APPENDIX E: SAR SYSTEM VALIDATION

Per FCC KDB Publication 865664 D02v01r02, SAR system validation status should be documented to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters has been included.

Table E-1
SAR System Validation Summary – 1g Head

SAR System	Freq. (MHz)	Date	Probe SN	Probe Cal Point		Cond. (σ)	Perm. (εr)	CW VALIDATION			MOD. VALIDATION		
								SENSITIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
D	750	02/02/2021	3589	750	Head	0.897	41.457	PASS	PASS	PASS	N/A	N/A	N/A
A	750	08/13/2021	7406	750	Head	0.896	40.771	PASS	PASS	PASS	N/A	N/A	N/A
D	835	02/02/2021	3589	835	Head	0.927	41.192	PASS	PASS	PASS	GMSK	PASS	N/A
J	835	06/01/2021	7526	835	Head	0.932	41.465	PASS	PASS	PASS	GMSK	PASS	N/A
A	835	08/17/2021	7406	835	Head	0.930	41.121	PASS	PASS	PASS	GMSK	PASS	N/A
P	1750	09/09/2020	7308	1750	Head	1.384	41.983	PASS	PASS	PASS	N/A	N/A	N/A
J	1750	04/02/2021	7526	1750	Head	1.364	41.162	PASS	PASS	PASS	N/A	N/A	N/A
J	1900	04/02/2021	7526	1900	Head	1.446	40.380	PASS	PASS	PASS	GMSK	PASS	N/A
B	1900	08/19/2021	7660	1900	Head	1.456	38.927	PASS	PASS	PASS	GMSK	PASS	N/A
E	2300	01/07/2021	7571	2300	Head	1.672	40.318	PASS	PASS	PASS	N/A	N/A	N/A
E	2450	01/07/2021	7571	2450	Head	1.847	39.716	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
B	2450	08/12/2021	7660	2450	Head	1.856	39.026	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
E	2600	01/07/2021	7571	2600	Head	2.025	39.117	PASS	PASS	PASS	TDD	PASS	N/A
B	2600	08/11/2021	7660	2600	Head	1.972	38.826	PASS	PASS	PASS	TDD	PASS	N/A
L	3500	08/10/2021	7539	3500	Head	2.783	38.261	PASS	PASS	PASS	TDD	PASS	N/A
L	3700	08/10/2021	7539	3700	Head	2.966	37.937	PASS	PASS	PASS	TDD	PASS	N/A
K	5250	03/24/2021	7538	5250	Head	4.577	36.451	PASS	PASS	PASS	OFDM	N/A	PASS
K	5600	03/24/2021	7538	5600	Head	4.972	37.736	PASS	PASS	PASS	OFDM	N/A	PASS
K	5750	03/24/2021	7538	5750	Head	5.166	35.643	PASS	PASS	PASS	OFDM	N/A	PASS

Table E-2
SAR System Validation Summary – 1g Body

SAR System	Freq. (MHz)	Date	Probe SN	Probe Cal Point		Cond. (σ)	Perm. (εr)	CW VALIDATION			MOD. VALIDATION		
								SENSITIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
G	750	05/27/2021	7357	750	Body	0.997	53.630	PASS	PASS	PASS	N/A	N/A	N/A
H	835	07/04/2021	7409	835	Body	0.938	52.574	PASS	PASS	PASS	GMSK	PASS	N/A
E	835	03/04/2021	7571	835	Body	0.943	54.670	PASS	PASS	PASS	GMSK	PASS	N/A
P	1750	09/08/2020	7308	1750	Body	1.478	52.861	PASS	PASS	PASS	N/A	N/A	N/A
H	1900	03/31/2021	7410	1900	Body	1.570	53.138	PASS	PASS	PASS	GMSK	PASS	N/A
I	1900	01/05/2021	7551	1900	Body	1.520	53.063	PASS	PASS	PASS	GMSK	PASS	N/A
P	1900	08/09/2021	7410	1900	Body	1.579	52.750	PASS	PASS	PASS	GMSK	PASS	N/A
P	1900	08/23/2021	7410	1900	Body	1.582	52.060	PASS	PASS	PASS	GMSK	PASS	N/A
O	1900	08/19/2021	7659	1900	Body	1.556	52.436	PASS	PASS	PASS	GMSK	PASS	N/A
K	2300	03/26/2021	7538	2300	Body	1.791	51.401	PASS	PASS	PASS	N/A	N/A	N/A
L	2300	07/06/2021	7539	2300	Body	1.741	52.641	PASS	PASS	PASS	N/A	N/A	N/A
J	2300	08/10/2021	7526	2300	Body	1.875	53.366	PASS	PASS	PASS	N/A	N/A	N/A
K	2450	03/26/2021	7538	2450	Body	1.962	51.166	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
L	2450	03/30/2021	7539	2450	Body	2.017	50.784	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
J	2450	08/09/2021	7526	2450	Body	2.006	51.654	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
K	2600	03/26/2021	7538	2600	Body	2.150	50.900	PASS	PASS	PASS	TDD	PASS	N/A
J	2600	08/10/2021	7526	2600	Body	2.137	53.008	PASS	PASS	PASS	TDD	PASS	N/A
I	3500	08/03/2021	7551	3500	Body	3.325	49.471	PASS	PASS	PASS	TDD	PASS	N/A
I	3700	08/03/2021	7551	3700	Body	3.515	49.242	PASS	PASS	PASS	TDD	PASS	N/A
J	5250	03/22/2021	7526	5250	Body	5.322	47.650	PASS	PASS	PASS	OFDM	N/A	PASS
J	5250	08/10/2021	7526	5250	Body	5.412	48.914	PASS	PASS	PASS	OFDM	N/A	PASS
J	5600	03/22/2021	7526	5600	Body	5.811	47.004	PASS	PASS	PASS	OFDM	N/A	PASS
J	5600	08/10/2021	7526	5600	Body	5.925	48.311	PASS	PASS	PASS	OFDM	N/A	PASS
J	5750	03/22/2021	7526	5750	Body	6.027	46.709	PASS	PASS	PASS	OFDM	N/A	PASS
J	5750	08/11/2021	7526	5750	Body	6.084	46.123	PASS	PASS	PASS	OFDM	N/A	PASS

Table E-3
SAR System Validation Summary – 10g

SAR System	Freq. (MHz)	Date	Probe SN	Probe Cal Point		Cond. (σ)	Perm. (εr)	CW VALIDATION			MOD. VALIDATION		
								SENSITIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
H	835	07/04/2021	7409	835	Body	0.938	52.574	PASS	PASS	PASS	GMSK	PASS	N/A
P	1750	09/08/2020	7308	1750	Body	1.478	52.861	PASS	PASS	PASS	N/A	N/A	N/A
P	1900	08/23/2021	7410	1900	Body	1.582	52.060	PASS	PASS	PASS	GMSK	PASS	N/A
K	2450	03/26/2021	7538	2450	Body	1.962	51.166	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
J	2450	08/09/2021	7526	2450	Body	2.006	51.654	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
K	2600	03/26/2021	7538	2600	Body	2.150	50.900	PASS	PASS	PASS	TDD	PASS	N/A
J	2600	08/10/2021	7526	2600	Body	2.137	53.008	PASS	PASS	PASS	TDD	PASS	N/A
J	5250	03/22/2021	7526	5250	Body	5.322	47.650	PASS	PASS	PASS	OFDM	N/A	PASS
J	5250	08/10/2021	7526	5250	Body	5.412	48.914	PASS	PASS	PASS	OFDM	N/A	PASS
J	5600	03/22/2021	7526	5600	Body	5.811	47.004	PASS	PASS	PASS	OFDM	N/A	PASS
J	5600	08/10/2021	7526	5600	Body	5.925	48.311	PASS	PASS	PASS	OFDM	N/A	PASS
J	5750	03/22/2021	7526	5750	Body	6.027	46.709	PASS	PASS	PASS	OFDM	N/A	PASS
J	5750	08/11/2021	7526	5750	Body	6.084	46.123	PASS	PASS	PASS	OFDM	N/A	PASS

NOTE: Probes have been calibrated for both CW and modulated signals. Modulations in the table above represent test configurations for which the measurement system has been validated per FCC KDB Publication 865664 D01v01r04 for scenarios when CW probe calibrations are used with other signal types. SAR systems were validated for modulated signals with a periodic duty cycle, such as GMSK, or with a high peak to average ratio (>5 dB), such as OFDM according to FCC KDB Publication 865664 D01v01r04.