FCC 47 CFR PART 02
FCC 47 CFR PART 96

CERTIFICATION TEST REPORT

For

Tablet

MODEL NUMBER: VT-TABLET-5081G

FCC ID: 2AAGE5081GB48

REPORT NUMBER: 4789823272-5

ISSUE DATE: March 17, 2021

Prepared for

Chengdu Vantron Technology Co., Ltd.
No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China

Prepared by

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Revision History

Rev.	Issue Date	Revisions	Revised By
--	03/17/2021	Initial Issue	

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	Chengdu Vantron Technology Co., Ltd.
Address:	No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China

Manufacturer Information

Company Name:	Chengdu Vantron Technology Co., Ltd.
Address:	No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China

EUT Information

EUT Name:	Tablet
Model:	VT-TABLET-5081G
Brand:	VANTRON
Sample Received Date:	January 20, 2021
Sample Status:	Normal
Sample ID:	/
Date of Tested:	January 20, 2021~ March 17,2021

APPLICABLE STANDARDS

STANDARD	TEST RESULTS
FCC 47 CFR PART 2	PASS
FCC 47 CFR PART 96	PASS

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.26-2015 & KDB971168, FCC CFR 47 Part 2, Part 27, Part90,RSS-140,RSS-192,RSS-197,RSS-199.

3. FACILITIES AND ACCREDITATIO

Accreditation Certificate	**A2LA (Certificate No.: 4102.01)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA. **FCC (FCC Designation No.: CN1187)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules **ISED (Company No.: 21320)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320. **VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011

Note 1: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

Note 2: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

4. CALIBRATION AND UNCERTAINTY

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

4.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Uncertainty for Conduction emission test	3.32dB (150KHz-30MHz)
	3.72dB (9KHz-150KHz)
Uncertainty for Radiation Emission test (include Fundamental emission) (30MHz-1GHz)	4.70 dB (Antenna Polarize: V)
	4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1GHz to 26GHz) (include Fundamental emission)	4.10dB(1-6GHz)
	4.40dB (6GHz-18Gz)
	3.54dB (18GHz-26Gz)
Bandwidth	1.1%
Stop Transmitting Time Test	0.6%
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

5. EQUIPMENT UNDER TEST

5.1 DESCRIPTION OF EUT

Equipment	Tablet		
Model Name	VT-TABLET-5081G		
Power Input	DC 3.85V, 890mAh		
Power Supply	Power Adapter	Input	/
		Output	/
	Li-ion Battery	3.8 V, 8000 mAh, 30.4Wh	
Hardware Version	5.0		
Software Version	/		

5.2 TECHNICAL INFORMATION

E-UTRA Band	Characteristics		
	E-UTRA operating bands		Bandwidth
	Transmit	Receive	
48	3550 MHz to 3700 MHz	3550 MHz to 3700 MHz	☒5M ☒20M ☒10M ☒15M

5.3 MAXIMUM OUTPUT POWER

The transmitter has a maximum radiated ERP / EIRP output powers as follows:

LTE Band48

Part 96						
EIRP Limit(W)/ 10MHz		0.20				
Antenna Gain (dBi)		-0.3				
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)
5	QPSK	3552.5	3697.5	20.24	19.94	0.099
	16QAM			20.26	19.96	0.099
10	QPSK	3555.0	3695.0	20.26	19.96	0.099
	16QAM			20.21	19.91	0.098
15	QPSK	3557.5	3692.5	20.4	20.1	0.102
	16QAM			20.48	20.18	0.104
20	QPSK	3560	3690	20.49	20.19	0.104
	16QAM			20.46	20.16	0.104

5.4 WORST-CASE CONFIGURATION AND MODE

The EUT supports LTE Bands of:
, Band 48.

During all testing, EUT is in link mode with base station emulator at maximum power level. The worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on QPSK, 16QAM. All testing was performed using QPSK and 16QAM modulations to represent the worst case.

The radiated spurious emissions measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT was investigated in three orthogonal orientations X, Y and Z. It was determined that X orientation was the worst-case orientation connected with charger and earphone.

Radiated spurious emissions were investigated below 30MHz, 30MHz-1GHz and above 1GHz. There were no emissions found on below 30MHz. the emissions between 30MHz-1GHz were tested the highest transmitting power channel and the worse configuration.

Worst Case

Test Items	Test configuration			
Description	Modulation	Channel	Bandwidth (MHz)	RB Configuration
Occupied Bandwidth	QPSK, 16QAM	L, M, H	5,10,15,20	Full RB
Band Edge Compliance(Adjacent Channel Power)	QPSK, 16QAM	L, M, H	The Maximum BW	RB size=1, RB Location= Low
Spurious Emission at Antenna Terminal	QPSK,	L, M, H	5,10,15,20	1.RB size=1, RB Location= Low,High 2.RB Size=Full
Radiated Spurious Emissions	QPSK	L, M, H	The Maximum BW	RB size=1, RB Location= Low

5.5 TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	52%	
Atmospheric Pressure:	1025Pa	
Temperature	TN	25.0 °C
Voltage:	VL	4.25 V
	VN	5.0 V
	VH	5.75 V
	End Voltage	3.00V

Note: VL= Lower Extreme Test Voltage
VN= Nominal Voltage
VH= Upper Extreme Test Voltage
TN= Normal Temperature

5.6 TEST CHANNEL LIST

Mode	TX/RX	Low	Middle	High
LTE Band 48	TX (5 MHz)	55265	55990	56715
		3552.5	3625.5	3697.5
	TX (10 MHz)	55290	55990	56690
		3555.0	3625.5	3695.0
	TX (15 MHz)	55315	55990	56665
		3557.5	3625.5	3692.5
	TX (20 MHz)	55340	55990	56640
		3560.0	3625.5	3690.0

5.7 DESCRIPTION OF AVAILABLE ANTENNAS

Band	Antenna Type	Antenna Gain (dBi)
LTE Band 48	PIFA	-0.3

5.8 DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	FCC ID
1	N/A	N/A	N/A	N/A

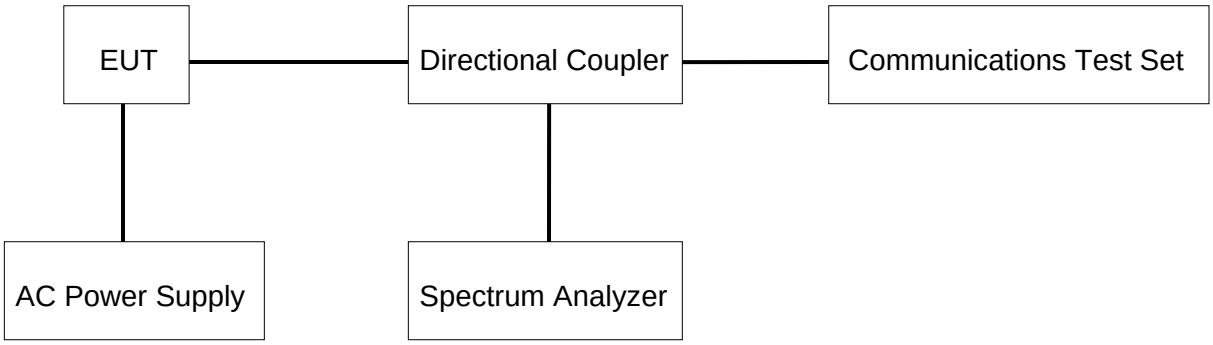
I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	N/A	N/A	N/A	N/A	N/A

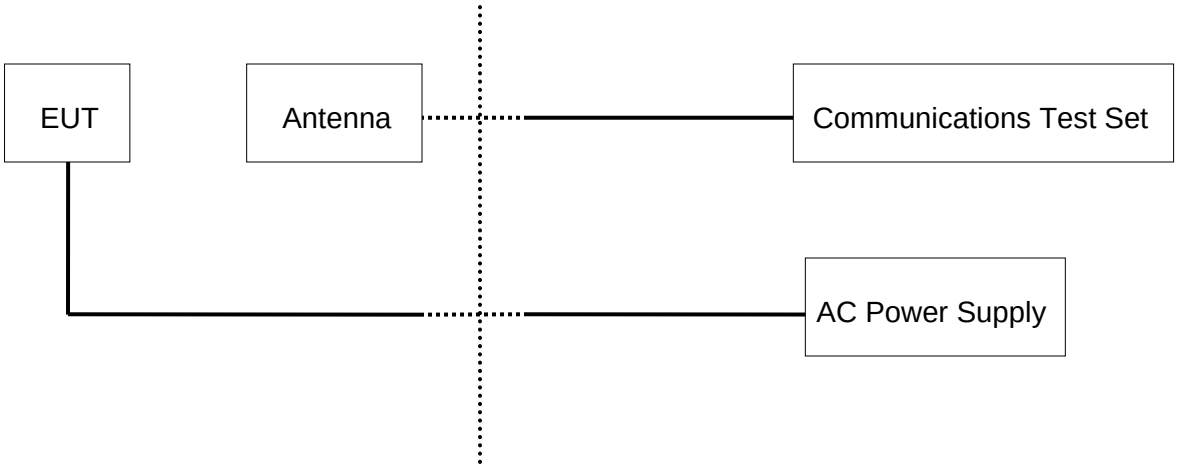
ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	Travel Changer	/	RD0501000-USBA18MG	5V/1A

CONDUCTED TEST SETUP



RADIATED TEST SETUP



5.9 MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions						
Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	UXM 5G Wireless Test Platform	Keysight	E7515B	MY60102194	Feb.09,2021	Feb.09,2022
☑	Wideband Radio Communication Tester	Starpoint	SP9500-CTS	SP9500-20517	Feb.09,2021	Feb.09,2022
☑	Signal & Spectrum analyzer	R&S	FSW	1312.8000K26-103950-sj	Nov.20,2020	Nov.19,2021
☑	RF conditioning unit	Tonscend	JS0806-1	1518.0003.14-101329-aZ	\	\
☑	Wideband filter unit	Tonscend	JS0806-F	20J8060329	\	\
Software						
Used	Description			Manufacturer	Name	Version
☑	JS1120 RF Test System			Tonscend	JS1120	Ver 2.6.9

Conducted Emissions					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
EMI Test Receiver	R&S	ESR3	101961	Nov. 12, 2020	Nov. 11, 2021
Two-Line V-Network	R&S	ENV216	101983	Nov. 12, 2020	Nov. 11, 2021
Software					
Description			Manufacturer	Name	Version
Test Software for Conducted Emissions			Farad	EZ-EMC	Ver. UL-3A1
Radiated Emissions					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Nov. 12, 2020	Nov. 11, 2021
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Aug. 11, 2018	Aug. 10, 2021
Preamplifier	HP	8447D	2944A09099	Nov. 12, 2020	Nov. 11, 2021
EMI Measurement Receiver	R&S	ESR26	101377	Nov. 12, 2020	Nov. 11, 2021
Horn Antenna	TDK	HRN-0118	130939	Sept. 17, 2018	Sept. 17, 2021

Preamplifier	TDK	PA-02-0118	TRS-305-00067	Nov. 20, 2020	Nov. 19, 2021
Horn Antenna	Schwarzbeck	BBHA9170	#691	Aug. 11, 2018	Aug. 11, 2021
Preamplifier	TDK	PA-02-2	TRS-307-00003	Nov. 12, 2020	Nov. 11, 2021
Preamplifier	TDK	PA-02-3	TRS-308-00002	Nov. 12, 2020	Nov. 11, 2021
Loop antenna	Schwarzbeck	1519B	00008	Jan.17, 2019	Jan.17,2022
Preamplifier	TDK	PA-02-001-3000	TRS-302-00050	Nov. 12, 2020	Nov. 11, 2021
Preamplifier	Mini-Circuits	ZX60-83LN-S+	SUP01201941	Nov. 20, 2020	Nov. 19, 2021
Highpass Filter	Wainwright	WHKX10-5850-6500-1800-40SS	4	Nov. 12, 2020	Nov. 11, 2021
Band Reject Filter	Wainwright	WRCJV12-5695-5725-5850-5880-40SS	4	Nov. 12, 2020	Nov. 11, 2021
Band Reject Filter	Wainwright	WRCJV20-5120-5150-5350-5380-60SS	2	Nov. 12, 2020	Nov. 11, 2021
Band Reject Filter	Wainwright	WRCJV20-5440-5470-5725-5755-60SS	1	Nov. 12, 2020	Nov. 11, 2021
Software					
Description		Manufacturer	Name	Version	
Test Software for Radiated Emissions		Farad	EZ-EMC	Ver. UL-3A1	

Tonsend RF Test System					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
Wideband Radio Communication Tester	R&S	CMW500	155523	Nov.20,2020	Nov.19,2021
PXA Signal Analyzer	Keysight	N9030A	MY55410512	Nov.20,2020	Nov.19,2021
MXG Vector Signal Generator	Keysight	N5182B	MY56200284	Nov.20,2020	Nov.19,2021
MXG Vector Signal Generator	Keysight	N5172B	MY56200301	Nov.20,2020	Nov.19,2021
DC power supply	Keysight	E3642A	MY55159130	Nov.24,2020	Nov.23,2021
Temperature & Humidity Chamber	SANMOOD	SG-80-CC-2	2088	Nov.20,2020	Nov.19,2021
Software					

Description	Manufacturer	Name	Version
Tonsend SRD Test System	Tonsend	JS1120-3 RF Test System	2.6.77.0518

Other Instruments					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Dual Channel Power Meter	Keysight	N1912A	MY55416024	Nov. 20, 2020	Nov. 19, 2021
Power Sensor	Keysight	USB Wideband Power Sensor	MY5100022	Nov. 20, 2020	Nov. 19, 2021

6. TEST RESULTS

6.1 OUTPUT POWER VERIFICATION

ERP/EIRP RULE PART(S)

FCC: §96.

ERP/EIRP TEST PROCEDURE

ANSI C63.26:2015/ KDB 971168 D01 Section 5.6.
ERP/ EIRP = PMeas + GT − LC
where:
ERP or EIRP = effective or equivalent isotropically radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);
PMeas = measured transmitter output power or PSD, in dBm or dBW;
GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB

RESULTS

See the following pages.

LTE Band 48

Bandwidth	Mode	RB Allocation	RB offset	Channel		
				55265	55990	56715
				3552.5MHz	3625.5MHz	3697.5MHz
5MHz	QPSK	1	0	19.01	19.91	19.99
		1	12	19.02	19.13	19.84
		1	24	19.17	19.22	20.01
		12	0	18.84	19.05	19.73
		12	7	19.35	19.82	20.24
		12	13	19.08	19.69	20.02
		25	0	19.02	19.66	19.92
	16QAM	1	0	18.95	19.65	19.89
		1	12	19.22	19.75	20.04
		1	24	18.91	19.56	19.78
		12	0	19.4	19.99	**20.26**
		12	7	19.23	19.69	20.03
		12	13	19.06	19.65	19.94
		25	0	19.06	19.66	19.98
Bandwidth	Mode	RB Allocation	RB offset	Channel		
				55290	55990	56690
				3555MHz	3625.5MHz	3695MHz
10MHz	QPSK	1	0	19.24	19.79	20.22
		1	25	19.12	19.78	**20.25**
		1	49	19.01	19.78	20.26
		25	0	19.01	19.77	20.18
		25	12	19	19.78	20.24
		25	25	19.01	19.77	20.24
		49	0	19.01	19.77	20.24
	16QAM	1	0	19.21	19.79	20.21
		1	25	19.08	19.78	20.19
		1	49	19.09	19.78	19.96
		25	0	19.08	19.77	19.96
		25	12	19.08	19.78	20.19
		25	25	19.09	19.77	19.95
		49	0	19.09	19.77	20.18
Bandwidth	Mode	RB Allocation	RB offset	Channel		
				55315	55990	56665
				3557.5MHz	3625.5MHz	3692.5MHz
15MHz	QPSK	1	0	19.06	19.46	20.37
		1	37	19.06	19.45	20.4
		1	74	19.04	19.46	20.39

		36	0	19.04	19.43	20.38
		36	20	19.02	19.44	20.37
		36	39	19.02	19.42	20.36
		75	0	19.01	19.42	20.35
	16QAM	1	0	19.14	19.96	**20.48**
		1	37	19.12	19.95	20.46
		1	74	19.12	19.95	20.45
		36	0	19.1	19.95	20.44
		36	20	19.09	19.95	20.43
		36	39	19.09	19.94	20.42
		75	0	19.21	19.94	20.4
				Channel		
				55340	55990	56640
Bandwidth	Mode	RB Allocation	RB offset	3560MHz	3625.5MHz	3690MHz
20MHz	QPSK	1	0	19.25	19.87	20.37
		1	49	19.25	19.8	**20.49**
		1	99	19.24	19.91	20.45
		50	0	19.23	19.9	20.43
		50	24	19.24	19.89	20.42
		50	50	19.24	19.88	20.4
		99	0	19.23	19.88	20.4
	16QAM	1	0	19.25	19.82	20.46
		1	49	19.24	19.92	20.43
		1	99	19.24	19.9	20.41
		50	0	19.24	19.89	20.39
		50	24	19.23	19.88	20.38
		50	50	19.24	19.88	20.37
		99	0	19.23	19.87	20.36

6.2 PEAK TO AVERAGE RADIO

LIMITS

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01.
The transmitter output was connected to a UXM Test Set and configured to operate at maximum power.
The PAR was measured on the Spectrum Analyzer.

RESULTS

See the following pages.

LTE Band	Bandwidth (MHz)	F (MHz)	RB Configuration	Modulation	Measured (dB)	Limit (dB)	Verdict
48	5	3525.5	25RB 0#	QPSK	7.96	13	PASS
				16QAM	7.96	13	PASS
	10		50RB 0#	QPSK	12.58	13	PASS
				16QAM	12.58	13	PASS
	15		75RB 0#	QPSK	7.84	13	PASS
				16QAM	7.84	13	PASS
	20		100RB 0#	QPSK	9.40	13	PASS
				16QAM	9.40	13	PASS

LTE Band 4

	
LTE4_5M_QPSK_PAR_MID	LTE4_5M_16QAM_PAR_ MID
	
LTE4_10M_QPSK_PAR_MID	LTE4_10M_16QAM_PAR_ MID
	
LTE4_15M_QPSK_PAR_MID	LTE4_15M_16QAM_PAR_ MID

	
LTE4_20M_QPSK_PAR_MID	LTE4_20M_16QAM_PAR_ MID

6.3 OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049.

LIMITS

For reporting purposes only.

TEST PROCEDURE

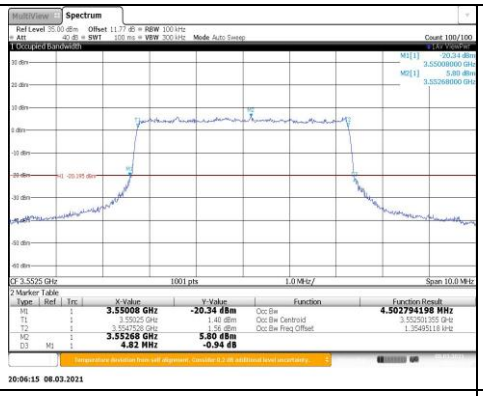
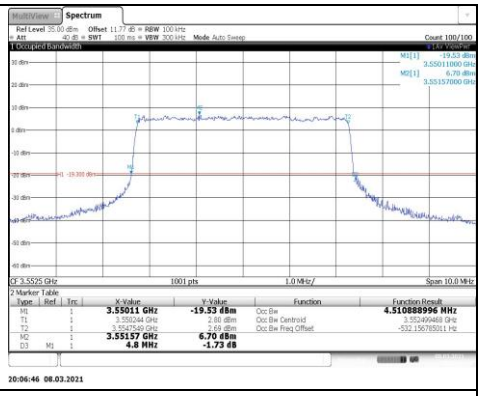
KDB 971168 D01 Power Meas License Digital Systems v03r01.
The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

RESULTS

See the following pages.

LTE Band	Bandwidth (MHz)	Channel	Modulation	The Maximum Measured OBW
48	5	MID	QPSK	4.508
		HIGH	16QAM	4.513
	10	HIGH	QPSK	8.983
		MID	16QAM	8.975
	15	HIGH	QPSK	13.45
		LOW	16QAM	13.475
	20	HIGH	QPSK	18.025
		HIGH	16QAM	18.024

LTE Band 48

5M		
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	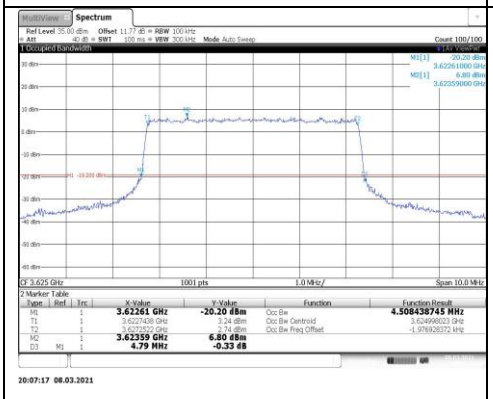	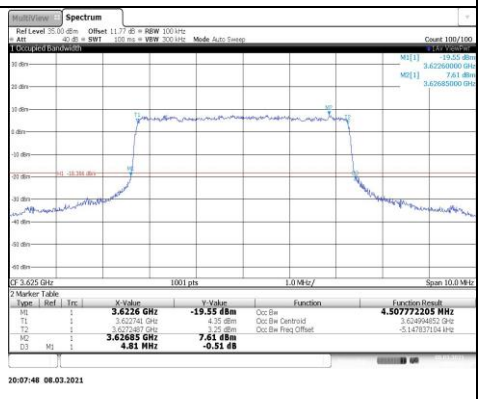
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	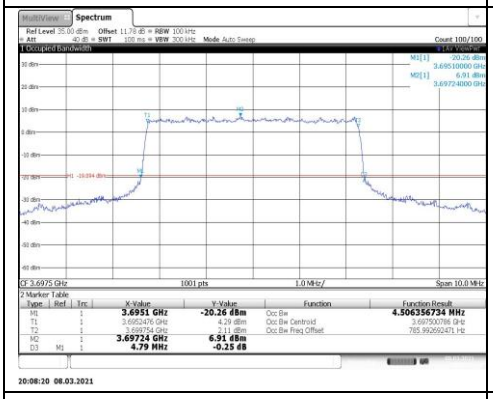	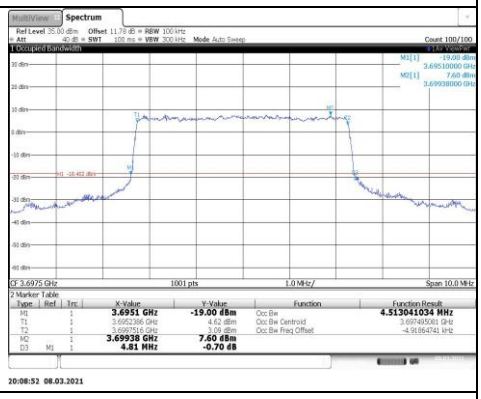
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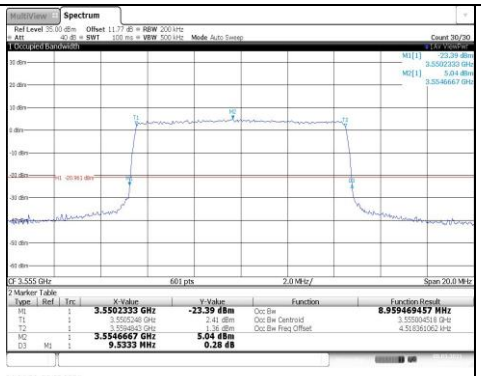
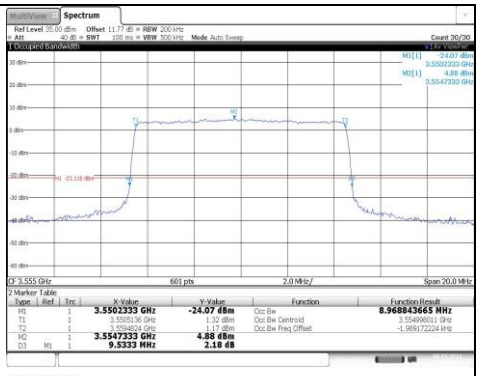
10M		
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	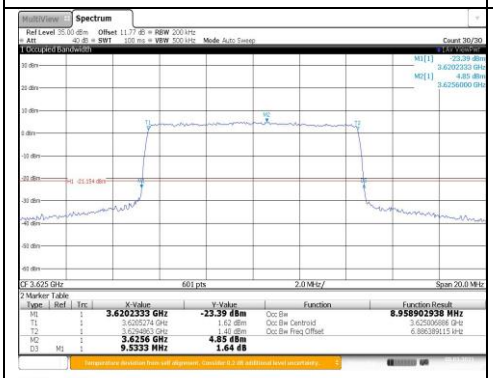	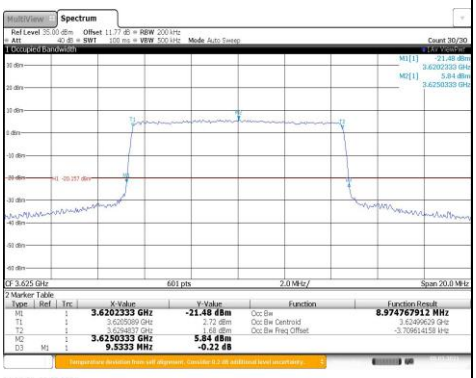
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	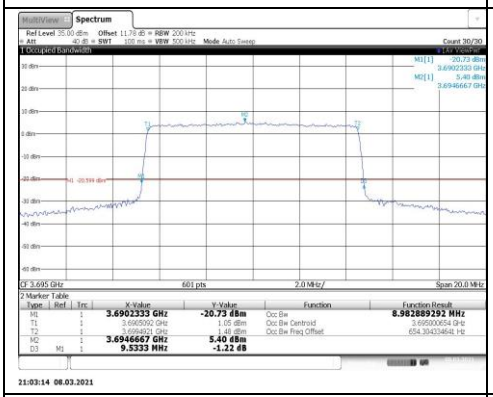	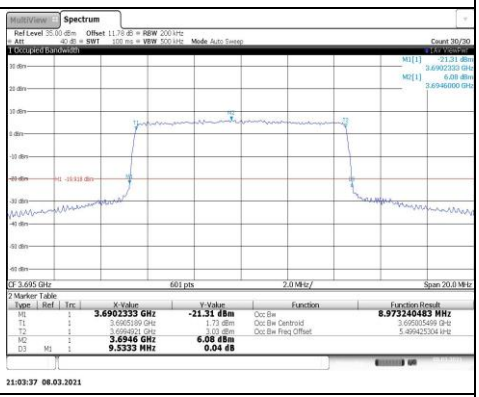
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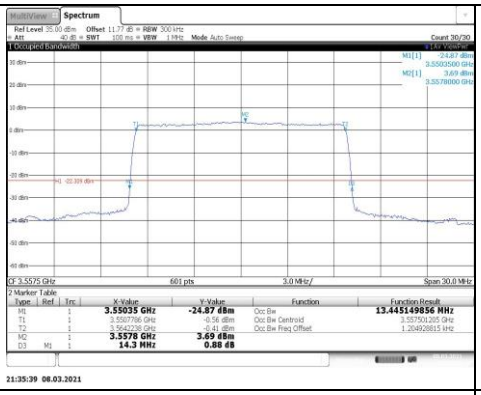
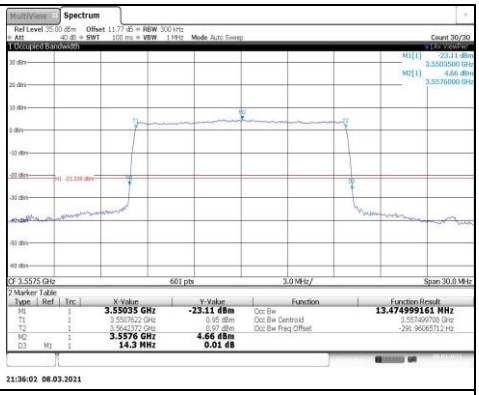
15M		
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	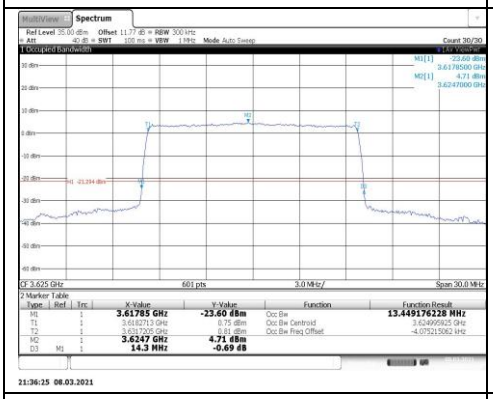	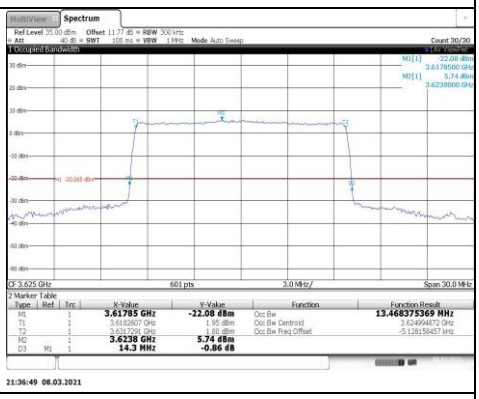
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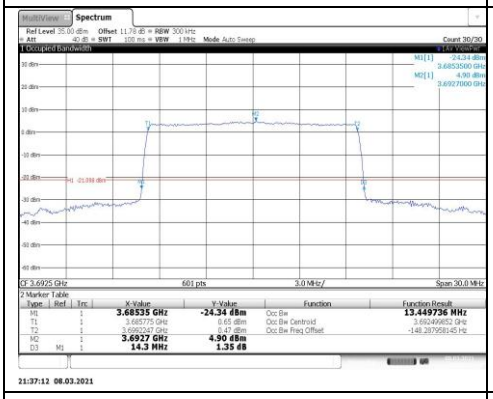
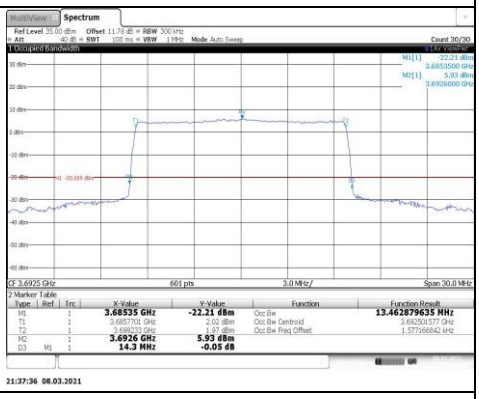
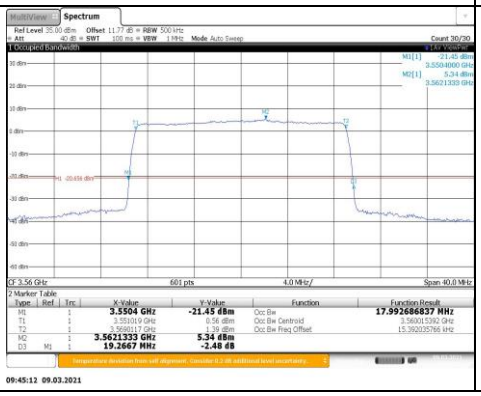
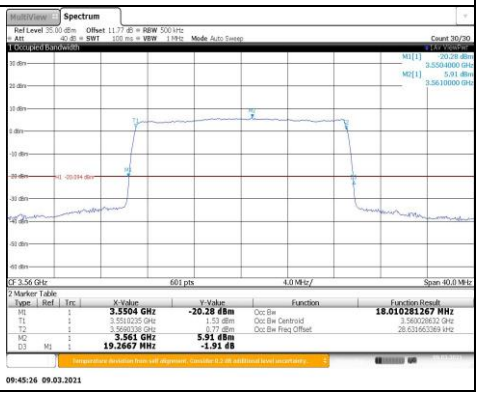
		
	LTE48_15M_QPSK_OBW_ HIGH	LTE48_15M_16QAM_OBW HIGH
20M		

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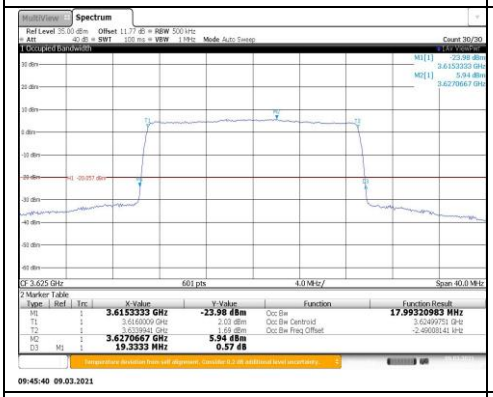
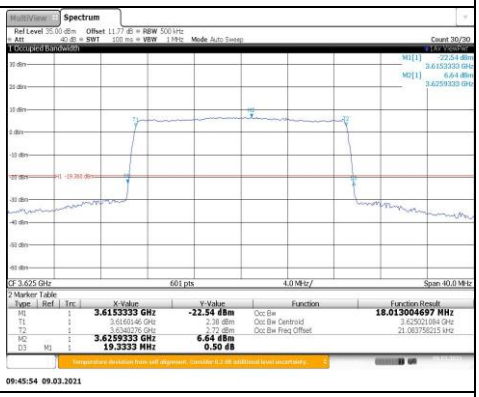
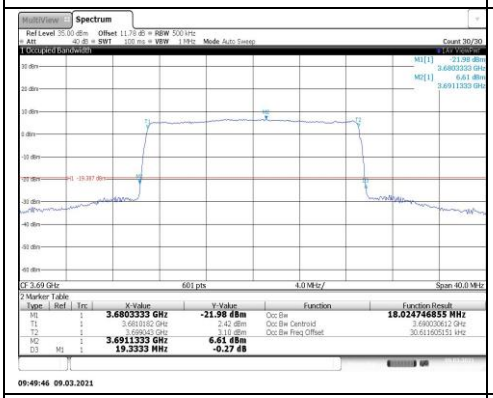
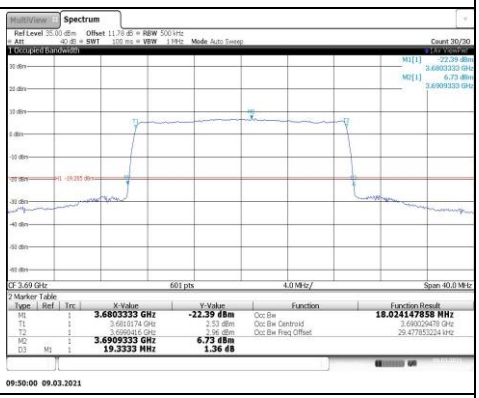
		
	LTE48_20M_QPSK_OBW_MID	LTE48_20M_16QAM_OBW_MID
		
	LTE48_20M_QPSK_OBW_ HIGH	LTE48_20M_16QAM_OBW_HIGH

6.4 FREQUENCY STABILITY

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01.

RESULTS

Test Mode	Test Conditions		Frequency Deviation Middle Channel		
	Power (VDC)	Temperature (°C)	Frequency Error	Frequency Error	Limit
			Hz	ppm	ppm
LTE Band 48	VN	-30	87.37	0.024594	±2.5
		-20	116.32	0.032743	
		-10	48.23	0.013576	
		0	-14.76	-0.004155	
		+10	131.72	0.037078	
		+20	7.47	0.002061	
		+30	42.44	0.011708	
		+40	26.33	0.007263	
		+50	113.92	0.031426	
	VL	TN	-74.96	-0.021101	
	VH		112.79	0.031749	
	End Point		-66.79	-0.018801	

6.5 BAND EDGE AND EMISSION MASK

RULE PART(S)

FCC:§96.41.

LIMITS

FCC: §96.41.
(e) 3.5 GHz Emissions and Interference Limits-
(ii) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed −13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed −25 dBm/MHz. Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed −25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01:
The transmitter output was connected to a Call BOX Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

Set the RBW = 1 ~ 1.5 % of OBW(Typically limited to a minimum RBW of 1% of the OBW)

b) Set VBW ≥ 3 × RBW;
c) Set span ≥ 1.5 times the OBW;
d) Sweep time = Auto;
e) Detector = RMS;
f) Ensure that the number of measurement points ≥ 2*Span/RBW;
g) Trace mode = Average (100).

TEST PROCEDURE（LTE Band48）

(i) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the licensee's authorized frequency channel, a resolution bandwidth of no less than one percent of the fundamental emission bandwidth may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full reference bandwidth (i.e., 1 MHz or 1 percent of emission bandwidth, as specified). 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.

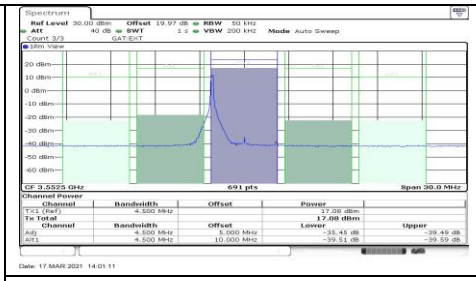
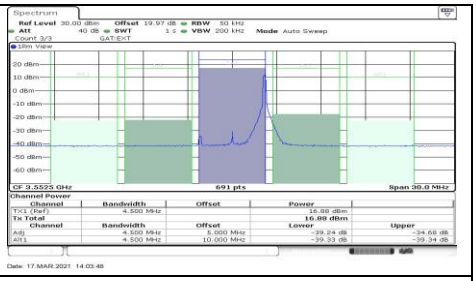
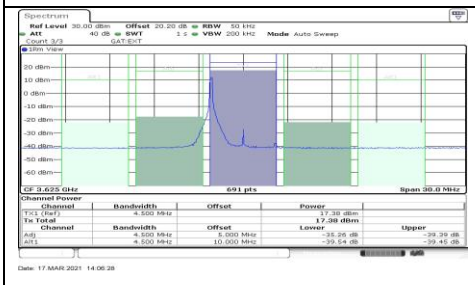
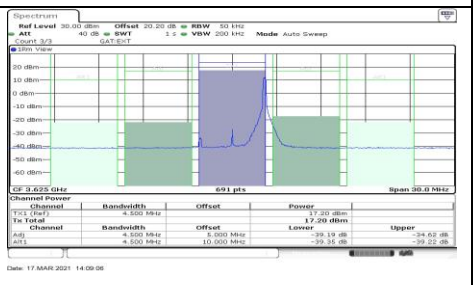
(ii) When measuring unwanted emissions to demonstrate compliance with the limits, the CBSD and End User Device nominal carrier frequency/ channel shall be adjusted as close to the licensee's authorized frequency block edges, both upper and lower, as the design permits.

(iii) Compliance with emission limits shall be demonstrated using either average(RMS)-detected or peak-detected power measurement techniques.

RESULTS

See the following pages.

LTE Band 48

5M		
	QPSK _LOW_1RB0#	QPSK _LOW_1RB24#
		
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	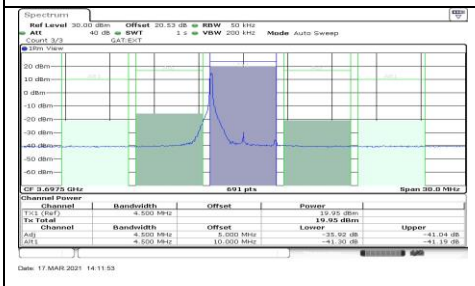	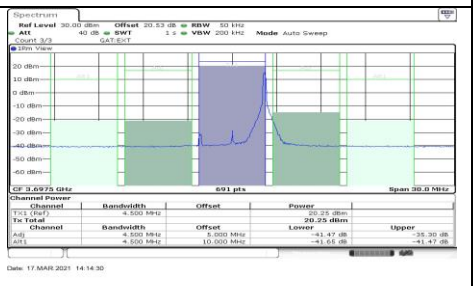
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	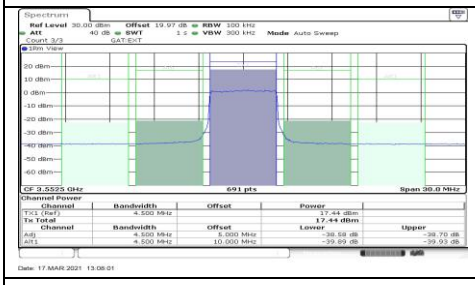	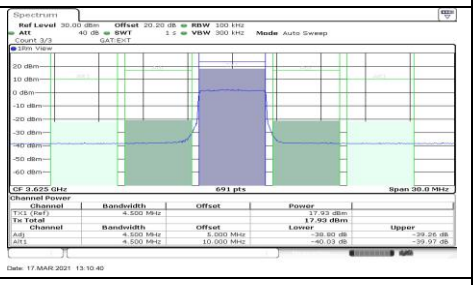
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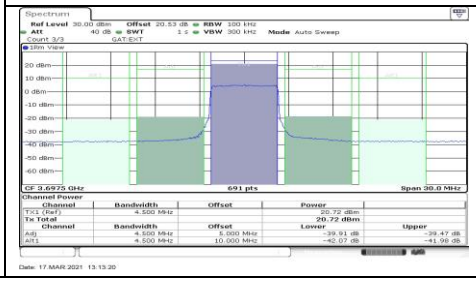
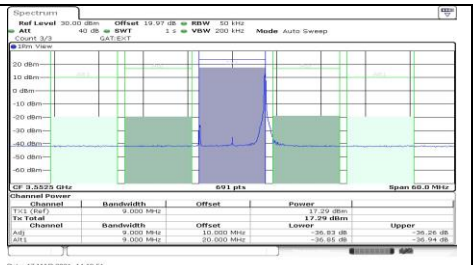
		/

	QPSK _HIGH_ Full RB	/

10M		
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	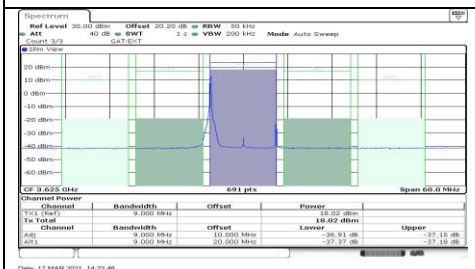	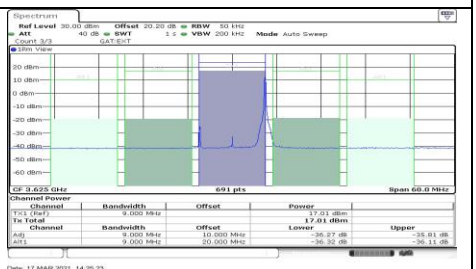
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	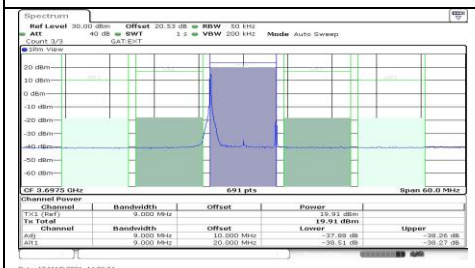	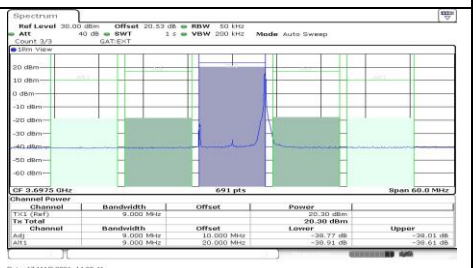
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	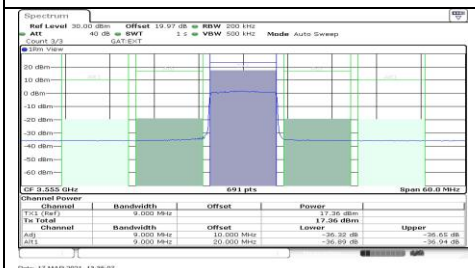	
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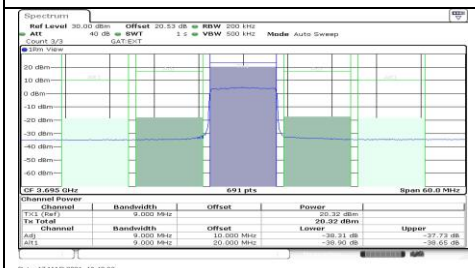
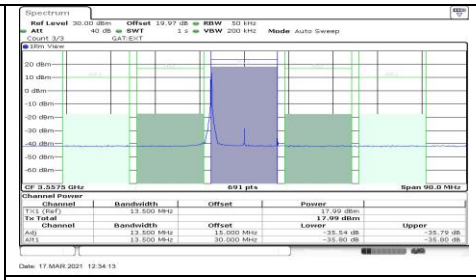
		/

	QPSK _HIGH_ Full RB	/

15M		
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	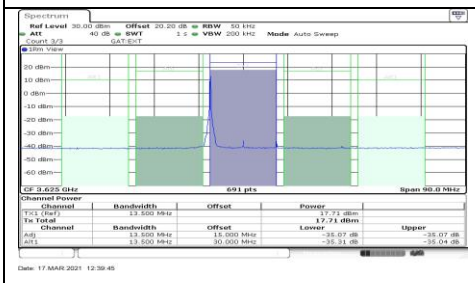	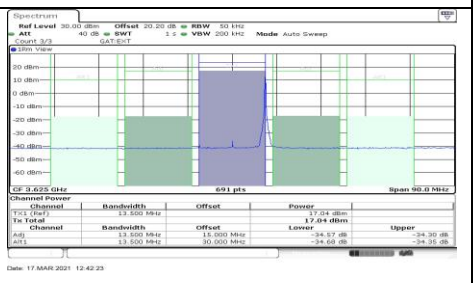
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	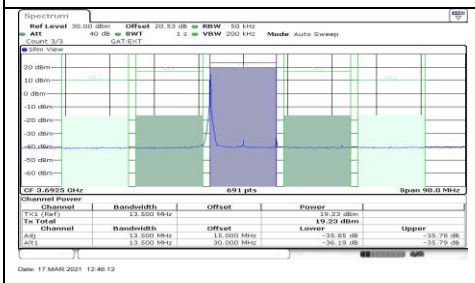	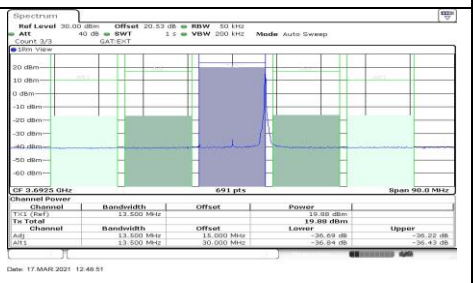
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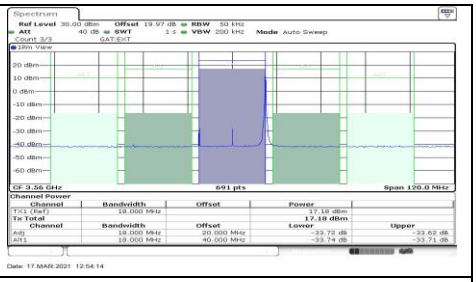
	QPSK _LOW_ Full RB	QPSK _MID_ Full RB
		/

	QPSK _HIGH_ Full RB	/

20M		
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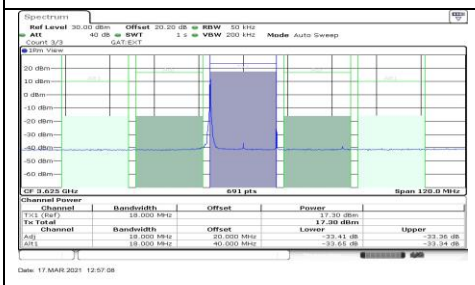
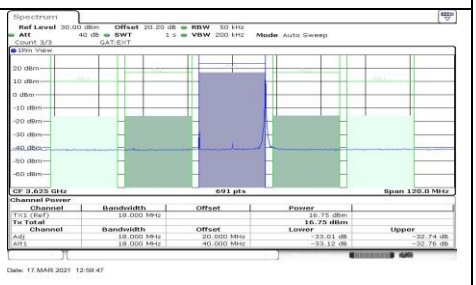
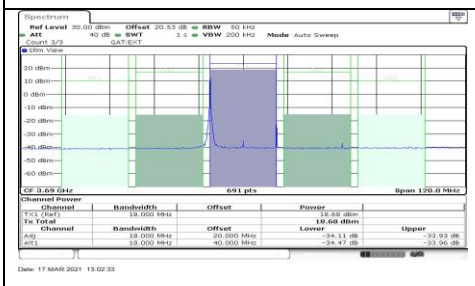
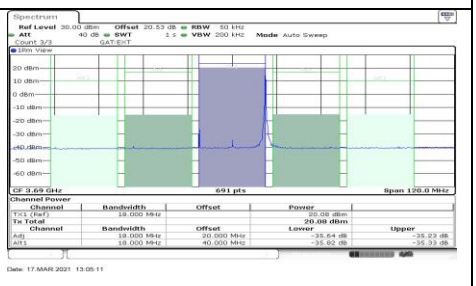
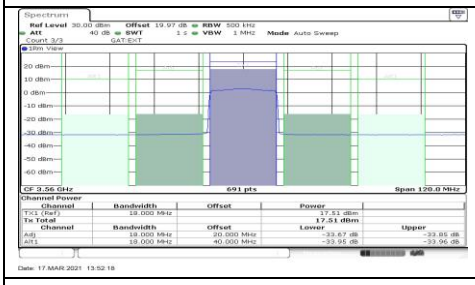
		
	QPSK _MID_1RB0#	QPSK _MID_1RB99#
		
	QPSK _HIGH_1RB0#	QPSK _HIGH_1RB99#
		
	QPSK _LOW_ Full RB	QPSK _MID_ Full RB

		/
	QPSK _HIGH_ Full RB	/

6.6 CONDUCTED OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §96.41.

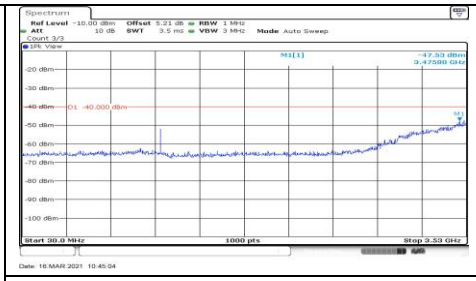
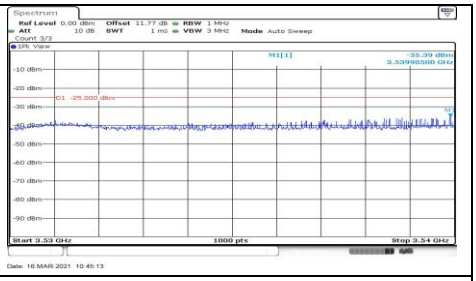
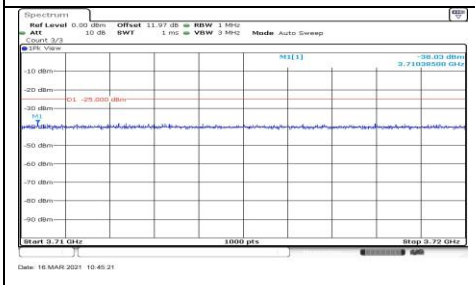
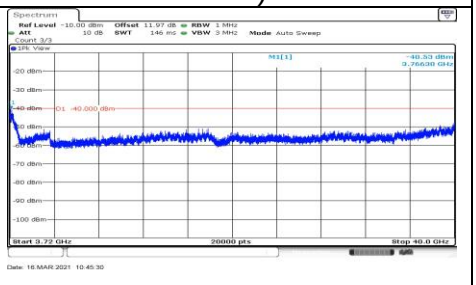
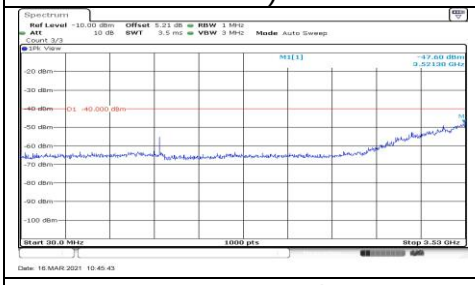
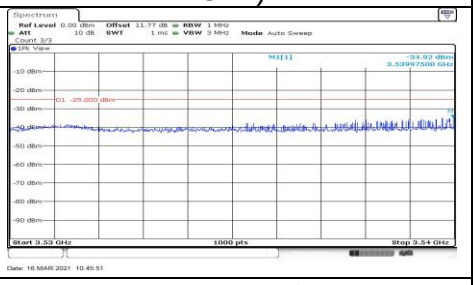
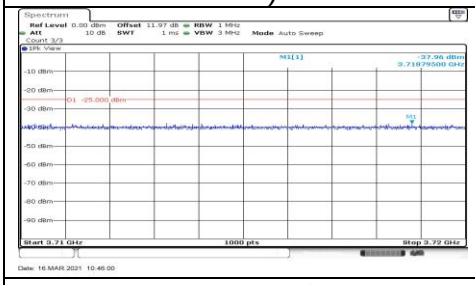
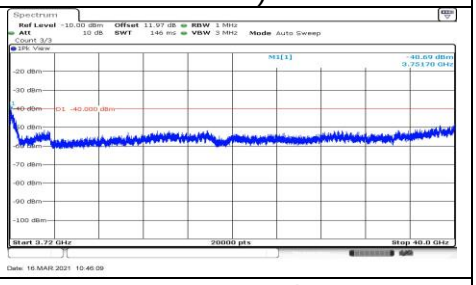
LIMITS

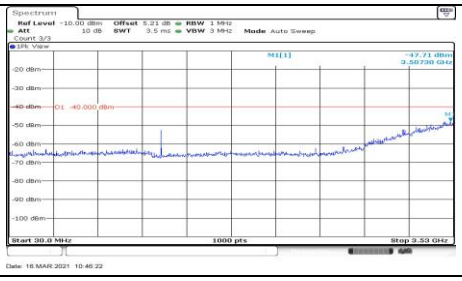
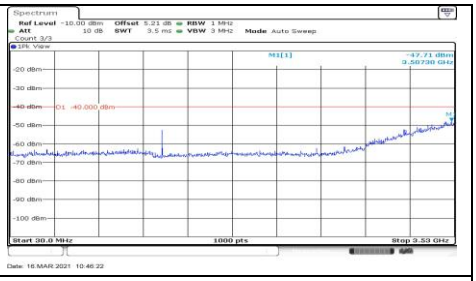
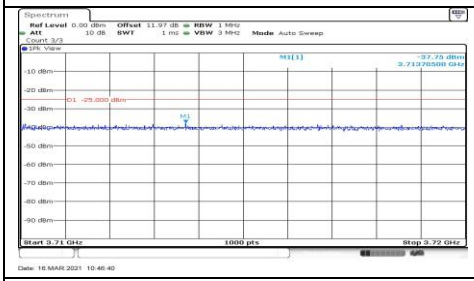
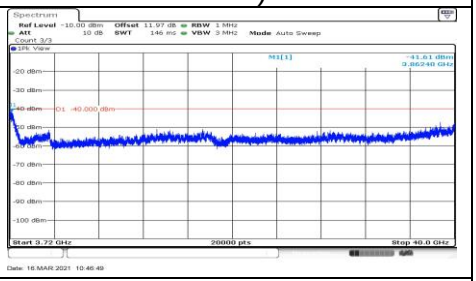
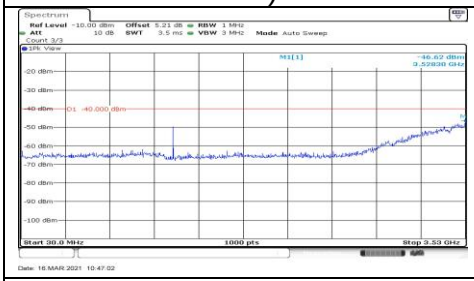
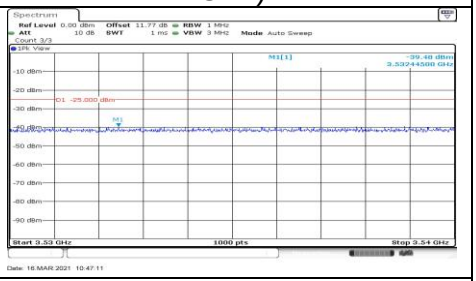
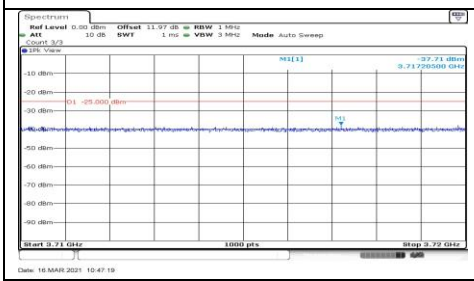
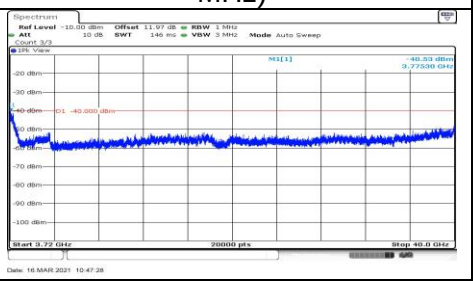
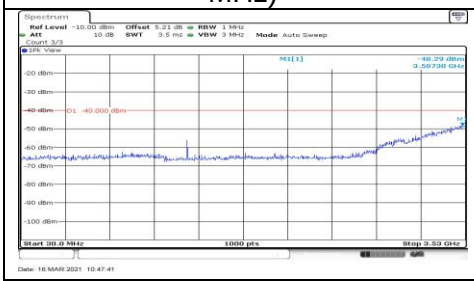
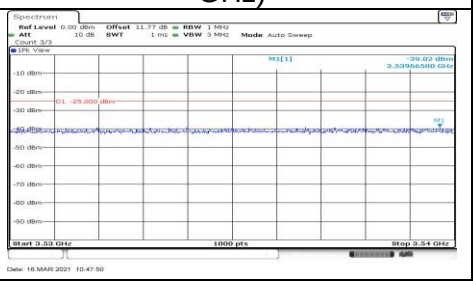
(e) 3.5GHz Emissions and Interference Limits-
(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed −25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz..

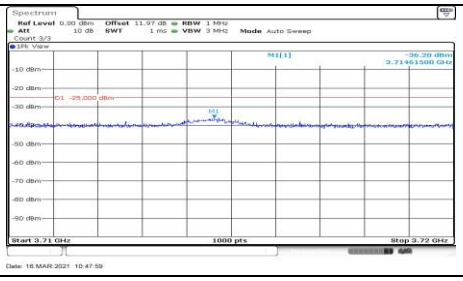
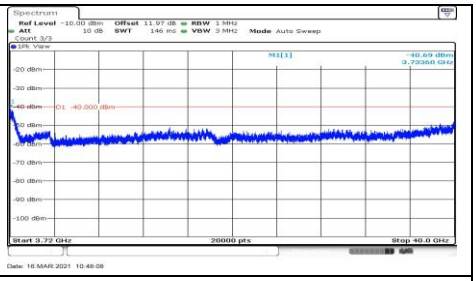
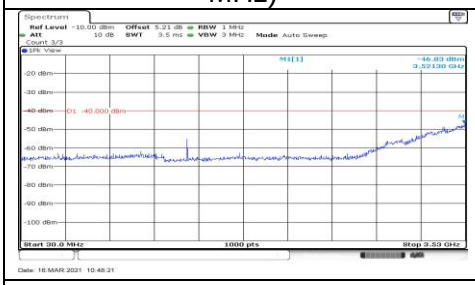
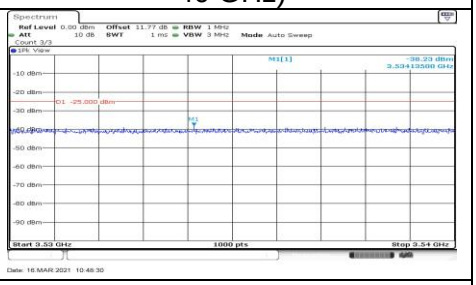
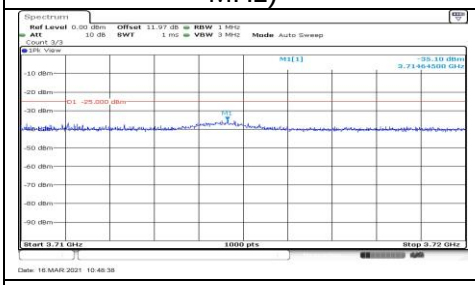
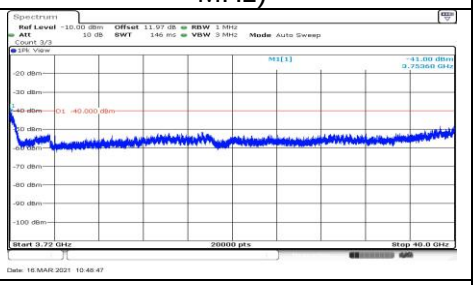
RESULTS

See the following pages.

LTE Band 48

20M		
	QPSK_CBE_LOW(30-3530 MHz)	QPSK_CBE_LOW(3530-3540 MHz)
		
	QPSK_CBE_LOW(3710-3720 MHz)	QPSK_CBE_LOW(3720 MHz-40 GHz)
		
	16QAM_CBE_LOW(30-3530 MHz)	16QAM _CBE_LOW(3530-3540 MHz)
		
	16QAM _CBE_LOW(3710-3720 MHz)	16QAM _CBE_LOW(3720 MHz-40 GHz)

	
QPSK_CBE_MID(30-3530 MHz)	QPSK_CBE_MID(3530-3540 MHz)
	
QPSK_CBE_MID(3710-3720 MHz)	QPSK_CBE_MID(3720 MHz-40 GHz)
	
16QAM_CBE_MID(30-3530 MHz)	16QAM _CBE_MID(3530-3540 MHz)
	
16QAM _CBE_MID(3710-3720 MHz)	16QAM _CBE_MID(3720 MHz-40 GHz)
	
16QAM_CBE_ HIGH (30-3530 MHz)	16QAM _CBE_ HIGH (3530-3540 MHz)

		
	16QAM _CBE_ HIGH (3710-3720 MHz)	16QAM _CBE_ HIGH (3720 MHz-40 GHz)
		
	16QAM_CBE_ HIGH (30-3530 MHz)	16QAM _CBE_ HIGH (3530-3540 MHz)
		
	16QAM _CBE_ HIGH (3710-3720 MHz)	16QAM _CBE_HIGH(3720 MHz-40 GHz)

6.7 FIELD STRENGTH OF SPURIOUS RADIATION

LIMIT

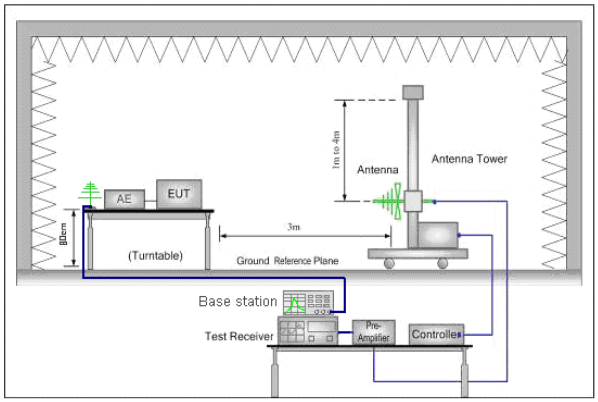
FCC: §96.41.

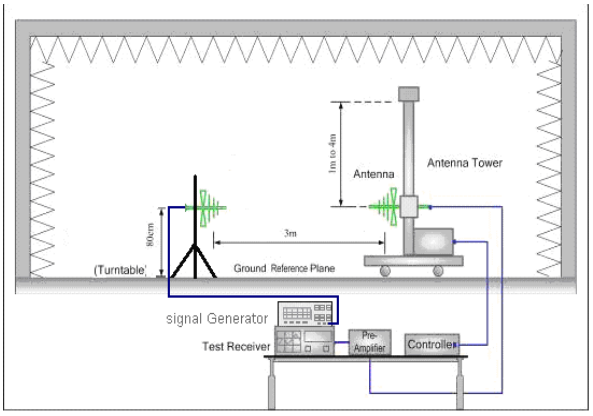
(e) 3.5GHz Emissions and Interference Limits-

(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

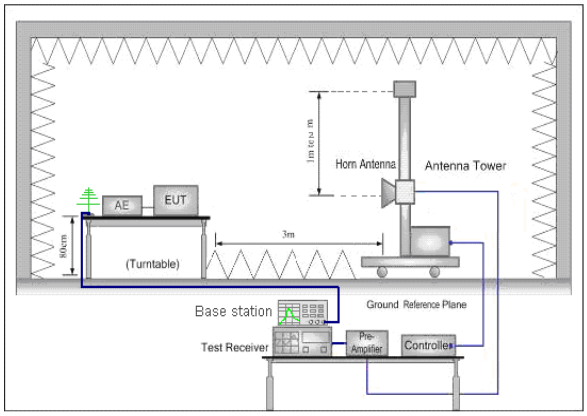
TEST SETUP

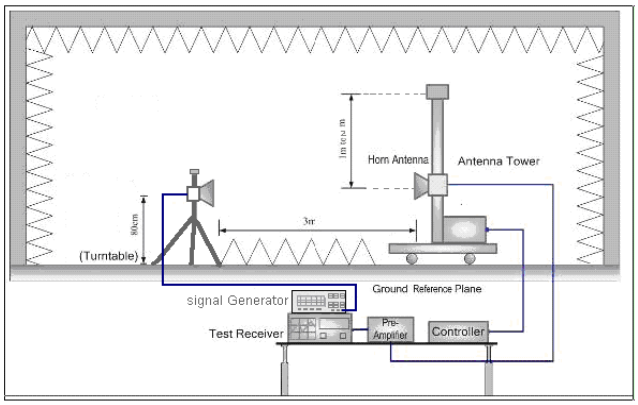
Test Setup for Below 1G





Test Setup for Above 1G





TEST PROCEDURE

KDB 971168 D01 Section 7

Below 1GHz test procedure as below:

1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. Calculate power in dBm by the following formula:

ERP(dBm) = Pg (dBm) – cable loss (dB) + antenna gain (dBd)

Where:

Pd is the dipole equivalent power, Pg is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to Pg [dBm] – cable loss [dB]. The calculated Pd levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of 43 + 10log10(Power [Watts]).

Above 1GHz test procedure as below:

1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.

10. Calculate power in dBm by the following formula:
EIRP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBi)
EIRP=ERP+2.15dB
Where: Pg is the generator output power into the substitution antenna.
11. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
= P(W)- [43 + 10log(P)] (dB)
= [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
= -13dBm.

NOTE 1: Radiated spurious emissions were investigated below 30MHz, 30MHz – 1GHz and above 1GHz. There were no emissions found on below 30MHz and 30MHz – 1GHz.
Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field based on KDB 414788.

NOTE 2: Please refer to section 5.4 for bandwidth and RB setting about LTE bands.

RESULTS

See the following pages

RADIATED SPURIOUS EMISSION RESULTS BETWEEN 30MHz and 1GHz

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
30.97	-75.47	-40.00	-35.47	Horizontal
58.13	-76.30	-40.00	-36.30	Horizontal
72.68	-79.65	-40.00	-39.65	Horizontal
226.91	-82.07	-40.00	-42.07	Horizontal
800.18	-73.89	-40.00	-33.89	Horizontal
900.09	-72.82	-40.00	-32.82	Horizontal
30.97	-73.40	-40.00	-33.40	Vertical
75.59	-72.33	-40.00	-32.33	Vertical
255.04	-72.67	-40.00	-32.67	Vertical
700.27	-74.73	-40.00	-34.73	Vertical
800.18	-69.33	-40.00	-29.33	Vertical
851.59	-71.62	-40.00	-31.62	Vertical

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LTE B48_20M_QPSK_LOW	/

RADIATED SPURIOUS EMISSION RESULTS ABOVE 1GHz

LTE Band 48

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1642	-51.77	-40.00	-11.77	Horizontal
2278	-47.97	-40.00	-7.97	Horizontal
3280	-48.51	-40.00	-8.51	Horizontal
4498	-49.31	-40.00	-9.31	Horizontal
5878	-44.79	-40.00	/	Horizontal
6742	-42.42	-40.00	-2.42	Horizontal
7099	-42.38	-40.00	-2.38	Horizontal
8496	-49.76	-40.00	-9.76	Horizontal
9002	-43.19	-40.00	-3.19	Horizontal
10652	-43.05	-40.00	-3.05	Horizontal
11752	-50.03	-40.00	-10.03	Horizontal
16009	-43.51	-40.00	-3.51	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1726	-50.58	-40.00	-10.58	Vertical
2398	-47.55	-40.00	-7.55	Vertical
3178	-42.57	-40.00	-2.57	Vertical
4486	-49.95	-40.00	-9.95	Vertical
4888	-47.10	-40.00	-7.10	Vertical
6544	-51.40	-40.00	-11.40	Vertical
7099	-47.16	-40.00	-7.16	Vertical
8496	-46.93	-40.00	-6.93	Vertical
10652	-52.34	-40.00	-12.34	Vertical
12269	-44.81	-40.00	-4.81	Vertical
14865	-45.43	-40.00	-5.43	Vertical
17725	-51.56	-40.00	-11.56	Vertical

LTE B48_20M_QPSK_LOW

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1564	-52.22	-40.00	-12.22	Horizontal
2206	-48.72	-40.00	-8.72	Horizontal
3130	-43.33	-40.00	-3.33	Horizontal
4594	-45.19	-40.00	-5.19	Horizontal
5812	-35.51	-40.00	/	Horizontal
6502	-41.45	-40.00	-1.45	Horizontal
7231	-45.37	-40.00	-5.37	Horizontal
8991	-46.21	-40.00	-6.21	Horizontal
10850	-47.77	-40.00	-7.77	Horizontal
11499	-49.51	-40.00	-9.51	Horizontal
14502	-51.02	-40.00	-11.02	Horizontal
16009	-51.86	-40.00	-11.86	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1750.00	-50.88	-40.00	-10.88	Vertical
2398.00	-44.97	-40.00	-4.97	Vertical
3358.00	-50.18	-40.00	-10.18	Vertical
4894.00	-47.68	-40.00	-7.68	Vertical
6028.00	-44.57	-40.00	/	Vertical
6508.00	-41.15	-40.00	-1.15	Vertical
7231.00	-45.23	-40.00	-5.23	Vertical
8749.00	-45.29	-40.00	-5.29	Vertical
10850.00	-46.78	-40.00	-6.78	Vertical
13589.00	-44.24	-40.00	-4.24	Vertical
16009.00	-44.11	-40.00	-4.11	Vertical
17604.00	-51.04	-40.00	-11.04	Vertical

LTE B48_20M_QPSK_MID

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1840.00	-49.99	-40.00	-9.99	Horizontal
2494.00	-46.61	-40.00	-6.61	Horizontal
3238.00	-50.53	-40.00	-10.53	Horizontal
4066.00	-47.55	-40.00	-7.55	Horizontal
5248.00	-47.16	-40.00	/	Horizontal
6490.00	-43.71	-40.00	-3.71	Horizontal
7352.00	-50.04	-40.00	-10.04	Horizontal
8991.00	-44.79	-40.00	-4.79	Horizontal
10003.00	-45.04	-40.00	-5.04	Horizontal
11499.00	-48.91	-40.00	-8.91	Horizontal
14722.00	-49.26	-40.00	-9.26	Horizontal
16009.00	-43.89	-40.00	-3.89	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1588.00	-50.84	-40.00	-10.84	Vertical
2398.00	-45.28	-40.00	-5.28	Vertical
3340.00	-48.24	-40.00	-8.24	Vertical
4870.00	-46.89	-40.00	-6.89	Vertical
5902.00	-44.87	-40.00	-4.87	Vertical
6502.00	-51.25	-40.00	-11.25	Vertical
7352.00	-44.76	-40.00	-4.76	Vertical
9002.00	-45.33	-40.00	-5.33	Vertical
9992.00	-44.84	-40.00	-4.84	Vertical
11037.00	-44.42	-40.00	-4.42	Vertical
14722.00	-47.76	-40.00	-7.76	Vertical
17659.00	-51.53	-40.00	-11.53	Vertical

LTE B48_20M_QPSK_HIGH

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END OF REPORT