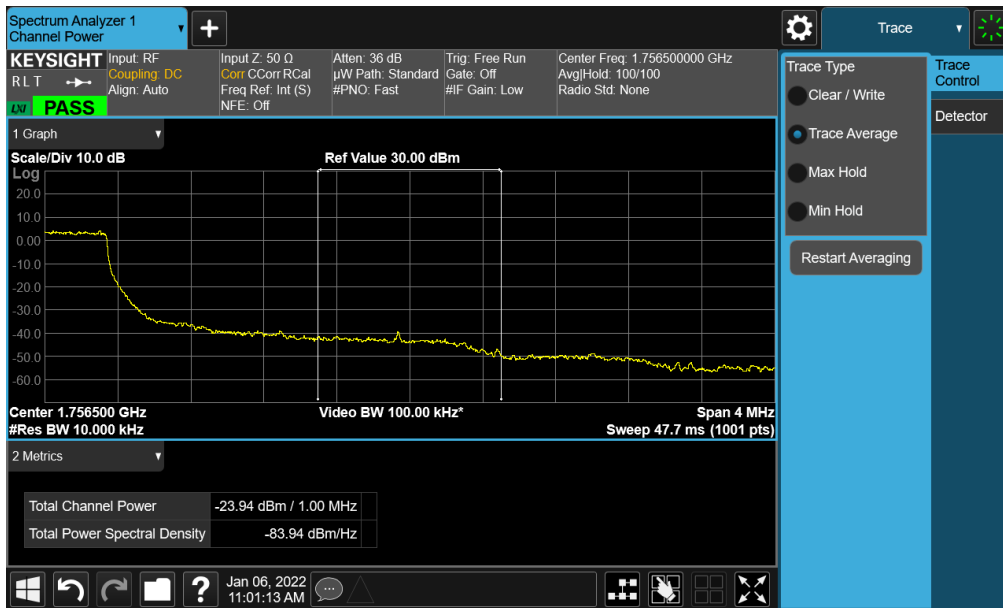




Plot 7-133. Upper Band Edge Plot (LTE Band 4 – 1.4MHz QPSK – Full RB)

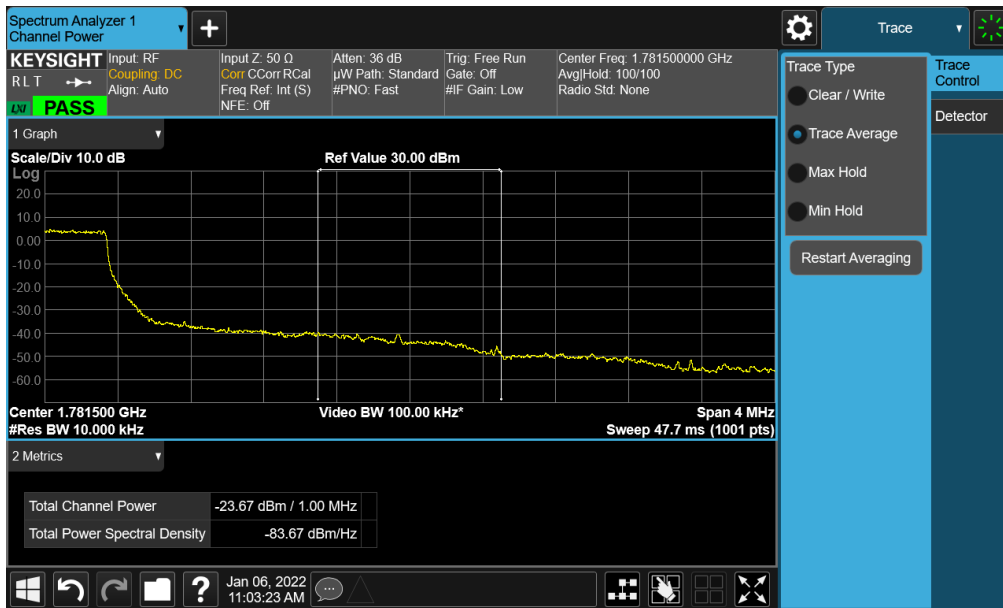


Plot 7-134. Upper Extended Band Edge Plot (LTE Band 4 – 1.4MHz QPSK – Full RB)

FCC ID: A3LSMA135U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>Approved by:</b> Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset	Page 85 of 121



Plot 7-135. Upper Band Edge Plot (LTE Band 66 – 1.4MHz QPSK – Full RB)



Plot 7-136. Upper Extended Band Edge Plot (LTE Band 66 – 1.4MHz QPSK – Full RB)

FCC ID: A3LSMA135U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset		Page 86 of 121

## 7.5 Peak-Average Ratio

### Test Overview

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

### Test Procedure Used

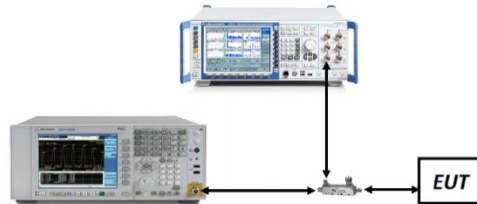
KDB 971168 D01 v03r01 – Section 5.7.1

### Test Settings

1. The signal analyzer’s CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW  $\geq$  OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal “RF Burst” trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the “on time” of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 7-4. Test Instrument & Measurement Setup**

### Test Notes

None.

FCC ID: A3LSMA135U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1M2112270166-04.A3L	<b>Test Dates:</b> 01/03/2022 - 01/26/2022	<b>EUT Type:</b> Portable Handset	Page 87 of 121

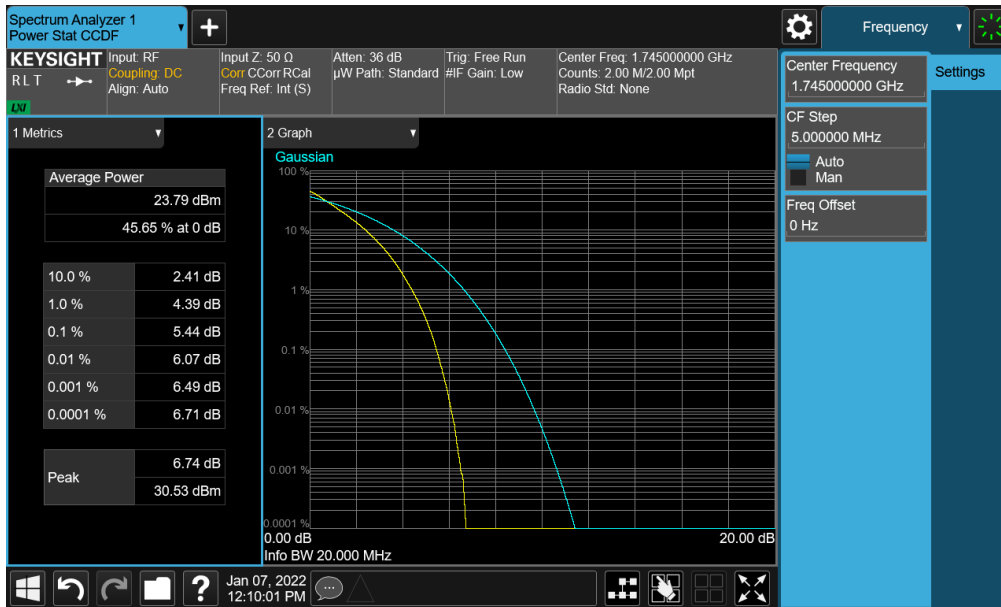
# WCDMA AWS



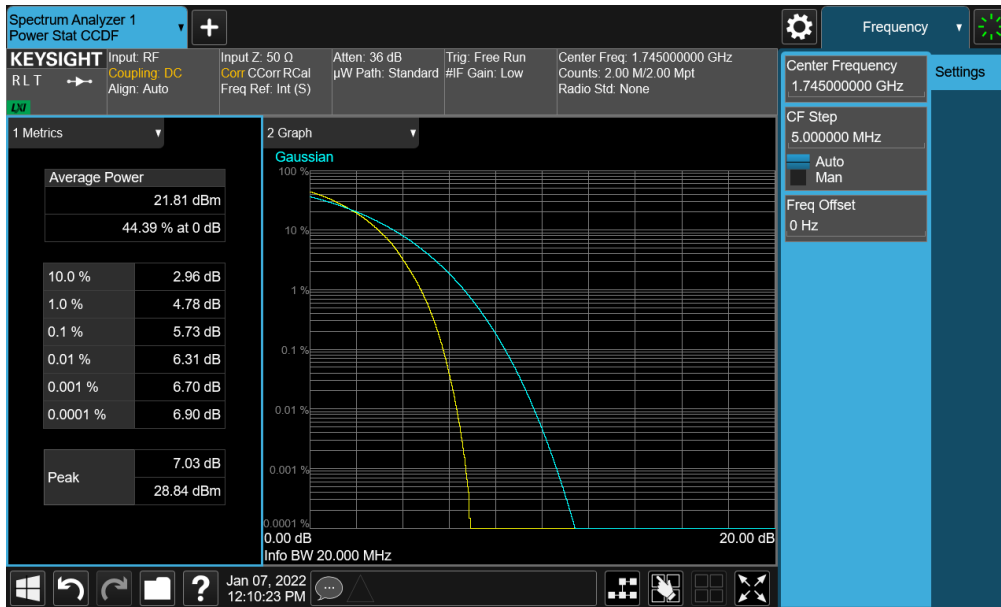
**Plot 7-137. PAR Plot (WCDMA, Ch. 1413)**

FCC ID: A3LSMA135U	<b>PART 27 MEASUREMENT REPORT</b>	Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset
		Page 88 of 121

# LTE Band 66/4

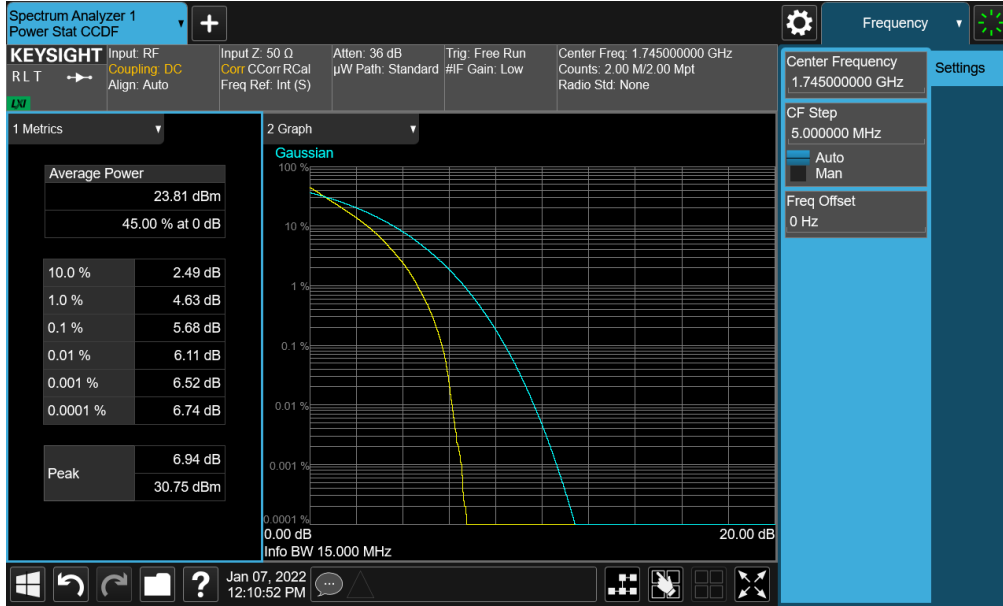


Plot 7-138. PAR Plot (LTE Band 66/4 - 20MHz QPSK - Full RB)

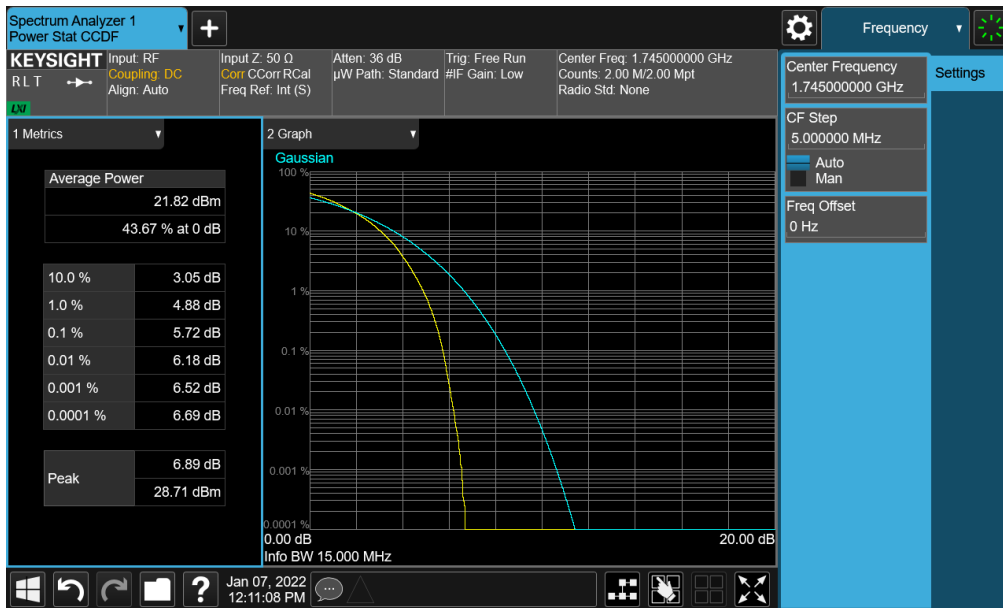


Plot 7-139. PAR Plot (LTE Band 66/4 - 20MHz 64-QAM - Full RB)

FCC ID: A3LSMA135U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset		Page 89 of 121

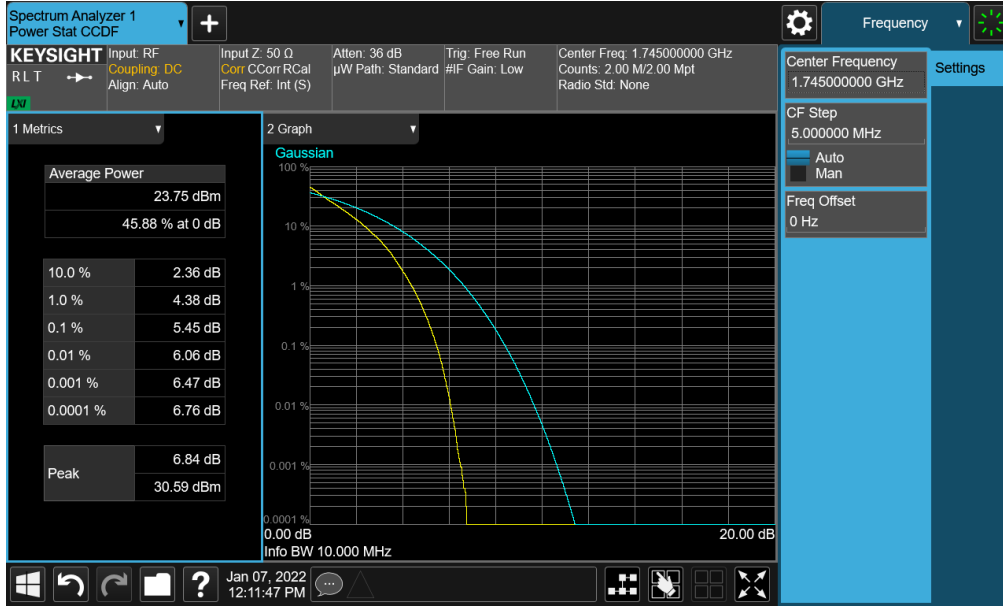


Plot 7-140. PAR Plot (LTE Band 66/4 - 15MHz QPSK - Full RB)

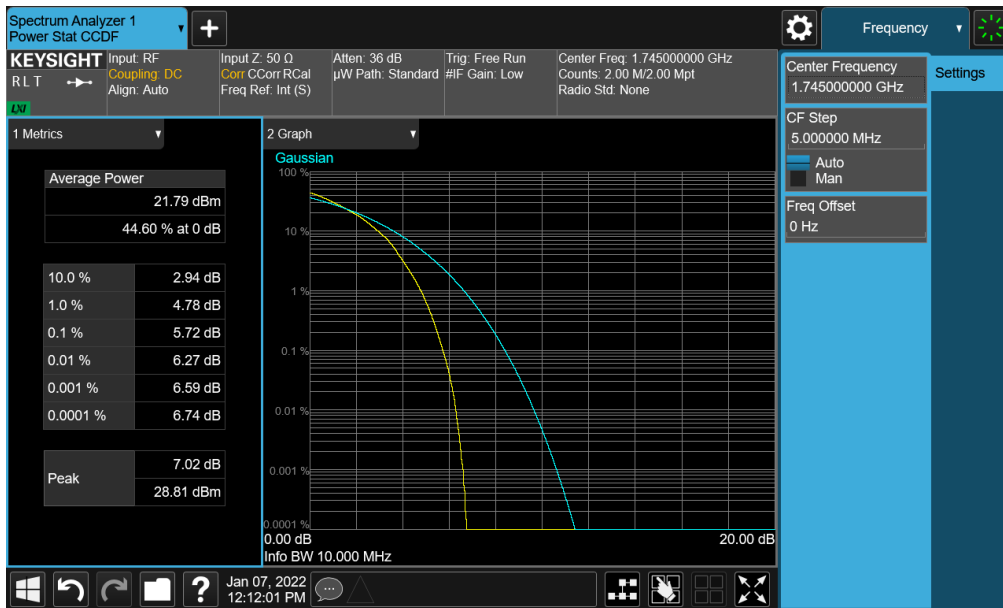


Plot 7-141. PAR Plot (LTE Band 66/4 - 15MHz 64-QAM - Full RB)

FCC ID: A3LSMA135U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset		Page 90 of 121

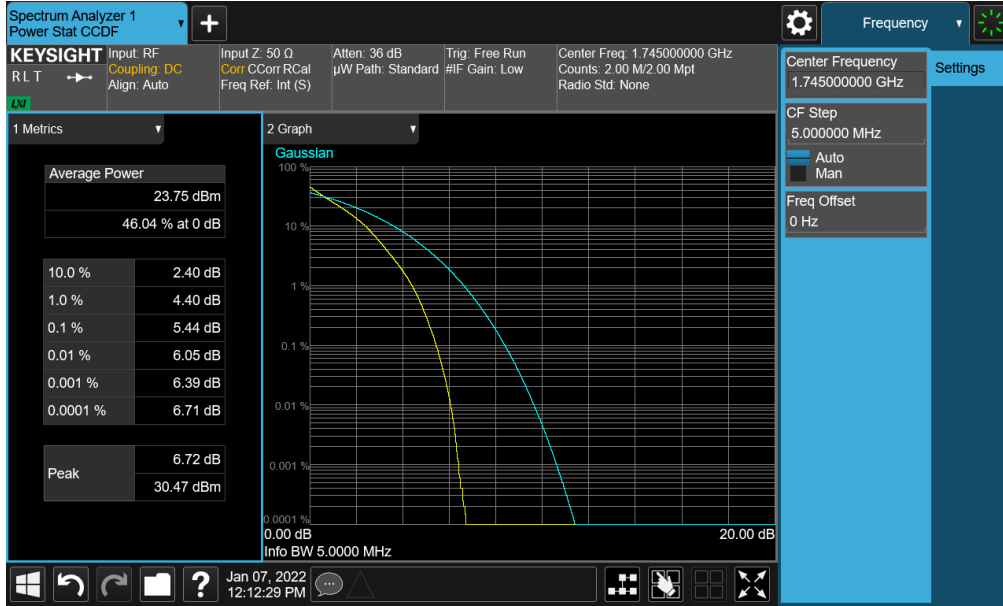


Plot 7-142. PAR Plot (LTE Band 66/4 - 10MHz QPSK - Full RB)

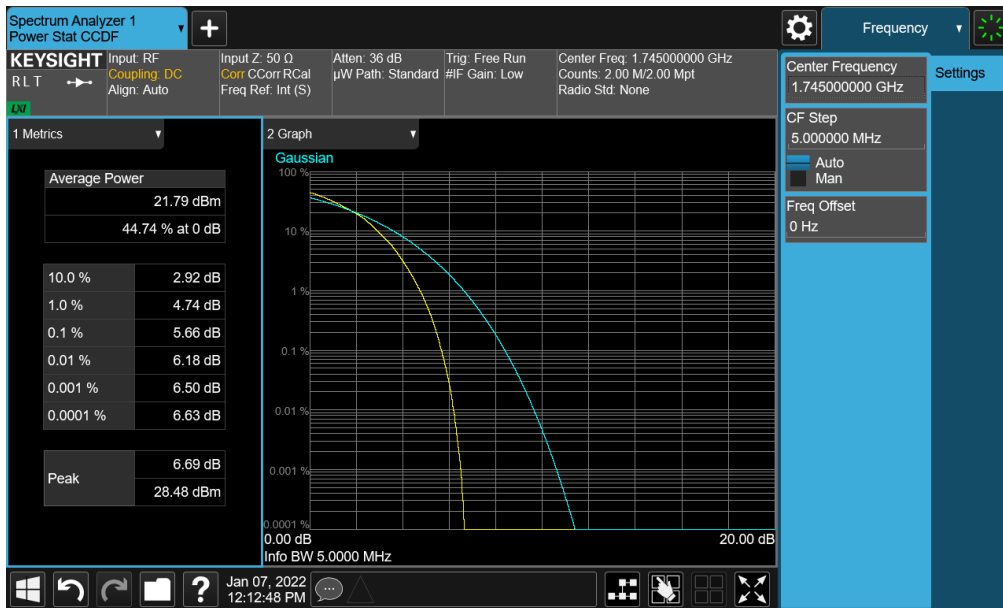


Plot 7-143. PAR Plot (LTE Band 66/4 - 10MHz 64-QAM - Full RB)

FCC ID: A3LSMA135U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset		Page 91 of 121



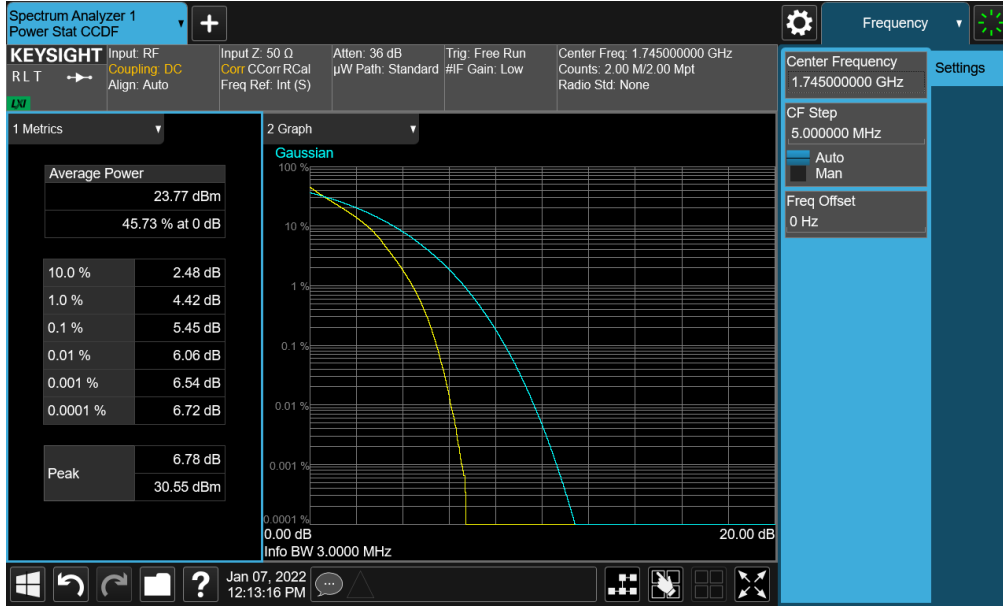
Plot 7-144. PAR Plot (LTE Band 66/4 - 5MHz QPSK - Full RB)



Plot 7-145. PAR Plot (LTE Band 66/4 - 5MHz 64-QAM - Full RB)

FCC ID: A3LSMA135U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset		Page 92 of 121



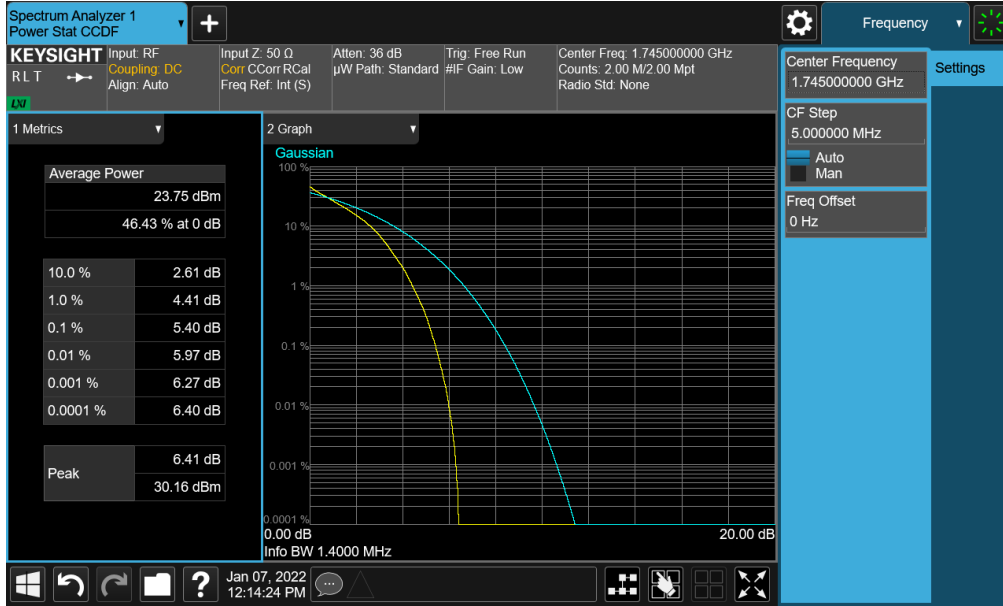


Plot 7-146. PAR Plot (LTE Band 66/4 - 3MHz QPSK - Full RB)

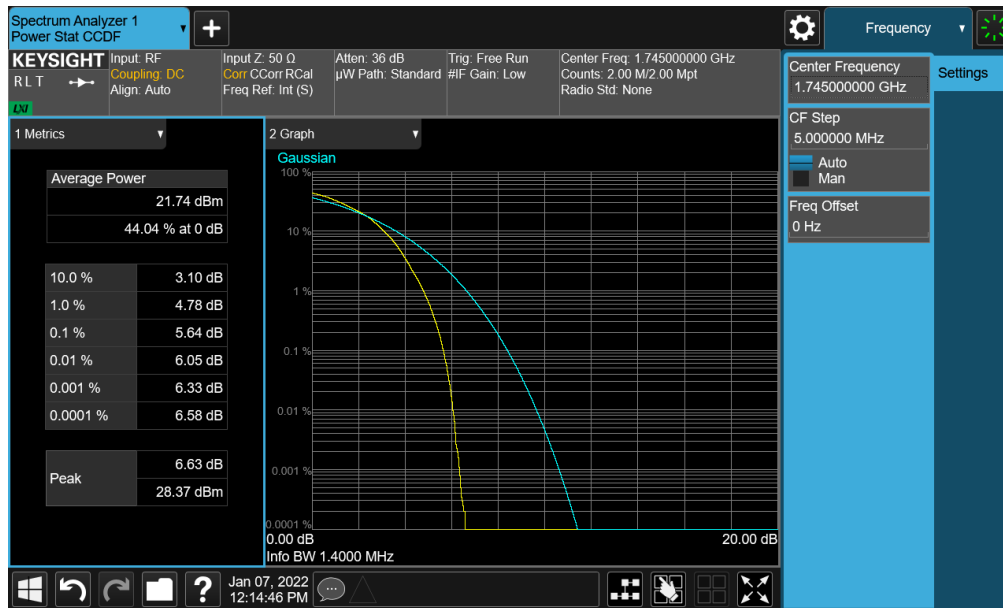


Plot 7-147. PAR Plot (LTE Band 66/4 - 3MHz 64-QAM - Full RB)

FCC ID: A3LSMA135U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset		Page 93 of 121



Plot 7-148. PAR Plot (LTE Band 66/4 - 1.4MHz QPSK - Full RB)



Plot 7-149. PAR Plot (LTE Band 66/4 - 1.4MHz 64-QAM - Full RB)

FCC ID: A3LSMA135U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset		Page 94 of 121

## 7.6 Radiated Power (ERP/EIRP)

### Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.



### Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

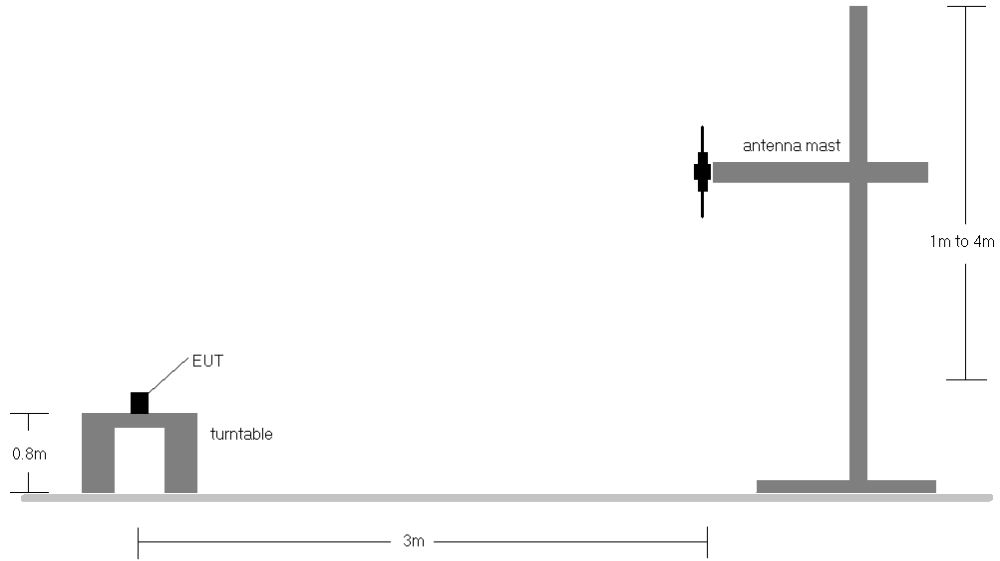
### Test Settings

1. Radiated power measurements are performed using the signal analyzer’s “channel power” measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW  $\geq$  3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points  $\geq$  2 x span / RBW
6. Detector = RMS
7. Trigger is set to “free run” for signals with continuous operation with the sweep times set to “auto”.
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

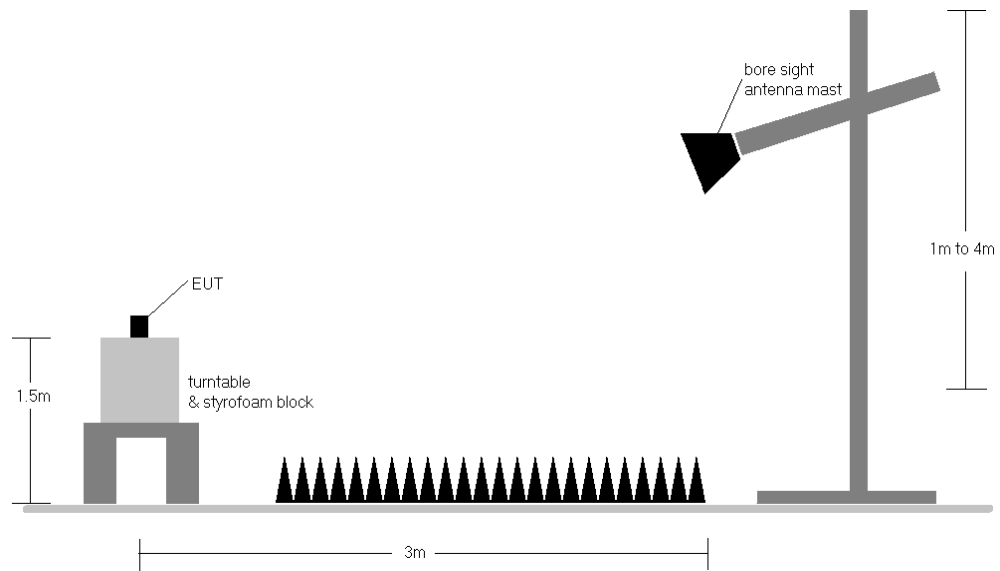
FCC ID: A3LSMA135U		PART 27 MEASUREMENT REPORT	 Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset	Page 95 of 121

**Test Setup**

The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 7-5. Radiated Test Setup <1GHz**





**Figure 7-6. Radiated Test Setup >1GHz**

FCC ID: A3LSMA135U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset		Page 96 of 121

**Test Notes**

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.

<b>FCC ID:</b> A3LSMA135U		<b>PART 27 MEASUREMENT REPORT</b> 	<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1M2112270166-04.A3L	<b>Test Dates:</b> 01/03/2022 - 01/26/2022	<b>EUT Type:</b> Portable Handset	Page 97 of 121

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
20 MHz	QPSK	673.0	V	163	343	1.18	1 / 99	17.85	19.03	0.080	36.99	-17.96	16.88	0.049	34.77	-17.89
	QPSK	680.5	V	151	332	1.19	1 / 99	18.76	19.95	0.099	36.99	-17.04	17.80	0.060	34.77	-16.97
	QPSK	688.0	V	152	337	1.20	1 / 50	19.47	<b>20.67</b>	0.117	36.99	-16.32	<b>18.52</b>	0.071	34.77	-16.25
	16-QAM	688.0	V	152	337	1.20	1 / 50	18.14	19.34	0.086	36.99	-17.65	17.19	0.052	34.77	-17.58
15 MHz	QPSK	670.5	V	163	343	1.18	1 / 37	17.90	19.08	0.081	36.99	-17.91	16.93	0.049	34.77	-17.84
	QPSK	680.5	V	151	332	1.19	1 / 37	18.61	19.80	0.096	36.99	-17.19	17.65	0.058	34.77	-17.12
	QPSK	690.5	V	152	337	1.20	1 / 0	19.41	<b>20.61</b>	0.115	36.99	-16.38	<b>18.46</b>	0.070	34.77	-16.31
	16-QAM	690.5	V	152	337	1.20	1 / 37	18.23	19.43	0.088	36.99	-17.56	17.28	0.053	34.77	-17.49
10 MHz	QPSK	668.0	V	163	343	1.18	1 / 25	17.94	19.11	0.082	36.99	-17.88	16.96	0.050	34.77	-17.81
	QPSK	680.5	V	151	332	1.19	1 / 25	18.54	19.73	0.094	36.99	-17.26	17.58	0.057	34.77	-17.19
	QPSK	693.0	V	152	337	1.20	1 / 25	19.41	<b>20.62</b>	0.115	36.99	-16.37	<b>18.47</b>	0.070	34.77	-16.30
	16-QAM	693.0	V	152	337	1.20	1 / 25	18.15	19.36	0.086	36.99	-17.63	17.21	0.053	34.77	-17.56
5 MHz	QPSK	665.5	V	163	343	1.18	1 / 12	17.73	18.90	0.078	36.99	-18.09	16.75	0.047	34.77	-18.02
	QPSK	680.5	V	151	332	1.19	1 / 12	18.41	19.60	0.091	36.99	-17.39	17.45	0.056	34.77	-17.32
	QPSK	695.5	V	152	337	1.21	1 / 0	19.01	<b>20.22</b>	0.105	36.99	-16.77	<b>18.07</b>	0.064	34.77	-16.70
	16-QAM	695.5	V	152	337	1.21	1 / 12	17.92	19.13	0.082	36.99	-17.86	16.98	0.050	34.77	-17.79
20 MHz	Opposite Pol.	688.0	H	271	10	1.20	1 / 0	18.36	19.56	0.090	36.99	-17.43	17.41	0.055	34.77	-17.36

Table 7-2. ERP Data (LTE Band 71)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
10 MHz	QPSK	704.0	H	100	175	1.20	1 / 0	19.17	20.37	0.109	36.99	-16.62	18.22	0.066	34.77	-16.55
	QPSK	707.5	H	113	172	1.19	1 / 25	17.99	19.18	0.083	36.99	-17.81	17.03	0.051	34.77	-17.74
	QPSK	711.0	H	110	163	1.19	1 / 25	19.20	<b>20.39</b>	0.109	36.99	-16.60	<b>18.24</b>	0.067	34.77	-16.53
	16-QAM	704.0	H	100	175	1.20	1 / 0	18.13	19.33	0.086	36.99	-17.66	17.18	0.052	34.77	-17.59
5 MHz	QPSK	701.5	H	100	175	1.21	1 / 12	18.97	<b>20.18</b>	0.104	36.99	-16.81	<b>18.03</b>	0.064	34.77	-16.74
	QPSK	707.5	H	113	172	1.19	1 / 0	17.67	18.86	0.077	36.99	-18.13	16.71	0.047	34.77	-18.06
	QPSK	713.5	H	110	163	1.18	1 / 12	18.57	19.75	0.094	36.99	-17.24	17.60	0.058	34.77	-17.17
	16-QAM	701.5	H	100	175	1.21	1 / 24	17.77	18.98	0.079	36.99	-18.01	16.83	0.048	34.77	-17.94
3 MHz	QPSK	700.5	H	100	175	1.21	1 / 14	19.05	<b>20.26</b>	0.106	36.99	-16.73	<b>18.11</b>	0.065	34.77	-16.66
	QPSK	707.5	H	113	172	1.19	1 / 7	17.65	18.84	0.077	36.99	-18.15	16.69	0.047	34.77	-18.08
	QPSK	714.5	H	110	163	1.18	1 / 0	18.43	19.61	0.091	36.99	-17.38	17.46	0.056	34.77	-17.31
	16-QAM	700.5	H	100	175	1.21	1 / 14	17.78	18.99	0.079	36.99	-18.00	16.84	0.048	34.77	-17.93
1.4 MHz	QPSK	699.7	H	100	175	1.21	1 / 5	18.99	<b>20.20</b>	0.105	36.99	-16.79	<b>18.05</b>	0.064	34.77	-16.72
	QPSK	707.5	H	113	172	1.19	1 / 0	17.74	18.93	0.078	36.99	-18.06	16.78	0.048	34.77	-17.99
	QPSK	715.3	H	110	163	1.18	1 / 3	18.54	19.72	0.094	36.99	-17.27	17.57	0.057	34.77	-17.20
	16-QAM	699.7	H	100	175	1.21	1 / 5	17.73	18.94	0.078	36.99	-18.05	16.79	0.048	34.77	-17.98
10 MHz	Opposite Pol.	711.0	V	149	331	1.19	1 / 25	19.06	20.25	0.106	36.99	-16.74	18.10	0.065	34.77	-16.67



Table 7-3. ERP Data (LTE Band 12)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
10 MHz	QPSK	782.0	V	163	211	1.04	1 / 0	19.83	<b>20.87</b>	0.122	36.99	-16.12	<b>18.72</b>	0.074	34.77	-16.05
	16-QAM	782.0	V	163	211	1.04	1 / 0	18.65	19.69	0.093	36.99	-17.30	17.54	0.057	34.77	-17.23
5 MHz	QPSK	779.5	V	163	211	1.04	1 / 0	19.81	<b>20.86</b>	0.122	36.99	-16.13	<b>18.71</b>	0.074	34.77	-16.06
	QPSK	782.0	V	163	211	1.04	1 / 0	19.54	20.58	0.114	36.99	-16.41	18.43	0.070	34.77	-16.34
	QPSK	784.5	V	163	211	1.03	1 / 0	19.71	20.74	0.118	36.99	-16.25	18.59	0.072	34.77	-16.18
	16-QAM	779.5	V	163	211	1.04	1 / 0	18.88	19.93	0.098	36.99	-17.06	17.78	0.060	34.77	-16.99
10 MHz	Opposite Pol.	782.0	H	245	290	1.04	1 / 0	19.21	20.25	0.106	36.99	-16.74	18.10	0.065	34.77	-16.67

Table 7-4. ERP Data (LTE Band 13)



Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1712.40	WCDMA 1700	V	121	115	13.43	8.43	<b>21.86</b>	<b>0.153</b>	30.00	-8.14
1732.60	WCDMA 1700	V	126	112	12.87	8.24	21.11	0.129	30.00	-8.89
1752.60	WCDMA 1700	V	142	125	12.21	8.09	20.30	0.107	30.00	-9.70
1712.40	WCDMA 1700	H	146	13	10.74	8.43	19.17	0.083	30.00	-10.83

Table 7-5. EIRP Data (WCDMA AWS)

FCC ID: A3LSMA135U	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset		Page 98 of 121

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
20 MHz	QPSK	1720.0	V	107	58	8.36	1 / 99	14.20	22.56	0.180	30.00	-7.44
	QPSK	1745.0	V	108	62	8.13	1 / 0	14.55	<b>22.68</b>	0.186	30.00	-7.32
	QPSK	1770.0	V	124	52	8.11	1 / 0	13.42	21.53	0.142	30.00	-8.47
	16-QAM	1745.0	V	108	62	8.13	1 / 0	12.74	20.87	0.122	30.00	-9.13
15 MHz	QPSK	1717.5	V	107	58	8.38	1 / 74	14.47	22.85	0.193	30.00	-7.15
	QPSK	1745.0	V	108	62	8.13	1 / 0	14.94	<b>23.07</b>	0.203	30.00	-6.93
	QPSK	1772.5	V	124	52	8.11	1 / 0	14.02	22.13	0.163	30.00	-7.87
	16-QAM	1745.0	V	108	62	8.13	1 / 0	13.29	21.42	0.139	30.00	-8.58
10 MHz	QPSK	1715.0	V	107	58	8.40	1 / 0	14.52	22.93	0.196	30.00	-7.07
	QPSK	1745.0	V	108	62	8.13	1 / 49	14.95	<b>23.08</b>	0.203	30.00	-6.92
	QPSK	1775.0	V	124	52	8.11	1 / 49	13.95	22.06	0.161	30.00	-7.94
	16-QAM	1745.0	V	108	62	8.13	1 / 49	13.10	21.23	0.133	30.00	-8.77
5 MHz	QPSK	1712.5	V	107	58	8.42	1 / 0	14.44	22.87	0.194	30.00	-7.13
	QPSK	1745.0	V	108	62	8.13	1 / 12	14.99	<b>23.12</b>	0.205	30.00	-6.88
	QPSK	1777.5	V	124	52	8.11	1 / 0	13.92	22.04	0.160	30.00	-7.96
	16-QAM	1745.0	V	108	62	8.13	1 / 12	13.42	21.55	0.143	30.00	-8.45
3 MHz	QPSK	1711.5	V	107	58	8.43	1 / 0	14.47	22.91	0.195	30.00	-7.09
	QPSK	1745.0	V	108	62	8.13	1 / 7	14.99	<b>23.12</b>	0.205	30.00	-6.88
	QPSK	1778.5	V	124	52	8.12	1 / 7	13.85	21.97	0.157	30.00	-8.03
	16-QAM	1745.0	V	108	62	8.13	1 / 7	13.37	21.50	0.141	30.00	-8.50
1.4 MHz	QPSK	1710.7	V	107	58	8.44	1 / 3	14.39	22.83	0.192	30.00	-7.17
	QPSK	1745.0	V	108	62	8.13	1 / 3	14.85	<b>22.98</b>	0.199	30.00	-7.02
	QPSK	1779.3	V	124	52	8.12	1 / 3	13.85	21.97	0.157	30.00	-8.03
	16-QAM	1745.0	V	108	62	8.13	1 / 0	13.15	21.28	0.134	30.00	-8.72
20 MHz	Opposite Pol.	1745.0	H	355	6	8.13	1 / 0	13.62	21.75	0.150	30.00	-8.25

Table 7-6. EIRP Data (LTE Band 66/4)

FCC ID: A3LSMA135U	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset	Page 99 of 121

## 7.7 Radiated Spurious Emissions Measurements

### Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using horizontally and vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS measurements while the EUT is operating at maximum power, and at the appropriate frequencies.



### Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

### Test Settings

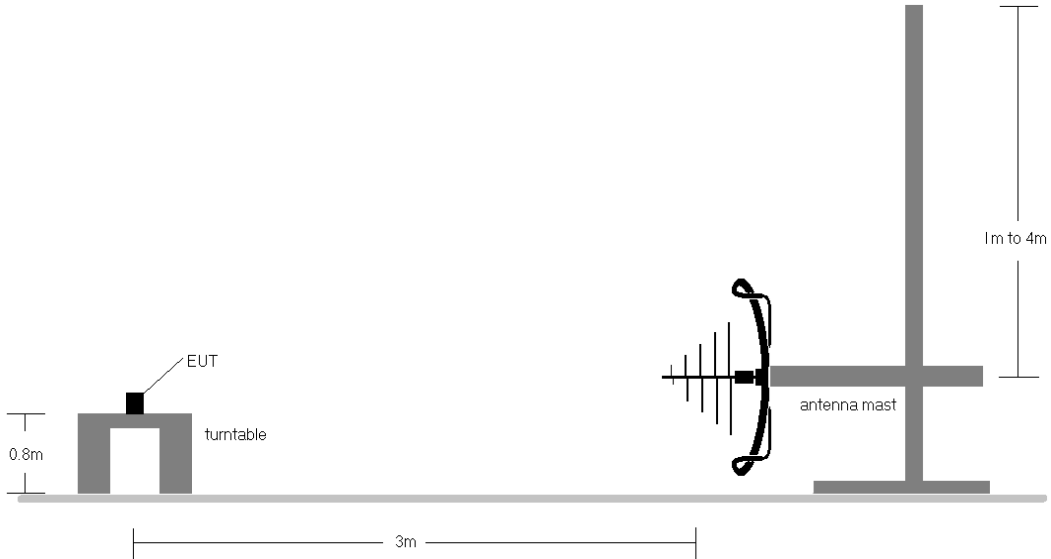
1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW  $\geq$  3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points  $\geq$  2 x span / RBW
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

FCC ID: A3LSMA135U		PART 27 MEASUREMENT REPORT	 Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset	Page 100 of 121

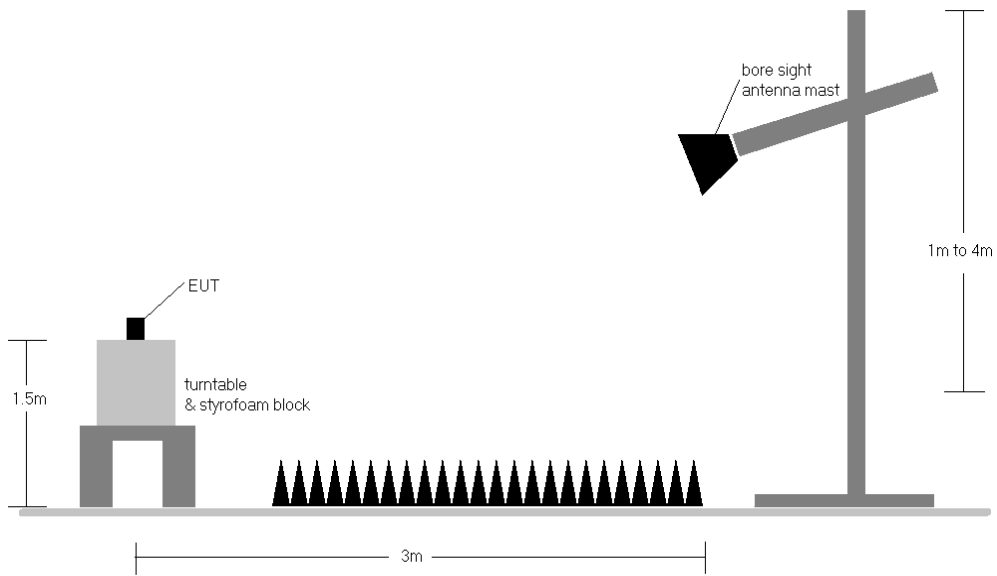


**Test Setup**

The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 7-7. Test Instrument & Measurement Setup < 1GHz**





**Figure 7-8. Test Instrument & Measurement Setup >1 GHz**

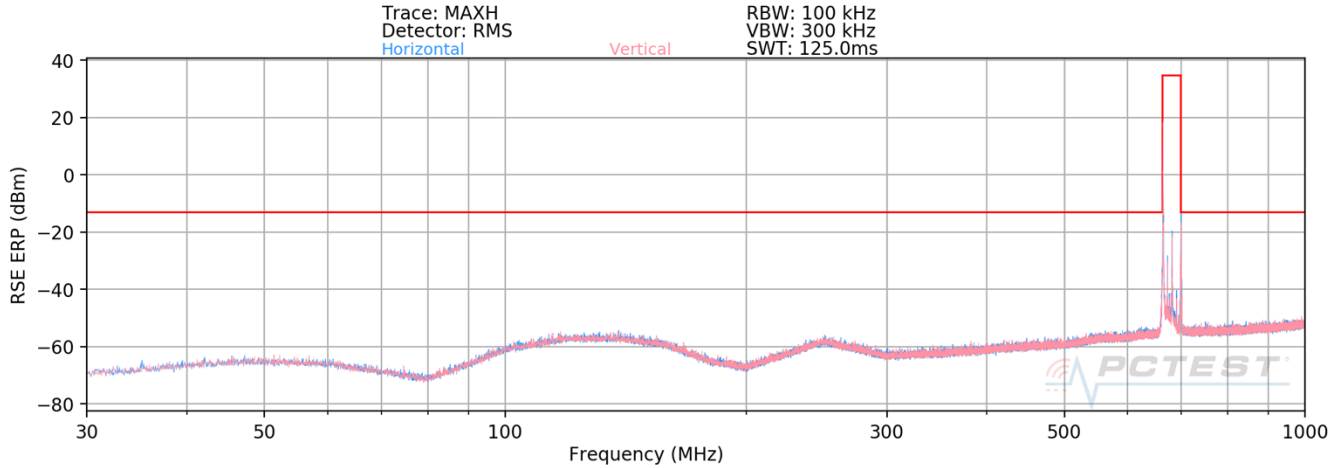
FCC ID: A3LSMA135U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1M2112270166-04.A3L	<b>Test Dates:</b> 01/03/2022 - 01/26/2022	<b>EUT Type:</b> Portable Handset	Page 101 of 121

## Test Notes

- 1) Field strengths are calculated using the Measurement quantity conversions in KDB 971168 Section 5.8.4.
  - a)  $E(\text{dB}\mu\text{V}/\text{m}) = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$
  - b)  $\text{EIRP (dBm)} = E(\text{dB}\mu\text{V}/\text{m}) + 20\log D - 104.8$ ; where D is the measurement distance in meters.
- 2) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 3) This unit was tested with its standard battery.
- 4) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 5) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 6) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

FCC ID: A3LSMA135U		PART 27 MEASUREMENT REPORT	 Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset	Page 102 of 121

# LTE Band 71



**Plot 7-150. Radiated Spurious Plot Below 1GHz (LTE Band 71)**

Bandwidth (MHz):	20
Frequency (MHz):	673.0
RB / Offset:	1 / 0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
699.72	H	247	14	-55.80	23.56	74.76	-20.50	-13.00	-7.50

**Table 7-7. Radiated Spurious Data (LTE Band 71 – Low Channel)**

Bandwidth (MHz):	20
Frequency (MHz):	680.5
RB / Offset:	1 / 0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
707.19	H	243	25	-58.14	23.60	72.46	-22.80	-13.00	-9.80

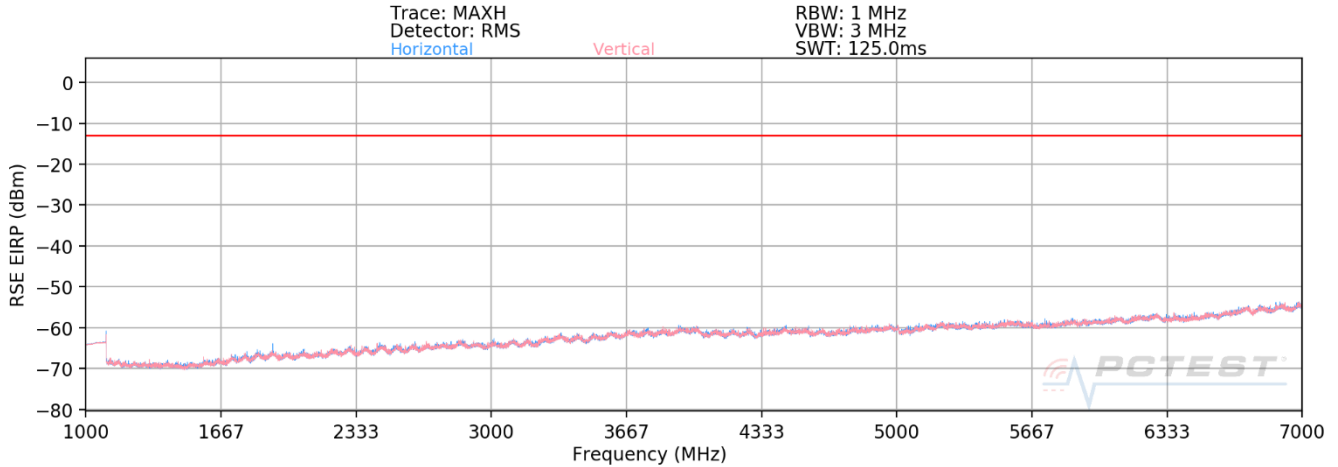
**Table 7-8. Radiated Spurious Data (LTE Band 71 – Mid Channel)**

Bandwidth (MHz):	20
Frequency (MHz):	688.0
RB / Offset:	1 / 0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
714.68	H	220	17	-79.95	23.63	50.68	-44.58	-13.00	-31.58

**Table 7-9. Radiated Spurious Data (LTE Band 71 – High Channel)**

FCC ID: A3LSMA135U	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset
		Page 103 of 121



**Plot 7-151. Radiated Spurious Plot Above 1GHz (LTE Band 71)**

Bandwidth (MHz):	20
Frequency (MHz):	673.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1346.00	H	-	-	-74.68	-9.31	23.01	-72.25	-13.00	-59.25
2019.00	H	-	-	-75.91	-6.06	25.03	-70.23	-13.00	-57.23
2692.00	H	-	-	-75.79	-3.76	27.45	-67.81	-13.00	-54.81

**Table 7-10. Radiated Spurious Data (LTE Band 71 – Low Channel)**

Bandwidth (MHz):	20
Frequency (MHz):	680.5
RB / Offset:	1 / 50



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1361.00	H	-	-	-74.81	-9.23	22.96	-72.30	-13.00	-59.30
2041.50	H	-	-	-75.48	-5.91	25.61	-69.64	-13.00	-56.64
2722.00	H	-	-	-77.26	-3.02	26.72	-68.54	-13.00	-55.54

**Table 7-11. Radiated Spurious Data (LTE Band 71 – Mid Channel)**

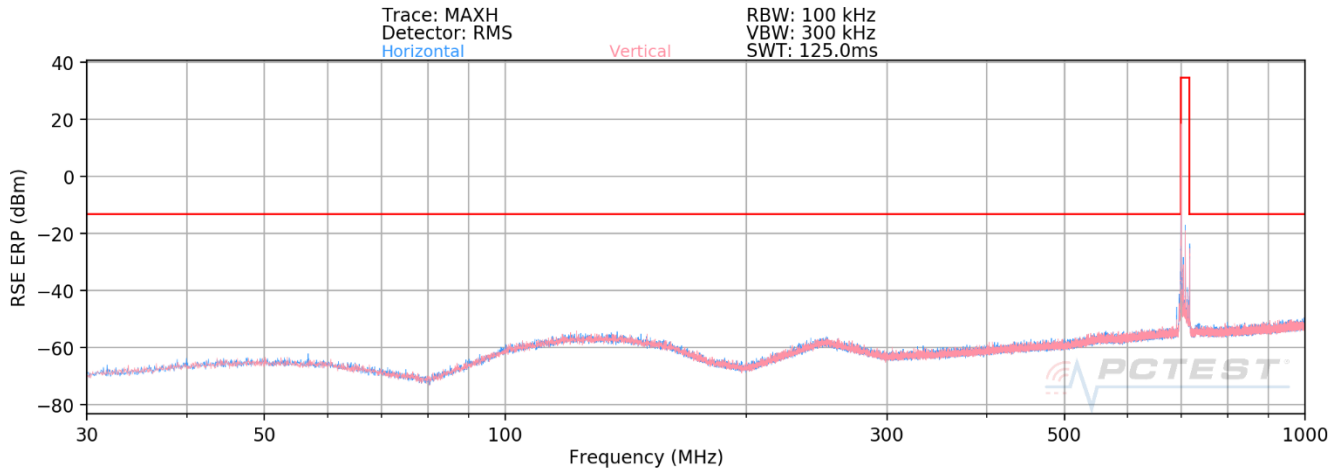
Bandwidth (MHz):	20
Frequency (MHz):	688.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1376.00	H	-	-	-75.10	-8.92	22.98	-72.28	-13.00	-59.28
2064.00	H	-	-	-75.23	-5.88	25.89	-69.37	-13.00	-56.37
2752.00	H	-	-	-76.52	-3.30	27.18	-68.08	-13.00	-55.08

**Table 7-12. Radiated Spurious Data (LTE Band 71 – High Channel)**

FCC ID: A3LSMA135U	 PART 27 MEASUREMENT REPORT 	Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset
		Page 104 of 121

## LTE Band 12



**Plot 7-152. Radiated Spurious Plot Below 1GHz (LTE Band 12)**

Bandwidth (MHz):	10
Frequency (MHz):	704.0
RB / Offset:	1 / 0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
717.20	H	104	292	-62.23	23.64	68.41	-26.85	-13.00	-13.85

**Table 7-13. Radiated Spurious Data (LTE Band 12 – Low Channel)**

Bandwidth (MHz):	10
Frequency (MHz):	707.5
RB / Offset:	1 / 0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
720.70	H	101	289	-69.57	23.65	61.08	-34.17	-13.00	-21.17

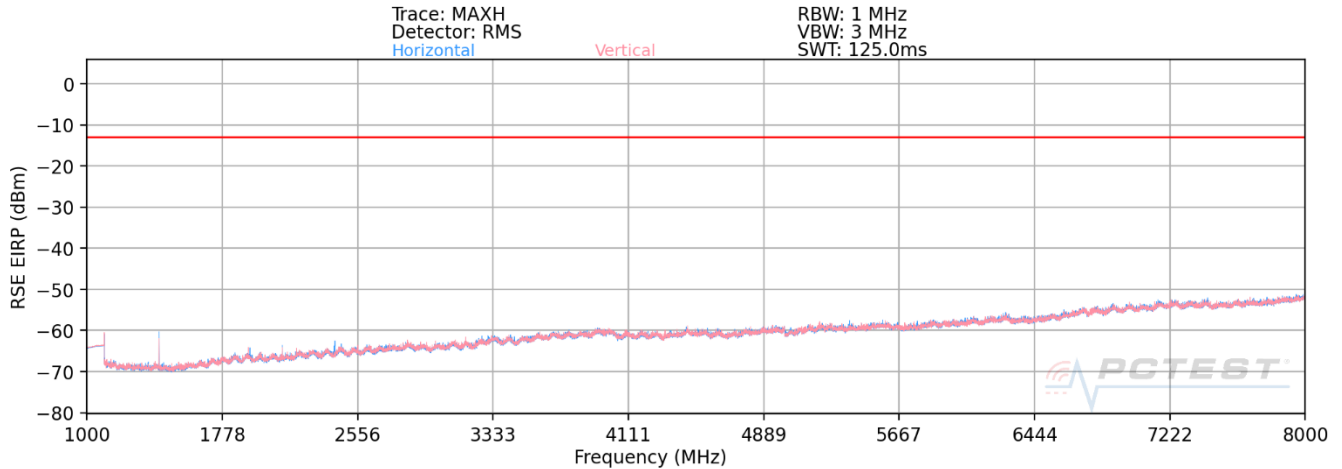
**Table 7-14. Radiated Spurious Data (LTE Band 12 – Mid Channel)**

Bandwidth (MHz):	10
Frequency (MHz):	711.0
RB / Offset:	1 / 0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
719.80	H	117	291	-78.88	23.65	51.77	-43.49	-13.00	-30.49

**Table 7-15. Radiated Spurious Data (LTE Band 12 – High Channel)**

FCC ID: A3LSMA135U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset		Page 105 of 121



**Plot 7-153. Radiated Spurious Plot Above 1GHz (LTE Band 12)**

Bandwidth (MHz):	10
Frequency (MHz):	704.0
RB / Offset:	1 / 25



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1408.00	V	291	308	-70.90	-8.83	27.27	-67.99	-13.00	-54.99
2112.00	V	-	-	-75.08	-5.94	25.98	-69.28	-13.00	-56.28
2816.00	V	-	-	-76.96	-3.43	26.61	-68.65	-13.00	-55.65
3520.00	V	-	-	-76.22	-1.10	29.68	-65.58	-13.00	-52.58
4224.00	V	-	-	-77.64	0.61	29.97	-65.28	-13.00	-52.28

**Table 7-16. Radiated Spurious Data (LTE Band 12 – Low Channel)**

Bandwidth (MHz):	10
Frequency (MHz):	707.5
RB / Offset:	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1415.00	V	302	293	-65.54	-8.85	32.61	-62.65	-13.00	-49.65
2122.50	V	323	301	-74.89	-6.00	26.11	-69.15	-13.00	-56.15
2830.00	V	-	-	-76.62	-3.22	27.16	-68.09	-13.00	-55.09
3537.50	V	-	-	-76.66	-0.93	29.41	-65.85	-13.00	-52.85
4245.00	V	-	-	-77.22	0.51	30.29	-64.97	-13.00	-51.97



**Table 7-17. Radiated Spurious Data (LTE Band 12 – Mid Channel)**

FCC ID: A3LSMA135U	 PART 27 MEASUREMENT REPORT 	Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset
		Page 106 of 121

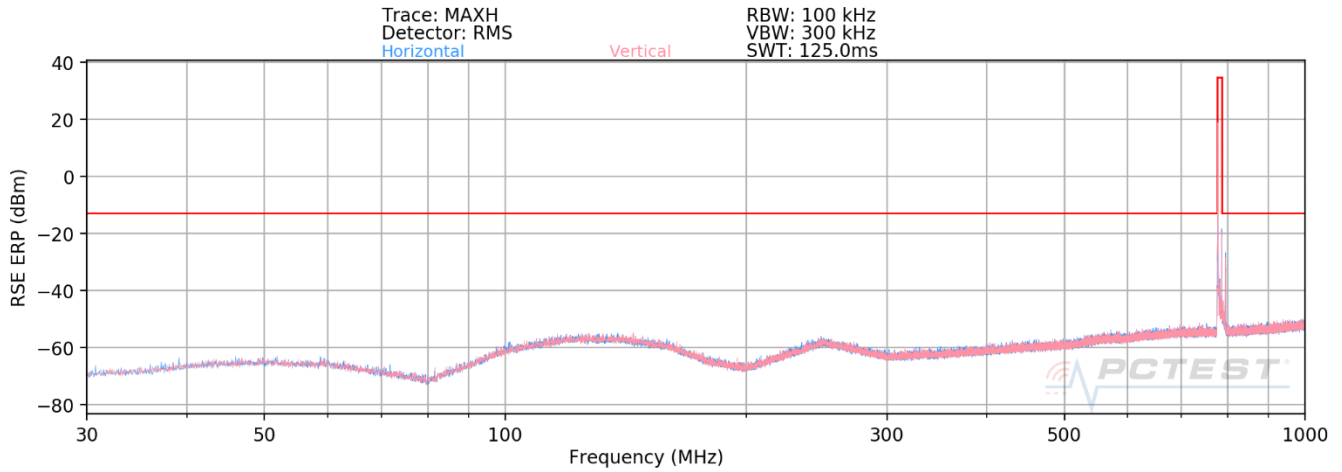
Bandwidth (MHz):	10
Frequency (MHz):	711.0
RB / Offset:	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1422.00	V	288	270	-67.91	-8.84	30.25	-65.01	-13.00	-52.01
2133.00	V	304	281	-73.89	-6.07	27.04	-68.22	-13.00	-55.22
2844.00	V	-	-	-75.94	-3.30	27.76	-67.50	-13.00	-54.50
3555.00	V	-	-	-77.09	-0.78	29.13	-66.13	-13.00	-53.13
4266.00	V	-	-	-76.65	0.77	31.12	-64.14	-13.00	-51.14

**Table 7-18. Radiated Spurious Data (LTE Band 12 – High Channel)**

FCC ID: A3LSMA135U	 PART 27 MEASUREMENT REPORT 	Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset
		Page 107 of 121

## LTE Band 13



**Plot 7-154. Radiated Spurious Plot Below 1GHz (LTE Band 13)**

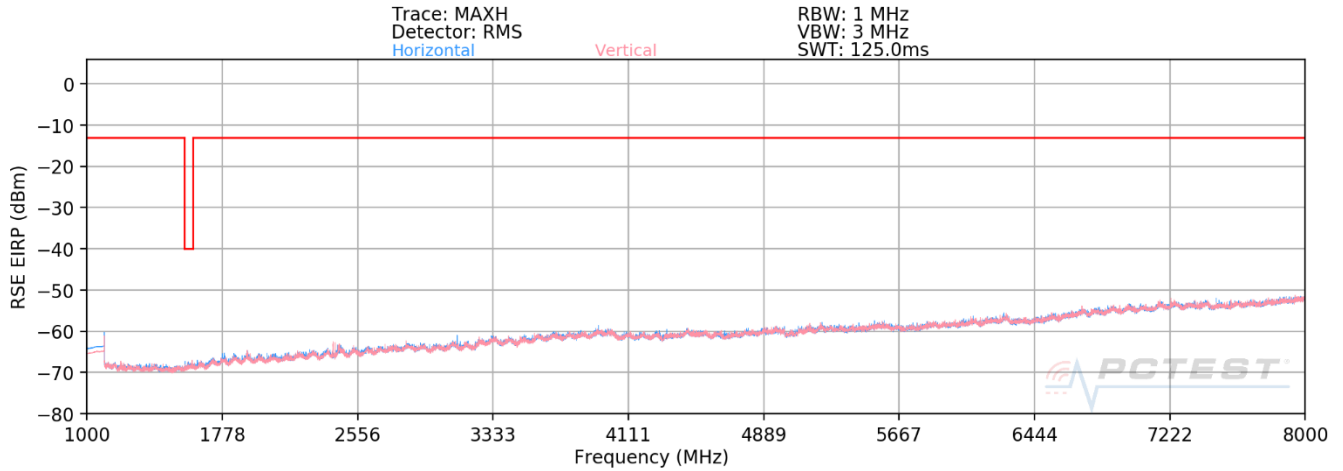
Bandwidth (MHz):	10
Frequency (MHz):	782.0
RB / Offset:	1 / 0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
792.20	H	102	291	-66.68	24.05	64.37	-30.89	-13.00	-17.89

**Table 7-19. Radiated Spurious Data (LTE Band 13 – Mid Channel)**

FCC ID: A3LSMA135U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset		Page 108 of 121







**Plot 7-155. Radiated Spurious Plot Above 1GHz (LTE Band 13)**

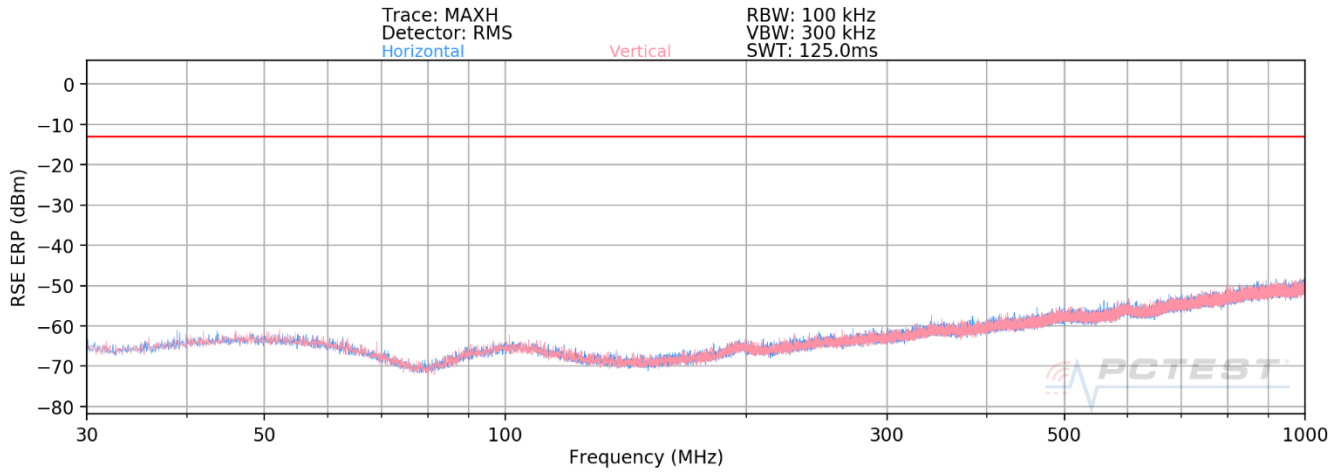
Bandwidth (MHz):	10
Frequency (MHz):	782.0
RB / Offset:	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1564.00	H	170	24	-68.57	-8.45	29.98	-65.28	-40.00	-25.28
2346.00	H	-	-	-76.21	-5.02	25.77	-69.49	-13.00	-56.49
3128.00	H	-	-	-76.67	-1.72	28.61	-66.65	-13.00	-53.65
3910.00	H	-	-	-77.12	0.91	30.79	-64.46	-13.00	-51.46

**Table 7-20. Radiated Spurious Data (LTE Band 13 – Mid Channel)**

FCC ID: A3LSMA135U	 PART 27 MEASUREMENT REPORT 	Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset
		Page 109 of 121

# WCDMA AWS



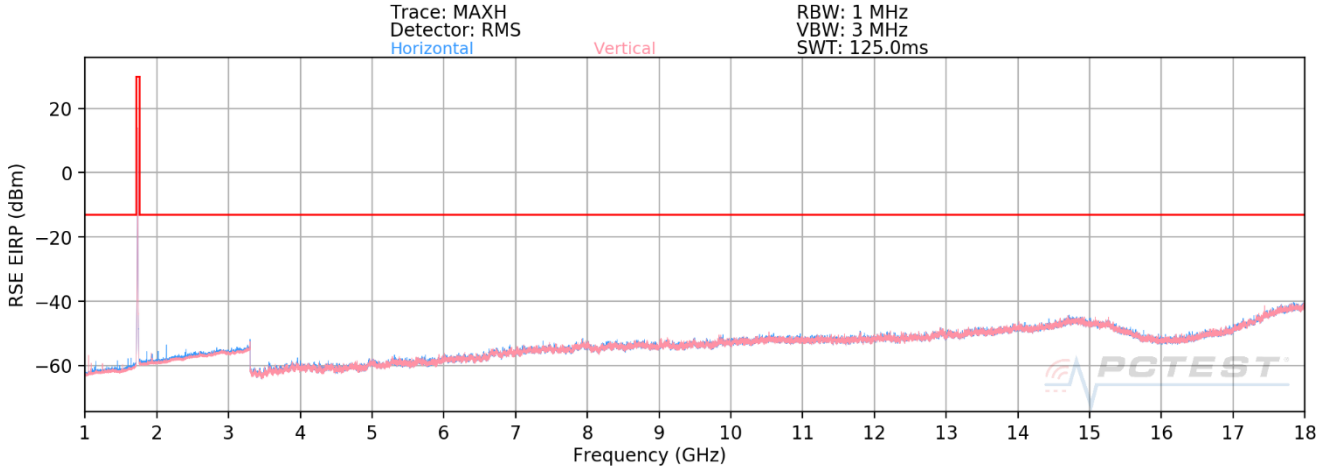
**Plot 7-156. Radiated Spurious Plot Below 1GHz (WCDMA AWS)**

Mode:	WCDMA RMC
Channel:	1312
Frequency (MHz):	1712.4

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
996.97	V	-	-	-84.77	26.04	48.27	-46.99	-13.00	-33.99

**7-21. Radiated Spurious Data (WCDMA AWS – Low Channel)**

FCC ID: A3LSMA135U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset		Page 110 of 121



**Plot 7-157. Radiated Spurious Plot Above 1GHz (WCDMA AWS)**

Mode:	WCDMA RMC
Channel:	1312
Frequency (MHz):	1712.4

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3424.80	V	-	-	-80.36	-1.09	25.55	-69.71	-13.00	-56.71
5137.20	V	-	-	-78.36	2.38	31.02	-64.24	-13.00	-51.24
6849.60	V	-	-	-83.32	7.20	30.88	-64.38	-13.00	-51.38
8562.00	V	-	-	-83.58	10.30	33.72	-61.54	-13.00	-48.54
10274.40	V	-	-	-82.47	12.13	36.66	-58.59	-13.00	-45.59

**7-22. Radiated Spurious Data (WCDMA AWS – Low Channel)**

Mode:	WCDMA RMC
Channel:	1413
Frequency (MHz):	1732.6

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3465.20	V	-	-	-77.81	-1.25	27.94	-67.32	-13.00	-54.32
5197.80	V	139	94	-77.58	2.49	31.91	-63.35	-13.00	-50.35
6930.40	V	-	-	-80.57	7.50	33.93	-61.33	-13.00	-48.33
8663.00	V	-	-	-81.39	10.74	36.35	-58.91	-13.00	-45.91
10395.60	V	-	-	-82.73	12.75	37.02	-58.24	-13.00	-45.24



**Table 7-23. Radiated Spurious Data (WCDMA AWS – Mid Channel)**

FCC ID: A3LSMA135U	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset
		Page 111 of 121

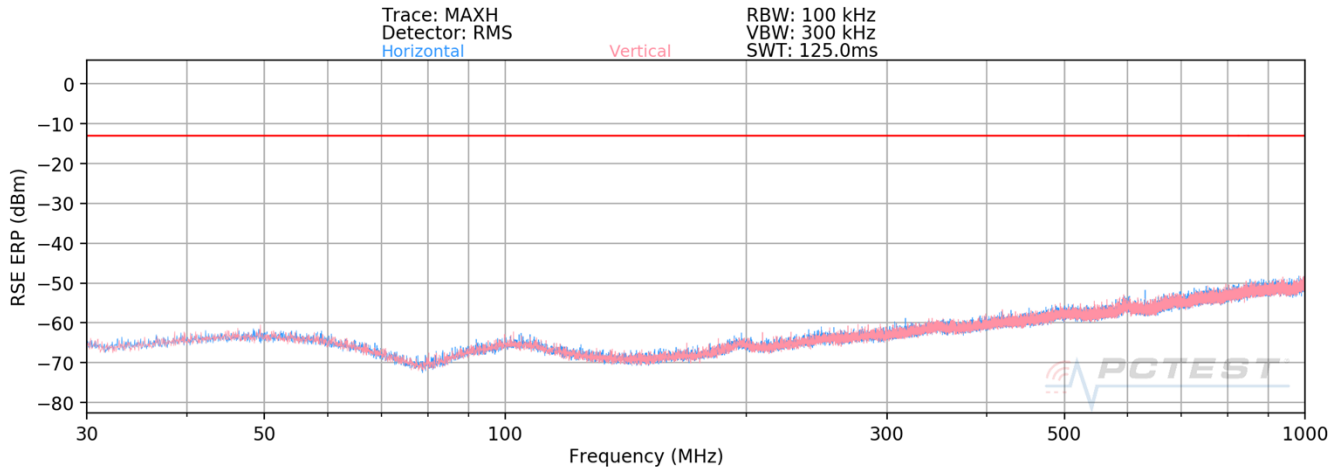
Mode:	WCDMA RMC
Channel:	1513
Frequency (MHz):	1752.6

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3505.20	V	-	-	-80.57	-0.82	25.61	-69.65	-13.00	-56.65
5257.80	V	154	107	-77.83	2.93	32.10	-63.15	-13.00	-50.15
7010.40	V	-	-	-82.22	7.50	32.28	-62.98	-13.00	-49.98
8763.00	V	-	-	-84.70	10.90	33.20	-62.06	-13.00	-49.06
10515.60	V	-	-	-82.82	12.85	37.03	-58.23	-13.00	-45.23

Table 7-24. Radiated Spurious Data (WCDMA AWS – High Channel)

FCC ID: A3LSMA135U		PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset		Page 112 of 121

# LTE Band 66/4



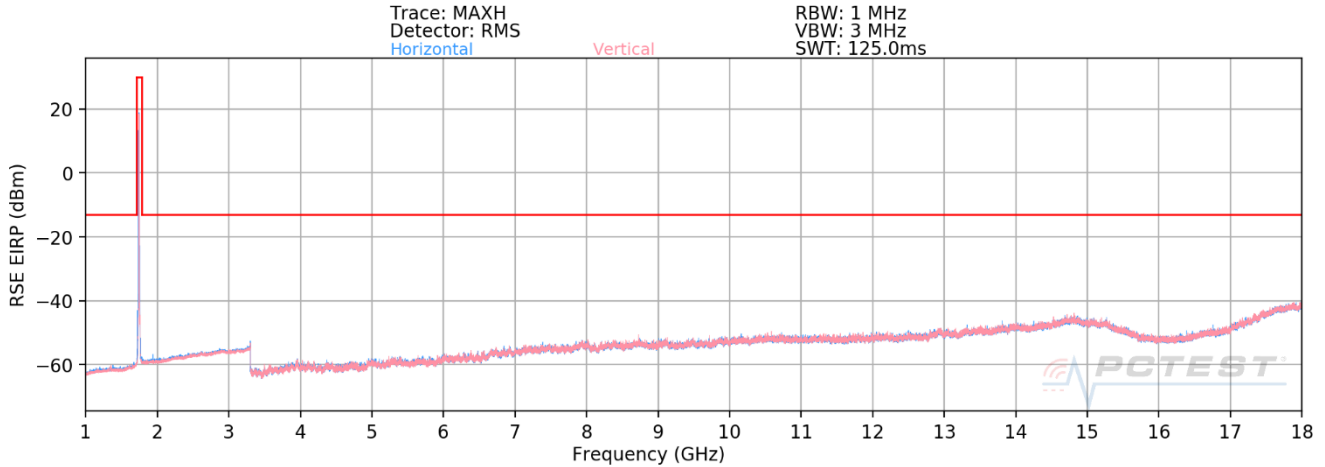
**Plot 7-158. Radiated Spurious Plot Below 1GHz (LTE Band 66/4)**

Bandwidth (MHz):	20
Frequency (MHz):	1745.0
RB / Offset:	1/50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
686.96	V	-	-	-84.12	22.33	45.21	-50.05	-13.00	-37.05

**Table 7-25. Radiated Spurious Data (LTE Band 66/4 – Mid Channel)**

FCC ID: A3LSMA135U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset		Page 113 of 121



**Plot 7-159. Radiated Spurious Plot Above 1GHz (LTE Band 66/4)**

Bandwidth (MHz):	20
Frequency (MHz):	1720.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3440.00	H	-	-	-77.21	-1.02	28.77	-66.49	-13.00	-53.49
5160.00	H	-	-	-77.78	2.61	31.83	-63.43	-13.00	-50.43
6880.00	H	-	-	-79.46	7.42	34.96	-60.30	-13.00	-47.30

**Table 7-26. Radiated Spurious Data (LTE Band 66/4 – Low Channel)**

Bandwidth (MHz):	20
Frequency (MHz):	1745.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3490.00	H	-	-	-76.23	-0.96	29.81	-65.44	-13.00	-52.44
5235.00	H	-	-	-77.58	2.48	31.90	-63.36	-13.00	-50.36
6980.00	H	-	-	-79.11	7.64	35.53	-59.73	-13.00	-46.73

**Table 7-27. Radiated Spurious Data (LTE Band 66/4 – Mid Channel)**

Bandwidth (MHz):	20
Frequency (MHz):	1770.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3540.00	H	-	-	-77.46	-0.54	29.00	-66.26	-13.00	-53.26
5310.00	H	-	-	-78.43	3.36	31.93	-63.32	-13.00	-50.32
7080.00	H	-	-	-79.14	7.63	35.49	-59.77	-13.00	-46.77

**Table 7-28. Radiated Spurious Data (LTE Band 66/4 – High Channel)**

FCC ID: A3LSMA135U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2112270166-04.A3L	Test Dates: 01/03/2022 - 01/26/2022	EUT Type: Portable Handset		Page 114 of 121