

	 MS ISO/IEC 17025 TESTING SAMM No. 0825																										
MOTOROLA PENANG ADV. COMM. LABORATORY Motorola Solutions Malaysia Sdn. Bhd. Innoplex Plot 2A Medan Bayan Lepas, Mukim 12, S.W.D. 11900 Bayan Lepas, Penang, Malaysia.	FCC / IC TEST REPORT Report Revision : Rev.A																										
<table><tr><td>Date/s Tested</td><td>: 22-May-2018 - 06-June-2018</td></tr><tr><td>Report Issue Date</td><td>: 06-June-2018</td></tr><tr><td>Manufacturer/Location</td><td>: Motorola Solutions - Penang</td></tr><tr><td>Requestor</td><td>: OOI, YUH SHENG</td></tr><tr><td>Product Type</td><td>: Portable</td></tr><tr><td>Model Number</td><td>: DLR1060BHLAB</td></tr><tr><td>Frequency Band</td><td>: 902 - 928 MHz</td></tr><tr><td>Rated / Max RF Output Power</td><td>: 1 Watt</td></tr><tr><td>Applicant Name</td><td>: Motorola Solution Malaysia Sdn Bhd</td></tr><tr><td>Applicant Address</td><td>: Innoplex Plot 2A, Medan Bayan lepas, Mukim 12, S.W.D. 11900 Bayan Lepas, Penang, Malaysia</td></tr><tr><td>FCC Registrations</td><td>: 461337</td></tr><tr><td>IC Registrations</td><td>: 109AK</td></tr></table>  The equipment was tested accordance to the requirement listed below: <table><tr><td>(900MHz ISM) Part 15C ISED RSS-GEN/247</td><td>PASS</td></tr></table>		Date/s Tested	: 22-May-2018 - 06-June-2018	Report Issue Date	: 06-June-2018	Manufacturer/Location	: Motorola Solutions - Penang	Requestor	: OOI, YUH SHENG	Product Type	: Portable	Model Number	: DLR1060BHLAB	Frequency Band	: 902 - 928 MHz	Rated / Max RF Output Power	: 1 Watt	Applicant Name	: Motorola Solution Malaysia Sdn Bhd	Applicant Address	: Innoplex Plot 2A, Medan Bayan lepas, Mukim 12, S.W.D. 11900 Bayan Lepas, Penang, Malaysia	FCC Registrations	: 461337	IC Registrations	: 109AK	(900MHz ISM) Part 15C ISED RSS-GEN/247	PASS
Date/s Tested	: 22-May-2018 - 06-June-2018																										
Report Issue Date	: 06-June-2018																										
Manufacturer/Location	: Motorola Solutions - Penang																										
Requestor	: OOI, YUH SHENG																										
Product Type	: Portable																										
Model Number	: DLR1060BHLAB																										
Frequency Band	: 902 - 928 MHz																										
Rated / Max RF Output Power	: 1 Watt																										
Applicant Name	: Motorola Solution Malaysia Sdn Bhd																										
Applicant Address	: Innoplex Plot 2A, Medan Bayan lepas, Mukim 12, S.W.D. 11900 Bayan Lepas, Penang, Malaysia																										
FCC Registrations	: 461337																										
IC Registrations	: 109AK																										
(900MHz ISM) Part 15C ISED RSS-GEN/247	PASS																										
This report shall not be reproduced without written approval from an officially designated representative of the Motorola Penang Adv. Comm. Laboratory. The results and statements contained in this report pertain only to the device(s) evaluated.																											
Prepared By: Gan Boon Teong Test Personnel	Approved By: Goh Aik Hong Responsible Engineer																										

Table of Contents

1.0. General Information.....	4
2.0. Summary of Test Results	5
3.0. Measurement Uncertainty	5
4.0. Equipment List.....	6
5.0. Test Mode Applicability and Test Channel Detail	7
6.0. Transmitter Test Parameters	8
6.1. Conducted RF Output Power (Peak) and E.I.R.P Measurement	8
6.1.1. Test Setup	8
6.1.2. Test Limits:	8
6.1.3. Test Data:	8
6.2. 20dB Channel Bandwidth.....	10
6.2.1. Test Setup	10
6.2.2. Test Limits:	10
6.2.3. Test Data:	10
6.3. Band-edge Conducted Spurious Emission.....	12
6.3.1. Test Setup	12
6.3.2. Test Limits.....	12
6.3.3. Test Result.....	12
6.4. Dwell time	14
6.4.1. Test Setup	14
6.4.2. Test Limits.....	14
6.4.3. Test Result.....	15
6.5. Number of hopping Frequency	16
6.5.1. Test Setup	16
6.5.2. Test Limits.....	16
6.5.3. Test Result.....	16
6.6. Channel Separation	18
6.6.1. Test Setup	18
6.6.2. Test Limits.....	18
6.6.3. Test Result.....	18
6.7. Conducted Spurious Emission	20
6.7.1. Test Setup	20
6.7.2. Test Limits.....	20
6.7.3. Test Data	20
6.8. Radiated Spurious Emission	23
6.8.1. Test Setup	23
6.8.2. Test Limits.....	24
6.8.3. Test Data:	25
6.9. AC Powerline Conducted Emission.....	37
6.9.1. Test Setup	37
6.9.2. Test Limits.....	38
6.9.3. Test Result.....	38

Report Template Document Number : FCD-00109
Report Template Revision Number : Rev. A

Report ID: 11945-RF-00010
FCC ID: AZ489FT5871
ISED: 109U-89FT5871

REVISION HISTORY

Revision History	Description	Date	Originator
Rev. A	Initial Report	06-June-2018	Gan Boon Teong

1.0. General Information

EUT Description:

Technologies	900MHz ISM
TX Frequency range	902MHz – 928MHz
Modulation Type	8FSK
No of Hopset	10
No of Channel Per Hopset	50
Input/Output	RF port
Connector type	PROGRAMMING
Antenna type	Helix Fixed Antenna
Antenna Gain	2.5 dBi

The EUT contains following accessory devices and data cable:

Item	Brand	Model or P/N
IMPRES 1800 mAH, LI-ION BATTERY	MOTOROLA	HKNN4013A
PROGRAMMING, TEST & ALIGNMENT CABLE	MOTOROLA	HKNN4027A

General Description of Applied Standards

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

ANSI C63.10-2013

2.0. Summary of Test Results

FCC Clause	IC Clause	Test Item	Result	Remark
15.247 (b)(2)	RSS-247 5.4(1)	Conducted RF Output Power (Peak) & EIRP Measurement	Pass	NA
15.247 (a)(1)	RSS-247 5.1(3) RSS-247 5.1(2)	(1) 20dB Channel Bandwidth (2) Channel Separation	Pass	NA
15.247(a)(1)(i)	RSS-247 5.1(3)	Number of hopping Frequency used	Pass	NA
15.247(a)(1)(i)	RSS-247 5.1(3)	Dwell time on each channel	Pass	NA
15.247 (d)	RSS-247 5.5	Band Edge Conducted Spurious Emission	Pass	NA
15.247 (d)	RSS-247 5.5	Conducted Spurious Emission	Pass	NA
15.205, 15.209, 15.247 (d)	RSS-247 5.5	Radiated Emission within Restricted Bands	Pass	NA
15.207	RSS-Gen 8.8	AC Powerline Conducted Emission	NA	Testing is not required, radio shall turn off during charging mode

3.0. Measurement Uncertainty

Measurement	Frequency	Expended Uncertainty (k=1.96) (±)
AC Power Line Conducted Spurious Emission	150KHz ~ 30MHz	3.43
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	5.01
	200MHz ~ 1000MHz	5.01
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.01
	18GHz ~ 25GHz	5.01

4.0. Equipment List

Bluetooth ATE # 1 (SW Version: Not Applicable)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
SIGNAL GENERATOR	2042	203002/742	8-Jun-17	8-Jun-18
POWER SUPPLY	6652A	MY40001437	11-Aug-16	11-Aug-18
SPECTRUM ANALYZER	FSEK30	838495/014	13-Jul-17	13-Jul-18
WIDEBAND RADIO COMMUNICATION TESTER	CMW500	163061	6-Jun-17	6-Jun-19
SPECTRUM ANALYZER	E4445A	MY46181597	21-Dec-16	21-Dec-18
CHAMBER	SH-641	92002859	3-Jan-18	3-Jan-19
SIGNAL GENERATOR	2042	203002/742	8-Jun-17	8-Jun-18

Radiated Emission Station (SW Version: EMC FCC RE v1.5.1)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
DRG HORN FREQ.	SAS-571	719	18-Jul-17	18-Jul-19
DRG HORN FREQ.	SAS-571	720	2-Mar-17	2-Mar-19
POWER SUPPLY	6032A	2615A01178	6-Jun-17	6-Jun-18
MICROWAVE SIGNAL GENERATOR	SMP04	100127	19-Jul-17	18-Jul-18
EMI TEST RECEIVER	ESIB26	100336	13-Jul-17	12-Jul-18
SIGNAL ANALYZER	FSV40	101103	18-Jul-17	17-Jul-18
5m Semi-anechoic Chamber	S800-HX	J2308	Not Required	Not Required
BILOG ANTENNA	CBL6112 D	25224	22-Jul-17	22-Jul-18
BILOG ANTENNA	CBL6112 B	2964	16-Feb-18	16-Feb-20
BROAD-BAND HORN ANTENNA	BBHA917 0	BBHA9170255	7-Nov-17	7-Nov-18
DATA LOGGER	SDL500	A.016776	18-Mar-17	18-Mar-19
LOOP ANTENNA	6502	208416	27-Jul-17	27-Jul-18
SYSTEM CONTROLLER	SC104V	050806-1	Not Required	Not Required
TURNTABLE FLUSH MOUNT 2M	FM2011	NA	Not Required	Not Required
ANTENNA POSITIONING TOWER	TLT2	NA	Not Required	Not Required
18 - 40GHz PREAMPLIFIER	Miteq Hi Gain Sucoflex	002	Not Required	Not Required
PREAMPLIFIER	PAM-0118P	361	Not Required	Not Required

5.0. Test Mode Applicability and Test Channel Detail

Radiated Emission Test (Above 1GHz)

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Radiated Emission Test (Below 1GHz)

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Total Channel	Tested Channel	Modulation Technology	Modulation Type
Test Mode	1 to 500	Hopset 1: 1, 26 Hopset 10: 50	FHSS	8FSK

Power Line Conducted Emission Test

☐ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☐ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type
Application Mode	1 to 500	AUTO	FHSS	AUTO

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

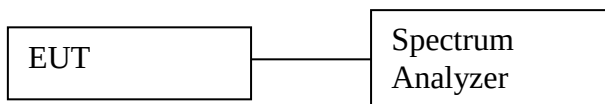
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Total Channel	Tested Channel	Modulation Technology	Modulation Type
Test Mode	1 to 500	Hopset 1: 1, 26 Hopset 10: 50	FHSS	8FSK

6.0. Transmitter Test Parameters

6.1. Conducted RF Output Power (Peak) and E.I.R.P Measurement

6.1.1. Test Setup



- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the EUT and set EUT to transmit in hopping disable mode.
- c) Connect EUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) Setting of Spectrum analyzer :
 - a. RBW = > 20 dB bandwidth
 - b. VBW = RBW
 - c. Detector mode = Peak
 - d. AMPLITUDE → Scale/Div = 10 dB
 - e. Trace = Max hold
 - f. Sweep = auto
- e) Measure the captured power within the band and recording the plot.
- f) Repeat above procedure with different channel frequency of operation.

6.1.2. Test Limits

Normal Condition (25 ° C)
Peak Output Power : < 1W (or 30dBm); E.I.R.P: < 4W

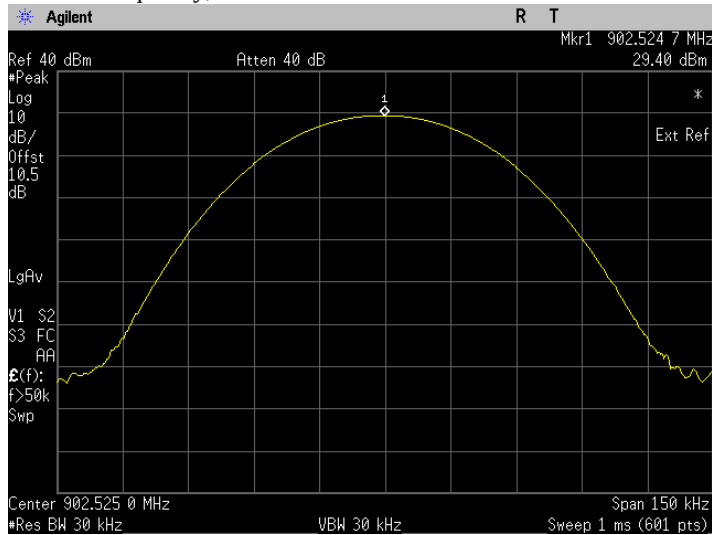
6.1.3. Test Data

Antenna Gain: 2.5dBi

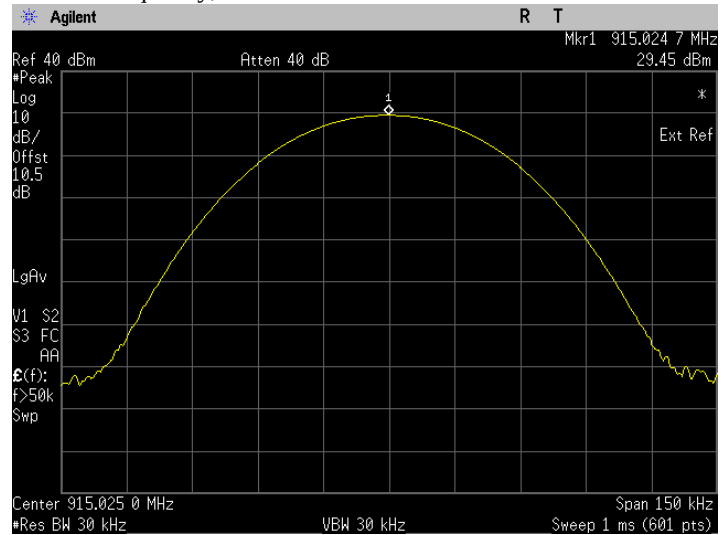
Test Conditions		Test Frequency (MHz)	Peak Output Power			E.I.R.P.		
Modulation	Voltage(V)		dBm	Watt	Status	dBm	Watt	Status
8FSK	3.80	902.525	29.40	0.87	Pass	31.90	1.55	Pass
		915.025	29.45	0.88	Pass	31.95	1.57	Pass
		927.475	29.03	0.80	Pass	31.53	1.42	Pass

****Note:** EIRP = PT +GT – LC, PT = Transmit Output Power, dBm
 GT = Antenna Gain, dBi
 LC = signal attenuation, dB1

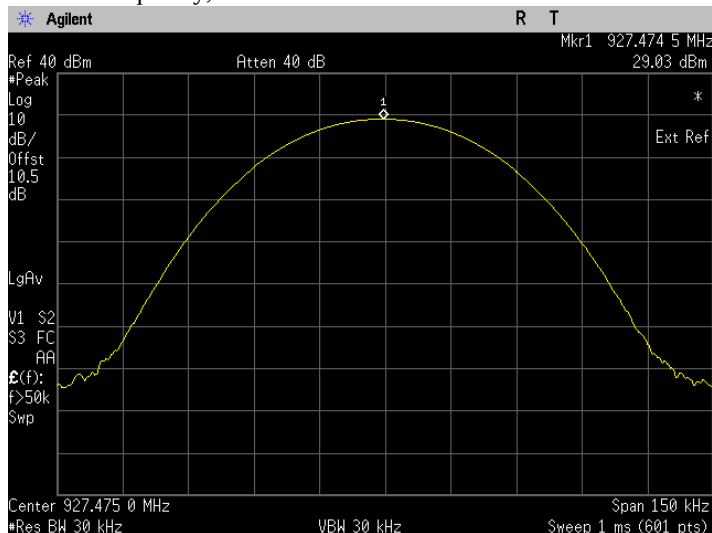
- i. The Conducted RF Output Power test with result at low frequency, 902.525MHz



- ii. The Conducted RF Output Power test with result at mid frequency, 915.025MHz.

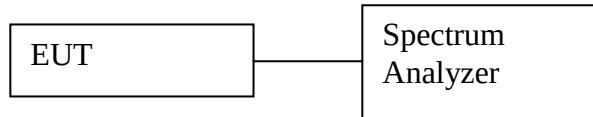


- iii. The Conducted RF Output Power test with result at high frequency, 927.475MHz.



6.2. 20dB Channel Bandwidth

6.2.1. Test Setup



- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the EUT and set EUT to transmit in hopping disable mode.
- c) Connect EUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) Setting of Spectrum analyzer :
 - a. RBW = 1 kHz
 - b. VBW = 3 kHz
 - c. SPAN = 130kHz, center on test frequency
 - d. AMPLITUDE → Scale/Div = 10 dB
 - e. Detector mode = Peak
 - f. Trace = Max hold
 - g. Sweep = auto
- e) Measure 20dB & 99% Bandwidth and record as the emission bandwidth.
- f) Save the plot result from spectrum analyzer screen.
- g) Repeat above procedure with different channel frequency of operation.

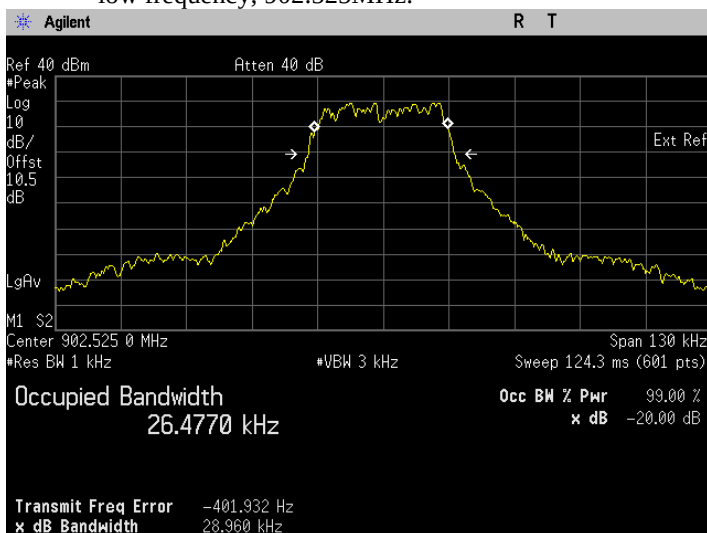
6.2.2. Test Limits

Normal Condition (25 ° C)
For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies

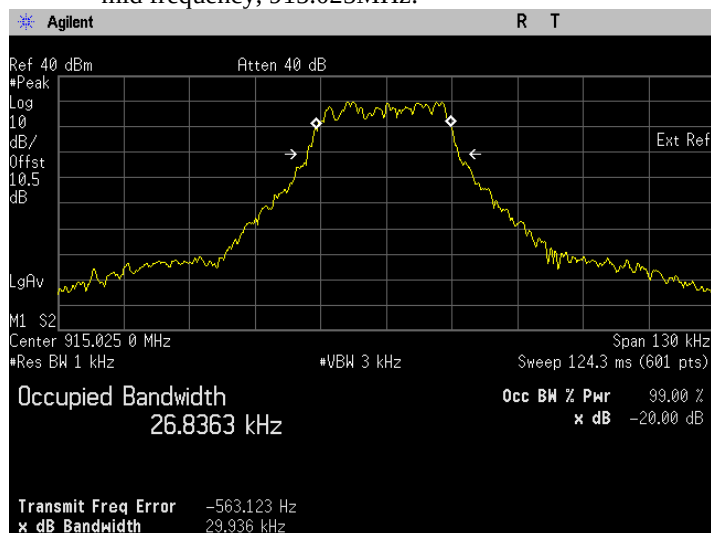
6.2.3. Test Data

Test Conditions		Test Frequency TX (GHz)	Results (MHz)		
Modulation Type	Voltage(V)		20dB Bandwidth (kHz)	99% Occupied Bandwidth (kHz)	Status
8FSK	3.80	902.525	28.960	26.4470	Pass
		915.025	29.936	26.8363	Pass
		927.475	30.085	26.9711	Pass

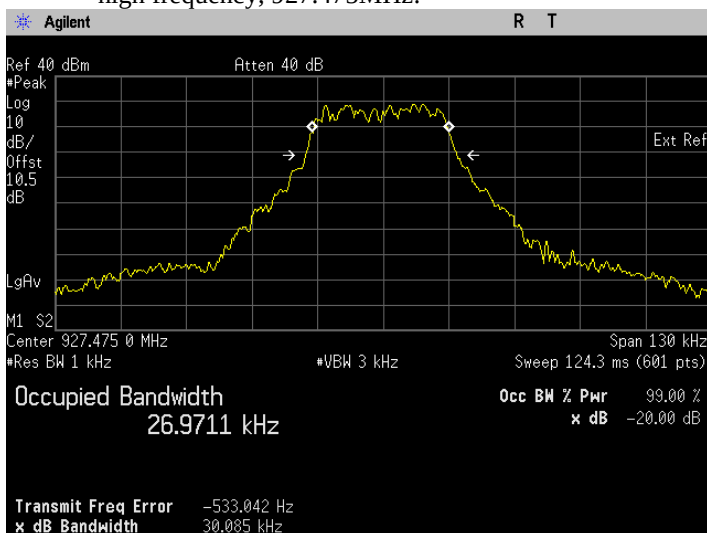
iv. The 20 dB BW & occupied bandwidth test with result at low frequency, 902.525MHz.



v. The 20 dB BW & occupied bandwidth test with result at mid frequency, 915.025MHz.

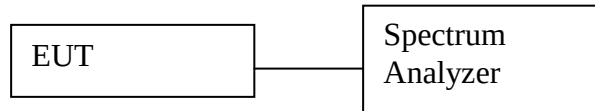


vi. The 20 dB BW & occupied bandwidth test with result at high frequency, 927.475MHz.



6.3. Band-edge Conducted Spurious Emission

6.3.1. Test Setup



- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the EUT and keep the EUT in hopping mode.
- c) Connect EUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) Setting of Spectrum analyzer :
 - a. RBW = 100 kHz
 - b. VBW = 300 kHz
 - c. SPAN = 4 MHz (Low channel) or 6MHz(High Channel)
 - d. Detector mode = Peak
 - e. Trace = Max hold
 - f. Sweep = auto
- e) Measure the captured band edge emission result and recording the plot.
- f) Repeat above on EUT with hopping disable.
- g) Repeat above procedure with other different test frequency.

6.3.2. Test Limits

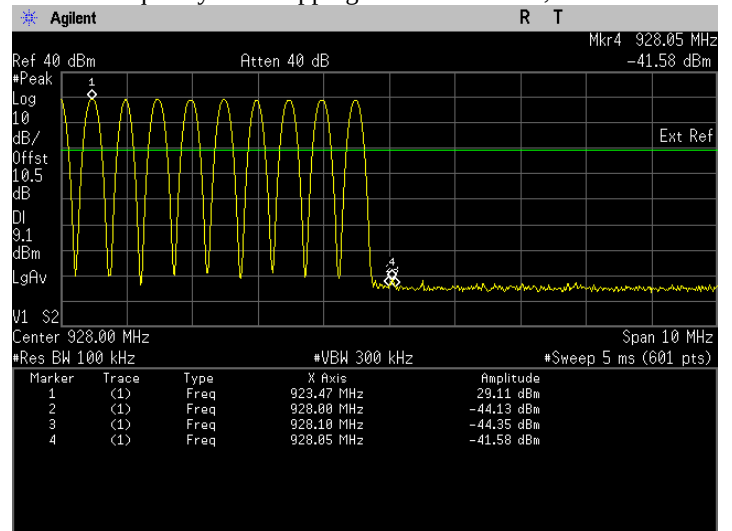
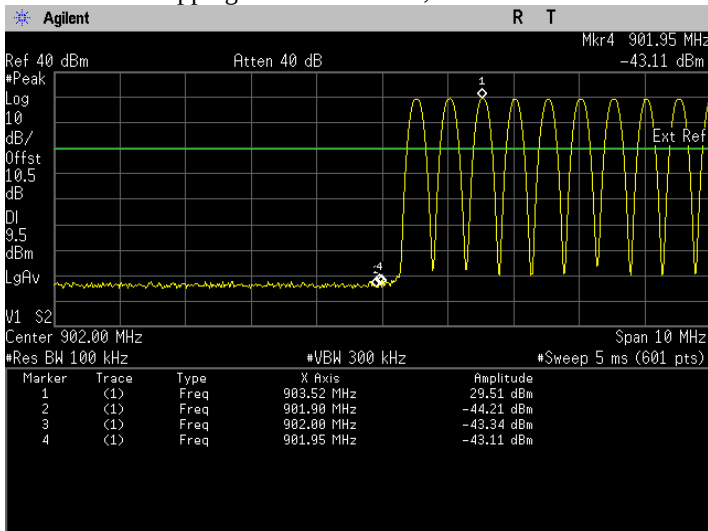
Normal Condition (25 ° C)
Shall be at least 20 dB below the peak power.

6.3.3. Test Result

Test Conditions		Hopping Method	Test Frequency(MHz)	Results	
Modulation	Voltage(V)			dB	Status
8FSK	3.80	Enabled (continuously)	902.525	-43.11	Pass
			927.475	-41.58	Pass
		Disabled (constantly)	902.525	-42.64	Pass
			927.475	-42.54	Pass

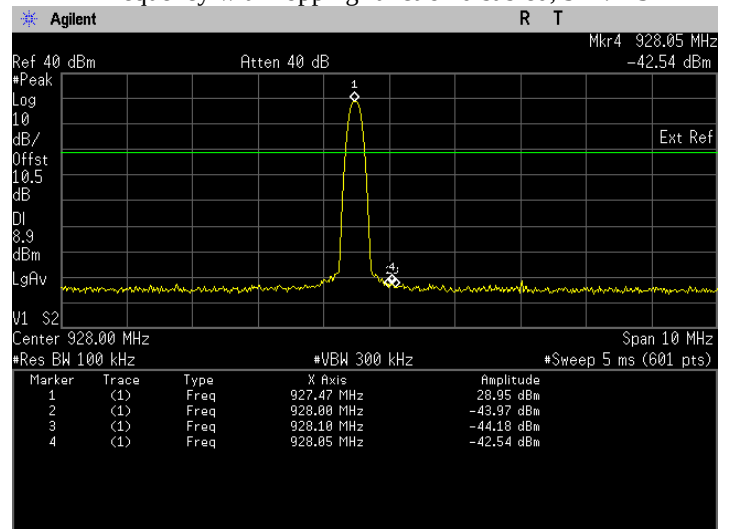
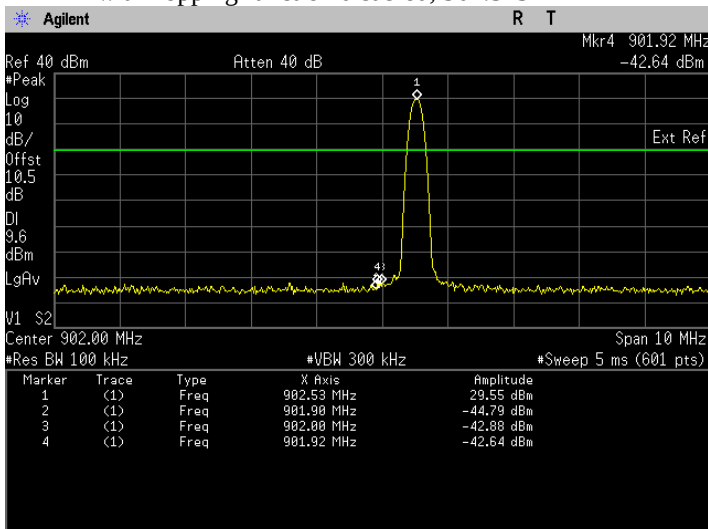
- i. The lowest band edge emission at low carrier frequency with hopping function enabled, 902.525MHz

- ii. The highest band edge emission at high carrier frequency with hopping function enabled, 927.475MHz



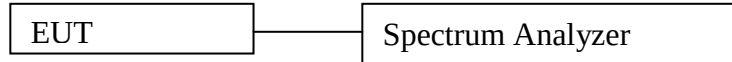
- iii. The lowest band edge emission at low carrier frequency with hopping function disabled, 902.525MHz

- iv. The highest band edge emission at high carrier frequency with hopping function disabled, 927.475MHz



6.4. Dwell time on each channel

6.4.1. Test Setup



- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the EUT and keep the EUT in hopping mode.
- c) Connect EUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) Setting of Spectrum analyzer :
 - a. RBW = 10 kHz
 - b. VBW = 30 kHz
 - c. SPAN = Zero SPAN, center on hopping frequency
 - d. Detector mode = Peak
 - e. Trace = Max hold
 - f. Sweep time = 10 second
 - g. Sweep = Single
- e) Measure total numbers of transmissions occur in 10 second and save the plot.
- f) Change the setting of spectrum analyzer :
 - a. RBW = 10 kHz
 - b. VBW = 30 kHz
 - c. Sweep time = sufficient to capture dwell time for 1 transmission
 - d. Sweep = Single
- g) Measure dwell time for 1 transmission and save the plot.
- h) Calculate accumulate dwell time in a given period equal to number of hopping frequencies.
- i) Repeat above procedure with different channel frequency of operation

6.4.2. Test Limits

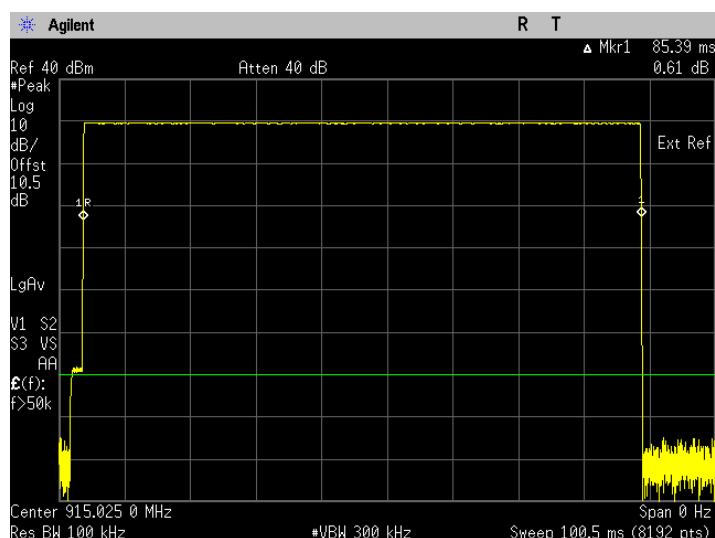
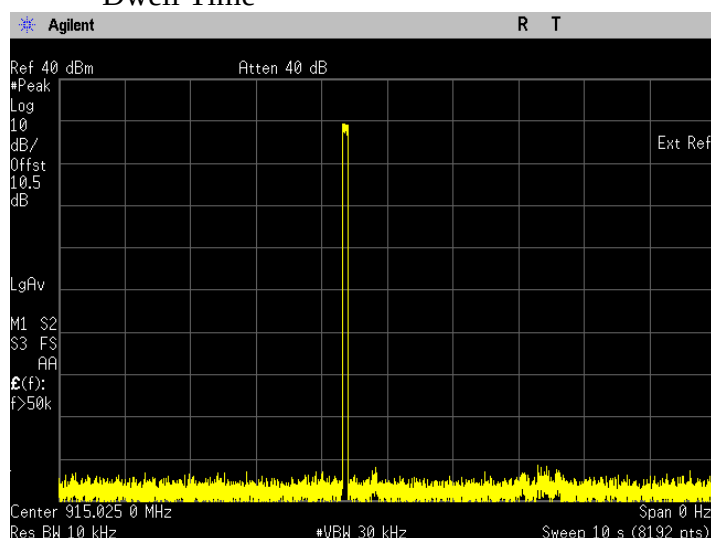
Normal Condition (25 ° C)
$\leq 0.4\text{sec}$

6.4.3. Test Result

Test Conditions			Results			
Modulation	Volt (V)	Test Frequency (MHz)	No. of transmission in 10s (a)	Dwell time in one transmission (msec) (b)	Total accumulate dwell time in 20s. (msec) (c)	Status
8FSK	3.80	915.025	1	85.39	170.78	Pass

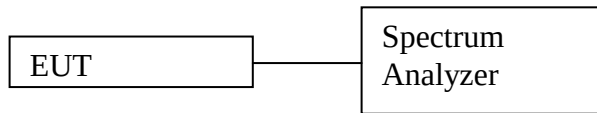
****Note:** Total dwell time in 20s, (c) = (a) x (b) x 2

Dwell Time



6.5. Number of hopping Frequency

6.5.1. Test Setup



- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the EUT and keep the EUT in hopping mode.
- c) Connect EUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) Setting of Spectrum analyzer :
 - a. RBW = 10 kHz
 - b. VBW = 10 kHz
 - c. Detector mode = Peak
 - d. Trace = Max hold
- e) Allow the trace to stabilized & save the plot result from spectrum analyzer screen.
- f) Count number of channel frequency in the operating.
- g) Repeat above procedure for other test frequency.

6.5.2. Test Limits

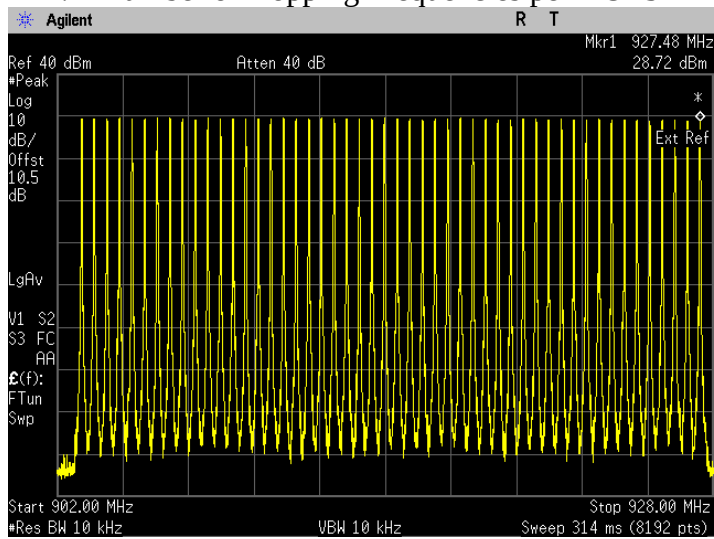
Normal Condition (25 ° C)
≥ 50

6.5.3. Test Result

Voltage = 3.80V

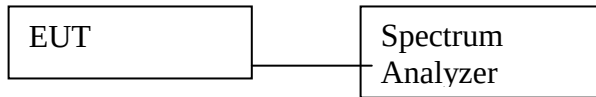
HOPSET	Sweep Range (MHz)	Results			
		Start Freq (MHz)	Last Freq (MHz)	No. of Hopping Frequencies	Status
1	902 - 928	902.525	927.025	50	Pass

i. Number of Hopping Frequencies per HOPSET



6.6. Channel Separation

6.6.1. Test Setup



- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the EUT and keep the EUT in hopping mode.
- c) Connect EUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) Setting of Spectrum analyzer :
 - a. RBW = 10 kHz
 - b. VBW = 30 kHz
 - c. SPAN = 1 MHz, center on test frequency
 - d. Detector mode = Peak
 - e. Trace = Max hold
 - f. Sweep = auto
- e) Measure the frequency different of these two adjacent channels with marker delta function & record the measurement results.
- f) Repeat above procedure with different channel frequency of operation

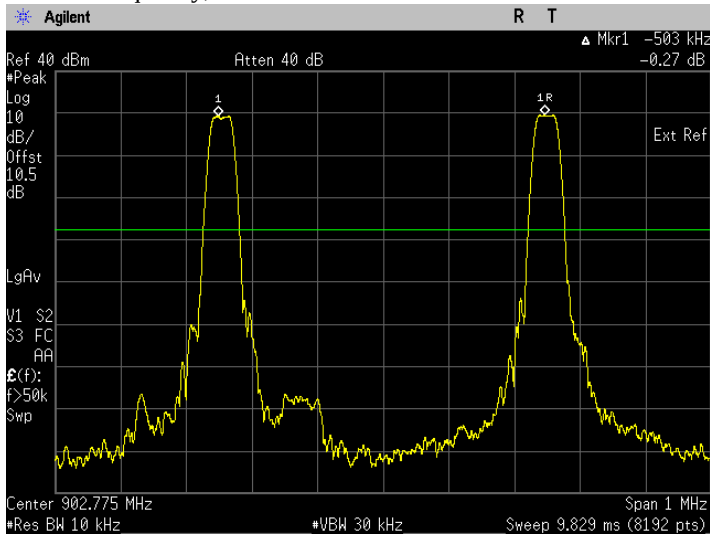
6.6.2. Test Limits

Normal Condition (25 ° C)
At least 25kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

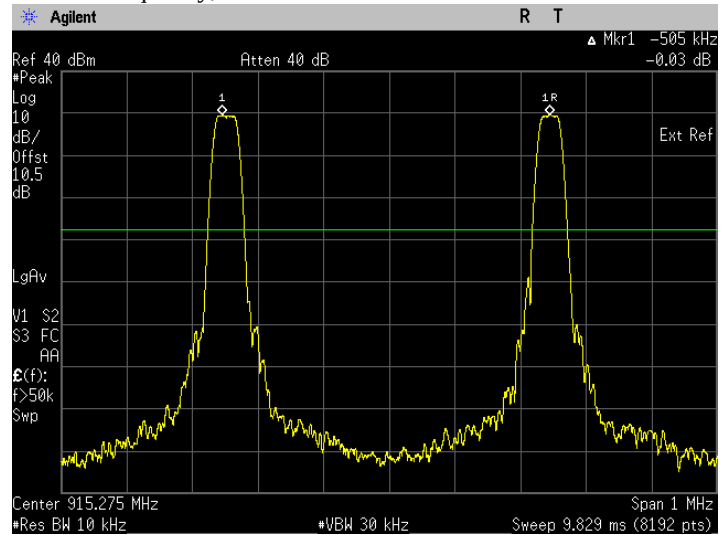
6.6.3. Test Result

Modulation	Voltage(V)	Test Frequency (MHz)	Test Data Adjacent Channel Separation (MHz)	Status
8FSK	3.80	902.525	0.503	Pass
		915.025	0.505	Pass
		927.475	0.502	Pass

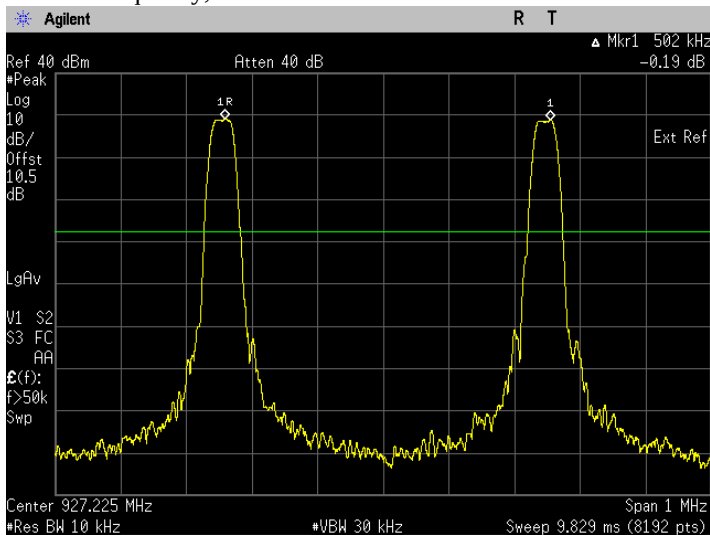
i. The Channel Separation test with result at low frequency, 902.525MHz.



ii. The Channel Separation test with result at mid frequency, 915.025MHz.

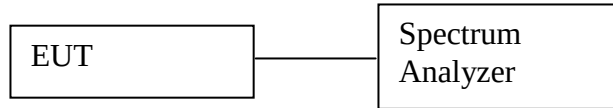


iii. The Channel Separation test with result at high frequency, 927.475MHz.



6.7. Conducted Spurious Emission

6.7.1. Test Setup



- Check and ensure the spectrum analyzer well calibrate.
- Turn on the EUT and set EUT to transmit maximum data rate with hopping disable.
- Connect EUT's antenna terminal to spectrum analyzer with a low loss cable.
- Setting of Spectrum analyzer :
 - RBW = 100 kHz
 - VBW = 300 kHz
 - SPAN = Cover until 10th harmonic
 - Detector mode = Peak
 - AMPLITUDE → Scale/Div = 10 dB
 - Trace = Max hold
 - Sweep = auto
- Measure the captured spurious emission result and recording the plot.
- Repeat above procedure with different channel frequency of operation.

6.7.2. Test Limits

Normal Condition (25 ° C)
Shall be at least 20 dB below for peak power.

6.7.3. Test Data

Test Conditions		Test Frequency (MHz)	Results	
Modulation	Voltage(V)		Spurious Level	Status
8FSK	3.80	902.525	-26.82	Pass
		915.025	-28.72	Pass
		927.475	-31.25	Pass

- **The high emission level within the assigned band at low carrier frequency.**
- Spurious emission measurement in **30MHz – 10GHz** at low carrier frequency.

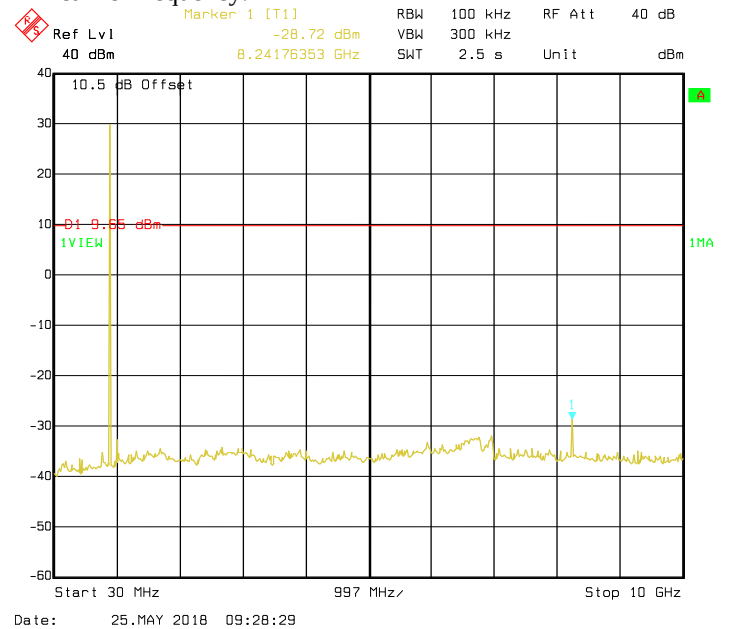


-
- 1
- Marker 1 [T1]
- RBW 100 kHz RF Att 40 dB
- VBW 300 kHz
- SWT 2.5 s Unit dBm
- Ref Lvl 40 dBm
- 8.12188377 GHz
- 26.82 dBm
- dB Offset
- Start 30 MHz
- 997 MHz
- Stop 10 GHz
- Date: 25.MAY 2018 09:22:02

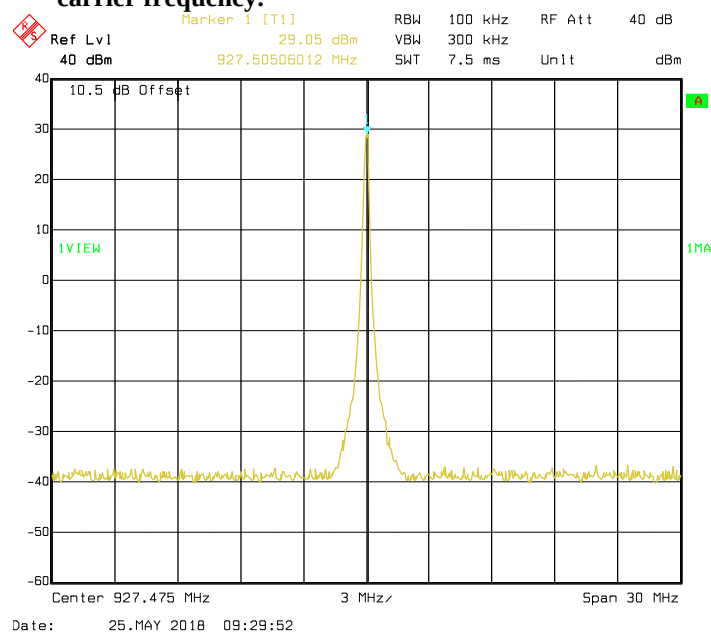
- Ref Lvl 40 dBm
 Marker 1 [T1] 29.65 dBm
 RBW 100 kHz
 VBW 300 kHz
 SWT 7.5 ms
 RF Att 40 dB
 Unit dBm

10.5 dB Offset
 1VIEW

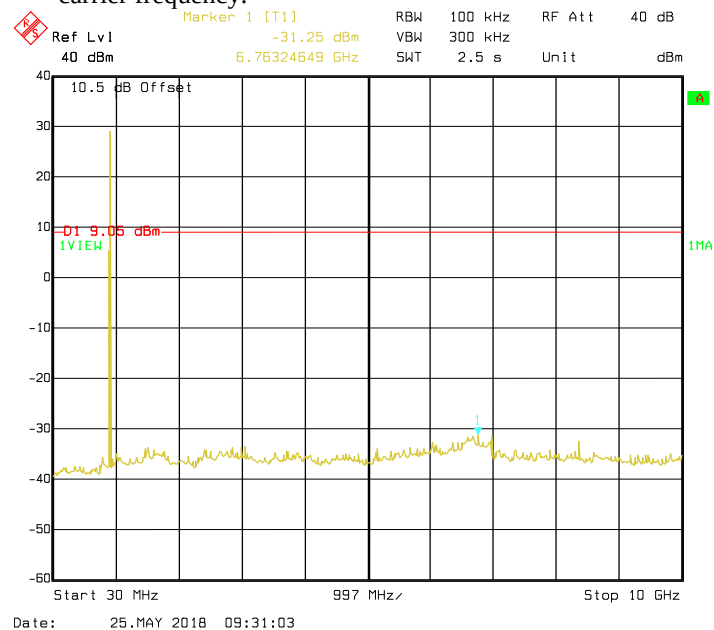
Center 915.025 MHz
 3 MHz
 Span 30 MHz



- The high emission level within the assigned band at high carrier frequency.

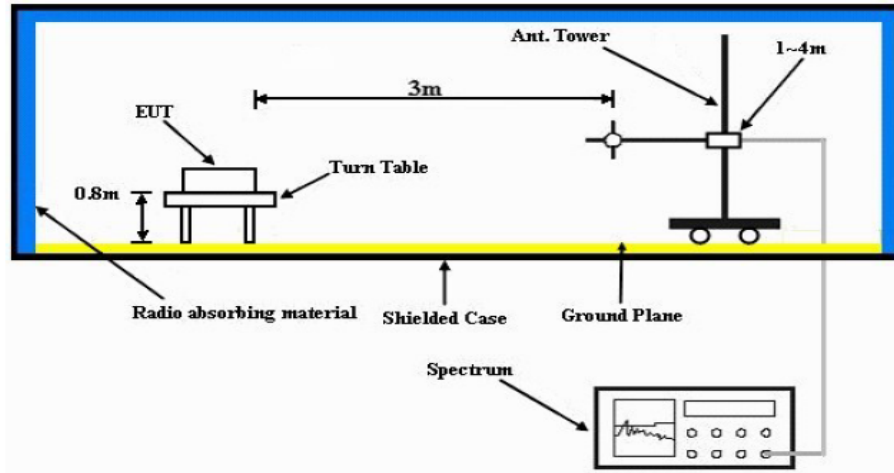


- Spurious emission measurement in 30MHz – 10GHz at high carrier frequency.



6.8. Radiated Spurious Emission

6.8.1. Test Setup



- The EUT is placed on the top of a rotating table 0.8m above the ground at a 3m semi-anechoic chamber. The table is rotated 360 degrees to determine the position of the highest radiation.
- The EUT is set 3m away from the interference-receiving antenna, which is mounted on the top of a variable-height antenna tower.
- The antenna is Bilog/Horn antenna depend on which frequency range uses, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT is arranged to its worst case and then the antenna is tuned to heights from 1m to 4m and the rotatable table is turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system is set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode is fall within the range of 10dB from the limit specified, the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. Otherwise, the testing could be stopped and the peak values of the EUT would be reported.

NOTE:

- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3 MHz for Peak detection at frequency above 1 GHz.
- All modes of operation were investigated and the worst-case emissions are reported.

6.8.2. Test Limits

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

NOTE:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Test: Bluetooth SAC Transmitter Radiated Emission

EMC SR ID#: 11945-EMC-00007

Accessory: NA

Test Standard: ANSI C63.10-2013

Worst Case Plane: X-Plane

Vertical Radiated Emission Result

Horizontal Radiated Emission Result

Remarks:
Pass Result

Fail Result

Humidity (%): 71.2

Test Date: Tue, May 22, 2018

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.

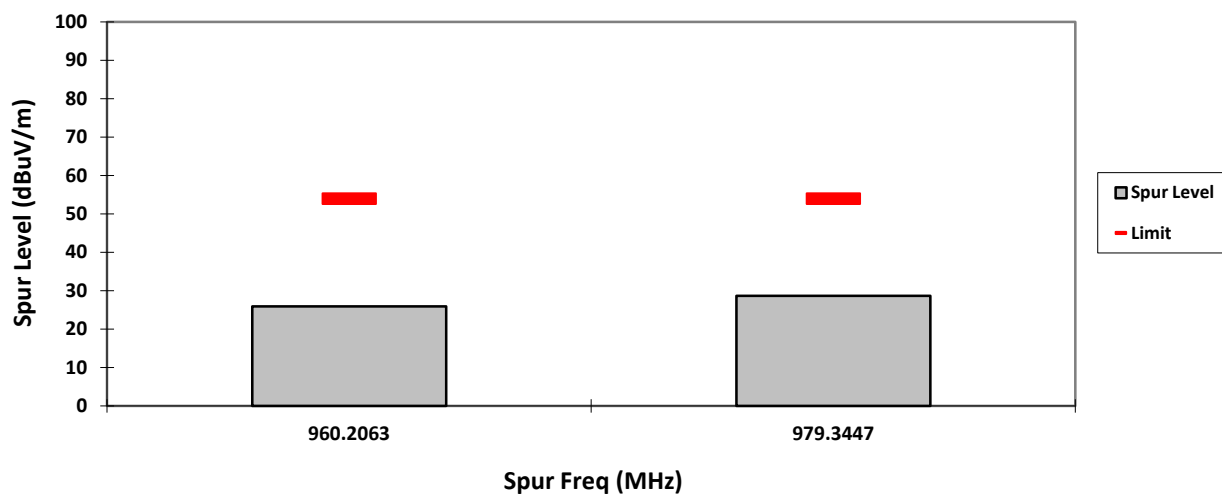
*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.

Duty cycle correction factor is determined using the formula $20 \log (\text{dwell time}/100 \text{ ms})$, and for the MOTOtalk emission, this factor is:

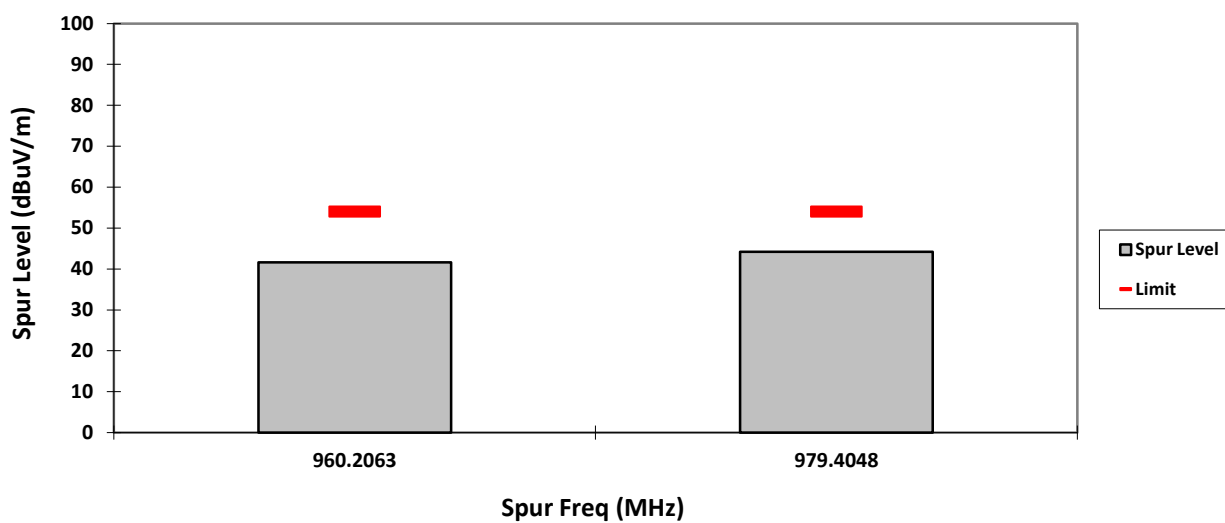
Dwell time = (274 symbols)/(3200 symbols/sec)/(8 frequencies) = 10.70 ms

Correction factor 20 Log (10.70 ms/100 ms) = -19.41 dB

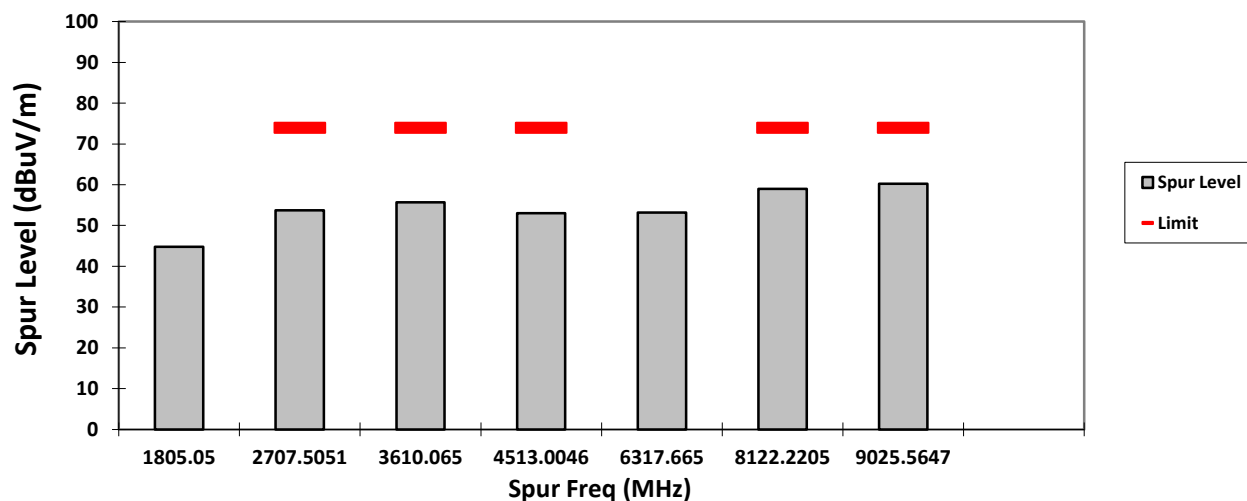
VERTICAL, QPK



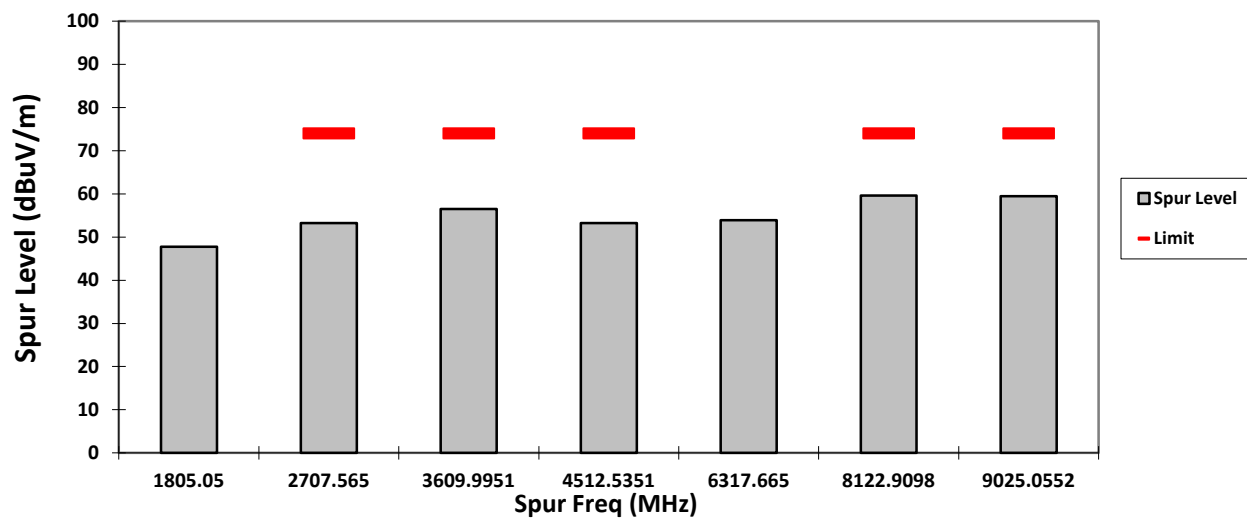
HORIZONTAL, QPK



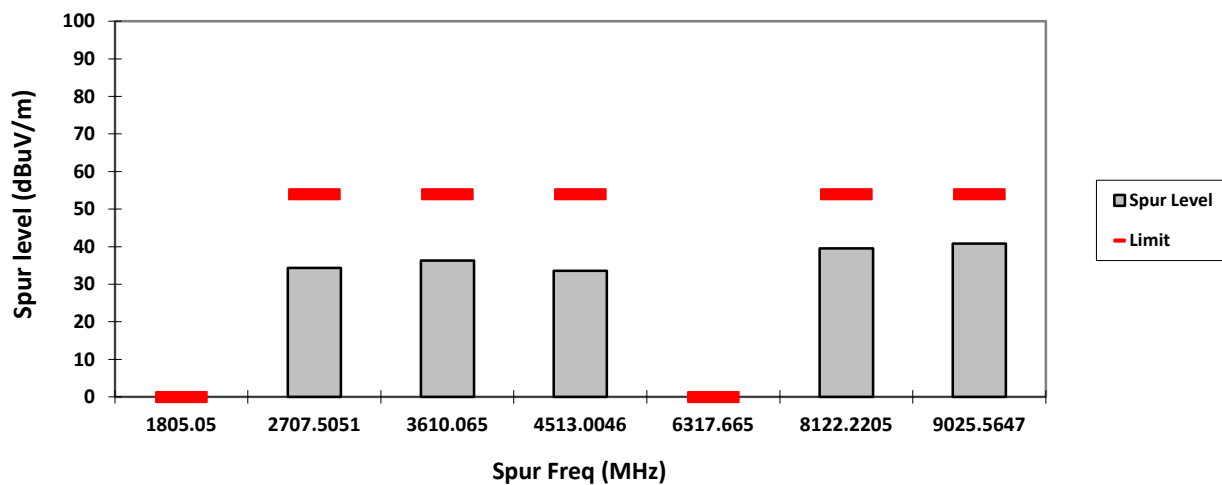
VERTICAL, PK



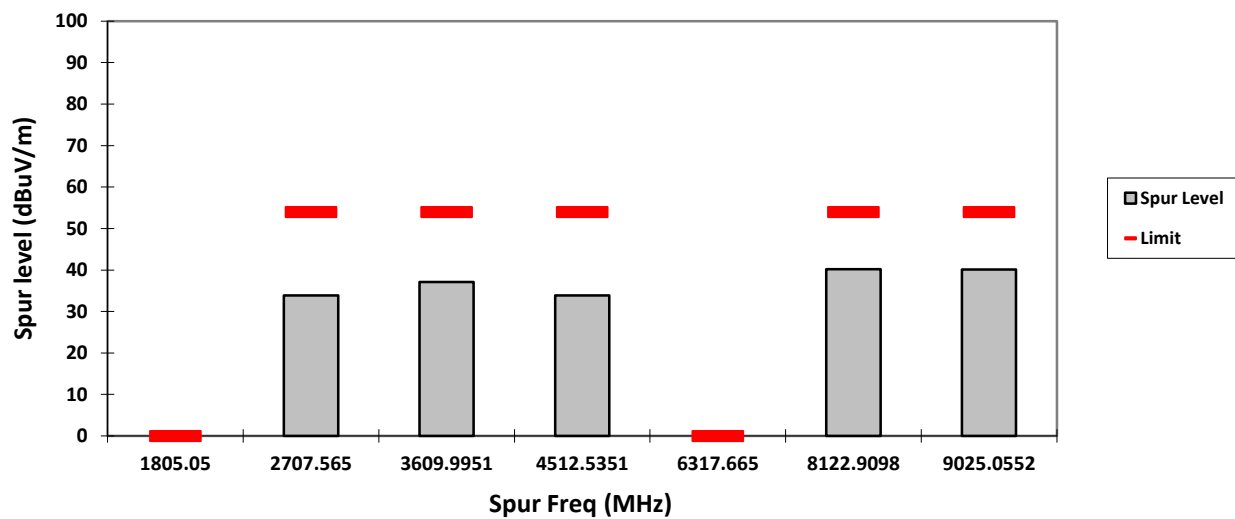
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



Test: Bluetooth SAC Transmitter Radiated Emission

EMC SR ID#: 11945-EMC-00007

Accessory: NA

Test Standard: ANSI C63.10-2013

Worst Case Plane: X-Plane

Vertical Radiated Emission Result

Horizontal Radiated Emission Result

Remarks:
Pass Result

Fail Result

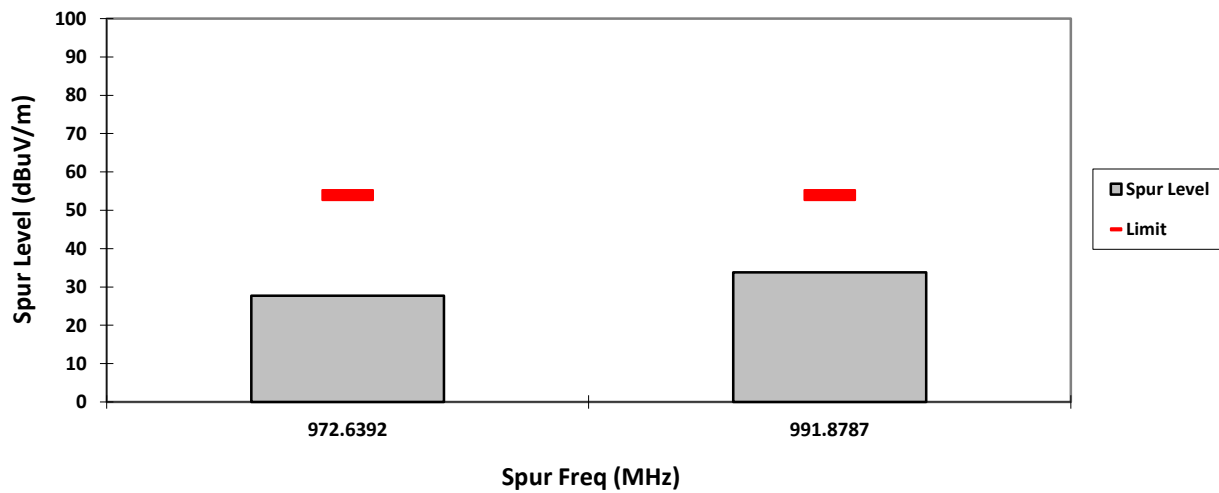
Humidity (%): 71.2

Test Date: Tue, May 22, 2018

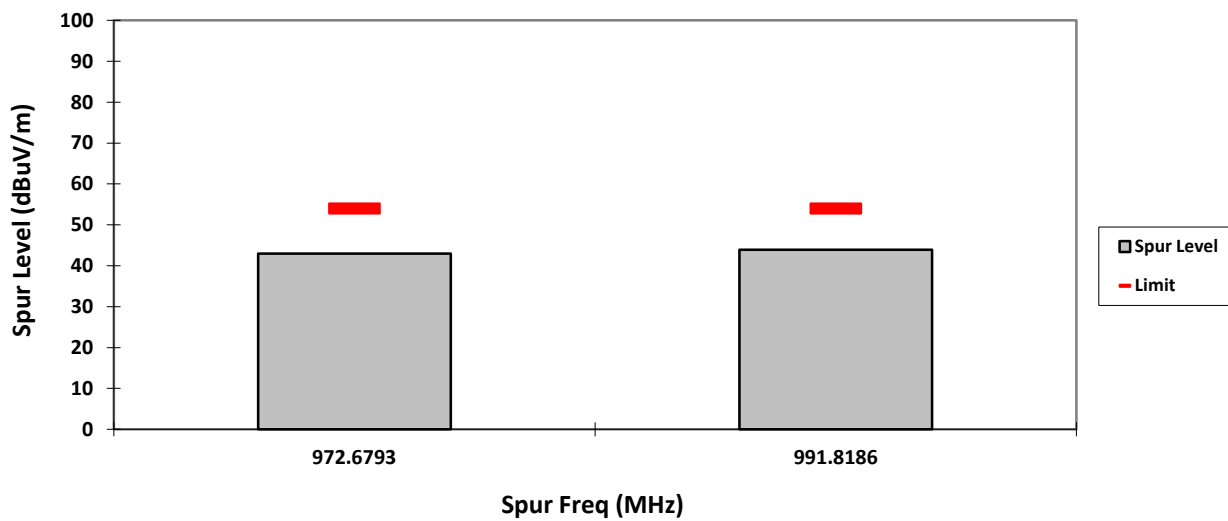
*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.

Dwell time = (274 symbols)/(3200 symbols/sec)/(8 frequencies) = 10.70 ms
Correction factor 20 Log (10.70 ms/100 ms) = -19.41 dB

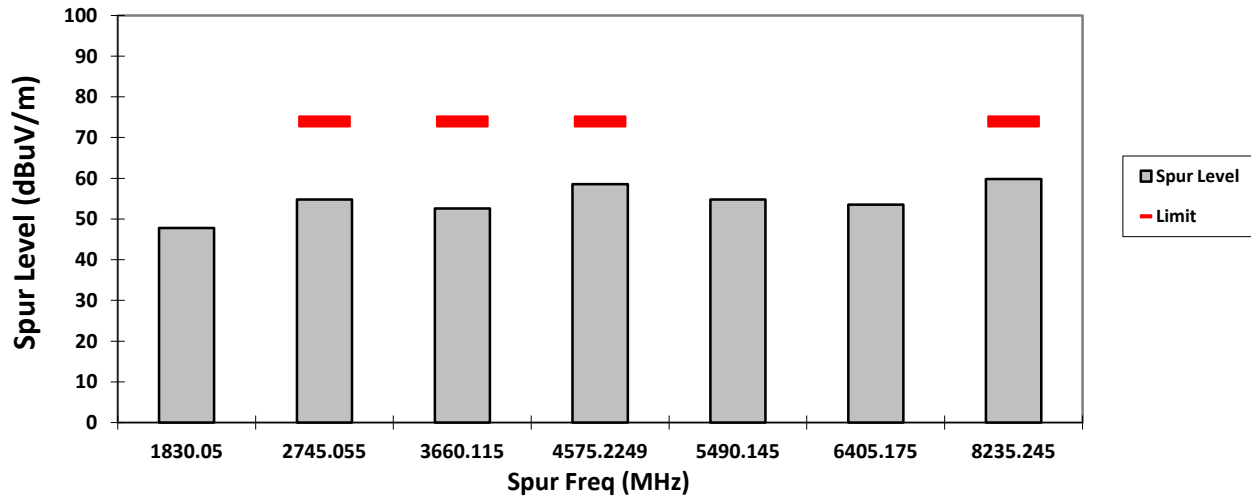
VERTICAL, QPK



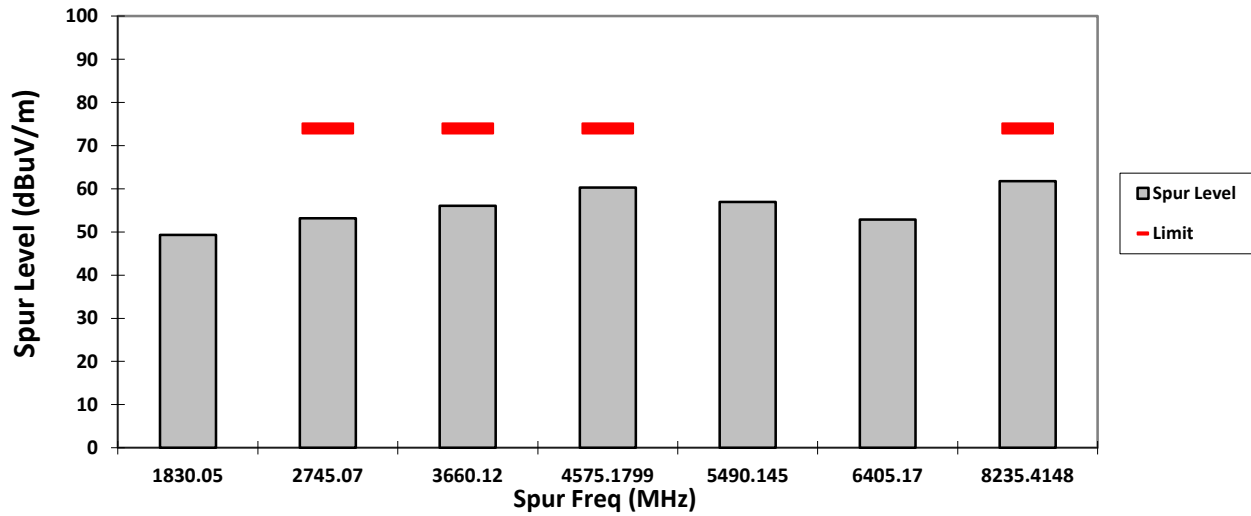
HORIZONTAL, QPK



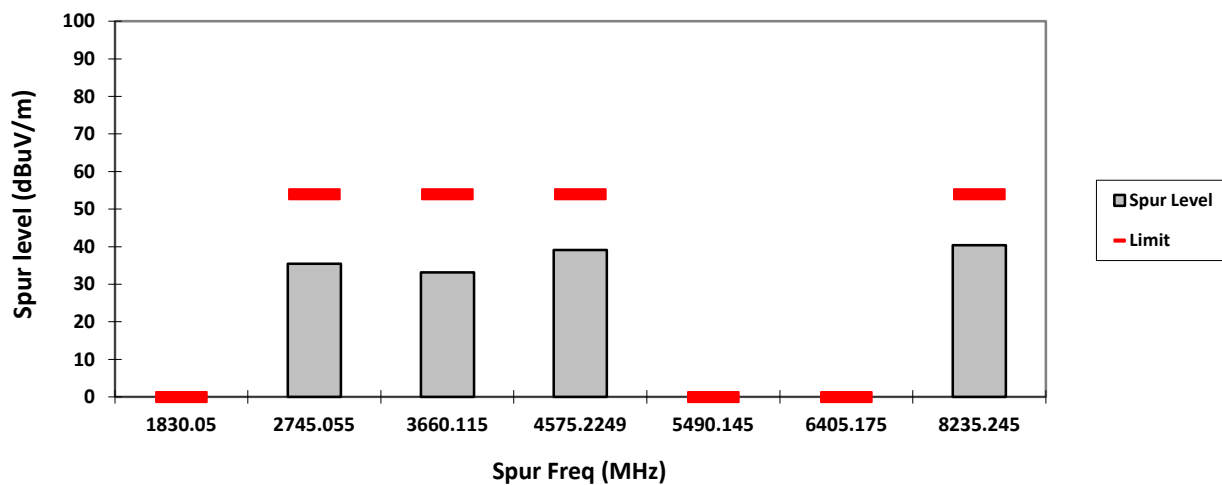
VERTICAL, PK



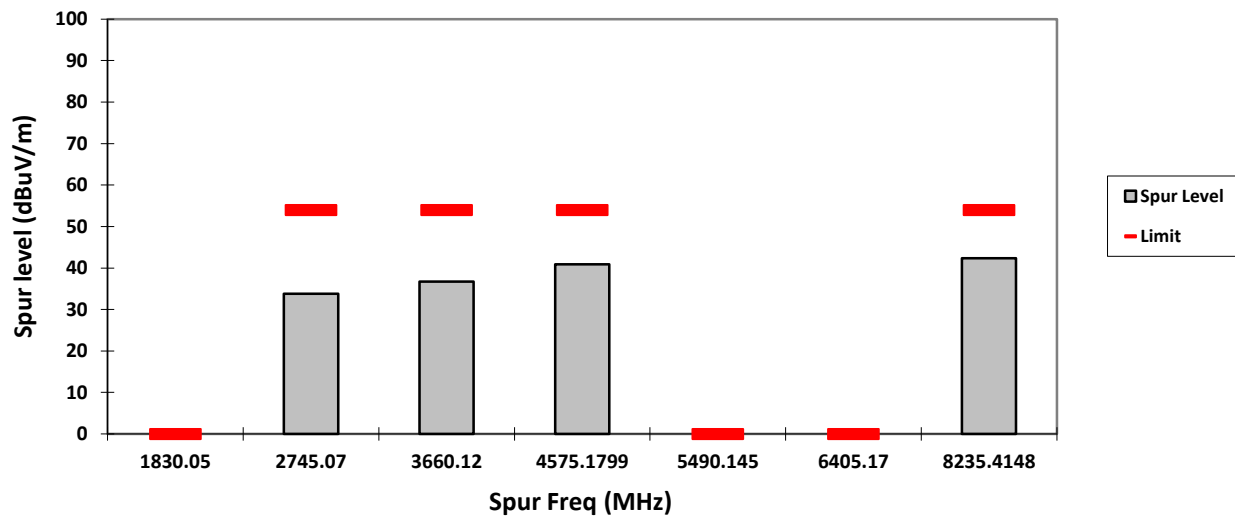
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



Test: Bluetooth SAC Transmitter Radiated Emission

EMC SR ID#: 11945-EMC-00007

Accessory: NA

Test Standard: ANSI C63.10-2013

Worst Case Plane: X-Plane

Vertical Radiated Emission Result

Horizontal Radiated Emission Result

Remarks:
Pass Result

Fail Result

Humidity (%): 71.2

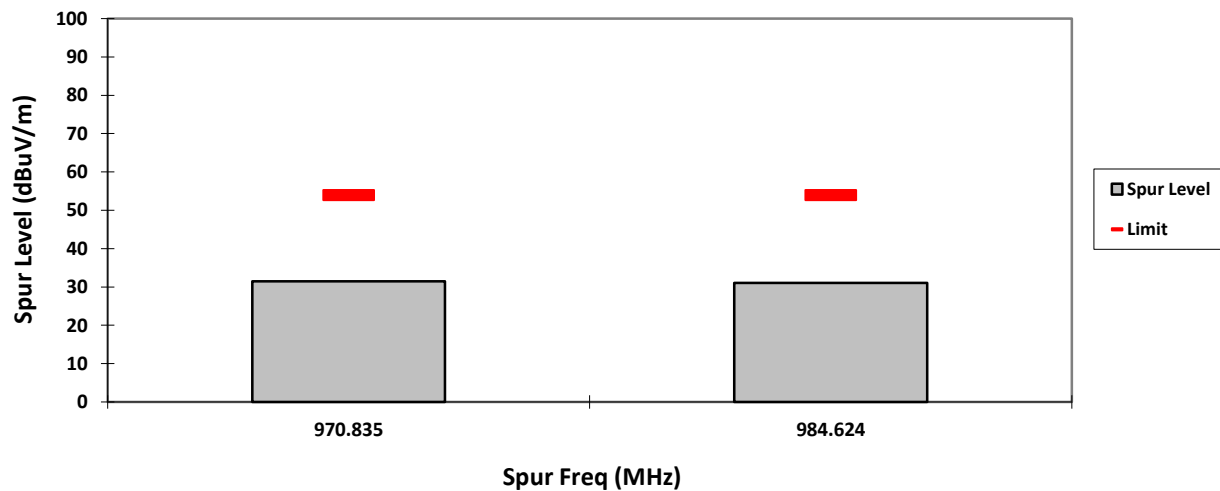
Test Date: Tue, May 22, 2018

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.

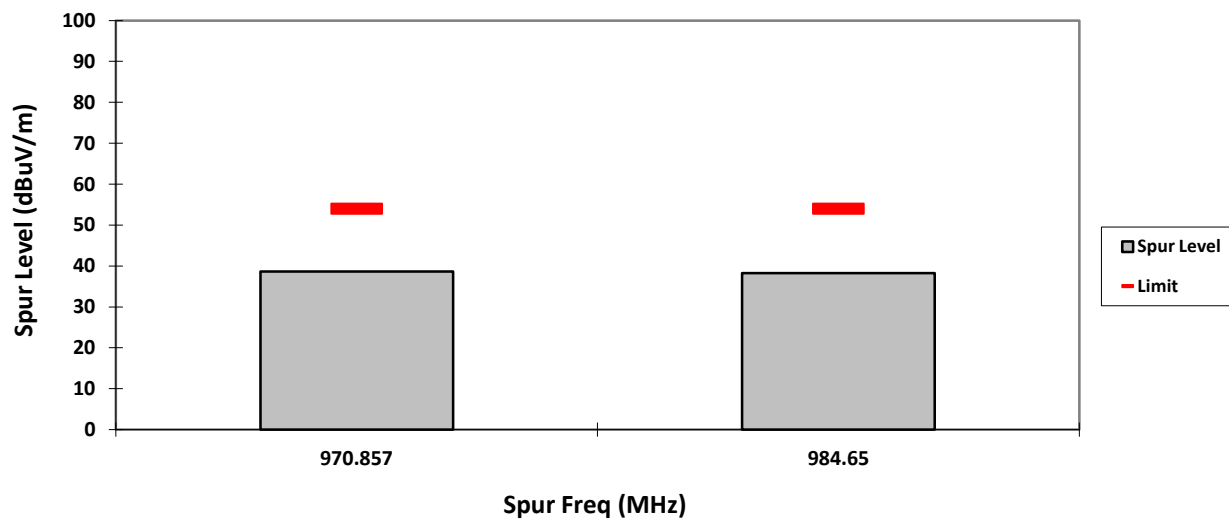
factor is:

Correction factor $20 \text{ Log } (10.70 \text{ ms}/100 \text{ ms}) = -19.41 \text{ dB}$

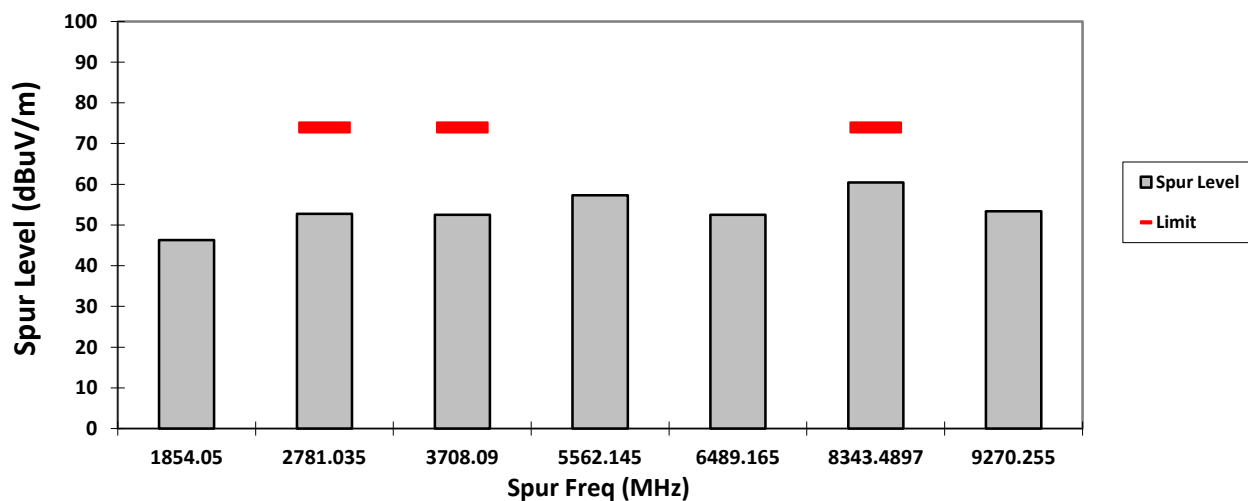
VERTICAL, QPK



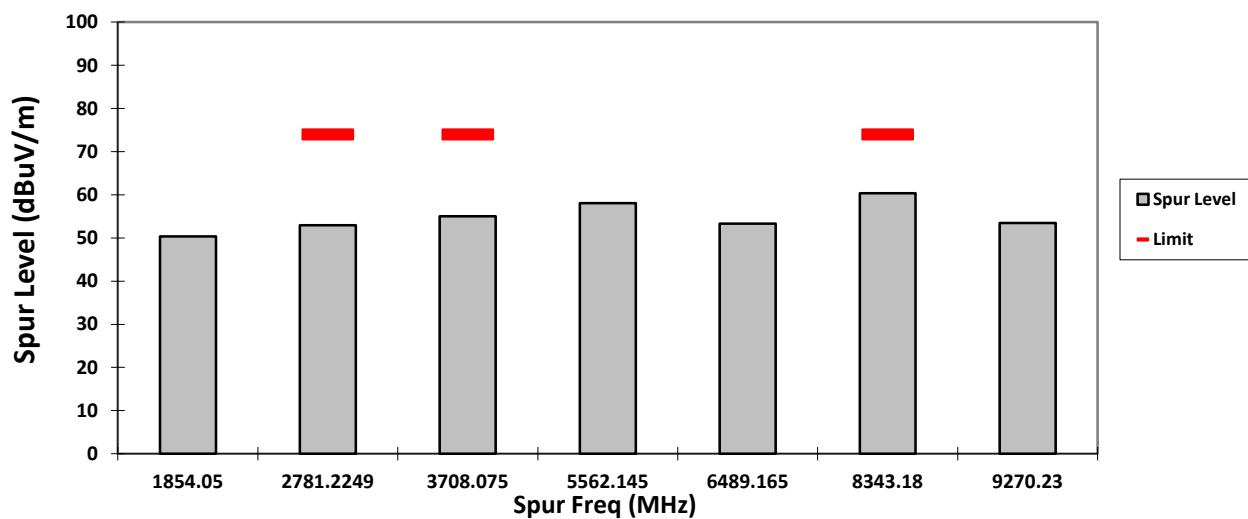
HORIZONTAL, QPK



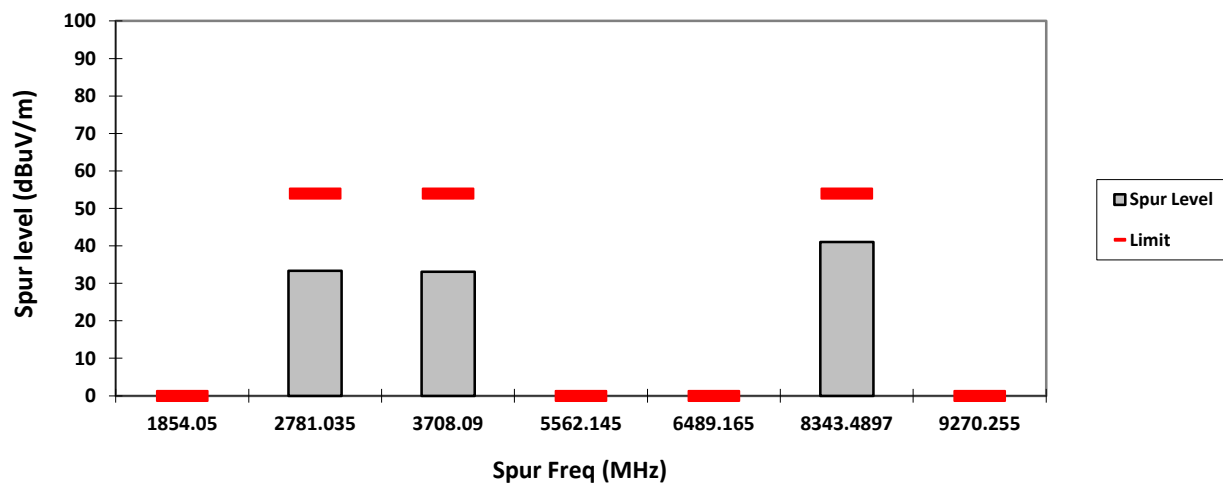
VERTICAL, PK



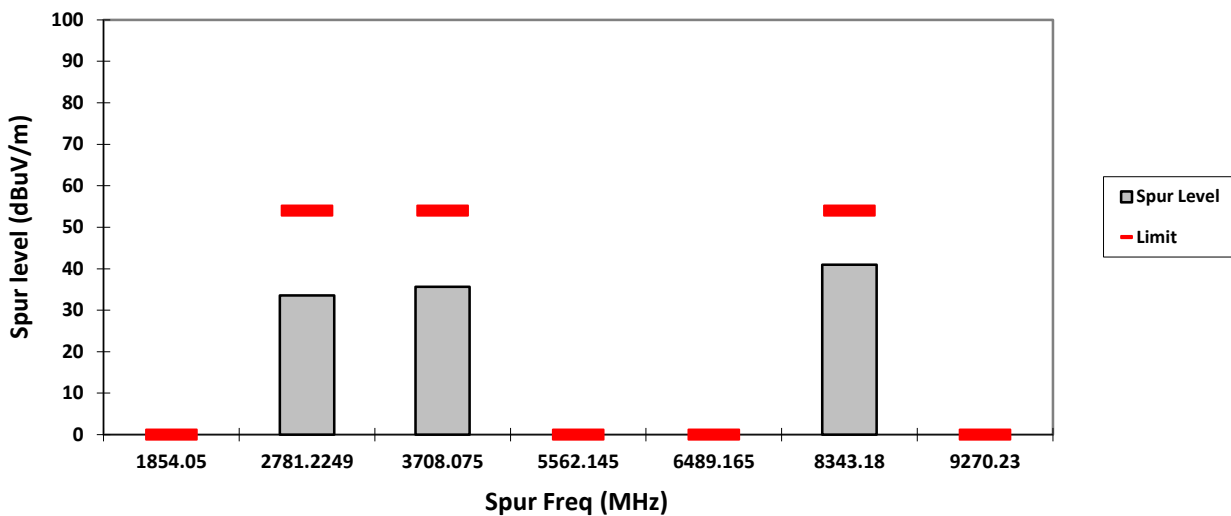
HORIZONTAL, PK



VERTICAL, AV

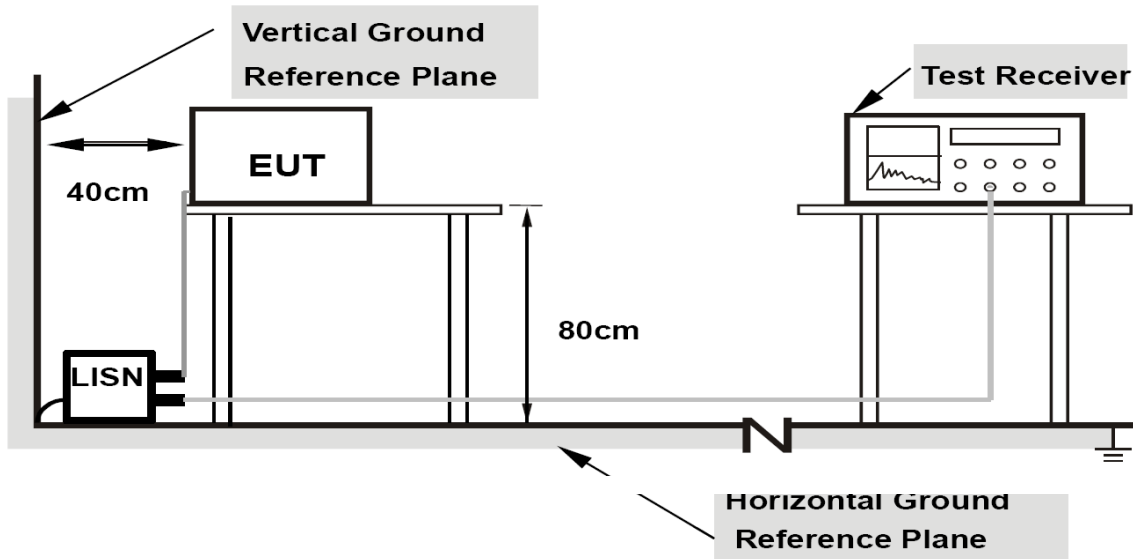


HORIZONTAL, AV



6.9. AC Powerline Conducted Emission

6.9.1. Test Setup



- 1) Tests were conducted for both Receive and Transmit Mode of the EUT.
- 2) The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50uH of coupling impedance for the measuring instrument.
- 3) Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- 4) The frequency range from 150 kHz to 30MHz was measured.

6.9.2. Test Limits

For AC Power Line Conducted Test Limit can be Class A or B depends on product classification.

**Limits for conducted disturbance at the mains ports
of class A ITE**

Frequency range MHz	Limits dB(μ V)	
	Quasi-peak	Average
0,15 to 0,50	79	66
0,50 to 30	73	60
NOTE The lower limit shall apply at the transition frequency.		

Table 1: Limits for Conducted Disturbance at the Mains Ports of Class A ITE.

**Limits for conducted disturbance at the mains ports
of class B ITE**

Frequency range MHz	Limits dB(μ V)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50
NOTE 1 The lower limit shall apply at the transition frequencies. NOTE 2 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

Table 2: Limits for Conducted Disturbance at the Mains Ports of Class B ITE

6.9.3. Test Result

Not Applicable. Testing is not required, radio shall turn off during charging mode