MOTOROLA

ACCREDITED
Certificate Number: 2518.01

FCC ID: AZ489FT7028
DECLARATION OF COMPLIANCE SAR ASSESSMENT Part 1 of 1

Networks & Enterprise
EME Test Laboratory
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Date of Report: 11/7/06
Report Revision: O
Report ID: HC700L_F3129AG_Rev O_061107
SR4521

Responsible Engineer:	Kim Uong (EME lead Eng.)
Date/s Tested:	NA – Computational assessment
Manufacturer/Location:	Motorola South – Arad Israel
Sector/Group/Div.:	MCIL
Date submitted for test:	10/23/06
DUT Description:	HC700-L - Handheld Computer with BlueTooth (BT) and WLAN b/g radios
Test TX mode(s):	NA – Computational assessment
Max. Power output:	BT: 2.19 mW, WLAN b: 39.8 mW; WLAN g 31.6mW
Nominal Power:	BT: 1 mW; WLAN: 39.8 mW
Tx Frequency Bands:	BT: 2402 - 2480MHz WLAN: 2412 - 2462MHz
Signaling type:	CDMA
Model(s) Tested:	NA – Computational assessment
Model(s) Certified:	F3129AG
Serial Number(s):	NA
Classification:	General Population/Uncontrolled
Rule Part(s):	15; Class B Digitial Device

Approved Accessories:

Antenna(s):
8489845V01 (Inverted F (on board) - WLAN 2.4GHz - 2.48GHz, 1/4wave, +1.2dBi)
8489845V01 (Inverted F (on board) - BT 2.4GHz - 2.48GHz, 1/4wave, 0dBi)

Battery(ies):
FNN7815A (7.2V Battery, 1800mAH)

Body worn accessory(ies):
FTN6839A (Belt Holster), FHN6621A (Hand Strap)

Audio/Data cable accessory(ies):
None

Max. Calc. : 1-g Avg. SAR: 0.04 W/kg

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 2.0 of this report. This report shall not be reproduced without written approval from an officially designated representative of the Motorola EME Laboratory.

This reporting format is consistent with the test report guidelines of the TIA TSB-150 December 2004
The results and statements contained in this report pertain only to the device(s) evaluated.

Signature on file – Ken Enger
Ken Enger N&E EME Lab Senior Resource Manager, Laboratory Director,

Approval Date:

Certification Date: 11/9/06

Certification No.: L1061103

Report Revision History

Date	Revision	Comments
11/7/06	O	Initial release

1.0 Introduction and Overview

This report details the intended use and the computational assessment used to justify S.A.R. compliance performance of model number F3129A of FCC ID: AZ489FT7028. The results herein reflect initial test results.

2.0 Referenced Standards and Guidelines

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

- IEC62209-1(2005) Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)
- United States Federal Communications Commission, Code of Federal Regulations; Rule Part 47CFR § 2.1093 sub-part J:1999
- Federal Communications Commission, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields”, OET Bulletin 65, Supplement C (Edition 01-01), FCC, Washington, D.C.: June 2001.
- IEEE 1528, 2003 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques"
- American National Standards Institute (ANSI) / Institute of Electrical and Electronic Engineers (IEEE) C95. 1-1992
- Institute of Electrical and Electronic Engineers (IEEE) C95.1-2005 Edition
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998
- Ministry of Health (Canada) Safety Code 6. Limits of Human Exposure to Radio frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz, 1999
- Australian Communications Authority Radiocommunications (Electromagnetic Radiation - Human Exposure) Standard 2003
- ANATEL, Brazil Regulatory Authority, Resolution No. 303 of July 2, 2002 "Regulation of the limitation of exposure to electrical, magnetic, and electromagnetic fields in the radio frequency range between 9KHz and 300 GHz." and “Attachment to resolution # 303 from July 2, 2002”

2.1 SAR Limits

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average - ANSI - (averaged over the whole body)	0.08	0.4
Spatial Peak - ANSI - (averaged over any 1-g of tissue)	1.60	8.0
Spatial Peak – ICNIRP/ANSI - (hands/wrists/feet/ankles averaged over 10-g)	4.0	20.0
Localized SAR - ICNIRP - (Head and Trunk 10-g)	2.0	10.0

3.0 Description of Device Under Test (DUT)

The HC700L, FCC ID: AZ489FT7028, is a Handheld Computer. This model utilize the Pocket PC 2003 operating system and include an imbeded 1D/2D imager for barcode scanning. This model incorporates the BlueTooth and WLAN 802.11 b/g transmitters, the maximum percentage transmitting time of WLAN is 0.09%. The max percentage transmitting time of Bluetooth in IMD with Wireless Imager scenario is 0.07%.

This device will be marketed to and used by the general population. This device may be used while held against the body in Data mode.

FCC ID: AZ489FT7028 is capable of operating in the 2402 - 2480MHz for BlueTooth band; and 2412 - 2462MHz for WLAN 802.11b/g bands. The rated conducted power is 1mW for BlueTooth, and 39.8mW for WLAN 802.11b/g. The maximum conducted output power is 2.19mW for BlueTooth, 39.8mW for WLAN 802.11b; and 31.6mW for WLAN 802.11 g as defined by the upper limit of the production line final test station.

FCC ID: AZ489FT7028 is offered with the options and accessories listed on the coversheet of this report.

4.0 Rationale for calculation of the compliance results

WLAN maximum transmission duty cycle rationale:

As defined by the Customer, the user can scan up to 500 barcodes in a 10 hour shift. A typical 1D (1 Dimension) barcode contains 100 to 300 bits of data while a 2D barcode contain more than the 1D. Therefore, the maximum theoretical case for 2D barcode is 31160 bits of data (Data Matrix symbology).

The HC700L embedded imager scans the barcode labels and the data is transmitted to the applicable computing infrastructure, using WLAN. WLAN overhead protocol is 100%.

The WLAN channel rate is 1Mbits/Sec to 11Mbits/Sec.

Calculation
500 scans in 10 hours = 500/10/60/60 = scan each 72 seconds

For each 72 seconds:
- Max data size is 31160 bits
- Max transmission size (including protocols overhead) is 31160 * 2 = 62320 bits

Max transmission time each 72 seconds is:

- At best case (11 Mbps), the transmission time is 62320 /11Mbps = 5.66 mSec.
- At worst case, (1 Mbps), the transmission time is 62320 /1M = 62.32 mSec.

At worst case, the WLAN is operating at 62.32m/72*100 = 0.09%.

Therefore, WLAN maximum EIRP with source-based time averaged output for is:

39.8 mW * 0.09% = 0.036 mW

BlueTooth maximum transmission duty cycle rationale:

As defined by the Customer, the user can scan up to 500 barcodes in a 10 hour shift. Typical 2D barcode can contain up to 31160 bits of data. Therefore, the Hands Free Imager scans the barcode labels and the data is transmitted to the HC700L using Bluetooth. Bluetooth overhead protocol is 50%.

The Bluetooth channel rate is 1Mbits/Sec.

Calculation
500 scans in 10 hours = 3000/10/60/60 = scan each 72 seconds

For each 72 seconds:
- Max data size is 31160 bits
- Max transmission size (including protocols overhead) is 31160 * 1.5 = 46740 bits

Max transmission time each 72 seconds is 46740 /1M = 46.74 mSec.

The BT is operating at 46.74 m/72*100 = 0.07%

Therefore, BlueTooth maximum EIRP with source-based time averaged output for is:

2.19 mW * 0.07% = 0.002 mW

For simultaneous transmission of WLAN and BT, the total maximum EIRP with source-based time averaged output is:

WLAN (EIRP) + BT (EIRP) = 0.036mW + 0.002 mW = 0.04 mW

Therefore, the highest calculated SAR for the simultaneous transmission of WLAN and BT is 0.04mW/g.

5.0 Conclusion

The highest conservative Operational Maximum Calculated SAR values found for FCC ID AZ489FT7028 models F3129AG is **0.04 mW/g.**

This result clearly demonstrates compliance with FCC General Population/Uncontrolled RF Exposure limit of **1.6W/kg** per the requirements of 47 CFR 2.1093(d) and also demonstrate compliance with the localized 10G average FCC General Population/Uncontrolled RF Exposure for Hand Limit of **4.0mW/g** per the requirements of 47 CFR2.1093 (d)(2).