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FCC PART 90

450-470MHz UHF PORTABLE

RADIATED EMISSONS TEST REPORT

APPLICANT	**MOTOROLA SOLUTIONS, INC.**
	8000 WEST SUNRISE BLVD FT. LAUDERDALE FL 33322-9947 USA
FCC ID	AZ489FT4931
MODEL NUMBER	CLP1040
PRODUCT DESCRIPTION	450-470 MHz RADIO
STANDARD APPLIED	CFR 47 Part 90
DATE SAMPLE RECEIVED	5/10/2016
DATE TESTED	5/10/2016
TESTED BY	Tim Royer
APPROVED BY	Cory Leverett
TEST RESULTS	☒ PASS ☐ FAIL

Report Number	Version Number	Description	Issue Date
792AUT16TestReport	Rev.1	Initial Issue	06/02/2016

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GENERAL REMARKS

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

Summary

The device under test does:

☒ Fulfill the general approval requirements as identified in this test report
☐ Not fulfill the general approval requirements as identified in this test report

Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025: 2005 requirements.

I attest that the necessary measurements were made, under my supervision, at:
I attest that the necessary measurements were made at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669

Tested by: _____
Name and Title: Tim Royer Project Manager

Date: 5/18/2016

Reviewed and approved by: _____
Name and Title:

Date: 06/02/2016

GENERAL INFORMATION

EUT Specification

EUT Description	450-470 MHz RADIO
FCC ID	AZ489FT4931
Model Number	CLP1040
Test Frequencies	451.1875, 461.0375, 469.5625MHz
Type of Emission	16K0F3E, 11K0F3E
Modulation	FM
EUT Power Source	☐ 110–120Vac/50– 60Hz
	☐ DC Power 12V
	☒ Battery Operated Exclusively
Test Item	☐ Prototype
	☒ Pre-Production
	☐ Production
Type of Equipment	☐ Fixed
	☐ Mobile
	☒ Portable
Test Conditions	The temperature was 26ºC with a relative humidity of 50%.
Revision History to the EUT	None
Test Exercise	The EUT was placed in continuous transmit mode.
Applicable Standards	ANSI/TIA 603-D:2010, FCC CFR 47 Part 90
Test Facility	**Timco Engineering Inc.** **849 NW State Road 45** **Newberry, FL 32669 USA**.

TEST REPORT SUMMARY

Rule Part No.	Scope of Work	Status Pass/Fail/NA
2.1053, Part 90.210	Field Strength Spurious Emissions	Pass

TEST PROCEDURE

Power Output: The RF power output was measured at the antenna feed point using a peak power meter.

Radiation Interference: The test procedure used was ANSI/TIA 603-D: 2010, using a Rohde & Schwarz – EMI test receiver. The bandwidth (RBW) of the spectrum receiver was 100 kHz up to 1 GHz and 1 MHz above 1 GHz with an appropriate sweep speed. The VBW above 1 GHz was 3 MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

RF POWER OUTPUT

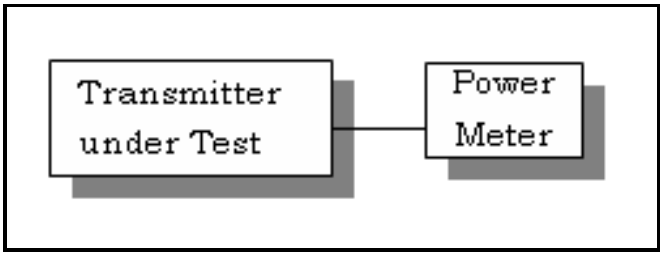
Rule Part No.: Part 2.1046(a), Part 90

Test Requirements: Manufacturer's Specification

Method of Measurement: RF power is measured by using a 50-ohm, resistive wattmeter to the RF output connector. With a nominal battery voltage (if battery operated), or a properly adjusted power supply (if not battery operated), and the transmitter properly adjusted the RF output measures:

For the device with a fixed or integral antenna, the RF power is measured as ERP. The substitution method was used. The RF output measures:

Test Setup Diagram:



Test Data:

OUTPUT POWER:

Tuned Frequency (MHz)	RF POWER (W)
451.1875	0.96
461.0375	1
469.5625	0.93

FIELD STRENGTH OF SPURIOUS EMISSIONS

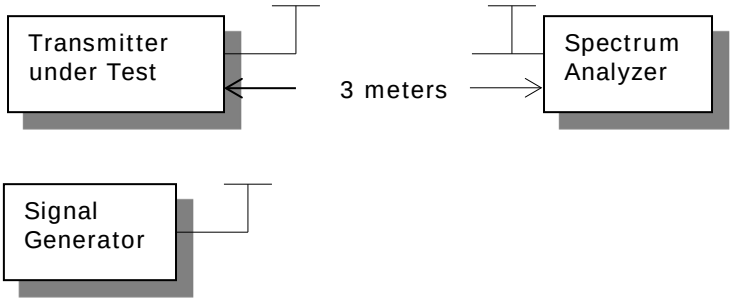
Rule Parts. No.: Part 2.1053, 90.210

Requirements:

12.5 kHz Channel Spacing = 50+10log (OP)
25 kHz Channel Spacing = 43+10log (OP)

METHOD OF MEASUREMENT: The tabulated data shows the results of the radiated field strength emissions test. The spectrum was scanned from 30 MHz to at least the tenth harmonic of the fundamental. This test was conducted per ANSI/TIA 603-D: 2010 using the substitution method.

Test Setup Diagram:



Test Data: Low End of the Band 16K0F3E

Emission Frequency (MHz)	Power Mode	ERP Power Output (dBm)	ERP Power Output (Watts)	FCC Requirement dB	Bandwidth - BW - kHz
451.18	Hi	29.83	0.96	42.83	25.00

Emission Frequency (MHz)	Ant. Polarity	Below Carrier (dBc)	Margin
492.36	V	95.60	52.77
902.36	H	82.39	39.56
902.36	V	84.83	41.83
1,804.72	H	86.93	44.10
2,255.90	H	85.07	42.24
2,707.08	H	81.62	38.79
3,158.26	H	81.11	38.28
3,158.26	V	79.10	36.27
3,609.44	V	78.01	35.01
4,060.62	V	78.40	35.40

Test Data: Middle of the Band 16K0F3E

Emission Frequency (MHz)	Power Mode	ERP Power Output (dBm)	ERP Power Output (Watts)	FCC Requirement dB	Bandwidth - BW - kHz
461.03	Hi	30.00	1.00	43.00	25.00

Emission Frequency (MHz)	Ant. Polarity	Below Carrier (dBc)	Margin
922.08	H	84.44	41.44
1,383.11	H	88.64	45.64
1,844.15	H	86.69	43.69
2,305.19	V	77.18	34.18
2,766.23	H	84.53	41.53
3,227.26	H	80.09	37.09
3,688.30	H	79.68	36.68
4,149.34	H	78.05	35.05
4,610.38	V	86.42	43.42

Test Data: High End of the Band 16K0F3E

Emission Frequency (MHz)	Power Mode	ERP Power Output (dBm)	ERP Power Output (Watts)	FCC Requirement dB	Bandwidth - BW - kHz
469.56	Hi	29.70	0.93	42.70	25.00

Emission Frequency (MHz)	Ant. Polarity	Below Carrier (dBc)	Margin
939.13	V	86.36	43.36
1,408.69	V	87.78	45.08
1,878.25	H	84.36	41.66
2,347.81	H	72.63	29.93
2,817.38	H	81.84	39.14
3,286.94	H	80.53	37.83
3,756.50	H	78.49	35.79
4,226.06	H	78.87	35.87
4,695.63	H	82.98	39.98

Test Data: Low End of the Band 11K0F3E

Emission Frequency (MHz)	Power Mode	ERP Power Output (dBm)	ERP Power Output (Watts)	FCC Requirement dB	Bandwidth - BW - kHz
451.18	Hi	30.00	1.00	50.00	12.50

Emission Frequency (MHz)	Ant. Polarity	Below Carrier (dBc)	Margin
902.38	H	77.17	27.17
1,353.56	V	87.99	37.99
1,804.75	V	84.73	34.73
2,255.94	V	83.86	33.86
2,707.13	V	81.75	31.75
3,158.31	H	80.85	30.85
3,609.50	V	79.38	29.38
4,060.69	V	78.48	28.48
4,511.88	V	80.49	30.49

Test Data: Middle of the Band 11K0F3E

Emission Frequency (MHz)	Power Mode	ERP Power Output (dBm)	ERP Power Output (Watts)	FCC Requirement dB	Bandwidth - BW - kHz
461.03	Hi	30.00	1.00	50.00	12.50

Emission Frequency (MHz)	Ant. Polarity	Below Carrier (dBc)	Margin
922.08	H	81.74	31.74
1,383.11	V	88.53	38.53
1,844.15	H	84.76	34.76
2,305.19	V	81.31	31.31
2,766.23	H	83.16	33.16
3,227.26	H	80.10	30.10
3,688.30	V	79.37	29.37
4,149.34	H	79.86	29.86
4,610.38	V	87.86	37.86

Test Data: High End of the Band 11K0F3E

Emission Frequency (MHz)	Power Mode	ERP Power Output (dBm)	ERP Power Output (Watts)	FCC Requirement dB	Bandwidth - BW - kHz
469.56	Hi	29.70	0.93	49.70	12.50

Emission Frequency (MHz)	Ant. Polarity	Below Carrier (dBc)	Margin
939.13	H	83.13	33.43
1,408.69	H	87.34	37.64
1,878.25	H	85.37	35.67
2,347.81	V	76.32	26.62
2,817.38	H	81.56	31.86
3,286.94	H	79.24	29.54
3,756.50	H	80.43	30.73
4,226.06	H	80.78	31.08
4,695.63	H	83.23	33.53

EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
Antenna: Log-Periodic 1122	Electro-Metrics	LPA-25	1122	07/14/15	07/14/17
CHAMBER	Panashield	3M	N/A	01/05/16	12/31/17
Antenna: Double-Ridged Horn/ETS Horn 2	ETS-Lindgren Chamber	3117	00041534	02/25/15	02/25/17
EMI Test Receiver R & S ESIB 40 Screen Room	Rohde & Schwarz	ESIB 40	100274	08/12/14	08/12/16
Software: Field Strength Program	Timco	N/A	Version 4.0	N/A	N/A
Coaxial Cable - Chamber 3 cable set (Primary)	Micro-Coax		Chamber 3 cable set (Primary)	12/05/15	12/05/17
Pre-amp	RF-LAMBDA	RLNA00M45GA	NA	01/04/16	01/04/18

***EMI RECEIVER SOFTWARE VERSION**

The receiver firmware used was version 4.43 Service Pack 3

END OF TEST REPORT