

PCTEST ENGINEERING LABORATORY, INC.

7185 Oakland Mills Road, Columbia, MD 21046 USA Tel. 410.290.6652 / Fax 410.290.6654 http://www.pctest.com



MEASUREMENT REPORT FCC PART 15.247 / ISED RSS-247

#### **Applicant Name:**

Motorola Solutions Inc 8000 West Sunrise Blvd Ft Lauderdale, FL 33322 United States Date of Testing: 6/6 - 6/19/2018, 7/9/2018 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M1806200129-01-R3.AZ4

FCC ID:	AZ489FT5875
IC:	109U-89FT5875
APPLICANT:	Motorola Solutions Inc
Application Type:	Certification
Model/HVIN:	CB300-D
EUT Type:	Call Button
Frequency Range:	902.525 – 927.475MHz
FCC Classification:	FCC Part 15 Spread Spectrum Transmitter (DSS)
FCC Rule Part(s):	Part 15 Subpart C (15.247)
ISED Specification:	RSS-247 Issue 2
Test Procedure(s):	ANSI C63.10-2013

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

This revised Test Report (S/N: 1M1806200129-01-R3.AZ4) supersedes and replaces the previously issued test report (S/N: 1M1806200129-01-R2.AZ4) on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Randy Ortanez President



FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION)	MOTOROLA SOLUTIONS	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 1 of 21
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button		Page 10121
© 2018 PCTEST Engineering Laboratory, Inc. V 8.1 05/10				



# TABLE OF CONTENTS

1.0	INTF	RODUCTION	3
	1.1	Scope	3
	1.2	PCTEST Test Location	3
	1.3	Test Facility / Accreditations	3
2.0	PRC	DUCT INFORMATION	4
	2.1	Equipment Description	4
	2.2	Device Capabilities	4
	2.3	Test Configuration	4
	2.4	EMI Suppression Device(s)/Modifications	4
3.0	DES	CRIPTION OF TESTS	5
	3.1	Evaluation Procedure	5
	3.2	Radiated Emissions	5
	3.3	Environmental Conditions	5
4.0	ANT	ENNA REQUIREMENTS	6
5.0	MEA	SUREMENT UNCERTAINTY	7
6.0	TES	T EQUIPMENT CALIBRATION DATA	8
7.0	TES	T RESULTS	9
	7.1	Summary	9
	7.2	Radiated Spurious Emission Measurements – Above 1GHz	.10
	7.3	Radiated Spurious Emissions Measurements – Below 1GHz	.17
8.0	CON	ICLUSION	21

FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION)	MOTOROLA SOLUTIONS	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 2 of 21
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button		Page 2 01 21
© 2018 PCTEST Engineering Laboratory, Inc. V 8.1 05/10/201				



# **1.0 INTRODUCTION**

#### 1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

# 1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

# 1.3 Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

FCC ID: AZ489FT5875		MEASUREMENT REPORT		Approved by:
		(CERTIFICATION)		Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 2 of 21
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button		Page 5 01 2 1
© 2018 PCTEST Engineering Laboratory, Inc. V 8.1 05/10/2018				



# 2.0 PRODUCT INFORMATION

## 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Motorola Solutions Inc Call Button FCC ID: AZ489FT5875**. The test data contained in this report pertains only to the emissions due to the EUT's 900MHz transmitter.

Test Device Serial No.: A180420

#### 2.2 Device Capabilities

This device contains the following capabilities:

Ch.	Frequency (MHz)
Low	902.525
:	
Mid	915.025
:	:
High	927.475
<b>T</b> 1 1 0 4	

Table 2-1. Frequency/ Channel Operations

**Note:** This device is capable of operating in hopping and non-hopping mode. The EUT can hop between 50 different channels in the 902 – 928MHz band.

#### 2.3 Test Configuration

The EUT was tested per the guidance of ANSI C63.10-2013. ANSI C63.10-2013 was also used to reference the appropriate EUT setup for radiated spurious emissions testing. See Sections 3.2 for radiated emissions test setups.

## 2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION)	MOTOROLA SOLUTIONS	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 4 of 21
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button		Page 4 01 2 1
© 2018 PCTEST Engineering Laboratory, Inc. V 8.1 05/10/2018				



# 3.0 DESCRIPTION OF TESTS

#### 3.1 Evaluation Procedure

The measurement procedure described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) was used in the measurement of the EUT.

Deviation from measurement procedure.....None

# 3.2 Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. An 80cm tall test table made of Styrodur is placed on top of the turn table. For measurements above 1GHz, an additional Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33 depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions.

## 3.3 Environmental Conditions

The temperature is controlled within range of 15°C to 35°C. The relative humidity is controlled within range of 10% to 75%. The atmospheric pressure is monitored within the range 86-106kPa (860-1060mbar).

FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION)	MOTOROLA SOLUTIONS	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 5 of 21
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button		Page 5 01 21
© 2018 PCTEST Engineering Laboratory, Inc.			V 8.1 05/10/2018	



# 4.0 ANTENNA REQUIREMENTS

#### Excerpt from §15.203 of the FCC Rules/Regulations:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

- The antennas of the EUT are permanently attached.
- There are no provisions for connection to an external antenna.

#### Conclusion:

The EUT complies with the requirement of §15.203.

FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 6 of 21
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button		Page 6 01 21
© 2018 PCTEST Engineering Laboratory, Inc. V 8.1 05/10/2018				



# 5.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Contribution	Expanded Uncertainty (±dB)
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07

FCC ID: AZ489FT5875	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	MOTOROLA SOLUTIONS	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 7 of 21
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button		Fage / 0121
© 2018 PCTEST Engineering Laboratory, Inc. V 8.1 05/10/201				



# 6.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	6/21/2017	Annual	7/21/2018	RE1
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2017	Biennial	10/10/2019	121034
Emco	3115	Horn Antenna (1-18GHz)	3/28/2018	Biennial	3/28/2020	9704-5182
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	5/21/2018	Annual	5/21/2019	100342
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/3/2017	Annual	8/3/2018	102134
Rohde & Schwarz	TS-PR8	Preamplifier-Antenna SYS; 30MHz-8GHz	10/19/2017	Annual	10/19/2018	102324
Seekonk	NC-100	Torque Wrench	12/28/2017	Annual	12/28/2018	N/A
Sunol Sciences	JB6	JB6 Antenna	9/27/2016	Biennial	9/27/2018	A082816

Table 6-1. Annual Test Equipment Calibration Schedule

#### Notes:

- 1. Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.
- 2. This table includes passive devices that have an influence on the final measured values, i.e. attenuators, splitters, directional couplers, and cables.

FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION) MOTOROLA SOLUTIONS		Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Daga 9 of 21		
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button		Page o of 21		
© 2018 PCTEST Engineering Laboratory, Inc. V 8.1 05/10/2018						



# 7.0 TEST RESULTS

## 7.1 Summary

Company Name:	Motorola Solutions Inc
FCC ID:	AZ489FT5875
Method/System:	Frequency Hopping Spread Spectrum (FHSS)
Number of Channels:	50

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(1)(i)	RSS-247 [5.1(c)]	20dB Bandwidth	<500kHz		PASS	Motorola 15C Report
15.247(b)(2)	RSS-247 [5.4(a)]	Peak Transmitter Output Power	< 1 Watt if <u>&gt;</u> 50 non- overlapping channels used		PASS	Motorola 15C Report
15.247(a)(1)	RSS-247 [5.1(b)]	Channel Separation	> 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater	CONDUCTED	PASS	Motorola 15C Report
15.247(a)(1)(i)	RSS-247 [5.1(c)]	Number of Channels	> 50 Channels		PASS	Motorola 15C Report
15.247(a)(1)(i)	RSS-247 [5.1(c)]	Time of Occupancy	< 0.4 sec in 20 sec period		PASS	Motorola 15C Report
15.247(d)	RSS-247 [5.5]	Band Edge / Out-of-Band Emissions	Conducted > 20dBc		PASS	Motorola 15C Report
15.205 15.209	RSS-Gen [8.9]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209 (RSS-247 limits)	RADIATED	PASS	Section 7.2, 7.3

#### Table 7-1. Summary of Test Results

#### Notes:

All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.

FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dago 0 of 21		
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button				
© 2018 PCTEST Engineering Laboratory, Inc. V 8.1 05/10/2018						



# 7.2 Radiated Spurious Emission Measurements – Above 1GHz §15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

#### **Test Overview and Limit**

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at maximum power and at the appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 6 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-2 per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [μV/m]	Measured Distance [Meters]	
Above 960.0 MHz	500	3	

Table 7-2. Radiated Limits

#### Test Procedure Used

ANSI C63.10-2013 - Section 6.6.4.3

#### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.





FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 10 of 21
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button		
© 2018 PCTEST Engineering Lab	oratory, Inc.			V 8.1 05/10/2018



- All emissions lying in restricted bands (highlighted in light yellow and denoted by a \* next to the frequency) specified in §15.205 and Section 8.10 of RSS-Gen are below the limit shown in Table 7-2. Emissions that do not lie in a restricted band are subject to a 20dBc limit as specified in 15.247(d) and Section 5.5 of RSS-247.
- 2. 20dBc limit is determined by Peak field strength 20dB. The peak field strengths are shown in Table 7-3
- 3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- 4. The spectrum is measured from 9kHz to the 10<sup>th</sup> harmonic and the worst-case emissions are reported.
- 5. The duty cycle correction factor was not applied to noise floor measurements.
- 6. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section.
- 7. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

#### Sample Calculation

- ο Field Strength Level [dBµV/m] = Analyzer Level [dBm] + 107 + AFCL [dB/m] + Duty Cycle Correction [dB]
- o AFCL [dB/m] = Antenna Factor [dB/m] + Cable Loss [dB]
- o Margin [dB] = Field Strength Level  $[dB\mu V/m]$  Limit  $[dB\mu V/m]$

FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dega 11 of 01		
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button		Page 110121		
© 2018 PCTEST Engineering Laboratory, Inc. V 8.1 05/10/2018						



# Radiated Spurious Emission Measurements §15.205 §15.209 §15.247 (d); RSS-Gen [8.9]





FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION)	MOTOROLA SOLUTIONS	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 12 of 21	
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button		Page 12 of 21	
© 2018 PCTEST Engineering Lab	V 8.1 05/10/2018				

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including the control of the method of the method



# **Fundamental Field Strength Level Measurement**

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
902.525	Peak	Н	221	346	-14.86	30.35	122.49	131.23	-8.74
915.025	Peak	Н	207	330	-15.93	30.49	121.56	131.23	-9.67
927.475	Peak	Н	221	331	-16.98	30.45	120.47	131.23	-10.76

**Table 7-3. Field Strength Measurements** 

#### Note:

To calculate the limit in  $dB\mu V/m$ , as specified in 15.247(b)(2) and 15.247(b)(4), the maximum allowed EIRP is 36dBm. By applying E ( $dB\mu V/m$ ) = EIRP (dBm) – 20 log D + 104.8; where D is the measurement distance in meters, the limit is 131.23  $dB\mu V/m$ .

FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION)	MOTOROLA SOLUTIONS	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 12 of 21	
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button		Fage 13 01 21	
© 2018 PCTEST Engineering Laboratory, Inc. V 8.1 05/10/201					



# Radiated Spurious Emission Measurements §15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

Measurement Distance: Operating Frequency:

3 Meters 902.525MHz

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Duty Cycle Correction [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	1805.050	Peak	V	321	206	-26.88	-4.81	0.00	75.31	102.49	-27.18
*	2707.575	Avg	V	111	233	-33.24	-2.31	-31.75	39.70	53.98	-14.27
*	2707.575	Peak	V	111	233	-33.24	-2.31	0.00	71.45	73.98	-2.52
*	3610.100	Avg	V	169	37	-40.16	2.16	-31.75	37.25	53.98	-16.73
*	3610.100	Peak	V	169	37	-40.16	2.16	0.00	69.00	73.98	-4.98
*	4512.625	Avg	V	134	276	-51.49	2.14	-31.75	25.90	53.98	-28.08
*	4512.625	Peak	V	134	276	-51.49	2.14	0.00	57.65	73.98	-16.33
*	5415.150	Avg	V	134	180	-47.40	5.40	-31.75	33.25	53.98	-20.73
*	5415.150	Peak	V	134	180	-47.40	5.40	0.00	65.00	73.98	-8.98
	6317.675	Peak	V	179	207	-60.07	6.50	0.00	53.43	102.49	-49.06
	7220.200	Peak	V	117	97	-64.07	8.42	0.00	51.35	102.49	-51.14
*	8122.725	Avg	V	130	353	-61.63	10.44	-31.75	24.06	53.98	-29.92
*	8122.725	Peak	V	130	353	-61.63	10.44	0.00	55.81	73.98	-18.17
*	9025.250	Avg	V	140	210	-66.45	10.44	-31.75	19.24	53.98	-34.74
*	9025.250	Peak	V	140	210	-66.45	10.44	0.00	50.99	73.98	-22.99

Table 7-4. Radiated Measurements

FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dogo 14 of 21		
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button	Page 14 01 21			
© 2018 PCTEST Engineering Laboratory, Inc. V 8.1 05/10//						



Measurement Distance:	3 Meters
Operating Frequency:	915.025MHz

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Duty Cycle Correction [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	1830.050	Peak	V	268	355	-26.92	-4.76	0.00	75.32	101.56	-26.24
*	2745.075	Avg	V	119	269	-39.49	-2.08	-31.75	33.67	53.98	-20.31
*	2745.075	Peak	V	119	269	-39.49	-2.08	0.00	65.43	73.98	-8.55
*	3660.100	Avg	V	114	349	-42.99	1.47	-31.75	33.73	53.98	-20.25
*	3660.100	Peak	V	114	349	-42.99	1.47	0.00	65.48	73.98	-8.49
*	4575.125	Avg	V	149	93	-52.59	3.15	-31.75	25.81	53.98	-28.17
*	4575.125	Peak	V	149	93	-52.59	3.15	0.00	57.56	73.98	-16.42
	5490.150	Peak	V	149	93	-54.63	5.18	0.00	57.55	101.56	-44.01
	6405.175	Peak	V	375	167	-55.16	6.12	0.00	57.96	101.56	-43.60
*	7320.200	Avg	V	152	331	-63.26	9.18	-31.75	21.17	53.98	-32.81
*	7320.200	Peak	V	152	331	-63.26	9.18	0.00	52.92	73.98	-21.06
*	8235.225	Avg	V	188	1	-65.35	11.01	-31.75	20.91	53.98	-33.07
*	8235.225	Peak	V	188	1	-65.35	11.01	0.00	52.66	73.98	-21.32
*	9150.250	Avg	V	174	20	-67.10	11.01	-31.75	19.16	53.98	-34.82
*	9150.250	Peak	V	174	20	-67.10	11.01	0.00	50.91	73.98	-23.07

Table 7-5. Radiated Measurements

FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION)	MOTOROLA SOLUTIONS	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 15 of 21
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button	Page 15 01 21	
© 2018 PCTEST Engineering Lab	V 8.1 05/10/2018			



Measurement Distance:	3 Meters
Operating Frequency:	927.475MHz

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Duty Cycle Correction [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	1854.950	Peak	V	278	111	-33.36	-4.25	0.00	69.39	100.47	-31.08
*	2782.425	Avg	V	152	7	-31.19	-2.45	-31.75	41.61	53.98	-12.37
*	2782.425	Peak	V	152	7	-31.19	-2.45	0.00	73.36	73.98	-0.62
*	3709.900	Avg	V	144	359	-47.76	1.72	-31.75	29.21	53.98	-24.77
*	3709.900	Peak	V	144	359	-47.76	1.72	0.00	60.96	73.98	-13.02
*	4637.375	Avg	V	188	311	-52.22	2.29	-31.75	25.32	53.98	-28.66
*	4637.375	Peak	V	188	311	-52.22	2.29	0.00	57.07	73.98	-16.91
	5564.850	Peak	V	144	201	-58.12	6.09	0.00	54.97	100.47	-45.50
	6492.325	Peak	V	228	322	-61.22	6.15	0.00	51.93	100.47	-48.54
*	7419.800	Avg	V	400	85	-64.78	8.92	-31.75	19.39	53.98	-34.59
*	7419.800	Peak	V	400	85	-64.78	8.92	0.00	51.14	73.98	-22.84
*	8347.275	Avg	V	112	276	-65.12	11.29	-31.75	21.42	53.98	-32.56
*	8347.275	Peak	V	112	276	-65.12	11.29	0.00	53.17	73.98	-20.81
	9274.750	Peak	V	120	7	-66.88	11.29	0.00	51.41	100.47	-49.06

Table 7-6. Radiated Measurements

FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION)	MOTOROLA SOLUTIONS	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dage 16 of 21		
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button	Page 10 01 21			
© 2018 PCTEST Engineering Laboratory, Inc.						



#### 7.3 Radiated Spurious Emissions Measurements – Below 1GHz §15.209; RSS-Gen [8.9]

#### **Test Overview and Limit**

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

# All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 6 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-7 per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [μV/m]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table 7-7. Radiated Limits

#### **Test Procedures Used**

ANSI C63.10-2013

#### **Test Settings**

#### **Quasi-Peak Field Strength Measurements**

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 120kHz (for emissions from 30MHz 1GHz)
- 3. Detector = quasi-peak
- 4. Sweep time = auto couple
- 5. Trace mode = max hold
- 6. Trace was allowed to stabilize

FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION)	MOTOROLA SOLUTIONS	Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Dogo 17 of 21			
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button		Fage 17 0121			
© 2018 PCTEST Engineering Laboratory, Inc. V 8.1 05/10/2018							



#### Test Setup

The EUT and measurement equipment were set up as shown in the diagrams below.



Figure 7-2. Radiated Test Setup < 30Mhz





FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION)	MOTOROLA SOLUTIONS	Approved by: Quality Manager				
Test Report S/N:	Test Dates:	EUT Type:		Dage 18 of 21				
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button		Fage 10 01 21				
© 2018 PCTEST Engineering Laboratory, Inc. V 8.1 05/10/2018								
All data around the second states are stated as and state around a state around around a state around a								



- 1. All emissions lying in restricted bands (highlighted in light yellow and denoted by a \* next to the frequency) specified in §15.205 and RSS-Gen (8.10) are below the limit shown in Table 7-7. Emissions that do not lie in a restricted band are subject to a 20dBc limit as specified in 15.247(d) and Section 5.5 of RSS-247.
- 2. 20dBc limit is determined by Peak field strength 20dB. The peak field strengths are shown in Table 7-3
- 3. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
- 4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
- 5. Emissions were measured at a 3 meter test distance.
- 6. Emissions are investigated while operating on the center channel of the mode, band, and modulation that produced the worst case results during the transmitter spurious emissions testing.
- 7. No spurious emissions were detected within 20dB of the limit below 30MHz.
- 8. The results recorded using the broadband antenna is known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antenna was found to be less than 2:1.
- The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. There were no emissions detected in the 30MHz – 1GHz frequency range, as shown in the subsequent plots.

FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Dage 10 of 21			
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button	Button				
© 2018 PCTEST Engineering Laboratory, Inc. V 8.1 05/10/2018							



# Radiated Spurious Emissions Measurements (Below 1GHz) §15.209; RSS-Gen [8.9]



Plot 7-4. Radiated Spurious Plot below 1GHz

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	46.96	Quasi-Peak	V	118	188	-60.39	-22.94	23.67	101.56	-77.89
	76.76	Quasi-Peak	V	145	142	-64.87	-22.31	19.82	101.56	-81.74
*	115.20	Quasi-Peak	V	143	242	-55.42	-16.94	34.64	43.52	-8.88
	780.62	Quasi-Peak	V	134	50	-53.72	-7.48	45.80	101.56	-55.76
	799.82	Quasi-Peak	V	136	66	-41.49	-6.57	58.94	101.56	-42.62
	838.28	Quasi-Peak	V	131	67	-51.42	-6.02	49.56	101.56	-52.00

Table 7-8. Radiated Spurious Emissions Below 1GHz

FCC ID: AZ489FT5875		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Dago 20 of 21			
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button		Page 20 01 21			
© 2018 PCTEST Engineering Laboratory, Inc. V 8.1 05/10/2018							



# 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Motorola Solutions Inc Call Button FCC ID: AZ489FT5875** is in compliance with Part 15 Subpart C (15.247) of the FCC Rules and RSS-247 of the Innovation, Science and Economic Development Canada Rules.

FCC ID: AZ489FT5875	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	MOTOROLA SOLUTIONS	Approved by:
				Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 21 of 21
1M1806200129-01-R3.AZ4	6/6 - 6/19/2018, 7/9/2018	Call Button		Page 21 01 21
© 2018 PCTEST Engineering Laboratory, Inc. V 8.1 05/10/2018				