

FCC SAR Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : 9843
FCC ID : IHDT56VE5
STANDARD : FCC 47 CFR Part 2 (2.1093)
ANSI/IEEE C95.1-1992
IEEE 1528-2013

This is a data re-used report which is only valid together with the original test report. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and had been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.



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Approved by: Jones Tsai / Manager

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Revision History

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1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Motorola Mobility LLC, Mobile Cellular Phone, 9843** are as follows.

Equipment Class	Frequency Band		Highest SAR Summary			Highest Simultaneous Transmission 1g SAR (W/kg)
			Head (Separation 0mm)	Body-worn (Separation 10mm)	Hotspot (Separation 10mm)	
			1g SAR (W/kg)			
Licensed	GSM	GSM850	0.27	0.35	0.41	1.31
		GSM1900	0.16	0.65	0.86	
	WCDMA	Band V	0.39	0.42	0.57	
	LTE	Band 5	0.39	0.33	0.50	
DTS	WLAN	2.4GHz WLAN	0.91	0.15	0.15	1.31
NII		5GHz WLAN	0.10	<0.10	0.11	0.86
DSS	2.4GHz Band	Bluetooth		<0.10		0.69
Date of Testing:			2016/11/04 ~ 2016/11/05			

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.



2. Administration Data

Testing Site	
Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958

Applicant	
Company Name	Motorola Mobility LLC
Address	222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

Manufacturer	
Company Name	Motorola Mobility LLC
Address	222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

3. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r03
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Cellular Phone
Brand Name	Motorola
Model Name	9843
FCC ID	IHDT56VE5
IMEI Code	358958060021711/358958060021729
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 5: 824 MHz ~ 849 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
Mode	· GSM/GPRS/EGPRS · RMC/AMR 12.2Kbps · HSDPA · HSUPA · DC-HSDPA · HSPA+(16QAM uplink is not supported) · LTE: QPSK, 16QAM · 802.11b/g/n HT20 · 802.11a/n HT20/HT40 · Bluetooth v3.0 + EDR, Bluetooth v4.0 LE, Bluetooth v4.2 LE · NFC:ASK
HW Version	DVT2
SW Version	NPN25.94_1198
GSM / (E)GPRS Transfer mode	Class B – EUT cannot support Packet Switched and Circuit Switched Network simultaneously but can automatically switch between Packet and Circuit Switched Network.
EUT Stage	Identical Prototype
Remark: 1. 802.11n-HT40 is not supported in 2.4GHz WLAN. 2. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation. 3. This device 2.4GHz WLAN/5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports WiFi Direct (GC/GO), and 5.3GHz / 5.5GHz supports WiFi Direct (GC only). 4. This device does not support DTM operation. 5. This device supports GRPS/EGRPS mode up to multi-slot class 12. 6. When the phone is in talking mode, receiver worked, all WWAN power are full power. 7. The device employs proximity sensors that detect the presence of the user's body at the front or back faces of the device. when front or back body worn condition is detected, GSM1900 reduced power will be active. (P-sensor can't work at detecting presence of the user's body at the four edges of the device.) 8. When WLAN hotspot worked, WWAN GSM1900 reduced power will be active. 9. This device hotspot reduced power and P-sensor reduced power level are the same. So only show one reduced power level for hotspot reduced power and P-sensor reduced power for this application. 10. This device has 2 SIM slots and supports dual SIM dual Standby. The WWAN radio transmission will be enabled by either one SIM at a time (Single active).	

4.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05								
FCC ID	IHDT56VE5							
Equipment Name	Mobile Cellular Phone							
Operating Frequency Range of each LTE transmission band	LTE Band 5: 824 MHz ~ 849 MHz							
Channel Bandwidth	LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz							
uplink modulations used	QPSK, and 16QAM							
LTE Voice / Data requirements	Voice and Data							
LTE MPR permanently built-in by design	Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3							
	Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
		1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)							
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.							
Power reduction applied to satisfy SAR compliance	Yes, when operating in hotspot mode and P-sensor, GSM1900 power reduction is applied to satisfy SAR compliance.							
LTE Release Version	R10, Cat 6							

Transmission (H, M, L) channel numbers and frequencies in each LTE band								
LTE Band 5								
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844



4.3 Re-use of Measured Data

4.4.1 Introduction Section

This application re-uses data collected on a similar device. The subject device of this application (Model: 9843, FCC ID: IHDT56VE5) is electrically identical to the reference device (Model: 9840, 9841, FCC ID: IHDT56VE4) for the portions of the circuitry corresponding to the data being re-used, as treated by KDB Publication 178919 D01.

4.4.2 Difference Section

For details concerning the similarity with respect to component placement, mechanical/electrical design etc., please refer to the Operational Description.

The re-used RF data includes the following bands provided in Appendix A (Sporton RF Report No. FA6O1212-06 for the reference device Model: 9840,9841, FCC ID: IHDT56VE4):

- GSM850/1900
- WCDMA Band V
- LTE Band 5
- 2.4G/5GHz WLAN
- Bluetooth

Spot check for WWAN and WLAN are performed for ensure that SAR measurement for both device are the same. So, the original SAR value can represent this application.

4.4.3 Spot Check Verification Data Section

Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Original model (FCC ID: IHDT56VE1)				Spot check model (FCC ID: IHDT56VE5)				Deviation
											Average Power (dBm)	Tune-Up Limit (dBm)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Average Power (dBm)	Tune-Up Limit (dBm)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	
WLAN 2.4GHz	-	-	-	-	802.11b 1Mbps	Left Cheek	10mm	off	1	2412	16.39	16.50	0.869	0.914	16.25	16.5	0.676	0.734	-19.69%
WLAN 5GHz	-	-	-	-	Band4 802.11a 6Mbps	Left Cheek	0mm	off	165	5825	14.64	16	0.065	0.103	14.64	16	0.058	0.092	-10.68%
GSM 850	-	-	-	-	GSM 1 Tx slot	Left Side	10mm	off	189	836.4	33.21	33.50	0.383	0.409	32.87	33.50	0.347	0.401	-1.96%
GSM1900	-	-	-	-	GPRS 1 Tx slot	Bottom Side	10mm	on	512	1850.2	27.04	28.00	0.791	0.987	27.59	28.00	0.844	0.928	-5.98%
WCDMA V	-	-	-	-	RMC 12.2Kbps	Left Side	10mm	off	4132	826.4	22.94	24.00	0.449	0.573	23.04	24.00	0.401	0.500	-12.74%
LTE Band 5	10M	QPSK	1RB	25Offset	-	Left Side	10mm	off	20525	836.5	23.16	24.00	0.408	0.495	23.50	24.00	0.484	0.543	9.70%
WLAN 5.2GHz	-	-	-	-	802.11a 6Mbps	Back	10mm	off	40	5200	13.78	15	0.072	0.110	14.99	15	0.091	0.106	-3.64%
WLAN 5.3GHz	-	-	-	-	802.11a 6Mbps	Back	10mm	off	56	5280	13.8	15	0.051	0.078	14.15	15	0.053	0.074	-5.13%
WLAN 5.5GHz	-	-	-	-	802.11a 6Mbps	Back	10mm	off	100	5500	14.92	16	0.036	0.053	15.08	16	0.041	0.059	11.32%
Bluetooth	-	-	-	-	1Mbps	Front	10mm	off	39	2441	11.12	11.5	0.028	0.033	11.21	11.5	0.029	0.033	0.00%

Note: In the table above, all the deviation of SAR test results are compliant with uncertainty budget.

4.4.4 Reference detail Section

Equipment Class	Reference FCC ID	Folder Test/RF Exposure	Report Title/Section
PCE	IHDT56VE4	RF Exposure(FA6O1212-06)	All sections applicable
DSS	IHDT56VE4	RF Exposure(FA6O1212-06)	All sections applicable
DTS (BLE)	IHDT56VE4	RF Exposure(FA6O1212-06)	All sections applicable
DTS (WLAN 2.4GHz)	IHDT56VE4	RF Exposure(FA6O1212-06)	All sections applicable
NIII (WLAN 5GHz)	IHDT56VE4	RF Exposure(FA6O1212-06)	All sections applicable

5. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Portable Handset			Note
		Head	Body-worn	Hotspot	
1.	GSM Voice + WLAN2.4GHz	Yes	Yes		
2.	GPRS/EDGE + WLAN2.4GHz	Yes	Yes	Yes	Hotspot
3.	WCDMA + WLAN2.4GHz	Yes	Yes	Yes	Hotspot
4.	LTE + WLAN2.4GHz	Yes	Yes	Yes	Hotspot
5.	GSM Voice + WLAN5.3/5.5GHz	Yes	Yes		
6.	GPRS/EDGE + WLAN5.3/5.5GHz	Yes	Yes		WWAN VoIP
7.	WCDMA + WLAN5.3/5.5GHz	Yes	Yes		WWAN VoIP
8.	LTE + WLAN5.3/5.5GHz	Yes	Yes		WWAN VoIP
9.	GSM Voice + WLAN5.2/5.8GHz	Yes	Yes	Yes	
10.	GPRS/EDGE + WLAN5.2/5.8GHz	Yes	Yes	Yes	WWAN VoIP
11.	WCDMA + WLAN5.2/5.8GHz	Yes	Yes	Yes	WWAN VoIP
12.	LTE + WLAN5.2/5.8GHz	Yes	Yes	Yes	WWAN VoIP
13.	GSM Voice + WLAN5GHz+Bluetooth		Yes		
14.	GPRS/EDGE + WLAN5GHz+Bluetooth		Yes		WWAN VoIP
15.	WCDMA + WLAN5GHz+Bluetooth		Yes		WWAN VoIP
16.	LTE + WLAN5GHz+Bluetooth		Yes		WWAN VoIP

5.1 Head Exposure Conditions

WWAN Band		Exposure Position	1	2	3	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	SPLSR	Case No
			WWAN	2.4GHz WLAN	5GHz WLAN				
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)				
GSM	GSM850	Right Cheek	0.196	0.386	0.102	0.58	0.30		
		Right Tilted	0.176	0.914	0.102	1.09	0.28		
		Left Cheek	0.267	0.914	0.102	1.18	0.37		
		Left Tilted	0.162	0.516	0.045	0.68	0.21		
	GSM1900	Right Cheek	0.164	0.386	0.102	0.55	0.27		
		Right Tilted	0.072	0.914	0.102	0.99	0.17		
		Left Cheek	0.106	0.914	0.102	1.02	0.21		
		Left Tilted	0.039	0.516	0.045	0.56	0.08		
WCDMA	Band V	Right Cheek	0.278	0.386	0.102	0.66	0.38		
		Right Tilted	0.253	0.914	0.102	1.17	0.36		
		Left Cheek	0.392	0.914	0.102	1.31	0.49		
		Left Tilted	0.223	0.516	0.045	0.74	0.27		
LTE	Band 5	Right Cheek	0.250	0.386	0.102	0.64	0.35		
		Right Tilted	0.164	0.914	0.102	1.08	0.27		
		Left Cheek	0.388	0.914	0.102	1.30	0.49		
		Left Tilted	0.218	0.516	0.045	0.73	0.26		

5.2 Hotspot Exposure Conditions

WWAN Band		Exposure Position	1	2	3	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	SPLSR	Case No
			WWAN	2.4GHz WLAN	5GHz WLAN				
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)				
GSM	GSM850	Front	0.346	0.146	0.109	0.49	0.46		
		Back	0.315	0.146	0.109	0.46	0.42		
		Left side	0.409			0.41	0.41		
		Right side	0.222	0.146	0.109	0.37	0.33		
		Top side		0.146	0.109	0.15	0.11		
		Bottom side	0.212			0.21	0.21		
	GSM1900	Front	0.652	0.146	0.109	0.80	0.76		
		Back	0.427	0.146	0.109	0.57	0.54		
		Left side	0.066			0.07	0.07		
		Right side	0.046	0.146	0.109	0.19	0.16		
		Top side		0.146	0.109	0.15	0.11		
		Bottom side	0.856			0.86	0.86		
WCDMA	Band V	Front	0.417	0.146	0.109	0.56	0.53		
		Back	0.424	0.146	0.109	0.57	0.53		
		Left side	0.573			0.57	0.57		
		Right side	0.378	0.146	0.109	0.52	0.49		
		Top side		0.146	0.109	0.15	0.11		
		Bottom side	0.250			0.25	0.25		
LTE	Band 5	Front	0.326	0.146	0.109	0.47	0.44		
		Back	0.324	0.146	0.109	0.47	0.43		
		Left side	0.495			0.50	0.50		
		Right side	0.254	0.146	0.109	0.40	0.36		
		Top side		0.146	0.109	0.15	0.11		
		Bottom side	0.245			0.25	0.25		



5.3 Body-Worn Accessory Exposure Conditions

WWAN Band		Exposure Position	1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)	SPLSR	Case No
			WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth						
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	Bluetooth 1g SAR (W/kg)						
GSM	GSM850	Front	0.346	0.146	0.077	0.033	0.49	0.42	0.38	0.46		
		Back	0.315	0.146	0.077	0.026	0.46	0.39	0.34	0.42		
	GSM1900	Front	0.652	0.146	0.077	0.033	0.80	0.73	0.69	0.76		
		Back	0.427	0.146	0.077	0.026	0.57	0.50	0.45	0.53		
WCDMA	Band V	Front	0.417	0.146	0.077	0.033	0.56	0.49	0.45	0.53		
		Back	0.424	0.146	0.077	0.026	0.57	0.50	0.45	0.53		
LTE	Band 5	Front	0.326	0.146	0.077	0.033	0.47	0.40	0.36	0.44		
		Back	0.324	0.146	0.077	0.026	0.47	0.40	0.35	0.43		

Test Engineer: Nick Hu

6. References

- [1] FCC 47 CFR Part 2 "Frequency Allocations and Radio Treaty Matters; General Rules and Regulations"
- [2] ANSI/IEEE Std. C95.1-1992, "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz", September 1992
- [3] IEEE Std. 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", Sep 2013
- [4] SPEAG DASY System Handbook
- [5] FCC KDB 248227 D01 v02r02, "SAR Guidance for IEEE 802.11 (WiFi) Transmitters", Oct 2015.
- [6] FCC KDB 447498 D01 v06, "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies", Oct 2015
- [7] FCC KDB 648474 D04 v01r03, "SAR Evaluation Considerations for Wireless Handsets", Oct 2015.
- [8] FCC KDB 941225 D01 v03r01, "3G SAR MEAUREMENT PROCEDURES", Oct 2015
- [9] FCC KDB 941225 D05 v02r05, "SAR Evaluation Considerations for LTE Devices", Dec 2015
- [10] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.
- [11] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.
- [12] FCC KDB 865664 D02 v01r02, "RF Exposure Compliance Reporting and Documentation Considerations" Oct 2015.



Appendix A. Original Report

Please refer to Sporton report number FA6O1212-06 which is issued separately.