



**FCC CFR47 PART 22 SUBPART H
FCC CFR47 PART 24 SUBPART E**

WWAN

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n, ANT+ and NFC

MODEL NUMBER : SM-A710F/DS, SM-A710F

FCC ID: A3LSMA710F

REPORT NUMBER: 15K22125-E7

ISSUE DATE: DEC 01, 2015

Prepared for
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Revision History

Rev.	Issue Date	Revisions	Revised By
--	11/26/15	Initial issue	Junwhan Lee
2	12/01/15	Revised note of summary table	Junwhan Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION: GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n, ANT+ and NFC
MODEL NUMBER: SM-A710F/DS, SM-A710F
SERIAL NUMBER: R38GA07QKLM (RADIATED); 3300225accaa723f (CONDUCTED)
DATE TESTED: OCT 31, 2015 - NOV 19, 2015

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22H and 24E	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
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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-D, FCC CFR 47 Part 22 and FCC CFR Part 24.

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:

EIRP = PSA reading with EUT worst orientation (dBm) + Path loss (dB) – cable loss(between the SG and substitution antenna) + Substitution Antenna Factor (dBi)

ERP = PSA reading with EUT worst orientation (dBm) + Path loss (dB) – 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 GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n, ANT+ and NFC.

SM-A710F and SM-A710F/DS are same hardware but for different number of SIM card slot.
SM-A710F has one slot. SM-A710F/DS is dual SIM version.

5.2. MAXIMUM OUTPUT POWER (GSM)

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

FCC Part 22/24						
Band	Frequency Range	Modulation	Conducted		Radiated	
	[MHz]	Peak	Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
GSM850	824~849	GMSK	32.90	1949.84		
		GPRS	32.92	1958.84	29.08	809.10
		EGPRS	27.47	558.47	24.32	270.40
GSM1900	1850~1910	GMSK	28.77	753.36		
		GPRS	28.90	776.25	28.69	739.61
		EGPRS	25.17	328.85	24.11	257.63

5.3. MAXIMUM OUTPUT POWER (WCDMA)

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

FCC Part 22/24						
Band	Frequency Range	Modulation	Conducted		Radiated	
	[MHz]	Peak	Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 5	824~849	REL99	23.35	216.27	19.59	90.99
		HSDPA	23.38	217.77	19.21	83.37
		HSUPA	23.30	213.80		
Band 2	1850~1910	REL99	22.93	196.34	18.56	71.78
		HSDPA	22.67	184.93	18.78	75.51
		HSUPA	22.77	189.23		

5.4. 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	23.27	212.32	17.13	51.64
			16QAM	22.13	163.31	16.15	41.21
		5	QPSK	23.24	210.86	17.79	60.12
			16QAM	21.97	157.40	16.75	47.32
		3	QPSK	23.29	213.30	16.34	43.05
			16QAM	22.22	166.72	15.47	35.24
		1.4	QPSK	23.25	211.35	14.24	26.55
			16QAM	22.17	164.82	13.37	21.73

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)
GSM850 / WCDMA Band 5 / LTE Band 5 824 ~ 849 MHz	-7.066
GSM1900 / WCDMA Band 2 1850 ~ 1910 MHz	-5.939

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA20EWE	R37G8H02Q92SE3	N/A
Data Cable	SAMSUNG	ECB-DU4AWE	N/A	N/A
Earphone	SAMSUNG	EHS64AVFWE	N/A	N/A

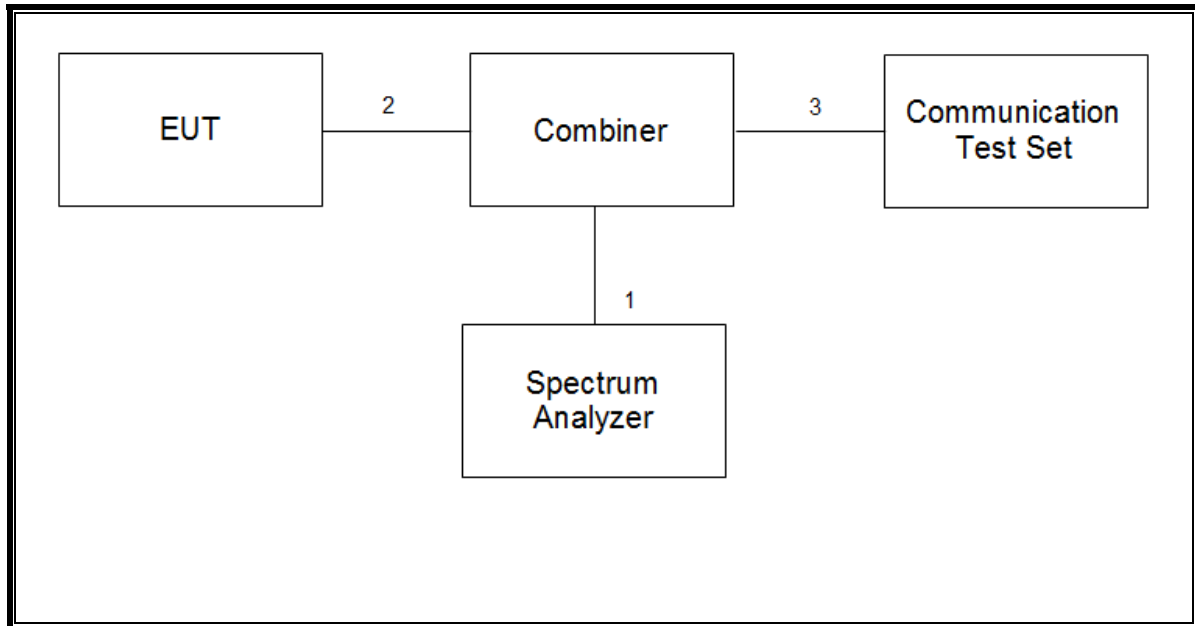
I/O CABLES

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
2	Audio	1	Mini-Jack	Unshielded	1.0m	N/A

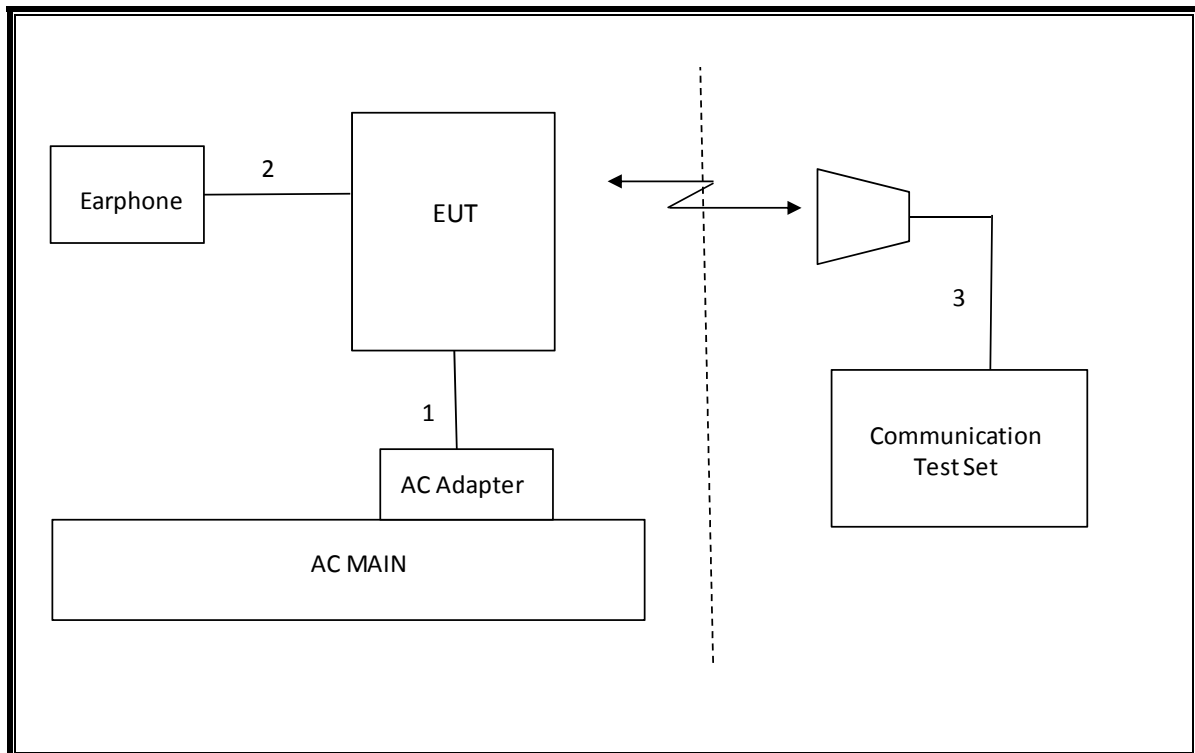
TEST SETUP

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	07-28-16
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	04-25-16
Antenna, Horn, 18 GHz	ETS	3115	00161451	05-17-16
Antenna, Horn, 18 GHz	ETS	3117	00168724	06-17-16
Antenna, Horn, 18 GHz	ETS	3117	00168717	06-17-16
Combiner	WEINSCHTEL	1575	2151	08-20-16
Communications Test Set	R&S	CMW500	150312	08-18-16
Communications Test Set	R&S	CMW500	115331	08-18-16
Communications Test Set	R&S	CMW500	102271	08-18-16
DC Power Supply	Agilent / HP	E3640A	MY54226395	08-18-16
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-18-16
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-18-16
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-18-16
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-18-16
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-19-16
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-19-16
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	08-18-16
Average Power Sensor	R&S	NRZ-Z91	102681	08-18-16
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-18-16
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-19-16
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-19-16
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-19-16
Attenuator / Switch driver	HP	11713A	3748A04272	N/A
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	009	08-18-16
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	015	08-18-16
High Pass Filter 5GHz	Micro-Tronics	HPS17542	009	08-18-16
High Pass Filter 6GHz	Micro-Tronics	HPM17543	010	08-18-16
High Pass Filter 5GHz	Micro-Tronics	HPS17542	016	08-18-16
High Pass Filter 6GHz	Micro-Tronics	HPM17543	015	08-18-16
LISN	R&S	ENV-216	101836	08-19-16
LISN	R&S	ENV-216	101837	08-19-16

7. Summary Table

The FCC ID: A3LSMA710F and A3LSMA710KOR have the same PCB design, the chipset, component including antennas are same. (except component of BT/WLAN).

A3LSMA710F supports GSM850, EGPRS of GSM feature and didn't support LTE Band17.

After confirming through preliminary radiated emissions that the performance of the FCC ID: A3LSMA710KOR remains representative of FCC ID: A3LSMA710F, test data for FCC ID: A3LSMA710KOR is being submitted for this application to cover WCDMA Band 2, WCDMA Band5, LTE Band5 features.

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result	Note
2.1049	Occupied Band width (99%)	N/A	Conducted	Pass	8.9645 MHz
22.917(a) 24.238(a)	Band Edge / Conducted Spurious Emission	-13dBm		Pass	-14.04 dBm
2.1046	Conducted output power	N/A		Pass	32.92 dBm
22.355 24.235	Frequency Stability	2.5PPM		Pass	0.040 PPM
22.913(a)(2)	Effective Radiated Power	38 dBm	Radiated	Pass	29.08 dBm
24.232(c)	Equivalent Isotropic Radiated Power	33dBm		Pass	28.69 dBm
22.917(a) 24.238(a)	Radiated Spurious Emission	-13dBm		Pass	-24.5 dBm

FCC Rule Part	Frequency Range [MHz]	Output Power [W]	Frequency Tolerance	Emission Designator	Emission Bandwidth [MHz]	Communication Type
GSM						
22H	824.2 - 848.8	0.809	2.5 ppm	243KGXW		GPRS850
	824.2 - 848.8	0.270	2.5 ppm	246KG7W		EGPRS850
24E	1850.2 - 1909.8	0.740	2.5 ppm	243KGXW		GSM1900
	1850.2 - 1909.8	0.258	2.5 ppm	246KG7W		EGSM1900
WCDMA						
22H	826.4 - 846.6	0.091	2.5 ppm	4M17F9W		WCDMA
24E	1852.4 - 1907.6	0.076	2.5 ppm	4M16F9W		WCDMA
LTE Band 5						
22H	829.0 - 844.0	0.052	2.5 ppm	8M96G7W	10	QPSK
22H	829.0 - 844.0	0.041	2.5 ppm	8M96D7W	10	16QAM
22H	826.5 - 846.5	0.060	2.5 ppm	4M50G7W	5	QPSK
22H	826.5 - 846.5	0.047	2.5 ppm	4M51D7W	5	16QAM

8. RF POWER OUTPUT VERIFICATION

8.1. GSM/GPRS/EDGE

Function: Menu select > GSM Mobile Station > GSM 850/900/1800/1900

Press Connection control to choose the different menus

Press RESET > choose all to reset all settings

Connection Press Signal Off to turn off the signal and change settings

Network Support > GSM+GPRS or GSM+EGPRS

Main Service > Packet Data

Service selection > Test Mode A – Auto Slot Config. off

MS Signal Press Slot Config bottom on the right twice to select and change the number of time slots and power setting

> Slot configuration > Uplink/Gamma

> 33 dBm for GPRS 850/900

> 30 dBm for GPRS1800/1900

BS Signal Enter the same channel number for TCH channel (test channel) and BCCH channel

Frequency Offset > + 0 Hz

Mode > BCCH and TCH

BCCH Level > -85 dBm (May need to adjust if link is not stable)

BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel]

Channel Type > Off

P0> 4 dB

Slot Config > Unchanged (if already set under MS Signal)

TCH > choose desired test channel

Hopping > Off

Main Timeslot > 3 (Default)

Network Coding Scheme > CS4 (GPRS) and MCS5 ~ MCS9 (EGPRS)

Bit Stream > 2E9-1PSR Bit Pattern

AF/RF Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input

Connection Press Signal On to turn on the signal and change settings

8.1.1. GSM OUTPUT POWER RESULT

GSM850 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. [MHz]	Max. Power	
						Burst Power [dBm]	Frame Power [dBm]
850	GSM (Voice)	CS1	1	128	824.2	32.62	23.59
				190	836.6	32.76	23.73
				251	848.8	32.90	23.87
	GPRS (GMSK)	CS1	1	128	824.2	32.51	23.48
				190	836.6	32.77	23.74
				251	848.8	32.92	23.89
			2	128	824.2	31.15	25.13
				190	836.6	31.33	25.31
				251	848.8	31.57	25.55
			3	128	824.2	29.80	25.54
				190	836.6	30.00	25.74
				251	848.8	30.40	26.14
			4	128	824.2	28.50	25.49
				190	836.6	28.92	25.91
				251	848.8	29.23	26.22
	EGPRS (8PSK)	MCS5	1	128	824.2	26.80	17.77
				190	836.6	26.98	17.95
				251	848.8	27.47	18.44
			2	128	824.2	25.33	19.31
				190	836.6	25.56	19.54
				251	848.8	25.93	19.91
			3	128	824.2	24.15	19.89
				190	836.6	24.45	20.19
				251	848.8	25.00	20.74
			4	128	824.2	23.00	19.99
				190	836.6	23.30	20.29
				251	848.8	23.58	20.57

GSM1900 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. [MHz]	Max. Power	
						Burst Pwr [dBm]	Frame Pwr [dBm]
1900	GSM (Voice)	CS1	1	512	1850.2	28.77	19.74
				661	1880.0	28.31	19.27
				810	1909.8	28.00	18.97
	GPRS (GMSK)	CS1	1	512	1850.2	28.90	19.87
				661	1880.0	28.41	19.38
				810	1909.8	28.07	19.04
			2	512	1850.2	27.42	21.40
				661	1880.0	27.27	21.25
				810	1909.8	27.21	21.19
			3	512	1850.2	26.10	21.84
				661	1880.0	26.12	21.86
				810	1909.8	26.25	21.99
			4	512	1850.2	24.30	21.29
				661	1880.0	24.43	21.42
				810	1909.8	24.51	21.50
	EGPRS (8PSK)	MCS5	1	512	1850.2	25.04	16.01
				661	1880.0	25.00	15.97
				810	1909.8	25.17	16.14
			2	512	1850.2	23.62	17.59
				661	1880.0	23.58	17.56
				810	1909.8	23.92	17.90
			3	512	1850.2	23.19	18.93
				661	1880.0	23.24	18.98
				810	1909.8	23.50	19.24
			4	512	1850.2	21.70	18.69
				661	1880.0	21.81	18.80
				810	1909.8	22.00	18.99

8.2. UMTS REL 99

Release 99 Setup Procedures used to establish the test signals

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 2
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

HSDPA Setup Procedures used to establish the test signals

The following 4 Sub-tests were completed according to Release 7 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm 2			
	β_c	2/15	11/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
	MPR (dB)	0	0	0.5	0.5
HSDPA Specific Settings	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	$A_{hs}=\beta_{hs}/\beta_c$	30/15			

HSPA (HSDPA & HSUPA) Setup Procedures used to establish the test signals

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSPA				
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2 kbps RMC				
	HSDPA FRC	H-Set 1				
	HSUPA Test	HSPA				
	Power Control Algorithm	Algorithm 2				Algorithm 1
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	0
	β_{ec}	209/225	12/15	30/15	2/15	5/15
	β_c/β_d	11/15	6/15	15/9	2/15	15/1
	β_{hs}	22/15	12/15	30/15	4/15	5/15
	β_{ed}	1309/225	94/75	47/15	56/75	47/15
HSDPA Specific Settings	CM (dB)	1	3	2	3	1
	MPR (dB)	0	2	1	2	0
	DACK	8				0
	DNAK	8				0
	DCQI	8				0
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
HSUPA Specific Settings	$A_{hs} = \beta_{hs}/\beta_c$	30/15				
	E-DPDCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E-TFCIs	5	5	2	5	1
	Reference E-TFCI	11	11	11	11	67
	Reference E-TFCI PO	4	4	4	4	18
	Reference E-TFCI	67	67	92	67	67
	Reference E-TFCI PO	18	18	18	18	18
	Reference E-TFCI	71	71	71	71	71
	Reference E-TFCI PO	23	23	23	23	23
	Reference E-TFCI	75	75	75	75	75
	Reference E-TFCI PO	26	26	26	26	26
	Reference E-TFCI	81	81	81	81	81
	Reference E-TFCI PO	27	27	27	27	27
	Maximum Channelisation Codes	2xSF2				SF4

DC-HSDPA Setup Procedures used to establish the test signals

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

Table E.5.0: Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.		
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

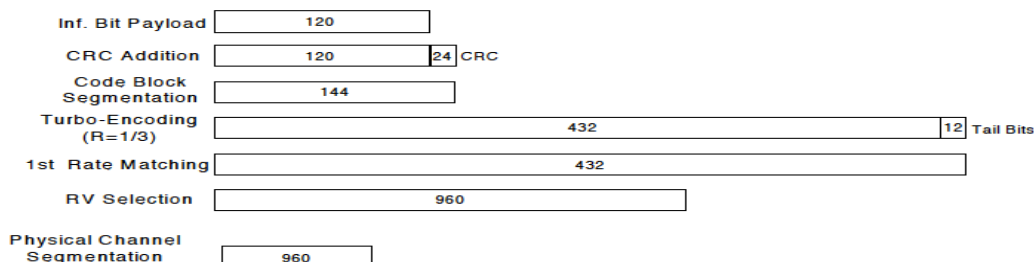


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 8 procedures in section 5.2 of 3GPP TS34.121. A summary of subtest settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm2			
	β_c	2/15	11/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_d (SF)	64			
	β_c/β_d	2/15	11/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
MPR (dB)	0	0	0.5	0.5	
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	$A_{hs} = \beta_{hs}/\beta_c$	30/15			

HSPA+

Since 16QAM is not used for uplink, the uplink Category and release is same as HSUPA, i.e., CAT 6 Rel 6. Therefore, the RF conducted power is not measured.

8.2.1. WCDMA OUTPUT POWER RESULT

WCDMA Band 5 Measured Results

Please refer to WWAN test report of FCC ID: A3LSMA710S

WCDMA Band 2 Measured Results

Please refer to WWAN test report of FCC ID: A3LSMA710S

8.3. LTE OUTPUT VERIFICATION

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

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

The allowed A-MPR values specified below in Table 6.2.4-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signalling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10, 15, 20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 ¹	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

8.3.1. LTE OUTPUT POWER RESULT

LTE Band 5

Please refer to WWAN test report of FCC ID: A3LSMA710S

9. PEAK TO AVERAGE RATIO

Test Procedure

Per KDB 971168 D01 Power Meas License Digital Systems v02r02;

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The PAR were measured on the Spectrum Analyzer.

Test Spec

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

9.1. CONDUCTED PEAK TO AVERAGE RESULT

GSM

Band	Channel	f [MHz]	Mode	Ratio [dB]	Limit [dB]
GSM850	190	836.6	GPRS	2.84	13.00
			EGPRS	5.60	
GSM1900	661	1880.0	GPRS	2.83	
			EGPRS	5.38	

WCDMA

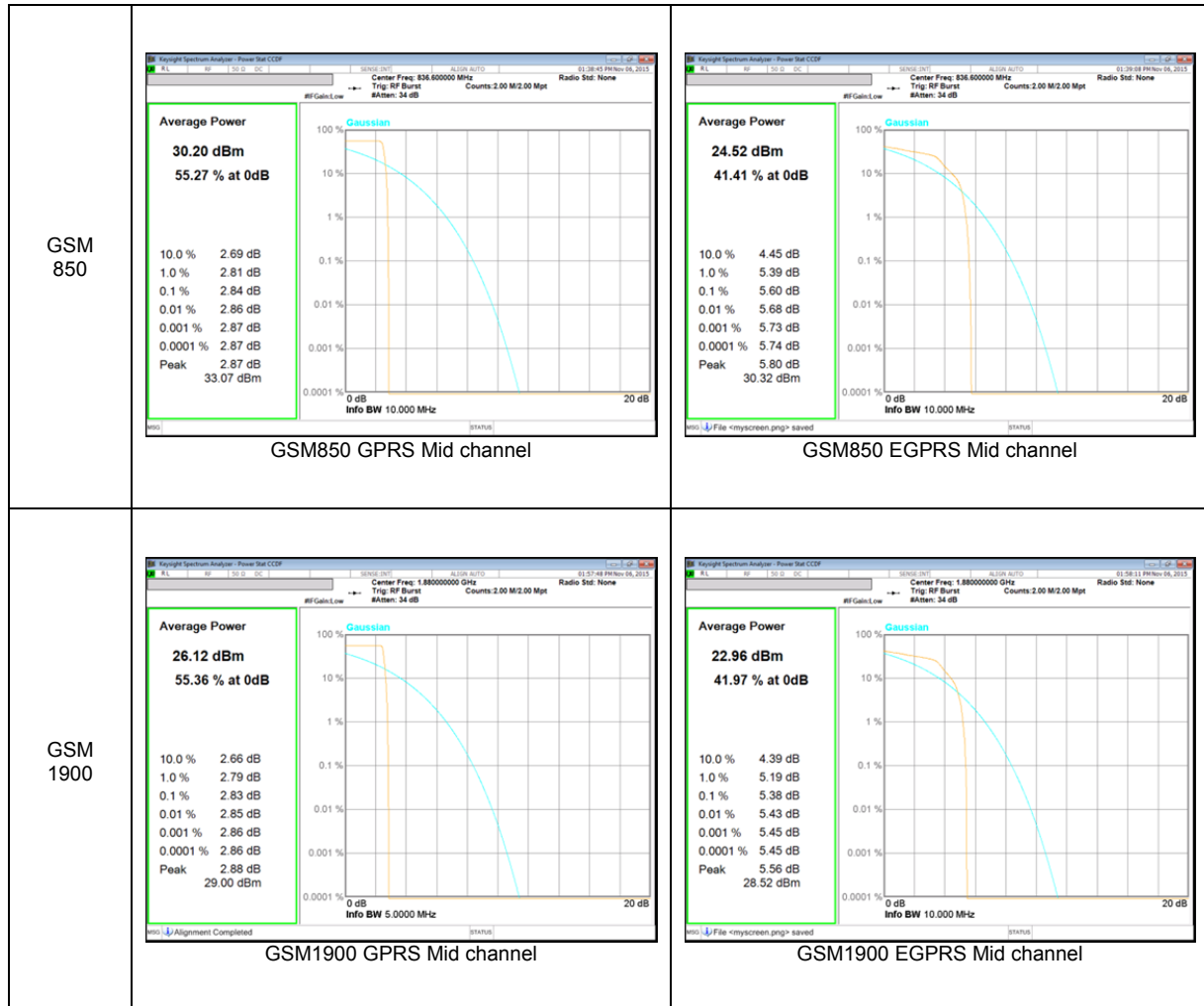
Please refer to WWAN test report of FCC ID: A3LSMA710S

LTE Band 5

Please refer to WWAN test report of FCC ID: A3LSMA710S

9.2. CONDUCTED PEAK TO AVERAGE PLOTS

GSM



WCDMA

Please refer to WWAN test report of FCC ID: A3LSMA710S

LTE Band 5

Please refer to WWAN test report of FCC ID: A3LSMA710S

10. LIMITS AND CONDUCTED RESULTS

10.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

(KDB 971168 D01 Power Meas License Digital Systems v02r02)

10.1.1. OCCUPIED BANDWIDTH RESULTS

GSM

Band	Mode	Channel	f [MHz]	99% BW [KHz]	26dB BW [KHz]
GSM850	GPRS	128	824.2	242.37	302.4
		190	836.6	238.38	310.5
		251	848.8	242.85	312.9
	EGPRS	128	824.2	244.63	312.6
		190	836.6	243.33	307.3
		251	848.8	246.16	318.6
GSM1900	GPRS	512	1850.2	242.91	312.3
		661	1880.0	240.18	317.9
		810	1909.8	242.51	310.2
	EGPRS	512	1850.2	244.57	314.2
		661	1880.0	241.26	322.8
		810	1909.8	246.11	315.2

WCDMA

Please refer to WWAN test report of FCC ID: A3LSMA710S

LTE Band 5

Please refer to WWAN test report of FCC ID: A3LSMA710S

10.1.2. OCCUPIED BANDWIDTH PLOTS

GSM 850



GSM 1900



WCDMA

Please refer to WWAN test report of FCC ID: A3LSMA710S

LTE Band 5

Please refer to WWAN test report of FCC ID: A3LSMA710S

10.2. BAND EDGE EMISSIONS

RULE PART(S)

FCC: §22.359 and §24.238

LIMITS

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

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

RESULTS

GSM

Band	Mode	Side	f [MHz]	Level [dBm]	Limit [dBm]
GSM850	GPRS	Lower	823.987	-14.534	-13.00
		Upper	849.008	-14.040	
	EGPRS	Lower	823.987	-24.380	
		Upper	849.018	-25.200	
GSM1900	GPRS	Lower	1849.982	-17.640	
		Upper	1910.000	-18.033	
	EGPRS	Lower	1849.972	-25.786	
		Upper	1910.000	-24.725	

WCDMA

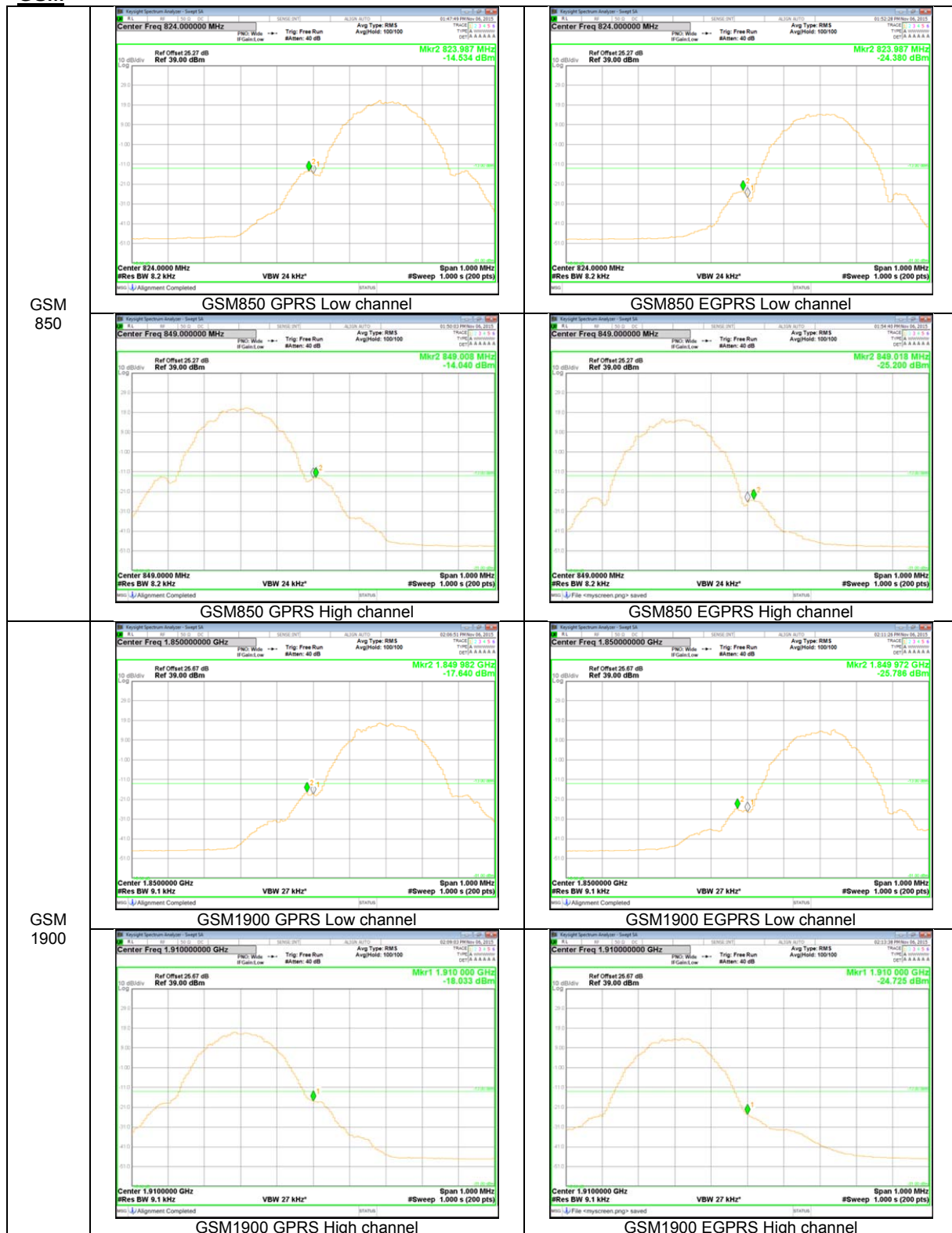
Please refer to WWAN test report of FCC ID: A3LSMA710S

LTE Band 5

Please refer to WWAN test report of FCC ID: A3LSMA710S

10.2.1. BAND EDGE PLOTS

GSM



WCDMA

Please refer to WWAN test report of FCC ID: A3LSMA710S

LTE Band 5

Please refer to WWAN test report of FCC ID: A3LSMA710S

10.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238 and §27. 53

LIMITS

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

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

RESULTS

10.3.1. OUT OF BAND EMISSIONS RESULT

GSM

Band	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]	Margin [dB]
GSM850	GPRS	824.2	-24.43	-13.00	11.43
		836.6	-23.41		10.41
		848.8	-23.77		10.77
	EGPRS	824.2	-24.55		11.55
		836.6	-24.03		11.03
		848.8	-24.32		11.32
GSM1900	GPRS	1850.2	-23.90		10.9
		1880.0	-23.94		10.94
		1909.8	-24.06		11.06
	EGPRS	1850.2	-23.70		10.7
		1880.0	-23.78		10.78
		1909.8	-23.73		10.73

WCDMA

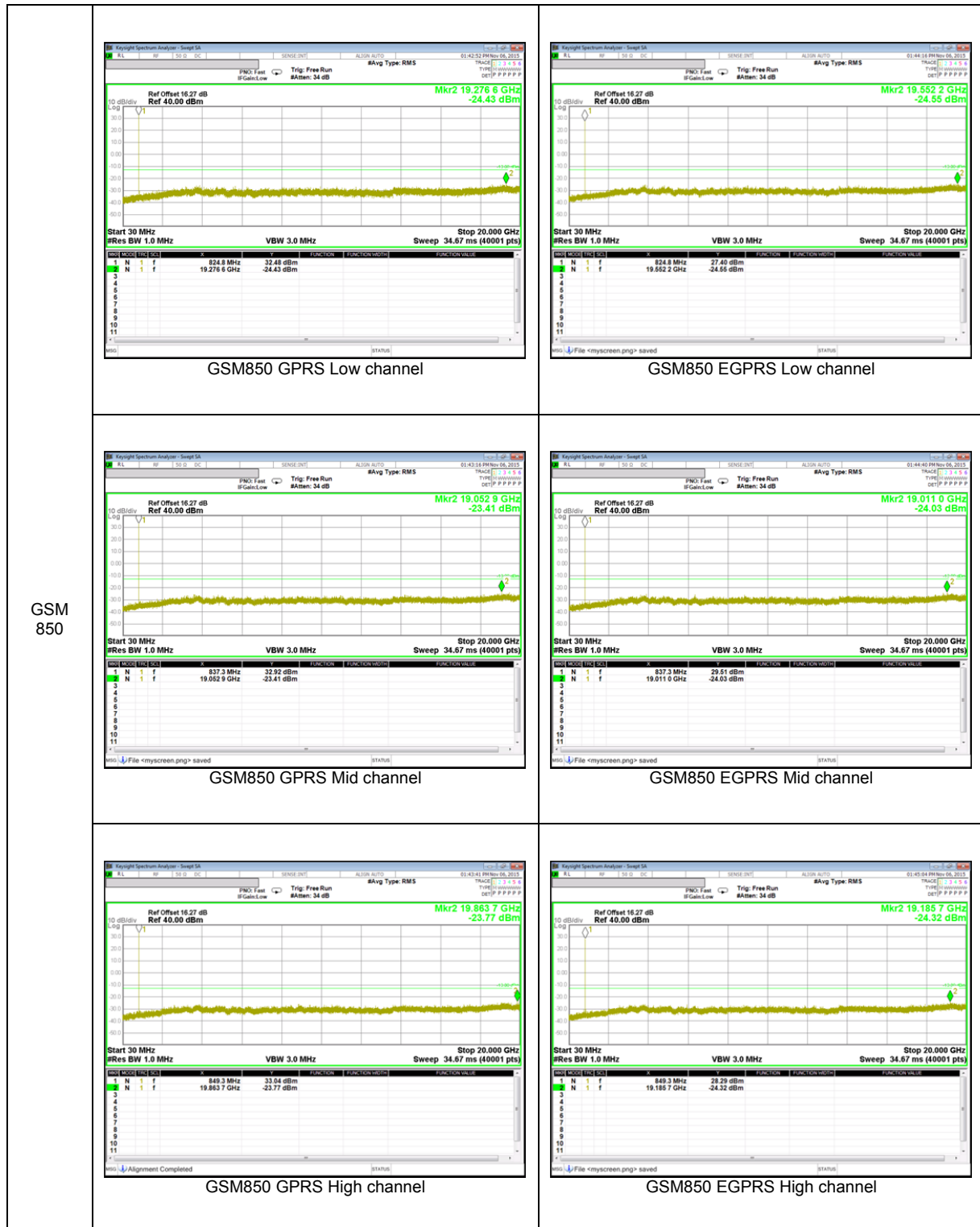
Please refer to WWAN test report of FCC ID: A3LSMA710S

LTE 5

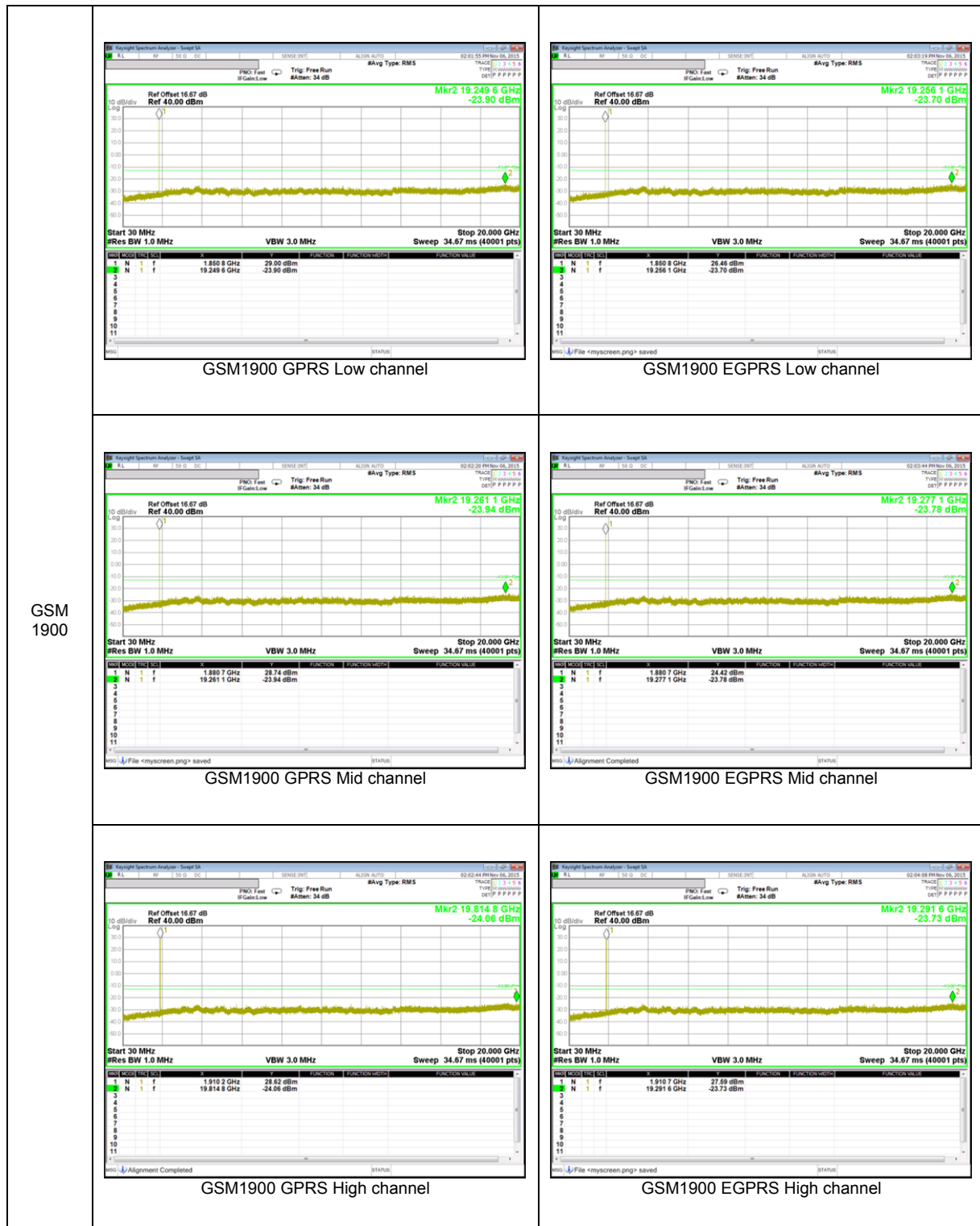
Please refer to WWAN test report of FCC ID: A3LSMA710S

10.3.2. OUT OF BAND EMISSIONS PLOTS

GSM 850



GSM 1900



WCDMA Band 5

Please refer to WWAN test report of FCC ID: A3LSMA710S

LTE Band 5

Please refer to WWAN test report of FCC ID: A3LSMA710S

10.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355 and §24.235

LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations.

§24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

RESULTS

See the following pages.

10.4.1. FREQUENCY STABILITY RESULTS

LTE Band 5, Channel 20524, Frequency 836.5 MHz

WCDMA Band 5, Channel 4183, Frequency 836.6 MHz

GSM 850, Channel 190, Frequency 836.6 MHz

Reference Frequency: CELL Mid Channel 836.6 MHz @ 20°C				
Limit: ± 2.5 ppm = 2091.500 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	836.59996799	0.011	2.5
3.80	40	836.59998096	-0.005	2.5
3.80	30	836.59997318	0.005	2.5
3.80	20	836.59997696	0	2.5
3.80	10	836.59995866	0.022	2.5
3.80	0	836.59997889	-0.002	2.5
3.80	-10	836.59996261	0.017	2.5
3.80	-20	836.59995808	0.023	2.5
3.80	-30	836.59997587	0.001	2.5

Reference Frequency: CELL Mid Channel 836.6 MHz @ 20°C				
Limit: ± 2.5 ppm = 2091.500 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	20	836.59997696	0	2.5
4.20	20	836.59997154	0.006	2.5
3.40	20	836.59998261	-0.007	2.5

WCDMA Band 2, Channel 9400, Frequency 1880.0 MHz

GSM 1900, Channel 661, Frequency 1880.0 MHz

Reference Frequency: PCS Mid Channel 1880 MHz @ 20°C				
Limit: ± 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1879.99995444	0.004	2.5
3.80	40	1879.99996070	0.001	2.5
3.80	30	1879.99995099	0.006	2.5
3.80	20	1879.99996218	0	2.5
3.80	10	1879.99996001	0.001	2.5
3.80	0	1879.99995872	0.002	2.5
3.80	-10	1879.99995979	0.001	2.5
3.80	-20	1879.99995574	0.003	2.5
3.80	-30	1879.99996694	-0.003	2.5

Reference Frequency: PCS Mid Channel 1880 MHz @ 20°C				
Limit: ± 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	20	1879.99996218	0	2.5
4.20	20	1879.99995911	0.002	2.5
3.40	20	1879.99996824	-0.003	2.5

11. RADIATED TEST RESULTS

11.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913 and §24.232.

LIMITS

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

24.232(c) - Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

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; MXA setting reference to 971168 D01 v02r02

For peak power measurement with a MXA:

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 MXA:

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

11.1.1. ERP/EIRP Results

GSM

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
GSM850	GPRS	128	824.2	29.08	809.10
		190	836.6	29.04	801.68
		251	848.8	28.84	765.60
	EGPRS	128	824.2	23.82	240.99
		190	836.6	24.32	270.40
		251	848.8	23.55	226.46
GSM1900	GPRS	512	1850.2	27.97	626.61
		661	1880.0	28.69	739.61
		810	1909.8	27.49	561.05
	EGPRS	512	1850.2	23.69	233.88
		661	1880.0	24.11	257.63
		810	1909.8	23.87	243.78

WCDMA

Please refer to WWAN test report of FCC ID: A3LSMA710S

LTE Band 5

Please refer to WWAN test report of FCC ID: A3LSMA710S

11.1.2. ERP/EIRP DATA

GSM 850

GSM GSM850 GPRS	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2								
	Company: Samsung Project #: 15K22125 Date: 11-19-15 Test Engineer: Steven.Kim Configuration: EUT ONLY, Z Position Mode: GPRS 850 MHz								
	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								
	824.20	31.70	V	1.1	-1.6	29.08	38.5	-9.4	
	824.20	20.79	H	1.1	-1.6	18.17	38.5	-20.3	
	Mid Ch								
	836.60	31.53	V	1.1	-1.4	29.04	38.5	-9.4	
	836.60	21.28	H	1.1	-1.4	18.79	38.5	-19.7	
	High Ch								
	848.80	31.20	V	1.1	-1.3	28.84	38.5	-9.6	
	848.80	23.92	H	1.1	-1.3	21.56	38.5	-16.9	
	Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								
GSM GSM850 EGPRS	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2								
	Company: Samsung Project #: 15K22125 Date: 11-19-15 Test Engineer: Steven.Kim Configuration: EUT ONLY, Z Position Mode: EGPRS 850 MHz								
	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								
	824.20	26.44	V	1.1	-1.6	23.82	38.5	-14.6	
	824.20	15.87	H	1.1	-1.6	13.25	38.5	-25.2	
	Mid Ch								
	836.60	26.81	V	1.1	-1.4	24.32	38.5	-14.1	
	836.60	16.27	H	1.1	-1.4	13.78	38.5	-24.7	
	High Ch								
	848.80	25.91	V	1.1	-1.3	23.55	38.5	-14.9	
	848.80	18.57	H	1.1	-1.3	16.21	38.5	-22.2	
	Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

GSM 1900

GSM GSM1900 GPRS	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2																																																																																																	
	Company:		Samsung																																																																																															
	Project #:		15K22125																																																																																															
	Date:		11-19-15																																																																																															
	Test Engineer:		Steven Kim																																																																																															
	Configuration:		EUT ONLY, X Position																																																																																															
	Mode:		GPRS 1900MHz																																																																																															
	Test Equipment:																																																																																																	
	Receiving: 3117[00168724] and Chamber 1 SMA Cables																																																																																																	
	Substitution: 3115[00161451] Substitution, 3m SMA Cable Warehouse																																																																																																	
<table><tr><th>f GHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1850.20</td><td>14.6</td><td>V</td><td>1.60</td><td>8.80</td><td>21.80</td><td>33.0</td><td>-11.2</td><td></td></tr><tr><td>1850.20</td><td>20.8</td><td>H</td><td>1.60</td><td>8.80</td><td>27.97</td><td>33.0</td><td>-5.0</td><td></td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1880.00</td><td>17.4</td><td>V</td><td>1.62</td><td>8.62</td><td>24.36</td><td>33.0</td><td>-8.6</td><td></td></tr><tr><td>1880.00</td><td>21.7</td><td>H</td><td>1.62</td><td>8.62</td><td>28.69</td><td>33.0</td><td>-4.3</td><td></td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1909.80</td><td>19.4</td><td>V</td><td>1.63</td><td>8.44</td><td>26.21</td><td>33.0</td><td>-6.8</td><td></td></tr><tr><td>1909.80</td><td>20.7</td><td>H</td><td>1.63</td><td>8.44</td><td>27.49</td><td>33.0</td><td>-5.5</td><td></td></tr></table>									f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									1850.20	14.6	V	1.60	8.80	21.80	33.0	-11.2		1850.20	20.8	H	1.60	8.80	27.97	33.0	-5.0		Mid Ch									1880.00	17.4	V	1.62	8.62	24.36	33.0	-8.6		1880.00	21.7	H	1.62	8.62	28.69	33.0	-4.3		High Ch									1909.80	19.4	V	1.63	8.44	26.21	33.0	-6.8		1909.80	20.7	H	1.63	8.44	27.49	33.0	-5.5	
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
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Rev. 3.17.11																																																																																																		

GSM GSM1900 EGPRS	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2																																																																																																	
	Company:		Samsung																																																																																															
	Project #:		15K22125																																																																																															
	Date:		11-19-15																																																																																															
	Test Engineer:		Steven Kim																																																																																															
	Configuration:		EUT ONLY, X Position																																																																																															
	Mode:		EGPRS 1900MHz																																																																																															
	Test Equipment:																																																																																																	
	Receiving: 3117[00168724] and Chamber 1 SMA Cables																																																																																																	
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f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
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Rev. 3.17.11																																																																																																		

WCDMA

Please refer to WWAN test report of FCC ID: A3LSMA710S

LTE Band 5

Please refer to WWAN test report of FCC ID: A3LSMA710S

11.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917 and §24.238.

LIMIT

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

11.2.1. SPURIOUS RADIATION PLOTS

GSM 850

GSM

GSM850

GPRS

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company:

Samsung

Project #:

15K22125

Date:

11-18-15

Test Engineer:

Steven.Kim

Configuration:

EUT / AC Adapter / Earphone, Z Position

Mode:

GPRS 850 MHz

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 Ch, 824.2MHz									
1.6484	10.1	V	3.0	39.1	1.0	-28.0	-13.0	-15.0	
2.4726	-7.8	V	3.0	39.5	1.0	-46.4	-13.0	-33.4	
3.2968	-21.1	V	3.0	40.1	1.0	-60.2	-13.0	-47.2	
1.6484	0.2	H	3.0	39.1	1.0	-37.9	-13.0	-24.9	
2.4726	-18.3	H	3.0	39.5	1.0	-56.8	-13.0	-43.8	
3.2968	-18.5	H	3.0	40.1	1.0	-57.6	-13.0	-44.6	
Mid Ch, 836.6MHz									
1.6730	10.0	V	3.0	39.1	1.0	-28.1	-13.0	-15.1	
2.5098	-11.1	V	3.0	39.5	1.0	-49.6	-13.0	-36.6	
3.3464	-19.1	V	3.0	40.1	1.0	-58.2	-13.0	-45.2	
1.6730	-5.3	H	3.0	39.1	1.0	-43.4	-13.0	-30.4	
2.5098	-21.3	H	3.0	39.5	1.0	-59.9	-13.0	-46.9	
3.3464	-16.9	H	3.0	40.1	1.0	-56.1	-13.0	-43.1	
High Ch, 848.8MHz									
1.6976	13.6	V	3.0	39.1	1.0	-24.5	-13.0	-11.5	
2.5466	-5.3	V	3.0	39.6	1.0	-43.8	-13.0	-30.8	
3.3952	-21.0	V	3.0	40.2	1.0	-60.2	-13.0	-47.2	
1.6976	-9.5	H	3.0	39.1	1.0	-47.6	-13.0	-34.6	
2.5466	-15.0	H	3.0	39.6	1.0	-53.5	-13.0	-40.5	
3.3952	-15.1	H	3.0	40.2	1.0	-54.3	-13.0	-41.3	

Rev. 03.03.09

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

GSM

GSM850

EGPRS

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company:

Samsung

Project #:

15K22125

Date:

11-18-15

Test Engineer:

Steven.Kim

Configuration:

EUT / AC Adapter / Earphone, Z Position

Mode:

EGPRS 850 MHz

Chamber

Chamber 1

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 Ch, 824.2MHz									
1.6484	2.1	V	3.0	39.1	1.0	-36.0	-13.0	-23.0	
2.4726	-14.9	V	3.0	39.5	1.0	-53.4	-13.0	-40.4	
3.2968	-21.0	V	3.0	40.1	1.0	-60.1	-13.0	-47.1	
1.6484	-5.1	H	3.0	39.1	1.0	-43.3	-13.0	-30.3	
2.4726	-23.4	H	3.0	39.5	1.0	-61.9	-13.0	-48.9	
3.2968	-21.4	H	3.0	40.1	1.0	-60.5	-13.0	-47.5	
Mid Ch, 836.6MHz									
1.6730	4.3	V	3.0	39.1	1.0	-33.8	-13.0	-20.8	
2.5098	-17.0	V	3.0	39.5	1.0	-55.5	-13.0	-42.5	
3.3464	-20.9	V	3.0	40.1	1.0	-60.0	-13.0	-47.0	
1.6730	-11.1	H	3.0	39.1	1.0	-49.2	-13.0	-36.2	
2.5098	-23.3	H	3.0	39.5	1.0	-61.8	-13.0	-48.8	
3.3464	-21.3	H	3.0	40.1	1.0	-60.4	-13.0	-47.4	
High Ch, 848.8MHz									
1.6976	5.2	V	3.0	39.1	1.0	-32.9	-13.0	-19.9	
2.5466	-12.8	V	3.0	39.6	1.0	-51.4	-13.0	-38.4	
3.3952	-20.4	V	3.0	40.2	1.0	-59.6	-13.0	-46.6	
1.6976	-17.1	H	3.0	39.1	1.0	-55.3	-13.0	-42.3	
2.5466	-22.5	H	3.0	39.6	1.0	-61.0	-13.0	-48.0	
3.3952	-20.7	H	3.0	40.2	1.0	-59.9	-13.0	-46.9	

Rev. 03.03.09

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

GSM 1900

GSM

GSM1900

GPRS

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Mode:

Samsung

15K22125

11-19-15

Steven Kim

EUT / AC Adapter / Earphone, X Position

GPRS 1900

Chamber

Chamber 2

Pre-amplifier

AFS42

Filter

Filter 1

Limit

Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3.7004	1.1	V	3.0	40.5	1.0	-38.4	-13.0	-25.4	
5.5506	2.0	V	3.0	40.8	1.0	-37.8	-13.0	-24.8	
7.4008	-2.1	V	3.0	40.8	1.0	-41.9	-13.0	-28.9	
3.7000	2.4	H	3.0	40.5	1.0	-37.1	-13.0	-24.1	
5.5506	-2.7	H	3.0	40.8	1.0	-42.6	-13.0	-29.6	
7.4008	-4.3	H	3.0	40.8	1.0	-44.0	-13.0	-31.0	
Mid Ch, 1880.0MHz									
3.7600	1.3	V	3.0	40.5	1.0	-38.2	-13.0	-25.2	
5.6400	0.9	V	3.0	40.8	1.0	-38.9	-13.0	-25.9	
7.5200	-2.7	V	3.0	40.7	1.0	-42.4	-13.0	-29.4	
3.7600	1.4	H	3.0	40.5	1.0	-38.2	-13.0	-25.2	
5.6400	-4.6	H	3.0	40.8	1.0	-44.4	-13.0	-31.4	
7.5200	-7.8	H	3.0	40.7	1.0	-47.6	-13.0	-34.6	
High Ch, 1909.8 MHz									
3.8196	1.9	V	3.0	40.6	1.0	-37.7	-13.0	-24.7	
5.7294	0.9	V	3.0	40.8	1.0	-38.9	-13.0	-25.9	
7.6392	-3.2	V	3.0	40.7	1.0	-42.8	-13.0	-29.8	
3.8196	1.9	H	3.0	40.6	1.0	-37.7	-13.0	-24.7	
5.7294	-1.8	H	3.0	40.8	1.0	-41.5	-13.0	-28.5	
7.6392	-8.9	H	3.0	40.7	1.0	-48.5	-13.0	-35.5	

Rev. 03.03.09

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

GSM

GSM1900

EGPRS

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Mode:

Samsung

15K22125

11-19-15

Steven Kim

EUT / AC Adapter / Earphone, X Position

EGPRS 1900 MHz

Chamber

Chamber 2

Pre-amplifier

AFS42

Filter

Filter 1

Limit

Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3.7004	-9.3	V	3.0	40.5	1.0	-48.7	-13.0	-35.7	
5.5506	-4.6	V	3.0	40.8	1.0	-44.5	-13.0	-31.5	
7.4008	-3.2	V	3.0	40.8	1.0	-43.0	-13.0	-30.0	
3.7000	-5.8	H	3.0	40.5	1.0	-45.2	-13.0	-32.2	
5.5500	-7.5	H	3.0	40.8	1.0	-47.3	-13.0	-34.3	
7.4000	-6.4	H	3.0	40.8	1.0	-46.2	-13.0	-33.2	
Mid Ch, 1880.0MHz									
3.7600	-5.8	V	3.0	40.5	1.0	-45.4	-13.0	-32.4	
5.6400	-2.7	V	3.0	40.8	1.0	-42.5	-13.0	-29.5	
7.5200	-5.0	V	3.0	40.7	1.0	-44.7	-13.0	-31.7	
3.7600	-3.8	H	3.0	40.5	1.0	-43.3	-13.0	-30.3	
5.6400	-8.2	H	3.0	40.8	1.0	-48.0	-13.0	-35.0	
7.5200	-7.6	H	3.0	40.7	1.0	-47.3	-13.0	-34.3	
High Ch, 1909.8 MHz									
3.8196	-7.8	V	3.0	40.6	1.0	-47.4	-13.0	-34.4	
5.7294	-3.5	V	3.0	40.8	1.0	-43.3	-13.0	-30.3	
7.6392	-4.0	V	3.0	40.7	1.0	-43.7	-13.0	-30.7	
3.8196	-5.6	H	3.0	40.6	1.0	-45.2	-13.0	-32.2	
5.7294	-3.7	H	3.0	40.8	1.0	-43.5	-13.0	-30.5	
7.6392	-9.6	H	3.0	40.7	1.0	-49.3	-13.0	-36.3	

Rev. 03.03.09

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

WCDMA

Please refer to WWAN test report of FCC ID: A3LSMA710S

LTE Band 5

Please refer to WWAN test report of FCC ID: A3LSMA710S