MOTOROLA SOLUTIONS

CERTIFICATE 2518.08

MOTOROLA PENANG ADV. COMM. LABORATORY
Motorola Solutions Malaysia SDN BHD,
Plot 2A, Medan Bayan Lepas,
Mukim 12 S.W.D, 11900 Bayan Lepas,
Penang, Malaysia.

FCC / ISED TEST REPORT
Report Revision : Rev.A

Date/s Tested	:	09-August-2020
Manufacturer	:	MOTOROLA SOLUTIONS MALAYSIA SDN BHD
Manufacturer Address	:	PLOT 2A, MEDAN BAYAN LEPAS MUKIM 12, S.W.D 11900 BAYAN LEPAS PENANG, MALAYSIA
Requestor	:	LEONG, JUN THYE
Product Type	:	Portable
Model Number	:	T600 (PMUE5712A)
Frequency Band	:	161.650-162.550MHz
Firmware Version	:	0_40
Applicant Name	:	Motorola Solutions Inc
Applicant Address	:	8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322.
ISED Registrations	:	MY0001
FCC Registrations	:	461337

The equipment was tested accordance to the requirement listed below:

FCC 47 CFR Part 15B / IC RSS-GEN / ICES-003	**PASS**

Prepared By:

Mohd Helmy Shamsuddin
Technician

Approved Signatory:

Tan Kien Hua
Responsible Engineer

Table of Contents

REVISION HISTORY

Revision History	Description	Date	Originator
Rev. A	Initial Report	**14-August-2020**	Mohd Helmy Shamsuddin

1.0. General Information

EUT Description:

Charging batteries with resistive loads connected to USB ports and data port is connected to fleet management module/laptop. EUT is powered on and connected to a laptop with programming cable. Data transfer is exercised with MOTOTRBO Tuner software (BER reading) and laptop is running H-script during testing. LMR, GNSS, NFC, Bluetooth and WiFi technologies in EUT are all turned on. For LTE technology, the EUT is connecting to test simulator and put in idle mode.

The EUT contains following accessory devices and data cable:

Item	Brand	Model or P/N
AA Alkaline Battery	NA	NA

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 C63.4.2014

2.0. Summary of Test Results

FCC General Rules Part (47CFR)	IC General Rules Part	Test Item	Result
15.111	RSS-Gen 7.4	Conducted Spurious Output Power	NA
15.109	ICES-003 6.2, RSS-Gen	Radiated Spurious Output Power	Pass
15.107	ICES-003 6.1, RSS-Gen	AC Power Conducted Spurious Emissions	NA

NA → Not Applicable

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	4.25
	200MHz ~ 1000MHz	4.25
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	4.94
	18GHz ~ 25GHz	4.94
Conducted Spurious Emissions	9kHz ~ 12.75GHz	2.82

4.0. Equipment List

Conducted Spur Emission ATE # 1

NA

Radiated Emission Station

EMC Chamber 1

DESCRIPTION	MODEL	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
DRG HORN FREQ.	SAS-571	720	21-Mar-19	21-Mar-21
DRG HORN FREQ.	SAS-571	1143	14-Feb-19	14-Feb-21
POWER SUPPLY (0-60V / 0-50A, 1000W)	6032A	2615A01178	21-MAY-20	21-MAY-21
SIGNAL GENERATOR	SMB 100A	181117	8-Nov-18	8-Nov-21
EMI TEST RECEIVER	ESW44	101750	24-Jul-19	24-Sep-20
EMI TEST RECEIVER	ESIB26	100017	19-Jul-19	19-Sep-20
5m Semi-anechoic Chamber	S800-HX	J2308	No Cal. Req'd	No Cal. Req'd
BILOG ANTENNA	CBL6112B	2964	23-Apr-19	23-Apr-21
BILOG ANTENNA	CBL6112B	2950	8-Jul-19	8-Jul-21
DATA LOGGER	SDL500	A.016776	4-Jun-20	4-Jun-21
SYSTEM CONTROLLER	SC104V	050806-1	No Cal. Req'd	No Cal. Req'd
TURNTABLE FLUSH MOUNT 2M	FM2011	NA	No Cal. Req'd	No Cal. Req'd
ANTENNA POSITIONING TOWER	TLT2	NA	No Cal. Req'd	No Cal. Req'd
BROAD-BAND HORN ANTENNA	BBHA9170	BBHA9170255	27-Jan-20	27-Jan-21
18 - 40GHz PREAMPLIFIER	Miteq Hi Gain Sucoflex	001	No Cal. Req'd	No Cal. Req'd
PREAMPLIFIER	PAM-0118	269	24-May-19	24-May-22
LOOP ANTENNA	6502	00208416	5-Sep-19	5-Sep-20
Test Software	EMC_FCC_IC_Bluetooth_RE_Test			
Version	EMC_FCC_RE_v1.6.2			

AC Power Line Conducted Spurious Emission

NA

4.1. Test Condition

4.1.1 Receiver Test Conditions

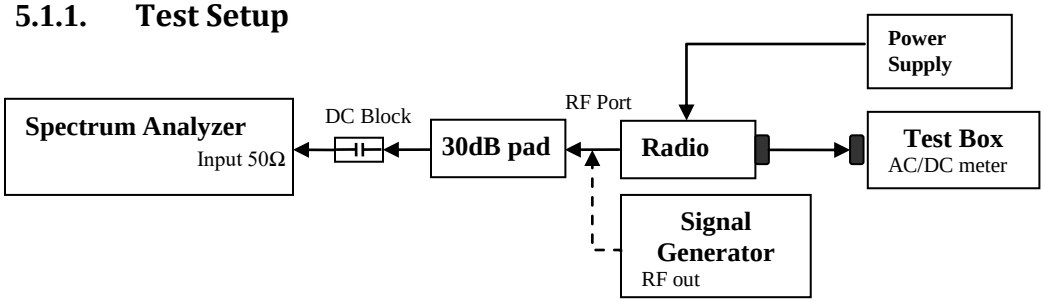
Test Item, (Channel Spacing)	Temperature (^oC)	Voltage Supply (V)	Power (W)	Modulation	Test Frequency (MHz)
Conducted Spurious Output Power (12.5kHz / 25kHz)	25^oC	NA	NA	NA	NA
Radiated Spurious Output Power (25kHz)	23.3^oC	NA	NA	NA	162.0000
AC Power Line Conducted Spurious Emissions (25kHz)	25^oC	NA	NA	NA	NA

NA → Not Applicable

5.0. Receiver Test Parameters

5.1. Conducted Spurious Output Power

5.1.1. Test Setup



1) Identify the radio is high side (LO = Fc + IF) or low side injection (LO = Fc – IF).
2) To get the reference point, set sigen to 1st LO frequency with amplitude level 0dBm.
3) Set the LO frequency into PSA. Adjust the PSA RBW = 100 kHz and record the Reference level offset.
4) Replace the Sigen with the UUT.
5) At PSA, set the frequency step size to LO frequency to test from 2LO to 10LO.
6) Record or screen captures the data in dBm value.

5.1.2. Test Result

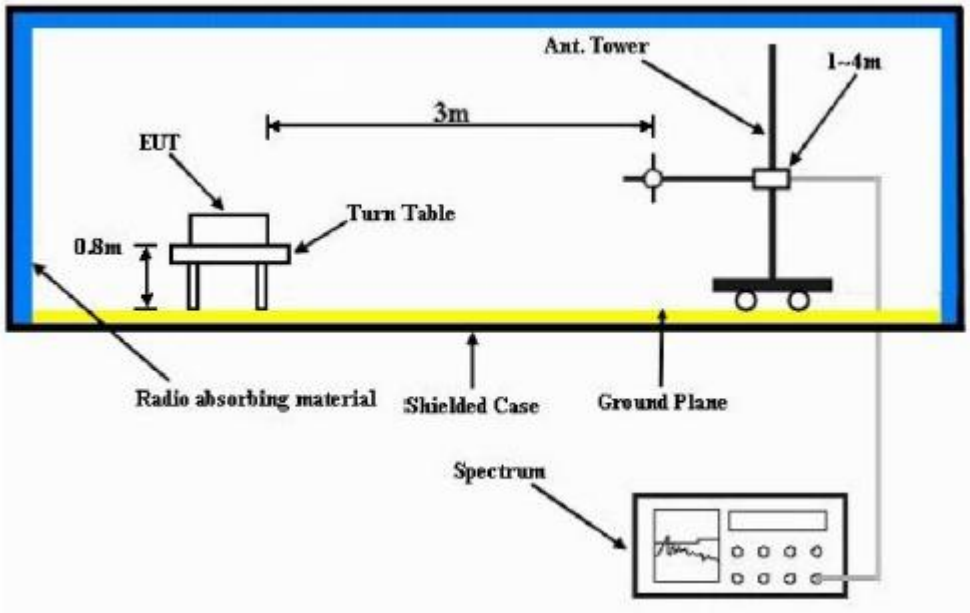
NA

5.1.3. Test Limit

NA

5.2. Radiated Spurious Output Power

5.2.1. Test Setup



a.The spectrum setting for scanning Radiated Emission below 1 GHz is RBW = 100 kHz, VBW = 300 kHz and above 1 GHz is RBW = 1MHz, VBW = 3MHz. Detector mode is positive peak. For exploratory testing.

b. Final is done using QP Detector (<1Ghz) and Peak and Average Detector (>1Ghz).

c. In the semi-anechoic chamber, setup as illustrated above the EUT placed on the 0.8m height of Turn table. For each radiated spurious emissions component detected, rotate the turn table around 360 degrees to search the maximum radiated spurious emissions and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiated spurious emissions. The “Read Value” is the spectrum reading the maximum radiated spurious emissions.

d. Final Radiated Spurious Emission (dBuV/m) = “Read Value (dBuV)” + Cable Loss (dB) +Antenna Gain (dB/m)-Pre-amp Gain (dB)

5.2.2. Test Result

Motorola Solutions. **FCC ID: AZ489FT4964, IC ID: 109U-89FT4964**

Test: SAC Receiver Radiated Emission
Model#: T600 S/N: 1758WN0003 EMC SR ID#: 23292-EMC-00005
Battery: AA ALKALINE Accessory: NA
Test Frequency: 162.0000 MHz Test Standard: ANSI C63.4-2014 Limit Class: B

Radiated Emission tabular data

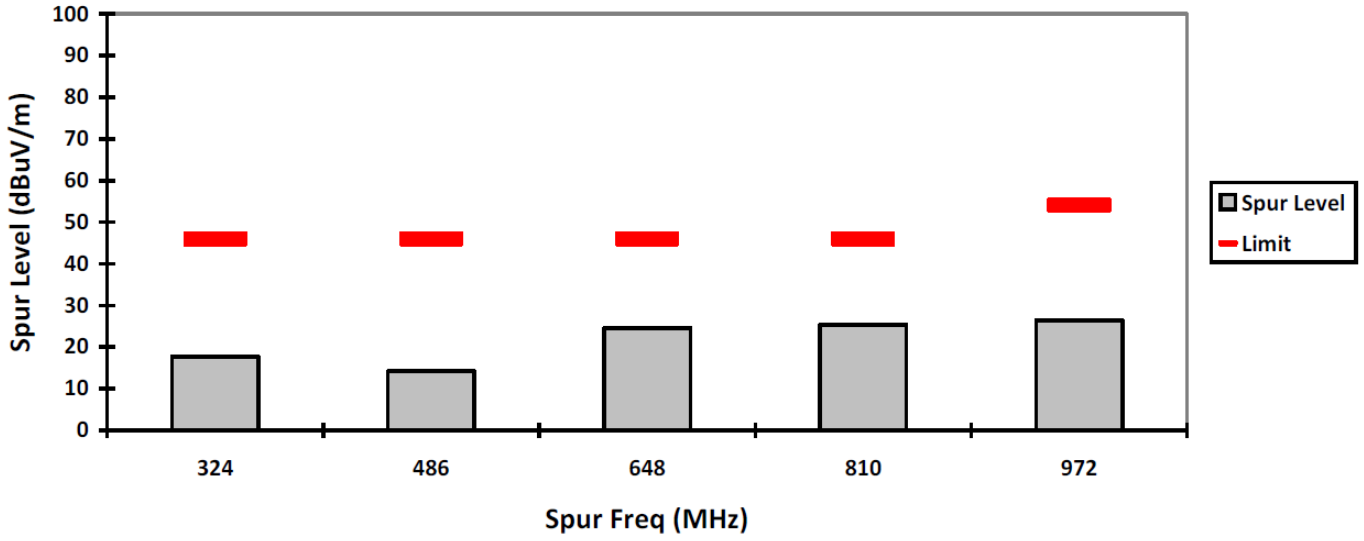
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
324.0000	17.8129**	-	**	46	-	-	28.1871	-	-	-
486.0000	14.2249**	-	**	46	-	-	31.7751	-	-	-
648.0000	24.5870**	-	**	46	-	-	21.4130	-	-	-
810.0000	25.3599**	-	**	46	-	-	20.6401	-	-	-
972.0000	26.4856**	-	**	54	-	-	27.5144	-	-	-
1134.0000	-	34.9250**	**	-	74	-	-	39.750	-	-
Horizontal Radiated Emission Result										
324.0000	19.0921**	-	**	46	-	-	26.9079	-	-	-
486.0000	14.7710**	-	**	46	-	-	31.2290	-	-	-
648.0000	25.7197**	-	**	46	-	-	20.2803	-	-	-
810.0000	28.8057**	-	**	46	-	-	17.1943	-	-	-
972.0000	27.8766**	-	**	54	-	-	26.1234	-	-	-
1134.0000	-	34.0222**	**	-	74	-	-	39.9778	-	-

Remarks: Pass Result	Marginal Result	Fail Result

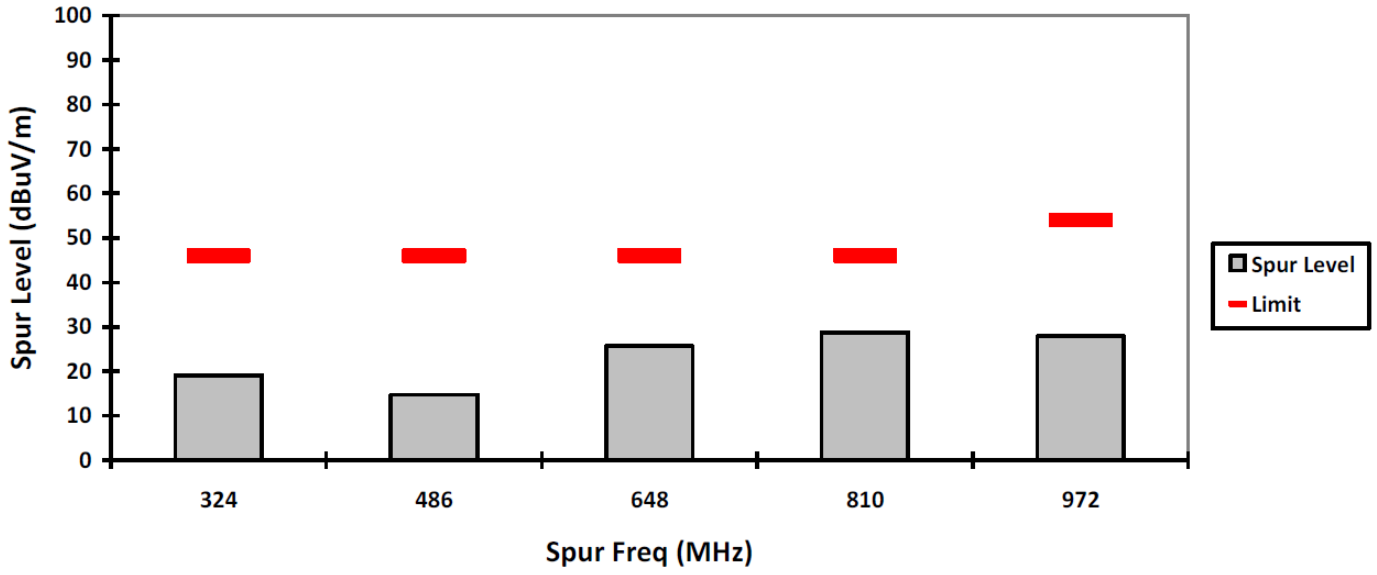
Temperature (degC): 23.3 **Humidity (%): 70.5**
Test Performed by: Nazrin&Qawiman **Test Date: Sun, Aug 09, 2020**
System MU: 4.25 dB (30-1000MHz), 4.94 dB (1000-18000MHz)

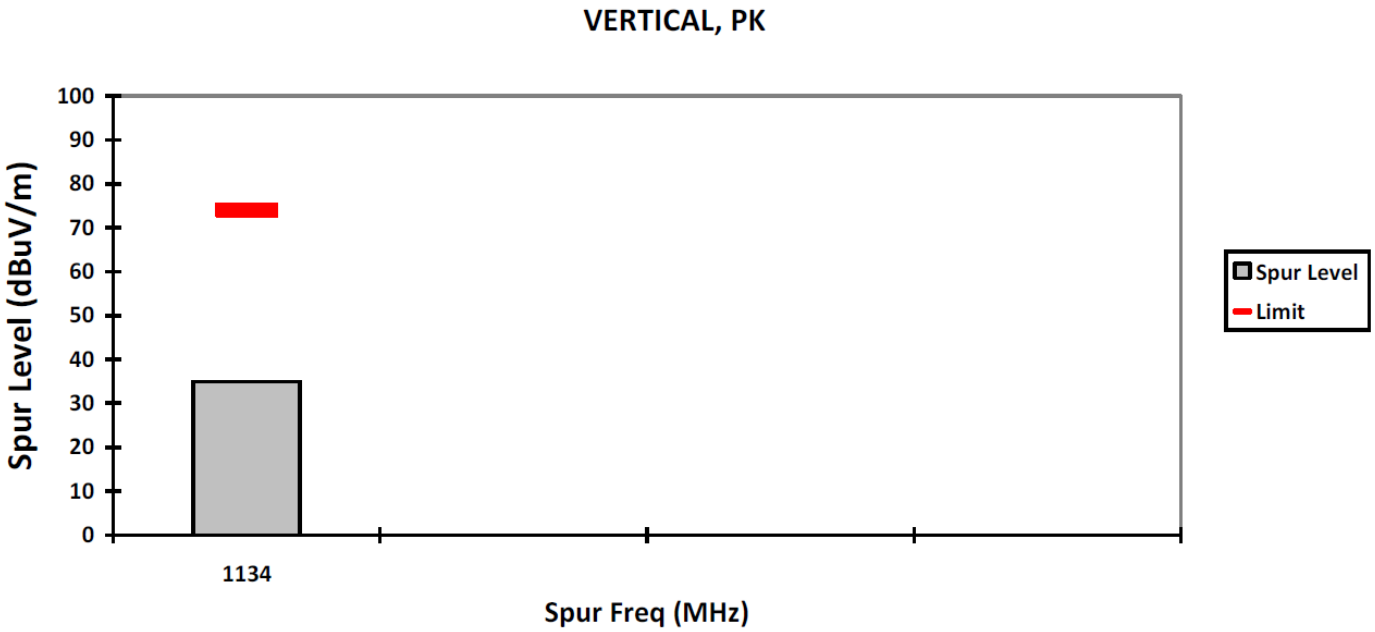
Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

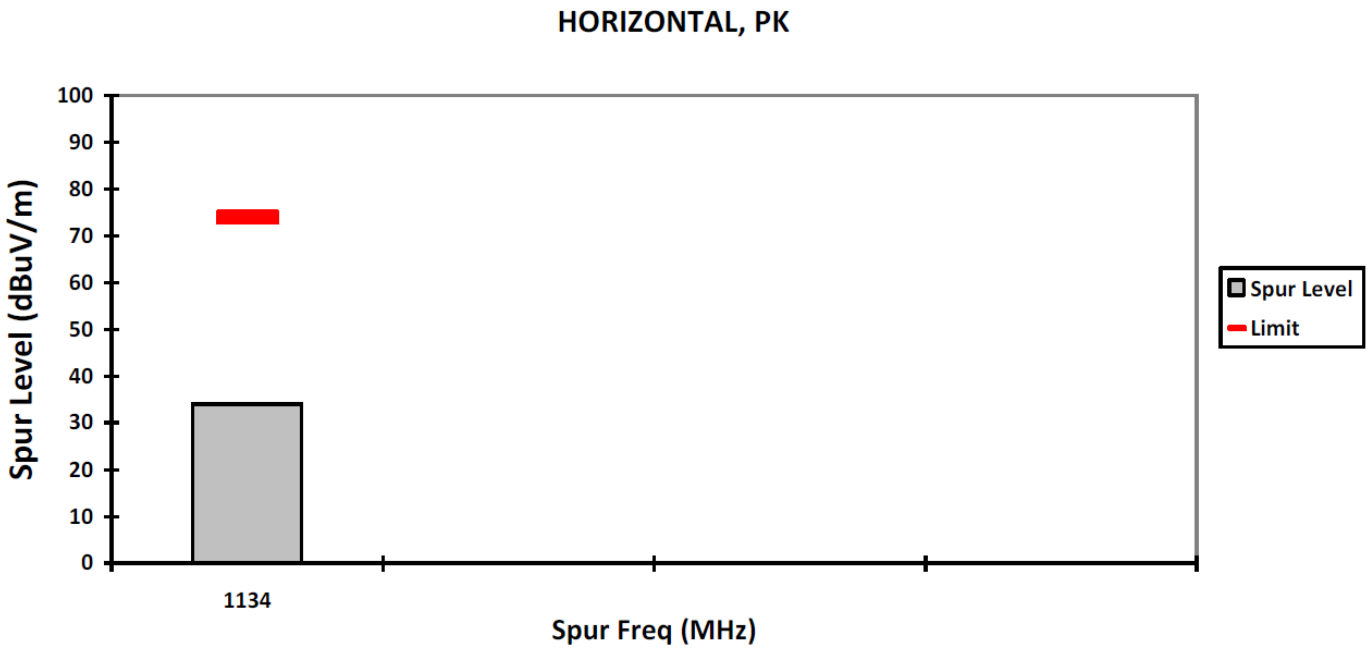
VERTICAL, QPK

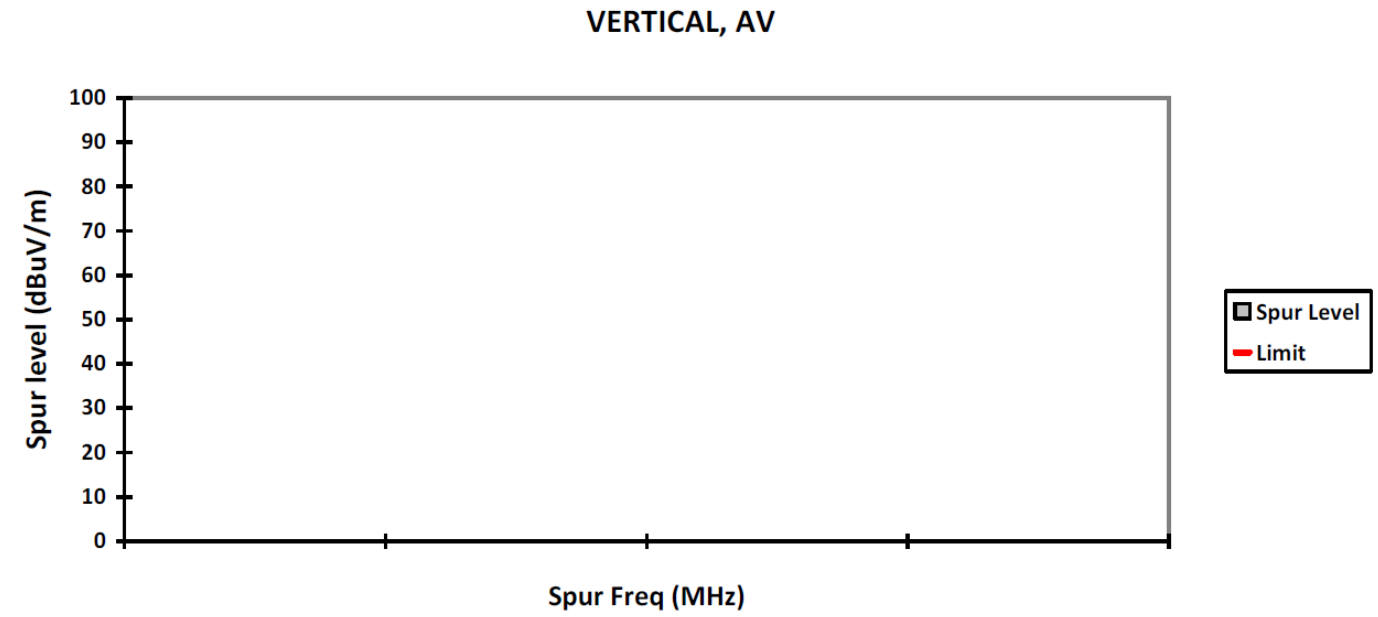


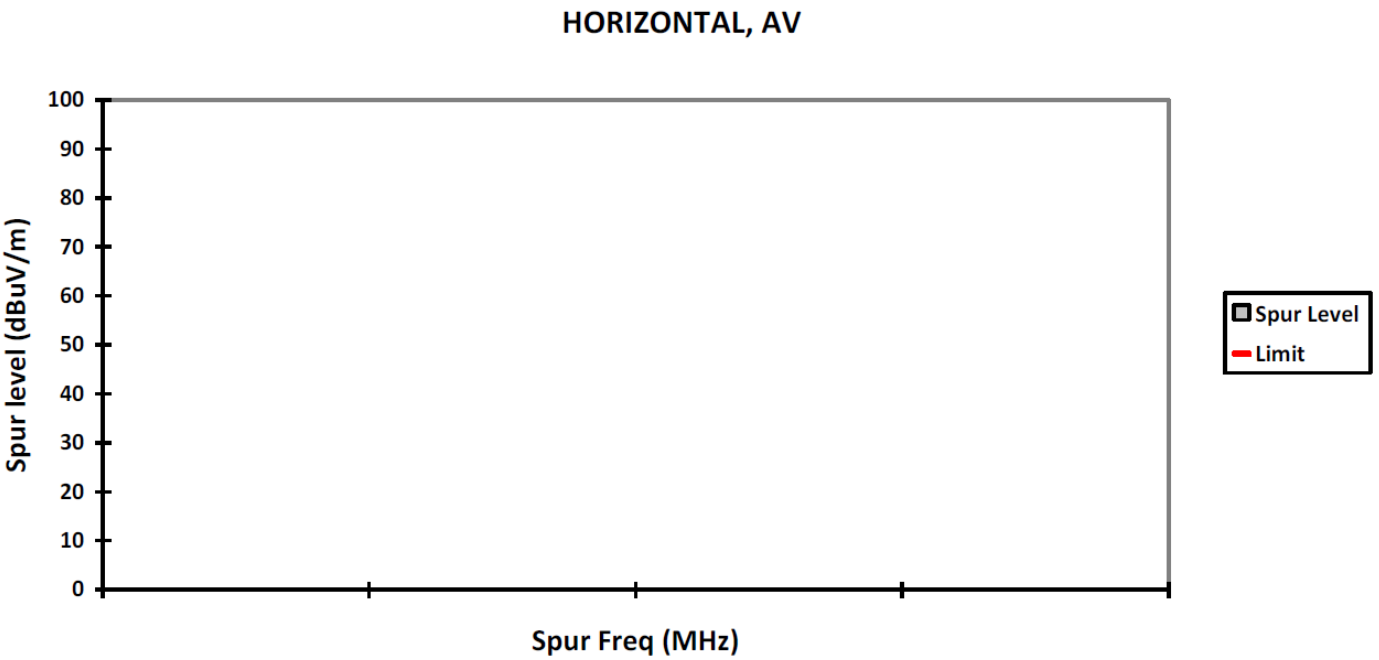
HORIZONTAL, QPK




VERTICAL, PK
Spur Level (dBuV/m)
100
90
80
70
60
50
40
30
20
10
0
1134
Spur Freq (MHz)
Spur Level
Limit


HORIZONTAL, PK
Spur Level (dBuV/m)
100
90
80
70
60
50
40
30
20
10
0
1134
Spur Freq (MHz)
Spur Level
Limit


VERTICAL, AV
Spur level (dBuV/m)
100
90
80
70
60
50
40
30
20
10
0
Spur Freq (MHz)
Spur Level
Limit


HORIZONTAL, AV
Spur level (dBuV/m)
100
90
80
70
60
50
40
30
20
10
0
Spur Freq (MHz)
Spur Level
Limit

5.2.3. Test Limit

(a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

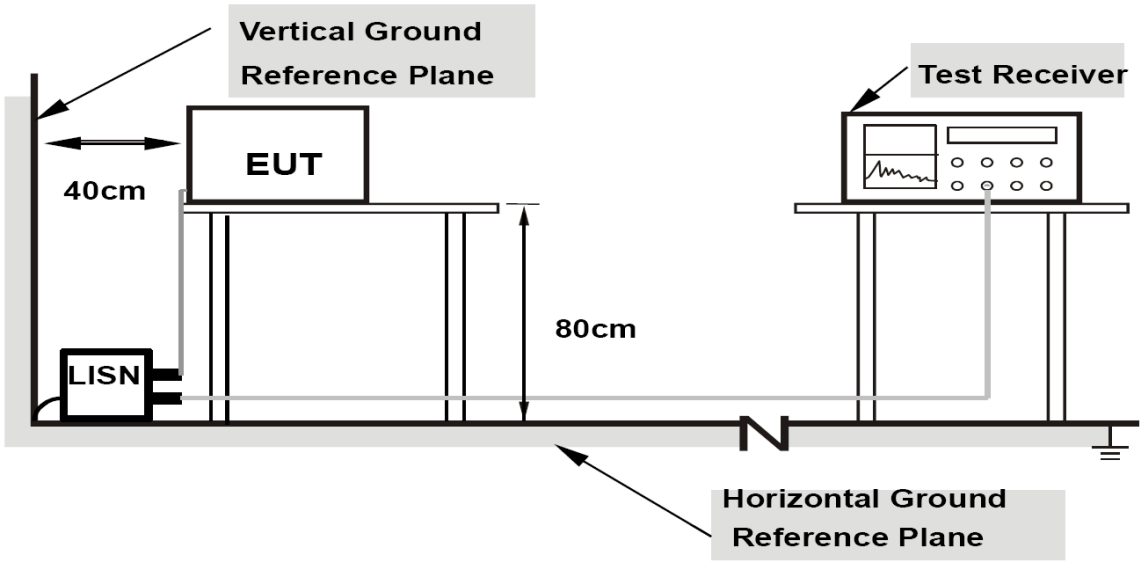
Frequency of emission (MHz)	Field strength (microvolts/meter)
30-88	100
88-216	150
216-960	200
Above 960	500

(b) The field strength of radiated emissions from a Class A digital device, as determined at a distance of 10 meters, shall not exceed the following:

Frequency of emission (MHz)	Field strength (microvolts/meter)
30-88	90
88-216	150
216-960	210
Above 960	300

5.3. AC Power Line Conducted Spur Emissions

5.3.1. 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.

5.3.2. Test Result

NA

5.3.3. Test Limits

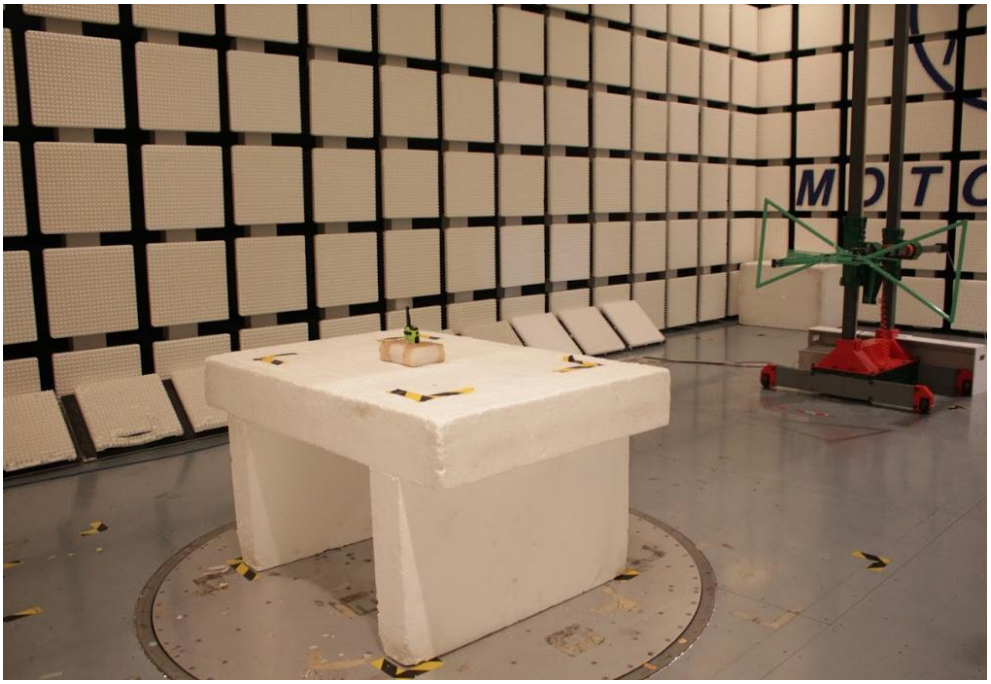
NA

6.0. Appendix: Test Setup Photo

6.1. Conducted Spur Emission ATE Station Setup

NA

6.2. Radiated Spur Emission Station Setup



6.3. AC Power Line Conducted Emission Station Setup

NA

6.4. Photographs – EUT

Radio + Batteries

~ End of Test Report ~