

	    CERTIFICATE 2518.08 MS ISO/IEC 17025 TESTING SAMM NO. 0825																												
MOTOROLA PENANG ADV. COMM. LABORATORY Motorola Solutions Malaysia Sdn Bhd, Plot 2A, Medan Bayan Lepas, Mukim 12 S.W.D, 11900 Bayan Lepas, Penang, Malaysia.	FCC / ISED TEST REPORT Report Revision : Rev.B																												
<table><tr><td>Date/s Tested</td><td>: 10-August-2020 - 27-August-2020</td></tr><tr><td>Manufacturer/Location</td><td>: Motorola Solutions Malaysia Sdn Bhd</td></tr><tr><td>Manufacturer Address</td><td>: Plot 2A, Medan Bayan lepas, Mukim 12, S.W.D. 11900 Bayan Lepas, Penang, Malaysia</td></tr><tr><td>Requestor</td><td>: SIEW KHENG TAN</td></tr><tr><td>Product Type</td><td>: Portable</td></tr><tr><td>Product Version (PMN)</td><td>: P2B</td></tr><tr><td>Model Number (HVIN)</td><td>: AAH90ZDU9RH1AN</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>ISED Registrations</td><td>: MY0001</td></tr><tr><td>Firmware Version (FVIN)</td><td>: I02.21.01.0029 (BP), D00.00.65 (AP)</td></tr></table>  The equipment was tested accordance to the requirement listed below: <table><tr><td>(LTE Band 13) FCC 47 CFR Part 2 / 27 ISED RSS GEN / 130</td><td>PASS</td></tr></table>		Date/s Tested	: 10-August-2020 - 27-August-2020	Manufacturer/Location	: Motorola Solutions Malaysia Sdn Bhd	Manufacturer Address	: Plot 2A, Medan Bayan lepas, Mukim 12, S.W.D. 11900 Bayan Lepas, Penang, Malaysia	Requestor	: SIEW KHENG TAN	Product Type	: Portable	Product Version (PMN)	: P2B	Model Number (HVIN)	: AAH90ZDU9RH1AN	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	ISED Registrations	: MY0001	Firmware Version (FVIN)	: I02.21.01.0029 (BP), D00.00.65 (AP)	(LTE Band 13) FCC 47 CFR Part 2 / 27 ISED RSS GEN / 130	PASS
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Prepared By:  Lim Khay Kwang Technician	Approve Signatory:  Ho Sze Khian Technical Manager																												

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REVISION HISTORY

Revision History	Description	Date	Originator
Rev A	Initial Report	7-September-2020	Lim Khay Kwang
Rev B	Update 1.3. General Information Table	11-November-2020	Lim Khay Kwang

1.0. Summary of Test Results

FCC Clause	ISED Clause	Test Item	Results	Remarks	Serial Number Tested
2.1046 27.50(b)(12)	RSS-Gen 6.12 RSS-130 4.4	Conducted RF Output Power	Pass	Meet the requirement of limit	734TWP0386
-	RSS 130 4.4	Peak-to-Average Power Ratio	Pass	Meet the requirement of limit	734TWP0386
2.1049	RSS-Gen 6.7	Occupied Bandwidth (26dBc, 99%)	Pass	Meet the requirement of limit	734TWP0386
2.1055 27.54	RSS-130 4.3	Frequency Stability	Pass	Meet the requirement of limit	734TWP0386
2.1051 27.53(c)(5)	RSS-Gen 6.13 RSS-130 4.6	Band Edge Conducted Spurious Emission	Pass	Meet the requirement of limit	734TWP0386
2.1051 27.53(c)(2)	RSS-Gen 6.13 RSS-130 4.6	Conducted Spurious Emissions	Pass	Meet the requirement of limit	734TWP0386
2.1053 27.53(c)(2)	RSS-130 4.6	Radiated Spurious Emission	Pass	Meet the requirement of limit	734TWP0308
2.1049 27.50(b)(10)	RSS-130 4.4	Effective Radiated Power (ERP)	Pass	Meet the requirement of limit	734TWP0386
27.53(f)	RSS – 130 4.7.2 (b)	GNSS(EIRP for 1599 – 1610MHz)	Pass	Meet the requirement of limit	734TWP0308

1.1. Measurement Uncertainty

Measurement	Frequency	Expanded Uncertainty (k=1.96) (±dB)
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 (RF Conducted Tests); Test Software Version: CMWRun v1.8.9				
SIGNAL ANALYZER	FSV40	101431	16-Jul-19	16-Jul-21
CHAMBER	SH-641	92003150	25-Sep-19	25-Sep-20
WIDEBAND RADIO COMMUNICATION TESTER	CMW500	154550	23-Jul-19	23-Jul-21
POWER SUPPLY	6652A	3117A00162	16-Mar-20	16-Mar-21

Radiated Spurious Emission (EMC Chamber 1); Test Software Version: EMC_FCC_RE_v1.6.2				
DRG HORN FREQ.	SAS-571	720	21-Mar-19	21-Mar-21
DRG HORN FREQ.	SAS-571	1143	14-Feb-19	14-Feb-21
POWER SUPPLY	6032A	2615A01178	21-MAY-20	21-MAY-21
SIGNAL GENERATOR	SMB 100A	181117	8-Nov-18	8-Nov-21
EMI TEST RECEIVER	ESW44	101750	24-Jul-19	24-Sep-20
EMI TEST RECEIVER	ESIB26	100017	19-Jul-19	19-Sep-20
5m Semi-anechoic Chamber	S800-HX	J2308	Not Required	Not Required
BILOG ANTENNA	CBL6112B	2964	23-Apr-19	23-Apr-21
BILOG ANTENNA	CBL6112B	2950	8-Jul-19	8-Jul-21
DATA LOGGER	SDL500	A.016776	4-Jun-20	4-Jun-21
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
BROAD-BAND HORN ANTENNA	BBHA9170	BBHA9170255	27-Jan-20	27-Jan-21
18 - 40GHz PREAMPLIFIER	Miteq Hi Gain Sucoflex	001	Not Required	Not Required
PREAMPLIFIER	PAM-0118	269	24-May-19	24-May-22
LOOP ANTENNA	6502	00208416	5-Sep-19	5-Sep-20

1.3. General Information

General Description of EUT

Product	MACKENZIE UHF NAG MODEL			
Brand	Motorola Solutions			
Test Model	AAH90ZDU9RH1AN			
Power Supply Rating	7.5Vdc			
Mode of operation	LTE Band 13			
Modulation Type	QPSK, 16QAM			
Operating Frequency	LTE Band 13	Channel Bandwidth 5MHz	779.5MHz~784.5MHz	
		Channel Bandwidth 10MHz	782MHz	
Max. ERP Power	LTE Band 13 QPSK	Channel Bandwidth 5MHz	22.476dBm (0.1768W)	
		Channel Bandwidth 10MHz	22.369dBm (0.1725W)	
	LTE Band 13 16QAM	Channel Bandwidth 5MHz	21.629dBm (0.1455W)	
		Channel Bandwidth 10MHz	21.525dBm (0.1421W)	
Emission Designator	LTE Band 13		QPSK	16QAM
		Channel Bandwidth 5MHz	4M47G7D	4M47D7W
		Channel Bandwidth 10MHz	8M91G7D	8M91D7W
Antenna Type	LTE Band 13	LTE LOW BAND MAIN ANTENNA (1.15dBi)		
SW Version	I02.21.01.0029 (BP), D00.00.65 (AP)			
HW Version	P2B			

Note:

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

Item	Brand	Model or P/N	Specification
Li-Ion	MOTOROLA	PMNN4804A	BATTERY PACK,BATTERY PACK,IMPRES GEN2, LIION,IP68, 2820T

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 27

KDB 971168 D01 Power Meas License Digital Systems v03r01

KDB 971168 D02 Misc OOB License Digital Systems v02r01

ANSI C63.26

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
LTE Band 13	5 MHz	23025 ~ 23255	23205	23230	23255	779.5	782	784.5
	10 MHz	23230		23230			782	

1.5. Test Mode Applicability and Tested Channel Detail

LTE Band 13

Test Item	Available Channel	Tested Channel	Channel Bandwidth	Uplink Modulation	Mode
Conducted RF Output Power	23025 ~ 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	As per table 1.6.3
	23025 ~ 23255	23230	10 MHz		
Peak to Average Power Ratio	23025 ~ 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
	23025 ~ 23255	23230	10 MHz		50 RB / 0 RB Offset
Occupied Bandwidth	23025 ~ 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
	23025 ~ 23255	23230	10 MHz		50 RB / 0 RB Offset
Frequency Stability	23025 ~ 23255	23205, 23255	5 MHz	QPSK	25 RB / 0 RB Offset
	23025 ~ 23255	23230	10 MHz		50 RB / 0 RB Offset
Band Edge Conducted Spurious Emission	23025 ~ 23255	23205, 23255	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
	23025 ~ 23255	23230	10 MHz		1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
Conducted Spurious Emission	23025 ~ 23255	23205, 23230, 23255	5 MHz	QPSK	1 RB / 13 RB Offset
	23025 ~ 23255	23230	10 MHz		1 RB / 49 RB Offset
Radiated Spurious Emission	23025 ~ 23255	23205	5 MHz	QPSK	1 RB / 0 RB Offset
		23230			1 RB / 13 RB Offset
		23255			1 RB / 13 RB Offset
GNSS (EIRP for 1599 – 1610MHz)	23025 ~ 23255	23205	5 MHz	QPSK	1 RB / 0 RB Offset
		23230			1 RB / 13 RB Offset
		23255			1 RB / 13 RB Offset
Effective Radiated Power (ERP)	23025 ~ 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	As per table 1.6.4
	23025 ~ 23255	23230	10 MHz		

NOTE:

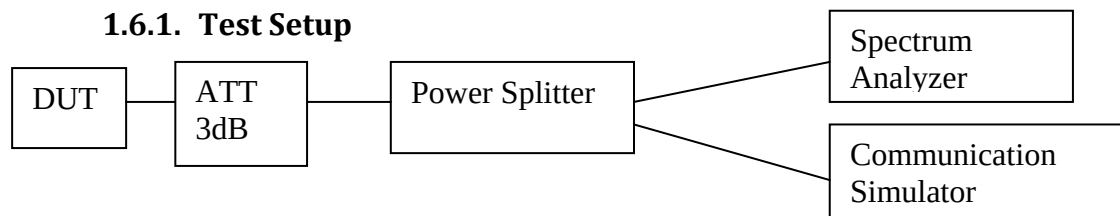
1. The Conducted RF Output Power for QPSK and 16QAM, measured value of QPSK mode is higher than 16QAM mode. Therefore, only Conducted Spurious Emission, Radiated Emission and GNSS (EIRP for 1599 – 1610MHz) had been tested under QPSK modes..
2. Band Edge was performed with 1 and full Resource Block at the lowest and highest operating frequency band.
3. The Equivalent Isotropically Radiated Power (EIRP) was calculated from Conducted RF Output Power results in QPSK and 16QAM modulation.
4. Peak to Average and Occupied Bandwidth were performed with full Resource Block which is the worst case.
5. Frequency stability was performed with full Resource Block in QPSK modulation.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
Conducted RF Output Power	25°C, 50% RH	7.5V DC	Khay Kwang
Peak-to-Average Power Ratio	25°C, 50% RH	7.5V DC	Khay Kwang
Occupied Bandwidth	25°C, 50% RH	7.5V DC	Khay Kwang
Frequency Stability	25°C, 50% RH	7.5V DC	Khay Kwang
Band Edge Conducted Spurious Emission	25°C, 50% RH	7.5V DC	Khay Kwang
Conducted Spurious Emission	25°C, 50% RH	7.5V DC	Khay Kwang
Radiated Spurious Emission	25°C, 63.7% RH	7.5V DC	Nazrin&Fendi
Equivalent Isotropically Radiated Power (EIRP)	25°C, 63.7% RH	7.5V DC	Khay Kwang

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. Limits

FCC: Portable stations (hand-held devices) transmitting in the 776-788 MHz band is limited to 3 watts ERP.
 ISSED: The e.i.r.p. shall not exceed 50 watts for mobile equipment or for outdoor fixed subscriber equipment, nor shall it exceed 5 watts for portable equipment or for indoor fixed subscriber equipment.

1.6.3. Conducted RF Output Power – LTE Band 13(777-787MHz)

Conducted Output Power (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			23205	23230	23255	23205	23230	23255
			779.5MHz	782 MHz	784.5 MHz	779.5 MHz	782 MHz	784.5 MHz
Band 13 / 5 MHz	1	0	23.346	23.323	23.305	22.629	22.458	22.36
	1	13	23.333	23.393	23.476	22.622	22.51	22.526
	1	24	23.343	23.286	23.372	22.607	22.441	22.436
	12	0	22.326	22.412	22.425	21.413	21.414	21.495
	12	6	22.313	22.426	22.424	21.382	21.434	21.477
	12	13	22.362	22.393	22.475	21.442	21.391	21.518
	25	0	22.427	22.414	22.41	21.466	21.487	21.421

Conducted Output Power (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
				23230			23230	
				782 MHz			782 MHz	
Band 13 / 10MHz	1	0		23.332			22.458	
	1	25		23.305			22.449	
	1	49		23.369			22.525	
	25	0		22.433			21.578	
	25	13		22.438			21.58	
	25	25		22.381			21.512	
	50	0		22.4			21.471	

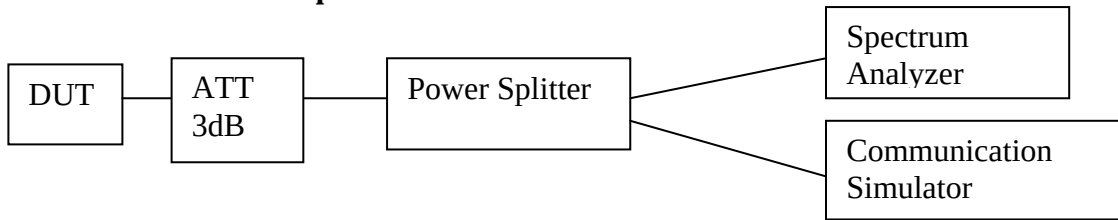
1.6.4. Effective Radiated Power (ERP) - LTE Band 13 (777-787MHz)

Effective Radiated Power (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
			23205	23230	23255	23205	23230	23255
			779.5MHz	782 MHz	784.5 MHz	779.5 MHz	782 MHz	784.5 MHz
Band 13 / 5MHz	1	0	22.346	22.323	22.305	21.629	21.458	21.36
	1	13	22.333	22.393	22.476	21.622	21.51	21.526
	1	24	22.343	22.286	22.372	21.607	21.441	21.436
	12	0	21.326	21.412	21.425	20.413	20.414	20.495
	12	6	21.313	21.426	21.424	20.382	20.434	20.477
	12	13	21.362	21.393	21.475	20.442	20.391	20.518
	25	0	21.427	21.414	21.41	20.466	20.487	20.421

Effective Radiated Power (dBm)								
LTE Band/BW	RB Size	RB Offset	QPSK Modulation			16QAM Modulation		
			Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
				23230			23230	
				782 MHz			782 MHz	
Band 13 / 10MHz	1	0		22.332			21.458	
	1	25		22.305			21.449	
	1	49		22.369			21.525	
	25	0		21.433			20.578	
	25	13		21.438			20.58	
	25	25		21.381			20.512	
	50	0		21.4			20.471	

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.

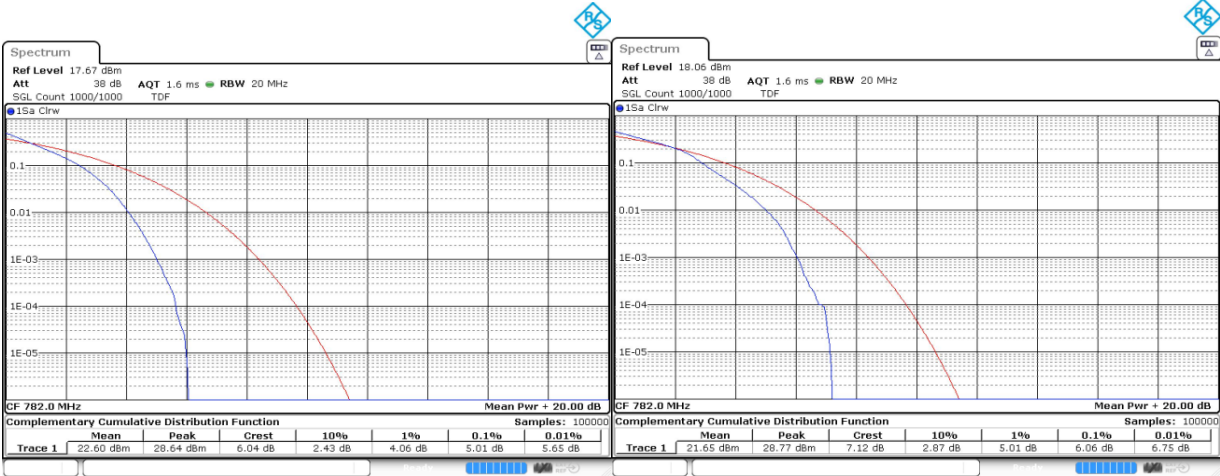
1.7.2. Test Limit

The peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

1.7.3. Peak-to-Average Power Ratio – LTE Band 13 (777-787MHz)

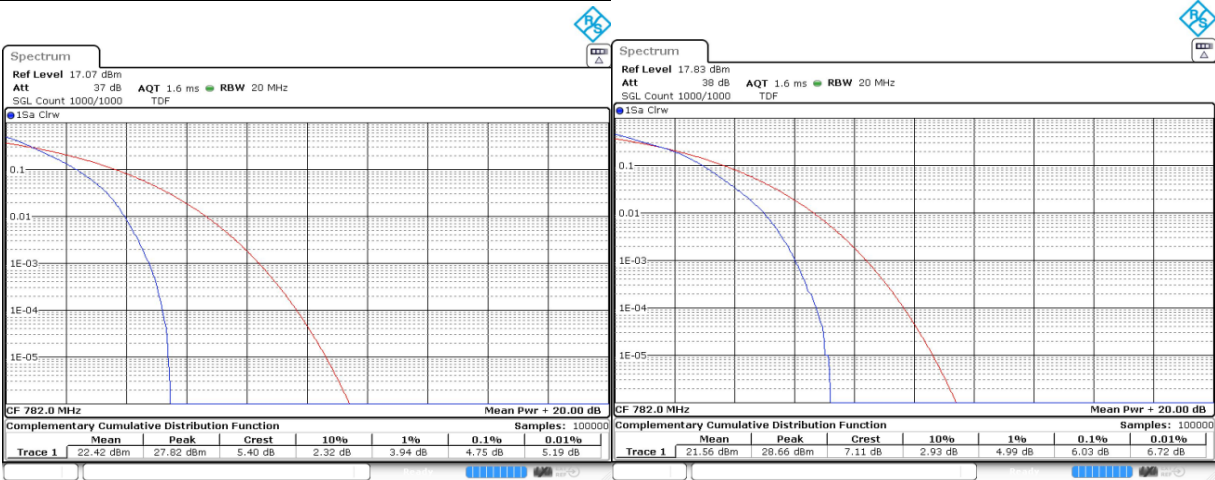
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 13/5MHz/25/0	Low CH 23205	779.5 MHz	4.928	6.029
	Mid CH 23230	782 MHz	5.014	6.058
	High CH 23255	784.5 MHz	4.957	6.058

Spectrum Plot of Worst Value	
QPSK	16QAM



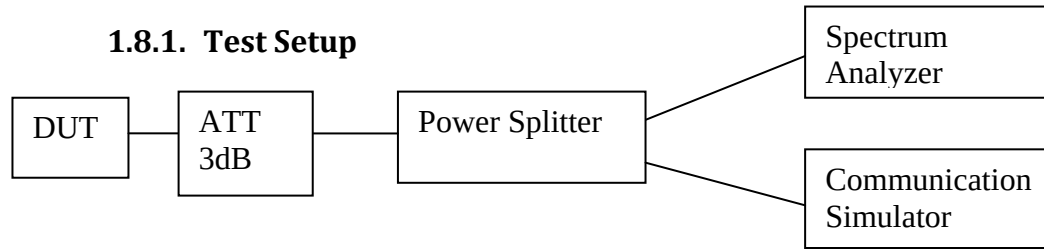
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 13/10MHz/50/0	Low CH			
	Mid CH 23230	782 MHz	4.754	6.029
	High CH			

Spectrum Plot of Worst Value	
QPSK	16QAM



1.8. Occupied Bandwidth

1.8.1. Test Setup



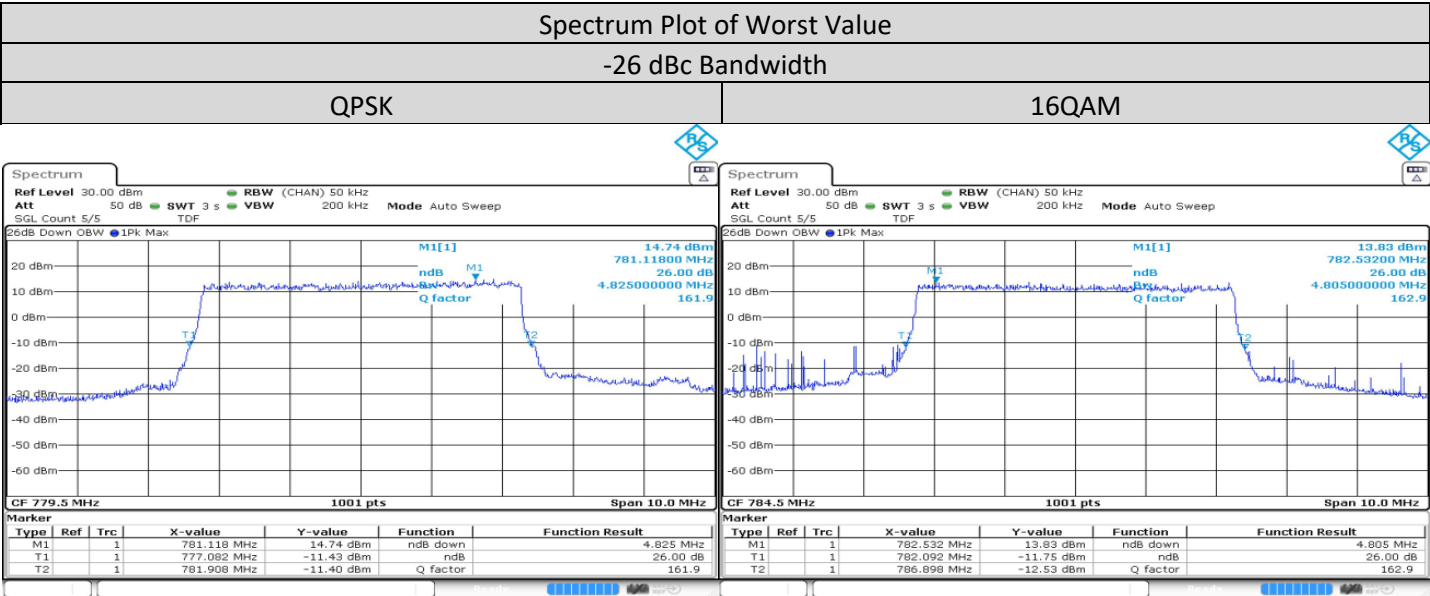
- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) For LTE measurement, set DUT to transmit maximum power & full RB size through communication simulator.
- 4) For LTE measurement, set DUT to transmit maximum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

1.8.2. Test Limit

For measurement 99% of occupied bandwidth that is required by FCC 2.1049 and RSS Gen 6.6.

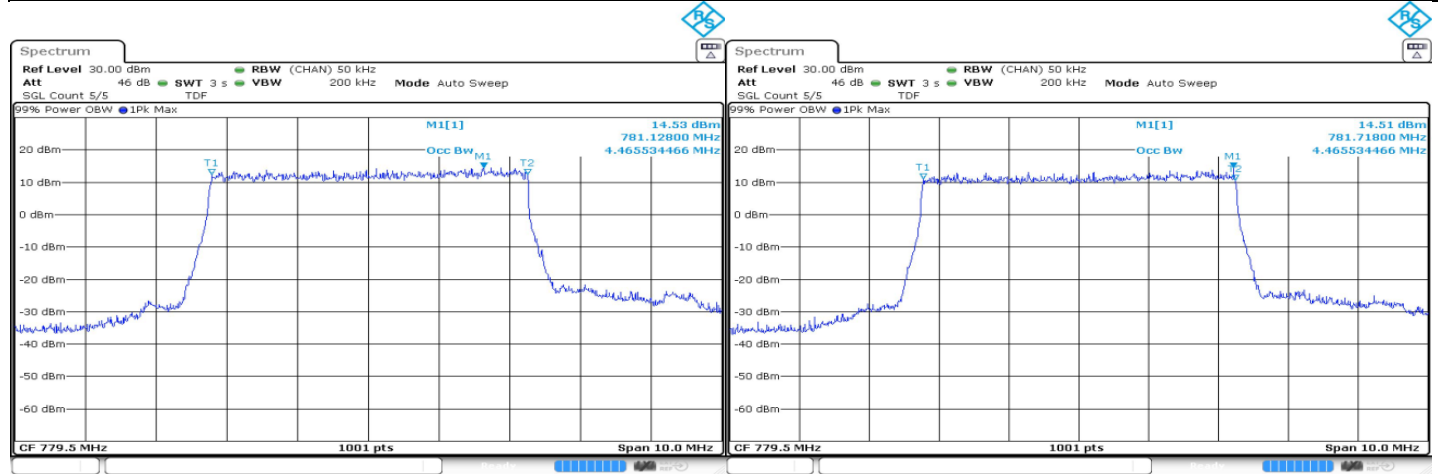
1.8.3. Occupied Bandwidth - LTE Band 13 (777-787MHz)

LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 13 / 5MHz/25/0	Low CH 23205	779.5 MHz	4.825	4.795
	Mid CH 23230	782 MHz	4.795	4.785
	High CH 23255	784.5 MHz	4.795	4.805



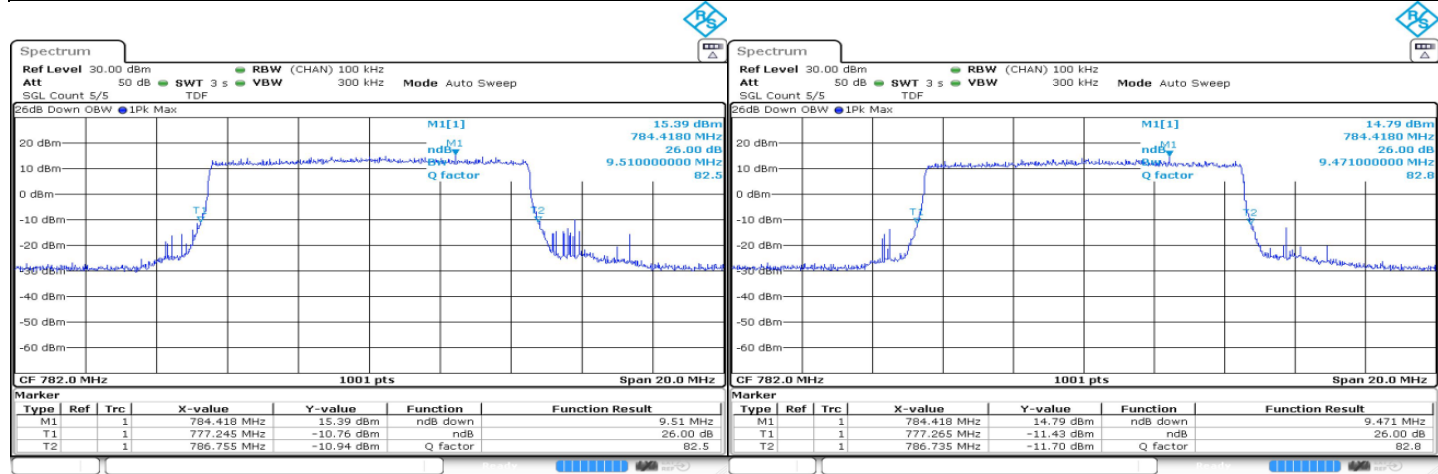
LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 13 / 5MHz/25/0	Low CH 23205	779.5 MHz	4.466	4.466
	Mid CH 23230	782 MHz	4.466	4.456
	High CH 23255	784.5 MHz	4.466	4.466

Spectrum Plot of Worst Value	
99% Occupied Bandwidth	
QPSK	16QAM



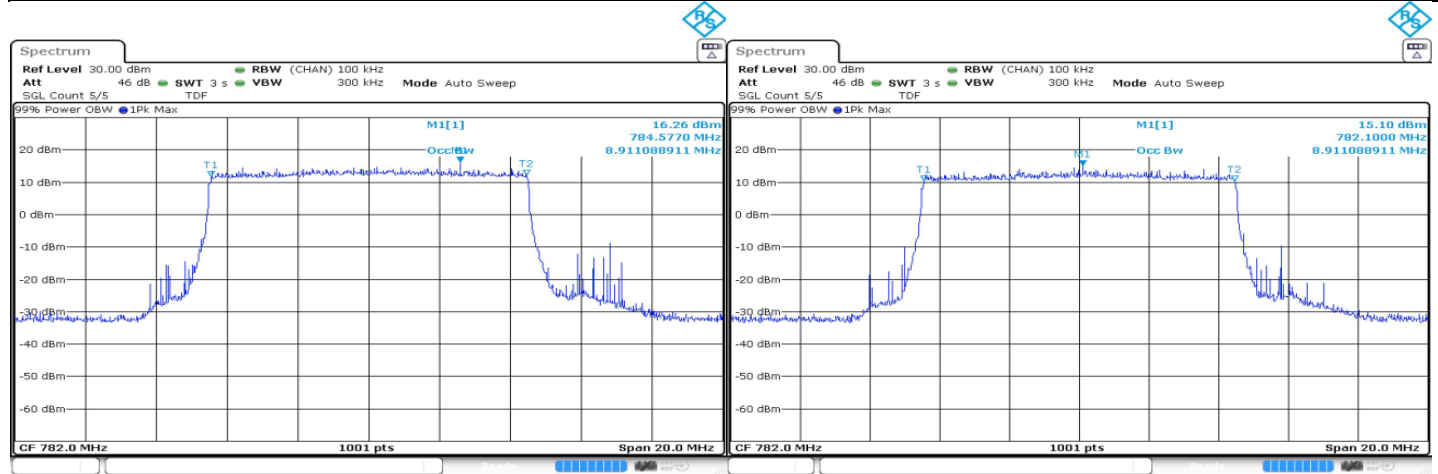
LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 13 / 10MHz/50/0	Low CH			
	Mid CH 23230	782 MHz	9.51	9.471
	High CH			

Spectrum Plot of Worst Value	
-26 dBc Bandwidth	
QPSK	16QAM



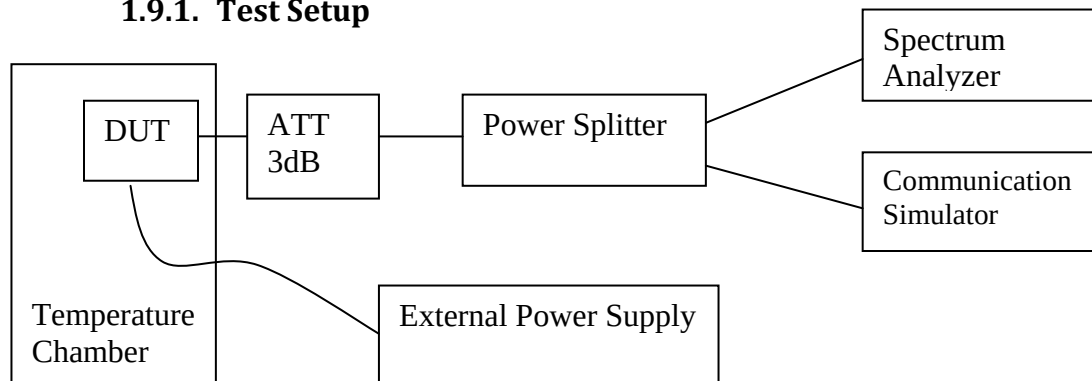
LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 13 / 10MHz/50/0	Low CH			
	Mid CH 23230	782 MHz	8.911	8.911
	High CH			

Spectrum Plot of Worst Value	
99% Occupied Bandwidth	
QPSK	16QAM



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

As per manufacturer declared product operating at -20 to 60 deg C with spec of +/- 0.1ppm.

1.9.3. Frequency Stability – LTE Band 13 (777-787MHz)

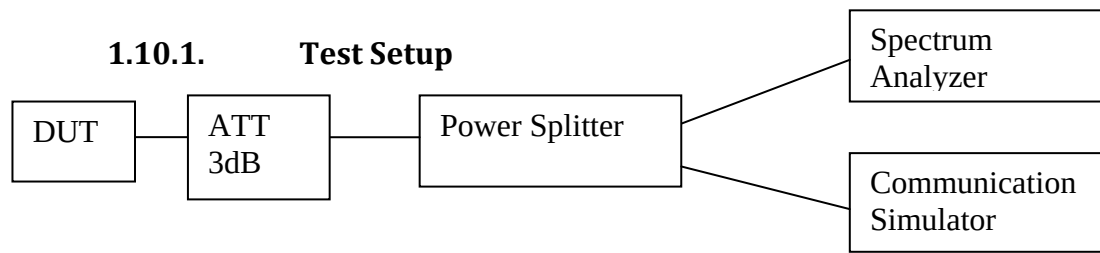
Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 5 MHz			
		Low Channel		High Channel	
		779.5MHz		784.5MHz	
LTE Band 13		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	60	779.500008	0.010332	784.500011	0.013785
	50	779.500007	0.008497	784.500007	0.00837
	40	779.499993	-0.009304	784.500008	0.010758
	30	779.499994	-0.008038	784.500014	0.017669
	20	779.500007	0.009102	784.500012	0.015335
	10	779.500004	0.005432	784.500012	0.014752
	0	779.499995	-0.006808	784.500001	0.012527
	-10	779.500006	0.00712	784.500013	0.016739
	-20	779.500008	0.010148	784.500013	0.016429

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 5 MHz			
		Low Channel		High Channel	
		779.5MHz		784.5MHz	
LTE Band 13		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	9	779.500007	0.008662	784.500013	0.016229
	7.5	779.499999	-0.012956	784.500001	0.012618
	6	779.499993	-0.008754	784.500006	0.007367

Band	Temp (Deg C)		
		Channel Bandwidth: 10 MHz	
		Mid Channel	
		782MHz	
LTE Band 13		Frequency (MHz)	Frequency Error (ppm)
	60	781.999991	-0.012073
	50	781.999999	-0.01297
	40	781.999999	-0.012183
	30	781.999999	-0.013098
	20	781.999993	-0.00847
	10	781.999992	-0.009897
	0	781.999992	-0.010829
	-10	781.999994	-0.00739
	-20	781.999991	-0.011342

Band	Voltage (V)	Frequency Error VS Voltage	
		Channel Bandwidth: 10 MHz	
		Mid Channel	
		782MHz	
LTE Band 13		Frequency (MHz)	Frequency Error (ppm)
	9V	781.999991	-0.011836
	7.5V	781.99999	-0.012842
	6V	781.99999	-0.012878

1.10. Band Edge Conducted Spurious Emission



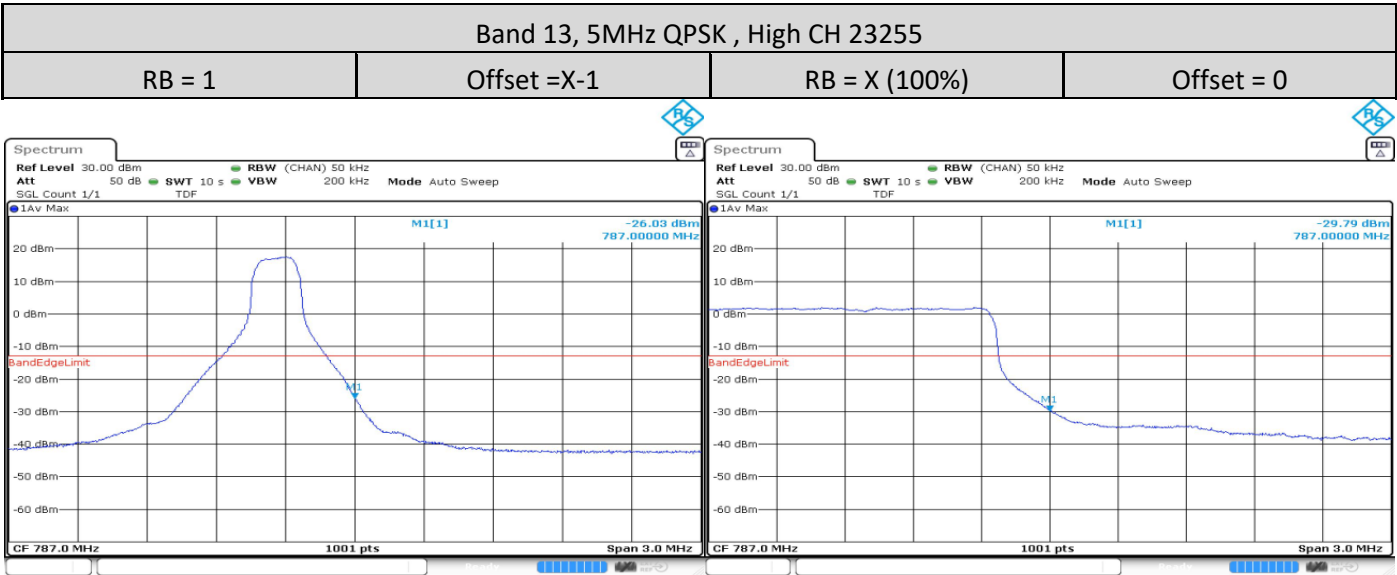
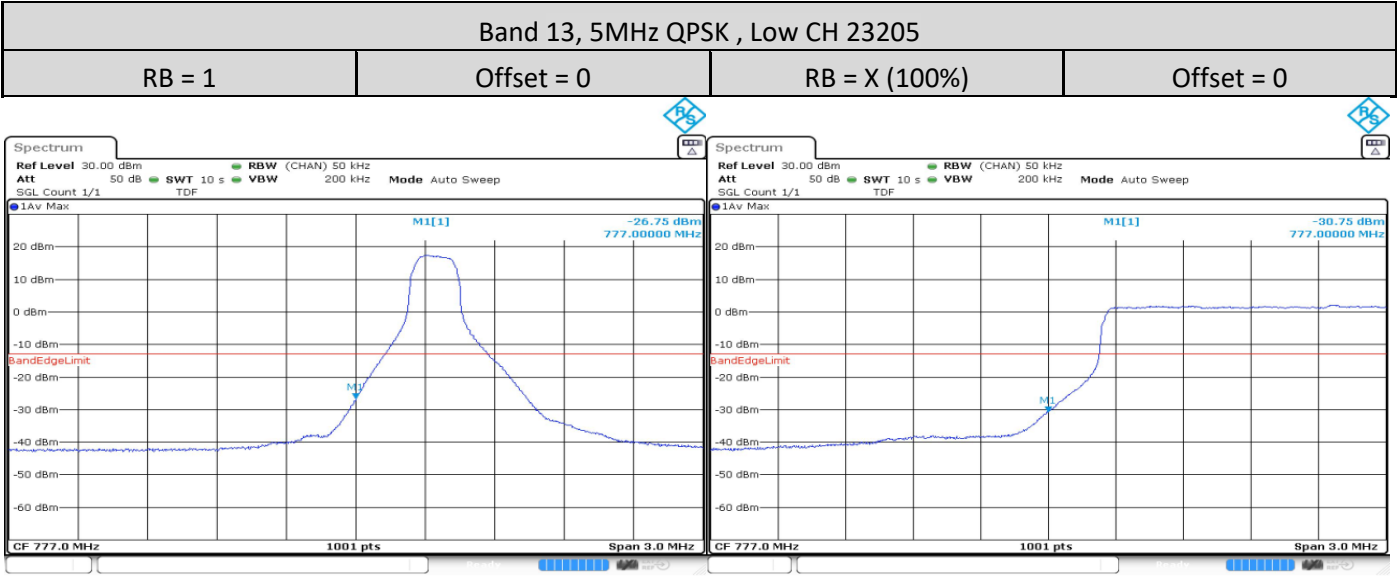
- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) Set DUT to transmit maximum power through communication simulator.
- 4) The band edges of lowest and highest channels with the highest RF powers were measured.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

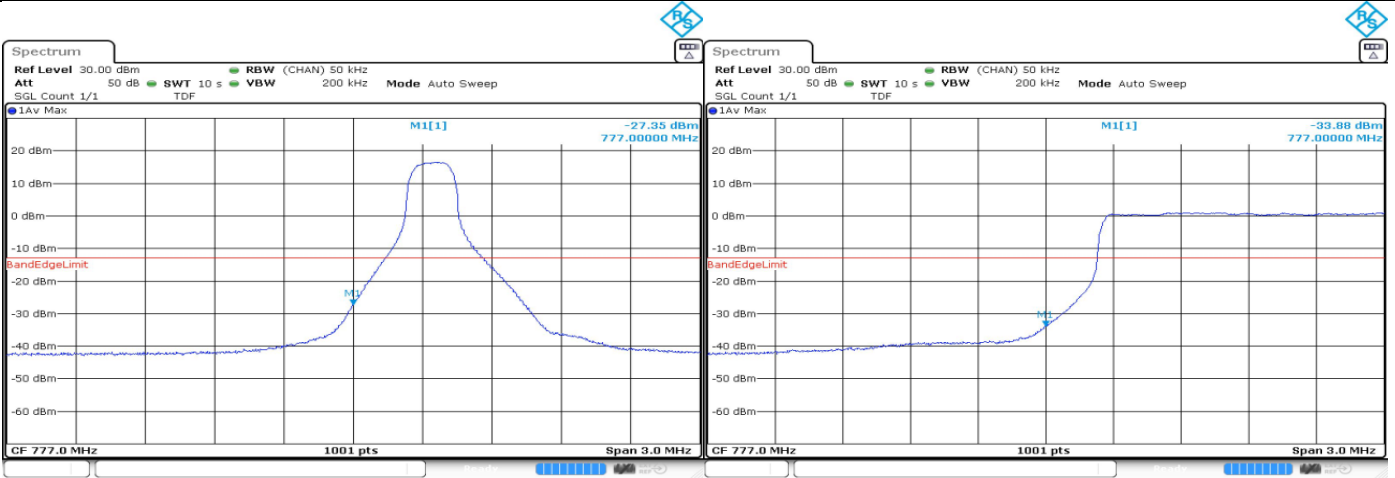
For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log (P)$ dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;
- (5) Compliance with the provisions of paragraphs (1) and (2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

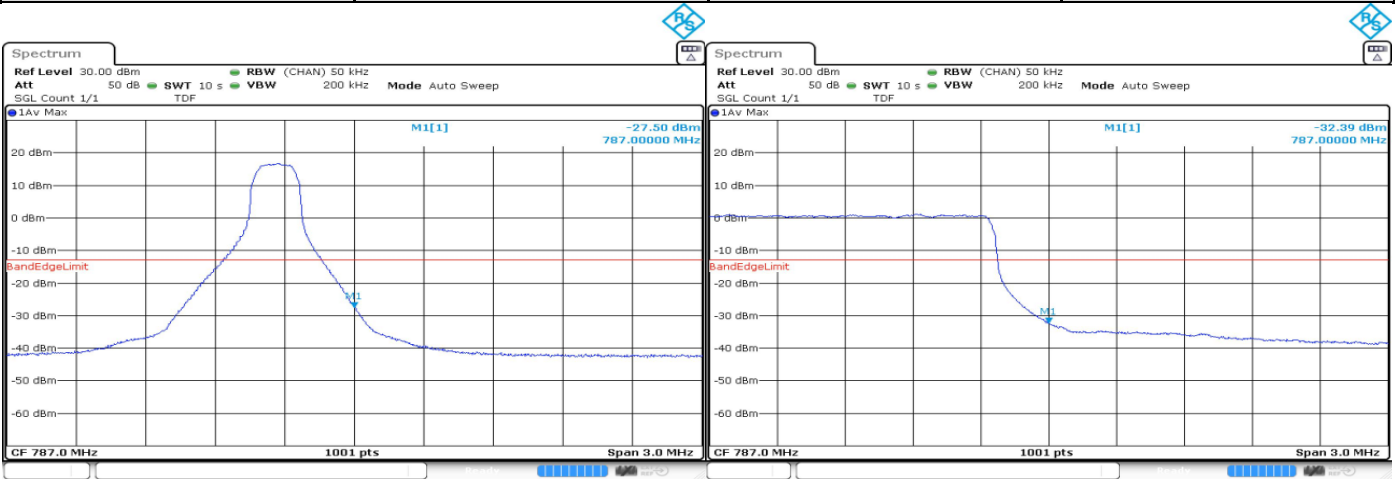
1.10.3. Band Edge / Emission Mask Conducted Spurious Emission – LTE Band 13 (777-787MHz)



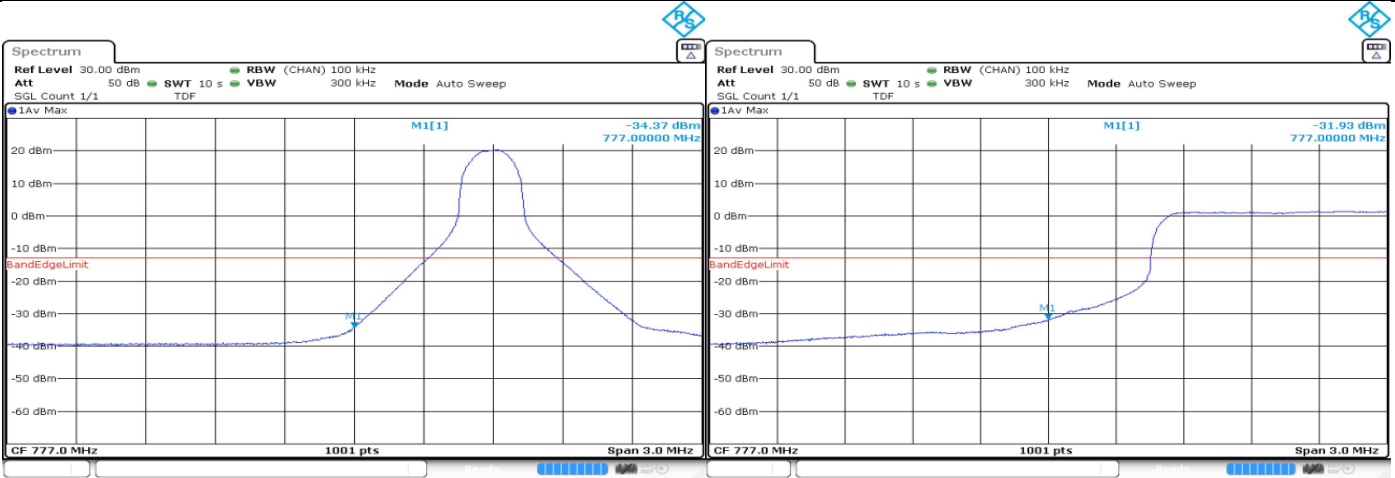
Band 13, 5MHz 16-QAM , Low CH 23205			
RB = 1	Offset = 0	RB = X (100%)	Offset = 0



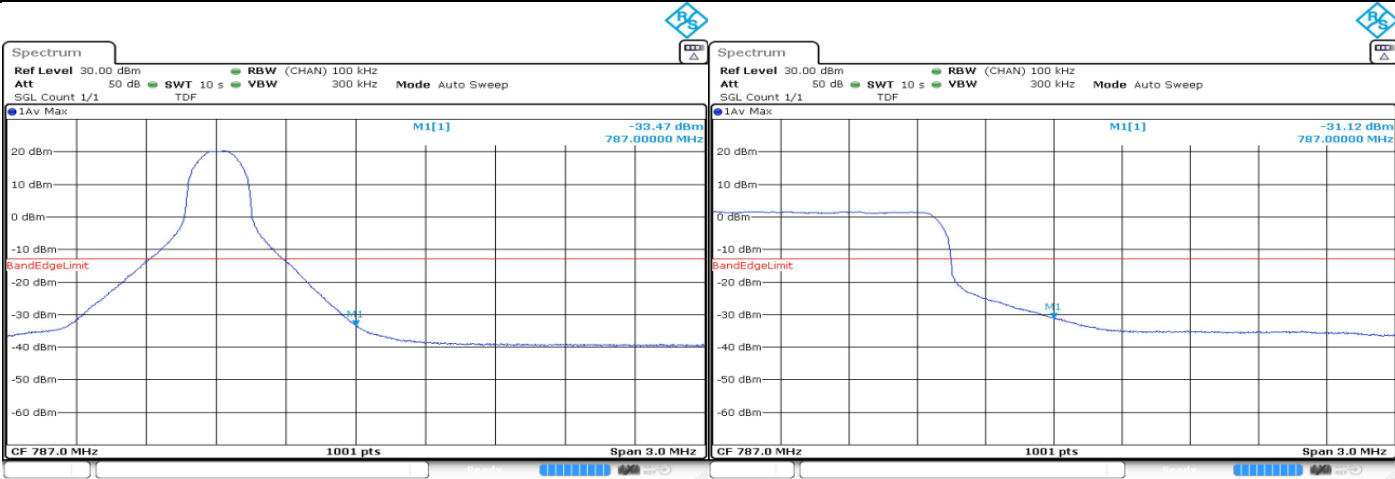
Band 13, 5MHz 16-QAM , High CH 23255			
RB = 1	Offset =X-1	RB = X (100%)	Offset = 0



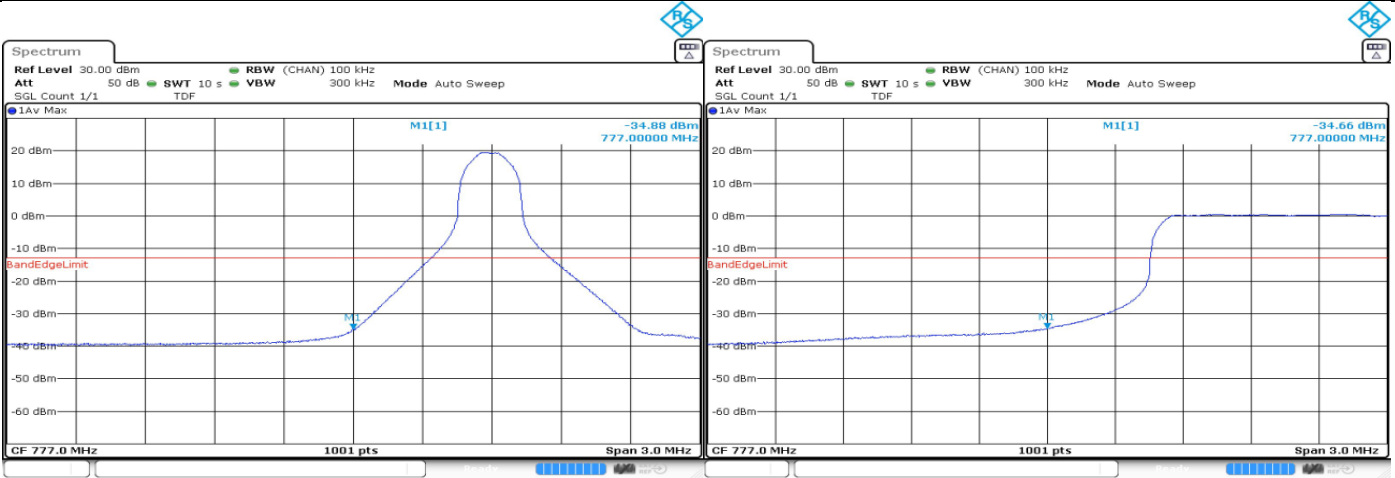
Band 13, 10MHz QPSK, Low CH 23230			
RB = 1	Offset = 0	RB = X (100%)	Offset = 0



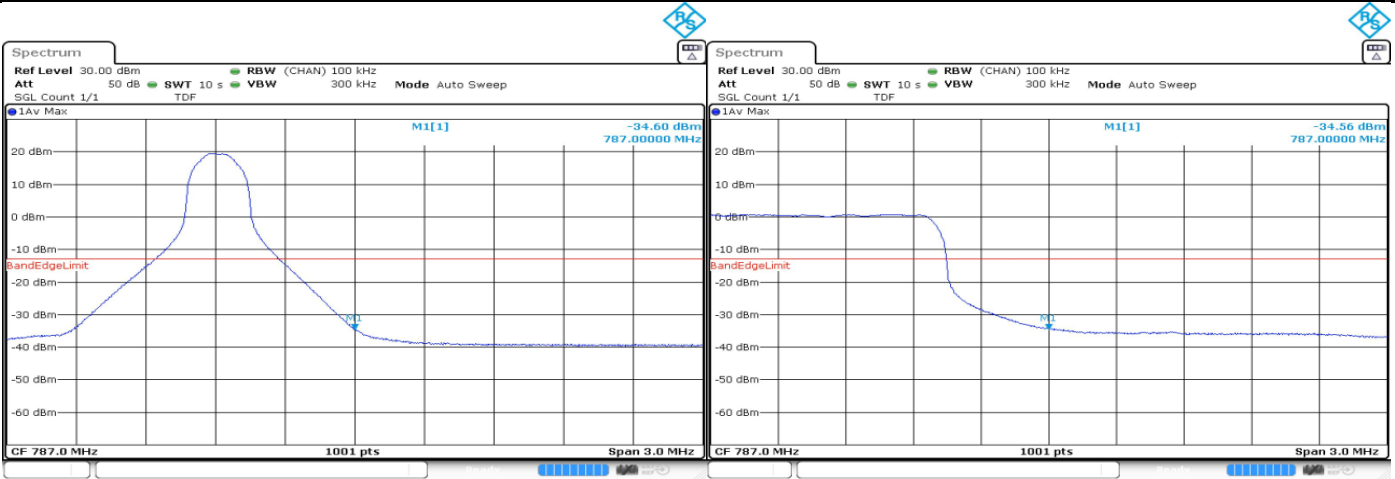
Band 13, 10MHz QPSK, High CH 23230			
RB = 1	Offset =X-1	RB = X (100%)	Offset = 0



Band 13, 10MHz 16-QAM, Low CH 23230			
RB = 1	Offset = 0	RB = X (100%)	Offset = 0

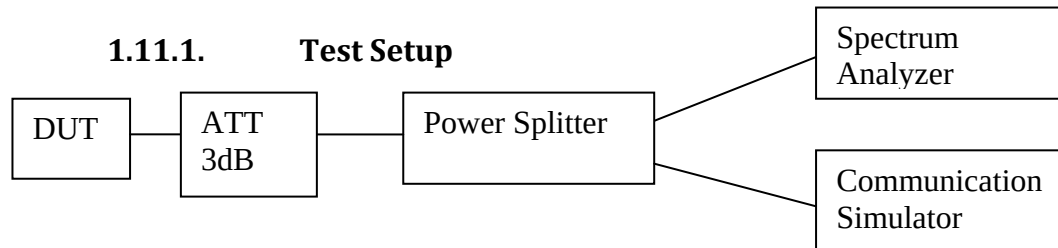


Band 13, 10MHz 16-QAM, High CH 23230			
RB = 1	Offset =X-1	RB = X (100%)	Offset = 0



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

For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log (P)$ dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;
- (5) Compliance with the provisions of paragraphs (1) and (2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

1.11.3. Conducted Spurious Emissions – LTE Band 13 (777-787MHz)

5MHz

