TESTING LABORATORY
CERTIFICATE #4820.01

FCC PART 15.407

TEST REPORT

For

OSEE TECHNOLOGY CO.,LTD.

No.13 Central Building,No.68 Zone,Beiqing Road,Haidian District,Beijing, China

FCC ID: PGFWVT-501-S

Report Type:	**Product Name:**
Original Report	Wireless Video Transmitter and Receiver

Report Number:	RBJ180329050-00
Report Date:	2018-05-09
Reviewed By:	Jerry Zhang EMC Manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:		Wireless Video Transmitter and Receiver
EUT Model:		WVT-501
FCC ID:		PGFWVT-501-S
Rated Input Voltage:		DC 12V from adapter
Adapter Information	**Model:**	TEKA018-1201500XX
	Input:	AC 100-240V~50/60Hz ,0.5A MAX
	Output:	DC 12V, 1.5A
External Dimension:		Length (168mm)*Width (107.1mm)*High (27mm)
Serial Number:		180329050
EUT Received Date:		2017. 11.23

Objective

This type approval report is prepared on behalf of ***OSEE TECHNOLOGY CO.,LTD.*** in accordance with Part 2-Subpart J, Part 15-Subparts A, and E of the Federal Communications Commission's rules.

The tests were performed in order to determine compliance with FCC Rules Part 15, Subpart E, section 15.203, 15.205, 15.207, 15.209 and 15.407 rules.

Related Submittal(s)/Grant(s)

Part of system submissions with FCC ID: PGFWVT-501.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices. And KDB 789033 D02 General U-NII Test Procedures New Rules v02r01.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61dB
Power Spectral Density, conducted	±0.61 dB
Unwanted Emissions, radiated	30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical 1G~6GHz: 4.45 dB, 6G~40GHz: 5.23 dB
Unwanted Emissions,conducted	±1.5 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Test Facility

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

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218,the FCC Designation No. : CN1220.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062D.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The EUT was configured for testing in an engineering mode which was provided by the manufacturer. It has four antennas.

The device is a client device, the EUT system only employs 4 TX transmission, and supports 40MHz bandwidth in 5150-5250MHz and 5725-5850MHz, the channels listed in the below table:

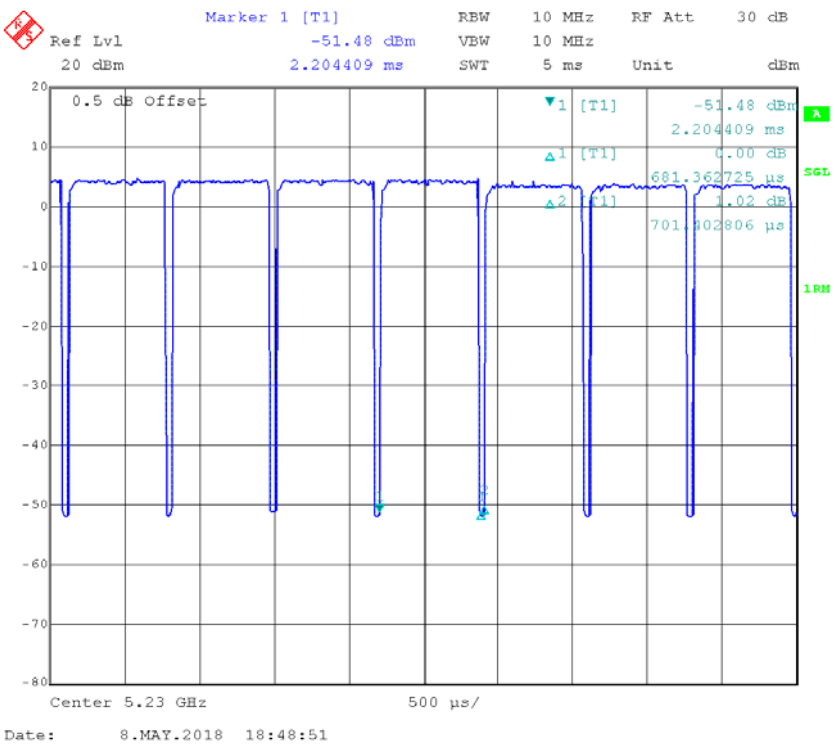
Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	5190	2	5230
3	5755	4	5795

EUT Exercise Software

No software was used in the test. The engineering mode configures the device transmitting with maximum power and maximum duty cycle. The test channels were changed by keys.

The duty cycle as below:

T_{on} (ms)	T_{on+off} (ms)	Duty Cycle (%)	Duty cycle Factor (10*log(1/x)) (dB)
0.681	0.701	97.15	0.13



Equipment Modifications

No modification was made to the EUT.

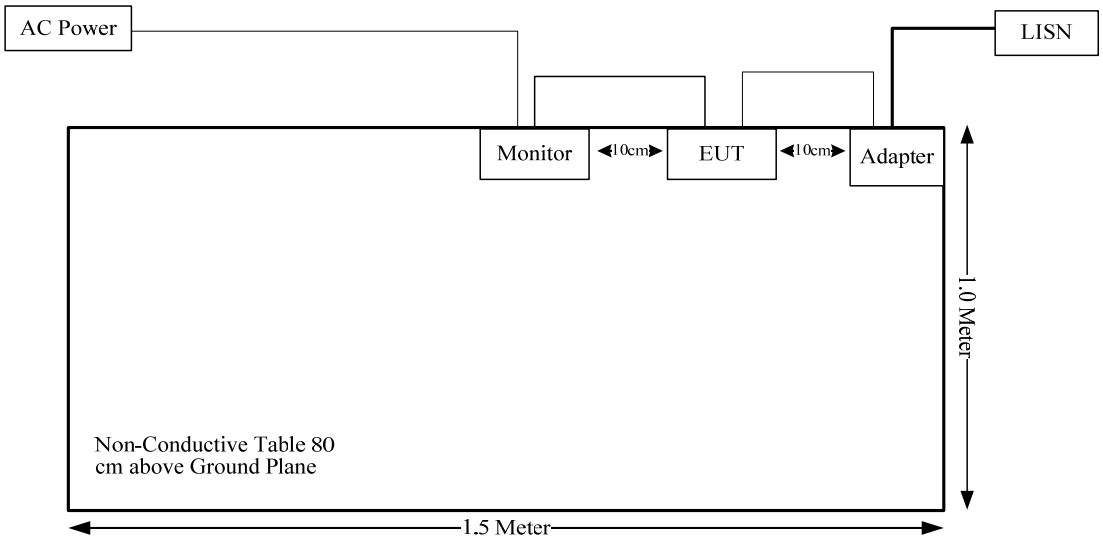
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Monitor	U3011t	CN-OPH5NY-74445-17M-114L

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
HDMI	Yes	Yes	1.5	EUT	Monitor

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.407 (f) & §1.1310 & §2.1091	Maximum Permissable Exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.407(b)(6)& §15.207(a)	Conducted Emissions	Compliance
§15.205& §15.209 &§15.407(b)	Undesirable Emission& Restricted Bands	Compliance
§15.407(b)	Out Of Band Emissions	Compliance
§15.407(a) (e)	Emission Bandwidth	Compliance
§15.407(a)	Conducted Transmitter Output Power	Compliance
§15.407 (a)	Power Spectral Density	Compliance

FCC §15.407 (f) & §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.407(f)and subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f^2)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculation formula:

Prediction of power density at the distance of the applicable MPE limit
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Calculated Data:

Frequency Band (MHz)	**Antenna Gain**		**Output Power including Turn-Up tolerance**		**Evaluation Distance (cm)**	**Power Density (mW/cm^2)**	**MPE Limit (mW/cm^2)**
	(dBi)	**(numeric)**	**(dBm)**	**(mW)**			
5150-5250	4.5	2.82	14	25.12	20.00	0.01	1.00
5725-5850	4.5	2.82	13	19.95	20.00	0.01	1.00

Result: The device meet FCC MPE at 20 cm distance

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
And according to FCC 47 CFR section 15.407 (a)(1),if transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT have 4 external Dipole antennas with RP-SMA connector, all of the antennas gain is 4.5dBi. Please refer to the EUT photo.

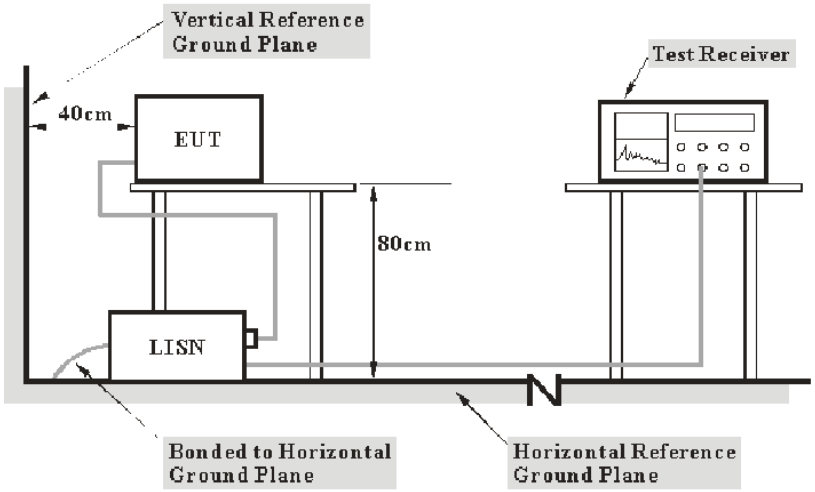
Result: Compliance.

FCC §15.407 (b) (6) §15.207 (a) – CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a), §15.407(b) (6).

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to the main lisn with a 120 V/60 Hz AC power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$
$C_f = A_C + VDF$

Herein,
V_C (cord. Reading): corrected voltage amplitude
V_R: reading voltage amplitude
A_c: attenuation caused by cable loss
VDF: voltage division factor of AMN
C_f: Correction Factor

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2017-12-08	2018-12-08
R&S	L.I.S.N	ESH2-Z5	892107/021	2017-09-25	2018-09-25
R&S	Two-line V-network	ENV 216	101614	2017-12-08	2018-12-08
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A
N/A	Coaxial Cable	C-NJNJ-50	C-0200-01	2017-09-05	2018-09-05

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

Test Procedure

During the conducted emission test, the adapter was connected to the first LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Test Data

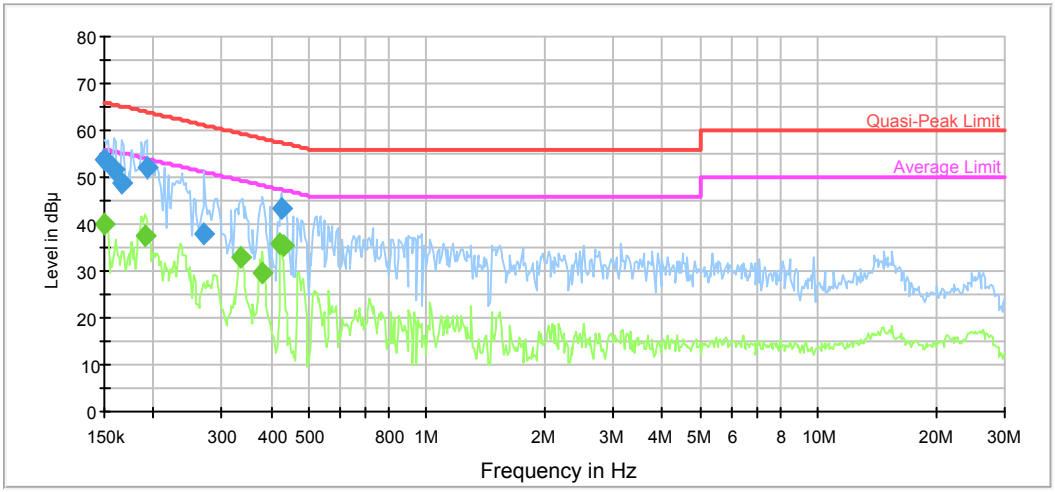
Environmental Conditions

Temperature:	25.1°C
Relative Humidity:	39 %
ATM Pressure:	101.3 kPa

The testing was performed by Jim Zhang on 2018-01-19.

Test Mode: Transmitting

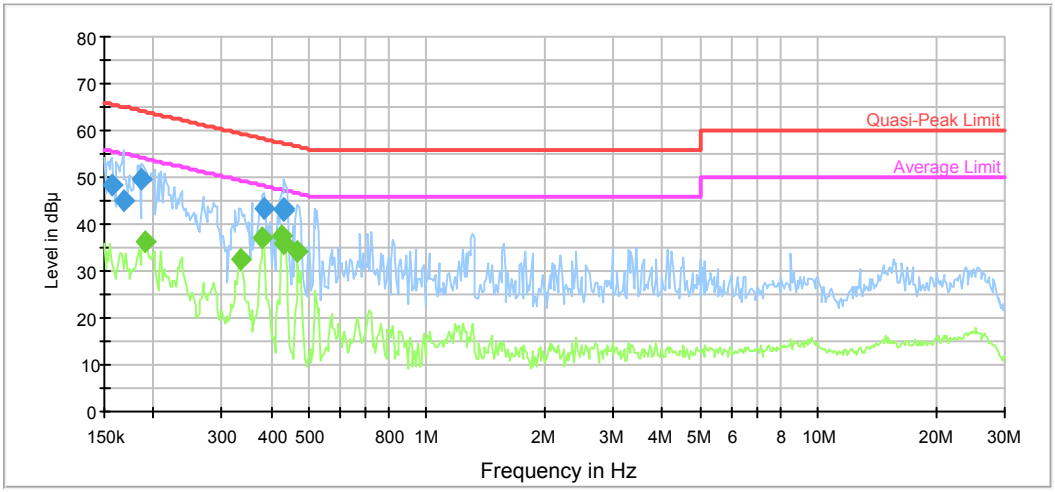
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	53.9	9.000	L1	11.2	12.1	66.0	Compliance
0.158604	51.7	9.000	L1	11.1	13.8	65.5	Compliance
0.166371	48.7	9.000	L1	11.0	16.4	65.1	Compliance
0.192030	52.1	9.000	L1	10.7	11.8	63.9	Compliance
0.270502	37.8	9.000	L1	10.3	23.3	61.1	Compliance
0.426011	43.3	9.000	L1	9.9	14.0	57.3	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	40.0	9.000	L1	11.2	16.0	56.0	Compliance
0.190505	37.5	9.000	L1	10.7	16.5	54.0	Compliance
0.335433	33.0	9.000	L1	10.1	16.3	49.3	Compliance
0.381043	29.5	9.000	L1	10.0	18.8	48.3	Compliance
0.422630	35.7	9.000	L1	10.0	11.7	47.4	Compliance
0.432855	35.5	9.000	L1	9.9	11.7	47.2	Compliance

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.157346	48.3	9.000	N	11.1	17.3	65.6	Compliance
0.167702	45.1	9.000	N	10.9	20.0	65.1	Compliance
0.187494	49.5	9.000	N	10.7	14.6	64.1	Compliance
0.384091	43.2	9.000	N	10.0	15.0	58.2	Compliance
0.429420	43.4	9.000	N	9.9	13.9	57.3	Compliance
0.432855	43.1	9.000	N	9.9	14.1	57.2	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.190505	36.2	9.000	N	10.7	17.8	54.0	Compliance
0.335433	32.5	9.000	N	10.1	16.8	49.3	Compliance
0.381043	37.2	9.000	N	10.0	11.1	48.3	Compliance
0.426011	37.3	9.000	N	9.9	10.0	47.3	Compliance
0.432855	35.7	9.000	N	9.9	11.5	47.2	Compliance
0.468757	34.2	9.000	N	9.9	12.3	46.5	Compliance

FCC §15.209, §15.205 & §15.407(b) –UNWANTED EMISSION

Applicable Standard

FCC §15.407; §15.209; §15.205;

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band:

(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

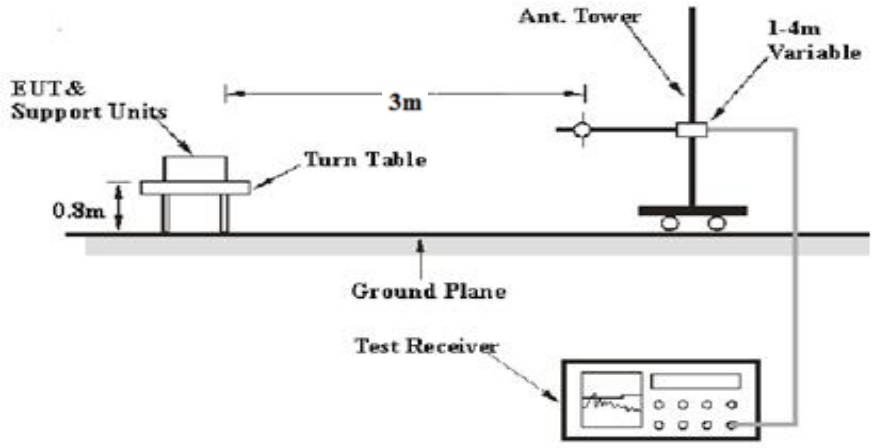
(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

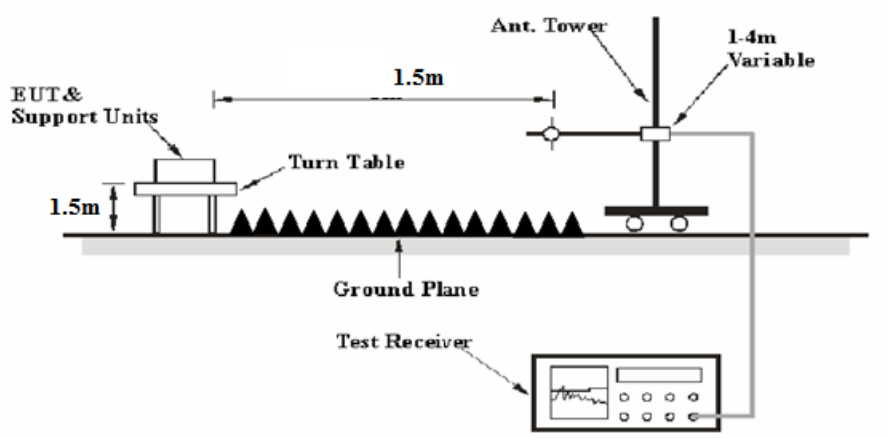
(7) The provisions of §15.205 apply to intentional radiators operating under this section.

EUT Setup

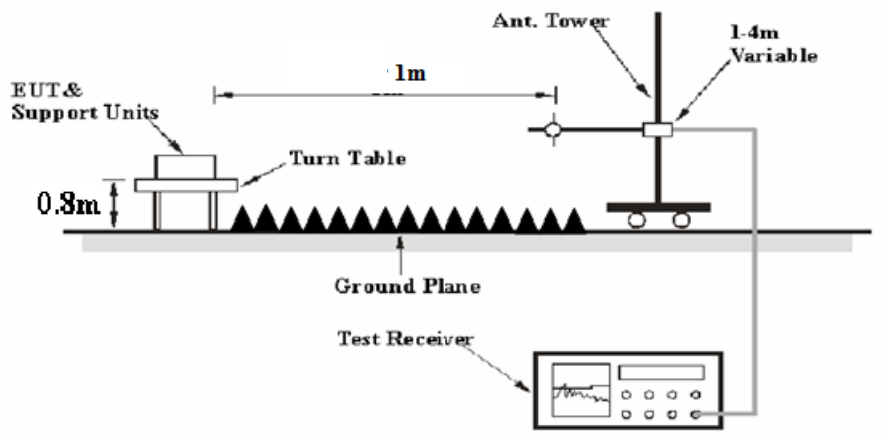
Below 1 GHz:



1-26.5 GHz:



26.5-40 GHz:



The radiated emission Below 1GHz tests were performed in the 3 meters chamber test site A, above 1GHz tests were performed in the 3 meters chamber test site B, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.407 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

30-1000MHz:

Measurement	RBW	Video B/W	IF B/W
QP	120 kHz	300 kHz	120kHz

1GHz- 40GHz:

Measurement	Duty cycle	RBW	Video B/W
PK	Any	1MHz	3 MHz
Ave.	>98%	1MHz	10 Hz
	<98%	1MHz	1/T

Test Procedure

During the radiated emission test, the adapter was connected to the first AC floor outlet.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz, peak and Average detection modes for frequencies above 1GHz.

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, emission shall be computed as: E [dBμV/m] = EIRP[dBm] + 95.2, for d = 3 meters.

According to C63.10, the above 1G test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 1.5m or 1m
Distance extrapolation factor =20 log (specific distance [3m]/test distance [1.5m]) dB= 6.02 dB
or
Distance extrapolation factor =20 log (specific distance [3m]/test distance [1m]) dB= 9.54 dB

All emissions under the average limit and under the noise floor have not recorded in the report.

Corrected Amplitude & Margin Calculation

For the range 30MHz-1GHz, the Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit - Corrected Amplitude

For the range 1GHz-40GHz, Test performed at 1.5m, the Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading and the Distance extrapolation factor. The basic equation is as follows:

Extrapolation result
= Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain-Distance extrapolation factor

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit-Extrapolation result

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100035	2017-08-04	2018-08-04
Sunol Sciences	Antenna	JB3	A060611-3	2017-07-21	2019-07-21
HP	Amplifier	8447F	2443A01912	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-NJNJ-50	C-0400-02	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-NJNJ-50	C-0075-02	2017-09-05	2018-09-05
Agilent	Spectrum Analyzer	E4440A	SG43360054	2017-12-08	2018-12-08
ETS-Lindgren	Horn Antenna	3115	000 527 35	2016-01-05	2019-01-05
MITEQ	Amplifier	AFS42-00101800-25-S-42	2001271	2017-09-05	2018-09-05
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-02 1304	2016-11-18	2019-11-18
Ducommun Technolagies	Horn Antenna	ARH-2823-02	1007726-01 1302	2016-11-18	2019-11-18
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2017-06-27	2018-06-27
N/A	Coaxial Cable	C-SJSJ-50	C-0800-01	2017-09-05	2018-09-05
Chengdu OuLi	Bandrejector Filter	5725-5850	005	2017-09-05	2018-09-05
Chengdu OuLi	Bandrejector Filter	5150-5350	009	2017-09-05	2018-09-05
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A

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

Test Data

Environmental Conditions

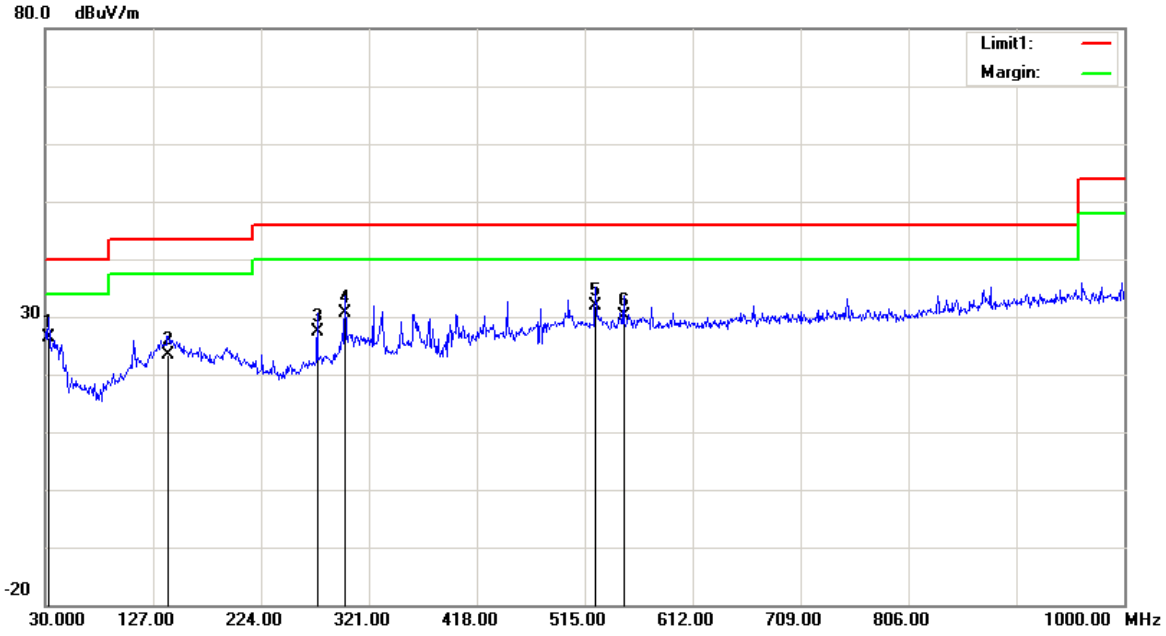
Temperature:	24.2 °C
Relative Humidity:	52 %
ATM Pressure:	100.6 kPa

** The testing was performed by Steve Zuo and Vern Shen on 2018-04-27.*

Test Mode: Transmitting

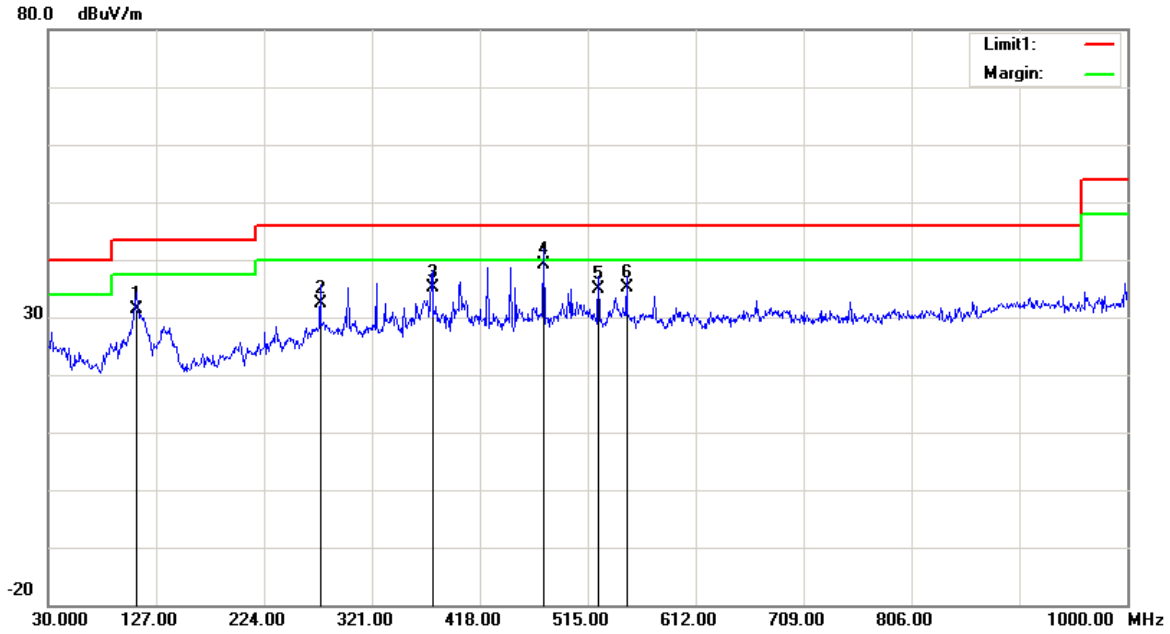
1) Below 1GHz(5190 MHz was the worst):

Horizontal



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
32.9100	29.55	QP	-3.25	26.30	40.00	13.70
140.5800	29.94	QP	-6.54	23.40	43.50	20.10
274.4400	33.04	QP	-5.74	27.30	46.00	18.70
299.6600	35.22	QP	-4.62	30.60	46.00	15.40
524.7000	30.95	QP	1.05	32.00	46.00	14.00
549.9200	28.42	QP	1.68	30.10	46.00	15.90

Vertical



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
109.5400	42.12	QP	-10.82	31.30	43.50	12.20
274.4400	38.24	QP	-5.74	32.50	46.00	13.50
375.3200	37.93	QP	-2.73	35.20	46.00	10.80
475.2300	39.52	QP	-0.42	39.10	46.00	6.90
524.7000	33.95	QP	1.05	35.00	46.00	11.00
549.9200	33.52	QP	1.68	35.20	46.00	10.80

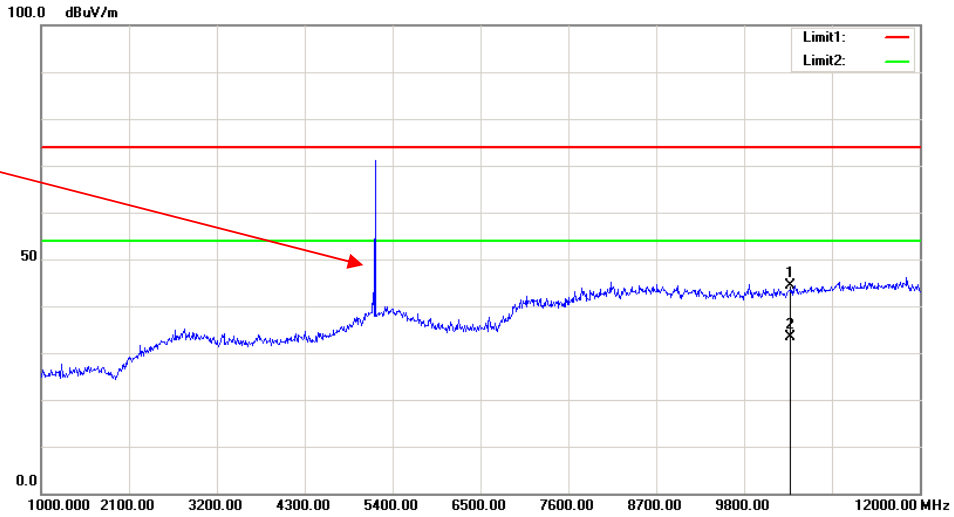
2) 1GHz-40GHz:

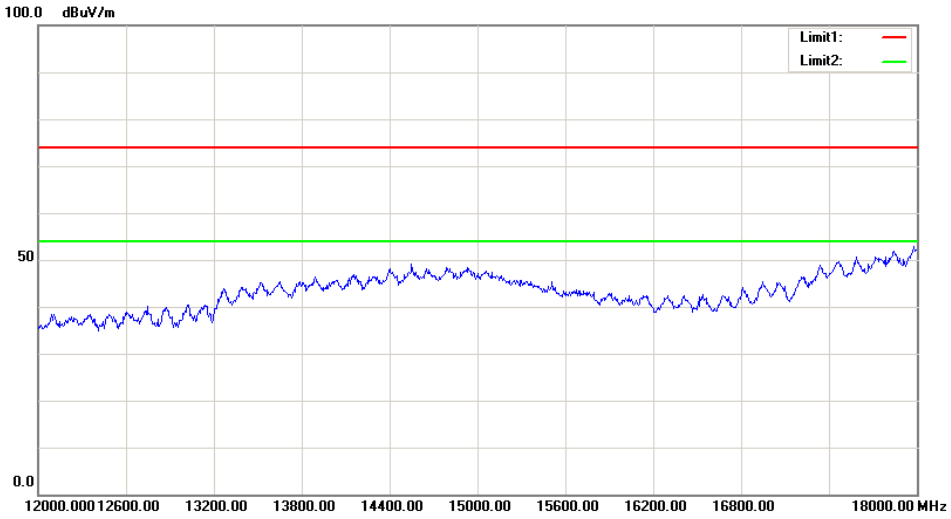
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB/m)						
Low Channel: 5190 MHz										
5190.00	69.23	PK	H	33.60	3.59	0.00	106.42	100.4	N/A	N/A
5190.00	51.48	AV	H	33.60	3.59	0.00	88.67	82.65	N/A	N/A
5190.00	81.23	PK	V	33.60	3.59	0.00	118.42	112.4	N/A	N/A
5190.00	63.41	AV	V	33.60	3.59	0.00	100.60	94.58	N/A	N/A
5150.00	37.19	PK	V	33.54	3.56	0.00	74.29	68.27	74.00	5.73
5150.00	19.14	AV	V	33.54	3.56	0.00	56.24	50.22	54.00	3.78
10380.00	52.56	PK	V	38.18	6.31	36.85	60.20	54.18	74.00	19.82
10380.00	39.46	AV	V	38.18	6.31	36.85	47.10	41.08	54.00	12.92
15570.00	46.75	PK	V	38.03	8.84	39.06	54.56	48.54	74.00	25.46
15570.00	35.48	AV	V	38.03	8.84	39.06	43.29	37.27	54.00	16.73
High Channel: 5230 MHz										
5230.00	70.46	PK	H	33.67	3.54	0.00	107.67	101.65	N/A	N/A
5230.00	52.39	AV	H	33.67	3.54	0.00	89.60	83.58	N/A	N/A
5230.00	82.04	PK	V	33.67	3.54	0.00	119.25	113.23	N/A	N/A
5230.00	64.15	AV	V	33.67	3.54	0.00	101.36	95.34	N/A	N/A
5350.00	26.43	PK	V	33.86	3.52	0.00	63.81	57.79	74.00	16.21
5350.00	13.28	AV	V	33.86	3.52	0.00	50.66	44.64	54.00	9.36
10460.00	51.62	PK	V	38.19	6.36	36.87	59.30	53.28	74.00	20.72
10460.00	38.49	AV	V	38.19	6.36	36.87	46.17	40.15	54.00	13.85
15690.00	46.57	PK	V	37.91	8.80	39.15	54.13	48.11	74.00	25.89
15690.00	35.23	AV	V	37.91	8.80	39.15	42.79	36.77	54.00	17.23

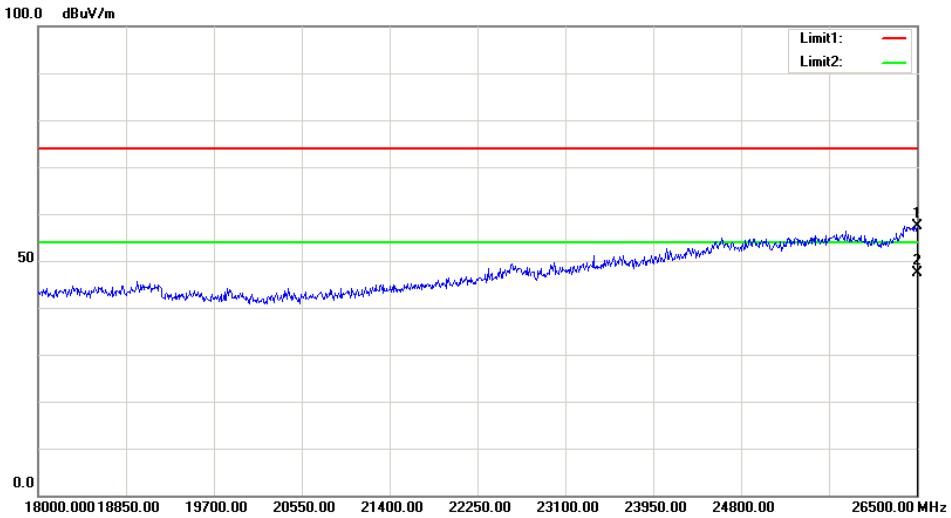
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Extrapolation result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)						
Low Channel: 5755MHz										
5755.00	69.18	PK	H	34.20	3.70	0.00	107.08	101.06	N/A	N/A
5755.00	51.26	AV	H	34.20	3.70	0.00	89.16	83.14	N/A	N/A
5755.00	80.54	PK	V	34.20	3.70	0.00	118.44	112.42	N/A	N/A
5755.00	62.73	AV	V	34.20	3.70	0.00	100.63	94.61	N/A	N/A
5725.00	45.36	PK	V	34.19	3.69	0.00	83.24	77.22	122.20	44.98
5720.00	41.22	PK	V	34.19	3.69	0.00	79.10	73.08	110.80	37.72
5700.00	27.69	PK	V	34.18	3.68	0.00	65.55	59.53	105.20	45.67
5650.00	26.54	PK	V	34.16	3.63	0.00	64.33	58.31	68.20	9.89
11510.00	46.28	PK	V	39.00	6.59	37.37	54.50	48.48	74.00	25.52
11510.00	34.67	AV	V	39.00	6.59	37.37	42.89	36.87	54.00	17.13
17265.00	45.26	PK	V	41.74	8.79	38.58	57.21	51.19	74.00	22.81
17265.00	33.65	AV	V	41.74	8.79	38.58	45.60	39.58	54.00	14.42
High Channel: 5795 MHz										
5795.00	69.13	PK	H	34.22	3.71	0.00	107.06	101.04	N/A	N/A
5795.00	51.05	AV	H	34.22	3.71	0.00	88.98	82.96	N/A	N/A
5795.00	80.78	PK	V	34.22	3.71	0.00	118.71	112.69	N/A	N/A
5795.00	62.53	AV	V	34.22	3.71	0.00	100.46	94.44	N/A	N/A
5850.00	31.98	PK	V	34.24	3.75	0.00	69.97	63.95	122.20	58.25
5855.00	30.26	PK	V	34.24	3.75	0.00	68.25	62.23	110.80	48.57
5875.00	27.43	PK	V	34.25	3.77	0.00	65.45	59.43	105.20	45.77
5925.00	26.58	PK	V	34.27	3.80	0.00	64.65	58.63	68.20	9.57
11590.00	46.37	PK	V	39.00	6.62	37.46	54.53	48.51	74.00	25.49
11590.00	34.52	AV	V	39.00	6.62	37.46	42.68	36.66	54.00	17.34
17385.00	45.63	PK	V	42.43	8.82	38.50	58.38	52.36	74.00	21.64
17385.00	33.75	AV	V	42.43	8.82	38.50	46.50	40.48	54.00	13.52

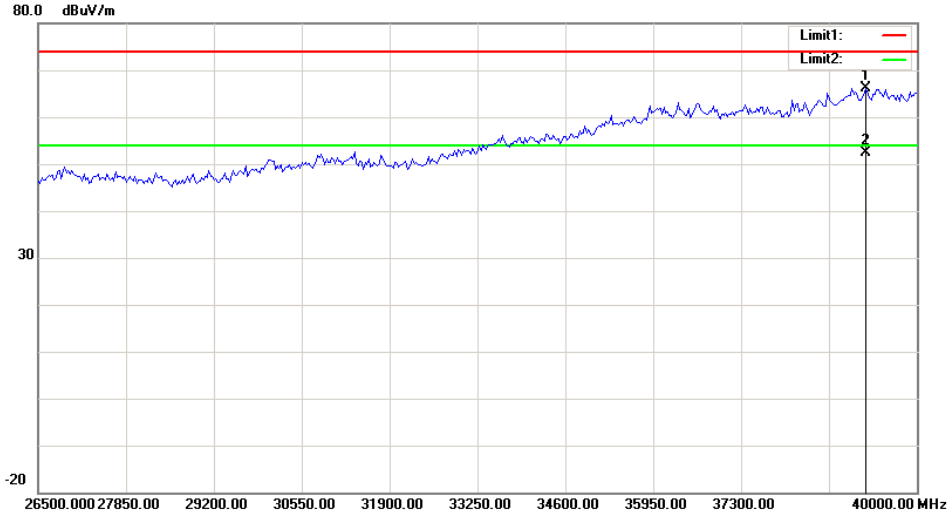
Worst Test Plots(5190MHz)
Horizontal:

Fundamental Test with Band Rejection Filter



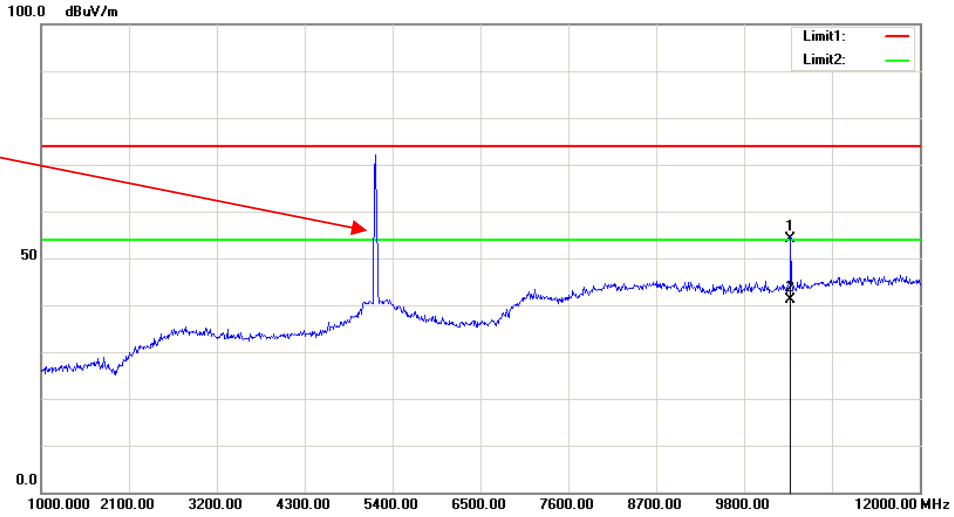


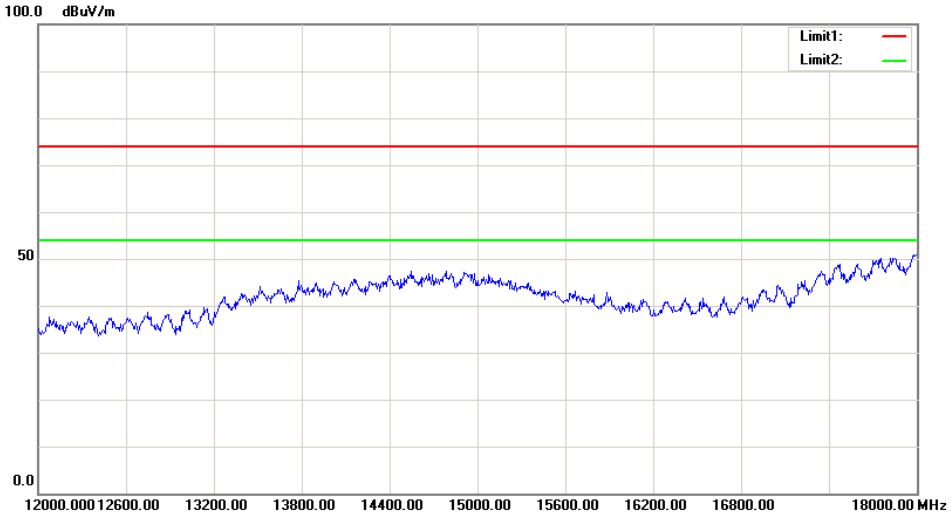


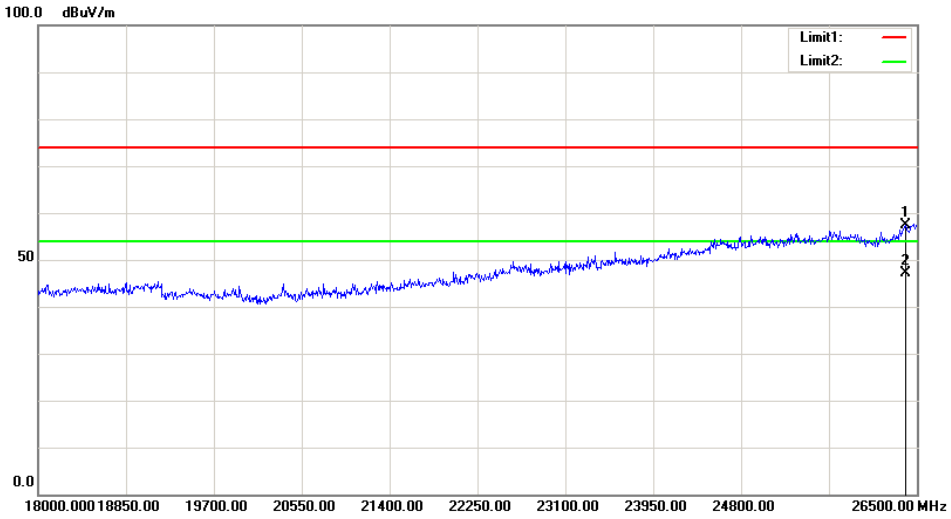


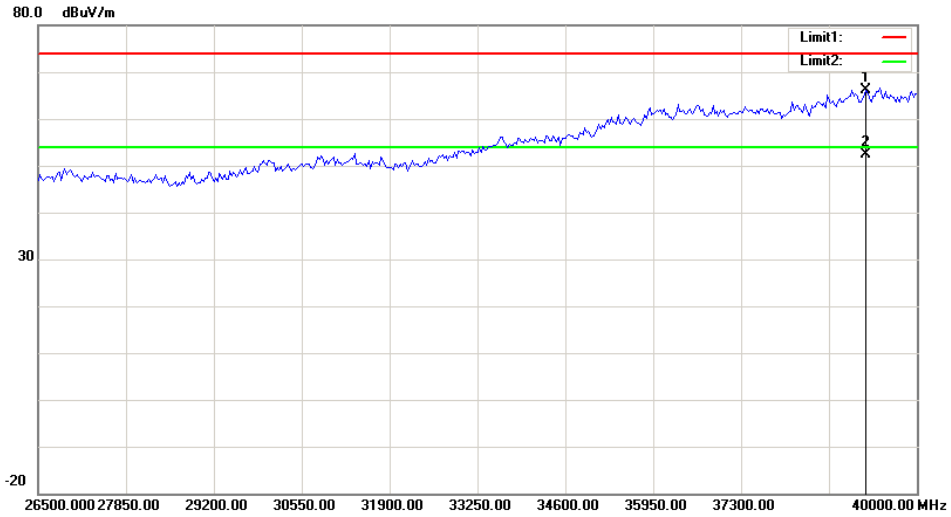
Vertical:

Fundamental Test with Band Rejection Filter






100.0 dBuV/m
Limit1:
Limit2:
50
0.0
1
2
18000.000 18850.00 19700.00 20550.00 21400.00 22250.00 23100.00 23950.00 24800.00 26500.00 MHz


80.0 dBuV/m
Limit1:
Limit2:
30
-20
1
2
26500.000 27850.00 29200.00 30550.00 31900.00 33250.00 34600.00 35950.00 37300.00 40000.00 MHz

FCC §15.407(b)–OUT- OF-BAND EMISSIONS

Applicable Standard

FCC §15.407

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band:

(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

Test Procedure

According to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2017-12-08	2018-12-08
N/A	Coaxial Cable	C-SJ00-0010	C0010/02	Each time	N/A

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

Test Data

Environmental Conditions

Temperature:	25.6~27.6°C
Relative Humidity:	50~60 %
ATM Pressure:	100.3~101.4kPa

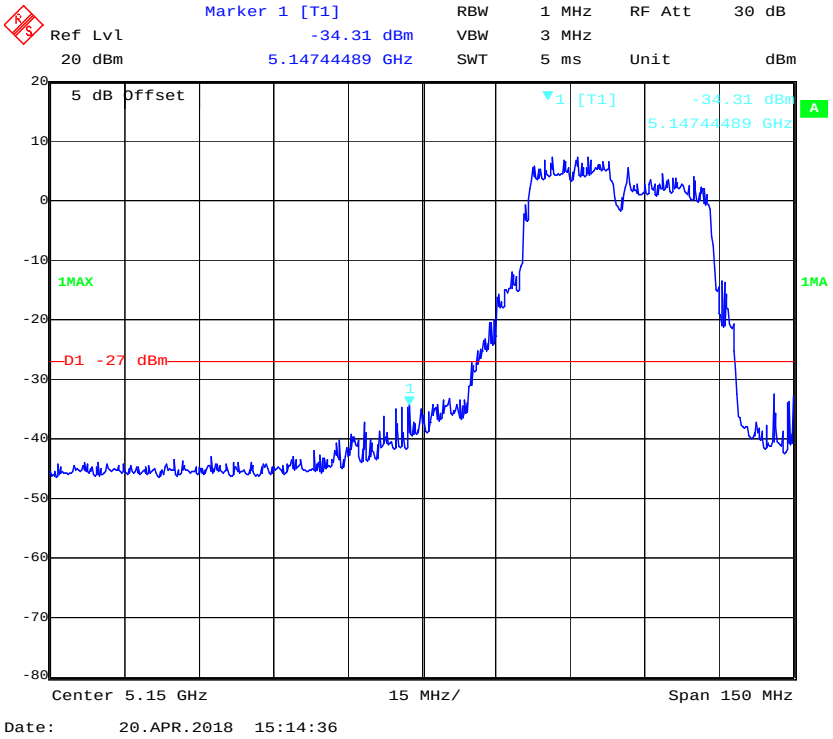
The testing was performed by Swim Lv on 2018-04-20&2018-04-27.

Test Result: Pass.

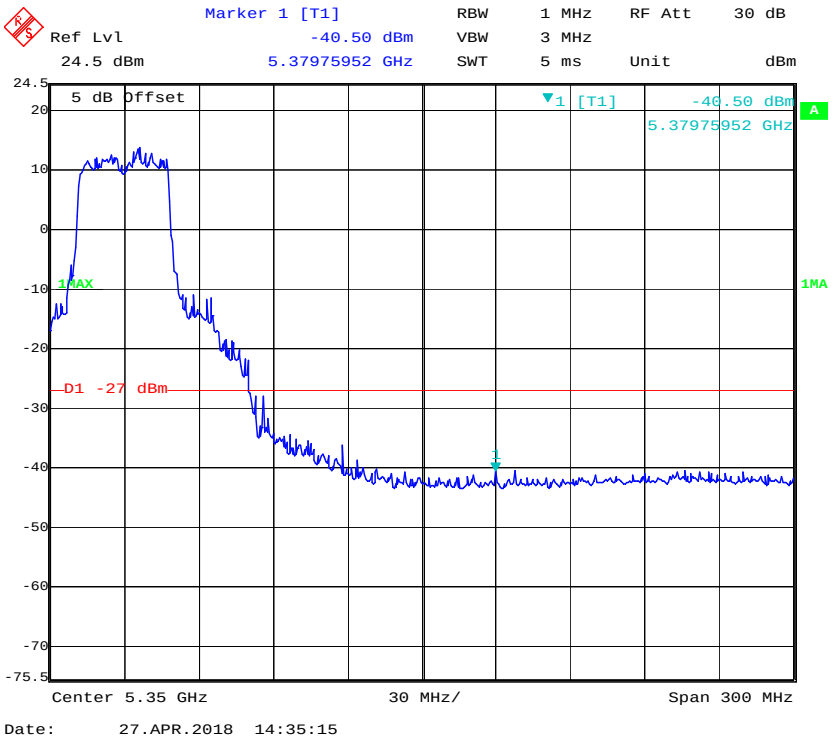
Please refer to the following plots.

5150-5250MHz(the atenna gain was offset in the display, all emission under limit more than 6dBc, so 4TX mode also compliance the requirement)

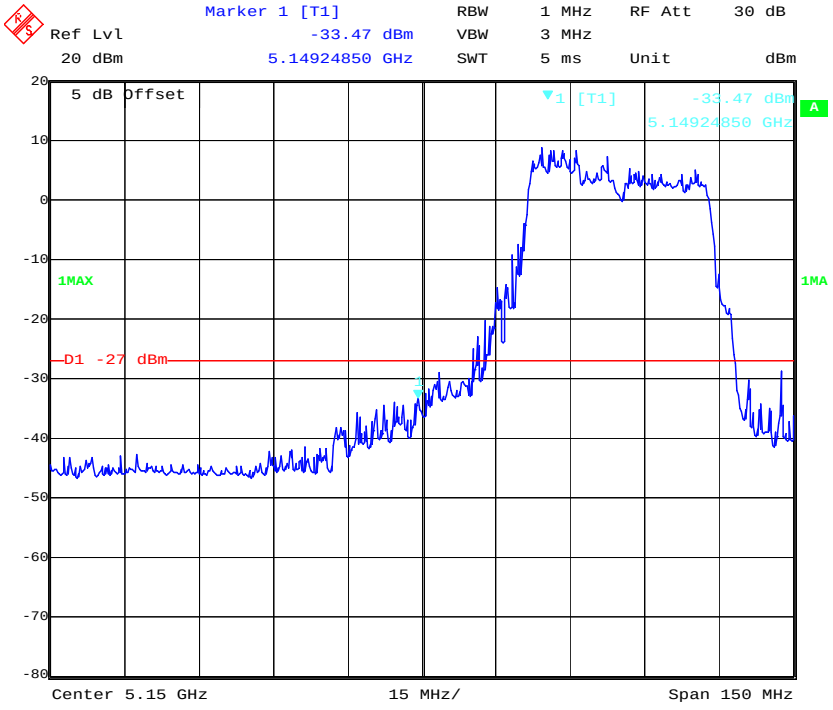
Chain 0, Low Channel



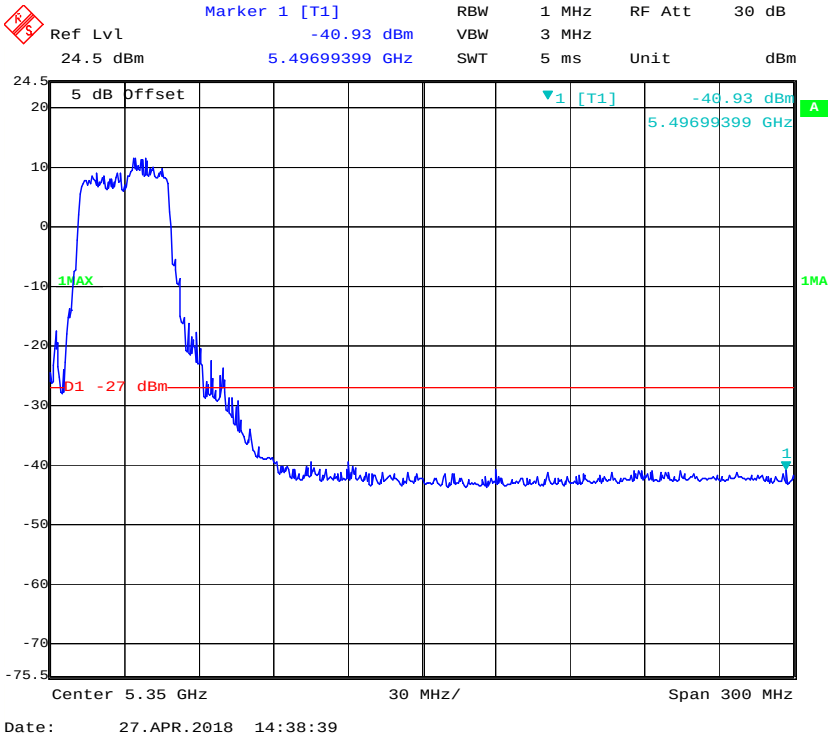
Chain 0, High Channel



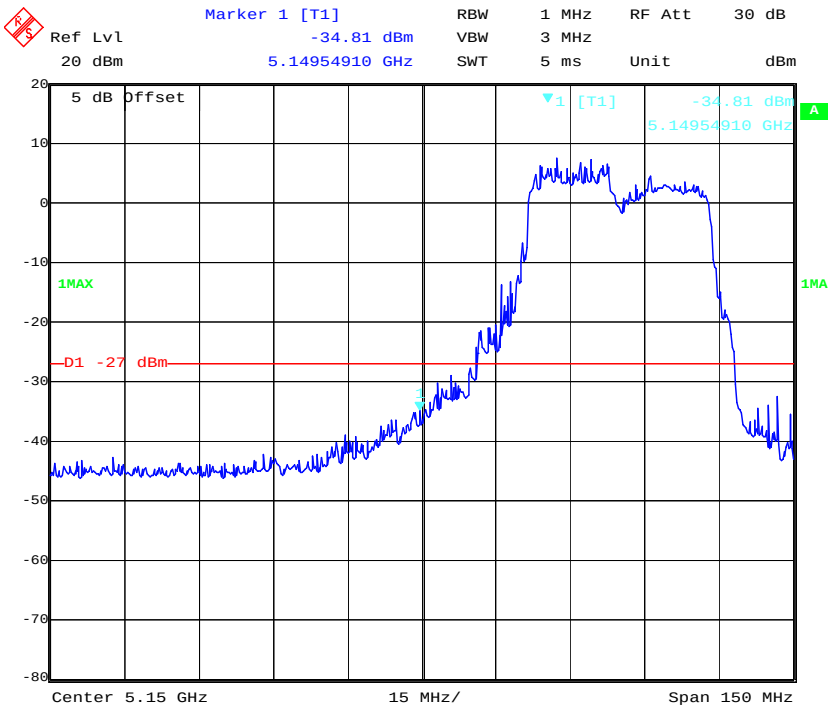
Chain 1, Low Channel



Chain 1, High Channel

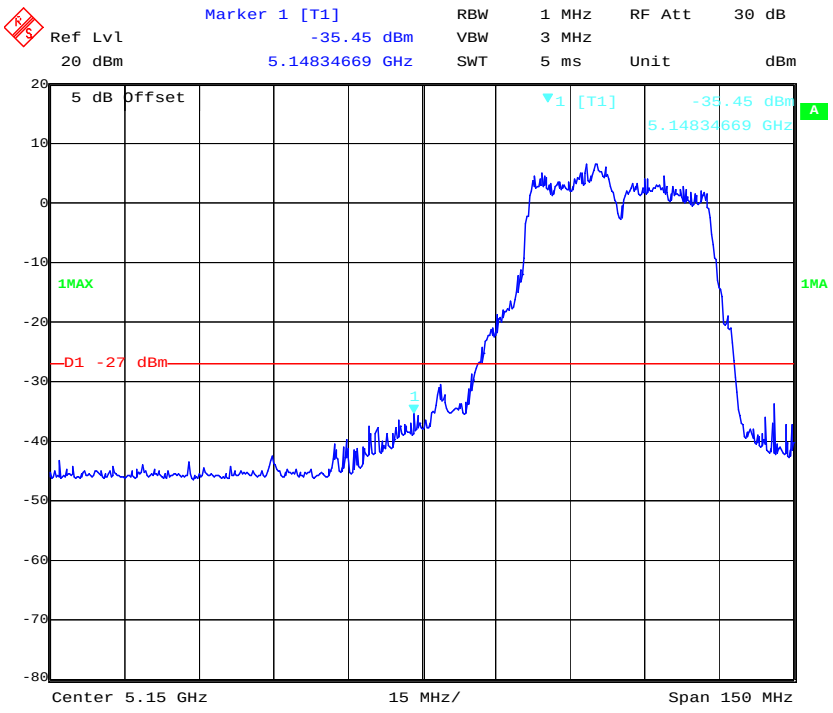


Chain 2, Low Channel



Chain 2, High Channel

Chain 3, Low Channel



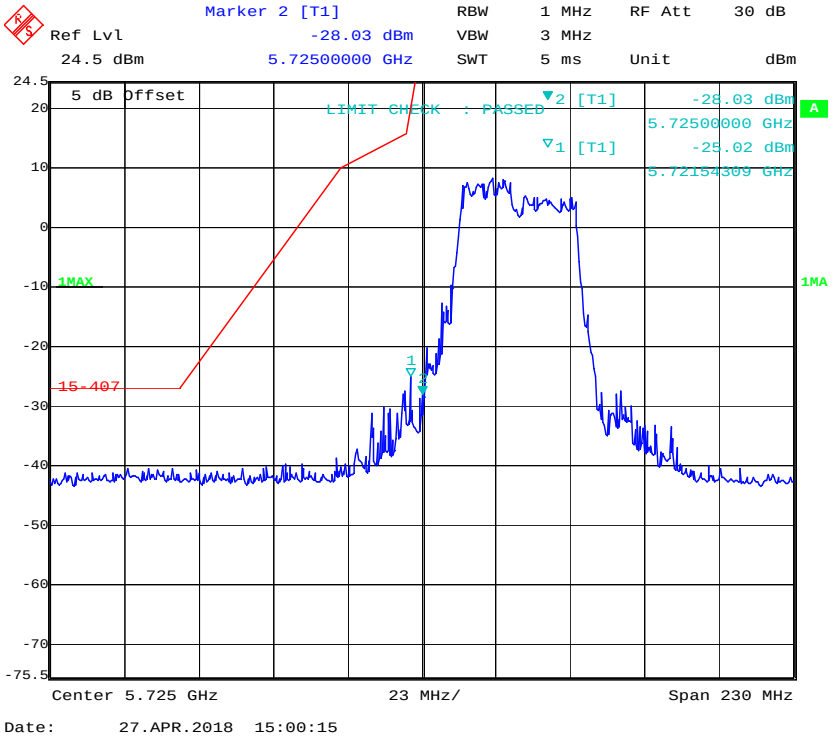
Date: 20.APR.2018 15:20:34

Chain 3, High Channel

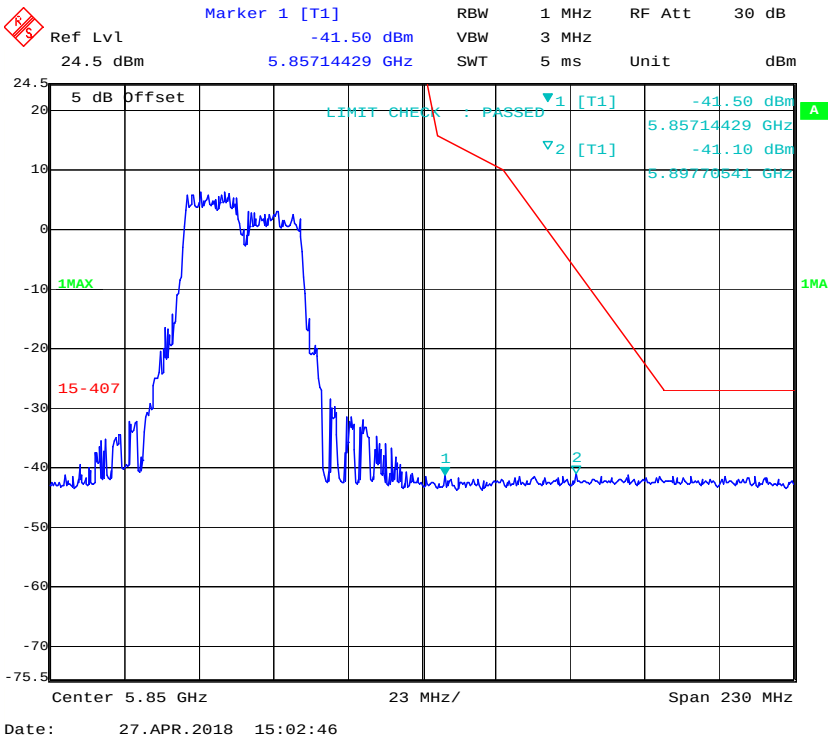
Date: 27.APR.2018 14:41:30

5725-5850MHz(the atenna gain was offset in the display, all emission under limit more than 6dBc, so 4TX mode also compliance the requirement)

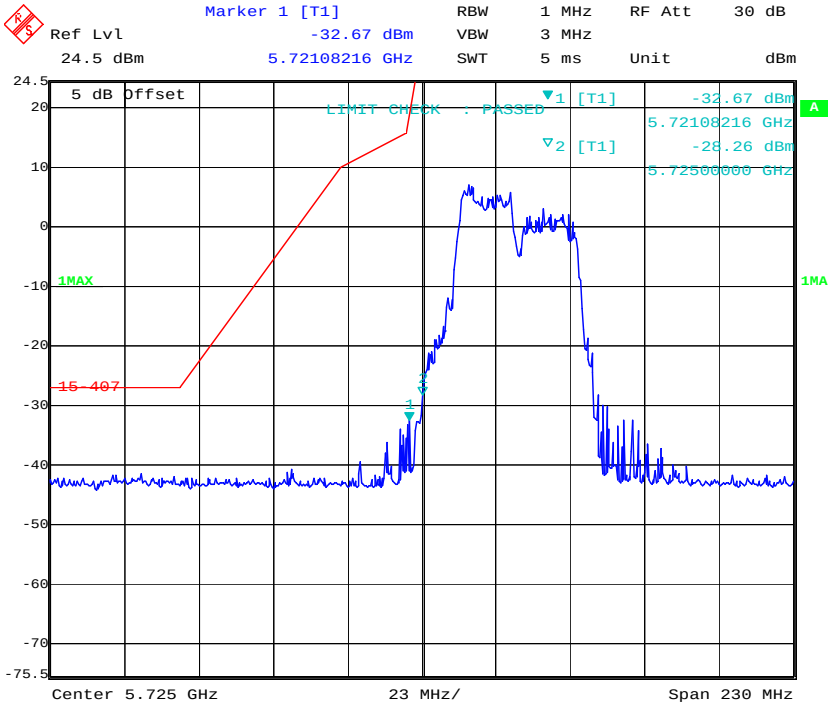
Chain 0, Low Channel



Chain 0, High Channel

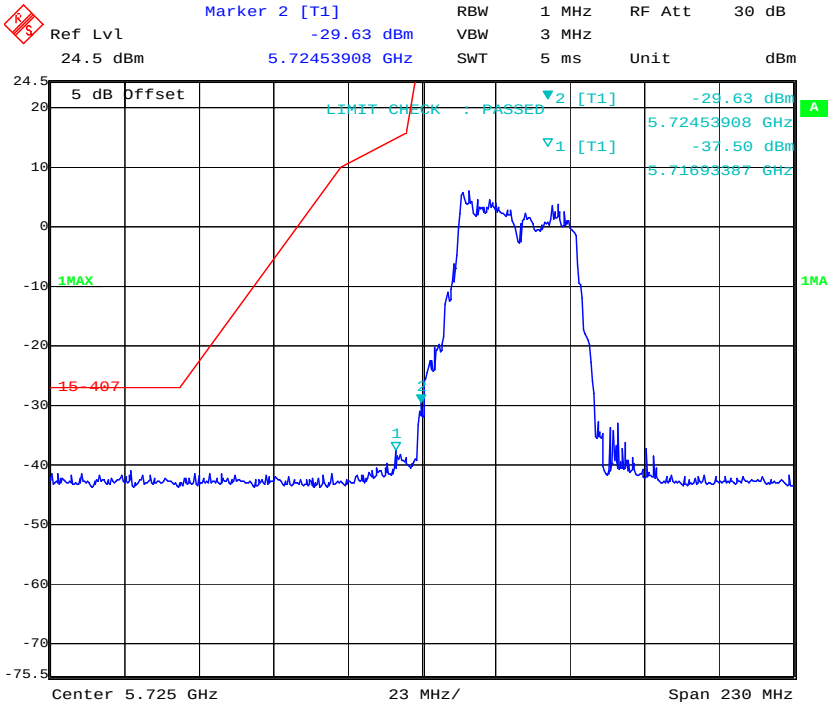


Chain 1, Low Channel



Chain 1, High Channel

Chain 2, Low Channel

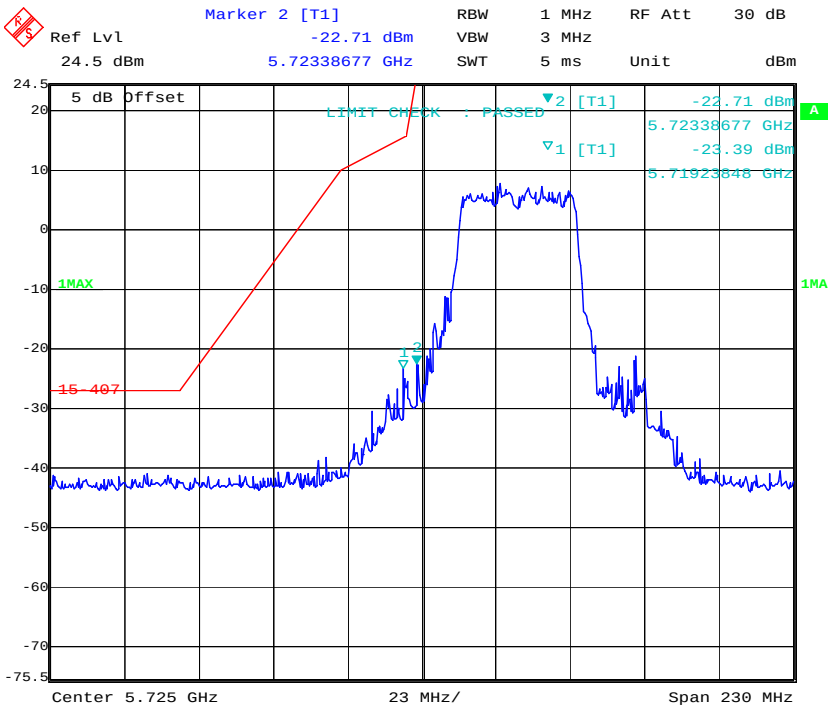


Date: 27.APR.2018 14:56:18

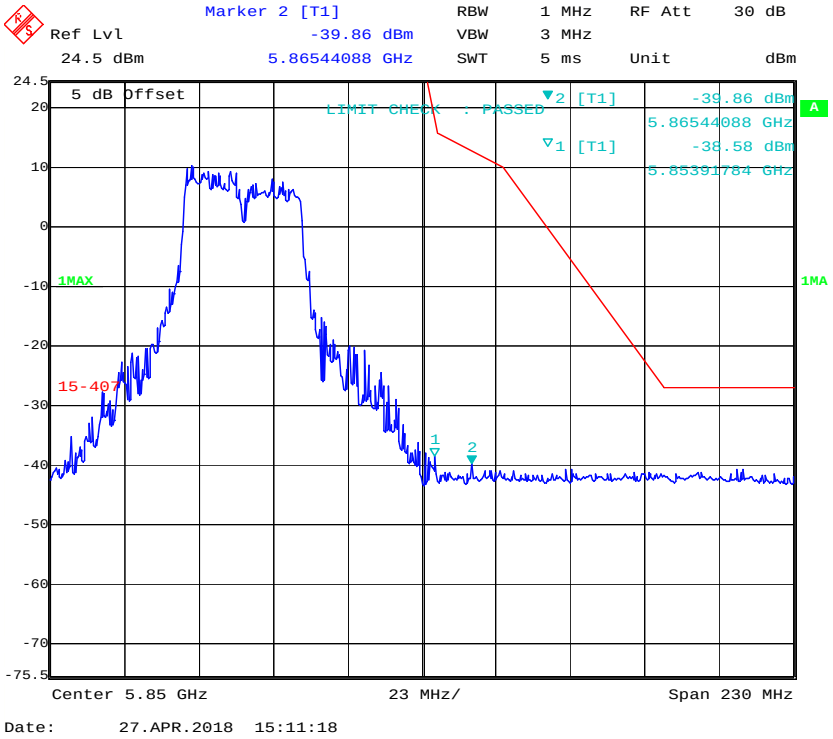
Chain 2, High Channel

Date: 27.APR.2018 15:09:11

Chain 3, Low Channel



Chain 3, High Channel



FCC §15.407(a)(e) –EMISSION BANDWIDTH AND OCCUPIED BANDWIDTH

Applicable Standard

15.407(a) (e)

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2017-12-08	2018-12-08
N/A	Coaxial Cable	C-SJ00-0010	C0010/02	Each time	N/A

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

Test Procedure

According to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

Test Data

Environmental Conditions

Temperature:	26.1°C
Relative Humidity:	57%
ATM Pressure:	100.6kPa

The testing was performed by Swim Lv on 2018-04-27.

Test Result: Pass.

Please refer to the following tables and plots.

Test mode: Transmitting(Test was performed at chain 0)

5150-5250MHz:

Channel	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
Low	5190	46.01	37.52
High	5230	45.21	37.35

Note: the 99% Occupied Bandwidth have not fall into the band 5250-5350MHz, please refer to the test plots of 99% Occupied Bandwidth.

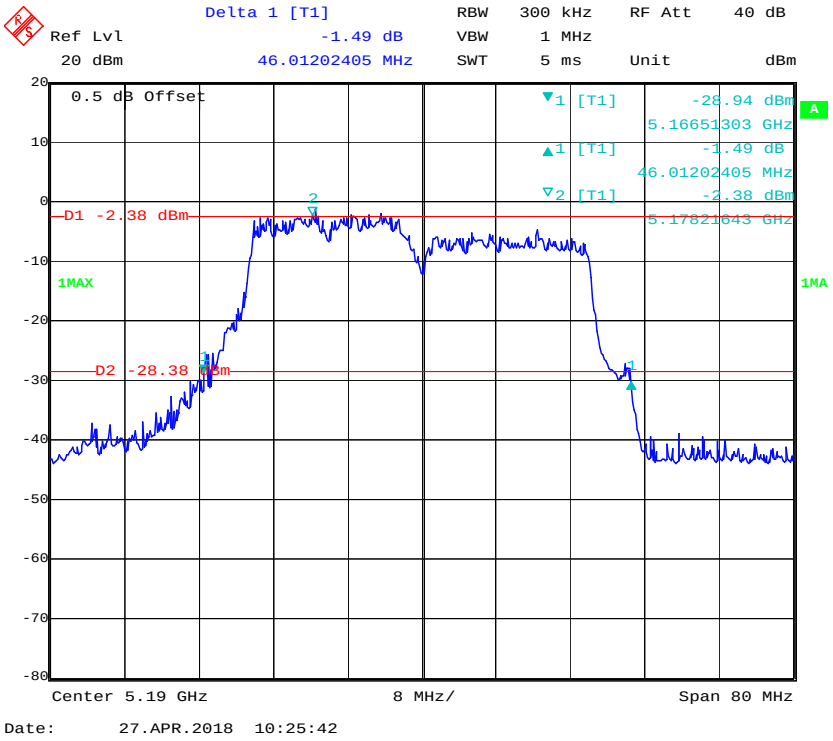
5725-5850MHz:

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	6 dB Emission Bandwidth Limits (MHz)	99% Occupied Bandwidth (MHz)
Low	5755	36.07	≥0.5	37.84
High	5795	36.07	≥0.5	37.03

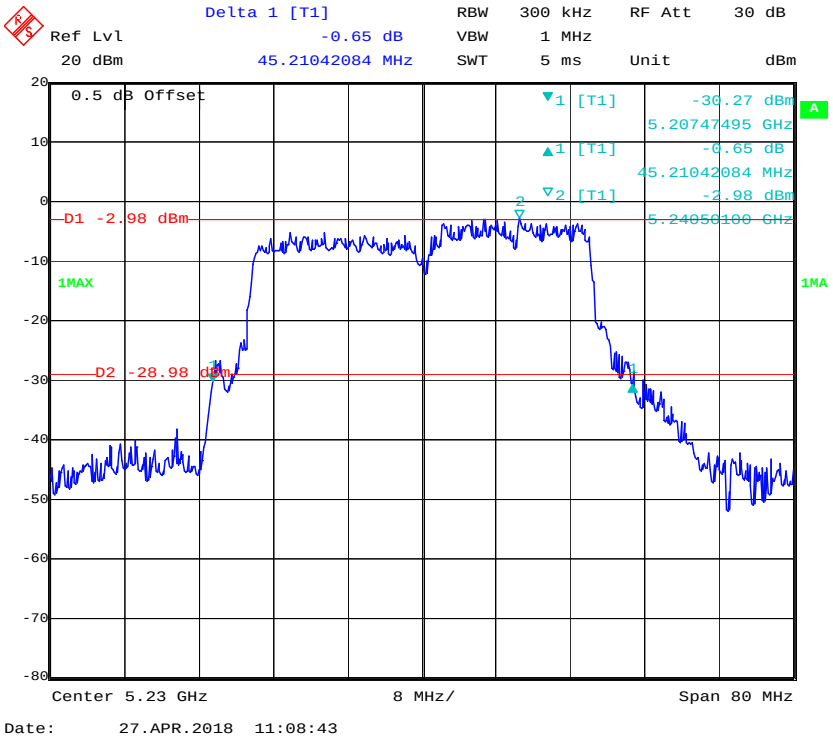
Note: For 5725-5850MHz band, the 99% Occupied Bandwidth have not fall into the band 5470-5725MHz.

5150-5250MHz: 26dB Emission Bandwidth:

Low Channel

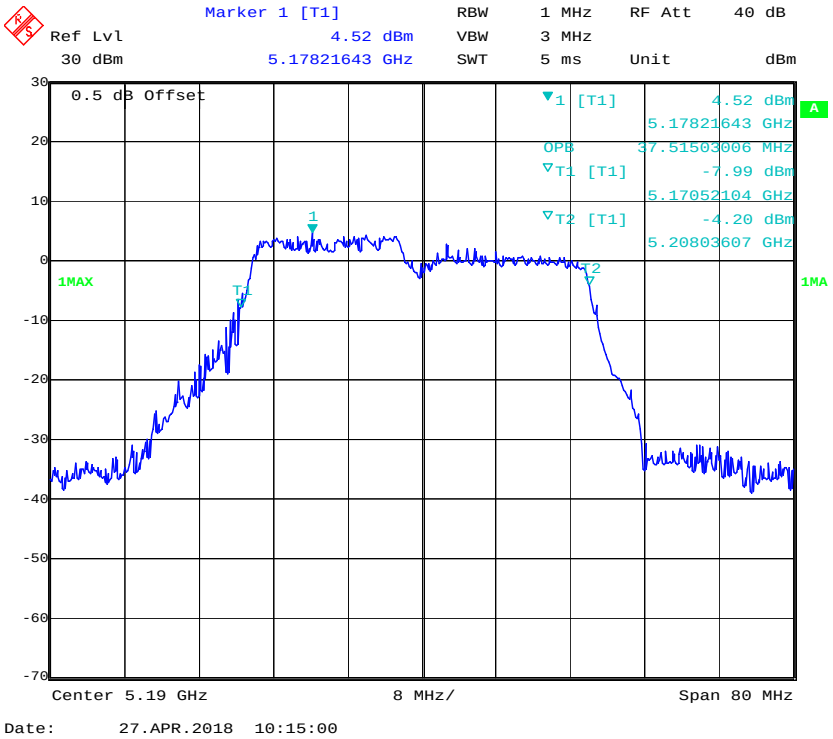


High Channel



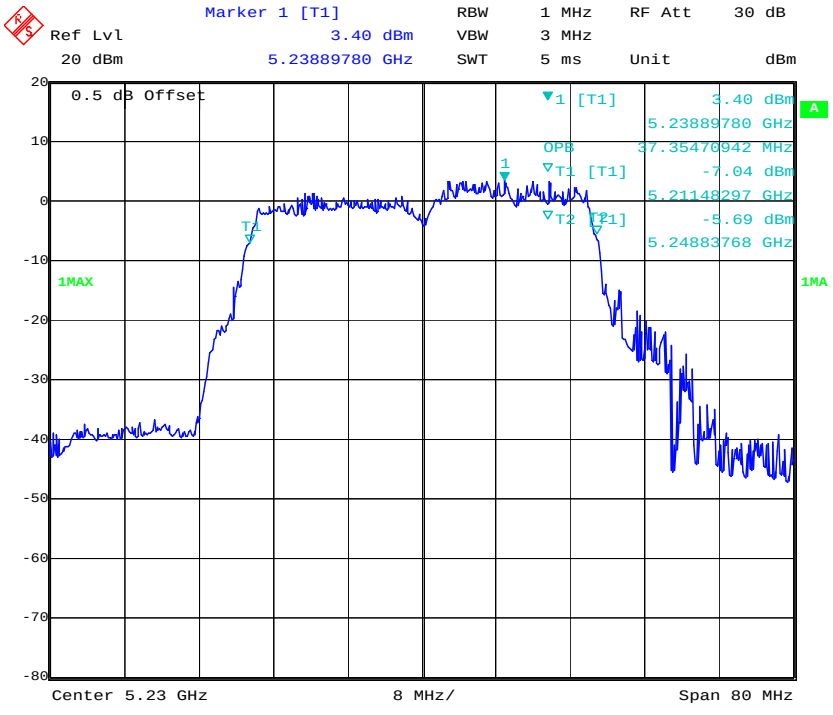
99% Occupied Bandwidth

Low Channel



Date: 27.APR.2018 10:15:00

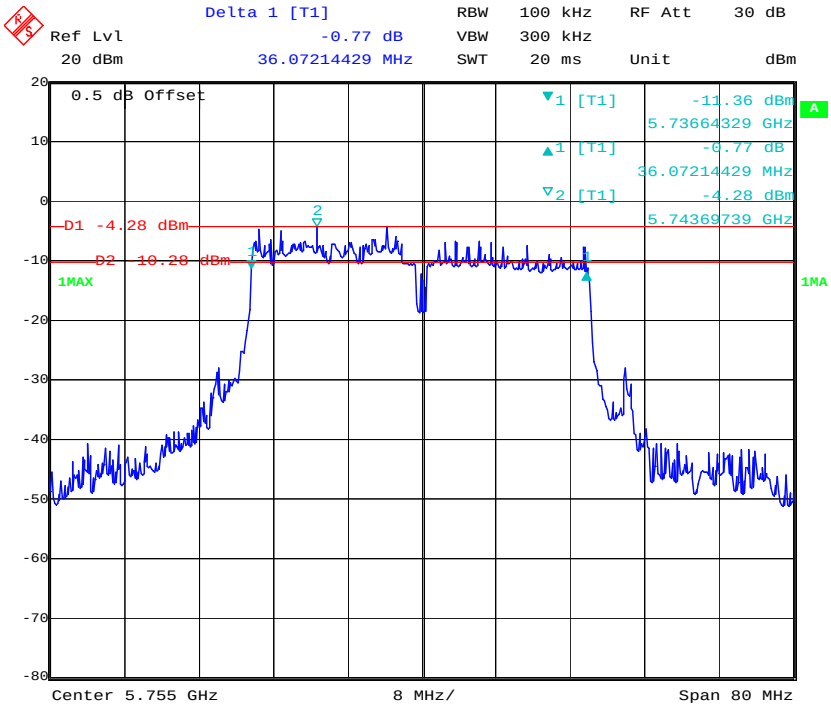
High Channel



Date: 27.APR.2018 11:01:00

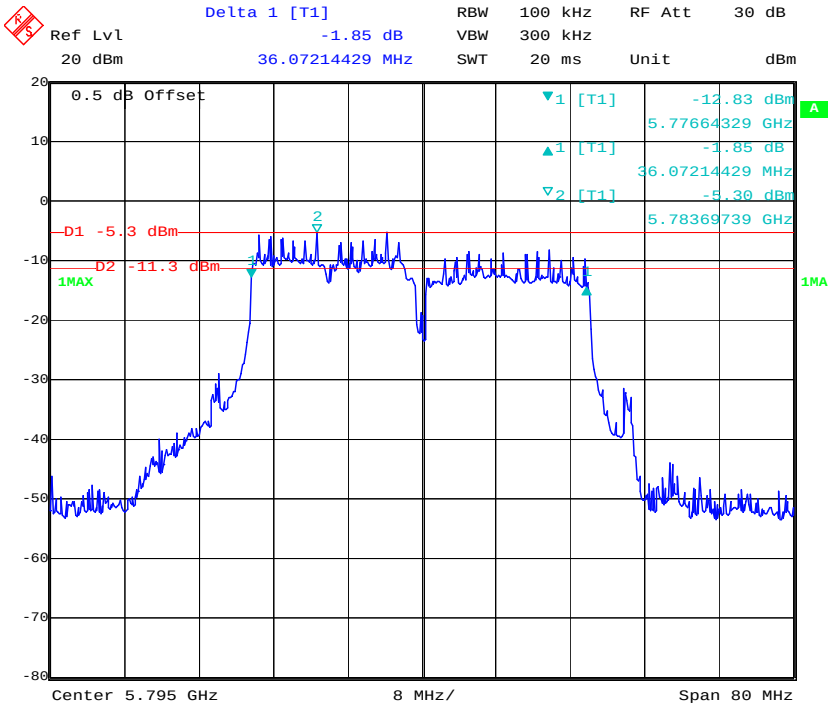
5725-5850MHz:
6dB Bandwidth:

Low Channel



Date: 27.APR.2018 11:36:21

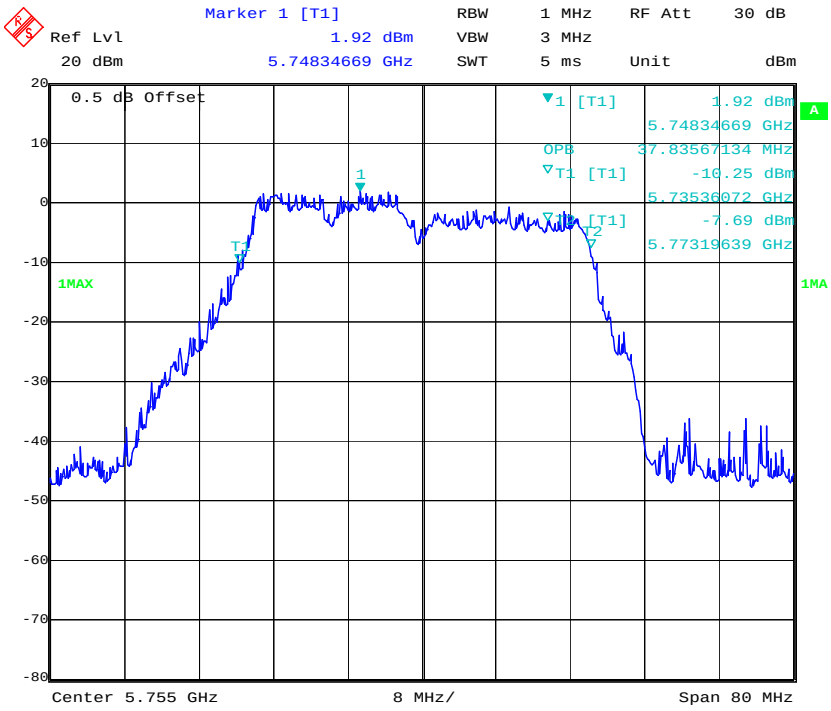
High Channel



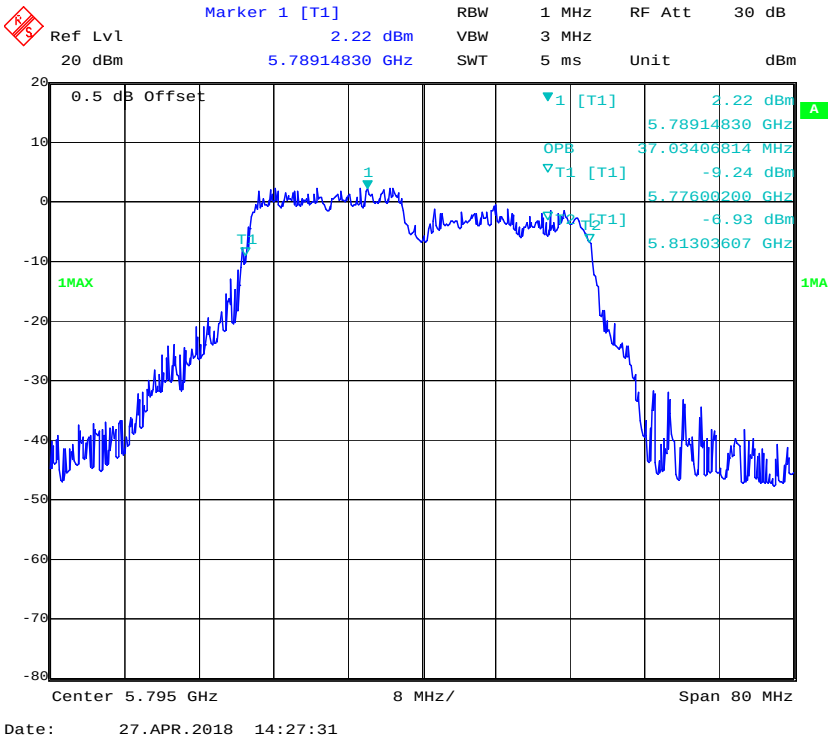
Date: 27.APR.2018 14:22:22

99% Occupied Bandwidth:

Low Channel



High Channel



FCC §15.407(a) –MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(4) The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Wideband Power Sensor	N1921A	MY54210016	2017-11-03	2018-11-03
Agilent	Wideband Power Sensor	N1921A	MY54170013	2017-11-03	2018-11-03
Agilent	P-Series Power Meter	N1912A	MY5000448	2017-11-03	2018-11-03
N/A	Coaxial Cable	C-SJ00-0010	C0010/02	Each time	N/A

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

Test Procedure

According to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

Test Data

Environmental Conditions

Temperature:	26.1°C
Relative Humidity:	57%
ATM Pressure:	100.6kPa

The testing was performed by Swim Lv on 2018-04-27.

Test Mode: Transmitting

Frequency (MHz)	Conducted Average Output Power (dBm)					Limit (dBm)	Result
	Chain 0	Chain 1	Chain 2	Chain 3	Total		
5190	6.23	7.41	6.09	9.13	13.42	24	PASS
5230	6.7	7.08	5.51	5.65	12.31	24	PASS
5755	5.95	5.86	5.86	5.12	11.73	30	PASS
5795	5.8	6.31	6.4	6.24	12.21	30	PASS

Note 1: the duty cycle have been calculated in the result.
Note 2: The maximum antenna gain is 4.5dBi in 5GHz band. The device employed Cyclic Delay Diversity (CDD) for 4 TX transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power measurements on:

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;

So:

Directional gain = G_{ANT} + Array Gain = 4.5dBi < 6dBi

FCC §15.407(a) - POWER SPECTRAL DENSITY

Applicable Standard

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output

power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Test Procedure

According to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2017-12-08	2018-12-08
N/A	Coaxial Cable	C-SJ00-0010	C0010/02	Each time	N/A

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

Test Data

Environmental Conditions

Temperature:	27.2°C
Relative Humidity:	64 %
ATM Pressure:	100.8~100.9kPa

The testing was performed by Swim Lv from 2018-04-28 to 2018-05-02.

Test Mode: Transmitting

Test Result:Compliance.Please refer to the following table and plot.

5150-5250MHz:

Frequency (MHz)	Reading (dBm/MHz)				Duty cycle factor (dB)	Total PSD (dBm/MHz)	Limit (dBm/MHz)
	Chain 0	Chain 1	Chain 2	Chain 3			
5190	-3.19	-1.81	-3.55	-4.12	0.13	3.07	11
5230	-3.56	-2.78	-4.62	-4.08	0.13	2.44	11

5725-5850MHz:

Frequency (MHz)	Reading (dBm/300kHz)				Duty cycle factor (dB)	Total PSD (dBm/ 500kHz)	Limit (dBm/500kHz)
	Chain 0	Chain 1	Chain 2	Chain 3			
5755	-4.00	-4.10	-4.20	-5.68	0.13	3.93	30
5795	-7.57	-5.31	-7.21	-8.13	0.13	1.45	30

Note 1:The maximum antenna gain is 4.5dBi in 5GHz band. The device employed Cyclic Delay Diversity (CDD) for 4 TX transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power spectral density (PSD) measurements on the devices:

Array Gain = 10 $\log(N_{ANT}/N_{SS})$ dB.

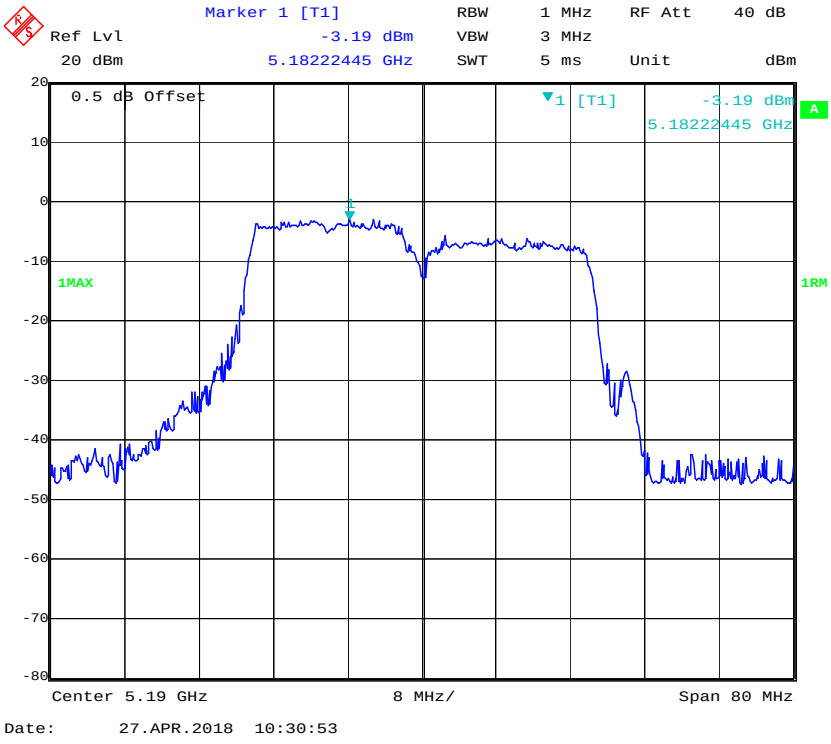
So:

Directional gain = G_{ANT} + Array Gain = 4.5dBi+10*log(4/4)=4.5dBi

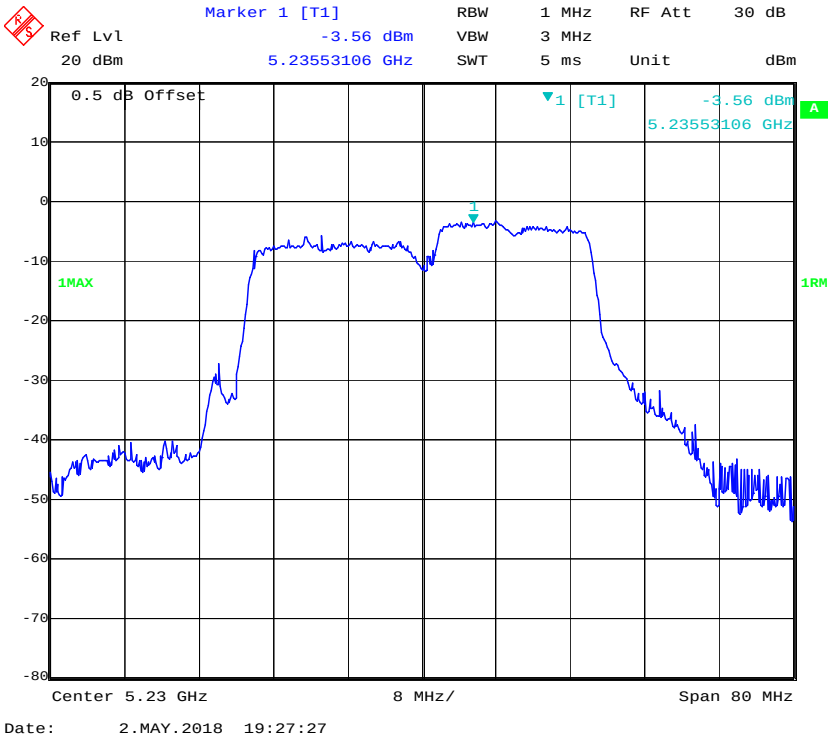
Note 2: For 5.8GHz band, If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

5150-5250MHz

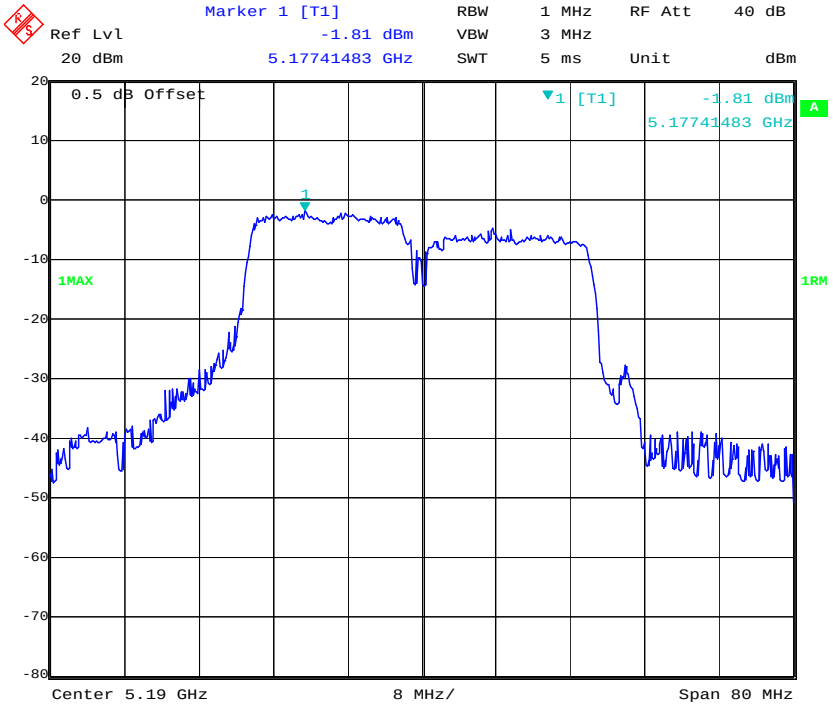
Chain 0, Low Channel



Chain 0, High Channel

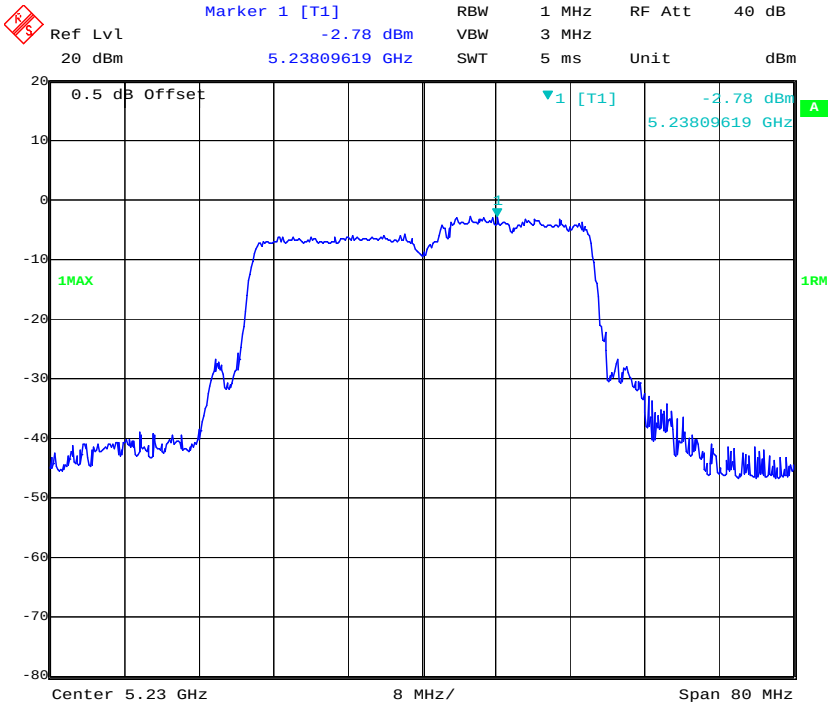


Chain 1, Low Channel



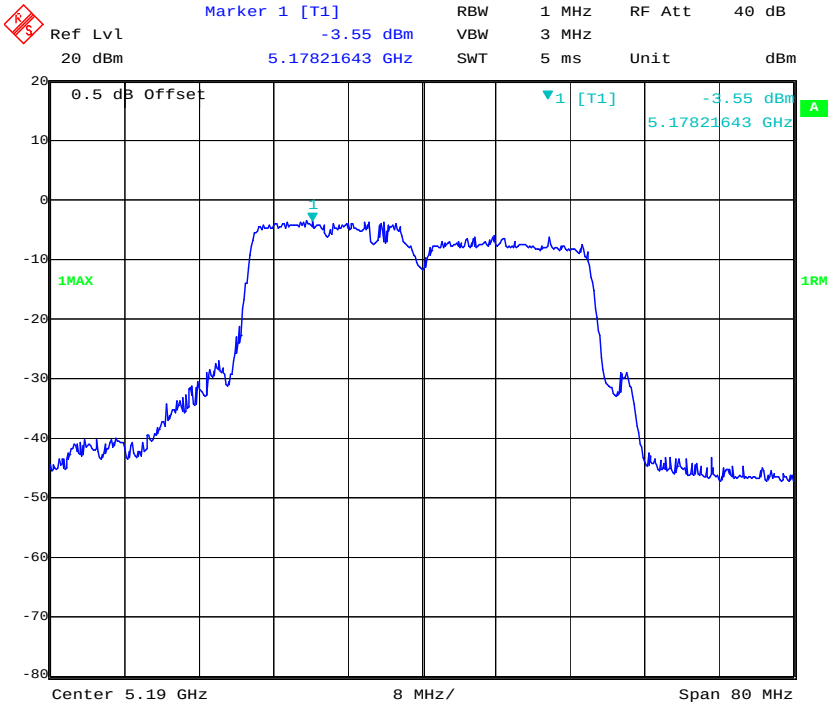
Date: 27.APR.2018 10:35:11

Chain 1, High Channel



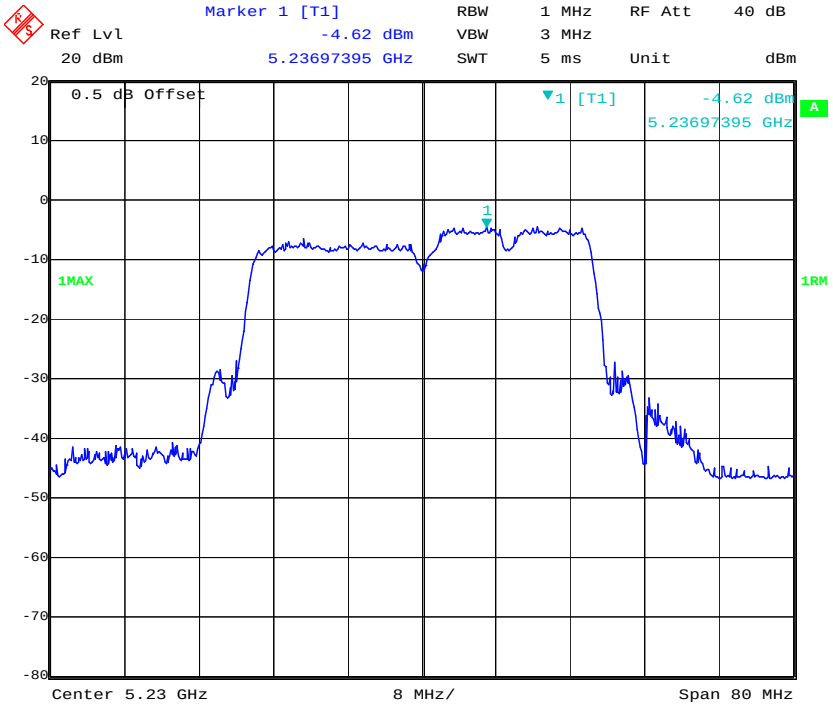
Date: 27.APR.2018 10:51:43

Chain 2, Low Channel



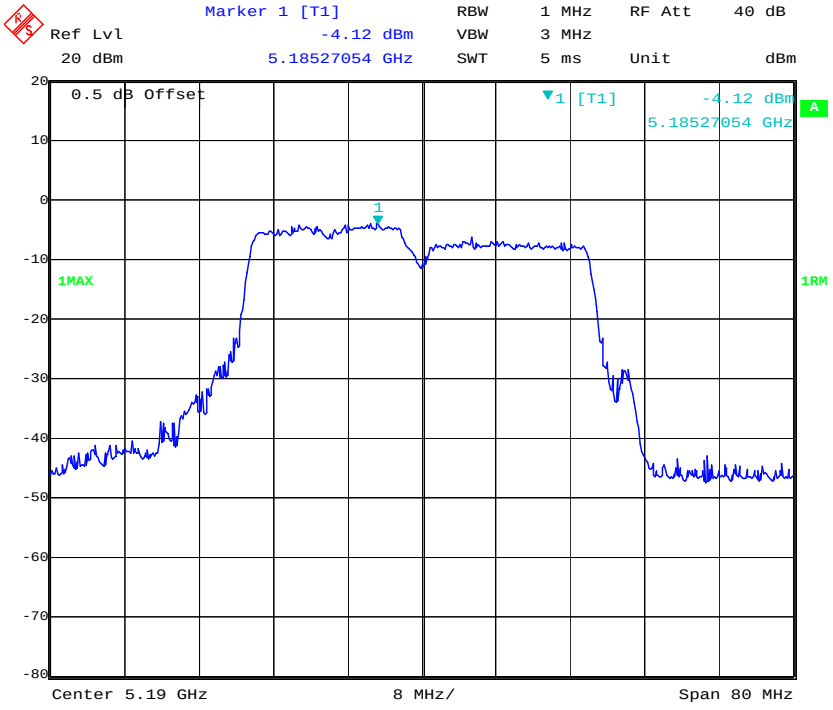
Date: 27.APR.2018 10:38:29

Chain 2, High Channel

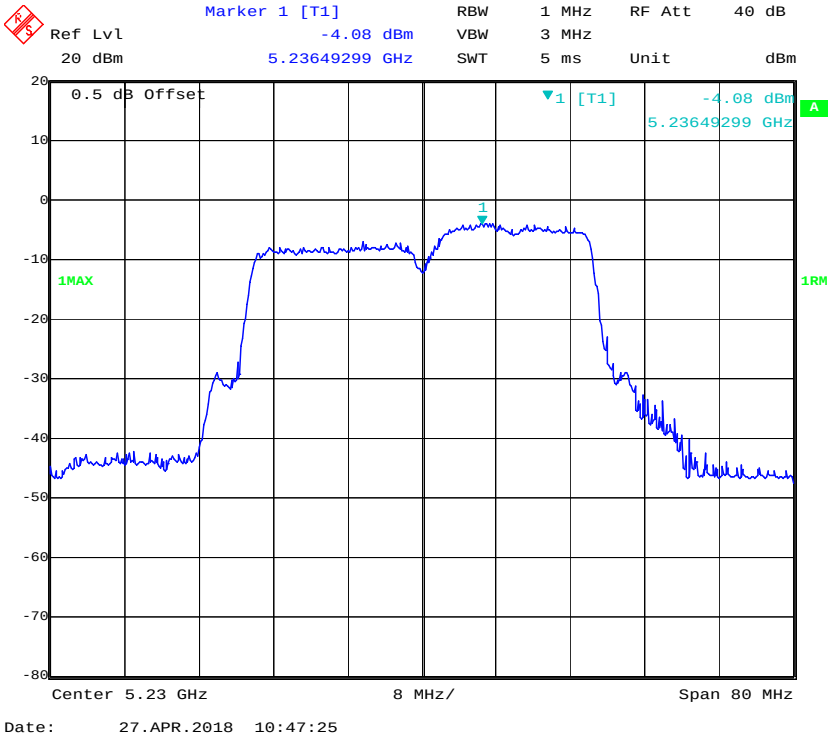


Date: 27.APR.2018 10:49:39

Chain 3, Low Channel

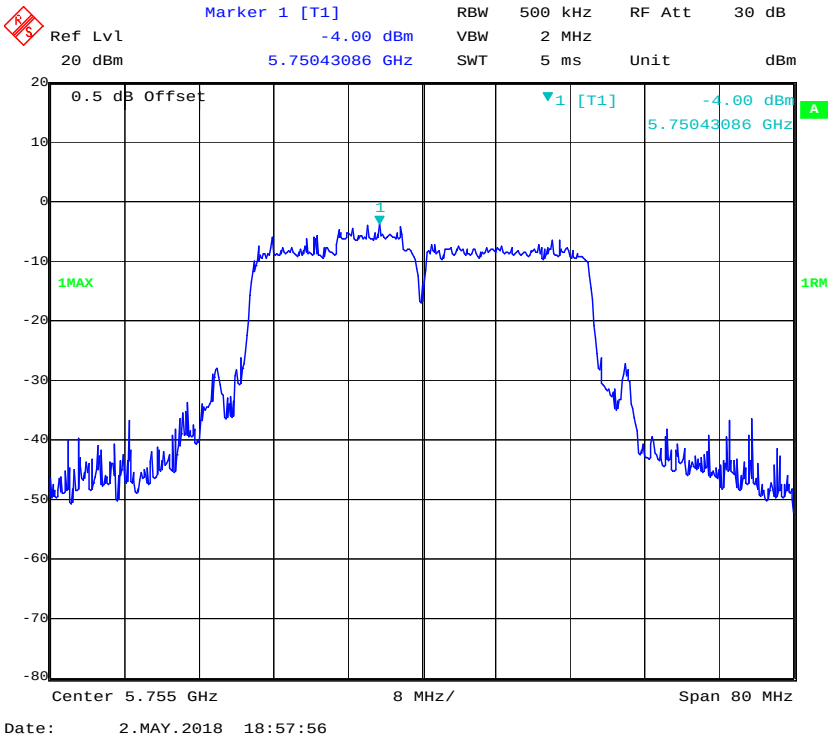


Chain 3, High Channel

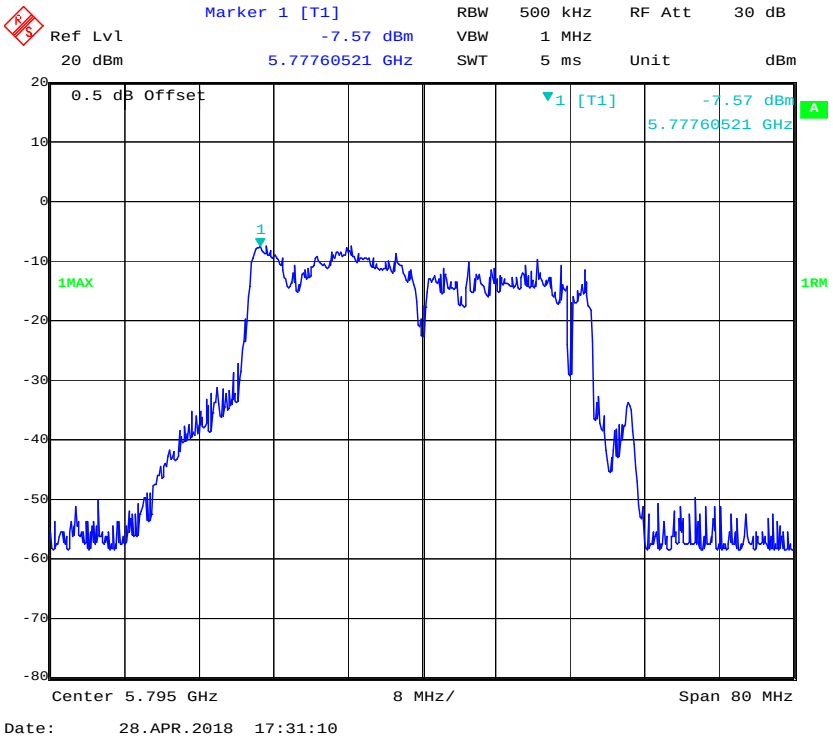


5725-5850MHz

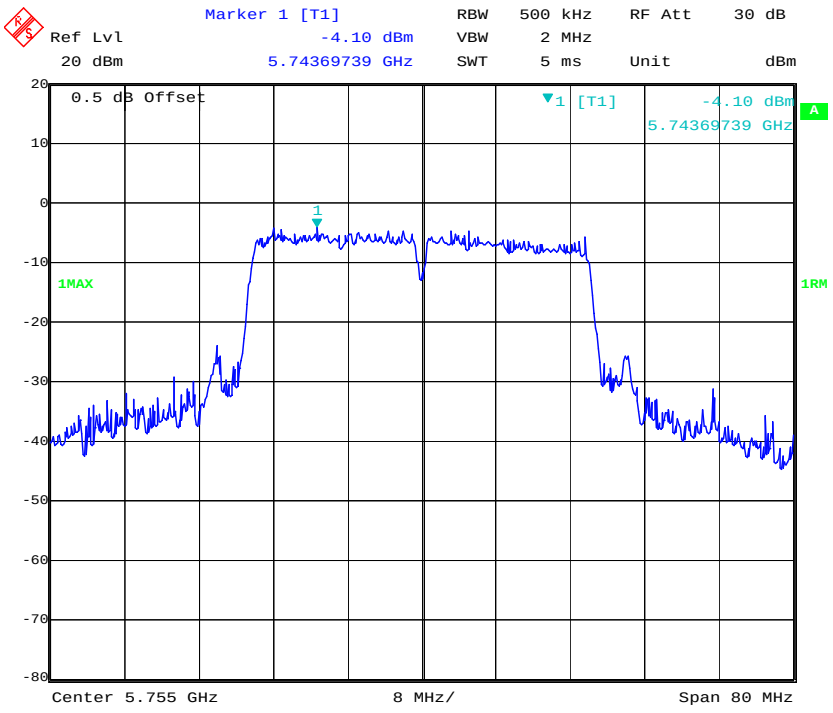
Chain 0, Low Channel



Chain 0, High Channel

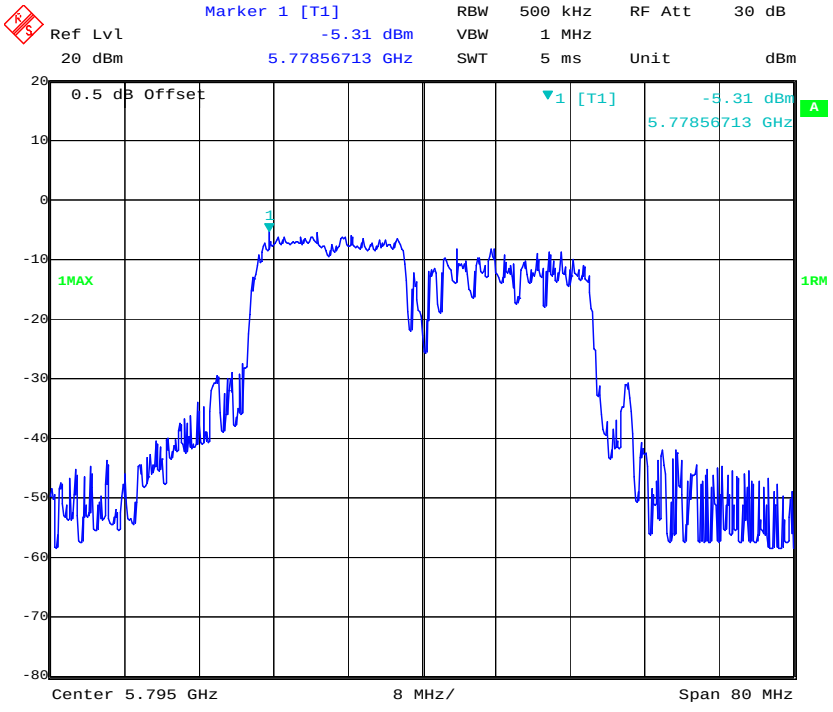


Chain 1, Low Channel



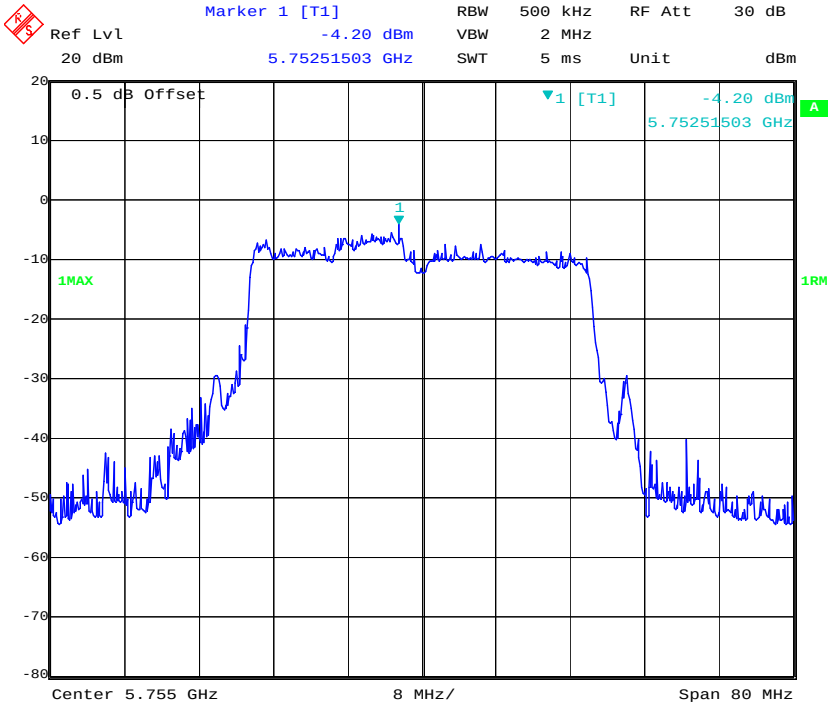
Date: 2.MAY.2018 19:02:36

Chain 1, High Channel



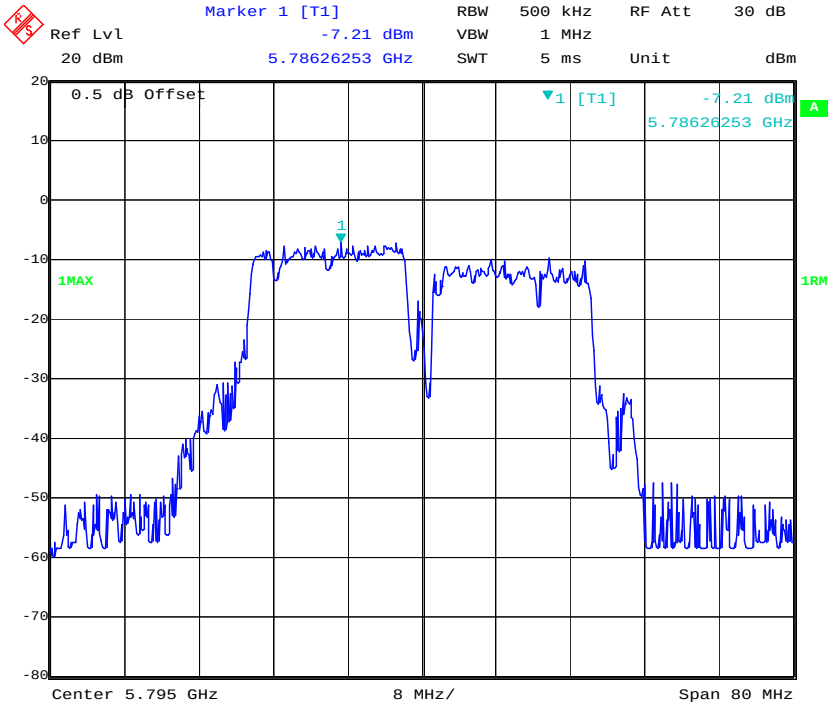
Date: 28.APR.2018 17:36:13

Chain 2, Low Channel



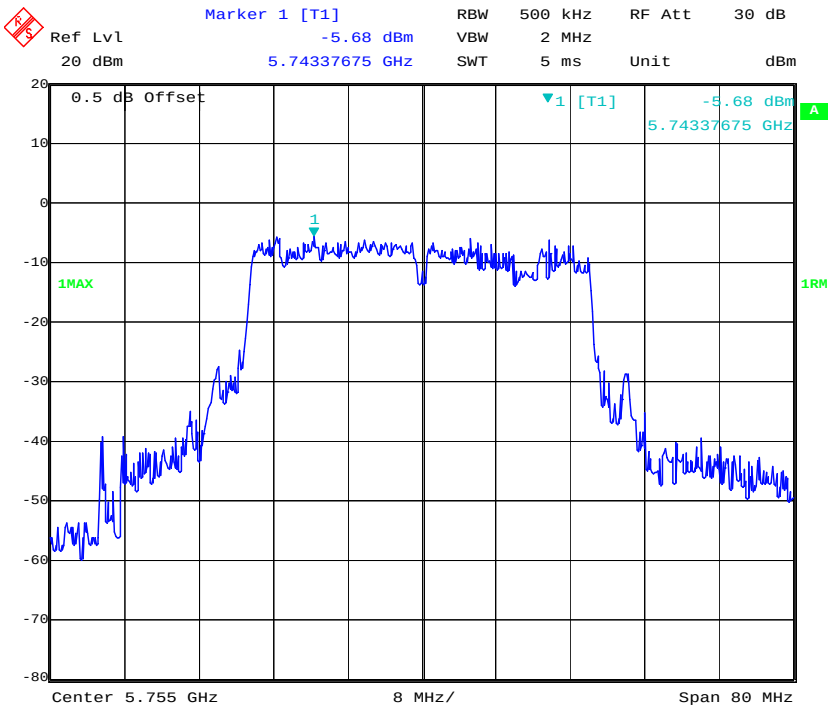
Date: 2.MAY.2018 19:10:44

Chain 2, High Channel



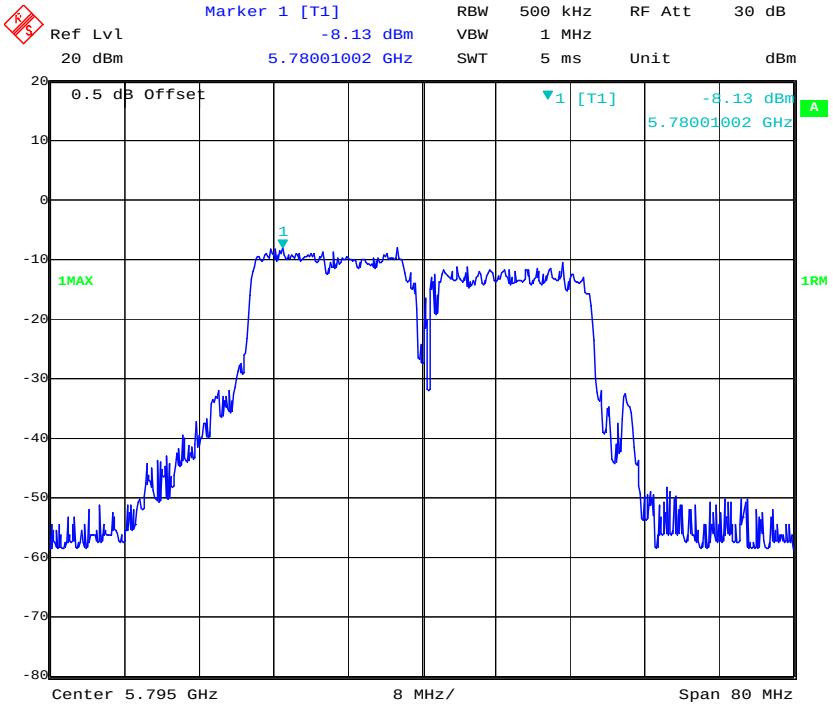
Date: 28.APR.2018 17:37:48

Chain 3, Low Channel



Date: 2.MAY.2018 19:13:55

Chain 3, High Channel



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