



MS ISO/IEC 17025
TESTING
SAMM No. 0825

MOTOROLA PENANG ADV. COMM. LABORATORY

Motorola Solutions Malaysia Sdn Bhd,
Innoplex Plot 2A, Medan Bayan Lepas,
Mukim 12 S.W.D, 11900 Bayan Lepas,
Penang, Malaysia.

FCC / IC TEST REPORT

Report Revision : Rev.B

Date/s Tested : 20-Nov-2017 - 20-Mar-2018
Manufacturer/Location : Motorola Solutions – Penang
Requestor : RONI KOZIEL
Product Type : LEX L11 Mission Critical LTE Device
Model Number : LEX L11n
Frequency Band : Refer to section 1.4
Applicant Name : Motorola Solutions, Inc
Applicant Address : 8000 West Sunrise Boulevard, Fort Lauderdale, Florida
33322
FCC Registrations : 461337
IC Registrations : 109AK

The equipment was tested accordance to the requirement listed below:

(UMTS Band 2)
FCC 47 CFR Part 2 / 24
ISED RSS GEN Issue 4,
November 2014
ISED RSS 133 Issue 6,
January 2018

PASS

This report shall not be reproduced without written approval from an officially designated representative of the Motorola Penang Adv. Comm. Laboratory. The results and statements contained in this report pertain only to the device(s) evaluated.

Prepared By:

Maheshvaran Rajagopal
Technician

Approved By:

Goh Aik Hong
Responsible Engineer

Table of Contents

1.0.	Summary of Test Results	3
1.1.	Measurement Uncertainty	3
1.2.	Equipment List.....	3
1.3.	General Information.....	4
1.4.	Channel number and frequency info.....	5
1.5.	Test Mode Applicability and Tested Channel Detail.....	6
1.6.	Conducted RF Output Power	7
1.6.1.	Test Setup.....	7
1.6.2.	Test Limits.....	7
1.6.3.	Conducted RF Output Power – UMTS Band 2 (1850-1910MHz).....	7
1.6.4.	Equivalent Isotropically Radiated Power (EIRP).....	8
1.7.	Peak-to-Average Power Ratio.....	9
1.7.1.	Test Setup.....	9
1.7.2.	Test Limit	9
1.7.3.	Peak-to-Average Power Ratio – UMTS Band 2 (1850-1910MHz)	9
1.8.	Occupied Bandwidth.....	10
1.8.1.	Test Setup.....	10
1.8.2.	Test Limit	10
1.8.3.	Occupied Bandwidth – UMTS Band 2 (1850-1910MHz)	10
1.9.	Frequency Stability	12
1.9.1.	Test Setup.....	12
1.9.2.	Test Limit	12
1.9.3.	Frequency Stability – UMTS Band 2 (1850-1910MHz).....	12
1.10.	Band Edge Conducted Spurious Emission	13
1.10.1.	Test Setup	14
1.10.2.	Test Limit	14
1.10.3.	Band Edge Conducted Spurious Emission – UMTS Band 2 (1850-1910MHz)	14
1.11.	Conducted Spurious Emission	14
1.11.1.	Test Setup	14
1.11.2.	Test Limit	15
1.11.3.	Conducted Spurious Emissions – UMTS Band 2 (1850-1910MHz)	15
1.12.	Radiated Spurious Emission	18
1.12.1.	Test Setup	18
1.12.2.	Test Limit	18
1.12.3.	Radiated Spurious Emission – UMTS Band 2 (1850-1910MHz)	19

REVISION HISTORY

Revision History	Description	Date	Originator
Rev A.	Initial Report	20-March-2018	Maheshvaran Rajagopal
Rev B.	i. Applicant name and address has been added. ii. The battery model number has been	30-May-2018	Maheshvaran Rajagopal

	revised. iii. AC adapter accessories devices information has been added. iv. The Test report number of page format is corrected. v. RSSs version standard have been added to the cover page. vi. The operating frequency point of high channel is corrected on page 4. vii. Justification statement of accessory devices is included at section 1.5.		
--	---	--	--

1.0. Summary of Test Results

FCC Clause	ISED Clause	Test Item	Results	Remarks
2.1046 24.232(e)	RSS-Gen 6.12 RSS-133 4.1	Conducted RF Output Power	Pass	Meet the requirement of limit
24.232(d)	RSS-133 6.4	Peak-to-Average Power Ratio	Pass	Meet the requirement of limit
2.1049 24.238(b)	RSS-Gen 6.6 RSS-133 2.3	Occupied Bandwidth (26dBc, 20dBc, 99%)	Pass	Meet the requirement of limit
2.1055 24.235	RSS-Gen 6.11 RSS-133 6.3	Frequency Stability	Pass	Meet the requirement of limit
2.1051 24.238(a)(b)	RSS-Gen 6.13 RSS-133 6.5	Band Edge Conducted Spurious Emission	Pass	Meet the requirement of limit
2.1051 24.238(a)(b)	RSS-Gen 6.13 RSS-133 6.5	Conducted Spurious Emissions	Pass	Meet the requirement of limit
2.1053 24.236, 24.238	RSS-133 6.5	Radiated Spurious Emission	Pass	Meet the requirement of limit
24.232 (c)	RSS-133 6.4	Equivalent Isotropically Radiated Power (EIRP)	Pass	Meet the requirement of limit

1.1. Measurement Uncertainty

Measurement	Frequency	Expanded Uncertainty (k=1.96) (±)
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	5.01
	200MHz ~ 1000MHz	5.01
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.01
	18GHz ~ 25GHz	5.01

1.2. Equipment List

Description	Model	Serial Number	Calibration Date	Calibration Due Date
Broadband ATE 1				
Wideband Radio Communication Tester	CMW500	154550	14-Feb-17	14-Feb-19
Signal Analyzer	FSV40	101431	13-Jul-17	12-Jul-19
Chamber	SH-641	92002651	6-Mar-17	6-Mar-18
Power Supply	6621A	US37370810	5-Jun-17	5-Jun-18
Radiated Emission				

DRG HORN FREQ.	SAS-571	719	18-Jul-17	18-Jul-19
DRG HORN FREQ.	SAS-571	720	2-Mar-17	2-Mar-19
POWER SUPPLY	6032A	2615A01178	6-Jun-17	6-Jun-18
MICROWAVE SIGNAL GENERATOR	SMP04	100127	19-Jul-17	18-Jul-18
EMI TEST RECEIVER	ESIB26	100336	13-Jul-17	12-Jul-18
SIGNAL ANALYZER	FSV40	101103	18-Jul-17	17-Jul-18
5m Semi-anechoic Chamber	S800-HX	J2308	Not Required	Not Required
BILOG ANTENNA	CBL6112B	2950	23-Feb-16	23-Feb-18
BILOG ANTENNA	CBL6112B	2964	3-Feb-17	3-Feb-18
BROAD-BAND HORN ANTENNA	BBHA9170	BBHA9170143	20-Mar-17	10-Apr-18
DATA LOGGER	SDL500	A.016776	18-Mar-17	18-Mar-18
LOOP ANTENNA	6502	208416	27-Jul-17	27-Jul-18
SYSTEM CONTROLLER	SC104V	050806-1	Not Required	Not Required
TURNTABLE FLUSH MOUNT 2M	FM2011	NA	Not Required	Not Required
ANTENNA POSITIONING TOWER	TLT2	NA	Not Required	Not Required
18 - 40GHz PREAMPLIFIER	BBV9721	9721-007	Not Required	Not Required
PREAMPLIFIER	PAM-0118P	361	Not Required	Not Required
Wideband Radio Communication Tester	CMW500	153174	9-Jan-17	9-Jan-19

1.3. General Information

General Description of EUT

Product	LEX L11 Mission Critical LTE Device	
Brand	Motorola Solutions	
Test Model	LEX L11n	
Power Supply Rating	3.7Vdc (Battery), 5Vdc (Adapter)	
Mode of operation	UMTS Band 2 (RMC 12kbps, HSDPA, HSUPA)	
Modulation Type	QPSK	
Operating Frequency	UMTS Band 2	1852.4MHz~1907.6MHz
Max. EIRP Power	UMTS Band 2 (RMC 12.2kbps)	25.641dBm (0.367W)
Antenna Type	UMTS Band 2	Monopole with 1.59dBi gain
SW Version	L11_D01.00.28	
HW Version	P3a	

Note:

1. The EUT contains following accessory devices and data cable.

Item	Brand	Model or P/N	Specification
Rechargeable Lithium ion battery	Motorola Solutions	PMNN4545A	2500mAh 3.7V LI-ION STD
Rechargeable Lithium ion battery	Motorola Solutions	PMNN4546A	5000mAh 3.7V LI-ION HICAP
Charger Vehicular Adapter VPA	Motorola Solutions	PMLN7779A	18W
Power Supply Adaptor, Power supply Wall cube, AC, DC (USB type A-C)	Motorola Solutions	PS000150A31 - US/JPN plug	7.5W, 100V-240V

Power Supply Adaptor (USB type C-C)	Motorola Solutions	PS000278A01 - US/JPN plug	27W
Detachable Power/Data Cable USB-A to USB-C	Motorola Solutions	CB000756A01	-
Detachable Power/Data Cable USB-C to USB-C	Motorola Solutions	CB000754A01	-

Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	Product	Brand	Model No.	Serial No.	FCC ID
1	Wideband Radio Communication Tester	R&S	CMW500	154550	NA

NO.	Signal Cable Description of The above Support Units
1	NA

Note:

1. All power cords of the above support units are non-shielded.
2. Item 1 acted as a communication partner to transfer data.

EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency.

General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 24

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI C63.26-2015

NOTE: All test items have been performed and recorded as per the above standards.

1.4. Channel number and frequency info

Band	Bandwidth supported	Available Channel Number	Test Channel Number			Test Channel Frequency (MHz)		
			Low Channel	Mid Channel	High Channel	Low Channel	Mid Channel	High Channel
UMTS Band 2	5 MHz	9262 ~ 9538	9262	9400	9538	1852.4	1880	1907.6

1.5. Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The Radiated Emission worst case was found when positioned on Y-Plane for UMTS Band 2.

Pre-scan also have been conducted with the accessory devices listed in section table 1.3, only the worst case radiated emission results of the combination test configuration is reported in this report.

The following channel(s) was (were) selected for the final test as listed below:

UMTS Band 2

Test Item	Available Channel	Tested Channel	Modulation	Mode
Conducted RF Output Power	9262~ 9538	9262, 9400, 9538	QPSK	All Modes, per table 1.6.3
Peak to Average Power Ratio	9262~ 9538	9262, 9400, 9538	QPSK	RMC 12.2kbps
Occupied Bandwidth	9262~ 9538	9262, 9400, 9538	QPSK	RMC 12.2kbps
Frequency Stability	9262~ 9538	9400	QPSK	RMC 12.2kbps
Band Edge Conducted Spurious Emission	9262~ 9538	9262, 9538	QPSK	RMC 12.2kbps
Conducted Spurious Emission	9262~ 9538	9262, 9400, 9538	QPSK	RMC 12.2kbps
Radiated Spurious Emission	9262~ 9538	9262, 9400, 9538	QPSK	RMC 12.2kbps
Equivalent Isotropically Radiated Power (EIRP)	9262~ 9538	9262, 9400, 9538	QPSK	All modes, per table 1.6.4

NOTE:

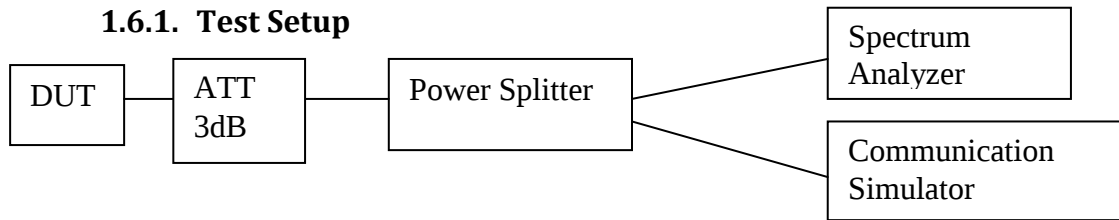
1. Pre-test was performed on Peak to Average Power ratio, occupied bandwidth, Band edge conducted spurious emission, Conducted spurious emission and RMC 12.2kbps was selected for final results reporting because it is the worst case.
2. Effective Isotropically Radiated power (EIRP) was calculated from the all modes of Conducted RF Output Power results.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
Conducted RF Output Power/ Equivalent Isotropically Radiated Power (EIRP)	25°C, 50% RH	3.7V DC	Maheshvaran
Peak-to-Average Power Ratio	25°C, 50% RH	3.7V DC	Maheshvaran
Occupied Bandwidth	25°C, 50% RH	3.7V DC	Maheshvaran
Frequency Stability	25°C, 50% RH	3.7V DC	Maheshvaran
Band Edge Conducted Spurious Emission	25°C, 50% RH	3.7V DC	Maheshvaran
Conducted Spurious Emission	25°C, 50% RH	3.7V DC	Maheshvaran
Radiated Spurious Emission	25°C, 63.7% RH	3.7V DC	Nazrin/Qawiman

1.6. Conducted RF Output Power

1.6.1. Test Setup



1. The DUT transmitter output port was connected to communication simulator with above setup.
2. Path loss for the measurement included.
3. Set DUT to transmit maximum power through communication simulator
4. All the measurement was done at low, mid, high channel for each band and different modulation.
5. Record the average power into the test report.

1.6.2. Test Limits

FCC: Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

ISED: Mobile stations and hand-held portables are limited to 2 watts maximum e.i.r.p. The equipment shall employ means to limit the power to the minimum necessary for successful communication.

1.6.3. Conducted RF Output Power – UMTS Band 2 (1850-1910MHz)

Conducted Output Power (dBm)				
	Test Mode	Conducted Output Power (dBm)		
		Low CH 9262	Mid CH 9400	High CH 9538
		1852.4MHz	1880MHz	1907.6MHz
RMC 12.2kbps	RMC 12.2Kbps Test Loop 1	23.934	24.051	23.721
HSDPA	Sub-test 1	22.911	23.056	22.463
	Sub-test 2	22.936	23.079	22.563
	Sub-test 3	22.426	22.572	22.099
	Sub-test 4	22.432	22.576	22.088
HSUPA	Sub-test 1	22.94	23.05	22.88
	Sub-test 2	21.08	21.16	20.94
	Sub-test 3	21.99	22.06	21.99
	Sub-test 4	20.92	21.02	21.09
	Sub-test 5	22.97	23.07	23.22

1.6.4. Equivalent Isotropically Radiated Power (EIRP)

EIRP (dBm)				
	Test Mode	Conducted Output Power (dBm)		
		Low CH	Mid CH	High CH
		9262	9400	9538
		1852.4MHz	1880MHz	1907.6MHz
RMC 12.2kbps	RMC 12.2Kbps Test Loop 1	25.524	25.641	25.311
HSDPA	Sub-test 1	24.501	24.646	24.053
	Sub-test 2	24.526	24.669	24.153
	Sub-test 3	24.016	24.162	23.689
	Sub-test 4	24.022	24.166	23.678
HSUPA	Sub-test 1	24.53	24.64	24.47
	Sub-test 2	22.67	22.75	22.53
	Sub-test 3	23.58	23.65	23.58
	Sub-test 4	22.51	22.61	22.68
	Sub-test 5	24.56	24.66	24.81

The maximum ERP/EIRP from the measured RF output power is given in Equation as follows:

$$\mathbf{EIRP = P_{Meas} + G_T}$$

$$\mathbf{ERP = EIRP - 2.15}$$

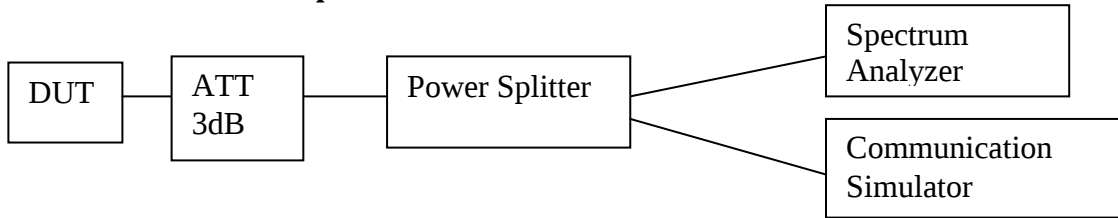
Where, ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively
 (Expressed in the same units as P_{Meas} , e.g., dBm)

P_{Meas} measured transmitter output power, in dBm

G_T gain of the transmitting antenna, in dBi (EIRP)

1.7. Peak-to-Average Power Ratio

1.7.1. Test Setup



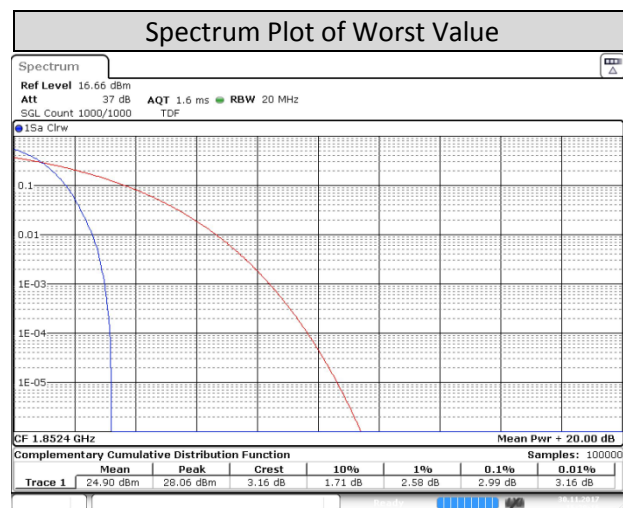
1. The DUT transmitter output port was connected to communication simulator with above setup.
2. Path loss for the measurement included.
3. Set DUT to transmit maximum power through communication simulator
4. Set the CCDF (Complementary Cumulative Distribution Function) option in the spectrum analyzer.
5. Spectrum Analyzer setting, RBW = 20MHz.
6. Recorded the maximum PAR level associated with a probability of 0.1% as Peak to Average Ratio.
7. All the measurement was done at low, mid, high channel for each band and different modulation.

1.7.2. Test Limit

In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

1.7.3. Peak-to-Average Power Ratio - UMTS Band 2 (1850-1910MHz)

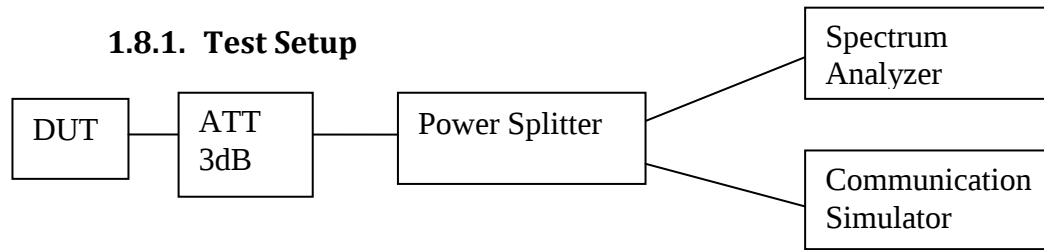
Mode	Channel Number	Tx Frequency (MHz)	Peak To Average (dB)
RMC-12.2kbps	Low CH 9262	1852.4 MHz	2.986
	Mid CH 9400	1880 MHz	2.87
	High CH 9538	1907.6 MHz	2.551



Date: 30 NOV. 2017 16:28:16

1.8. Occupied Bandwidth

1.8.1. Test Setup



- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) For UMTS measurement, set DUT to transmit maximum power through communication simulator.
- 4) Spectrum Analyzer setting, RBW is 1% of OBW and VBW is 3 times of RBW.
- 5) Measure & record -26dBc and 99% occupied bandwidth (BW).
- 6) All the measurement was done at low, mid, high channel for each band and different modulation.

1.8.2. Test Limit

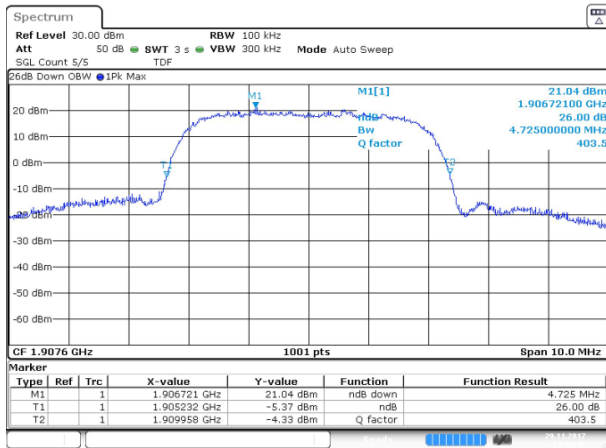
FCC: The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

ISED: Emission bandwidth is, for the purpose of this document, defined as the width of the signal between two points, one below the carrier frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 20 dB below the transmitter power (i.e. -20 dBc), when measured with a resolution bandwidth of approximately 1% of the occupied bandwidth. In lieu of the -20 dBc bandwidth, the occupied bandwidth may be used.

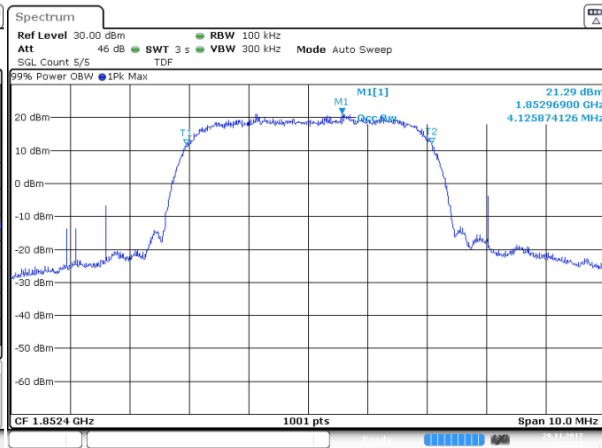
1.8.3. Occupied Bandwidth – UMTS Band 2 (1850-1910MHz)

Mode	Channel Number	Tx Frequency (MHz)	-26 dBc Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
RMC-12.2kbps	Low CH 9262	1852.4 MHz	4.705	4.126
	Mid CH 9400	1880 MHz	4.715	4.126
	High CH 9538	1907.6 MHz	4.725	4.126

Spectrum Plot of Worst Value	
-26 dBc Bandwidth	99% Occupied Bandwidth



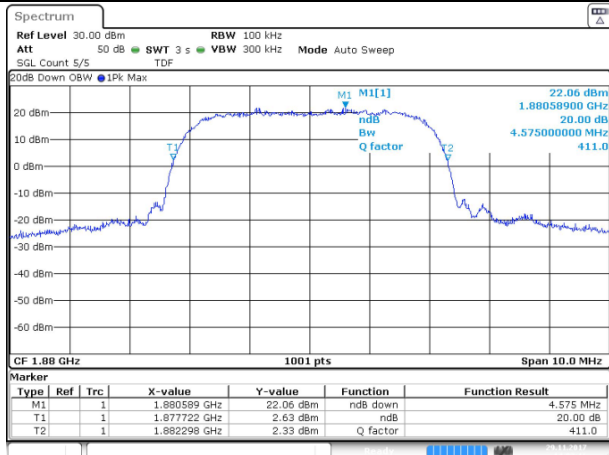
Date: 29 NOV 2017 14:03:47



Date: 29 NOV 2017 13:59:32

Mode	Channel Number	Tx Frequency (MHz)	-20 dBc Bandwidth (MHz)
RMC-12.2kbps	Low CH 9262	1852.4 MHz	4.565
	Mid CH 9400	1880 MHz	4.575
	High CH 9538	1907.6 MHz	4.565

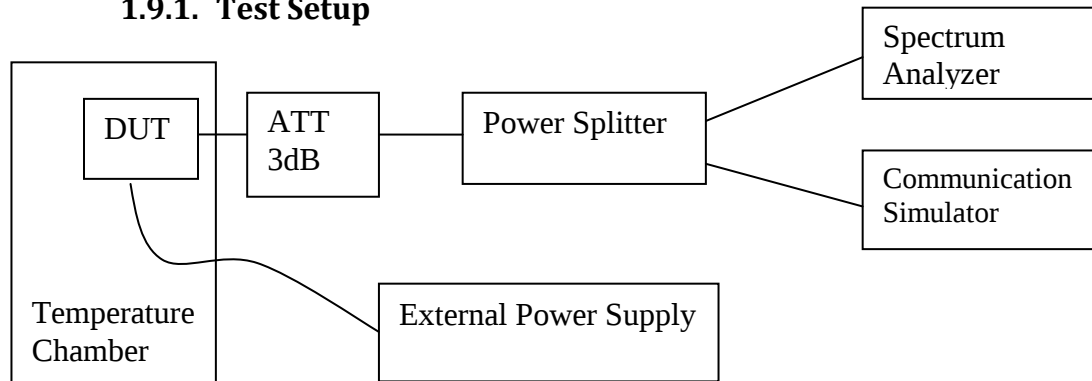
Spectrum Plot of Worst Value -20 dBc Bandwidth



Date: 29 NOV 2017 14:02:16

1.9. Frequency Stability

1.9.1. Test Setup



- 1) The DUT is placed in the temperature chamber and DUT is power up by external power supply to control the DC input voltage.
- 2) The temperature chamber could control the temperature and humidity and external power supply could control the test voltage range from minimum to maximum operating voltage.
- 3) Measured frequency error from the communication simulator by vary below step :
 - i. Vary temperature of the temperature chamber from -30 ~ 50 deg C (10 deg C / Step) and set external supply voltage constant at nominal voltage.
 - ii. Vary external supply voltage from minimum to maximum operation voltage support by DUT and set temperature chamber constant at room temp.
- 4) All the measurement was done at mid channel for each band.

1.9.2. Test Limit

FCC: The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

ISED: The carrier frequency shall not depart from the reference frequency, in excess of ± 2.5 ppm for mobile stations and ± 1.0 ppm for base stations.

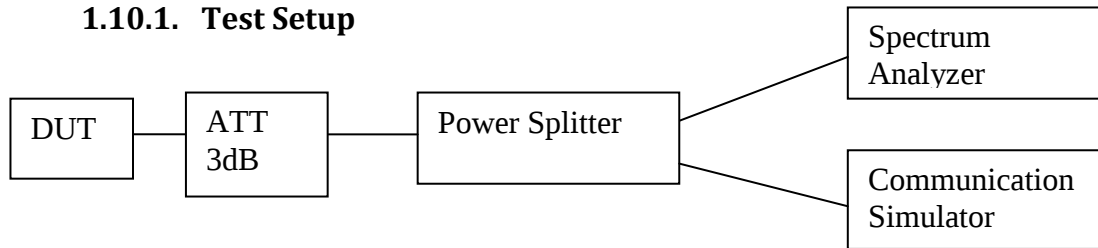
1.9.3. Frequency Stability – UMTS Band 2 (1850-1910MHz)

Band	Temp (Deg C)	Frequency Error VS Temperature			
		RMC-12.2kbps			
		Low Channel		High Channel	
		1852.4MHz		1907.6MHz	
UMTS Band 2		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	50	1852.400021	0.011514	1907.600011	0.005602
	40	1852.400019	0.010418	1907.600011	0.005774
	30	1852.400014	0.007595	1907.600012	0.006224
	20	1852.40001	0.005483	1907.600013	0.006914
	10	1852.400007	0.003676	1907.600017	0.0088
	0	1852.400005	0.002761	1907.600022	0.011672
	-10	1852.400004	0.002212	1907.600023	0.012197
	-20	1852.400009	0.004792	1907.600026	0.013584
	-30	1852.400015	0.008016	1907.600029	0.015024

Band	Voltage (V)	Frequency Error VS Voltage			
		RMC-12.2kbps			
		Low Channel		High Channel	
		1852.4MHz		1907.6MHz	
UMTS Band 2		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	4.35	1852.400012	0.006487	1907.600013	0.006637
	3.7	1852.400014	0.007294	1907.600013	0.007053
	3.2	1852.400015	0.007842	1907.600015	0.007671

1.10. Band Edge Conducted Spurious Emission

1.10.1. Test Setup

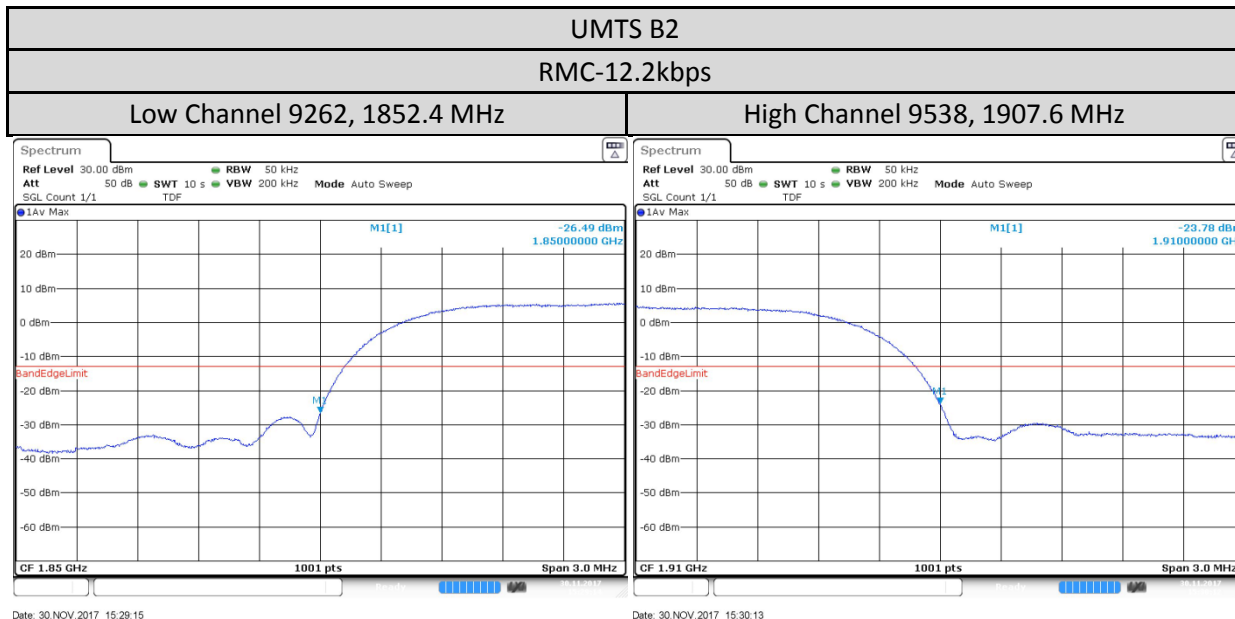


- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) Set DUT to transmit maximum power through communication simulator.
- 4) The band edges of lowest and highest channels with the highest RF powers were measured.
- 5) The center frequency of spectrum is the band edge frequency, span is 3MHz, RBW is 1~3% of EBW and VBW is at least 3 times of RBW.
- 6) Record the maximum trace plot into the test report.

1.10.2. Test Limit

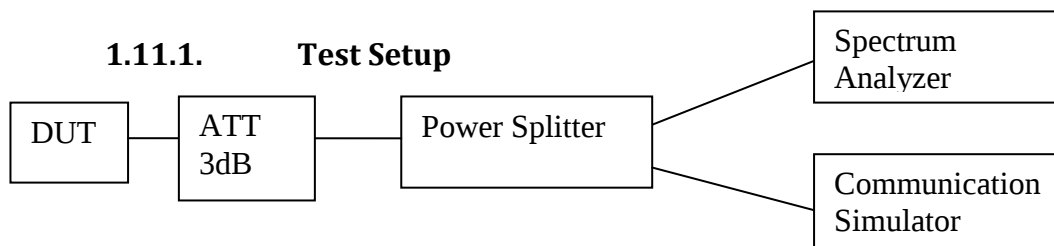
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB. In the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

1.10.3. Band Edge Conducted Spurious Emission – UMTS Band 2 (1850-1910MHz)



1.11. Conducted Spurious Emission

1.11.1. Test Setup

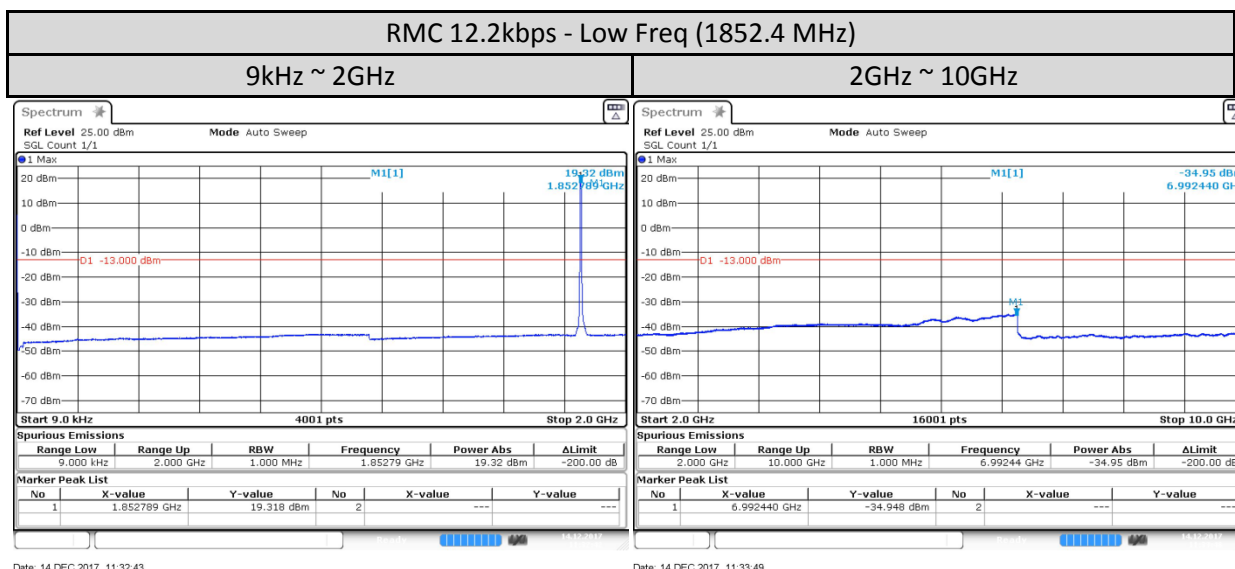


- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) Set DUT to transmit maximum power through communication simulator.
- 4) Spectrum Analyzer setting, RBW = 1 MHz, VBW = 3 MHz.
- 5) The spurious emission of lowest, middle and highest channels with the highest RF powers were measured.
- 6) Record the maximum trace plot into the test report.

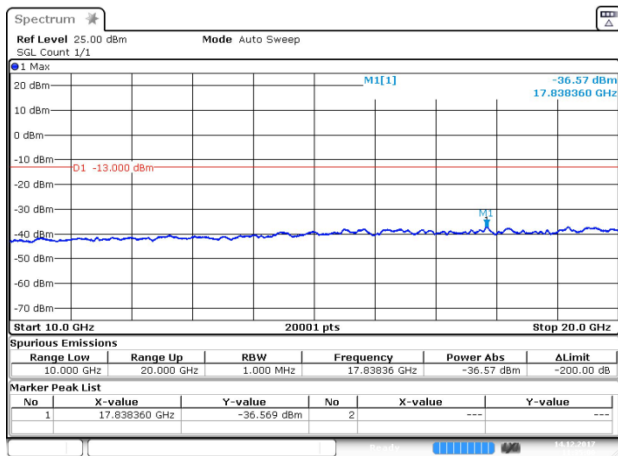
1.11.2. Test Limit

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB. The measurement instrumentation is employing a resolution bandwidth of 1 megahertz or greater.

1.11.3. Conducted Spurious Emissions - UMTS Band 2 (1850-1910MHz)



10GHz ~ 20GHz	
---------------	--

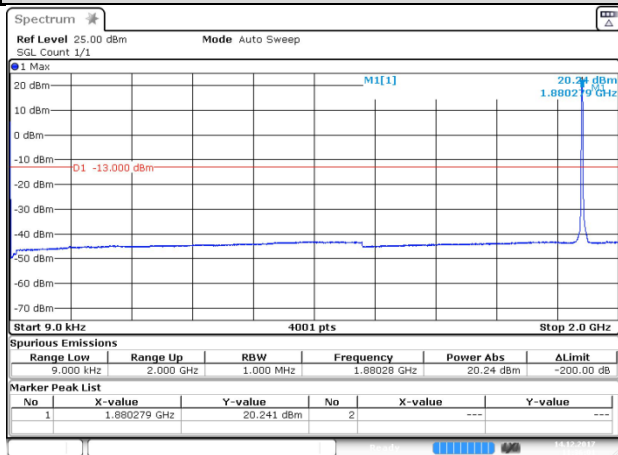


Date: 14 DEC 2017 11:35:00

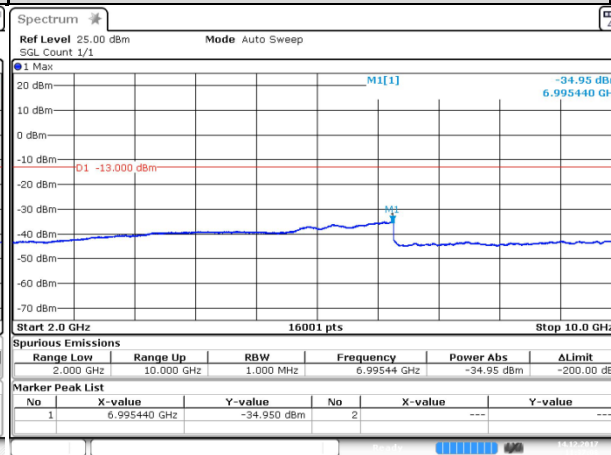
RMC 12.2kbps - Mid Freq (1880.0 MHz)

9kHz ~ 2GHz

2GHz ~ 10GHz

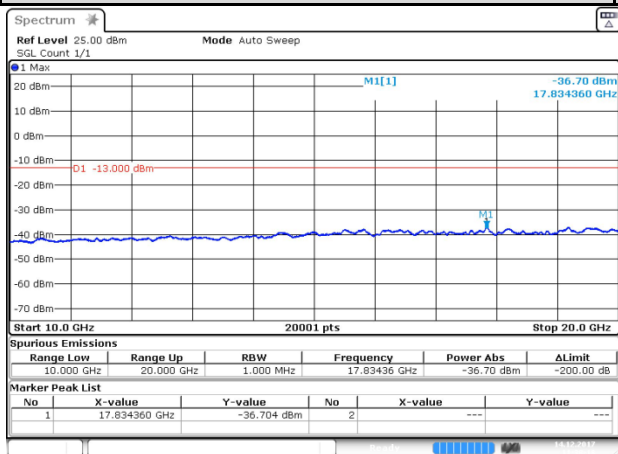


Date: 14 DEC 2017 11:36:01



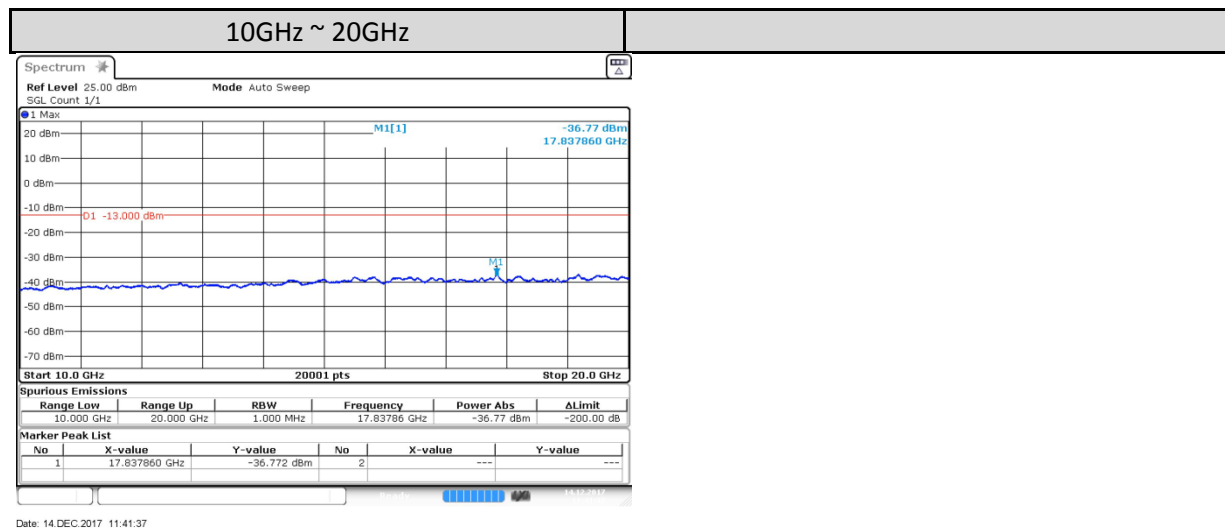
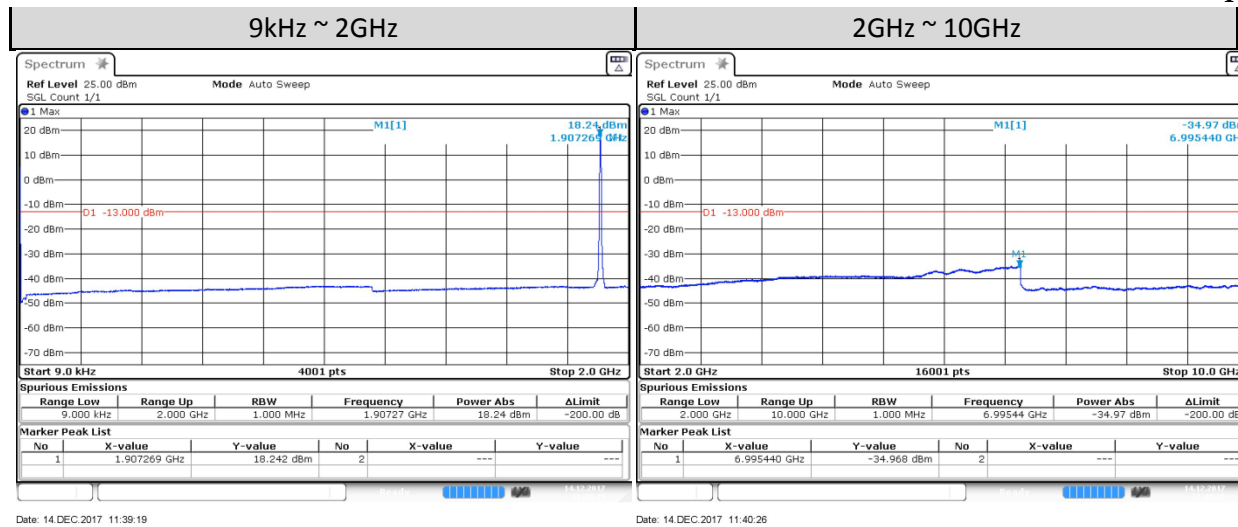
Date: 14 DEC 2017 11:37:08

10GHz ~ 20GHz



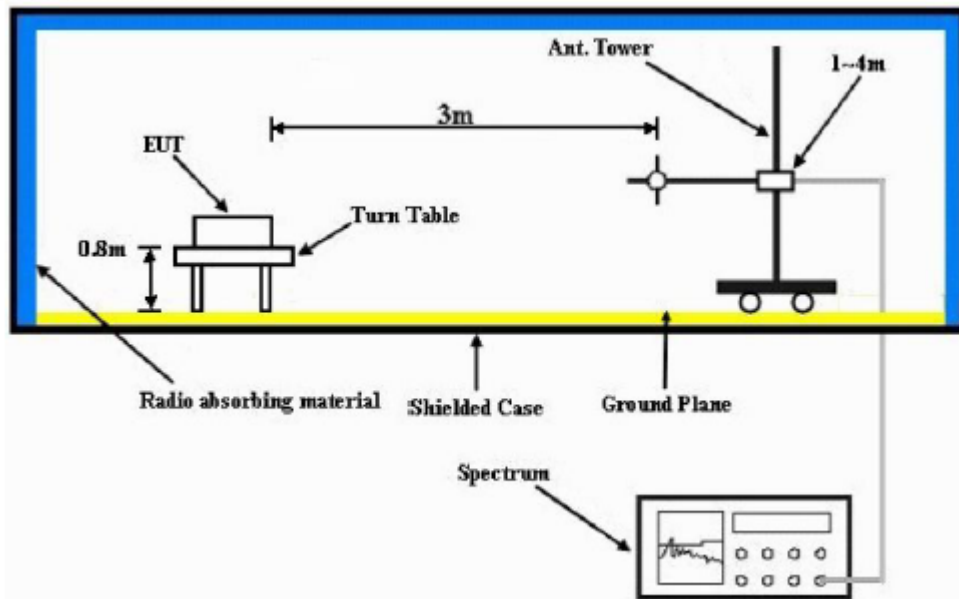
Date: 14 DEC 2017 11:38:19

RMC 12.2kbps - High Freq (1907.6 MHz)



1.12. Radiated Spurious Emission

1.12.1. Test Setup



- 1) The spectrum setting for scanning Radiated Emission below 1 GHz is RBW = 100 kHz, VBW = 300 kHz and above 1 GHz is RBW = 1MHz, VBW = 3MHz. Detector mode is positive peak.
- 2) In the semi-anechoic chamber, setup as illustrated above the EUT placed on the Turn Table at 0.8m height for below 1Ghz measurement and at 1.5m height for above 1GHz measurement, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- 3) The substitution antenna is substituted for EUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiation power. Record the power level of maximum radiation power from spectrum. So, the measured substitution value = Ref level of S.G + TX cables loss – Substituted Antenna Gain.
- 4) Final Radiated Spurious Emission = “Read Value” + Measured substitution value.

1.12.2. Test Limit

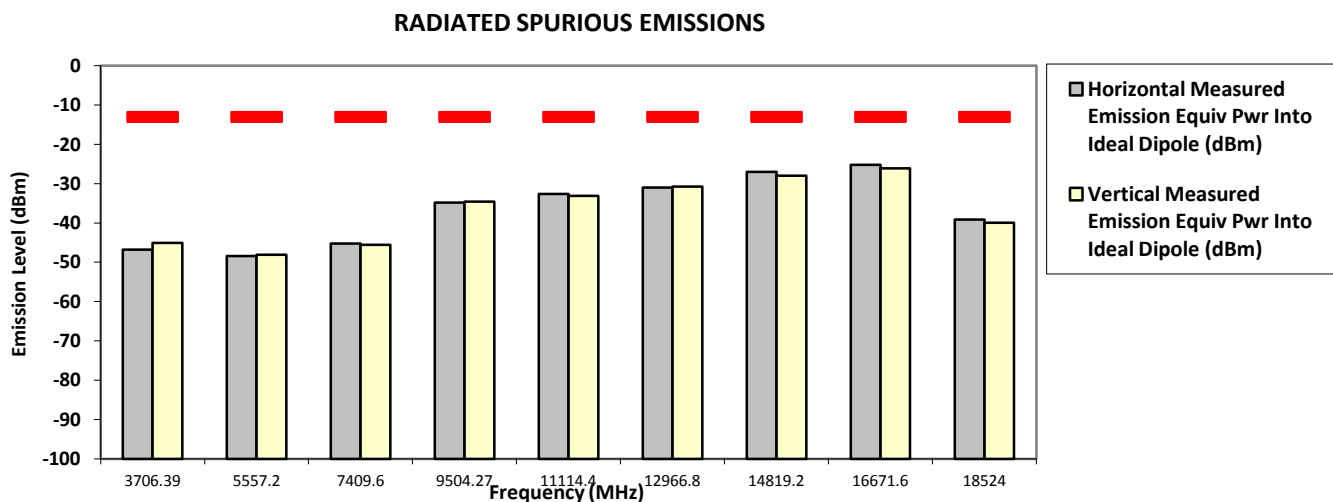
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB. The emission limit equal to -13dBm.

1.12.3. Radiated Spurious Emission – UMTS Band 2 (1850-1910MHz)

DC configuration: Link Mode 12V

Model Number: LEX L11n
Battery Part No: PMNN4546A
Link Mode Radiated Emission:
S/N: 790TTV0214
Accy Part No: 8397-PMLN7779A-2, 8397-PMLN7779A-5
Test Mode: TX WCDMA (UMTS B2)
Bandwidth 3.7MHz
0.317 Watt(s) /Max Power
SR:08397-EMC-00063
1852.400000 MHz (Low)

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
3706.3900	-13.0000	-46.7600 *	-45.1100 *
5557.2000	-13.0000	-48.4395 **	-48.0684 **
7409.6000	-13.0000	-45.2821 **	-45.5759 **
9504.2700	-13.0000	-34.7900 *	-34.5700 *
11114.4000	-13.0000	-32.6465 **	-33.1294 **
12966.8000	-13.0000	-30.9739 **	-30.7753 **
14819.2000	-13.0000	-27.0163 **	-28.0061 **
16671.6000	-13.0000	-25.1942 **	-26.0809 **
18524.0000	-13.0000	-39.1681 **	-39.9286 **



The data presented here was taken using the substitution method as found in the TIA/EIA-603E document.

Motorola Penang EMC Lab - Test Performed by: Nazrin&Qawiman

Sun, Dec 24, 2017

Industry Canada: 109AK

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported

Temp(Deg): 23.8 Hum(%RH): 71.2

System MU: 5.01 dB

Remarks:

Passed Results	Marginal Results	Failed Results
----------------	------------------	----------------

Link Mode Radiated Emission:

Model Number: LEX L11n

S/N: 790TTV0214

Battery Part No: PMNN4546A

Accy Part No: 8397-PMLN7779A-2, 8397-PMLN7779A-5

Test Mode: TX WCDMA (UMTS B2)

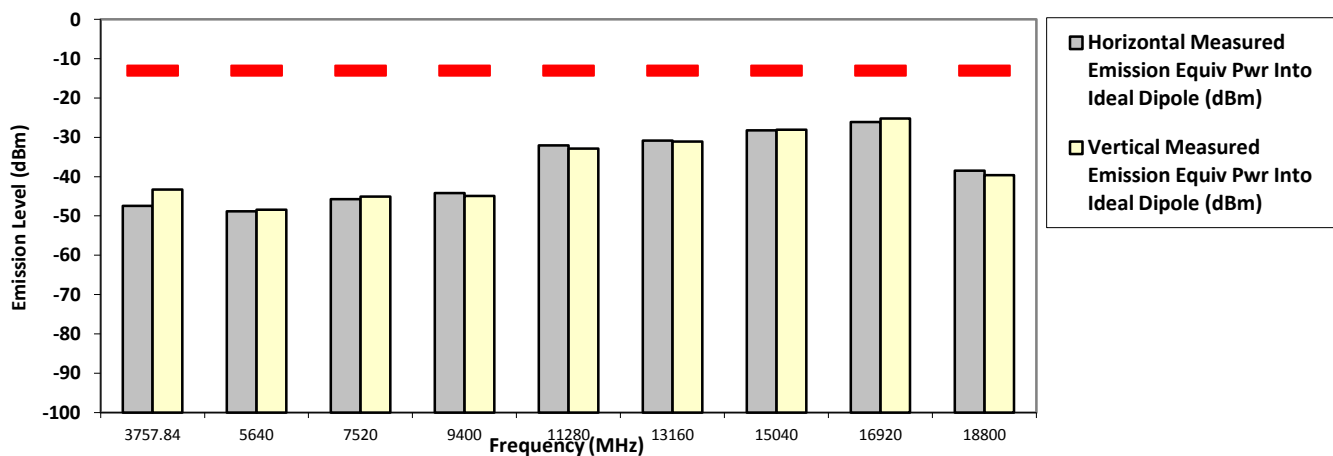
1880.000000 MHz (Mid)

Bandwidth 3.7MHz

0.317 Watt(s) /Max Power

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
3757.8400	-13.0000	-47.4200 *	-43.2900 *
5640.0000	-13.0000	-48.8111 **	-48.3955 **
7520.0000	-13.0000	-45.7070 **	-45.0607 **
9400.0000	-13.0000	-44.1847 **	-44.9171 **
11280.0000	-13.0000	-32.0558 **	-32.8726 **
13160.0000	-13.0000	-30.8190 **	-31.0409 **
15040.0000	-13.0000	-28.2429 **	-28.0584 **
16920.0000	-13.0000	-26.0752 **	-25.2456 **
18800.0000	-13.0000	-38.4977 **	-39.6331 **

RADIATED SPURIOUS EMISSIONS



The data presented here was taken using the substitution method as found in the TIA/EIA-603E document.

Motorola Penang EMC Lab - Test Performed by: Nazrin&Qawiman

Sun, Dec 24, 2017

Industry Canada: 109AK

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported
 Temp(Deg): 23.8 Hum(%RH): 71.2

System MU: 5.01 dB

Remarks:

Passed Results	Marginal Results	Failed Results
----------------	------------------	----------------

Link Mode Radiated Emission:

Model Number: LEX L11n

Battery Part No: PMNN4546A

S/N: 790TTV0214

Accy Part No: 8397-PMLN7779A-2, 8397-PMLN7779A-5

Test Mode: TX WCDMA (UMTS B2)

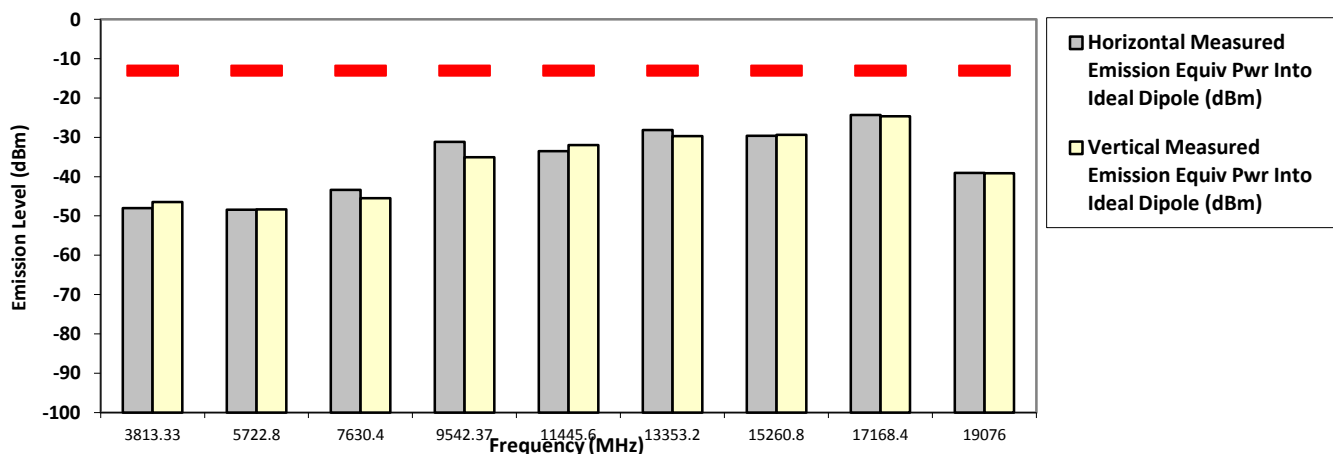
Bandwidth 3.7MHz

0.317 Watt(s) /Max Power

1907.600000 MHz (High)

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
3813.3300	-13.0000	-48.0300 *	-46.4300 *
5722.8000	-13.0000	-48.3896 **	-48.3396 **
7630.4000	-13.0000	-43.3333 **	-45.4620 **
9542.3700	-13.0000	-31.1800	-35.0400 *
11445.6000	-13.0000	-33.5515 **	-32.0125 **
13353.2000	-13.0000	-28.1423 **	-29.6842 **
15260.8000	-13.0000	-29.6301 **	-29.3379 **
17168.4000	-13.0000	-24.2911 **	-24.6443 **
19076.0000	-13.0000	-39.0258 **	-39.1362 **

RADIATED SPURIOUS EMISSIONS



The data presented here was taken using the substitution method as found in the TIA/EIA-603E document.

Motorola Penang EMC Lab - Test Performed by: Nazrin&Qawiman

Sun, Dec 24, 2017

Industry Canada: 109AK

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported
 Temp(Deg): 23.8 Hum(%RH): 71.2

System MU: 5.01 dB

Remarks:

Passed Results

Marginal Results

Failed Results

DC configuration: Link Mode 24V

Link Mode Radiated Emission:

Model Number: LEX L11n

Battery Part No: PMNN4546A

S/N: 790TTV0214

Accy Part No: 8397-PMLN7779A-2, 8397-PMLN7779A-5

Test Mode: TX WCDMA (UMTS B2)

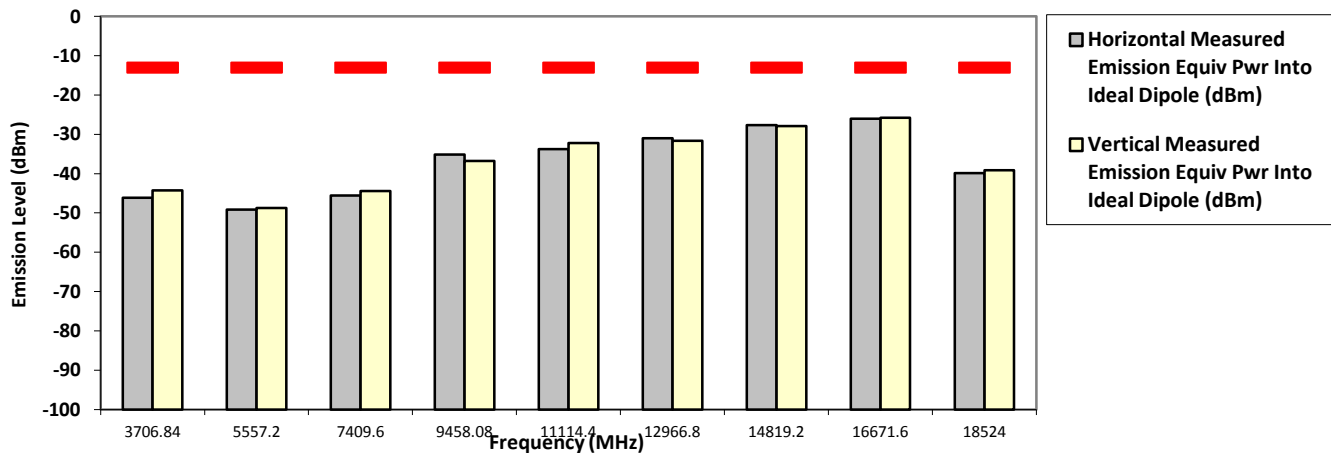
Bandwidth 3.7MHz

1852.400000 MHz (Low)

0.317 Watt(s) /Max Power

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
3706.8400	-13.0000	-46.1400 *	-44.2700 *
5557.2000	-13.0000	-49.1362 **	-48.7158 **
7409.6000	-13.0000	-45.5444 **	-44.4280 **
9458.0800	-13.0000	-35.1300 *	-36.7400 *
11114.4000	-13.0000	-33.7414 **	-32.1899 **
12966.8000	-13.0000	-31.0367 **	-31.6207 **
14819.2000	-13.0000	-27.6850 **	-27.8650 **
16671.6000	-13.0000	-26.0132 **	-25.7571 **
18524.0000	-13.0000	-39.8570 **	-39.1014 **

RADIATED SPURIOUS EMISSIONS



The data presented here was taken using the substitution method as found in the TIA/EIA-603E document.

Motorola Penang EMC Lab - Test Performed by: Nazrin&Qawiman

Sun, Dec 24, 2017

Industry Canada: 109AK

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported
Temp(Deg): 23.8 Hum(%RH): 71.2

System MU: 5.01 dB

Remarks:

Passed Results	Marginal Results	Failed Results
----------------	------------------	----------------

Link Mode Radiated Emission:

Model Number: LEX L11n

S/N: 790TTV0214

SR:08397-EMC-00063

Battery Part No: PMNN4546A

Accy Part No: 8397-PMLN7779A-2, 8397-PMLN7779A-5

Test Mode: TX WCDMA (UMTS B2)

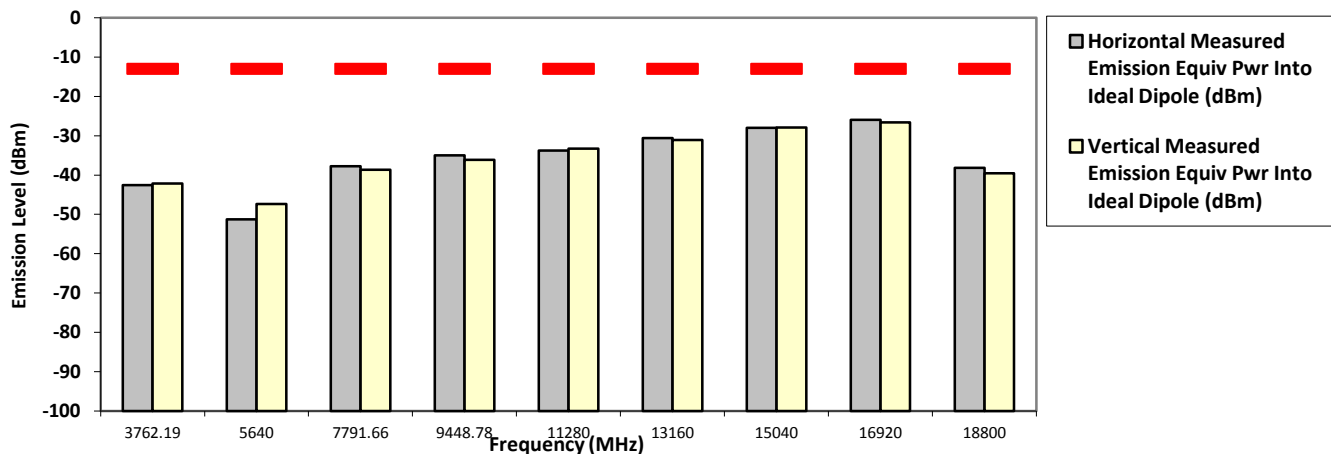
1880.000000 MHz (Mid)

Bandwidth 3.7MHz

0.317 Watt(s) /Max Power

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
3762.1900	-13.0000	-42.5900 *	-42.1900 *
5640.0000	-13.0000	-51.2957 **	-47.3329 **
7791.6600	-13.0000	-37.7300 *	-38.6700 *
9448.7800	-13.0000	-34.9600 *	-36.1300 *
11280.0000	-13.0000	-33.7760 **	-33.2940 **
13160.0000	-13.0000	-30.6149 **	-31.1084 **
15040.0000	-13.0000	-28.0099 **	-27.9301 **
16920.0000	-13.0000	-25.9765 **	-26.5855 **
18800.0000	-13.0000	-38.1398 **	-39.5773 **

RADIATED SPURIOUS EMISSIONS



The data presented here was taken using the substitution method as found in the TIA/EIA-603E document.

Motorola Penang EMC Lab - Test Performed by: Nazrin&Qawiman

Sun, Dec 24, 2017

Industry Canada: 109AK

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported
 Temp(Deg): 23.8 Hum(%RH): 71.2

System MU: 5.01 dB

Remarks:

Passed Results	Marginal Results	Failed Results
----------------	------------------	----------------

Model Number: LEX L11n
 Battery Part No: PMNN4546A

Link Mode Radiated Emission:
 S/N: 790TTV0214
 Accy Part No: 8397-PMLN7779A-2, 8397-PMLN7779A-5
 Test Mode: TX WCDMA (UMTS B2)

SR:08397-EMC-00063

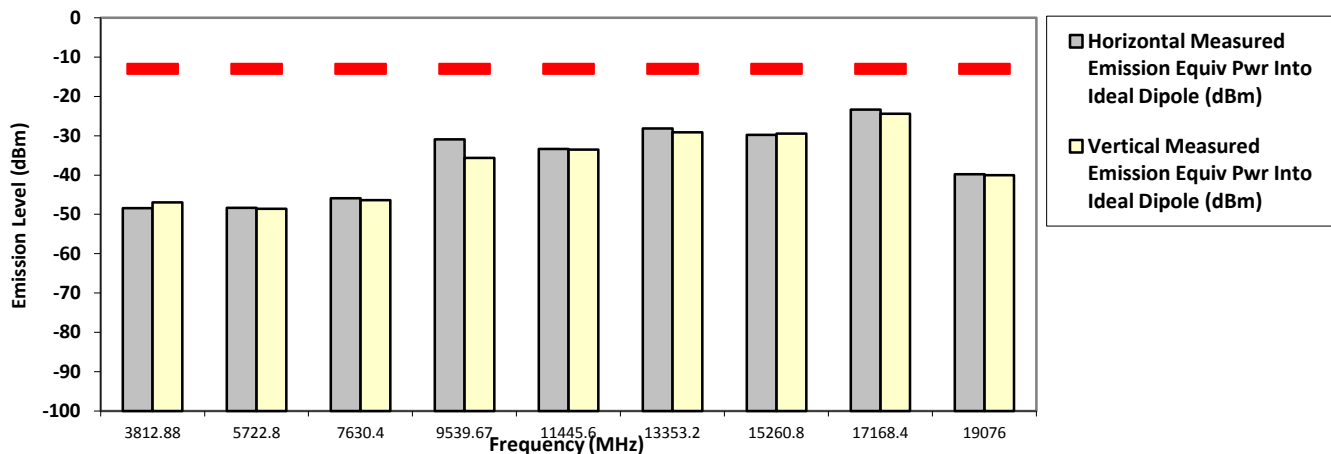
1907.600000 MHz (High)

Bandwidth 3.7MHz

0.317 Watt(s) /Max Power

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
3812.8800	-13.0000	-48.4000 *	-46.9800 *
5722.8000	-13.0000	-48.3587 **	-48.6122 **
7630.4000	-13.0000	-45.8787 **	-46.3670 **
9539.6700	-13.0000	-30.9100	-35.6100 *
11445.6000	-13.0000	-33.3404 **	-33.4926 **
13353.2000	-13.0000	-28.1159 **	-29.1005 **
15260.8000	-13.0000	-29.7987 **	-29.4621 **
17168.4000	-13.0000	-23.3731 **	-24.4386 **
19076.0000	-13.0000	-39.8033 **	-39.9956 **

RADIATED SPURIOUS EMISSIONS



The data presented here was taken using the substitution method as found in the TIA/EIA-603E document.

Motorola Penang EMC Lab - Test Performed by: Nazrin&Qawiman

Sun, Dec 24, 2017

Industry Canada: 109AK

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported

Temp(Deg): 23.8 Hum(%RH): 71.2

System MU: 5.01 dB

Remarks:

Passed Results	Marginal Results	Failed Results
----------------	------------------	----------------

--Test Report End--