MOTOROLA SOLUTIONS

MS ISO/IEC 17025
TESTING

SAMM No. 0826

DECLARATION OF COMPLIANCE: MPE ASSESSMENT

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Date of Report: 7/27/2018
Report Revision: B

Responsible Engineer:	Tiong Nguk Ing
Report Author:	Tiong Nguk Ing
Assessment Date(s)	7/6/2018
Manufacturer:	Alert Technologies
DUT Description:	CB300-D 1W 900MHz DLR Call Box
Test TX mode(s):	Paging
Max. Power output:	1 W
Tx Frequency Bands:	902-928 MHz
Model(s) Tested:	CB300-D
Model(s) Certified:	CB300-D
Classification:	General Population/ Uncontrolled Environment
FCC ID:	AZ489FT5875
IC:	109U-89FT5875
ISED Test Site Registration:	109AK
FCC Test Firm Registration Number:	823256

Based on the information and the testing results provided herein, the undersigned certifies that when used as stated in the operating instructions supplied, said product complies with the national and international reference standards and guidelines listed in section 4.0 of this report. This report shall not be reproduced without written approval from an officially designated representative of the Motorola Solutions EME Laboratory. I attest to the accuracy of the data and assume full responsibility for the completeness of these measurements.
This reporting format is consistent with the suggested guidelines of the TIA TSB-159 April 2006
The results and statements contained in this report pertain only to the device(s) evaluated herein.

Tiong

Tiong Nguk Ing
Deputy Technical Manager
Approval Date: 7/27/2018

Tiong Nguk Ing
Digitally signed by Tiong Nguk Ing
Date: 2018.07.27 17:02:53 +08'00'

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Report Revision History

Date	Revision	Comments
7/6/2018	A	Initial release
7/27/2018	B	Update section 6.0 and 7.0

1.0 Introduction

This report contains calculated Maximum Permissible Exposure (MPE) results for product model CB300-D.

2.0 MPE Summary

Table 1

Frequency (MHz)	Power Density (mW/cm^2)	FCC Limit (mW/cm^2)
902	0.173	0.60
928	0.173	0.62

3.0 Abbreviations / Definitions

DUT: Device Under Test
EME: Electromagnetic Energy
MPE: Maximum Permissible Exposure

4.0 Referenced Standards and Guidelines

This product is designed to comply with the following applicable national and international standards and guidelines.

- United States Federal Communications Commission, Code of Federal Regulations; Rule Part 47CFR § 1.1310, § 2.1091 (d) and § 2.1093 for RF Exposure, where applicable.
- Federal Communications Commission, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields", OET Bulletin 65 (Edition 97-01), FCC, Washington, D.C.: August 1997.
- American National Standards Institute (ANSI) / Institute of Electrical and Electronics Engineers (IEEE) C95. 1-1999
- American National Standards Institute (ANSI) / Institute of Electrical and Electronics Engineers (IEEE) C95. 1-1992. Specific to FCC rules and regulations.
- Institute of Electrical and Electronics Engineers (IEEE) C95.3-2002
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998
- Ministry of Health (Canada) Safety Code 6 (2015), Limits of Human Exposure to Radio frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz
- RSS-102 (Issue 5) – Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands)
- FCC KDB – 447498 D01 General RF Exposure Guidance v06
- FCC KDB – 865664 D02 RF Exposure Reporting v01r02

5.0 Power Density Limits

Table 2 – Occupational / Controlled Exposure Limits

Frequency Range (MHz)	FCC OET Bulletin 65 mW/cm^2	ICNIRP W/m^2	IEEE C95.1 1992/1999 mW/cm^2	IEEE C95.1 2005 W/m^2	RSS-102 Issue 5 2015 W/m^2
10 – 20					10.0
20 – 48					$44.72 / f^{0.5}$
30 – 300	1.0				
48 – 100					6.455
10 – 400		10.0			
100 – 300			1.0	10.0	
100 – 6,000					$0.6455 f^{0.5}$
300 – 1,500	f/300				
300 – 3,000			f/300	f/30	
400 – 2,000		f/40			
1,500 – 15,000					
1,500 – 100,000	5.0				
2,000 – 300,000		50.0			
3,000 – 300,000			10.0	100.0	
6,000 – 15,000					50.0
15000 – 150,000					50.0
150000 –300,000					3.33×10-4 f

Table 3 – General Population / Uncontrolled Exposure Limits

Frequency Range (MHz)	FCC OET Bulletin 65 mW/cm^2	ICNIRP W/m^2	IEEE C95.1 1992/1999 mW/cm^2	IEEE C95.1 2005 W/m^2	RSS-102 Issue 5 2015 W/m^2
10 – 20					2.0
20 – 48					$8.944 / f^{0.5}$
30 – 300	0.2				
48 – 300					1.291
10 – 400		2.0			
100 – 300			0.2		
100 – 400				2.0	
300 – 1,500	f/1,500				
300 – 6000					$0.02619 f^{0.6834}$
400 – 2,000		f/200		f/200	
300 – 15,000			f/1,500		
1,500 – 15,000					
1,500 – 100,000	1.0				
2,000 – 100,000				10.0	
2,000 – 300,000		10.0			
6,000 – 15,000					10.0
15,000 – 150,000					10.0
150,000 – 300,000					$6.67\times10^{-5} f$

6.0 Product and System Description

CB300-D call box is a battery operated call box typically installed mounted to a wall using 3M DuoLock strips or by using optional wall mounting bracket and also use on a counter top. The message will be prerecorded in call box; recorded message length cannot more than 10 seconds. When the button on the LCD display is pressed and released, the prerecorded local audio message will send over the air. The call cycles to repeat the message can be set from 1 to 30 cycles. Call delay between repeating message can be set from 10 to 180 seconds.

Transmission time will be up to 10 seconds long maximum, the shortest delay is 10 seconds before 2nd transmission of the repeating message. The conservative duty cycle will be 50% with 10 seconds transmission with 20 seconds period.

7.0 MPE Assessment

MPE calculations were used to determine the RF exposure for this device. According to FCC's OET Bulletin 65 Edition 97-01 Section 2, calculations can be made to predict RF field strength and power density levels around typical RF sources.

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (mW/cm^2)
P = power input to the antenna (mW)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator (dBi)
R = distance to center of radiation of the antenna (cm)

P = 1 W*50% duty cycle = 500 mW;
G= 2.4 dBi; Linear Gain = 10^ (2.4 dBi/10) = 1.74;
R= 20 cm

$$S = \frac{500mW*1.74}{4*\pi*20^2} = 0.173 mW/cm^2$$

Frequency (MHz)	Distance (cm)	Power Density (mW/cm^2)	FCC Limit (mW/cm^2)	ISED Limit (mW/cm^2)
902	20	0.173	0.60	0.27
928	20	0.173	0.62	0.28

The MPE assessment presented in this report concludes that model CB300-D is compliant to FCC and ISED General Population /Uncontrolled RF exposure limits.