	11	19.33
				25	0	19.34
			16-QAM	1	0	19.41
				1	12	19.42
				1	24	19.29
				12	0	18.44
				12	6	18.36
				12	11	18.37
				25	0	18.43
	High (23825)	713.5	QPSK	1	0	20.11
				1	12	20.15
				1	24	20.01
				12	0	19.35
				12	6	19.29
				12	11	19.28
				25	0	19.31
			16-QAM	1	0	19.36
				1	12	19.36
				1	24	19.25
				12	0	18.41
				12	6	18.37
				12	11	18.38
				25	0	18.4

OUTPUT POWER

WTD.2012.10.24

EUT:	WSBUB-SDS	Work Order:	INTE5478
Serial Number:	FZWZ42600237	Date:	08/07/2014
Customer:	Intel Corporation	Temperature:	22.3°C
Attendees:	Mike Lowe	Relative Humidity:	32.1%
Customer Project:	None	Bar. Pressure:	1014 mb
Tested By:	Brandon Hobbs	Job Site:	EV06
Power:	110VAC/60Hz	Configuration:	INTE5478-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 2.1093:2014	IEEE Std 1528:2003 FCC KDB 248227 D01 v01r02

COMMENTS

Normal full output power. Radio was operated by customer.

DEVIATIONS FROM TEST STANDARD

None

RESULTS

Tested By

OUTPUT POWER

Band 2 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
20 MHz	Low (18700)	1860	QPSK	1	0	22.84
				1	49	22.50
				1	99	22.61
				50	0	22.13
				50	24	21.93
				50	49	22.02
				100	0	22.10
			16-QAM	1	0	22.30
				1	49	21.94
				1	99	22.03
				50	0	21.02
				50	24	20.77
				50	49	20.92
				100	0	20.95
	Mid (18900)	1880	QPSK	1	0	23.11
				1	49	22.52
				1	99	22.50
				50	0	22.31
				50	24	21.97
				50	49	21.87
				100	0	22.05
			16-QAM	1	0	22.54
				1	49	21.97
				1	99	21.80
				50	0	21.17
				50	24	20.82
				50	49	20.80
				100	0	20.96
	High (19100)	1900	QPSK	1	0	23.31
				1	49	22.72
				1	99	22.74
				50	0	22.27
				50	24	21.98
				50	49	22.01
				100	0	22.10
			16-QAM	1	0	22.47
				1	49	21.98
				1	99	21.97
				50	0	21.09
				50	24	20.85
				50	49	20.89
				100	0	21.03

OUTPUT POWER

Band 2 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
15 MHz	Low (18675)	1857.5	QPSK	1	0	23.00
				1	37	22.57
				1	74	22.87
				36	0	22.10
				36	18	21.97
				36	37	22.07
				75	0	22.11
			16-QAM	1	0	22.40
				1	37	22
				1	74	22.30
				36	0	21.00
				36	18	20.86
				36	37	20.93
				75	0	20.95
	Mid (18900)	1880	QPSK	1	0	23.34
				1	37	22.66
				1	74	22.80
				36	0	22.30
				36	18	22.06
				36	37	21.00
				75	0	22.14
			16-QAM	1	0	22.75
				1	37	22.14
				1	74	22.18
				36	0	21.25
				36	18	20.91
				36	37	20.92
				75	0	21.06
	High (19125)	1902.5	QPSK	1	0	23.35
				1	37	22.88
				1	74	22.91
				36	0	22.22
				36	18	22.05
				36	37	22.05
				75	0	22.17
			16-QAM	1	0	22.60
				1	37	22.15
				1	74	22.23
				36	0	21.17
				36	18	20.92
				36	37	20.94
				75	0	21.07

OUTPUT POWER

Band 2 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
10 MHz	Low (18650)	1855	QPSK	1	0	22.87
				1	24	22.71
				1	49	22.82
				25	0	21.90
				25	12	21.78
				25	24	21.87
				50	0	21.88
			16-QAM	1	0	22.10
				1	24	21.95
				1	49	22.06
				25	0	20.83
				25	12	20.77
				25	24	20.81
				50	0	20.78
	Mid (18900)	1880	QPSK	1	0	23.13
				1	24	22.87
				1	49	22.83
				25	0	22.15
				25	12	21.96
				25	24	21.90
				50	0	22.06
			16-QAM	1	0	22.45
				1	24	22.10
				1	49	22.02
				25	0	21.05
				25	12	20.91
				25	24	20.85
				50	0	20.96
	High (19150)	1905	QPSK	1	0	23.18
				1	24	22.89
				1	49	22.90
				25	0	22.13
				25	12	21.97
				25	24	21.97
				50	0	22.02
			16-QAM	1	0	22.36
				1	24	22.08
				1	49	22.07
				25	0	21.01
				25	12	20.91
				25	24	20.88
				50	0	20.96

OUTPUT POWER

Band 2 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
5 MHz	Low (18625)	1852.5	QPSK	1	0	22.68
				1	12	22.64
				1	24	22.63
				12	0	21.75
				12	6	21.76
				12	11	21.75
				25	0	21.77
			16-QAM	1	0	21.89
				1	12	21.90
				1	24	21.87
				12	0	20.76
				12	6	20.70
				12	11	20.69
				25	0	20.74
	Mid 18900)	1880	QPSK	1	0	22.69
				1	12	22.60
				1	24	22.62
				12	0	21.78
				12	6	21.71
				12	11	21.73
				25	0	21.74
			16-QAM	1	0	21.82
				1	12	21.90
				1	24	21.86
				12	0	20.75
				12	6	20.67
				12	11	20.73
				25	0	20.72
	High (19195)	1909.5	QPSK	1	0	22.95
				1	12	22.87
				1	24	22.80
				12	0	22
				12	6	21.91
				12	11	21.90
				25	0	21.93
			16-QAM	1	0	22.13
				1	12	22.06
				1	24	21.89
				12	0	20.95
				12	6	20.87
				12	11	20.90
				25	0	20.90

OUTPUT POWER

Band 2 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
3 MHz	Low (18615)	1851.5	QPSK	1	0	22.63
				1	7	22.58
				1	14	22.59
				8	0	21.73
				8	4	21.74
				8	7	21.75
				15	0	21.73
			16-QAM	1	0	21.80
				1	7	21.83
				1	14	21.85
				8	0	20.75
				8	4	20.67
				8	7	20.68
				15	0	20.69
	Mid (18900)	1880	QPSK	1	0	22.97
				1	7	22.90
				1	14	22.86
				8	0	22.02
				8	4	21.98
				8	7	21.94
				15	0	21.96
			16-QAM	1	0	22.15
				1	7	22.11
				1	14	22.05
				8	0	20.99
				8	4	20.94
				8	7	20.93
				15	0	20.91
	High (19185)	1908.5	QPSK	1	0	22.90
				1	7	22.83
				1	14	22.83
				8	0	21.99
				8	4	21.98
				8	7	21.94
				15	0	21.95
			16-QAM	1	0	22.09
				1	7	22.09
				1	14	22.02
				8	0	20.94
				8	4	20.90
				8	7	20.87
				15	0	20.92

OUTPUT POWER

Band 2 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
1.4MHz	Low (18607)	1850.7	QPSK	1	0	22.40
				1	2	22.39
				1	5	22.40
				3	0	22.47
				3	1	22.45
				3	2	22.44
				6	0	21.75
			16-QAM	1	0	21.84
				1	2	21.78
				1	5	21.83
				3	0	21.76
				3	1	21.74
				3	2	21.74
				6	0	20.69
	Mid (18900)	1880	QPSK	1	0	22.83
				1	2	22.89
				1	5	22.85
				3	0	22.95
				3	1	22.93
				3	2	22.91
				6	0	21.97
			16-QAM	1	0	22.18
				1	2	22.16
				1	5	22.10
				3	0	22.05
				3	1	21.01
				3	2	22
				6	0	20.98
	High (19193)	1909.3	QPSK	1	0	22.90
				1	2	22.80
				1	5	22.65
				3	0	22.72
				3	1	22.70
				3	2	22.71
				6	0	21.94
			16-QAM	1	0	22.04
				1	2	22.05
				1	5	22
				3	0	21.98
				3	1	21.95
				3	2	21.95
				6	0	20.93

OUTPUT POWER

Band 4 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
20 MHz	Low (20050)	1720	QPSK	1	0	23.05
				1	49	22.36
				1	99	22.41
				50	0	22.28
				50	24	21.95
				50	49	21.98
				100	0	22.13
			16-QAM	1	0	22.54
				1	49	21.90
				1	99	21.96
				50	0	21.30
				50	24	20.97
				50	49	20.97
				100	0	21.10
	Mid (20175)	1732.5	QPSK	1	0	22.90
				1	49	22.38
				1	99	22.31
				50	0	22.23
				50	24	21.95
				50	49	21.93
				100	0	22.00
			16-QAM	1	0	22.42
				1	49	21.95
				1	99	21.85
				50	0	21.21
				50	24	20.99
				50	49	20.98
				100	0	21.04
	High (20300)	1745	QPSK	1	0	22.91
				1	49	22.37
				1	99	21.95
				50	0	22.02
				50	24	21.81
				50	49	21.67
				100	0	21.89
			16-QAM	1	0	22.22
				1	49	21.86
				1	99	21.47
				50	0	21.06
				50	24	20.86
				50	49	20.73
				100	0	20.92

OUTPUT POWER

Band 4 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
15 MHz	Low (20025)	1717.5	QPSK	1	0	23.04
				1	37	22.60
				1	74	22.58
				36	0	22.24
				36	18	21.99
				36	37	21.96
				75	0	22.08
			16-QAM	1	0	22.60
				1	37	22.09
				1	74	22.09
				36	0	21.30
				36	18	21.04
				36	37	21.00
				75	0	21.13
	Mid (20175)	1732.5	QPSK	1	0	23.10
				1	37	22.55
				1	74	22.71
				36	0	22.23
				36	18	22.01
				36	37	22.02
				75	0	22.15
			16-QAM	1	0	22.63
				1	37	22.10
				1	74	22.25
				36	0	21.31
				36	18	21.08
				36	37	21.07
				75	0	21.13
	High (20325)	1747.5	QPSK	1	0	22.85
				1	37	22.46
				1	74	22.28
				36	0	22.09
				36	18	21.89
				36	37	21.80
				75	0	21.94
			16-QAM	1	0	22.40
				1	37	22.00
				1	74	21.80
				36	0	21.14
				36	18	20.95
				36	37	20.81
				75	0	20.99

OUTPUT POWER

Band 4 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
10 MHz	Low (20000)	1715	QPSK	1	0	23.17
				1	24	22.55
				1	49	22.57
				25	0	22.14
				25	12	21.98
				25	24	21.98
				50	0	22.07
			16-QAM	1	0	22.41
				1	24	22.08
				1	49	22.10
				25	0	21.23
				25	12	21.05
				25	24	21.00
				50	0	21.11
	Mid (20175)	1732.5	QPSK	1	0	22.82
				1	24	22.57
				1	49	22.55
				25	0	22.07
				25	12	21.94
				25	24	21.96
				50	0	22.04
			16-QAM	1	0	22.34
				1	24	22.12
				1	49	22.10
				25	0	21.17
				25	12	21.04
				25	24	21.00
				50	0	21.07
	High (20350)	1750	QPSK	1	0	22.98
				1	24	22.68
				1	49	22.40
				25	0	21.97
				25	12	21.85
				25	24	21.82
				50	0	21.90
			16-QAM	1	0	22.27
				1	24	21.93
				1	49	21.89
				25	0	21.05
				25	12	20.90
				25	24	20.85
				50	0	20.95

OUTPUT POWER

Band 4 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
5 MHz	Low (19975)	1712.5	QPSK	1	0	23.08
				1	12	22.99
				1	24	22.89
				12	0	22.19
				12	6	22.09
				12	11	22.07
				25	0	22.12
			16-QAM	1	0	22.28
				1	12	22.18
				1	24	22.13
				12	0	21.21
				12	6	21.12
				12	11	21.09
				25	0	21.10
	Mid (20175)	1732.5	QPSK	1	0	22.94
				1	12	22.90
				1	24	22.82
				12	0	22.10
				12	6	22.04
				12	11	22.00
				25	0	22.03
			16-QAM	1	0	22.20
				1	12	22.20
				1	24	22.08
				12	0	21.12
				12	6	21.09
				12	11	21.10
				25	0	21.08
	High (20375)	1752.5	QPSK	1	0	22.85
				1	12	22.78
				1	24	22.65
				12	0	21.93
				12	6	21.91
				12	11	21.88
				25	0	21.91
			16-QAM	1	0	22.08
				1	12	21.97
				1	24	21.91
				12	0	21.00
				12	6	20.91
				12	11	20.88
				25	0	20.94

OUTPUT POWER

Band 4 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
3 MHz	Low (19965)	1711.5	QPSK	1	0	23.00
				1	7	22.98
				1	14	22.94
				8	0	22.14
				8	4	22.08
				8	7	22.08
				15	0	22.11
			16-QAM	1	0	22.25
				1	7	22.18
				1	14	22.15
				8	0	21.18
				8	4	21.13
				8	7	21.11
				15	0	21.13
	Mid (20175)	1732.5	QPSK	1	0	22.93
				1	7	22.89
				1	14	22.85
				8	0	22.09
				8	4	22.07
				8	7	22.04
				15	0	22.05
			16-QAM	1	0	22.21
				1	7	22.23
				1	14	22.15
				8	0	21.11
				8	4	21.05
				8	7	21.06
				15	0	21.08
	High (20384)	1753.4	QPSK	1	0	22.78
				1	7	22.73
				1	14	22.69
				8	0	21.91
				8	4	21.86
				8	7	21.85
				15	0	21.93
			16-QAM	1	0	22.05
				1	7	21.95
				1	14	21.90
				8	0	20.97
				8	4	20.92
				8	7	20.91
				15	0	20.90

OUTPUT POWER

Band 4 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
1.4MHz	Low (19957)	1710.7	QPSK	1	0	23.05
				1	2	22.97
				1	5	22.98
				3	0	23.06
				3	1	23.05
				3	2	23.05
				6	0	22.08
			16-QAM	1	0	22.23
				1	2	22.21
				1	5	22.19
				3	0	22.13
				3	1	22.13
				3	2	22.13
				6	0	21.18
	Mid (20175)	1732.5	QPSK	1	0	22.94
				1	2	22.93
				1	5	22.92
				3	0	22.99
				3	1	22.98
				3	2	22.97
				6	0	22.05
			16-QAM	1	0	22.20
				1	2	22.20
				1	5	22.14
				3	0	22.08
				3	1	22.05
				3	2	22.01
				6	0	21.10
	High (20392)	1754.2	QPSK	1	0	22.78
				1	2	22.78
				1	5	22.70
				3	0	22.78
				3	1	22.78
				3	2	22.78
				6	0	21.84
			16-QAM	1	0	22.02
				1	2	21.99
				1	5	21.99
				3	0	21.92
				3	1	21.93
				3	2	21.89
				6	0	20.94

OUTPUT POWER

Band 5 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
10 MHz	Low (20450)	829	QPSK	1	0	23.65
				1	24	23.65
				1	49	23.35
				25	0	22.75
				25	12	22.68
				25	24	22.58
				50	0	22.65
			16-QAM	1	0	23.79
				1	24	22.80
				1	49	22.80
				25	0	21.71
				25	12	21.65
				25	24	21.55
				50	0	21.60
	Mid (20525)	836.5	QPSK	1	0	23.66
				1	24	23.49
				1	49	23.33
				25	0	22.65
				25	12	22.53
				25	24	22.50
				50	0	22.60
			16-QAM	1	0	22.80
				1	24	22.60
				1	49	22.44
				25	0	21.62
				25	12	21.52
				25	24	21.44
				50	0	21.53
	High (20600)	844	QPSK	1	0	23.49
				1	24	23.40
				1	49	23.31
				25	0	22.48
				25	12	22.47
				25	24	22.45
				50	0	22.50
			16-QAM	1	0	22.68
				1	24	22.50
				1	49	22.48
				25	0	21.47
				25	12	21.40
				25	24	21.38
				50	0	21.40

OUTPUT POWER

Band 5 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
5 MHz	Low (20425)	826.5	QPSK	1	0	23.73
				1	12	23.70
				1	24	23.62
				12	0	22.82
				12	6	22.75
				12	11	22.73
				25	0	22.76
			16-QAM	1	0	22.89
				1	12	22.85
				1	24	22.75
				12	0	21.75
				12	6	21.71
				12	11	21.69
				25	0	21.68
	Mid (20525)	836.5	QPSK	1	0	23.55
				1	12	23.52
				1	24	23.41
				12	0	22.63
				12	6	22.56
				12	11	22.53
				25	0	22.57
			16-QAM	1	0	22.70
				1	12	22.68
				1	24	22.53
				12	0	21.58
				12	6	21.51
				12	11	21.48
				25	0	21.50
	High (20625)	846.5	QPSK	1	0	23.37
				1	12	23.43
				1	24	23.34
				12	0	22.50
				12	6	22.46
				12	11	22.48
				25	0	22.45
			16-QAM	1	0	22.54
				1	12	22.53
				1	24	22.50
				12	0	21.46
				12	6	21.42
				12	11	21.41
				25	0	21.41

OUTPUT POWER

Band 5 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
3 MHz	Low (20415)	825.6	QPSK	1	0	23.72
				1	7	23.70
				1	14	23.68
				8	0	22.83
				8	4	22.78
				8	7	22.75
				15	0	22.78
			16-QAM	1	0	22.84
				1	7	22.85
				1	14	22.80
				8	0	21.77
				8	4	21.73
				8	7	21.75
				15	0	21.75
	Mid (20525)	836.5	QPSK	1	0	23.53
				1	7	23.49
				1	14	23.45
				8	0	22.60
				8	4	22.57
				8	7	22.55
				15	0	22.57
			16-QAM	1	0	22.70
				1	7	22.65
				1	14	22.58
				8	0	21.56
				8	4	21.52
				8	7	21.50
				15	0	21.49
	High (20635)	847.5	QPSK	1	0	23.40
				1	7	23.41
				1	14	23.42
				8	0	22.50
				8	4	22.50
				8	7	22.51
				15	0	22.51
			16-QAM	1	0	22.50
				1	7	22.53
				1	14	22.53
				8	0	21.48
				8	4	21.43
				8	7	21.45
				15	0	21.40

OUTPUT POWER

Band 5 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
1.4MHz	Low (20407)	824.7	QPSK	1	0	23.79
				1	2	23.77
				1	5	23.77
				3	0	23.80
				3	1	23.83
				3	2	23.82
				6	0	22.81
			16-QAM	1	0	22.92
				1	2	22.90
				1	5	22.88
				3	0	22.83
				3	1	22.82
				3	2	22.80
				6	0	21.78
	Mid (20525)	836.5	QPSK	1	0	23.55
				1	2	23.55
				1	5	23.55
				3	0	23.60
				3	1	23.60
				3	2	23.54
				6	0	22.58
			16-QAM	1	0	22.70
				1	2	22.70
				1	5	22.67
				3	0	22.62
				3	1	22.60
				3	2	22.62
				6	0	21.58
	High (20643)	848.3	QPSK	1	0	23.46
				1	2	23.45
				1	5	23.47
				3	0	23.55
				3	1	23.54
				3	2	23.56
				6	0	22.52
			16-QAM	1	0	22.56
				1	2	22.53
				1	5	22.56
				3	0	22.48
				3	1	22.48
				3	2	22.50
				6	0	21.46

OUTPUT POWER

Band 7 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
20 MHz	Low (20890)	2514	QPSK	1	0	24.00
				1	49	23.00
				1	99	23.24
				50	0	22.68
				50	24	22.23
				50	49	22.32
				100	0	22.49
			16-QAM	1	0	23.16
				1	49	22.24
				1	99	22.48
				50	0	21.68
				50	24	21.22
				50	49	21.33
				100	0	21.50
	Mid (21020)	2527	QPSK	1	0	23.92
				1	49	23.50
				1	99	23.80
				50	0	22.90
				50	24	22.65
				50	49	22.85
				100	0	22.89
			16-QAM	1	0	23.08
				1	49	22.75
				1	99	22.99
				50	0	21.89
				50	24	21.65
				50	49	21.85
				100	0	21.86

OUTPUT POWER

Band 7 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
15 MHz	Low (20865)	2511.5	QPSK	1	0	23.80
				1	37	22.83
				1	74	23.01
				36	0	22.67
				36	18	22.30
				36	37	22.29
				75	0	22.47
			16-QAM	1	0	23.18
				1	37	22.29
				1	74	22.50
				36	0	21.68
				36	18	21.27
				36	37	21.24
				75	0	21.43
	Mid (21045)	2529.5	QPSK	1	0	23.94
				1	37	23.48
				1	74	23.72
				36	0	22.95
				36	18	22.78
				36	37	22.90
				75	0	22.93
			16-QAM	1	0	23.20
				1	37	22.82
				1	74	23.12
				36	0	21.93
				36	18	21.76
				36	37	21.95
				75	0	21.95
	High (21375)	2562.5	QPSK	1	0	23.61
				1	37	22.90
				1	74	23.44
				36	0	22.64
				36	18	22.38
				36	37	22.40
				75	0	22.58
			16-QAM	1	0	23.07
				1	37	22.30
				1	74	22.85
				36	0	21.59
				36	18	21.33
				36	37	21.47
				75	0	21.53

OUTPUT POWER

Band 7 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
10 MHz	Low (20840)	2509	QPSK	1	0	23.56
				1	24	23.02
				1	49	22.91
				25	0	22.56
				25	12	22.28
				25	24	22.21
				50	0	22.37
			16-QAM	1	0	22.95
				1	24	22.40
				1	49	22.30
				25	0	21.57
				25	12	21.27
				25	24	21.23
				50	0	21.37
	Mid (21070)	2532	QPSK	1	0	23.79
				1	24	23.77
				1	49	23.45
				25	0	22.85
				25	12	22.75
				25	24	22.79
				50	0	22.80
			16-QAM	1	0	22.92
				1	24	22.90
				1	49	22.84
				25	0	21.86
				25	12	21.83
				25	24	21.84
				50	0	21.87
	High (21400)	2565	QPSK	1	0	23.30
				1	24	23.09
				1	49	23.30
				25	0	22.50
				25	12	22.37
				25	24	22.47
				50	0	22.49
			16-QAM	1	0	22.70
				1	24	22.55
				1	49	22.70
				25	0	21.44
				25	12	21.33
				25	24	21.48
				50	0	21.50

OUTPUT POWER

Band 7 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
5 MHz	Low (20815)	2506.5	QPSK	1	0	23.15
				1	12	23.02
				1	24	22.80
				12	0	22.45
				12	6	22.32
				12	11	22.26
				25	0	22.33
			16-QAM	1	0	22.53
				1	12	22.40
				1	24	22.13
				12	0	21.50
				12	6	21.36
				12	11	21.30
				25	0	21.33
	Mid (21095)	2534.5	QPSK	1	0	23.78
				1	12	23.76
				1	24	23.70
				12	0	22.88
				12	6	22.80
				12	11	22.79
				25	0	22.81
			16-QAM	1	0	22.91
				1	12	22.90
				1	24	22.81
				12	0	21.90
				12	6	21.87
				12	11	21.88
				25	0	21.90
	High (21425)	2567.5	QPSK	1	0	23.35
				1	12	23.14
				1	24	23.17
				12	0	22.46
				12	6	22.43
				12	11	22.47
				25	0	22.45
			16-QAM	1	0	22.50
				1	12	22.48
				1	24	22.51
				12	0	21.48
				12	6	21.44
				12	11	21.46
				25	0	21.45

OUTPUT POWER

Band 13 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
10 MHz	Mid (23230)	782	QPSK	1	0	22.37
				1	24	22.45
				1	49	21.49
				25	0	22.02
				25	12	21.95
				25	24	21.96
				50	0	21.98
			16-QAM	1	0	21.77
				1	24	21.90
				1	49	21.39
				25	0	21
				25	12	20.92
				25	24	20.93
				50	0	20.95

OUTPUT POWER

Band 13 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
5 MHz	Low (23205)	779.5	QPSK	1	0	22.83
				1	12	22.65
				1	24	22.55
				12	0	21.97
				12	6	21.92
				12	11	21.90
				25	0	21.91
			16-QAM	1	0	22
				1	12	22
				1	24	21.95
				12	0	20.97
				12	6	20.92
				12	11	20.90
				25	0	20.89
	Mid (23230)	782	QPSK	1	0	22.76
				1	12	22.70
				1	24	22.56
				12	0	21.95
				12	6	21.90
				12	11	21.90
				25	0	21.90
			16-QAM	1	0	22
				1	12	22.01
				1	24	21.90
				12	0	20.95
				12	6	20.89
				12	11	20.94
				25	0	20.94
	High (23255)	784.5	QPSK	1	0	22.85
				1	12	22.84
				1	24	22.73
				12	0	21.94
				12	6	21.87
				12	11	21.85
				25	0	21.88
			16-QAM	1	0	22
				1	12	22
				1	24	21.89
				12	0	20.93
				12	6	20.9
				12	11	20.93
				25	0	20.92

OUTPUT POWER

Band 17 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
10 MHz	Low (23780)	709	QPSK	1	0	22.51
				1	24	22.47
				1	49	22.31
				25	0	21.65
				25	12	21.64
				25	24	21.60
				50	0	21.66
			16-QAM	1	0	21.80
				1	24	21.71
				1	49	21.59
				25	0	20.67
				25	12	20.56
				25	24	20.57
				50	0	20.63
	Mid (23790)	710	QPSK	1	0	22.47
				1	24	22.43
				1	49	22.28
				25	0	21.67
				25	12	21.63
				25	24	21.56
				50	0	21.59
			16-QAM	1	0	21.70
				1	24	21.68
				1	49	21.50
				25	0	20.60
				25	12	20.53
				25	24	20.55
				50	0	20.58
	High (23800)	711	QPSK	1	0	22.51
				1	24	22.44
				1	49	22.30
				25	0	21.66
				25	12	21.58
				25	24	21.55
				50	0	21.61
			16-QAM	1	0	21.78
				1	24	21.69
				1	49	21.57
				25	0	20.65
				25	12	20.58
				25	24	20.54
				50	0	20.60

OUTPUT POWER

Band 17 Bandwidth	Channel	Channel Frequency	Modulation	RB Allocation	RB start	Output Power (dBm)
5 MHz	Low (23755)	706.5	QPSK	1	0	22.47
				1	12	22.45
				1	24	22.37
				12	0	21.65
				12	6	21.60
				12	11	21.63
				25	0	21.64
			16-QAM	1	0	21.73
				1	12	21.75
				1	24	21.63
				12	0	20.70
				12	6	20.66
				12	11	20.64
				25	0	20.62
	Midn (23790)	710	QPSK	1	0	22.49
				1	12	22.50
				1	24	22.35
				12	0	21.68
				12	6	21.66
				12	11	21.64
				25	0	21.64
			16-QAM	1	0	21.70
				1	12	21.70
				1	24	21.62
				12	0	20.67
				12	6	20.61
				12	11	20.60
				25	0	20.60
	High (23825)	713.5	QPSK	1	0	22.45
				1	12	22.45
				1	24	22.31
				12	0	21.60
				12	6	21.56
				12	11	21.60
				25	0	21.61
			16-QAM	1	0	21.70
				1	12	21.67
				1	24	21.56
				12	0	20.61
				12	6	20,57
				12	11	20.59
				25	0	20.61