

	    CERTIFICATE 2518.08 MS ISO/IEC 17025 TESTING SAMM NO 0825						
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.D						
Date/s Tested : 04-October-2019 to 05-October-2019 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 : T460 Frequency Band : 462-467 MHZ Firmware Version : V0_11 Rated / Max RF Output Power : 2 Watts (462MHz), 0.5 Watts (467MHz) Applicant Name : Motorola Solution Inc ISED Registrations : MY0001 FCC Registrations : 461337 The equipment was tested accordance to the requirement listed below: (LMR) PASS FCC 47 CFR Part 15B /							
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REVISION HISTORY

Revision History	Description	Date	Originator
Rev. A	Initial Report	18-October-2019	Faris Abdullah
Rev.B	Added ILAC logos and removed ISED references	8-November-2019	Vincent Foong
Rev.C	Updated Manufacturer Address	29-November-2019	Faris Abdullah
Rev.D	Updated Manufacturer Address	4-December-2019	Faris Abdullah

1.0. General Information

EUT Description:

Technologies	T460 CONSUMER RADIOS 462-467 MHZ DARK BLUE
Modulation Type	Analog

The EUT contains following accessory devices and data cable:

Item	Brand	Model or P/N
800MAH 3XAA NIMH RECHARGEABLE BATTERY PACK	MOTOROLA	PMNN4477A

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
15.109, 15.111	RSS-Gen	Conducted Spurious Output Power	NA
15.109, 15.111	RSS-Gen	Radiated Spurious Output Power	Pass
15.107, 15.111	RSS-Gen	AC Power Conducted Spurious Emissions	NA

NA → Not Applicable

3.0. Measurement Uncertainty

Measurement	Frequency	Expanded 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 Emissions	9kHz ~ 12.75GHz	2.82

4.0. Equipment List

Conducted Spur Emission ATE # 1
 NA

Radiated Emission Station

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	MY41001736	25-May-19	25-May-20
SIGNAL GENERATOR	SMB 100A	181117	8-Nov-18	8-Nov-21
EMI TEST RECEIVER	ESW44	101750	24-Jul-19	24-Jul-20
EMI TEST RECEIVER	ESIB26	100017	19-Jul-19	19-Jul-20
5m Semi-anechoic Chamber	S800-HX	J2308	No Cal. Req'd	No Cal. Req'd
BILOG ANTENNA	CBL6112D	25224	1-Aug-18	1-Nov-19
BILOG ANTENNA	CBL6112B	2964	16-Feb-18	16-Feb-20
DATA LOGGER	SDL500	A.016800	19-Mar-19	18-Mar-20
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	21-Dec-18	21-Dec-19
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-20
LOOP ANTENNA	6502	00203479	10-Dec-18	10-Dec-19
Test Software	EMC_FCC_IC_Bluetooth_RE_Test			
Version	EMC_FCC_RE_v1.6.0			

AC Power Line Conducted Spurious Emission
 NA

4.1. Test Condition

5.1 Receiver Test Conditions

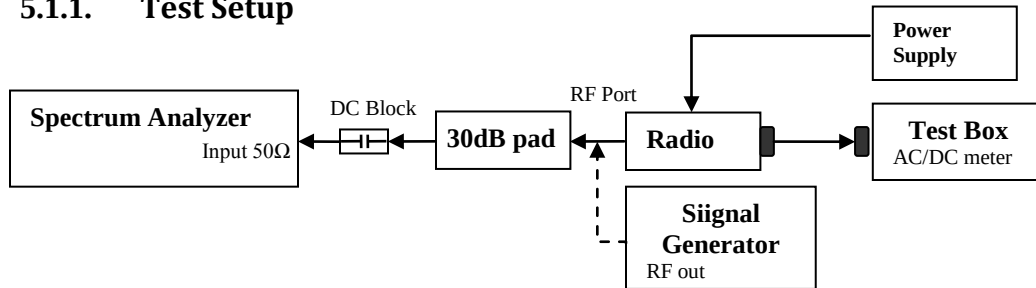
Test Item, (Channel Spacing)	Temperature (°C)	Voltage Supply (V)	Power (W)	Modulation	Test Frequency (MHz)
Conducted Spurious Output Power (12.5kHz / 25kHz)	25°C	NA	NA	NA	NA
Radiated Spurious Output Power (12.5kHz/ 25kHz)	25°C	NA	NA	Analog	162 MHz (Weather Channel)
AC Power Line Conducted Spurious Emissions (12.5kHz/ 25kHz)	25°C	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 ($LO = F_c + IF$) or low side injection ($LO = F_c - IF$).
- 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

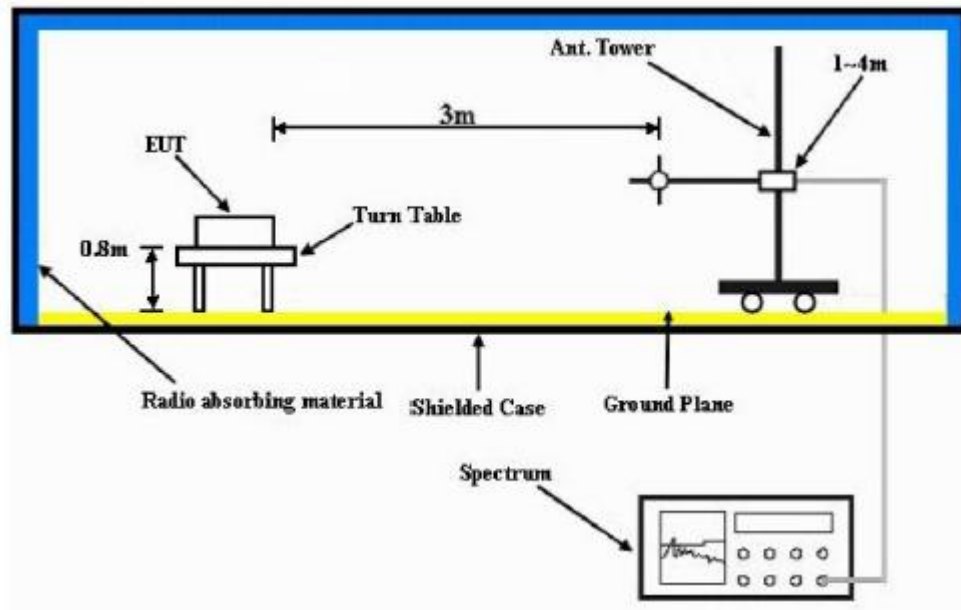
NA

5.1.3. Test Limit

NA

5.2. Radiated Spurious Output Power

5.2.1. Test Setup

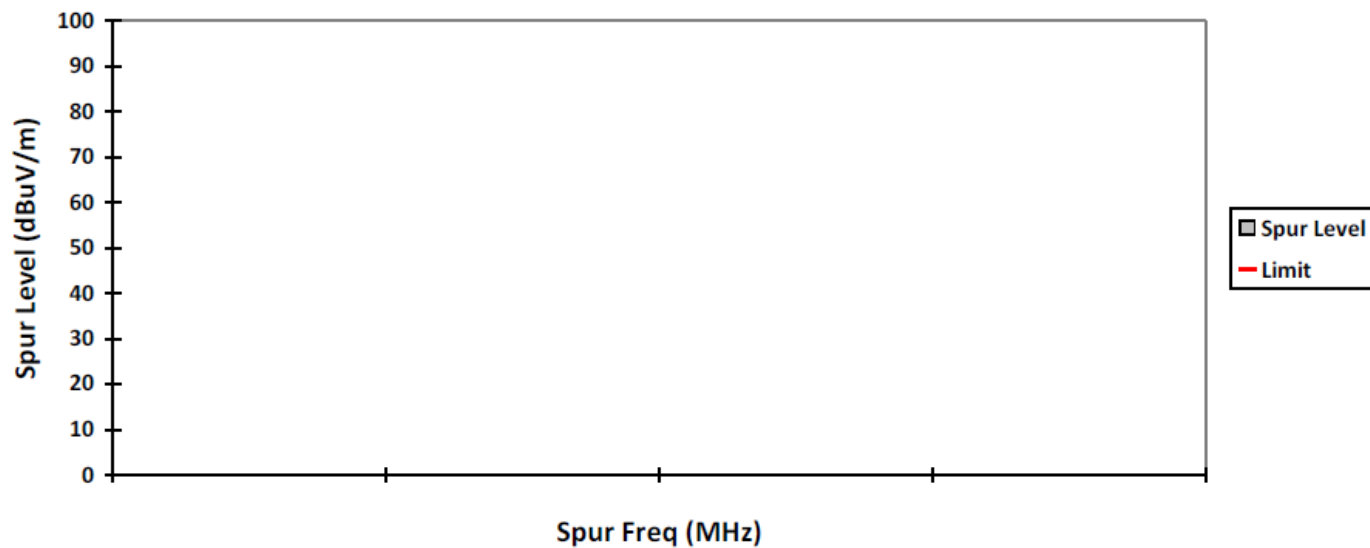


- 1) The spectrum setting for scanning Radiated Emission below 1 GHz is RBW = 100 kHz, VBW = 300 kHz and above 1 GHz is RBW = 1MHz, VBW = 3MHz. Detector mode is positive peak.
- 2) In the semi-anechoic chamber, setup as illustrated above the EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- 3) The substitution antenna is substituted for EUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiation power. Record the power level of maximum radiation power from spectrum. So, the measured substitution value = Ref level of S.G + TX cables loss – Substituted Antenna Gain.
- 4) Final Radiated Spurious Emission = “Read Value” + Measured substitution value.

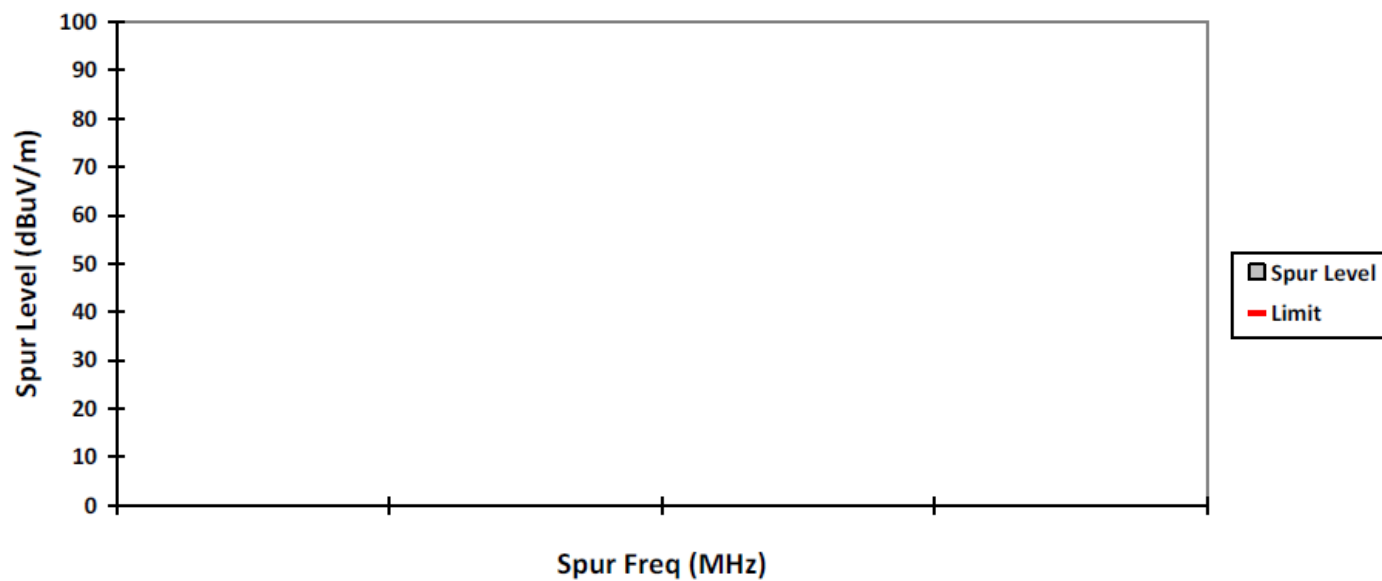
Motorola Solutions.

FCC ID: AZ489FT4957, IC ID: NA

VERTICAL, QPK



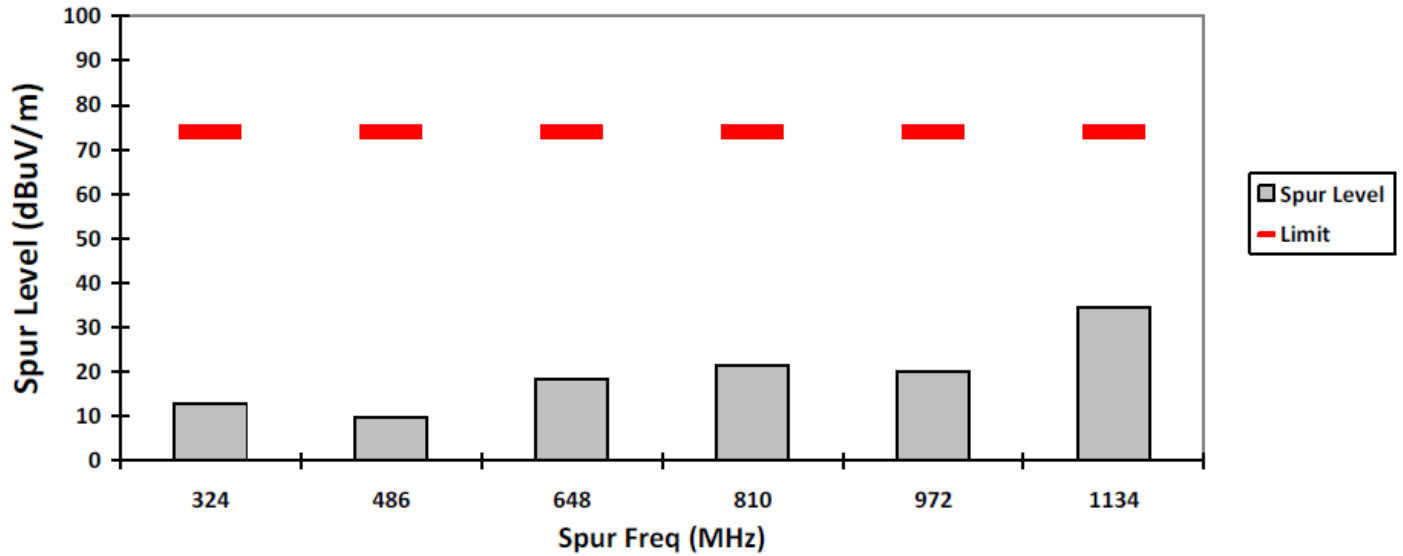
HORIZONTAL, QPK



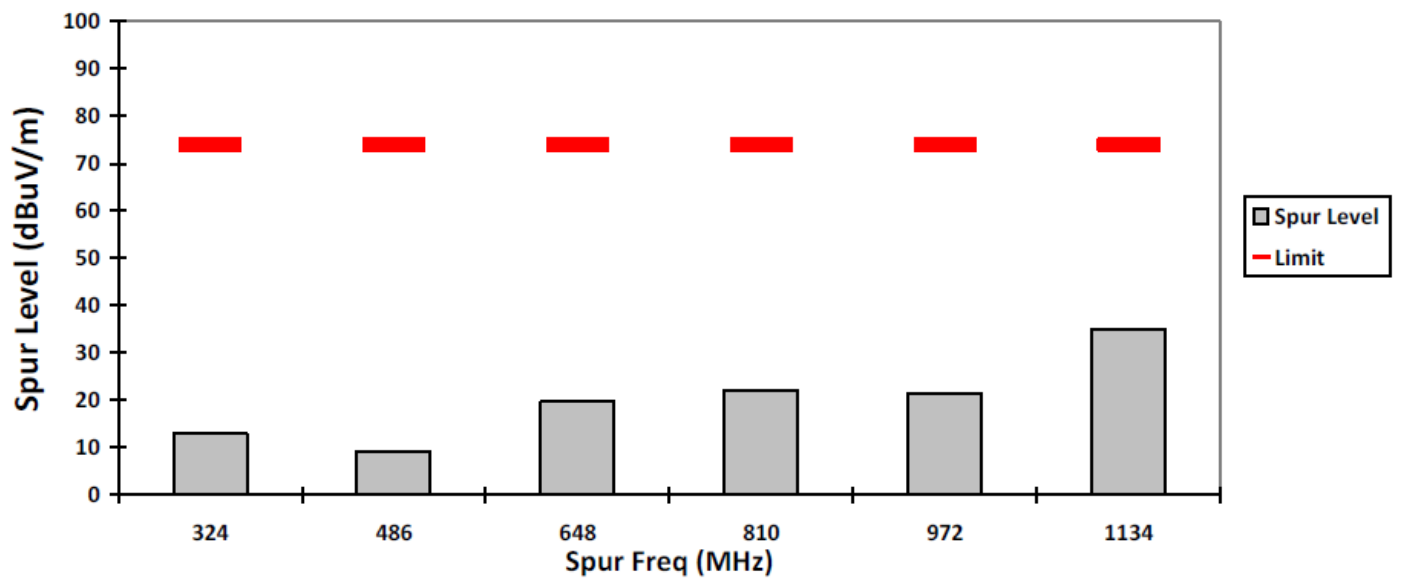
Motorola Solutions.

FCC ID: AZ489FT4957, IC ID: NA

VERTICAL, PK



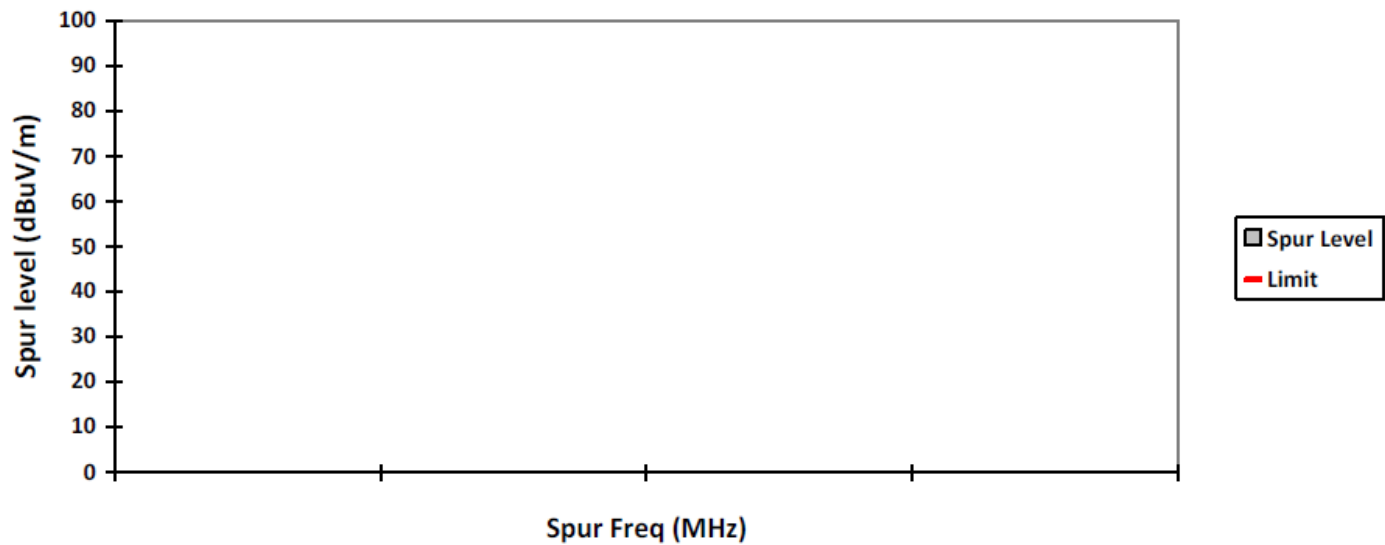
HORIZONTAL, PK



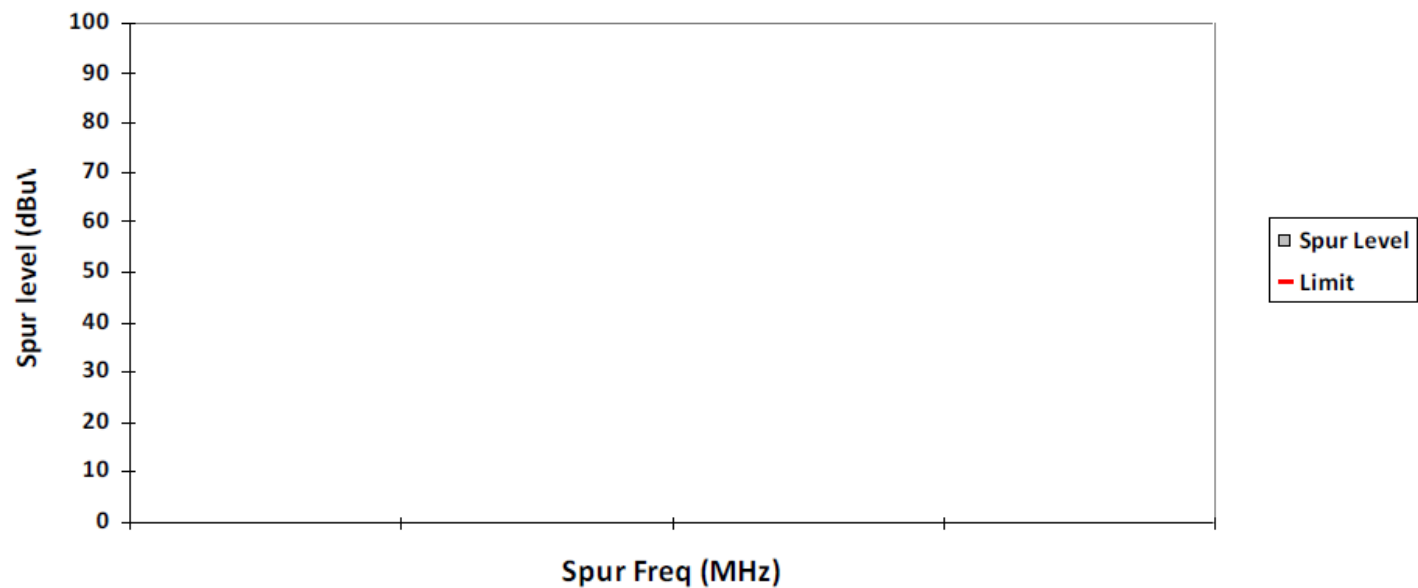
Motorola Solutions.

FCC ID: AZ489FT4957, IC ID: NA

VERTICAL, AV



HORIZONTAL, AV



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:

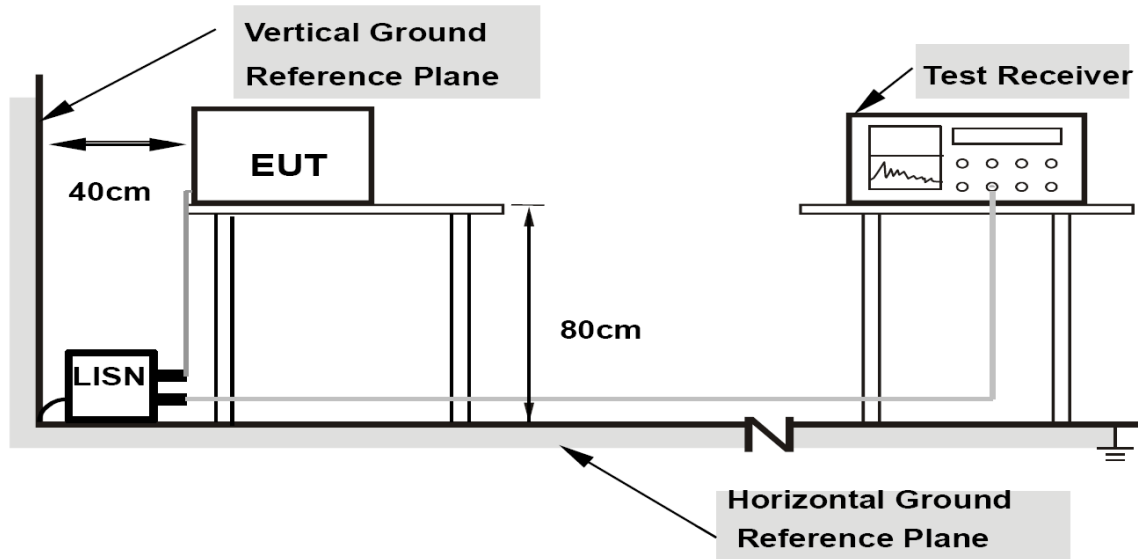
Frequency of emission (MHz)	Field strength (microvolts/meter)
30-88	100
88-216	150
216-960	200
Above 960	500

(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

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(μV)	
	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.		

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

Frequency range MHz	Limits dB(μV)	
	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.		

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 + Battery

~ End of Test Report ~