ACCREDITED
TESTING LABORATORY
CERTIFICATE # 4821.01

BACL
Bay Area Compliance Labs Corp.

FCC PART 90

TEST REPORT

For

RCA Communications Systems

133 West Market Street, Suite 227, Indianapolis, Indiana 46204, United States

FCC ID: XYH-RDR1500V

Report Type:	**Product Type:**
Original Report	Digital Two-Way Radio

Report Number:	RSZ190516002-00B
Report Date:	2019-07-25
Reviewed By:	Candy Li RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

Note: This report must not be used by the customer to claim product certification, approval, or endorsement by A2LA* or any agency of the Federal Government. * This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "*".

The information marked # is provided by the applicant, the laboratory is not responsible for its authenticity.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Digital Two-Way Radio
Model	RDR1520V
Frequency Range	136-174MHz
Transmit Power	Digital: 0.5W/1W/2W/3W Analog: 0.5W/1W/2W
Channel separation	12.5kHz
Modulation Technique	4FSK, FM
Antenna Specification	SMA External Antenna
Voltage Range	DC 3.7V from battery or DC 5V from adapter or DC 5.0V from charger adapter
Date of Test	2019/05/28~2019/06/04
Sample serial number	190516002
Received date	2019/05/16
Sample/EUT Status	Good condition
Adapter information	Model: NLA100050W1A6 Input: AC 100-240V, 50/60Hz, 0.2A Max Output: DC 5V, 1A

Objective

This test report is prepared on behalf of *RCA Communications Systems* in accordance with Part 2, and Part 90 of the Federal Communication Commissions rules.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

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

Part 90 – Private Land Mobile Radio Service

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF Output Power with Power meter		±0.73dB
RF conducted test with spectrum		±1.6dB
Emissions, Radiated	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB
Temperature		±1℃
Humidity		±6%
Supply voltages		±0.4%

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, 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. : 342867, the FCC Designation No. : CN1221.

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a test mode which has been done in the factory.

EUT Exercise Software

No exercise software was used.

Special Accessories

No special accessory was used.

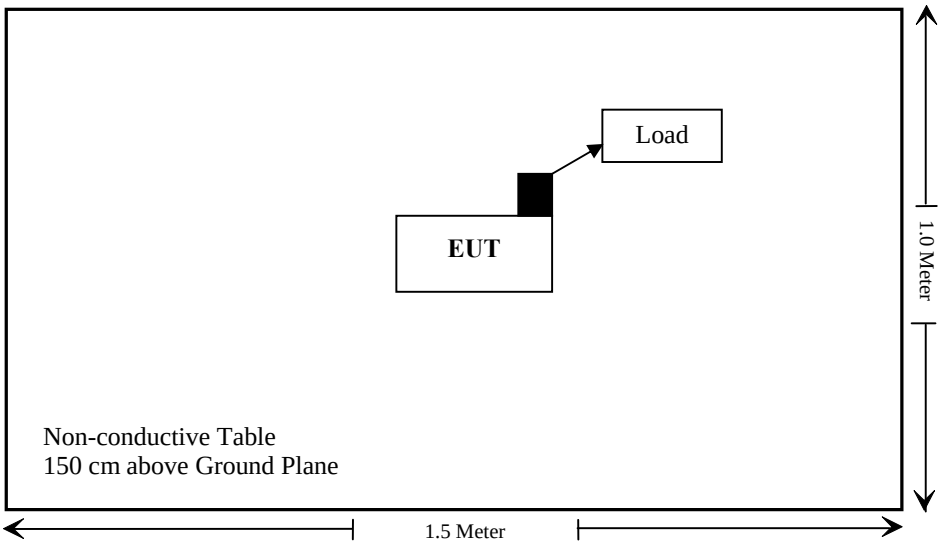
Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Un-known	Load	Un-known	161714

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§2.1093	RF Exposure	Compliance
§2.1046; §90.205	RF Output Power	Compliance
§2.1047; §90.207	Modulation Characteristic	Compliance
§2.1049; §90.210	Occupied Bandwidth & Emission Mask	Compliance
§2.1051;§90.210	Spurious Emission at Antenna Terminal	Compliance
§2.1053;§90.210	Spurious Radiated Emissions	Compliance
§2.1055;§90.213	Frequency Stability	Compliance
§90.214	Transient Frequency Behavior	Compliance

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Sunol Sciences	Horn Antenna	DRH-118	A052604	2017-12-22	2020-12-21
Rohde & Schwarz	Signal Analyzer	FSEM	845987/005	2018-06-23	2019-06-23
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017-12-22	2020-12-21
COM-POWER	Pre-amplifier	PA-122	181919	2018-11-12	2019-11-12
Sonoma Instrument	Amplifier	310N	186238	2018-11-12	2019-11-12
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2018-07-11	2019-07-11
A.H. System	Horn Antenna	SAS-200/571	135	2018-09-01	2021-08-31
UTiFLEX MICRO-C0AX	RF Cable	UFA147A-2362-100100	MFR64639 231029-003	2018-11-12	2019-11-12
Ducommun Technologies	RF Cable	104PEA	218124002	2018-11-12	2019-11-12
Ducommun technologies	RF Cable	RG-214	1	2019-05-21	2019-11-19
Ducommun technologies	RF Cable	RG-214	2	2018-11-12	2019-11-12
COM POWER	Dipole Antenna	AD-100	041000	NCR	NCR
RF Conducted test					
Rohde & Schwarz	Spectrum Analyzer	FSU26	200120	2019-03-02	2020-03-01
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR
Leader	AC Millivolt Meter	LMV-181A	6041126	2018-10-15	2019-10-15
HP	Microwave frequency counter	5343A	2232A00827	2016-08-29	2019-08-29
ESPEC	Temperature & Humidity Chamber	EL-10KA	9107726	2019-01-05	2020-01-05
Ducommun technologies	RF Cable	RG-214	3	Each Time	
N/A	30dB Attenuator	53-30-43	PG633	Each Time	
HP Agilent	RF Communication Test Set	8920B	3325U00859	2019-01-15	2020-01-15
Unknown	High Pass filter	NHP-250	Unknown	2019-01-12	2020-01-12
Aeroflex	3920 Digital Radio tester	3920	1000636779	2018-06-23	2019-06-23

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

FCC §1.1307(b) & §2.1093 - RF EXPOSURE

Applicable Standard

According to FCC §1.1307(b) and §2.1093, protable device operates Part 90 should be subjected to rountine environmental evaluation for RF exposure prior or equipment authorization or use.

Result: Compliance.

Please refer to SAR Report Number: RSZ190516002-20A.

FCC §2.1046 & §90.205 - RF OUTPUT POWER

Applicable Standard

FCC §2.1046 and §90.205

Test Procedure

Conducted RF Output Power:

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

Spectrum Analyzer Setting:

R B/W	Video B/W
100 kHz	300 kHz

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Kieron Luo on 2019-06-04.

Test Mode: Transmitting

Test Result: Compliance. Please refer to following table.

Modulation	Channel Separation (kHz)	Frequency (MHz)	Power Level	Output Power (dBm)	Output Power (W)	Result	Remark
Analog	12.5	136.0125	0.5W	27.57	0.57	Pass	For Federal
			1W	30.31	1.07	Pass	
			2W	33.44	2.21	Pass	
	12.5	155.7525	0.5W	27.66	0.58	Pass	For Part 90
			1W	30.12	1.03	Pass	
			2W	33.16	2.07	Pass	
	12.5	173.9875	0.5W	27.17	0.52	Pass	For Federal
			1W	30.24	1.06	Pass	
			2W	33.72	2.36	Pass	

Modulation	Channel Separation (kHz)	Frequency (MHz)	Power Level	Output Power (dBm)	Output Power (W)	Result	Remark
Digital	12.5	136.0125	0.5W	27.42	0.55	Pass	For Federal
			1W	30.33	1.08	Pass	
			2W	32.75	1.88	Pass	
			3W	33.81	2.40	Pass	
	12.5	155.7525	0.5W	27.12	0.52	Pass	For Part 90
			1W	30.76	1.19	Pass	
			2W	32.87	1.94	Pass	
			3W	33.88	2.44	Pass	
	12.5	173.9875	0.5W	27.65	0.58	Pass	For Federal
			1W	30.64	1.16	Pass	
			2W	33.17	2.07	Pass	
			3W	33.95	2.48	Pass	

FCC §2.1047 & §90.207 - MODULATION CHARACTERISTIC

Applicable Standard

FCC§2.1047 and §90.207:

(a) Equipment which utilizes voice modulated communication shall show the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz. for equipment which is required to have a low pass filter, the frequency response of the filter, or all of the circuitry installed between the modulation limited and the modulated stage shall be supplied.
(b) Equipment which employs modulation limiting, a curve showing the percentage of modulation versus the modulation input voltage shall be supplied.

Test Procedure

Test Method: TIA/EIA-603-D

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Kieron Luo on 2019-06-04.

Test Mode: Transmitting

Please refer to the following tables and plots.

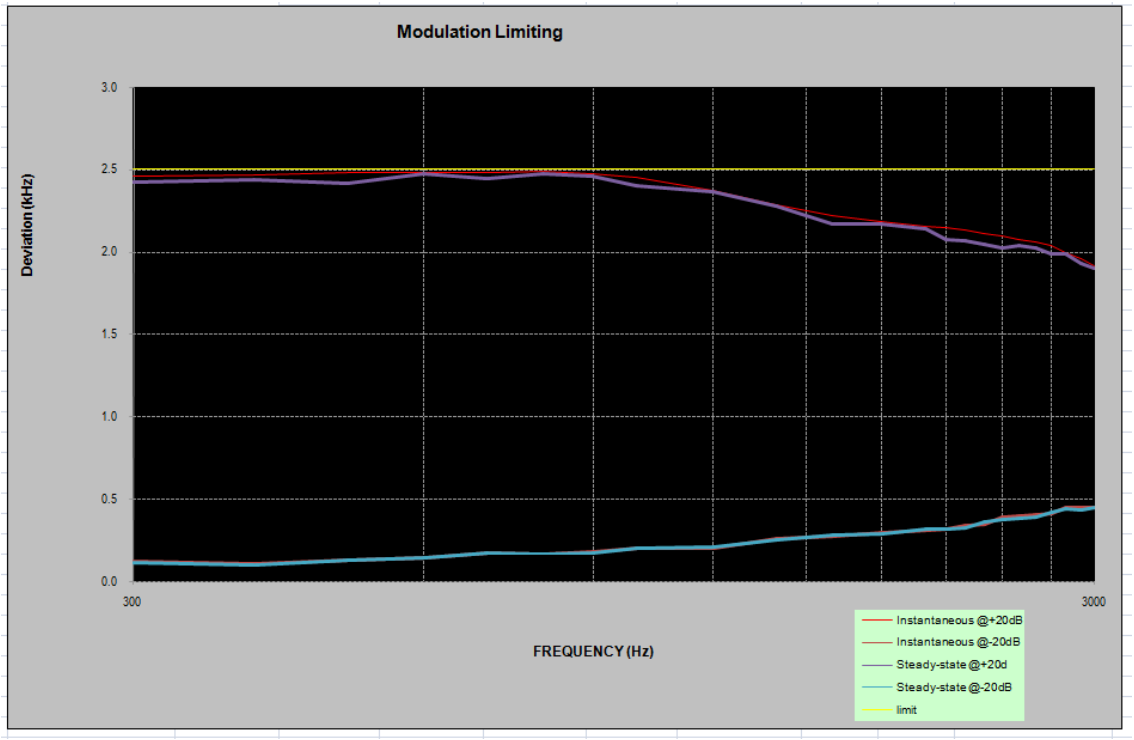
Note: Test was performed at highest power level.

Analog Modulation:

MODULATION LIMITING

Carrier Frequency: 155.7525 MHz, Channel Separation=12.5 kHz

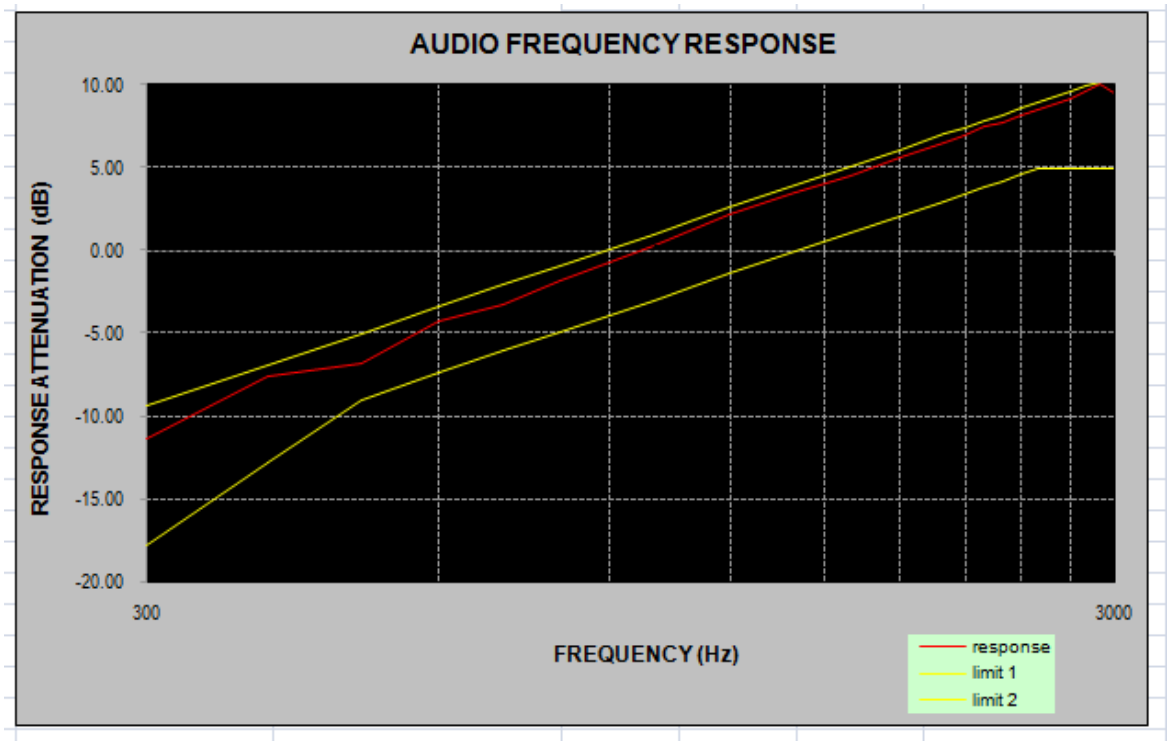
Audio Frequency (Hz)	Instantaneous		Steady-state		FCC Limit [kHz]
	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	
300	2.456	0.118	2.424	0.112	2.500
400	2.468	0.105	2.436	0.098	2.500
500	2.479	0.129	2.418	0.125	2.500
600	2.481	0.144	2.470	0.140	2.500
700	2.479	0.172	2.445	0.169	2.500
800	2.485	0.164	2.470	0.161	2.500
900	2.476	0.178	2.456	0.173	2.500
1000	2.448	0.202	2.401	0.197	2.500
1200	2.371	0.202	2.366	0.208	2.500
1400	2.285	0.255	2.280	0.250	2.500
1600	2.217	0.276	2.167	0.280	2.500
1800	2.185	0.294	2.166	0.289	2.500
2000	2.156	0.307	2.142	0.320	2.500
2100	2.144	0.320	2.075	0.314	2.500
2200	2.131	0.341	2.068	0.326	2.500
2300	2.112	0.347	2.047	0.362	2.500
2400	2.095	0.387	2.026	0.372	2.500
2500	2.076	0.395	2.040	0.379	2.500
2600	2.056	0.403	2.020	0.388	2.500
2700	2.036	0.412	1.986	0.417	2.500
2800	1.995	0.447	1.985	0.439	2.500
2900	1.956	0.449	1.931	0.433	2.500
3000	1.911	0.449	1.903	0.450	2.500


Modulation Limiting
Deviation (kHz)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
300
3000
FREQUENCY (Hz)
Instantaneous @+20dB
Instantaneous @-20dB
Steady-state @+20d
Steady-state @-20dB
limit

Audio Frequency Response

Carrier Frequency: 155.7525 MHz, Channel Separation=12.5 kHz

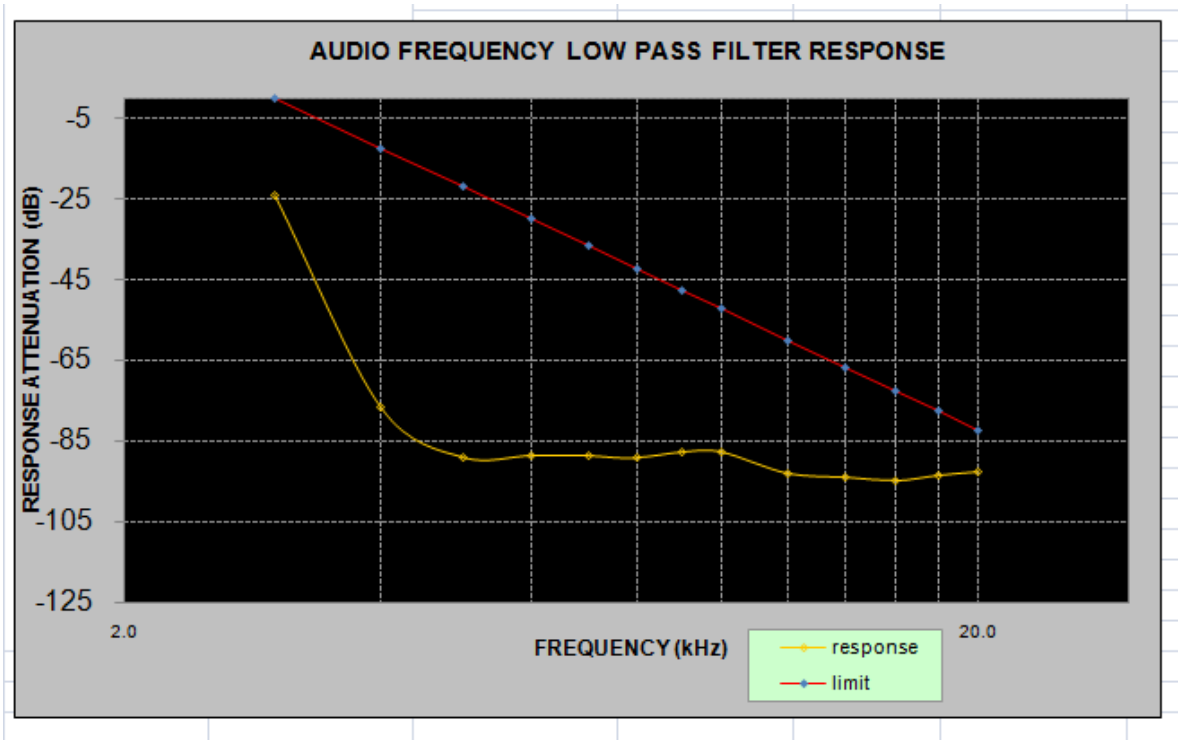
Audio Frequency (Hz)	Response Attenuation (dB)
300	-11.37
400	-7.62
500	-6.82
600	-4.32
700	-3.32
800	-1.81
900	-0.67
1000	0
1200	2.16
1400	3.50
1600	4.53
1800	5.58
2000	6.51
2100	6.97
2200	7.47
2300	7.77
2400	8.19
2500	8.53
2600	8.83
2700	9.22
2800	9.66
2900	10.04
3000	9.46


AUDIO FREQUENCY RESPONSE
RESPONSE ATTENUATION (dB)
10.00
5.00
0.00
-5.00
-10.00
-15.00
-20.00
300
3000
FREQUENCY (Hz)
response
limit 1
limit 2

Audio frequency lows pass filter response

Carrier Frequency: 155.7525 MHz, Channel Separation=12.5 kHz

Audio Frequency (kHz)	Response Attenuation (dB)	Limit (dB)
1.0	0.0	/
3.0	-24.0	0.0
4.0	-76.8	-12.5
5.0	-89.2	-22.2
6.0	-88.6	-30.1
7.0	-88.9	-36.8
8.0	-89.2	-42.6
9.0	-87.8	-47.7
10.0	-87.7	-52.3
12.0	-93.2	-60.2
14.0	-94.3	-66.9
16.0	-94.9	-72.7
18.0	-93.4	-77.8
20.0	-92.8	-82.5



FCC §2.1049 & §90.210 – OCCUPIED BANDWIDTH & EMISSION MASK

Applicable Standard

FCC §2.1049 and §90.210

Emission Mask D - 12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

1) For any frequency removed from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0, 0dB.

2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.626 kHz but no more than 12.5 kHz, at least 7.27 (f_d –2.88 kHz) dB.

3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz at least: At least 50 + 10 log (P) dB or 70 dB, whichever is the lesser attenuation.

Test Procedure

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

The resolution bandwidth of the spectrum analyzer was set at 100 Hz and the spectrum was recorded in the frequency band ±50 kHz from the carrier frequency.

Test Data

Environmental Conditions

Temperature:	25~26 ℃
Relative Humidity:	52~56 %
ATM Pressure:	101.0~101.2 kPa

The testing was performed by Kieron Luo from 2019-05-31 to 2019-07-25.

Modulation	Channel Separation (kHz)	Frequency (MHz)	Power Level	99% Occupied Bandwidth (kHz)	26 dB Emissions Bandwidth (kHz)
Analog	12.5	155.7525	0.5W	9.936	10.176
			1W	9.936	10.176
			2W	9.936	10.176
Digital	12.5	155.7525	0.5W	7.131	9.295
			1W	7.131	9.696
			2W	7.372	9.455
			3W	7.212	9.215

Note: Emission bandwidth was based on calculation method instead of measurement.

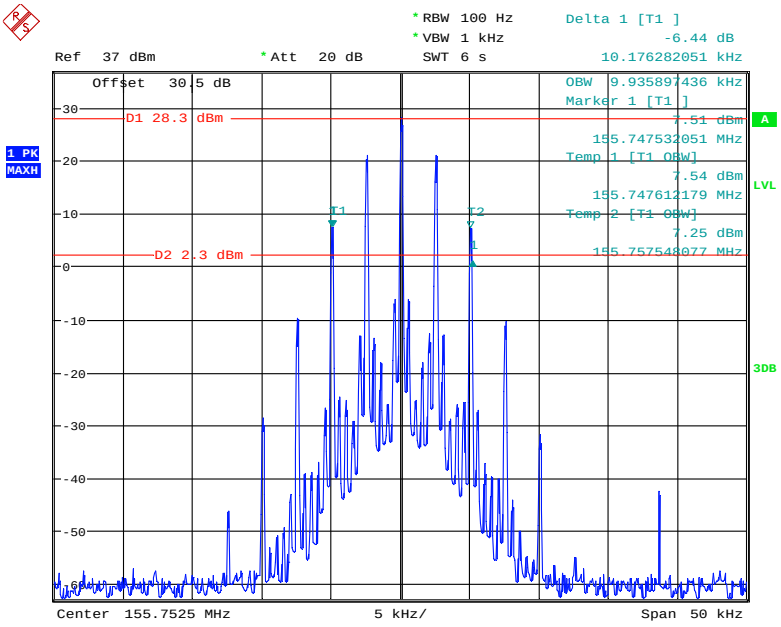
Emission Designator, Per CFR 47 §2.201& §2.202&, Bn = 2M + 2D

For FM Mode (Channel Spacing: 12.5 kHz)
Emission Designator 11K0F3E, In this case, the maximum modulating frequency is 3.0 kHz with a 2.5 kHz deviation. BW = 2(M+D) = 2*(3.0 kHz + 2.5 kHz) = 11 kHz → 11K0
F3E portion of the designator represents an FM voice transmission Therefore, the entire designator for 12.5 kHz channel spacing FM mode is 11K0F3E.

For Digital Mode (Channel Spacing: 12.5 kHz)
Emission Designator 7K60F1D and 7K60F1E
The 99% energy rule (title 47CFR 2.1049) was used for digital mode. It basically states that 99% of the modulation energy falls within X kHz, in this case, 7.60 kHz. The emission mask was obtained from 47CFR 90.210(d).
F1D and F1E portion of the designator indicates digital information.
Therefore, the entire designator for 12.5 kHz channel spacing digital mode is 7K60F1D and 7K60F1E.

Analog Modulation:

Frequency 155.7525 MHz: 99% Occupied & 26 dB Bandwidth, Power Level 0.5W



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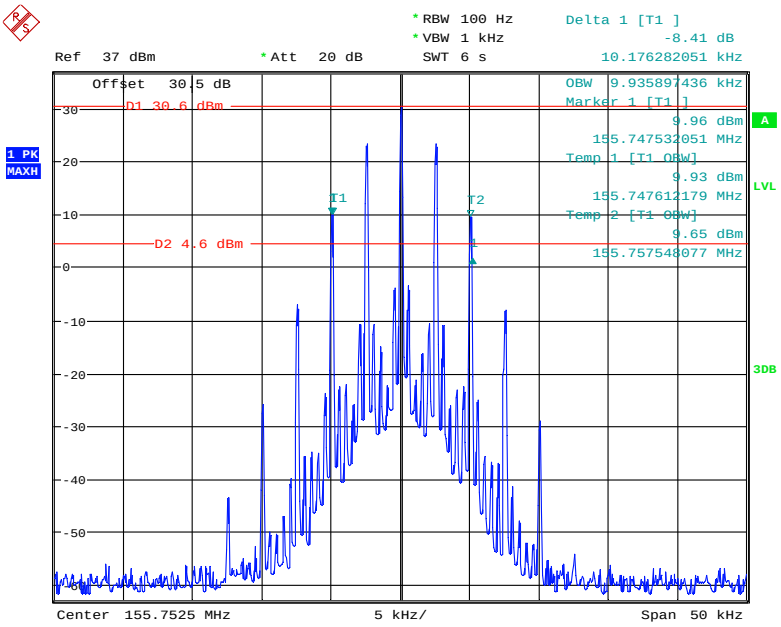
Frequency 155.7525 MHz: 99% Occupied & 26 dB Bandwidth, Power Level 1W



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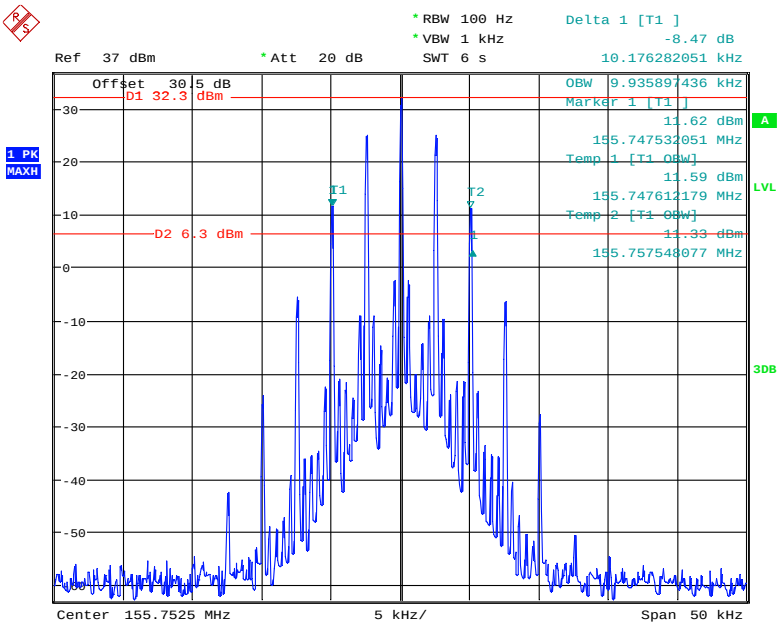
Frequency 155.7525 MHz: 99% Occupied & 26 dB Bandwidth, Power Level 2W



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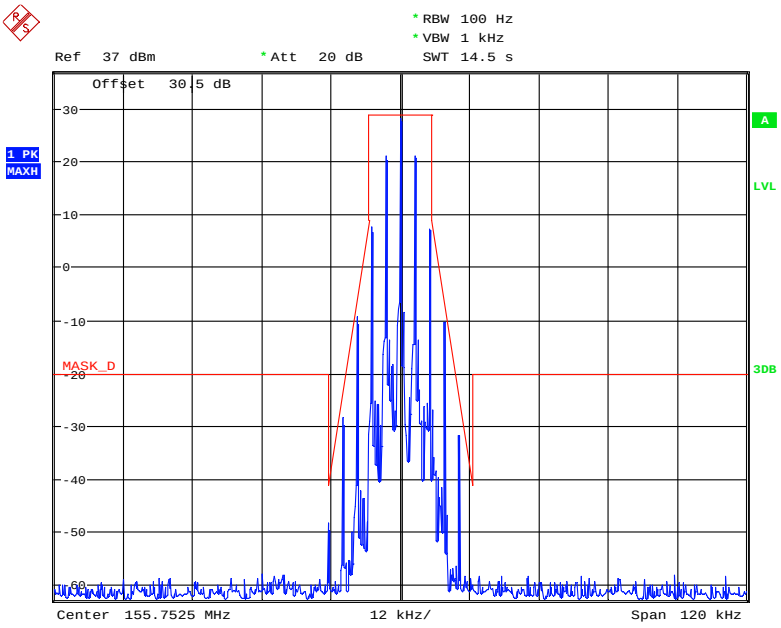
Frequency 155.7525 MHz: Emission Mask, Power Level 0.5W



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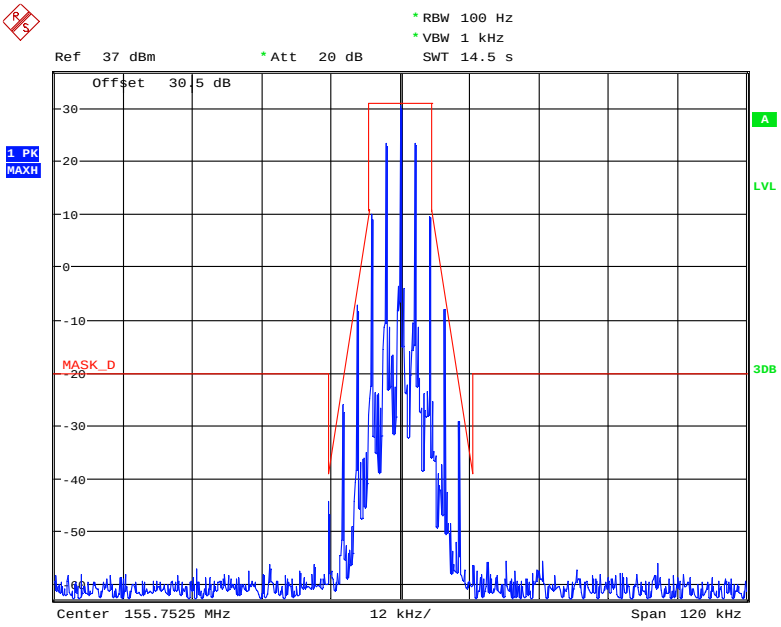
Frequency 155.7525 MHz: Emission Mask, Power Level 1W



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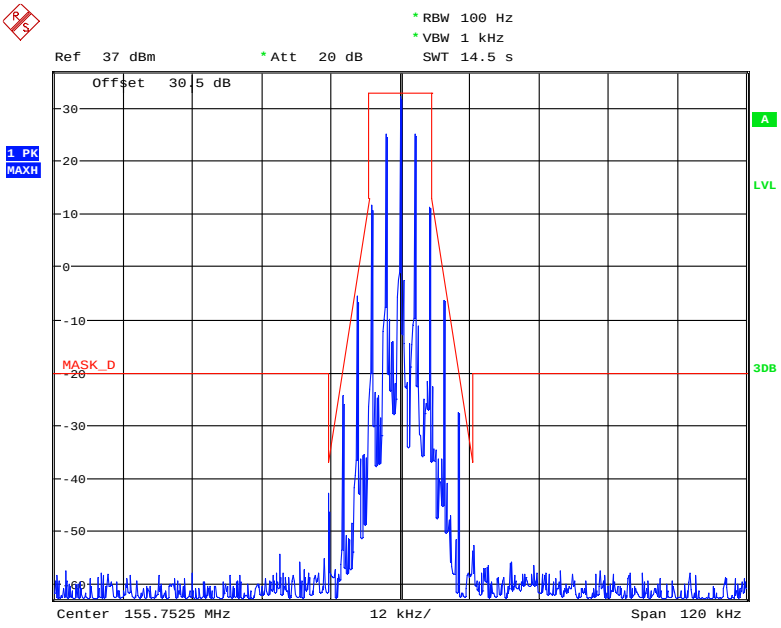
Frequency 155.7525 MHz: Emission Mask, Power Level 2W



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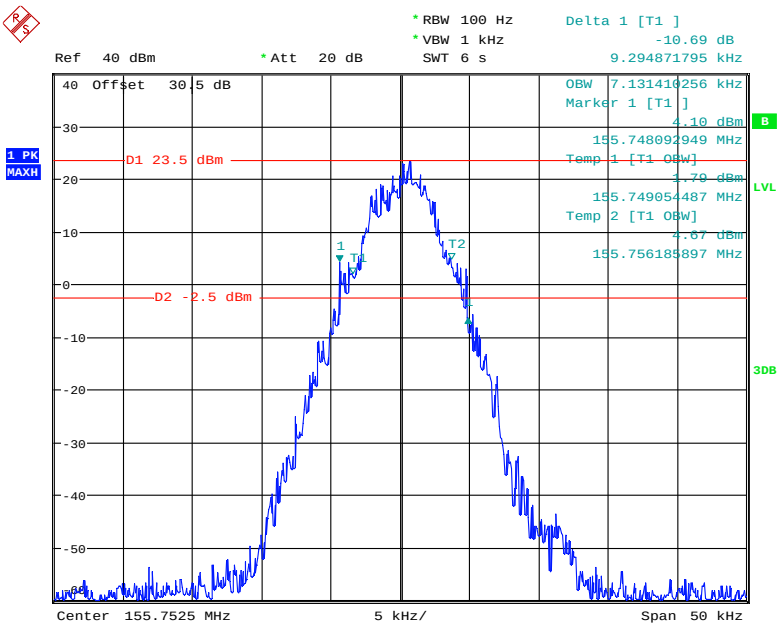
Digital Modulation:

Frequency 155.7525 MHz: 99% Occupied & 26 dB Bandwidth, Power Level 0.5W



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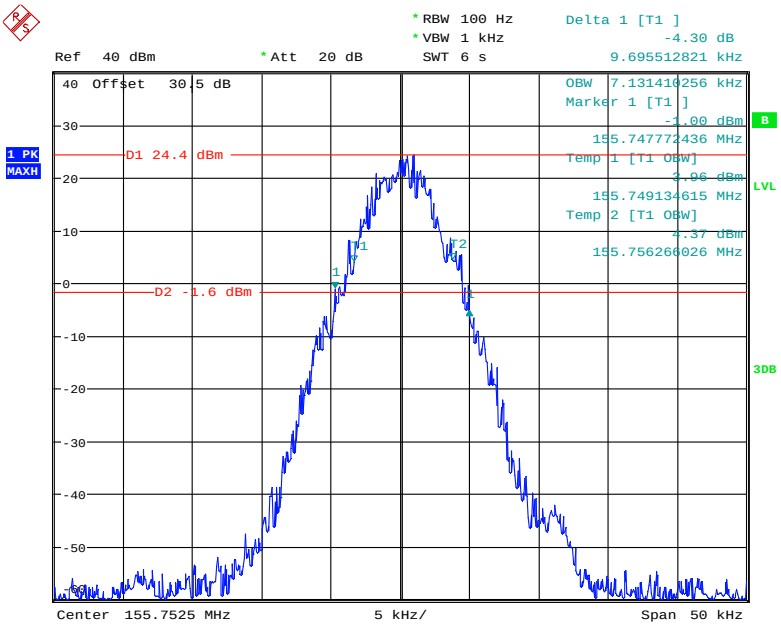
Frequency 155.7525 MHz: 99% Occupied & 26 dB Bandwidth, Power Level 1W



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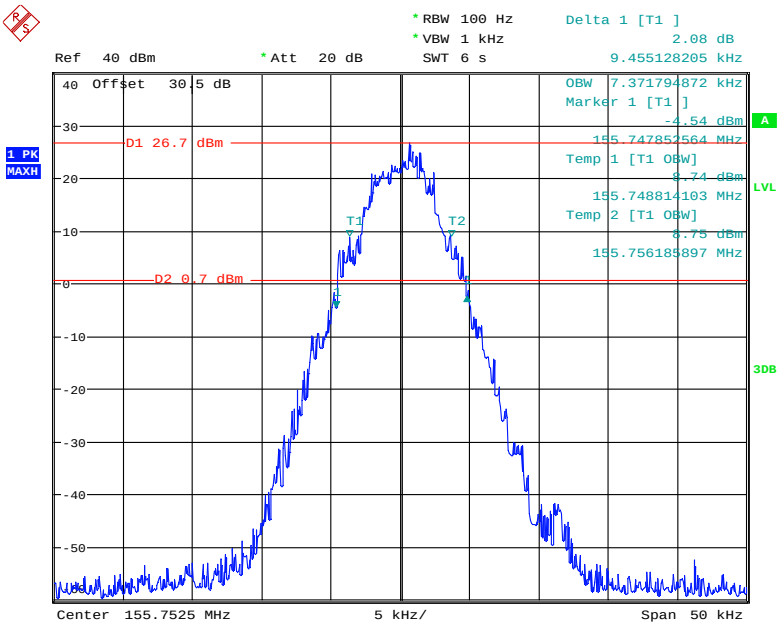
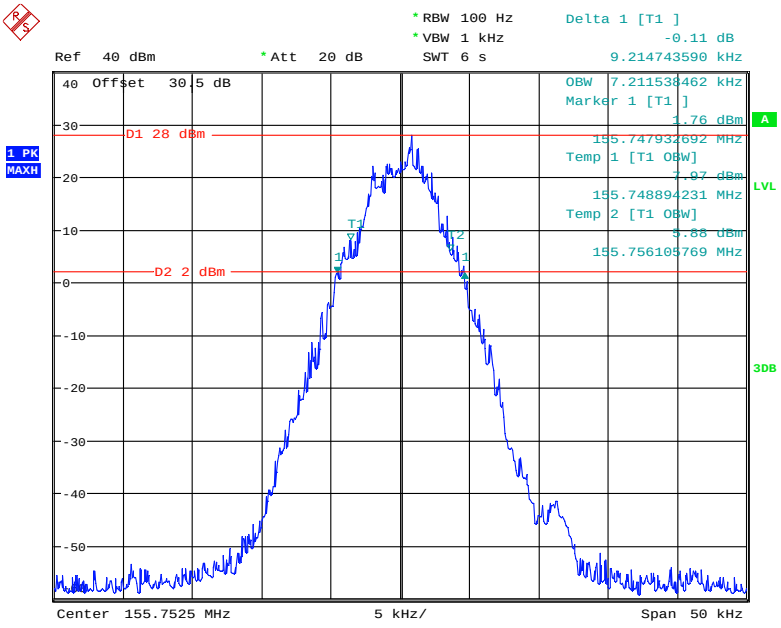
Frequency 155.7525 MHz: 99% Occupied & 26 dB Bandwidth, Power Level 2W



Date: 25.JUL.2019 14:31:27

Frequency 155.7525 MHz: 99% Occupied & 26 dB Bandwidth, Power Level 3W



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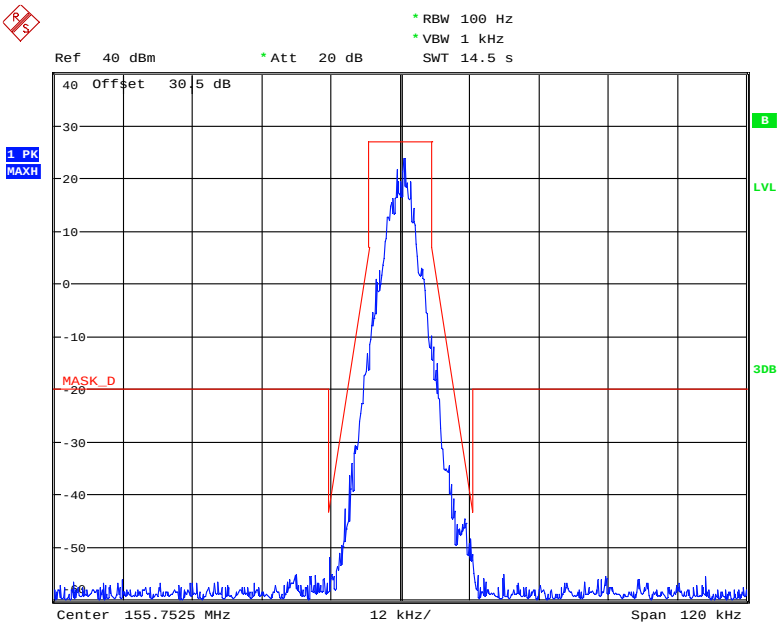
Frequency 155.7525 MHz: Emission Mask, Power Level 0.5W



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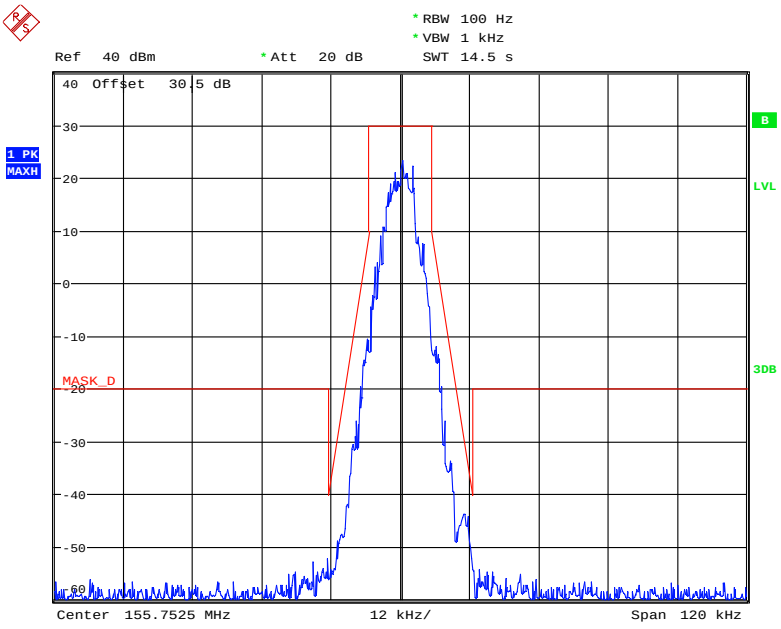

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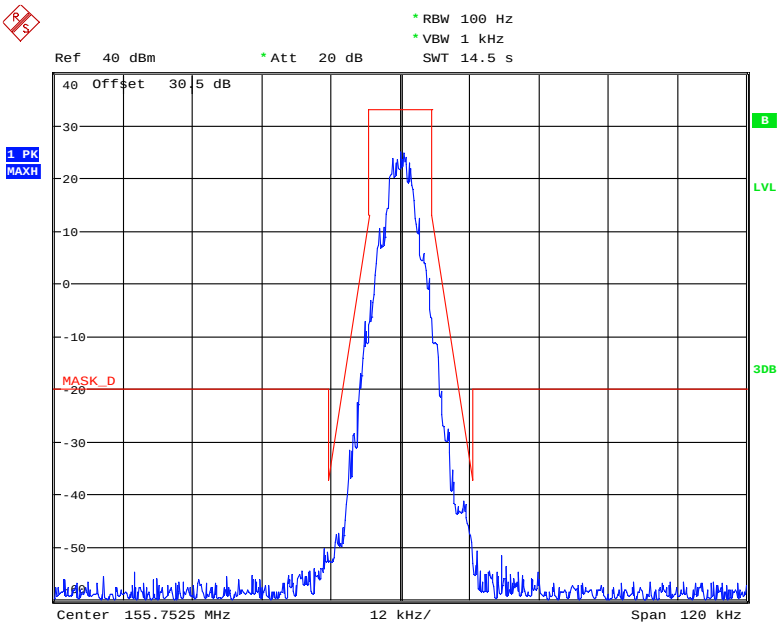

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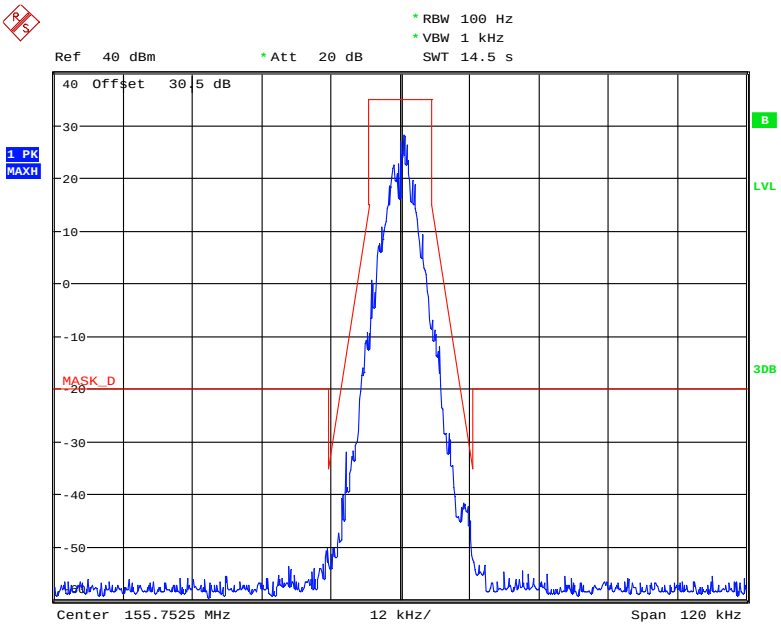
Frequency 155.7525 MHz: Emission Mask, Power Level 3W



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FCC §2.1051 & §90.210 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standard

Emission Mask D—12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

1) For any frequency removed from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0, 0 dB.

2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.626 kHz but no more than 12.5 kHz, at least 7.27 (f_d –2.88 kHz) dB.

3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz: At least 50 + 10 log (P) dB or 70 dB, whichever is the lesser attenuation.

Test Procedure

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100kHz for below 1GHz, and 1MHz for above 1GHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

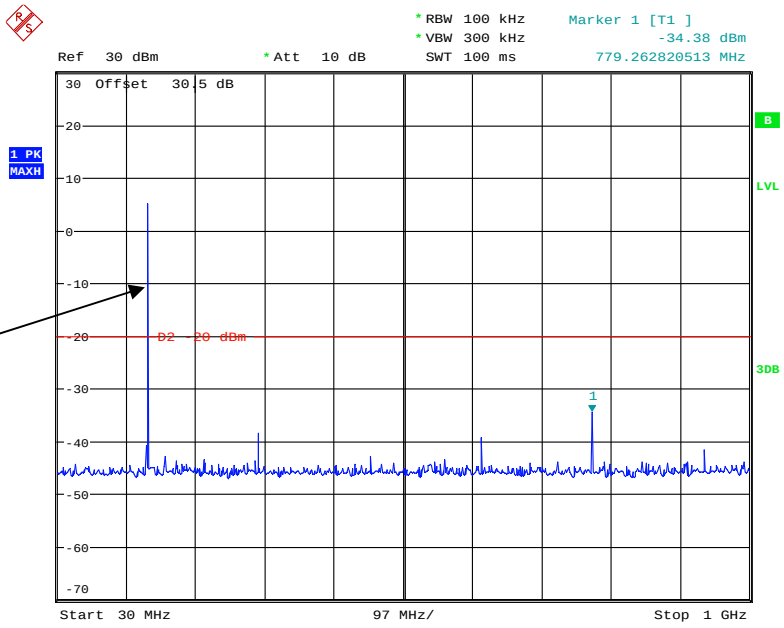
The testing was performed by Kieron Luo on 2019-05-31.

Test Mode: Transmitting, please refer to the following plots.

Note: High power level and middle channel was tested.

Analog Modulation:

30MHz – 1 GHz, Spacing Channel 12.5 kHz



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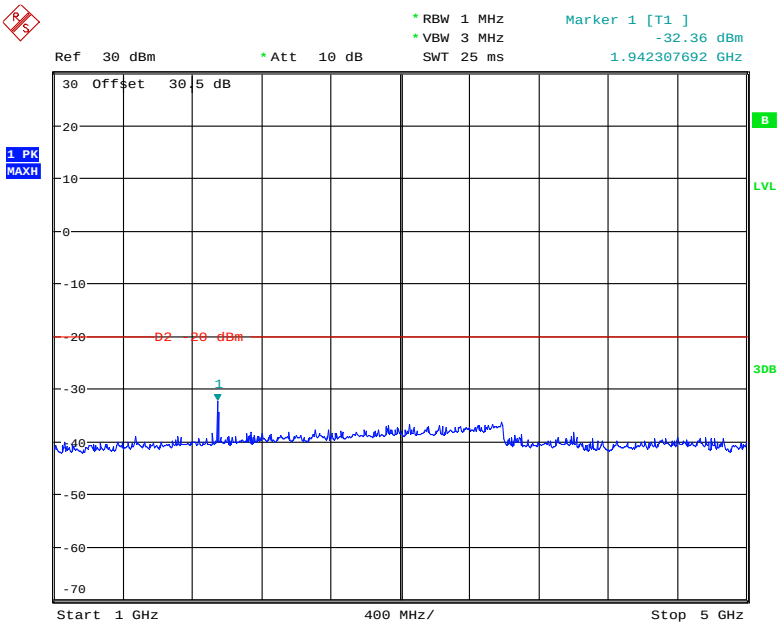
1 GHz – 5 GHz, Spacing Channel 12.5 kHz



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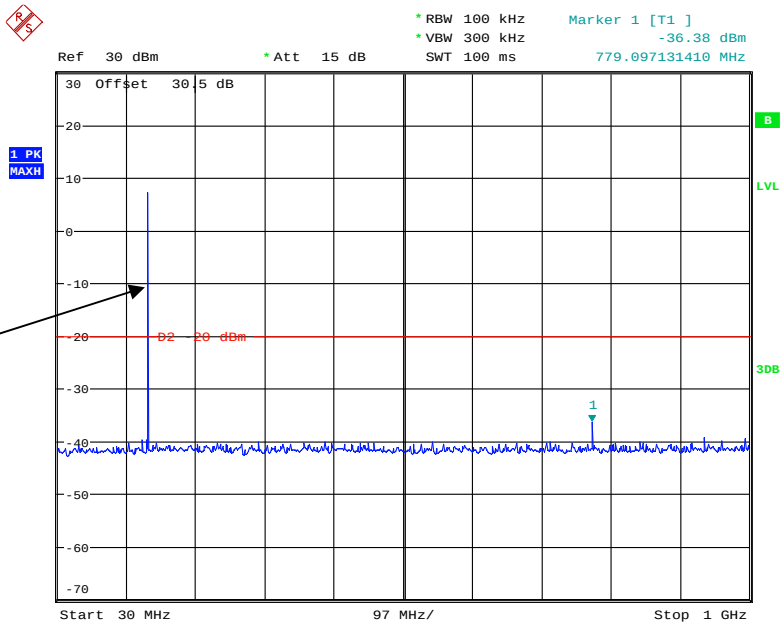
Digital Modulation:

30MHz – 1 GHz, Spacing Channel 12.5 kHz



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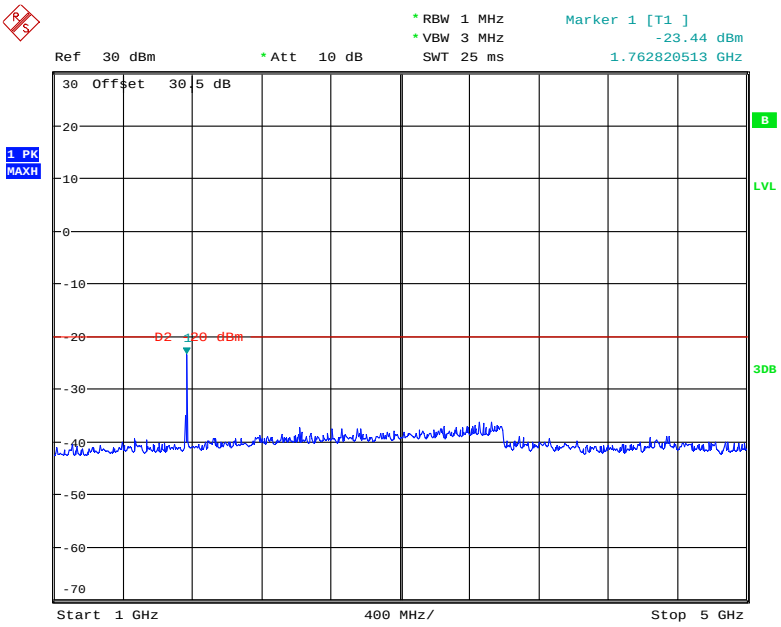
1 GHz – 5 GHz, Spacing Channel 12.5 kHz



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FCC §2.1053 & §90.210 - RADIATED SPURIOUS EMISSIONS

Applicable Standard

FCC §2.1053 and §90.210

Test Procedure

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

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

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

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

Spurious emissions in dB =10 1g (TXpwr in Watts/0.001)-the absolute level

Spurious attenuation limit in dB =50+10 Log_{10} (power out in Watts) for EUT with a 12.5 kHz channel bandwidth.

Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	54 %
ATM Pressure:	101.0 kPa

The testing was performed by Alan He and Andy Yu on 2019-05-28.

Test Mode: Transmitting

Note: High power level and middle channel was tested.

30MHz - 2GHz:

Frequency (MHz)	Receiver Reading (dBμV)	Turn Table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
Analog Modulation 155.7525MHz										
311.51	42.08	8	2	H	-59.4	0.71	0	-60.11	-20	40.11
311.51	55.37	355	1.1	V	-44.5	0.71	0	-45.21	-20	25.21
467.26	27.15	344	2.3	H	-69.8	0.91	0	-70.71	-20	50.71
467.26	39.01	305	1.7	V	-56.3	0.91	0	-57.21	-20	37.21
623.01	41.62	68	2.4	H	-55.3	1.08	0	-56.38	-20	36.38
623.01	46.23	91	2.4	V	-49	1.08	0	-50.08	-20	30.08
778.76	49.93	342	2.5	H	-47	1.3	0	-48.30	-20	28.30
778.76	51.68	53	1.2	V	-43.6	1.3	0	-44.90	-20	24.90
934.52	45.41	30	1.7	H	-51.5	1.37	0	-52.87	-20	32.87
934.52	47.65	7	1.6	V	-47.6	1.37	0	-48.97	-20	28.97
1090.27	43.83	187	2.0	H	-64.9	1.60	6.20	-60.30	-20	40.30
1090.27	43.38	252	1.9	V	-66.2	1.60	6.20	-61.60	-20	41.60
Digital Modulation 155.7525MHz										
311.51	34.19	124	1.2	H	-67.3	0.71	0	-68.01	-20	48.01
311.51	47.6	282	2.3	V	-52.3	0.71	0	-53.01	-20	33.01
467.26	30.67	149	1.2	H	-66.3	0.91	0	-67.21	-20	47.21
467.26	36.06	194	1.3	V	-59.3	0.91	0	-60.21	-20	40.21
623.01	36.13	339	1.9	H	-60.8	1.08	0	-61.88	-20	41.88
623.01	40.8	320	1.4	V	-54.4	1.08	0	-55.48	-20	35.48
778.76	51.25	35	2.5	H	-45.7	1.3	0	-47.00	-20	27.00
778.76	52.66	209	2.5	V	-42.6	1.3	0	-43.90	-20	23.90
934.52	39.86	254	2.2	H	-57.1	1.37	0	-58.47	-20	38.47
934.52	41.81	48	1.2	V	-53.4	1.37	0	-54.77	-20	34.77
1090.27	45.46	221	1.6	H	-63.3	1.60	6.20	-58.70	-20	38.70
1090.27	44.14	15	1.1	V	-65.4	1.60	6.20	-60.80	-20	40.80

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

FCC §2.1055 & §90.213 - FREQUENCY STABILITY

Applicable Standard

FCC §2.1055 and §90.213

Test Procedure

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

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the counter.

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Kieron Luo on 2019-06-04.

Test Mode: Transmitting

Reference Frequency: 155.7525MHz, Limit: ±5.0 ppm, Analog 12.5 kHz			
Test Environment		Frequency Measure with Time Elapsed	
Temperature (℃)	Power Supplied (V_{DC})	Measured Frequency error (MHz)	Frequency Error (ppm)
Frequency Stability versus Input Temperature			
50	3.7	155.752568	0.44
40	3.7	155.752581	0.52
30	3.7	155.752578	0.50
20	3.7	155.752568	0.44
10	3.7	155.752573	0.47
0	3.7	155.752575	0.48
-10	3.7	155.752581	0.52
-20	3.7	155.752576	0.49
-30	3.7	155.752581	0.52
Frequency Stability versus Input Voltage			
20	3.3	155.752576	0.49

Reference Frequency: 155.7525MHz, Limit: ±5.0 ppm, Digital 12.5 kHz			
Test Environment		Frequency Measure with Time Elapsed	
Temperature (℃)	Power Supplied (V_{DC})	Measured Frequency error (MHz)	Frequency Error (ppm)
Frequency Stability versus Input Temperature			
50	3.7	155.752546	0.30
40	3.7	155.752549	0.31
30	3.7	155.752560	0.39
20	3.7	155.752553	0.34
10	3.7	155.752550	0.32
0	3.7	155.752541	0.26
-10	3.7	155.752545	0.29
-20	3.7	155.752561	0.39
-30	3.7	155.752541	0.26
Frequency Stability versus Input Voltage			
20	3.3	155.752545	0.29

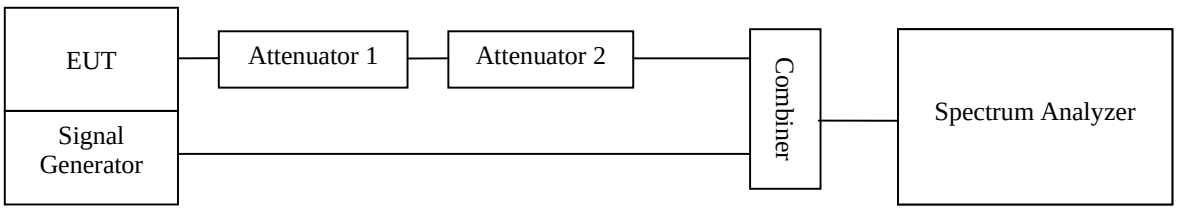
FCC §90.214 - TRANSIENT FREQUENCY BEHAVIOR

Applicable Standard

Regulations: FCC §90.214
Test method: TIA-603-D 2010, section 2.2.19.3

Test Procedure

a) Connect the EUT and test equipment as shown on the following block diagram.
b) Set the Spectrum Analyzer to measure FM deviation, and tune the RF frequency to the transmitter assigned frequency.
c) Set the signal generator to the assigned transmitter frequency and modulate it with a 1 kHz tone at ±12.5 kHz deviation and set its output level to -100dBm.
d) Turn on the transmitter.
e) Supply sufficient attenuation via the RF attenuator to provide an input level to the Spectrum Analyzer that is 40 dB below the maximum allowed input power when the transmitter is operating at its rated power level. Note this power level on the Spectrum Analyzer as P_0.
f) Turn off the transmitter.
g) Adjust the RF level of the signal generator to provide RF power equal to P_0. This signal generator RF level shall be maintained throughout the rest of the measurement.
h) Remove the attenuation 1, so the input power to the Spectrum Analyzer is increased by 30 dB when the transmitter is turned on.
i) Adjust the vertical amplitude control of the spectrum analyzer to display the 1000 Hz at ±4 divisions vertically centered on the display. Set trigger mode of the Spectrum Analyzer to "Video", and tune the "trigger level" on suitable level. Then set the "tiger offset" to -10ms for turn on and -15ms for turn off.
j) Turn on the transmitter and the transient wave will be captured on the screen of Spectrum Analyzer. Observe the stored display. The instant when the 1 kHz test signal is completely suppressed is considered to be t_{on}. The trace should be maintained within the allowed divisions during the period t_1 and t_2.
k) Then turn off the transmitter, and another transient wave will be captured on the screen of Spectrum Analyzer. The trace should be maintained within the allowed divisions during the period t_3.



Test Data

Environmental Conditions

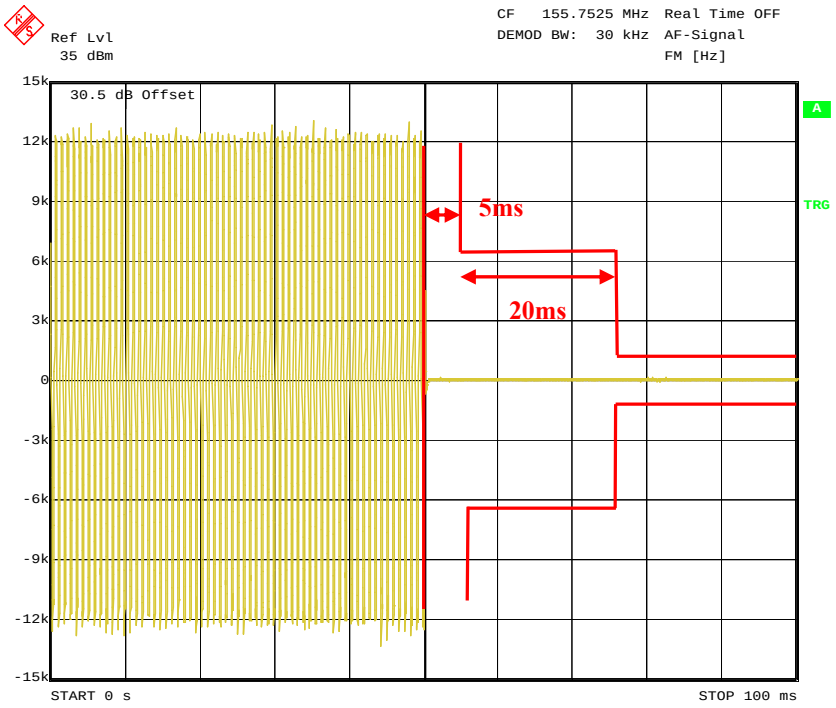
Temperature:	25 ℃
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Kieron Luo on 2019-06-04.

Channel Separation (kHz)	Transient Period (ms)	Transient Frequency	Result
12.5	5 (t1)	<+/-12.5 kHz	Pass
	20(t2)	<+/-6.25 kHz	
	5 (t3)	<+/-12.5 kHz	

Please refer to the following plots.

Turn on



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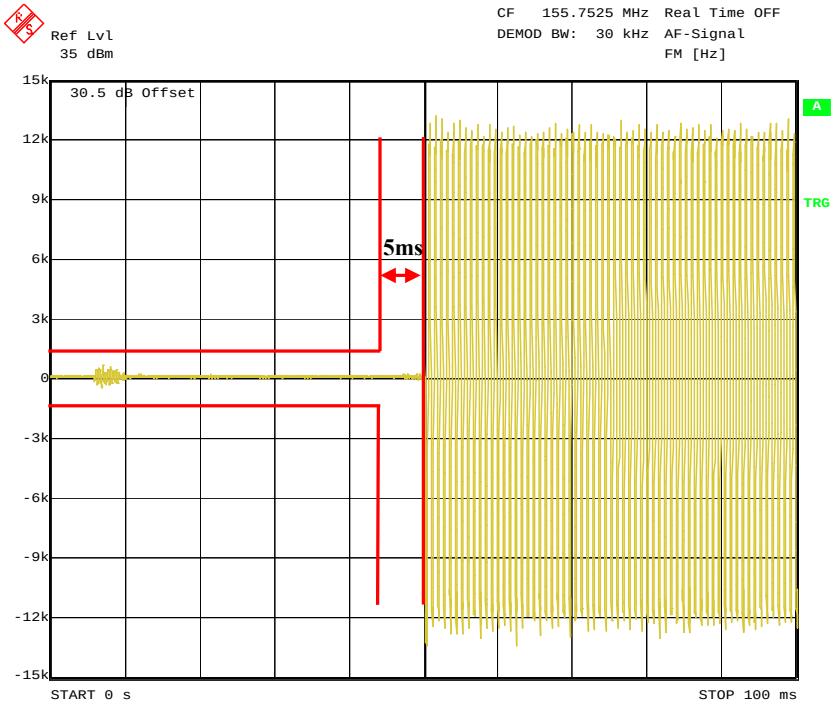
Turn off



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