TESTING LABORATORY
CERTIFICATE #4820.01

FCC PART 27

MEASUREMENT AND TEST REPORT

For

Shenzhen Xinguodu Technology Co., Ltd.

17B JinSong Mansion, Terra Industrial & Trade Park Chegongmiao, Futian District, Shenzhen, China, 518040

FCC ID: XDQN5-1

Report Type:	Product Name:
Original Report	POS TERMINAL

Report Number:	RDG190313003-00D
Report Date:	2019-04-19
Reviewed By:	Jerry Zhang EMC Manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:		POS TERMINAL
EUT Model:		N5
Operation modes:		FDD-LTE
Operation Frequency:		LTE Band 4: 1710-1755 MHz(TX) ; 2110-2155 MHz(RX) LTE Band 13: 777-787 MHz(TX); 746-756 MHz(RX)
Maximum Output Power: (Conducted)		LTE Band 4: 18.16 dBm LTE Band13: 18.90 dBm
Modulation Type:		QPSK, 16QAM
Rated Input Voltage:		DC3.7V from Battery or DC5V from adapter
Adapter Information	**Model:**	ADS-12CG-06 05010EPCU
	Input:	AC 100-240V, 50/60Hz, 0.3A
	Output:	DC5V, 2000mA
External Dimension:		141.5mm(L)* 66.8mm(W)*9mm(H)
Serial Number:		190125001
EUT Received Date:		2019.01.28

Objective

This report is prepared on behalf of ***Shenzhen Xinguodu Technology Co., Ltd.*** in accordance with: Part 2-Subpart J, Part 27 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Rules for output power, modulation characteristic, occupied bandwidth, spurious emissions at antenna terminal, spurious radiated emission, frequency stability and band edge.

Related Submittal(s)/Grant(s)

FCC Part 15C DTS submissions with FCC ID: XDQN5-1
FCC Part 15B JBP submissions with FCC ID: XDQN5-1
FCC Part 15C DSS submissions with FCC ID: XDQN5-1.
FCC Part 15C DXX submissions with FCC ID: XDQN5-1.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 27 – Miscellaneous wireless communications services

Applicable Standards: TIA/EIA 603-D-2010.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp.(Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61dB
Unwanted Emissions, radiated	30MHz ~ 1GHz:5.85 dB 1G~26.5GHz: 5.23 dB
Unwanted Emissions, conducted	±1.5 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier : CN0022.

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to TIA/EIA-603-D 2010.

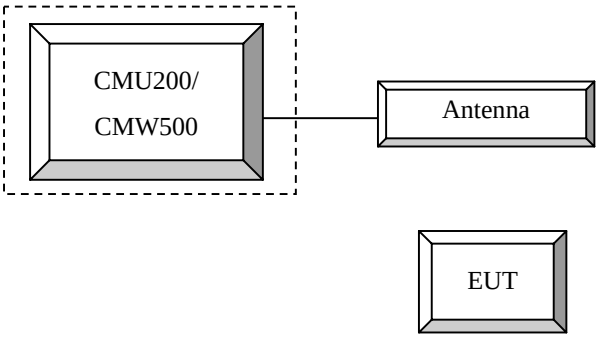
Equipment Modifications

No modification was made to the EUT.

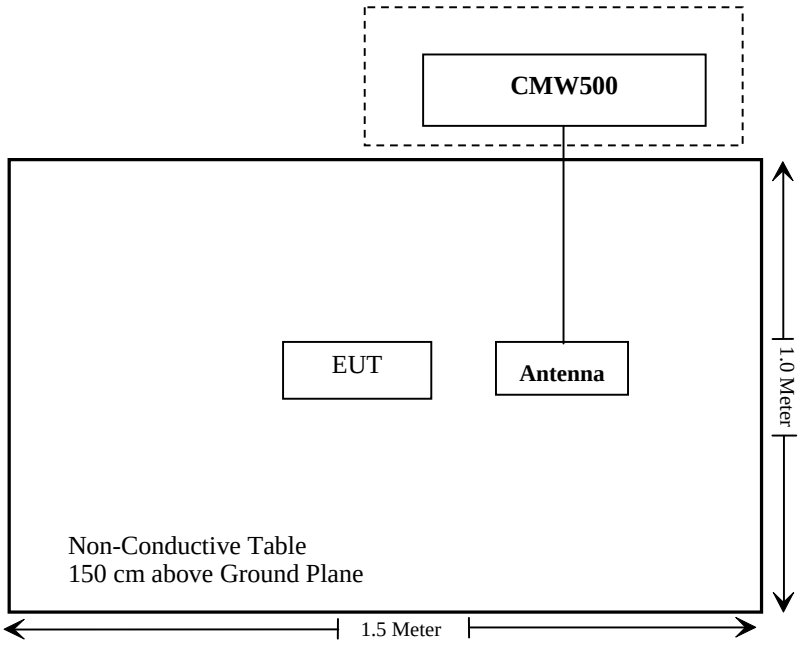
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R&S	Wideband Radio Communication Tester	CMW500	147473
Un-known	ANTENNA	/	/

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

Rules	Description of Test	Result
FCC§1.1310, §2.1093	RF Exposure	Compliance
FCC§2.1046; §27.50	RF Output Power	Compliance
FCC§ 2.1047	Modulation Characteristics	Not Applicable
FCC§ 2.1049; §27.53	Occupied Bandwidth	Compliance
FCC§ 2.1051, §27.53	Spurious Emissions at Antenna Terminal	Compliance
FCC§ 2.1053 §27.53	Field Strength of Spurious Radiation	Compliance
FCC §27.53	Out of band emission, Band Edge	Compliance
FCC§ 2.1055 §27.54	Frequency stability vs. temperature Frequency stability vs. voltage	Compliance

FCC §1.1310 & §2.1093- RF EXPOSURE

Applicable Standard

FCC§1.1310 and §2.1093

Test Result

Compliant, please refer to the SAR report: RDG190313003-20.

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E, Part 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC § 2.1046, § 27.50- RF OUTPUT POWER

Applicable Standard

According to §27.50

(b)(10) Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

(c) (10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

(d), (4) 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. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

(h),(2) Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

Test Procedure

LTE (FDD):

The following tests were conducted according to the test requirements in 3GPP TS36.101

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23[1]	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

Radiated method:

ANSI/TIA-603-D section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2018-12-10	2019-12-10
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
EMCO	Adjustable Dipole Antenna	3121C	9109-753	Not Required	/
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2018-05-06	2019-05-06
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2018-09-05	2019-09-05
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
TDK RF	Horn Antenna	HRN-0118	130 084	2018-10-12	2021-10-12
R&S	Spectrum Analyzer	FSP 38	100478	2018-12-10	2019-12-10
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2018-09-05	2019-09-05
Agilent	Signal Generator	E8247C	MY43321350	2018-12-10	2019-12-10
R&S	Wideband Radio Communication Tester	CMW500	147473	2018-08-03	2019-08-03
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	25.5°C
Relative Humidity:	62 %
ATM Pressure:	101.6 kPa

** The testing was performed by Blake Yang on 2019-04-08.*

Conducted Output Power

LTE Band 4

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	17.6	17.82	17.53
		RB1#3	17.79	17.98	17.79
		RB1#5	17.73	17.90	17.71
		RB3#0	17.59	17.96	17.64
		RB3#3	17.64	17.86	17.69
		RB6#0	16.53	16.86	16.73
	16QAM	RB1#0	16.49	17.23	16.64
		RB1#3	16.94	17.34	16.60
		RB1#5	16.78	17.22	16.45
		RB3#0	16.62	16.96	16.66
		RB3#3	16.63	16.88	16.77
		RB6#0	15.41	15.92	15.37
3MHz	QPSK	RB1#0	17.35	17.84	17.43
		RB1#8	17.49	17.90	17.59
		RB1#14	17.46	17.95	17.63
		RB6#0	16.36	16.96	16.37
		RB6#9	16.35	16.83	16.84
		RB15#0	16.40	16.90	16.51
	16QAM	RB1#0	16.64	17.49	16.37
		RB1#8	16.58	17.45	16.42
		RB1#14	16.57	17.13	16.36
		RB6#0	15.46	16.01	15.34
		RB6#9	15.35	16.03	15.62
		RB15#0	15.50	15.85	15.71
5MHz	QPSK	RB1#0	17.48	17.72	17.47
		RB1#13	17.53	17.74	17.67
		RB1#24	17.55	17.73	17.72
		RB15#0	16.34	17.01	16.54
		RB15#10	16.47	16.85	16.77
		RB25#0	16.40	17.02	16.67
	16QAM	RB1#0	16.15	16.45	16.82
		RB1#13	16.29	16.14	17.16
		RB1#24	16.17	16.17	17.31
		RB15#0	15.39	15.87	15.56
		RB15#10	15.52	15.82	15.77
		RB25#0	15.46	15.98	15.68

10MHz	QPSK	RB1#0	17.44	17.68	17.61
		RB1#25	17.68	17.65	17.98
		RB1#49	17.51	17.68	18.14
		RB25#0	16.29	16.92	16.49
		RB25#25	16.47	16.82	16.55
		RB50#0	16.31	16.94	16.44
	16QAM	RB1#0	16.78	16.83	16.63
		RB1#25	17.40	17.22	16.43
		RB1#49	17.44	17.28	16.83
		RB25#0	15.37	16.07	15.72
		RB25#25	15.55	15.76	15.77
		RB50#0	15.33	15.76	15.49
15MHz	QPSK	RB1#0	17.47	17.63	17.79
		RB1#38	17.31	17.88	17.78
		RB1#74	17.57	17.78	17.85
		RB36#0	16.28	16.76	16.66
		RB36#39	16.56	16.73	16.58
		RB75#0	16.34	16.84	16.52
	16QAM	RB1#0	16.45	17.17	17.23
		RB1#38	16.54	17.19	17.04
		RB1#74	16.87	16.98	17.94
		RB36#0	15.19	15.72	15.52
		RB36#39	15.46	15.85	15.82
		RB75#0	15.34	15.76	15.57
20MHz	QPSK	RB1#0	17.38	17.55	18.08
		RB1#50	17.63	18.04	17.89
		RB1#99	17.88	17.56	18.02
		RB50#0	16.34	16.84	16.98
		RB50#50	16.66	16.85	16.76
		RB100#0	16.60	16.90	16.73
	16QAM	RB1#0	17.09	16.95	17.18
		RB1#50	17.67	17.63	16.71
		RB1#99	18.16	17.25	16.75
		RB50#0	15.28	15.81	15.92
		RB50#50	15.53	15.94	15.69
		RB100#0	15.60	15.93	15.80

LTE Band 13

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5MHz	QPSK	RB1#0	18.75	18.68	18.54
		RB1#13	18.71	18.72	18.90
		RB1#24	18.53	18.67	18.84
		RB15#0	17.73	17.73	17.68
		RB15#10	17.62	17.71	17.76
		RB25#0	17.77	17.79	17.70
	16QAM	RB1#0	18.15	18.07	16.99
		RB1#13	17.57	17.40	17.15
		RB1#24	17.37	17.50	17.60
		RB15#0	16.67	16.72	16.75
		RB15#10	16.47	16.78	16.92
		RB25#0	16.71	16.87	16.81
10MHz	QPSK	RB1#0	/	18.86	/
		RB1#25	/	18.65	/
		RB1#49	/	18.77	/
		RB25#0	/	17.66	/
		RB25#25	/	17.60	/
		RB50#0	/	17.70	/
	16QAM	RB1#0	/	18.05	/
		RB1#25	/	17.69	/
		RB1#49	/	17.65	/
		RB25#0	/	16.75	/
		RB25#25	/	16.77	/
		RB50#0	/	16.86	/

PAR, Band 4

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	20 MHz	2.53	5.06	4.52	13
	100 RB		6.75	6.15	6.47	13
16QAM	1 RB	20 MHz	2.92	3.14	4.17	13
	100 RB		7.34	6.96	7.12	13

PAR, Band 13

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	10 MHz	/	2.22	/	13
	50 RB		/	6.16	/	13
16QAM	1 RB	10 MHz	/	3.33	/	13
	50 RB		/	6.11	/	13

Note: peak-to-average ratio (PAR) <13 dB.

ERP & EIRP:

LTE Band 4

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
					Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1732.50	1.40	QPSK	H	84.40	9.19	10.70	1.52	**18.37**	30.00	11.63
1732.50			V	81.41	5.90	10.70	1.52	15.08	30.00	14.92
1732.50	3.00		H	84.38	9.17	10.70	1.52	18.35	30.00	11.65
1732.50			V	81.40	5.89	10.70	1.52	15.07	30.00	14.93
1732.50	5.00		H	83.20	7.99	10.70	1.52	17.17	30.00	12.83
1732.50			V	81.02	5.51	10.70	1.52	14.69	30.00	15.31
1732.50	10.00		H	82.58	7.37	10.70	1.52	16.55	30.00	13.45
1732.50			V	79.90	4.39	10.70	1.52	13.57	30.00	16.43
1732.50	15.00		H	82.00	6.79	10.70	1.52	15.97	30.00	14.03
1732.50			V	79.00	3.49	10.70	1.52	12.67	30.00	17.33
1732.50	20.00		H	83.10	7.89	10.70	1.52	**17.07**	30.00	12.93
1732.50			V	80.15	4.64	10.70	1.52	13.82	30.00	16.18
1732.50	1.40	16QAM	H	84.59	9.38	10.70	1.52	**18.56**	30.00	11.44
1732.50			V	81.44	5.93	10.70	1.52	15.11	30.00	14.89
1732.50	3.00		H	84.45	9.24	10.70	1.52	18.42	30.00	11.58
1732.50			V	81.45	5.94	10.70	1.52	15.12	30.00	14.88
1732.50	5.00		H	83.95	8.74	10.70	1.52	17.92	30.00	12.08
1732.50			V	81.10	5.59	10.70	1.52	14.77	30.00	15.23
1732.50	10.00		H	82.66	7.45	10.70	1.52	16.63	30.00	13.37
1732.50			V	79.94	4.43	10.70	1.52	13.61	30.00	16.39
1732.50	15.00		H	82.33	7.12	10.70	1.52	16.30	30.00	13.70
1732.50			V	79.17	3.66	10.70	1.52	12.84	30.00	17.16
1732.50	20.00		H	83.15	7.94	10.70	1.52	**17.12**	30.00	12.88
1732.50			V	80.81	5.30	10.70	1.52	14.48	30.00	15.52

LTE Band 13

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
					Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
782.00	5.00	QPSK	H	92.83	15.30	0.00	0.93	14.37	34.77	20.40
782.00			V	83.82	9.21	0.00	0.93	8.28	34.77	26.49
782.00	10.00		H	92.37	14.84	0.00	0.93	13.91	34.77	20.86
782.00			V	83.56	8.95	0.00	0.93	8.02	34.77	26.75
782.00	5.00	16QAM	H	91.85	14.32	0.00	0.93	13.39	34.77	21.38
782.00			V	82.85	8.24	0.00	0.93	7.31	34.77	27.46
782.00	10.00		H	91.42	13.89	0.00	0.93	12.96	34.77	21.81
782.00			V	82.41	7.80	0.00	0.93	6.87	34.77	27.90

Note:
1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
2) Absolute Level = Substituted Level - Cable loss + Antenna Gain
3) Margin = Limit-Absolute Level

FCC §2.1049, §27.53- OCCUPIED BANDWIDTH

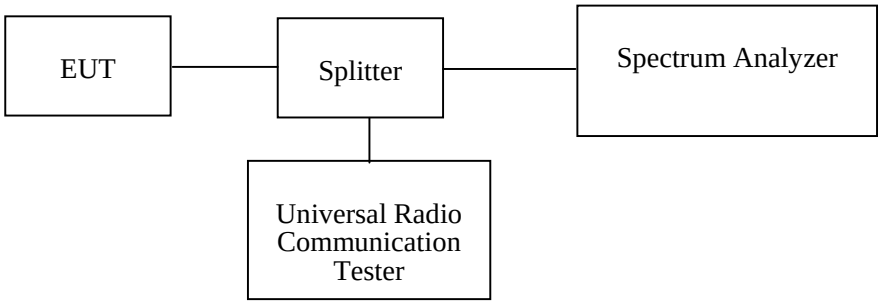
Applicable Standard

FCC §2.1049,§27.53.

Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The 26 dB & 99% bandwidth was recorded.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2018-08-03	2019-08-03
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005012	Each time	N/A
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	N/A
E-Microwave	Two-way Spliter	ODP-1-6-2S	OE0120142	Each time	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

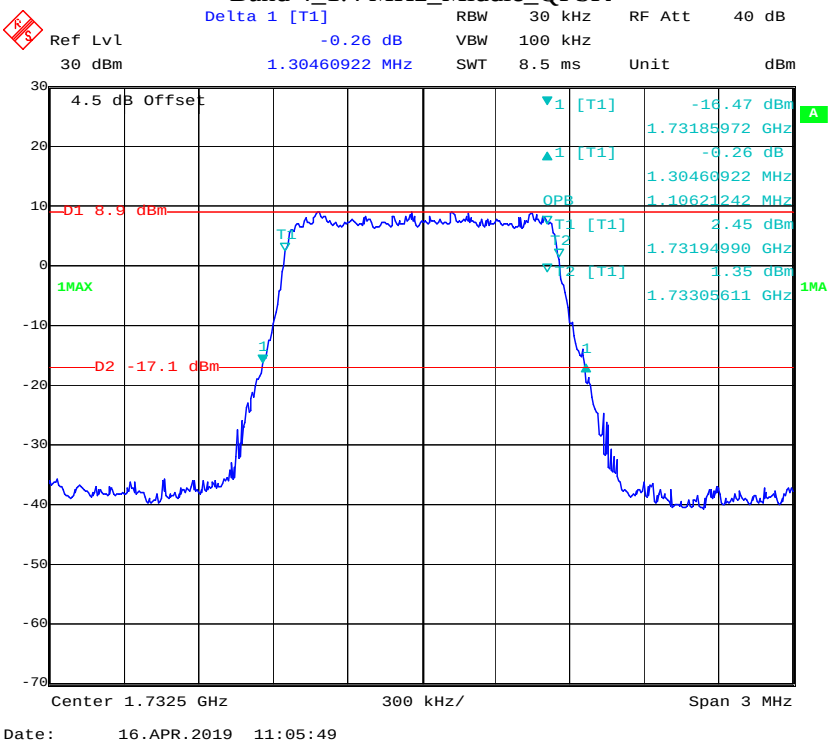
Temperature:	25.4°C
Relative Humidity:	55 %
ATM Pressure:	100.8 kPa

The testing was performed by Blake Yang on 2019-04-16.

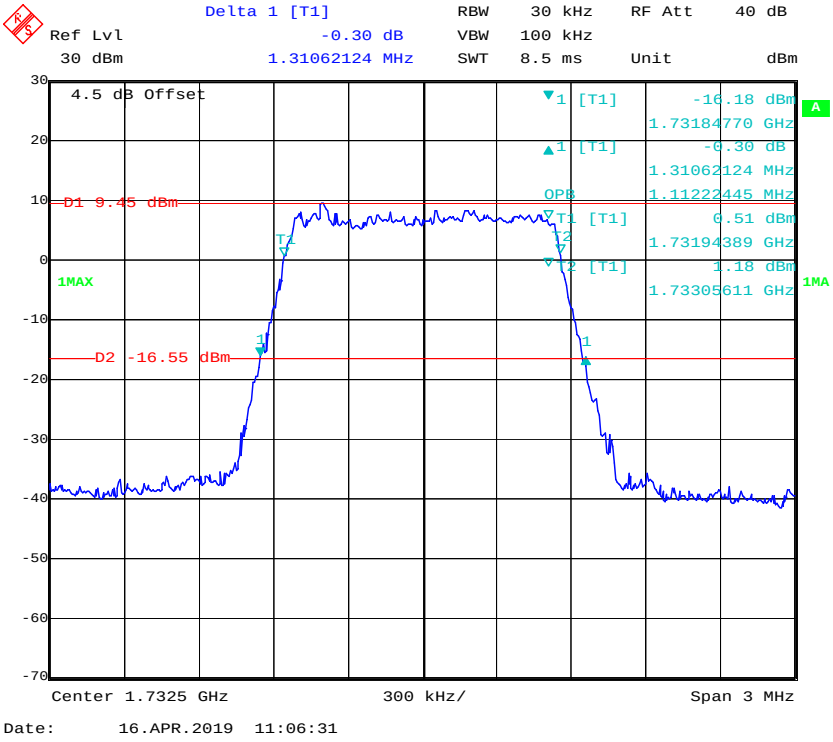
Test Mode: Transmitting
Test Result: Compliant. Please refer to the following table and plots.

Band	Bandwidth	Modulation	99% occupied bandwidth (MHz)	26 dB bandwidth (MHz)
LTE Band 4	1.4 MHz	QPSK	1.106	1.305
		16QAM	1.112	1.311
	3 MHz	QPSK	2.693	2.946
		16QAM	2.693	2.946
	5 MHz	QPSK	4.549	5.030
		16QAM	4.529	5.050
	10 MHz	QPSK	8.938	9.699
		16QAM	8.938	9.619
	15 MHz	QPSK	13.467	14.790
		16QAM	13.407	14.729
	20 MHz	QPSK	17.796	19.158
		16QAM	17.796	19.319
LTE Band 13	5 MHz	QPSK	4.549	5.010
		16QAM	4.529	5.010
	10 MHz	QPSK	8.978	9.780
		16QAM	8.978	9.699

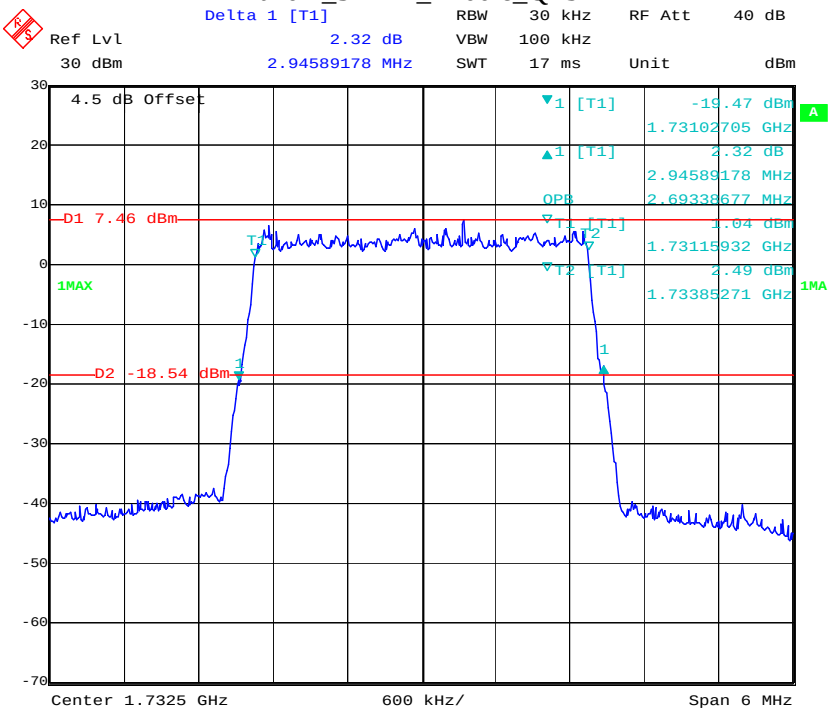
Band 4_1.4 MHz_Middle_QPSK



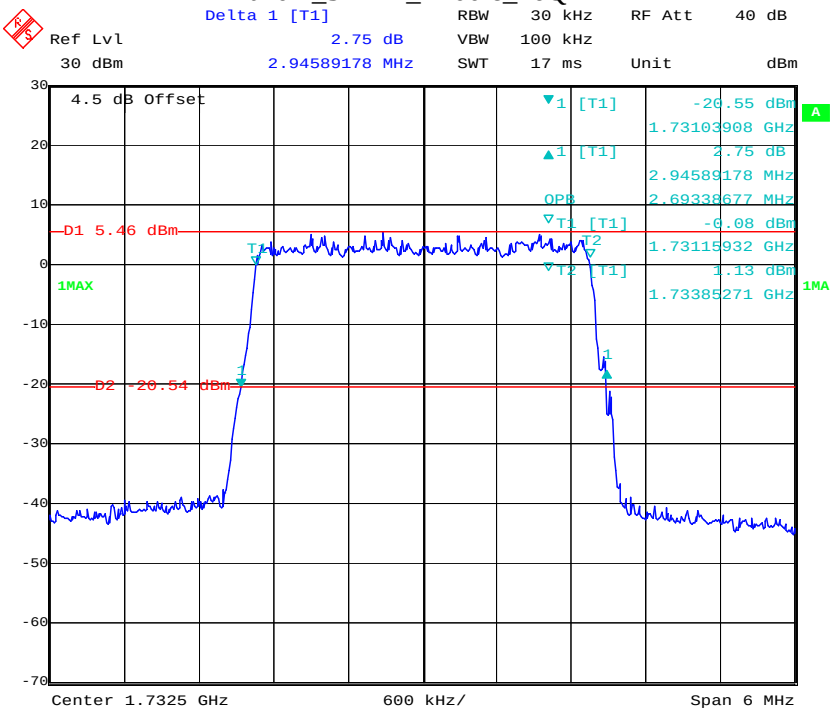
Band 4_1.4 MHz_Middle_16QAM



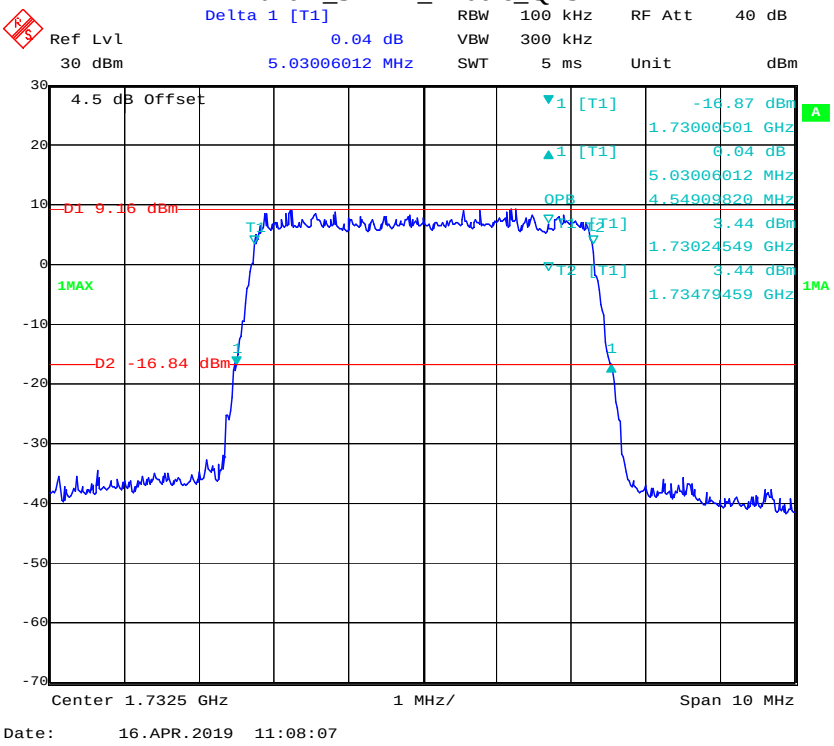
Band 4_3 MHz_Middle_QPSK



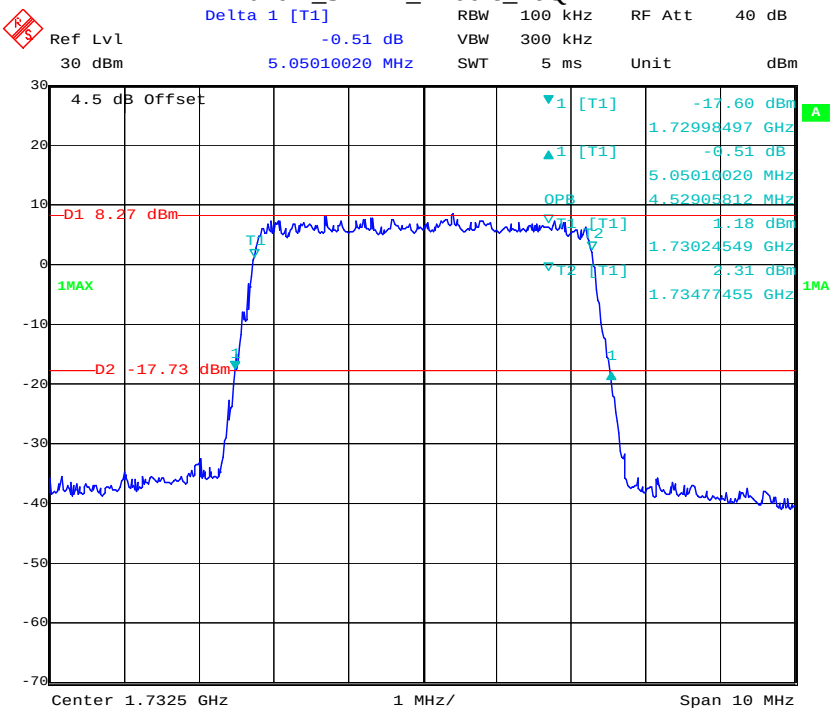
Band 4_3 MHz_Middle_16QAM



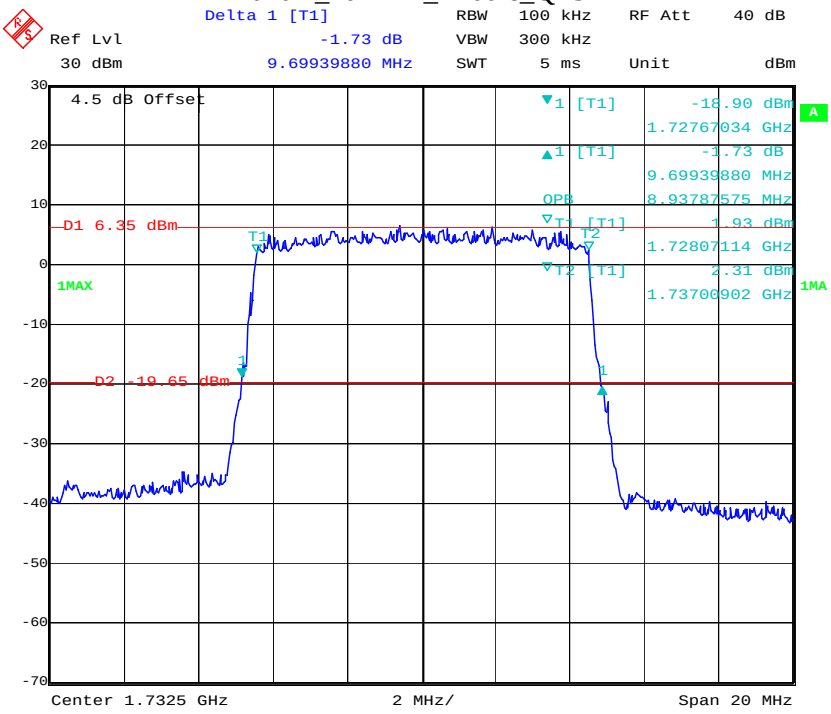
Band 4_5 MHz_Middle_QPSK



Band 4_5 MHz_Middle_16QAM

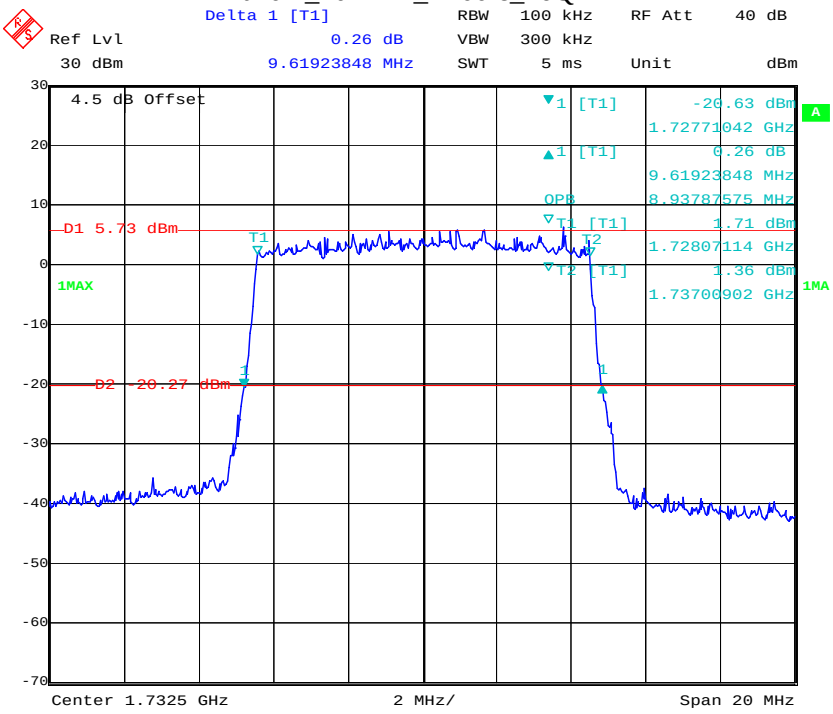


Band 4_10 MHz_Middle_QPSK



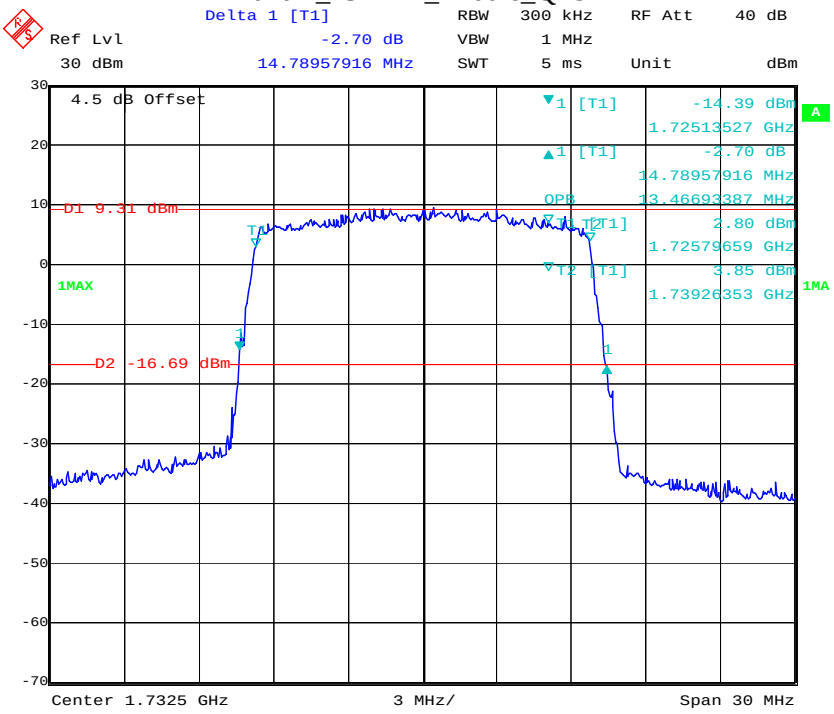
Date: 16.APR.2019 11:09:35

Band 4_10 MHz_Middle_16QAM

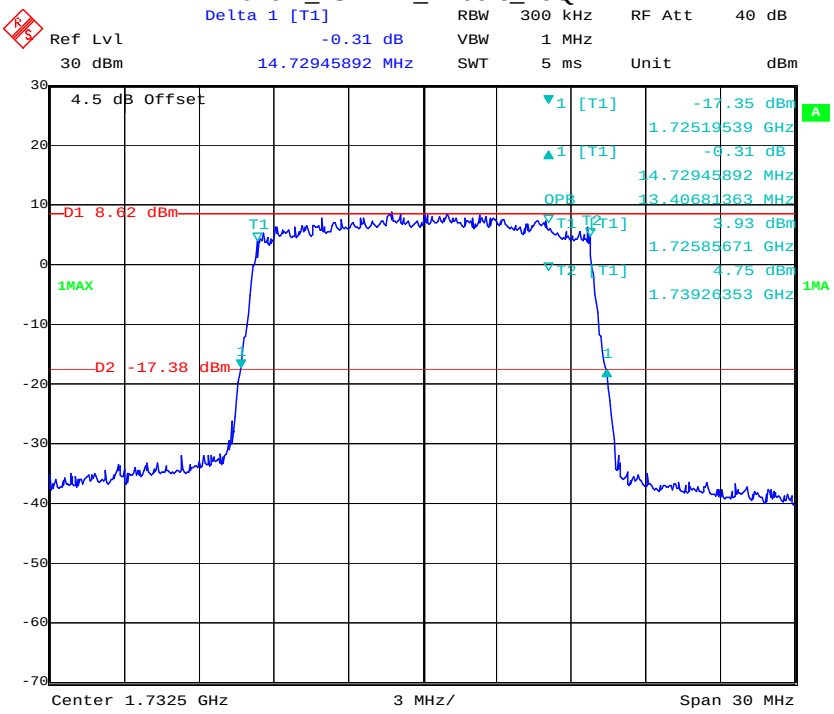


Date: 16.APR.2019 11:10:08

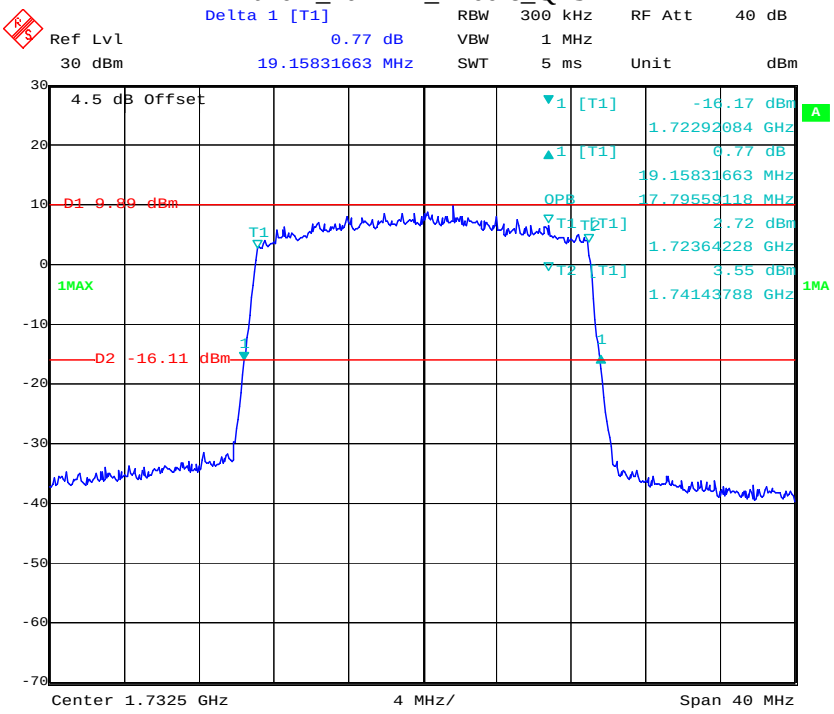
Band 4_15 MHz_Middle_QPSK



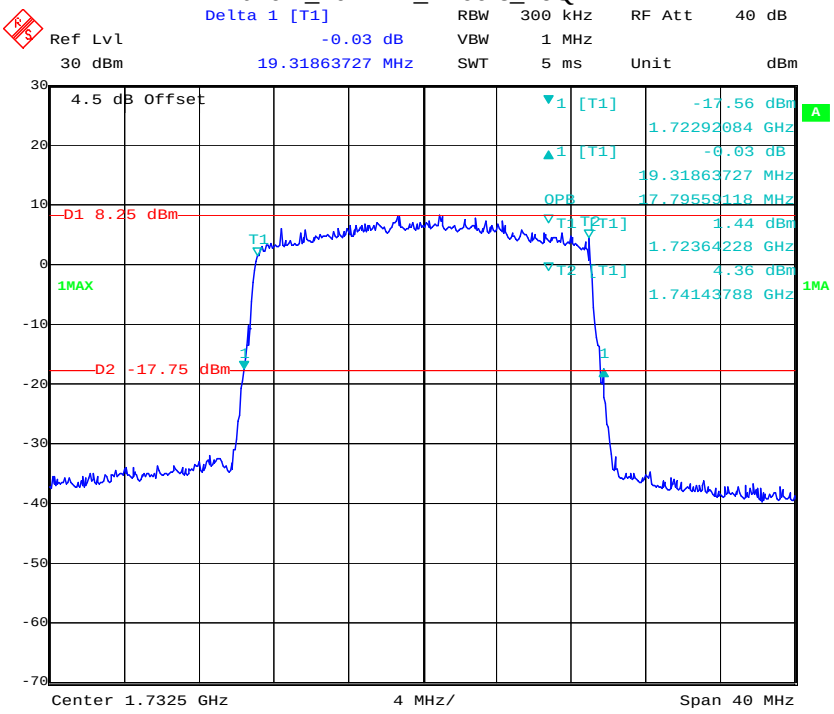
Band 4_15 MHz_Middle_16QAM



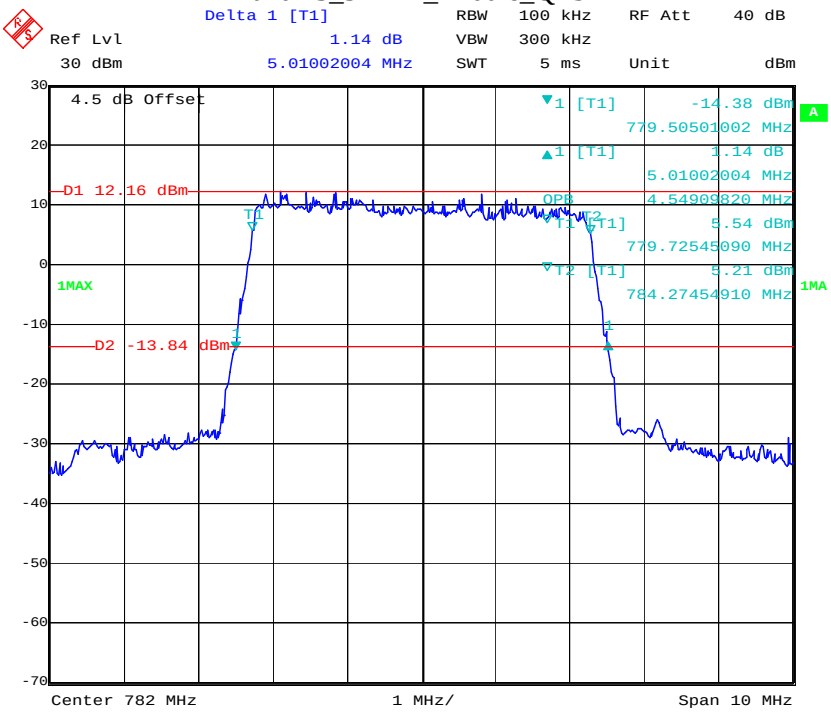
Band 4_20 MHz_Middle_QPSK



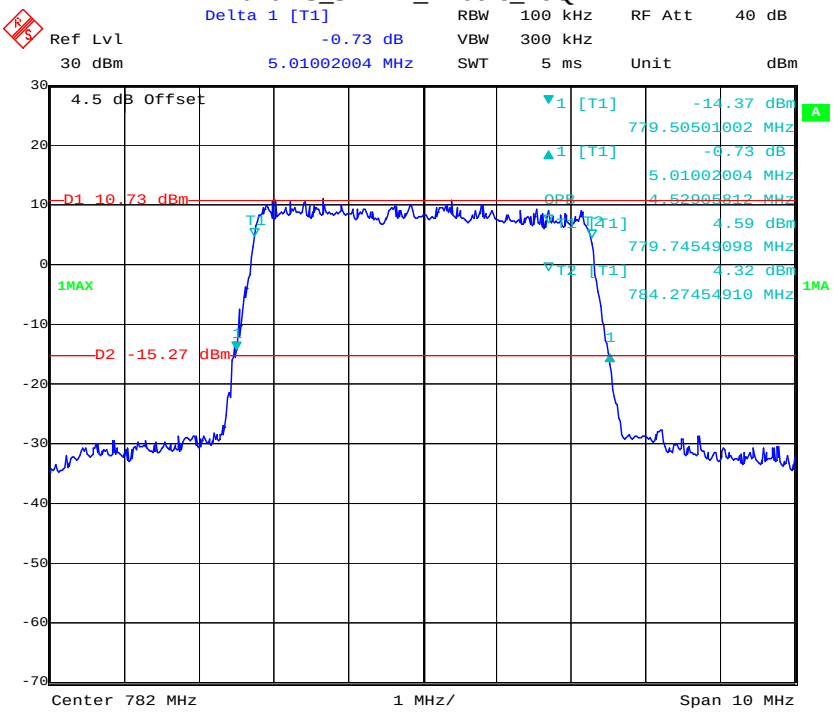
Band 4_20 MHz_Middle_16QAM



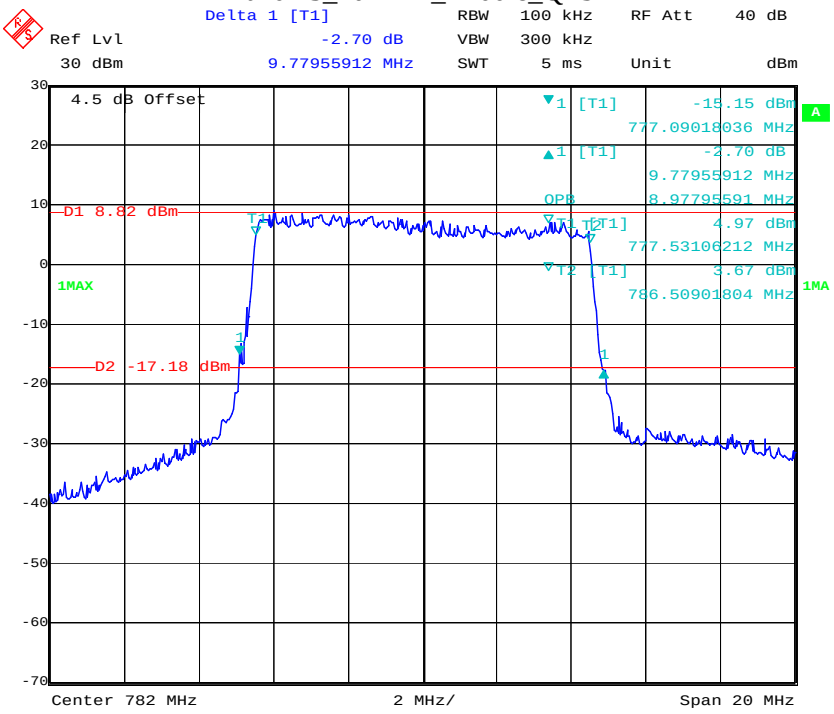
Band 13_5 MHz_Middle_QPSK



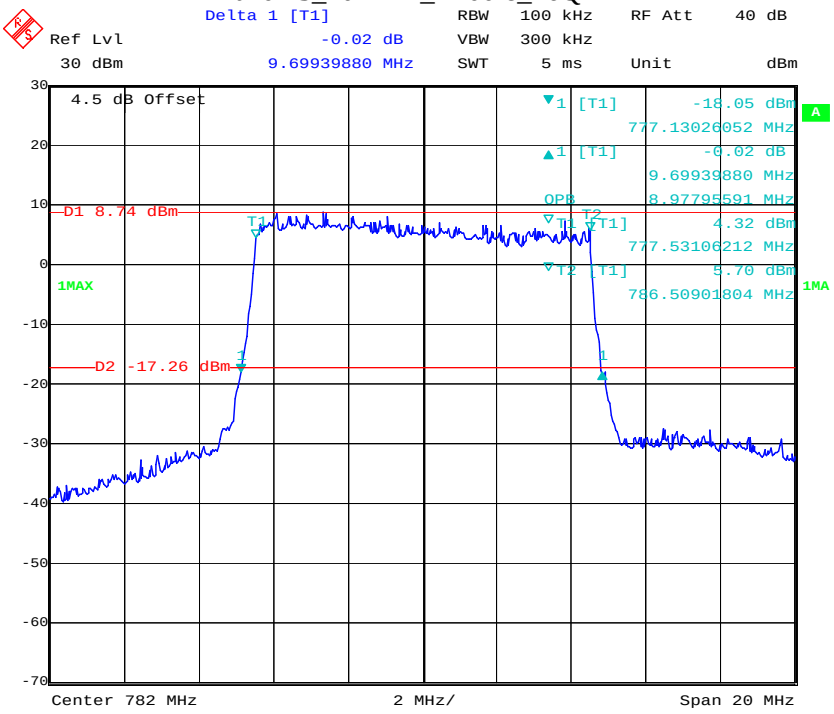
Band 13_5 MHz_Middle_16QAM



Band 13_10 MHz_Middle_QPSK



Band 13_10 MHz_Middle_16QAM



FCC §2.1051 §27.53- SPURIOUS EMISSIONS AT ANTENNA TERMINALS

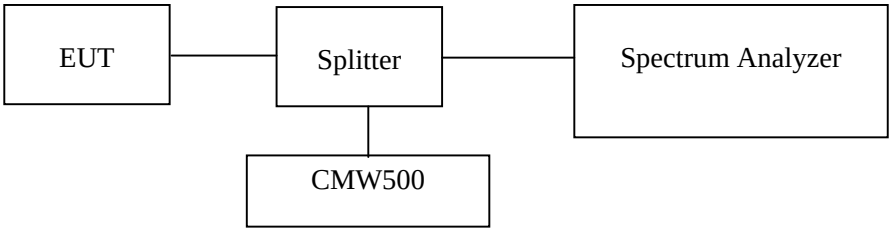
Applicable Standard

FCC §2.1051, §27.53.

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2018-08-03	2019-08-03
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005012	Each time	N/A
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	N/A
E-Microwave	Two-way Spliter	ODP-1-6-2S	OE0120142	Each time	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

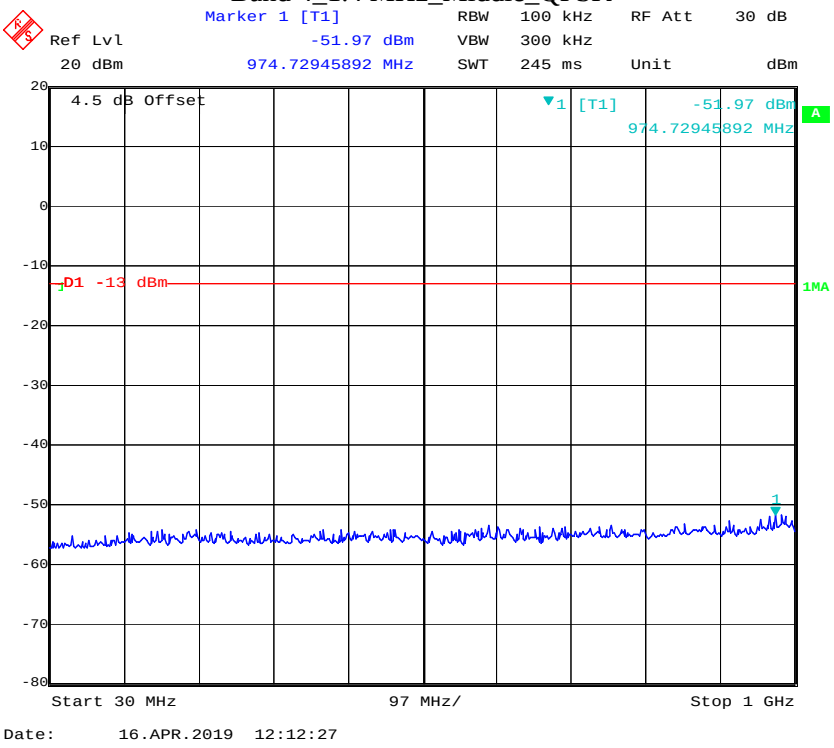
Environmental Conditions

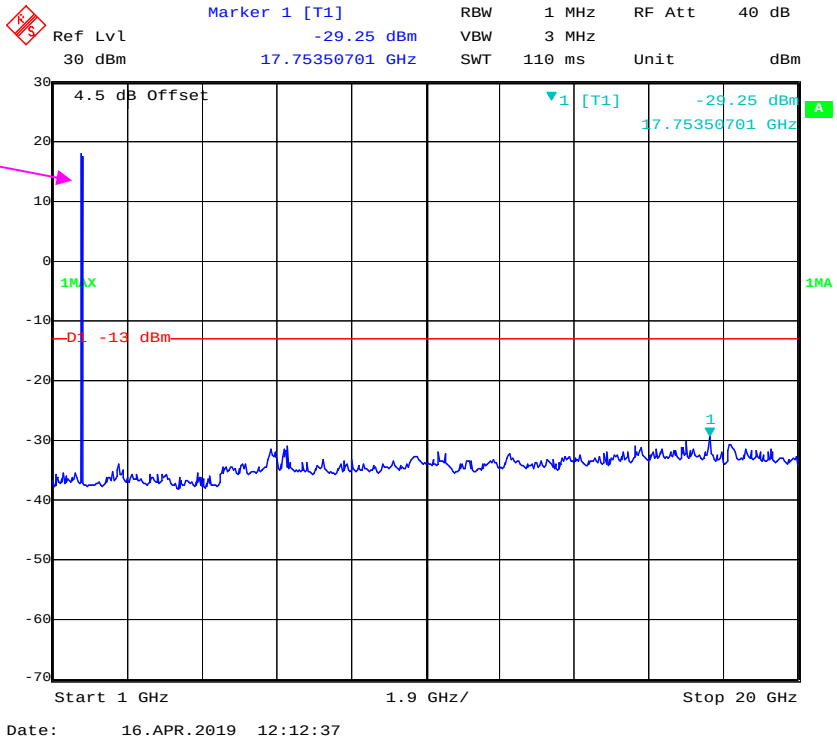
Temperature:	25.4°C
Relative Humidity:	55 %
ATM Pressure:	100.8 kPa

The testing was performed by Elena Lei & Blake Yang on 2019-04-16.

Please refer to the following plots.

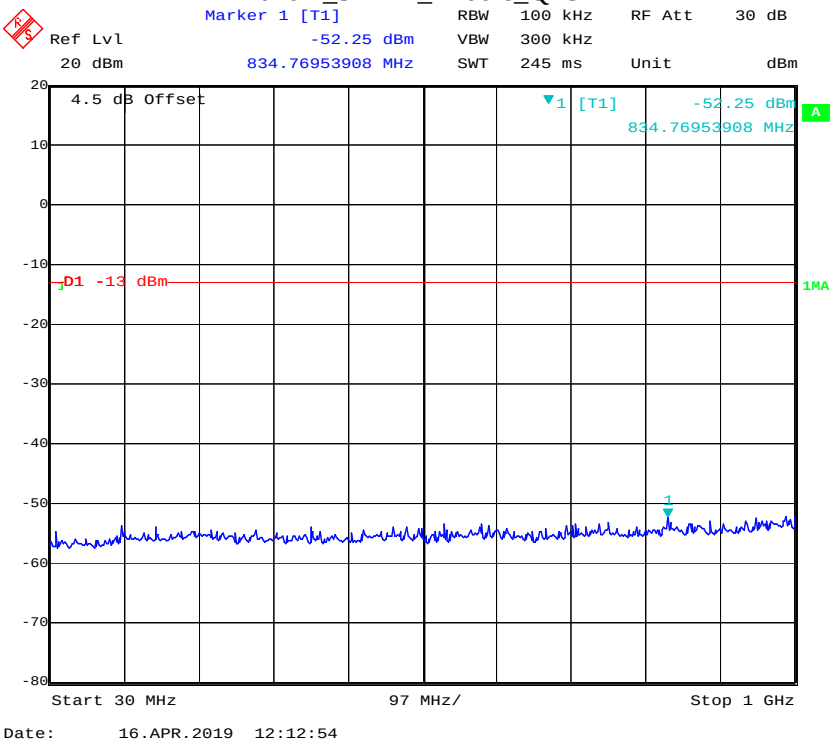
Band 4_1.4 MHz_Middle_QPSK



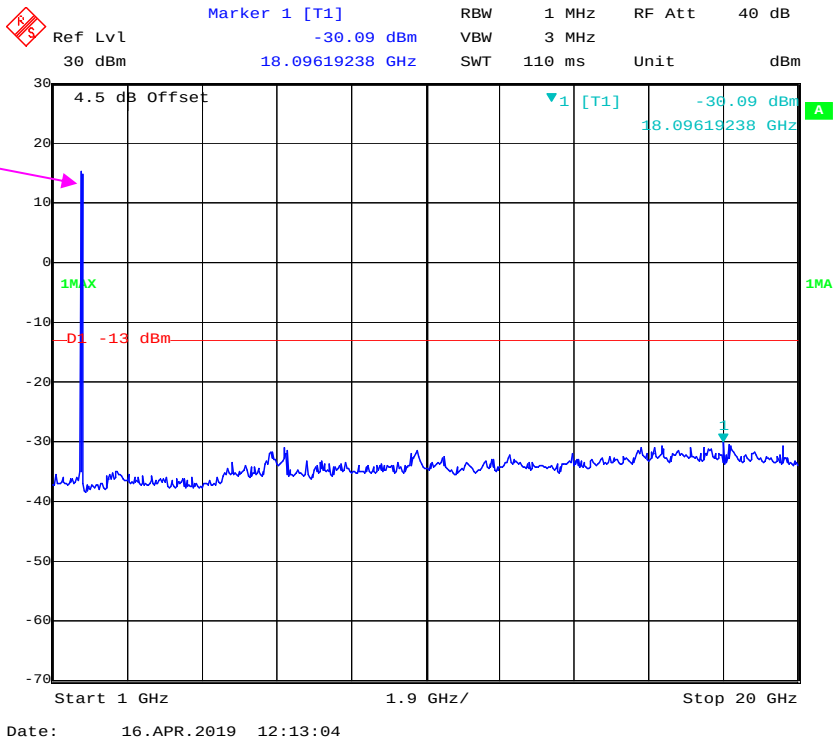


Fundamental

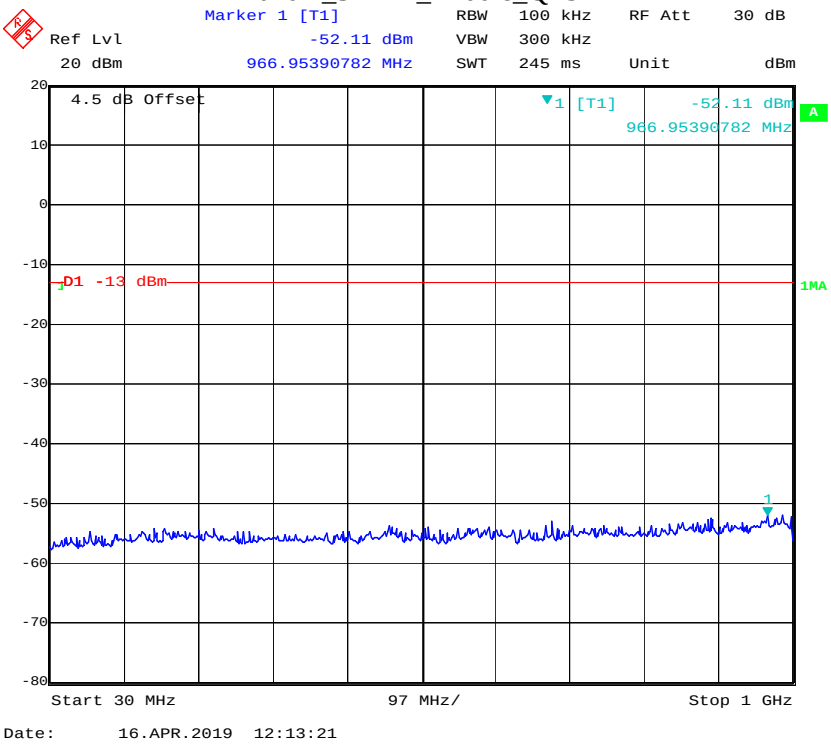
Band 4_3 MHz_Middle_QPSK



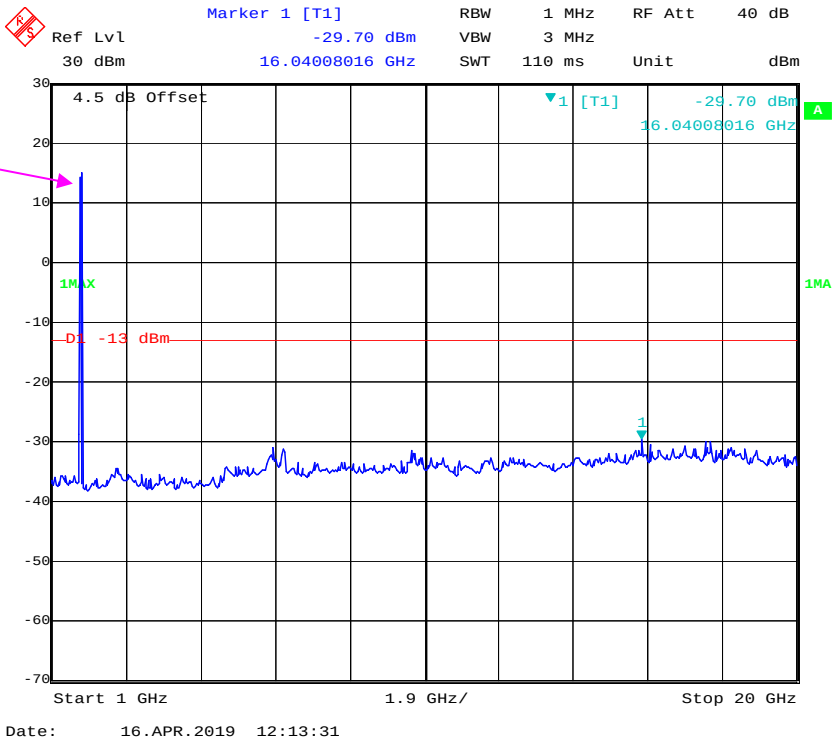
Fundamental



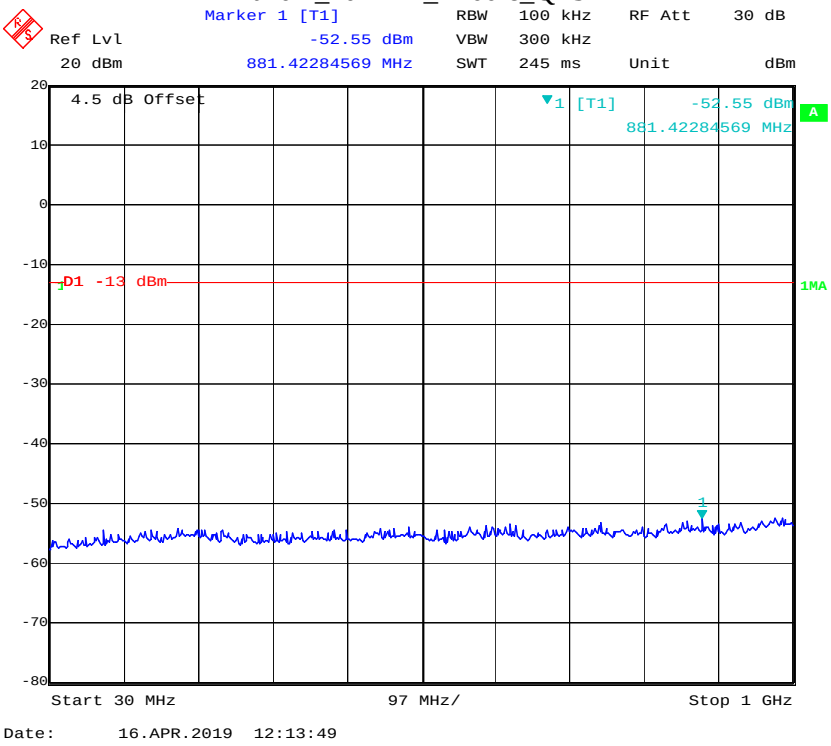
Band 4_5 MHz_Middle_QPSK



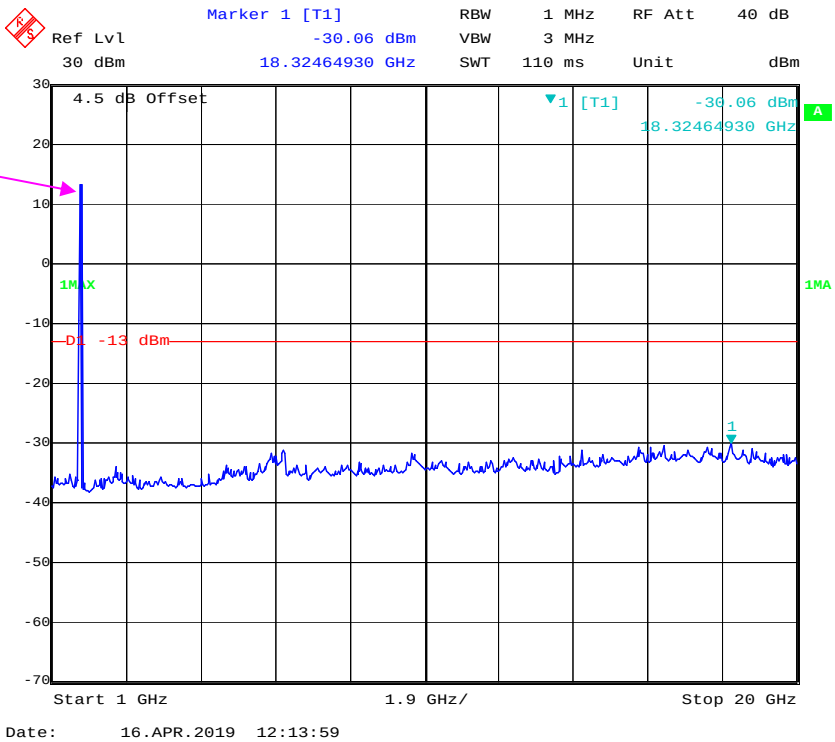
Fundamental



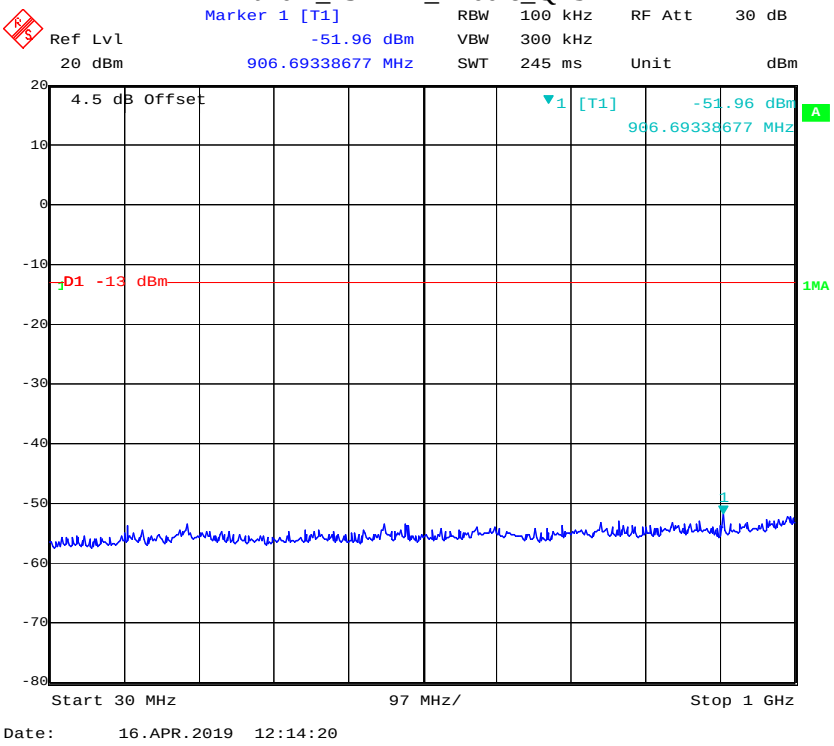
Band 4_10 MHz_Middle_QPSK

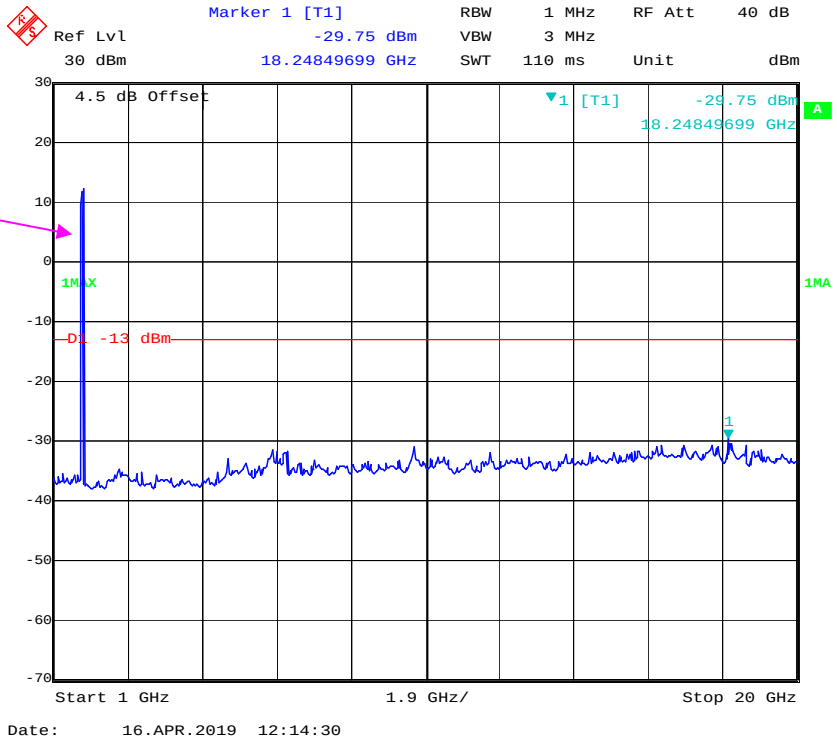


Fundamental



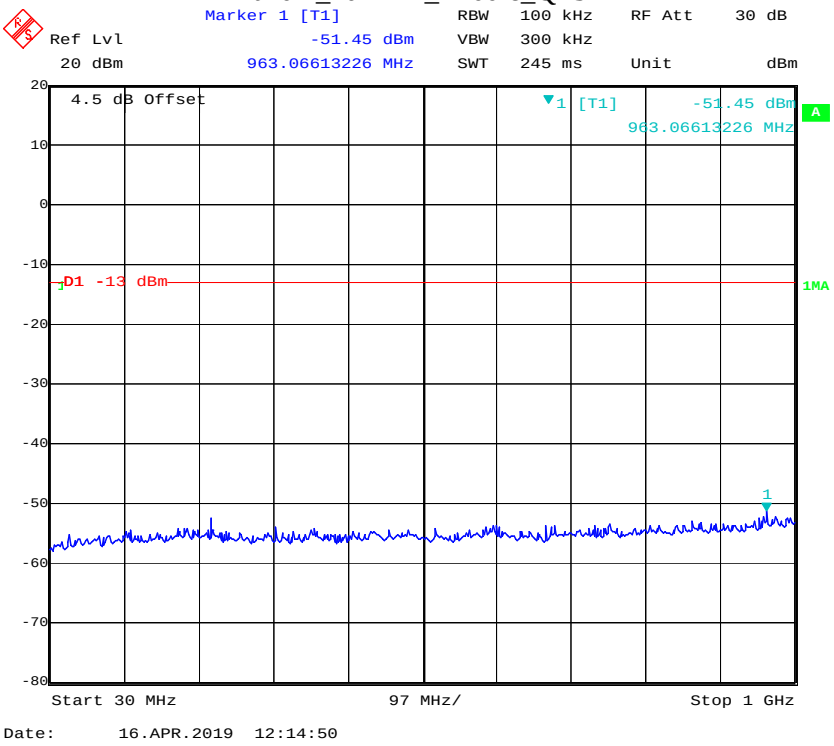
Band 4_15 MHz_Middle_QPSK

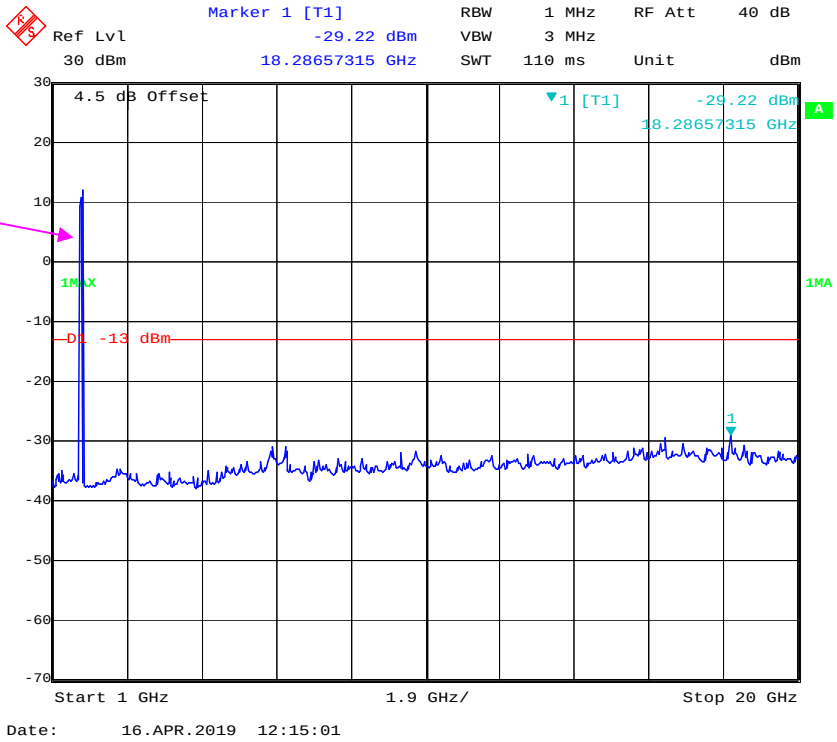




Fundamental

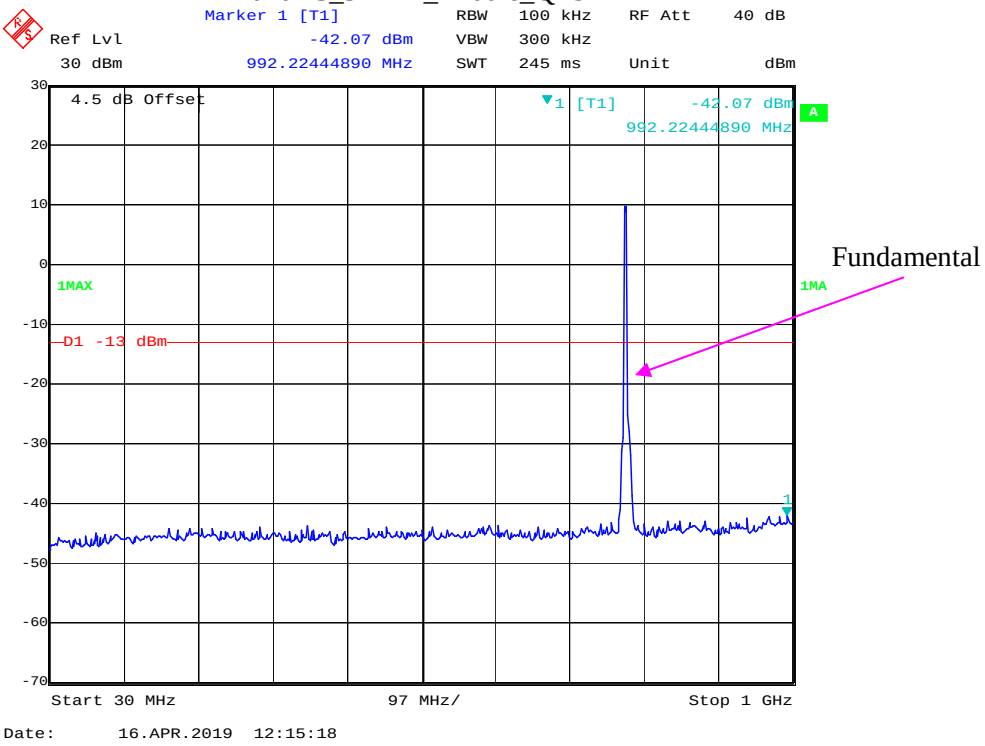
Band 4_20 MHz_Middle_QPSK

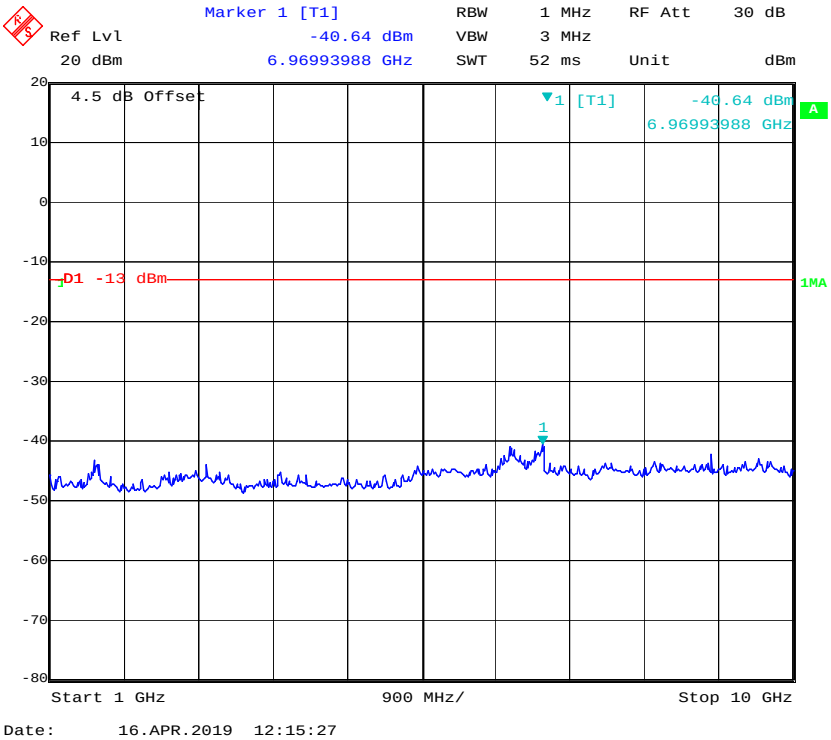




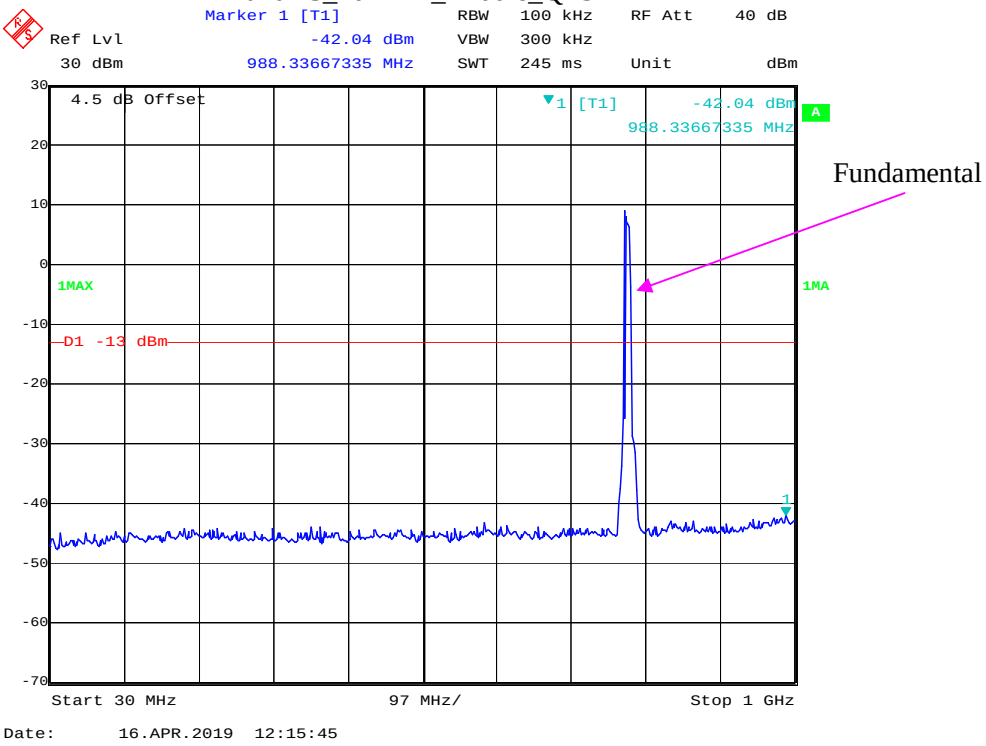
Fundamental

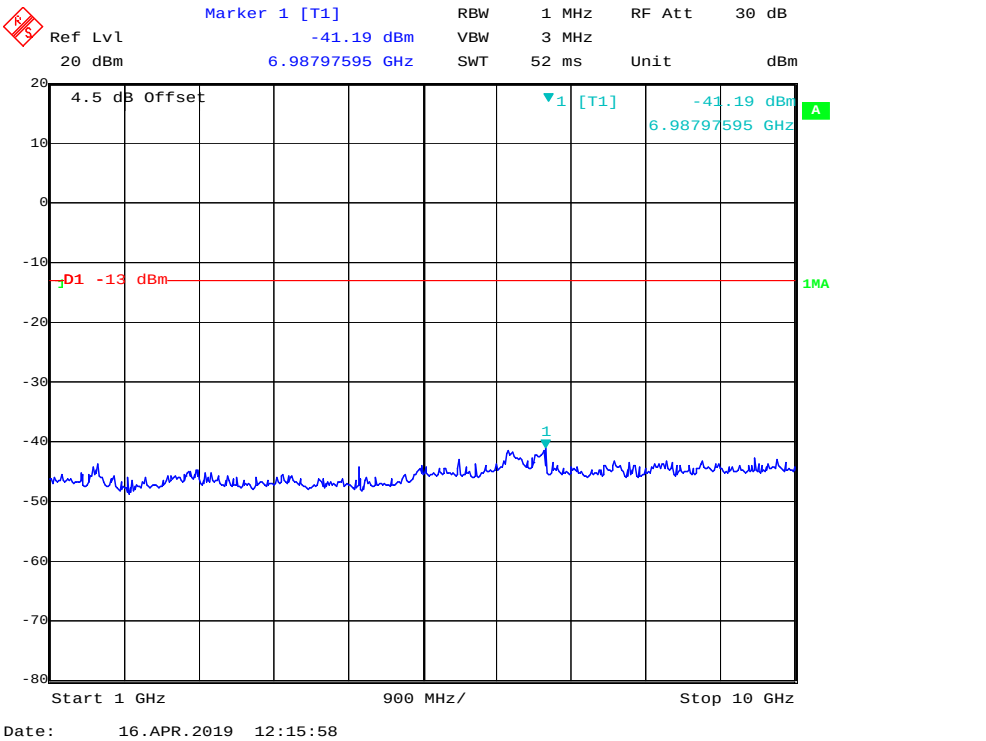
Band 13_5 MHz_Middle_QPSK





Band 13_10 MHz_Middle_QPSK





FCC §2.1053, §27.53- SPURIOUS RADIATED EMISSIONS

Applicable Standard

FCC § 2.1053 and § 27.53;

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2018-12-10	2019-12-10
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2018-05-06	2019-05-06
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2018-09-05	2019-09-05
HP	Amplifier	8447D	2727A05902	2018-09-05	2019-09-05
Agilent	Signal Generator	E8247C	MY43321350	2018-12-10	2019-12-10
R&S	Spectrum Analyzer	FSP 38	100478	2018-12-10	2019-12-10
TDK RF	Horn Antenna	HRN-0118	130 084	2018-10-12	2021-10-12
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2018-09-05	2019-09-05
MICRO-COAX	Coaxial Cable	UFA147-1-2362-100100	64639 231029-001	2019-02-24	2020-02-24
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2018-09-05	2019-09-05
Sinoscite	Band-stop filter	BSF1710-1785MN-0383-003	0383003	2018-06-16	2019-06-16

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	22.8~23.8°C
Relative Humidity:	31~61 %
ATM Pressure:	100.5~100.8 kPa

** The testing was performed by Tyler Pan, Vern Shen, Neil Liao on 2019-04-10.*

EUT Operation Mode: Transmitting

LTE Band 4 (30MHz-20GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK,Frequency:1732.500 MHz								
3465.00	H	39.56	-61.41	12.21	1.60	-50.80	-13.00	37.80
3465.00	V	40.17	-59.39	12.21	1.60	-48.78	-13.00	35.78
5197.50	H	38.75	-57.33	12.92	1.36	-45.77	-13.00	32.77
5197.50	V	38.50	-57.55	12.92	1.36	-45.99	-13.00	32.99
332.64	H	41.36	-66.03	0.00	0.55	-66.58	-13.00	53.58
332.64	V	42.15	-67.24	0.00	0.55	-67.79	-13.00	54.79

LTE Band 13 (30MHz-10GHz)

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK,Frequency:782 MHz								
1564.00	H	40.03	-64.46	10.19	1.32	-55.59	-13.00	42.59
1564.00	V	39.44	-64.98	10.19	1.32	-56.11	-13.00	43.11
2346.00	H	37.88	-65.30	11.98	1.21	-54.53	-13.00	41.53
2346.00	V	39.54	-64.60	11.98	1.21	-53.83	-13.00	40.83
3128.00	H	39.97	-61.63	12.35	1.53	-50.81	-13.00	37.81
3128.00	V	40.58	-60.55	12.35	1.53	-49.73	-13.00	36.73
332.64	H	41.36	-66.03	0.00	0.55	-66.58	-13.00	53.58
332.64	V	42.22	-67.17	0.00	0.55	-67.72	-13.00	54.72

Note:
1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
2) Absolute Level = Substituted Level - Cable loss + Antenna Gain
3) Margin = Limit-Absolute Level

FCC §27.53- BAND EDGES

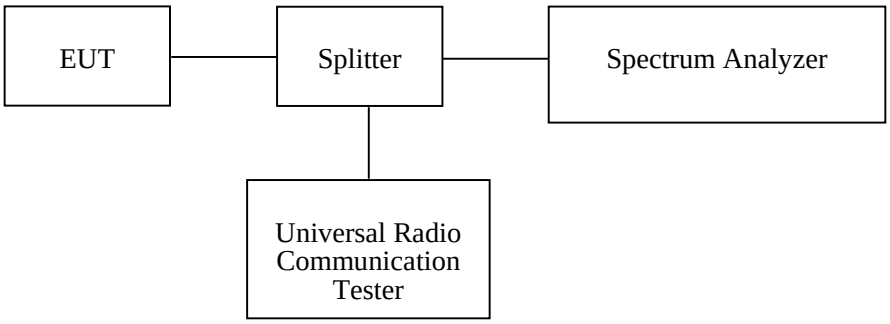
Applicable Standard

FCC § 2.1053, and § 27.53;

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2018-08-03	2019-08-03
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005012	Each time	N/A
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	N/A
E-Microwave	Two-way Spliter	ODP-1-6-2S	OE0120142	Each time	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

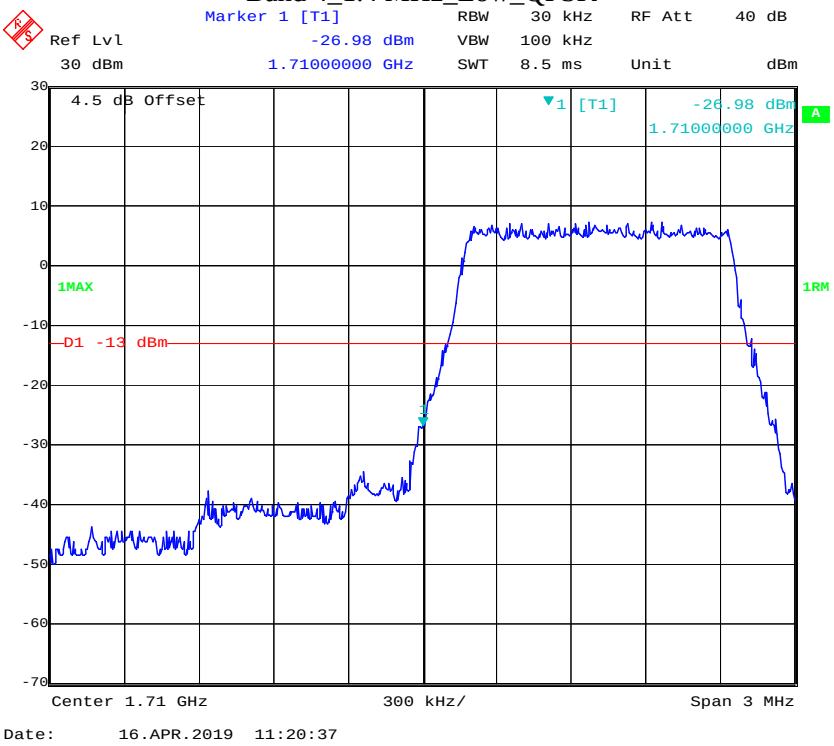
Temperature:	25.4°C
Relative Humidity:	40~55 %
ATM Pressure:	100.6~100.8 kPa

The testing was performed by Elena Lei & Blake Yang on 2019-04-16.

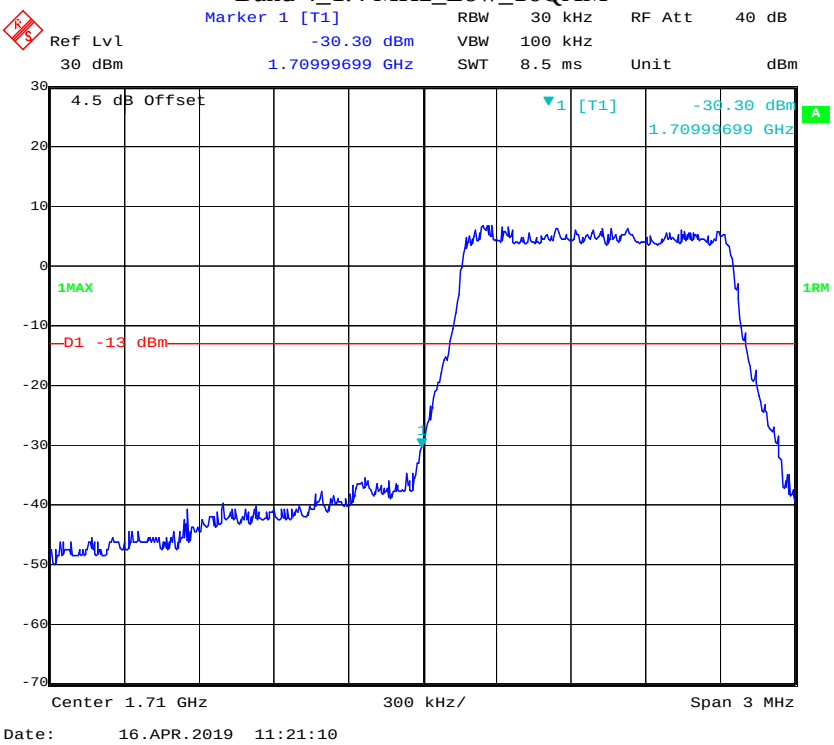
Test Mode: Transmitting

Test Result: Compliant. Please refer to the following plots.

Band 4_1.4 MHz_Low_QPSK



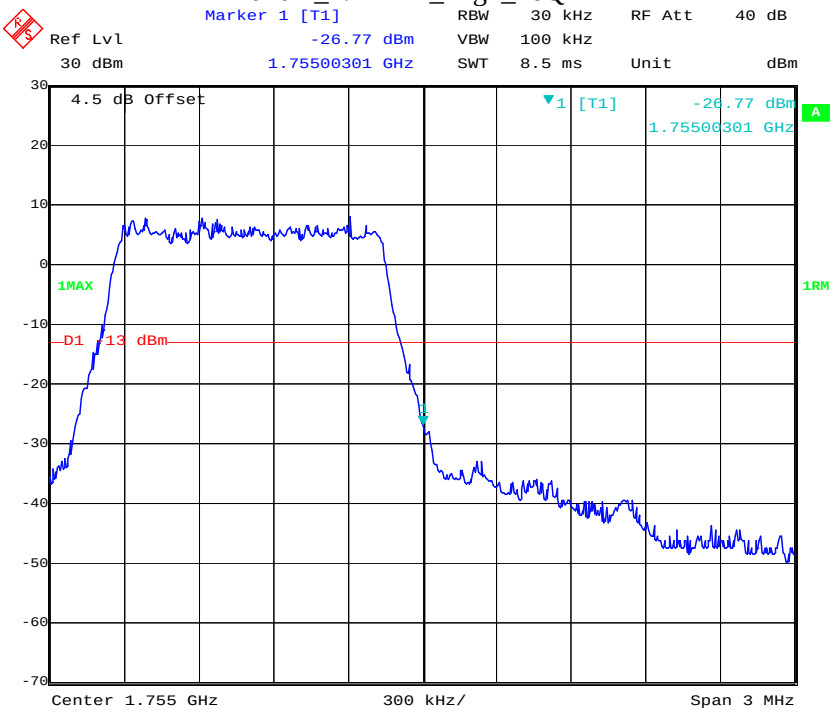
Band 4_1.4 MHz_Low_16QAM



Band 4_1.4 MHz_High_QPSK

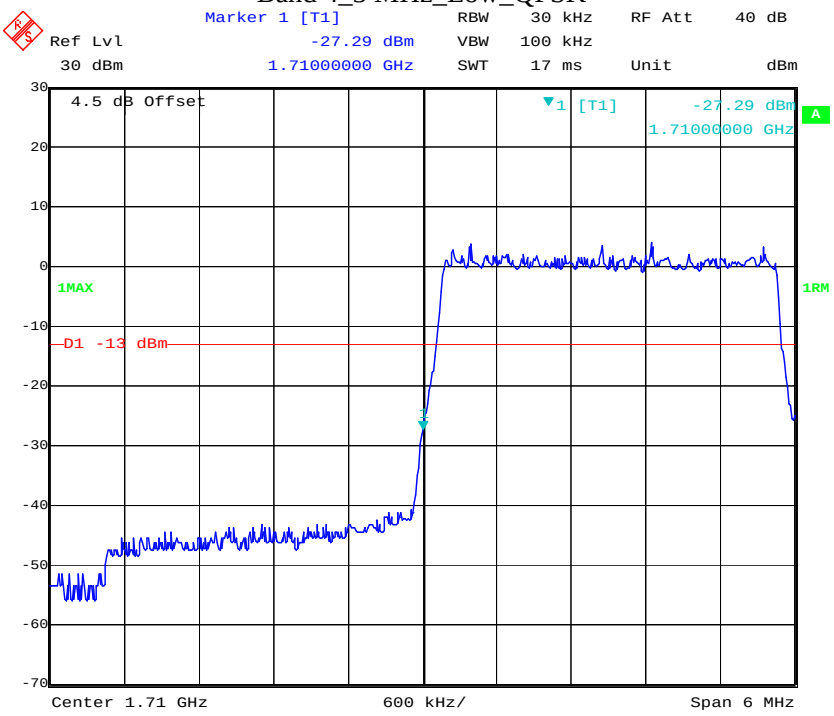
Date: 16.APR.2019 11:21:44

Band 4_1.4 MHz_High_16QAM

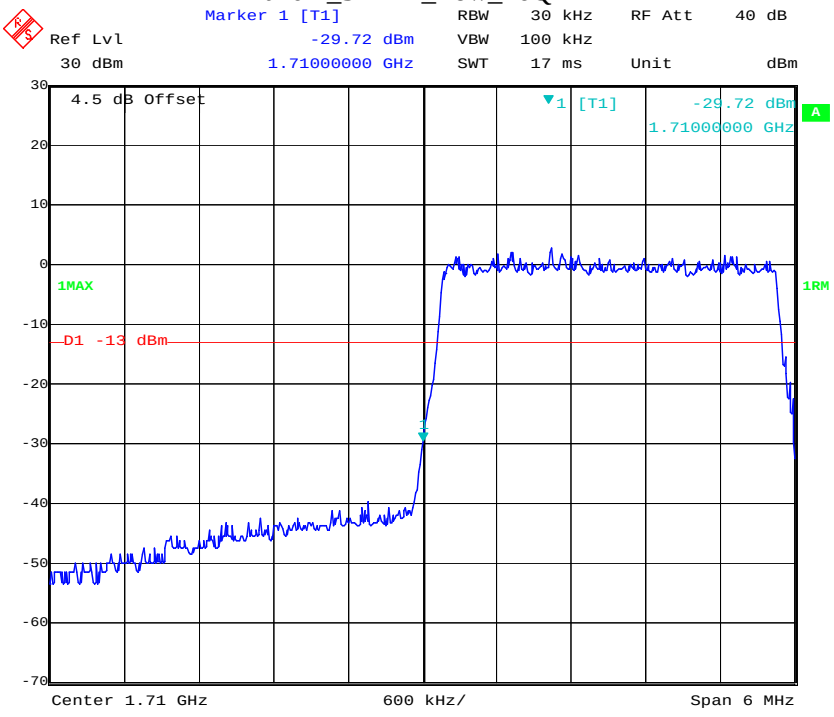


Date: 16.APR.2019 11:22:29

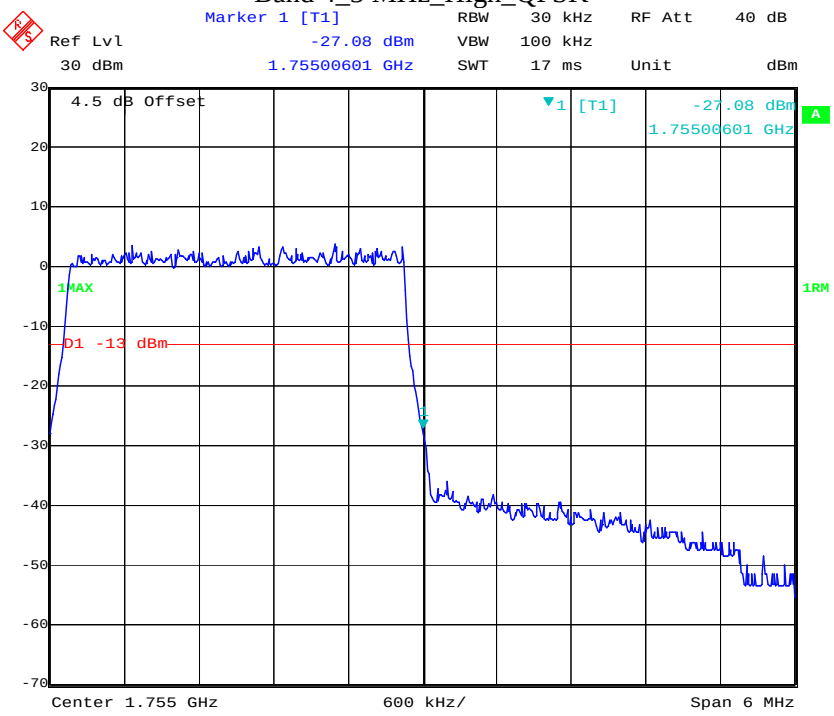
Band 4_3 MHz_Low_QPSK



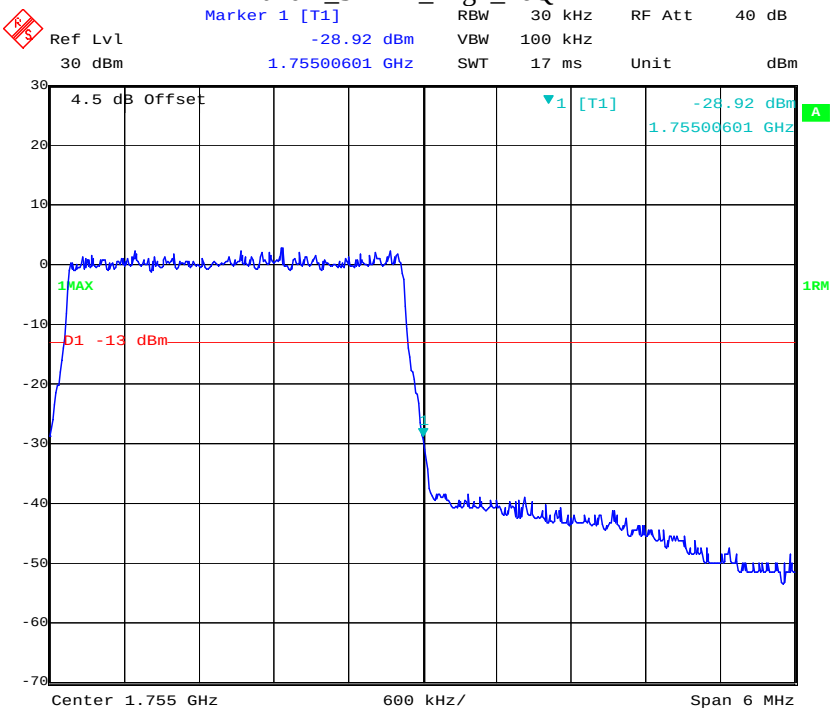
Band 4_3 MHz_Low_16QAM



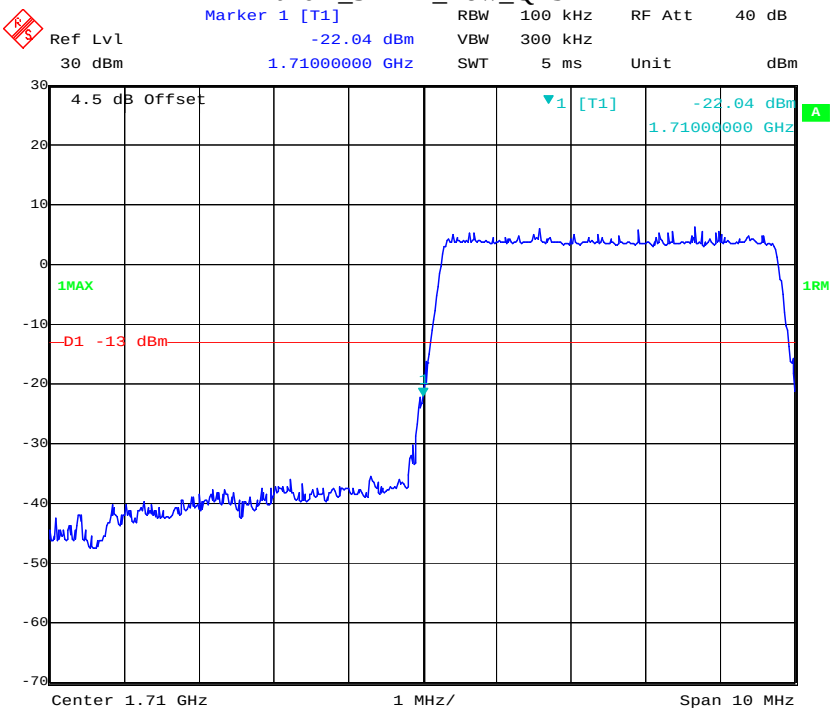
Band 4_3 MHz_High_QPSK



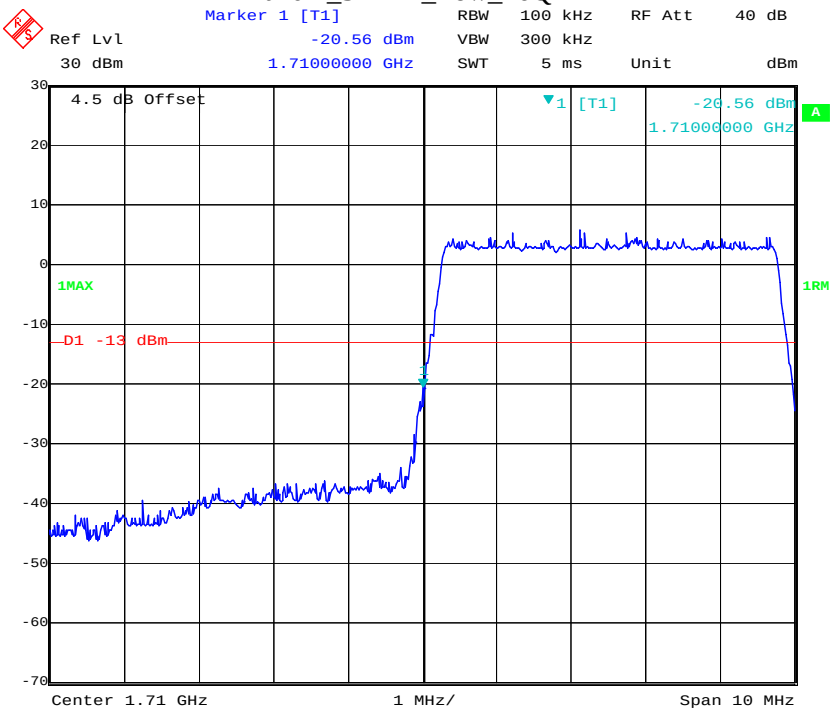
Band 4_3 MHz_High_16QAM



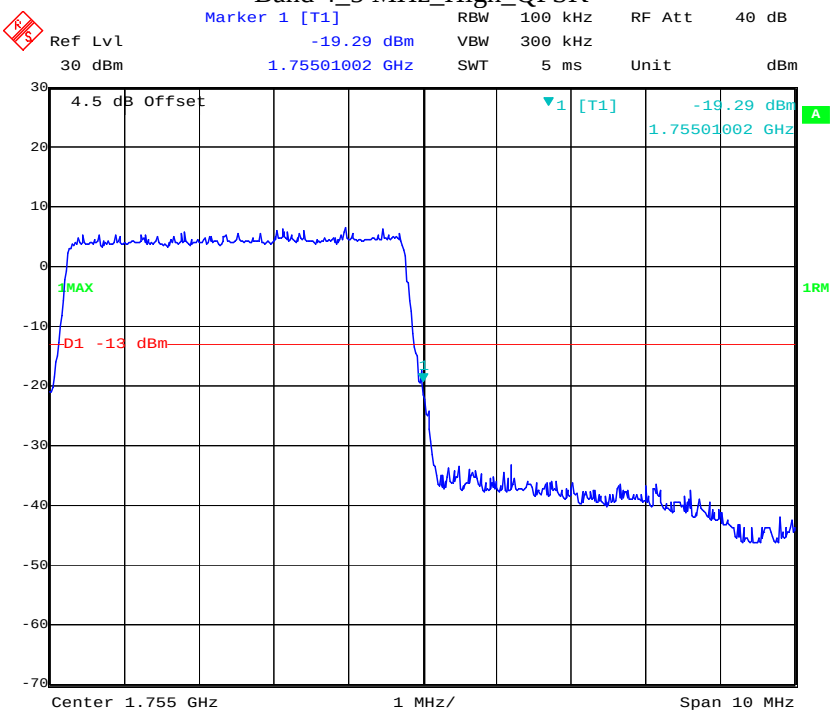
Band 4_5 MHz_Low_QPSK



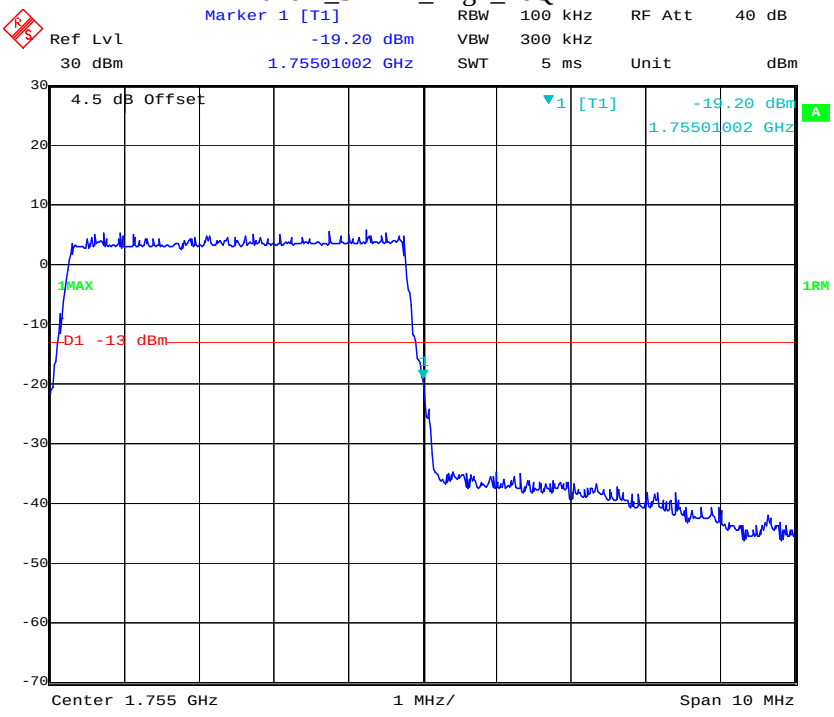
Band 4_5 MHz_Low_16QAM



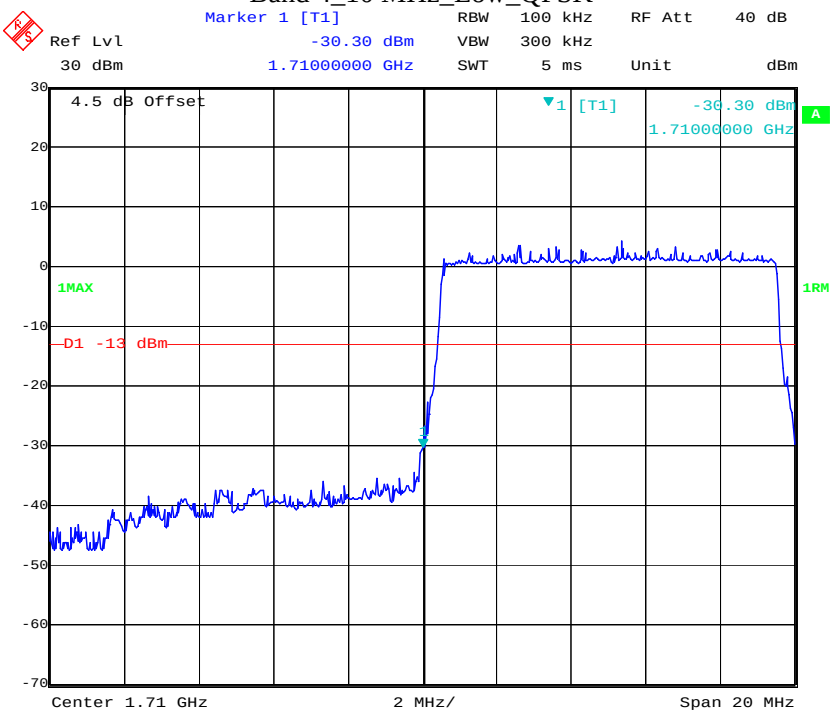
Band 4_5 MHz_High_QPSK



Band 4_5 MHz_High_16QAM



Band 4_10 MHz_Low_QPSK



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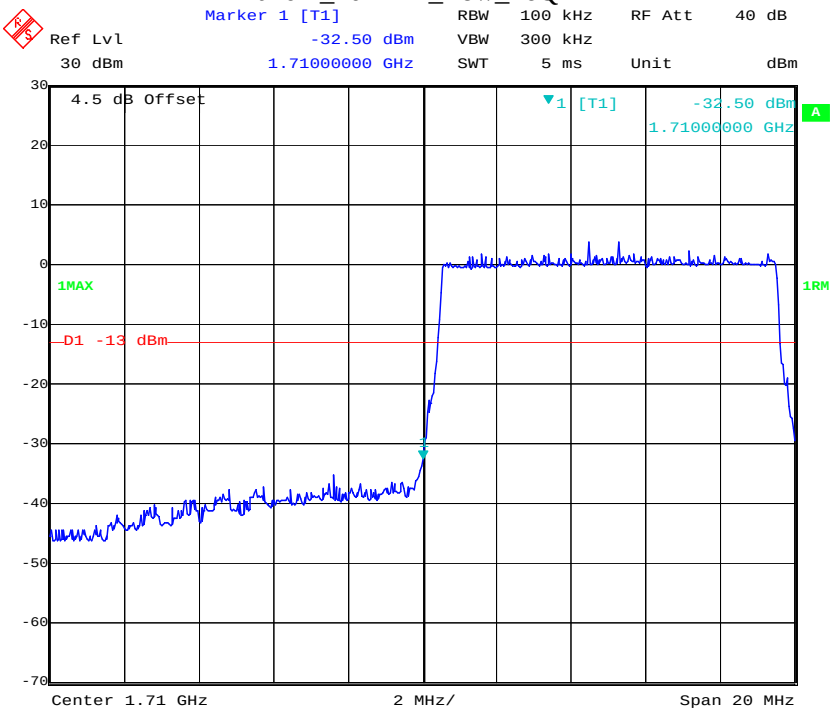
Band 4_10 MHz_Low_16QAM



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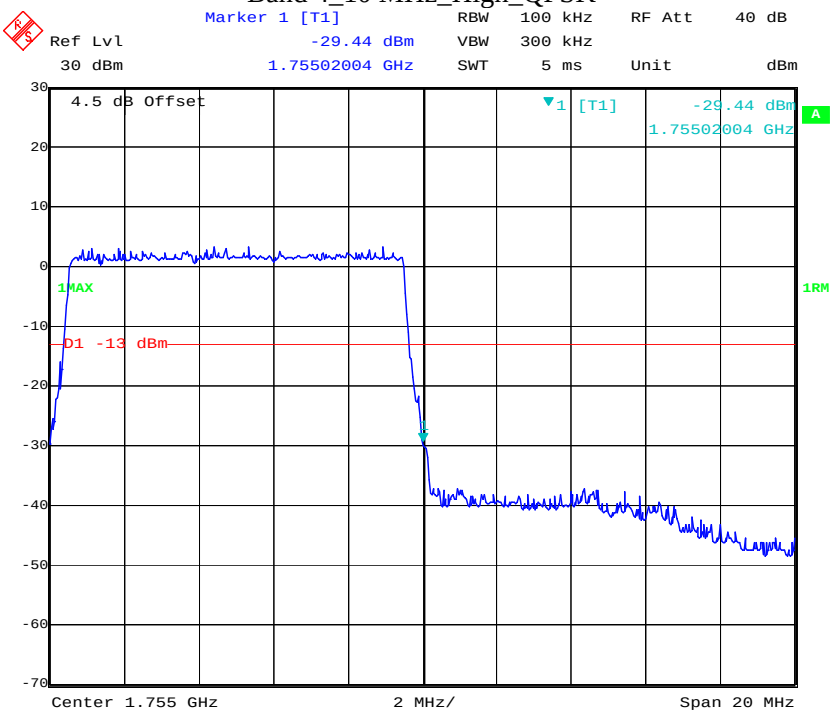
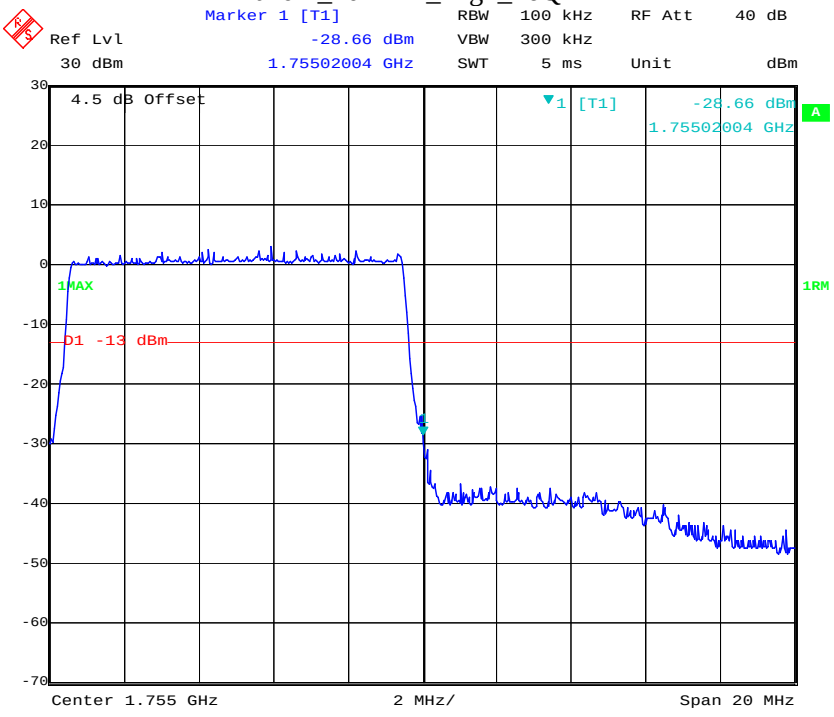
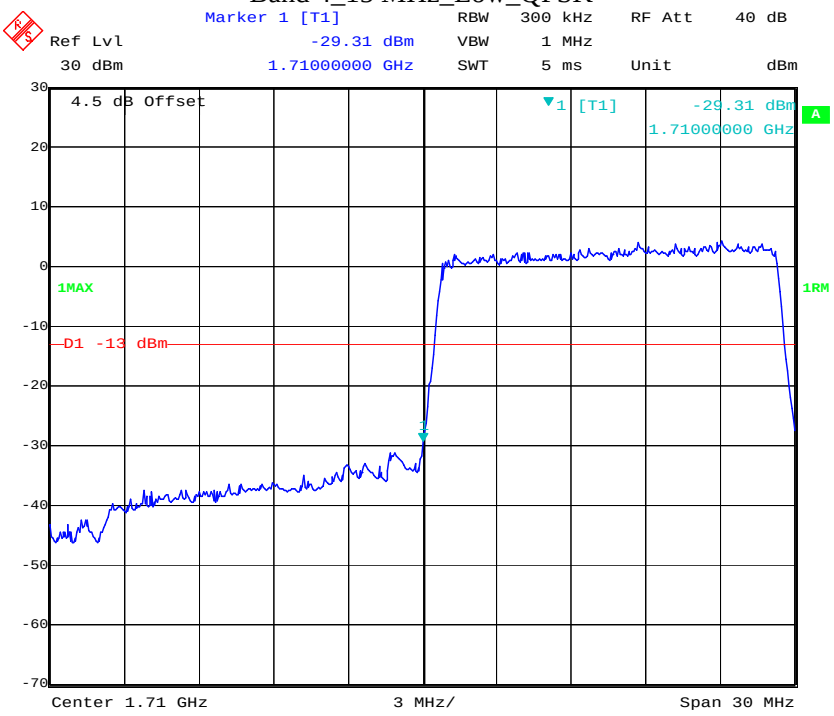
Band 4_10 MHz_High_QPSK



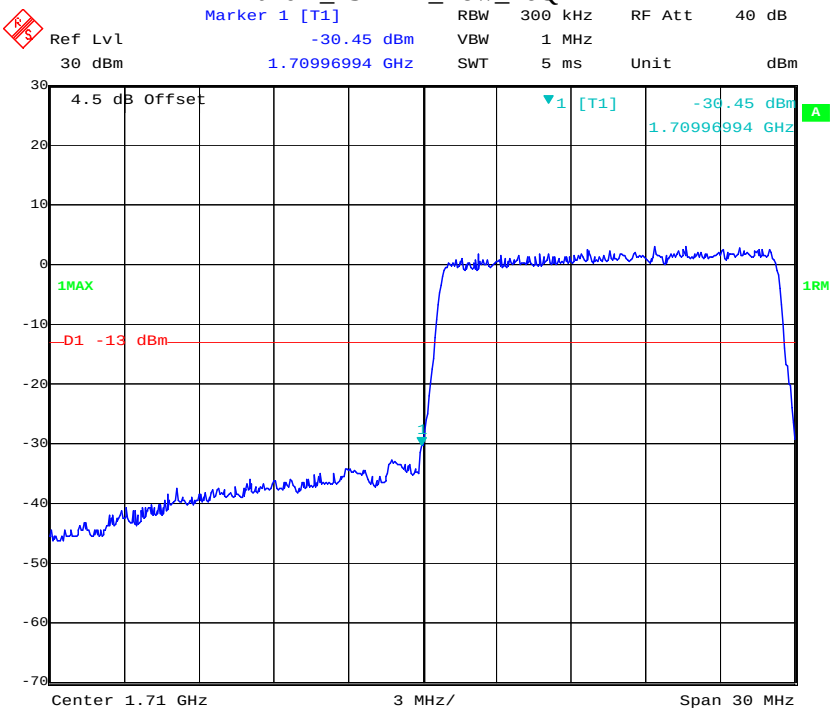
Band 4_10 MHz_High_16QAM



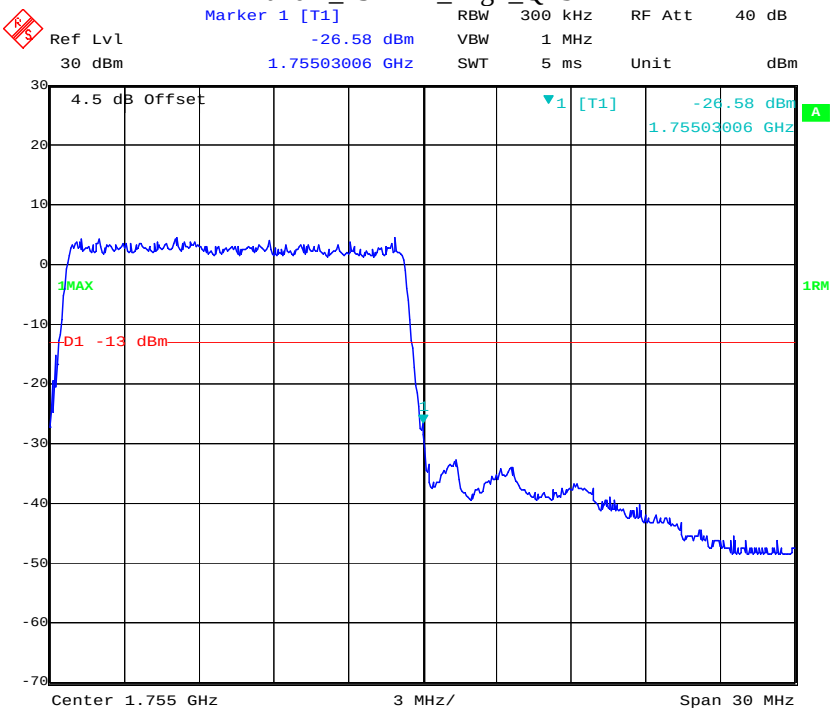
Band 4_15 MHz_Low_QPSK



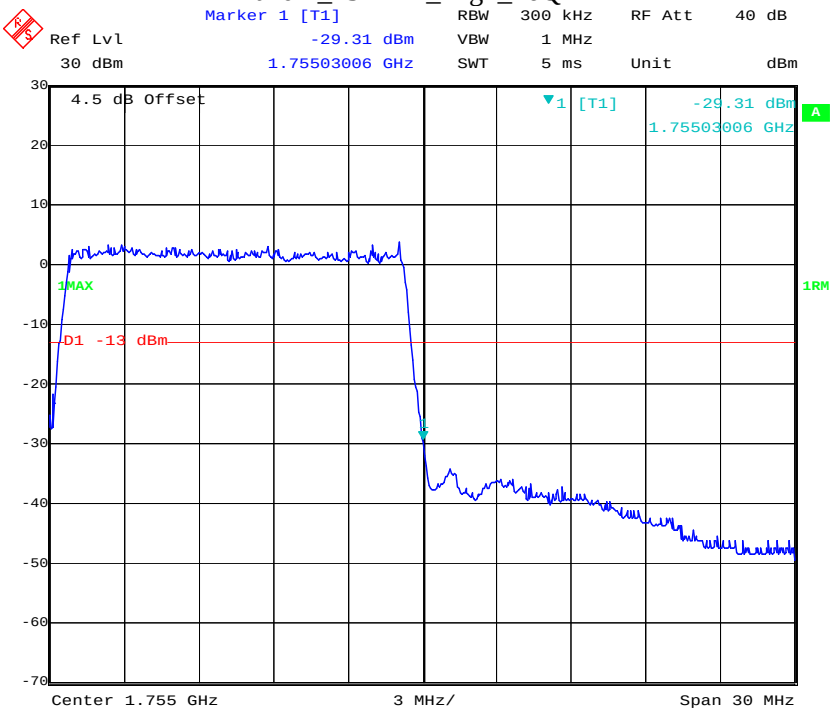
Band 4_15 MHz_Low_16QAM



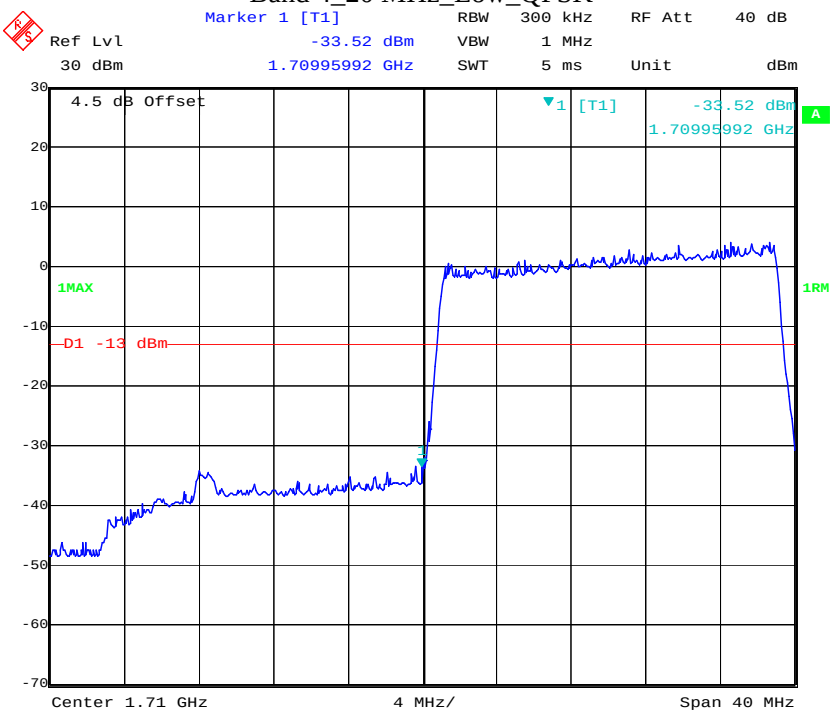
Band 4_15 MHz_High_QPSK



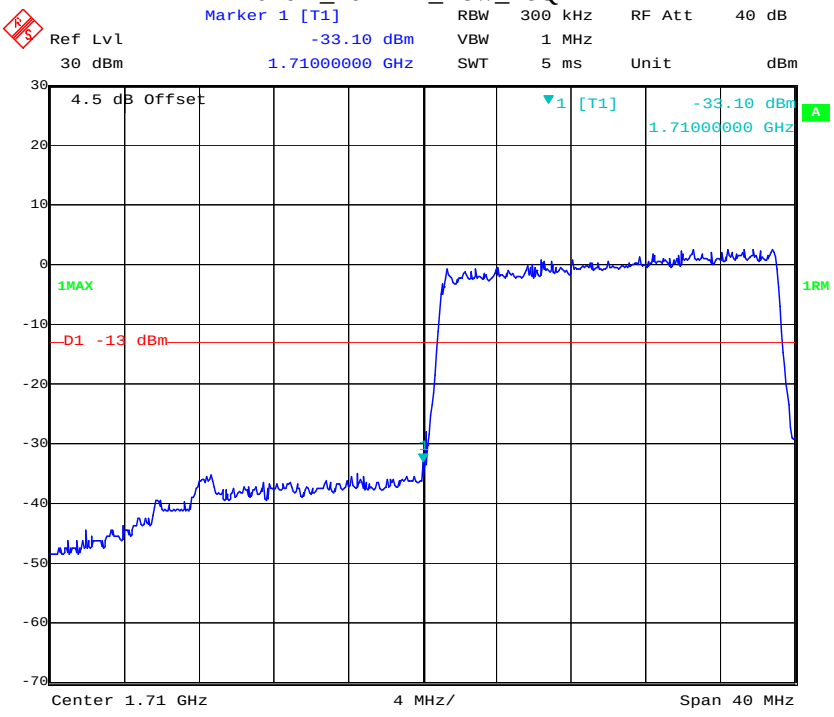
Band 4_15 MHz_High_16QAM



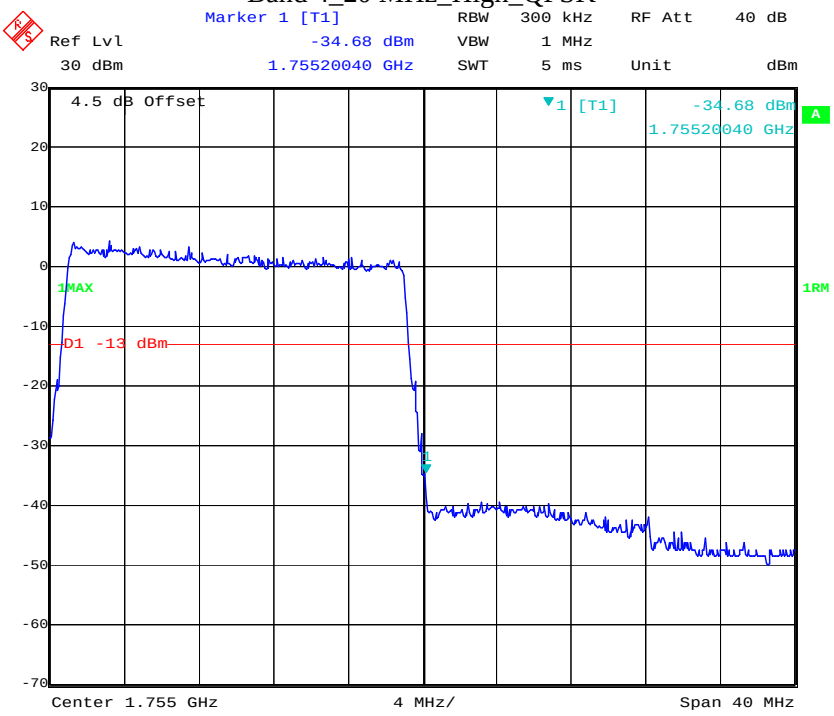
Band 4_20 MHz_Low_QPSK



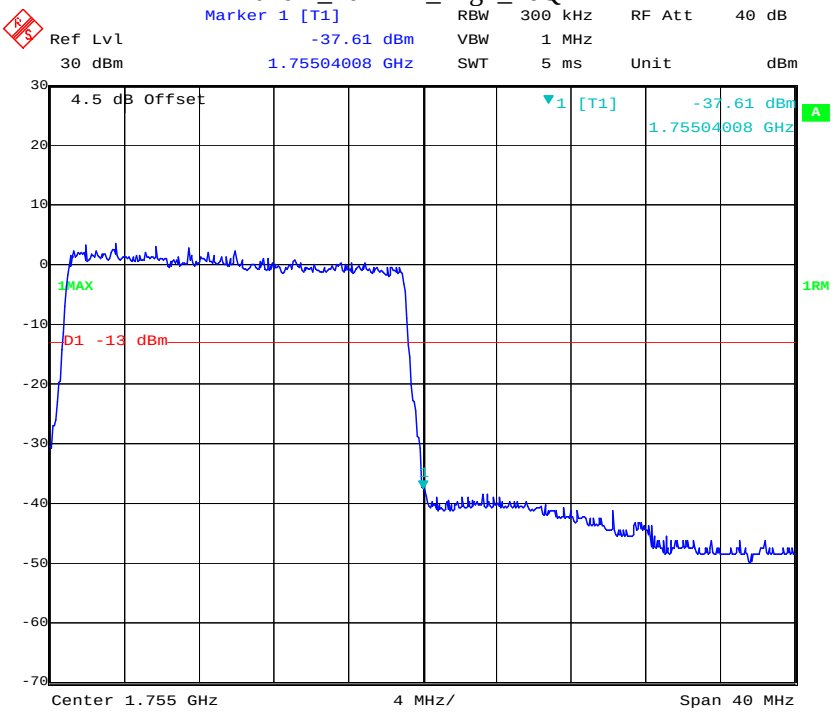
Band 4_20 MHz_Low_16QAM



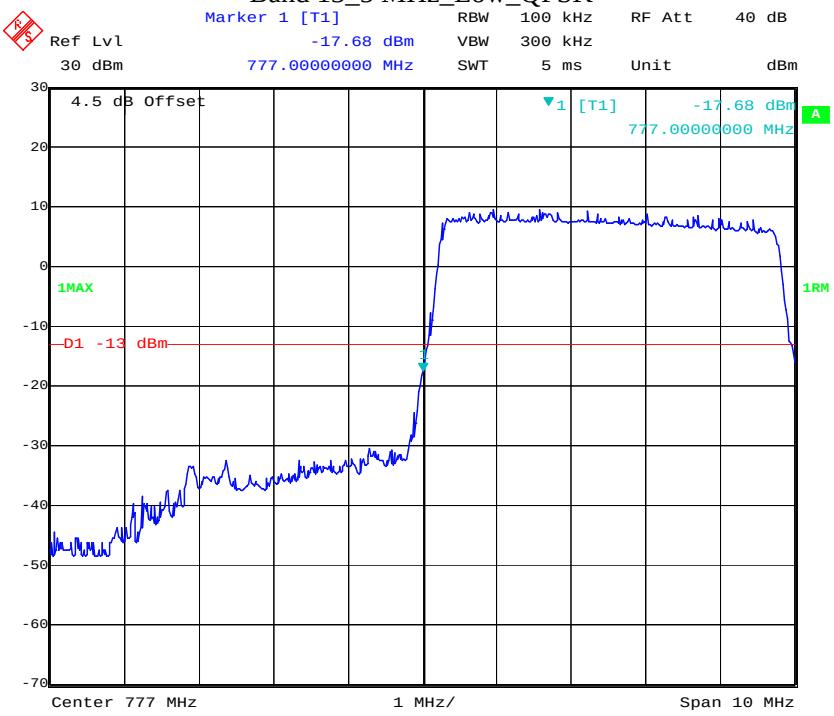
Band 4_20 MHz_High_QPSK



Band 4_20 MHz_High_16QAM



Band 13_5 MHz_Low_QPSK



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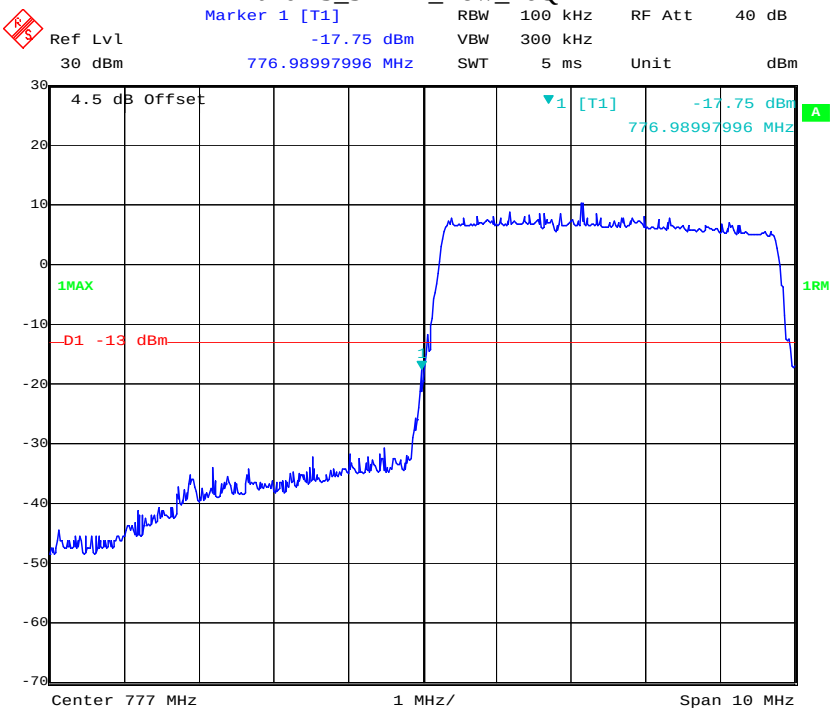
Band 13_5 MHz_Low_16QAM



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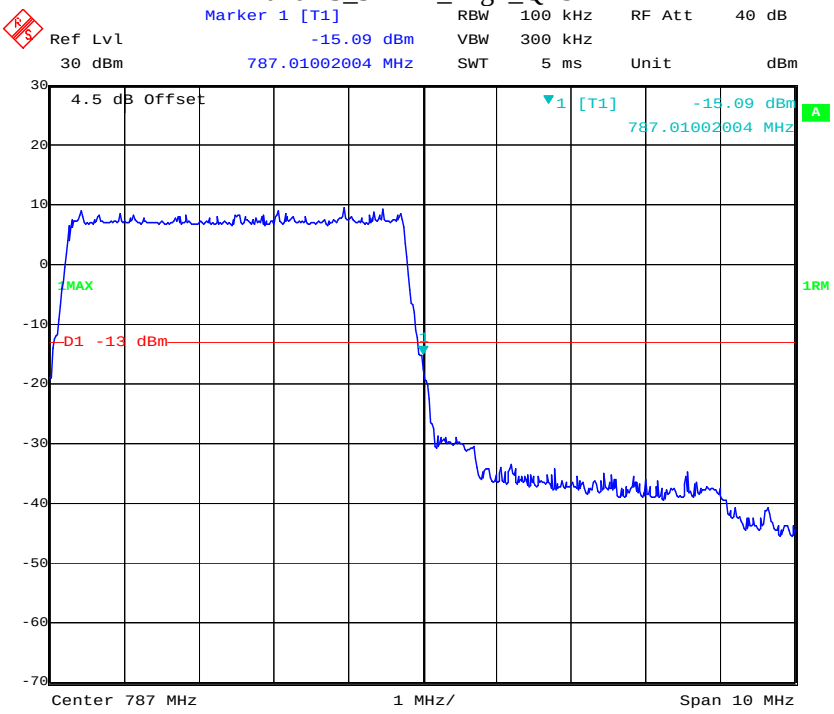
Band 13_5 MHz_High_QPSK



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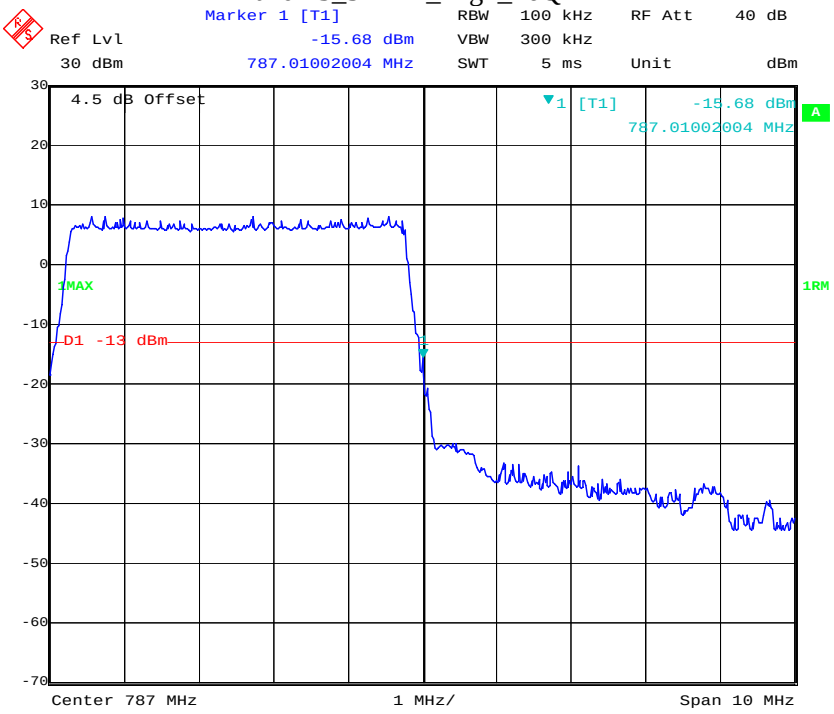
Band 13_5 MHz_High_16QAM



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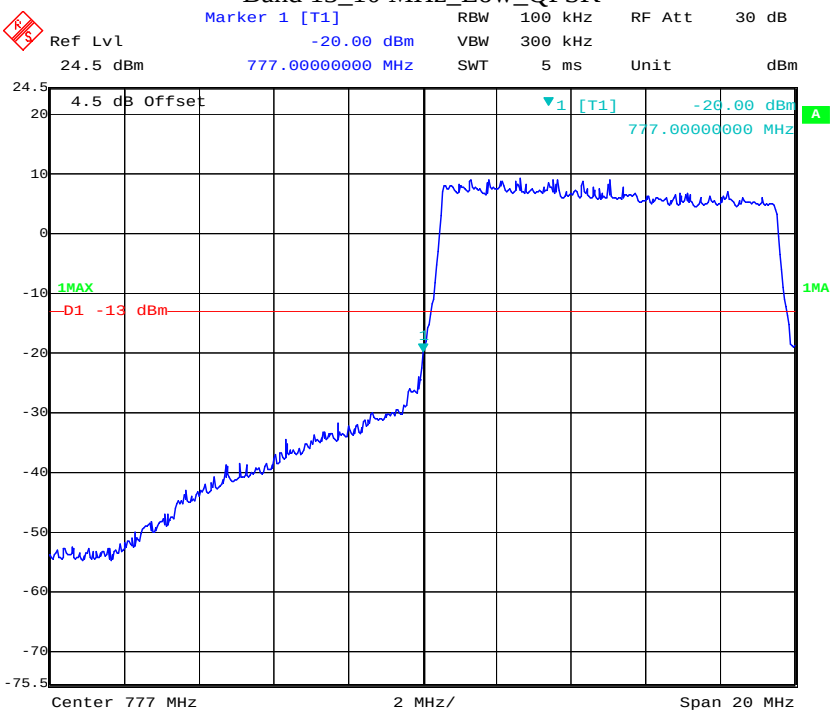
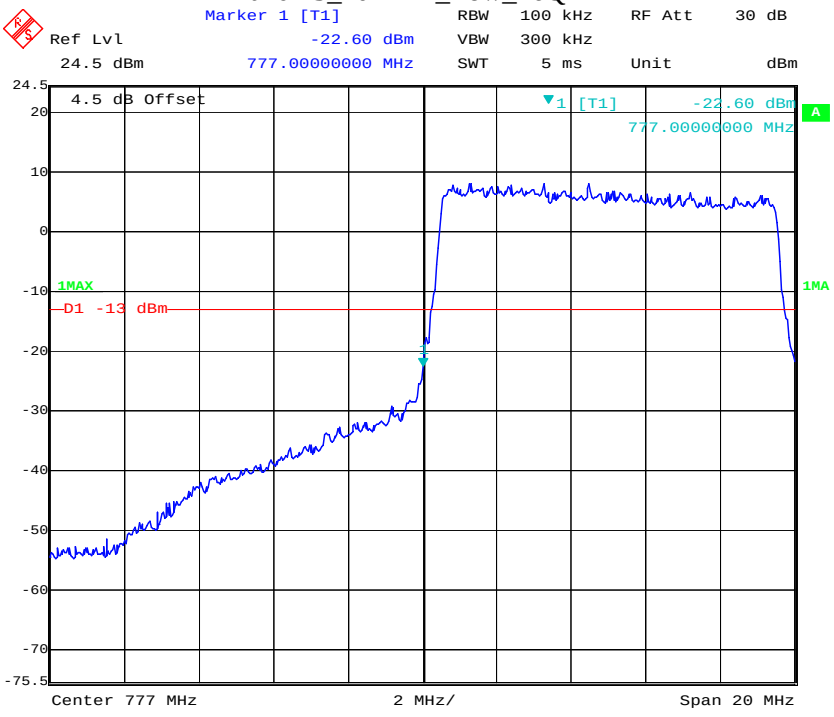
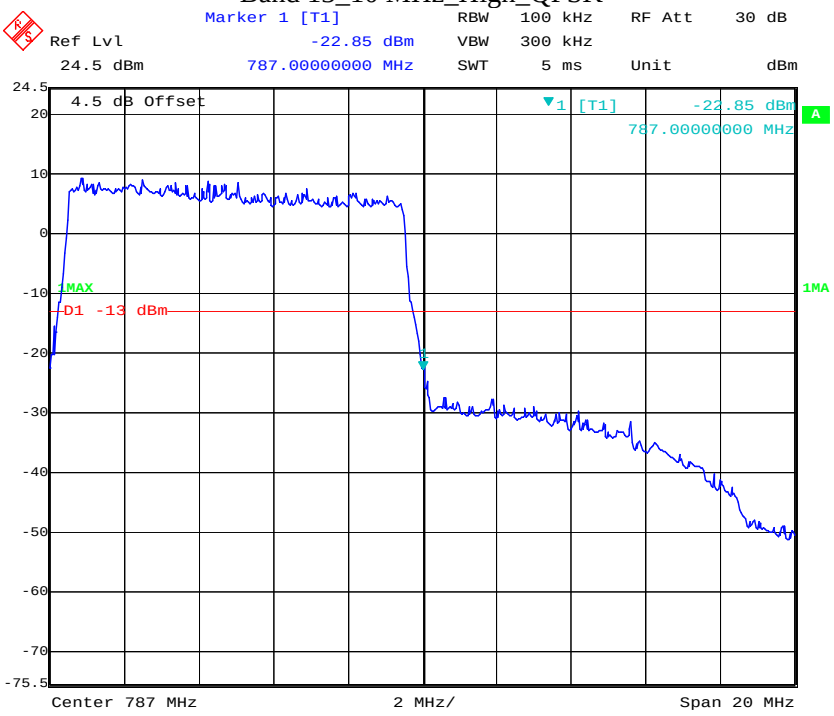
Band 13_10 MHz_Low_QPSK



Band 13_10 MHz_Low_16QAM

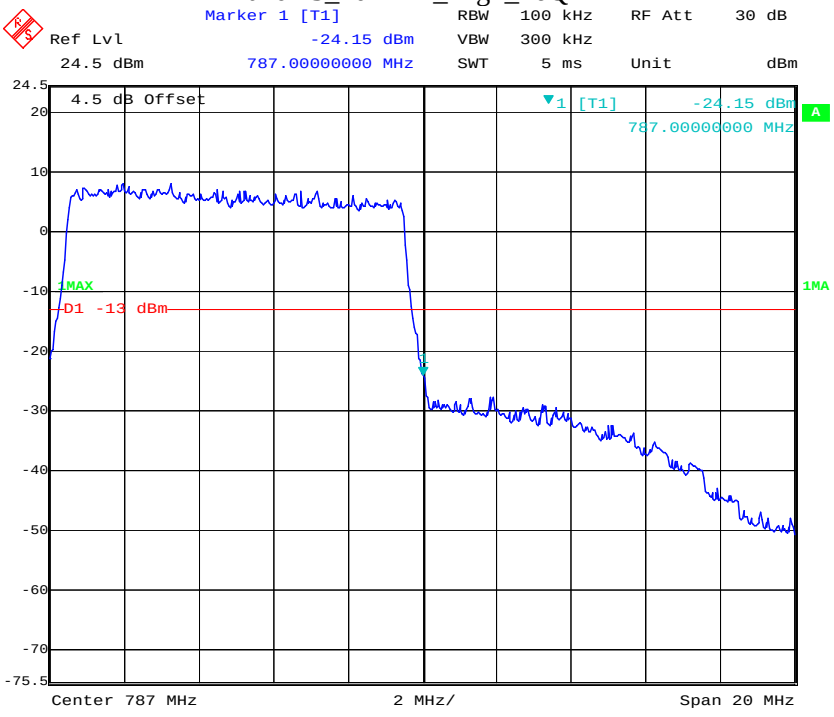


Band 13_10 MHz_High_QPSK



Date: 16.APR.2019 13:31:19

Band 13_10 MHz_High_16QAM



Date: 16.APR.2019 13:30:47

FCC §2.1055, §27.54- FREQUENCY STABILITY

Applicable Standard

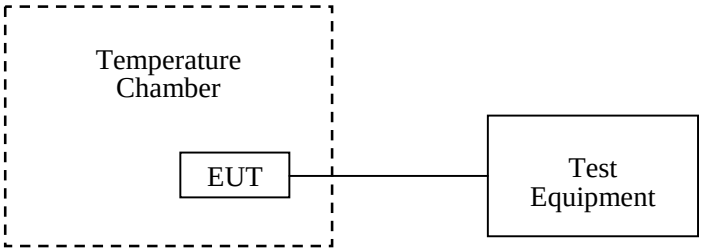
FCC § 2.1055 (a), § 2.1055 (d), §27.54

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: An external variable power supply was connected to the battery terminals of the equipment under test. The voltage was set from 85% to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	147473	2018-08-03	2019-08-03
ESPEC	Constant temperature and humidity Tester	ESX-4CA	018 463	2019-03-26	2020-03-26
UNI-T	Multimeter	UT39A	M130199938	2018-07-24	2019-07-24
R&S	Spectrum Analyzer	FSU 26	200256	2019-01-04	2020-01-04
Pro instrument	DC Power Supply	pps3300	3300012	N/A	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	25.4~25.9 °C
Relative Humidity:	40~64 %
ATM Pressure:	100.5~100.6 kPa

The testing was performed by Elena Lei & Blake Yang on 2019-04-16.

LTE Band 4:

QPSK, Channel Bandwidth:10MHz					
Temperature	**Voltage**	**Test Result (MHz)**		**Limit (MHz)**	
℃	V_{DC}	F_L	F_H	F_L	F_H
-30	3.7	1710.535701	1754.533587	1710	1755
-20		1710.537176	1754.532174	1710	1755
-10		1710.579380	1754.516294	1710	1755
0		1710.615409	1754.471265	1710	1755
10		1710.529827	1754.524873	1710	1755
20		1710.571140	1754.509020	1710	1755
30		1710.551805	1754.527001	1710	1755
40		1710.568283	1754.526924	1710	1755
50		1710.562791	1754.485332	1710	1755
20	4.2	1710.606907	1754.524130	1710	1755
20	3.5	1710.587941	1754.480446	1710	1755

16QAM, Channel Bandwidth:10MHz					
Temperature	**Voltage**	**Test Result (MHz)**		**Limit (MHz)**	
℃	V_{DC}	F_L	F_H	F_L	F_H
-30	3.7	1710.556344	1754.478818	1710	1755
-20		1710.540230	1754.504326	1710	1755
-10		1710.620699	1754.476341	1710	1755
0		1710.618195	1754.476513	1710	1755
10		1710.587261	1754.471780	1710	1755
20		1710.571140	1754.509020	1710	1755
30		1710.594295	1754.469108	1710	1755
40		1710.536333	1754.473517	1710	1755
50		1710.542055	1754.518356	1710	1755
20	4.2	1710.606429	1754.474572	1710	1755
20	3.5	1710.531947	1754.527406	1710	1755

LTE Band 13:

QPSK, Channel Bandwidth:10MHz					
Temperature	**Voltage**	**Test Result (MHz)**		**Limit (MHz)**	
℃	V_{DC}	F_L	F_H	F_L	F_H
-30	3.7	777.570219	786.536243	777	787
-20		777.547295	786.532652	777	787
-10		777.503098	786.544347	777	787
0		777.572793	786.512705	777	787
10		777.554958	786.556831	777	787
20		777.531062	786.509018	777	787
30		777.524499	786.503369	777	787
40		777.500342	786.475884	777	787
50		777.575770	786.527638	777	787
20	4.2	777.525069	786.518876	777	787
20	3.5	777.501226	786.468267	777	787

16QAM, Channel Bandwidth:10MHz					
Temperature	**Voltage**	**Test Result (MHz)**		**Limit (MHz)**	
℃	V_{DC}	F_L	F_H	F_L	F_H
-30	3.7	777.532042	786.530695	777	787
-20		777.499767	786.477564	777	787
-10		777.577957	786.461682	777	787
0		777.526770	786.542514	777	787
10		777.494432	786.556020	777	787
20		777.531062	786.509018	777	787
30		777.511201	786.527732	777	787
40		777.530782	786.494845	777	787
50		777.566701	786.506525	777	787
20	4.2	777.530537	786.485103	777	787
20	3.5	777.508743	786.512480	777	787

Note: The fundamental emissions stay within the authorized bands of operation based on the frequency deviation measured is small, the extreme voltage was declared by applicant.

******* END OF REPORT *******