

	    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.A																												
<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 4) FCC 47 CFR Part 2 / 27 ISED RSS GEN / 139</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 4) FCC 47 CFR Part 2 / 27 ISED RSS GEN / 139	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	2-September-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(d)(6)	RSS-Gen 6.12 RSS-139 4.1	Conducted RF Output Power	Pass	Meet the requirement of limit	734TWP0386
27.50(d)(5)	RSS-139 6.5	Peak-to-Average Power Ratio	Pass	Meet the requirement of limit	734TWP0386
2.1049 27.53(h)(3)	RSS-Gen 6.7	Occupied Bandwidth (26dBc, 99%)	Pass	Meet the requirement of limit	734TWP0386
2.1055 27.54	RSS-139 6.4	Frequency Stability	Pass	Meet the requirement of limit	734TWP0386
2.1051 27.53(h)(1)(3)	RSS-Gen 6.13 RSS-139 6.6	Band Edge Conducted Spurious Emission	Pass	Meet the requirement of limit	734TWP0386
2.1051 27.53(h)(1)	RSS-Gen 6.13 RSS-139 6.6	Conducted Spurious Emissions	Pass	Meet the requirement of limit	734TWP0386
2.1053 27.53 (h)	RSS-139 6.6	Radiated Spurious Emission	Pass	Meet the requirement of limit	734TWP0308
2.1049 27.50(d)(4)	RSS-139 6.5	Equivalent Isotropically Radiated Power (EIRP)	Pass	Meet the requirement of limit	734TWP0386

1.1. Measurement Uncertainty

Measurement	Frequency	Expended 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 4			
Modulation Type	QPSK, 16QAM			
Operating Frequency	LTE Band 4	Channel Bandwidth 1.4MHz	1710.7MHz~1754.3MHz	
		Channel Bandwidth 3MHz	1711.5MHz~1753.5MHz	
		Channel Bandwidth 5MHz	1712.5MHz~1752.5MHz	
		Channel Bandwidth 10MHz	1715.0MHz~1750.0MHz	
		Channel Bandwidth 15MHz	1717.5MHz~1747.5MHz	
		Channel Bandwidth 20MHz	1720.0MHz~1745.0MHz	
Max. EIRP Power	LTE Band 4 QPSK	Channel Bandwidth 1.4MHz	26.361dBm (0.433W)	
		Channel Bandwidth 3MHz	26.42dBm (0.439W)	
		Channel Bandwidth 5MHz	26.361dBm (0.433W)	
		Channel Bandwidth 10MHz	26.308dBm (0.427W)	
		Channel Bandwidth 15MHz	26.249dBm (0.422W)	
		Channel Bandwidth 20MHz	26.194dBm (0.416W)	
	LTE Band 4 16QAM	Channel Bandwidth 1.4MHz	25.594dBm (0.363W)	
		Channel Bandwidth 3MHz	25.565dBm (0.360W)	
		Channel Bandwidth 5MHz	25.539dBm (0.358W)	
		Channel Bandwidth 10MHz	25.586dBm (0.362W)	
		Channel Bandwidth 15MHz	25.291dBm (0.338W)	
		Channel Bandwidth 20MHz	25.638dBm (0.366W)	
Emission Designator	LTE Band 4		QPSK	16QAM
		Channel Bandwidth 1.4MHz	1M07G7D	1M07D7W
		Channel Bandwidth 3MHz	2M68G7D	2M68D7W
		Channel Bandwidth 5MHz	4M48G7D	4M48D7W
		Channel Bandwidth 10MHz	8M93G7D	8M95D7W
		Channel Bandwidth 15MHz	13M4G7D	13M4D7W
		Channel Bandwidth 20MHz	17M8G7D	17M8D7W
Antenna Type	LTE Band 4	LTE MID-HIGH BAND MAIN ANTENNA (2.84dBi)		
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
Rechargeable Lithium ion battery	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 4	1.4 MHz	19957 ~ 20393	19957	20175	20393	1710.7	1732.5	1754.3
	3 MHz	19965 ~ 20386	19965	20175	20385	1711.5	1732.5	1753.5
	5 MHz	19975 ~ 20375	19975	20175	20375	1712.5	1732.5	1752.5
	10 MHz	20000 ~ 20350	20000	20175	20350	1715.0	1732.5	1750.0
	15 MHz	20025 ~ 20325	20025	20175	20325	1717.5	1732.5	1747.5
	20 MHz	20050 ~ 20300	20050	20175	20300	1720.0	1732.5	1745.0

1.5. Test Mode Applicability and Tested Channel Detail

LTE Band 4

Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Conducted RF Output Power	19957 ~ 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	As per table 1.6.3
	19965 ~ 20386	19965, 20175, 20385	3 MHz		
	19975 ~ 20375	19975, 20175, 20375	5 MHz		
	20000 ~ 20350	20000, 20175, 20350	10 MHz		
	20025 ~ 20325	20025, 20175, 20325	15 MHz		
	20050 ~ 20300	20050, 20175, 20300	20 MHz		
Peak to Average Power Ratio	19957 ~ 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
	19965 ~ 20386	19965, 20175, 20385	3 MHz		15 RB / 0 RB Offset
	19975 ~ 20375	19975, 20175, 20375	5 MHz		25 RB / 0 RB Offset
	20000 ~ 20350	20000, 20175, 20350	10 MHz		50 RB / 0 RB Offset
	20025 ~ 20325	20025, 20175, 20325	15 MHz		75 RB / 0 RB Offset
	20050 ~ 20300	20050, 20175, 20300	20 MHz		100 RB / 0 RB Offset
Occupied Bandwidth	19957 ~ 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
	19965 ~ 20386	19965, 20175, 20385	3 MHz		15 RB / 0 RB Offset
	19975 ~ 20375	19975, 20175, 20375	5 MHz		25 RB / 0 RB Offset
	20000 ~ 20350	20000, 20175, 20350	10 MHz		50 RB / 0 RB Offset
	20025 ~ 20325	20025, 20175, 20325	15 MHz		75 RB / 0 RB Offset
	20050 ~ 20300	20050, 20175, 20300	20 MHz		100 RB / 0 RB Offset
Frequency Stability	19957 ~ 20393	20175	1.4 MHz	QPSK	6 RB / 0 RB Offset
	19965 ~ 20386	20175	3 MHz		15 RB / 0 RB Offset
	19975 ~ 20375	20175	5 MHz		25 RB / 0 RB Offset
	20000 ~ 20350	20175	10 MHz		50 RB / 0 RB Offset
	20025 ~ 20325	20175	15 MHz		75 RB / 0 RB Offset
	20050 ~ 20300	20175	20 MHz		100 RB / 0 RB Offset
Band Edge Conducted Spurious Emission	19957 ~ 20393	19957, 20393	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset 1 RB / 5 RB Offset 6 RB / 0 RB Offset
	19965 ~ 20386	19965, 20385	3 MHz		1 RB / 0 RB Offset 1 RB / 14 RB Offset 15 RB / 0 RB Offset
	19975 ~ 20375	19975, 20375	5 MHz		1 RB / 0 RB Offset

					1 RB / 24 RB Offset 25 RB / 0 RB Offset
	20000 ~ 20350	20000, 20350	10 MHz		1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
	20025 ~ 20325	20025, 20325	15 MHz		1 RB / 0 RB Offset 1 RB / 74 RB Offset 75 RB / 0 RB Offset
	20050 ~ 20300	20050, 20300	20 MHz		1 RB / 0 RB Offset 1 RB / 99 RB Offset 100 RB / 0 RB Offset
Conducted Spurious Emission	19957 ~ 20393	19957, 20175, 20393	1.4 MHz	QPSK	1 RB / 3 RB Offset
	19965 ~ 20386	19965, 20175, 20385	3 MHz		1 RB / 7 RB Offset
	19975 ~ 20375	19975, 20175, 20375	5 MHz		1 RB / 0 RB Offset
	20000 ~ 20350	20000, 20175, 20350	10 MHz		1 RB / 49 RB Offset
	20025 ~ 20325	20025, 20175, 20325	15 MHz		1 RB / 0 RB Offset
	20050 ~ 20300	20050, 20175, 20300	20 MHz		1 RB / 99 RB Offset
Radiated Emission	19965 ~ 20386	19965	3 MHz	QPSK	1 RB / 7 RB Offset
	20025 ~ 20325	20175	15 MHz		1 RB / 0 RB Offset
	20050 ~ 20300	20300	20 MHz		1 RB / 99 RB Offset
Equivalent Isotropically Radiated Power (EIRP)	19957 ~ 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	As per table 1.6.4
	19965 ~ 20386	19965, 20175, 20385	3 MHz		
	19975 ~ 20375	19975, 20175, 20375	5 MHz		
	20000 ~ 20350	20000, 20175, 20350	10 MHz		
	20025 ~ 20325	20025, 20175, 20325	15 MHz		
	20050 ~ 20300	20050, 20175, 20300	20 MHz		

NOTE:

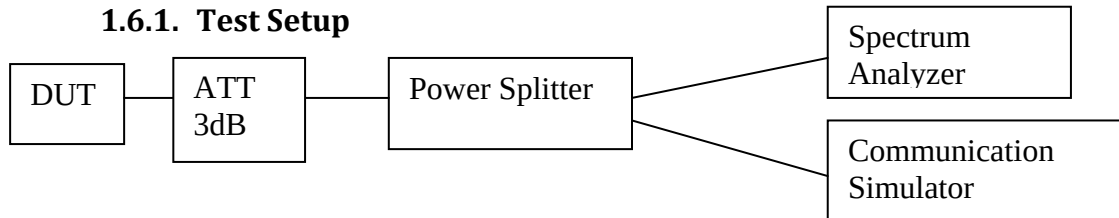
1. The Conducted RF Output Power for QPSK and 16QAM, measured value of QPSK mode is higher than 16QAM mode. Therefore, only Conducted Spurious Emission and Radiated Emission had been tested under QPSK modes.
2. Band Edge was performed with 1 and full Resource Block at the lowest and highest operating 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: Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.
 ISSED: The equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters shall not exceed one watt.

1.6.3. Conducted RF Output Power – LTE Band 4 (1710-1755MHz)

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
			19957	20175	20393	19957	20175	20393
			1710.7 MHz	1732.5 MHz	1754.3 MHz	1710.7 MHz	1732.5 MHz	1754.3 MHz
Band 4 / 1.4 MHz	1	0	23.461	23.243	22.884	22.598	22.371	21.885
	1	3	23.521	23.293	22.923	22.675	22.445	22.065
	1	5	23.437	23.26	22.875	22.629	22.372	22.002
	3	0	23.458	23.267	22.825	22.675	22.292	22.055
	3	2	23.495	23.298	22.88	22.754	22.353	22.1
	3	3	23.432	23.247	22.848	22.694	22.292	22.07
	6	0	22.459	22.273	21.804	21.576	21.299	20.942

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
			19965	20175	20385	19965	20175	20385
			1711.5 MHz	1732.5 MHz	1753.5 MHz	1711.5 MHz	1732.5 MHz	1753.5 MHz
Band 4 / 3MHz	1	0	23.524	23.255	22.884	22.594	22.632	21.987
	1	7	23.58	23.344	22.996	22.599	22.725	22.107
	1	14	23.486	23.28	22.875	22.526	22.581	21.993
	8	0	22.503	22.306	21.902	21.584	21.515	20.94
	8	4	22.525	22.327	21.922	21.612	21.543	20.966
	8	7	22.438	22.317	21.902	21.57	21.505	20.933
	15	0	22.483	22.322	21.914	21.584	21.421	20.981

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
			19975	20175	20375	19975	20175	20375
			1712.5MHz	1732.5MHz	1752.5MHz	1712.5MHz	1732.5MHz	1752.5MHz
Band 4 / 5MHz	1	0	23.521	23.372	22.841	22.632	22.699	21.877
	1	13	23.494	23.392	22.9	22.623	22.687	21.923
	1	24	23.433	23.315	22.871	22.578	22.645	21.875
	12	0	22.483	22.358	21.948	21.502	21.442	21.005
	12	6	22.491	22.366	21.959	21.5	21.401	21.014
	12	13	22.427	22.328	21.953	21.453	21.382	21.024
	25	0	22.449	22.341	21.966	21.539	21.393	20.985

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
			20000	20175	20350	20000	20175	20350
			1715MHz	1732.5MHz	1750MHz	1715MHz	1732.5MHz	1750MHz
Band 4 / 10MHz	1	0	23.459	23.373	22.828	22.49	22.746	21.934
	1	25	23.353	23.251	22.806	22.366	22.654	21.919
	1	49	23.468	23.279	22.878	22.466	22.674	21.964
	25	0	22.425	22.42	21.853	21.526	21.513	21.003
	25	13	22.379	22.343	21.869	21.488	21.483	21.036
	25	25	22.449	22.326	21.888	21.563	21.468	21.034
	50	0	22.464	22.37	21.901	21.588	21.473	20.955

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
			20025	20175	20325	20025	20175	20325
			1717.5MHz	1732.5MHz	1747.5MHz	1717.5MHz	1732.5MHz	1747.5MHz
Band 4 / 15MHz	1	0	23.409	23.401	23.056	22.426	22.451	22.385
	1	38	23.252	23.207	22.885	22.261	22.34	22.224
	1	74	23.335	23.26	22.975	22.358	22.374	22.281
	36	0	22.321	22.433	22.022	21.435	21.509	21.159
	36	19	22.359	22.36	21.933	21.491	21.447	21.036
	36	39	22.315	22.358	21.939	21.424	21.439	21.091
	75	0	22.35	22.357	22.035	21.447	21.461	21.167

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
			20050	20175	20300	20050	20175	20300
			1720MHz	1732.5MHz	1745MHz	1720MHz	1732.5MHz	1745MHz
Band 4 / 20MHz	1	0	23.29	23.31	23.085	22.739	22.798	22.137
	1	49	23.169	23.294	22.915	22.61	22.704	21.96
	1	99	23.238	23.354	23.175	22.703	22.736	22.102
	50	0	22.368	22.468	22.145	21.454	21.536	21.208
	50	25	22.308	22.412	22.191	21.376	21.464	21.239
	50	50	22.375	22.348	22.105	21.452	21.42	21.161
	100	0	22.288	22.39	22.149	21.38	21.493	21.245

1.6.4. Equivalent Isotropically Radiated Power (EIRP) - LTE Band 4 (1710-1755MHz)

Equivalent Isotropically 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
			19957	20175	20393	19957	20175	20393
			1710.7 MHz	1732.5 MHz	1754.3 MHz	1710.7 MHz	1732.5 MHz	1754.3 MHz
Band 4 / 1.4 MHz	1	0	26.301	26.083	25.724	25.438	25.211	24.725
	1	3	26.361	26.133	25.763	25.515	25.285	24.905
	1	5	26.277	26.1	25.715	25.469	25.212	24.842
	3	0	26.298	26.107	25.665	25.515	25.132	24.895
	3	2	26.335	26.138	25.72	25.594	25.193	24.94
	3	3	26.272	26.087	25.688	25.534	25.132	24.91
	6	0	25.299	25.113	24.644	24.416	24.139	23.782

Equivalent Isotropically 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
			19965	20175	20385	19965	20175	20385
			1711.5 MHz	1732.5 MHz	1753.5 MHz	1711.5 MHz	1732.5 MHz	1753.5 MHz
Band 4 / 3MHz	1	0	26.364	26.095	25.724	25.434	25.472	24.827
	1	7	26.42	26.184	25.836	25.439	25.565	24.947
	1	14	26.326	26.12	25.715	25.366	25.421	24.833
	8	0	25.343	25.146	24.742	24.424	24.355	23.78
	8	4	25.365	25.167	24.762	24.452	24.383	23.806
	8	7	25.278	25.157	24.742	24.41	24.345	23.773
	15	0	25.323	25.162	24.754	24.424	24.261	23.821

Equivalent Isotropically 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
			19975	20175	20375	19975	20175	20375
			1712.5MHz	1732.5MHz	1752.5MHz	1712.5MHz	1732.5MHz	1752.5MHz
Band 4 / 5MHz	1	0	26.361	26.212	25.681	25.472	25.539	24.717
	1	13	26.334	26.232	25.74	25.463	25.527	24.763
	1	25	26.273	26.155	25.711	25.418	25.485	24.715
	12	0	25.323	25.198	24.788	24.342	24.282	23.845
	12	6	25.331	25.206	24.799	24.34	24.241	23.854
	12	13	25.267	25.168	24.793	24.293	24.222	23.864
	25	0	25.289	25.181	24.806	24.379	24.233	23.825

Equivalent Isotropically 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
			20000	20175	20350	20000	20175	20350
			1715MHz	1732.5MHz	1750MHz	1715MHz	1732.5MHz	1750MHz
Band 4 / 10MHz	1	0	26.299	26.213	25.668	25.33	25.586	24.774
	1	25	26.193	26.091	25.646	25.206	25.494	24.759
	1	49	26.308	26.119	25.718	25.306	25.514	24.804
	25	0	25.265	25.26	24.693	24.366	24.353	23.843
	25	13	25.219	25.183	24.709	24.328	24.323	23.876
	25	25	25.289	25.166	24.728	24.403	24.308	23.874
	50	0	25.304	25.21	24.741	24.428	24.313	23.795

Equivalent Isotropically 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
			20025	20175	20325	20025	20175	20325
			1717.5MHz	1732.5MHz	1747.5MHz	1717.5MHz	1732.5MHz	1747.5MHz
Band 4 / 15MHz	1	0	26.249	26.241	25.896	25.266	25.291	25.225
	1	38	26.092	26.047	25.725	25.101	25.18	25.064
	1	74	26.175	26.1	25.815	25.198	25.214	25.121
	36	0	25.161	25.273	24.862	24.275	24.349	23.999
	36	19	25.199	25.2	24.773	24.331	24.287	23.876
	36	39	25.155	25.198	24.779	24.264	24.279	23.931
	75	0	25.19	25.197	24.875	24.287	24.301	24.007

Equivalent Isotropically 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
			20050	20175	20300	20050	20175	20300
			1720MHz	1732.5MHz	1745MHz	1720MHz	1732.5MHz	1745MHz
Band 4 / 20MHz	1	0	26.13	26.15	25.925	25.579	25.638	24.977
	1	49	26.009	26.134	25.755	25.45	25.544	24.8
	1	99	26.078	26.194	26.015	25.543	25.576	24.942
	50	0	25.208	25.308	24.985	24.294	24.376	24.048
	50	25	25.148	25.252	25.031	24.216	24.304	24.079
	50	50	25.215	25.188	24.945	24.292	24.26	24.001
	100	0	25.128	25.23	24.989	24.22	24.333	24.085

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

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

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

Where, ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively

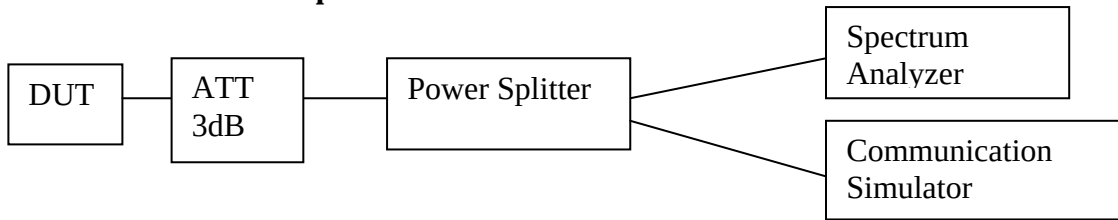
(Expressed in the same units as P_{Meas}, e.g., dBm)

P_{Meas} measured transmitter output power, in dBm

GT 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.

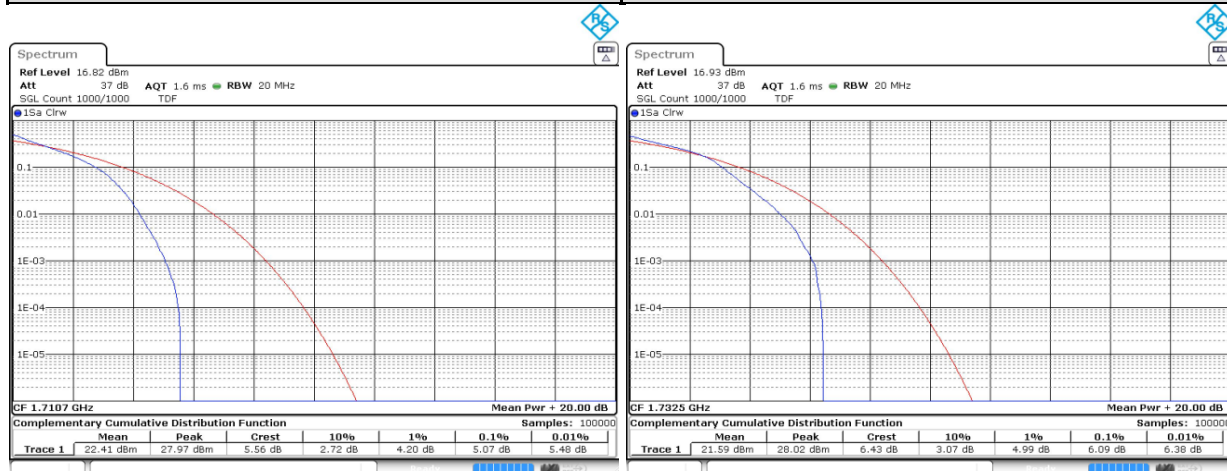
1.7.2. Test Limit

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 - LTE Band 4 (1710-1755MHz)

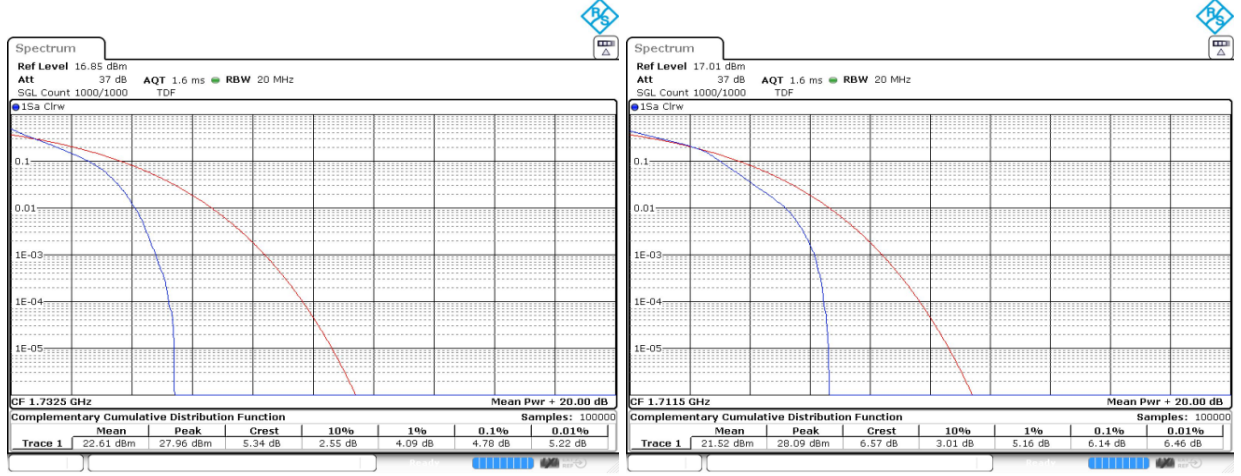
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 4/1.4MHz/6/0	Low CH 19957	1710.7 MHz	5.072	5.971
	Mid CH 20175	1732.5 MHz	4.899	6.087
	High CH 20393	1754.3 MHz	4.899	5.942

Spectrum Plot of Worst Value	
QPSK	16QAM



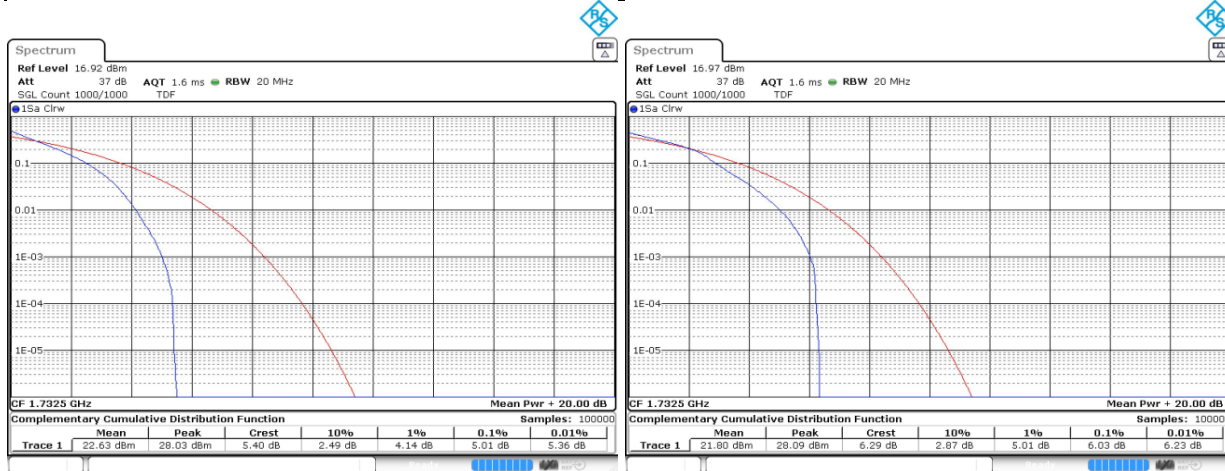
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 4/3MHz/15/0	Low CH 19965	1711.5 MHz	4.667	6.145
	Mid CH 20175	1732.5 MHz	4.783	6.087
	High CH 20385	1753.5 MHz	4.638	5.855

Spectrum Plot of Worst Value	
QPSK	16QAM



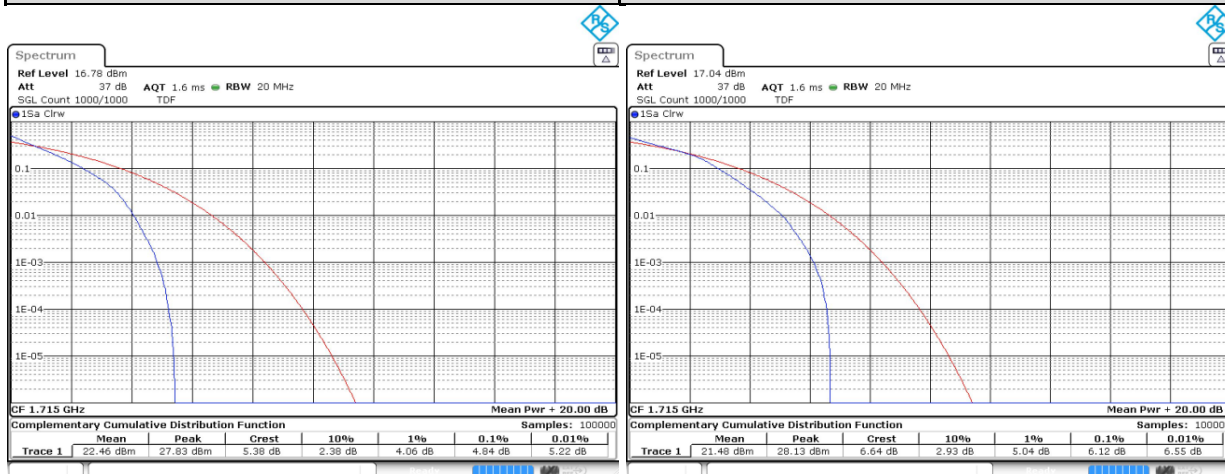
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 4/5MHz/25/0	Low CH 19975	1712.5 MHz	4.812	6
	Mid CH 20175	1732.5 MHz	5.014	6.029
	High CH 20375	1752.5 MHz	4.841	5.884

Spectrum Plot of Worst Value	
QPSK	16QAM



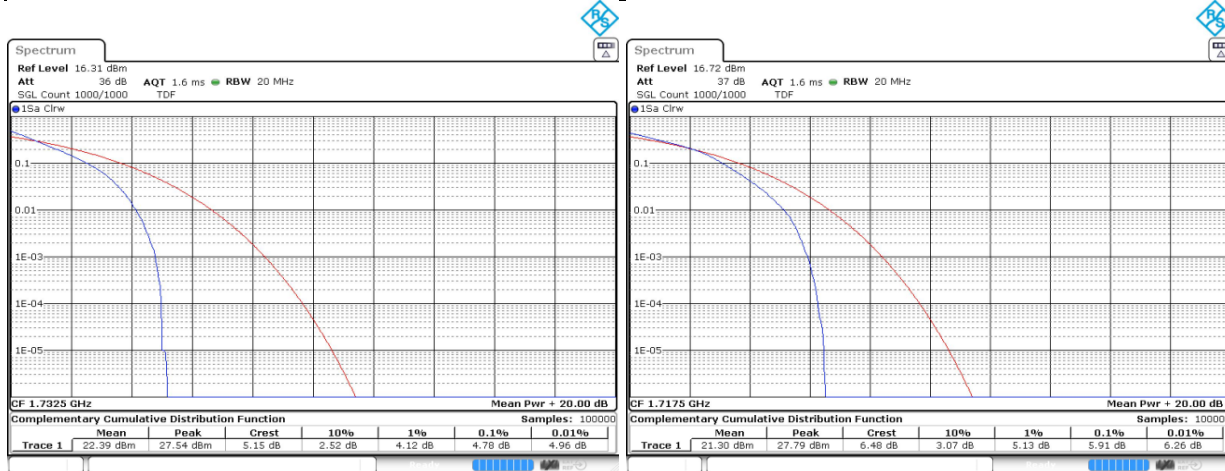
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 4/10MHz/50/0	Low CH 20000	1715 MHz	4.841	6.116
	Mid CH 20175	1732.5 MHz	4.841	6
	High CH 20350	1750 MHz	4.783	5.913

Spectrum Plot of Worst Value	
QPSK	16QAM



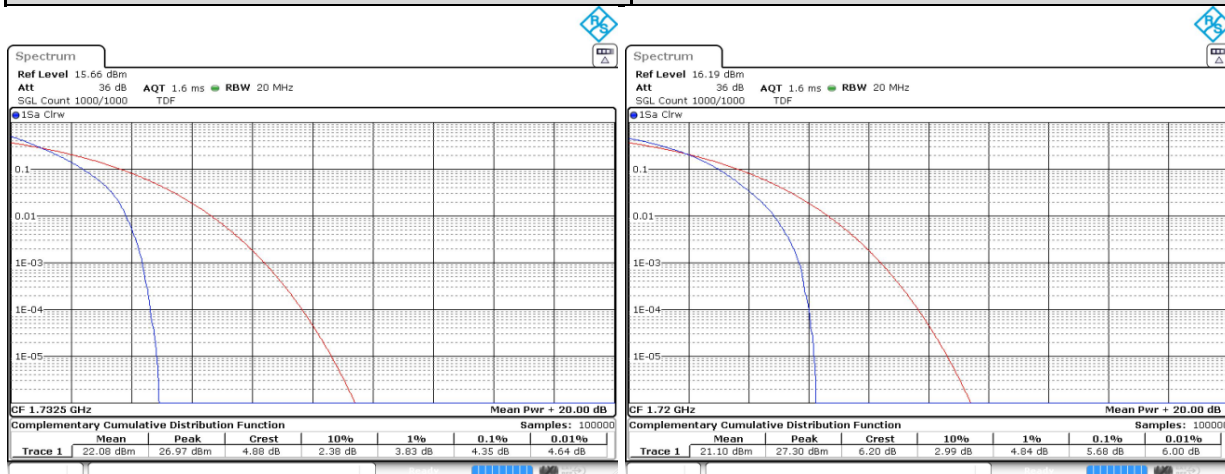
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 4/15MHz/75/0	Low CH 20025	1717.5 MHz	4.754	5.913
	Mid CH 20175	1732.5 MHz	4.783	5.884
	High CH 20325	1747.5 MHz	4.638	5.768

Spectrum Plot of Worst Value	
QPSK	16QAM



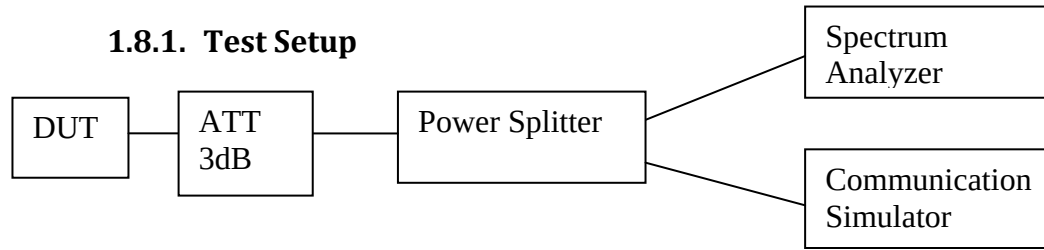
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	Peak To Average (dB)	
			QPSK Modulation	16QAM Modulation
Band 4/20MHz/100/0	Low CH 20050	1720 MHz	4.261	5.681
	Mid CH 20175	1732.5 MHz	4.348	5.652
	High CH 20300	1745 MHz	4.174	5.594

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.

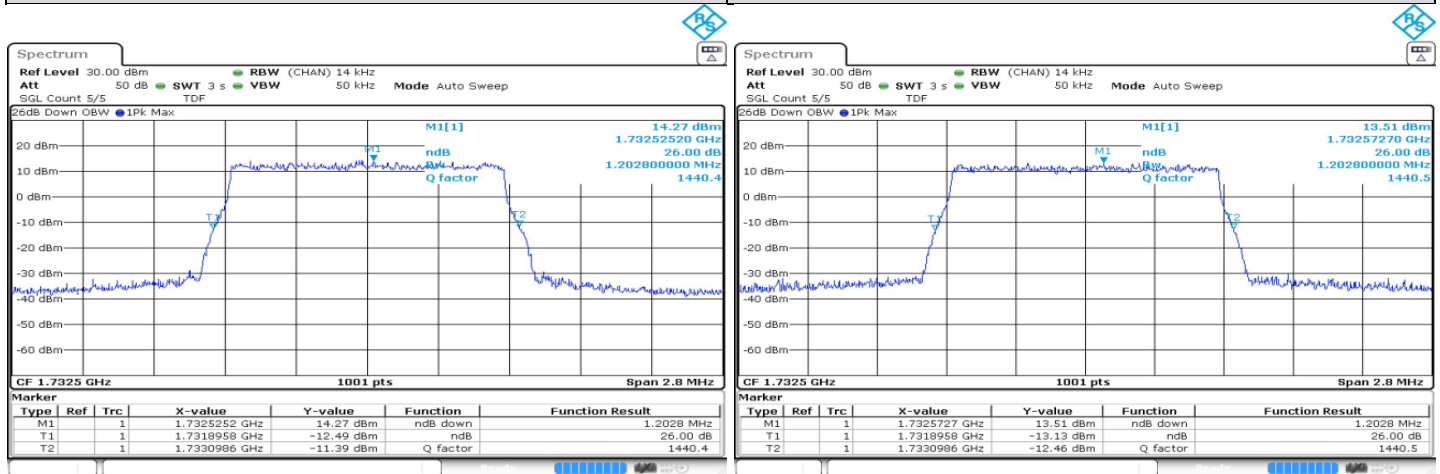
1.8.2. Test Limit

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.

1.8.3. Occupied Bandwidth - LTE Band 4 (1710-1755MHz)

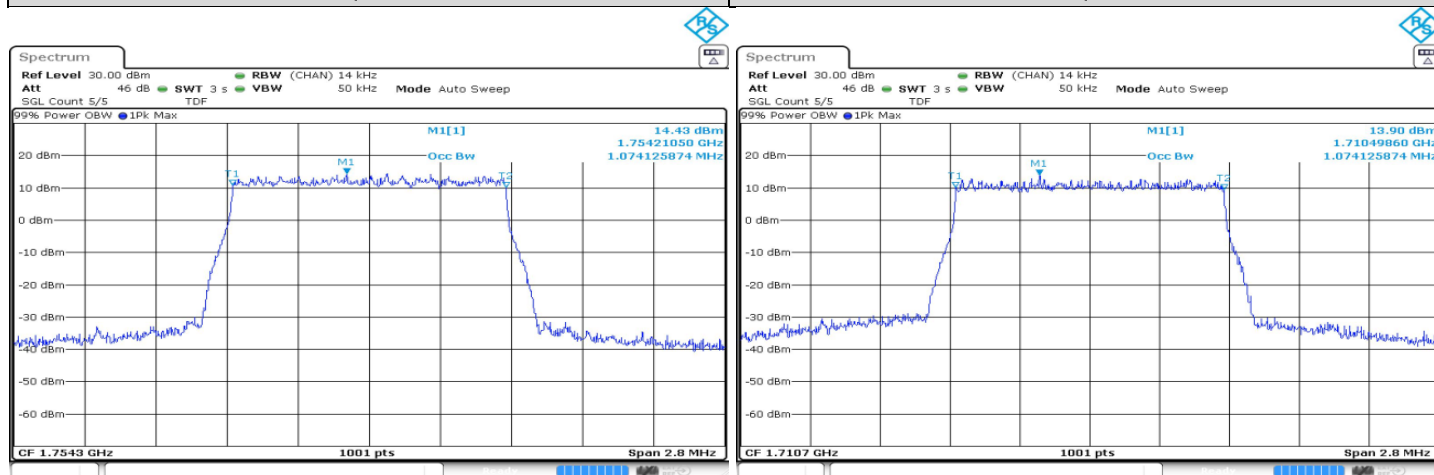
LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4 / 1.4MHz/6/0	Low CH 19957	1710.7 MHz	1.183	1.178
	Mid CH 20175	1732.5 MHz	1.203	1.203
	High CH 20393	1754.3 MHz	1.197	1.178

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



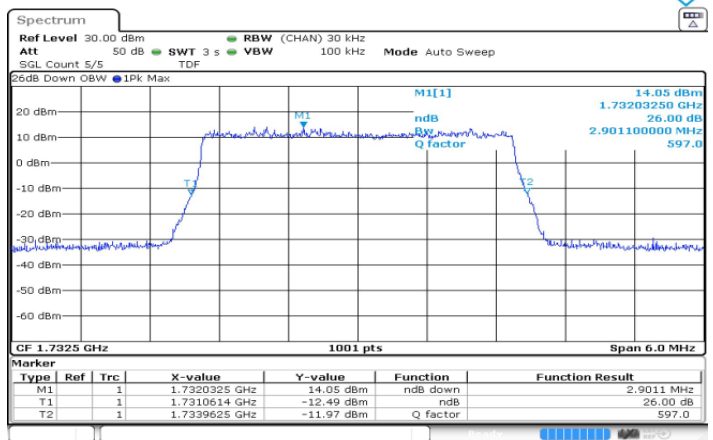
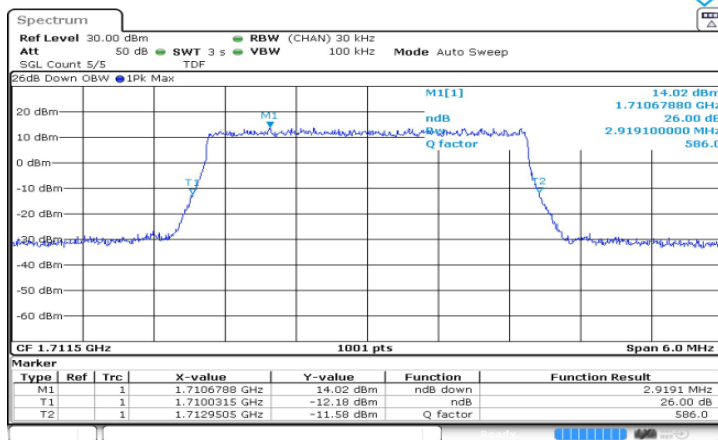
LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4 / 1.4MHz/6/0	Low CH 19957	1710.7 MHz	1.071	1.074
	Mid CH 20175	1732.5 MHz	1.071	1.074
	High CH 20393	1754.3 MHz	1.074	1.071

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



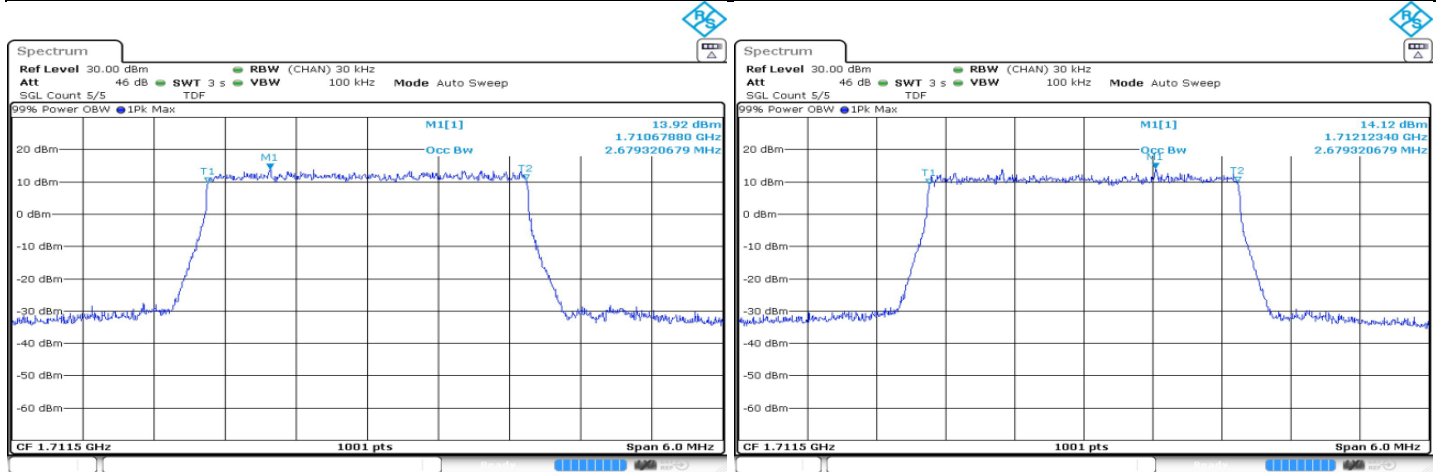
LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4 / 3MHz/15/0	Low CH 19965	1711.5 MHz	2.919	2.895
	Mid CH 20175	1732.5 MHz	2.889	2.901
	High CH 20385	1753.5 MHz	2.895	2.865

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



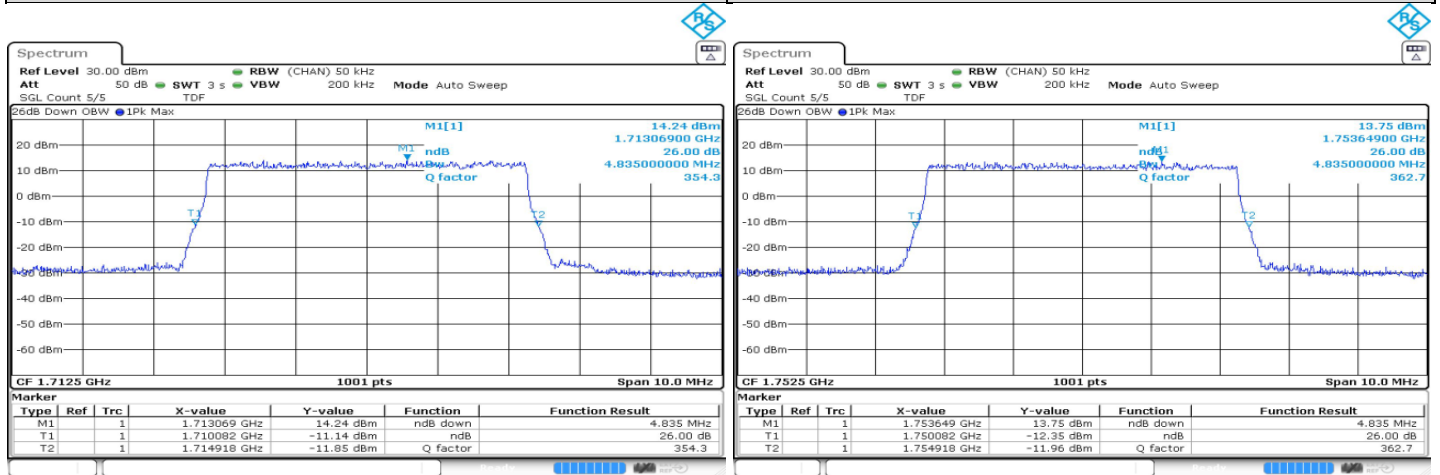
LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4 / 3MHz/15/0	Low CH 19965	1711.5 MHz	2.679	2.679
	Mid CH 20175	1732.5 MHz	2.679	2.673
	High CH 20385	1753.5 MHz	2.673	2.679

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



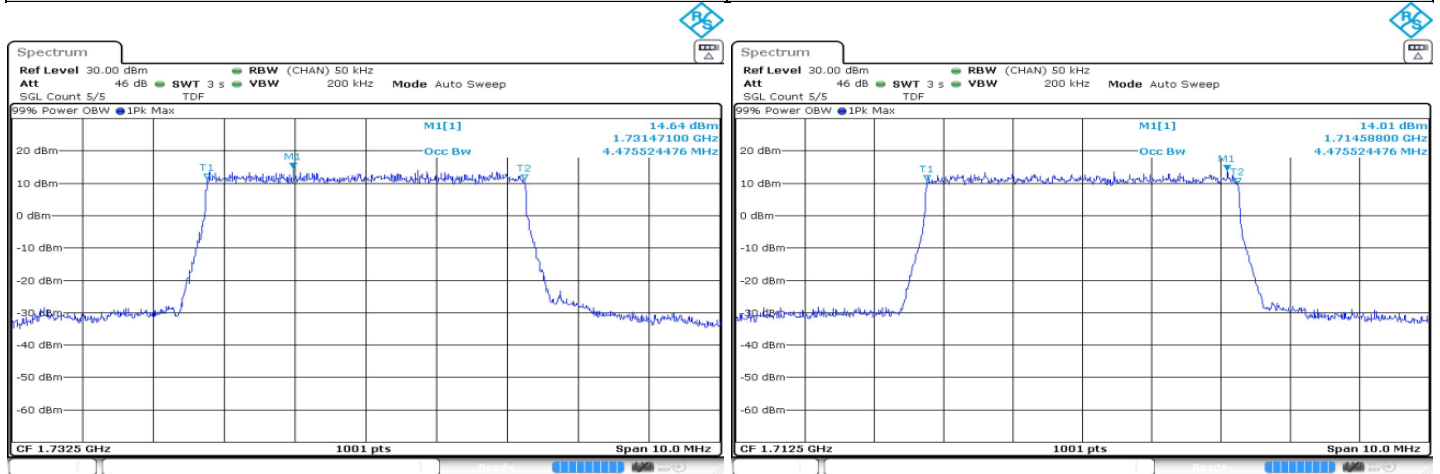
LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4 / 5MHz/25/0	Low CH 19975	1712.5 MHz	4.835	4.785
	Mid CH 20175	1732.5 MHz	4.825	4.785
	High CH 20375	1752.5 MHz	4.815	4.835

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



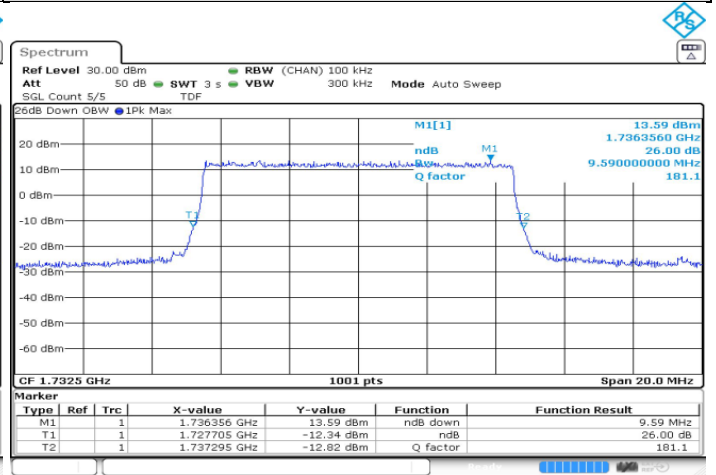
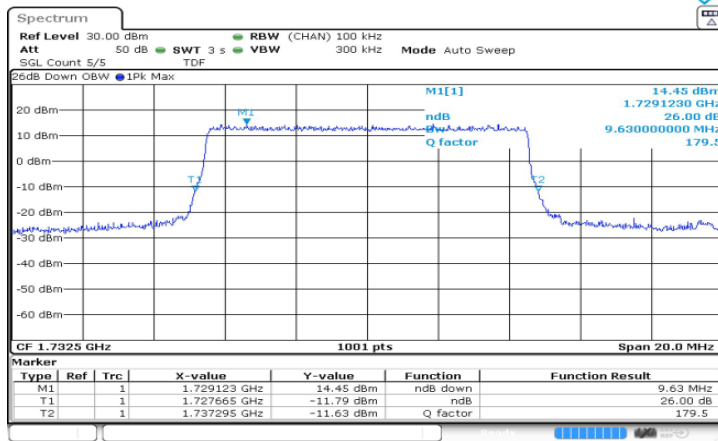
LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4 / 5MHz/25/0	Low CH 19975	1712.5 MHz	4.466	4.476
	Mid CH 20175	1732.5 MHz	4.476	4.476
	High CH 20375	1752.5 MHz	4.476	4.476

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



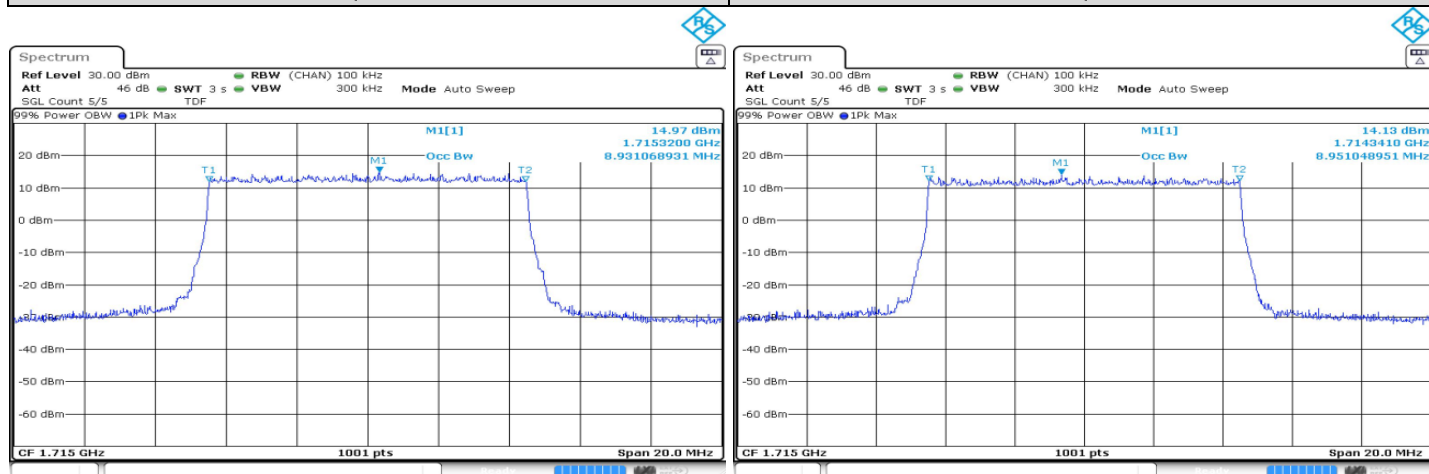
LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4 / 10MHz/50/0	Low CH 20000	1715 MHz	9.53	9.53
	Mid CH 20175	1732.5 MHz	9.63	9.59
	High CH 20350	1750 MHz	9.51	9.51

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 4 / 10MHz/50/0	Low CH 20000	1715 MHz	8.931	8.951
	Mid CH 20175	1732.5 MHz	8.931	8.931
	High CH 20350	1750 MHz	8.911	8.911

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 4 / 15MHz/75/0	Low CH 20025	1717.5 MHz	14.266	14.206
	Mid CH 20175	1732.5 MHz	14.416	14.266
	High CH 20325	1747.5 MHz	14.356	14.206

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

