

 MOTOROLA SOLUTIONS	 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																						
<table><tr><td>Date/s Tested</td><td>: 20-Nov-2017 - 7-Feb-2018</td></tr><tr><td>Manufacturer/Location</td><td>: Motorola Solutions – Penang</td></tr><tr><td>Requestor</td><td>: RONI KOZIEL</td></tr><tr><td>Product Type</td><td>: LEX L11 Mission Critical LTE Device</td></tr><tr><td>Model Number</td><td>: LEX L11n</td></tr><tr><td>Frequency Band</td><td>: Refer to section 1.4</td></tr><tr><td>Applicant Name</td><td>: Motorola Solutions, Inc</td></tr><tr><td>Applicant Address</td><td>: 8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322</td></tr><tr><td>FCC Registrations</td><td>: 461337</td></tr><tr><td>IC Registrations</td><td>: 109AK</td></tr></table> The equipment was tested accordance to the requirement listed below: <table><tr><td>(GSM 1900) FCC 47 CFR Part 2 / 24 ISED RSS GEN Issue 4, November 2014 ISED RSS 133 Issue 6, January 2018</td><td>PASS</td></tr></table>		Date/s Tested	: 20-Nov-2017 - 7-Feb-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	(GSM 1900) FCC 47 CFR Part 2 / 24 ISED RSS GEN Issue 4, November 2014 ISED RSS 133 Issue 6, January 2018	PASS
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Prepared By:  Maheshvaran Rajagopal Technician	Approved By:  Goh Aik Hong Responsible Engineer																						

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REVISION HISTORY

Revision History	Description	Date	Originator
Rev A.	Initial Report	7-February-2018	Maheshvaran Rajagopal
Rev B.	i. Applicant name and address has been added. ii. The battery model number has been revised. iii. AC adapter accessories devices information has been added.	30-May-2018	Maheshvaran Rajagopal

	iv. The Test report number of page format is corrected.		
	v. RSSs version standard have been added to the cover page.		
	vi. 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	Expended 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 Spurious Emission (EMC Chamber 1)				
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	GSM 1900, EDGE1900		
Modulation Type	GMSK, 8PSK		
Operating Frequency	GSM 1900 EDGE 1900	Channel Bandwidth 200kHz	1850.2MHz~1909.8MHz
Max. EIRP Power	GSM 1900	31.687 dBm (1.475W)	
	EDGE 1900	27.102 dBm (0.513W)	
Antenna Type	GSM 1900	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	-
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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
GSM 1900	200kHz	512 ~ 810	512	661	810	1850.2	1880	1909.8

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 GSM 1900.

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:

GSM 1900

Test Item	Available Channel	Tested Channel	Modulation	Mode
Conducted RF Output Power	512~ 810	512, 661, 810	GMSK, 8PSK	All Modes, per table 1.6.3
Peak to Average Power Ratio	512~ 810	512, 661, 810	GMSK, 8PSK	GSM uplink 1 slot, EDGE MCS-9 uplink 1 slot
Occupied Bandwidth	512~ 810	512, 661, 810	GMSK, 8PSK	GSM uplink 1 slot, EDGE MCS-9 uplink 1 slot
Frequency Stability	512~ 810	512,810	GMSK, 8PSK	GSM uplink 1 slot, EDGE MCS-9 uplink 1 slot
Band Edge Conducted Spurious Emission	512~ 810	512, 810	GMSK, 8PSK	GSM uplink 1 slot, EDGE MCS-9 uplink 1 slot
Conducted Spurious Emission	512~ 810	512, 661, 810	GMSK, 8PSK	GSM uplink 1 slot, EDGE MCS-9 uplink 1 slot
Radiated Spurious Emission	512~ 810	512, 661, 810	GMSK	GSM uplink 1 slot
Equivalent Isotropically Radiated Power (EIRP)	512~ 810	512, 661, 810	GMSK, 8PSK	All Modes, per table 1.6.4

NOTE:

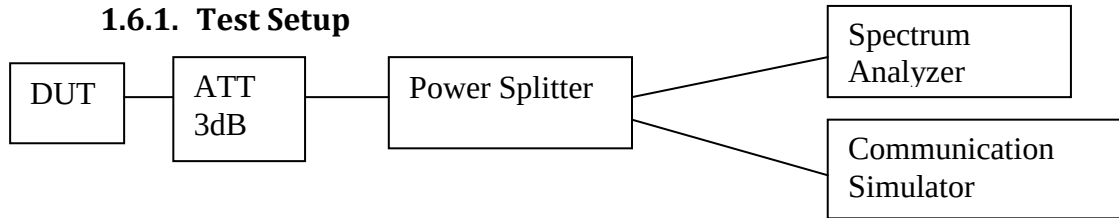
- The Peak to average ratio, occupied bandwidth, frequency stability, band edge conducted spurious emission, and conducted spurious emission was performed under GSM uplink 1 slot and Edge MSC-9 uplink 1 slot because this is worst case value (highest power) found in 2 different modulations. The Radiated emission was performed under GSM uplink 1 slot only because of this is the worst case scenario (highest power) among different modulation. The Equivalent Isotropically Radiated Power (EIRP) was calculated 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 – GSM 1900 (1850 – 1910MHz)

Conducted Output Power (dBm)				
	Test Mode	Conducted Output Power (dBm)		
		Low CH 512	Mid CH 661	High CH 810
		1850.2 MHz	1880 MHz	1909.8 MHz
GSM	Uplink 1 slot	30.097	30.065	29.363
GPRS, CS4	Multislot class 8, uplink 1 slot	30.072	30.037	29.34
	Multislot class 10, uplink 2 slot	27.722	28.028	27.732
EDGE MCS-9 (8-PSK)	Multislot class 8, uplink 1 slot	25.157	25.512	25.419
	Multislot class 10, uplink 2 slot	23.528	23.759	23.803

1.6.4. Equivalent Isotropically Radiated Power (EIRP)

EIRP (dBm)				
	Test Mode	Conducted Output Power (dBm)		
		Low CH	Mid CH	High CH
		512	661	810
		1850.2 MHz	1880 MHz	1909.8 MHz
GSM	Uplink 1 slot	31.687	31.655	30.953
GPRS, CS4	Multislot class 8, uplink 1 slot	31.662	31.627	30.930
	Multislot class 10, uplink 2 slot	29.312	29.618	29.322
EDGE MCS-9 (8-PSK)	Multislot class 8, uplink 1 slot	26.747	27.102	27.009
	Multislot class 10, uplink 2 slot	25.118	25.349	25.393

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

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

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

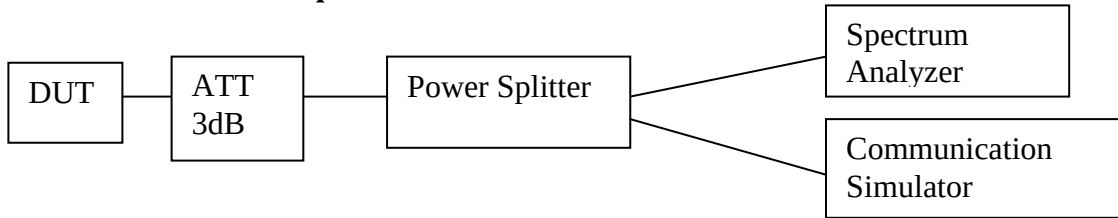
Where, ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively
 (Expressed in the same units as P_{Meas}, e.g., dBm)

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



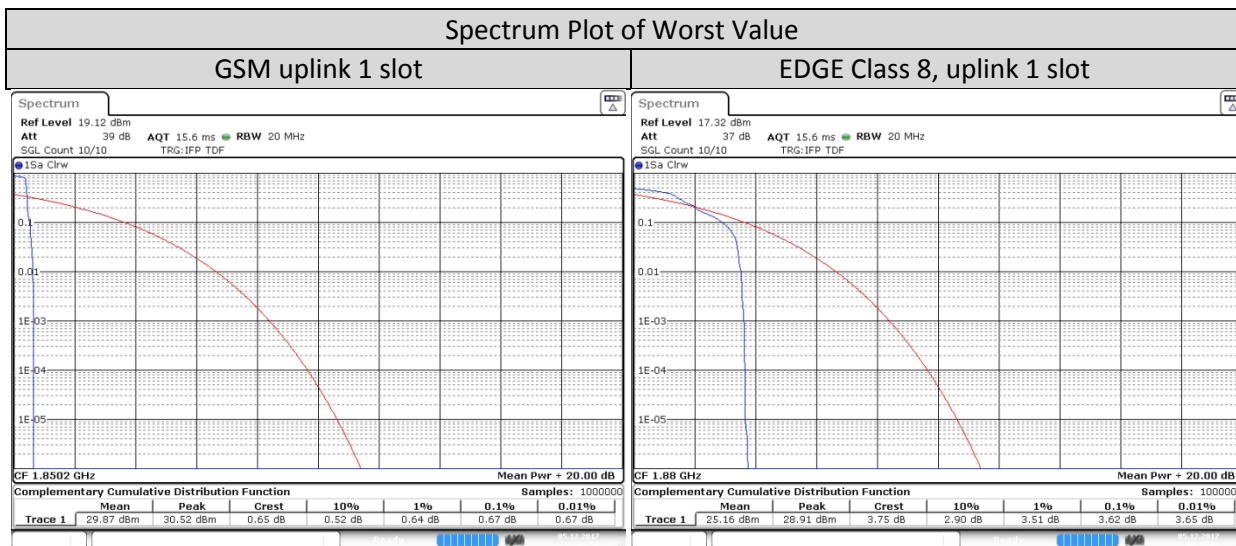
1. The DUT transmitter output port was connected to communication simulator with above setup.
2. Path loss for the measurement included.
3. Set DUT to transmit maximum power through communication simulator
4. Set the CCDF (Complementary Cumulative Distribution Function) option in the spectrum analyzer.
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 - GSM 1900 (1850 - 1910MHz)

GSM Band	Channel Number	Tx Frequency (MHz)	Peak To Average (dB)	
			GSM uplink 1 slot	EDGE Class 8 uplink 1 slot
GSM1900	Low CH 512	1850.2 MHz	0.667	3.536
	Mid CH 661	1880 MHz	0.493	3.623
	High CH 810	1909.8 MHz	0.493	3.623

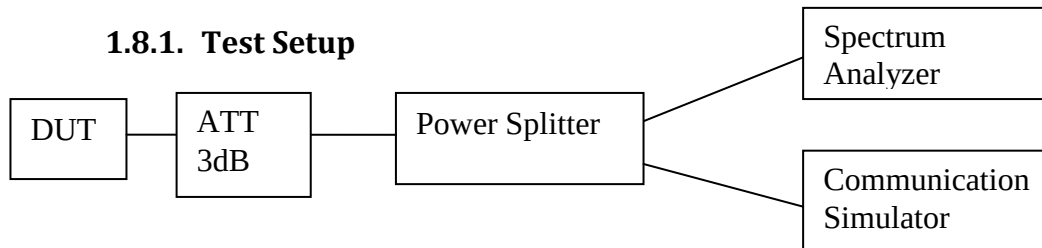


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1.8. Occupied Bandwidth

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 GSM 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

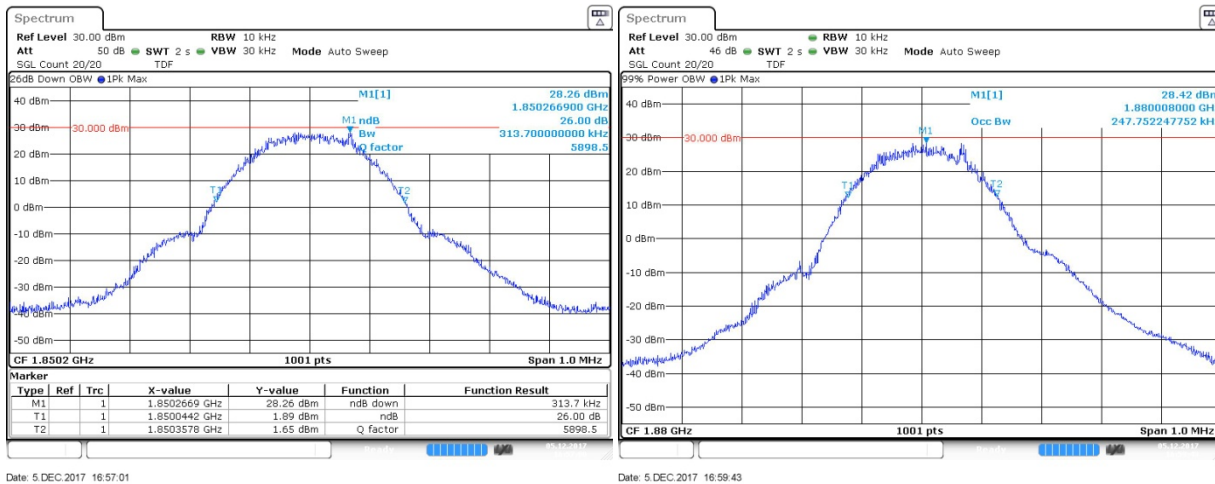
FCC: The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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 - GSM 1900 (1850 - 1910MHz)

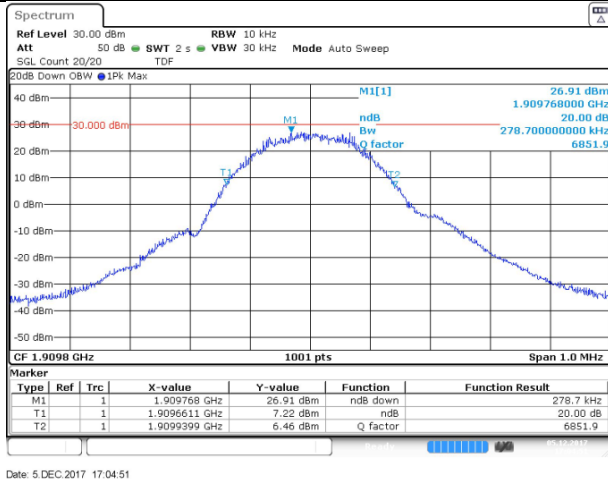
Mode	Channel Number	Tx Frequency (MHz)	-26 dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
GSM uplink 1 slot	Low CH 512	1850.2 MHz	313.7	243.756
	Mid CH 661	1880 MHz	311.7	247.752
	High CH 810	1909.8 MHz	309.7	246.753

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



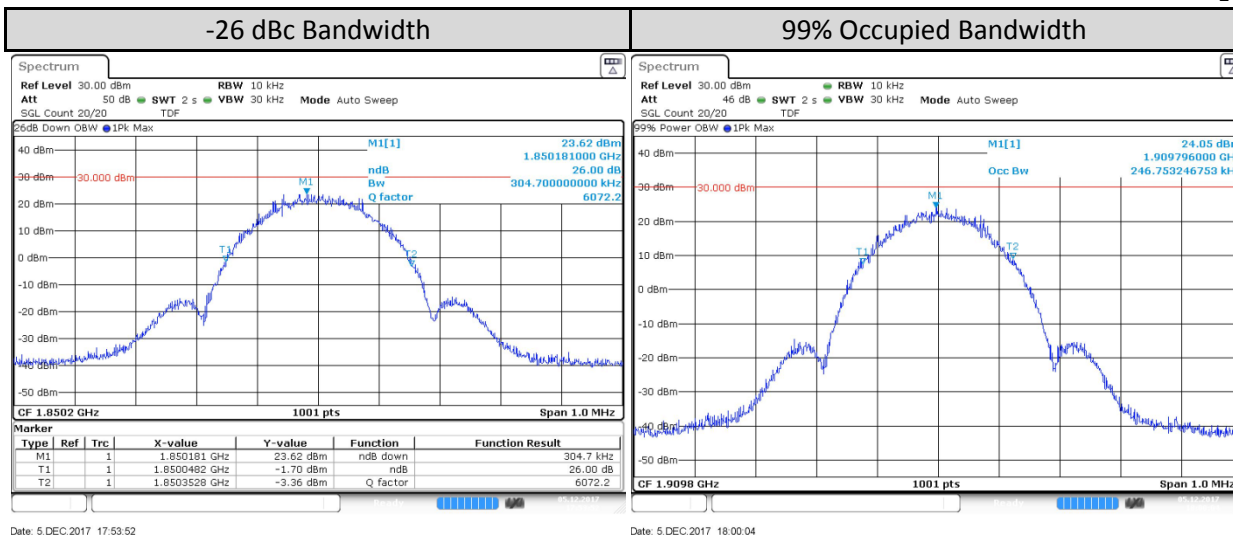
Mode	Channel Number	Tx Frequency (MHz)	-20 dBc Bandwidth (kHz)
GSM uplink 1 slot	Low CH 512	1850.2 MHz	272.7
	Mid CH 661	1880 MHz	276.7
	High CH 810	1909.8 MHz	278.7

Spectrum Plot of Worst Value
 -20 dBc Bandwidth



Mode	Channel Number	Tx Frequency (MHz)	-26 dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
EDGE Class 8 uplink 1 slot	Low CH 512	1850.2 MHz	304.7	244.755
	Mid CH 661	1880 MHz	303.7	243.756
	High CH 810	1909.8 MHz	300.7	246.753

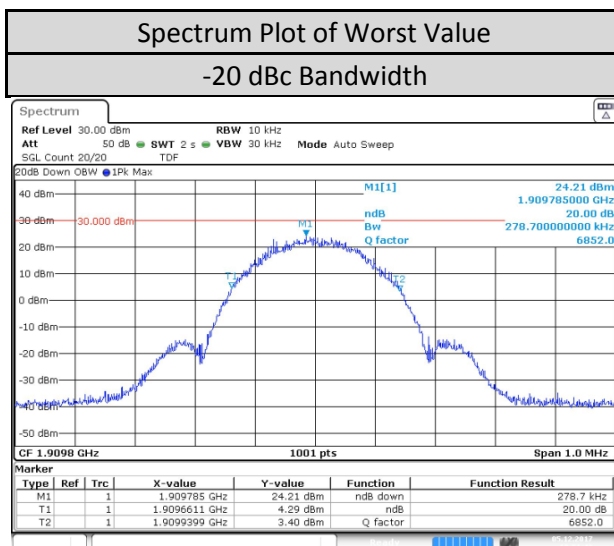
Spectrum Plot of Worst Value



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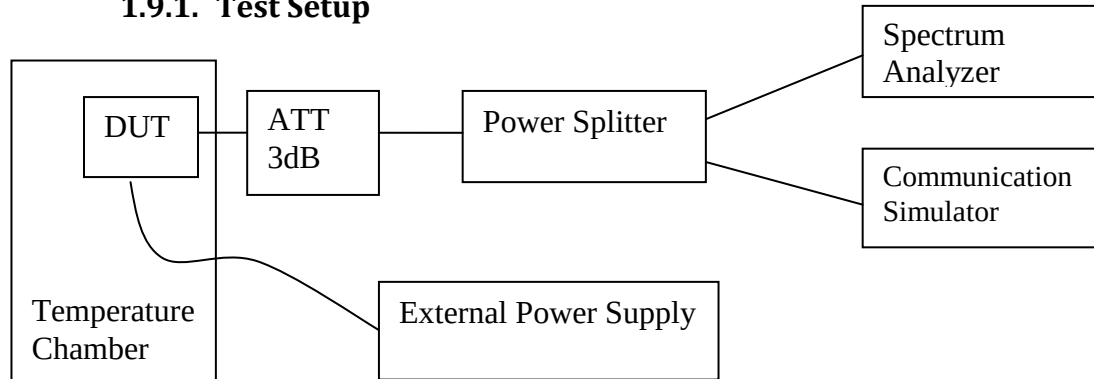
Mode	Channel Number	Tx Frequency (MHz)	-20 dBc Bandwidth (kHz)
EDGE Class 8 uplink 1 slot	Low CH 512	1850.2 MHz	270.7
	Mid CH 661	1880 MHz	276.7
	High CH 810	1909.8 MHz	278.7



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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 – GSM 1900 (1850 – 1910MHz)

Band	Temp (Deg C)	Frequency Error VS Temperature			
		GSM uplink 1 slot			
		Low Channel		High Channel	
		1850.2MHz		1909.8MHz	
GSM 1900		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	50	1850.20002	0.01061	1909.800014	0.007405
	40	1850.200022	0.011761	1909.800018	0.009213
	30	1850.200015	0.008132	1909.800017	0.009044
	20	1850.200014	0.007312	1909.800014	0.007303
	10	1850.200018	0.009824	1909.800018	0.009349
	0	1850.200021	0.011499	1909.800016	0.008334
	-10	1850.200016	0.008917	1909.800026	0.01344
	-20	1850.200023	0.012337	1909.800023	0.012037
	-30	1850.200027	0.014431	1909.80003	0.015925

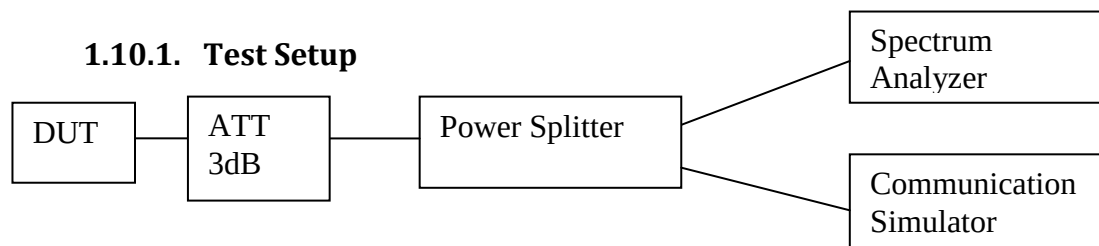
Band	Voltage (V)	Frequency Error VS Voltage			
		GSM uplink 1 slot			
		Low Channel		High Channel	
		1850.2MHz		1909.8MHz	
GSM 1900		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	4.35	1850.200023	0.012389	1909.800016	0.008453
	3.7	1850.200022	0.011657	1909.80002	0.01038
	3.2	1850.200023	0.012163	1909.800018	0.009433

Band	Temp (Deg C)	Frequency Error VS Temperature			
		EDGE Class 8 uplink 1 slot			
		Low Channel		High Channel	
		1850.2MHz		1909.8MHz	
GSM 1900		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	50	1850.200017	0.009283	1909.800014	0.00732
	40	1850.200029	0.01581	1909.800016	0.00847
	30	1850.200029	0.015513	1909.800027	0.014116
	20	1850.200033	0.018026	1909.800029	0.015367
	10	1850.200035	0.018759	1909.800028	0.014894
	0	1850.200019	0.010191	1909.800022	0.011411
	-10	1850.200027	0.014571	1909.800026	0.013389
	-20	1850.200027	0.014658	1909.800018	0.009518
	-30	1850.200035	0.018741	1909.800025	0.013203

Band	Voltage (V)	Frequency Error VS Voltage			
		EDGE Class 8 uplink 1 slot			
		Low Channel		High Channel	
		1850.2MHz		1909.8MHz	
GSM 1900		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	4.35	1850.200039	0.020888	1909.800029	0.01508
	3.7	1850.20003	0.01642	1909.800029	0.015215
	3.2	1850.200031	0.017014	1909.800025	0.012916

1.10. Band Edge Conducted Spurious Emission

1.10.1. Test Setup

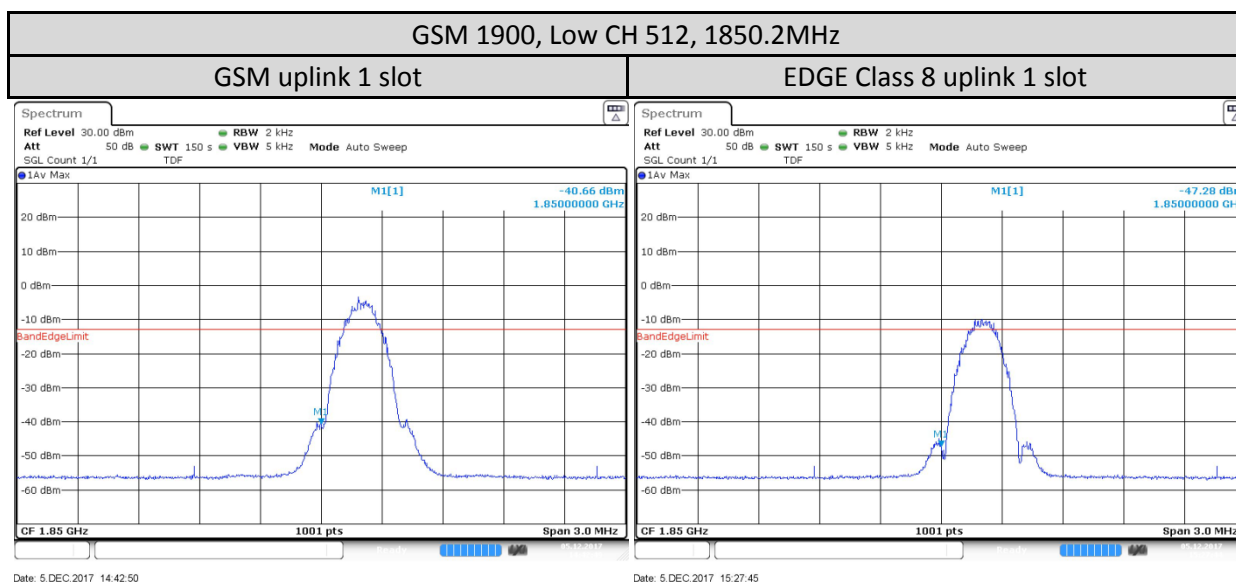


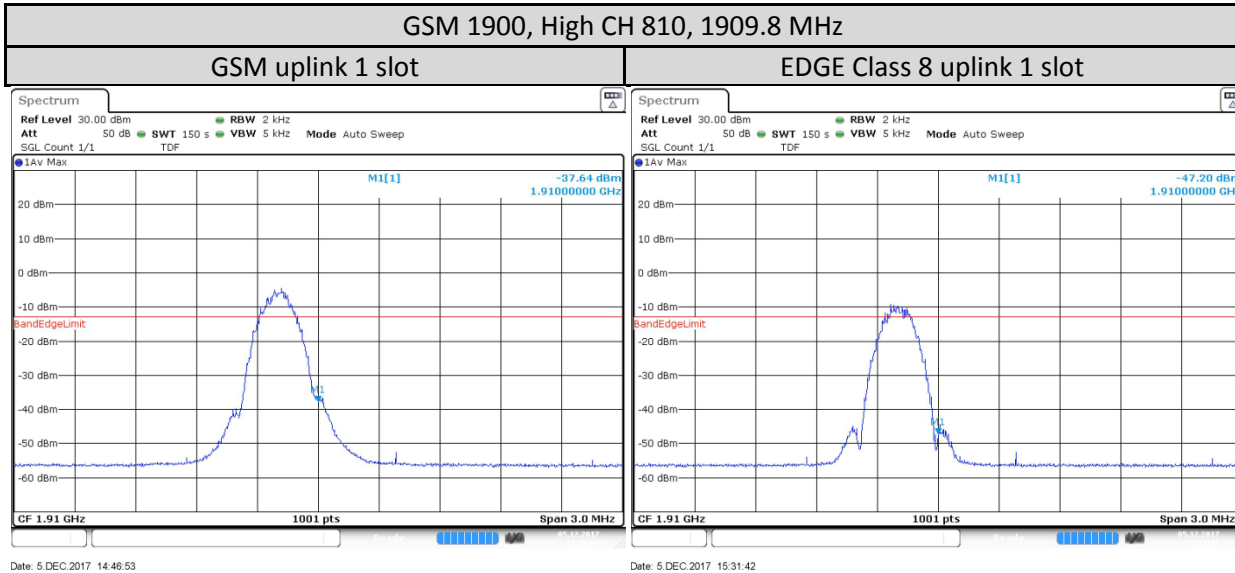
- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) Set DUT to transmit maximum power through communication simulator.
- 4) The band edges of lowest and highest channels with the highest RF powers were measured.
- 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.

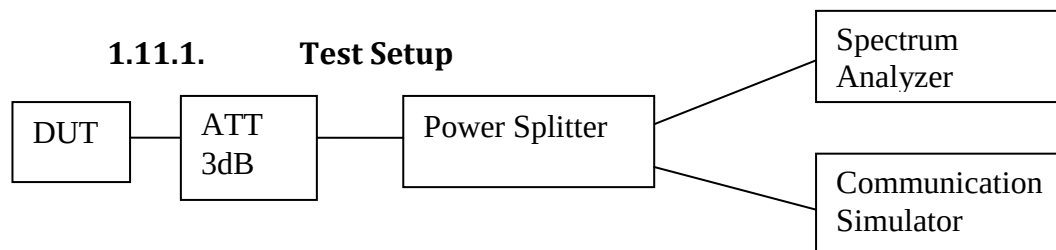
1.10.3. Band Edge Conducted Spurious Emission – GSM 1900 (1850 – 1910MHz)





1.11. Conducted Spurious Emission

1.11.1. Test Setup

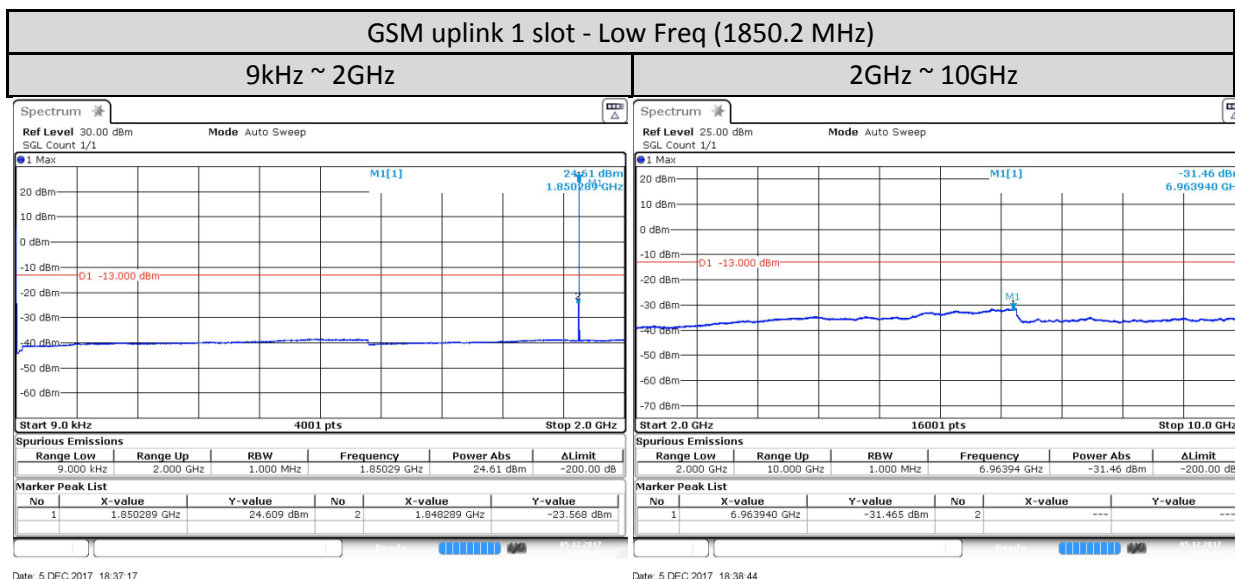


- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) Set DUT to transmit maximum power through communication simulator.
- 4) Spectrum Analyzer setting, RBW = 1 MHz, VBW = 3 MHz.
- 5) The spurious emission of 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

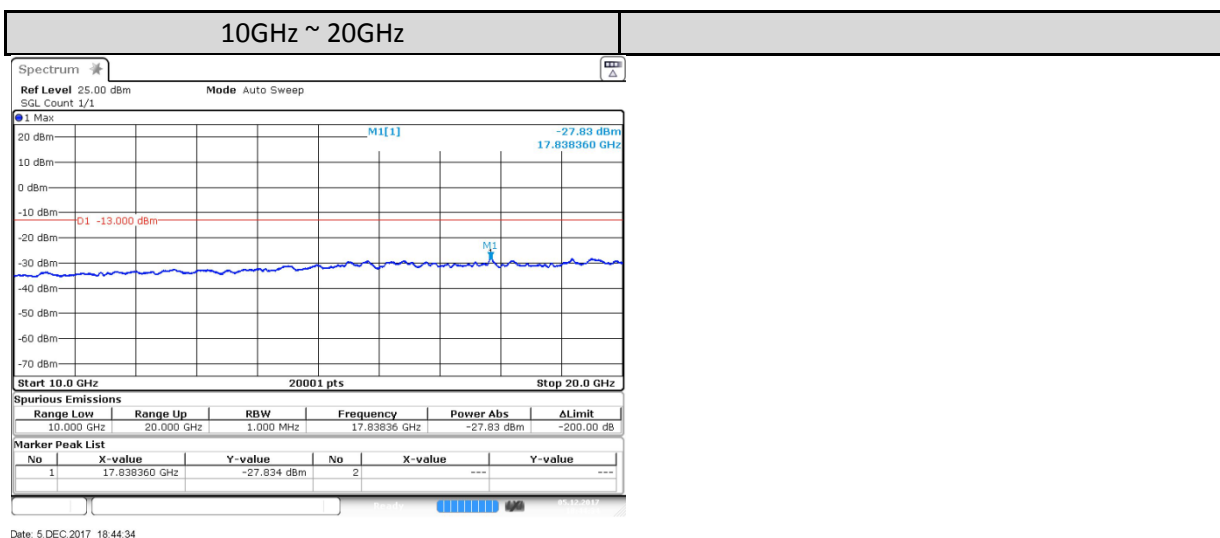
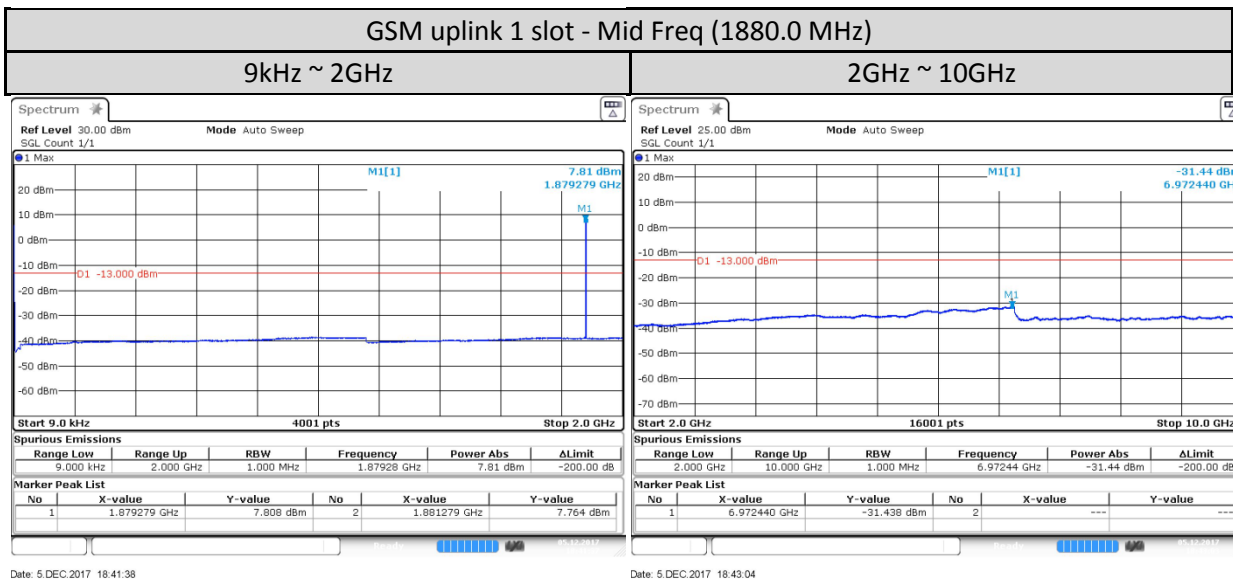
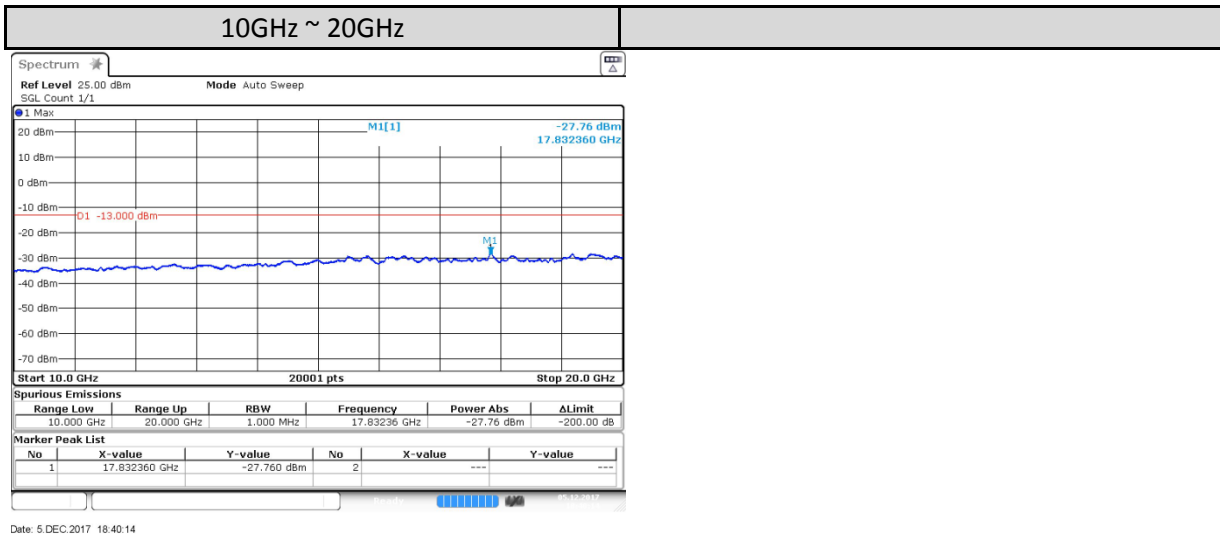
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB. The measurement instrumentation is employing a resolution bandwidth of 1 megahertz or greater.

1.11.3. Conducted Spurious Emissions – GSM 1900, GPRS 1900, EDGE 1900 (1850 – 1910MHz)



Date: 5 DEC.2017 18:37:17

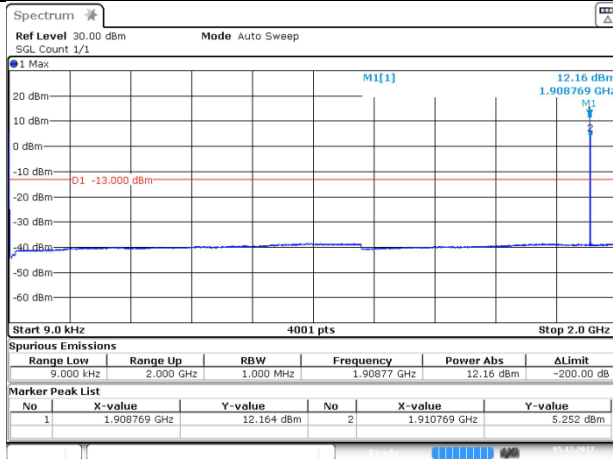
Date: 5 DEC.2017 18:38:44



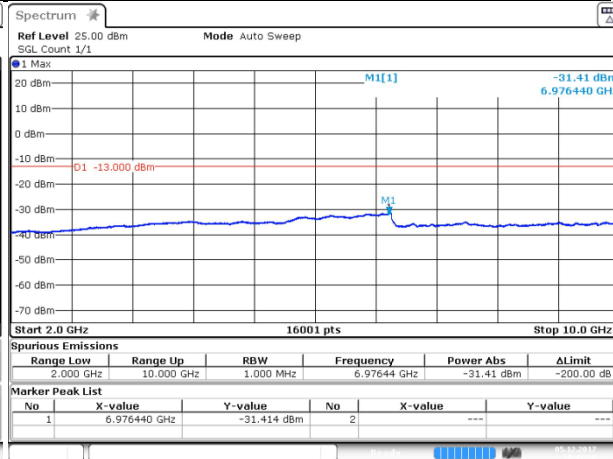
GSM uplink 1 slot - High Freq (1909.8 MHz)

9kHz ~ 2GHz

2GHz ~ 10GHz

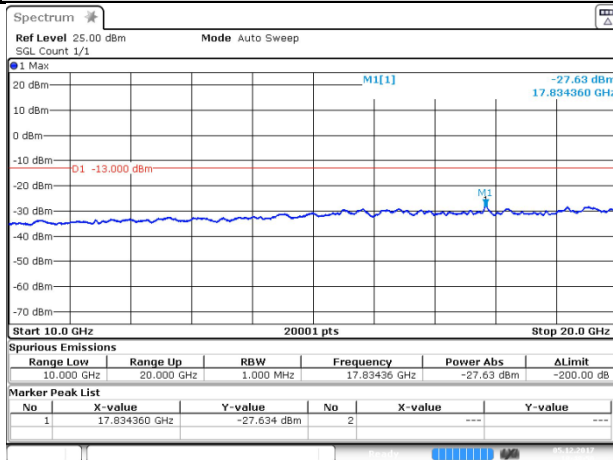


Date: 5 DEC.2017 18:45:54



Date: 5 DEC.2017 18:47:20

10GHz ~ 20GHz

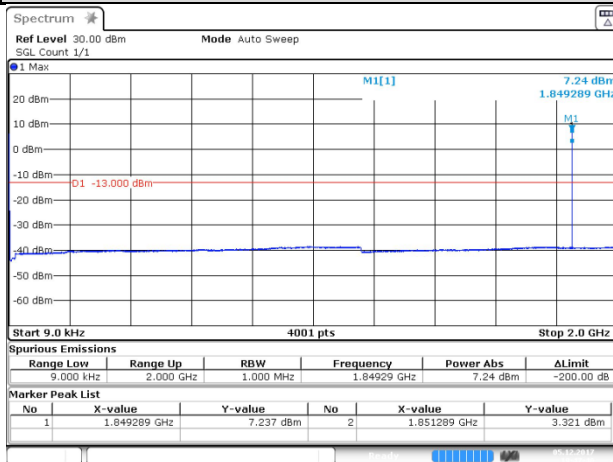


Date: 5 DEC.2017 18:48:51

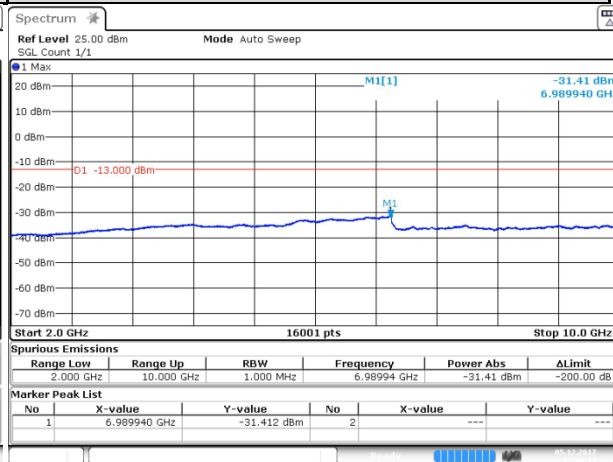
EDGE Class 8 uplink 1 slot -Low Freq (1850.2 MHz)

9kHz ~ 2GHz

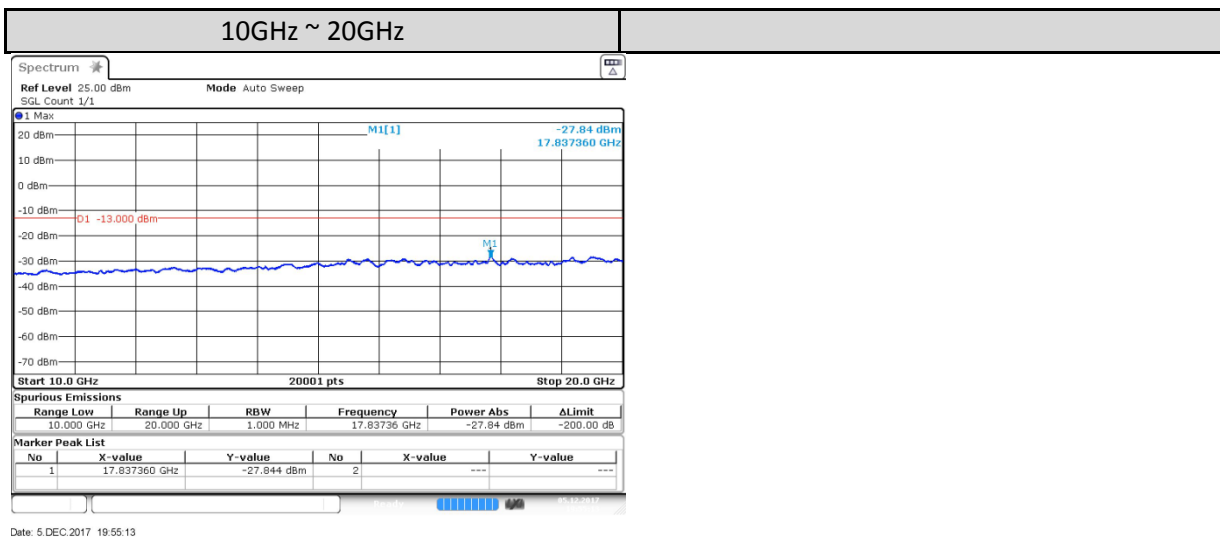
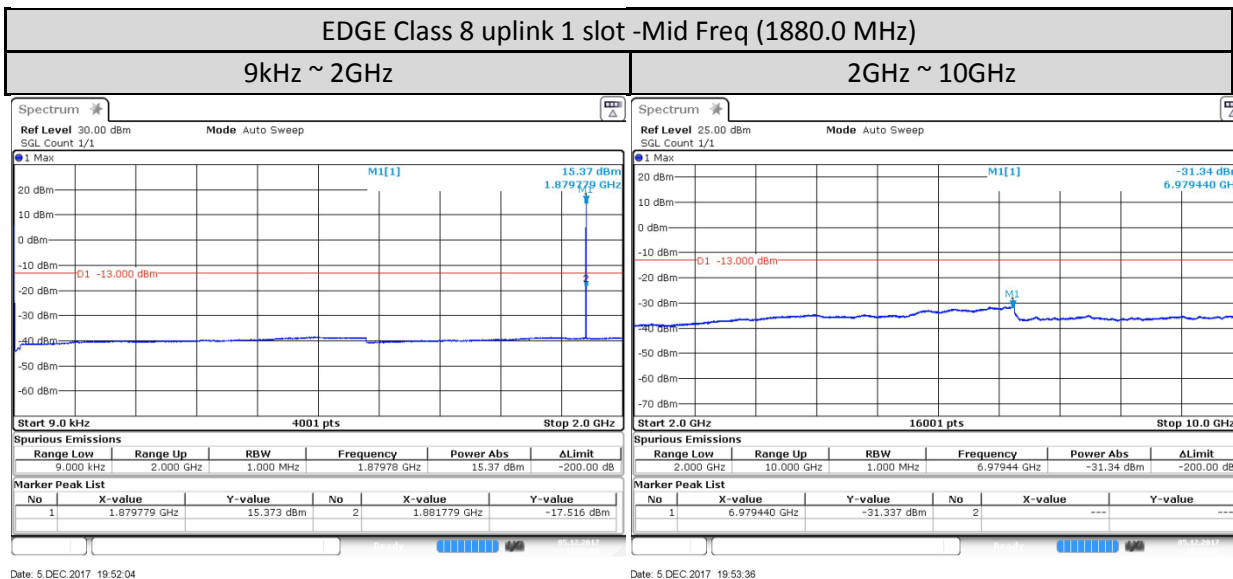
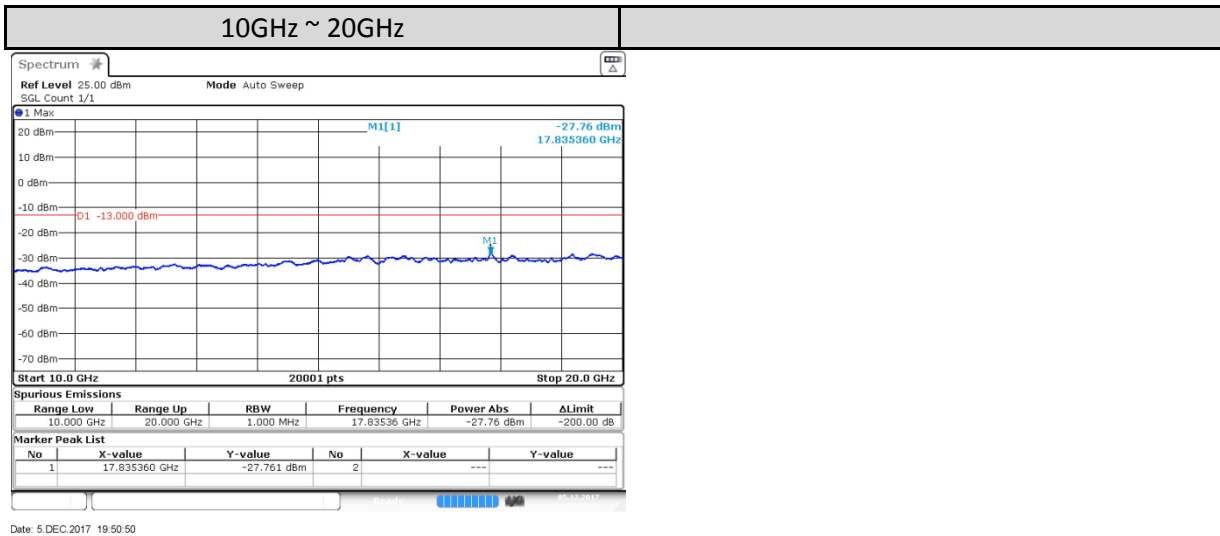
2GHz ~ 10GHz

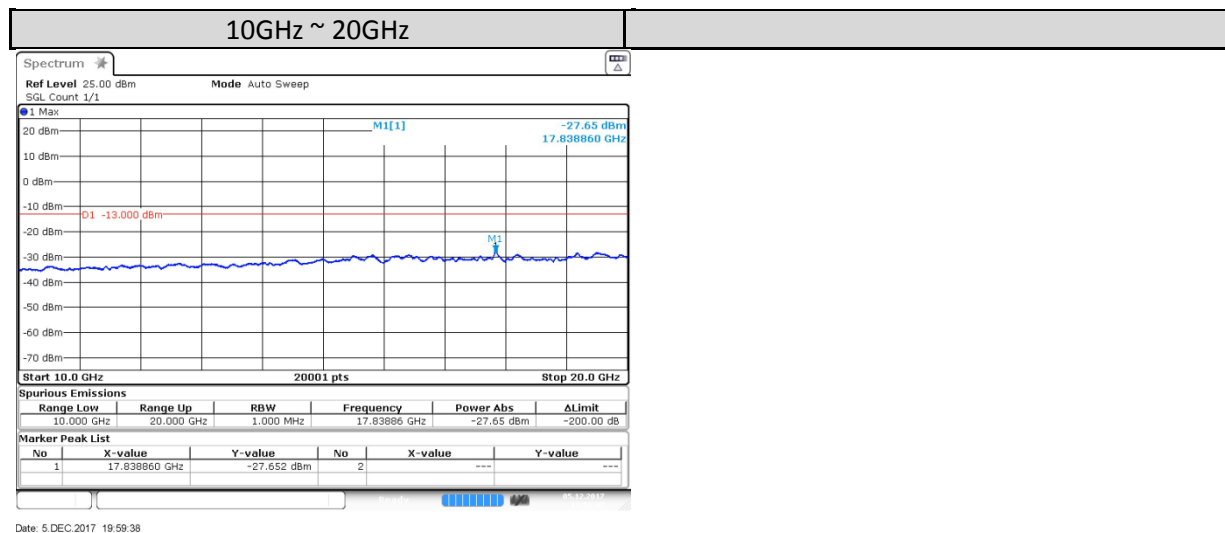
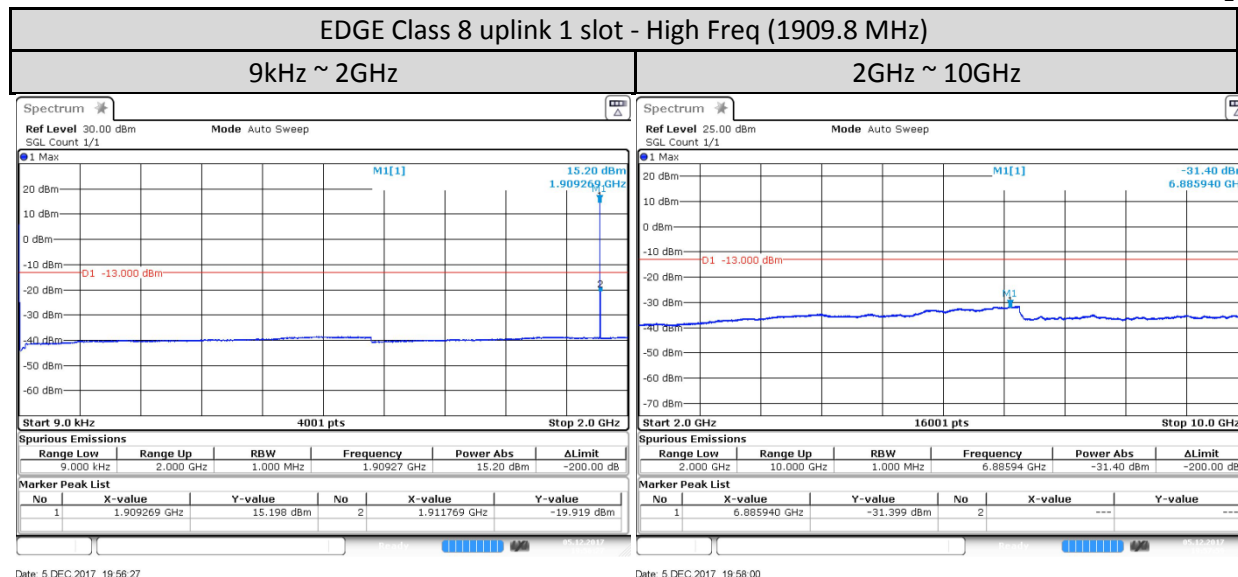


Date: 5 DEC.2017 19:47:41



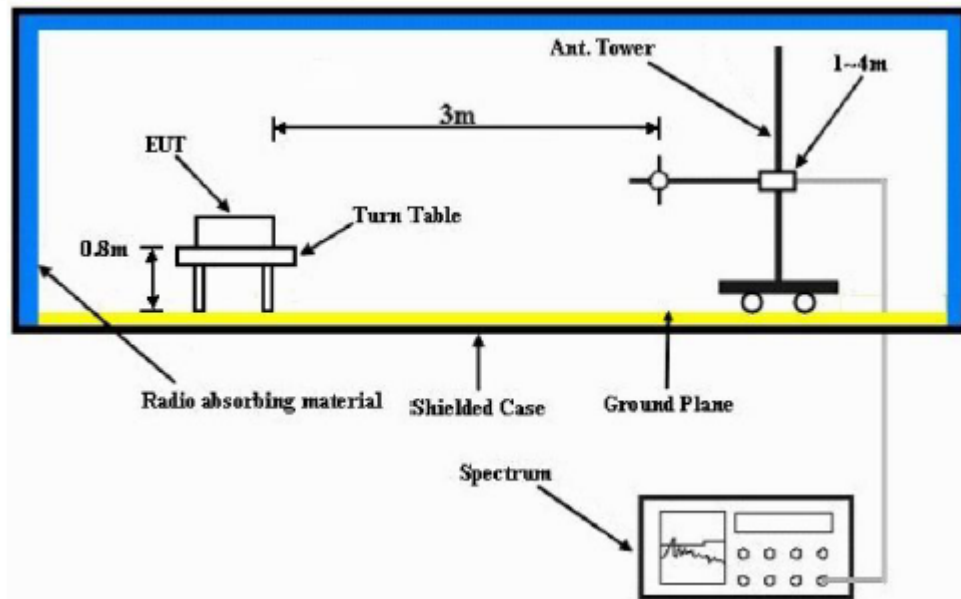
Date: 5 DEC.2017 19:49:13





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.

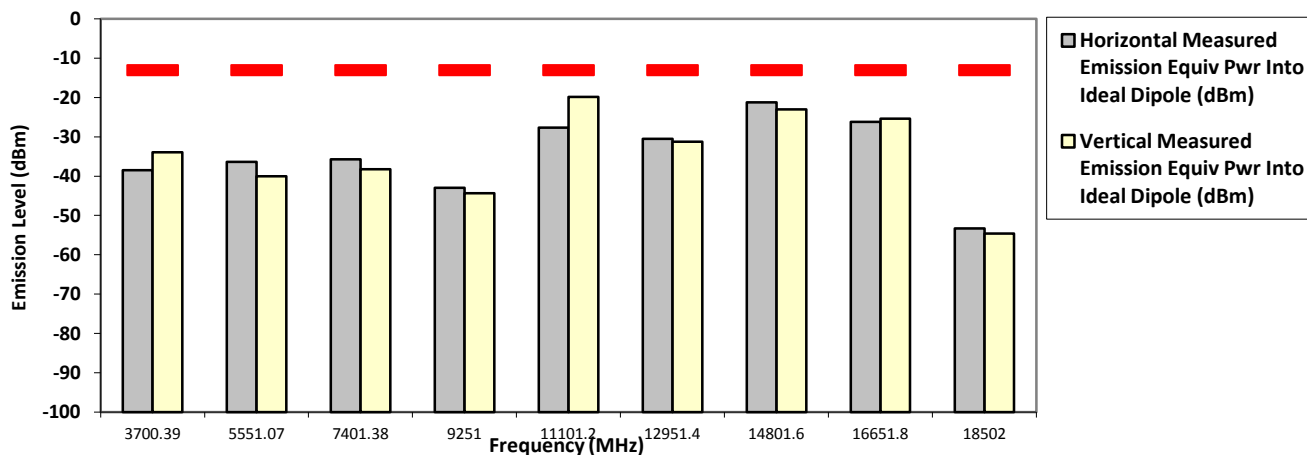
1.12.3. Radiated Spurious Emission – GSM 1900 (1850 – 1910MHz)

DC configuration: Link Mode 12V

Model Number: LEX L11n Link Mode Radiated Emission: S/N: 790TTV0214 SR:08397-EMC-00062
 Battery Part No: PMNN4546A Accy Part No: 8397-PMLN7779A-2, 8397-PMLN7779A-5
 Test Mode: TX GSM 1900
 1850.200000 MHz (Low) Bandwidth 0.2MHz 1.259 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)
3700.3900	-13.0000	-38.4700 *	-33.9100 *
5551.0700	-13.0000	-36.3400 *	-40.0300 *
7401.3800	-13.0000	-35.6900 *	-38.2500 *
9251.0000	-13.0000	-42.9442 **	-44.3266 **
11101.2000	-13.0000	-27.6708 **	-19.8280 **
12951.4000	-13.0000	-30.4692 **	-31.2408 **
14801.6000	-13.0000	-21.1948 **	-22.9853 **
16651.8000	-13.0000	-26.1932 **	-25.3632 **
18502.0000	-13.0000	-53.2878 **	-54.6020 **

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

Mon, Dec 25, 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

SR:08397-EMC-00062

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

Test Mode: TX GSM 1900

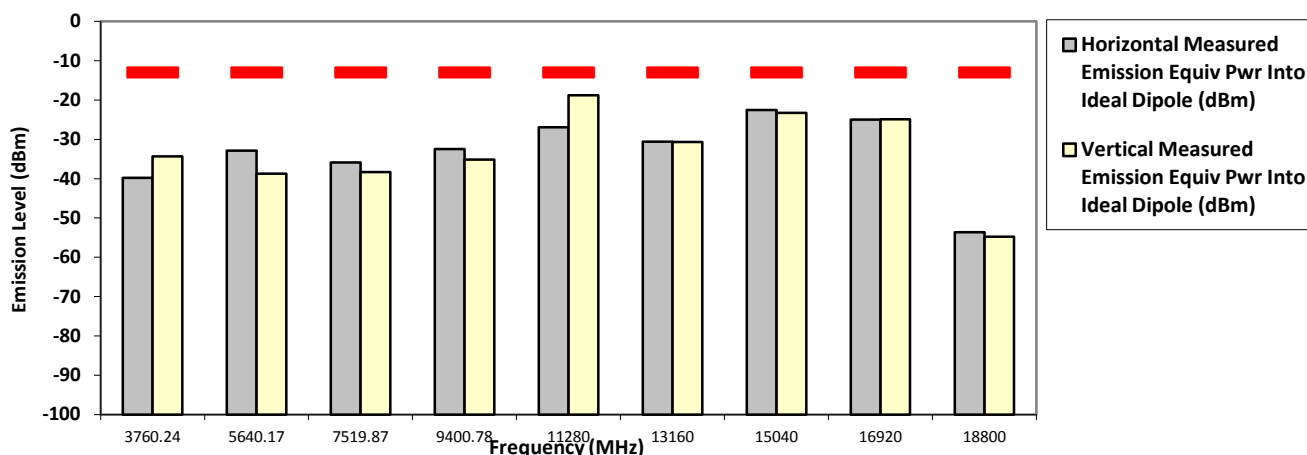
1880.000000 MHz (Mid)

Bandwidth 0.2MHz

1.259 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)
3760.2400	-13.0000	-39.7600 *	-34.3200 *
5640.1700	-13.0000	-32.8800	-38.7100 *
7519.8700	-13.0000	-35.8800 *	-38.3400 *
9400.7800	-13.0000	-32.5000	-35.1900 *
11280.0000	-13.0000	-26.9549 **	-18.8261 **
13160.0000	-13.0000	-30.5711 **	-30.6896 **
15040.0000	-13.0000	-22.5642 **	-23.2901 **
16920.0000	-13.0000	-25.0088 **	-24.9007 **
18800.0000	-13.0000	-53.6151 **	-54.7665 **

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

Mon, Dec 25, 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

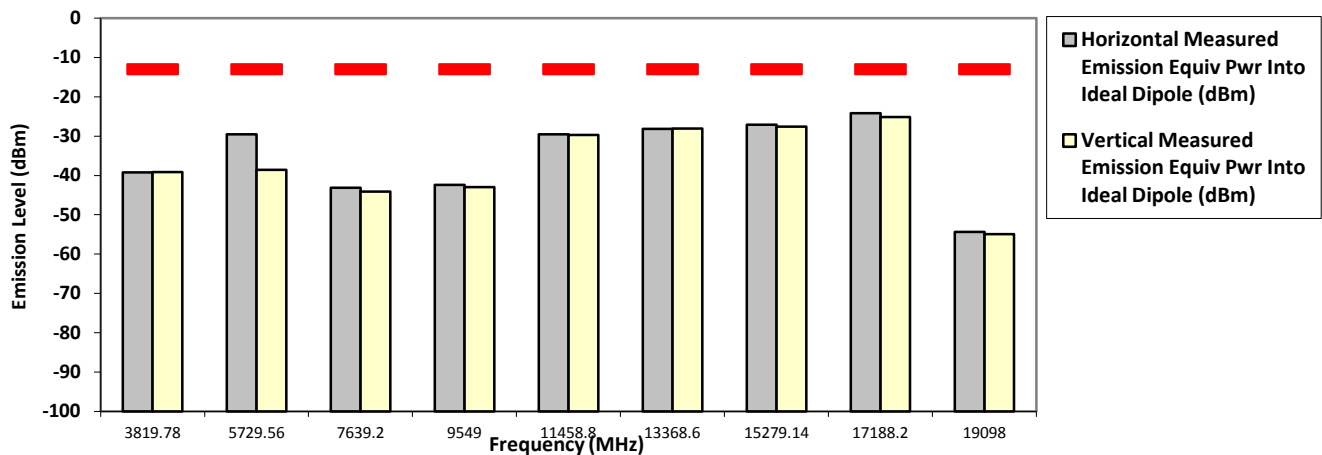
Remarks:

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 GSM 1900
 1909.800000 MHz (High) Bandwidth 0.2MHz 1.259 Watt(s) /Max Power
 SR:08397-EMC-00062

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
3819.7800	-13.0000	-39.2600 *	-39.1700 *
5729.5600	-13.0000	-29.5200	-38.5600 *
7639.2000	-13.0000	-43.1022 **	-44.0815 **
9549.0000	-13.0000	-42.4203 **	-42.9896 **
11458.8000	-13.0000	-29.5419 **	-29.7126 **
13368.6000	-13.0000	-28.1426 **	-28.0402 **
15279.1400	-13.0000	-27.0900	-27.5800
17188.2000	-13.0000	-24.1954 **	-25.1001 **
19098.0000	-13.0000	-54.3798 **	-54.9532 **

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

Mon, Dec 25, 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

Model Number: LEX L11n
Battery Part No: PMNN4546A

Link Mode Radiated Emission:

S/N: 790TTV0214

SR:08397-EMC-00062

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

Test Mode: TX GSM 1900

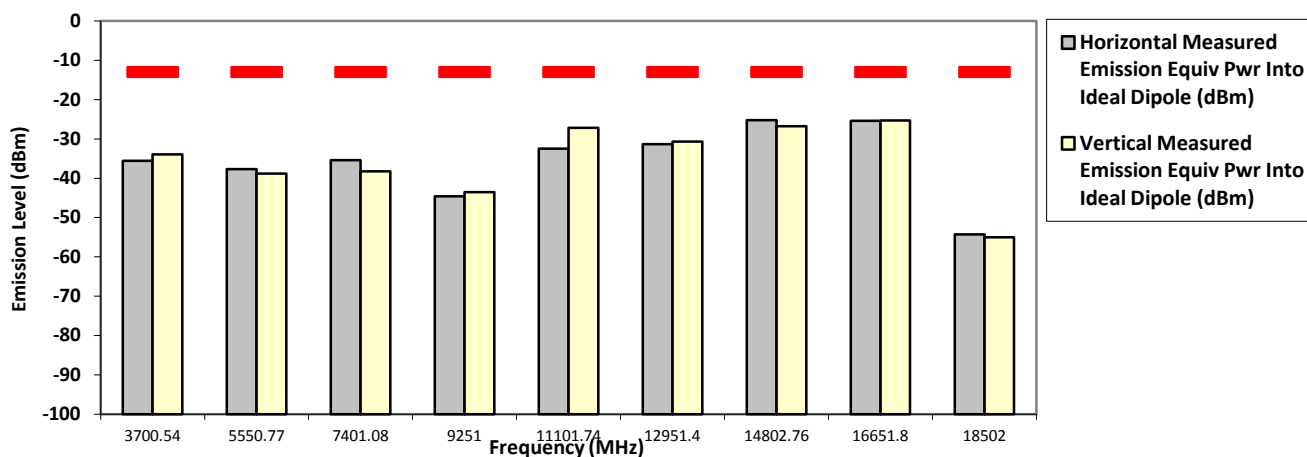
1850.200000 MHz (Low)

Bandwidth 0.2MHz

1.259 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)
3700.5400	-13.0000	-35.5200 *	-33.9300 *
5550.7700	-13.0000	-37.7100 *	-38.8000 *
7401.0800	-13.0000	-35.3800 *	-38.2700 *
9251.0000	-13.0000	-44.6145 **	-43.5378 **
11101.7400	-13.0000	-32.5000	-27.1500
12951.4000	-13.0000	-31.3424 **	-30.7127 **
14802.7600	-13.0000	-25.2000	-26.8000
16651.8000	-13.0000	-25.3945 **	-25.3268 **
18502.0000	-13.0000	-54.2592 **	-55.0324 **

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

Mon, Dec 25, 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

SR:08397-EMC-00062

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

Test Mode: TX GSM 1900

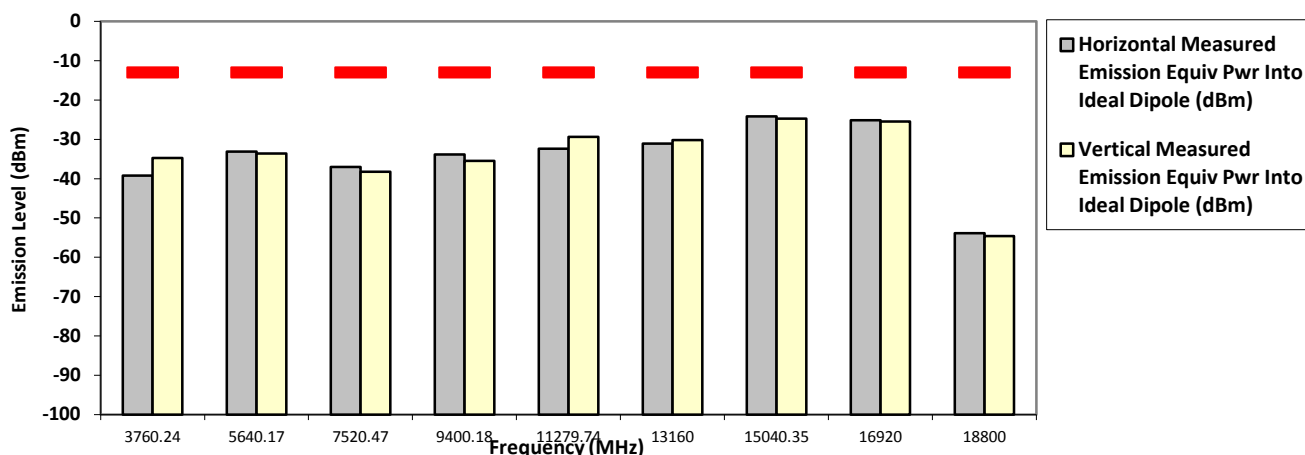
1880.000000 MHz (Mid)

Bandwidth 0.2MHz

1.259 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)
3760.2400	-13.0000	-39.2400 *	-34.7300 *
5640.1700	-13.0000	-33.0900 *	-33.6200 *
7520.4700	-13.0000	-37.0500 *	-38.2400 *
9400.1800	-13.0000	-33.8700 *	-35.4600 *
11279.7400	-13.0000	-32.4200	-29.3500
13160.0000	-13.0000	-31.0600 **	-30.1717 **
15040.3500	-13.0000	-24.1300	-24.7100
16920.0000	-13.0000	-25.1381 **	-25.4791 **
18800.0000	-13.0000	-53.8348 **	-54.5748 **

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

Mon, Dec 25, 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 GSM 1900

SR:08397-EMC-00062

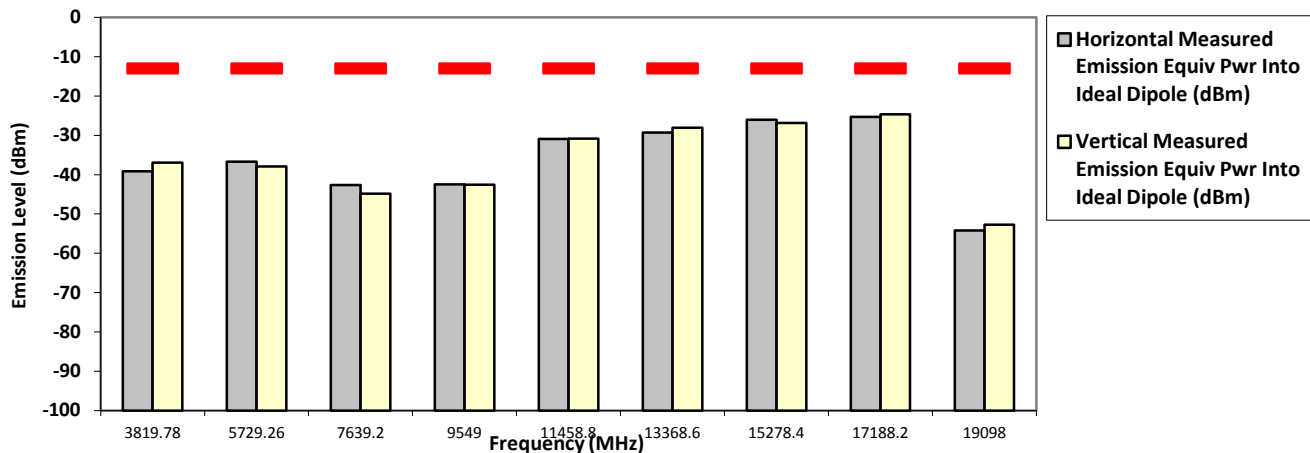
1909.800000 MHz (High)

Bandwidth 0.2MHz

1.259 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)
3819.7800	-13.0000	-39.1300 *	-36.9500 *
5729.2600	-13.0000	-36.7200 *	-37.9100 *
7639.2000	-13.0000	-42.6194 **	-44.8352 **
9549.0000	-13.0000	-42.4888 **	-42.5171 **
11458.8000	-13.0000	-30.9028 **	-30.8022 **
13368.6000	-13.0000	-29.2675 **	-28.1025 **
15278.4000	-13.0000	-26.0052 **	-26.8419 **
17188.2000	-13.0000	-25.3371 **	-24.6433 **
19098.0000	-13.0000	-54.2277 **	-52.7562 **

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

Mon, Dec 25, 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--