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## COMPLIANCE TEST REPORT

### PER FCC PT 90, PT 24

### AND RSS-119 N RSS-134

APPLICANT	MOTOROLA, INC.
	600 NORTH U.S. HWY 45 LIBERTYVILLE ILLINOIS 60048-5343 USA
FCC ID	IHDT56KD1
IC	109O-KD1
MODEL NUMBER	H85XAH6JR5AN
PRODUCT DESCRIPTION	iDEN i680 with BK10 battery
DATE SAMPLE RECEIVED	9/1/2009
DATE TESTED	9/14/2009
TESTED BY	Richard Block
APPROVED BY	Mario de Aranzeta
TIMCO REPORT NO.	2122AUT9TestReport_iDEN.pdf
TEST RESULTS	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL

**THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.**



Certificate # 0955-01



**TABLE OF CONTENTS**

ATTESTATIONS .....3  
REPORT SUMMARY.....4  
TEST ENVIRONMENT AND TEST SETUP .....4  
DUT SPECIFICATION.....5  
EQUIPMENT LIST .....6  
TEST PROCEDURE.....7  
RF POWER OUTPUT .....9  
MODULATION CHARACTERISTICS.....10  
OTHER MODULATION CHARACTERISTICS .....11  
FIELD STRENGTH OF SPURIOUS EMISSIONS – HIGH POWER.....12  
FIELD STRENGTH OF SPURIOUS EMISSIONS – LOW POWER.....14

## 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.



Testing Certificate # 0955-01

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

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



### Authorized Signatory Name:

Mario de Aranzeta C.E.T.  
Compliance Engineer/ Lab. Supervisor

**Date:** 9/16/2009

## REPORT SUMMARY

Disclaimer	The test results relate only to the items tested.
Purpose of Test	To demonstrate compliance with FCC CFR 47, Part 90 requirements. To demonstrate compliance with FCC CFR 47, Part 24 requirements for narrow band PCS equipment. To demonstrate compliance with IC RSS-119 requirements. To demonstrate compliance with IC RSS-134 requirements.
Test Standards	ANSI/TIA 603-C: 2004, FCC CFR 47 Part 90, ANSI C63.4: 2003 RSS-119, RSS-134, RSS-GEN
Related Approval	Digital portion is verified

## TEST ENVIRONMENT AND TEST SETUP

Test Facility	Timco Engineering Inc. located at 849 NW State Road 45, Newberry, FL 32669 USA
Laboratory Test Condition	The temperature was 26°C with a relative humidity of 50%.
Deviation from the standards	No deviation
Modification to the DUT	No modification was made.
Test Exercise (software etc.)	The DUT was placed in continuous transmitting mode of operation.
System Setup	Stand alone device.

Applicant: MOTOROLA, INC.

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**DUT SPECIFICATION**

DUT Description	iDEN i680
FCC ID	IHDT56KD1
IC	109O-KD1
Model Number	H85XAH6JR5AN
Serial Number	364VKQPFN8
Hardware	P4A
Software	IAA.00.24
Battery	BK10
Operating Frequency	806.0125 ~ 824.9875 MHz 896.01875 – 901.98125 MHz
DUT Power Source	<input type="checkbox"/> 110–120Vac/50– 60Hz
	<input type="checkbox"/> DC Power 12V
	<input checked="" type="checkbox"/> Battery Operated Exclusively
Test Item	<input type="checkbox"/> Prototype
	<input checked="" type="checkbox"/> Pre-Production
	<input type="checkbox"/> Production
Type of Equipment	<input type="checkbox"/> Fixed
	<input type="checkbox"/> Mobile
	<input checked="" type="checkbox"/> Portable



## EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/20/07	3/19/10
3-Meter OATS	TEI	N/A	N/A	Listed 1/11/09	1/10/12
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	Listed 5/11/07	5/11/10
AC Voltmeter	HP	400FL	2213A14499	CAL 12/29/08	12/29/10
Analyzer Tan Tower Quasi-Peak Adapter	HP	85650A	3303A01690	CAL 11/30/07	11/30/09
Analyzer Tan Tower RF Preselector	HP	85685A	3221A01400	CAL 11/30/07	11/30/09
Analyzer Tan Tower Spectrum Analyzer	HP	8566B Opt 462	3138A07786 3144A20661	CAL 11/30/07	11/30/09
Analyzer Tan Tower Preamplifier	HP	8449B-H02	3008A00372	CAL 11/30/07	11/30/09
Coaxial Cable #64	Semflex Inc.	60637	Timco #64	CHAR 3/30/09	3/30/11
Antenna: Dipole Kit	Electro-Metrics	TDA-30/1-4	152	CAL 3/3/09	3/3/12
Antenna: Dipole Kit	Electro-Metrics	TDA-30/1-4	153	CHAR 4/5/09	4/5/12
Frequency Counter	HP	5385A	2730A03025	CAL 7/6/07	7/6/09
Hygro-Thermometer	Extech	445703	0602	CAL 11/15/07	11/15/09
Antenna: Log-Periodic	Electro-Metrics	LPA-25	1122	CAL 12/1/06	12/1/08
Measuring Tape-7.5M	Kraftixx	7.5M PROFI		CHAR 11/13/07	11/13/09
Modulation Analyzer	HP	8901A	3435A06868	CAL 5/9/09	5/9/11
Digital Multimeter	Fluke	FLUKE-77-3	79510405	CAL 5/14/09	5/14/11
System One	Audio Precision	System One	SYS1-45868	CHAR 2/27/08	2/27/10
Temperature Chamber	Tenney Engineering	TTRC	11717-7	CHAR 4/25/08	4/25/10

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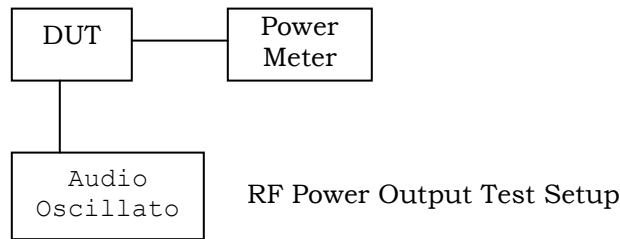
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**TEST PROCEDURE**

**Power Line Conducted Interference:** The procedure used was ANSI/TIA 603-C:2004, using a 50uH LISN. Both lines were observed with the UUT transmitting. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

**Bandwidth 20 dB:** The measurements were made with the spectrum analyzer's resolution bandwidth (RBW) = 1 MHz and the video bandwidth (VBW) = 3 MHz and the span set as shown on plot.

**Power Output:** The RF power output was measured at the antenna feed point using a peak power meter. A 50-ohm, resistive wattmeter was connected to the RF output connector. With a nominal battery voltage or supply voltage, and the transmitter properly adjusted the RF output measures:



**Antenna Conducted Emissions:** The RBW = 100 kHz, VBW = 300 kHz and the span set to 10.0 MHz and the spectrum was scanned from 30 MHz to the 10<sup>th</sup> harmonic of the fundamental. Above 1 GHz the resolution bandwidth was 1 MHz and the VBW = 3 MHz and the span to 50 MHz.

**Radiation Interference:** The test procedure used was ANSI/TIA 603-C:2004, using an Agilent spectrum receiver with pre-selector. The bandwidth (RBW) of the spectrum ANSI/TIA 603-C: 2004, 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. The ambient temperature of the UUT was 76°F with a humidity of 55%.

[Continued]

**Modulation Characteristic**

Audio frequency response

The audio frequency response was measured in accordance with ANSI/TIA 603-C: 2004. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 – 5000Hz shall be submitted. The audio frequency response curve is shown below.

Audio Low Pass Filter

The audio low pass filter for voice-modulated equipment was measured in accordance with ANSI/TIA 603-C: 2004. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all the circuitry installed between the modulation limiter and the modulated stage shall be submitted.

Audio Input versus modulation

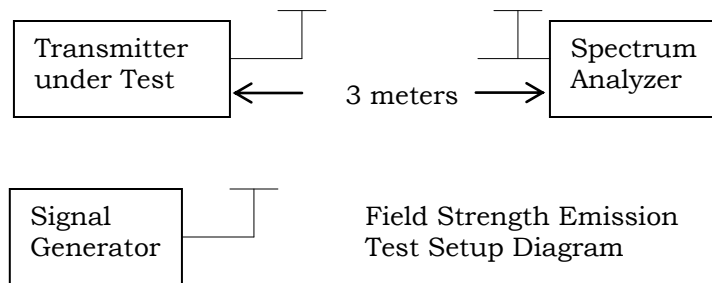
The audio input level needed for a particular percentage of modulation was measured in accordance with ANSI/TIA 603-C: 2004. Curves are provided for audio input frequencies of 300, 1000, and 3000 Hz.

**Frequency Stability**

The frequency stability was measured per ANSI/TIA 603-C: 2004.

**Field Strength of Spurious Emissions**

The spectrum was scanned from 30 MHz to at least the tenth harmonic of the fundamental. This test was conducted per ANSI/TIA 603-C: 2004 using the substitution method.





**RF POWER OUTPUT**

**Rule Part No.:** Pt 2.1046(a), Pt 90, Pt 24, RSS-119, RSS-134

**Test Requirements:** Pt 2.1046(a), Pt 90, Pt 24, RSS-119, RSS-134

**Test Data:**

OUTPUT POWER: HIGH – 0.640 Watts  
LOW – 0.001 Watts

Part 2.1033 (c)(8) DC Input into the final amplifier

FOR HIGH POWER SETTING INPUT POWER:  $(3.7V)(1.2A) = 4.44$  Watts



**MODULATION CHARACTERISTICS**

**Rule Part No.:** Part 2.1047(a)(b), Pt 90, Pt 24, RSS-119, RSS-134

**Test Requirements:** Part 2.1047(a)(b), Pt 90, Pt 24, RSS-119, RSS-134

**Test Data:**

AUDIO FREQUENCY RESPONSE PLOT

N/A  
Digital Emissions

AUDIO LOW PASS FILTER

N/A  
Digital Emissions

Audio Input Versus Modulation - Modulation Limiting Plot

N/A  
Digital Emissions



**OTHER MODULATION CHARACTERISTICS**

**Rule Part No.:** Part 2.1033(c)(4), Pt 90.209, Pt 90.207, Pt 24, RSS-119, RSS-134

**Requirements:** Part 2.1033(c)(4), Pt 90.209, Pt 90.207, Pt 24, RSS-119, RSS-134

**Test Data:** See Motorola exhibit 12



**FIELD STRENGTH OF SPURIOUS EMISSIONS – HIGH POWER**

**Rule Parts. No.:** Part 2.1051(a), Pt 90, Pt 24, RSS-119, RSS-134

**Requirements:** 25kHz Channel Spacing =  $43+10\log(0.64) = 41$  dBc

**Test Data:**

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)		Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
806.0625	0	0.00		813.5625	0	0.00
1612.1250	V	63.91		1627.1250	V	62.10
2418.1875	V	72.57		2440.6875	V	70.91
3224.2500	H	78.52		3254.2500	H	78.70
4030.3125	V	83.64		4067.8125	V	84.79
4836.3750	H	81.42		4881.3750	H	84.78
5642.4375	V	77.56		5694.9375	H	78.10
6448.5000	V	80.06		6508.5000	H	79.81
7254.5625	V	81.42		7322.0625	H	79.85
8060.6250	V	80.30		8135.6250	H	80.74

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)		Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
820.9875	0	0.00		824.9875	0	0.00
1641.9750	V	62.20		1649.9750	V	64.69
2462.9625	V	68.45		2474.9625	V	69.11
3283.9500	V	79.49		3299.9500	H	80.98
4104.9375	V	84.04		4124.9375	H	83.31
4925.9250	V	81.44		4949.9250	H	83.57
5746.9125	H	77.14		5774.9125	V	80.10
6567.9000	H	81.48		6599.9000	H	81.07
7388.8875	H	80.09		7424.8875	H	80.09
8209.8750	V	80.67		8249.8750	H	81.27

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Report: Y:\M\MOTOROLA\_Libertyville\_II\2122AUT9\2122AUT9TestReport\_iDEN.doc



Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)	Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)	Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
896.01875	0	0.00	900.98125	0	0.00	901.49375	0	0.00
1792.03750	V	69.53	1801.96250	V	68.23	1802.98750	V	68.13
2688.05625	V	78.71	2702.94375	V	77.40	2704.48125	V	76.60
3584.07500	V	83.11	3603.92500	H	83.81	3605.97500	V	83.21
4480.09375	H	82.09	4504.90625	H	82.96	4507.46875	H	82.96
5376.11250	H	80.56	5405.88750	V	77.24	5408.96250	H	76.64
6272.13125	V	81.83	6306.86875	V	82.45	6310.45625	H	80.85
7168.15000	H	81.64	7207.85000	V	81.56	7211.95000	V	81.96
8064.16875	H	79.50	8108.83125	V	80.41	8113.44375	V	80.91
8960.18750	H	77.42	9009.81250	V	78.42	9014.93750	V	77.92

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**FIELD STRENGTH OF SPURIOUS EMISSIONS – LOW POWER**

**Rule Parts. No.:** Part 2.1051(a), Pt 90, Pt 24, RSS-119, RSS-134

**Requirements:** 25kHz Channel Spacing =  $43+10\log(0.001) = 13$  dBc

**Test Data:**

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)		Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
806.0625	0	0.00		813.5625	0	0.00
1612.1250	H	55.55		1627.1250	V	55.84
2418.1875	H	57.81		2440.6875	V	56.75
3224.2500	V	52.36		3254.2500	H	53.74
4030.3125	V	51.48		4067.8125	V	53.53
4836.3750	V	50.76		4881.3750	V	50.12
5642.4375	H	46.80		5694.9375	H	46.24
6448.5000	V	51.40		6508.5000	V	49.85
7254.5625	H	48.56		7322.0625	H	48.59
8060.6250	H	50.14		8135.6250	H	49.08

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)		Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
820.9875	0	0.00		824.9875	0	0.00
1641.9750	V	54.23		1649.9750	H	55.03
2462.9625	V	56.45		2474.9625	V	55.25
3283.9500	H	53.42		3299.9500	V	52.82
4104.9375	H	52.75		4124.9375	H	51.05
4925.9250	V	51.81		4949.9250	V	52.11
5746.9125	H	47.74		5774.9125	V	49.04
6567.9000	V	51.71		6599.9000	H	49.21
7388.8875	H	48.83		7424.8875	H	47.83
8209.8750	H	50.61		8249.8750	V	50.11

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Report: Y:\M\MOTOROLA\_Libertyville\_II\2122AUT9\2122AUT9TestReport\_iDEN.doc



Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)	Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)	Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
896.01875	0	0.00	900.98125	0	0.00	901.49375	0	0.00
1792.03750	V	52.67	1801.96250	V	51.07	1802.98750	H	50.77
2688.05625	H	54.55	2702.94375	H	55.34	2704.48125	V	55.14
3584.07500	H	52.75	3603.92500	H	54.15	3605.97500	V	52.15
4480.09375	H	51.23	4504.90625	V	51.80	4507.46875	V	50.60
5376.11250	H	47.40	5405.88750	H	45.08	5408.96250	H	46.68
6272.13125	V	51.37	6306.86875	V	52.09	6310.45625	H	50.19
7168.15000	H	49.58	7207.85000	V	50.60	7211.95000	H	49.20
8064.16875	H	49.44	8108.83125	H	49.35	8113.44375	H	49.45
8960.18750	H	46.06	9009.81250	H	46.16	9014.93750	V	46.56

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