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<table><tr><td>Date/s Tested</td><td>: 26-June-2024</td></tr><tr><td>Report Issue Date</td><td>: 26-August-2024</td></tr><tr><td>Manufacturer/Location</td><td>: Motorola Solutions Malaysia Sdn Bhd</td></tr><tr><td>Manufacturer Address</td><td>: Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia</td></tr><tr><td>Requestor</td><td>: ISMAIL NABIL AZRI</td></tr><tr><td>Product Type</td><td>: Portable</td></tr><tr><td>Product Marketing Name (PMN)</td><td>: DTR700</td></tr><tr><td>Hardware Version Identification Name (HVIN)</td><td>: DTS150NBDLAA</td></tr><tr><td>Frequency Band</td><td>: 902 - 928 MHz</td></tr><tr><td>Max RF Output Power</td><td>: 1 Watt</td></tr><tr><td>Applicant Name</td><td>: Motorola Solutions Inc</td></tr><tr><td>Applicant Address</td><td>: Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia</td></tr><tr><td>Firmware Version Identification Name (FVIN)</td><td>: R01.04.00</td></tr><tr><td>FCC Registrations</td><td>: 461337</td></tr><tr><td>ISED Registrations</td><td>: MY0001</td></tr></table> The equipment was tested accordance to the requirement listed below: <table><tr><td>FCC 47 CFR Part 15C</td><td>PASS</td></tr><tr><td>ISED RSS-GEN Issue 5 / 247 Issue 3</td><td></td></tr></table>		Date/s Tested	: 26-June-2024	Report Issue Date	: 26-August-2024	Manufacturer/Location	: Motorola Solutions Malaysia Sdn Bhd	Manufacturer Address	: Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia	Requestor	: ISMAIL NABIL AZRI	Product Type	: Portable	Product Marketing Name (PMN)	: DTR700	Hardware Version Identification Name (HVIN)	: DTS150NBDLAA	Frequency Band	: 902 - 928 MHz	Max RF Output Power	: 1 Watt	Applicant Name	: Motorola Solutions Inc	Applicant Address	: Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia	Firmware Version Identification Name (FVIN)	: R01.04.00	FCC Registrations	: 461337	ISED Registrations	: MY0001	FCC 47 CFR Part 15C	PASS	ISED RSS-GEN Issue 5 / 247 Issue 3	
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REVISION HISTORY

Revision History	Description	Date	Originator
Rev. A	Initial Report	28-July-2024	Hidayati
Rev. B	Update Product Marketing Name (PMN)	12-August-2024	Hidayati
Rev. C	Update ISED RSS 247 Issue Version	26-August-2024	Hidayati

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	WHIP
Antenna Gain	2.15 dBi

The EUT contains following accessory devices and data cable:

Item	Brand	Model or P/N
BATTERY PACK, BATTERY PACK, BATT LIION 2500T	MOTOROLA	PMNN4578A
HANDSET ANTENNA (900MHz) 902-928 MHz	MOTOROLA	PMAF4024A

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

No modifications were done to the UUT to facilitate the tests in this report.

Deviation from standard

Not applicable as no deviation from standard test method

2.0. Summary of Test Results

FCC Clause	IC Clause	Test Item	Result	Remarks	Serial number	Tested by
15.247 (b)(2)	RSS-247 5.4(1)	Conducted RF Output Power (Peak) & EIRP Measurement	Pass	Highest output power: 29.438dBm (0.88W)	37922AL2325	Hidayati
15.247 (a)(1)	RSS-247 5.1(3) RSS-247 5.1(2)	(1) 20dB Channel Bandwidth (2) Channel Separation	NA	NA	NA	NA
15.247(a)(1)(i)	RSS-247 5.1(3)	Number of hopping Frequency used	NA	NA	NA	NA
15.247(a)(1)(i)	RSS-247 5.1(3)	Dwell time on each channel	NA	NA	NA	NA
15.247 (d)	RSS-247 5.5	Band Edge Conducted Spurious Emission	NA	NA	NA	NA
15.247 (d)	RSS-247 5.5	Conducted Spurious Emission	Pass	Worst case emission: -37.379dBm	37922AL2325	Hidayati
15.205, 15.209, 15.247 (d)	RSS-247 5.5	Radiated Emission within Restricted Bands	Pass	Worst case emission: 30.5027dBuV/m (margin: 23.4973dBuV/m)	37922AL2270	Rezza & Fuad
15.207	RSS-Gen 8.8	AC Powerline Conducted Emission	NA	Testing is not required, radio shall turn off during charging mode	NA	NA

NOTE1: Selection of test parameters, the report contain a limited number of parameters deemed to be influenced by the relevant design changes, as agreed with the applicant.

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
Conducted Spurious Emission	9kHz ~ 12.75GHz	2.82

4.0. Equipment List

Bluetooth ATE # 1 (SW Version: Ate Main_3.1.12)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
SPECTRUM ANALYZER	E4440A	MY48250517	8-Nov-23	8-Nov-24
CHAMBER	SH-641	92005573	1-Apr-24	1-Apr-25
POWER SUPPLY	6652A	3541A02371	18-Jul-23	18-Jul-24

Radiated Emission Station (SW Version: EMC FCC RE v1.6.5)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
DRG HORN FREQ.	SAS-571	1143	08-Mar-23	08-Mar-25
DRG HORN FREQ.	SAS-571	720	18-Apr-23	18-Apr-25
DC Power Supply	NR973A	MY54180189	30-Aug-23	30-Aug-24
SIGNAL GENERATOR	SMB 100A	182511	04-Sep-21	04-Sep-24
EMI TEST RECEIVER	ESW44	101731	11-Aug-23	11-Aug-24
LOOP ANTENNA	6502	00203479	06-Mar-24	06-Mar-25
BILOG ANTENNA	CBL6112B	2950	14-Dec-23	14-Dec-24
BILOG ANTENNA	CBL6112B	2964	25-Sep-23	25-Sep-24
DATA LOGGER THERMOHYGROMETER	SDL500	A.016800	26-Jun-24	26-Jun-25
BROAD-BAND HORN ANTENNA	BBHA9170	BBHA9170143	28-Aug-23	28-Aug-24
PREAMPLIFIER	PAM-0118P	574	19-Mar-24	19-Mar-25
5m SEMI-ANECHOIC CHAMBER	S800-HX	J2308	Not Required	Not Required
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
PREAMPLIFIER 18-40GHz	Miteq Hi Gain Sucoflex	002	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	Tested by	Environmental Conditions
Test Mode	1 to 500	Hopset 1: 1, 26 Hopset 10: 50	FHSS	8FSK	Rezza & Fuad	26.2°C, 63.5% RH

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	Tested by	Environmental Conditions
Application Mode	1 to 500	AUTO	FHSS	AUTO	NA	NA

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).

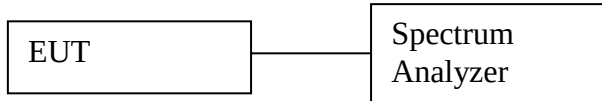
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Total Channel	Tested Channel	Modulation Technology	Modulation Type	Tested by	Environmental Conditions
Test Mode	1 to 500	Hopset 1: 1, 26 Hopset 10: 50	FHSS	8FSK	Hidayati	25°C, 50% RH

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

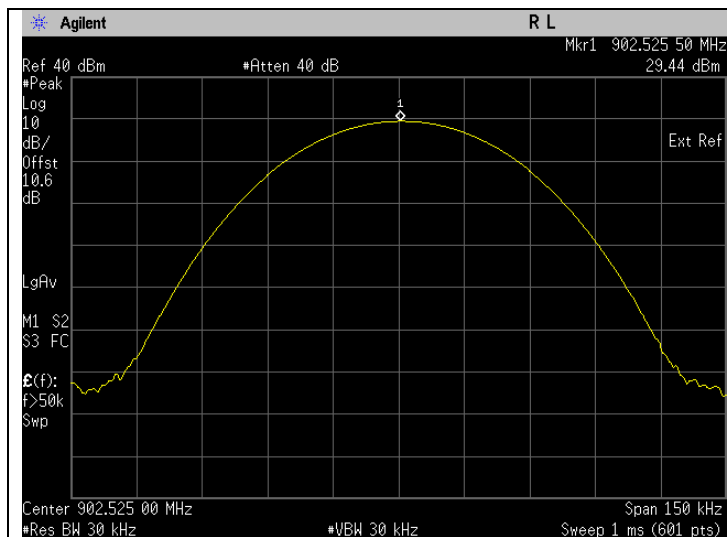
Normal Condition (25 ° C)
Peak Output Power : < 1W (or 30dBm); E.I.R.P: < 4W

6.1.3. Test Data

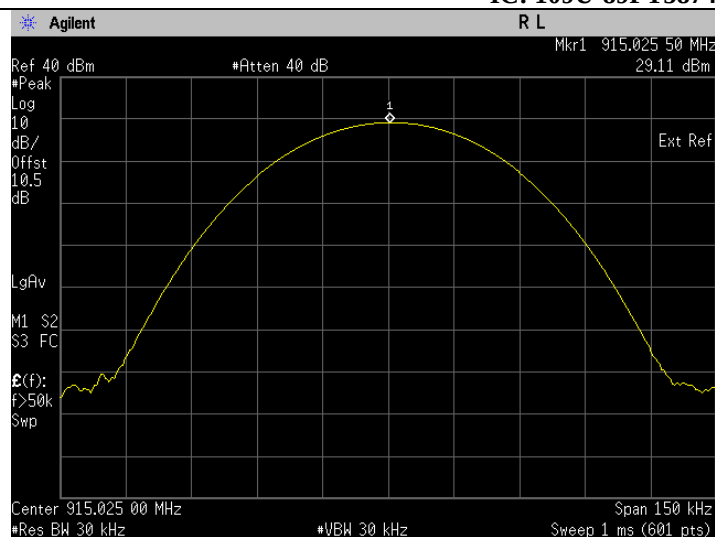
Antenna Gain: 2.15dBi

Test Conditions		Test Frequency (MHz)	Peak Output Power			E.I.R.P.		
Modulation	Voltage(V)		dBm	Watt	Status	dBm	Watt	Status
8FSK	3.70	902.525	29.44	0.88	Pass	31.59	1.44	Pass
		915.025	29.11	0.81	Pass	31.26	1.34	Pass
		927.475	29.09	0.81	Pass	31.24	1.33	Pass

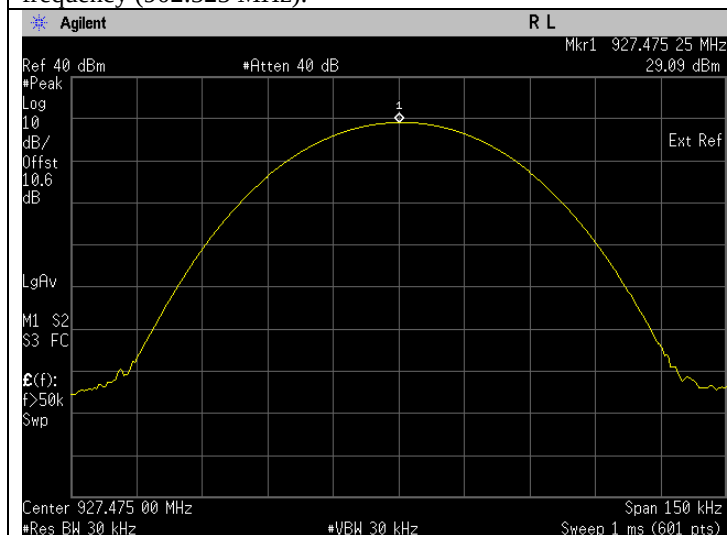
****Note:** EIRP = PT +GT – LC, PT = Transmit Output Power, dBm
 GT = Antenna Gain, dBi
 LC = signal attenuation, dB1



The Conducted RF Output Power test with result at low frequency (902.525 MHz).



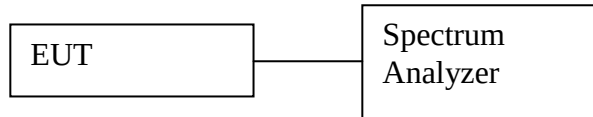
The Conducted RF Output Power test with result at middle frequency (915.025 MHz).



The Conducted RF Output Power test with result at high frequency (927.475 MHz).

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

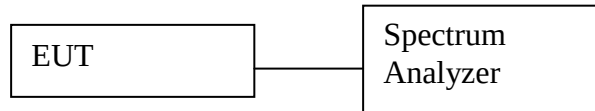
Normal Condition (25 ° C)
For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies

6.2.3. Test Data

Not applicable.

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

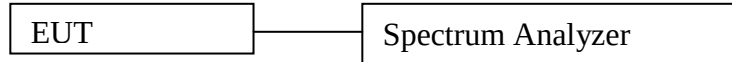
Normal Condition (25 ° C)
Shall be at least 20 dB below the peak power.

6.3.3. Test Result

Not Applicable.

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

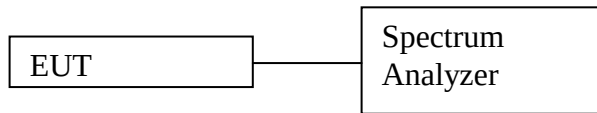
Normal Condition (25 ° C)
$\leq 0.4\text{sec}$

6.4.3. Test Result

Not Applicable.

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

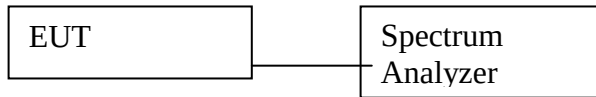
Normal Condition (25 ° C)
≥ 50

6.5.3. Test Result

Not Applicable.

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

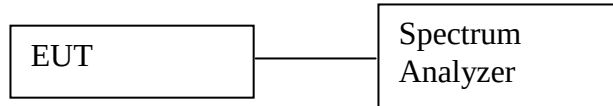
Normal Condition (25 ° C)
At least 25kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

6.6.3. Test Result

Not Applicable.

6.7. Conducted Spurious Emission

6.7.1. Test Setup



- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the EUT and set EUT to transmit maximum data rate with hopping disable.
- 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 = Cover until 10th harmonic
 - d. Detector mode = Peak
 - e. AMPLITUDE → Scale/Div = 10 dB
 - f. Trace = Max hold
 - g. Sweep = auto
- e) Measure the captured spurious emission result and recording the plot.
- f) Repeat above procedure with different channel frequency of operation.

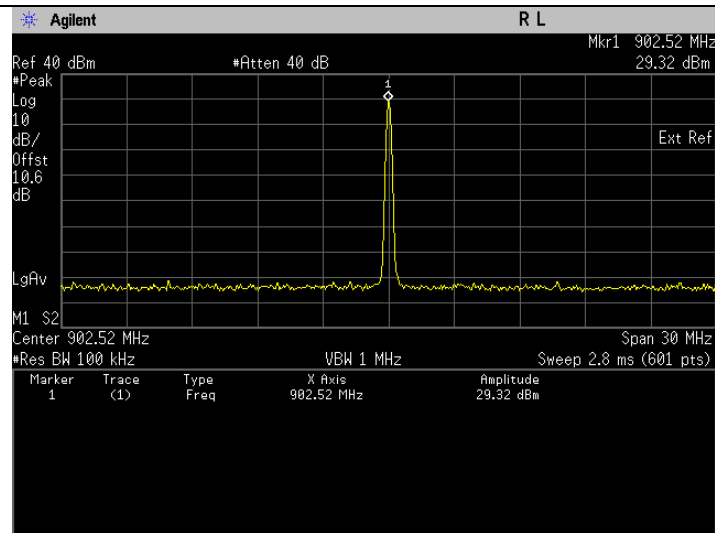
6.7.2. Test Limits

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

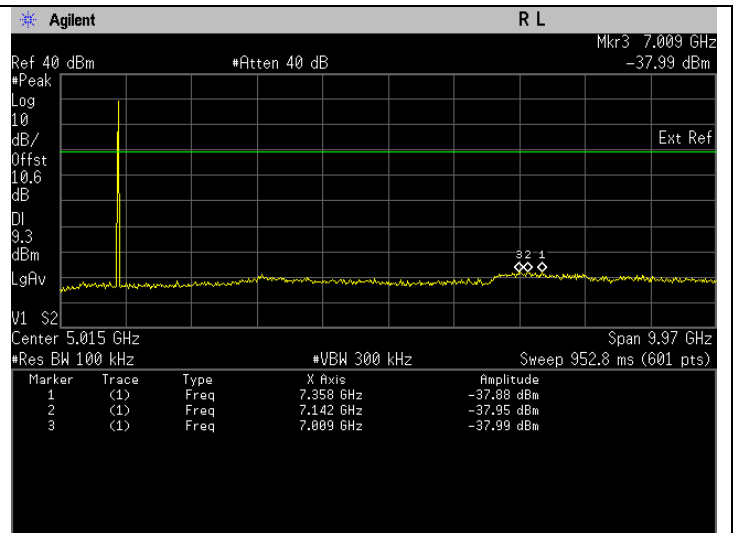
6.7.3. Test Data

Test Conditions		Test Frequency (MHz)	Results	
Modulation	Voltage(V)		Spurious Level	Status
8FSK	3.70	902.525	-37.875	Pass
		915.025	-37.511	Pass
		927.475	-37.379	Pass

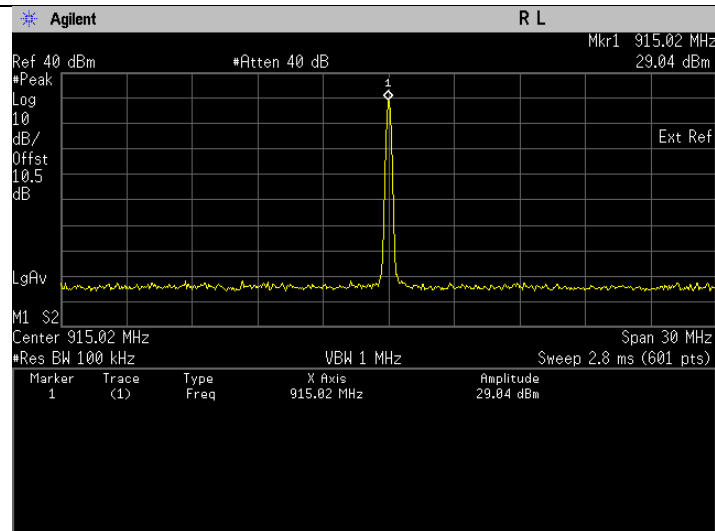
8FSK Modulation:



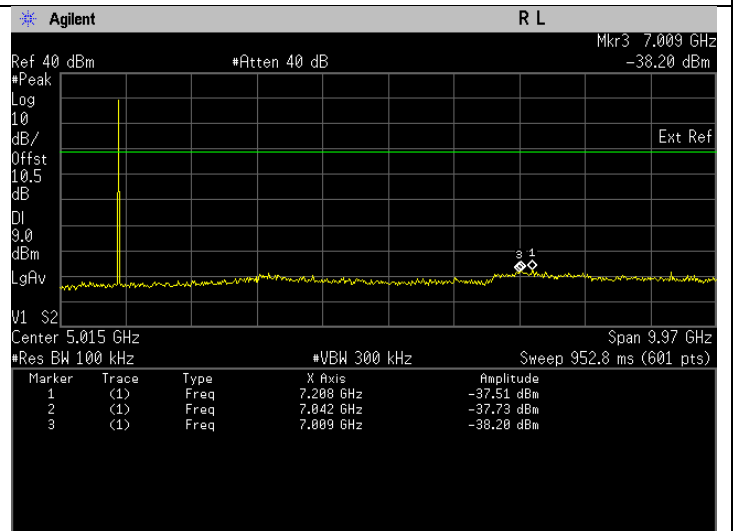
The highest emission level within the assigned band at low carrier frequency.



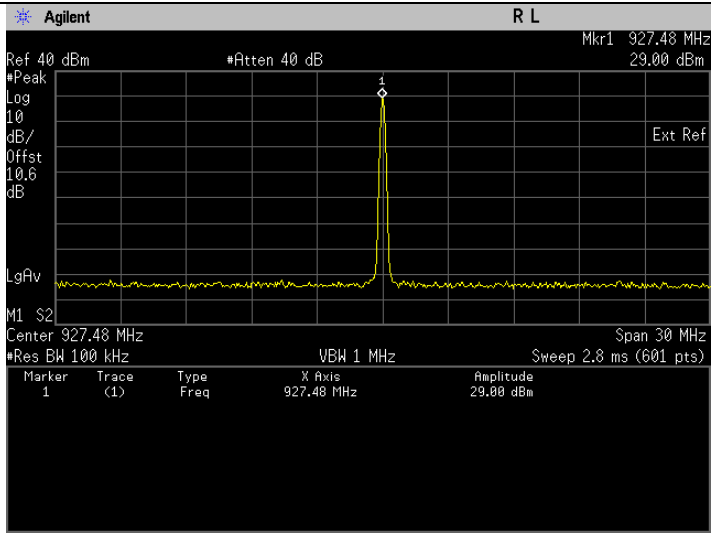
Spurious emission measurement in 30MHz – 10GHz at low carrier frequency.



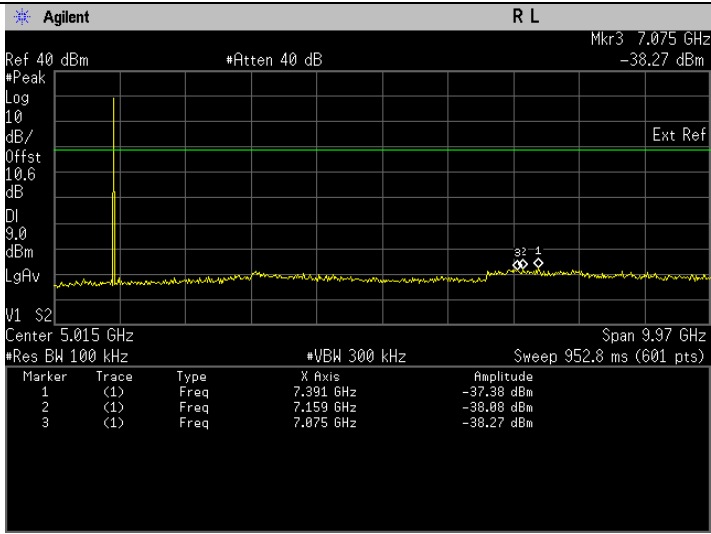
The highest emission level within the assigned band at middle carrier frequency.



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



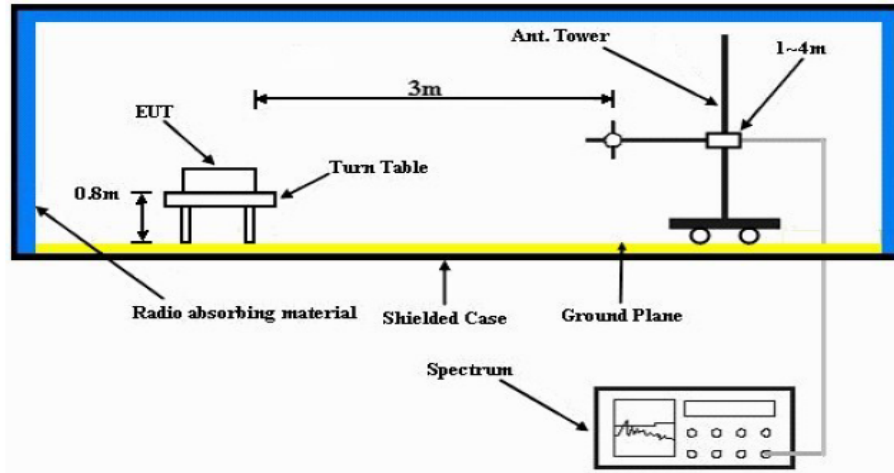
The highest emission level within the assigned band at high carrier frequency.



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 (<1Ghz) and 1.5m (>1Ghz) 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

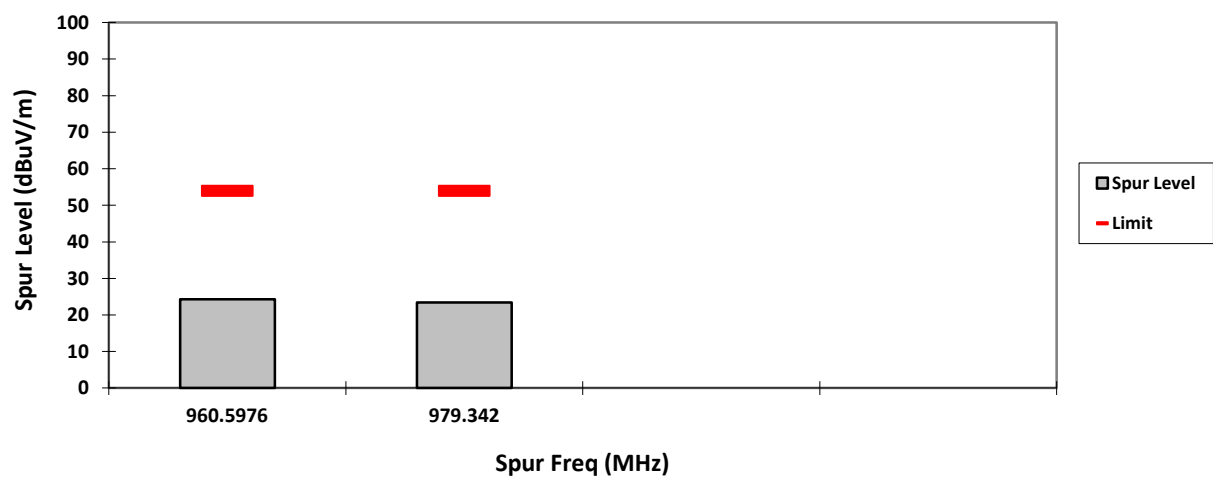
Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power.

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

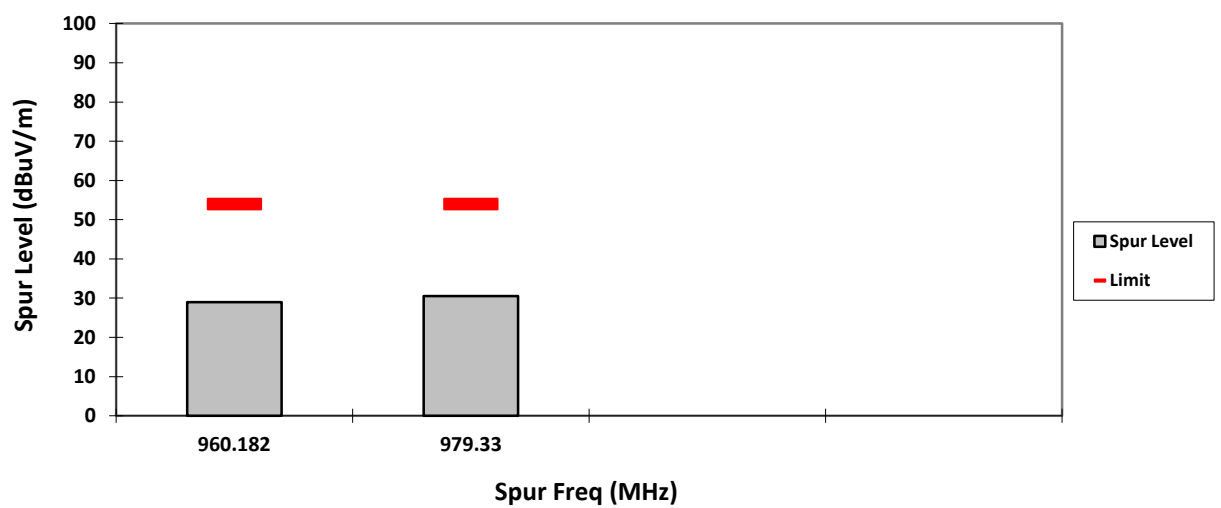
NOTE:

- 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.

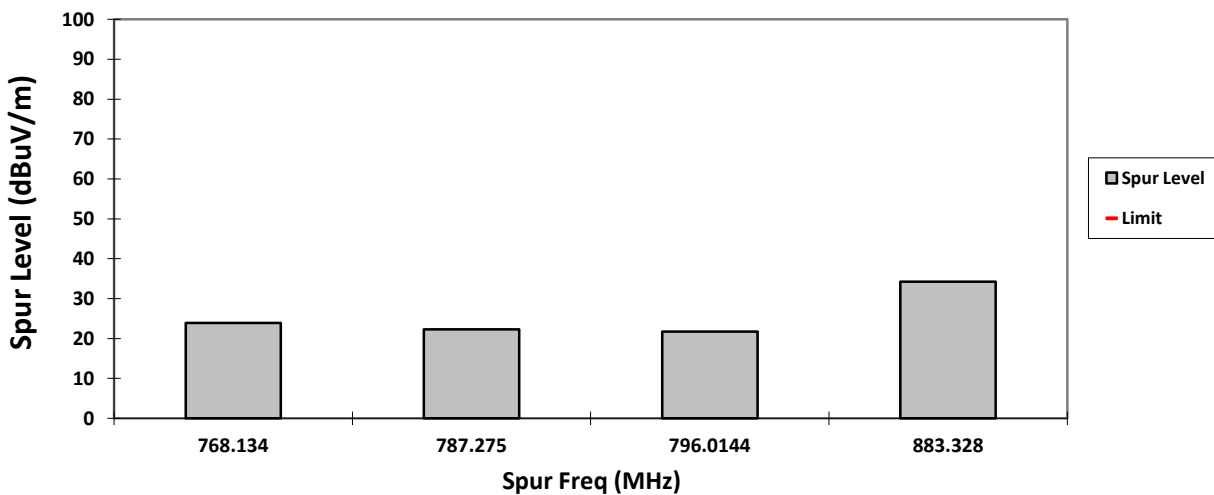
VERTICAL, QPK



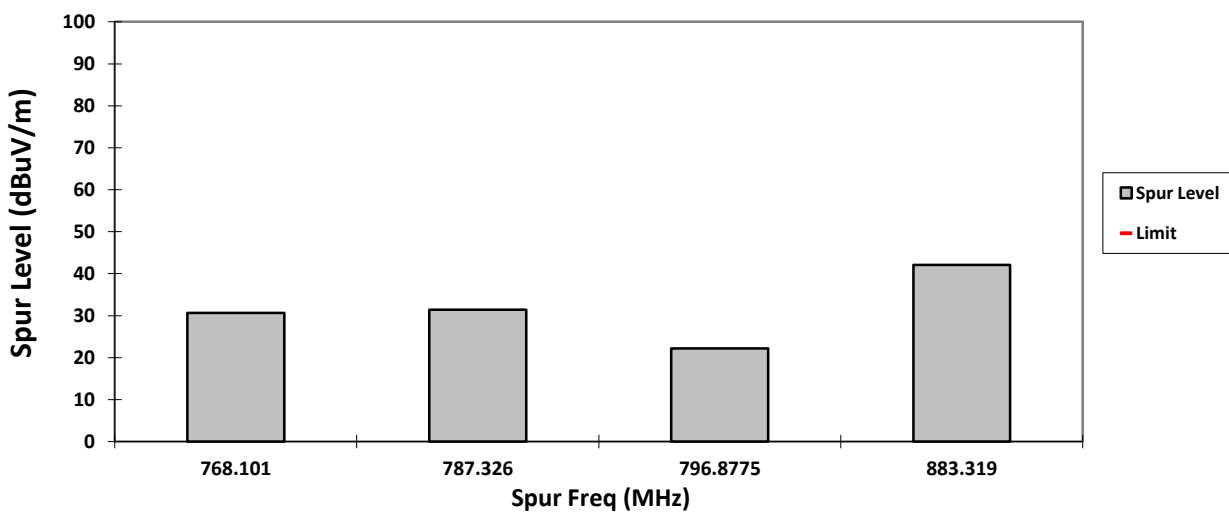
HORIZONTAL, QPK



VERTICAL, PK



HORIZONTAL, PK



Test: SAC Transmitter Radiated Emission

Model#: DTS150NBDLAA

S/N: 37922AL2270

EMC SR ID#: 0824P00-EMC-00002

Battery: PMNN4578A

Accessory: PMAF4024A

Test Channel: Mid

Test Frequency: 915.0250 MHz

Test Standard: ANSI C63.10-2013

Worst Case Plane: Z-Plane

Radiated Emission (Mid Channel) tabular data

[illegible]

Remarks: Pass Result	Marginal Result	Fail Result
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Temperature (degC): 26.2

Humidity (%): 63.5

Test Performed by: Rezza & Fuad

Test Date: Wed, 10 Jul, 2024

System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

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.

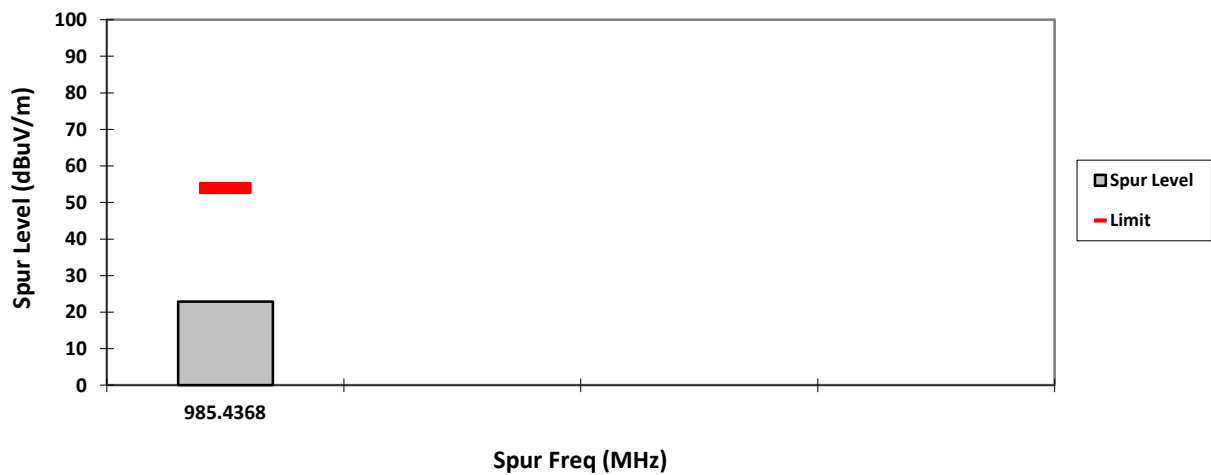
Duty cycle correction factor is determined using the formula $20 \log (\text{dwell time}/100 \text{ ms})$, and for the MOTotalk emission, this factor is:

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

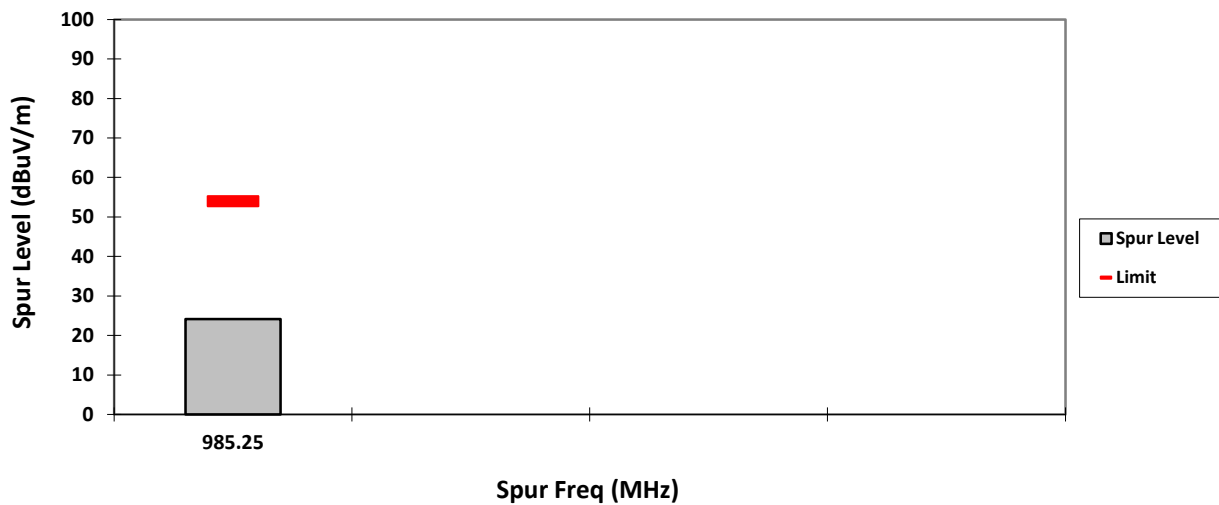
Correction factor 20 Log (10.70 ms/100 ms) = -19.41 dB

are not reported.

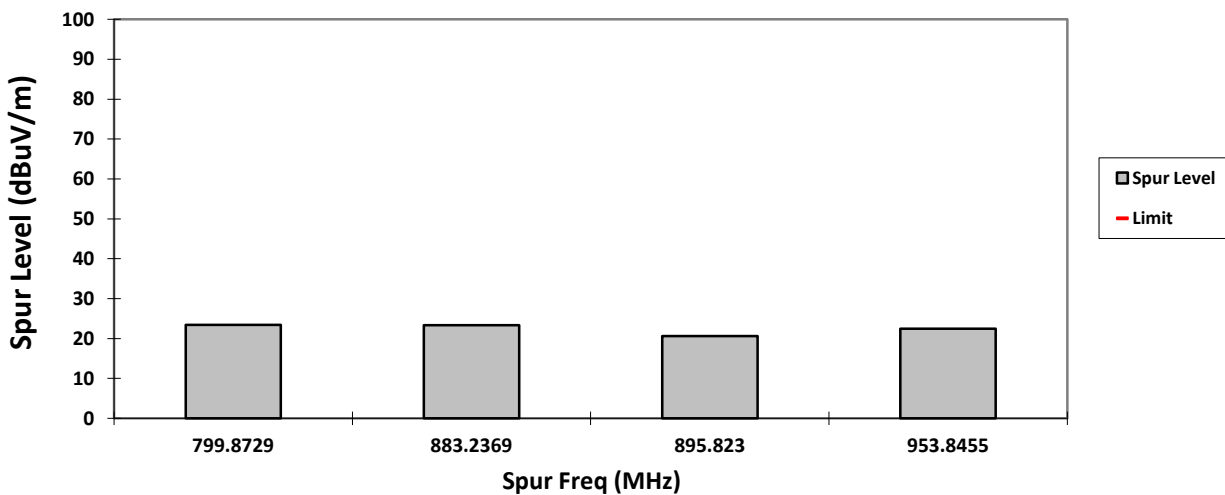
VERTICAL, QPK



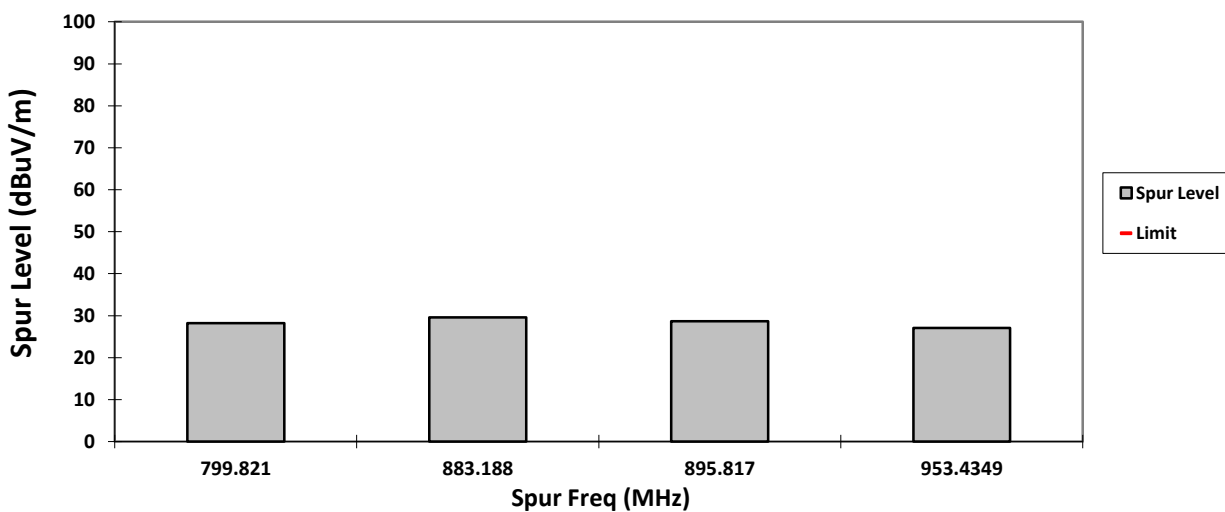
HORIZONTAL, QPK



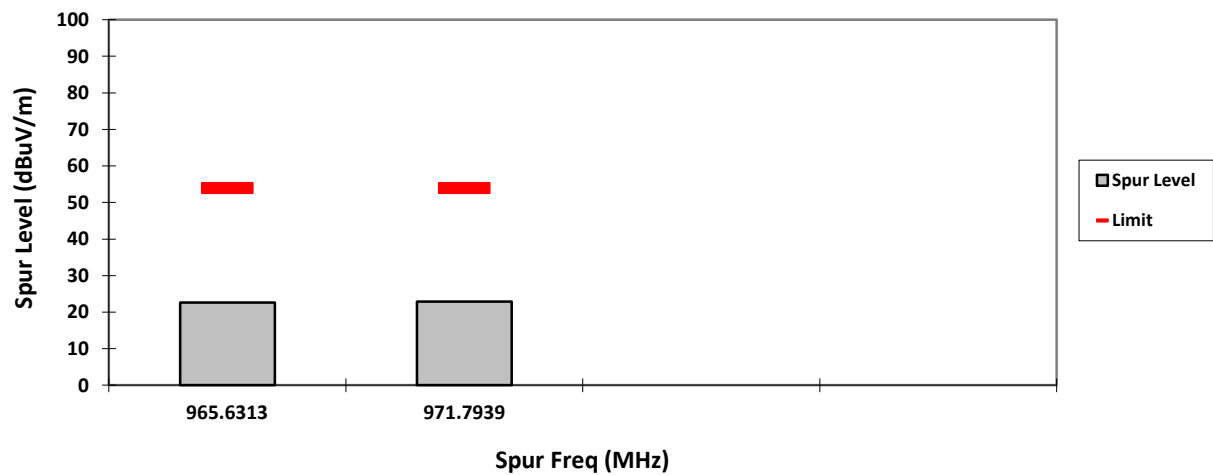
VERTICAL, PK



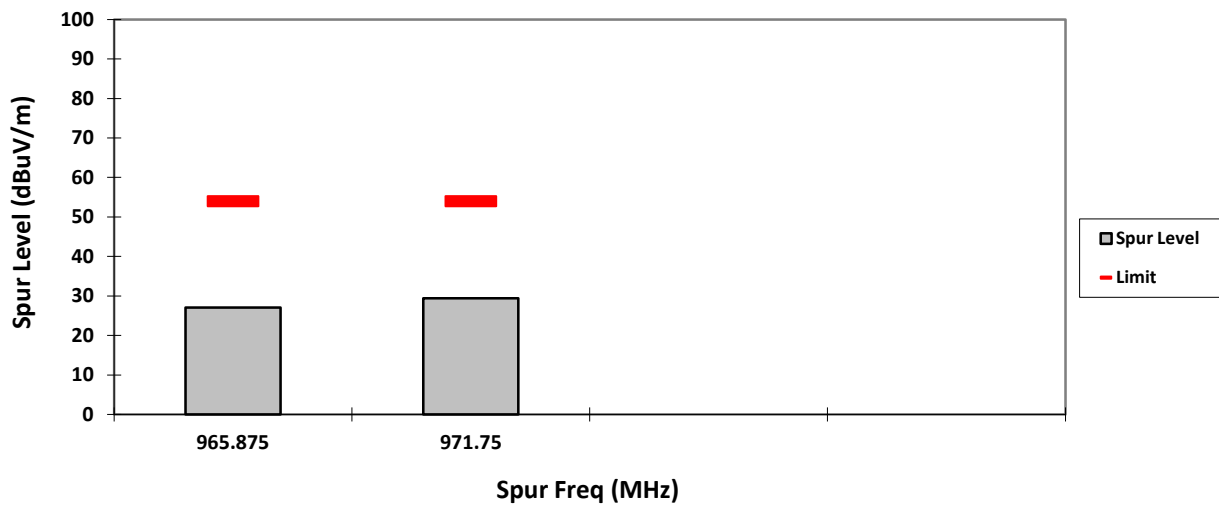
HORIZONTAL, PK



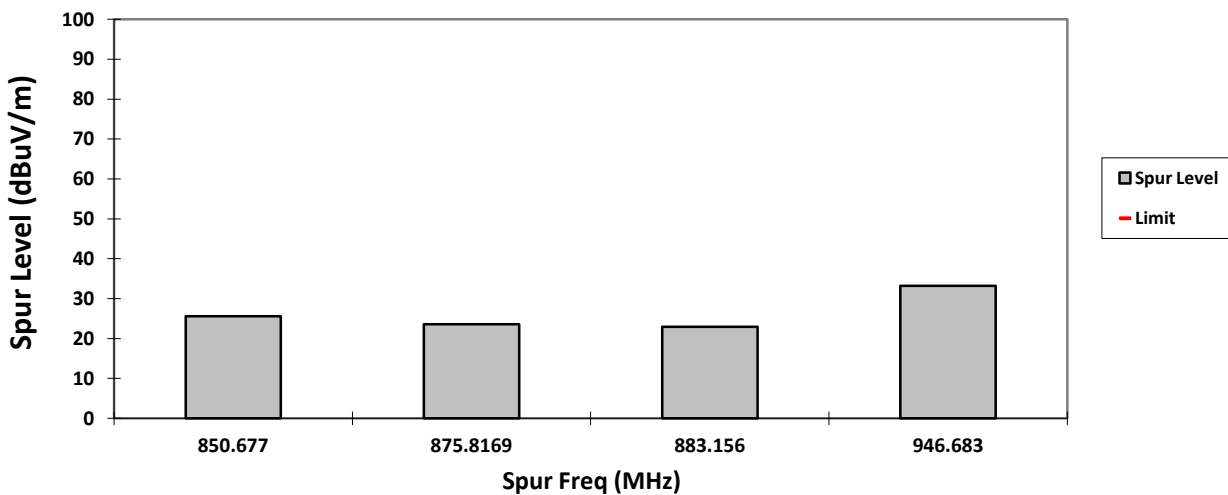
VERTICAL, QPK



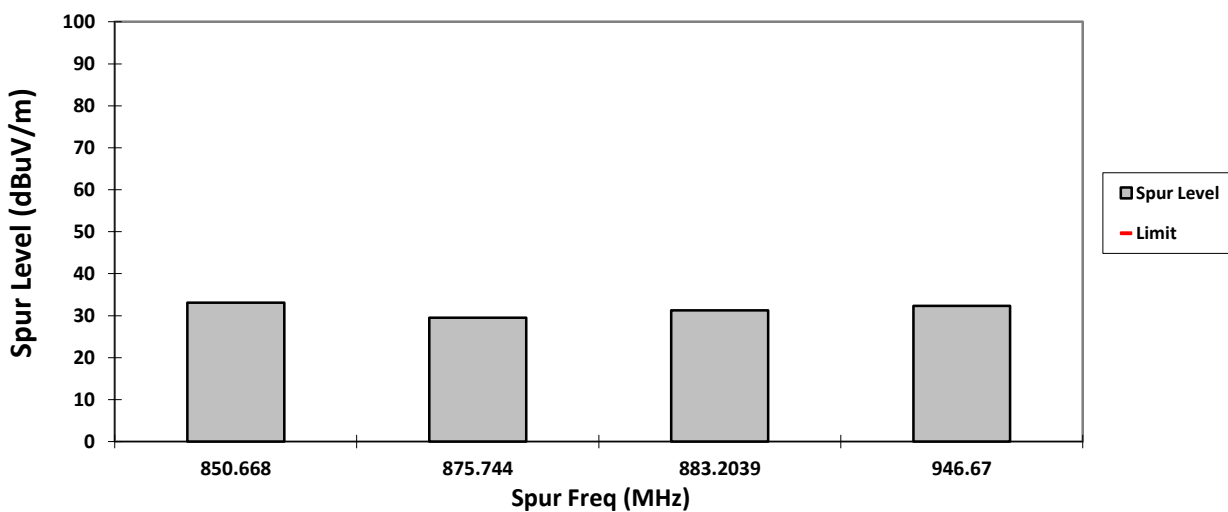
HORIZONTAL, QPK



VERTICAL, PK

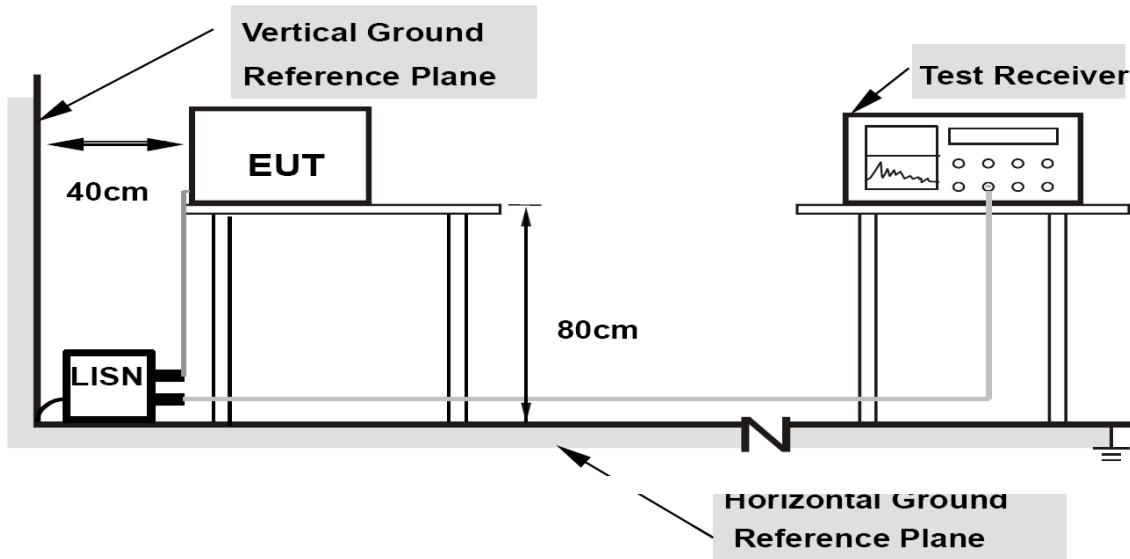


HORIZONTAL, PK



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

~ End of Test Report ~