

FCC Test Report (Part 96)

Report No.: RF191202D01

FCC ID: P27-SCE4255W

Test Model: SCE4255W

Received Date: Dec. 2, 2019

Test Date: Feb. 27 to Apr. 8, 2020

Issued Date: Apr. 10, 2020

Applicant: Sercomm Corp.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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Release Control Record

Issue No.	Description	Date Issued
RF191202D01	Original release.	Apr. 10, 2020

1 Certificate of Conformity

Product: Englewood

Brand: Sercomm

Test Model: SCE4255W

Sample Status: Engineering sample

Applicant: Sercomm Corp.

Test Date: Feb. 27 to Apr. 8, 2020

Standards: 47 CFR FCC Part 96

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by :



Celia Chen / Supervisor

Date: Apr. 10, 2020

Approved by :



Rex Lai / Associate Technical Manager

Date: Apr. 10, 2020

2 Summary of Test Results

47 CFR FCC Part 96			
FCC Clause	Test Item	Result	Remarks
2.1046 96.41(b)	Maximum Average Output Power and Maximum EIRP	Pass	Meet the requirement of limit.
2.1046 96.41(b)	Maximum Power Spectral Density	Pass	Meet the requirement of limit.
2.1047 96.41(a)	Modulation Characteristics	Pass	Meet the requirement.
96.41(g)	Peak to Average Ratio	Pass	Meet the requirement of limit.
2.1049	Emission Bandwidth	Pass	Meet the requirement of limit.
2.1055	Frequency Stability	Pass	Meet the requirement of limit.
2.1051 96.41(e)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 96.41(e)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -2.71dB at 7249.87MHz.
2.1046 96.41(c)(1)	Transmit Power Control (TPC)	Pass	Meet the requirement.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) ($\pm$)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.61 dB
	30MHz ~ 1GHz	5.43 dB
Radiated Emissions above 1 GHz	Above 1GHz	5.14 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Englewood	
Brand	Sercomm	
Test Model	SCE4255W	
Status of EUT	Engineering sample	
Power Supply Rating	12Vdc from adapter or 55Vdc from PoE	
Modulation Type	QPSK, 16QAM, 64QAM	
Operating Frequency	Channel Bandwidth 10MHz	TX: 3555 ~ 3695 MHz RX: 3555 ~ 3695 MHz
	Channel Bandwidth 20MHz	TX: 3560 ~ 3690 MHz RX: 3560 ~ 3690 MHz
	2-Carriers (10MHz)	TX: 3555 ~ 3695 MHz RX: 3555 ~ 3695 MHz
	2-Carriers (20MHz)	TX: 3560 ~ 3690 MHz RX: 3560 ~ 3690 MHz
Channel Bandwidth	10MHz & 20MHz	
Max. EIRP Power (dBm/10MHz)	Channel Bandwidth 10MHz	28.24 dBm/10MHz
	Channel Bandwidth 20MHz	25.05 dBm/10MHz
	CA (10MHz+10MHz)	27.56 dBm/10MHz
	CA (20MHz+20MHz)	24.20 dBm/10MHz
Max. FULL EIRP Power (dBm)	Channel Bandwidth 10MHz	28.24 dBm
	Channel Bandwidth 20MHz	28.15 dBm
	CA (10MHz+10MHz)	27.56 dBm
	CA (20MHz+20MHz)	27.38 dBm
Emission Designator	Channel Bandwidth 10MHz	QPSK: 8M94G7D
		16QAM: 8M94D7W
		64QAM: 8M96D7W
	Channel Bandwidth 20MHz	QPSK: 17M8G7D
		16QAM: 17M8D7W
		64QAM: 17M9D7W
	CA (10MHz+10MHz)	QPSK: 18M8G7D
		16QAM: 18M8D7W
		64QAM: 18M9D7W
	CA (20MHz+20MHz)	QPSK: 37M7G7D
		16QAM: 37M8D7W
		64QAM: 37M6D7W
Antenna Type	Refer to note as below	
Antenna Connector	Refer to note as below	
Accessory Device	Adapter, GPS Antenna	
Data Cable Supplied	Shielded LAN cable (1.5m)	

Note:

1. The EUT provides 4 completed transmitters and 4 receivers. The antennas provided to the EUT, please refer to the following table:

TX Antenna	Antenna Type	Antenna Connector	Antenna Gain (dBi)	Frequency Range
Ant 1	PIFA	I-PEX	5.30	3.5~3.7GHz
Ant 2			5.26	
Ant 3			5.48	
Ant 4			5.68	

2. The EUT support single carrier and carrier aggregation (CA) in intra-band contiguous spectrum operation, the CA mode is operation in 10MHz+10MHz or 20MHz+20MHz channel bandwidth and MIMO technology.
3. The EUT uses following adapter.

Brand	APD
Model	WA-30P12FU
Input Power	100-240Vac, 50-60Hz, 0.9A
Output Power	12Vdc, 2.5A
Power Line	AC 2 Pin Non-shielded DC (2.0m)

4. The EUT was pre-tested with the following modes:

- ✧ EUT powered from Adapter
- ✧ EUT powered from PoE (for support unit only)

The worst emission level was found when the EUT tested under **powered from Adapter** for final test.

5. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

Channel Bandwidth (MHz)	Channel
10	Low
	Middle
	High
20	Low
	Middle
	High
CA (10MHz+10MHz)	Low
	Middle
	High
CA (20MHz+20MHz)	Low
	Middle
	High

3.2.1 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports.

The worst case was found when positioned on Z-plane. Following channel(s) was (were) selected for the final test as listed below:

SC MODE

Test Item	Available Channel (MHz)	Tested Channel (MHz)	Channel Bandwidth	Modulation
EIRP	3555 to 3695	3555, 3625, 3695	10MHz	QPSK, 16QAM, 64QAM
	3560 to 3690	3560, 3625, 3690	20MHz	QPSK, 16QAM, 64QAM
Power Spectral Density	3555 to 3695	3555, 3625, 3695	10MHz	QPSK, 16QAM, 64QAM
	3560 to 3690	3560, 3625, 3690	20MHz	QPSK, 16QAM, 64QAM
Modulation Characteristics	3555 to 3695	3555	10MHz	QPSK, 16QAM, 64QAM
Frequency Stability	3555 to 3695	3625	10MHz	QPSK
	3560 to 3690	3625	20MHz	QPSK
Emission Bandwidth	3555 to 3695	3555, 3625, 3695	10MHz	QPSK, 16QAM, 64QAM
	3560 to 3690	3560, 3625, 3690	20MHz	QPSK, 16QAM, 64QAM
Peak to Average Ratio	3555 to 3695	3555, 3625, 3695	10MHz	QPSK
	3560 to 3690	3560, 3625, 3690	20MHz	QPSK
Conducted Emission	3555 to 3695	3555, 3625, 3695	10MHz	QPSK
	3560 to 3690	3560, 3625, 3690	20MHz	QPSK
Radiated Emission Above 1GHz	3555 to 3695	3555, 3625, 3695	10MHz	QPSK
	3560 to 3690	3560, 3625, 3690	20MHz	QPSK
Radiated Emission Below 1GHz	3555 to 3695	3555	10MHz	QPSK
	3560 to 3690	3560	20MHz	QPSK

CA MODE

Test Item	Available Channel (MHz)	Tested Channel (MHz)	Channel Bandwidth	Modulation
EIRP	3555 to 3695	3555 + 3565, 3620 + 3630, 3685 + 3695	10MHz+10MHz	QPSK, 16QAM, 64QAM
	3560 to 3690	3560 + 3580, 3615 + 3635, 3670 + 3690	20MHz+20MHz	QPSK, 16QAM, 64QAM
Power Spectral Density	3555 to 3695	3555 + 3565, 3620 + 3630, 3685 + 3695	10MHz+10MHz	QPSK, 16QAM, 64QAM
	3560 to 3690	3560 + 3580, 3615 + 3635, 3670 + 3690	20MHz+20MHz	QPSK, 16QAM, 64QAM
Frequency Stability	3555 to 3695	3620 + 3630	10MHz+10MHz	QPSK
	3560 to 3690	3615 + 3635	20MHz+20MHz	QPSK
Emission Bandwidth	3555 to 3695	3555 + 3565, 3620 + 3630, 3685 + 3695	10MHz+10MHz	QPSK, 16QAM, 64QAM
	3560 to 3690	3560 + 3580, 3615 + 3635, 3670 + 3690	20MHz+20MHz	QPSK, 16QAM, 64QAM
Peak to Average Ratio	3555 to 3695	3555 + 3565, 3620 + 3630, 3685 + 3695	10MHz+10MHz	QPSK
	3560 to 3690	3560 + 3580, 3615 + 3635, 3670 + 3690	20MHz+20MHz	QPSK
Conducted Emission	3555 to 3695	3555 + 3565, 3620 + 3630, 3685 + 3695	10MHz+10MHz	QPSK
	3560 to 3690	3560 + 3580, 3615 + 3635, 3670 + 3690	20MHz+20MHz	QPSK
Radiated Emission	3555 to 3695	3555 + 3565	10MHz+10MHz	QPSK
	3560 to 3690	3560 + 3580	20MHz+20MHz	QPSK

NOTE:

1. All supported modulation types were evaluated. The Worst case of QPSK was selected. Therefore, the Frequency Stability, Peak to Average Ratio, Conducted Emission and Radiated Emission were presented under QPSK mode only.
2. For radiated emission below 1GHz, low, mid and high channels were pre-tested in chamber. Low channel was found to be the worst case and therefore had been chosen for all final tests.
3. This device was tested under all RB configs/offsets. The worst case was found in full RB config/offset for all final tests.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
EIRP	20deg. C, 76%RH	120Vac, 60Hz	Saxon Lee
Power Spectral Density	20deg. C, 76%RH	120Vac, 60Hz	Saxon Lee
Modulation Characteristics	20deg. C, 76%RH	120Vac, 60Hz	Saxon Lee
Frequency Stability	20deg. C, 76%RH	120Vac, 60Hz	Saxon Lee
Emission Bandwidth	20deg. C, 76%RH	120Vac, 60Hz	Saxon Lee
Peak to Average Ratio	20deg. C, 76%RH	120Vac, 60Hz	Saxon Lee
Conducted Emission	20deg. C, 76%RH	120Vac, 60Hz	Saxon Lee
Radiated Emission	23deg. C, 76%RH	120Vac, 60Hz	Ian Chang

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook PC	SONY	SVS151A12P	275548477000760	N/A	Provided by Lab
B.	LAN Load	N/A	N/A	N/A	N/A	Provided by Lab
C.	GPS Antenna	N/A	N/A	N/A	N/A	Supplied by client

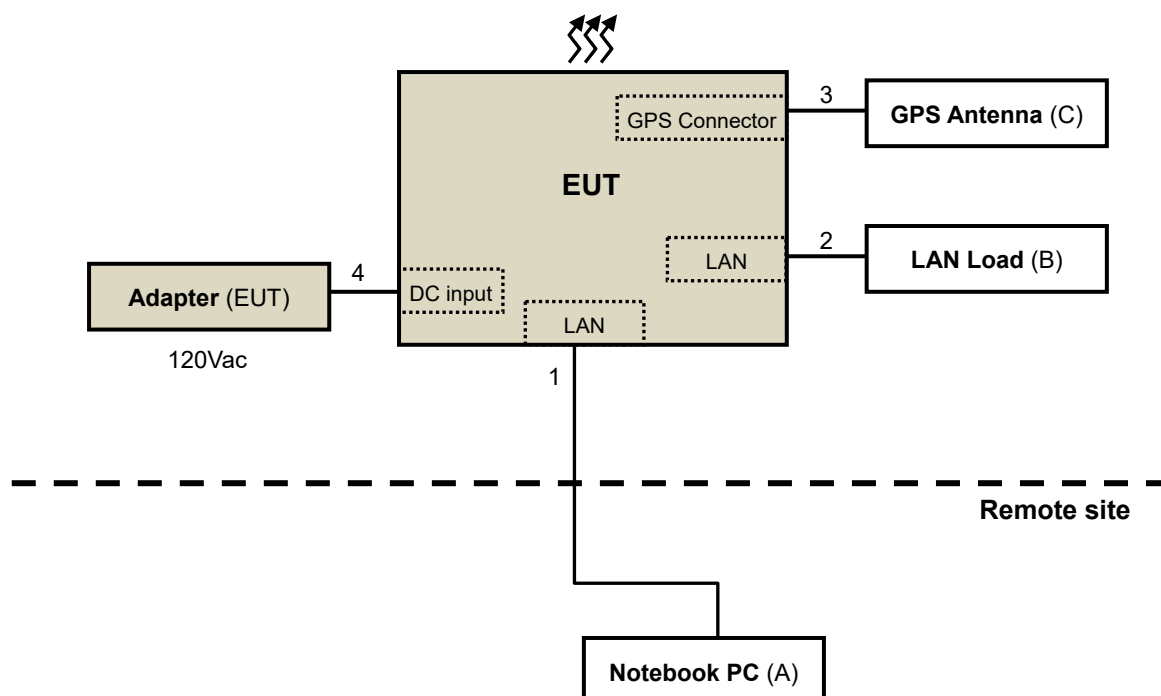
Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as communication partners to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN cable	1	10	N	0	Provided by Lab
2.	LAN cable	1	1.2	N	0	Provided by Lab
3.	GPS Antenna cable	1	5.0	N	0	Supplied by client
4.	DC power cord	1	2.0	N	0	Supplied by client

Note: The core(s) is(are) originally attached to the cable(s).

3.3.1 Configuration of System under Test



3.4 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and references:

47 CFR FCC Part 96

ANSI/TIA/EIA-603-E 2016

ANSI C63.26-2015

All test items have been performed and recorded as per the above standards.

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01

KDB 662911 D01 Multiple Transmitter Output v02r01

KDB 940660 D01 Part 96 CBRS Equipment v02

All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

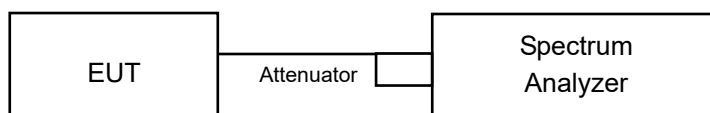
4.1 Maximum EIRP Measurement

4.1.1 Limits of Maximum EIRP Measurement

Device		Maximum EIRP (dBm/10 MHz)
☐	End User Device	23
☒	Category A CBSD	30
☐	Category B CBSD	47

4.1.2 Test Setup

Conducted Measurement Method



4.1.3 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	Feb. 19, 2020	Feb. 18, 2021
HP Preamplifier	8449B	3008A01201	Feb. 20, 2020	Feb. 19, 2021
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Feb. 19, 2020	Feb. 18, 2021
Agilent TEST RECEIVER	N9038A	MY51210137	Jun. 6, 2019	Jun. 5, 2020
Schwarzbeck Antenna	VULB 9168	139	Nov. 7, 2019	Nov. 6, 2020
Schwarzbeck Antenna	VHBA 9123	480	Jun. 3, 2019	Jun. 2, 2021
Schwarzbeck Horn Antenna	BBHA-9170	212	Nov. 24, 2019	Nov. 23, 2020
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	Nov. 24, 2019	Nov. 23, 2020
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	Radiated_V7.6.15.9.5	NA	NA	NA
SUHNER RF cable With 4dB PAD	SF102	Cable-CH6-01	Jul. 10, 2019	Jul. 9, 2020
SUHNER RF cable With 3/4dB PAD	SF102	Cable-CH8-3.6m	Jul. 10, 2019	Jul. 9, 2020
KEYSIGHT MIMO Powermeasurement Test set	U2021XA	U2021XA-001	Jun. 11, 2019	Jun. 10, 2020
KEYSIGHT Spectrum Analyzer	N9030A	MY54490260	Jul. 30, 2019	Jul. 29, 2020
Loop Antenna EMCI	LPA600	270	Aug. 23, 2019	Aug. 22, 2021
EMCO Horn Antenna	3115	00028257	Nov. 24, 2019	Nov. 23, 2020
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 23, 2019	Sep. 22, 2020
Anritsu Power Sensor	MA2411B	0738404	Apr. 16, 2019	Apr. 15, 2020
Anritsu Power Meter	ML2495A	0842014	Apr. 16, 2019	Apr. 15, 2020
Temperature & Humidity Chamber	MHU-225AU	920409	May 24, 2019	May 23, 2020
DIGITAL POWER METER IDRC	CP-240	240515	Sep. 11, 2019	Sep. 10, 2020
AC Power Source ExTech	CFW-105	E000603	NA	NA
Programable DC Source IDRC	DSP-030-025HD	500155	Jul. 12, 2019	Jul. 11, 2020

- NOTE:**
1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
 2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 3. The test was performed in Chamber No. 6.

4.1.4 Test Procedures

Conducted Measurement Method

1. Connect the DUT transmitter output to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.
2. Set span to at least 1.5 times the OBW.
3. Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
4. Set VBW $\geq 3 \times$ RBW.
5. Set number of points in sweep $\geq 2 \times$ span / RBW.
6. Sweep time = auto-couple.
7. Detector = RMS (power averaging).
8. If the EUT can be configured to transmit continuously (i.e., burst duty cycle $\geq 98\%$), then set the trigger to free run.
9. If the EUT cannot be configured to transmit continuously (i.e., burst duty cycle $< 98\%$), then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Ensure that the sweep time is less than or equal to the transmission burst duration.
10. Trace average at least 100 traces in power averaging (i.e., RMS) mode.
11. Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
12. For per 10MHz method, channel power integrating bandwidth 10MHz is used for bandwidth 5M, 10M, 15M and 20M.
13. For all power method, channel power integrating bandwidth 5MHz is used for bandwidth 5M, integrating bandwidth 10MHz is used for bandwidth 10M, integrating bandwidth 15MHz is used for bandwidth 15M, integrating bandwidth 20MHz is used for bandwidth 20M.

Maximum EIRP

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation as follows:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_T$$

where

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

P_{Meas} measured transmitter output power or PSD, in dBm or dBW

G_T gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

4.1.5 Deviation from Test Standard

No deviation.

4.1.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.1.7 Test Results

SC MODE

Conducted Output Power & EIRP Power (dBm/10MHz)

Channel	Freq. (MHz)	Band / BW: 48 / 10M					
		QPSK					
		Conducted Output Power (dBm/10MHz)					EIRP (dBm/10MHz)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3555	10.78	10.48	10.70	10.07	16.54	28.24
Middle	3625	10.38	10.52	10.44	9.96	16.35	28.05
High	3695	10.43	10.39	10.07	9.94	16.23	27.93
Channel	Freq. (MHz)	16QAM					
		Conducted Output Power (dBm/10MHz)					EIRP (dBm/10MHz)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3555	10.70	10.48	10.63	10.06	16.50	28.20
Middle	3625	10.59	10.56	10.13	9.62	16.26	27.96
High	3695	10.69	10.75	10.21	10.11	16.47	28.17
Channel	Freq. (MHz)	64QAM					
		Conducted Output Power (dBm/10MHz)					EIRP (dBm/10MHz)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3555	10.40	10.25	10.52	9.62	16.23	27.93
Middle	3625	10.29	10.53	10.50	9.52	16.25	27.95
High	3695	10.64	10.58	10.33	10.13	16.45	28.15

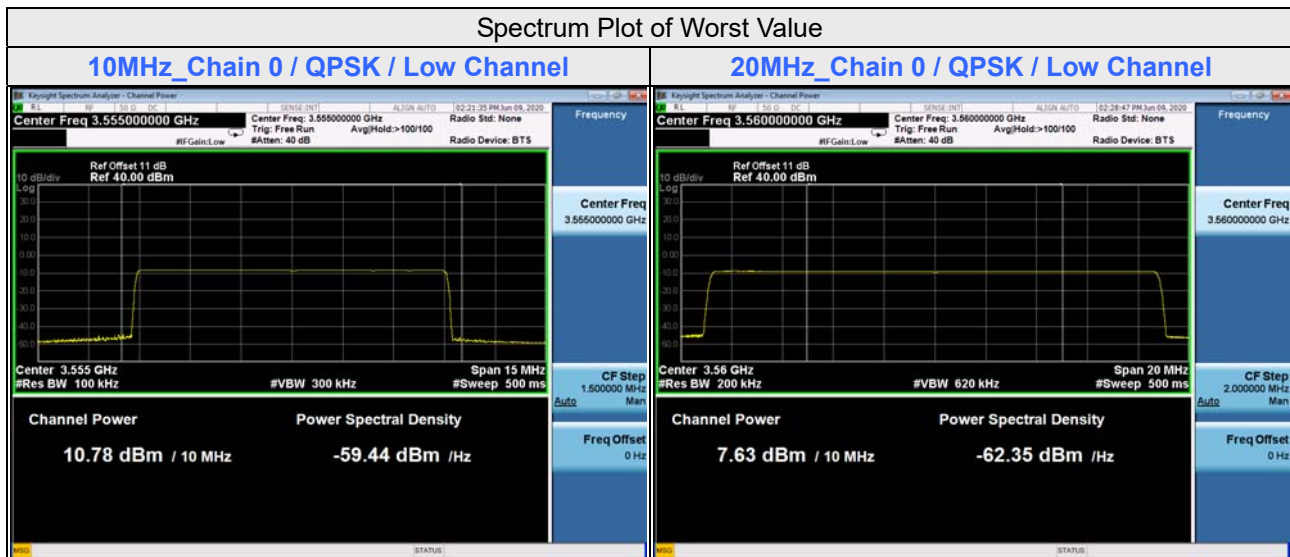
Note:

1. Directional gain = 5.68dBi + 10log(4) = 11.7dBi
2. EIRP (dBm / 10MHz) = Total Conducted Output Power (dBm / 10MHz) + Directional Gain

Channel	Freq. (MHz)	Band / BW: 48 / 20M					
		QPSK					
		Conducted Output Power (dBm/10MHz)					EIRP (dBm/10MHz)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3560	7.63	7.45	7.53	6.64	13.35	25.05
Middle	3625	6.86	6.99	7.12	6.64	12.93	24.63
High	3690	7.30	7.34	6.83	6.55	13.04	24.74
Channel	Freq. (MHz)	16QAM					
		Conducted Output Power (dBm/10MHz)					EIRP (dBm/10MHz)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3560	7.17	7.26	7.40	6.66	13.15	24.85
Middle	3625	6.95	7.08	7.13	6.30	12.90	24.60
High	3690	7.32	7.43	6.86	6.77	13.12	24.82
Channel	Freq. (MHz)	64QAM					
		Conducted Output Power (dBm/10MHz)					EIRP (dBm/10MHz)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3560	7.07	7.23	7.35	6.43	13.05	24.75
Middle	3625	6.88	6.95	6.97	7.14	13.01	24.71
High	3690	7.16	7.17	6.88	6.63	12.99	24.69

Note:

- Directional gain = 5.68dBi + 10log(4) = 11.7dBi
- EIRP (dBm / 10MHz) = Total Conducted Output Power (dBm / 10MHz) + Directional Gain



SC MODE

For FULL EIRP Power

Channel	Freq. (MHz)	Band / BW: 48 / 10M						
		QPSK						
		Conducted Output Power (dBm)					EIRP (dBm)	EIRP (W)
		Chain 0	Chain 1	Chain 2	Chain 3	Total		
Low	3555	10.78	10.48	10.70	10.07	16.54	28.24	0.67
Middle	3625	10.38	10.52	10.44	9.96	16.35	28.05	0.64
High	3695	10.43	10.39	10.07	9.94	16.23	27.93	0.62
Channel	Freq. (MHz)	16QAM						
		Conducted Output Power (dBm)					EIRP (dBm)	EIRP (W)
		Chain 0	Chain 1	Chain 2	Chain 3	Total		
Low	3555	10.70	10.48	10.63	10.06	16.50	28.20	0.66
Middle	3625	10.59	10.56	10.13	9.62	16.26	27.96	0.63
High	3695	10.69	10.75	10.21	10.11	16.47	28.17	0.66
Channel	Freq. (MHz)	64QAM						
		Conducted Output Power (dBm)					EIRP (dBm)	EIRP (W)
		Chain 0	Chain 1	Chain 2	Chain 3	Total		
Low	3555	10.40	10.25	10.52	9.62	16.23	27.93	0.62
Middle	3625	10.29	10.53	10.50	9.52	16.25	27.95	0.62
High	3695	10.64	10.58	10.33	10.13	16.45	28.15	0.65

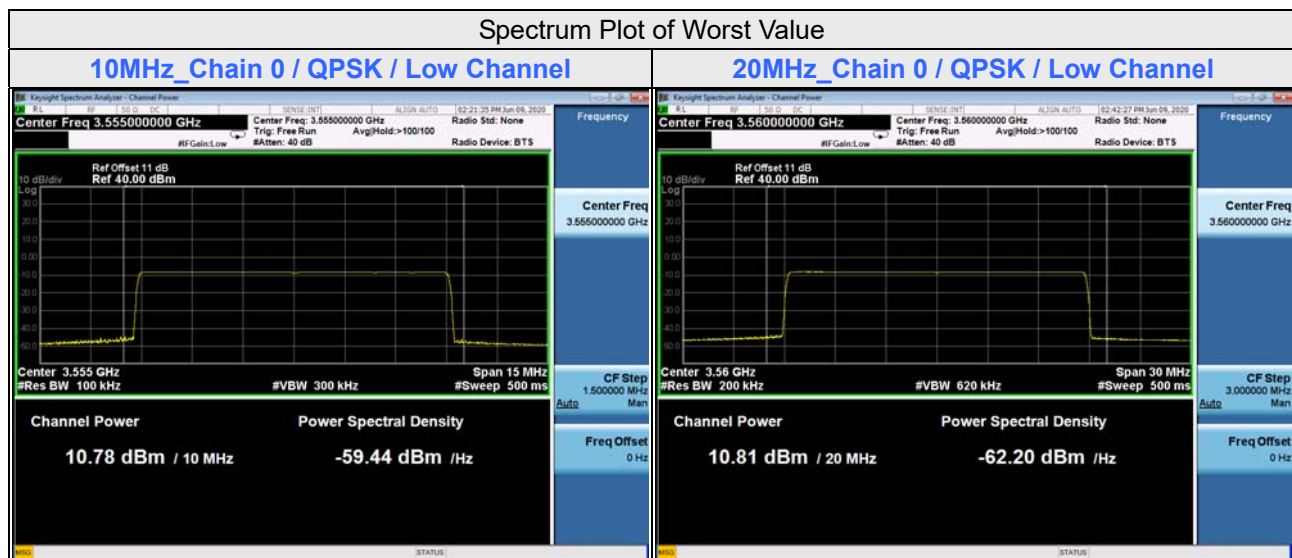
Note:

1. Directional gain = $5.68\text{dBi} + 10\log(4) = 11.7\text{dBi}$
2. EIRP (dBm) = Total Conducted Output Power (dBm) + Directional Gain

Channel	Freq. (MHz)	Band / BW: 48 / 20M						
		QPSK						
		Conducted Output Power (dBm)					EIRP (dBm)	EIRP (W)
		Chain 0	Chain 1	Chain 2	Chain 3	Total		
Low	3560	10.81	10.60	10.43	9.80	16.45	28.15	0.65
Middle	3625	10.03	10.15	10.27	9.29	15.97	27.67	0.59
High	3690	10.46	10.52	10.00	9.72	16.21	27.91	0.62
Channel	Freq. (MHz)	16QAM						
		Conducted Output Power (dBm)					EIRP (dBm)	EIRP (W)
		Chain 0	Chain 1	Chain 2	Chain 3	Total		
Low	3560	10.36	10.46	10.58	9.85	16.34	28.04	0.64
Middle	3625	10.15	10.26	10.34	9.50	16.10	27.80	0.60
High	3690	10.52	10.62	10.04	9.97	16.32	28.02	0.63
Channel	Freq. (MHz)	64QAM						
		Conducted Output Power (dBm)					EIRP (dBm)	EIRP (W)
		Chain 0	Chain 1	Chain 2	Chain 3	Total		
Low	3560	10.30	10.47	10.58	9.65	16.29	27.99	0.63
Middle	3625	10.11	10.30	10.30	10.36	16.29	27.99	0.63
High	3690	10.38	10.40	10.11	9.85	16.21	27.91	0.62

Note:

- Directional gain = 5.68dBi + 10log(4) = 11.7dBi
- EIRP (dBm) = Total Conducted Output Power (dBm) + Directional Gain



CA MODE

Conducted Output Power & EIRP Power (dBm/10MHz)

Channel	Freq. (MHz)	Band / BW: 48 / 10MHz+10MHz							
		QPSK							
		Conducted Output Power (dBm/10MHz)							EIRP (dBm/10MHz)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
Low	3555 + 3565	10.73	10.49	13.62	9.01	8.78	11.91		
Middle	3620 + 3630	10.60	10.43	13.53	8.60	8.63	11.63	15.69	27.39
High	3685 + 3695	10.04	9.87	12.97	8.60	8.49	11.56	15.33	27.03
Channel	Freq. (MHz)	16QAM							
		Conducted Output Power (dBm/10MHz)							EIRP (dBm/10MHz)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
Low	3555 + 3565	10.60	10.33	13.48	8.83	8.63	11.74	15.71	27.41
Middle	3620 + 3630	10.44	10.31	13.39	8.49	8.51	11.51	15.56	27.26
High	3685 + 3695	9.87	9.72	12.81	8.43	8.33	11.39	15.17	26.87
Channel	Freq. (MHz)	64QAM							
		Conducted Output Power (dBm/10MHz)							EIRP (dBm/10MHz)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
Low	3555 + 3565	10.51	10.30	13.42	8.78	8.59	11.70	15.65	27.35
Middle	3620 + 3630	10.41	10.19	13.31	8.36	8.42	11.40	15.47	27.17
High	3685 + 3695	9.86	9.67	12.78	8.42	8.30	11.37	15.14	26.84

Note:

- Directional gain = $5.68\text{dBi} + 10\log(4) = 11.7\text{dBi}$
- EIRP (dBm / 10MHz) = Total Conducted Output Power (dBm / 10MHz) + Directional Gain

Channel	Freq. (MHz)	Band / BW: 48 / 20MHz+20MHz							
		QPSK							
		Conducted Output Power (dBm/10MHz)							EIRP (dBm/10MHz)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
Low	3560 + 3580	7.52	7.28	10.41	5.45	5.18	8.33		
Middle	3615 + 3635	7.25	7.19	10.23	5.29	5.23	8.27	12.37	24.07
High	3670 + 3690	6.98	6.94	9.97	5.28	5.27	8.29	12.22	23.92
Channel	Freq. (MHz)	16QAM							
		Conducted Output Power (dBm/10MHz)							EIRP (dBm/10MHz)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
		Low	3560 + 3580	7.39	7.12	10.27	5.28		
Middle	3615 + 3635	7.12	6.99	10.07	5.13	5.10	8.13	12.21	23.91
High	3670 + 3690	6.86	6.74	9.81	5.16	5.13	8.16	12.07	23.77
Channel	Freq. (MHz)	64QAM							
		Conducted Output Power (dBm/10MHz)							EIRP (dBm/10MHz)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
		Low	3560 + 3580	7.26	7.08	10.18	5.25		
Middle	3615 + 3635	7.09	6.93	10.02	5.05	4.99	8.03	12.15	23.85
High	3670 + 3690	6.82	6.75	9.80	5.09	5.02	8.07	12.03	23.73

Note:

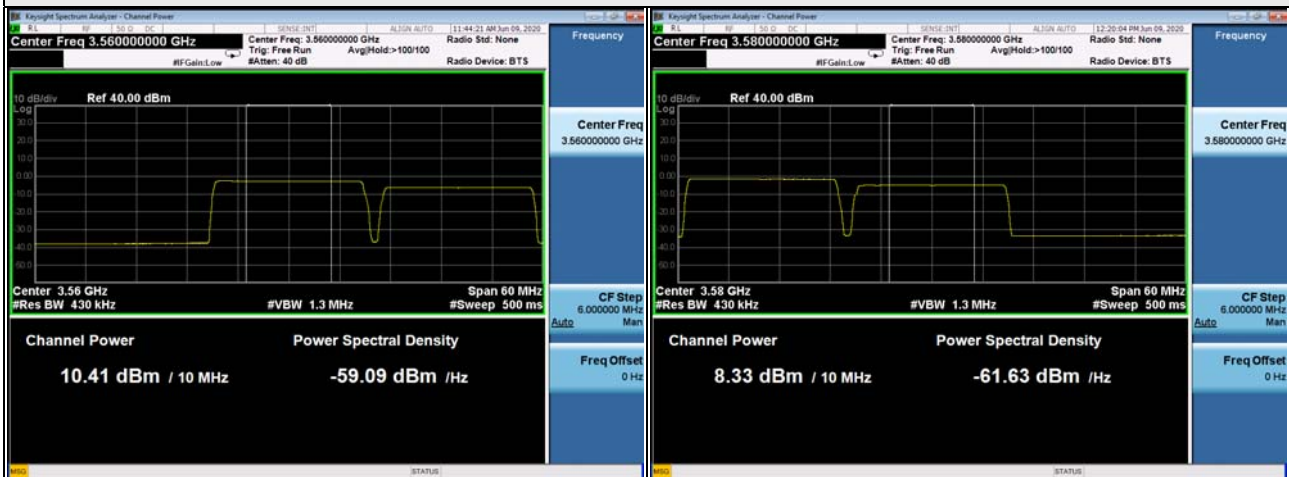
- Directional gain = 5.68dBi + 10log(4) = 11.7dBi
- EIRP (dBm / 10MHz) = Total Conducted Output Power (dBm / 10MHz) + Directional Gain

Spectrum Plot of Worst Value

10MHz+10MHz / QPSK / Low Channel



20MHz+20MHz / QPSK / Low Channel



CA MODE

For FULL EIRP Power

Channel	Freq. (MHz)	Band / BW: 48 / 10MHz+10MHz								
		QPSK								
		Conducted Output Power (dBm)							EIRP (dBm)	EIRP (W)
		PCC			SCC			PCC + SCC Total		
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total			
Low	3555 + 3565	10.73	10.49	13.62	9.01	8.78	11.91	15.86	27.56	0.57
Middle	3620 + 3630	10.60	10.43	13.53	8.60	8.63	11.63	15.69	27.39	0.55
High	3685 + 3695	10.04	9.87	12.97	8.60	8.49	11.56	15.33	27.03	0.50
Channel	Freq. (MHz)	16QAM								
		Conducted Output Power (dBm)							EIRP (dBm)	EIRP (W)
		PCC			SCC			PCC + SCC Total		
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total			
Low	3555 + 3565	10.60	10.33	13.48	8.83	8.63	11.74	15.71	27.41	0.55
Middle	3620 + 3630	10.44	10.31	13.39	8.49	8.51	11.51	15.56	27.26	0.53
High	3685 + 3695	9.87	9.72	12.81	8.43	8.33	11.39	15.17	26.87	0.49
Channel	Freq. (MHz)	64QAM								
		Conducted Output Power (dBm)							EIRP (dBm)	EIRP (W)
		PCC			SCC			PCC + SCC Total		
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total			
Low	3555 + 3565	10.51	10.30	13.42	8.78	8.59	11.70	15.65	27.35	0.54
Middle	3620 + 3630	10.41	10.19	13.31	8.36	8.42	11.40	15.47	27.17	0.52
High	3685 + 3695	9.86	9.67	12.78	8.42	8.30	11.37	15.14	26.84	0.48

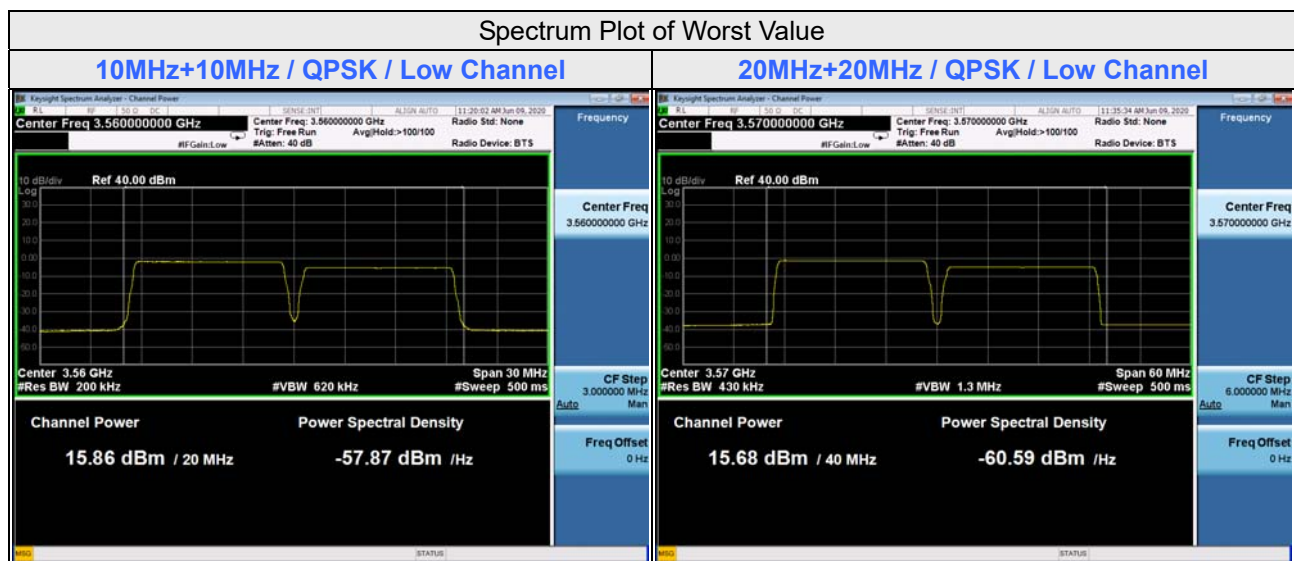
Note:

- Directional gain = $5.68\text{dBi} + 10\log(4) = 11.7\text{dBi}$
- EIRP (dBm) = Total Conducted Output Power (dBm) + Directional Gain

Channel	Freq. (MHz)	Band / BW: 48 / 20MHz+20MHz								
		QPSK								
		Conducted Output Power (dBm)							EIRP (dBm)	EIRP (W)
		PCC			SCC			PCC + SCC Total		
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total			
Low	3560 + 3580	10.70	10.47	13.60	8.61	8.37	11.50	15.68	27.38	0.55
Middle	3615 + 3635	10.43	10.34	13.40	8.44	8.39	11.43	15.53	27.23	0.53
High	3670 + 3690	10.17	10.12	13.16	8.46	8.44	11.46	15.40	27.10	0.51
Channel	Freq. (MHz)	16QAM								
		Conducted Output Power (dBm)							EIRP (dBm)	EIRP (W)
		PCC			SCC			PCC + SCC Total		
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total			
		Low	3560 + 3580	10.55	10.30	13.44	8.48	8.25	11.38	15.54
Middle	3615 + 3635	10.29	10.17	13.24	8.32	8.26	11.30	15.39	27.09	0.51
High	3670 + 3690	10.05	9.94	13.01	8.33	8.30	11.33	15.26	26.96	0.50
Channel	Freq. (MHz)	64QAM								
		Conducted Output Power (dBm)							EIRP (dBm)	EIRP (W)
		PCC			SCC			PCC + SCC Total		
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total			
		Low	3560 + 3580	10.45	10.24	13.36	8.43	8.13	11.29	15.46
Middle	3615 + 3635	10.24	10.13	13.20	8.22	8.15	11.20	15.32	27.02	0.50
High	3670 + 3690	9.98	9.92	12.96	8.26	8.21	11.25	15.20	26.90	0.49

Note:

- Directional gain = $5.68\text{dBi} + 10\log(4) = 11.7\text{dBi}$
- EIRP (dBm) = Total Conducted Output Power (dBm) + Directional Gain

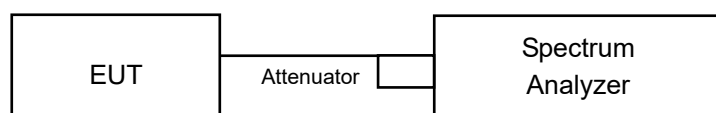


4.2 Maximum Power Spectral Density Measurement

4.2.1 Limits of Maximum Power Spectral Density Measurement

Device		Maximum PSD (dBm/MHz)
☐	End User Device	n/a
☒	Category A CBSD	20
☐	Category B CBSD	37

4.2.2 Test Setup



4.2.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.2.4 Test Procedure

1. Connect the transmitter to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.
2. Set instrument center frequency to OBW center frequency.
3. Set span to 2 × to 3 × the OBW.
4. Set the RBW to the specified reference bandwidth (often 1 MHz).
5. Set VBW ≥ 3 × RBW.
6. Detector = RMS (power averaging).
7. Ensure that the number of measurement points in the sweep ≥ 2 × span/RBW.
8. Sweep time = auto couple.
9. Employ trace averaging (RMS) mode over a minimum of 100 traces.
10. Use the peak marker function to determine the maximum amplitude level within the reference bandwidth (PSD).

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.2.7 Test Results

SC MODE

Channel	Freq. (MHz)	10MHz							
		QPSK							
		Conducted Power Density (dBm/MHz)					EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3	Total			
Low	3555	2.60	2.17	2.40	1.81	8.28	19.98	20.0	Pass
Middle	3625	2.12	2.27	2.15	1.65	8.07	19.77	20.0	Pass
High	3695	2.21	2.13	1.81	1.71	7.99	19.69	20.0	Pass
Channel	Freq. (MHz)	16QAM							
		Conducted Power Density (dBm/MHz)					EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3	Total			
Low	3555	2.37	2.13	2.25	1.66	8.13	19.83	20.0	Pass
Middle	3625	2.26	2.22	1.77	1.24	7.91	19.61	20.0	Pass
High	3695	2.37	2.42	1.89	1.72	8.13	19.83	20.0	Pass
Channel	Freq. (MHz)	64QAM							
		Conducted Power Density (dBm/MHz)					EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3	Total			
Low	3555	1.94	1.83	2.10	1.12	7.78	19.48	20.0	Pass
Middle	3625	1.78	2.10	2.06	1.10	7.80	19.50	20.0	Pass
High	3695	2.21	2.14	1.92	1.69	8.02	19.72	20.0	Pass

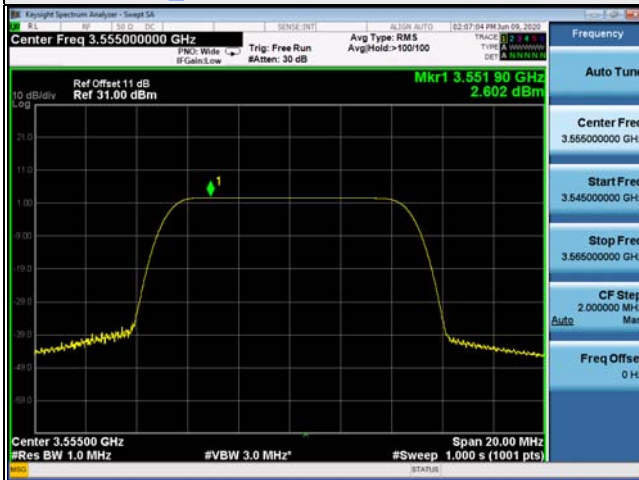
Channel	Freq. (MHz)	20MHz							
		QPSK							
		Conducted Power Density (dBm/MHz)					EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3	Total			
Low	3560	-1.22	-1.38	-1.40	-2.15	4.50	16.20	20.0	Pass
Middle	3625	-1.93	-1.83	-1.73	-2.66	4.00	15.70	20.0	Pass
High	3690	-1.47	-1.44	-1.94	-2.27	4.25	15.95	20.0	Pass
Channel	Freq. (MHz)	16QAM							
		Conducted Power Density (dBm/MHz)					EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3	Total			
Low	3560	-1.72	-1.64	-1.52	-2.19	4.26	15.96	20.0	Pass
Middle	3625	-1.95	-1.80	-1.77	-2.55	4.01	15.71	20.0	Pass
High	3690	-1.56	-1.43	-1.98	-2.07	4.27	15.97	20.0	Pass
Channel	Freq. (MHz)	64QAM							
		Conducted Power Density (dBm/MHz)					EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3	Total			
Low	3560	-1.81	-1.67	-1.57	-2.54	4.14	15.84	20.0	Pass
Middle	3625	-2.05	-1.82	-1.82	-1.82	4.14	15.84	20.0	Pass
High	3690	-1.80	-1.78	-2.06	-2.29	4.04	15.74	20.0	Pass

Note:

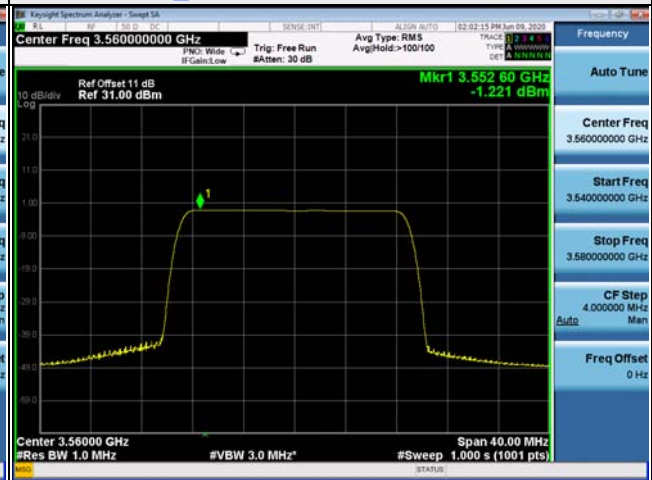
- Directional gain = $5.68\text{dBi} + 10\log(4) = 11.7\text{dBi}$
- EIRP PSD (dBm/MHz) = Total Conducted Power Density (dBm/MHz) + Directional Gain

Spectrum Plot of Worst Value

10MHz_Chain 0 / QPSK / Low Channel



20MHz_Chain 0 / QPSK / Low Channel



CA MODE

Channel	Freq. (MHz)	10MHz+10MHz									
		QPSK									
		Conducted Power Density (dBm/MHz)							EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		PCC			SCC			PCC + SCC Total			
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total				
Low	3555 + 3565	2.22	1.99	5.12	0.49	0.31	3.41				
Middle	3620 + 3630	2.14	1.88	5.02	0.06	0.12	3.10	7.18	18.88	20.0	Pass
High	3685 + 3695	1.57	1.42	4.51	0.14	-0.05	3.06	6.85	18.55	20.0	Pass
Channel	Freq. (MHz)	16QAM									
		Conducted Power Density (dBm/MHz)							EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		PCC			SCC			PCC + SCC Total			
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total				
Low	3555 + 3565	2.11	1.79	4.96	0.34	0.16	3.26	7.21	18.91	20.0	Pass
Middle	3620 + 3630	1.94	1.78	4.87	0.01	-0.03	3.00	7.05	18.75	20.0	Pass
High	3685 + 3695	1.33	1.20	4.28	-0.10	-0.19	2.87	6.64	18.34	20.0	Pass
Channel	Freq. (MHz)	64QAM									
		Conducted Power Density (dBm/MHz)							EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		PCC			SCC			PCC + SCC Total			
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total				
Low	3555 + 3565	1.97	1.81	4.90	0.31	0.11	3.22	7.15	18.85	20.0	Pass
Middle	3620 + 3630	1.90	1.71	4.82	-0.13	-0.12	2.89	6.97	18.67	20.0	Pass
High	3685 + 3695	1.38	1.17	4.29	-0.08	-0.18	2.88	6.65	18.35	20.0	Pass

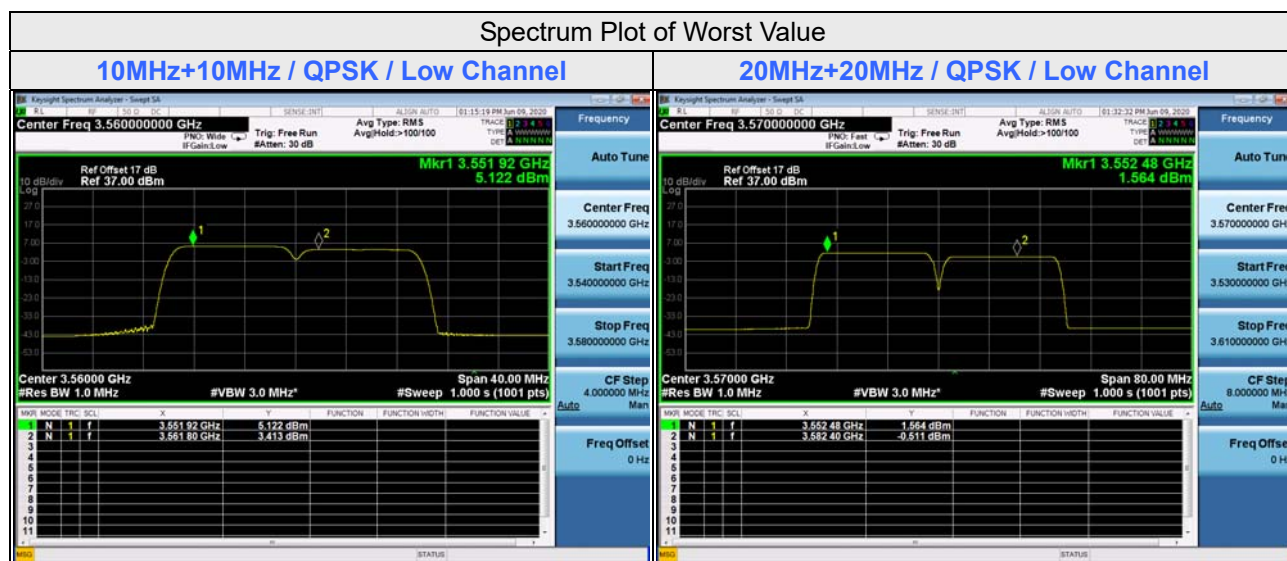
Note:

- Directional gain = $5.68\text{dBi} + 10\log(4) = 11.7\text{dBi}$
- EIRP PSD (dBm/MHz) = Total Conducted Power Density (dBm/MHz) + Directional Gain

Channel	Freq. (MHz)	20MHz+20MHz									
		QPSK									
		Conducted Power Density (dBm/MHz)							EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		PCC			SCC			PCC + SCC Total			
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total				
Low	3560 + 3580	-1.33	-1.57	1.56	-3.43	-3.59	-0.50				
Middle	3615 + 3635	-1.60	-1.62	1.40	-3.60	-3.64	-0.61	3.52	15.22	20.0	Pass
High	3670 + 3690	-1.83	-1.89	1.15	-3.55	-3.60	-0.56	3.39	15.09	20.0	Pass
Channel	Freq. (MHz)	16QAM									
		Conducted Power Density (dBm/MHz)							EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		PCC			SCC			PCC + SCC Total			
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total				
		Low	3560 + 3580	-1.47	-1.68	1.44	-3.51				
Middle	3615 + 3635	-1.75	-1.79	1.24	-3.67	-3.76	-0.70	3.39	15.09	20.0	Pass
High	3670 + 3690	-1.90	-2.01	1.06	-3.63	-3.65	-0.63	3.30	15.00	20.0	Pass
Channel	Freq. (MHz)	64QAM									
		Conducted Power Density (dBm/MHz)							EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		PCC			SCC			PCC + SCC Total			
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total				
		Low	3560 + 3580	-1.58	-1.79	1.33	-3.57				
Middle	3615 + 3635	-1.71	-1.90	1.21	-3.73	-3.82	-0.76	3.34	15.04	20.0	Pass
High	3670 + 3690	-1.98	-2.11	0.97	-3.69	-3.82	-0.74	3.20	14.90	20.0	Pass

Note:

- Directional gain = $5.68\text{dBi} + 10\log(4) = 11.7\text{dBi}$
- EIRP PSD (dBm/MHz) = Total Conducted Power Density (dBm/MHz) + Directional Gain



4.3 Modulation Characteristics Measurement

4.3.1 Limits of Modulation Characteristics

N/A

4.3.2 Test Procedure

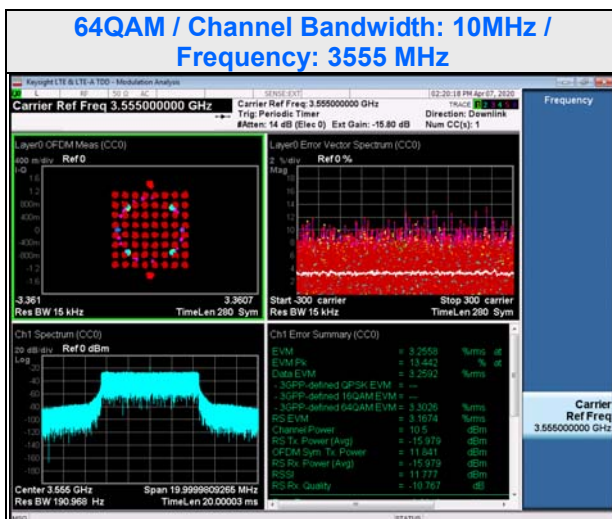
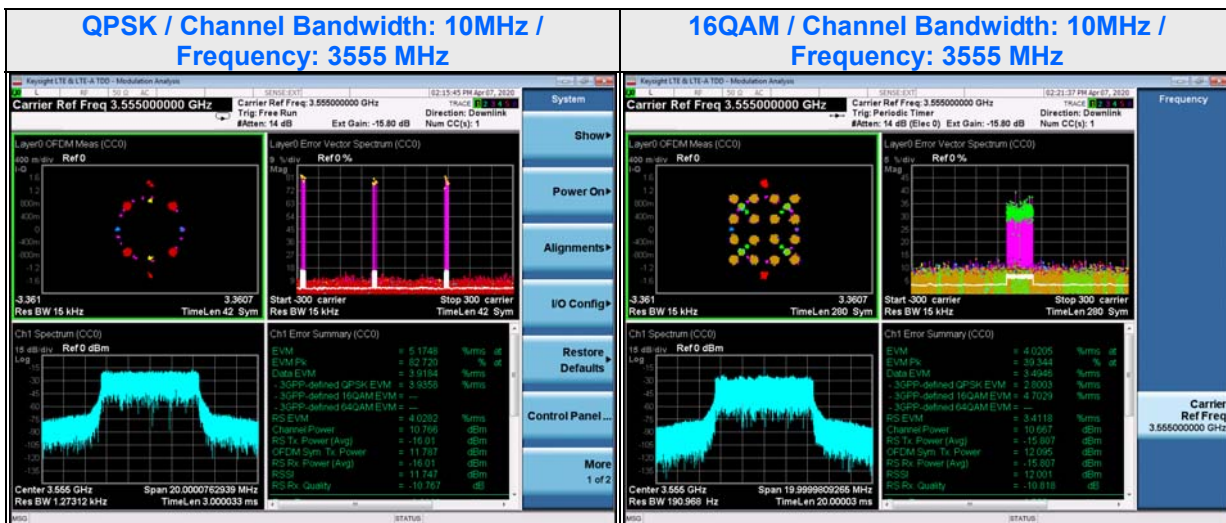
Connect the EUT to Communication Simulator via the antenna connector, the frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.3.3 Test Setup



4.3.4 Test Results

SC MODE



4.4 Frequency Stability Measurement

4.4.1 Limits of Frequency Stability Measurement

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency band.

4.4.2 Test Procedure

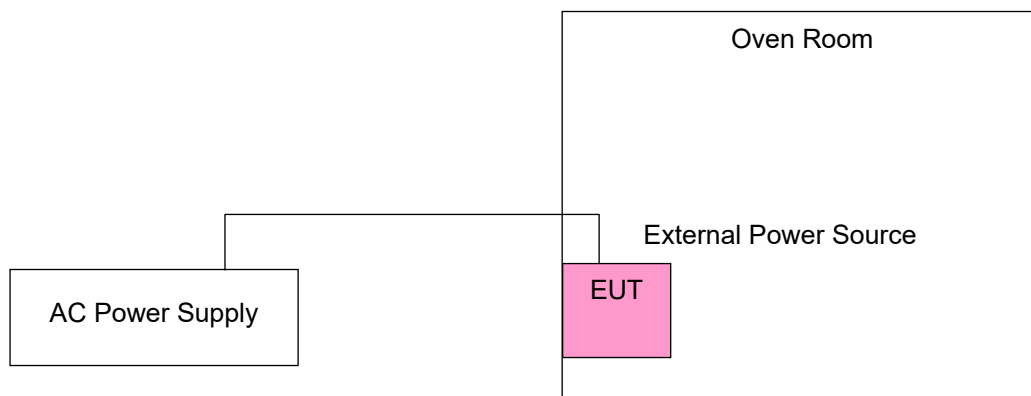
- Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- EUT is connected the external power supply to control the AC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the $\pm 0.5^{\circ}\text{C}$ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

4.4.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.4.4 Test Setup



4.4.5 Test Results

SC MODE

Frequency vs. Voltage

Voltage (Vac)	Frequency (MHz)		Pass/Fail
	10MHz	20MHz	
102	3625.0000031	3625.0000029	Pass
120	3625.0000033	3625.0000031	Pass
138	3625.0000032	3625.0000033	Pass

Frequency vs. Temperature.

TEMP. (°C)	Frequency (MHz)		Pass/Fail
	10MHz	20MHz	
-30	3625.0000029	3625.0000027	Pass
-20	3625.0000014	3625.0000015	Pass
-10	3625.0000019	3625.0000020	Pass
0	3625.0000015	3625.0000017	Pass
10	3625.0000015	3625.0000019	Pass
20	3624.9999982	3624.9999984	Pass
30	3624.9999969	3624.9999970	Pass
40	3624.9999980	3624.9999979	Pass
50	3624.9999976	3624.9999978	Pass
60	3624.9999972	3624.9999976	Pass
70	3624.9999971	3624.9999974	Pass
75	3624.9999969	3624.9999972	Pass

CA MODE

Frequency vs. Voltage

Voltage (Vac)	Frequency (MHz)		Pass/Fail
	10MHz	20MHz	
102	3625.0000031	3625.0000029	Pass
120	3625.0000033	3625.0000031	Pass
138	3625.0000032	3625.0000033	Pass

Frequency vs. Temperature.

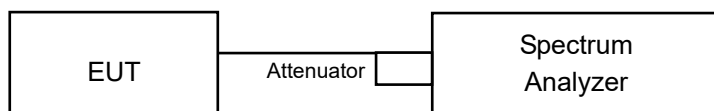
TEMP. (°C)	Frequency (MHz)		Pass/Fail
	10MHz	20MHz	
-30	3625.0000029	3625.0000027	Pass
-20	3625.0000014	3625.0000015	Pass
-10	3625.0000019	3625.0000020	Pass
0	3625.0000015	3625.0000017	Pass
10	3625.0000015	3625.0000019	Pass
20	3624.9999982	3624.9999984	Pass
30	3624.9999969	3624.9999970	Pass
40	3624.9999980	3624.9999979	Pass
50	3624.9999976	3624.9999978	Pass
60	3624.9999972	3624.9999976	Pass
70	3624.9999971	3624.9999974	Pass
75	3624.9999969	3624.9999972	Pass

4.5 Emission Bandwidth Measurement

4.5.1 Limit of Emission Bandwidth Measurement

Reference only

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.5.4 Test Procedure

26dBc Bandwidth:

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW = 100 kHz (10 MHz bandwidth), RBW = 200 kHz (20 MHz bandwidth). 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.

Occupied Bandwidth:

All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

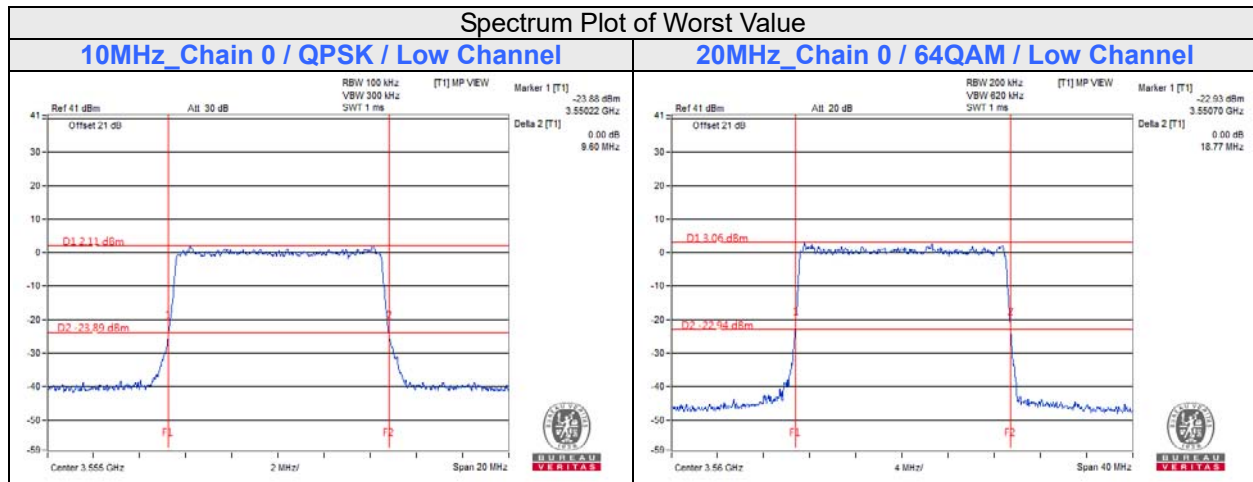
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.5.7 Test Result (-26dB Bandwidth)

SC MODE

Channel	Freq. (MHz)	26dB Down Bandwidth (MHz)											
		10MHz											
		Chain 0			Chain 1			Chain 2			Chain 3		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Low	3555	9.60	9.54	9.53	9.59	9.48	9.52	9.59	9.52	9.52	9.58	9.50	9.52
Middle	3625	9.41	9.44	9.43	9.57	9.32	9.36	9.51	9.32	9.41	9.52	9.37	9.47
High	3695	9.45	9.42	9.47	9.44	9.33	9.46	9.47	9.30	9.49	9.51	9.31	9.42

Channel	Freq. (MHz)	26dB Down Bandwidth (MHz)											
		20MHz											
		Chain 0			Chain 1			Chain 2			Chain 3		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Low	3560	18.73	18.71	18.77	18.71	18.69	18.77	18.72	18.69	18.77	18.73	18.69	18.76
Middle	3625	18.68	18.62	18.65	18.55	18.46	18.58	18.60	18.52	18.55	18.48	18.47	18.59
High	3690	18.63	18.57	18.58	18.59	18.56	18.50	18.54	18.52	18.61	18.46	18.53	18.56



4.5.8 Test Result (Occupied Bandwidth)

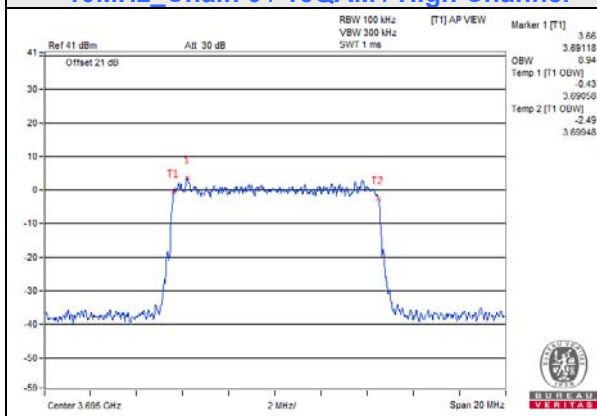
SC MODE

Channel	Freq. (MHz)	OCP 99 Bandwidth (MHz)											
		10MHz											
		Chain 0			Chain 1			Chain 2			Chain 3		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Low	3555	8.92	8.92	8.90	8.92	8.90	8.92	8.92	8.92	8.90	8.92	8.92	8.92
Middle	3625	8.92	8.90	8.88	8.90	8.80	8.90	8.92	8.88	8.88	8.90	8.88	8.96
High	3695	8.90	8.94	8.92	8.94	8.90	8.88	8.90	8.84	8.92	8.88	8.90	8.94

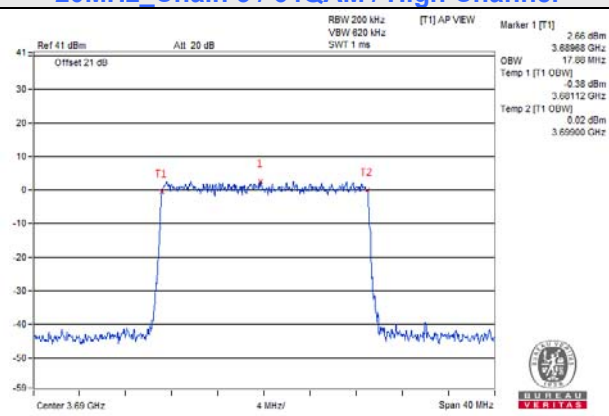
Channel	Freq. (MHz)	OCP 99 Bandwidth (MHz)											
		20MHz											
		Chain 0			Chain 1			Chain 2			Chain 3		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Low	3560	17.80	17.84	17.80	17.80	17.76	17.80	17.84	17.80	17.84	17.80	17.84	17.84
Middle	3625	17.80	17.72	17.84	17.80	17.72	17.80	17.80	17.64	17.80	17.80	17.60	17.76
High	3690	17.76	17.80	17.80	17.84	17.72	17.76	17.84	17.80	17.80	17.80	17.72	17.88

Spectrum Plot of Worst Value

10MHz_Chain 0 / 16QAM / High Channel



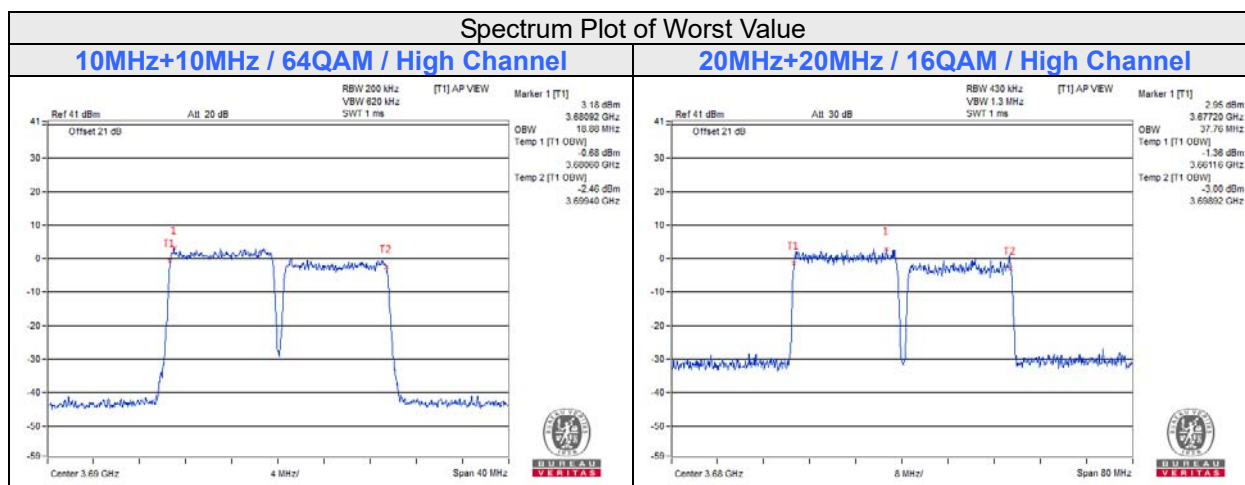
20MHz_Chain 3 / 64QAM / High Channel



CA MODE

Channel	Freq. (MHz)	OCP 99 Bandwidth (MHz)		
		10MHz+10MHz		
		PCC + SCC		
		QPSK	16QAM	64QAM
Low	3555 + 3565	18.80	18.84	18.84
Middle	3620 + 3630	18.80	18.80	18.80
High	3685 + 3695	18.84	18.76	18.88

Channel	Freq. (MHz)	OCP 99 Bandwidth (MHz)		
		20MHz+20MHz		
		PCC + SCC		
		QPSK	16QAM	64QAM
Low	3560 + 3580	37.68	37.60	37.60
Middle	3615 + 3635	37.60	37.60	37.60
High	3670 + 3690	37.60	37.76	37.60

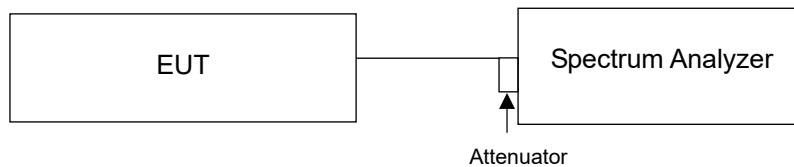


4.6 Peak to Average Ratio

4.6.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

4.6.2 Test Setup



4.6.3 Test Procedures

- Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
- Set the number of counts to a value that stabilizes the measured CCDF curve;
- Record the maximum PAPR level associated with a probability of 0.1%.

4.6.4 Test Results

SC MODE

Channel	Freq. (MHz)	Peak to Average Ratio (dB)				Limit (dB)	Pass / Fail
		10MHz					
		Chain 0	Chain 1	Chain 2	Chain 3		
		QPSK					
Low	3555	8.62	9.11	9.19	9.37	13	Pass
Middle	3625	9.91	9.24	9.26	8.90	13	Pass
High	3695	8.99	9.44	9.47	9.39	13	Pass

Channel	Freq. (MHz)	Peak to Average Ratio (dB)				Limit (dB)	Pass / Fail
		20MHz					
		Chain 0	Chain 1	Chain 2	Chain 3		
		QPSK					
Low	3560	8.36	9.10	9.16	9.23	13	Pass
Middle	3625	9.11	9.40	9.24	9.19	13	Pass
High	3690	9.27	9.35	9.21	9.20	13	Pass

10MHz:

Spectrum Plot of Worst Value

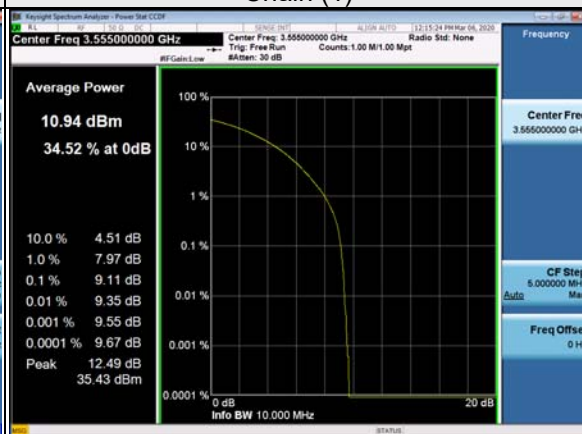
QPSK

Low Channel

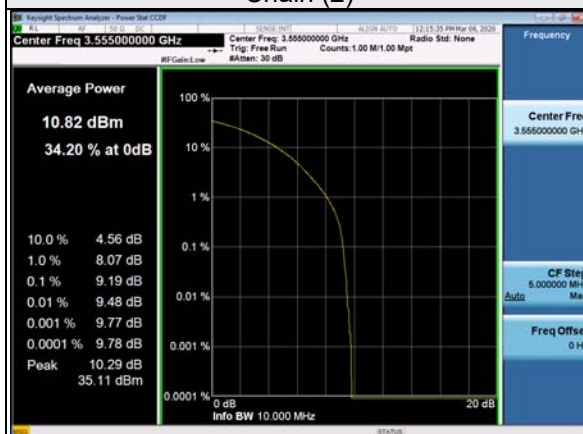
Chain (0)



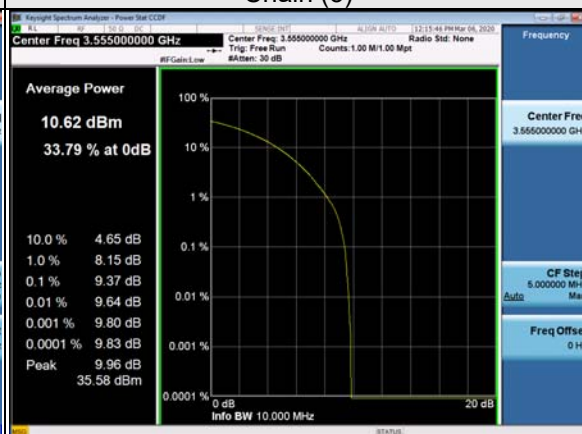
Chain (1)

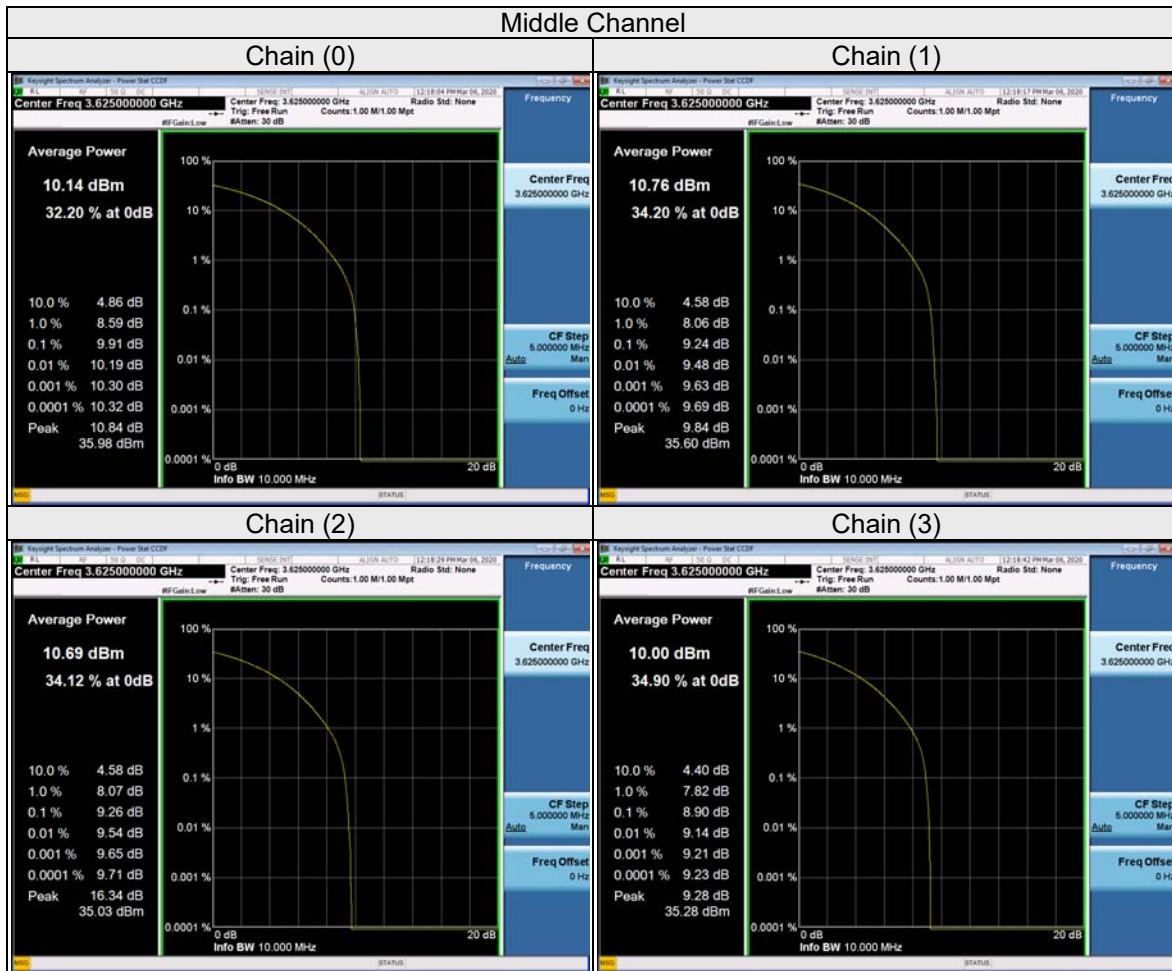


Chain (2)



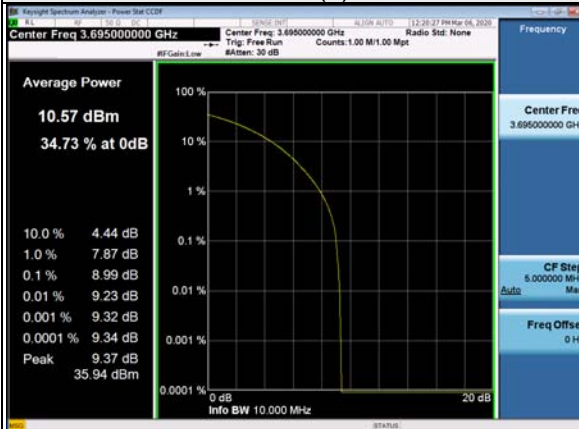
Chain (3)



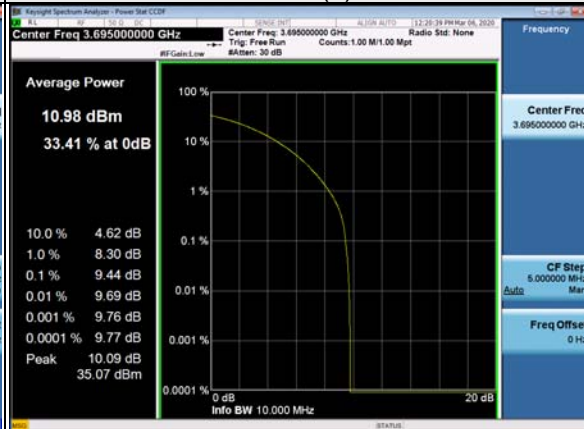


High Channel

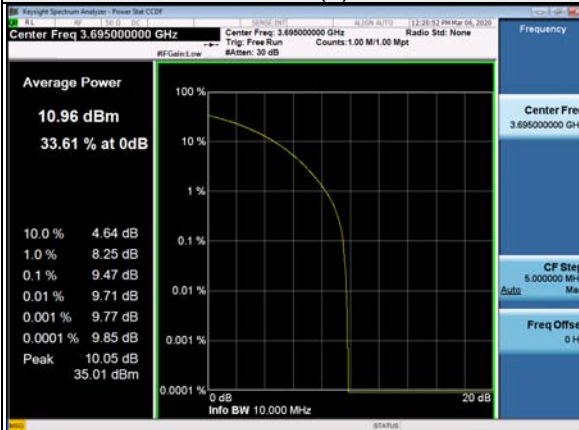
Chain (0)



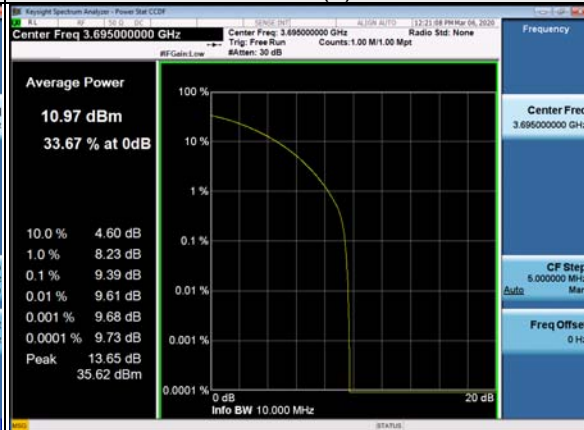
Chain (1)



Chain (2)



Chain (3)



20MHz:

Spectrum Plot of Worst Value

QPSK

Low Channel

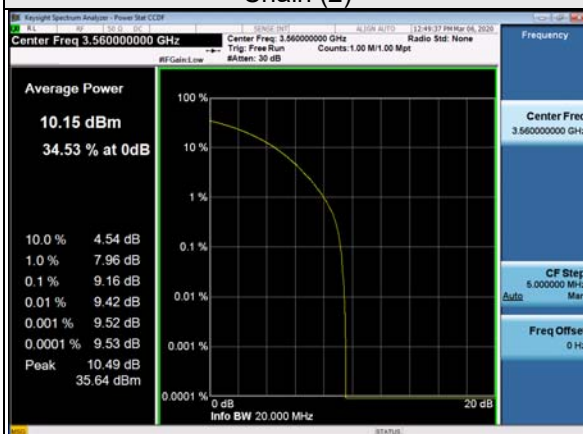
Chain (0)



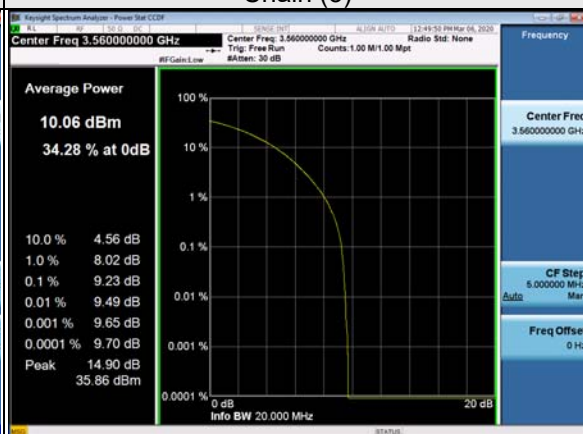
Chain (1)

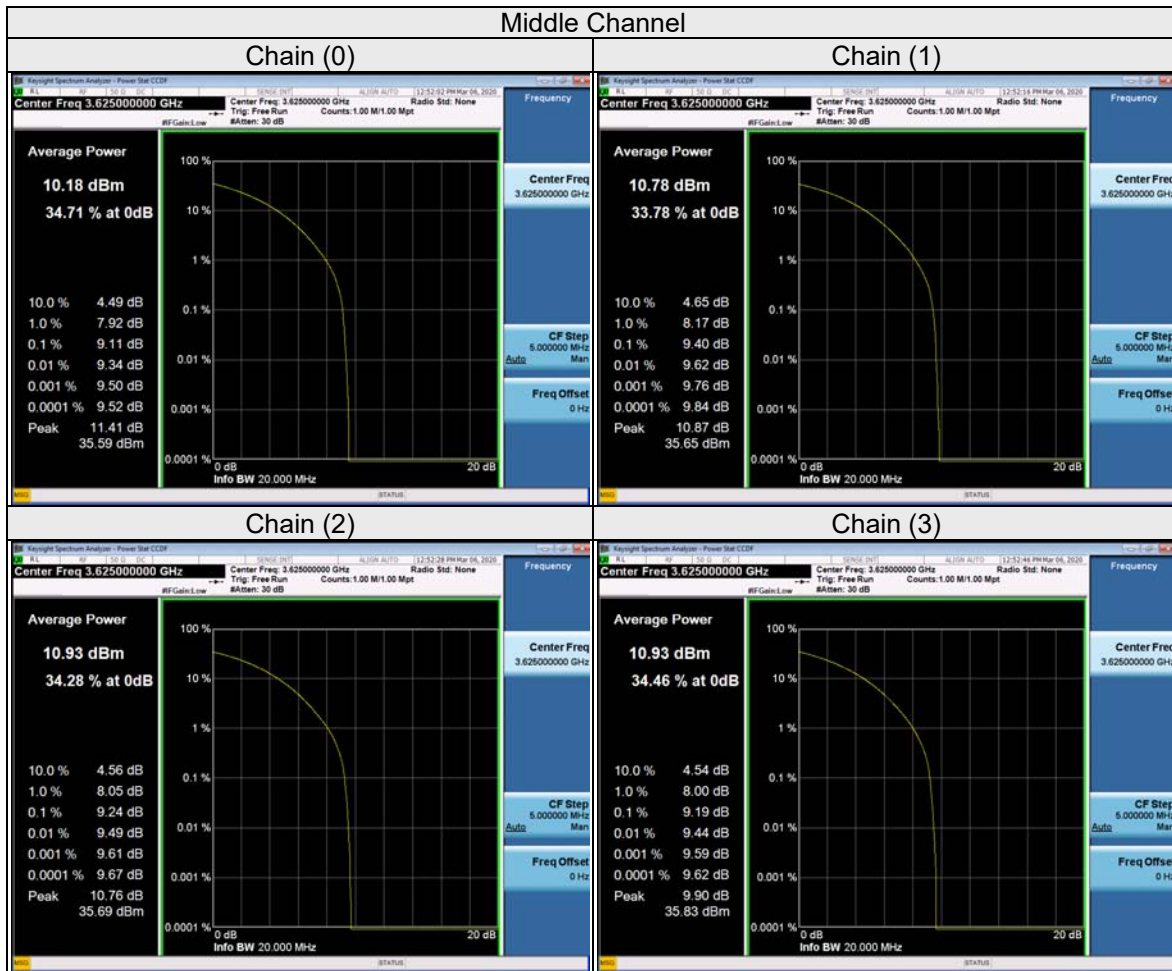


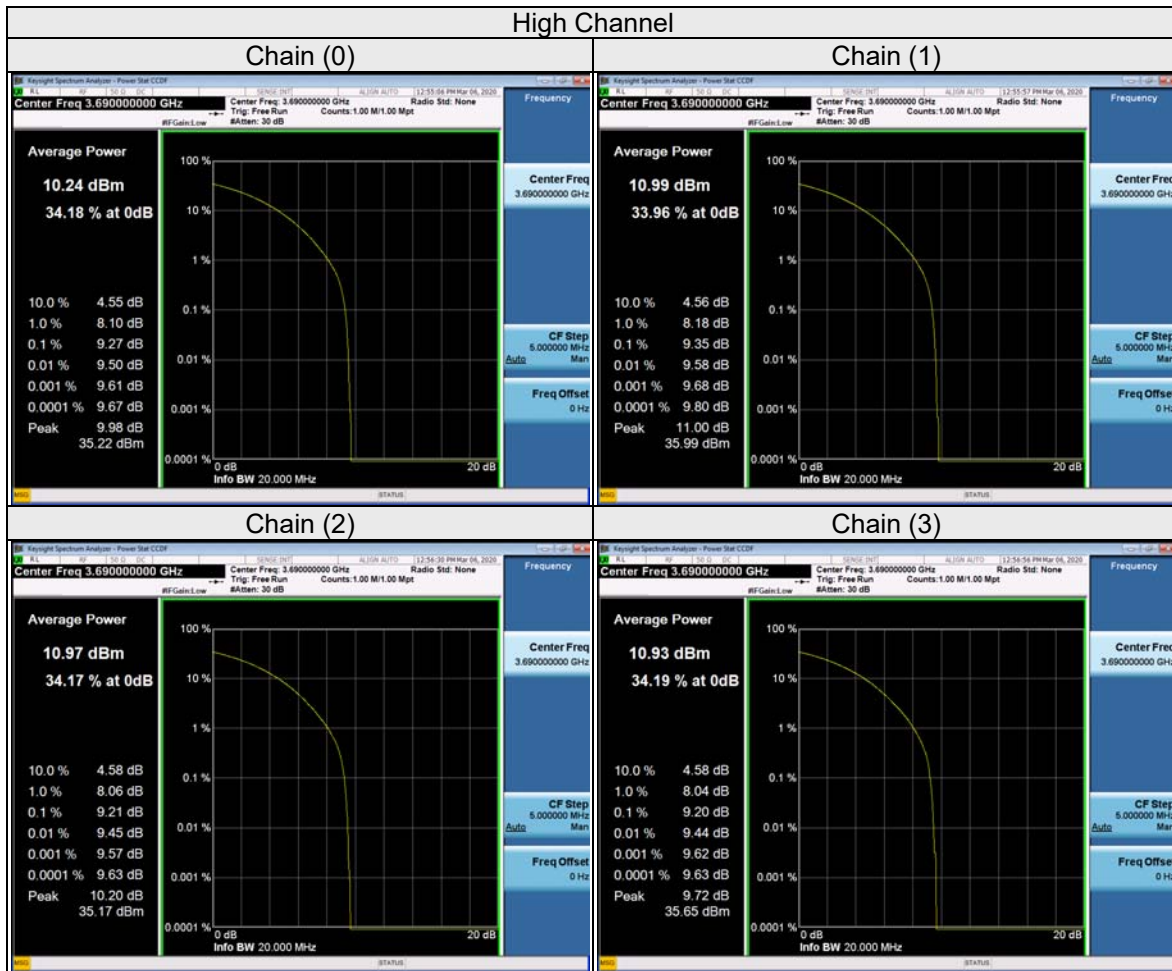
Chain (2)



Chain (3)







CA MODE

Channel	Freq. (MHz)	Peak to Average Ratio (dB)	Limit (dB)	Pass / Fail
		10MHz+10MHz		
		PCC + SCC		
		QPSK		
Low	3555	9.31	13	Pass
	3565	9.45	13	Pass
Middle	3620	9.40	13	Pass
	3630	9.40	13	Pass
High	3685	9.45	13	Pass
	3695	9.35	13	Pass

Channel	Freq. (MHz)	Peak to Average Ratio (dB)	Limit (dB)	Pass / Fail
		20MHz+20MHz		
		PCC + SCC		
		QPSK		
Low	3560	9.35	13	Pass
	3580	9.21	13	Pass
Middle	3615	9.45	13	Pass
	3635	9.35	13	Pass
High	3670	9.31	13	Pass
	3690	9.26	13	Pass

10MHz+10MHz:

Spectrum Plot of Worst Value

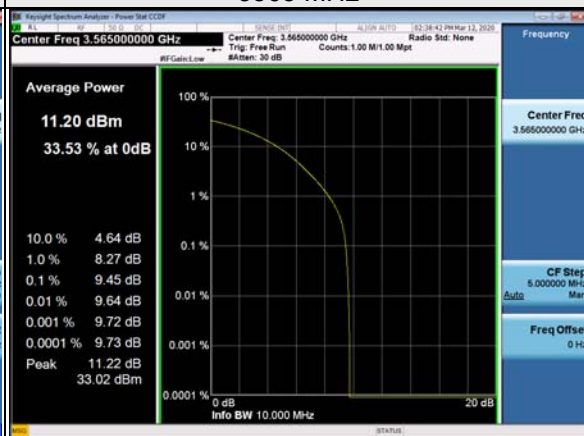
QPSK

Low Channel

3555 MHz



3565 MHz



Middle Channel

3620 MHz

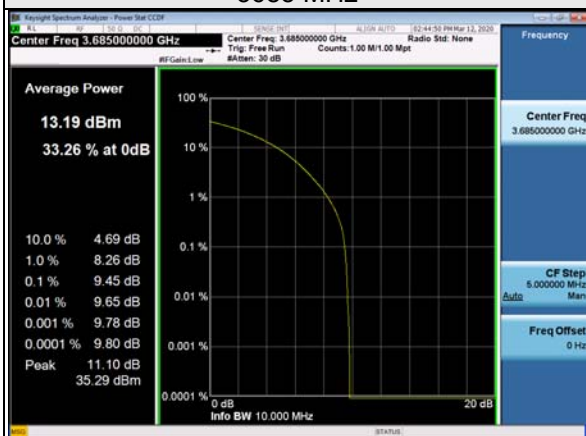


3630 MHz

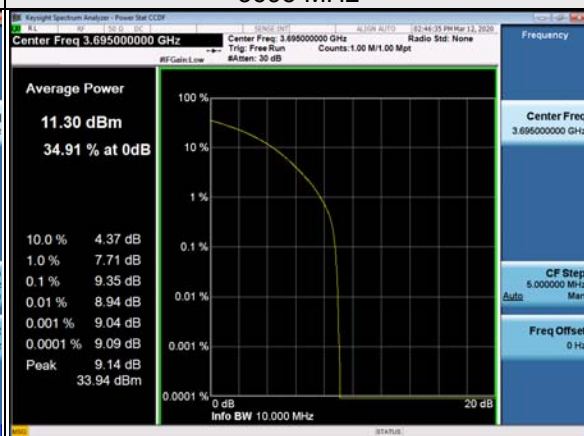


High Channel

3685 MHz



3695 MHz



20MHz+20MHz:

Spectrum Plot of Worst Value

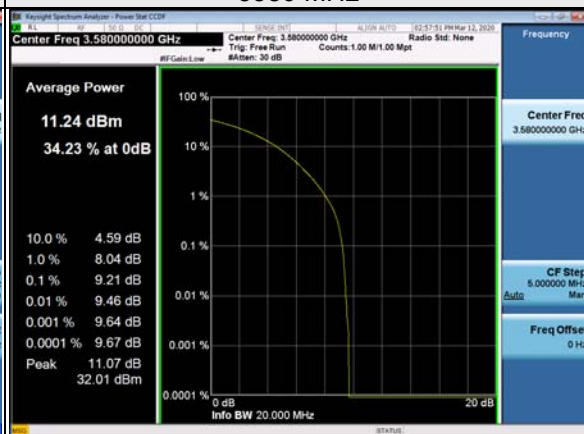
QPSK

Low Channel

3560 MHz



3580 MHz

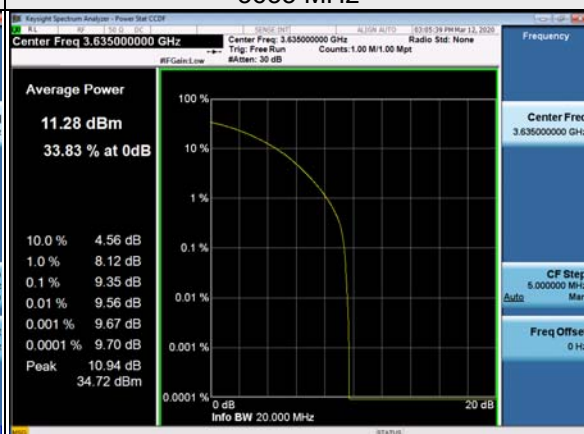


Middle Channel

3615 MHz



3635 MHz

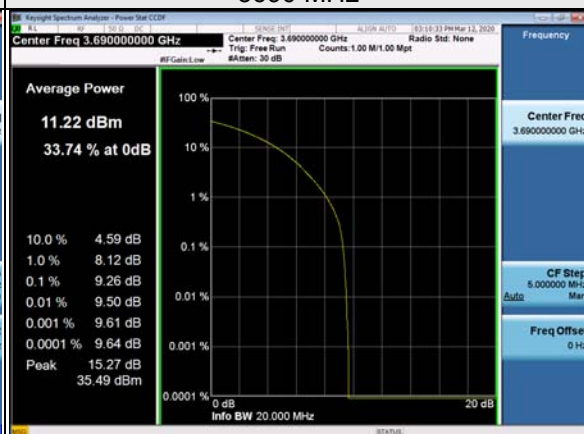


High Channel

3670 MHz



3690 MHz



4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

Power of any emissions outside the Fundamental	Limit
Within 0-10MHz above the Assigned Channel	-13 dBm/MHz
Within 0-10MHz below the Assigned Channel	
Greater than 0-10MHz above the Assigned Channel	-25 dBm/MHz
Greater than 0-10MHz below the Assigned Channel	
Power of any emission below 3530MHz	-40 dBm/MHz
Power of any emission above 3720MHz	

Note:

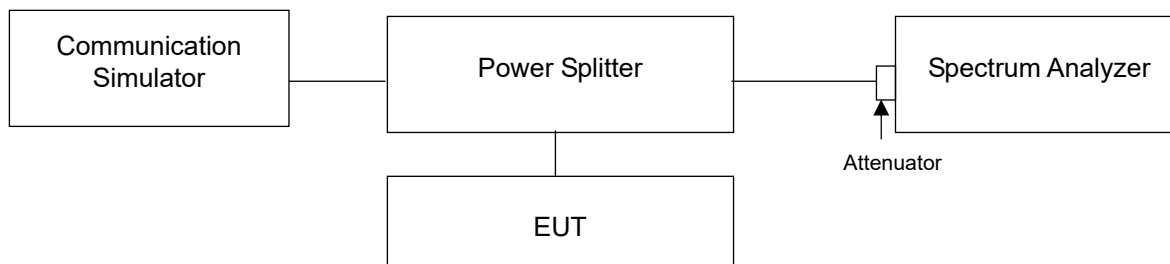
This device can be implement MIMO function, so the limit of spurious emissions needs to be reduced by $10\log(\text{Numbers}_{\text{Ant}})$, according to FCC KDB 662911 D01 guidance.

{The limit is adjusted to $-13\text{dBm} - 10*\log(4) = -19.02\text{dBm}$.}

{The limit is adjusted to $-25\text{dBm} - 10*\log(4) = -31.02\text{dBm}$.}

{The limit is adjusted to $-40\text{dBm} - 10*\log(4) = -46.02\text{dBm}$.}

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.7.4 Test Procedure

- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 30 MHz to 37 GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.
- Measuring frequency band edge, 20dB attenuation pad is connected with spectrum. 1% of the fundamental emission bandwidth is used for conducted emission measurement.
- For 10 MHz channel BW mode, extend the 1% range from 1M to 2M above and below the channel edge and then reduce the limit further by $10\log(1000/100)=10\text{dB}$ (i.e. total $-19 + -10 = -29\text{dB}$) to compensate for the integration from 100k to 1M.

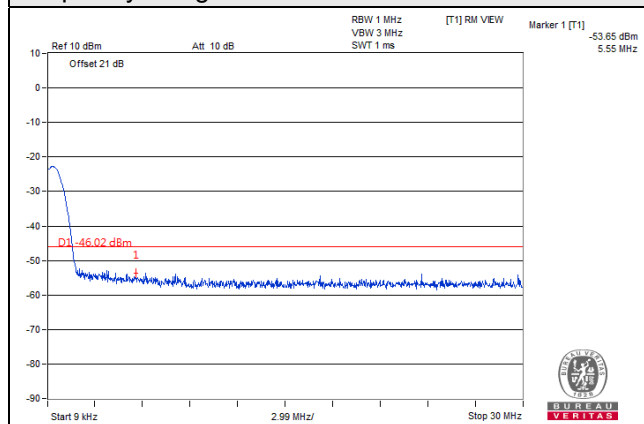
4.7.5 Test Results

SC MODE

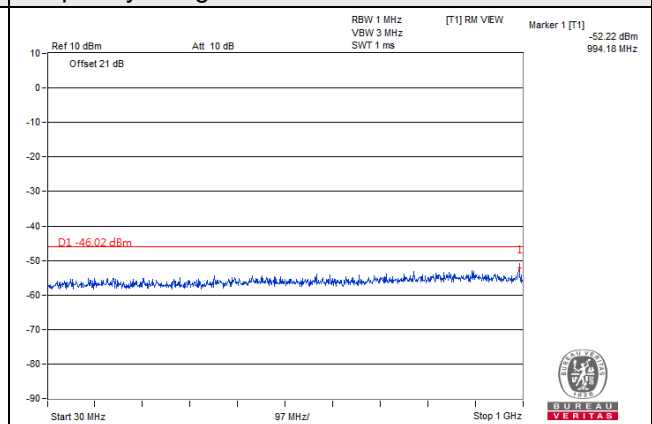
10MHz / QPSK / Chain 0 / Low Channel



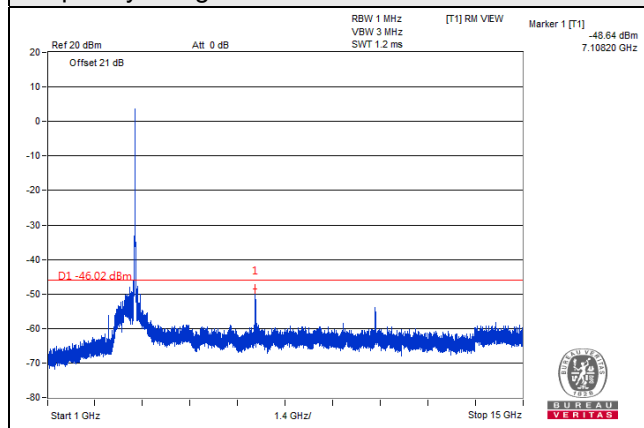
Frequency Range : 9kHz~30MHz



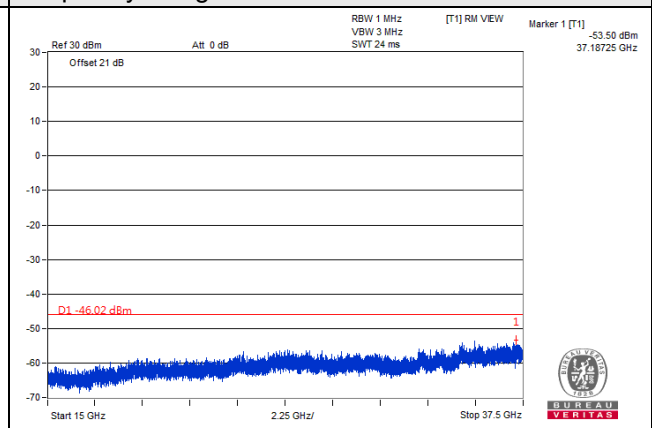
Frequency Range : 30MHz~1GHz



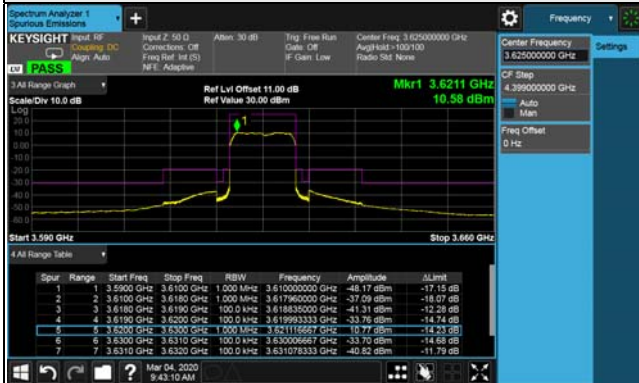
Frequency Range : 1GHz~15GHz



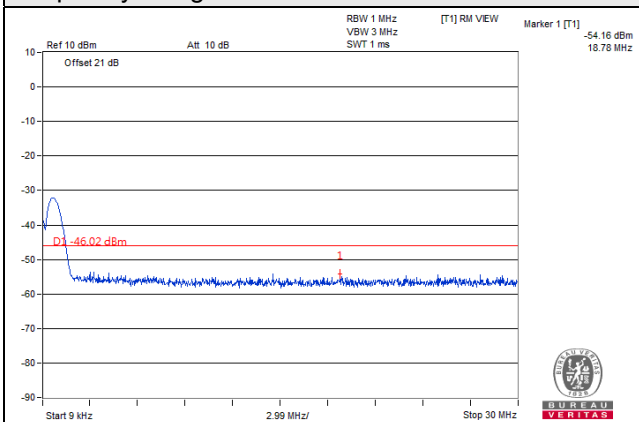
Frequency Range : 15GHz~37.5GHz



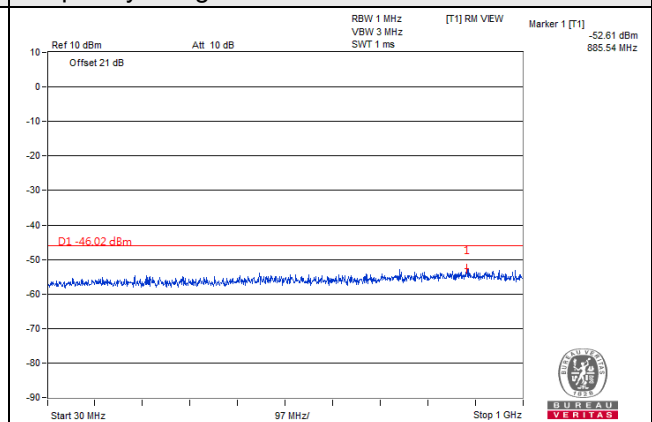
10MHz / QPSK / Chain 0 / Middle Channel



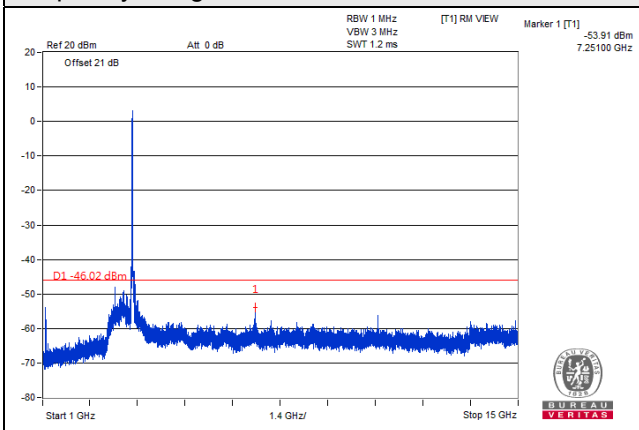
Frequency Range : 9kHz~30MHz



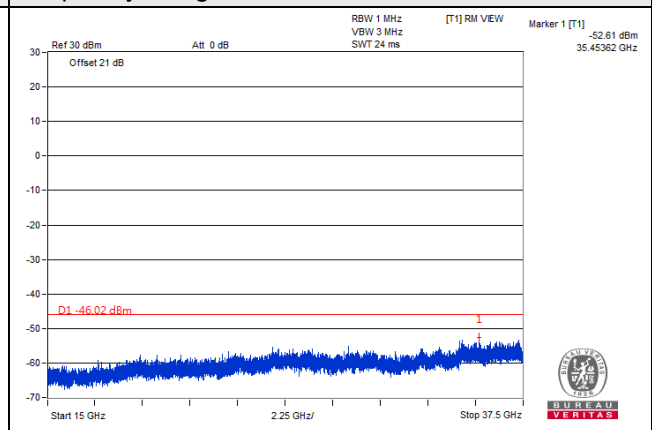
Frequency Range : 30MHz~1GHz



Frequency Range : 1GHz~15GHz



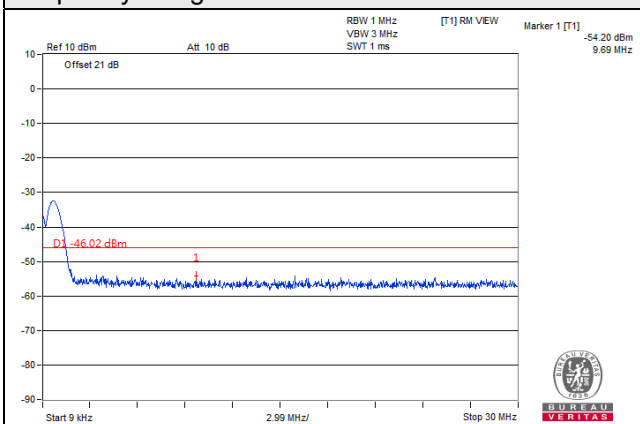
Frequency Range : 15GHz~37.5GHz



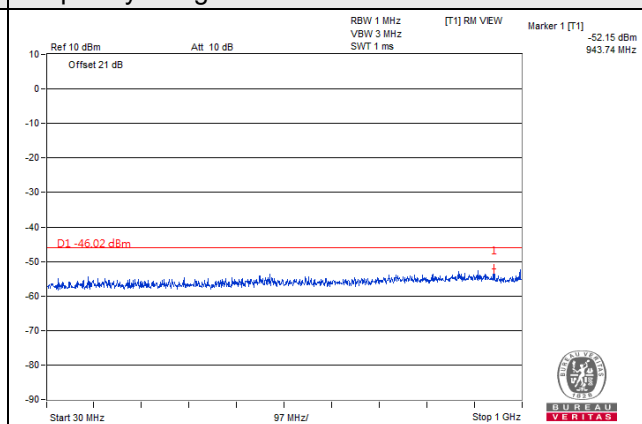
10MHz / QPSK / Chain 0 / High Channel



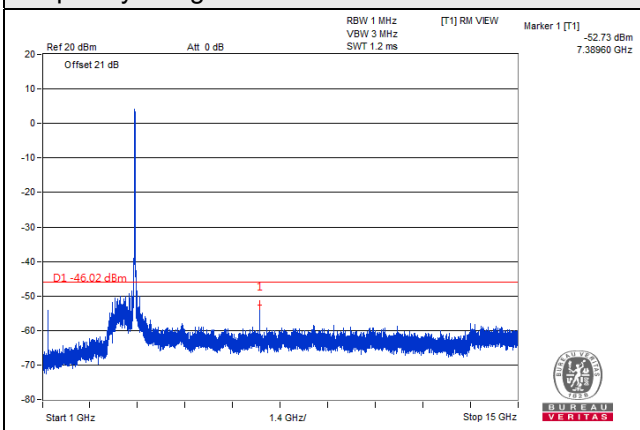
Frequency Range : 9kHz~30MHz



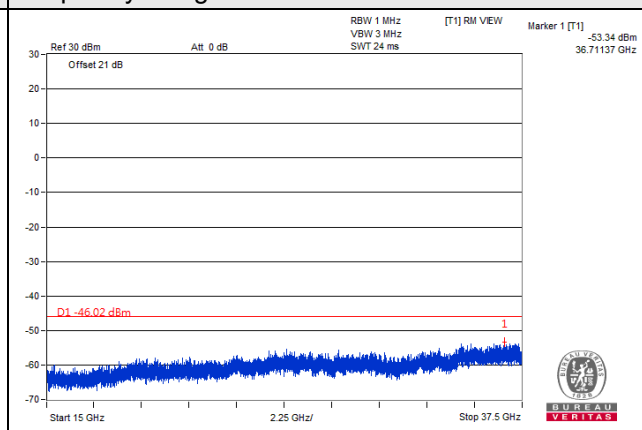
Frequency Range : 30MHz~1GHz



Frequency Range : 1GHz~15GHz



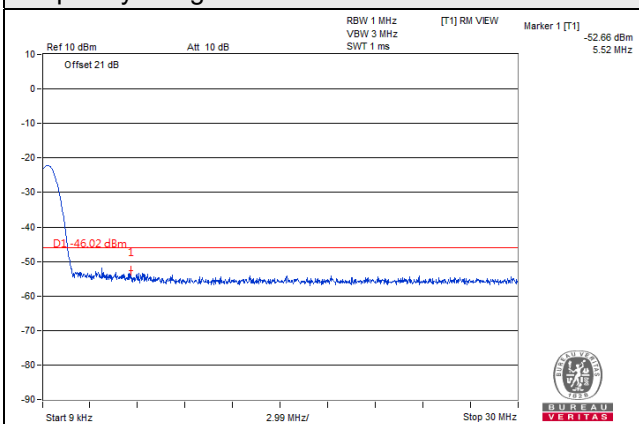
Frequency Range : 15GHz~37.5GHz



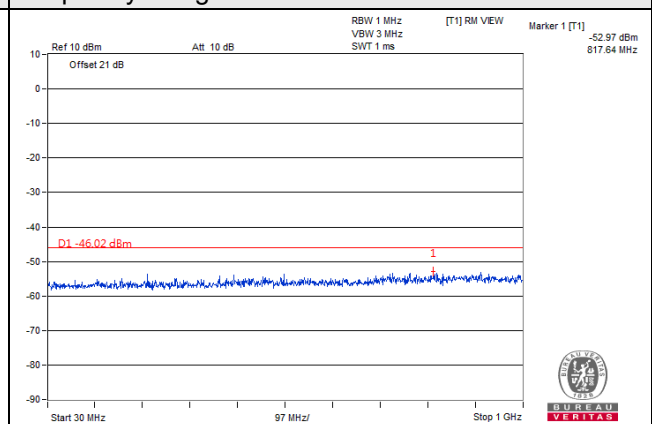
10MHz / QPSK / Chain 1 / Low Channel



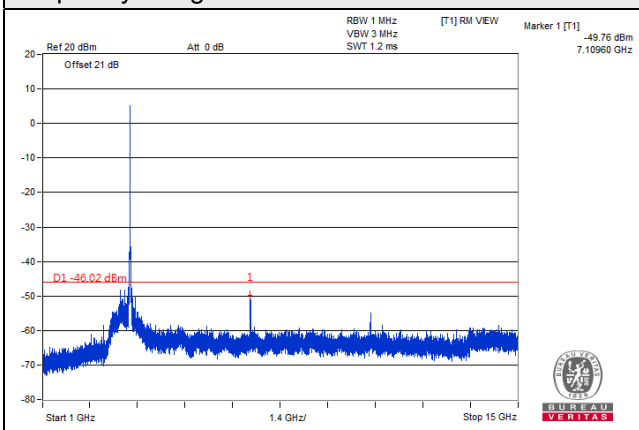
Frequency Range : 9kHz~30MHz



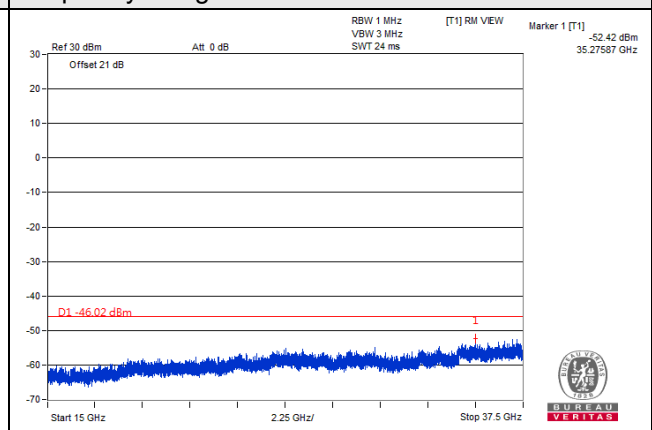
Frequency Range : 30MHz~1GHz



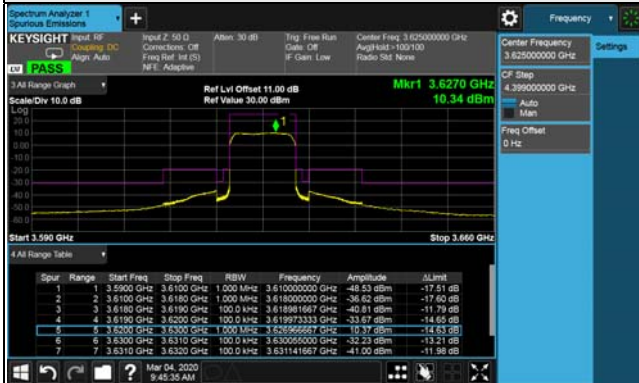
Frequency Range : 1GHz~15GHz



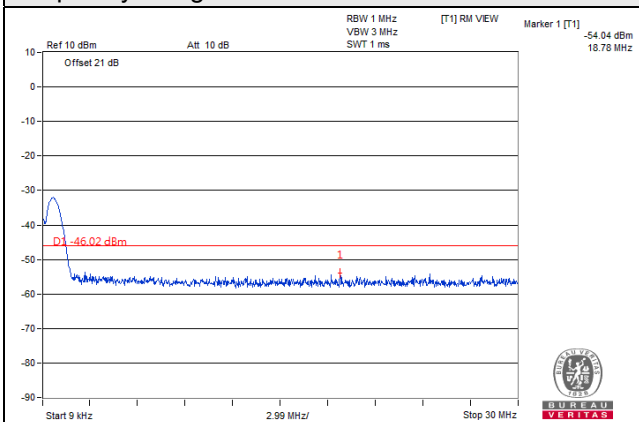
Frequency Range : 15GHz~37.5GHz



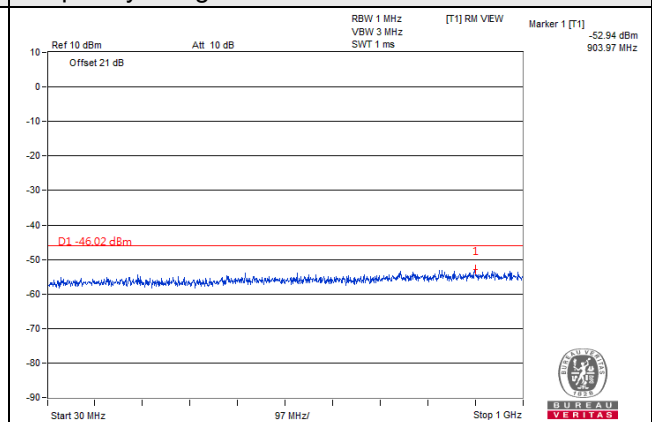
10MHz / QPSK / Chain 1 / Middle Channel



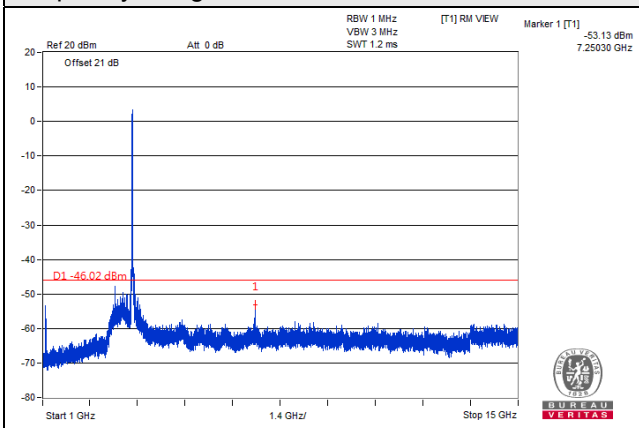
Frequency Range : 9kHz~30MHz



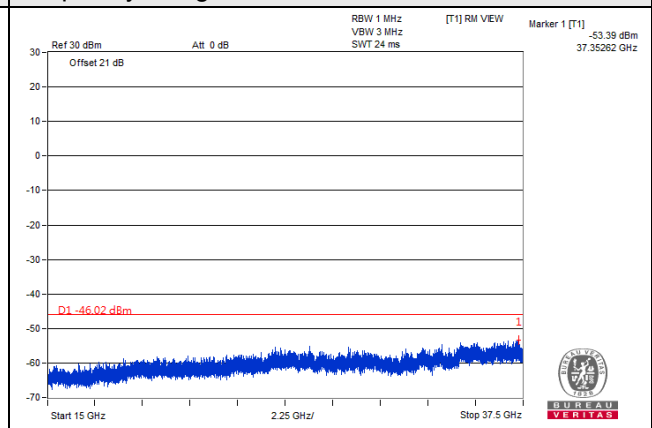
Frequency Range : 30MHz~1GHz



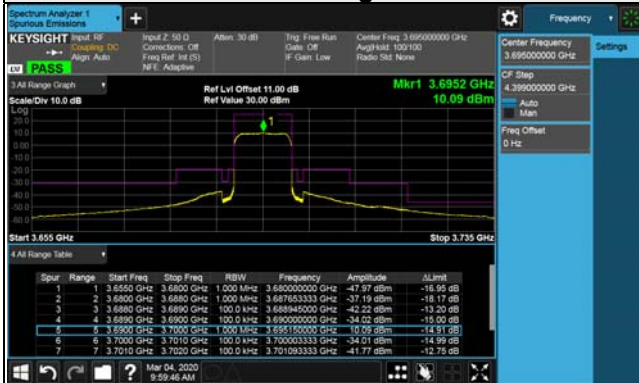
Frequency Range : 1GHz~15GHz



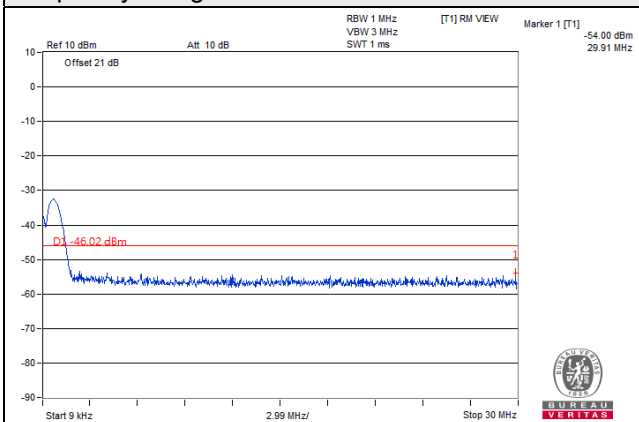
Frequency Range : 15GHz~37.5GHz



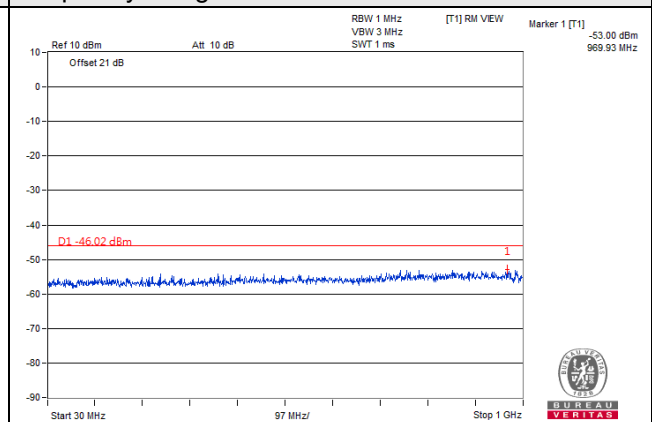
10MHz / QPSK / Chain 1 / High Channel



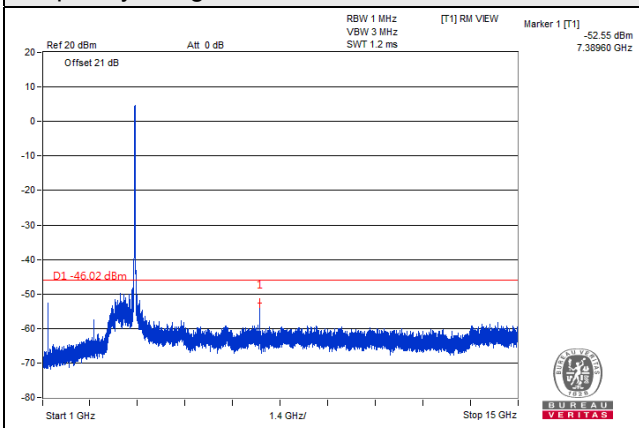
Frequency Range : 9kHz~30MHz



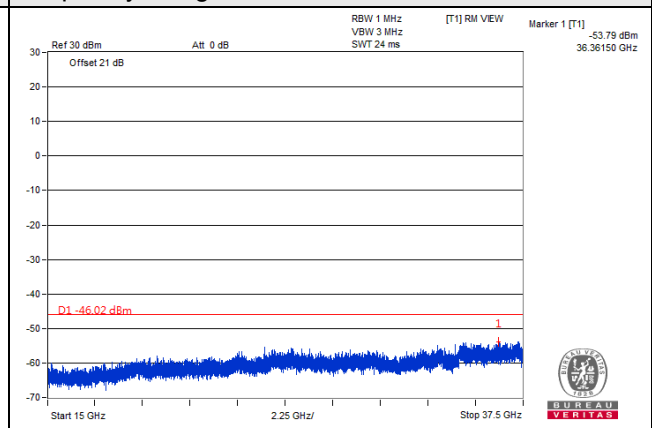
Frequency Range : 30MHz~1GHz



Frequency Range : 1GHz~15GHz



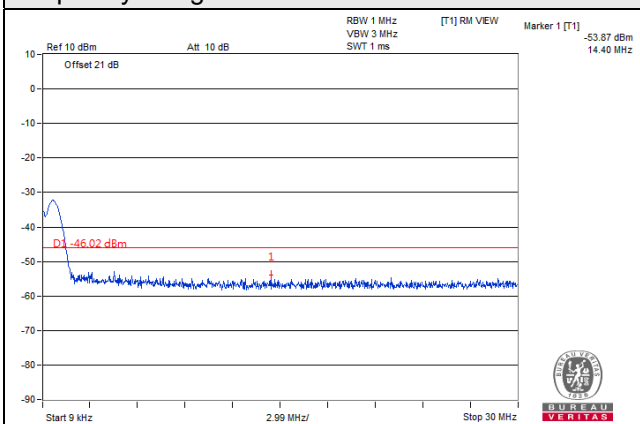
Frequency Range : 15GHz~37.5GHz



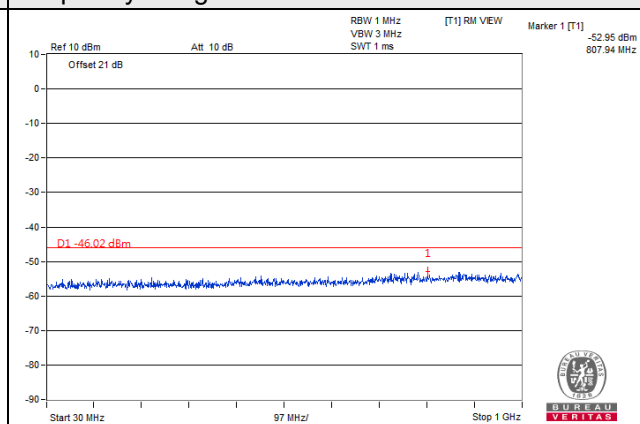
10MHz / QPSK / Chain 2 / Low Channel



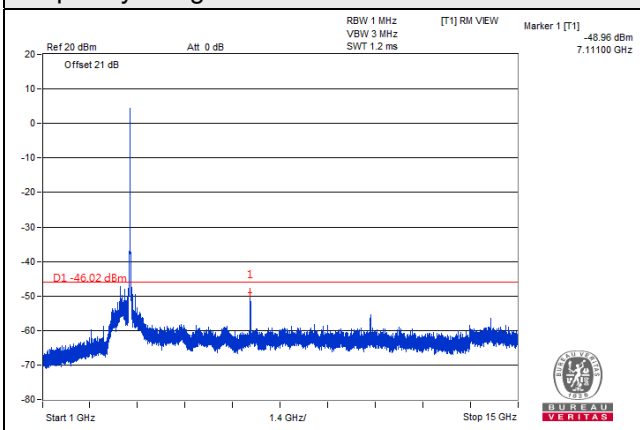
Frequency Range : 9kHz~30MHz



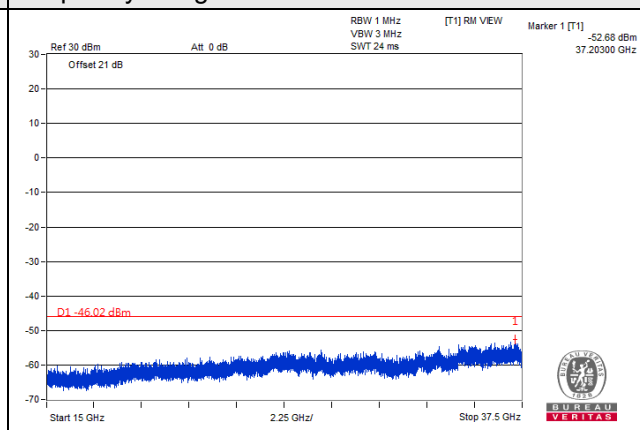
Frequency Range : 30MHz~1GHz



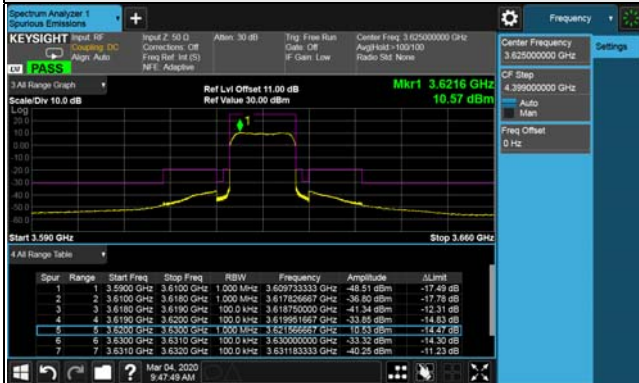
Frequency Range : 1GHz~15GHz



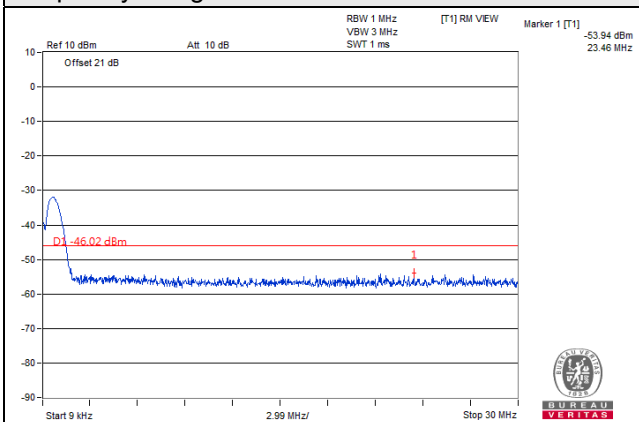
Frequency Range : 15GHz~37.5GHz



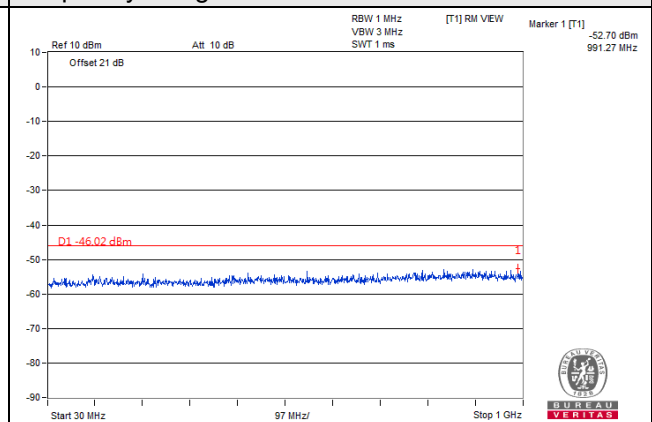
10MHz / QPSK / Chain 2 / Middle Channel



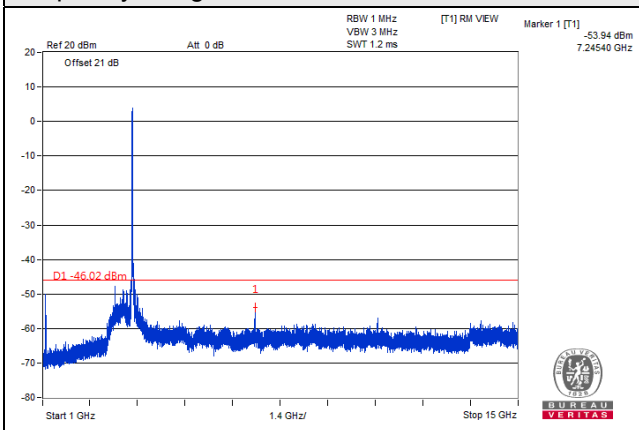
Frequency Range : 9kHz~30MHz



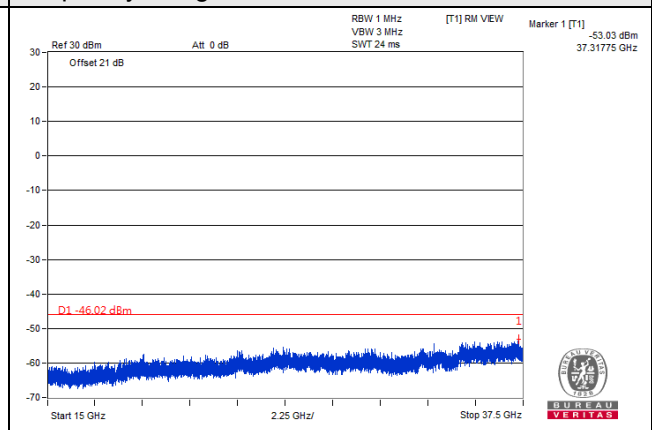
Frequency Range : 30MHz~1GHz



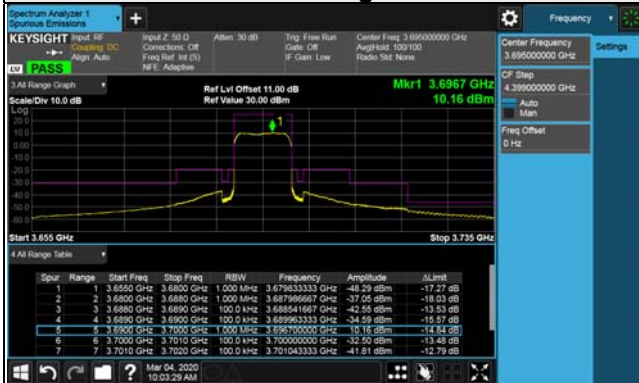
Frequency Range : 1GHz~15GHz



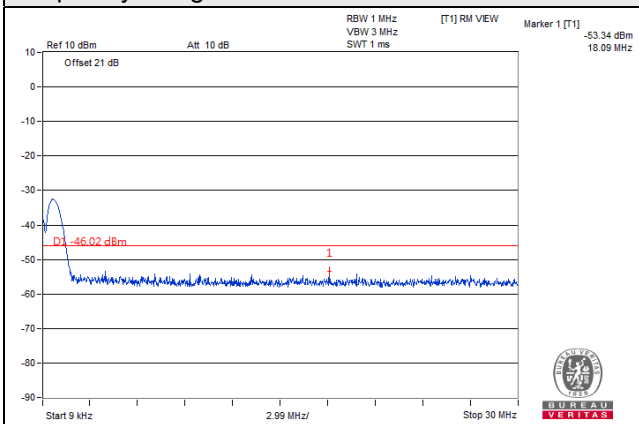
Frequency Range : 15GHz~37.5GHz



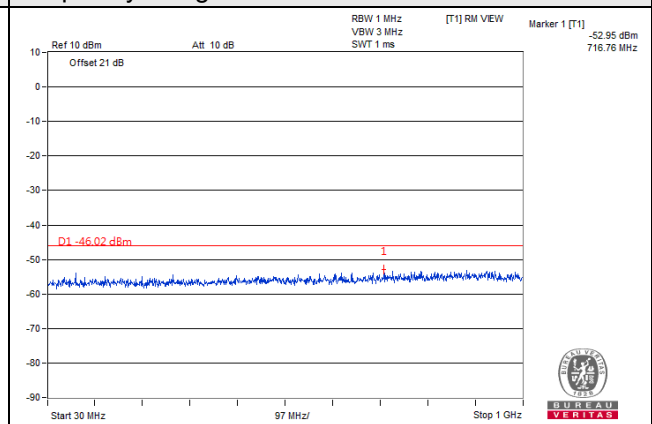
10MHz / QPSK / Chain 2 / High Channel



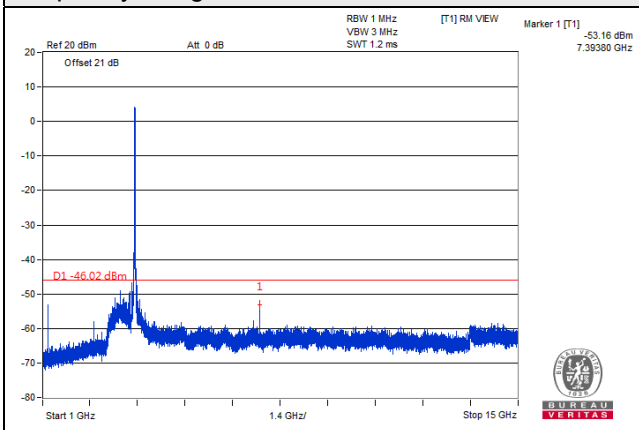
Frequency Range : 9kHz~30MHz



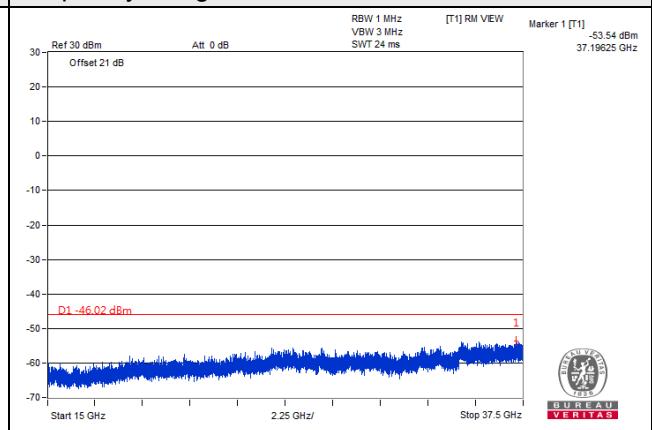
Frequency Range : 30MHz~1GHz



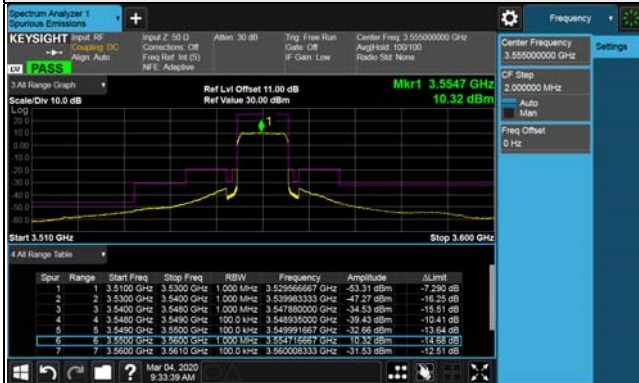
Frequency Range : 1GHz~15GHz



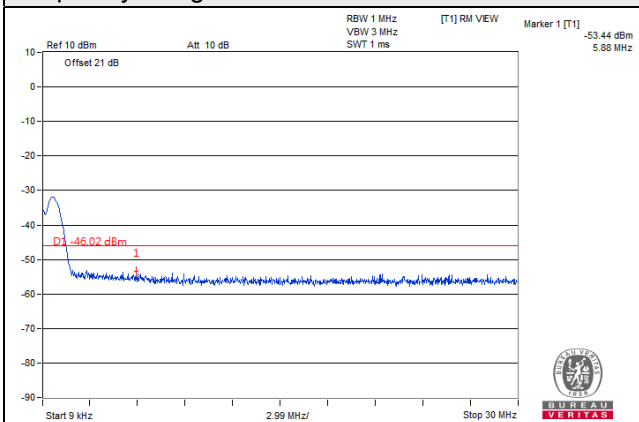
Frequency Range : 15GHz~37.5GHz



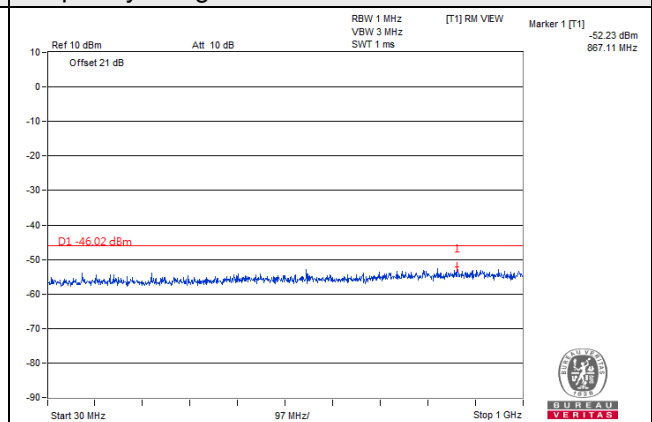
10MHz / QPSK / Chain 3 / Low Channel



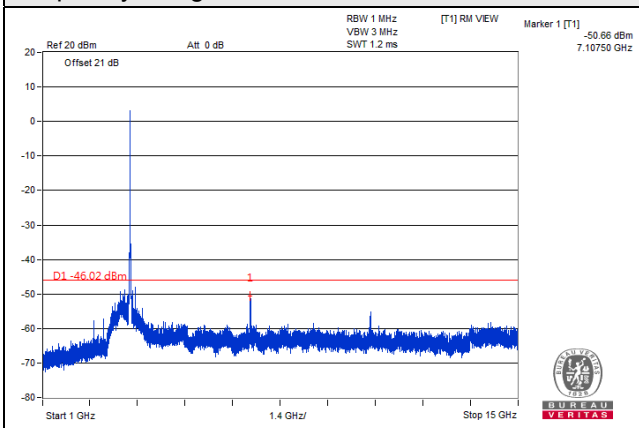
Frequency Range : 9kHz~30MHz



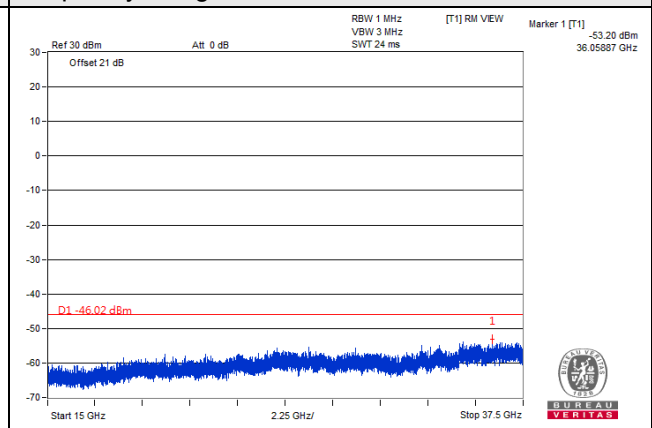
Frequency Range : 30MHz~1GHz



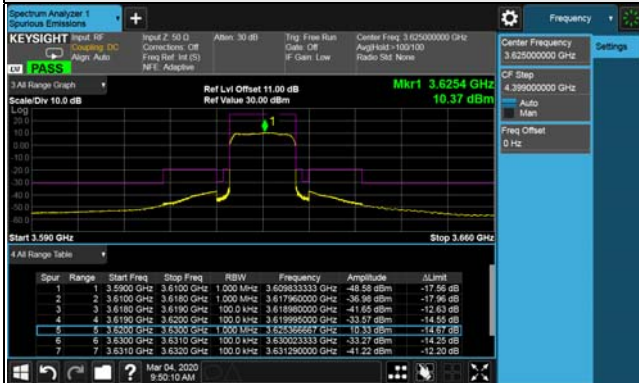
Frequency Range : 1GHz~15GHz



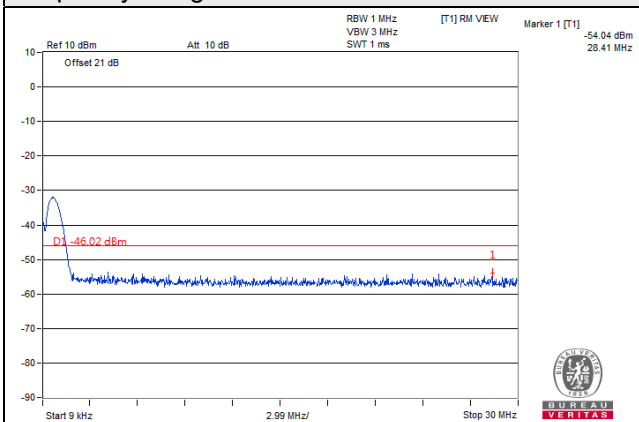
Frequency Range : 15GHz~37.5GHz



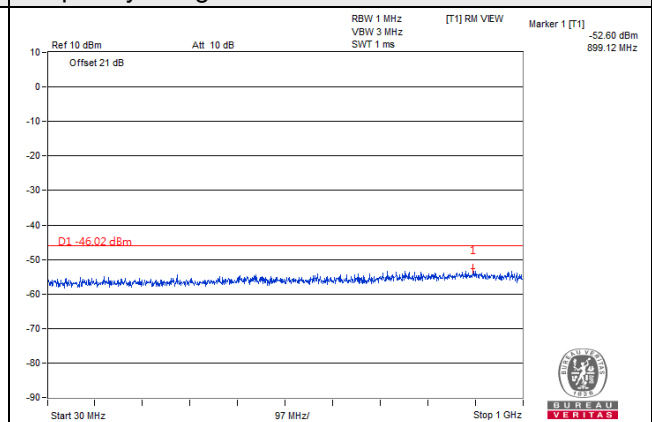
10MHz / QPSK / Chain 3 / Middle Channel



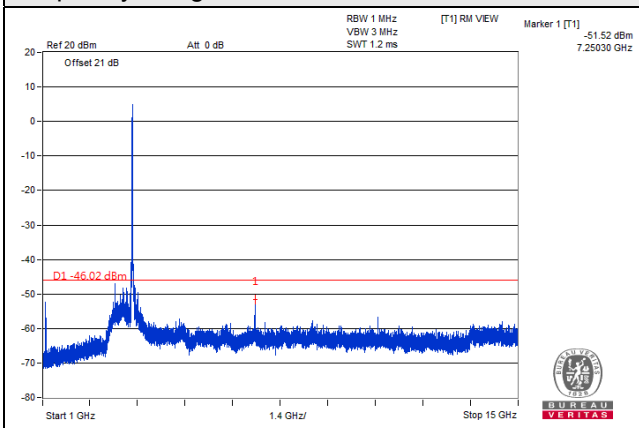
Frequency Range : 9kHz~30MHz



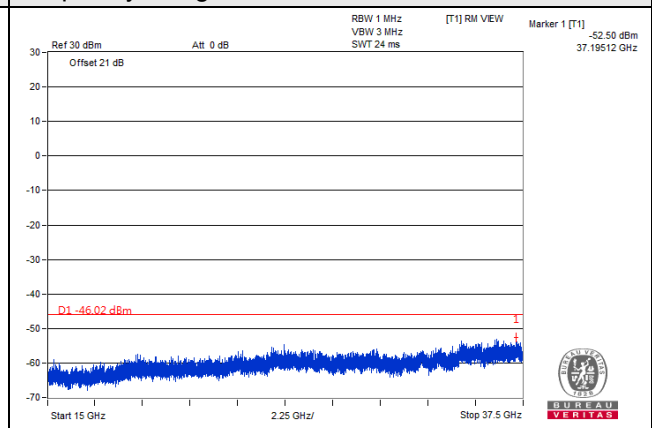
Frequency Range : 30MHz~1GHz



Frequency Range : 1GHz~15GHz



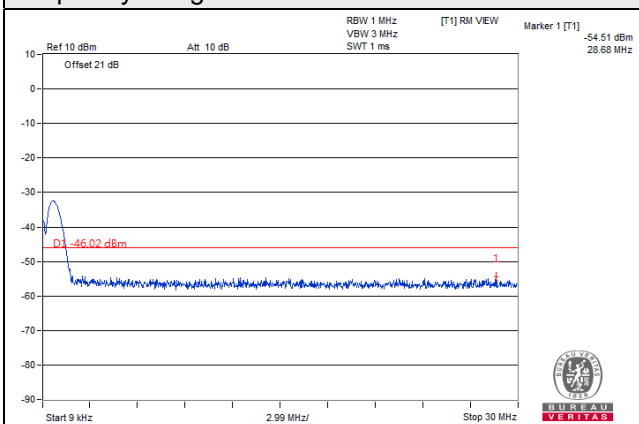
Frequency Range : 15GHz~37.5GHz



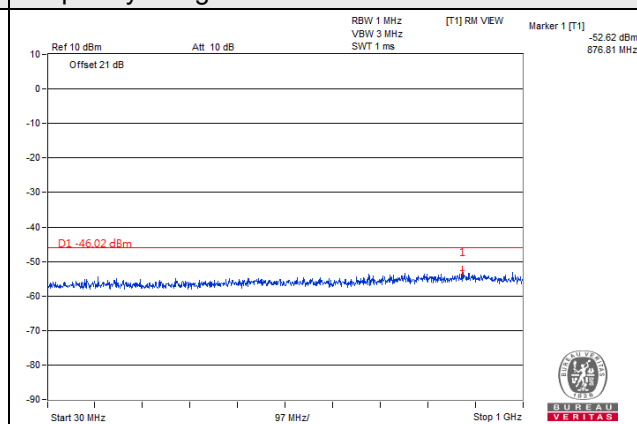
10MHz / QPSK / Chain 3 / High Channel



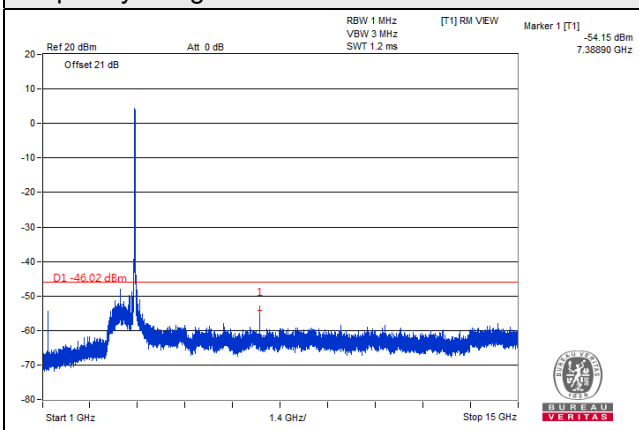
Frequency Range : 9kHz~30MHz



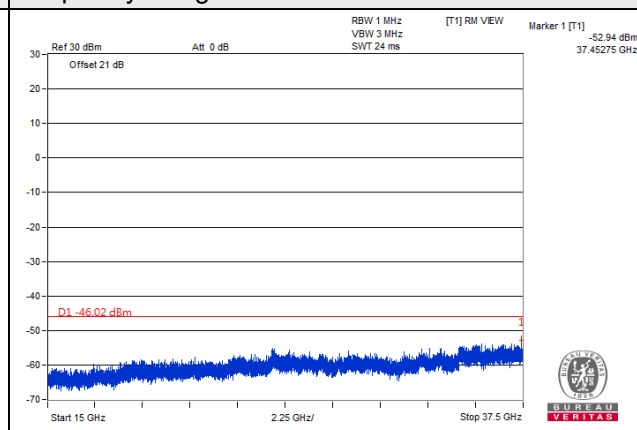
Frequency Range : 30MHz~1GHz



Frequency Range : 1GHz~15GHz



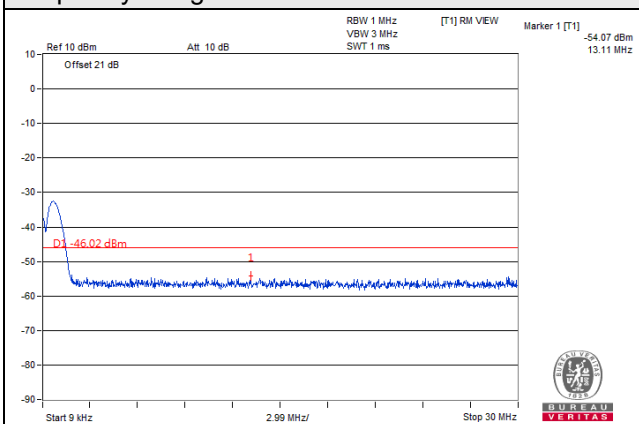
Frequency Range : 15GHz~37.5GHz



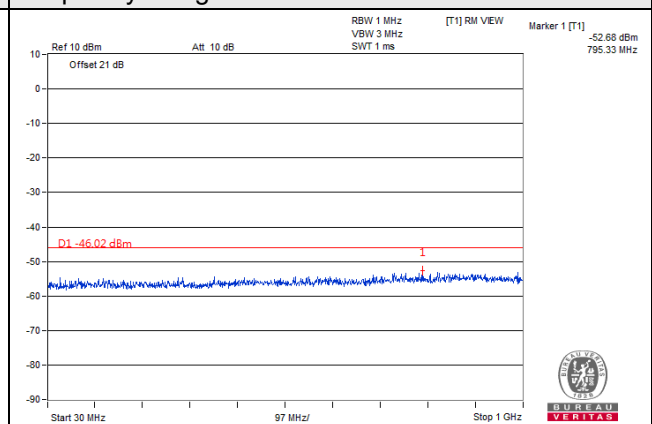
20MHz / QPSK / Chain 0 / Low Channel



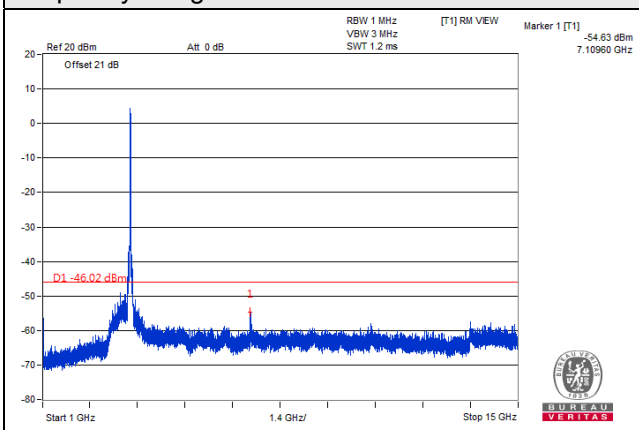
Frequency Range : 9kHz~30MHz



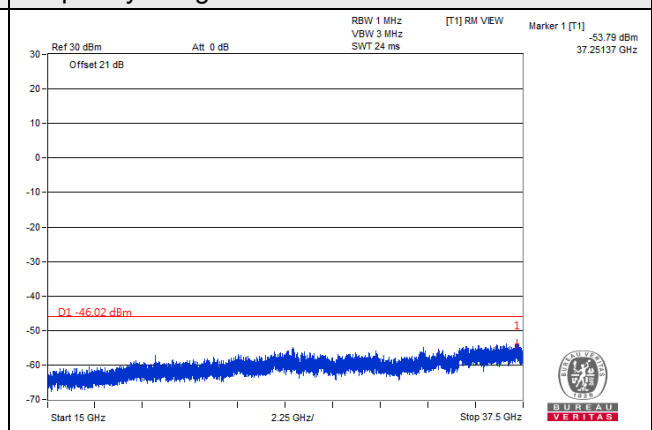
Frequency Range : 30MHz~1GHz



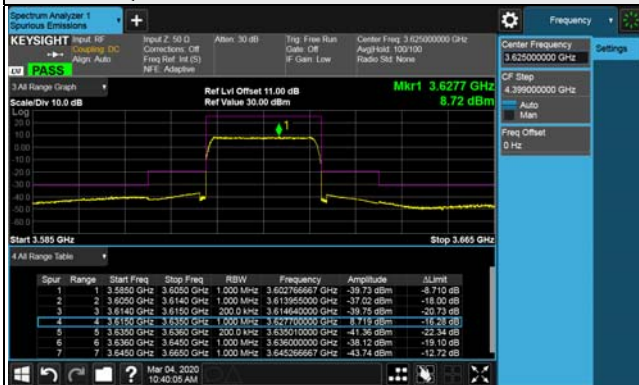
Frequency Range : 1GHz~15GHz



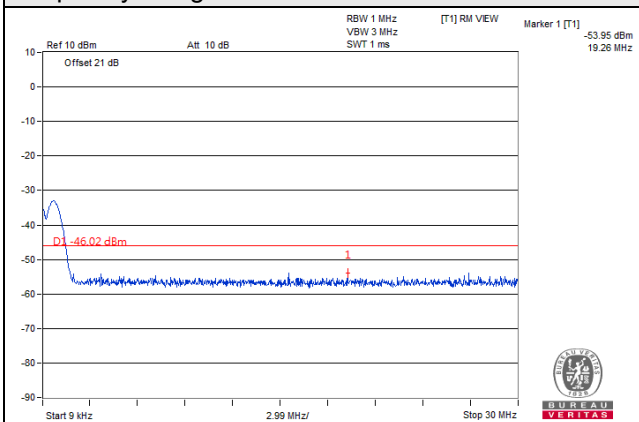
Frequency Range : 15GHz~37.5GHz



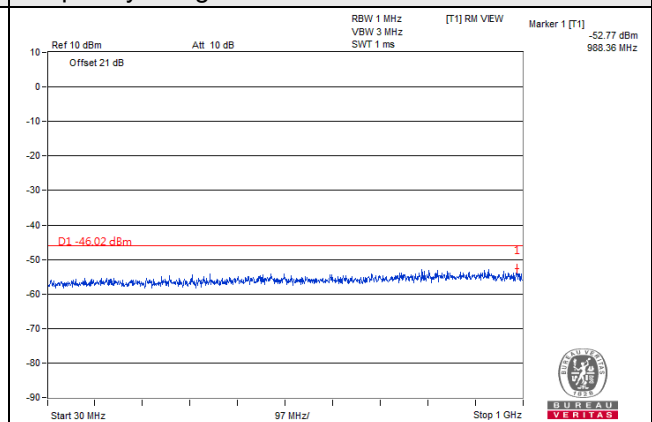
20MHz / QPSK / Chain 0 / Middle Channel



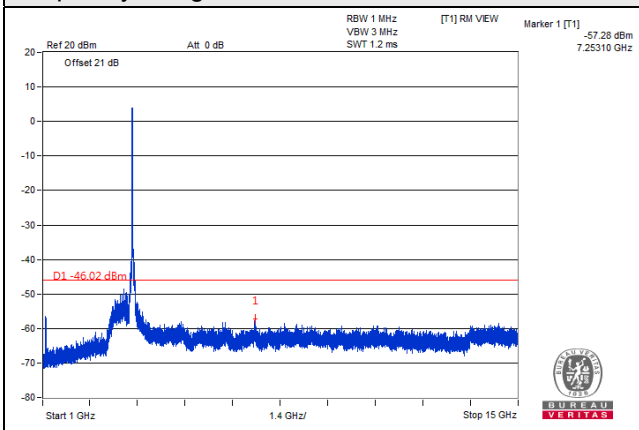
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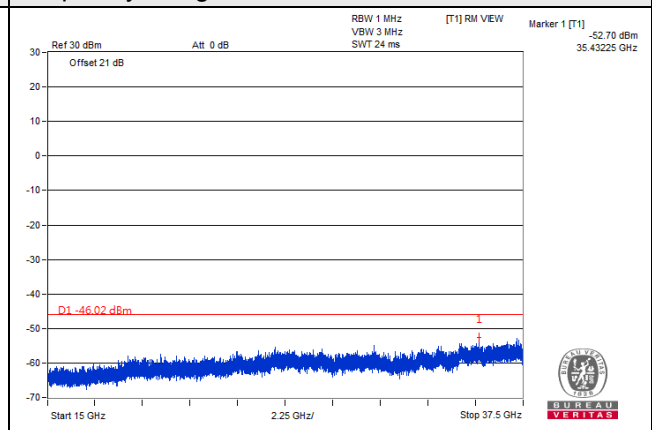
Frequency Range : 30MHz~1GHz



Frequency Range : 1GHz~15GHz



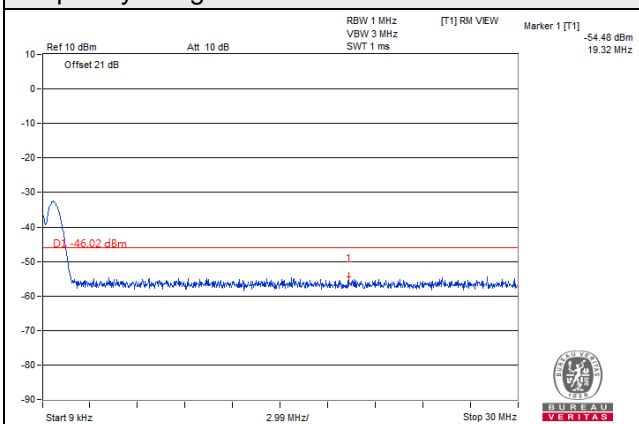
Frequency Range : 15GHz~37.5GHz



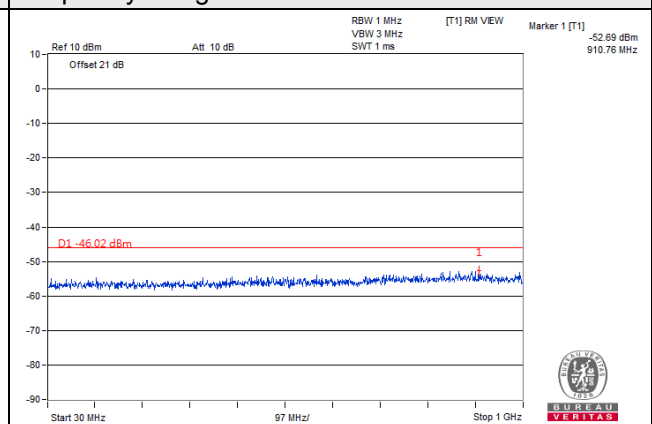
20MHz / QPSK / Chain 0 / High Channel



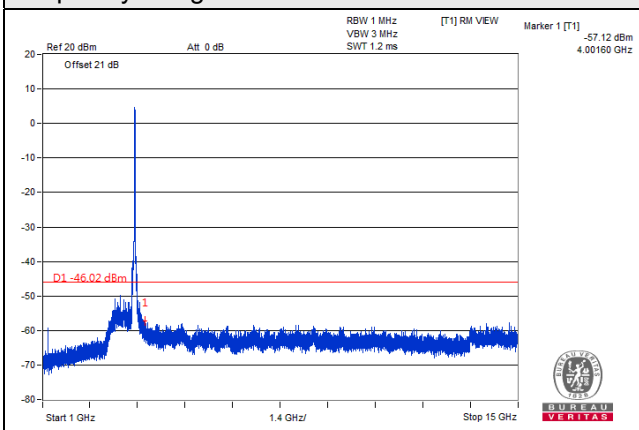
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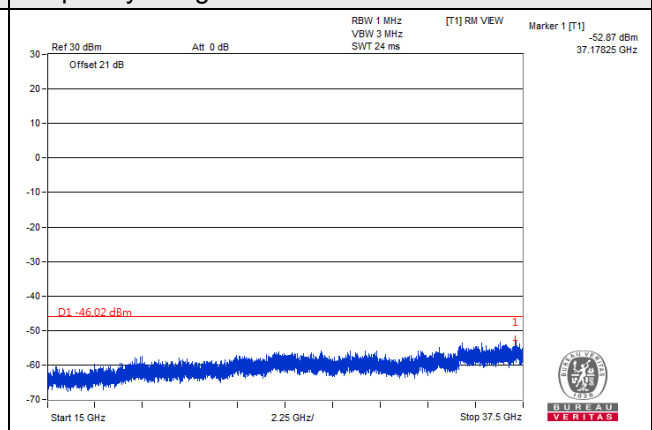
Frequency Range : 30MHz~1GHz



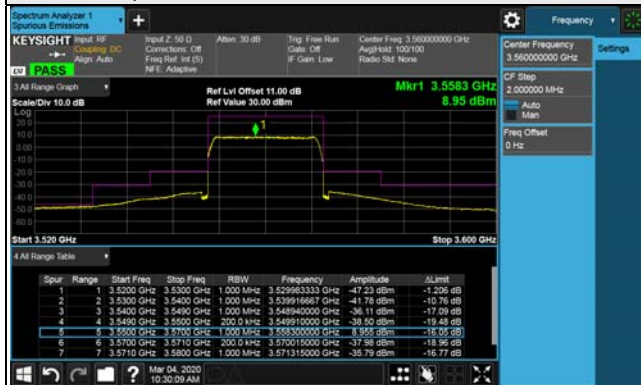
Frequency Range : 1GHz~15GHz



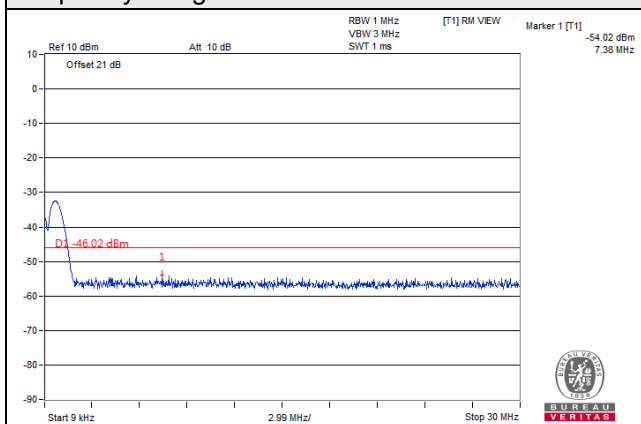
Frequency Range : 15GHz~37.5GHz



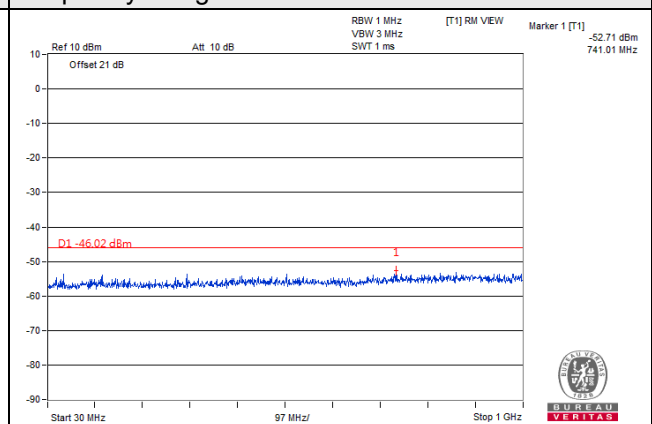
20MHz / QPSK / Chain 1 / Low Channel



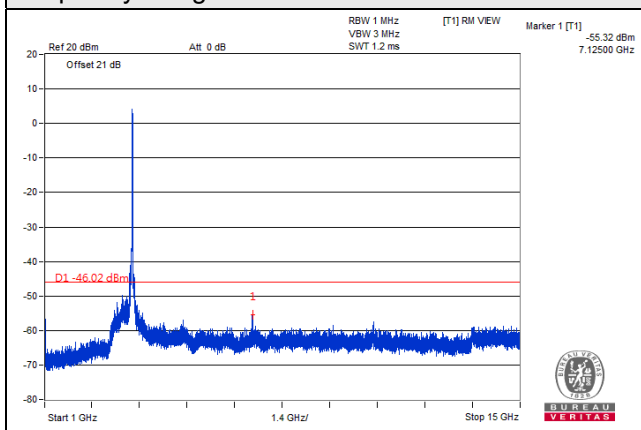
Frequency Range : 9kHz~30MHz



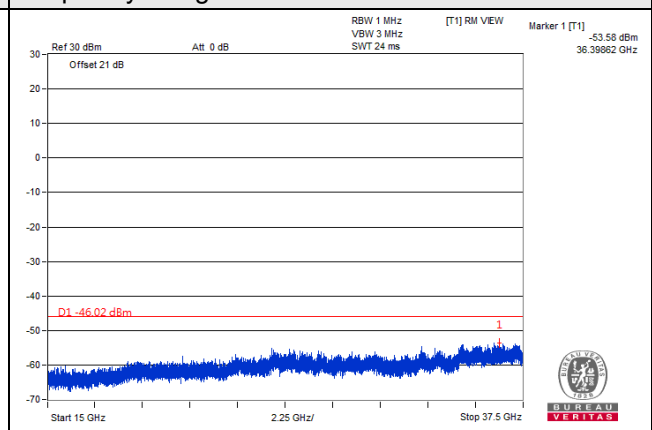
Frequency Range : 30MHz~1GHz



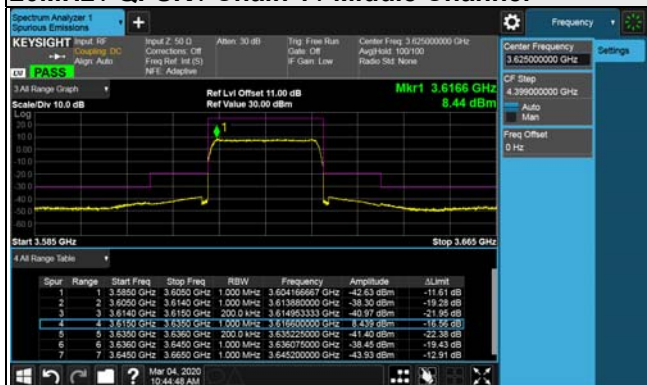
Frequency Range : 1GHz~15GHz



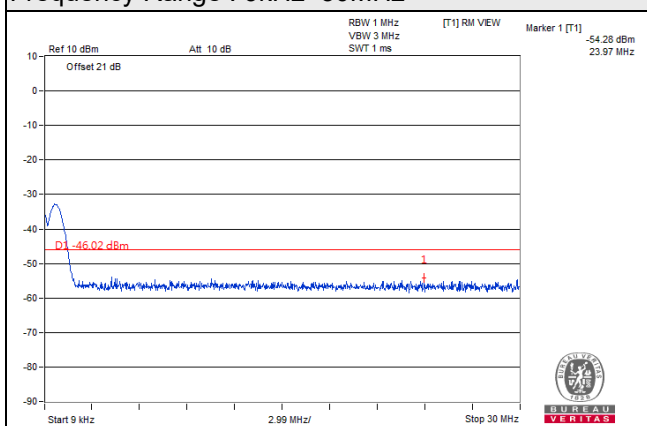
Frequency Range : 15GHz~37.5GHz



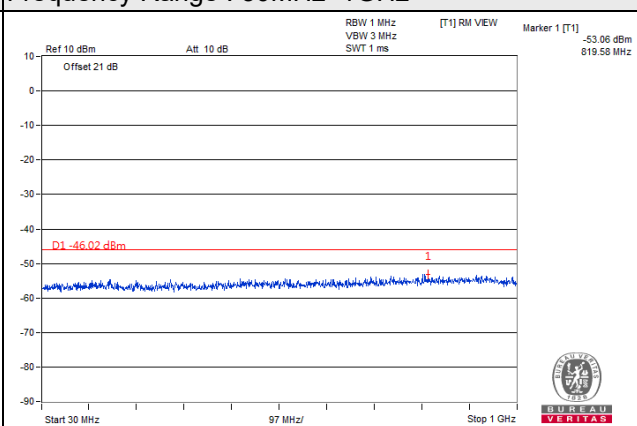
20MHz / QPSK / Chain 1 / Middle Channel



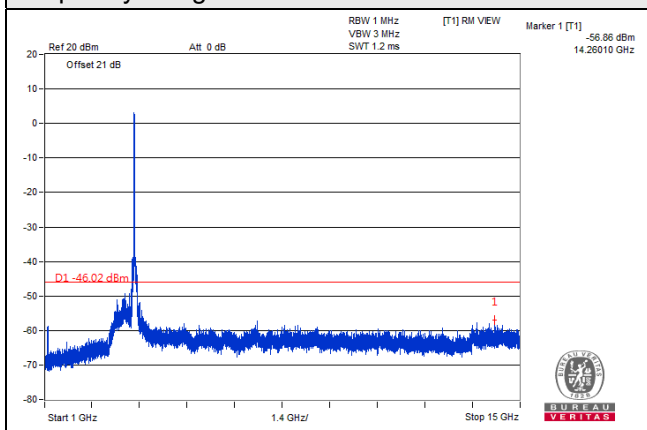
Frequency Range : 9kHz~30MHz



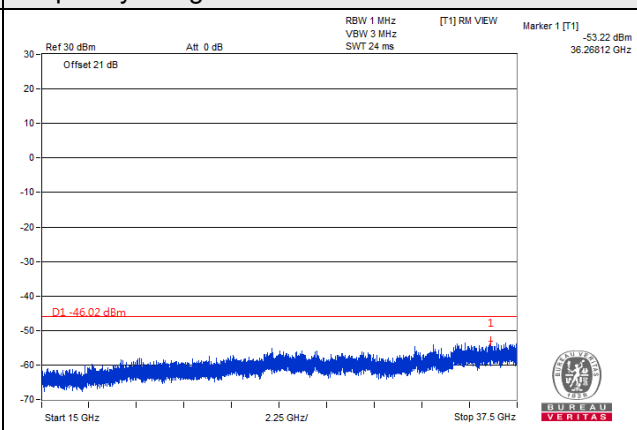
Frequency Range : 30MHz~1GHz



Frequency Range : 1GHz~15GHz



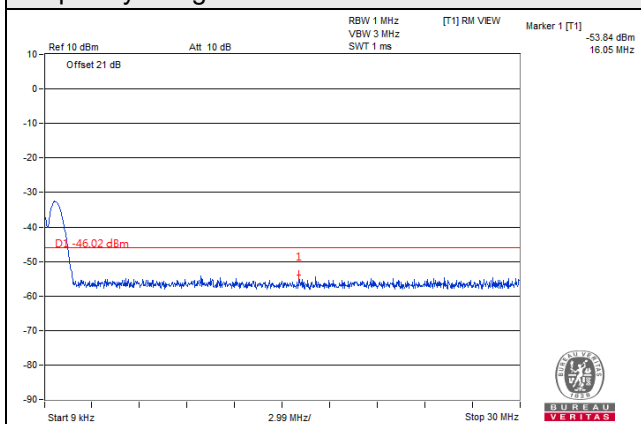
Frequency Range : 15GHz~37.5GHz



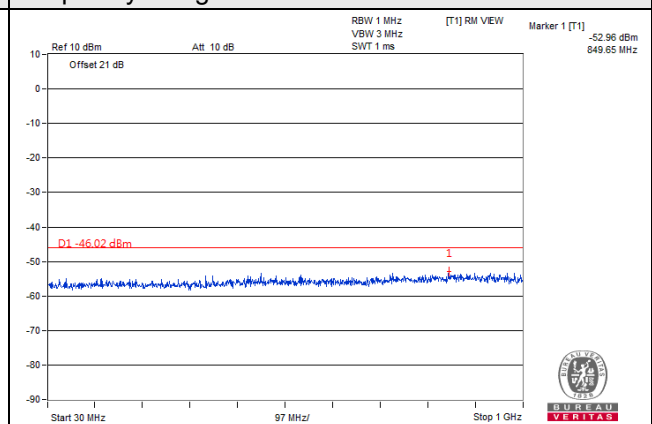
20MHz / QPSK / Chain 1 / High Channel



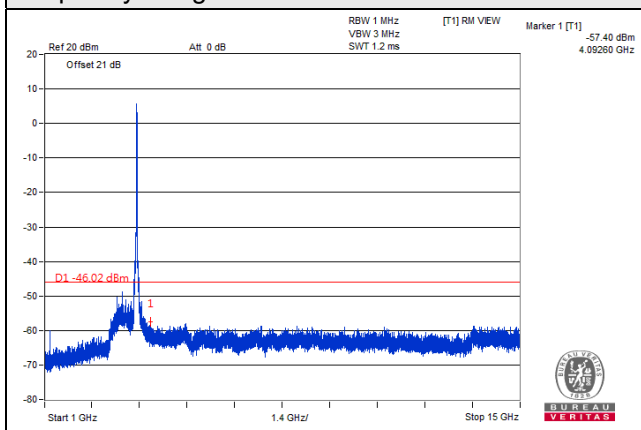
Frequency Range : 9kHz~30MHz



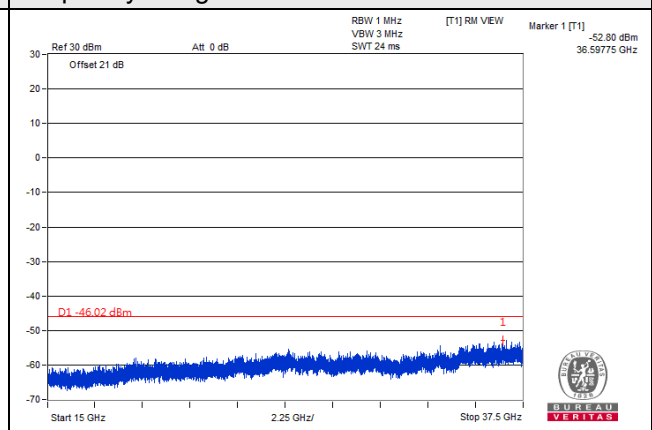
Frequency Range : 30MHz~1GHz



Frequency Range : 1GHz~15GHz



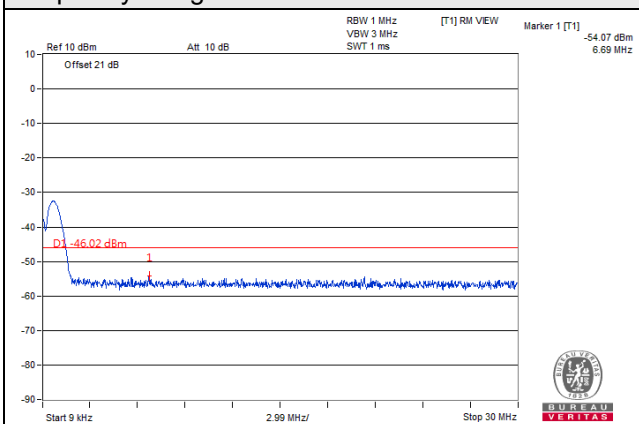
Frequency Range : 15GHz~37.5GHz



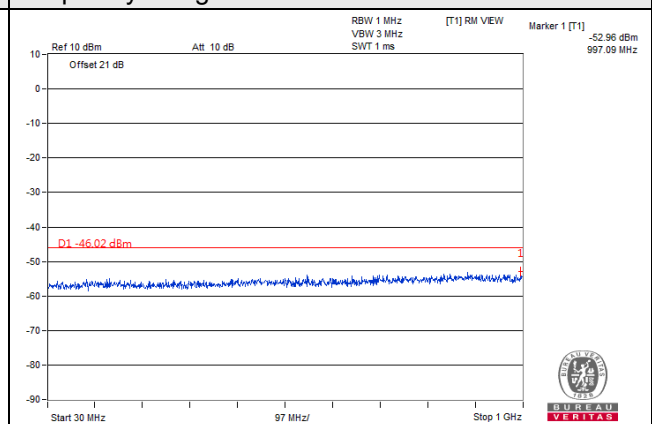
20MHz / QPSK / Chain 2 / Low Channel



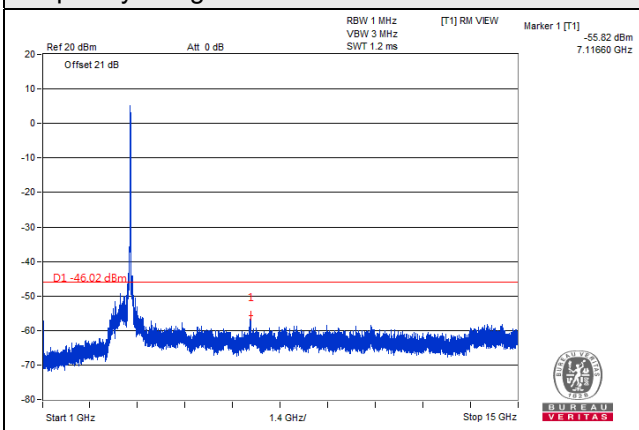
Frequency Range : 9kHz~30MHz



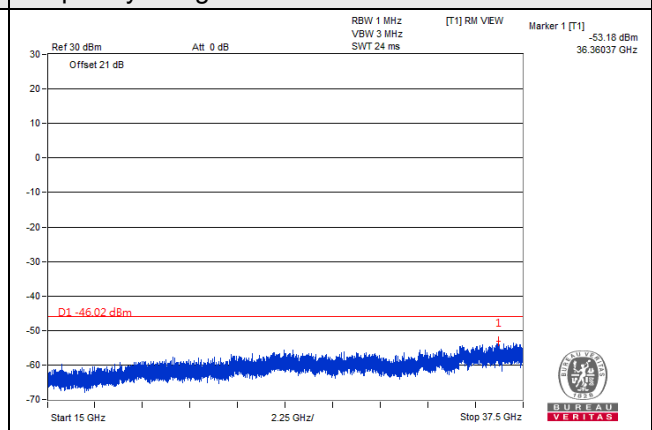
Frequency Range : 30MHz~1GHz



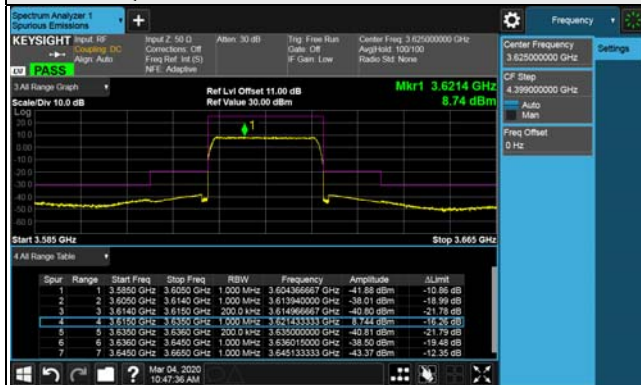
Frequency Range : 1GHz~15GHz



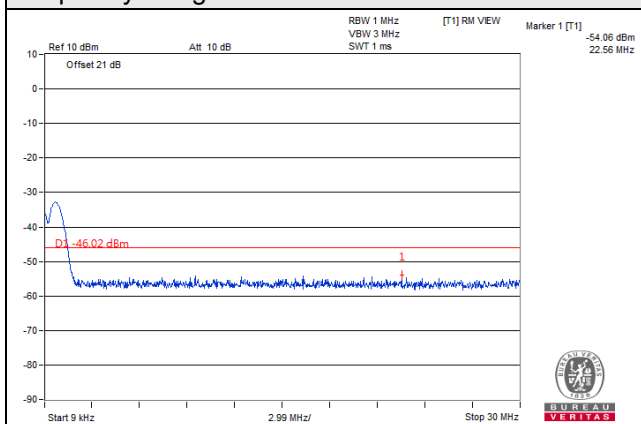
Frequency Range : 15GHz~37.5GHz



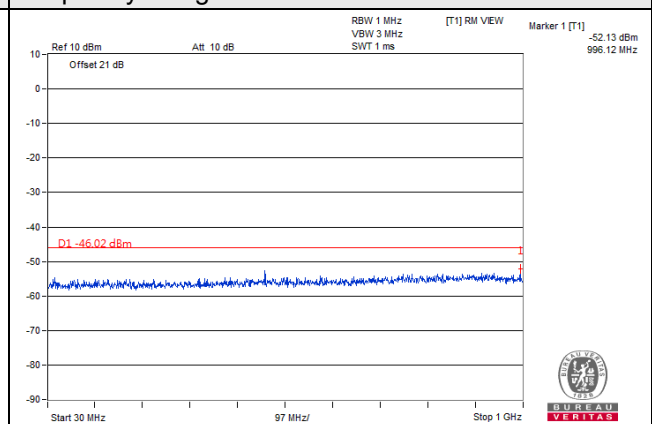
20MHz / QPSK / Chain 2 / Middle Channel



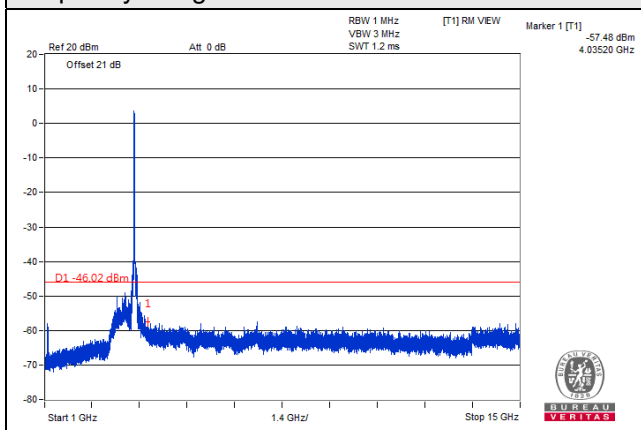
Frequency Range : 9kHz~30MHz



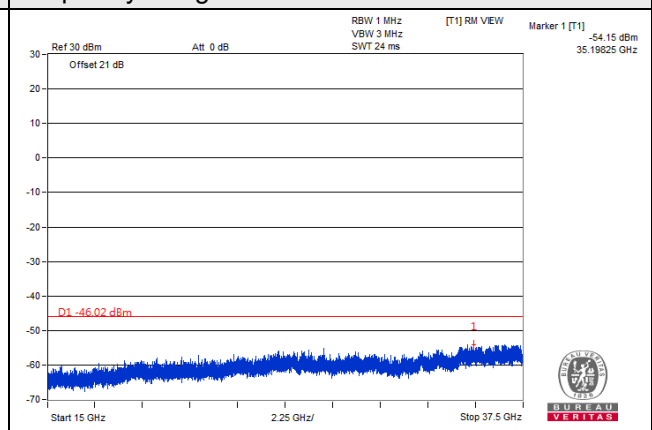
Frequency Range : 30MHz~1GHz



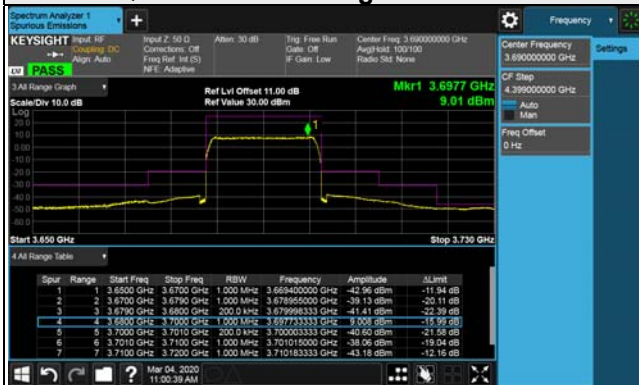
Frequency Range : 1GHz~15GHz



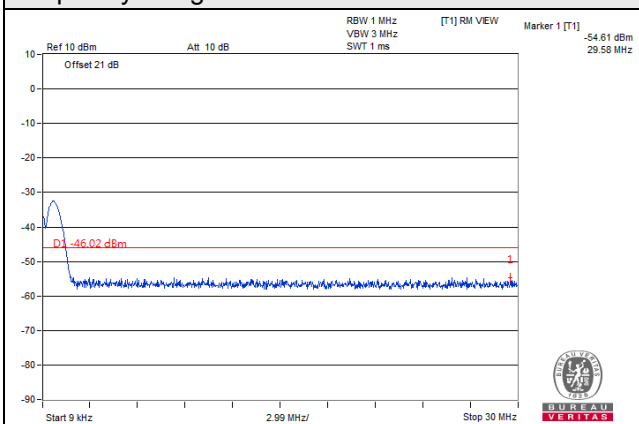
Frequency Range : 15GHz~37.5GHz



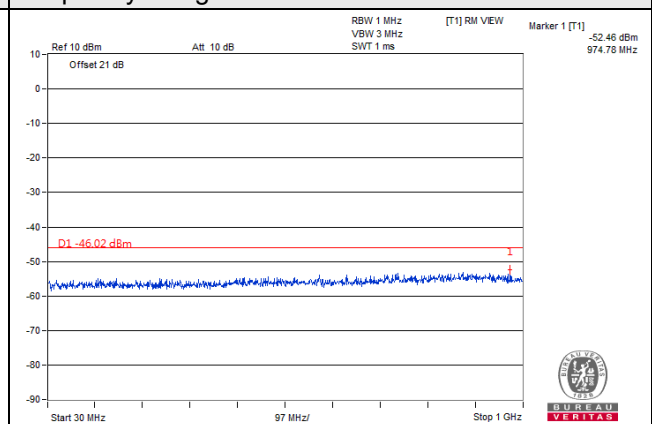
20MHz / QPSK / Chain 2 / High Channel



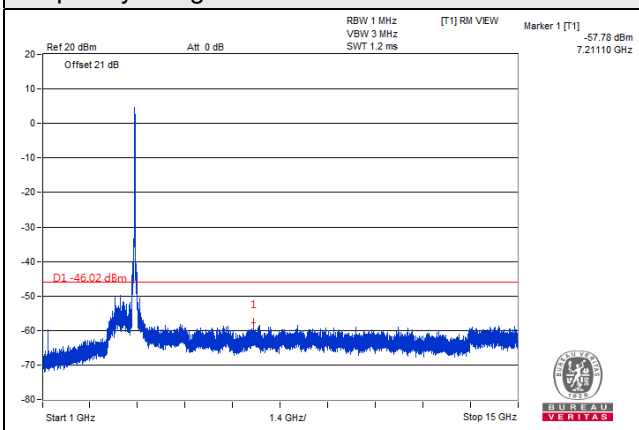
Frequency Range : 9kHz~30MHz



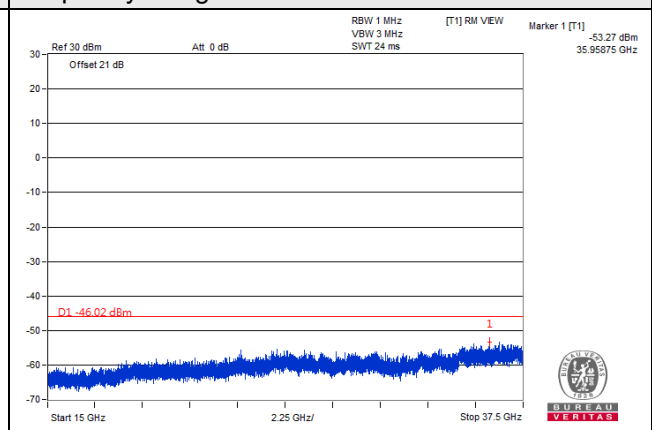
Frequency Range : 30MHz~1GHz



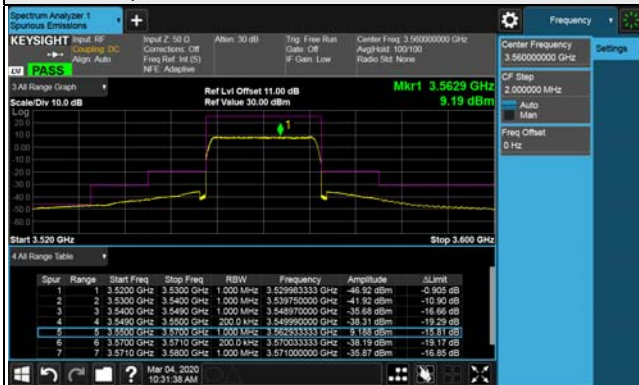
Frequency Range : 1GHz~15GHz



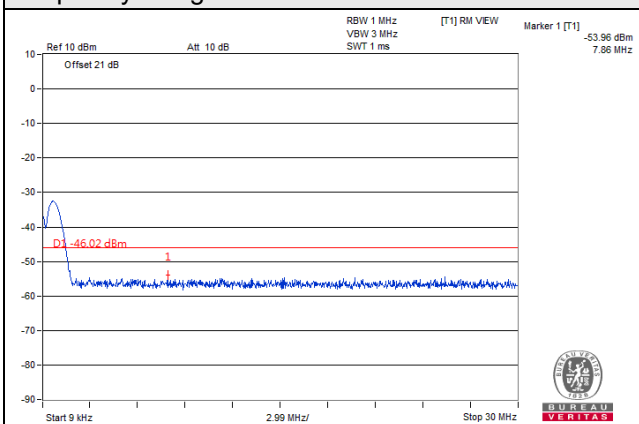
Frequency Range : 15GHz~37.5GHz



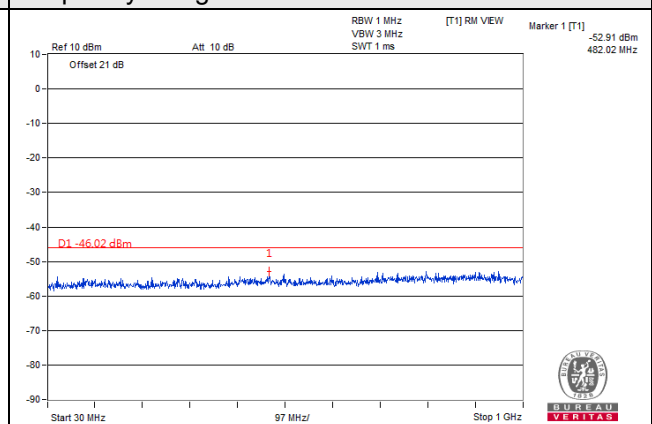
20MHz / QPSK / Chain 3 / Low Channel



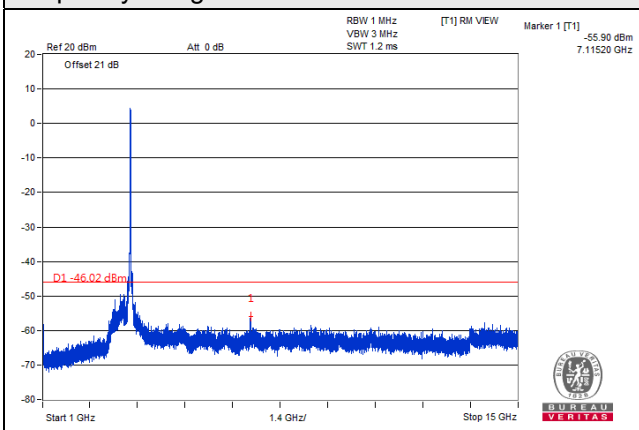
Frequency Range : 9kHz~30MHz



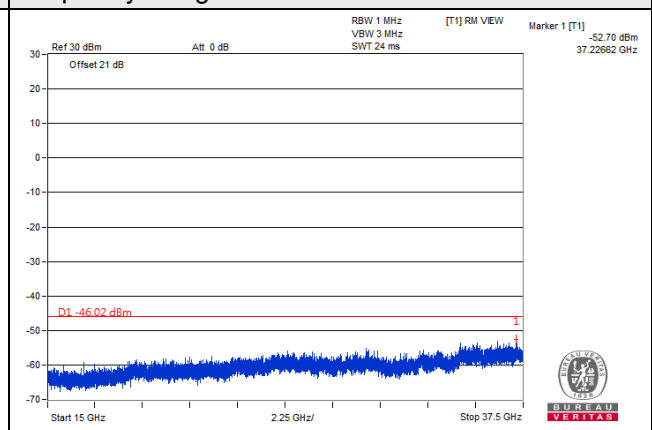
Frequency Range : 30MHz~1GHz



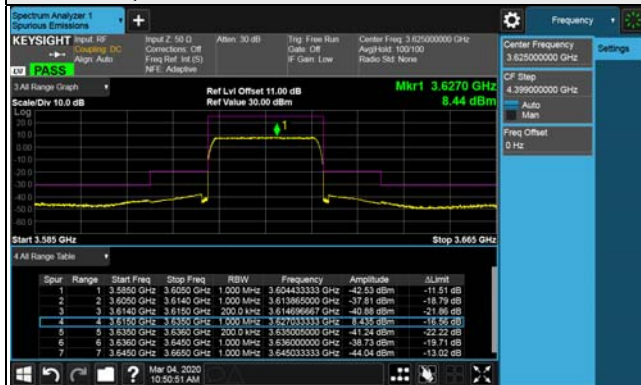
Frequency Range : 1GHz~15GHz



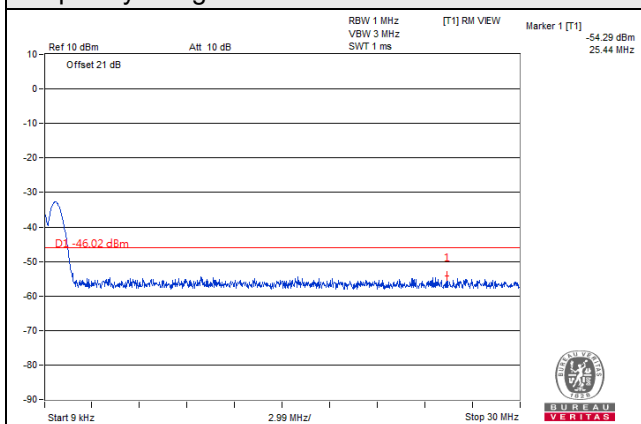
Frequency Range : 15GHz~37.5GHz



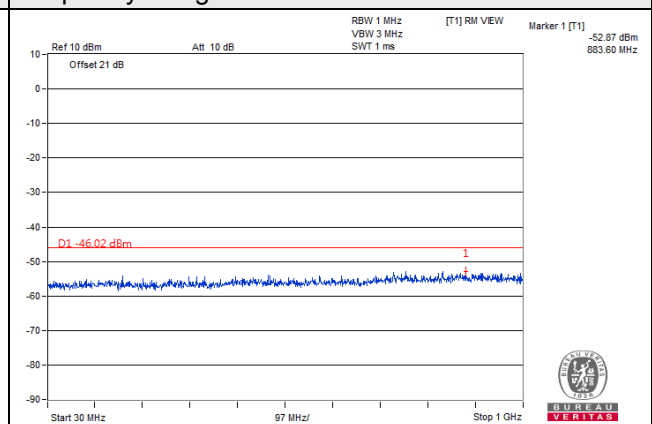
20MHz / QPSK / Chain 3 / Middle Channel



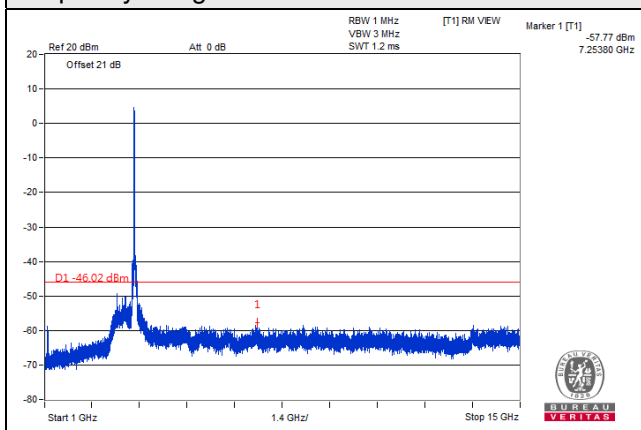
Frequency Range : 9kHz~30MHz



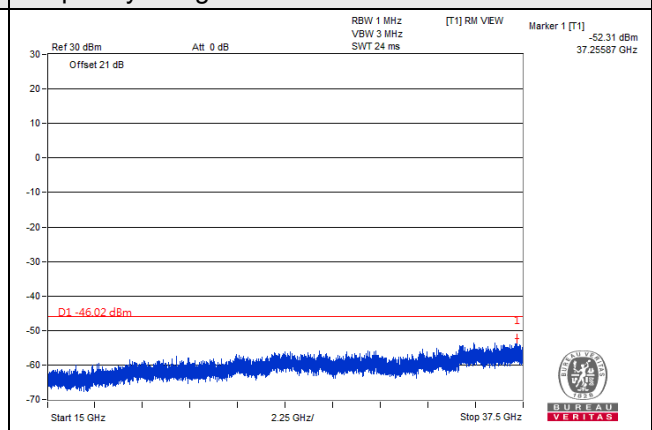
Frequency Range : 30MHz~1GHz



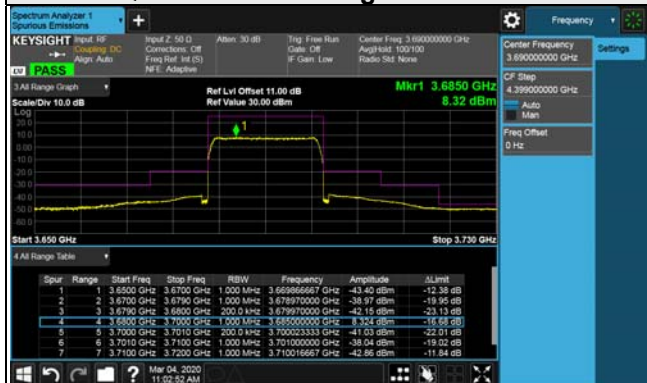
Frequency Range : 1GHz~15GHz



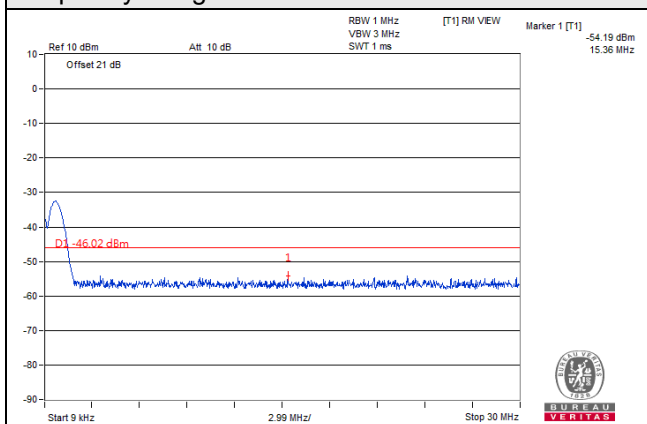
Frequency Range : 15GHz~37.5GHz



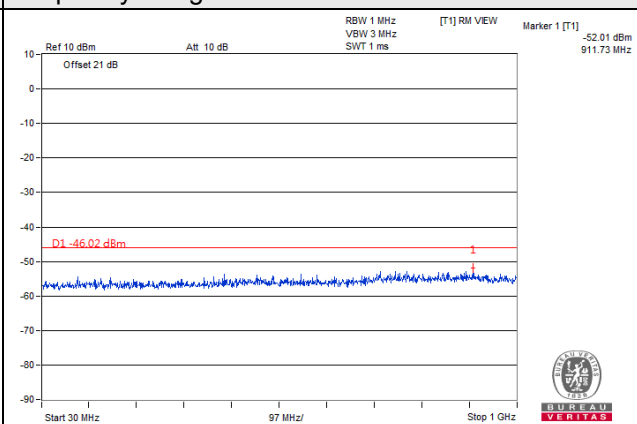
20MHz / QPSK / Chain 3 / High Channel



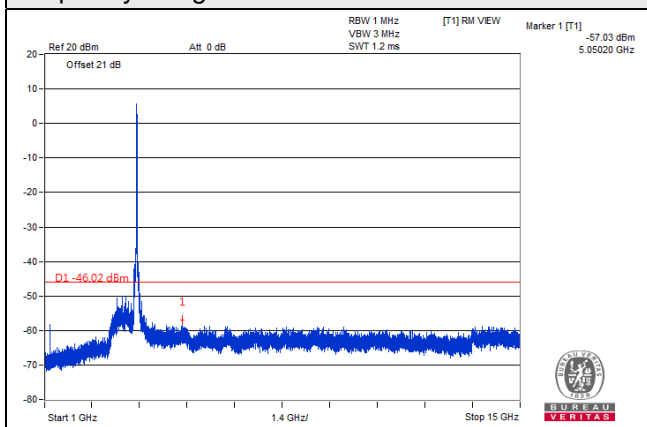
Frequency Range : 9kHz~30MHz



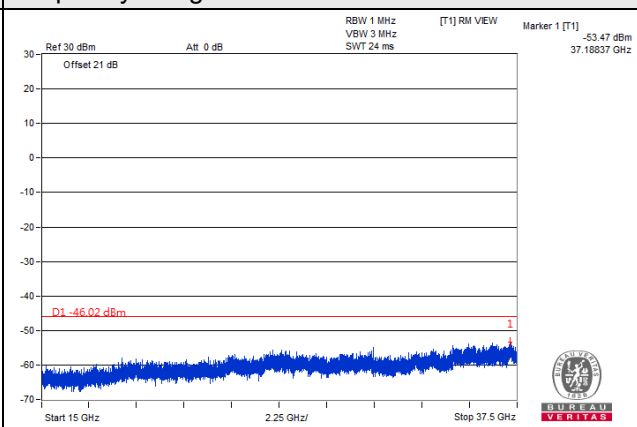
Frequency Range : 30MHz~1GHz



Frequency Range : 1GHz~15GHz

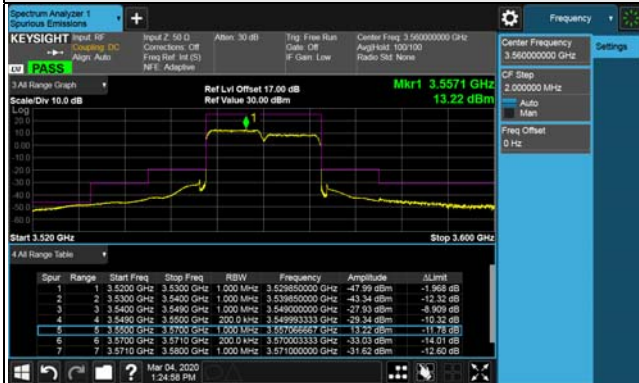


Frequency Range : 15GHz~37.5GHz

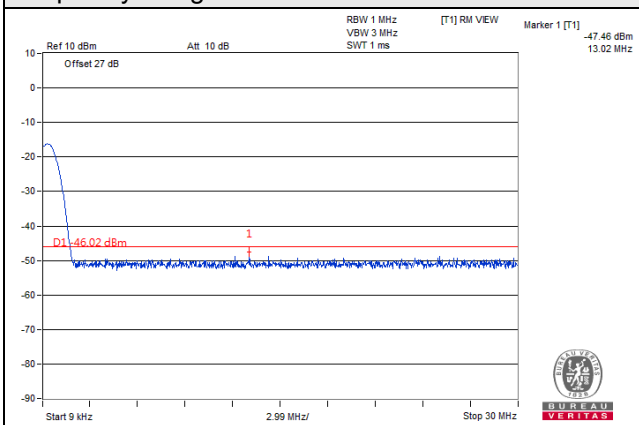


CA MODE

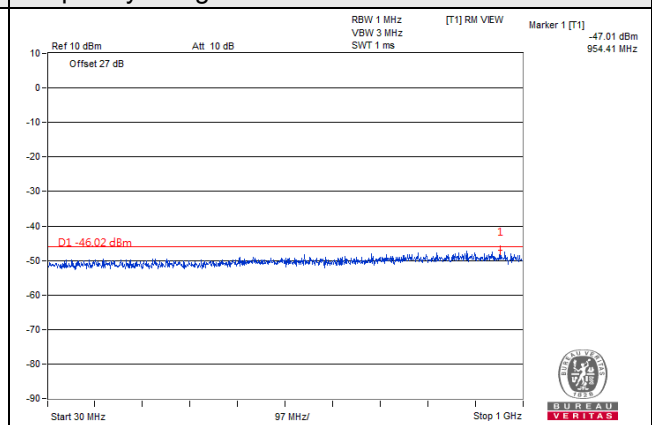
10MHz+10MHz / QPSK / Low Channel



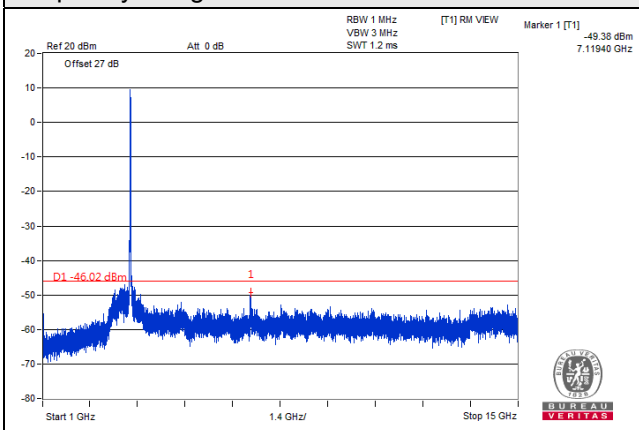
Frequency Range : 9kHz~30MHz



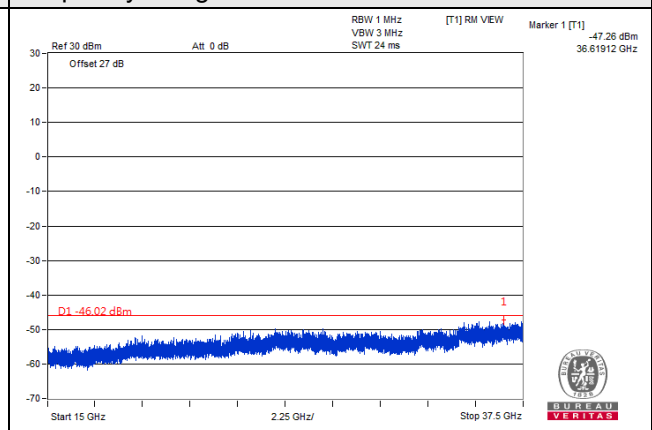
Frequency Range : 30MHz~1GHz



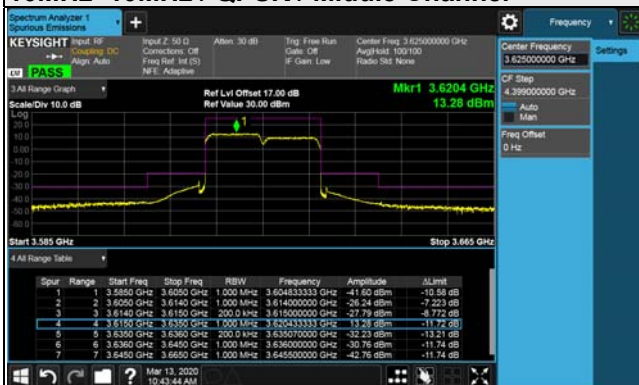
Frequency Range : 1GHz~15GHz



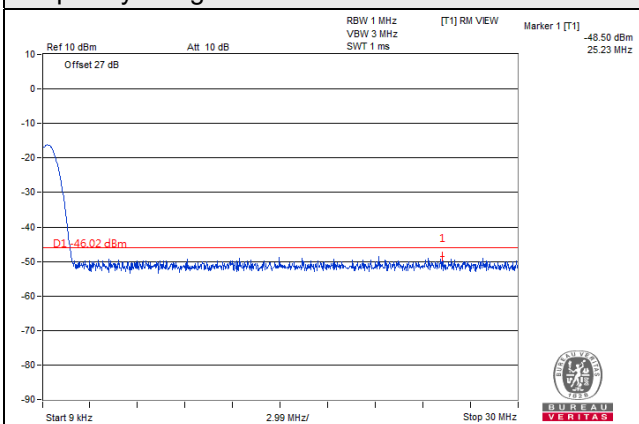
Frequency Range : 15GHz~37.5GHz



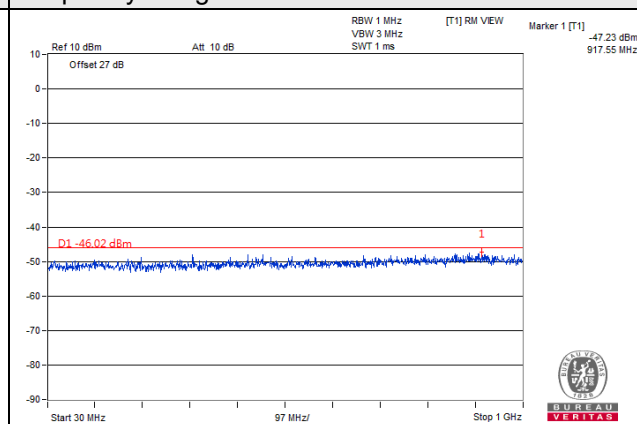
10MHz+10MHz / QPSK / Middle Channel



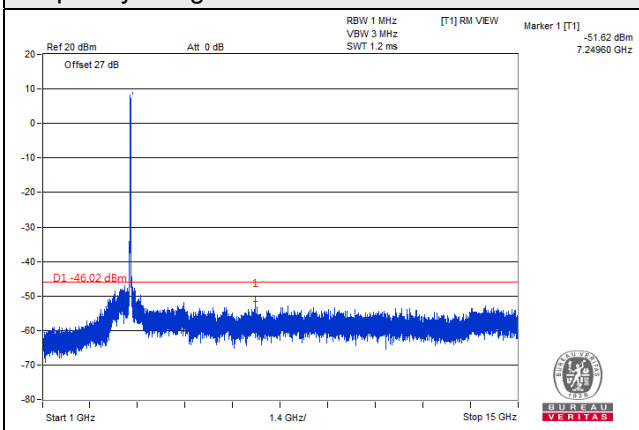
Frequency Range : 9kHz~30MHz



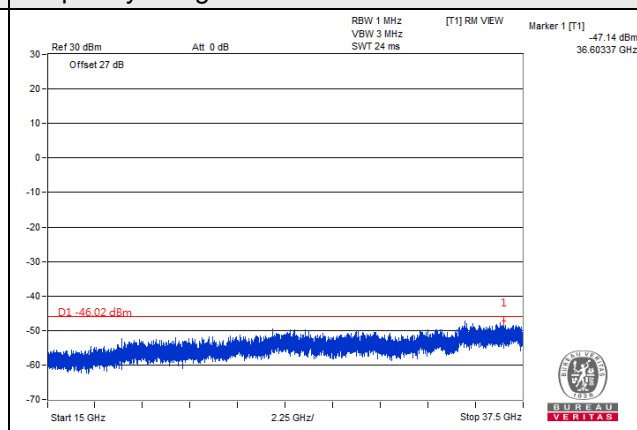
Frequency Range : 30MHz~1GHz



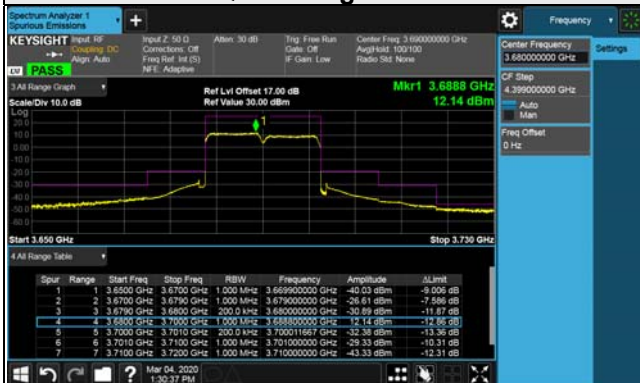
Frequency Range : 1GHz~15GHz



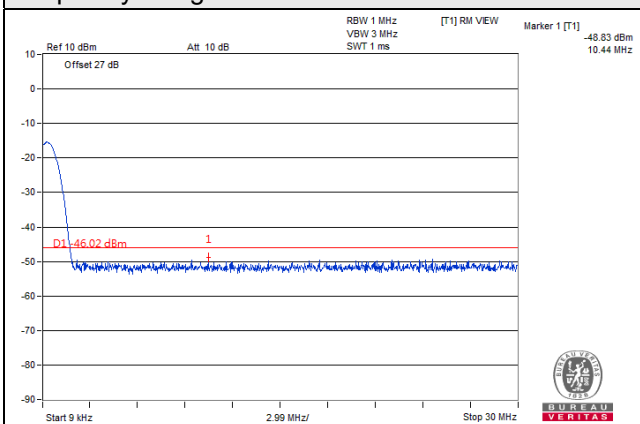
Frequency Range : 15GHz~37.5GHz



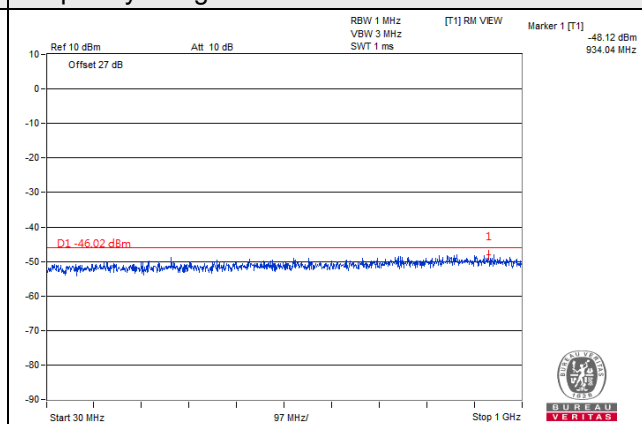
10MHz+10MHz / QPSK / High Channel



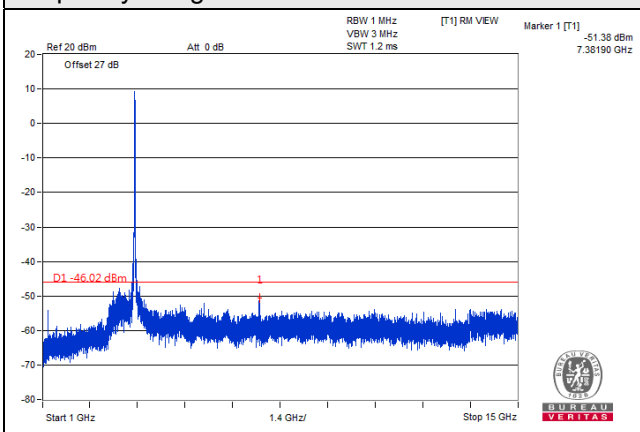
Frequency Range : 9kHz~30MHz



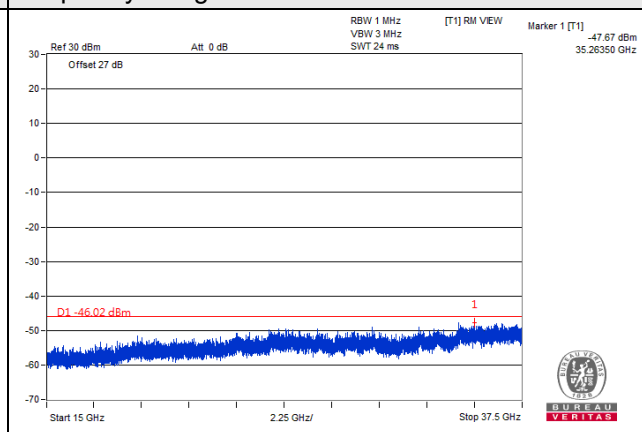
Frequency Range : 30MHz~1GHz



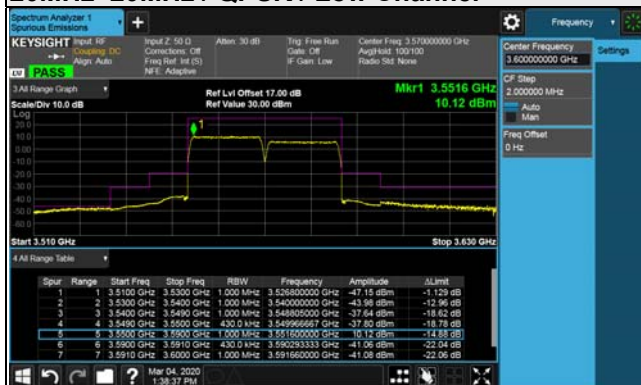
Frequency Range : 1GHz~15GHz



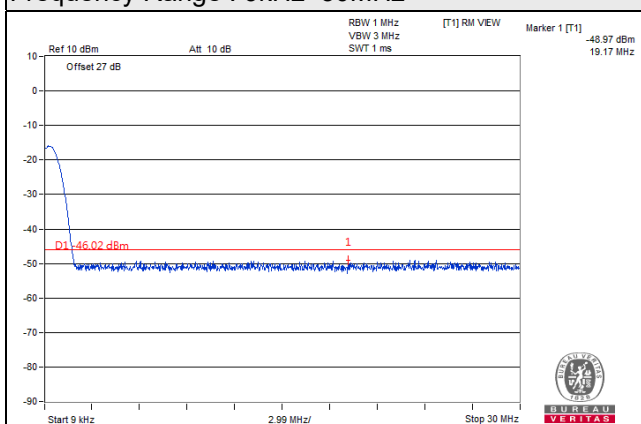
Frequency Range : 15GHz~37.5GHz



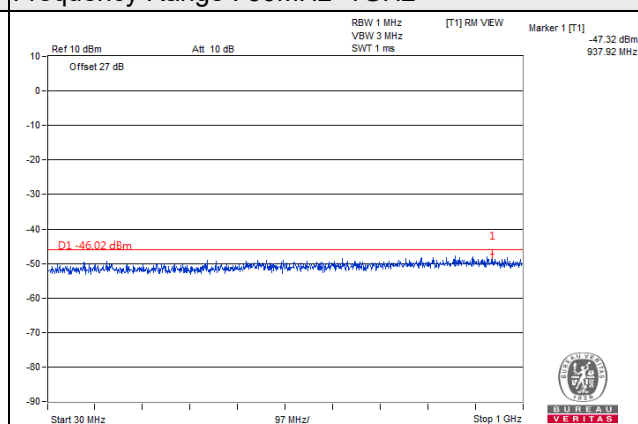
20MHz+20MHz / QPSK / Low Channel



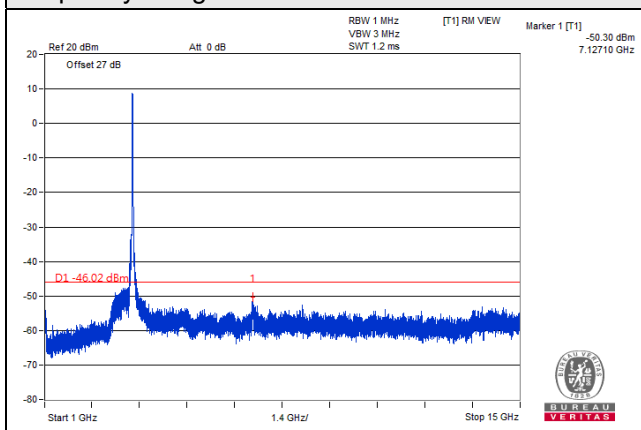
Frequency Range : 9kHz~30MHz



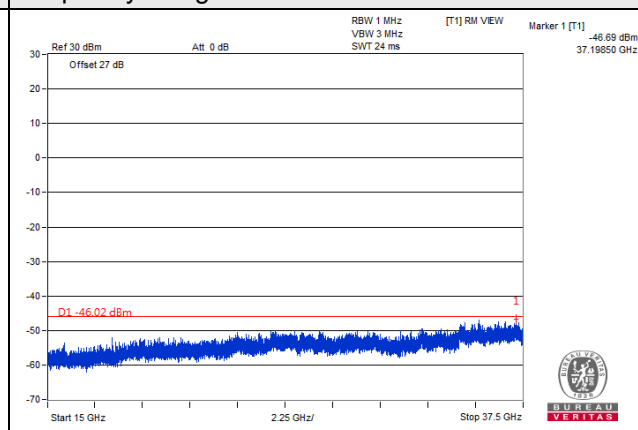
Frequency Range : 30MHz~1GHz



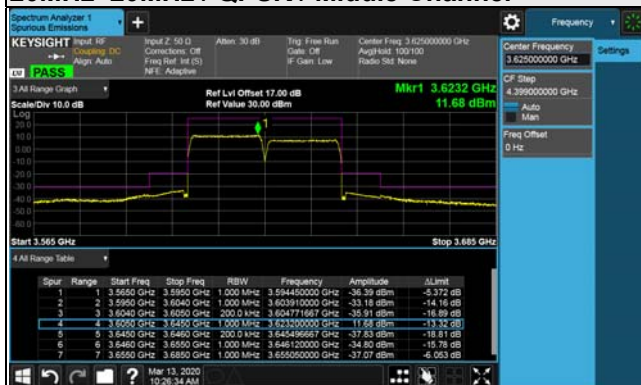
Frequency Range : 1GHz~15GHz



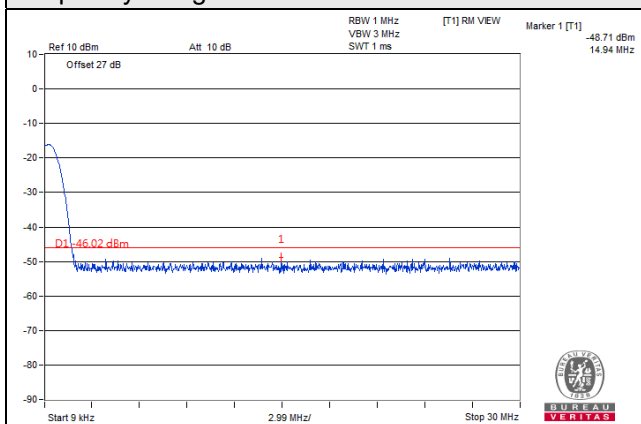
Frequency Range : 15GHz~37.5GHz



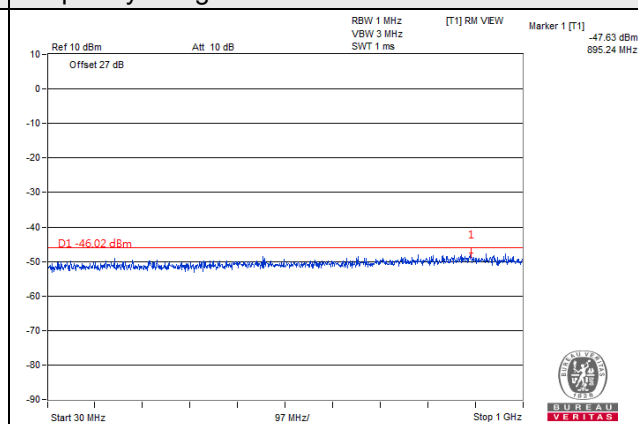
20MHz+20MHz / QPSK / Middle Channel



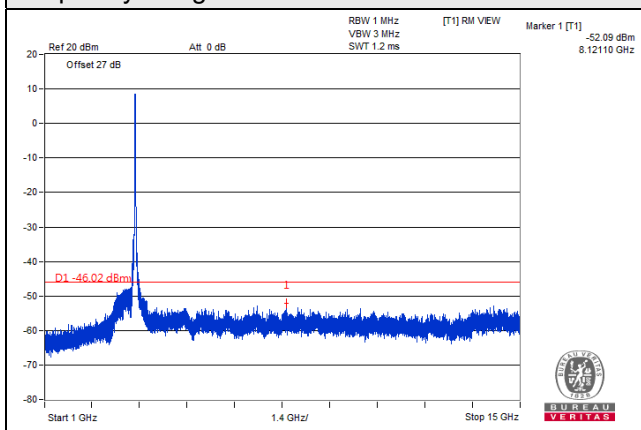
Frequency Range : 9kHz~30MHz



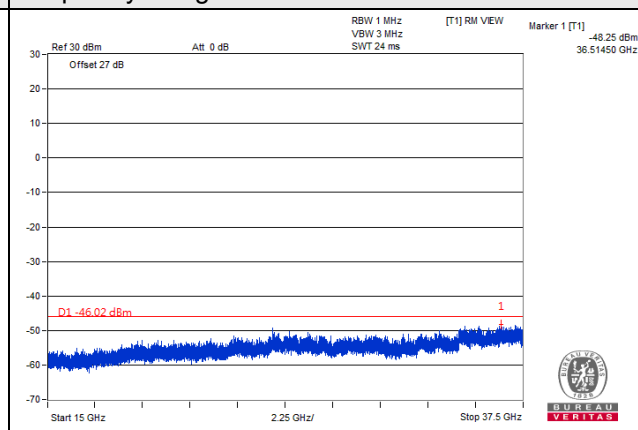
Frequency Range : 30MHz~1GHz



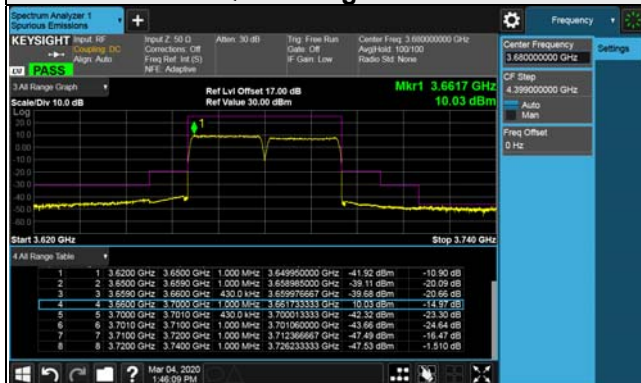
Frequency Range : 1GHz~15GHz



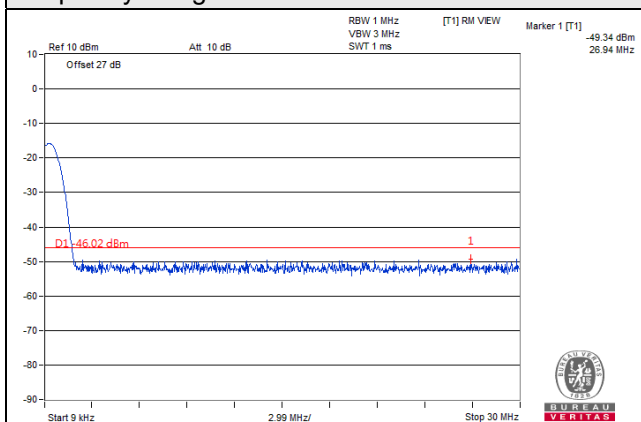
Frequency Range : 15GHz~37.5GHz



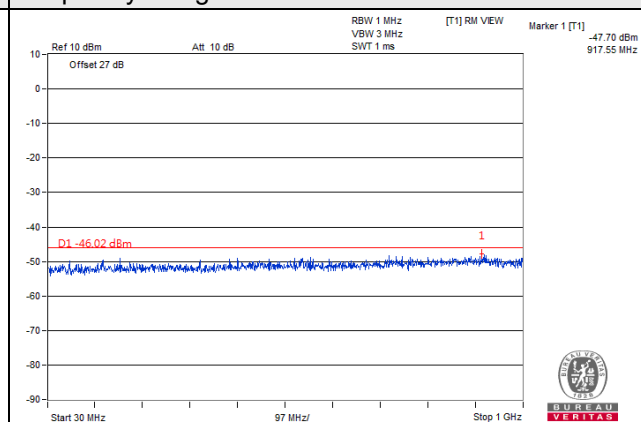
20MHz+20MHz / QPSK / High Channel



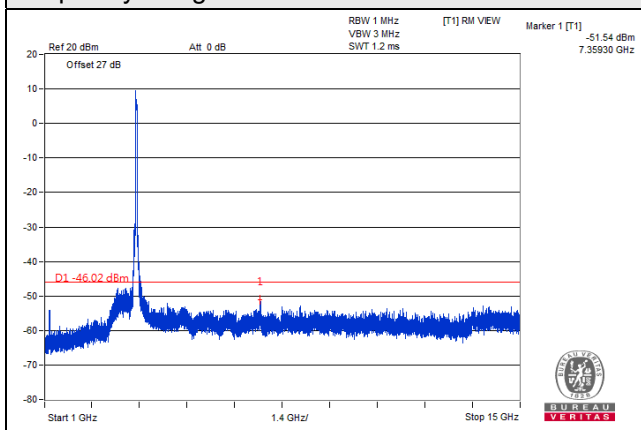
Frequency Range : 9kHz~30MHz



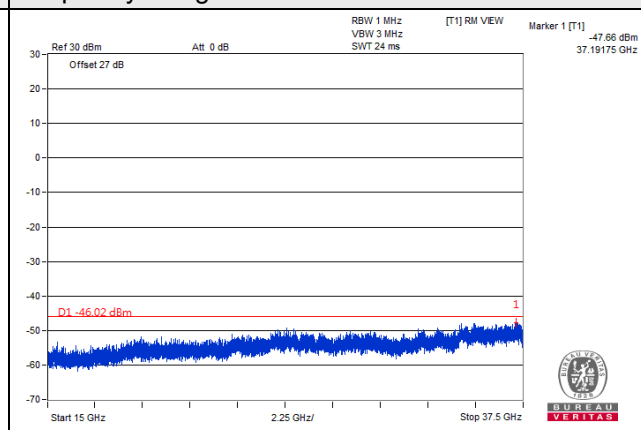
Frequency Range : 30MHz~1GHz



Frequency Range : 1GHz~15GHz



Frequency Range : 15GHz~37.5GHz



4.8 Radiated Emission Measurement

4.8.1 Limits of Radiated Emission Measurement

The power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.

4.8.2 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.8.3 Test Procedures

- a. Substitution method is used for EIRP measurement. In the semi-anechoic chamber, EUT placed on the 0.8m / 1.5m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The substitution antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G.
- c. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$

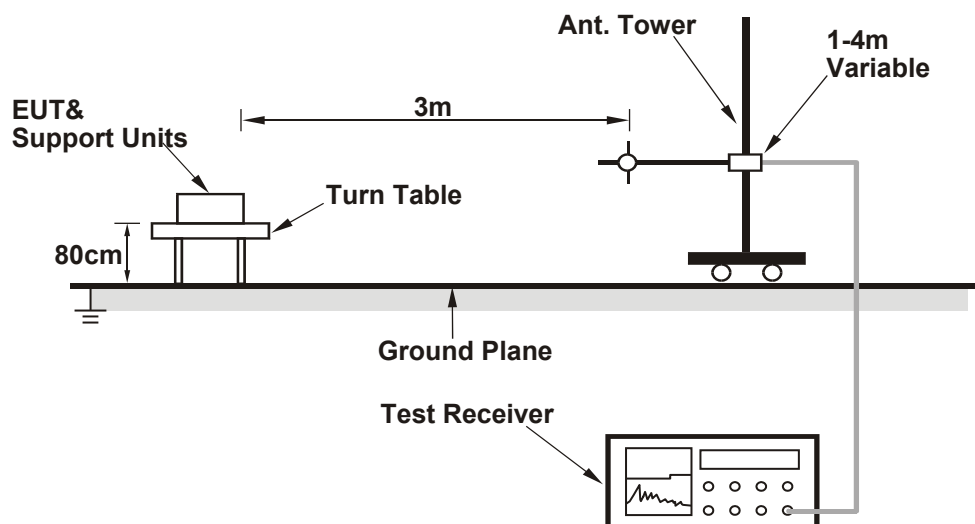
Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.8.4 Deviation from Test Standard

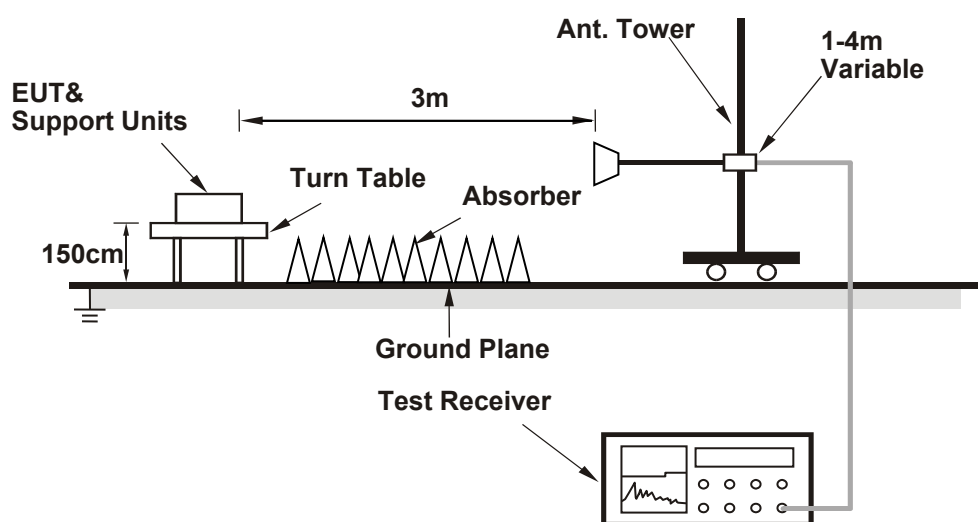
No deviation.

4.8.5 Test Set Up

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.8.6 Test Results

SC MODE

Above 1GHz Data :

10MHz

Channel	TX Low	Frequency Range	Above 1000 MHz
---------	--------	-----------------	----------------

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	7109.84	-53.07	-93.23	49.37	-43.86	-40.00	-3.86
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	7110.05	-54.74	-94.90	49.37	-45.53	-40.00	-5.53

Remarks:

1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Channel	TX Middle	Frequency Range	Above 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	7249.95	-53.59	-93.77	49.42	-44.35	-40.00	-4.35
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	7249.87	-51.95	-92.13	49.42	-42.71	-40.00	-2.71

Remarks:

1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Channel	TX High	Frequency Range	Above 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	7390.24	-57.02	-97.41	49.66	-47.75	-40.00	-7.75
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	7389.91	-53.28	-93.67	49.66	-44.01	-40.00	-4.01

Remarks:

1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

20MHz

Channel	TX Low	Frequency Range	Above 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	7120.01	-53.62	-93.79	49.38	-44.41	-40.00	-4.41
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	7119.84	-57.85	-98.02	49.38	-48.64	-40.00	-8.64

Remarks:

1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Channel	TX Middle	Frequency Range	Above 1000 MHz
---------	-----------	-----------------	----------------

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	7249.82	-57.48	-97.66	49.42	-48.24	-40.00	-8.24
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	7250.05	-55.83	-96.02	49.43	-46.59	-40.00	-6.59

Remarks:

1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Channel	TX High	Frequency Range	Above 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	7379.98	-56.91	-97.30	49.65	-47.65	-40.00	-7.65
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	7380.20	-55.12	-95.51	49.65	-45.86	-40.00	-5.86

Remarks:

1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Below 1GHz Data :

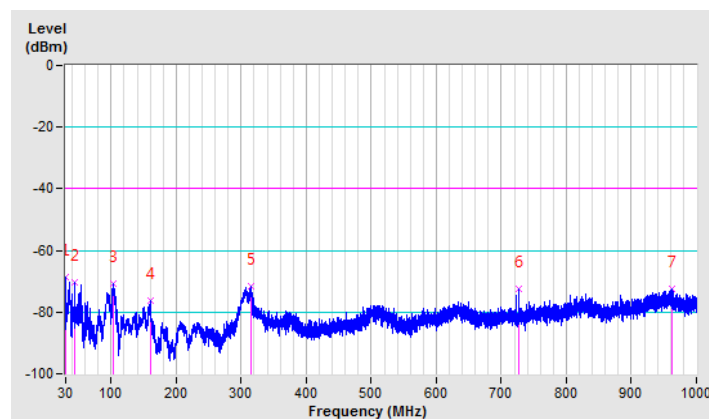
10MHz

Channel	TX Low	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	30.61	-60.21	-81.51	12.98	-68.53	-40.00	-28.53
2	44.67	-68.88	-84.26	14.04	-70.22	-40.00	-30.22
3	103.23	-64.61	-81.73	10.84	-70.89	-40.00	-30.89
4	159.98	-71.76	-91.28	14.97	-76.31	-40.00	-36.31
5	315.54	-70.85	-88.06	16.66	-71.40	-40.00	-31.40
6	727.43	-78.97	-98.22	25.63	-72.59	-40.00	-32.59
7	962.41	-84.46	-101.30	29.03	-72.27	-40.00	-32.27

Remarks:

1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

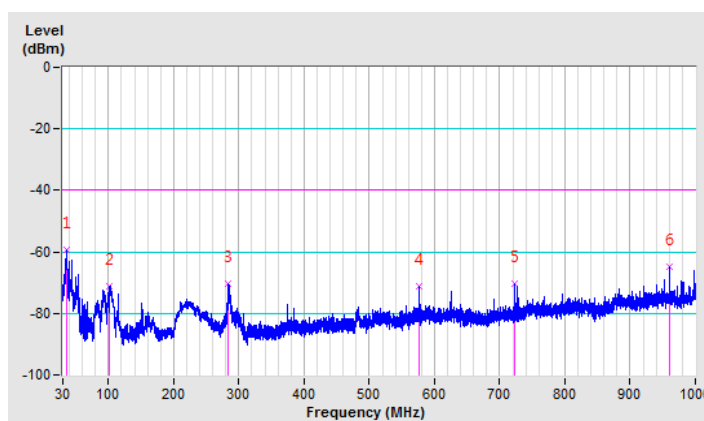


Channel	TX Low	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	35.34	-54.86	-72.42	13.23	-59.19	-40.00	-19.19
2	101.66	-65.42	-81.80	10.56	-71.24	-40.00	-31.24
3	283.78	-67.15	-85.98	15.67	-70.31	-40.00	-30.31
4	575.99	-76.67	-94.32	22.96	-71.36	-40.00	-31.36
5	723.43	-76.93	-95.83	25.49	-70.34	-40.00	-30.34
6	959.99	-77.48	-93.97	28.99	-64.98	-40.00	-24.98

Remarks:

1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



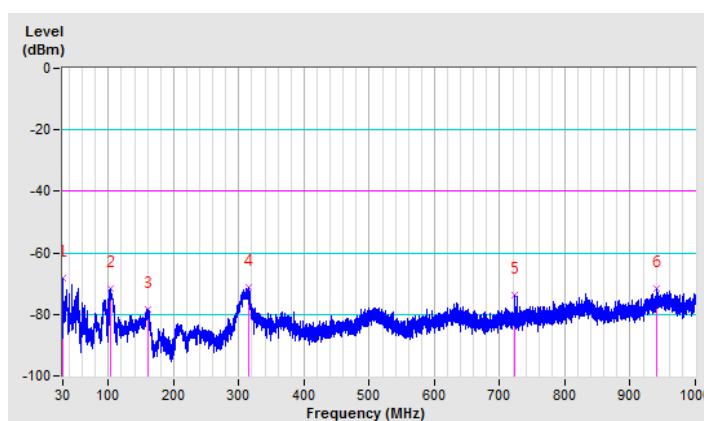
20MHz

Channel	TX Low	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	30.61	-59.93	-81.23	12.98	-68.25	-40.00	-28.25
2	102.63	-65.40	-82.23	10.72	-71.51	-40.00	-31.51
3	160.10	-73.78	-93.31	14.95	-78.36	-40.00	-38.36
4	315.91	-70.67	-87.89	16.66	-71.23	-40.00	-31.23
5	723.43	-79.97	-99.34	25.49	-73.85	-40.00	-33.85
6	939.74	-83.40	-100.26	28.79	-71.47	-40.00	-31.47

Remarks:

1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

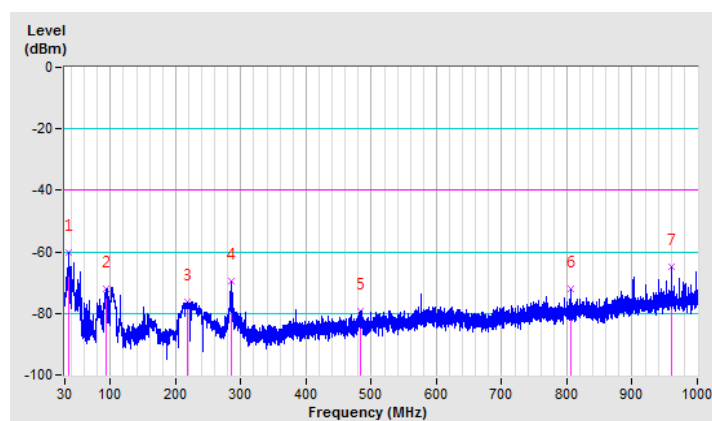


Channel	TX Low	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	35.39	-55.97	-73.46	13.23	-60.23	-40.00	-20.23
2	93.78	-64.51	-81.23	9.37	-71.86	-40.00	-31.86
3	219.03	-67.77	-88.29	12.13	-76.16	-40.00	-36.16
4	284.46	-66.47	-85.24	15.70	-69.54	-40.00	-29.54
5	483.35	-81.09	-100.17	20.88	-79.29	-40.00	-39.29
6	806.36	-80.69	-98.99	26.92	-72.07	-40.00	-32.07
7	960.00	-77.28	-93.77	28.99	-64.78	-40.00	-24.78

Remarks:

1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



CA MODE

Above 1GHz Data :

10MHz+10MHz

Channel	TX Low	Frequency Range	Above 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	7109.86	-54.67	-94.83	49.37	-45.46	-40.00	-5.46
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	7109.98	-56.35	-96.51	49.37	-47.14	-40.00	-7.14

Remarks:

1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

20MHz+20MHz

Channel	TX Low	Frequency Range	Above 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	7119.94	-56.65	-96.82	49.38	-47.44	-40.00	-7.44
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	7119.86	-57.73	-97.90	49.38	-48.52	-40.00	-8.52

Remarks:

1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Below 1GHz Data :

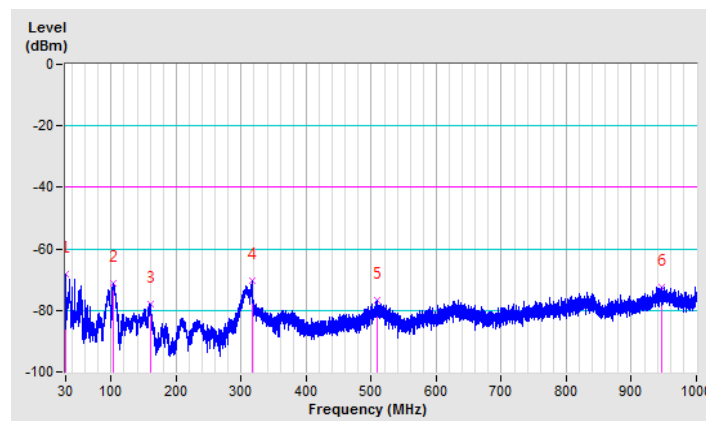
10MHz+10MHz

Channel	TX Low	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	30.61	-59.70	-81.00	12.98	-68.02	-40.00	-28.02
2	102.75	-64.93	-81.83	10.75	-71.08	-40.00	-31.08
3	159.98	-73.22	-92.74	14.97	-77.77	-40.00	-37.77
4	316.39	-69.69	-86.93	16.67	-70.26	-40.00	-30.26
5	508.69	-80.67	-97.98	21.47	-76.51	-40.00	-36.51
6	946.16	-84.81	-101.26	28.92	-72.34	-40.00	-32.34

Remarks:

1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

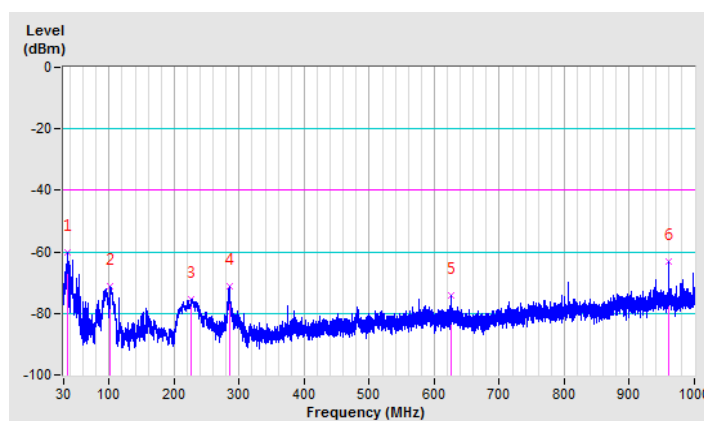


Channel	TX Low	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	35.34	-55.80	-73.36	13.23	-60.13	-40.00	-20.13
2	102.02	-65.23	-81.73	10.60	-71.13	-40.00	-31.13
3	225.94	-67.87	-87.37	12.04	-75.33	-40.00	-35.33
4	284.50	-68.04	-86.81	15.70	-71.11	-40.00	-31.11
5	624.97	-80.40	-98.43	24.23	-74.20	-40.00	-34.20
6	959.99	-75.63	-92.12	28.99	-63.13	-40.00	-23.13

Remarks:

1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



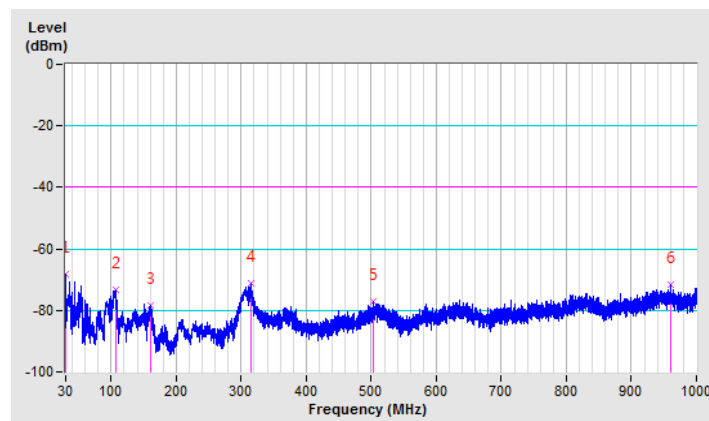
20MHz+20MHz

Channel	TX Low	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	30.61	-59.70	-81.00	12.98	-68.02	-40.00	-28.02
2	106.27	-66.86	-84.73	11.29	-73.44	-40.00	-33.44
3	160.34	-73.72	-93.29	14.90	-78.39	-40.00	-38.39
4	315.79	-70.52	-87.73	16.66	-71.07	-40.00	-31.07
5	502.39	-81.05	-98.24	21.27	-76.97	-40.00	-36.97
6	959.99	-84.29	-100.75	28.99	-71.76	-40.00	-31.76

Remarks:

1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

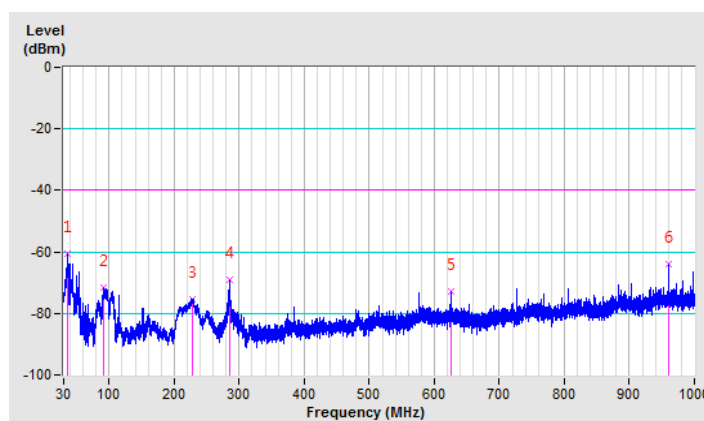


Channel	TX Low	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	35.34	-56.47	-74.03	13.23	-60.80	-40.00	-20.80
2	92.08	-63.80	-80.89	9.24	-71.65	-40.00	-31.65
3	227.27	-67.82	-87.45	12.17	-75.28	-40.00	-35.28
4	284.62	-66.01	-84.77	15.71	-69.06	-40.00	-29.06
5	624.97	-79.04	-97.07	24.23	-72.84	-40.00	-32.84
6	959.99	-76.58	-93.07	28.99	-64.08	-40.00	-24.08

Remarks:

1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



4.9 Transmit Power Control (TPC)

4.9.1 Definition

CBSDs must support transmit power control capability and the capability to limit their maximum EIRP and the maximum EIRP of associated End User Devices in response to instructions from an SAS.

4.9.2 Requirement

The EUT can adjust a transmitter's output power based on the signal level present at the receiver.
TPC is auto controlled by software.

Manufacturer provides declaration form to meet this requirement.

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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