



FCC CFR47 PART 22 SUBPART H

WWAN

C2PC CERTIFICATION TEST REPORT

FOR

LTE Watch + Bluetooth/BLE and DTS b/g/n

MODEL NUMBER : SM-R775S

FCC ID: A3LSMR775S

REPORT NUMBER: 4787686874-E4V1

ISSUE DATE: NOV 23, 2016

Prepared for

**SAMSUNG ELECTRONICS CO., LTD.
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,
GYEONGGI-DO, 16677, KOREA**

Prepared by

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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	11/23/16	Initial issue	Junwhan Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION: LTE Watch + Bluetooth/BLE and DTS b/g/n
MODEL NUMBER: SM-R775S
SERIAL NUMBER: R3AHB004RX, R3AHB004RL, R3AHB004RJ (RADIATED)
DATE TESTED: NOV 21, 2016 - NOV 22, 2016

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22H	Pass

UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Korea, Ltd. By:



CY Choi
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:



Junwhan Lee
Suwon Lab Engineer
UL Korea, Ltd.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-D, FCC CFR 47 Part 2 and Part 22.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro	
☐	Chamber 1
☒	Chamber 2

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at <http://www.iasonline.org/PDF/TL/TL-637.pdf>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\text{EIRP} = \text{PSA reading with EUT worst orientation (dBm)} + \text{Path loss (dB)} - \text{cable loss (between the SG and substitution antenna)} + \text{Substitution Antenna Factor (dBi)}$$

$$\text{ERP} = \text{PSA reading with EUT worst orientation (dBm)} + \text{Path loss (dB)} - \text{cable loss (between the SG and substitution antenna)}$$

(Path loss = Signal generator output – PSA reading with substitution antenna)

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	2.32 dB
Radiated Disturbance, Below 1GHz	4.14 dB
Radiated Disturbance, Above 1 GHz	5.97 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a LTE Watch + Bluetooth/BLE and DTS b/g/n.

5.2. MAXIMUM OUTPUT POWER (LTE)

The transmitter has a maximum peak conducted and radiated ERP / EIRP output powers as follows:

LTE Band 5

FCC Part 22							
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation Peak	Conducted		Radiated	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 5	824 ~ 849	10	QPSK	23.55	226.46	-0.20	0.95
			16QAM	21.58	143.88	-1.19	0.76
		5	QPSK	23.53	225.42	-0.48	0.90
			16QAM	21.45	139.64	-1.04	0.79
		3	QPSK	23.61	229.61	-1.53	0.70
			16QAM	21.55	142.89	-2.08	0.62
		1.4	QPSK	23.72	235.50	-2.82	0.52
			16QAM	21.72	148.59	-2.81	0.52

**Note: Conducted test data is from test result of original filing.
(FCC ID: A3LSMR775S, TEST REPORT: 4787656438-E4V1)**

DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a FPCB antenna for the [List the bands supported with a maximum peak gain as follow:

Frequency (MHz)	Peak Gain (dBi)
LTE Band 5 824 ~ 849 MHz	-14.5

5.3. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Adapter	SAMSUNG	EP-TA60KBK	R73H58A0B72DK3	N/A
Wireless Charger	SAMSUNG	EP-YO760	N/A	A3LEPYO760

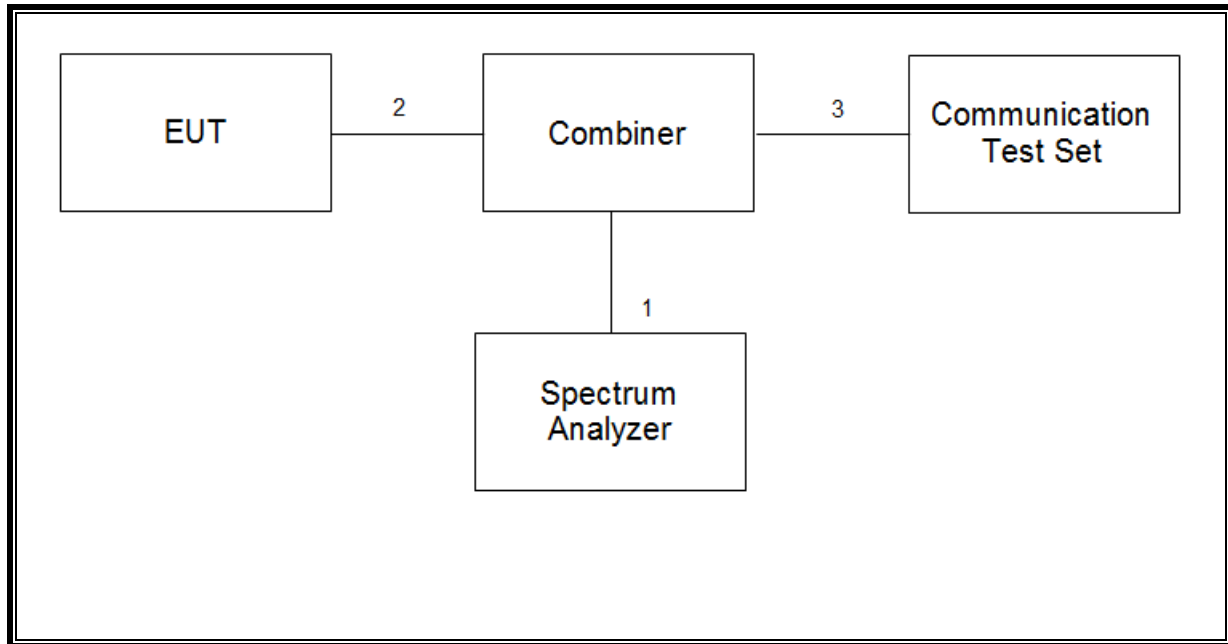
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	Mini-USB	Shielded	0.8m	N/A

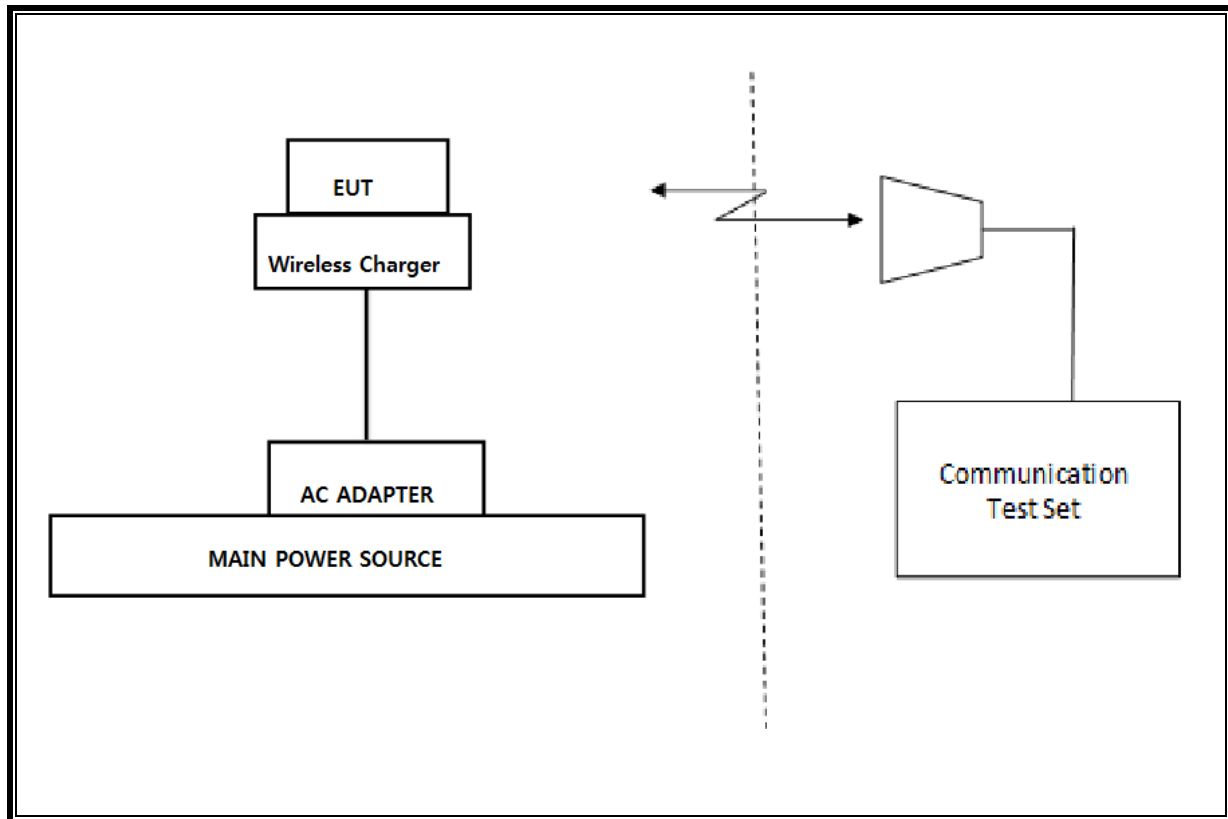
TEST SETUP

The EUT is continuously communicated to the call box during the tests.

SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	Manufacturer	Model	S/N	Cal Due
Antenna, Tuned Dipole 400~1000 MHz	ETS	3121D DB4	00164753	07-28-17
Antenna, Horn, 40 GHz	ETS	3116C	00166155	11-30-17
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	12-15-17
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	04-25-17
Antenna, Horn, 18 GHz	ETS	3115	00161451	05-17-17
Antenna, Horn, 18 GHz	ETS	3117	00168724	06-17-17
Antenna, Horn, 18 GHz	ETS	3117	00168717	06-17-17
Combiner	WEINSCHTEL	1575	2152	08-16-17
Communications Test Set	R&S	CMW500	150312	08-17-17
Communications Test Set	R&S	CMW500	115331	08-17-17
DC Power Supply	Agilent / HP	E3640A	MY54226395	08-16-17
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-17-17
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-16-17
Preamplifier	ETS	3115-PA	00167475	08-17-17
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-16-17
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-17-17
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-16-17
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	08-18-17
Average Power Sensor	R&S	NRZ-Z91	102681	08-16-17
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-17-17
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-17-17
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-16-17
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-16-17
Attenuator / Switch driver	HP	11713A	3748A04272	N/A
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G005	08-17-17
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G006	08-17-17
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	010	08-17-17
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	011	08-17-17
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G001	08-17-17
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G002	08-17-17
LISN	R&S	ENV-216	101836	08-16-17
LISN	R&S	ENV-216	101837	08-16-17
Attenuator	PASTERNAK	PE7087-10	A009	08-16-17

7. Summary Table

C2PC Reason: Please see A3LSMR775S C2PC description for details.

: The changes of this C2PC model are minor circuitry for non-transmitter portions.

So we tested only radiated items.

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result	Note
2.1049	Occupied Band width (99%)	N/A	Conducted	Pass	See original
22.917(a)	Band Edge / Conducted Spurious Emission	-13dBm		Pass	See original
2.1046	Conducted output power	N/A		Pass	See original
22.355	Frequency Stability	2.5PPM		Pass	See original
22.913(a)(2)	Effective Radiated Power	38 dBm	Radiated	Pass	-0.2 dBm
22.917(a)	Radiated Spurious Emission	-13dBm		Pass	-42.5 dBm

FCC Rule Part	Frequency Range [MHz]	Output Power [W]	Frequency Tolerance	Emission Designator	Emission Bandwidth	Communication Type
LTE Band 5						
22H	829.0 - 844.0	0.00095	2.5 ppm	8M95G7W	10	QPSK
22H	829.0 - 844.0	0.00076	2.5 ppm	8M96D7W	10	16QAM

8. OCCUPIED BANDWIDTH

Please refer to WWAN test report(4787656438-E4V1) of FCC ID: A3LSMR775S.

9. RADIATED TEST RESULTS

9.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913

LIMITS

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13dB.

TEST PROCEDURE

ANSI / TIA / EIA 603D Clause 2.2.17; ESU40 setting reference to 971168 D01 v02r02

For peak power measurement with a ESU40:

a) Set the RBW $\geq$ OBW; b) Set VBW $\geq 3 \times$ RBW; c) Set span $\geq 2 \times$ RBW; d) Sweep time = auto couple; e) Detector = peak; f) Ensure that the number of measurement points $\geq$ span/RBW; g) Trace mode = max hold;

For average power measurement with a ESU40:

a) Set span to at least 1.5 times the OBW; b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz; c) Set VBW $\geq 3 \times$ RBW; d) Set number of points in sweep $\geq 2 \times$ span / RBW; e) Sweep time = auto-couple; f) Detector = RMS (power averaging); g) Use free run trigger If burst duty cycle ≥ 98 ; h) Use trigger to capture bursts If burst duty cycle < 98 ; i) Trace average at least 100 traces in power averaging (*i.e.*, RMS) mode. j) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function.

TEST RESULTS

9.1.1. ERP/EIRP Results

LTE Band 5

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 5	10	QPSK	50/0	829.0	-0.2	0.95
			50/0	836.5	-0.64	0.86
			50/0	844.0	-0.82	0.83
		16QAM	50/0	829.0	-1.19	0.76
			50/0	836.5	-1.70	0.68
			50/0	844.0	-1.92	0.64
	5	QPSK	25/0	826.5	-0.93	0.81
			25/0	836.5	-0.48	0.90
			25/0	846.5	-3.18	0.48
		16QAM	25/0	826.5	-1.04	0.79
			25/0	836.5	-1.51	0.71
			25/0	846.5	-1.61	0.69
	3	QPSK	15/0	825.5	-1.53	0.70
			15/0	836.5	-1.69	0.68
			15/0	847.5	-1.75	0.67
		16QAM	15/0	825.5	-2.66	0.54
			15/0	836.5	-2.08	0.62
			15/0	847.5	-2.26	0.59
	1.4	QPSK	6/0	824.7	-2.82	0.52
			6/0	836.5	-3.19	0.48
			6/0	848.3	-3.72	0.42
		16QAM	6/0	824.7	-2.81	0.52
			6/0	836.5	-3.28	0.47
			6/0	848.3	-3.96	0.40

9.1.2. ERP/EIRP DATA

LTE Band 5

LTE Band 5 10MHz QPSK	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2 Company: Samsung Project #: 4787686874 Date: 11-21-16 Test Engineer: YH Lim Configuration: EUT ONLY, X Position Mode: TX, LTE BAND 5, 10MHz BW, QPSK Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	829.00	2.38	V	1.1	-1.5	-0.20	38.5	-38.7	
	829.00	-7.07	H	1.1	-1.5	-9.65	38.5	-48.1	
	Mid Ch								
	836.50	1.86	V	1.1	-1.4	-0.64	38.5	-39.1	
	836.50	-6.44	H	1.1	-1.4	-8.94	38.5	-47.4	
	High Ch								
	844.00	1.57	V	1.1	-1.3	-0.82	38.5	-39.3	
	844.00	-7.96	H	1.1	-1.3	-10.38	38.5	-48.8	
	Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								
LTE Band 5 10MHz 16QAM	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2 Company: Samsung Project #: 4787686874 Date: 11-21-16 Test Engineer: YH Lim Configuration: EUT ONLY, X Position Mode: LTE5 10MHz FUND 16QAM Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	829.00	1.39	V	1.1	-1.5	-1.19	38.5	-39.6	
	829.00	-6.17	H	1.1	-1.5	-8.75	38.5	-47.2	
	Mid Ch								
	836.50	0.81	V	1.1	-1.4	-1.70	38.5	-40.1	
	836.50	-7.48	H	1.1	-1.4	-9.99	38.5	-48.4	
	High Ch								
	844.00	0.50	V	1.1	-1.3	-1.92	38.5	-40.4	
	844.00	-6.91	H	1.1	-1.3	-9.33	38.5	-47.8	
	Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

LTE Band 5 5MHz QPSK	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2								
	Company: Samsung Project #: 4787686874 Date: 11-21-16 Test Engineer: YH Lim Configuration: EUT ONLY, X Position Mode: LTE5 5MHz FUND QPSK								
	Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	826.50	1.67	V	1.1	-1.5	-0.93	38.5	-39.4	
	826.50	-6.34	H	1.1	-1.5	-8.94	38.5	-47.4	
	Mid Ch								
	836.50	2.02	V	1.1	-1.4	-0.48	38.5	-38.9	
	836.50	-6.52	H	1.1	-1.4	-9.02	38.5	-47.5	
	High Ch								
	846.50	-0.30	V	1.6	-1.3	-3.18	38.5	-41.6	
	846.50	-7.08	H	1.6	-1.3	-9.96	38.5	-48.4	
Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm									
LTE Band 5 5MHz 16QAM	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2								
	Company: Samsung Project #: 4787686874 Date: 11-21-16 Test Engineer: YH Lim Configuration: EUT ONLY, X Position Mode: LTE5 5MHz FUND 16QAM								
	Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	826.50	1.56	V	1.1	-1.5	-1.04	38.5	-39.5	
	826.50	-6.33	H	1.1	-1.5	-8.93	38.5	-47.4	
	Mid Ch								
	836.50	0.99	V	1.1	-1.4	-1.51	38.5	-40.0	
	836.50	-7.45	H	1.1	-1.4	-9.95	38.5	-48.4	
	High Ch								
	846.50	0.78	V	1.1	-1.3	-1.61	38.5	-40.1	
	846.50	-8.23	H	1.1	-1.3	-10.62	38.5	-49.1	
Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm									

LTE Band 5 3MHz QPSK	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2 Company: Samsung Project #: 4787686874 Date: 11-21-16 Test Engineer: YH Lim Configuration: EUT ONLY, X Position Mode: LTE5 3MHz FUND QPSK Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	825.50	1.07	V	1.1	-1.5	-1.53	38.5	-40.0	
	825.50	-6.10	H	1.1	-1.5	-8.70	38.5	-47.2	
	Mid Ch								
	836.50	0.81	V	1.1	-1.4	-1.69	38.5	-40.1	
	836.50	-7.17	H	1.1	-1.4	-9.67	38.5	-48.1	
	High Ch								
	847.50	1.13	V	1.6	-1.3	-1.75	38.5	-40.2	
	847.50	-6.99	H	1.6	-1.3	-9.87	38.5	-48.3	
Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm									
LTE Band 5 3MHz 16QAM	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2 Company: Samsung Project #: 4787686874 Date: 11-21-16 Test Engineer: YH Lim Configuration: EUT ONLY, X Position Mode: LTE5 3MHz FUND 16QAM Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	825.50	-0.06	V	1.1	-1.5	-2.66	38.5	-41.1	
	825.50	-7.30	H	1.1	-1.5	-9.90	38.5	-48.4	
	Mid Ch								
	836.50	0.42	V	1.1	-1.4	-2.08	38.5	-40.5	
	836.50	-6.67	H	1.1	-1.4	-9.17	38.5	-47.6	
	High Ch								
	847.50	0.13	V	1.1	-1.3	-2.26	38.5	-40.7	
	847.50	-7.94	H	1.1	-1.3	-10.33	38.5	-48.8	
Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm									

LTE Band 5 1.4MHz QPSK	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2								
	Company: Samsung Project #: 4787686874 Date: 11-21-16 Test Engineer: YH Lim Configuration: EUT ONLY, X Position Mode: LTE5 1.4MHz FUND QPSK								
	Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	824.70	-0.22	V	1.1	-1.5	-2.82	38.5	-41.3	
	824.70	-7.09	H	1.1	-1.5	-9.69	38.5	-48.1	
	Mid Ch								
	836.50	-0.69	V	1.1	-1.4	-3.19	38.5	-41.6	
	836.50	-7.58	H	1.1	-1.4	-10.08	38.5	-48.5	
	High Ch								
	848.30	-0.84	V	1.6	-1.3	-3.72	38.5	-42.2	
	848.30	-7.56	H	1.6	-1.3	-10.44	38.5	-48.9	
Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm									
LTE Band 5 1.4MHz 16QAM	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2								
	Company: Samsung Project #: 4787686874 Date: 11-21-16 Test Engineer: YH Lim Configuration: EUT ONLY, X Position Mode: LTE5 1.4MHz FUND 16QAM								
	Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	824.70	-0.21	V	1.1	-1.5	-2.81	38.5	-41.3	
	824.70	-7.44	H	1.1	-1.5	-10.04	38.5	-48.5	
	Mid Ch								
	836.50	-0.78	V	1.1	-1.4	-3.28	38.5	-41.7	
	836.50	-8.08	H	1.1	-1.4	-10.58	38.5	-49.0	
	High Ch								
	848.30	-1.57	V	1.1	-1.3	-3.96	38.5	-42.4	
	848.30	-8.41	H	1.1	-1.3	-10.80	38.5	-49.2	
Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm									

9.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917

LIMIT

Part 22.917(a) The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

RESULTS

9.2.1. SPURIOUS RADIATION DATA

LTE Band 5

		UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement											
		Company: Samsung		Project #: 4787686874		Date: 11-22-16		Test Engineer: YH Lim		Configuration: EUT / AC Adapter / Cradle, X Position		Mode: TX, LTE BAND 5, 10MHz BW, QPSK	
LTE Band 5 10MHz QPSK		Chamber		Pre-amplifier		Filter		Limit					
		Chamber 2		AFS42		Filter 1		Part 22					
		f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes		
		Low Channel (829MHz)											
		1.6580	-14.2	V	3.0	38.2	1.0	-51.4	-13.0	-38.4			
		2.4870	-10.4	V	3.0	38.8	1.0	-48.2	-13.0	-35.2			
		3.3160	-20.2	V	3.0	39.4	1.0	-58.7	-13.0	-45.7			
		1.6580	-15.8	H	3.0	38.2	1.0	-53.0	-13.0	-40.0			
		2.4870	-7.0	H	3.0	38.8	1.0	-44.8	-13.0	-31.8			
		3.3160	-19.3	H	3.0	39.4	1.0	-57.7	-13.0	-44.7			
		Mid Channel (836.5MHz)											
		1.6730	-15.6	V	3.0	38.2	1.0	-52.8	-13.0	-39.8			
		2.5090	-15.1	V	3.0	38.8	1.0	-53.0	-13.0	-40.0			
		3.3460	-20.5	V	3.0	39.5	1.0	-58.9	-13.0	-45.9			
		1.6730	-12.9	H	3.0	38.2	1.0	-50.1	-13.0	-37.1			
		2.5090	-7.5	H	3.0	38.8	1.0	-45.3	-13.0	-32.3			
		3.3460	-19.8	H	3.0	39.5	1.0	-58.2	-13.0	-45.2			
		High Channel (844MHz)											
		1.6880	-13.3	V	3.0	38.2	1.0	-50.6	-13.0	-37.6			
		2.5320	-13.6	V	3.0	38.9	1.0	-51.5	-13.0	-38.5			
		3.3760	-20.1	V	3.0	39.5	1.0	-58.6	-13.0	-45.6			
		1.6880	-14.0	H	3.0	38.2	1.0	-51.3	-13.0	-38.3			
		2.5320	-10.7	H	3.0	38.9	1.0	-48.5	-13.0	-35.5			
		3.3760	-19.8	H	3.0	39.5	1.0	-58.2	-13.0	-45.2			
		Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.											

		UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement											
		Company: Samsung		Project #: 4787686874		Date: 11-22-16		Test Engineer: YH Lim		Configuration: EUT / Cradle / AC Adapter, X Position		Mode: TX, LTE BAND 5, 10MHz BW, 16QAM	
LTE Band 5 10MHz 16QAM		Chamber		Pre-amplifier		Filter		Limit					
		Chamber 2		AFS42		Filter 1		Part 22					
		f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes		
		Low Channel (829MHz)											
		1.6580	-13.4	V	3.0	38.2	1.0	-50.7	-13.0	-37.7			
		2.4870	-9.1	V	3.0	38.8	1.0	-46.9	-13.0	-33.9			
		3.3160	-20.4	V	3.0	39.4	1.0	-58.9	-13.0	-45.9			
		1.6580	-16.3	H	3.0	38.2	1.0	-53.6	-13.0	-40.6			
		2.4870	-7.0	H	3.0	38.8	1.0	-44.8	-13.0	-31.8			
		3.3160	-19.4	H	3.0	39.4	1.0	-57.8	-13.0	-44.8			
		Mid Channel (836.5MHz)											
		1.6730	-16.5	V	3.0	38.2	1.0	-53.8	-13.0	-40.8			
		2.5090	-15.4	V	3.0	38.8	1.0	-53.2	-13.0	-40.2			
		3.3460	-20.6	V	3.0	39.5	1.0	-59.1	-13.0	-46.1			
		1.6730	-13.3	H	3.0	38.2	1.0	-50.5	-13.0	-37.5			
		2.5090	-6.8	H	3.0	38.8	1.0	-44.7	-13.0	-31.7			
		3.3460	-20.1	H	3.0	39.5	1.0	-58.5	-13.0	-45.5			
		High Channel (844MHz)											
		1.6880	-14.6	V	3.0	38.2	1.0	-51.8	-13.0	-38.8			
		2.5320	-13.8	V	3.0	38.9	1.0	-51.7	-13.0	-38.7			
		3.3760	-20.5	V	3.0	39.5	1.0	-59.0	-13.0	-46.0			
		1.6880	-15.8	H	3.0	38.2	1.0	-53.0	-13.0	-40.0			
		2.5320	-11.1	H	3.0	38.9	1.0	-48.9	-13.0	-35.9			
		3.3760	-19.9	H	3.0	39.5	1.0	-58.4	-13.0	-45.4			
		Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.											

LTE
Band 5

3MHz

QPSK

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company: Samsung

Project #: 4787686874

Date: 11-22-16

Test Engineer: YH Lim

Configuration: EUT / AC Adapter / Cradle, X Position

Mode: TX, LTE BAND 5, 3MHz BW, QPSK

Chamber

Chamber 2

Pre-amplifier

AFS42

Filter

Filter 1

Limit

Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Channel (825.5MHz)									
1.6510	-13.6	V	3.0	38.2	1.0	-50.8	-13.0	-37.8	
2.4765	-9.2	V	3.0	38.8	1.0	-47.0	-13.0	-34.0	
3.3020	-20.9	V	3.0	39.4	1.0	-59.3	-13.0	-46.3	
1.6510	-13.1	H	3.0	38.2	1.0	-50.3	-13.0	-37.3	
2.4765	-6.9	H	3.0	38.8	1.0	-44.7	-13.0	-31.7	
3.3020	-20.3	H	3.0	39.4	1.0	-58.7	-13.0	-45.7	
Mid Channel (836.5MHz)									
1.6730	-13.9	V	3.0	38.2	1.0	-51.2	-13.0	-38.2	
2.5090	-11.9	V	3.0	38.8	1.0	-49.7	-13.0	-36.7	
3.3460	-19.9	V	3.0	39.5	1.0	-58.3	-13.0	-45.3	
1.6730	-12.5	H	3.0	38.2	1.0	-49.8	-13.0	-36.8	
2.5090	-6.9	H	3.0	38.8	1.0	-44.8	-13.0	-31.8	
3.3460	-21.0	H	3.0	39.5	1.0	-59.4	-13.0	-46.4	
High Channel (847.5MHz)									
1.6950	-15.9	V	3.0	38.2	1.0	-53.1	-13.0	-40.1	
2.5425	-10.8	V	3.0	38.9	1.0	-48.7	-13.0	-35.7	
3.3900	-19.8	V	3.0	39.5	1.0	-58.3	-13.0	-45.3	
1.6950	-13.9	H	3.0	38.2	1.0	-51.1	-13.0	-38.1	
2.5425	-7.1	H	3.0	38.9	1.0	-45.0	-13.0	-32.0	
3.3900	-20.5	H	3.0	39.5	1.0	-59.0	-13.0	-46.0	

Rev. 03.03.09

Note: No other emissions were detected above the system noise floor.

LTE
Band 5

3MHz

16QAM

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company: Samsung

Project #: 4787686874

Date: 11-22-16

Test Engineer: YH Lim

Configuration: EUT / AC Adapter / Cradle, X Position

Mode: TX, LTE BAND 5, 3MHz BW, 16QAM

Chamber

Chamber 2

Pre-amplifier

AFS42

Filter

Filter 1

Limit

Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Channel (825.5MHz)									
1.6510	-14.9	V	3.0	38.2	1.0	-52.1	-13.0	-39.1	
2.4765	-10.7	V	3.0	38.8	1.0	-48.5	-13.0	-35.5	
3.3020	-20.2	V	3.0	39.4	1.0	-58.6	-13.0	-45.6	
1.6510	-13.9	H	3.0	38.2	1.0	-51.1	-13.0	-38.1	
2.4765	-8.0	H	3.0	38.8	1.0	-45.8	-13.0	-32.8	
3.3020	-20.1	H	3.0	39.4	1.0	-58.6	-13.0	-45.6	
Mid Channel (836.5MHz)									
1.6730	-14.5	V	3.0	38.2	1.0	-51.7	-13.0	-38.7	
2.5090	-11.9	V	3.0	38.8	1.0	-49.8	-13.0	-36.8	
3.3460	-19.7	V	3.0	39.5	1.0	-58.1	-13.0	-45.1	
1.6730	-14.3	H	3.0	38.2	1.0	-51.6	-13.0	-38.6	
2.5090	-8.0	H	3.0	38.8	1.0	-45.8	-13.0	-32.8	
3.3460	-21.2	H	3.0	39.5	1.0	-59.7	-13.0	-46.7	
High Channel (847.5MHz)									
1.6950	-15.9	V	3.0	38.2	1.0	-53.1	-13.0	-40.1	
2.5425	-11.4	V	3.0	38.9	1.0	-49.3	-13.0	-36.3	
3.3900	-20.2	V	3.0	39.5	1.0	-58.6	-13.0	-45.6	
1.6950	-14.0	H	3.0	38.2	1.0	-51.2	-13.0	-38.2	
2.5425	-8.2	H	3.0	38.9	1.0	-46.0	-13.0	-33.0	
3.3900	-21.0	H	3.0	39.5	1.0	-59.5	-13.0	-46.5	

Rev. 03.03.09

Note: No other emissions were detected above the system noise floor.

LTE Band 5 1.4MHz QPSK	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4787686874 Date: 11-22-16 Test Engineer: YH Lim Configuration: EUT / AC Adapter / Cradle, X Position Mode: TX, LTE BAND 5, 1.4MHz BW,QPSK									
	Chamber Chamber 2 Pre-amplifier AFS42 Filter Filter 1 Limit Part 22									
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Channel (824.7MHz)									
	1.6494	-14.0	V	3.0	38.2	1.0	-51.2	-13.0	-38.2	
	2.4741	-6.1	V	3.0	38.8	1.0	-43.9	-13.0	-30.9	
	3.2988	-19.8	V	3.0	39.4	1.0	-58.2	-13.0	-45.2	
	1.6494	-11.6	H	3.0	38.2	1.0	-48.8	-13.0	-35.8	
	2.4741	-4.8	H	3.0	38.8	1.0	-42.6	-13.0	-29.6	
	3.2988	-20.7	H	3.0	39.4	1.0	-59.1	-13.0	-46.1	
	Mid Channel (836.5MHz)									
	1.6730	-15.4	V	3.0	38.2	1.0	-52.7	-13.0	-39.7	
	2.5090	-7.2	V	3.0	38.8	1.0	-45.1	-13.0	-32.1	
	3.3460	-19.4	V	3.0	39.5	1.0	-57.9	-13.0	-44.9	
	1.6730	-17.0	H	3.0	38.2	1.0	-54.3	-13.0	-41.3	
	2.5090	-11.4	H	3.0	38.8	1.0	-49.2	-13.0	-36.2	
	3.3460	-20.2	H	3.0	39.5	1.0	-58.7	-13.0	-45.7	
	High Channel (848.3MHz)									
	1.6966	-11.0	V	3.0	38.2	1.0	-48.2	-13.0	-35.2	
	2.5449	-15.6	V	3.0	38.9	1.0	-53.5	-13.0	-40.5	
	3.3932	-19.6	V	3.0	39.5	1.0	-58.1	-13.0	-45.1	
	1.6966	-14.9	H	3.0	38.2	1.0	-52.1	-13.0	-39.1	
	2.5449	-10.3	H	3.0	38.9	1.0	-48.2	-13.0	-35.2	
	3.3932	-20.3	H	3.0	39.5	1.0	-58.8	-13.0	-45.8	
	Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.									

LTE Band 5 1.4MHz 16QAM	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4787686874 Date: 11-22-16 Test Engineer: YH Lim Configuration: EUT / AC Adapter / Cradle, X Position Mode: TX, LTE BAND 5, 1.4MHz BW,16QAM									
	Chamber Chamber 2 Pre-amplifier AFS42 Filter Filter 1 Limit Part 22									
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Channel (824.7MHz)									
	1.6494	-14.2	V	3.0	38.2	1.0	-51.4	-13.0	-38.4	
	2.4741	-5.9	V	3.0	38.8	1.0	-43.7	-13.0	-30.7	
	3.2988	-19.6	V	3.0	39.4	1.0	-58.0	-13.0	-45.0	
	1.6494	-11.4	H	3.0	38.2	1.0	-48.7	-13.0	-35.7	
	2.4741	-4.7	H	3.0	38.8	1.0	-42.5	-13.0	-29.5	
	3.2988	-21.0	H	3.0	39.4	1.0	-59.4	-13.0	-46.4	
	Mid Channel (836.5MHz)									
	1.6730	-15.5	V	3.0	38.2	1.0	-52.7	-13.0	-39.7	
	2.5090	-8.1	V	3.0	38.8	1.0	-45.9	-13.0	-32.9	
	3.3460	-19.7	V	3.0	39.5	1.0	-58.2	-13.0	-45.2	
	1.6730	-16.2	H	3.0	38.2	1.0	-53.5	-13.0	-40.5	
	2.5090	-11.6	H	3.0	38.8	1.0	-49.4	-13.0	-36.4	
	3.3460	-20.4	H	3.0	39.5	1.0	-58.9	-13.0	-45.9	
	High Channel (848.3MHz)									
	1.6966	-12.0	V	3.0	38.2	1.0	-49.3	-13.0	-36.3	
	2.5449	-16.6	V	3.0	38.9	1.0	-54.5	-13.0	-41.5	
	3.3932	-19.9	V	3.0	39.5	1.0	-58.3	-13.0	-45.3	
	1.6966	-15.9	H	3.0	38.2	1.0	-53.1	-13.0	-40.1	
	2.5449	-11.1	H	3.0	38.9	1.0	-49.0	-13.0	-36.0	
	3.3932	-20.1	H	3.0	39.5	1.0	-58.6	-13.0	-45.6	
	Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.									