



DECLARATION OF COMPLIANCE SAR ASSESSMENT Part 2 of 4

Motorola Solutions Inc. EME Test Laboratory Motorola Solutions Malaysia Sdn Bhd Plot 2A, Medan Bayan Lepas, Mukim 12 SWD 11900 Bayan Lepas Penang, Malaysia.	Date of Report: 01/30/2023 Report Revision: I
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Report Author:	Kin Kting Lee (EME Technician)
Date/s Tested:	8/24/2022-8/30/2022, 9/4/2022-9/13/2022, 11/13/2022 – 11/25/2022
Manufacturer:	Motorola Solutions Inc.
DUT Description:	Handheld Portable – WAVE PTX TWO WAY RADIO
Test TX mode(s):	LTE, WCDMA, WLAN, BT / BT LE
Max. Power output:	Refer table 3 (Part 1 of 4)
Nominal Power output:	Refer table 3 (Part 1 of 4)
Tx Frequency Bands:	Refer table 3 (Part 1 of 4)
Signaling type:	QPSK, 16QAM, 64QAM, QPSK, DSSS, OFDM, SC-FDMA, RMC/AMR 12.2Kbps, HSDPA, HSUPA
Model(s) Tested:	HK2183A [HKUN4243A]
Model(s) Certified:	HK2183A [HKUN4243A], HK2184A [HKUN4245A]
Serial Number(s):	642QYQ0178, 642QYQ0141, 642QYU0102 and 642QYU0031
Firmware Version:	TAURUS_BASE_D00.00.02_APP_D00.01.63
Classification:	General Population / Uncontrolled Environment
Applicant Name:	Motorola Solutions Inc.
Applicant Address:	8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322
FCC ID:	AZ489FT7166
FCC Test Firm	
Registration Number:	823256
IC:	109U-89FT7166
ISED Test Site registration:	24843

The test results clearly demonstrate compliance with General Population / Uncontrolled RF Exposure limits of 1.6 W/kg averaged over 1 gram per the requirements of FCC 47 CFR § 2.1093 and RSS-102 (Issue 5)

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 (no deviation from standard methods). This report shall not be reproduced without written approval from an officially designated representative of the Motorola Solutions Inc 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-150 December 2004. The results and statements contained in this report pertain only to the device(s) evaluated.

 Saw Sun Hock (Approval Signatory) Approval Date: 01/30/2023	
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1.0 System Validation for WCDMA

The SAR measurement system was validated according to procedures in KDB 865664. The validation status summary Table is below.

Table 1

Dates	Probe Calibration Point	Probe SN	Measured Tissue Parameters		Validation			
			σ	ϵ_r	Sensitivity	Linearity	Isotropy	
CW								
06/23/2022	Head	835	7519	0.94	42.40	Pass	Pass	Pass
06/25/2022		1800		1.38	39.60	Pass	Pass	Pass
06/25/2022		1900		1.38	39.60	Pass	Pass	Pass

2.0 System Verification for WCDMA

System verification checks were conducted each day during the SAR assessment. The results are normalized to 1W. Appendix D includes DASY plots with the largest deviation from the qualified source SAR target for each dipole. The Table below summarizes the daily system check results used for the SAR assessment.

Table 2

Probe Serial #	Tissue Type	Dipole Kit / Serial #	Reference SAR @ 1W (W/kg)	System Check Results Measured (W/kg)	System Check Test Results when normalized to 1W (W/kg)	Tested Date
7519	IEEE/IEC Head	D835V2/4d092	9.84 +/- 10%	2.54	10.16	08/30/2022
				2.49	9.96	11/13/2022#
				0.31	9.65	11/24/2022#
		D1800V2/2d120	38.70 +/- 10%	9.62	38.48	08/30/2022
				1.20	37.97	11/14/2022#
				1.22	38.61	11/24/2022#
D1900V2/5d065	40.50 +/- 10%	9.69	38.76	08/29/2022		

Note: # denotes that the system verification check covers next testing day (within 24 hours)

3.0 Equivalent Tissue Test Results for LTE

Simulated tissue prepared for SAR measurements are measured daily and within 24 hours of SAR testing to verify that the tissue is within +/- 5% of target parameters for each tested channel. The table below summarizes the measured tissue parameters used for the SAR assessment.

Table 3

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
826	IEEE/IEC Head	0.9 (0.85-0.94)	41.5 (39.5-43.6)	0.92	40.5	08/30/2022
				0.87	42.3	11/13/2022#
				0.87	40.4	11/24/2022#
835		0.9 (0.86-0.95)	41.5 (39.4-43.6)	0.92	40.5	08/30/2022
				0.88	42.3	11/13/2022#
				0.87	40.4	11/24/2022#
836		0.9 (0.86-0.95)	41.5 (39.4-43.6)	0.92	40.5	08/30/2022
847		0.91 (0.87-0.96)	41.5 (39.4-43.6)	0.93	40.4	08/30/2022
1712		1.35 (1.28-1.42)	40.1 (38.1-42.1)	1.29	38.3	08/30/2022
1733		1.36 (1.29-1.43)	40.1 (38.1-42.1)	1.30	38.3	08/30/2022
1753		1.37 (1.3-1.44)	40.1 (38.1-42.1)	1.31	38.3	08/30/2022
				1.33	38.8	11/13/2022#
				1.32	40.5	11/24/2022#
1800		1.4 (1.33-1.47)	40 (38-42)	1.34	38.2	08/30/2022
				1.35	38.7	11/13/2022#
	1.34			40.4	11/24/2022#	
1852	1.4 (1.33-1.47)	40 (38-42)	1.40	39.5	08/29/2022	
1880	1.4 (1.33-1.47)	40 (38-42)	1.40	39.5	08/29/2022	
			1.38	38.9	11/13/2022#	
1900	1.4 (1.33-1.47)	40 (38-42)	1.43	39.5	08/29/2022	
1908	1.4 (1.33-1.47)	40 (38-42)	1.43	39.5	08/29/2022	

Note: # denotes that the tissue date covers next testing day (within 24 hours)

4.0 DUT Test Data for WCDMA

Per KDB 941225 D01 v03r01, for SAR testing is measure using a 12.2 kbps RMC with TPC bits configured to all “1’s”.

Per KDB 941225 D01 v03r01, 12.2 kbps RMC setting is use to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA is $\leq \frac{1}{4}$ dB higher than the 12.2 kbps RMC or when the highest reported SAR of the 12.2 kbps RMC is scale by the ratio of the specified maximum output power and tune-up tolerance of HSDPA / HSUPA to 12.2 kbps RMC and the adjusted SAR is ≤ 1.2 W/kg.

SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following output power, the output power results of the secondary modes (HSDPA / HSUPA) are less than $\frac{1}{4}$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA.

4.1 SAR assessment for WCDMA Band 2 (1850 – 1910 MHz)

Output Power Data

These power measurements were used to determine the necessary modes for SAR testing according to KDB 941225.

Table 4

3GPP Release Version	Radio Config.	Low (MHz)	Mid (MHz)	High (MHz)	Max Tune-Up Power (dBm)
		1852.4	1880.0	1907.6	
REL99	12.2 Kbps RMC	23.98	23.90	23.99	24.50
REL99	12.2kbps AMR	22.57	22.63	22.91	24.50
REL5	HSDPA Subtest 1	23.29	23.22	23.30	24.50
REL5	HSDPA Subtest 2	22.90	22.90	22.99	24.50
REL5	HSDPA Subtest 3	22.05	22.01	22.23	24.00
REL5	HSDPA Subtest 4	22.20	22.13	22.40	24.00
REL6	HSUPA Subtest 1	22.92	22.75	23.16	24.50
REL6	HSUPA Subtest 2	22.03	21.98	22.31	22.50
REL6	HSUPA Subtest 3	22.42	21.58	22.43	23.50
REL6	HSUPA Subtest 4	22.43	22.44	22.42	22.50
REL6	HSUPA Subtest 5	23.30	23.03	23.12	24.50

Assessments at the Body

Table below presents the data of the body assessment. SAR plot is included in Appendix D for the highest configuration (bolded).

Table 5

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
HKAN4005A	PMNN4578A	PMLN7128A	None	1907.6000	0.251	-0.45	0.345	0.430	BAD-AB-220829-05
HKAN4005A	PMNN4578A	PMLN8439A	None	1907.6000	0.251	-0.28	0.313	0.375	BAD-AB-220829-06

Assessments at the Face

Table below presents the data of the Face assessment. SAR plot is included in Appendix D for the highest configuration (bolded).

Table 6

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
HKAN4005A	PMNN4578A	None	None	1907.6000	0.251	-0.06	0.232	0.264	BAD-FACE-220829-09

Additional Assessments for ISED Canada

As per ISED Notice 2016-DRS001, additional tests were required for the low, mid and high frequency channels for the configuration with the highest SAR value. The SAR results are in Tables below. SAR plot is included in Appendix D for the highest configuration (bolded).

Table 7

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
Body									
HKAN4005A	PMNN4578A	PMLN7128A	None	1852.4000	0.250	-0.34	0.357	0.435	BAD-AB-220829-07
				1880.0000	0.221	-0.07	0.388	0.448	DAN-AB-221114-09#
				1907.6000	0.251	-0.45	0.345	0.430	BAD-AB-220829-05
Face									
HKAN4005A	PMNN4578A	None	None	1852.4000	0.209	-0.35	0.281	0.365	DAN-FACE-221114-11#
				1880.0000	0.246	-0.05	0.243	0.282	BAD-FACE-220829-11
				1907.6000	0.251	-0.45	0.232	0.264	BAD-AB-220829-05

4.2 SAR assessment for WCDMA Band 4 (1710 – 1755 MHz)

Output Power Data

These power measurements were used to determine the necessary modes for SAR testing according to KDB 941225.

Table 8

3GPP Release Version	Radio Config.	Low (MHz)	Mid (MHz)	High (MHz)	Max Tune-Up Power (dBm)
		1712.4	1732.6	1752.6	
REL99	12.2 Kbps RMC	24.33	24.28	24.34	24.50
REL99	12.2kbps AMR	23.30	23.00	23.17	24.50
REL5	HSDPA Subtest 1	22.71	22.72	22.71	24.50
REL5	HSDPA Subtest 2	23.73	23.67	23.61	24.50
REL5	HSDPA Subtest 3	23.81	23.68	23.63	24.00
REL5	HSDPA Subtest 4	23.29	23.12	23.18	24.00
REL6	HSUPA Subtest 1	23.02	23.28	23.63	24.50
REL6	HSUPA Subtest 2	22.24	22.19	22.27	22.50
REL6	HSUPA Subtest 3	21.95	22.80	21.92	23.50
REL6	HSUPA Subtest 4	22.48	22.50	22.47	22.50
REL6	HSUPA Subtest 5	23.09	23.29	23.10	24.50

Assessments at the Body

Table below presents the data of the body assessment. SAR plot is included in Appendix D for the highest configuration (bolded).

Table 9

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
HKAN4005A	PMNN4578A	PMLN7128A	None	1752.6000	0.188	-0.03	0.364	0.491	DAN-AB-221114-10#
HKAN4005A	PMNN4578A	PMLN8439A	None	1752.6000	0.272	-0.11	0.311	0.330	BAD-AB-220830-12

Assessments at the Face

Table below presents the data of the Face assessment. SAR plot is included in Appendix D for the highest configuration (bolded).

Table 10

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
HKAN4005A	PMNN4578A	None	None	1752.6000	0.188	0.14	0.284	0.380	DAN-FACE-221125-05#

Additional Assessments for ISED Canada

As per ISED Notice 2016-DRS001, additional tests were required for the low, mid and high frequency channels for the configuration with the highest SAR value. The SAR results are in Tables below. SAR plot is included in Appendix D for the highest configuration (bolded).

Table 11

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
Body									
HKAN4005A	PMNN4578A	PMLN7128A	None	1712.4000	0.271	-0.23	0.204	0.224	IRA-AB-220830-13
HKAN4005A	PMNN4578A	PMLN7128A	None	1732.6000	0.268	-0.03	0.255	0.270	IRA-AB-220830-14
HKAN4005A	PMNN4578A	PMLN7128A	None	1752.6000	0.188	-0.03	0.364	0.491	DAN-AB-221114-10#
Face									
HKAN4005A	PMNN4578A	None	None	1712.4000	0.271	0.12	0.163	0.169	IRA-FACE-220830-16
HKAN4005A	PMNN4578A	None	None	1732.6000	0.268	0.13	0.198	0.208	IRA-FACE-220830-17
HKAN4005A	PMNN4578A	None	None	1752.6000	0.188	0.14	0.284	0.380	DAN-FACE-221125-05#

4.3 SAR assessment for WCDMA Band 5 (824 – 849 MHz)

Output Power Data

These power measurements were used to determine the necessary modes for SAR testing according to KDB 941225.

Table 12

3GPP Release Version	Radio Config.	Low (MHz)	Mid (MHz)	High (MHz)	Max Tune-Up Power (dBm)
		826.4	836.4	846.6	
REL99	12.2 Kbps RMC	23.80	23.86	23.84	24.50
REL99	12.2kbps AMR	22.91	22.84	22.88	24.50
REL5	HSDPA Subtest 1	23.30	23.25	23.30	24.50
REL5	HSDPA Subtest 2	23.28	23.21	23.29	24.50
REL5	HSDPA Subtest 3	23.32	23.30	23.22	24.00
REL5	HSDPA Subtest 4	22.67	22.51	22.61	24.00
REL6	HSUPA Subtest 1	23.18	23.01	23.10	24.50
REL6	HSUPA Subtest 2	22.38	22.42	22.07	22.50
REL6	HSUPA Subtest 3	22.30	22.27	21.50	23.50
REL6	HSUPA Subtest 4	21.79	21.86	22.02	22.50
REL6	HSUPA Subtest 5	22.80	22.83	23.07	24.50

Assessments at the Body

Table below presents the data of the body assessment. SAR plot is included in Appendix D for the highest configuration (bolded).

Table 13

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
HKAN4005A	PMNN4578A	PMLN7128A	None	836.4000	0.243	-0.40	0.340	0.432	BAD-AB-220830-03
HKAN4005A	PMNN4578A	PMLN8439A	None	836.4000	0.243	-0.24	0.367	0.450	BAD-AB-220830-04

Assessments at the Face

Table below presents the data of the Face assessment. SAR plot is included in Appendix D for the highest configuration (bolded).

Table 14

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
HKAN4005A	PMNN4578A	None	None	836.4000	0.243	-0.01	0.244	0.284	BAD-FACE-220830-07

Additional Assessments for ISED Canada

As per ISED Notice 2016-DRS001, additional tests were required for the low, mid and high frequency channels for the configuration with the highest SAR value. The SAR results are in Tables below. SAR plot is included in Appendix D for the highest configuration (bolded).

Table 15

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
Body									
HKAN4005A	PMNN4578A	PMLN7128A	None	826.4000	0.221	-0.35	0.462	0.569	IRA-AB-221114-02#
HKAN4005A	PMNN4578A	PMLN7128A	None	836.4000	0.282	-0.24	0.367	0.450	BAD-AB-220830-04
HKAN4005A	PMNN4578A	PMLN7128A	None	846.6000	0.282	-0.39	0.366	0.466	BAD-AB-220830-06
Face									
HKAN4005A	PMNN4578A	None	None	826.4000	0.221	-0.39	0.237	0.295	DAN-FACE-221125-03#
HKAN4005A	PMNN4578A	None	None	836.4000	0.243	-0.01	0.244	0.284	BAD-FACE-220830-07
HKAN4005A	PMNN4578A	None	None	846.6000	0.242	0.04	0.217	0.253	BAD-FACE-220830-09

5.0 Variability Assessment

Per the guidelines in KDB 865664 SAR variability assessment is not required because SAR results are below 0.8W/kg (General population).