

Measurement Certificate / Material Test

Item Name **Body Tissue Simulating Liquid (MBBL600-6000V6)**
 Product No. **SL AAM U16 BC (Batch: 181029-1)**
 Manufacturer **SPEAG**

Measurement Method

TSL dielectric parameters measured using calibrated DAK probe.

Target Parameters

Target parameters as defined in the KDB 865664 compliance standard.

Test Condition

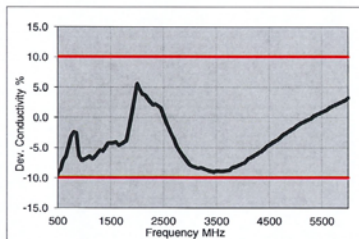
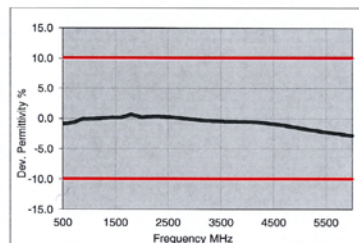
Ambient Condition **22°C ; 30% humidity**
 TSL Temperature **22°C**
 Test Date **30-Oct-18**
 Operator **CL**

Additional Information

TSL Density
 TSL Heat-capacity

Results

f [MHz]	Measured			Target		Diff. to Target [%]	
	e'	e''	sigma	eps	sigma	Δ-eps	Δ-sigma
800	55.1	21.3	0.95	55.3	0.97	-0.4	-2.1
825	55.1	20.8	0.98	55.2	0.98	-0.3	-2.0
835	55.1	20.6	0.98	55.1	0.99	0.0	-2.5
850	55.1	20.4	0.98	55.2	0.99	-0.1	-3.0
900	55.0	19.7	0.98	55.0	1.05	0.0	-6.7
1400	54.2	15.6	1.22	54.1	1.28	0.2	-4.7
1450	54.1	15.4	1.24	54.0	1.30	0.2	-4.6
1500	54.1	15.3	1.27	53.9	1.33	0.3	-4.5
1550	54.0	15.1	1.30	53.9	1.36	0.2	-4.4
1600	53.9	15.0	1.33	53.8	1.39	0.2	-4.3
1625	53.9	14.9	1.35	53.8	1.41	0.3	-4.3
1640	53.9	14.9	1.36	53.7	1.42	0.3	-4.2
1650	53.8	14.9	1.36	53.7	1.43	0.2	-4.9
1700	53.8	14.8	1.40	53.6	1.46	0.4	-4.1
1750	53.7	14.7	1.43	53.4	1.49	0.5	-4.0
1800	53.7	14.6	1.46	53.3	1.52	0.8	-3.9
1810	53.7	14.6	1.47	53.3	1.52	0.8	-3.3
1825	53.7	14.6	1.48	53.3	1.52	0.8	-2.6
1850	53.6	14.5	1.50	53.3	1.52	0.6	-1.3
1900	53.5	14.5	1.53	53.3	1.52	0.4	0.7
1950	53.5	14.5	1.57	53.3	1.52	0.4	3.3
2000	53.4	14.4	1.60	53.3	1.52	0.2	5.3
2050	53.4	14.4	1.64	53.2	1.57	0.3	4.5
2100	53.3	14.4	1.68	53.2	1.62	0.2	3.7
2150	53.3	14.4	1.72	53.1	1.66	0.4	3.6
2200	53.2	14.4	1.76	53.0	1.71	0.3	2.9
2250	53.1	14.4	1.81	53.0	1.76	0.2	2.8
2300	53.1	14.4	1.85	52.9	1.81	0.4	2.2
2350	53.0	14.5	1.89	52.8	1.85	0.3	2.2
2400	52.9	14.5	1.94	52.8	1.90	0.2	2.1
2450	52.9	14.5	1.98	52.7	1.95	0.4	1.5
2500	52.8	14.6	2.03	52.6	2.02	0.3	0.5
2550	52.7	14.6	2.07	52.6	2.09	0.2	-1.0
2600	52.6	14.7	2.12	52.5	2.16	0.2	-1.9



3500	51.1	15.5	3.02	51.3	3.31	-0.4	-8.8
3700	50.8	15.7	3.24	51.1	3.55	-0.5	-8.8
5200	48.1	18.2	5.27	49.0	5.30	-1.8	-0.6
5250	48.0	18.3	5.34	49.0	5.36	-1.9	-0.4
5300	47.9	18.4	5.41	48.9	5.42	-2.0	-0.2
5500	47.5	18.6	5.70	48.6	5.65	-2.2	0.8
5600	47.3	18.8	5.84	48.5	5.77	-2.3	1.3
5700	47.1	18.9	5.99	48.3	5.88	-2.5	1.8
5800	47.0	19.0	6.14	48.2	6.00	-2.6	2.3

TSL Dielectric Parameters

1

Figure D-2
 750 – 5800 MHz Body Tissue Equivalent Matter

FCC ID: ZNFX320PM		SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 06/27/19-07/15/19	DUT Type: Portable Handset			APPENDIX D: Page 2 of 3

Measurement Certificate / Material Test

Item Name **Head Tissue Simulating Liquid (HBBL600-10000V6)**
 Product No. **SL AAH U16 BC (Batch: 181031-2)**
 Manufacturer **SPEAG**

Measurement Method

TSL dielectric parameters measured using calibrated DAK probe.

Target Parameters

Target parameters as defined in the IEEE 1528 and IEC 62209 compliance standards.

Test Condition

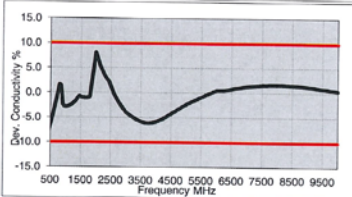
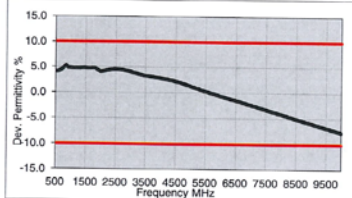
Ambient Condition **22°C ; 30% humidity**
 TSL Temperature **22°C**
 Test Date **31-Oct-18**
 Operator **CL**

Additional Information

TSL Density
 TSL Heat-capacity

Results

f [MHz]	Measured			Target		Diff.to Target [%]	
	e'	e''	sigma	eps	sigma	Δ-eps	Δ-sigma
800	43.8	20.5	0.91	41.7	0.90	5.1	1.4
825	43.8	20.1	0.92	41.6	0.91	5.3	1.5
835	43.8	19.9	0.93	41.5	0.91	5.4	2.0
850	43.7	19.7	0.93	41.5	0.92	5.3	1.5
900	43.5	18.9	0.95	41.5	0.97	4.8	-2.1
1400	42.5	15.0	1.17	40.6	1.18	4.7	-0.8
1450	42.5	14.8	1.19	40.5	1.20	4.9	-0.8
1600	42.2	14.3	1.27	40.3	1.28	4.7	-1.1
1625	42.2	14.2	1.29	40.3	1.30	4.8	-0.7
1640	42.2	14.2	1.30	40.3	1.31	4.8	-0.5
1650	42.1	14.2	1.30	40.2	1.31	4.6	-1.0
1700	42.1	14.0	1.33	40.2	1.34	4.8	-0.9
1750	42.0	13.9	1.36	40.1	1.37	4.8	-0.8
1800	41.9	13.9	1.39	40.0	1.40	4.7	-0.7
1810	41.9	13.8	1.40	40.0	1.40	4.7	0.0
1825	41.9	13.8	1.41	40.0	1.40	4.7	0.7
1850	41.8	13.8	1.42	40.0	1.40	4.5	1.4
1900	41.8	13.7	1.45	40.0	1.40	4.5	3.6
1950	41.7	13.7	1.48	40.0	1.40	4.3	5.7
2000	41.6	13.6	1.51	40.0	1.40	4.0	7.9
2050	41.6	13.6	1.55	39.9	1.44	4.2	7.3
2100	41.5	13.5	1.58	39.8	1.49	4.2	6.1
2150	41.4	13.5	1.62	39.7	1.53	4.2	5.7
2200	41.4	13.5	1.65	39.6	1.58	4.4	4.6
2250	41.3	13.5	1.69	39.6	1.62	4.4	4.2
2300	41.2	13.5	1.72	39.5	1.67	4.4	3.2
2350	41.1	13.5	1.76	39.4	1.71	4.4	2.9
2400	41.1	13.5	1.80	39.3	1.76	4.6	2.5
2450	41.0	13.5	1.84	39.2	1.80	4.6	2.2
2500	40.9	13.5	1.88	39.1	1.85	4.5	1.4
2550	40.8	13.5	1.92	39.1	1.91	4.4	0.6
2600	40.8	13.6	1.96	39.0	1.96	4.6	-0.2
3500	39.2	14.1	2.74	37.9	2.91	3.3	-5.8
3700	38.9	14.2	2.93	37.7	3.12	3.1	-6.1



5200	36.3	15.8	4.57	36.0	4.66	0.9	-1.7
5250	36.2	15.9	4.63	35.9	4.71	0.8	-1.6
5300	36.1	15.9	4.69	35.9	4.76	0.7	-1.4
5500	35.8	16.1	4.92	35.6	4.96	0.3	-0.9
5600	35.6	16.2	5.04	35.5	5.07	0.1	-0.6
5700	35.4	16.2	5.15	35.4	5.17	0.0	-0.3
5800	35.2	16.3	5.27	35.3	5.27	-0.2	0.0
6000	34.9	16.5	5.50	35.1	5.48	-0.6	0.5
6500	34.0	16.9	6.12	34.5	6.07	-1.4	0.9
7000	33.1	17.3	6.74	33.9	6.65	-2.3	1.3
7500	32.2	17.6	7.36	33.3	7.24	-3.2	1.6
8000	31.4	17.9	7.97	32.7	7.84	-4.1	1.7
8500	30.5	18.2	8.59	32.1	8.45	-5.0	1.6
9000	29.7	18.4	9.20	31.5	9.08	-5.9	1.3
9500	28.9	18.5	9.80	31.0	9.71	-6.8	0.9
10000	28.1	18.7	10.40	30.4	10.36	-7.6	0.4

Figure D-3
750 – 5800 MHz Head Tissue Equivalent Matter

FCC ID: ZNFX320PM		SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 06/27/19-07/15/19	DUT Type: Portable Handset			APPENDIX D: Page 3 of 3

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

SAR SYSTEM #	FREQ. [MHz]	DATE	PROBE SN	PROBE CAL. POINT	COND.	PERM.	CW VALIDATION			MOD. VALIDATION		
					(σ)	(ϵ_r)	SENSITIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
E	750	2/6/2019	3589	750	Head	0.891	43.677	PASS	PASS	PASS	N/A	N/A
H	835	6/6/2019	7406	835	Head	0.93	43.8	PASS	PASS	PASS	GMSK	PASS
E	1750	2/6/2019	3589	1750	Head	1.363	41.67	PASS	PASS	PASS	N/A	N/A
G	1900	7/3/2019	7409	1900	Head	1.46	40.732	PASS	PASS	PASS	GMSK	PASS
E	2450	2/5/2019	3589	2450	Head	1.825	39.836	PASS	PASS	PASS	OFDM/TDD	PASS
E	2600	2/7/2019	3589	2600	Head	1.964	40.46	PASS	PASS	PASS	TDD	PASS
D	750	7/2/2019	3914	750	Body	0.945	57.55	PASS	PASS	PASS	N/A	N/A
O	835	7/3/2019	7538	835	Body	0.972	55.349	PASS	PASS	PASS	GMSK	PASS
I	1750	5/21/2019	7357	1750	Body	1.442	55.384	PASS	PASS	PASS	N/A	N/A
G	1750	7/11/2019	7409	1750	Body	1.445	53.92	PASS	PASS	PASS	N/A	N/A
J	1900	2/8/2019	7488	1900	Body	1.571	52.538	PASS	PASS	PASS	GMSK	PASS
K	2450	3/6/2019	7417	2450	Body	2.039	50.67	PASS	PASS	PASS	OFDM/TDD	PASS
K	2600	3/6/2019	7417	2600	Body	2.224	50.17	PASS	PASS	PASS	TDD	PASS

NOTE: While the probes have been calibrated for both CW and modulated signals, all measurements were performed using communication systems calibrated for CW signals only. 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.

FCC ID: ZNFX320PM		SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 06/27/19 - 07/15/19	DUT Type: Portable Handset			APPENDIX E: Page 1 of 1

APPENDIX G: DOWNLINK LTE CA RF CONDUCTED POWERS

1.1 LTE Downlink Only Carrier Aggregation Test Reduction Methodology

SAR test exclusion for LTE downlink Carrier Aggregation is determined by power measurements according to the number of component carriers (CCs) supported by the product implementation. Per April 2018 TCBC Workshop Notes, the following test reduction methodology was applied to determine the combinations required for conducted power measurements.

LTE DLCA Test Reduction Methodology:

- The supported combinations were arranged by the number of component carriers in columns.
- Any limitations on the PCC or SCC for each combination were identified alongside the combination (e.g. CA_2A-2A-4A-12A, but B12 can only be configured as a SCC).
- Power measurements were performed for "supersets" (LTE CA combinations with multiple components carriers) and any "subsets" (LTE CA combinations with fewer component carriers) that were not completely covered by the supersets.
- Only subsets that have the exact same components as a superset were excluded for measurement.
- When there were certain restrictions on component carriers that existed in the superset that were not applied for the subset, the subset configuration was additionally evaluated.
- Both inter-band and intra-band downlink carrier aggregation scenarios were considered.

Table 1 – Example of Exclusion Table for SISO Configurations

Table 1 - Examples of Non-Compliance Data for the 2023 Reporting Period																		
Case ID		ICC	Supervision Order Breach(s) (s/s)	Responsible	Compliance Covered by Measurement Support	Notes	Case ID		ICC	Supervision Order Breach(s) (s/s)	Responsible	Compliance Covered by Measurement Support	Notes					
Case ID	ICC	Supervision Order Breach(s) (s/s)	Responsible	Compliance Covered by Measurement Support	Notes	Case ID	ICC	Supervision Order Breach(s) (s/s)	Responsible	Compliance Covered by Measurement Support	Notes	Case ID	ICC	Supervision Order Breach(s) (s/s)	Responsible	Compliance Covered by Measurement Support	Notes	
ICC-01	CA-20-100	1.01.15.10, 1.01.15.20	ICC-01	ICC-01	ICC-01	ICC-01	ICC-01	CA-20-100-001	1.01.15.10, 1.01.15.20	ICC-01	ICC-01	ICC-01	ICC-01	CA-20-100-002	1.01.15.10, 1.01.15.20	ICC-01	ICC-01	ICC-01
ICC-02	CA-20-101	1.01.15.10, 1.01.15.20	ICC-02	ICC-02	ICC-02	ICC-02	ICC-02	CA-20-101-001	1.01.15.10, 1.01.15.20	ICC-02	ICC-02	ICC-02	ICC-02	CA-20-101-002	1.01.15.10, 1.01.15.20	ICC-02	ICC-02	ICC-02
ICC-03	CA-20-102	1.01.15.10, 1.01.15.20	ICC-03	ICC-03	ICC-03	ICC-03	ICC-03	CA-20-102-001	1.01.15.10, 1.01.15.20	ICC-03	ICC-03	ICC-03	ICC-03	CA-20-102-002	1.01.15.10, 1.01.15.20	ICC-03	ICC-03	ICC-03
ICC-04	CA-20-103	1.01.15.10, 1.01.15.20	ICC-04	ICC-04	ICC-04	ICC-04	ICC-04	CA-20-103-001	1.01.15.10, 1.01.15.20	ICC-04	ICC-04	ICC-04	ICC-04	CA-20-103-002	1.01.15.10, 1.01.15.20	ICC-04	ICC-04	ICC-04
ICC-05	CA-20-104	1.01.15.10, 1.01.15.20	ICC-05	ICC-05	ICC-05	ICC-05	ICC-05	CA-20-104-001	1.01.15.10, 1.01.15.20	ICC-05	ICC-05	ICC-05	ICC-05	CA-20-104-002	1.01.15.10, 1.01.15.20	ICC-05	ICC-05	ICC-05
ICC-06	CA-20-105	1.01.15.10, 1.01.15.20	ICC-06	ICC-06	ICC-06	ICC-06	ICC-06	CA-20-105-001	1.01.15.10, 1.01.15.20	ICC-06	ICC-06	ICC-06	ICC-06	CA-20-105-002	1.01.15.10, 1.01.15.20	ICC-06	ICC-06	ICC-06
ICC-07	CA-20-106	1.01.15.10, 1.01.15.20	ICC-07	ICC-07	ICC-07	ICC-07	ICC-07	CA-20-106-001	1.01.15.10, 1.01.15.20	ICC-07	ICC-07	ICC-07	ICC-07	CA-20-106-002	1.01.15.10, 1.01.15.20	ICC-07	ICC-07	ICC-07
ICC-08	CA-20-107	1.01.15.10, 1.01.15.20	ICC-08	ICC-08	ICC-08	ICC-08	ICC-08	CA-20-107-001	1.01.15.10, 1.01.15.20	ICC-08	ICC-08	ICC-08	ICC-08	CA-20-107-002	1.01.15.10, 1.01.15.20	ICC-08	ICC-08	ICC-08
ICC-09	CA-20-108	1.01.15.10, 1.01.15.20	ICC-09	ICC-09	ICC-09	ICC-09	ICC-09	CA-20-108-001	1.01.15.10, 1.01.15.20	ICC-09	ICC-09	ICC-09	ICC-09	CA-20-108-002	1.01.15.10, 1.01.15.20	ICC-09	ICC-09	ICC-09
ICC-10	CA-20-109	1.01.15.10, 1.01.15.20	ICC-10	ICC-10	ICC-10	ICC-10	ICC-10	CA-20-109-001	1.01.15.10, 1.01.15.20	ICC-10	ICC-10	ICC-10	ICC-10	CA-20-109-002	1.01.15.10, 1.01.15.20	ICC-10	ICC-10	ICC-10
ICC-11	CA-20-110	1.01.15.10, 1.01.15.20	ICC-11	ICC-11	ICC-11	ICC-11	ICC-11	CA-20-110-001	1.01.15.10, 1.01.15.20	ICC-11	ICC-11	ICC-11	ICC-11	CA-20-110-002	1.01.15.10, 1.01.15.20	ICC-11	ICC-11	ICC-11
ICC-12	CA-20-111	1.01.15.10, 1.01.15.20	ICC-12	ICC-12	ICC-12	ICC-12	ICC-12	CA-20-111-001	1.01.15.10, 1.01.15.20	ICC-12	ICC-12	ICC-12	ICC-12	CA-20-111-002	1.01.15.10, 1.01.15.20	ICC-12	ICC-12	ICC-12
ICC-13	CA-20-112	1.01.15.10, 1.01.15.20	ICC-13	ICC-13	ICC-13	ICC-13	ICC-13	CA-20-112-001	1.01.15.10, 1.01.15.20	ICC-13	ICC-13	ICC-13	ICC-13	CA-20-112-002	1.01.15.10, 1.01.15.20	ICC-13	ICC-13	ICC-13
ICC-14	CA-20-113	1.01.15.10, 1.01.15.20	ICC-14	ICC-14	ICC-14	ICC-14	ICC-14	CA-20-113-001	1.01.15.10, 1.01.15.20	ICC-14	ICC-14	ICC-14	ICC-14	CA-20-113-002	1.01.15.10, 1.01.15.20	ICC-14	ICC-14	ICC-14
ICC-15	CA-20-114	1.01.15.10, 1.01.15.20	ICC-15	ICC-15	ICC-15	ICC-15	ICC-15	CA-20-114-001	1.01.15.10, 1.01.15.20	ICC-15	ICC-15	ICC-15	ICC-15	CA-20-114-002	1.01.15.10, 1.01.15.20	ICC-15	ICC-15	ICC-15
ICC-16	CA-20-115	1.01.15.10, 1.01.15.20	ICC-16	ICC-16	ICC-16	ICC-16	ICC-16	CA-20-115-001	1.01.15.10, 1.01.15.20	ICC-16	ICC-16	ICC-16	ICC-16	CA-20-115-002	1.01.15.10, 1.01.15.20	ICC-16	ICC-16	ICC-16
ICC-17	CA-20-116	1.01.15.10, 1.01.15.20	ICC-17	ICC-17	ICC-17	ICC-17	ICC-17	CA-20-116-001	1.01.15.10, 1.01.15.20	ICC-17	ICC-17	ICC-17	ICC-17	CA-20-116-002	1.01.15.10, 1.01.15.20	ICC-17	ICC-17	ICC-17
ICC-18	CA-20-117	1.01.15.10, 1.01.15.20	ICC-18	ICC-18	ICC-18	ICC-18	ICC-18	CA-20-117-001	1.01.15.10, 1.01.15.20	ICC-18	ICC-18	ICC-18	ICC-18	CA-20-117-002	1.01.15.10, 1.01.15.20	ICC-18	ICC-18	ICC-18
ICC-19	CA-20-118	1.01.15.10, 1.01.15.20	ICC-19	ICC-19	ICC-19	ICC-19	ICC-19	CA-20-118-001	1.01.15.10, 1.01.15.20	ICC-19	ICC-19	ICC-19	ICC-19	CA-20-118-002	1.01.15.10, 1.01.15.20	ICC-19	ICC-19	ICC-19
ICC-20	CA-20-119	1.01.15.10, 1.01.15.20	ICC-20	ICC-20	ICC-20	ICC-20	ICC-20	CA-20-119-001	1.01.15.10, 1.01.15.20	ICC-20	ICC-20	ICC-20	ICC-20	CA-20-119-002	1.01.15.10, 1.01.15.20	ICC-20	ICC-20	ICC-20
ICC-21	CA-20-120	1.01.15.10, 1.01.15.20	ICC-21	ICC-21	ICC-21	ICC-21	ICC-21	CA-20-120-001	1.01.15.10, 1.01.15.20	ICC-21	ICC-21	ICC-21	ICC-21	CA-20-120-002	1.01.15.10, 1.01.15.20	ICC-21	ICC-21	ICC-21
ICC-22	CA-20-121	1.01.15.10, 1.01.15.20	ICC-22	ICC-22	ICC-22	ICC-22	ICC-22	CA-20-121-001	1.01.15.10, 1.01.15.20	ICC-22	ICC-22	ICC-22	ICC-22	CA-20-121-002	1.01.15.10, 1.01.15.20	ICC-22	ICC-22	ICC-22
ICC-23	CA-20-122	1.01.15.10, 1.01.15.20	ICC-23	ICC-23	ICC-23	ICC-23	ICC-23	CA-20-122-001	1.01.15.10, 1.01.15.20	ICC-23	ICC-23	ICC-23	ICC-23	CA-20-122-002	1.01.15.10, 1.01.15.20	ICC-23	ICC-23	ICC-23
ICC-24	CA-20-123	1.01.15.10, 1.01.15.20	ICC-24	ICC-24	ICC-24	ICC-24	ICC-24	CA-20-123-001	1.01.15.10, 1.01.15.20	ICC-24	ICC-24	ICC-24	ICC-24	CA-20-123-002	1.01.15.10, 1.01.15.20	ICC-24	ICC-24	ICC-24
ICC-25	CA-20-124	1.01.15.10, 1.01.15.20	ICC-25	ICC-25	ICC-25	ICC-25	ICC-25	CA-20-124-001	1.01.15.10, 1.01.15.20	ICC-25	ICC-25	ICC-25	ICC-25	CA-20-124-002	1.01.15.10, 1.01.15.20	ICC-25	ICC-25	ICC-25
ICC-26	CA-20-125	1.01.15.10, 1.01.15.20	ICC-26	ICC-26	ICC-26	ICC-26	ICC-26	CA-20-125-001	1.01.15.10, 1.01.15.20	ICC-26	ICC-26	ICC-26	ICC-26	CA-20-125-002	1.01.15.10, 1.01.15.20	ICC-26	ICC-26	ICC-26
ICC-27	CA-20-126	1.01.15.10, 1.01.15.20	ICC-27	ICC-27	ICC-27	ICC-27	ICC-27	CA-20-126-001	1.01.15.10, 1.01.15.20	ICC-27	ICC-27	ICC-27	ICC-27	CA-20-126-002	1.01.15.10, 1.01.15.20	ICC-27	ICC-27	ICC-27
ICC-28	CA-20-127	1.01.15.10, 1.01.15.20	ICC-28	ICC-28	ICC-28	ICC-28	ICC-28	CA-20-127-001	1.01.15.10, 1.01.15.20	ICC-28	ICC-28	ICC-28	ICC-28	CA-20-127-002	1.01.15.10, 1.01.15.20	ICC-28	ICC-28	ICC-28
ICC-29	CA-20-128	1.01.15.10, 1.01.15.20	ICC-29	ICC-29	ICC-29	ICC-29	ICC-29	CA-20-128-001	1.01.15.10, 1.01.15.20	ICC-29	ICC-29	ICC-29	ICC-29	CA-20-128-002	1.01.15.10, 1.01.15.20	ICC-29	ICC-29	ICC-29
ICC-30	CA-20-129	1.01.15.10, 1.01.15.20	ICC-30	ICC-30	ICC-30	ICC-30	ICC-30	CA-20-129-001	1.01.15.10, 1.01.15.20	ICC-30	ICC-30	ICC-30	ICC-30	CA-20-129-002	1.01.15.10, 1.01.15.20	ICC-30	ICC-30	ICC-30
ICC-31	CA-20-130	1.01.15.10, 1.01.15.20	ICC-31	ICC-31	ICC-31	ICC-31	ICC-31	CA-20-130-001	1.01.15.10, 1.01.15.20	ICC-31	ICC-31	ICC-31	ICC-31	CA-20-130-002	1.01.15.10, 1.01.15.20	ICC-31	ICC-31	ICC-31
ICC-32	CA-20-131	1.01.15.10, 1.01.15.20	ICC-32	ICC-32	ICC-32	ICC-32	ICC-32	CA-20-131-001	1.01.15.10, 1.01.15.20	ICC-32	ICC-32	ICC-32	ICC-32	CA-20-131-002	1.01.15.10, 1.01.15.20	ICC-32	ICC-32	ICC-32
ICC-33	CA-20-132	1.01.15.10, 1.01.15.20	ICC-33	ICC-33	ICC-33	ICC-33	ICC-33	CA-20-132-001	1.01.15.10, 1.01.15.20	ICC-33	ICC-33	ICC-33	ICC-33	CA-20-132-002	1.01.15.10, 1.01.15.20	ICC-33	ICC-33	ICC-33
ICC-34	CA-20-133	1.01.15.10, 1.01.15.20	ICC-34	ICC-34	ICC-34	ICC-34	ICC-34	CA-20-133-001	1.01.15.10, 1.01.15.20	ICC-34	ICC-34	ICC-34	ICC-34	CA-20-133-002	1.01.15.10, 1.01.15.20	ICC-34	ICC-34	ICC-34
ICC-35	CA-20-134	1.01.15.10, 1.01.15.20	ICC-35	ICC-35	ICC-35	ICC-35	ICC-35	CA-20-134-001	1.01.15.10, 1.01.15.20	ICC-35	ICC-35	ICC-35	ICC-35	CA-20-134-002	1.01.15.10, 1.01.15.20	ICC-35	ICC-35	ICC-35
ICC-36	CA-20-135	1.01.15.10, 1.01.15.20	ICC-36	ICC-36	ICC-36	ICC-36	ICC-36	CA-20-135-001	1.01.15.10, 1.01.15.20	ICC-36	ICC-36	ICC-36	ICC-36	CA-20-135-002	1.01.15.10, 1.01.15.20	ICC-36	ICC-36	ICC-36
ICC-37	CA-20-136	1.01.15.10, 1.01.15.20	ICC-37	ICC-37	ICC-37	ICC-37	ICC-37	CA-20-136-001	1.01.15.10, 1.01.15.20	ICC-37	ICC-37	ICC-37	ICC-37	CA-20-136-002	1.01.15.10, 1.01.15.20	ICC-37	ICC-37	ICC-37
ICC-38	CA-20-137	1.01.15.10, 1.01.15.20	ICC-38	ICC-38	ICC-38	ICC-38	ICC-38	CA-20-137-001	1.01.15.10, 1.01.15.20	ICC-38	ICC-38	ICC-38	ICC-38	CA-20-137-002	1.01.15.10, 1.01.15.20	ICC-38	ICC-38	ICC-38
ICC-39	CA-20-138	1.01.15.10, 1.01.15.20	ICC-39	ICC-39	ICC-39	ICC-39	ICC-39	CA-20-138-001	1.01.15.10, 1.01.15.20	ICC-39	ICC-39	ICC-39	ICC-39	CA-20-138-002	1.01.15.10, 1.01.15.20	ICC-39	ICC-39	ICC-39
ICC-40	CA-20-139	1.01.15.10, 1.01.15.20	ICC-40	ICC-40	ICC-40	ICC-40	ICC-40	CA-20-139-001	1.01.15.10, 1.01.15.20	ICC-40	ICC-40	ICC-40	ICC-40	CA-20-139-002	1.01.15.10, 1.01.15.20	ICC-40	ICC-40	ICC-40
ICC-41	CA-20-140	1.01.15.10, 1.01.15.20	ICC-41	ICC-41	ICC-41	ICC-41	ICC-41	CA-20-140-001	1.01.15.10, 1.01.15.20	ICC-41	ICC-41	ICC-41	ICC-41	CA-20-140-002	1.01.15.10, 1.01.15.20	ICC-41	ICC-41	ICC-41
ICC-42	CA-20-141	1.01.15.10, 1.01.15.20	ICC-42	ICC-42	ICC-42	ICC-42	ICC-42	CA-20-141-001	1.01.15.10, 1.01.15.20	ICC-42	ICC-42	ICC-42	ICC-42	CA-20-141-002	1.01.15.10, 1.01.15.20	ICC-42	ICC-42	ICC-42
ICC-43	CA-20-142	1.01.15.10, 1.01.15.20	ICC-43	ICC-43	ICC-43	ICC-43	ICC-43	CA-20-142-001	1.01.15.10, 1.01.15.20	ICC-43	ICC-43	ICC-43	ICC-43	CA-20-142-002	1.01.15.10, 1.01.15.20	ICC-43	ICC-43	ICC-43
ICC-44	CA-20-143	1.01.15.10, 1.01.15.20	ICC-44	ICC-44	ICC-44	ICC-44	ICC-44	CA-20-143-001	1.01.15.10, 1.01.15.20	ICC-44	ICC-44	ICC-44	ICC-44	CA-20-143-002	1.01.15.10, 1.01.15.20	ICC-44	ICC-44	ICC-44
ICC-45	CA-20-144	1.01.15.10, 1.01.15.20	ICC-45	ICC-45	ICC-45	ICC-45	ICC-45	CA-20-144-001	1.01.15.10, 1.01.15.20	ICC-45	ICC-45	ICC-45	ICC-45	CA-20-144-002	1.01.15.10, 1.01.15.20	ICC-45	ICC-45	ICC-45
ICC-46	CA-20-145	1.01.15.10, 1.01.15.20	ICC-46	ICC-46	ICC-46	ICC-46	ICC-46	CA-20-145-001	1.01.15.10, 1.01.15.20	ICC-46	ICC-46	ICC-46	ICC-46	CA-20-145-002	1.01.15.10, 1.01.15.20	ICC-46	ICC-46	ICC-46
ICC-47	CA-20-146	1.01.15.10, 1.01.15.20	ICC-47	ICC-47	ICC-47	ICC-47	ICC-47	CA-20-146-001	1.01.15.10, 1.01.15.20	ICC-47	ICC-47	ICC-47	ICC-47	CA-20-146-002	1.01.15.10, 1.01.15.20	ICC-47	ICC-47	ICC-47
ICC-48	CA-20-147	1.01.15.10, 1.01.15.20	ICC-48	ICC-48	ICC-48	ICC-48	ICC-48	CA-20-147-001	1.01.15.10, 1.01.15.20	ICC-48	ICC-48	ICC-48	ICC-48	CA-20-147-002	1.01.15.10, 1.01.15.20	ICC-48	ICC-48	ICC-48
ICC-49	CA-20-148	1.01.15.10, 1.01.15.20	ICC-49	ICC-49	ICC-49	ICC-49	ICC-49	CA-20-148-001	1.0									

FCC ID: ZNFX320PM	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Test Dates: 06/27/19 – 07/15/19	DUT Type: Portable Handset	APPENDIX G: Page 1 of 3		

1.2 LTE Downlink Only Carrier Aggregation Test Selection and Setup

SAR test exclusion for LTE downlink Carrier Aggregation is determined by power measurements according to the number component carriers (CCs) supported by the product implementation. For those configurations required by April 2018 TCBC Workshop Notes, conducted power measurements with LTE Carrier Aggregation (CA) (downlink only) active are made in accordance to KDB Publication 941225 D05Av01r02. The RRC connection is only handled by one cell, the primary component carrier (PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds secondary component carrier(s) (SCC) on the downlink only. All uplink communications and acknowledgements remain identical to specifications when downlink carrier aggregation is inactive on the PCC. Additional conducted output powers are measured with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band.

Per FCC KDB Publication 941225 D05Av01r02, no SAR measurements are required for carrier aggregation configurations when the maximum average output power with downlink only carrier aggregation active is not more than 0.25 dB higher than the average output power with downlink only carrier aggregation inactive. All bands required for SAR testing per FCC KDB procedures were considered. Based on the measured maximum powers below, no additional SAR tests were required for DLCA SAR configurations.

General PCC and SCC configuration selection procedure

- PCC uplink channel, channel bandwidth, modulation and RB configurations were selected based on section C)3)b)ii) of KDB 941225 D05 V01r02. The downlink PCC channel was paired with the selected PCC uplink channel according to normal configurations without carrier aggregation.
- To maximize aggregated bandwidth, highest channel bandwidth available for that CA combination was selected for SCC. For inter-band CA, the SCC downlink channels were selected near the middle of their transmission bands. For contiguous intra-band CA, the downlink channel spacing between the component carriers was set to multiple of 300 kHz less than the nominal channel spacing defined in section 5.4.1A of 3GPP TS 36.521. For non-contiguous intra-band CA, the downlink channel spacing between the component carriers was set to be larger than the nominal channel spacing and provided maximum separation between the component carriers.
- All selected PCC and SCC(s) remained fully within the uplink/downlink transmission band of the respective component carrier.

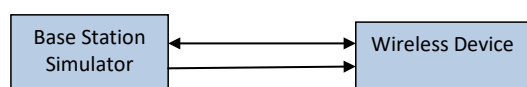


Figure 1
DL CA Power Measurement Setup

FCC ID: ZNFX320PM	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Test Dates: 06/27/19 – 07/15/19	DUT Type: Portable Handset			APPENDIX G: Page 2 of 3

1.3 Downlink Carrier Aggregation RF Conducted Powers

1.3.1 LTE Band 26 as PCC

Table 1
Maximum Output Powers

Combination	PCC									SCC 1				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx.Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_25A-26A	LTE B26	3	26865	831.5	QPSK	1	7	8865	876.5	LTE B25	20	8365	1962.5	25.30	25.25

1.3.2 LTE Band 25 as PCC

Table 2
Maximum Output Powers

Combination	PCC									SCC 1				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx.Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_25A-25A (1)	LTE B25	20	26365	1882.5	QPSK	1	50	8365	1962.5	LTE B25	20	8140	1940	24.80	24.80
CA_25A-26A	LTE B25	20	26365	1882.5	QPSK	1	50	8365	1962.5	LTE B26	15	8865	876.5	24.79	24.80

1.3.3 LTE Band 41 as PCC

Table 3
Maximum Output Powers

Combination	PCC									SCC 1				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx.Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41A-41A (1)	LTE B41	20	40620	2593	QPSK	1	50	40620	2593	LTE B41	20	39750	2506	24.69	24.74
CA_41C (1)	LTE B41	20	40620	2593	QPSK	1	50	40620	2593	LTE B41	20	40818	2612.8	24.72	24.74

1.3.4 LTE Band 41 PC2 as PCC

Table 4
Maximum Output Powers

Combination	PCC									SCC 1				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx.Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41A-41A (1)	LTE B41 PC2	20	39750	2506	QPSK	1	50	39750	2506	LTE B41 PC2	20	41490	2680	27.63	27.55
CA_41C (1)	LTE B41 PC2	20	39750	2506	QPSK	1	50	39750	2506	LTE B41 PC2	20	39948	2525.8	27.58	27.55

FCC ID: ZNFX320PM	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Test Dates: 06/27/19 – 07/15/19	DUT Type: Portable Handset			APPENDIX G: Page 3 of 3