SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD. FCC ID: 2ADQZTPD5X

Report No.: LCS1412030188E

RADIO TEST REPORT

For

Quanshun Communication Technology Co., Ltd DMR Digital Portable Radio Test Model: D5X

Prepared for Address Quanshun Communication Technology Co., Ltd Quanshun Bldg., Daxiamei, Nan'an, Quanzhou, Fujian, China 362302

Prepared by Address

Tel Fax Web Mail

Date of receipt of test sample Number of tested samples Serial number Date of Test Date of Report Shenzhen LCS Compliance Testing Laboratory Ltd. 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China (+86)755-82591330 (+86)755-82591332 www.LCS-cert.com webmaster@LCS-cert.com

May 15, 2016 1 D5X May 15, 2016 ~ June 11, 2016 June 25, 2016

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Report No.: LCS1412030188E SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD. FCC ID: 2ADQZTPD5X

	RADIO TEST REPORT FCC Part 90
Report Reference No	: LCS1412030188E
Date of Issue	: June 25, 2016
Testing Laboratory Name	: Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	: 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure	 Full application of Harmonised standards Partial application of Harmonised standards Other standard testing method
Applicant's Name	: Quanshun Communication Technology Co., Ltd
Address	: Quanshun Bldg., Daxiamei, Nan'an, Quanzhou, Fujian, China 362302
Test Specification	13 13 13 13 13
Standard	: FCC Part 90/FCC Part 2/FCC Part 15B
Test Report Form No	: LCSEMC-1.0
Y 25 Y 25	CSEMC-1.0Shenzhen LCS Compliance Testing Laboratory Ltd.
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Aking Jin/ File administrators

Glin Lu/ Technique principal

Gavin Liang/ Manager

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RADIO -- TEST REPORT

Test Report No. : LCS1412030188E

June 25, 2016 Date of issue

Test Model	: D5X	ICS.	LC13	LCS
EUT	: DMR Digital	Portable Radio		J.C.
Applicant	: Quanshun C	ommunication Tech	nology Co., Lt	d
Address	: Quanshun Bl 362302	ldg., Daxiamei, Nan'	an, Quanzhou,	Fujian, China
Telephone	:/			63
Fax	:/5			LES
Manufacturer	: Quanshun C	ommunication Tech	nology Co., Lt	d
Address	: Quanshun Bl 362302	ldg., Daxiamei, Nan'	an, Quanzhou,	Fujian, China
Telephone	:/			00
Fax	:/ 565			3 5
Factory	: Quanshun C	ommunication Tech	nology Co., Lt	d
Address	: Quanshun Bl 362302	dg., Daxiamei, Nan'	'an, Quanzhou,	Fujian, China
Telephone				CS.
Fax	:/			BCS
				6.5)

Test Result

Positive

The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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Revision	Issue Date	Revisions	Revised By
00	2016-06-08	Initial Issue	Gavin Liang
165	163	100 C200	65 65
5 . 3	203	63 5	B Bio

Revision History

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FCC ID: 2ADQZTPD5X

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1. GENERAL INFORMATION

1.1. Product Description for Equipment Under Test (EUT)

EUT	: DMR Digital Portable Radio
Test Model	: D5X
Power Supply	: DC 7.4V by Lithium ion polymer battery(1650mAh)
	Recharged by DC 8.4V/400mA
Hardware Version	: TP-D5X UHF-V1.X
Software Version	: TP-D5X V1.00
Frequency Range	: 400MHz-470MHz
Channel Separation	: Analog Voice 12.5KHz
	Digital Voice/Data 12.5KHz
	Digital Data 12.5KHz
Modulation Type	: FM for Analog Voice
	4FSK for Digital Voice/Digital Data
	4FSK for Digital Data
Emission Designator	: 11K0F3E for FM Modulation at 12.5KHz Channel Separation
	7K60FXD for Digital Data only at 12.5KHz Channel Separation
	7K60FXW for Digital Data & Digital Voice at 12.5KHz Channel Separation
Antenna Description	: External, 0dBi (Max)
Rated Power	: 4Wattes/1Watts

Note: The product has the same digital working characters when operating in both two digitized voice/data mode. So only one set of test results for digital modulation modes are provided in this test report.

1.2. Objective

The tests were performed according to following standards: <u>FCC Rules Part 90: 2015</u>: PRIVATE LAND MOBILE RADIO SERVICES. <u>47 CFR FCC Part 15 Subpart B: 2015</u> - Unintentional Radiators <u>FCC Part 2</u>: FREQUENCY ALLOCA-TIONS AND RADIO TREATY MAT-TERS; GENERAL RULES AND REG-ULATIONS <u>TIA/EIA 603 D: June 2014</u>: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

1.3. Related Submittal(s)/Grant(s)

No Related Submittals.

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1.4. Description of Test Facility

CNAS Registration Number. is L4595. FCC Registration Number. is 899208. Industry Canada Registration Number. is 9642A-1. VCCI Registration Number. is C-4260 and R-3804. ESMD Registration Number. is ARCB0108. UL Registration Number. is 100571-492. TUV SUD Registration Number. is SCN1081. TUV RH Registration Number. is UA 50296516-001

1.5. Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate
Quanshun Communication Technology Co., Ltd	Adapter	BC-50A	e3	CE
Quanshun Communication Technology Co., Ltd	Charger	BC-50D	33	CE

1.6. External I/O

I/O Port Description	Quantity	Cable
Microphone Jack	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	N/A
Earphone Jack	9 ag 1 9 ag	N/A
Battery Pole Piece	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	N/A

1.7. Measurement Uncertainty

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

Test Items	Measurement Uncertainty	Notes	
Frequency stability	30 Hz	(1)	
Transmitter power conducted	0.62 dB	(1)	
Transmitter power Radiated	2.67 dB	(1)	
Conducted spurious emission 9KHz-40 GHz	1.88 dB	(1)	
Conducted Emission 9KHz-30MHz	1.63 dB	(1)	
Radiated Emission 30~1000MHz	4.65 dB	(1)	
Radiated Emission 1~18GHz	3.89 dB	(1)	
Radiated Emission 18-40GHz	3.90 dB	(1)	
Occupied Bandwidth	Pro-	(1)	
Emission Mask	· C	(1)	
Modulation Characteristic	Barren Bo	(1)	
Transmitter Frequency Behavior	0. <u>Cc</u>	(1)	

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

1.8. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

1.9. Description Of Test Modes

The EUT has been tested under typical operating condition and The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

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EUT operation mode no.	Description of operation mode	Additional information
Op 1	FM+BW12.5KHz+TX	The equipment is set with FM modulation and 12.5KHz bandwidth at maximum rated power for transmitter, powered by DC 7.40V
Op 2	FM+BW12.5KHz+TX	The equipment is set with FM modulation and 12.5KHz bandwidth at minimum rated power for transmitter, powered by DC 7.40V
Op 3	4FSK+BW12.5KHz+TX	The equipment is set with 4FSK modulation and 12.5KHz bandwidth at maximum rated power for transmitter, powered by DC 7.40V
Op 4	4FSK+BW12.5KHz+TX	The equipment is set with 4FSK modulation and 12.5KHz bandwidth at minimum rated power for transmitter, powered by DC 7.40V
Op 5	FM+BW12.5KHz+RX (Standby)	The equipment is set with FM modulation and 12.5KHz bandwidth at Receiver/Standby mode, powered by DC 7.40V(or for charging mode for AC conducted emission)
Op 6	4FSK+BW12.5KHz+RX (Standby)	The equipment is set with 4FSK modulation and 12.5KHz bandwidth at Receiver/Standby mode, powered by DC 7.40V(or for charging mode for AC conducted emission)

Test frequency list

	Channel	Test Channel	Test Frequency (MHz)	
Modulation Type	Separation	Test Channel	ТХ	RX
200	D'ag	Ch1	406.125	406.125
Analog/FM	12.5KHz	Ch2	456.125	456.125
5 6.0	5 68	Ch3	469.975	469.975
S S	3. 10-	Ch4	406.125	406.125
Digital/4FSK	12.5KHz	Ch5	456.125	456.125
25		Ch6	469.975	469.975

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2. SYSTEM TEST CONFIGURATION

2.1. Justification

The system was configured for testing in engineering mode.

2.2. EUT Exercise Software

N/A.

2.3. Special Accessories

N/A.

2.4. Block Diagram/Schematics

Please refer to the related document.

2.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

2.6. Configuration of Test Setup

Please refer to the test setup photo.

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3. SUMMARY OF TEST RESULT

Test specification clause	Test case	Verdict
FCC Part 15.107	Conducted Emission	PASS
FCC Part 90.205	Maximum Transmitter Power	PASS
FCC Part 90.207	Modulation Characteristic	PASS
FCC Part 90.209	Occupied Bandwidth	PASS
FCC Part 90.210	Emission Mask	PASS
FCC Part 90.213	Frequency Stability	PASS
FCC Part 90.214	Transmitter Frequency Behavior	PASS
FCC Part 90.210	Transmitter Radiated Spurious Emission	PASS
FCC Part 90.210	Spurious Emission On Antenna Port	PASS

Remark:

1. The measurement uncertainty is not included in the test result.

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4. TEST CONDITIONS AND RESULTS

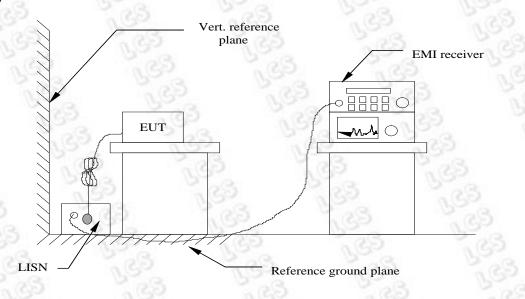
4.1. Conducted Emissions Test

TEST APPLICABLE

The EUT was tested according to ANSI C63.4 - 2014. The frequency spectrum from 0.15 MHz to 30 MHz was investigated. The LISN used was 50 ohm / 50 u Henry as specified by section 5.1 of ANSI C63.4 - 2014. Cables and peripherals were moved to find the maximum emission levels for each frequency.

TEST CONFIGURATION

For AC Power



TEST PROCEDURE

- 1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4-2014.
- 2 Support equipment, if needed, was placed as per ANSI C63.4-2014.
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4-2014.
- 4 If a EUT received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5 All support equipments received AC power from a second LISN, if any.
- 6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8 During the above scans, the emissions were maximized by cable manipulation.

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Conducted Power Line Emission Limit

For intentional device, according to § 15.207(a) and RSS-Gen Section 7.2.4 for AC Power Conducted Emission Limits is as following:

F		Maximum RF L	ine Voltage (dBµV)		
Frequency (MHz)	CLA	ASS A	CLA	ASS B	
(MHZ)	Q.P.	Ave.	Q.P.	Ave.	
0.15 - 0.50	79	66	66-56*	56-46*	
0.50 - 5.00	73	60	56	46	
5.00 - 30.0	73	60	60	50	

* Decreasing linearly with the logarithm of the frequency

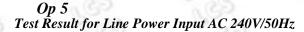
TEST RESULTS

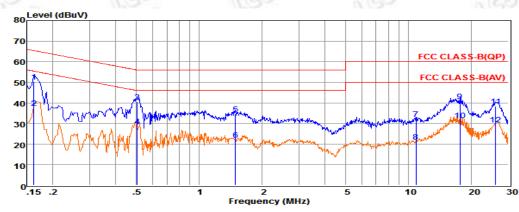
Remark:

1. We tested all Op 5 to Op 6, recorded worst case at Op 5.Please Refer to the following page.

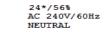
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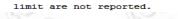


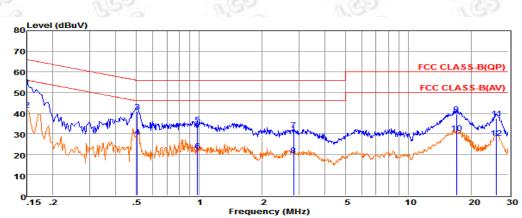
Env. Ins: Power Rating: Pol:



Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark
MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1 0.16241	30.51	9.67	0.02	10.00	50.20	65.34	-15.14	QP
2 0.16251	17.91	9.67	0.02	10.00	37.60	55.33	-17.73	Average
3 0.50469	20.83	9.62	0.04	10.00	40.49	56.00	-15.51	QP
4 0.50479	8.90	9.62	0.04	10.00	28.56	46.00	-17.44	Average
5 1.48743	14.94	9.63	0.05	10.00	34.62	56.00	-21.38	QP
6 1.48843	2.30	9.63	0.05	10.00	21.98	46.00	-24.02	Average
710.84735	12.18	9.72	0.08	10.00	31.98	60.00	-28.02	QP
810.84835	1.41	9.72	0.08	10.00	21.21	50.00	-28.79	Average
917.56779	20.80	9.79	0.11	10.00	40.70	60.00	-19.30	QP
1017.56879	11.70	9.79	0.11	10.00	31.60	50.00	-18.40	Average
1126.13933	18.36	9.83	0.13	10.00	38.32	60.00	-21.68	QP
1226.14033	9.58	9.83	0.13	10.00	29.54	50.00	-20.46	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac. 2. The emission levels that are 20dB below the official





Env. Ins:		24	*/56%
Power Rat:	ing:	AC	240V/60Hz
Pol:		NEU	JTRAL
	Freq	Reading	LisnFac C

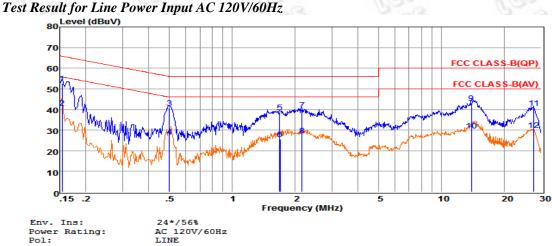
Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark
MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1 0.15000	32.93	9.70	0.02	10.00	52.65	66.00	-13.35	QP
2 0.15010	21.81	9.70	0.02	10.00	41.53	55.99	-14.46	Average
3 0.50469	21.14	9.62	0.04	10.00	40.80	56.00	-15.20	QP
4 0.50479	8.97	9.62	0.04	10.00	28.63	46.00	-17.37	Average
5 0.98391	14.87	9.63	0.05	10.00	34.55	56.00	-21.45	QP
6 0.98401	2.11	9.63	0.05	10.00	21.79	46.00	-24.21	Average
7 2.82398	12.01	9.64	0.06	10.00	31.71	56.00	-24.29	QP
8 2.82498	-0.16	9.64	0.06	10.00	19.54	46.00	-26.46	Average
916.92817	19.76	9.76	0.11	10.00	39.63	60.00	-20.37	QP
1016.92917	10.36	9.76	0.11	10.00	30.23	50.00	-19.77	Average
1126.27819	17.52	9.83	0.13	10.00	37.48	60.00	-22.52	QP
1226.27919	8.11	9.83	0.13	10.00	28.07	50.00	-21.93	Average
Remarks: 1. 2.			-	isn Factor at are 20d1			_	

limit are not reported.

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Remark

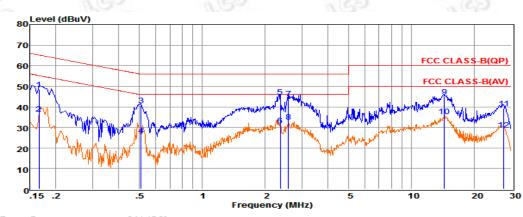




Freq Reading LisnFac CabLos Atten_Fac Measured Limit Over

MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1 0.15403 2 0.15413 3 0.50203 4 0.50213	33.18 21.02 21.20 7.11	9.58 9.58 9.62 9.62	0.02 0.02 0.04 0.04	10.00 10.00 10.00 10.00	52.78 40.62 40.86 26.77	65.78 55.77 56.00 46.00	-13.00 -15.15 -15.14 -19.23	QP Average QP Average
5 1.68913 6 1.69013 7 2.15531 8 2.15631 913.91464 1013.91564 1127.56162 1227.56262	19.12 5.99 20.30 7.69 23.34 10.02 20.90 10.12	9.64 9.64 9.64 9.71 9.71 9.71 9.71	0.05 0.05 0.05 0.10 0.10 0.14 0.14	10.00 10.00 10.00 10.00 10.00 10.00 10.00	38.81 25.68 39.99 27.38 43.15 29.83 40.75 29.97	56.00 46.00 56.00 46.00 60.00 50.00 60.00 50.00	-17.19 -20.32 -16.01 -18.62 -16.85 -20.17 -19.25 -20.03	QP Average QP Average QP Average QP Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac. 2. The emission levels that are 20dB below the official limit are not reported.



Env. Ins: Power Rating: Pol:

24*/56% AC 120V/60Hz NEUTRAL

Reading LisnFac CabLos Atten_Fac Measured Limit Freq Over Remark

MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
MHz 1 0.16589 2 0.16599 3 0.51007 4 0.51017 5 2.35845 6 2.35945 7 2.58074 8 2.58174 914.36409	dBuV 28.87 16.96 21.01 6.51 25.29 11.39 24.24 12.96 25.03	dB 9.66 9.62 9.62 9.64 9.64 9.64 9.64 9.64 9.64 9.74	dB 0.02 0.02 0.04 0.05 0.05 0.05 0.05 0.10	dB 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00	dBuV 48.55 36.64 40.67 26.17 44.98 31.08 43.93 32.65 44.87	dBuV 65.16 55.16 56.00 46.00 56.00 46.00 56.00 46.00 60.00	dB -16.61 -18.52 -15.33 -19.83 -11.02 -14.92 -14.92 -12.07 -13.35 -15.13	QP Average QP Average QP Average QP Average OP
1014.36509 1127.56162 1227.56262	15.50 19.18 8.99	9.74 9.84 9.84	0.10 0.14 0.14	10.00 10.00 10.00	35.34 39.16 28.97	50.00 60.00 50.00	-14.66 -20.84 -21.03	Average QP Average

1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac. Remarks: The emission levels that are 20dB below the official 2.

limit are not reported.

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SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD.

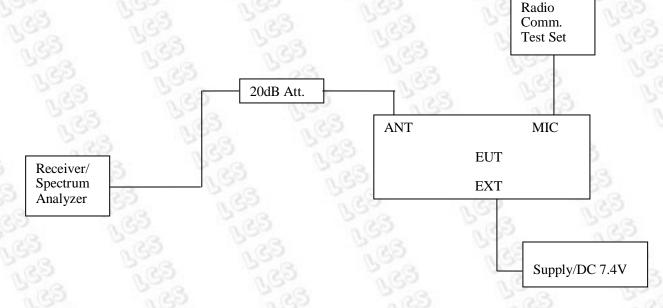
FCC ID: 2ADQZTPD5X

4.2. Occupied Bandwidth and Emission Mask Test

TEST APPLICABLE

- (a). Occupied Bandwidth: The EUT was connected to the audio signal generator and the spectrum analyzer via the main RF connector, and through an appropriate attenuator. The EUT was controlled to transmit its maximum power. Then the bandwidth of 99% power can be measured by the spectrum analyzer.
 - (c). 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) On any frequency from the centre of the authorized bandwidth f0 to 5.625 kHz removed from f0: Zero dB.
 - (2) On any frequency removed from the centre of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.625 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 centre 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 CONFIGURATION



TEST PROCEDURE

- 1 The EUT was placed on a turn table which is 0.8m above ground plane.
- 2 The EUT was modulated by 2.5 KHz Sine wave audio signal; the level of the audio signal employed is 16 dB greater than that necessary to produce 50% of rated system deviation. Rated system deviation is 2.5 kHz (12.5 kHz channel spacing).
- 3 Set EUT as normal operation.
- 4 Set SPA Centre Frequency = fundamental frequency, RBW=300Hz, VBW= 3 KHz, span = 50 KHz.
- 5 Set SPA Max hold. Mark peak, Set 99% Occupied Bandwidth and 26dB Occupied Bandwidth.
- 6 Set SPA Centre Frequency=fundamental frequency, set =300Hz, VBW=1 KHz, span=50 KHz for 12.5 KHz channel spacing.

TEST RESULTS

Remark:

1. We tested Op 1 to Op 4, recorded worst case at Op 1 and Op 3.

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Report No.: LCS1412030188E

4.2.1 Occupied Bandwidth

Modulation	Channel Separation	Operation Mode	Test Channel	Test Frequency (MHz)	-	Bandwidth Hz)
Туре	Separation	Mode	Channel	(IVITIZ)	99%	26dB
0	10-0	1 m	Ch1	406.125	6.37	10.42
Analog/FM	12.5KHz	Op 1	Ch2	456.125	6.05	10.35
- B-		Rose	Ch3	469.975	6.06	10.35
90	192	0.60	Ch4	406.125	7.75	9.79
Digital/4FSK	12.5KHz	Op 3	Ch5	456.125	7.26	8.85
Barth		. Ca	Ch6	469.975	7.23	9.34
	Limit		11.25	KHz for 12.5KHz Ch	annel Separa	tion
	Test Results			PASS		
	0.035424			- 10.C.I	1 (A 20)	

Plots of 99% and 26dB Bandwidth Measurement

Туре	Separation	Operation Mode	Test Channel	Frequer (MHz	z)	Bandwidt 99%	pied th (KHz) 26dB	- Limit (KHz)	Resu
FM	12.5 KHz	Op 1	Ch1	406.12	25	6.37	10.42	11.25	PAS
LXI	ilent Spectrum Analyzer - ଉପ RF 50 ହ enter Freq 406.125	AC	SENSE:PULSE Center Freq: 406 Trig: Free Run #Atten: 28 dB		F >10/10	02:38:27 PM May: Ladio Std: Non Ladio Device: E	e Trace	Detector	
Lo 30 20	0.0	0 dBm						lear Write	
-10 -10 -20 -30	00				1			Average	
-30 -40 -50).0 maryhan Mary markany			UV10	hon war artinger	wy horan horan	<u>.</u>	Max Hold	
#R	enter 406.1 MHz Res BW 300 Hz	width	#VBW 11	kHz	S	Span 5 weep 527		Min Hold	
33 (25	Transmit Freq Err	6.367 kł	Hz OBW	V Power	99.0 -26.00		Auto	Detector Peak► <u>Man</u>	

STATUS

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(,)) (0		Test	Occ	upied	T • •/	
lodulation Type	Channel Separation	Operation Mode	Test Channel	Frequency (MHz)	Bandwid 99%	ith (KHz) 26dB	Limit (KHz)	Resu
FM	12.5 KHz	Op 1	Ch2	456.125	6.05	10.35	11.25	PAS
Agi	lent Spectrum Analyzer - Oc				1.0			
Ce	nter Freq 456.12	ac 5000 MHz	SENSE:PULSE Center Freq: 456	ALIGN AUT .125000 MHz Avg Hold:>10/10	0 02:39:14 PM Ma Radio Std: No		ace/Detector	
23		#IFGain:Low	, Trig: Free Run #Atten: 28 dB	Avg Hold:>10/10	Radio Device:	: BTS	1	
10	dB/div Ref 40.0	0 dBm						
	99 0.0							
			+AAA				Clear Write	
0.	00							
-10			Υ ·				Average	
-20 -30		A.		i p l				
	.0 .0	www.chulmanini			ᡃᡙᢇᡡᡐᠬᠺᠰᢑᢦᢛᡀᠹᢍᡟ	my los ny	Max Hold	
-50								
-	enter 456.1 MHz Res BW 300 Hz		#VBW 11	kHz	Span : Sweep 52	50 kHz 7.2 ms	Min Hold	
2	Occupied Band	lwidth					C	
52		6.047 k	Hz				Detector	
Contraction of the second s								
(GD	Transmit Freq Er	ror -61	6 Hz OBW	V Power	99.00 %	Auto	Peak► <u>Man</u>	
63	Transmit Freq En x dB Bandwidth	ror -61 10.35			99.00 % 26.00 dB	Auto		
LCS LCS	-					Auto		
163	-					Auto		
MSC	x dB Bandwidth			-2		Auto		
MSC	x dB Bandwidth			s -2	26.00 dB			Les Les
Iodulation	x dB Bandwidth	10.35	kHz x dB	s -2 st/ Test		upied dth (KHz)	Limit	Resu
Iodulation Type	x dB Bandwidth	10.35 Operation Mode	kHz x dB Test Channel	Test Frequency (MHz)	26.00 dB	upied Ith (KHz) 26dB	<u>Man</u> Limit (KHz)	
lodulation	x dB Bandwidth	10.35	kHz x dB	s -2 st Test Frequency	26.00 dB	upied dth (KHz)	Limit	Resu
lodulation Type FM	x dB Bandwidth	10.35 Operation Mode Op 1 cupied BW	kHz x dB Test Channel	Test Frequency (MHz)	26.00 dB	upied tth (KHz) 26dB 10.35	<u>Man</u> Limit (KHz) 11.25	
lodulation Type FM	x dB Bandwidth Channel Separation 12.5 KHz Interspectrum Analyzer - Oc	10.35 0peration Mode 0p 1 cupied BW AC 5000 MHz	kHz x dB	st/ Test Frequency (MHz) 469.975	26.00 dB	upied Ith (KHz) 26dB 10.35	<u>Man</u> Limit (KHz)	
lodulation Type FM	x dB Bandwidth Channel Separation 12.5 KHz Interference - 0c	10.35 Operation Mode Op 1	kHz x dB	тезt Frequency (MHz) 469.975	C6.00 dB	upied Ith (KHz) 26dB 10.35	<u>Man</u> Limit (KHz) 11.25	
Iodulation Type FM Cc	x dB Bandwidth Channel Separation 12.5 KHz Interspectrum Analyzer - 00 RF 50 Q enter Freq 469.975 dB/div Ref 40.0	10.35 Operation Mode Op 1 Cupied BW AC FIGGin:Low	kHz x dB	тезt Frequency (MHz) 469.975	26.00 dB	upied Ith (KHz) 26dB 10.35	<u>Man</u> Limit (KHz) 11.25	
Iodulation Type FM	x dB Bandwidth Channel Separation 12.5 KHz Inter Spectrum Analyzer - Oc RF 50 g Channel Separation Channel S	10.35 Operation Mode Op 1 Cupied BW AC FIGGin:Low	kHz x dB	тезt Frequency (MHz) 469.975	26.00 dB	upied Ith (KHz) 26dB 10.35	Man Limit (KHz) 11.25	
Iodulation Type FM	x dB Bandwidth Channel Separation 12.5 KHz Inter Spectrum Analyzer - Oc RF 50 Q Enter Freq 469.975	10.35 Operation Mode Op 1 Cupied BW AC FIGGin:Low	kHz x dB	тезt Frequency (MHz) 469.975	26.00 dB	upied Ith (KHz) 26dB 10.35	<u>Man</u> Limit (KHz) 11.25	
Iodulation Type FM	x dB Bandwidth Channel Separation 12.5 KHz Interspectrum Analyzer - Oc RF 50 Q Enter Freq 469.975 dB/div Ref 40.0	10.35 Operation Mode Op 1 Cupied BW AC FIGGin:Low	kHz x dB	тезt Frequency (MHz) 469.975	26.00 dB	upied Ith (KHz) 26dB 10.35	Man Limit (KHz) 11.25 ace/Detector	
Iodulation Type FM Ce IO Ce IO Co IC Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE CE IO CE CE CE CE CE CE CE CE CE CE CE CE CE	x dB Bandwidth Channel Separation 12.5 KHz Inter Freq 469.975	10.35 Operation Mode Op 1 Cupied BW AC FIGGin:Low	kHz x dB	ST/ Test Frequency (MHz) 469.975 ALIGN AUT 1.975000 MHz Avg Hold>10/10	26.00 dB	upied Ith (KHz) 26dB 10.35	Man Limit (KHz) 11.25	
Iodulation Type FM Ce IO Ce IO Co IC Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO Ce IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE IO CE CE IO CE CE CE CE CE CE CE CE CE CE CE CE CE	x dB Bandwidth Channel Separation 12.5 KHz tent Spectrum Analyzer - Oc RF 50 Q onter Freq 469.973	10.35	kHz x dB	-2 Test Frequency (MHz) 469.975 ALIGN AUT 	26.00 dB	upied Ith (KHz) 26dB 10.35 w/31,2016 rr BTS	Man Limit (KHz) 11.25 ace/Detector	
Iodulation Type FM Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iodulation Iod	x dB Bandwidth Channel Separation 12.5 KHz Inter Freq 469.975	10.35	kHz x dB	-2 Test Frequency (MHz) 469.975 ALIGN AUT 	26.00 dB	upied Ith (KHz) 26dB 10.35 w/31,2016 rr BTS	Man Limit (KHz) 11.25 ace/Detector	
Iodulation Type FM Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca	x dB Bandwidth Channel Separation 12.5 KHz Inter Spectrum Analyzer - Oc RF 50 © Channel GB/div Ref 40.0	10.35	kHz x dB	-2 Test Frequency (MHz) 469.975 ALIGN AUT 	26.00 dB	upied th (KHz) 26dB 10.35 ^{3/31,2016} Тг :втs	Man Limit (KHz) 11.25 ace/Detector	
Iodulation Type FM Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca	x dB Bandwidth Channel Separation 12.5 KHz Inter Freq 469.975	10.35	kHz x dB	-2 Test Frequency (MHz) 469.975 ALIGN AUT Avg Hold>10/10	26.00 dB	upied hth (KHz) 26dB 10.35 sy31,2016 rr BTS 50 kHz	Man Limit (KHz) 11.25 ace/Detector Clear Write Average Max Hold	
Iodulation Type FM Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca	x dB Bandwidth	10.35	kHz x dB	-2 Test Frequency (MHz) 469.975 ALIGN AUT Avg Hold>10/10	26.00 dB	upied hth (KHz) 26dB 10.35 sy31,2016 rr BTS 50 kHz	Man Limit (KHz) 11.25 ace/Detector	
Iodulation Type FM Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca	x dB Bandwidth Channel Separation 12.5 KHz Inter Freq 469.975	10.35	kHz x dB	-2 Test Frequency (MHz) 469.975 ALIGN AUT Avg Hold>10/10	26.00 dB	upied hth (KHz) 26dB 10.35 sy31,2016 rr BTS 50 kHz	Man Limit (KHz) 11.25 ace/Detector Clear Write Average Max Hold Min Hold Detector	
Iodulation Type FM Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca	x dB Bandwidth	10.35	kHz x dB	str Test Frequency (MHz) 469.975 ALIGN AUT 1975000 MHz Avg Hold>10/10	26.00 dB	upied hth (KHz) 26dB 10.35 sy31,2016 rr BTS 50 kHz	Man Limit (KHz) 11.25 ace/Detector Clear Write Average Max Hold Min Hold Detector Peak	
Iodulation Type FM 200 200 200 200 200 200 200 200 200 20	x dB Bandwidth	10.35	kHz x dB	s -2	26.00 dB	upied Ith (KHz) 26dB 10.35 xy 31, 2016 rr BTS 50 kHz 7.2 ms	Man Limit (KHz) 11.25 ace/Detector Clear Write Average Max Hold Min Hold Detector Peak	

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Aodulation Type	Channel Separation	Operation Mode	Test Channel	Test Frequency (MHz)	Bandwid 99%	cupied dth (KHz) 26dB	Limit (KHz)	Resul
4FSK	12.5 KHz	Op 3	Ch4	406.125	7.75	9.79	11.25	PAS
	enter Freq 406.125	AC 5000 MHz #IFGain:Low	SENSE:PULSE Center Freq: 406 Trig: Free Run #Atten: 28 dB	ALIGN AUT 125000 MHz Avg Hold>10/10	0 02:37:38 PM Ma Radio Std: No Radio Device	one	e/Detector	
LC 30 20	D dB/div Ref 40.0 Pg	0 dBm	AW AND A				Clear Write	
0. -10	0.0	- Ar	A4				Average	
-40 -50	0.0 0.0 ml/pm/ml/pm/m/ml 0.0	ynwar yn lynn			mps-printfai		Max Hold	
	enter 406.1 MHz Res BW 300 Hz Occupied Band	width	#VBW 11	kHz	Span Sweep 52	50 kHz 27.2 ms	Min Hold	
63 163	Transmit Freq Eri x dB Bandwidth	7.754 kl ror 17 9.789	7 Hz OBW		99.00 % 6.00 dB	Auto	Detector Peak► <u>Man</u>	
MSC	G	<u>,</u> (25	. 6	STA	NTUS	5	<i>a</i> S	
N.C	G Channel Separation	Operation Mode	Test Channel	Test Frequency	Occ Bandwid	cupied dth (KHz)	Limit (KHz)	Resul
Iodulation	Channel			Test	Occ			
Iodulation Type 4FSK	Channel Separation	Mode Op 3	Channel Ch5	Test Frequency (MHz) 456.125	Occ Bandwid 99% 7.26	dth (KHz) 26dB 8.85 ay 31, 2016 one Trace	(KHz)	
Iodulation Type 4FSK	Channel Separation 12.5 KHz ilent Spectrum Analyzer - Oct	Mode Op 3	Channel Ch5	Test Frequency (MHz) 456.125	Occ Bandwid 99% 7.26 0 02:44:55 PM MA Radio Std: No	dth (KHz) 26dB 8.85 ay 31, 2016 ay 31, 2016 r racc	(KHz) 11.25	
Iodulation Type 4FSK CC CC CC CC CC CC CC CC CC CC CC CC CC	Channel Separation 12.5 KHz ilent Spectrum Analyzer - Occ RF 50 g enter Freq 456.125 0 dB/div Ref 40.0 00 00 0.0 00 0.0 00 0.0 00 0.0 00 0.0 00 0.0 00	Mode Op 3 Cupied BW AC SOOO MHz #IFGain:Low O dBm	Channel Ch5	Test Frequency (MHz) 456.125	Occ Bandwid 99% 7.26 0 02:44:55 PM Ma Radio Std: No Radio Device	dth (KHz) 26dB 8.85 8.85 av 31, 2016 Track ar BTS 0	e/Detector	
Iodulation Type 4FSK 4FSK	Channel Separation 12.5 KHz ilent Spectrum Analyzer - Occ RF 50 Q enter Freq 456.125 0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0	Mode Op 3 Cupied BW AC SOOO MHz #IFGain:Low O dBm	Channel Ch5 Sense:PULSE Center Freq: 456 Trig: Free Run #Atten: 28 dB	Test Frequency (MHz) 456.125	Occ Bandwic 99% 7.26	dth (KHz) 26dB 8.85 av 31, 2016 one av 31, 2016 s: BTS av 31, 2016 for an and the second s	e/Detector	
AFSK 4FSK 4FSK 24FSK 24 10 24 24 24 24 24 24 24 24 24 24 24 24 24	Channel Separation 12.5 KHz ilent Spectrum Analyzer - 0cd RF 50 Q enter Freq 456.125 0 dB/div Ref 40.0 00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Mode Op 3	Channel Ch5	Test Frequency (MHz) 456.125	Occ Bandwic 99% 7.26	dth (KHz) 26dB 8.85 av 31, 2016 one av 31, 2016 s: BTS av 31, 2016 for an and the second s	<pre>(KHz) 11.25 e/Detector Clear Write Average</pre>	Resul

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odulation Type	Chai Separ	ation	Operation Mode	Tes Char	nnel	Test Frequer (MHz	ncy z)	Bandwid 99%	ipied th (Kl 260		Limit (KHz)	Resu
4FSK	12.5	KHz	Op 3	Ch	16	469.97	'5	7.23	9.3	34	11.25	PAS
Ce	enter Freq	RF 50 Ω 1 469.975	AC 5000 MHz #IFGain:Low				ALIGN AUTO >10/10	02:45:47 PM May Radio Std: Nor Radio Device:	ıe	Trace/	Detector	
10 Lo 30 20 10	.0	Ref 40.0				ĥ				C	lear Write	
0,1 -10 -20 -30	.0						<u></u>				Average	
-40 -50	.0	₩Hz					m rywywi,	Span 5			Max Hold	
40 E	Occupie				BW 1 kH	z		Sweep 527			Min Hold	
1 1/2-1	Transmit x dB Ban	•	7.233 k or -223 9.340	2 Hz	OBW F x dB	? ower		9.00 % 00 dB	4	Auto	Detector Peak► <u>Man</u>	

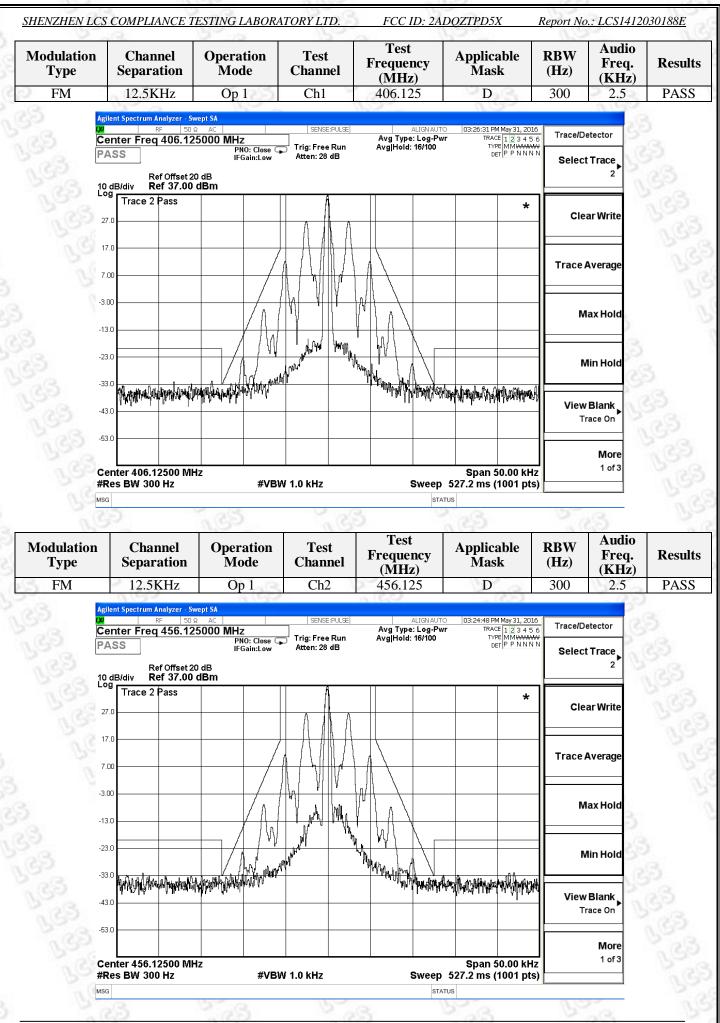
4.2.2 Emission Mask

Modulation Type	Channel Separation	Operation Mode	Test Channel	Test Frequency (MHz)	Applicable Mask	RBW (Hz)
5	285	2 aG	Ch1	406.125	D	300
Analog/FM	12.5 KHz	Op 1	Ch2	456.125	D	300
652	GS	2.25	Ch3	469.975	D	300
28	S all	B-R	Ch1	406.125	D	300
Digital/4FSK	12.5 KHz	Op 3	Ch2	456.125	D	300
CSS	es.	20	Ch3	469.975	D	300
	Test Results			PASS		

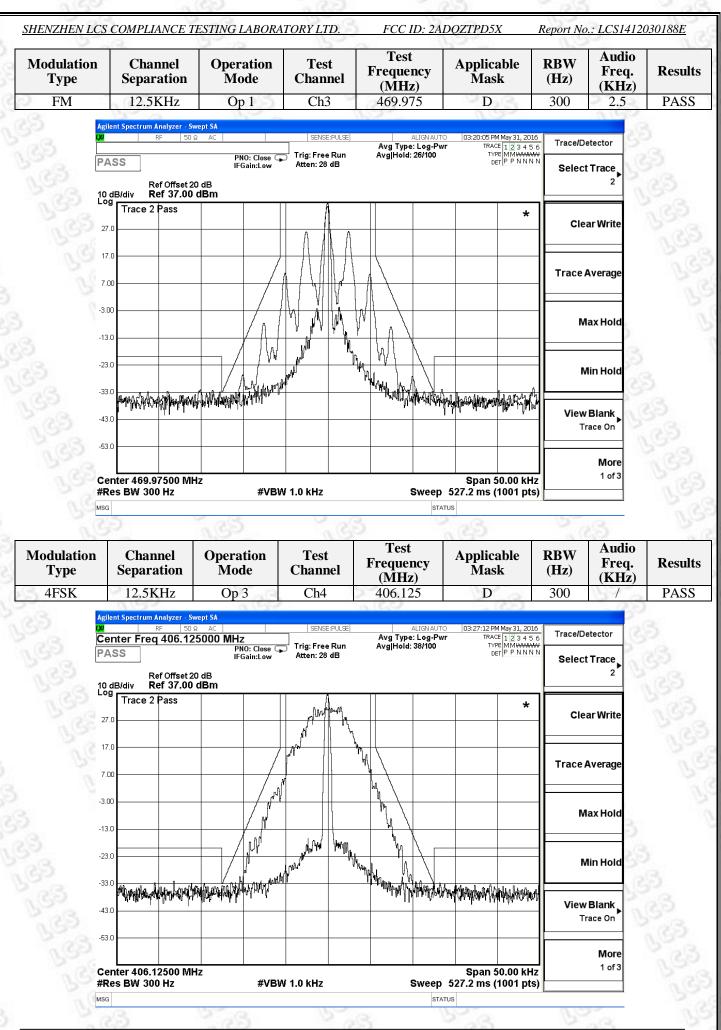
Plots of Emission Mask Measurement

Referred as the attached plot hereinafter Note: The Black curve represents unmodulated signal. The Blue curve represents modulated signal.

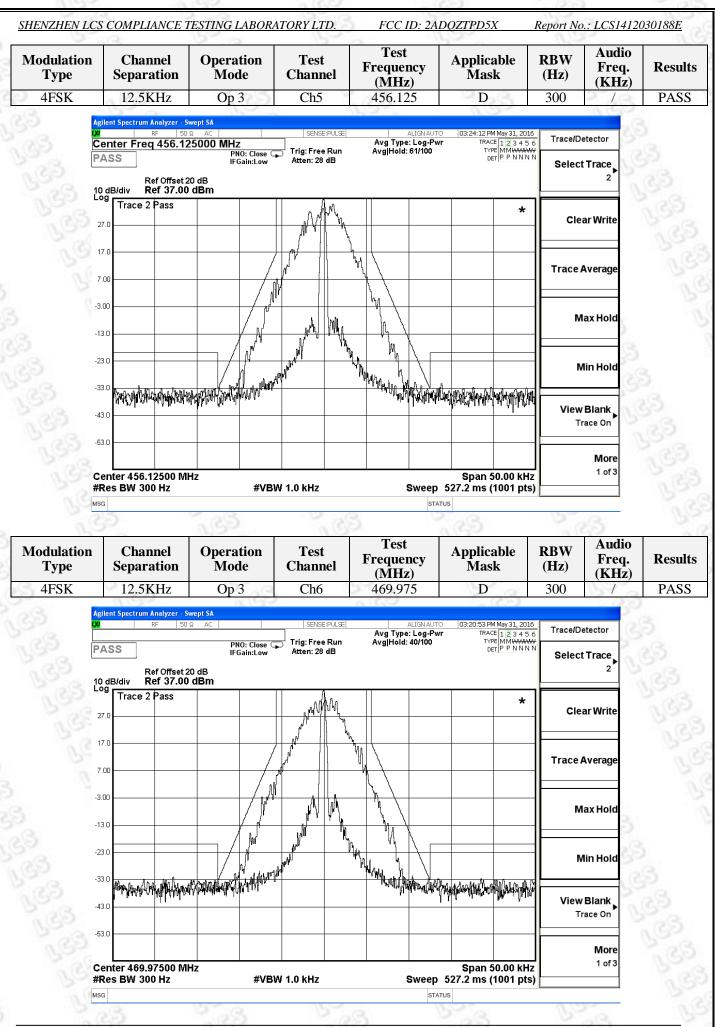
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4.3. Transmitter Radiated Spurious Emission

TEST APPLICABLE

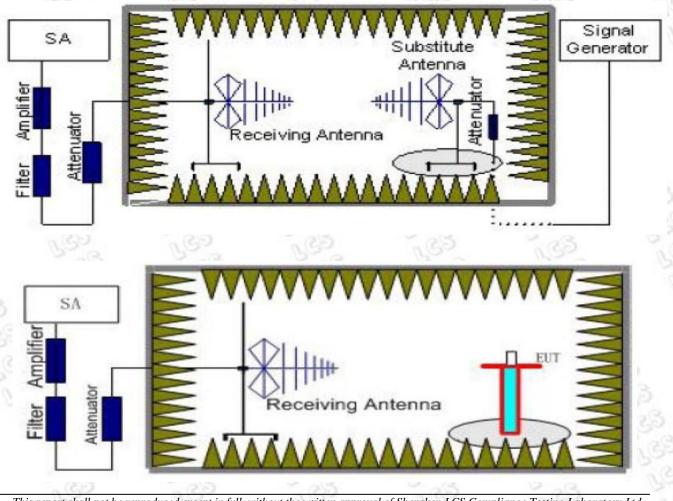
According to the TIA/EIA 603 test method, and according to Section 90.210, the power of each unwanted emission shall be less than Transmitted Power as specified below for transmitters designed to operate with 12.5 KHz channel bandwidth:

- $1 \quad \text{On any frequency removed from the centre of the authorized bandwidth } f_o \text{ to } 5.625 \text{ KHz removed from } f_o\text{:} \\ \text{Zero } dB$
- 2 On any frequency removed from the centre of the authorized bandwidth by a displacement frequency (f_d in KHz) f_o of more than 5.625 KHz but no more than 12.5 KHz: At least 7.27dB
- 3 On any frequency removed from the centre of the authorized bandwidth by a displacement frequency (f_d in KHz) f_o of more than 12.5 KHz: At least 50+10 log (P) dB or 70 dB, which ever is lesser attenuation.

For transmitters designed to transmit with 25 KHz channel separation and equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as following:

- 1 On any frequency removed from the assigned frequency by more than 50 percent, but no more than 100 percent of the authorized bandwidth: At least 25 dB.
- 2 On any frequency removed from the assigned frequency by more than 100 percent, but no more than 250 percent of the authorized bandwidth: At least 35 dB.
- 3 On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43+10Log (P) dB.

TEST CONFIGURATION



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SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD. FCC ID: 2/

FCC ID: 2ADQZTPD5X

TEST PROCEDURE

- EUT was placed on a 1.50 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.50 m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in six channels were measured with peak detector.
- 2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
- The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz for above 1GHz and RBW=100 KHz, VBW=300 KHz for 30MHz to 1GHz, and the maximum value of the receiver should be recorded as (P_r).
- 4. The EUT shall be replaced by a substitution antenna. In the chamber, a substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
- 5. An amplifier should be connected to the Signal Source output port. And the cable should be connecting between the Amplifier and the Substitution Antenna. The cable loss (P_{cl}) , the Substitution Antenna Gain (G_a) and the Amplifier Gain (P_{Ag}) should be recorded after test.

The measurement results are obtained as described below:

Power (EIRP) = P_{Mea} - P_{Ag} - P_{cl} - G_a

Amplifier for substituation test;

The measurement results are amending as described below:

Power (EIRP) = P_{Mea} - P_{cl} - G_a

- This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
- 7. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

LIMIT

Modulation Type: FM

FCC Part 22.359, 74.462, 80.211 and 90.210 and RSS Gen, RSS 119 Issue 12:

For 12.5 kHz bandwidth:

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:

High: $50 + 10 \log (Pwatts) = 50 + 10 \log (4.0) = 56.02 \text{ dB}$

Low: $50 + 10 \log (Pwatts) = 50 + 10 \log (1.0) = 50.00 \text{ dB}$

Note: In general, the worst case attenuation requirement shown above was applied.

Calculation: Limit (dBm) =EL-50-10log10 (TP)

Notes: EL is the emission level of the Output Power expressed in dBm,

In this application, the EL is 36.02 dBm for Rated High power level and 30.00 dBm for Rated Lower power level; High: Limit (dBm) =36.99-50-10log10 (4.0) = -20 dBm

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FCC ID: 2ADQZTPD5X

Low: Limit (dBm) =30.00-50-10log10 (1.0) = -20 dBm

Modulation Type: 4FSK

FCC Part 22.359, 74.462, 80.211 and 90.210 and RSS Gen, RSS 119 Issue 12 (12.5 kHz Bandwidth only): 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:

High: $50 + 10 \log (Pwatts) = 50 + 10 \log (4.0) = 56.02 dB$

Low: $50 + 10 \log (Pwatts) = 50 + 10 \log (1.0) = 50.00 \text{ dB}$

Note: In general, the worst case attenuation requirement shown above was applied.

Calculation: Limit (dBm) =EL-50-10log10 (TP)

Notes: EL is the emission level of the Output Power expressed in dBm,

In this application, the EL is 36.02 dBm for Rated High power level and 30.00 dBm for Rated Lower power level;

High: Limit (dBm) =36.99-50-10log10 (4.0) = -20 dBm

Low: Limit (dBm) =30.00-50-10log10 (1.0) = -20 dBm

Note:

1. In general, the worse case attenuation requirement shown above was applied.

2. The measurement frequency range from 30 MHz to 5 GHz.

3. *** means that the emission level is too low to be measured or at least 20 dB down than the limit.

4. Radiated spurious tested ERP for below 1GHz and EIRP for above 1GHz.

TEST RESULTS

Remark:

1. We tested Op 1 to Op 4, recorded worst case at Op 1 and Op 3.

			Modula	tion Type: FM				
	Operation M	Iode: Op 1			Channel Separa	ation:12.5KH	Iz	
	Test Chan	nel: Ch1		Test Frequency:406.125MHz				
Frequency (MHz)	PMea (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak EIRP (dBm)	Limit (dBm)	Polarization	
812.250	-50.88	0.87	6.42	2.15	-47.48	-20.00	Н	
1215.375	-47.42	1.02	7.35	2.15	-43.24	-20.00	Н	
2030.625	-57.39	1.10	8.26	2.15	-52.38	-20.00	Н	
2	07	· · · ·	Still B	5	\		Н	
812.250	-49.81	0.87	6.42	2.15	-46.41	-20.00	V	
1215.375	-48.70	1.02	7.35	2.15	-44.52	-20.00	V	
2030.625	-57.16	1.10	8.26	2.15	-52.15	-20.00	V	
				D		•••	V	

			Modula	tion Type: FM			
	Operation M	Iode: Op 1			Channel Separa	tion:12.5KH	Iz
	Test Chan	nel: Ch2		Test Frequency: 456.125MHz			
Frequency (MHz)	PMea (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak EIRP (dBm)	Limit (dBm)	Polarization
912.250	-52.43	0.92	6.80	2.15	-48.70	-20.00	H
1368.375	-43.34	1.06	7.89	2.15	-38.66	-20.00	Н
2280.625	-60.42	1.12	8.12	2.15	-55.57	-20.00	Н
1 Com			19.4	·•• (CD)		NO	Н
912.250	-50.91	0.92	6.80	2.15	-47.18	-20.00	V
1368.375	-46.86	1.06	7.89	2.15	-42.18	-20.00	V
2280.625	-58.62	1.12	8.12	2.15	-53.77	-20.00	V
1.08				<u>.</u>		6.0	V

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	Operation N	A		Channel Separation:12.5KHz			
	Test Chan	mel: Ch3		Test Frequency: 469.975MHz			
Frequency (MHz)	PMea (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak EIRP (dBm)	Limit (dBm)	Polarization
939.950	-53.52	0.95	6.80	2.15	-49.82	-20.00	Н
1409.925	-44.59	1.10	7.91	2.15	-39.93	-20.00	Н
2349.875	-59.88	1.21	8.25	2.15	-54.99	-20.00	H
· · · · ·				1.65		S	Н
939.950	-53.64	0.95	6.80	2.15	-49.94	-20.00	V
1409.925	-42.99	1.10	7.91	2.15	-38.33	-20.00	V
2349.875	-58.45	1.21	8.25	2.15	-53.56	-20.00	V
			•••			A 19	V

			Modulat	ion Type: 4FSK						
	Operation M	Iode: Op 3		Channel Separation: 12.5KHz						
	Test Chan	nel: Ch4			Test Frequency	7:406.125MH	[z			
Frequency (MHz)	PMea (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak EIRP (dBm)	Limit (dBm)	Polarization			
812.250	-51.88	0.87	6.42	2.15	-48.48	-20.00	Н			
1215.375	-45.19	1.02	7.35	2.15	-41.01	-20.00	H			
2030.625	-60.55	1.10	8.26	2.15	-55.54	-20.00	Н			
28.	Ser. S		A.C	S			Н			
812.250	-50.99	0.87	6.42	2.15	-47.59	-20.00	V			
1215.375	-43.93	1.02	7.35	2.15	-39.75	-20.00	V			
2030.625	-61.96	1.10	8.26	2.15	-56.95	-20.00	V			
1.60			0.00		o 🖂		V			

			Modulati	ion Type: 4FSK			
	Operation N	Iode: Op 3			Channel Separa	ation:12.5KH	Iz
	Test Chan	nel: Ch5		Test Frequency: 456.125MHz			
Frequency (MHz)	PMea (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak EIRP (dBm)	Limit (dBm)	Polarization
912.250	-51.88	0.92	6.80	2.15	-48.15	-20.00	Н
1368.375	-46.02	1.06	7.89	2.15	-41.34	-20.00	Н
2280.625	-55.90	1.12	8.12	2.15	-51.05	-20.00	Н
	•••			A.C		•••	H CO
912.250	-52.67	0.92	6.80	2.15	-48.94	-20.00	V
1368.375	-43.90	1.06	7.89	2.15	-39.22	-20.00	V
2280.625	-58.87	1.12	8.12	2.15	-54.02	-20.00	V
							V
Bara	l'a		1.50	150	0	62	620

Ro-0	Pa		1,50	1.50			620	
			Modulat	ion Type: 4FSK				
	Operation N	Iode: Op 3			Channel Separa	ation:12.5KH	Iz	
	Test Chan	nel: Ch6		Test Frequency: 469.975MHz				
Frequency (MHz)	PMea (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak EIRP (dBm)	Limit (dBm)	Polarization	
939.950	-51.35	0.95	6.80	2.15	-47.65	-20.00	Н	
1409.925	-45.88	1.10	7.91	2.15	-41.22	-20.00	Н	
2349.875	-58.87	1.21	8.25	2.15	-53.98	-20.00	Н	
			•••	0.05	- Onge		Н	
939.950	-53.80	0.95	6.80	2.15	-50.10	-20.00	V	
1409.925	-44.89	1.10	7.91	2.15	-40.23	-20.00	V	
2349.875	-62.68	1.21	8.25	2.15	-57.79	-20.00	V	
			10°	S			V	

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Radio Comm.

4.4. Spurious Emission on Antenna Port

TEST APPLICABLE

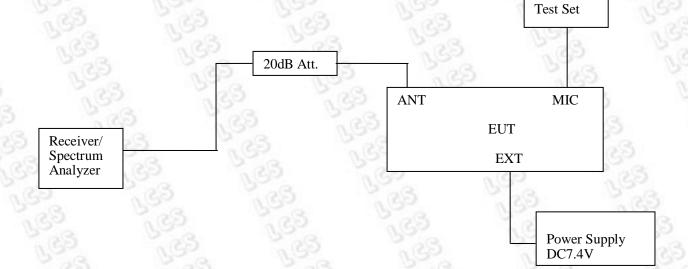
The same as Section 4.3

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 to 100 kHz. Sufficient scans were taken to show any out of band emission up to 10th. Harmonic for the lower and the highest frequency range. Set RBW=1KHz/VBW=3KHz in the frequency band 9KHz to 150KHz, RBW=10KHz/VBW=30 KHz in the frequency band 150KHz to 30 MHz, RBW=100 kHz/VBW=300 kHz in the frequency band 30MHz to 1GHz, and RBW=1MHz/VBW=3MHz from the 1GHz to 10th Harmonic.

The audio input was set to 0 to get the unmodulated carrier, the resulting picture is print out for each channel separation.

TEST CONFIGURATION



LIMIT

Modulation Type: FM

FCC Part 22.359, 74.462, 80.211 and 90.210 and RSS Gen, RSS 119 Issue 12:

For 12.5 kHz bandwidth:

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:

High: $50 + 10 \log (Pwatts) = 50 + 10 \log (4.0) = 56.02 \text{ dB}$

Low: $50 + 10 \log (Pwatts) = 50 + 10 \log (1.0) = 50.00 \text{ dB}$

Note: In general, the worst case attenuation requirement shown above was applied.

Calculation: Limit (dBm) =EL-50-10log10 (TP)

Notes: EL is the emission level of the Output Power expressed in dBm,

In this application, the EL is 36.02 dBm for Rated High power level and 30.00 dBm for Rated Lower power level; High: Limit (dBm) =36.99-50-10log10 (4.0) = -20 dBm

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Low: Limit (dBm) =30.00-50-10log10 (1.0) = -20 dBm

Modulation Type: 4FSK

FCC Part 22.359, 74.462, 80.211 and 90.210 and RSS Gen, RSS 119 Issue 12 (12.5 kHz Bandwidth only): On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 12.5 kHz at least:

High: $50 + 10 \log (Pwatts) = 50 + 10 \log (4.0) = 56.02 \text{ dB}$

Low: $50 + 10 \log (Pwatts) = 50 + 10 \log (1.0) = 50.00 \text{ dB}$

Note: In general, the worst case attenuation requirement shown above was applied.

Calculation: Limit (dBm) =EL-50-10log10 (TP)

Notes: EL is the emission level of the Output Power expressed in dBm,

In this application, the EL is 36.02 dBm for Rated High power level and 30.00 dBm for Rated Lower power level; High: Limit (dBm) =36.99-50-10log10 (4.0) = -20 dBm

Low: Limit (dBm) = $30.00-50-10\log_{10}(1.0) = -20 \text{ dBm}$

Note:

1. In general, the worse case attenuation requirement shown above was applied.

2. The measurement frequency range from 9 KHz to 6GHz.

TEST RESULTS

Operation	Test	Test		imum Conducted Maximum Conducted Spu Emissions Below 1GHz Emissions Above 1GH			
Mode	Channel	Frequency (MHz)	Frequency (MHz)	Data (dBm)	Frequency (MHz)	Data (dBm)	
P.	Ch1	406.125	811.82	-36.31	1220.00	-33.27	
Op 1	Ch2	456.125	912.70	-34.66	1368.00	-26.99	
	Ch3	469.975	939.86	-34.94	1412.00	-26.29	
	Ch4	406.125	811.82	-35.75	1220.00	-34.35	
Op 3	Ch5	456.125	912.70	-35.05	1368.00	-25.97	
	Ch6	469.975	939.86	-34.64	1412.00	-26.28	
	Limit		-200	Bm for 12.5KHz	Channel Separati	on	
	Test Result	S		PA	SS		

Plots of Spurious Emission on Antenna Port Measurement

 SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD.
 FCC ID: 2AD0ZTPD5X

Report No.: LCS1412030188E

Operation	Test	Test	Maximum Condu Emissions Bel			nducted Spurious Above1GHz	Limit
Mode	Channel	Frequency (MHz)	Frequency (MHz)	Data (dBm)	Frequency (MHz)	Data (dBm)	(dBm)
Op 1	Ch1	406.125	811.82	-36.31	1220.00	-33.27	-20.00

z NextPeal	E 1 2 3 4 5 6 E M MWWW T P P N N N N	TYP		Avg Type Avg Hold:		Trig: Free Atten: 6 o	NO: Wide 😱 Gain:Low	Р	141000	ker 1 9.	Marl
NextPea	141 kHz 30 dBm	Mkr1 9.1 -51.88							ef Offset 20 ef 10.00		0 dE
Next Pk Rigl											0.00
Next Pk Le											10.0
	-20.00 dBm										20.0
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Agilent Spectr	um Analyzer - Sw									
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warker 1	150.00000	UKHZ	PNO: Fast	Trig: Free	Run	Avg Hold:		TY	EMMMMM	
			IFGain:Low	Atten: 6	dB			DI		
								Mkr1 [·]	150 kHz	NextPea
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-og	1101 10.00				1				 _	
0.00										Next Pk Rig
10.0										
										Next Pk Le
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30.0										
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Res BW			#\/P\//	30 kHz			Sween 2		1001 pts)	
			#VDVV	JU KHZ			· ·		• •	
ISG							STATUS	📕 AC cou	pled: Accy un	spec'd < 10MHz

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Report No.: LCS1412030188E

TPD5X

nalyzer - Swept SA							
F 50 Ω AC 1.820000000		SENSE:PULSE	Avg Type:		TRAC		Peak Search
	IFGain:Low	Atten: 30 dB		М	kr1 811.	82 MHz	Next Peal
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							Next Pk Le
							Marker Delf
						-20.00 dBm	Mkr→C
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							Mor 1 of
	1.820000000	1.82000000 MHz PN0: Fast IFGain:Low of Offset 20 dB of 40.00 dBm	1.82000000 MHz PN0: Fast IFGain:Low Trig: Free Run Atten: 30 dB of Offset 20 dB of 40.00 dBm	1.82000000 MHz PN0: Fast IFGain:Low FOffset 20 dB of 00ffset 20 dB of 40.00 dBm FOffset 20 dB of 40.00 dBm FOffset 20 dB of 40.00 dBm FOffset 20 dB FOffset 20 d	1.82000000 MHz Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Avg Hold>100/100 of Offset 20 dB M of 40.00 dBm M of under the second distribution of the second distresecond distribution of the second distribu	1.82000000 MHz Trig: Free Run Avg Type: Log-Pvr AvglHold>100/100 Trig: Free Run AvgHold>100/100 Trig: Free Run AvgHold>100/100	1.820000000 MHz Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr AvglHold>100/100 TrACE 123456 PN0: Fast Free Run IFGain:Low Atten: 30 dB Mkr1 811.82 MHz -36.308 dBm of Offset 20 dB Mkr1 811.82 MHz -36.308 dBm of Offset 20 dB -36.308 dBm <td< td=""></td<>

Peak Search	4 May 31, 2016 E 1 2 3 4 5 6	TRA	ALIGNAUTO : Log-Pwr	Avg Typ	E:PULSE	SENS	Hz	AC	Analyzer - Swo RF 50 Ω 22000000		
NextPeal	20 GHz 74 dBm	₀ /kr1 1.2		Avg Hold		J Trig: Free Atten: 20	PNO: Fast 🕞 Gain:Low	P IF dB	ef Offset 20 ef 30.00 c	R	dB
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Mkr→RefLv			ትትት ትርጉሙ	ี้ "" รางหุลงไ					WARKING A FLAG	Wine de la Calance	0.0 -
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	1001 pts)		Sweep o		<u>.</u>	/ 3.0 MHz	#VBW		IVIAZ	s BW 1.0	Res

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Report No.: LCS1412030188E

		- AR.		12	0	19-		11/2
			Test	Maximum Condu	cted Spurious	Maximum Co	nducted Spurious	
2	Operation	Test	-	Emissions Bel	ow 1GHz	Emissions	Above1GHz	Limit
	Mode	Channel	Frequency (MHz)	Frequency	Data	Frequency	Data	(dBm)
ĉ			(IVIIIZ)	(MHz)	(dBm)	(MHz)	(dBm)	
	Op 1	Ch2	456.125	912.70	-34.66	1368.00	-26.99	-20.00

			2	27.72		2		mat 64	Analyzer - Sv	t Spectrum	Lailen
Peak Search	M May 31, 2016 CE 1 2 3 4 5 6		ALIGN AUTO : Log-Pwr		PULSE	SENSE		2 🛕 DC			u
NextPea	705 kHz 017 dBm	۳۲۴ ۵۵ 1.10 Mkr1	36/100	Avg Hold:		Trig: Free Atten: 6 c	PNO: Wide 🍙 FGain:Low	F II D dB	tef Offset 2 tef 10.00	F	
Next Pk Rig											0 9 0.00
Next Pk Lo	-20.00 dBm										10.0 20.0
Marker De											0.0 0.0
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Mkr→RefL	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Mr.JugAy	VWW	Mrdon Donar And	ᡃᡅᡗᢦᡗᡐᡁᢇᢩᢔ᠋ᠥ	1. only	all and a second	www.www.al.n	" የሥ የሥላ		0.0
M 0 1 o	50.00 kHz (1001 pts)	Stop 15				3.0 kHz				t 9.00 kl s BW 1.1	tar

gilent Spectrum Analyzer - Sw RF 50 ន	2 AC	SENSE:PULSE	ALIGN AUTO	03:37:38 PM May 31, 2016	Peak Search
larker 1 150.00000	IO KHZ PNO: Fast G IFGain:Low	Trig: Free Run Atten: 6 dB	Avg Type: Log-Pwr Avg Hold: 8/100	TRACE 1 2 3 4 5 6 TYPE M MWWWW DET P P N N N N	
Ref Offset 20 0 dB/div Ref 10.00				Mkr1 150 kHz -27.148 dBm	NextPea
0.00					Next Pk Rig
20.0				-20.00 dBm	Next Pk Le
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	Harrington and the second s				Mkr→RefL
start 150 kHz		ilian and and an and an		ակչություր Stop 30.00 MHz 85.3 ms (1001 pts)	1 of

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Report No.: LCS1412030188E

							- Swept SA	um Analyzer - !	ent Spect
D 1 0 1	20 PM May 31, 2016	TO 03:43	ALIGN AUTO	EPULSE	SENSI		50Ω AC	RF 50	
Peak Search	TRACE 1 2 3 4 5 6	wr	g Type: Log-Pwr			ЛНz	000000 N	912.7000	rker 1
	DET P P N N N N		Hold: 58/100		Trig: Free	PNO: Fast 😱			
	DEI			dB	Atten: 30	IFGain:Low			
NextPe	12.70 MHz	Mkr1 9	N				4 00 JE	D.6054	
	1.663 dBm	-34						Ref Offset Ref 40.00	dB/div
								Rei 40.0	
					1				
Next Pk Rig									_
nextrang									0
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Next Pk L									
									0
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Marker De									
									0
	-20.00 dBm								
Mkr→G	-10.00 0.011								0
	4 1								o ———
	. (• · · · · -								-
Mkr→RefL	und the workerst	. manulature	المعامد المتدراة الألامية	adia Chamad	Lally was	where where the second s	at the Wears .		
	and the second second	4- (in 1-) r-	A STREET AND	- UN WATHING	անու թերելելել	a series of a local sector of the sector of		wind a fear of the second s	ar-hand
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Mo									
1 0									
10	1.0000 GHz								art 30.0
	ns (1001 pts) 占) 92.73 r	Sweep		300 kHz	#VBW		100 kHz	es BW
		ATUS							

Agilent Spectrum Analyzer - Swe XI RF 50 Ω	AC SENSE:PULSE	ALIGN AUTO 03:48:11 PM May 31, 2016	Peak Search
Marker 1 1.36800000 Ref Offset 20 10 dB/div Ref 30.00 d	PN0: Fast 🏹 Trig: Free Run IFGain:Low Atten: 20 dB dB	Avg Type: Log-Pwr Avg Hold: 51/100 Mkr1 1.368 GHz -26.986 dBm	Next Peak
20.0			Next Pk Righ
0.00			Next Pk Le
20.0		20.00 dBm	Marker De
	with the state of	Here were and the state of the	Mkr→C
50.0		Philosoften and Angle Perfection and a second	Mkr→RefL
60.0 Start 1.000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	Stop 5.000 GHz Sweep 6.667 ms (1001 pts)	Mo 1 of

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Report No.: LCS1412030188E

Operation	Test	Test	Maximum Condu Emissions Bel	-		nducted Spurious Above1GHz	Limit
Mode	Channel	Frequency (MHz)	Frequency (MHz)	Data (dBm)	Frequency (MHz)	Data (dBm)	(dBm)
Op 1	Ch3	469.975	939.86	-34.94	1412.00	-26.29	-20.00

	03:34:02 PM May 31, 2016	ALIGN AUTO		ISE:PULSE	SEN		zer - Swept SA 50 Ω 🚹 DC	Spectrum Analyze	gilent <mark>1</mark>
www.	TRACE 123456 TYPE MMWWWW DET PPNNNN	oe: Log-Pwr d: 23/100		ee Run	Trig: Fre	PNO: Wide 😱 IFGain:Low		ker 1 11.820	lark
Next Pea	kr1 11.820 kHz -53.139 dBm	М			nach. e	IFGalli.LUW	ffset 20 dB 0.00 dBm)dB 9g r
Next Pk Rig									.00 -
Next Pk Le	-20.00 dBm								0.0 0.0 -
Marker De	F).0 -).0 -
Mkr→C								1	0.0
Mkr→RefL	Montelling	M. M	low the low of	and many	¦far≁ ^a nniu∫ffµf	J. M.	Mar and a france	ີ " ^ເ ທີ່ໃນ ທີ່ມີ	0.0 - 0.0 -
Mo 1 o	Stop 150.00 kHz 34.8 ms (1001 pts)				3.0 kHz			t 9.00 kHz s BW 1.0 kHz	
	L Coupled	STATUS							G
Po	Les S		2,5	2		35	0		දුයි

Peak Search	1 May 31, 2016 E <u>1</u> 2 3 4 5 6 E M MWWW T P P N N N N	TRAC	ALIGNAUTO e: Log-Pwr I: 94/100	Avg Tyj Avg Hol		SENSE Trig: Free Atten: 6 d	NO: Fast 😱	AC D kHz F	RF 50 Ω 150.00000	ilent Spectr arker 1
Next Pea	150 kHz 84 dBm	Mkr1 1				Attent	Gain:Low	dB	Ref Offset 20 Ref 10.00 () dB/div
Next Pk Rig).00
Next Pk Lo	-20.00 dBm									0.0
Marker De										io.o
Mkr→0										
Mkr→RefL	My long tout	k kvynu dyny pry	งสุขไม่การราชเมืองเห็น	mplum	Muthan	Murawillin	hyracionalistation	witneymanual	&	ι
M a 1 o	0.00 MHz	Stop 30	Sweep 2			30 kHz			Hz	tart 150 Res BW

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Report No.: LCS1412030188E

	-										
								ept SA	Analyzer - Sw	Spectrum /	lent
D 1 0 1	M May 31, 2016		ALIGN AUTO		:PULSE	SENSI		AC	RF 50 Ω		
Peak Search	E123456	TRAC	: Log-Pwr				7	0000 MH	9.86000	cer 1 93	ark
	PE MMWWWW -	TY	71/100	Avg Hold		Trig: Free	NO: Fast 🗔				
	ETIPPNNNN	D			dB	Atten: 30	Gain:Low				
NextPea	06 MU-	kr1 939.	м								
			141						ef Offset 20		
	40 dBm	-34.9						iBm	ef 40.00 (Vdiv R	
											g L
	I II										1
Next Pk Rig											.0
	-										1
	F										.0
	I II										
Next Pk Le	II										
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	-										
											00
Marker De	I II										
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											.°
	-20.00 dBm										.0
Mkr→C	II										
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	I Y IF										
Million Defi						ļ).0
Mkr→RefL	- Well-witzen-g-	h wh w w w	البذانه المرافق المدانية	for any and the second	առուստարելեր	bel from the party	William Contractor	and the second second	all about see have	ปและสาวเป็น	
	II		ſ						. N= 1	9610 P. P. P. P. P. P.	
											0.0
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Mo	I II										
1 of		-							-		
	0000 GHz		. .							30.0 MI	
	1001 pts) 🗋	92.73 ms (Sweep 9			300 kHz	#VBW		0 KHZ	5 BW 10	es
			STATUS								

ept S/ Peak Search Marker 1 1.412000000000 GHz Avg Type: Log-Pwr Avg|Hold:>100/100 RACE 1 2 3 4 5 6 TYPE MMWWWW DET P P N N N N Trig: Free Run Atten: 20 dB PNO: Fast IFGain:Low Next Peak Mkr1 1.412 GHz -26.298 dBm Ref Offset 20 dB Ref 30.00 dBm 10 dB/div Log Next Pk Right 20.0 10.0 Next Pk Left 0.00 10.0 Marker Delta -20.00 dBi -20.0 -30.0 Mkr→CF and and the state and a state of the state o 40.0 unter the second -50.0 Mkr→RefLvl -60.0 More 1 of 2 Start 1.000 GHz #Res BW 1.0 MHz Stop 5.000 GHz Sweep 6.667 ms (1001 pts) #VBW 3.0 MHz MSG STATUS

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Report No.: LCS1412030188E

Operation	Test	Test	Maximum Condu Emissions Bel	-		nducted Spurious Above1GHz	Limit
Mode	Channel	Frequency (MHz)	Frequency (MHz)	Data (dBm)	Frequency (MHz)	Data (dBm)	(dBm)
Op 3	Ch4	406.125	811.82	-35.75	1220.00	-34.35	-20.00
	a.	25	ac3	2S	200	3 30	

	PEMMWWWW	D	1: 70/100	Avg Ho		Trig: Fre Atten: 6	PNO: Wide 😱 IFGain:Low			
NextPe	115 kHz '60 dBm		Μ					et 20 dB 00 dBm	Ref Offs Ref 10.) dB/div
Next Pk Rig										
Next Pk L	-20.00 dBm									0.0
Marker De										0.0
Mkr→									wyhriten (b)].	
Mkr→Ref	Maryan	ᠰᡙ᠕ᡙᠰᡗ᠊ᡪ	ut wyw?trwywr	n ^{nar} wr Why	^h ht ^a y wrtaf	WWWW	rurunahu Panhyu M	WWWWWWWWWWWW		0.0
M 0 1 c	50.00 kHz (1001 pts)	Stop 1				3.0 kHz				tart 9.0

Agilent Spectrum Marker 1 1	RF 50 Ω	AC		SENS	E:PULSE	Avg Type			4 May 31, 2016 E 1 2 3 4 5 6	Peak Search
F	S0.000000 Ref Offset 20 Ref 10.00 d	PI IFC dB	NO: Fast 🕞 Gain:Low	Atten: 6		Avg Hold:		۳۷۴ De Mkr1 ′	150 kHz 39 dBm	NextPe
0.00										Next Pk Rig
-20.0									-20.00 dBm	Next Pk L
30.0										Marker De
50.0										Mkr→
		Marine History	สาประกัญญิงเลือ	Anlininthat	4. marth of mirile	leng Lakeling control	::::::::::::::::::::::::::::::::::::::	ria, isila alkitis		Mkr→Ref
80.0 Start 150 kł #Res BW 10	Hz	····		30 kHz	k sir Ann faffin i sku då			Stop 3	0.00 MHz 1001 pts)	M d 1 d

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Report No.: LCS1412030188E

								Swept SA	um Analyzer -	nt Spectr
D 1 0 1	M May 31, 2016		ALIGN AUTO		E:PULSE	SENS		50Ω AC	RF 5	
Peak Search	E123456	Avg Type: Log-Pwr TRACE 1 2 3 4 5 6		t		arker 1 811.820000000 MHz				
	PE MMWWWW - ET P P N N N N	TYI	:>100/100	AvgHol		Trig: Fre	PNO: Fast 😱			
New Ber		Di Di) dB	Atten: 30	IFGain:Low			
NextPea	Mkr1 811.82 MHz								Ref Offset	
	45 dBm	-35.7							Ref 40.0	B/div
									Kei 40.0	ID/UIV
							i			
Next Pk Rig										
nextrang)
Next Pk Le										
) — — –
MarkenDal										
Marker De										
	I			_)
	-20.00 dBm									
Mkr→C		-) — — — — — — — — — — — — — — — — — — —
		÷1) ——
		• '								
		K								
Mkr→RefL	materia	with a state of the local section of the section of	MIN LAWALAWA	With Minhows	11 W14/10	***	ective produced and	hornerwitcher	فعبائية الطمال وروا	
									- Booting . B .	1.44.44
)
	IF									ή Γ
Mo										
1 0		0tem 4.4	1	1	1					L
	0000 GHz						<i></i>			rt 30.0
	1001 pts)	92.73 ms (Sweep 9			300 kHz	#VBW		100 kHz	es BW
	-	IS	STATUS							

Agilent Spectr	um Analyzer - Swept SA	() () () () () () () () () ()					
	RF 50 Ω AC		SENSE:PULSE	A	ALIGNAUTO e: Log-Pwr	03:49:01 PM May 31, 2016 TRACE 1 2 3 4 5 6	Peak Search
Marker 1	1.22000000000	PN0: Fast	rig: Free Run	Avg iyp Avg Hold		TYPE MMMMMMM DET P P N N N N	
		IFGain:Low	Atten: 20 dB				NevéDee
	Ref Offset 20 dB				I	Mkr1 1.220 GHz	NextPea
10 dB/div	Ref 30.00 dBm					-34.345 dBm	
20.0							Next Pk Rigi
20.0							
10.0							
							Next Pk Le
0.00							NEXIPKLE
-10.0						I	
							Marker Del
-20.0						-20.00 dBm	
30.0	1						Mkr→C
	'						IVIRI→C
-40.0	Hours have been that the store	alalogia de la prise a destructions de la seconda de la	ALAN - BEAN MARK	Marghal generation	North Annual	www.www.www.www.www.www.www.	
				1~141			
50.0							Mkr→RefL
-60.0						<u>├</u> ┃┏	
							Mor
Start 1.00	0 GHz		1	1		Stop 5.000 GHz	1 of
#Res BW	1.0 MHz	#VBW 3	0 MHz		Sweep (6.667 ms (1001 pts)	
ISG					STATU	s	

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Report No.: LCS1412030188E

Operation	Test	Test	Maximum Condu Emissions Bel	-		nducted Spurious Above1GHz	Limit
Mode	Channel	Frequency (MHz)	Frequency (MHz)	Data (dBm)	Frequency (MHz)	Data (dBm)	(dBm)
Op 3	Ch5	456.125	912.70	-35.05	1368.00	-25.97	-20.00
	a.	25	63	2S	200	3 30	

							Swept SA	um Analyzer -	gilent Spect
Peak Search	3:32:07 PM May 31, 2016		ALIGN AUT	E:PULSE	SENSE		50 Ω <u>Å</u> DC		
Feak Search	TRACE 1 2 3 4 5 6		Avg Type: Log-Pw	_			0 kHz	9.00000	larker 1
	DET P P N N N		vg Hold: 26/100		Trig: Free Atten: 6 d	PNO: Wide 😱			
NextPe					Atten: 6 (IFGain:Low			
NextPe	r1 9.000 kHz	Mkr					- 20 AD	Ref Offset	
	-53.232 dBm L							Ref 10.0	0 dB/div
Next Pk Rig									
									.00
									0.0
Next Pk L	-20.00 dBm								
									0.0
						_			0.0
Marker De									
									0.0
									0.0 1 —
Mkr→C									-
								for all -	γγ ^w γγ
							Un Blue .	May of May	0.0
						እዲ አብ ላ ሊ	՟֎֍ՠֈ	Υ	
Mkr→RefL		•			MALA ~	<u>՝ կտպես տաղ</u>	. 1 1.		0.0
	าให้สำคัญ เพ	han .	$w_{\rm rel} = w_{\rm rel}$. ու Իպրհայ					
	ላ ነበ። አለት የ	·· · · · · · · · · · · · · · · · · · ·	1 1 1 1						
									0.0
Ма	yellalara myan ya								
1 0									
10	top 150.00 kHz								tart 9.00
	8 ms (1001 pts) 🗖	p 134.8	Sweep		3.0 kHz	#VBW		1.0 kHz	Res BW
	DC Coupled	TATUS 🔥 D	STA						G
	be ecopied	····							-

3	11000	1100	01A100	DC Coupled	12 1 2 2
Agilent Spectrum Analyzer - Sw	ent SA				11.55
α RF 50 Ω Marker 1 150.00000	AC	SENSE:PULSE	ALIGN AUTO Avg Type: Log-Pwr Avg Hold: 10/100	03:38:54 PM May 31, 2016 TRACE 1 2 3 4 5 6 TYPE MMWWWW	Peak Search
Ref Offset 20	IFGain:Low	Atten: 6 dB		Mkr1 150 kHz -28.289 dBm	Next Pe
0.00					Next Pk Rig
20.0				-20.00 dBm	Next Pk L
30.0					Marker De
40.0					
60.0					Mkr→
					Mkr→RefL
80.0	musiconsultantination	<u>kender auch die der Bereichten die Bereichten die Bereichten die Bereichten die Bereichten die Bereichten die B</u>	hand all and a state of the sta		Мо
Start 150 kHz #Res BW 10 kHz	#VBW	30 kHz	Sweep 2	Stop 30.00 MHz 85.3 ms (1001 pts)	1 0

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Report No.: LCS1412030188E

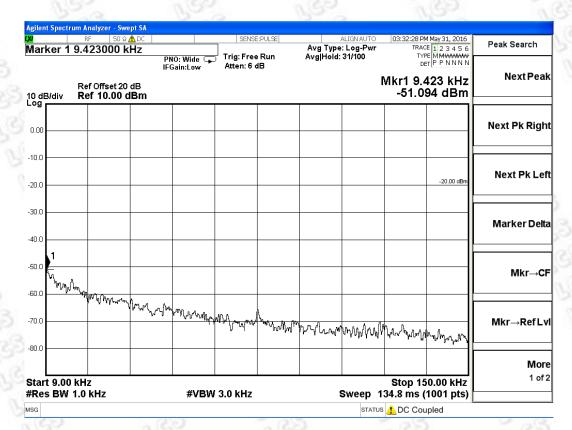
									Analyzer - Sw	t Spectru
Peak Search	1 May 31, 2016 E 1 2 3 4 5 6 E M MWWW	TRAC	LIGNAUTO : Log-Pwr 100/100			Trig: Free		AC 0000 MH2	RF 50 S	ker 1 9
NextPea	70 MHz 50 dBm	™ 1 912.		Arginola.		Atten: 30	IO: Fast 😱 ain:Low	IFG dB	Ref Offset 20 Ref 40.00	
Next Pk Righ	[
Next Pk Le										
Marker Delt										
Mkr→C	-20.00 dBm									
Mkr→RefL	◆ ^N utherstill-randersk-te	YTUPAT.optic.iv	annage for the	ntonortantilitat	herral Mathematical		_ป ุษตร์แหนะสารใจไปไปเล่า	NRW-aph-14/16-1440.	Konterner allier Mar	production
Mor 1 of	0000 GHz 1001 pts)					300 kHz			Hz 10 kHz	t 30.0 l

U R	nalyzer - Swept SA F 50 Ω AC 680000000000	GHz PNO: Fast	Trig: Free			ALIGN AUTO ype: Log-Pwr old: 57/100		Peak Search
	f Offset 20 dB f 30.00 dBm	IFGain:Low	Atten: 20	dB			Mkr1 1.368 GHz -25.970 dBm	Next Pea
20.0								Next Pk Rig
0.00								Next Pk Le
20.0	1						-20.00 dBm	Marker De
30.0			بيات العا	1 1 11/16 at 100a.c. 1				Mkr⊸(
^{40.0} х ицияция 50.0	ungurat 41922 valt 41924	₩,₩₩,₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Labor Labor Labor	here and the second s	hiperfead-galanterrowe	กระจำหลังไปของไปของปีเรื่องเรื่องแล้วของไปข้างไป 	Mkr→RefL
50.0							Stop 5.000 GHz	M a 1 o

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1.0	Operation	Test	Test	Maximum Condu Emissions Bel	1		nducted Spurious Above1GHz	Limit
	Mode	Channel	Frequency	Frequency	Data	Frequency	Data	(dBm)
2			(MHz)	(MHz)	(dBm)	(MHz)	(dBm)	· · ·
	Op 3	Ch6	469.975	939.86	-34.64	1412.00	-26.28	-20.00



gilent Spectrum Analyzer - Swep	AC	SENSE:PULSE	ALIGN AUTO Avg Type: Log-Pwr Avg Hold: 15/100	03:39:55 PM May 31, 2016 TRACE 1 2 3 4 5 6 TYPE M MWWWM	Peak Search
Ref Offset 20 d 0 dB/div Ref 10.00 dE	IFGain:Low	Atten: 6 dB	-	^{DET PPNNNN} Mkr1 150 kHz -27.466 dBm	NextPea
0.00					Next Pk Rig
20.0				-20.00 dBm	Next Pk Le
40.0					Marker De
50.0					Mkr→0
h u,	www.anaralalkulaanshariyaay.cal	erkuner (Lillinger in Standa	The Institution of the sector	t phalper and the second	Mkr→RefL
BOOD	#VBW			Stop 30.00 MHz 285.3 ms (1001 pts)	1 of

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		1.5					1 M M				_
								vept SA	n Analyzer - Sv	t Spectr	ilent
D 1 0 1	4 May 31, 2016 🛛	03:42:10 PM	ALIGN AUTO		E:PULSE	SENS		2 AC	RF 50 :		
Peak Search	E123456		e: Log-Pwr				Hz	0000 N	39.86000	ker 1	arl
	E MMMMMM -	TYP	: 83/100	Avg Hole		Trig: Fre	PNO: Fast 😱				
	i pri ratatata	DE			dB	Atten: 30	IFGain:Low				
NextPea	86 MHz I	kr1 939.	M								
	37 dBm								Ref Offset 2		
		-04.0						asm	Ref 40.00	3/div	dE g
						1					"
Next Pk Rig											
Next PK Rig											.0
											UO -
Next Pk Le											1
											0.0
		+									DO
Marker Del											1
											.u I
											1
	-20.00 dBm	+						_			.0
Mkr→C											1
	-][.0
	1										
Mkr→RefL			,								in l
WIKI →KCI L	Makedpharoutin		level where the second s	للطورجة المجارجين المجلوا فجارة	المراجع المراجع المراجع	shinled here to		ryl - Inthe light	LAND WIND WIND	m man	
								-			.0
Ma											
Mo											
1 of	000 GHz	Stop 1.(/Hz	t 30.0	arf
		92.73 ms (Sween O			300 kHz	#\/R\M		00 kHz		
	ioo i pis)	72.7 J IIIS (aweep a				# V D V V		00 KHZ	3 11 11	
		s	STATUS								

Peak Search	03:50:00 PM May 31, 2016	IGN AUTO		E:PULSE	SENSE		Ω AC	rum Analyzer - S RF SC	
	TRACE 123456 TYPE M MWWWW DET PPNNNN	100/100	Avg Type Avg Hold:		Trig: Free Atten: 20	HZ NO: Fast 🕞 Gain:Low	F	1.412000	larker
NextPea	kr1 1.412 GHz -26.284 dBm	N						Ref Offset Ref 30.00	0 dB/div og r
Next Pk Rig									20.0
Next Pk Le									0.00
Marker De									10.0
	-20.00 dBm							•1	20.0
Mkr→C	Mar and Margh and Marg	draha a	ahalaha	hydrogram harrow the sec	- International Astronomy of the second s	payothryland	ĸ _{ĸŨ} Ĺŧŗŧŀŀŗŧ ^{ĸIJ} ĸĬŗŧĬ	where with with the	10.0
Mkr→RefL		ort Helfas A	~~Uniter 11						50.0
Мо									50.0
1 of	Stop 5.000 GHz 667 ms (1001 pts)	weep 6.			3.0 MHz	#VBW		0 GHz 1.0 MHz	tart 1.0 Res BW

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4.5. Modulation Characteristics

TEST APPLICABLE

According to CFR47 section 2.1047(a), for Voice Modulation Communication Equipment, the frequency response of the audio modulation circuit over a range of 100 to 5000Hz shall be measured.

TEST PROCEDURE

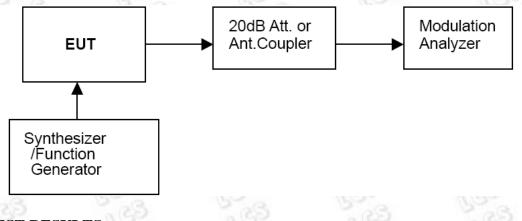
Modulation Limit

- 1 Configure the EUT as shown in figure 1, adjust the audio input for 60% of rated system deviation at 1 KHz using this level as a reference (0dB) and vary the input level from -20 to +20dB. Record the frequency deviation obtained as a function of the input level.
- 2 Repeat step 1 with input frequency changing to 300, 1004, 1500 and 2500Hz in sequence.

Audio Frequency Response

- 1 Configure the EUT as shown in figure 1.
- 2 Adjust the audio input for 20% of rated system deviation at 1 KHz using this level as a reference (0dB).
- 3 Vary the Audio frequency from 100 Hz to 3 KHz and record the frequency deviation.
- 4 Audio Frequency Response =20log10 (Deviation of test frequency/Deviation of 1 KHz reference).

TEST CONFIGURATION



TEST RESULTS

Remark:

1. We tested Op 1 to Op 2 recorded worst case at Op 1.

Modulation Type: FM

0	GP CI	2.5 KHz Channel Separat	ion Op1	.23
Modulation Level (dB)	Peak Freq. Deviation At 300 Hz (KHz)	Peak Freq. Deviation At 1004 Hz (KHz)	Peak Freq. Deviation At 1500 Hz (KHz)	Peak Freq. Deviation At 2500 Hz (KHz)
-20	0.15	0.19	0.33	0.45
-15	0.21	0.36	0.57	0.84
-10	0.29	0.55	0.79	1.47
-5	0.55	0.95	1.51	2.01
0	0.73	1.69	1.93	2.25
+5	0.94	1.97	2.02	2.25
+10	1.14	2.09	2.25	2.25
+15	1.35	2.22	2.25	2.25
+20	1.44	2.25	2.25	2.25

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Modulation type: 4FSK

Channel bandwidth: 12.5 kHz

It is not applicable for devices which operate with the digitized voice/data modulation type.

b). Audio Frequency Response:

Rule Part No.: Part 2.1407(a) (b)

Method of Measurement:

The audio frequency response was measured in accordance with TIA/EIA Specification 603 with no exception.

A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 300-3000Hz shall be submitted and Audio Post Limiter Low Pass Filter Response from 3.0 KHz to 50KHz.However, the audio frequency response should test from 100Hz to 5.0 KHz according to FCC Part 90.

Modulation Type: FM

The audio frequency response curve is show below.

Test Audio Level (1 KHz and 20% maximum deviation) for 12.5 KHz channel separation is 2.75mV. Note:

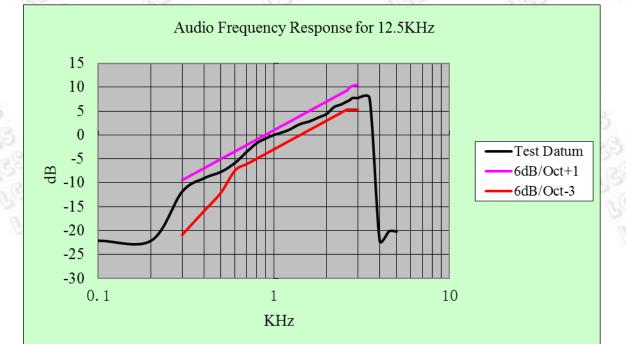
1. Not applicable to new standard. However, tests are conducted under FCC's recommendation.

2. The Audio Frequency Response is identical for 12.5 KHz channel separation

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203	5.05		12 D 0
Frequency (KHz)	Frequency Deviation (KHz)	1KHz Reference Deviation (KHz)	Audio Frequency Response (dB)
0.1	0.04	0.51	-22.11
0.2	0.04	0.51	-22.11
0.3	0.13	0.51	-11.87
0.4	0.18	0.51	-9.05
0.5	0.21	0.51	-7.71
0.6	0.26	0.51	-5.85
0.7	0.34	0.51	-3.52
0.8	0.42	0.51	-1.69
0.9	0.47	0.51	-0.71
1.0	0.51	0.51	0.00
1.2	0.57	0.51	0.97
1.4	0.66	0.51	2.24
1.6	0.71	0.51	2.87
1.8	0.78	0.51	3.69
2.0	0.85	0.51	4.44
2.2	1.00	0.51	5.85
2.4	1.06	0.51	6.35
2.6	1.14	0.51	6.99
2.7	1.18	0.51	7.29
2.8	1.24	0.51	7.72
3.0	1.24	0.51	7.72
3.5	1.24	0.51	7.72
4.0	0.04	0.51	-22.11
4.5	0.05	0.51	-20.17
5.0	0.05	0.51	-20.17

12.5 KHz Channel Separation Op1



Modulation type: 4FSK

Channel bandwidth: 12.5 kHz

It is not applicable for devices which operate with the digitized voice/data modulation type.

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4.6. Frequency Stability Test

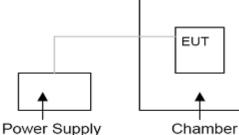
TEST APPLICABLE

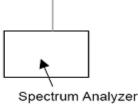
- 1 According to FCC Part 2 Section 2.1055 (a) (1), the frequency stability shall be measured with variation of ambient temperature from -30° C to $+60^{\circ}$ C centigrade.
- 2 According to FCC Part 2 Section 2.1055 (e) (2), for battery powered equipment, the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point, which is specified by the manufacture.
- 3 Vary primary supply voltage from 85 to 115 percent of the nominal value.
- 4 According to §90.213, the frequency stability limit is 2.5 ppm for 12.5KHz channel separation

TEST PROCEDURE

The EUT was set in the climate chamber and connected to an external DC power supply. The RF output was directly connected to Spectrum Analyzer ESPI7. The coupling loss of the additional cables was recorded and taken in account for all the measurements. After temperature stabilization (approx. 20 min for each stage), the frequency for the lower, the middle and the highest frequency range was recorded. For Frequency stability Vs. Voltage the EUT was connected to a DC power supply and the voltage was adjusted in the required ranges. The result was recorded.

TEST CONFIGURATION





TEST LIMITS

According to 90.213, Transmitters used must have minimum frequency stability as specified in the following table.

		Freque	ncy Tolerance (ppm	1)
Frequency Range (MHz)	Channel Bandwidth (KHz)	Fixed and Base Stations	Mobil	e Stations
(11112)	(((()_)))	Fixed and base stations	> 2 W	<u><</u> 2 W
150-174 MHz	6.25 12.5 25	1.0 2.5 5.0	2.0 5.0 5.0	2.0 5.0 50.0*
421-512 MHz	6.25 12.5 25	0.5 1.5 2.5	1.0 2.5 5.0	1.0 2.5 5.0

Stations operating in the 154.45 to 154.49 MHz or the 173.2 to 173.4 MHz bands must have a frequency stability of 5 ppm.

Paging transmitters operating on paging-only frequencies must operate with frequency stability of 5 ppm in the 150-174 MHz band and 2.5 ppm in the 421-512 MHz band.

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Report No.: LCS1412030188E

TEST RESULTS

Remark:

1. We tested Op 1 to Op 4, recorded worst case at Op 1 and Op 3.

Operation	Channel	Test cond	litions	Freq	uency error (ppm)
Mode	Separation	Voltage(V)	Temp(°C)	406.125	456.125	469.975
Search and	10m	1.52	-30	0.36	0.14	0.48
	65	2.23	-20	0.45	0.61	0.82
	Bare.	Ross	-10	0.65	0.36	0.92
	162	630	0	0.95	0.15	0.52
	200	7.40 V	10	0.48	0.49	0.54
Op1	12.5KHz	6 190	20	0.84	0.21	0.61
600		53 × 63	30	0.62	0.56	0.31
	5 13	-R 150	40	0.15	0.59	0.26
		60 0.0	50	0.48	0.59	0.14
	S	6.29 (85% Rated)	20	0.59	0.89	0.92
	12	8.51(115% Rated)	20	0.31	0.48	0.15
	Limit			2.5 ppm	l	•
	Test Resul	ts		PASS		
	U.S.	190	160	a (62)	1	6.5

Operation	Channel	Test cond	litions	Freq	uency error (ppm)
Mode	Separation	Voltage(V)	Temp(°C)	406.125	456.125	469.975
192	nigo -	192	-30	0.65	0.48	0.48
	× 28	5 28	-20	0.12	0.15	0.51
	Bar	P.GO	-10	0.21	0.62	0.62
	620	655	0	0.23	0.26	0.26
	53	7.40 V	10	0.33	0.26	0.26
Op3	12.5KHz	0 160	20	0.26	0.45	0.32
C.S.		25 29	30	0.15	0.48	0.31
	8	20 10	40	0.45	0.65	0.14
	2	65	50	0.69	0.51	0.17
	Sci V	6.29 (85% Rated)	20	0.62	0.23	0.61
	54	8.51(115% Rated)	20	0.15	0.35	0.15
	Limit			2.5 ppm		
	Test Resul	ts		PASS		

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Report No.: LCS1412030188E

4.7. Maximum Transmitter Power <u>TEST APPLICABLE</u>

Per FCC Part 2.1046 and Part 90.205: Maximum ERP is dependent upon the station's antenna HAAT and required service area.

Per RSS-119 Section 5.4 and 5.4.1: The output power shall be within ± 1.0 dB of the manufacturer's rated power. Typical transmitter output powers are 110 watts for base and/or fixed stations (paging transmitters excepted), and 30 watts for mobile stations. Higher powers may be certified, but it should be noted that mobile stations are normally only licensed up to 30 watts. See the SRSP relevant to the operating frequency for equipment power limits.

TEST PROCEDURE

Measurements shall be made to establish the radio frequency power delivered by the transmitter the standard output termination. The power output shall be monitored and recorded and no adjustment shall be made to the transmitter after the test has begun, except as noted bellow:

If the power output is adjustable, measurements shall be made for the highest and lowest power levels.

The EUT connect to the Receiver through 20 dB attenuator.

Measurement with Spectrum Analyzer ESPI7 for conducted measurement, external power supply with 7.40 V stabilized supply voltage.

TEST CONFIGURATION



The EUT was directly connected to a RF Communication Test set by a 20 dB attenuator

TEST RESULTS

Modulation Type	Channel Separation	Operation Mode	Test Channel	Test Frequency (MHz)	Test Results (dBm)
65	6.9 %	100	Ch1	406.125	36.41
aB		Op 1	Ch2	456.125	36.75
Analog/EM	12.5KHz	G(2)	Ch3	469.975	36.62
Analog/FM	12.3KHZ	9	Ch1	406.125	30.13
Bass		Op 2	Ch2	456.125	30.39
650			Ch3	469.975	29.57
O R	5-1	5 15	Ch4	406.125	36.66
1.90		Op 3	Ch5	456.125	36.22
D:-:+-1/4ECV	10 5VII-	S	Ch6	469.975	36.48
Digital/4FSK	12.5KHz	2	Ch4	406.125	29.93
00		Op 4	Ch5	456.125	30.56
5		2.48	Ch6	469.975	30.28
Limit	The limit is c	lependent upon t	he station's ante	nna HAAT and requir	ed service area.
Test R	lesults			PASS	

Plots of Transmitter Power Measurement

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	<u>SHENZHEN I</u>	LCS COMPLIANO	<u>CE TESTING LAE</u>	BORATORY L	TD. FCC	ID: 2ADQZ	TPD5X Report	No.: LCSI	<u>412030188E</u>
1010	Modulati on Type	Channel Separation	Operation Mode	Test Channel	Test Frequency (MHz)	Rated Power (Watt)	Measurement (dBm)	Limit	Results
2	FM	12.5KHz	Op 1	Ch1	406.125	4.0	36.41	Varies	PASS

Marker 1 406.12400	00000 MHz PNO: Wide 🗔	SENSE:PULSE	ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100	02:03:44 PM May 31, 2016 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N	Peak Search
Ref Offset 2 10 dB/div Ref 40.00		Atten: 30 dB	Mk	r1 406.124 MHz 36.406 dBm	Next Peal
30.0					Next Pk Righ
20.0			\mathbf{N}	[Next Pk Le
10.0					
-10.0					Marker Delt
-20.0					Mkr→C
-30.0	Mun M		- Lawy	margen of Margan	
-40.0					Mkr→RefLv
Center 406.1250 MHz				Span 1.000 MHz	Mor 1 of
#Res BW 100 kHz		300 kHz	Sweep	1.000 ms (1001 pts)	

Modulation Type	Channel Separation	Operation Mode	Test Channel	Test Frequency (MHz)	Rated Power (Watt)	Measurement (dBm)	Limit	Results
FM	12.5KHz	Op 1	Ch2	456.125	4.0	36.75	Varies	PASS

0 MHz PNO: Wide	Trig: Free Run	ALIGNAUTO Avg Type: Log-Pwr Avg Hold:>100/100	02:02:12 PM May 31, 2016 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N	Peak Search
IFGain:Low	Attention	Mk	r1 456.125 MHz 36.745 dBm	Next Pea
				Next Pk Righ
		\land		Next Pk Le
				Marker Del
				Mkr→C
an and a start and a start a st			Www.www.	
				Mkr→RefL
			Span 1.000 MHz	Mo 1 of
	O MHz PNO: Wide IFGain:Low	O MHz PNO: Wide Atten: 30 dB	O MHz PN0: Wide Trig: Free Run IFGain:Low Trig: Free Run Atten: 30 dB Mik Mik	0 MHz PN0: Wide Trig: Free Run Arg Type: Log-Pwr Arg Hold>100/100 TRACE I 23456 TRACE I 234566 TRACE I 2345666 TRACE I 2345666666666666666666666666666666666666

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Modulati Type	ion	Channel Separation	n Opera	tion de	Test Channel	Test Frequenc (MHz)	y Rated (Watt	r Measur		Limit	Res
FM		12.5KHz	Op	15	Ch3	469.975	4.0	36.0	52	Varies	PA
	LXI	nt Spectrum Analyzer	50 Ω AC	-	SENSE:PU		ALIGNAUTO 0	2:00:55 PM May 31, 2016 TRACE 1 2 3 4 5 6		Search	
		Ref Offse	PN IFC	Z 10: Wide Gain:Low	Trig: Free R Atten: 30 dE	un Avg Hold:	>100/100	түре Милийн ост Р N N N N 469.977 MHz 36.623 dBm	i N	lext Peak	
	30.0				1					Pk Right	
	20.0			/					Nex	kt Pk Left	
	-10.0								Mar	ker Delta	
	-20.0		-sa a ard				Le Viller			Mkr→CF	
	-40.0	mannon					U MC MAR	MM	Mkr	−→RefLvi	
		nter 469.9750 M	IHz	#\/				pan 1.000 MHz		More 1 of 2	
	Cen		IHz	#VE	300 kHz			pan 1.000 MHz 0 ms (1001 pts)			
LES LES	Cen #Re	nter 469.9750 M	IHz	#VE	300 kHz	eS.	Sweep 1.00				10
	Cen #Re ^{MSG}	nter 469.9750 M ss BW 100 kHz	IHz Operation Mode	1	Tost	Test Frequency (MHz)	Sweep 1.00		nent	1 of 2	Resul
уре	Cen #Re ^{MSG}	hannel	Operation	1	Test	Test Frequency	Sweep 1.00 STATUS Rated Power	0 ms (1001 pts)	nent	1 of 2	
ype	Cen #Re MSG Cl Sep 12	hannel baration	Operation Mode Op 2	1	Test hannel	Test Frequency (MHz)	Sweep 1.00 STATUS Rated Power	o ms (1001 pts) Measurer (dBm	nent	1 of 2	
уре	Cen #Re MSG Cl Sep 12	hannel paration	Operation Mode Op 2	¹ C	Test hannel	Test Frequency (MHz) 406.125	Sweep 1.00 STATUS STATUS Rated Power (Watt) 1 ALIGNAUTO I0 :: Log-Pwr Log-Pwr	Measurer (dBm 30.13	nent	1 of 2	
уре	Cen #Re MSG Cl Sep 12	hannel baration 2.5KHz	Operation Mode Op 2 - Swept SA 50Ω AC 5000000 MH: PN IFC	¹ C	Test hannel	Test Frequency (MHz) 406.125	Sweep 1.00 STATUS STATUS Rated Power (Watt) 1 1 ALIGNAUTO ID *: Log-Pwr >100/100 >10	0 ms (1001 pts) Меазигет (dBm 30.13 2:04:51 РММау 31, 2016 тгясе [1 2 3 4 5 с түре [мимими рет/Р NNNN	nent	1 of 2 Limit Varies	
ulation ype FM	Cen #Re MSG Cl Sep 12 Agiter Mar	hannel paration 2.5KHz nt Spectrum Analyzer rker 1 406.125 Ref Offse B/div Ref 40.	Operation Mode Op 2 - Swept SA 50Ω AC 5000000 MH: PN IFC	C Z VO: Wide	Test hannel Ch1	Test Frequency (MHz) 406.125	Sweep 1.00 STATUS STATUS Rated Power (Watt) 1 1 ALIGNAUTO ID *: Log-Pwr >100/100 >10	Measurer (dBm 30.13	nent	1 of 2 Limit Varies Search	
уре	Cen #Re MsG Cl Sep 12 Agiter Mar	hannel baration 2.5KHz htspectrum Analyzer rker 1 406.125 Ref Offse B/div Ref 40.	Operation Mode Op 2 - Swept SA 50 Ω AC 50 Ω AC 50 Ω AC FROM IFO	C Z VO: Wide	Test hannel Ch1	Test Frequency (MHz) 406.125	Sweep 1.00 STATUS STATUS Rated Power (Watt) 1 1 ALIGNAUTO ID *: Log-Pwr >100/100 >10	Measurer (dBm 30.13 04:51 PM May 31, 2016 17RACE 1 2 3 4 5 6 17YPE MWWWWW DET P NNNN 406. 125 MHz	nent	1 of 2 Limit Varies Search	
уре	Cen #Re MsG Cl Sep 12 Agiter Mar	hannel baration 2.5KHz htspectrum Analyzer rker 1 406.125	Operation Mode Op 2 - Swept SA 50 Ω AC 50 Ω AC 50 Ω AC FROM IFO	C Z VO: Wide	Test hannel Ch1 SENSE:PU Trig: Free R Atten: 30 df	Test Frequency (MHz) 406.125	Sweep 1.00 STATUS STATUS Rated Power (Watt) 1 1 ALIGNAUTO D *: Log-Pwr >100/100 >10	Measurer (dBm 30.13 04:51 PM May 31, 2016 17RACE 1 2 3 4 5 6 17YPE MWWWWW DET P NNNN 406. 125 MHz	nent	1 of 2 Limit Varies Search ext Peak	
уре	Cen #Re MsG Cl Sep 12 Agiter Mar	hannel baration 2.5KHz htspectrum Analyzer rker 1 406.125	Operation Mode Op 2 - Swept SA 50 Ω AC 50 Ω AC 50 Ω AC FROM IFO	C Z VO: Wide	Test hannel Ch1 SENSE:PU Trig: Free R Atten: 30 df	Test Frequency (MHz) 406.125	Sweep 1.00 STATUS STATUS Rated Power (Watt) 1 1 ALIGNAUTO D *: Log-Pwr >100/100 >10	Measurer (dBm 30.13 04:51 PM May 31, 2016 17RACE 1 2 3 4 5 6 17YPE MWWWWW DET P NNNN 406. 125 MHz	nent	1 of 2 Limit Varies Search ext Peak	Resul PAS
уре	Cen #Re Msg Cl Sep 12 Agiler Mar 10 di Log 30.0 20.0	hannel baration 2.5KHz http://www.analyzer rker 1 406.125	Operation Mode Op 2 - Swept SA 50 Ω AC 50 Ω AC 50 Ω AC FROM IFO	C Z VO: Wide	Test hannel Ch1 SENSE:PU Trig: Free R Atten: 30 df	Test Frequency (MHz) 406.125	Sweep 1.00 STATUS STATUS Rated Power (Watt) 1 1 ALIGNAUTO D *: Log-Pwr >100/100 >10	Measurer (dBm 30.13 04:51 PM May 31, 2016 17RACE 1 2 3 4 5 6 17YPE MWWWWW DET P NNNN 406. 125 MHz	nent) Peak Next Next	1 of 2 Limit Varies Search ext Peak Pk Right tt Pk Left	
уре	Cen #Re Msg Cl Sep 12 Agiler Mar 10 di Log 30.0 20.0 10.0	hannel baration 2.5KHz http://www.analyzer rker 1 406.125 B/div Ref 40.	Operation Mode Op 2 - Swept SA 50 Ω AC 50 Ω AC 50 Ω AC FROM IFO	C Z VO: Wide	Test hannel Ch1 SENSE:PU Trig: Free R Atten: 30 df	Test Frequency (MHz) 406.125	Sweep 1.00 STATUS STATUS Rated Power (Watt) 1 1 ALIGNAUTO D *: Log-Pwr >100/100 >10	Measurer (dBm 30.13 04:51 PM May 31, 2016 17RACE 1 2 3 4 5 6 17YPE MWWWWW DET P NNNN 406. 125 MHz	nent) Peak Next Next	1 of 2 Limit Varies Search lext Peak Pk Right	
уре	Cen #Re MsG Cl Sep 12 Agiler Mar 10 di Log 30.0 20.0 10.0	hannel baration 2.5KHz http://www.analyzer RF rker 1 406.125 B/div Ref 40.	Operation Mode Op 2 - Swept SA 50 Ω AC 50 Ω AC 50 Ω AC FROM IFC et 20 dB	C Z VO: Wide	Test hannel Ch1 SENSE:PU Trig: Free R Atten: 30 df	Test Frequency (MHz) 406.125	Sweep 1.00 STATUS STATUS Rated Power (Watt) 1 1 ALIGNAUTO D *: Log-Pwr >100/100 >10	Measurer (dBm 30.13 04:51 PM May 31, 2016 17RACE 1 2 3 4 5 6 17YPE MWWWWW DET P NNNN 406. 125 MHz	nent Peak Next Next Mar	1 of 2 Limit Varies Search ext Peak Pk Right tt Pk Left	
уре	Cen #Re MsG 12 Agiter Mar 10 di 0.00 20.0 10.0 -10.0 -20.0 -30.0	hannel baration 2.5KHz nt Spectrum Analyzer rker 1 406.125 B/div Ref Offse B/div Ref 40.	Operation Mode Op 2 - Swept SA 50 Q AC 50000000 MHH PP IFC et 20 dB 00 dBm	C Z VO: Wide	Test hannel Ch1 SENSE:PU Trig: Free R Atten: 30 df	Test Frequency (MHz) 406.125	Sweep 1.00 STATUS STATUS Rated Power (Watt) I 1 I ALIGNAUTO ID I: Log-Pwr >100/100 ID Mkr1 ID	0 ms (1001 pts) Measurer (dBm 30.13 104:51 PMMay31, 2016 TRACE [12, 3, 4 5 6 TYPE [NWMMA 0ert]P NNNN 406.125 MHz 30.131 dBm	nent) Peak Next Next Mar	1 of 2 Limit Varies Search lext Peak Pk Right ct Pk Left ker Delta	
уре	Cen #Re MsG 12 Agiter Mar 10 di 0.00 20.0 10.0 -10.0 -20.0 -30.0	hannel baration 2.5KHz nt Spectrum Analyzer RF IRer 1 406. 125 B/div Ref 40.	Operation Mode Op 2 - Swept SA 50 Q AC 50000000 MHH PP IFC et 20 dB 00 dBm	C Z VO: Wide	Test hannel Ch1 SENSE:PU Trig: Free R Atten: 30 df	Test Frequency (MHz) 406.125	Sweep 1.00 STATUS STATUS Rated Power (Watt) I 1 I ALIGNAUTO ID I: Log-Pwr >100/100 ID Mkr1 ID	Measurer (dBm 30.13 04:51 PM May 31, 2016 17RACE 1 2 3 4 5 6 17YPE MWWWWW DET P NNNN 406. 125 MHz	nent) Peak Next Next Mar	1 of 2 Limit Varies Search lext Peak Pk Right ct Pk Left ker Delta	

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Modulation Type	Channel Separation	Operation Mode	Test Channel	Test Frequency (MHz)	Rated Power (Watt)	Measurem (dBm)	ent	Limit	Result
FM	12.5KHz	Op 2	Ch2	456.975	1.0	30.39		Varies	PASS
	Agilent Spectrum Analy			21.6		197. IA			
	Marker 1 456.1	50 Ω AC 25000000 MHz			ALIGNAUTO 02 e: Log-Pwr >100/100	2:03:12 PM May 31, 2016 TRACE 1 2 3 4 5 6 TYPE M MANAAAAA	Pea	k Search	
		PNO: IFGair				TYPE MWWWWW DET P NNNNN 456.125 MHz		Next Peak	
		ffset 20 dB 10.00 dBm			WIKI I 4	30.392 dBm			
	5			↓1			Nex	t Pk Right	
	30.0							g	
	20.0						Ne	ext Pk Left	
	10.0						140		
	0.00		/			I			
	-10.0		/				Ma	arker Delta	
	-20.0	/	(I		-	
					le l			Mkr→CF	
	-30.0 -40.0	mannon			Mr. Marling May	"Multhemany			
	-40.0 300 mm					4 W WWANT	Mk	(r→RefLvl	
						I I I			
	-50.0							Mara	
	2	0 MHz			s	pan 1.000 MHz		More 1 of 2	
	Center 456.1250 #Res BW 100 kl		#VBW 300 kHz	z	Sweep 1.00	pan 1.000 MHz 0 ms (1001 pts)			
	Center 456.1250		#VBW 300 kH	z			5		
odulation	Center 456.1250 #Res BW 100 kl		#VBW 300 kHz	Test	Sweep 1.000 STATUS Rated		ent	1 of 2	Derecht
odulation Type	Center 456.125 #Res BW 100 kl	Hz		Test Frequency	Sweep 1.00	0 ms (1001 pts)	ent		Result
	Center 456.125 #Res BW 100 kl	Hz Operation	Test	Test	Sweep 1.000 STATUS Rated	0 ms (1001 pts)	ent	1 of 2	Result PASS
Туре	Center 456.1256 #Res BW 100 kl	Hz Operation Mode Op 2	Test Channel	Test Frequency (MHz)	Sweep 1.000 STATUS Rated Power (Watt)	0 ms (1001 pts) Measurem (dBm)	ent	1 of 2	
Туре	Center 456.125 #Res BW 100 kl MsG Channel Separation 12.5KHz	Hz Operation Mode Op 2 ////////////////////////////////////	Test Channel Ch3	Test Frequency (MHz) 469.975	Sweep 1.000 status status Rated Power (Watt) 1.0 ALIGNAUTO 00 e: Log-Pwr 000	0 ms (1001 pts) Measurem (dBm) 29.57		1 of 2	
Туре	Center 456.1256 #Res BW 100 kl Msg Channel Separation 12.5KHz Agilent Spectrum Analy Marker 1 469.9	Hz Operation Mode Op 2 Zer - Swept SA 50 R AC 50 R AC PNO: IFGair	Test Channel Ch3	Test Frequency (MHz) 469.975	Sweep 1.000 STATUS STATUS Rated Power (Watt) 1.0 ALIGNAUTO 03 E: Log-Pwr >100/100	0 ms (1001 pts) Measurem (dBm) 29.57 1:59:53 PM May 31, 2016 TYPE[MWWWWW DET]P NNNNN	Peal	1 of 2 Limit Varies	
Туре	Center 456.125 #Res BW 100 kl Msg Channel Separation 12.5KHz Agilent Spectrum Analy Marker 1 469.9	Hz Operation Mode Op 2 ////////////////////////////////////	Test Channel Ch3	Test Frequency (MHz) 469.975	Sweep 1.000 STATUS STATUS Rated Power (Watt) 1.0	0 ms (1001 pts) Measurem (dBm) 29.57	Peal	1 of 2 Limit Varies	
Туре	Center 456.1256 #Res BW 100 kl Msg Channel Separation 12.5KHz Agilent Spectrum Analy Marker 1 469.9	Hz Operation Mode Op 2 Zer - Swept SA 50 & AC FOO FOO FGair ffset 20 dB	Test Channel Ch3	Test Frequency (MHz) 469.975	Sweep 1.000 STATUS STATUS Rated Power (Watt) 1.0 ALIGNAUTO 03 E: Log-Pwr >100/100	0 ms (1001 pts) Measurem (dBm) 29.57 159:53 PM May 31, 2016 TRACE [1 2 3 4 5 6 TRACE [1 3 4 5 6 T	Peak	1 of 2 Limit Varies k Search Next Peak	Result PASS
Туре	Center 456.1256 #Res BW 100 kl MSG Channel Separation 12.5KHz Agilent Spectrum Analy Marker 1 469.9	Hz Operation Mode Op 2 Zer - Swept SA 50 & AC FOO FOO FGair ffset 20 dB	Test Channel Ch3	Test Frequency (MHz) 469.975	Sweep 1.000 STATUS STATUS Rated Power (Watt) 1.0 ALIGNAUTO 03 E: Log-Pwr >100/100	0 ms (1001 pts) Measurem (dBm) 29.57 159:53 PM May 31, 2016 TRACE [1 2 3 4 5 6 TRACE [1 3 4 5 6 T	Peak	1 of 2 Limit Varies	
Туре	Center 456.1256 #Res BW 100 kl Msg Channel Separation 12.5KHz Agilent Spectrum Analy Marker 1 469.9	Hz Operation Mode Op 2 Zer - Swept SA 50 & AC FOO FOO FGair ffset 20 dB	Test Channel Ch3	Test Frequency (MHz) 469.975	Sweep 1.000 STATUS STATUS Rated Power (Watt) 1.0 ALIGNAUTO 03 E: Log-Pwr >100/100	0 ms (1001 pts) Measurem (dBm) 29.57 159:53 PM May 31, 2016 TRACE [1 2 3 4 5 6 TRACE [1 3 4 5 6 T	Peal	1 of 2 Limit Varies k Search Next Peak ct Pk Right	
Туре	Center 456.1256 #Res BW 100 kl Msg Channel Separation 12.5KHz Agilent Spectrum Analy Marker 1 469.9	Hz Operation Mode Op 2 Zer - Swept SA 50 & AC FOO FOO FGair ffset 20 dB	Test Channel Ch3	Test Frequency (MHz) 469.975	Sweep 1.000 STATUS STATUS Rated Power (Watt) 1.0 ALIGNAUTO 03 E: Log-Pwr >100/100	0 ms (1001 pts) Measurem (dBm) 29.57 159:53 PM May 31, 2016 TRACE [1 2 3 4 5 6 TRACE [1 3 4 5 6 T	Peal	1 of 2 Limit Varies k Search Next Peak	
Туре	Center 456.1256 #Res BW 100 kl Msg Channel Separation 12.5KHz Agilent Spectrum Analy Marker 1 469.9 Marker 1 469.9	Hz Operation Mode Op 2 Zer - Swept SA 50 & AC FOO FOO FGair ffset 20 dB	Test Channel Ch3	Test Frequency (MHz) 469.975	Sweep 1.000 STATUS STATUS Rated Power (Watt) 1.0 ALIGNAUTO 03 E: Log-Pwr >100/100	0 ms (1001 pts) Measurem (dBm) 29.57 159:53 PM May 31, 2016 TRACE [1 2 3 4 5 6 TRACE [1 3 4 5 6 T	Peal	1 of 2 Limit Varies k Search Next Peak kt Pk Right ext Pk Left	
Туре	Center 456.1256 #Res BW 100 kl Msg Channel Separation 12.5KHz Marker 1 469.9 00 00 00 00 00 00 00 00 00 00 00 00 00	Hz Operation Mode Op 2 Zer - Swept SA 50 & AC FOO FOO FGair ffset 20 dB	Test Channel Ch3	Test Frequency (MHz) 469.975	Sweep 1.000 STATUS STATUS Rated Power (Watt) 1.0 ALIGNAUTO 03 E: Log-Pwr >100/100	0 ms (1001 pts) Measurem (dBm) 29.57 159:53 PM May 31, 2016 TRACE [1 2 3 4 5 6 TRACE [1 3 4 5 6 T	Peal	1 of 2 Limit Varies k Search Next Peak ct Pk Right	
Туре	Center 456,1256 #Res BW 100 kl Msg Channel Separation 12.5KHz Marker 1 469.9 00 Ref 0 10 dB/div Ref 2 30.0 20.0 10.0 -10.0	Hz Operation Mode Op 2 Zer - Swept SA 50 & AC FOO FOO FGair ffset 20 dB	Test Channel Ch3	Test Frequency (MHz) 469.975	Sweep 1.000 STATUS STATUS Rated Power (Watt) 1.0 ALIGNAUTO 03 E: Log-Pwr >100/100	0 ms (1001 pts) Measurem (dBm) 29.57 159:53 PM May 31, 2016 TRACE [1 2 3 4 5 6 TRACE [1 3 4 5 6 T	Peal	1 of 2 Limit Varies k Search Next Peak ct Pk Right ext Pk Left arker Delta	
Туре	Center 456,1256 #Res BW 100 kl Msg Channel Separation 12.5KHz Marker 1 469.9 00 Ref 0 10 dB/div Ref 0 10 dB/di	Hz Operation Mode Op 2 Zer - Swept SA 50 & AC FOO FOO FGair ffset 20 dB	Test Channel Ch3	Test Frequency (MHz) 469.975	Sweep 1.000 STATUS STATUS Rated Power (Watt) 1.0 ALIGNAUTO 03 E: Log-Pwr >100/100	0 ms (1001 pts) Measurem (dBm) 29.57 159:53 PM May 31, 2016 TRACE [1 2 3 4 5 6 TRACE [1 3 4 5 6 T	Peal	1 of 2 Limit Varies k Search Next Peak kt Pk Right ext Pk Left	
Туре	Center 456.1256 #Res BW 100 kl Msg Channel Separation 12.5KHz Marker 1 469.9 00 000 10.0 0.00 -10.0 -20.0 -30.0	Hz Operation Mode Op 2 7er - Swept SA 50 Q AC 976000000 MHz PNO: IFGair ffset 20 dB 10.00 dBm	Test Channel Ch3	Test Frequency (MHz) 469.975	Sweep 1.000 STATUS STATUS Rated Power (Watt) 1.0 ALIGNAUTO 03 E: Log-Pwr >100/100 Mkr1 4 03	0 ms (1001 pts) Measurem (dBm) 29.57 1:59:53 PM May 31, 2016 TYPE MAXEE 112 3 4 56 TYPE MAXEMAN DET P NNNNN 469.976 MHz 29.571 dBm	Peal	1 of 2 Limit Varies k Search Next Peak ct Pk Right ext Pk Left arker Delta	
Туре	Center 456.1256 #Res BW 100 kl Msg Channel Separation 12.5KHz Marker 1 469.9 00 Ref 0 10 dB/div Ref 0 10 dB/di	Hz Operation Mode Op 2 Zer - Swept SA 50 & AC FOO FOO FGair ffset 20 dB	Test Channel Ch3	Test Frequency (MHz) 469.975	Sweep 1.000 STATUS STATUS Rated Power (Watt) 1.0 ALIGNAUTO 03 E: Log-Pwr >100/100	0 ms (1001 pts) Measurem (dBm) 29.57 1:59:53 PM May 31, 2016 TYPE MAXEE 112 3 4 56 TYPE MAXEMAN DET P NNNNN 469.976 MHz 29.571 dBm	Peal Nex Ne	1 of 2 Limit Varies k Search Next Peak ct Pk Right ext Pk Left arker Delta	
Туре	Center 456.1256 #Res BW 100 kl Msg Channel Separation 12.5KHz Marker 1 469.9 00 000 10.0 0.00 -10.0 -20.0 -30.0	Hz Operation Mode Op 2 7er - Swept SA 50 Q AC 976000000 MHz PNO: IFGair ffset 20 dB 10.00 dBm	Test Channel Ch3	Test Frequency (MHz) 469.975	Sweep 1.000 STATUS STATUS Rated Power (Watt) 1.0 ALIGNAUTO 03 E: Log-Pwr >100/100 Mkr1 4 03	0 ms (1001 pts) Measurem (dBm) 29.57 159:53 PM May 31, 2016 TRACE 12.3 4 5 6 TYPE M WWWWW DET P N N N N 469.976 MHz 29.571 dBm	Peal Nex Ne	1 of 2 Limit Varies k Search Next Peak ct Pk Right ext Pk Left arker Delta Mkr→CF	

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lodulation Type	Channel Separation	Operation Mode	Test Channel	Test Frequency (MHz)	Rated Power (Watt)	Measureme (dBm)	ent Limit	Result
4FSK	12.5KHz	Op 3	Ch4	406.125	4.0	36.66	Varies	PASS
	Marker 1 406.1 Ref 0	50 Ω AC 121000000 MHz PNO: IFGair Offset 20 dB	Wide 😱 Trig: Fre	e Run Avg Hold	e: Log-Pwr I:>100/100 Mkr1 4	1:57:00 PM May 31, 2016 TRACE 11 2 3 4 5 6 Type MWWWWW DET P N N N N N 106. 121 MHz 36. 661 dBm	Peak Search NextPeak	
	10 dB/div Ref 4	40.00 dBm		1			Next Pk Right	
	20.0						Next Pk Left	
	-10.0						Marker Delta	
	-20.0 -30.0	mmmmm			h h h h h h h h h h h h h h h h h h h	munn fimpe and	Mkr→CF	
	-40.0						Mkr→Ref Lvl More	
	Center 406.1250 #Res BW 100 kl		#VBW 300 kH	z		pan 1.000 MHz 0 ms (1001 pts)	1 of 2	
		Operation	Test	Test	Rated	Measureme	nt	
odulation Type	Channel Separation	Mode	Channel	Frequency (MHz)	Power (Watt)	(dBm)	Limit	Result
				(MHz) 456.125	Power (Watt)4.0		Limit Varies	Result PASS
Туре	Separation	Mode Op 3	Channel	(MHz)	(Watt)	(dBm)	Limit	
Туре	Separation 12.5KHz Agilent Spectrum Analy X RF	Mode Op 3 yzer - Swept SA 50 Ω AC 126000000 MHz	Channel Ch5	(MHz) 456.125	(Watt) 4.0	(dBm) 36.22	Limit	
Туре	Separation 12.5KHz Agilent Spectrum Analy Marker 1 456.1	Mode Op 3 yzer - Swept SA 50 Ω AC 126000000 MHz PNO: IFGair	Channel Ch5	(MHz) 456.125 EPULSE Avg Typ are Run Avg Hold	(Watt) 4.0 ALIGNAUTO 0: e: Log-Pwr I> 100/100	(dBm) 36.22	Varies	
Туре	Separation 12.5KHz Agilent Spectrum Analy Marker 1 456.1 Ref O	Mode Op 3 yzer - Swept SA 50 Q AC 126000000 MHz PNO:	Channel Ch5	(MHz) 456.125 EPULSE Avg Typ are Run Avg Hold	(Watt) 4.0 ALIGNAUTO 0: e: Log-Pwr I:> 100/100 Mkr1 4	(dBm) 36.22	Peak Search	
Туре	Separation 12.5KHz Agilent Spectrum Analy W RF Marker 1 456.1	Mode Op 3 yzer - Swept SA 50 Ω 126000000 MHz PN0: IFGair Offset 20 dB	Channel Ch5	(MHz) 456.125 EPULSE Avg Typ are Run Avg Hold	(Watt) 4.0 ALIGNAUTO 0: e: Log-Pwr I:> 100/100 Mkr1 4	(dBm) 36.22	Peak Search	
Туре	Separation 12.5KHz Agilent Spectrum Analy Marker 1 456.1 Agilent Spectrum Ref O Ref O 10 dB/div Ref O	Mode Op 3 yzer - Swept SA 50 Ω 126000000 MHz PN0: IFGair Offset 20 dB	Channel Ch5	(MHz) 456.125 EPULSE Avg Typ are Run Avg Hold	(Watt) 4.0 ALIGNAUTO 0: e: Log-Pwr I:> 100/100 Mkr1 4	(dBm) 36.22	Peak Search Next Peak	
Туре	Separation 12.5KHz Agilent Spectrum Analy W RF Marker 1 456.1 10 dB/div Ref 0 10 dB/div Ref 2 30.0 20.0	Mode Op 3 yzer - Swept SA 50 Ω 126000000 MHz PN0: IFGair Offset 20 dB	Channel Ch5	(MHz) 456.125 EPULSE Avg Typ are Run Avg Hold	(Watt) 4.0 ALIGNAUTO 0: e: Log-Pwr I:> 100/100 Mkr1 4	(dBm) 36.22	Peak Search Next Peak Next Pk Right	
Туре	Separation 12.5KHz Agilent Spectrum Analy Marker 1 456.1 Marker 1 456.1 10 dB/div Ref 0 30.0 20.0 10.0 -0.0 -0.0	Mode Op 3 yzer - Swept SA S0 & AC 126000000 MHz PN0: IFGair Offset 20 dB 40.00 dBm	Channel Ch5	(MHz) 456.125 EPULSE Avg Typ are Run Avg Hold	(Watt) 4.0 aLIGNAUTO 0: e: Log-Pwr I>100/100 Mkr1 4	(dBm) 36.22	Peak Search Next Peak Next Pk Right Next Pk Left	
Туре	Separation 12.5KHz Agilent Spectrum Analy W RF Marker 1 456.1 10 dB/div Ref 0 10 dB/div Ref 2 30.0 20.0 10.0 -10.0	Mode Op 3 yzer - Swept SA S0 & AC 126000000 MHz PN0: IFGair Offset 20 dB 40.00 dBm	Channel Ch5	(MHz) 456.125 EPULSE Avg Typ are Run Avg Hold	(Watt) 4.0 4.0 e: Log-Pwr 1>100/100 Mkr1 4	(dBm) 36.22	Limit Varies Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta	

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Туре	Channel Separation	Operation Mode	Test Channel	Test Frequency (MHz)	Rated Power (Watt)	Measuremo (dBm)	ent Limit	Result
4FSK	12.5KHz	Op 3	Ch6	469.975	4.0	36.48	Varies	PASS
		50Ω AC	SEN	SE:PULSE		1:59:00 PM May 31, 2016	Peak Search	
	Marker 1 469.9	9 76000000 MHz PNO: IFGair	Wide Trig: Fre	e Run Avg Hold	e: Log-Pwr I:>100/100	TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N		
	10 dB/div Ref 4	ffset 20 dB 40.00 dBm			Mkr1 4	469.976 MHz 36.479 dBm	Next Peak	
	30.0						Next Pk Right	
	20.0						Next Pk Left	
	0.00						Marker Delta	
	-20.0						Mkr→CF	
	-30.0 -40.0	Man Mar			how and for	Mrownay Mayroway	Mkr→RefLvl	
	-50.0						More	
	Center 469.9750 #Res BW 100 kł	0 MHz Hz	#VBW 300 kH	Z		ipan 1.000 MHz 0 ms (1001 pts)	1 of 2	
	25	28		a G	1211	12	3 0	
	1.1.1	0.00		a. (6.52	- 6	50	0.00	
odulation Type	Channel Separation	Operation Mode	Test Channel	Test Frequency (MHz)	Rated Power (Watt)	Measureme (dBm)	ent Limit	Result
odulation Type 4FSK							ent Limit Varies	
Туре	Separation 12.5KHz	Mode Op 4	Channel	Frequency (MHz)	Power (Watt)	(dBm)	Limit	
Туре	Separation 12.5KHz	Mode Op 4	Channel Ch4	Frequency (MHz) 406.125	Power (Watt) 1.0	(dBm) 29.93	Limit	
Туре	Separation 12.5KHz	Mode Op 4 yzer - Swept SA 50 x AC 124000000 MHz	Channel Ch4	Frequency (MHz) 406.125	Power (Watt) 1.0 1.0 ALIGNAUTO 0: e: Log-Pwr 1:>100/100	(dBm) 29.93	Limit Varies Peak Search	
Туре	Separation 12.5KHz Agilent Spectrum Analy OV RF Marker 1 406.1 Ref O	Mode Op 4 yzer - Swept SA 50 x AC 124000000 MHz PN0:	Channel Ch4	Frequency (MHz) 406.125	Power (Watt) 1.0 1.0 ALIGNAUTO 0: e: Log-Pwr 1:>100/100	(dBm) 29.93	Varies	
Туре	Separation 12.5KHz Agilent Spectrum Analy Marker 1 406.1 10 dB/div Ref 0	Mode Op 4 yzer - Swept SA 50 Q AC 124000000 MHz PNO: IFGain offset 20 dB	Channel Ch4	Frequency (MHz) 406.125	Power (Watt) 1.0 1.0 ALIGNAUTO 0: e: Log-Pwr 1:>100/100	(dBm) 29.93	Limit Varies Peak Search	
Туре	Separation 12.5KHz Agilent Spectrum Analy Marker 1 406.1 Marker 1 406.1	Mode Op 4 yzer - Swept SA 50 Q AC 124000000 MHz PNO: IFGain offset 20 dB	Channel Ch4	Frequency (MHz) 406.125	Power (Watt) 1.0 1.0 ALIGNAUTO 0: e: Log-Pwr 1:>100/100	(dBm) 29.93	Peak Search Next Peak	
Туре	Separation 12.5KHz Agilent Spectrum Analy Marker 1 406.1 10 dB/div Ref Q 30.0 20.0 10.0 0.00	Mode Op 4 yzer - Swept SA 50 Q AC 124000000 MHz PNO: IFGain offset 20 dB	Channel Ch4	Frequency (MHz) 406.125	Power (Watt) 1.0 1.0 ALIGNAUTO 0: e: Log-Pwr 1:>100/100	(dBm) 29.93	Limit Varies Peak Search Next Peak Next Pk Right	Result
Туре	Separation 12.5KHz Agilent Spectrum Analy Marker 1 406.1 10 dB/div Ref Q 30.0 20.0 10.0	Mode Op 4 yzer - Swept SA 50 Q AC 124000000 MHz PNO: IFGain offset 20 dB	Channel Ch4	Frequency (MHz) 406.125	Power (Watt) 1.0 1.0 ALIGNAUTO 0: e: Log-Pwr 1:>100/100	(dBm) 29.93	Limit Varies Peak Search Next Peak Next Pk Right Next Pk Left	
Туре	Separation 12.5KHz Agilent Spectrum Analy Marker 1 406.1 10 dB/div Ref Q 30.0 20.0 10.0 0.00	Mode Op 4 yzer - Swept SA 50 Q AC 124000000 MHz PNO: IFGain offset 20 dB	Channel Ch4	Frequency (MHz) 406.125	Power (Watt) 1.0 1.0 ALIGNAUTO 0: e: Log-Pwr 1:>100/100	(dBm) 29.93	Limit Varies Peak Search Next Peak Next Pk Right Next Pk Left	
Туре	Separation 12.5KHz Agilent Spectrum Analy X Marker 1 406.1 10 dB/div Ref O 30.0 20.0 10.0 10.0 20.0 10.0 -20.0 -30.0	Mode Op 4 yzer - Swept SA 50 Ω AC 124000000 MHz PNO: IFGair	Channel Ch4	Frequency (MHz) 406.125	Power (Watt) 1.0 ALIGNAUTO 0: e: Log.Pwr :> 100/100	(dBm) 29.93	Limit Varies Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr→CF	
Туре	Separation 12.5KHz Agilent Spectrum Analy X Marker 1 406.1 10 dB/div Ref O 30.0 20.0 10.0 10.0 20.0 10.0 -20.0 -30.0	Mode Op 4 yzer - Swept SA 50 Q AC 124000000 MHz PNO: IFGain offset 20 dB	Channel Ch4	Frequency (MHz) 406.125	Power (Watt) 1.0 ALIGNAUTO 0: e: Log.Pwr :> 100/100	(dBm) 29.93	Limit Varies Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta	

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Туре	Channel Separation	Operation Mode	Test Channel	Test Frequency (MHz)	Rated Power (Watt)	Measureme (dBm)	ent Limit	Result
4FSK	12.5KHz	Op 4	Ch5	456.125	1.0	30.56	Varies	PASS
	Agilent Spectrum Analy	yzer - Swept SA		20.0		5.0	1020	
		50 Ω AC 26000000 MHz			ALIGNAUTO 0: e: Log-Pwr i:>100/100	1:58:06 PM May 31, 2016 TRACE 1 2 3 4 5 6 TYPE MWWWWW	Peak Search	
	10 dB/div Ref 4	PNO: IFGair ffset 20 dB 40.00 dBm			Mkr1 4	456.126 MHz 30.560 dBm	Next Peak	
	30.0			↓ ¹			Next Pk Right	
	20.0						Next Pk Left	
	-10.0						Marker Delta	
	-20.0						Mkr→CF	
		man man			M M M	WM wall for the	Mkr→RefLvl	
	-50.0 Center 456.1250					pan 1.000 MHz	More 1 of 2	
			#17010 200 20					
	#Res BW 100 kl	HZ	#VBW 300 kH:	Z		0 ms (1001 pts)		
		HZ	#VBW 300 KH	2	Sweep 1.00	0 ms (1001 pts)	5-ag	
odulation Type		Operation Mode	Test Channel	z Test Frequency (MHz)		Measureme (dBm)	ent Limit	Resul
	MSG	Operation	Test	Test Frequency	status Rated Power	Measureme	ent Limit Varies	
Туре	Msg Channel Separation 12.5KHz	Operation Mode Op 4	Test Channel	Test Frequency (MHz)	Rated Power (Watt)	Measureme (dBm)	Limit	
Туре	Channel Separation 12.5KHz	Operation Mode Op 4 yzer - Swept SA 50 x AC 777000000 MHz	Test Channel Ch6	Test Frequency (MHz) 469.975	STATUS Rated Power (Watt) 1.0	Measureme (dBm) 30.28	Limit	
Туре	Channel Separation 12.5KHz	Operation Mode Op 4 yzer - Swept SA 50 x AC 777000000 MHz	Test Channel Ch6	Test Frequency (MHz) 469.975	STATUS Rated Power (Watt) 1.0 ALIGNAUTO 0: e: Log-Pwr I>100/100	Measureme (dBm) 30.28 1:59:20 РМ Мау 31, 2016 ТРАСЕ [1 2 3 4 5 6 ТУРЕ (МУМИМИ) DET (P NNNNN)	Varies Peak Search	
Туре	MSG Channel Separation 12.5KHz Agilent Spectrum Analy V RF Marker 1 469.9	Operation Mode Op 4	Test Channel Ch6	Test Frequency (MHz) 469.975	STATUS Rated Power (Watt) 1.0 ALIGNAUTO 0: e: Log-Pwr I>100/100	Measureme (dBm) 30.28	Varies	
Туре	MSG Channel Separation 12.5KHz Agilent Spectrum Analy X Marker 1 469.9	Operation Mode Op 4 vzer - Swept SA 50 R AC P77000000 MHz PNO: IFGain ffset 20 dB	Test Channel Ch6	Test Frequency (MHz) 469.975	STATUS Rated Power (Watt) 1.0 ALIGNAUTO 0: e: Log-Pwr I>100/100	Measureme (dBm) 30.28	Varies Peak Search	Result PASS
Туре	MSG Channel Separation 12.5KHz Agilent Spectrum Analy V/ RF Marker 1 469.9	Operation Mode Op 4 vzer - Swept SA 50 R AC P77000000 MHz PNO: IFGain ffset 20 dB	Test Channel Ch6	Test Frequency (MHz) 469.975	STATUS Rated Power (Watt) 1.0 ALIGNAUTO 0: e: Log-Pwr I>100/100	Measureme (dBm) 30.28	Peak Search Next Peak	
Туре	MSG Channel Separation 12.5KHz Agilent Spectrum Analy X/ RF Marker 1 469.9 10 dB/div Ref 0 10 dB/div Ref 0 20.0	Operation Mode Op 4 vzer - Swept SA 50 R AC P77000000 MHz PNO: IFGain ffset 20 dB	Test Channel Ch6	Test Frequency (MHz) 469.975	STATUS Rated Power (Watt) 1.0 ALIGNAUTO 0: e: Log-Pwr I>100/100	Measureme (dBm) 30.28	Peak Search Next Peak	
Туре	MSG Channel Separation 12.5KHz Agilent Spectrum Analy Marker 1 469.9 0 dB/div Ref 0 10 dB/div Ref 0	Operation Mode Op 4 vzer - Swept SA 50 R AC P77000000 MHz PNO: IFGain ffset 20 dB	Test Channel Ch6	Test Frequency (MHz) 469.975	STATUS STATUS Rated Power (Watt) 1.0 ALIGNAUTO 0: Log-Pwr > 100/100 Mkr1 4	Measureme (dBm) 30.28	Peak Search Next Peak Next Pk Right	
Туре	MSG Channel Separation 12.5KHz Agient Spectrum Analy Marker 1 469.9 Marker 1 469.9 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Operation Mode Op 4 vzer - Swept SA 50 R AC P77000000 MHz PNO: IFGain ffset 20 dB	Test Channel Ch6	Test Frequency (MHz) 469.975	STATUS STATUS Rated Power (Watt) 1.0 ALIGNAUTO 0: Log-Pwr > 100/100 Mkr1 4	Measureme (dBm) 30.28	Limit Varies Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta	

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4.8. Transmitter Frequency Behavior <u>TEST APPLICABLE</u>

Section 90.214

Transient frequencies must be within the maximum frequency difference limits during the time intervals indicated:

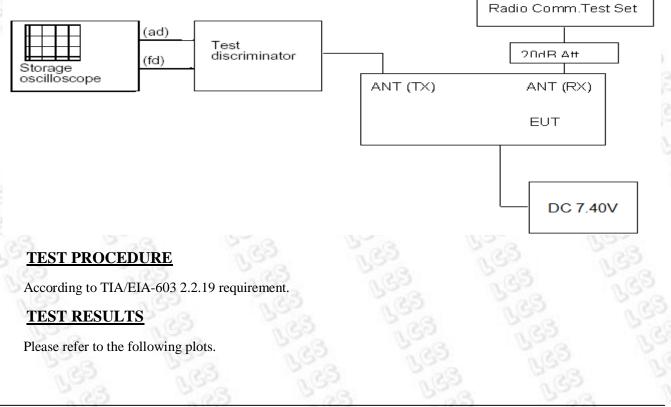
Time intervals ^{1, 2}	Maximum frequency	All equipment		
	difference ³	150 to 174 MHz 421 to 512M		
Transient Frequer	icy Behavior for Equipment D	esigned to Operate on 2	KHz Channels	
t ₁ ⁴	± 25.0 KHz	5.0 ms	10.0 ms	
t ₂	± 12.5 KHz	20.0 ms	25.0 ms	
t ₃ ⁴	± 25.0 KHz	5.0 ms	10.0 ms	
Transient Frequence	cy Behavior for Equipment De	esigned to Operate on 12	5 KHz Channels	
t ₁ ⁴	± 12.5 KHz	5.0 ms	10.0 ms	
t ₂	± 6.25 KHz	20.0 ms	25.0 ms	
t ₃ ⁴	± 12.5 KHz	5.0 ms	10.0 ms	
Transient Frequend	y Behavior for Equipment De	signed to Operate on 6.2	5 KHz Channels	
t ₁ ⁴	±6.25 KHz	5.0 ms	10.0 ms	
t ₂	±3.125 KHz	20.0 ms	25.0 ms	
	±6.25 KHz	5.0 ms	10.0 ms	
t ₃ ⁴		5.0 115	10.0 1115	

 t_{on} is the instant when a 1 KHz test signal is completely suppressed, including any capture time due to phasing. t₁ is the time period immediately following t_{on}.

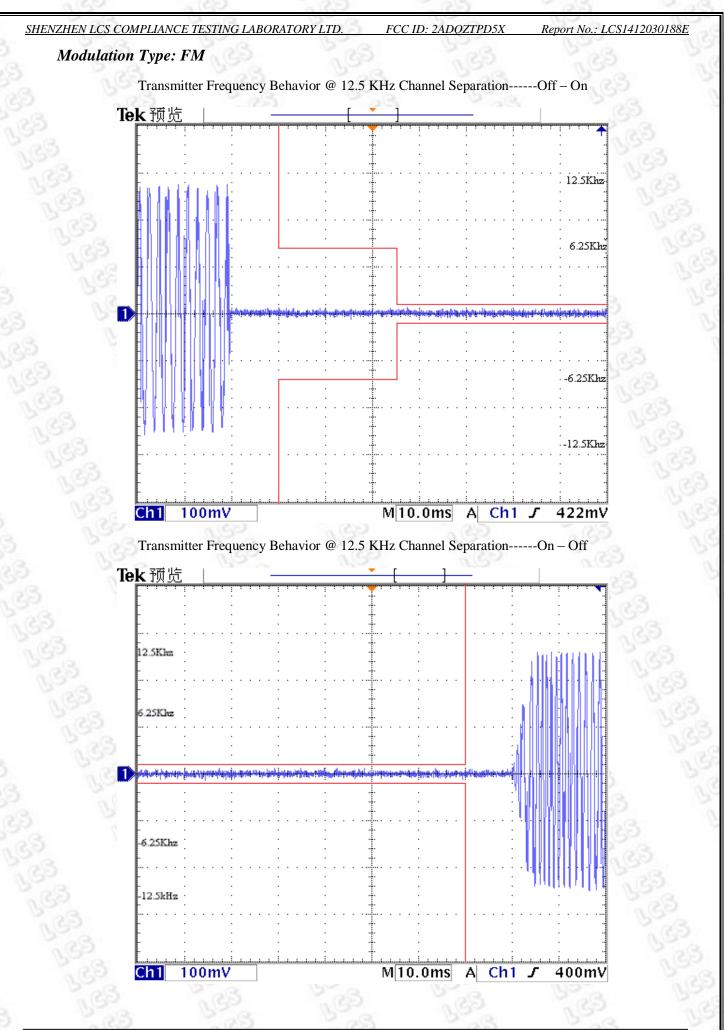
- t_2 is the time period immediately following t_1 .
- t_3 is the time period from the instant when the transmitter is turned off until $t_{\text{off.}}$
- t_{off} is the instant when the 1 KHz test signal starts to rise.
- 2. During the time from the end of t_2 to the beginning of t_3 , the frequency difference must not exceed the limits specified in § 90.213.
- 3. Difference between the actual transmitter frequency and the assigned transmitter frequency.

4. If the transmitter carrier output power rating is 6 watts or less, the frequency difference during this time period may exceed the maximum frequency difference for this time period.

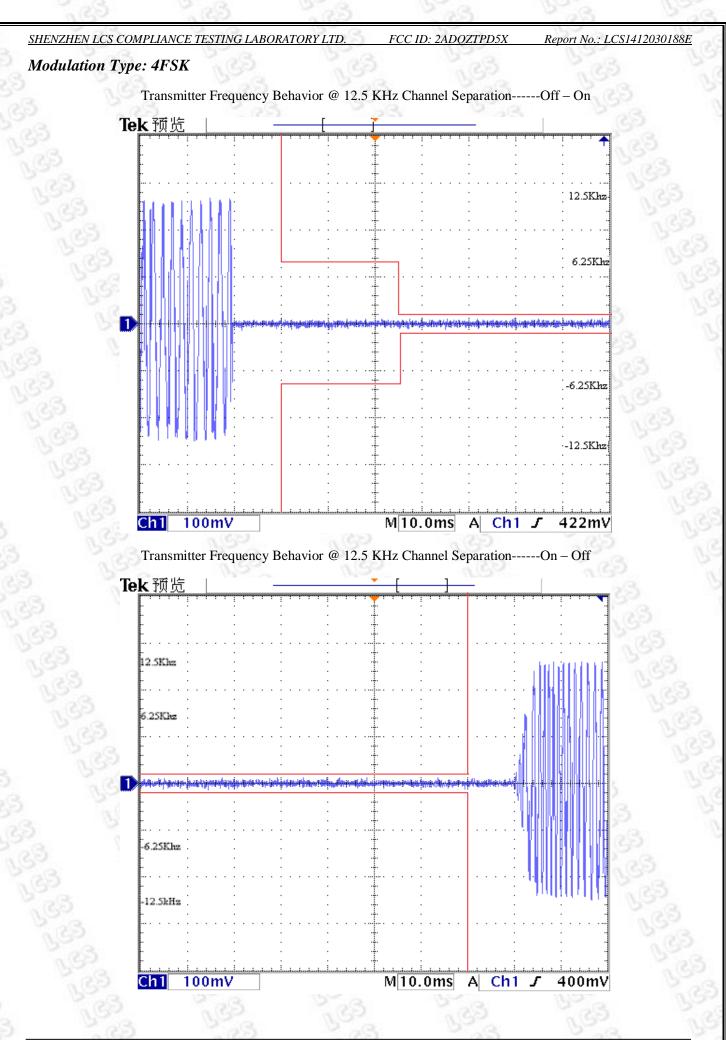
TEST CONFIGURATION



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Report No.: LCS1412030188E

LIST OF MEASURING EQUIPMENT 5.

C Power Conducted Emission	1			
Name of Equipment	Manufacturer	Model	Serial Number	Cal Date
Artificial Mains	MESS Tec	NNB-2/16Z	99079	June 18,2015
EMI Test Receiver	R&S	ESCS 30	100174	June 18,2015
EMI Test Software	Audix	E3	N/A	N/A
RF COMMUNICATION TEST SET	HP	8920A	3813A10245	June 19,2015

Modulation Characteristic				
Name of Equipment	Manufacturer	Model	Serial Number	Cal Date
RF COMMUNICATION TEST SET	HP	8920A	3813A10245	June 19,2015
Base	000	50	1.50	1.60

Name of Equipment	Manufacturer	Model	Serial Number	Cal Date
RF COMMUNICATION TEST SET	HP	8920A	3813A10245	June 19,2015
Signal Generator	Rohde&Schwarz	SMR40	10016	July 16, 2015
Climate Chamber	Giant Force	GTH-225-20-S	MAB0103-00	June 18,2015

Maximum Transmitter Power & Spurious Emission On Antenna Port & Occupied Bandwidth & Emission Mask

Name of Equipment	Manufacturer	Model	Serial Number	Cal Date
Receiver	Rohde&Schwarz	ESPI 7	125590	June 19,2015
RF COMMUNICATION TEST SET	S HP	8920A	3813A10245	June 19,2015
High-Pass Filter	Anritsu	MP526B	6220875288	July 16, 2015
High-Pass Filter	Anritsu	MP526D	6220878442	July 16, 2015

Transient Frequency Behavior				
Name of Equipment	Manufacturer	Model	Serial Number	Cal Date
Signal Generator	Rohde&Schwarz	SMR40	10016	July 16, 2015
Storage Oscilloscope	Tektronix	TDS3054B	B033154	July 17, 2015
RF COMMUNICATION TEST SET	HP	8920A	3813A10245	June 19,2015

Name of Equipment	Manufacturer	Model	Serial Number	Cal Date
Receiver	Rohde&Schwarz	ESPI 7	125590	June 19,2015
EMI Test Software	Audix	E3	N/A	N/A
RF COMMUNICATION TEST SET	HP	8920A	3813A10245	June 19,2015
HORN ANTENNA	EMCO	3115	6741	June 10, 2015
HORN ANTENNA	EMCO	3115	6829	June 10, 2015
By-log Antenna	SCHWARZBECK	VULB9163	9163-470	June 10, 2015
By-log Antenna	SCHWARZBECK	VULB9163	9163-498	May 29, 2016
High-Pass Filter	Anritsu	MP526B	6220875288	July 16, 2015
High-Pass Filter	Anritsu	MP526D	6220878442	July 16, 2015

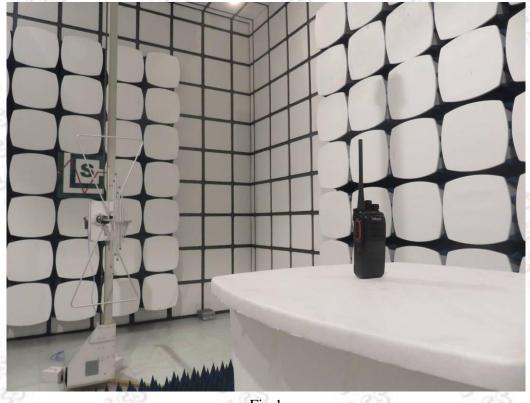
The calibration interval was one year.

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6. Test Setup Photographs









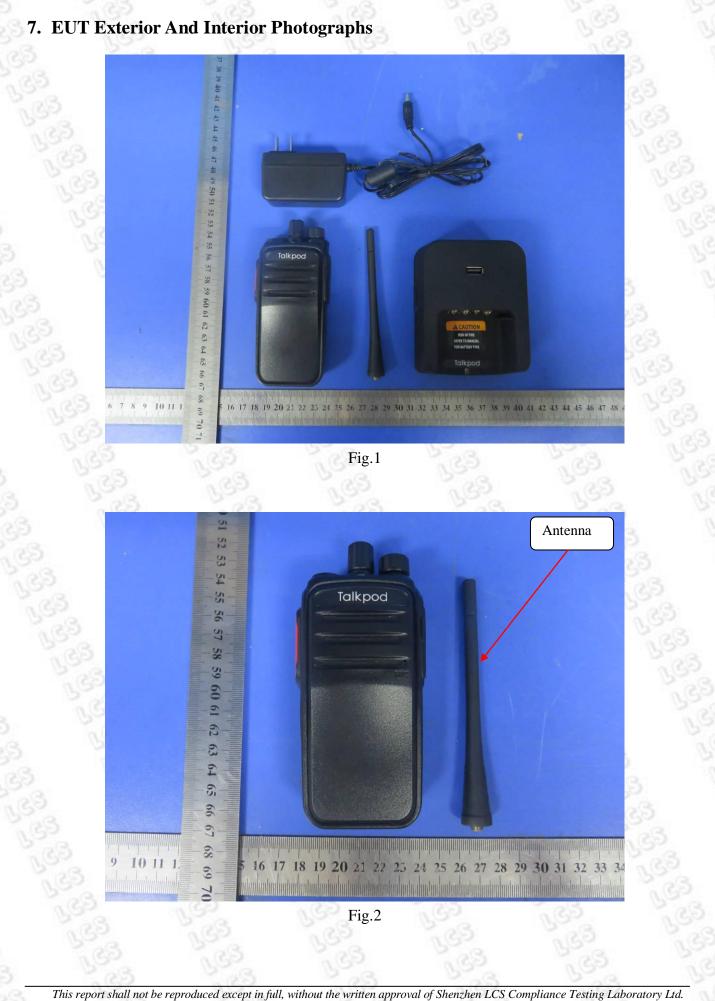
This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd. Page 57 of 65 6.2. Photo of Line Conducted Emissions Measurement



Fig.3

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Report No.: LCS1412030188E



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Fig.5 Fig.6

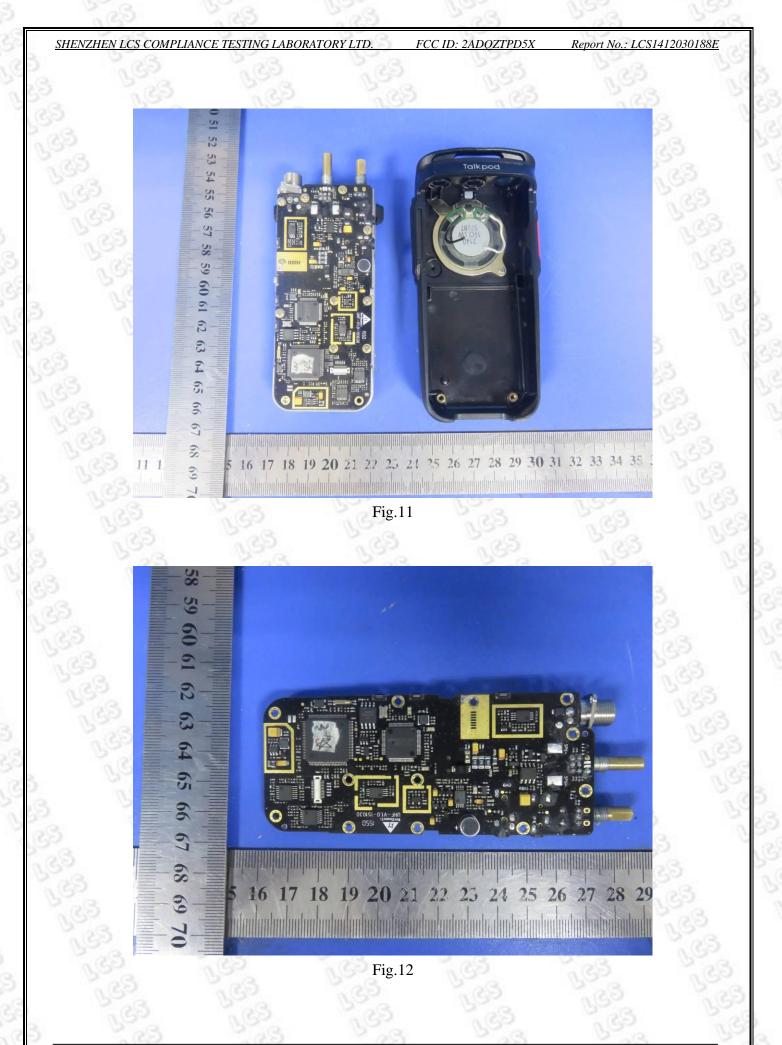
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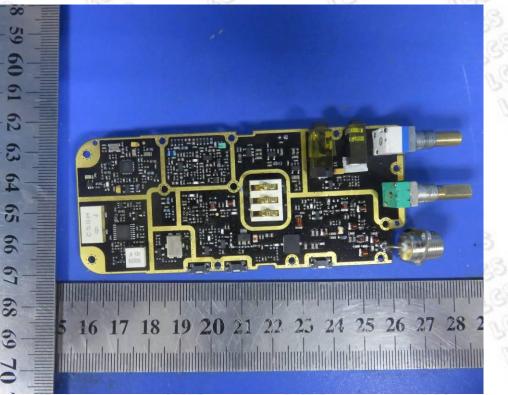


Fig.13

.....The End of Report.....

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