## 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

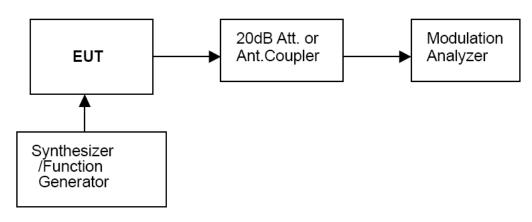
## **Modulation Limit**

- 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

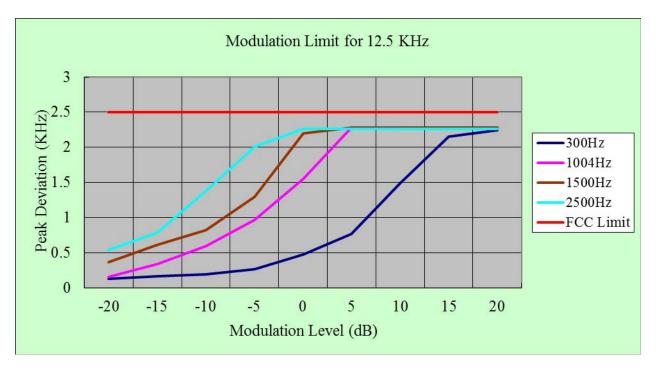
#### Remark:

1. We tested Op 1 to Op 2 recorded worst case at Op 1. Please refer to the following page.

#### **Modulation Type: FM**

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	0.13	0.16	0.37	0.54
-15	0.17	0.34	0.61	0.79
-10	0.19	0.59	0.82	1.38
-5	0.27	0.97	1.30	2.01
0	0.48	1.55	2.20	2.26
+5	0.77	2.28	2.28	2.26
+10	1.49	2.28	2.28	2.26
+15	2.15	2.28	2.28	2.26
+20	2.24	2.28	2.28	2.26

#### 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.

#### 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.

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#### **Modulation Type: FM**

The audio frequency response curve is show below.

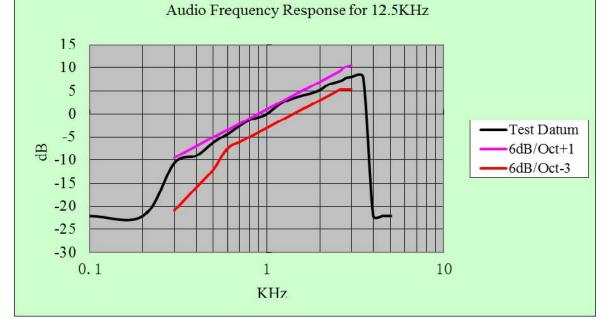
# Test Audio Level (1 KHz and 20% maximum deviation) for 12.5 KHz channel separation is 2.81mV.

#### 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

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	0.15	0.51	-10.63
0.4	0.18	0.51	-9.05
0.5	0.25	0.51	-6.19
0.6	0.31	0.51	-4.32
0.7	0.38	0.51	-2.56
0.8	0.44	0.51	-1.28
0.9	0.47	0.51	-0.71
1.0	0.51	0.51	0.00
1.2	0.66	0.51	2.24
1.4	0.75	0.51	3.35
1.6	0.81	0.51	4.02
1.8	0.86	0.51	4.54
2.0	0.93	0.51	5.22
2.2	1.05	0.51	6.27
2.4	1.11	0.51	6.76
2.6	1.16	0.51	7.14
2.7	1.20	0.51	7.43
2.8	1.25	0.51	7.79
3.0	1.28	0.51	7.99
3.5	1.28	0.51	7.99
4.0	0.04	0.51	-22.11
4.5	0.04	0.51	-22.11
5.0	0.04	0.51	-22.11

#### 12.5 KHz Channel Separation Op1



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 SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD.
 FCC ID: 2ABUBSPM6050

Report No.: LCS1606130856E

#### **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

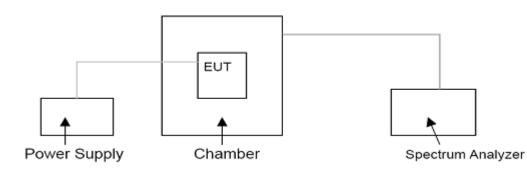
## TEST APPLICABLE

- 1 According to FCC Part 2 Section 2.1055 (a)(1), the frequency stability shall be measured with variation of ambient temperature from  $-30^{\circ}$ 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.

		Frequency Tolerance (ppm)				
Frequency Range (MHz)	Channel Bandwidth (KHz)	Fixed and Base Stations	Mobile Stations			
		Fixed and base stations	> 2 W	<u>&lt;</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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#### TEST RESULTS

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

Operation	Channel	Test cond	litions	Frequ	ency error (	(ppm)		
Mode	Separation	Voltage(V)	Temp(°C)	450.025	467.775	511.9875		
			-30	0.36	0.26	0.45		
			-20	0.26	0.62	0.54		
			-10	0.45	0.15	0.15		
			0	0.15	0.04	0.21		
		13.60V	10	0.26	0.70	0.32		
Op1	12.5KHz		20	0.21	0.48	0.26		
_			30	0.58	0.48	0.59		
			40	0.69	0.59	0.89		
		_			50	0.15	0.66	0.90
			11.56 (85% Rated)	20	0.45	0.20	0.21	
		15.64(115% Rated)	20	0.48	0.56	0.26		
	Limit			2.5 ppm				
	Test Res	ults		PASS				

Operation	Channel	Test cond	litions	Frequ	ency error (	(ppm)
Mode	Separation	Voltage(V)	Temp(°C)	450.025	467.775	511.9875
			-30	0.32	0.77	0.15
			-20	0.56	0.68	0.21
			-10	0.15	0.45	0.36
			0	0.02	0.62	0.62
		13.60V	10	0.15	0.84	0.25
Op3	12.5KHz		20	0.48	0.78	0.45
_			30	0.65	0.48	0.55
			40	0.55	0.45	0.48
			50	0.45	0.15	0.84
		11.56 (85% Rated)	20	0.15	0.21	0.15
		15.64(115% Rated)	20	0.20	0.21	0.23
	Limit			2.5 ppm		
	Test Res	ults		PASS		

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## 4.7. Maximum Transmitter Power

## TEST APPLICABLE

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  $\pm 1.0$  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 13.60V stabilized supply voltage.

## **TEST CONFIGURATION**

EUT	Attenuator	Spectrum Analyzer/Receiver
	l	

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

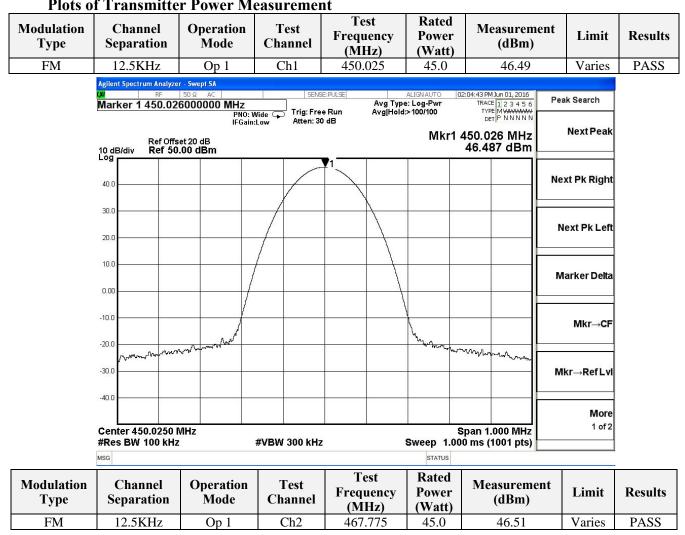
#### TEST RESULTS

Modulation Type	Channel Separation	Operation Mode	Test Channel	Test Frequency (MHz)	Test Results (dBm)
			Ch1	450.025	46.49
		Op 1	Ch2	467.775	46.51
Analog/EM	12.5KHz	-	Ch3	511.9875	46.52
Analog/FM	12.3KHZ		Ch4	450.025	37.02
		Op 2	Ch5	467.775	37.12
		<b>^</b>	Ch6	511.9875	37.05
			Ch7	450.025	46.50
		Op 3	Ch8	467.775	46.43
Digital/AESK	12.5KHz	-	Ch9	511.9875	46.53
Digital/4FSK	12.3KHZ		Ch10	450.025	37.00
		Op 4	Ch11	467.775	37.02
		~	Ch12	511.9875	37.04
Limit	The limit is d	ependent upon	the station's an	tenna HAAT and re	equired service area.
Test R	esults			PASS	

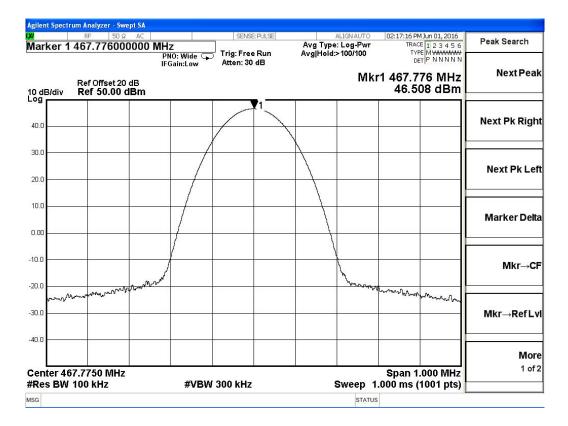
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#### **Plots of Transmitter Power Measurement**

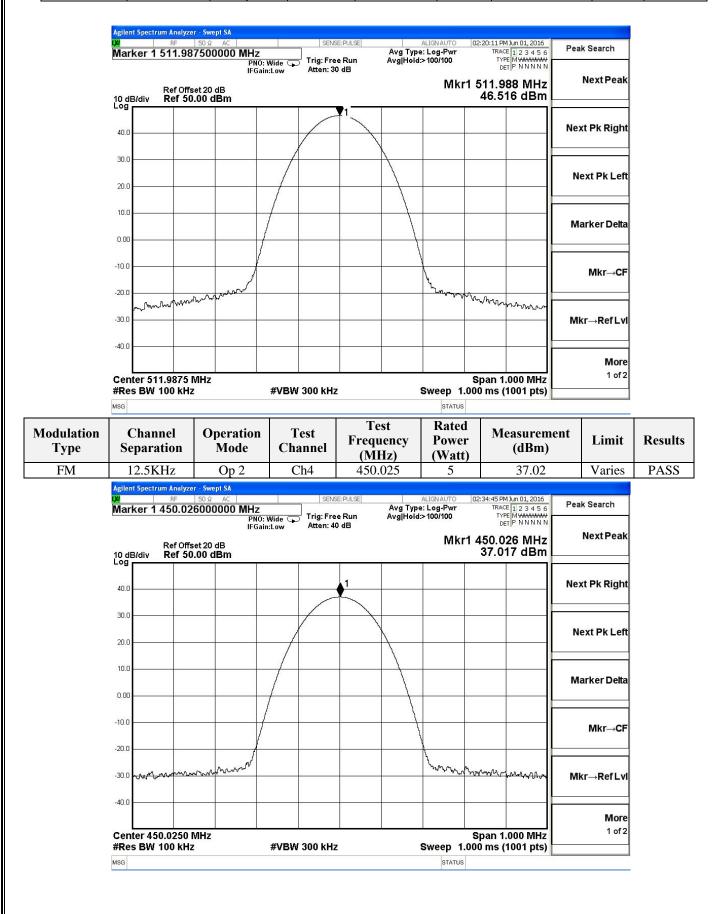


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Report No.: LCS1606130856E

Modulation Type	Channel Separation	Operation Mode	Test Channel	Test Frequency (MHz)	Rated Power (Watt)	Measurement (dBm)	Limit	Results
FM	12.5KHz	Op 1	Ch3	511.9875	45.0	46.52	Varies	PASS



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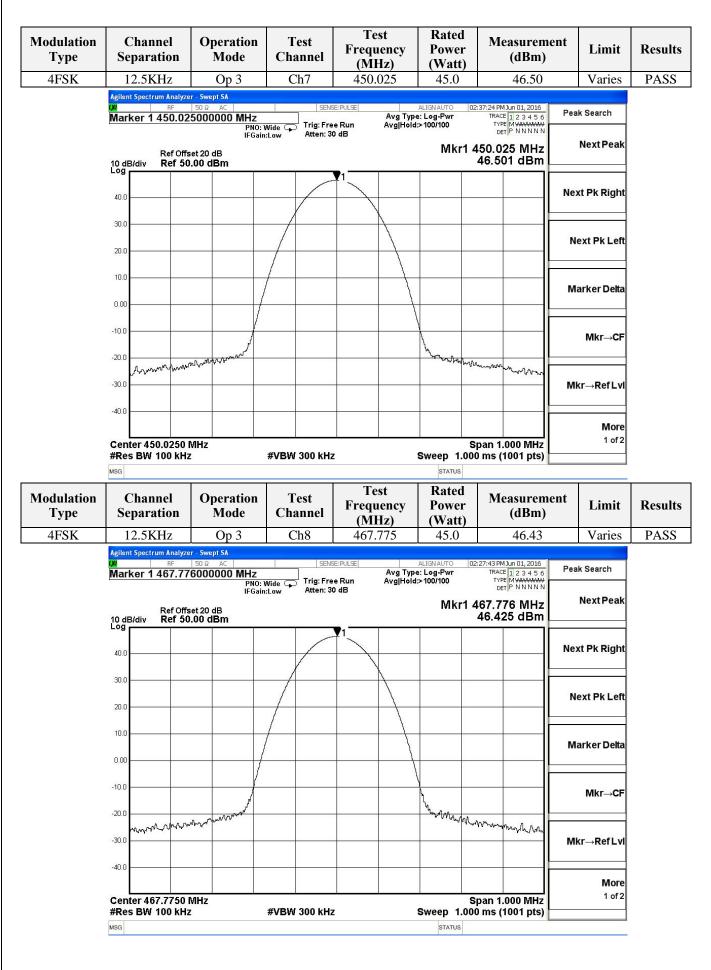
Report No.: LCS1606130856E

Modulation Type	Channel Separation	Operation Mode	Test Channel	Test Frequency (MHz)	Rated Power (Watt)	Measurem (dBm)	ent	Limit	Results
FM	12.5KHz	Op 2	Ch5	467.775	5	37.12		Varies	PASS
	Agilent Spectrum Analyze					200.00 PM 3 = 01.0016	1		
	Marker 1 467.77	6000000 MHz		E:PULSE Avg Ty; e Run AvgHol	ALIGNAUTO 02 ce: Log-Pwr d:>100/100	2:29:32 PM Jun 01, 2016 TRACE 1 2 3 4 5 6 TYPE M MANANANA	Pea	k Search	
	Ref Offs	IFGain set 20 dB			Mkr1 4	TYPE MWWWWWW DET P NNNNN 467.776 MHz		Next Peak	
	10 dB/div Ref 50	0.00 dBm				37.117 dBm			
	40.0			<b>↓</b> 1			Ne	kt Pk Right	
	20.0						N	ext Pk Left	
	10.0		/				M	arker Delta	
	0.00						IVIO		
	-10.0							Mkr→CF	
	-20.0 -30.0 -30.0	monorman			mmmm	Manyour	Mł	⟨r→RefLvl	
	-40.0							More	
	Center 467.7750					pan 1.000 MHz		1 of 2	
	#Res BW 100 kHz	2	#VBW 300 kHz	2	Sweep 1.00	0 ms (1001 pts)			
	#Res BW 100 kHz	2	#VBW 300 kHz		Sweep 1.00	0 ms (1001 pts)			
Modulation Type		2 Operation Mode	#VBW 300 kH2 Test Channel	Test Frequency	status Rated Power	0 ms (1001 pts) Measurem (dBm)	ent	Limit	Results
	Channel	Operation	Test	Test	status Rated	Measurem	ent	Limit	<b>Results</b> PASS
Туре	MSG Channel Separation 12.5KHz Agilent Spectrum Analyze	Operation Mode Op 2	Test Channel Ch6	Test Frequency (MHz) 511.9875	STATUSRated Power (Watt)5	Measurem (dBm) 37.05	ent		
Туре	MSG Channel Separation 12.5KHz Agilent Spectrum Analyze	Operation Mode           Op 2           50 & AC           6500000 MHz	Test Channel Ch6	Test Frequency (MHz) 511.9875 EPULSE Avg Tyj e Run Avg Tyj	STATUSRated Power (Watt)5	Measurem (dBm)	Pea	Varies k Search	
Туре	MSG Channel Separation 12.5KHz Agitent Spectrum Analyze Marker 1 511.98 Ref Offs	Operation Mode           Op 2           r - Swept SA           50 Q AC           65500000 MHz PNO: 1	Test Channel Ch6	Test Frequency (MHz) 511.9875 EPULSE Avg Tyj e Run Avg Tyj	status       Rated Power (Watt)       5       ALIGNAUTO       02       ALIGNAUTO       02	Measurem (dBm) 37.05	Pea	Varies	
Туре	MsG Channel Separation 12.5KHz Agilent Spectrum Analyze Marker 1 511.98 10 dB/div Ref 50	Operation Mode Op 2 rr - Swept SA 50 Q AC 6500000 MHz IFGain set 20 dB	Test Channel Ch6	Test Frequency (MHz) 511.9875 EPULSE Avg Tyj e Run Avg Tyj	status       Rated Power (Watt)       5       ALIGNAUTO       02       ALIGNAUTO       02	Measurem (dBm) 37.05 2:40:56 PM Jun 01, 2016 TRACE [12:3 4 5 6 TYPE MAMMAN DET P NNNN 511.987 MHz	Pea	Varies k Search	
Туре	MSG Channel Separation 12.5KHz Agilent Spectrum Analyze Marker 1 511.98 10 dB/div Ref Offs 10 dB/div Ref 50 30.0	Operation Mode Op 2 rr - Swept SA 50 Q AC 6500000 MHz IFGain set 20 dB	Test Channel Ch6	Test Frequency (MHz) 511.9875 E:PUSE e Run Avg Typ Avg Typ Avg Typ	status       Rated Power (Watt)       5       ALIGNAUTO       02       ALIGNAUTO       02	Measurem (dBm) 37.05 2:40:56 PM Jun 01, 2016 TRACE [12:3 4 5 6 TYPE MAMMAN DET P NNNN 511.987 MHz	Pea	Varies k Search Next Peak	
Туре	MSG Channel Separation 12.5KHz Agilent Spectrum Analyze Marker 1 511.98 10 dB/div Ref Offe 10 dB/div Ref 50 40.0	Operation Mode Op 2 rr - Swept SA 50 Q AC 6500000 MHz IFGain set 20 dB	Test Channel Ch6	Test Frequency (MHz) 511.9875 E:PUSE e Run Avg Typ Avg Typ Avg Typ	status       Rated Power (Watt)       5       ALIGNAUTO       02       ALIGNAUTO       02	Measurem (dBm) 37.05 2:40:56 PM Jun 01, 2016 TRACE [12:3 4 5 6 TYPE MAMMAN DET P NNNN 511.987 MHz	Pea Ne>	Varies k Search Next Peak kt Pk Right ext Pk Left	
Туре	MSG Channel Separation 12.5KHz Agilent Spectrum Analyze Marker 1 511.98 Ref Offs 10 dB/div Ref 50 40.0 30.0 20.0	Operation Mode Op 2 rr - Swept SA 50 Q AC 6500000 MHz IFGain set 20 dB	Test Channel Ch6	Test Frequency (MHz) 511.9875 E:PUSE e Run Avg Typ Avg Typ Avg Typ	status       Rated Power (Watt)       5       ALIGNAUTO       02       ALIGNAUTO       02	Measurem (dBm) 37.05 2:40:56 PM Jun 01, 2016 TRACE [12:3 4 5 6 TYPE MAMMAN DET P NNNN 511.987 MHz	Pea Ne>	Varies k Search Next Peak ct Pk Right	
Туре	MSG Channel Separation 12.5KHz Agilent Spectrum Analyze Marker 1 511.98 10 dB/div Ref 50 40.0 30.0 20.0 10.0 -10.0	Operation Mode Op 2 rr - Swept SA 50 Q AC 6500000 MHz IFGain set 20 dB	Test Channel Ch6	Test Frequency (MHz) 511.9875 E:PUSE e Run Avg Typ Avg Typ Avg Typ	status       Rated Power (Watt)       5       ALIGNAUTO       02       ALIGNAUTO       02	Measurem (dBm) 37.05 2:40:56 PM Jun 01, 2016 TRACE [12:3 4 5 6 TYPE MAMMAN DET P NNNN 511.987 MHz	Pea Ne>	Varies k Search Next Peak kt Pk Right ext Pk Left	
Туре	MSG Channel Separation 12.5KHz Agilent Spectrum Analyze Marker 1 511.98 Ref Offs 10 dB/div Ref 50 20.0 10.0 0.00	Operation Mode Op 2 r- Swept SA 50 Q AC 6500000 MHz PNO: PRO: PRO: PRO: PRO: PRO: PRO: PRO: PR	Test Channel Ch6	Test Frequency (MHz) 511.9875 E:PUSE e Run Avg Typ Avg Typ Avg Typ	status       Rated Power (Watt)       5       ALIGNAUTO       02       ALIGNAUTO       02	Measurem (dBm)           37.05           2:40:56 PM Jun 01, 2016           TRACE [12:3:45:6           TYPE MWWWWW           511.987 MHz           37.050 dBm	Pea Ne>	Varies k Search Next Peak ct Pk Right ext Pk Left arker Delta	
Туре	Msg           Channel Separation           12.5KHz           Agilent Spectrum Analyze           Marker 1 511.98           10 dB/div         Ref Offs           40.0	Operation Mode Op 2 r- Swept SA 50 Q AC 6500000 MHz PNO: PRO: PRO: PRO: PRO: PRO: PRO: PRO: PR	Test Channel Ch6	Test Frequency (MHz) 511.9875 E:PUSE e Run Avg Typ Avg Typ Avg Typ	STATUS  Rated Power (Watt) 5  ALIGNAUTO 00 Mkr1	Measurem (dBm)           37.05           2:40:56 PM Jun 01, 2016           TRACE [12:3:45:6           TYPE MWWWWW           511.987 MHz           37.050 dBm	Pea Ne>	Varies k Search Next Peak k Pk Right ext Pk Left arker Delta Mkr→CF kr→Ref Lvl	
Туре	MSG           Channel Separation           12.5KHz           Agitent Spectrum Analyze           Marker 1 511.98           10 dB/div           Ref Offs           40.0           30.0           20.0           10.0           -20.0           -30.0           Agitent Analyze	Operation Mode Op 2 r - Swept SA SO Q AC 6500000 MHZ	Test Channel Ch6	Test Frequency (MHz) 511.9875	STATUS  Rated Power (Watt) 5  ALIGNAUTO OX PO: Log-Pwr d> 100/100 Mkr1 4	Measurem (dBm)           37.05           2:40:56 PM Jun 01, 2016           TRACE [12:3:45:6           TYPE MWWWWW           511.987 MHz           37.050 dBm	Pea Ne>	Varies k Search Next Peak kt Pk Right ext Pk Left arker Delta Mkr→CF	

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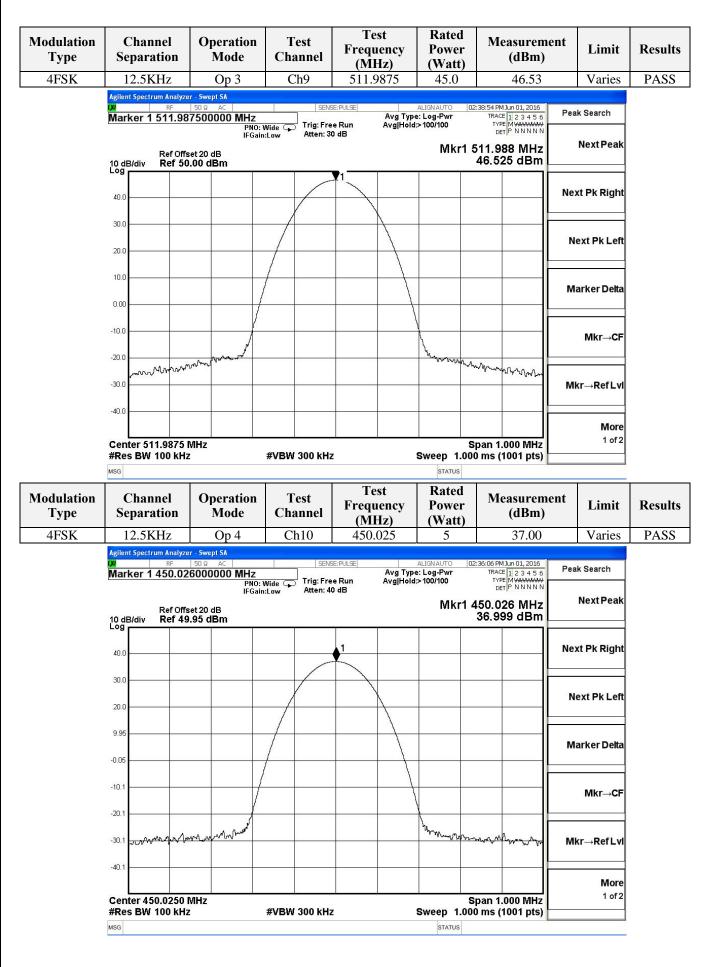
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FCC ID: 2ABUBSPM6050 Re

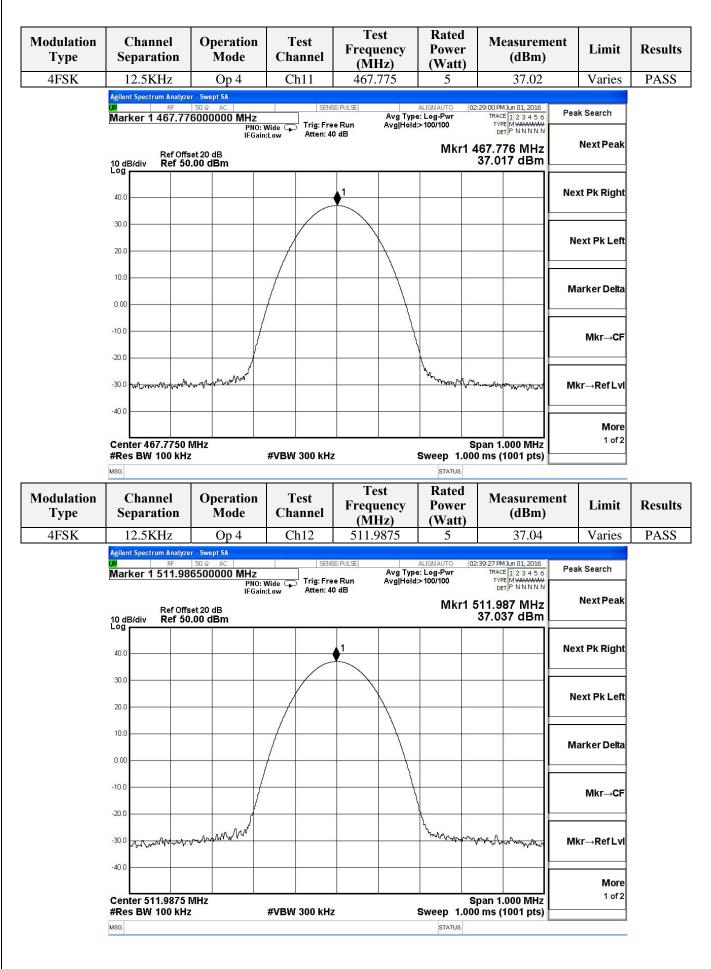
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#### 4.8. Transmitter Frequency Behavior

#### **TEST APPLICABLE**

#### Section 90.214

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

Time intervals <sup>1, 2</sup>	Maximum frequency	All equ	ipment				
	difference <sup>3</sup>	150 to 174 MHz	421 to 512MHz				
Transient Frequency Behavior for Equipment Designed to Operate on 25 KHz Channels							
t <sub>1</sub> <sup>4</sup>	± 25.0 KHz	5.0 ms	10.0 ms				
t <sub>2</sub>	± 12.5 KHz	20.0 ms	25.0 ms				
t <sub>3</sub> <sup>4</sup>	± 25.0 KHz	5.0 ms	10.0 ms				
Transient Frequence	y Behavior for Equipment De	signed to Operate on 12.	5 KHz Channels				
t <sub>1</sub> <sup>4</sup>	± 12.5 KHz	5.0 ms	10.0 ms				
t <sub>2</sub>	± 6.25 KHz	20.0 ms	25.0 ms				
t <sub>3</sub> <sup>4</sup>	± 12.5 KHz	5.0 ms	10.0 ms				
Transient Frequence	by Behavior for Equipment De	signed to Operate on 6.2	5 KHz Channels				
t <sub>1</sub> <sup>4</sup>	±6.25 KHz	5.0 ms	10.0 ms				
t <sub>2</sub>	±3.125 KHz	20.0 ms	25.0 ms				
t <sub>3</sub> <sup>4</sup>	±6.25 KHz	5.0 ms	10.0 ms				

1. ton is the instant when a 1 KHz test signal is completely suppressed, including any capture time due to phasing.  $t_1$  is the time period immediately following  $t_{on}$ .

t2 is the time period immediately following t1.

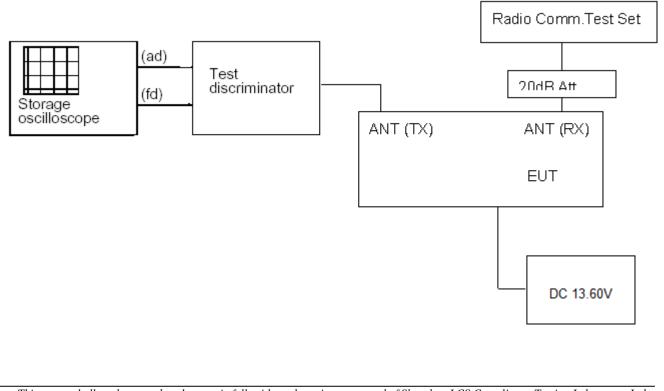
 $t_3$  is the time period from the instant when the transmitter is turned off until  $t_{\text{off.}}$ 

toff 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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#### **TEST PROCEDURE**

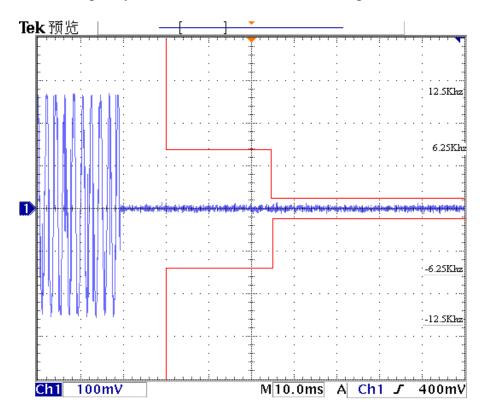
According to TIA/EIA-603 2.2.19 requirement.

#### TEST RESULTS

Please refer to the following plots.

#### Modulation Type: FM

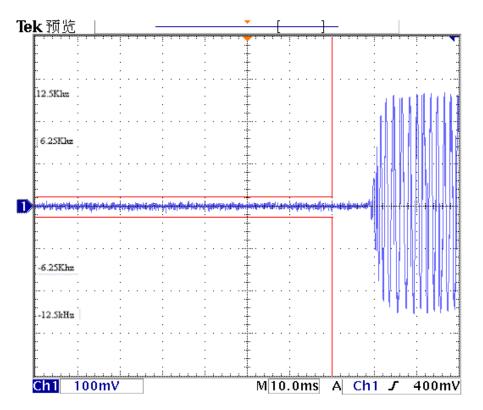
Transmitter Frequency Behavior @ 12.5 KHz Channel Separation-----Off - On



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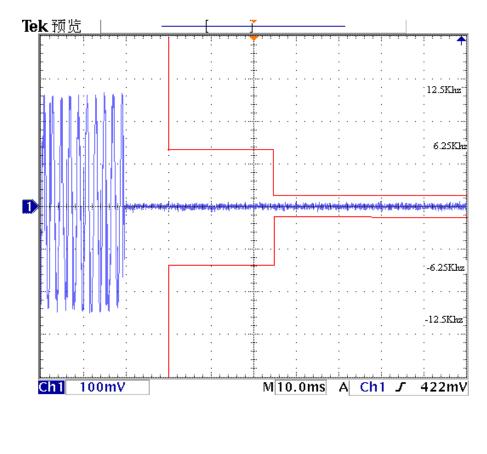
Report No.: LCS1606130856E

Transmitter Frequency Behavior @ 12.5 KHz Channel Separation-----On – Off



Modulation Type: 4FSK

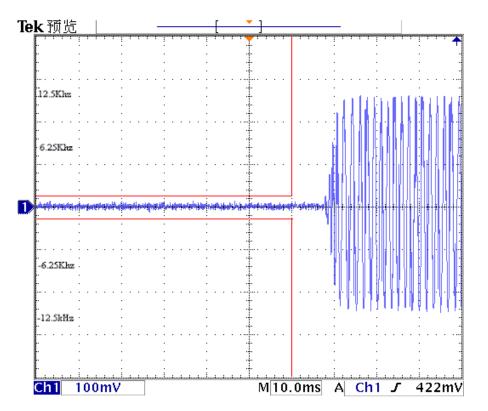
Transmitter Frequency Behavior @ 12.5 KHz Channel Separation-----Off - On



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Transmitter Frequency Behavior @ 12.5 KHz Channel Separation-----On – Off



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#### LIST OF MEASURING EQUIPMENT 5.

Modulation Characteristic								
Name of Equipment	Manufacturer	Model	Serial Number	Cal Date				
<b>RF COMMUNICATION</b>	IJD	80204	3813A10245	June 10 2015				
TEST SET	HP	8920A	3813A10243	June 19,2015				

Frequency Stability								
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
Spectrum Analyzer	Agilent	N9020A	MY50510140	October 27,2015
RF COMMUNICATION TEST SET	HP	8920A	3813A10245	June 19,2015
High-Pass Filter	Anritsu	MP526B	6220875288	July 16, 2015
High-Pass Filter	Anritsu	MP526D	6220878442	July 16, 2015

Transmitter Radiated Spurious Emission						
Name of Equipment	Manufacturer	Model	Serial Number	Cal Date		
Receiver	Rohde&Schwarz	ESPI 7	125590	June 19,2015		
Spectrum Analyzer	Agilent	N9020A	MY50510140	October 27,2015		
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		

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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	

The calibration interval was one year.

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