

**LTE Band 2 (Sub ANT) – Spot Check**

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP	
					[dBm]	[mW]
Band 2	20	QPSK	1/0	1860.0	<b>21.55</b>	<b>142.89</b>
			1/0	1880.0	18.72	74.47
			1/0	1900.0	20.42	110.15
		16QAM	1/0	1860.0	<b>20.31</b>	<b>107.40</b>
			1/0	1880.0	18.40	69.18
			1/0	1900.0	19.78	95.06
	15	QPSK				
		16QAM				
	10	QPSK				
		16QAM				
	5	QPSK				
		16QAM				
	3	QPSK				
		16QAM				
	1.4	QPSK				
16QAM						

**LTE Band 12**

Band	BW [MHz]	Mode	RB Size/	f [MHz]	ERP / EIRP	
			RB Offset		[dBm]	[mW]
Band 12	10	QPSK	1/0	704.0	19.02	79.80
			1/0	707.5	<b>19.19</b>	<b>82.99</b>
			1/0	711.0	<b>19.19</b>	<b>82.99</b>
		16QAM	1/25	704.0	<b>16.95</b>	<b>49.55</b>
			1/0	707.5	16.61	45.81
			1/0	711.0	16.91	49.09
	5	QPSK	1/24	701.5	<b>19.29</b>	<b>84.92</b>
			1/24	707.5	18.96	78.70
			1/24	713.5	18.37	68.71
		16QAM	1/0	701.5	<b>17.09</b>	<b>51.17</b>
			1/0	707.5	16.88	48.75
			1/0	713.5	16.69	46.67
	3	QPSK	1/14	700.5	<b>19.12</b>	<b>81.66</b>
			1/14	707.5	18.80	75.86
			1/0	714.5	18.88	77.27
		16QAM	1/0	700.5	16.50	44.67
			1/0	707.5	<b>17.01</b>	<b>50.23</b>
			1/14	714.5	16.16	41.30
	1.4	QPSK	1/5	699.7	19.06	80.54
			1/0	707.5	<b>19.28</b>	<b>84.72</b>
			1/0	715.3	18.49	70.63
16QAM		1/3	699.7	<b>16.61</b>	<b>45.81</b>	
		1/3	707.5	16.60	45.71	
		1/3	715.3	16.47	44.36	

**LTE Band 26**

Band	BW [MHz]	Mode	RB Size/	f [MHz]	ERP/EIRP	
			RB Offset		[dBm]	[mW]
Band 26	15	QPSK	1/0	821.5	22.26	168.27
			1/0	831.5	<b>20.81</b>	<b>120.50</b>
			1/0	841.5	19.54	89.95
		16QAM	1/0	821.5	20.20	104.71
			1/0	831.5	<b>18.87</b>	<b>77.09</b>
			1/0	841.5	17.21	52.60
	10	QPSK	1/49	819.0	21.67	146.89
			1/0	829.0	<b>20.62</b>	<b>115.35</b>
			1/0	831.5	20.55	113.50
			1/49	844.0	19.31	85.31
		16QAM	1/0	819.0	20.30	107.15
			1/0	829.0	18.71	74.30
			1/0	831.5	<b>18.74</b>	<b>74.82</b>
			1/25	844.0	17.38	54.70
	5	QPSK	1/0	816.5	21.70	147.91
			1/24	821.5	<b>21.92</b>	<b>155.60</b>
			1/24	826.5	20.46	111.17
			1/24	831.5	20.60	114.82
		16QAM	1/24	846.5	19.43	87.70
			1/24	816.5	19.68	92.90
			1/24	821.5	<b>19.98</b>	<b>99.54</b>
			1/0	826.5	18.51	70.96
			1/0	831.5	18.20	66.07
			1/0	846.5	17.41	55.08
	3	QPSK	1/0	815.5	21.54	142.56
			1/14	822.5	<b>22.07</b>	<b>161.06</b>
			1/0	825.5	20.53	112.98
			1/14	831.5	20.75	118.85
			1/14	847.5	19.17	82.60
		16QAM	1/14	815.5	19.48	88.72
			1/0	822.5	<b>20.23</b>	<b>105.44</b>
			1/0	825.5	18.54	71.45
			1/0	831.5	18.63	72.95
			1/0	847.5	17.37	54.58
	1.4	QPSK	1/0	814.7	20.26	106.17
			1/0	823.3	<b>20.82</b>	<b>120.78</b>
			1/0	824.7	20.49	111.94
			1/0	831.5	20.78	119.67
			1/0	848.3	19.53	89.74
		16QAM	1/3	814.7	18.03	63.53
1/5			823.3	18.60	72.44	
1/5			824.7	18.27	67.14	
1/3			831.5	18.34	68.23	
1/3			848.3	<b>19.61</b>	<b>91.41</b>	

**LTE Band 26(Straddle)**

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP/EIRP	
					[dBm]	[mW]
Band 26	15	QPSK	1/0	824	20.50	112.20
		16QAM	1/0		18.65	73.28
	10	QPSK	1/0	824	20.43	110.41
		16QAM	1/25		18.27	67.14
	5	QPSK	1/24	824	20.43	110.41
		16QAM	1/0		18.30	67.61
	3	QPSK	1/14	824	20.29	106.91
		16QAM	1/0		18.17	65.61
	1.4	QPSK	1/0	824	20.25	105.93
		16QAM	1/5		18.33	68.08

**LTE Band 41**

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP	
					[dBm]	[mW]
Band 41	20	QPSK	1/0	2506.0	21.48	140.60
			1/99	2593.0	21.21	132.13
			1/0	2680.0	<b>22.29</b>	<b>169.43</b>
		16QAM	1/99	2506.0	19.36	86.30
			1/99	2593.0	20.15	103.51
			1/49	2680.0	<b>20.60</b>	<b>114.82</b>
	15	QPSK	1/0	2503.5	20.53	112.98
			1/0	2593.0	22.28	169.04
			1/0	2682.5	<b>23.10</b>	<b>204.17</b>
		16QAM	1/74	2503.5	19.34	85.90
			1/74	2593.0	20.17	103.99
			1/37	2682.5	<b>21.29</b>	<b>134.59</b>
	10	QPSK	1/0	2501.0	21.71	148.25
			1/25	2593.0	22.62	182.81
			1/25	2685.0	<b>22.79</b>	<b>190.11</b>
		16QAM	1/49	2501.0	20.00	100.00
			1/49	2593.0	20.95	124.45
			1/0	2685.0	<b>21.37</b>	<b>137.09</b>
	5	QPSK	1/0	2498.5	22.08	161.44
			1/0	2593.0	22.49	177.42
			1/0	2687.5	<b>22.66</b>	<b>184.50</b>
		16QAM	1/24	2498.5	19.90	97.72
			1/0	2593.0	20.73	118.30
			1/24	2687.5	<b>20.91</b>	<b>123.31</b>

**LTE Band 66 (Main ANT)**

Band	BW [MHz]	Mode	RB Size/	f [MHz]	ERP / EIRP	
			RB Offset		[dBm]	[mW]
Band 66	20	QPSK	1/99	1720.0	20.55	113.50
			1/49	1745.0	<b>22.23</b>	<b>167.11</b>
			1/49	1770.0	21.59	144.21
		16QAM	1/49	1720.0	20.00	100.00
			1/49	1745.0	19.86	96.83
			1/49	1770.0	<b>20.05</b>	<b>101.16</b>
	15	QPSK	1/74	1717.5	22.30	169.82
			1/74	1747.5	<b>22.37</b>	<b>172.58</b>
			1/74	1772.5	22.18	165.20
		16QAM	1/74	1717.5	19.90	97.72
			1/0	1747.5	<b>20.42</b>	<b>110.15</b>
			1/74	1772.5	20.03	100.69
	10	QPSK	1/49	1715.0	<b>22.52</b>	<b>178.65</b>
			1/49	1745.0	22.39	173.38
			1/49	1775.0	22.15	164.06
		16QAM	1/25	1715.0	20.09	102.09
			1/25	1745.0	20.04	100.93
			1/25	1775.0	<b>20.41</b>	<b>109.90</b>
	5	QPSK	1/24	1712.5	22.21	166.34
			1/24	1745.0	21.97	157.40
			1/24	1777.5	<b>22.56</b>	<b>180.30</b>
		16QAM	1/24	1712.5	20.46	111.17
			1/0	1745.0	<b>20.73</b>	<b>118.30</b>
			1/0	1777.5	20.04	100.93
	3	QPSK	1/14	1711.5	21.60	144.54
			1/14	1745.0	<b>22.06</b>	<b>160.69</b>
			1/14	1778.5	21.87	153.82
		16QAM	1/8	1711.5	19.52	89.54
			1/14	1745.0	<b>19.68</b>	<b>92.90</b>
			1/0	1778.5	19.62	91.62
1.4	QPSK	1/5	1710.7	20.62	115.35	
		1/5	1745.0	<b>22.49</b>	<b>177.42</b>	
		1/5	1779.3	20.81	120.50	
	16QAM	1/0	1710.7	20.13	103.04	
		1/0	1745.0	<b>21.08</b>	<b>128.23</b>	
		1/0	1779.3	20.00	100.00	

**LTE Band 66 (Sub ANT) – Spot Check**

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP	
					[dBm]	[mW]
Band 66	20	QPSK	1/0	1720.0	20.64	115.88
			1/0	1745.0	<b>22.09</b>	<b>161.81</b>
			1/0	1770.0	20.43	110.41
		16QAM	1/49	1720.0	19.75	94.41
			1/49	1745.0	<b>21.47</b>	<b>140.28</b>
			1/49	1770.0	19.29	84.92
	15	QPSK				
		16QAM				
	10	QPSK				
		16QAM				
	5	QPSK				
		16QAM				
	3	QPSK				
		16QAM				
1.4	QPSK					
	16QAM					

**9.5.2. ERP/EIRP DATA**

**GSM850**

GSM850  GPRS	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																																																																																
	<p> <b>Company:</b> Samsung  <b>Project #:</b> 4790160849  <b>Date:</b> 12/17/2021  <b>Test Engineer:</b> 19568  <b>Configuration:</b> EUT, Z-Position  <b>Location:</b> Chamber 2  <b>Mode:</b> GPRS 850 MHz Fundamentals                 </p> <p> <b>Test Equipment:</b>                      Receiving: VULB9163-749, and Chamber 2 SMA Cables                      Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable                 </p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9"><b>Low Ch</b></td> </tr> <tr> <td>824.20</td> <td>34.18</td> <td>V</td> <td>3.0</td> <td>-1.3</td> <td>29.83</td> <td>38.5</td> <td>-8.7</td> <td></td> </tr> <tr> <td>824.20</td> <td>20.94</td> <td>H</td> <td>3.0</td> <td>-1.3</td> <td>16.59</td> <td>38.5</td> <td>-21.9</td> <td></td> </tr> <tr> <td colspan="9"><b>Mid Ch</b></td> </tr> <tr> <td>836.60</td> <td>35.16</td> <td>V</td> <td>3.0</td> <td>-1.2</td> <td>30.91</td> <td>38.5</td> <td>-7.6</td> <td></td> </tr> <tr> <td>836.60</td> <td>21.27</td> <td>H</td> <td>3.0</td> <td>-1.2</td> <td>17.02</td> <td>38.5</td> <td>-21.5</td> <td></td> </tr> <tr> <td colspan="9"><b>High Ch</b></td> </tr> <tr> <td>848.80</td> <td>35.19</td> <td>V</td> <td>3.1</td> <td>-1.1</td> <td>31.03</td> <td>38.5</td> <td>-7.5</td> <td></td> </tr> <tr> <td>848.80</td> <td>21.90</td> <td>H</td> <td>3.1</td> <td>-1.1</td> <td>17.73</td> <td>38.5</td> <td>-20.8</td> <td></td> </tr> </tbody> </table>								f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	<b>Low Ch</b>									824.20	34.18	V	3.0	-1.3	29.83	38.5	-8.7		824.20	20.94	H	3.0	-1.3	16.59	38.5	-21.9		<b>Mid Ch</b>									836.60	35.16	V	3.0	-1.2	30.91	38.5	-7.6		836.60	21.27	H	3.0	-1.2	17.02	38.5	-21.5		<b>High Ch</b>									848.80	35.19	V	3.1	-1.1	31.03	38.5	-7.5		848.80	21.90	H	3.1	-1.1	17.73	38.5	-20.8
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GSM850  EGPRS	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																																																																																
<p> <b>Company:</b> Samsung  <b>Project #:</b> 4790160849  <b>Date:</b> 12/17/2021  <b>Test Engineer:</b> 19568  <b>Configuration:</b> EUT, Z-Position  <b>Location:</b> Chamber 2  <b>Mode:</b> EGPRS 850 MHz Fundamentals                 </p> <p> <b>Test Equipment:</b>                      Receiving: VULB9163-749, and Chamber 2 SMA Cables                      Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable                 </p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9"><b>Low Ch</b></td> </tr> <tr> <td>824.20</td> <td>30.26</td> <td>V</td> <td>3.0</td> <td>-1.3</td> <td>25.91</td> <td>38.5</td> <td>-12.6</td> <td></td> </tr> <tr> <td>824.20</td> <td>16.45</td> <td>H</td> <td>3.0</td> <td>-1.3</td> <td>12.10</td> <td>38.5</td> <td>-26.4</td> <td></td> </tr> <tr> <td colspan="9"><b>Mid Ch</b></td> </tr> <tr> <td>836.60</td> <td>30.97</td> <td>V</td> <td>3.0</td> <td>-1.2</td> <td>26.72</td> <td>38.5</td> <td>-11.8</td> <td></td> </tr> <tr> <td>836.60</td> <td>17.29</td> <td>H</td> <td>3.0</td> <td>-1.2</td> <td>13.04</td> <td>38.5</td> <td>-25.5</td> <td></td> </tr> <tr> <td colspan="9"><b>High Ch</b></td> </tr> <tr> <td>848.80</td> <td>30.00</td> <td>V</td> <td>3.1</td> <td>-1.1</td> <td>25.84</td> <td>38.5</td> <td>-12.7</td> <td></td> </tr> <tr> <td>848.80</td> <td>17.37</td> <td>H</td> <td>3.1</td> <td>-1.1</td> <td>13.20</td> <td>38.5</td> <td>-25.3</td> <td></td> </tr> </tbody> </table>								f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	<b>Low Ch</b>									824.20	30.26	V	3.0	-1.3	25.91	38.5	-12.6		824.20	16.45	H	3.0	-1.3	12.10	38.5	-26.4		<b>Mid Ch</b>									836.60	30.97	V	3.0	-1.2	26.72	38.5	-11.8		836.60	17.29	H	3.0	-1.2	13.04	38.5	-25.5		<b>High Ch</b>									848.80	30.00	V	3.1	-1.1	25.84	38.5	-12.7		848.80	17.37	H	3.1	-1.1	13.20	38.5	-25.3	
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**GSM1900**

GSM1900 GPRS		UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																								
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		<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/17/2021 <b>Test Engineer:</b> 19568 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 2 <b>Mode:</b> GPRS 1900 MHz Fundamentals																																																																																								
		<b>Test Equipment:</b> Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable																																																																																								
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GSM1900 EGPRS		UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																								
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**WCDMA Band 5**

Band 5 REL99	<b>UL Verification Services, Inc. High Frequency Substitution Measurement</b>								
	<b>Company:</b>		Samsung						
	<b>Project #:</b>		4790160849						
	<b>Date:</b>		12/21/2021						
	<b>Test Engineer:</b>		19227						
	<b>Configuration:</b>		EUT, Z-Position						
	<b>Location:</b>		Chamber 2						
	<b>Mode:</b>		Rel99 Band 5 Fundamentals						
	<b>Test Equipment:</b>								
	Receiving: VULB9163-749, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	<b>f MHz</b>	<b>SG reading (dBm)</b>	<b>Ant. Pol. (H/V)</b>	<b>Cable Loss (dB)</b>	<b>Antenna Gain (dBd)</b>	<b>ERP (dBm)</b>	<b>Limit (dBm)</b>	<b>Delta (dB)</b>	<b>Notes</b>
	Low Ch								
	826.40	24.88	V	3.0	-1.3	20.55	38.5	-17.9	
	826.40	11.82	H	3.0	-1.3	7.49	38.5	-31.0	
	Mid Ch								
	836.60	25.46	V	3.0	-1.2	21.21	38.5	-17.3	
	836.60	12.91	H	3.0	-1.2	8.66	38.5	-29.8	
	High Ch								
	846.60	24.23	V	3.0	-1.1	20.05	38.5	-18.4	
	846.60	11.97	H	3.0	-1.1	7.79	38.5	-30.7	

Band 5 HSDPA	<b>UL Verification Services, Inc. High Frequency Substitution Measurement</b>								
	<b>Company:</b>		Samsung						
	<b>Project #:</b>		4790160849						
	<b>Date:</b>		12/21/2021						
	<b>Test Engineer:</b>		19227						
	<b>Configuration:</b>		EUT, Z-Position						
	<b>Location:</b>		Chamber 2						
	<b>Mode:</b>		HSDPA Band 5 Fundamentals						
	<b>Test Equipment:</b>								
	Receiving: VULB9163-749, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	<b>f MHz</b>	<b>SG reading (dBm)</b>	<b>Ant. Pol. (H/V)</b>	<b>Cable Loss (dB)</b>	<b>Antenna Gain (dBd)</b>	<b>ERP (dBm)</b>	<b>Limit (dBm)</b>	<b>Delta (dB)</b>	<b>Notes</b>
	Low Ch								
	826.40	23.81	V	3.0	-1.3	19.48	38.5	-19.0	
	826.40	10.46	H	3.0	-1.3	6.13	38.5	-32.4	
	Mid Ch								
	836.60	24.27	V	3.0	-1.2	20.02	38.5	-18.5	
	836.60	11.63	H	3.0	-1.2	7.38	38.5	-31.1	
	High Ch								
	846.60	23.73	V	3.0	-1.1	19.55	38.5	-18.9	
	846.60	11.40	H	3.0	-1.1	7.22	38.5	-31.3	

**WCDMA Band 4**

Band 4 REL99	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b>		Samsung						
	<b>Project #:</b>		4790160849						
	<b>Date:</b>		12/22/2021						
	<b>Test Engineer:</b>		19227						
	<b>Configuration:</b>		EUT, X-Position						
	<b>Location:</b>		Chamber 2						
	<b>Mode:</b>		Rel99 Band 4 Fundamentals						
	<b>Test Equipment:</b>								
	Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable								
	<b>f MHz</b>	<b>SG reading (dBm)</b>	<b>Ant. Pol. (H/V)</b>	<b>Cable Loss (dB)</b>	<b>Antenna Gain (dBi)</b>	<b>EIRP (dBm)</b>	<b>Limit (dBm)</b>	<b>Delta (dB)</b>	<b>Notes</b>
	Low Ch								
	1712.40	8.79	V	4.3	9.6	14.08	30.0	-15.9	
	1712.40	16.60	H	4.3	9.6	21.88	30.0	-8.1	
	Mid Ch								
	1732.60	10.81	V	4.3	9.6	16.14	30.0	-13.9	
	1732.60	16.66	H	4.3	9.6	21.98	30.0	-8.0	
	High Ch								
	1752.60	10.75	V	4.3	9.7	16.11	30.0	-13.9	
	1752.60	17.39	H	4.3	9.7	22.74	30.0	-7.3	

Band 4 HSDPA	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b>		Samsung						
	<b>Project #:</b>		4790160849						
	<b>Date:</b>		12/22/2021						
	<b>Test Engineer:</b>		19227						
	<b>Configuration:</b>		EUT, X-Position						
	<b>Location:</b>		Chamber 2						
	<b>Mode:</b>		HSDPA Band 4 Fundamentals						
	<b>Test Equipment:</b>								
	Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable								
	<b>f MHz</b>	<b>SG reading (dBm)</b>	<b>Ant. Pol. (H/V)</b>	<b>Cable Loss (dB)</b>	<b>Antenna Gain (dBi)</b>	<b>EIRP (dBm)</b>	<b>Limit (dBm)</b>	<b>Delta (dB)</b>	<b>Notes</b>
	Low Ch								
	1712.40	8.78	V	4.3	9.6	14.07	30.0	-15.9	
	1712.40	16.44	H	4.3	9.6	21.72	30.0	-8.3	
	Mid Ch								
	1732.60	10.74	V	4.3	9.6	16.07	30.0	-13.9	
	1732.60	16.63	H	4.3	9.6	21.95	30.0	-8.0	
	High Ch								
	1752.60	10.61	V	4.3	9.7	15.97	30.0	-14.0	
	1752.60	17.38	H	4.3	9.7	22.73	30.0	-7.3	

**WCDMA Band 2**

Band 2 REL99	<p><b>UL Verification Services, Inc.</b>  <b>High Frequency Substitution Measurement</b></p> <p><b>Company:</b> Samsung  <b>Project #:</b> 4790160849  <b>Date:</b> 12/21/2021  <b>Test Engineer:</b> 25546  <b>Configuration:</b> EUT / Z-Position  <b>Location:</b> Chamber 2  <b>Mode:</b> HSDPA Band 2 Fundamentals</p> <p><b>Test Equipment:</b>                  Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables                  Substitution: Horn 3115[00161451], 8.5m SMA-type Cable</p> <table border="1"> <thead> <tr> <th>f MHz</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> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>1852.40</td> <td>11.59</td> <td>V</td> <td>4.5</td> <td>9.6</td> <td>16.74</td> <td>33.0</td> <td>-16.3</td> <td></td> </tr> <tr> <td>1852.40</td> <td>16.06</td> <td>H</td> <td>4.5</td> <td>9.6</td> <td>21.22</td> <td>33.0</td> <td>-11.8</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>1880.00</td> <td>11.31</td> <td>V</td> <td>4.5</td> <td>9.4</td> <td>16.18</td> <td>33.0</td> <td>-16.8</td> <td></td> </tr> <tr> <td>1880.00</td> <td>16.35</td> <td>H</td> <td>4.5</td> <td>9.4</td> <td>21.22</td> <td>33.0</td> <td>-11.8</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>1907.60</td> <td>10.82</td> <td>V</td> <td>4.5</td> <td>9.1</td> <td>15.38</td> <td>33.0</td> <td>-17.6</td> <td></td> </tr> <tr> <td>1907.60</td> <td>14.95</td> <td>H</td> <td>4.5</td> <td>9.1</td> <td>19.51</td> <td>33.0</td> <td>-13.5</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									1852.40	11.59	V	4.5	9.6	16.74	33.0	-16.3		1852.40	16.06	H	4.5	9.6	21.22	33.0	-11.8		Mid Ch									1880.00	11.31	V	4.5	9.4	16.18	33.0	-16.8		1880.00	16.35	H	4.5	9.4	21.22	33.0	-11.8		High Ch									1907.60	10.82	V	4.5	9.1	15.38	33.0	-17.6		1907.60	14.95	H	4.5	9.1	19.51	33.0	-13.5	
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**LTE Band 2 (Main ANT)**

LTE Band 2  20MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/2/2021 <b>Test Engineer:</b> 19227 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 2 <b>Mode:</b> LTE_QPSK Band 2 Fundamentals, 20MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1860.00	10.59	V	4.5	9.6	15.67	33.0	-17.3	
	1860.00	16.71	H	4.5	9.6	21.78	33.0	-11.2	
	Mid Ch								
	1880.00	12.90	V	4.5	9.4	17.77	33.0	-15.2	
	1880.00	16.47	H	4.5	9.4	21.34	33.0	-11.7	
High Ch									
1900.00	11.85	V	4.5	9.2	16.51	33.0	-16.5		
1900.00	15.47	H	4.5	9.2	20.13	33.0	-12.9		

LTE Band 2  20MHz  16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/2/2021 <b>Test Engineer:</b> 19227 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 2 <b>Mode:</b> LTE_16QAM Band 2 Fundamentals, 20MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1860.00	8.29	V	4.5	9.6	13.37	33.0	-19.6	
	1860.00	14.52	H	4.5	9.6	19.59	33.0	-13.4	
	Mid Ch								
	1880.00	10.42	V	4.5	9.4	15.29	33.0	-17.7	
	1880.00	14.24	H	4.5	9.4	19.11	33.0	-13.9	
High Ch									
1900.00	10.86	V	4.5	9.2	15.52	33.0	-17.5		
1900.00	15.17	H	4.5	9.2	19.83	33.0	-13.2		

LTE Band 2  15MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																																																																									
	<p> <b>Company:</b> Samsung  <b>Project #:</b> 4790160849  <b>Date:</b> 12/1/2021  <b>Test Engineer:</b> 19227  <b>Configuration:</b> EUT, X-Position  <b>Location:</b> Chamber 2  <b>Mode:</b> LTE_QPSK Band 2 Fundamentals, 15MHz Bandwidth                 </p> <p> <b>Test Equipment:</b>                      Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables                      Substitution: Horn 3115[00161451], 8.5m SMA-type Cable                 </p> <table border="1"> <thead> <tr> <th>f MHz</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> </thead> <tbody> <tr> <td colspan="9"><b>Low Ch</b></td> </tr> <tr> <td>1857.50</td> <td>13.37</td> <td>V</td> <td>4.5</td> <td>9.6</td> <td>18.47</td> <td>33.0</td> <td>-14.5</td> <td></td> </tr> <tr> <td>1857.50</td> <td>15.93</td> <td>H</td> <td>4.5</td> <td>9.6</td> <td>21.03</td> <td>33.0</td> <td>-12.0</td> <td></td> </tr> <tr> <td colspan="9"><b>Mid Ch</b></td> </tr> <tr> <td>1880.00</td> <td>11.97</td> <td>V</td> <td>4.5</td> <td>9.4</td> <td>16.84</td> <td>33.0</td> <td>-16.2</td> <td></td> </tr> <tr> <td>1880.00</td> <td>16.85</td> <td>H</td> <td>4.5</td> <td>9.4</td> <td>21.72</td> <td>33.0</td> <td>-11.3</td> <td></td> </tr> <tr> <td colspan="9"><b>High Ch</b></td> </tr> <tr> <td>1902.50</td> <td>13.37</td> <td>V</td> <td>4.5</td> <td>9.2</td> <td>18.00</td> <td>33.0</td> <td>-15.0</td> <td></td> </tr> <tr> <td>1902.50</td> <td>17.27</td> <td>H</td> <td>4.5</td> <td>9.2</td> <td>21.90</td> <td>33.0</td> <td>-11.1</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	<b>Low Ch</b>									1857.50	13.37	V	4.5	9.6	18.47	33.0	-14.5		1857.50	15.93	H	4.5	9.6	21.03	33.0	-12.0		<b>Mid Ch</b>									1880.00	11.97	V	4.5	9.4	16.84	33.0	-16.2		1880.00	16.85	H	4.5	9.4	21.72	33.0	-11.3		<b>High Ch</b>									1902.50	13.37	V	4.5	9.2	18.00	33.0	-15.0		1902.50	17.27	H	4.5	9.2	21.90	33.0	-11.1
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LTE Band 2  10MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/1/2021 <b>Test Engineer:</b> 19227 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 2 <b>Mode:</b> LTE_QPSK Band 2 Fundamentals, 10MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1855.00	12.13	V	4.5	9.6	17.25	33.0	-15.7	
	1855.00	16.20	H	4.5	9.6	21.32	33.0	-11.7	
	Mid Ch								
	1880.00	12.07	V	4.5	9.4	16.94	33.0	-16.1	
	1880.00	16.76	H	4.5	9.4	21.63	33.0	-11.4	
High Ch									
1905.00	12.11	V	4.5	9.1	16.71	33.0	-16.3		
1905.00	15.79	H	4.5	9.1	20.38	33.0	-12.6		
LTE Band 2  10MHz  16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/1/2021 <b>Test Engineer:</b> 19227 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 2 <b>Mode:</b> LTE_16QAM Band 2 Fundamentals, 10MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1855.00	8.05	V	4.5	9.6	13.17	33.0	-19.8	
	1855.00	13.39	H	4.5	9.6	18.51	33.0	-14.5	
	Mid Ch								
	1880.00	10.20	V	4.5	9.4	15.07	33.0	-17.9	
	1880.00	14.72	H	4.5	9.4	19.59	33.0	-13.4	
High Ch									
1905.00	11.79	V	4.5	9.1	16.39	33.0	-16.6		
1905.00	14.91	H	4.5	9.1	19.50	33.0	-13.5		

LTE Band 2  5MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																																																																									
	<p> <b>Company:</b> Samsung  <b>Project #:</b> 4790160849  <b>Date:</b> 12/1/2021  <b>Test Engineer:</b> 19227  <b>Configuration:</b> EUT, X-Position  <b>Location:</b> Chamber 2  <b>Mode:</b> LTE_QPSK Band 2 Fundamentals, 5MHz Bandwidth                 </p> <p> <b>Test Equipment:</b>                      Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables                      Substitution: Horn 3115[00161451], 8.5m SMA-type Cable                 </p> <table border="1"> <thead> <tr> <th>f MHz</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> </thead> <tbody> <tr> <td colspan="9"><b>Low Ch</b></td> </tr> <tr> <td>1852.50</td> <td>13.05</td> <td>V</td> <td>4.5</td> <td>9.6</td> <td>18.20</td> <td>33.0</td> <td>-14.8</td> <td></td> </tr> <tr> <td>1852.50</td> <td>15.29</td> <td>H</td> <td>4.5</td> <td>9.6</td> <td>20.44</td> <td>33.0</td> <td>-12.6</td> <td></td> </tr> <tr> <td colspan="9"><b>Mid Ch</b></td> </tr> <tr> <td>1880.00</td> <td>11.88</td> <td>V</td> <td>4.5</td> <td>9.4</td> <td>16.75</td> <td>33.0</td> <td>-16.2</td> <td></td> </tr> <tr> <td>1880.00</td> <td>16.13</td> <td>H</td> <td>4.5</td> <td>9.4</td> <td>21.00</td> <td>33.0</td> <td>-12.0</td> <td></td> </tr> <tr> <td colspan="9"><b>High Ch</b></td> </tr> <tr> <td>1907.50</td> <td>12.32</td> <td>V</td> <td>4.5</td> <td>9.1</td> <td>16.88</td> <td>33.0</td> <td>-16.1</td> <td></td> </tr> <tr> <td>1907.50</td> <td>16.36</td> <td>H</td> <td>4.5</td> <td>9.1</td> <td>20.92</td> <td>33.0</td> <td>-12.1</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	<b>Low Ch</b>									1852.50	13.05	V	4.5	9.6	18.20	33.0	-14.8		1852.50	15.29	H	4.5	9.6	20.44	33.0	-12.6		<b>Mid Ch</b>									1880.00	11.88	V	4.5	9.4	16.75	33.0	-16.2		1880.00	16.13	H	4.5	9.4	21.00	33.0	-12.0		<b>High Ch</b>									1907.50	12.32	V	4.5	9.1	16.88	33.0	-16.1		1907.50	16.36	H	4.5	9.1	20.92	33.0	-12.1
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**LTE Band 2 (Sub ANT) – Spot Check**

LTE Band 2  20MHz  QPSK	<p><b>UL Verification Services, Inc.</b>  <b>High Frequency Substitution Measurement</b></p> <p><b>Company:</b> Samsung  <b>Project #:</b> 4790160849  <b>Date:</b> 12/17/2021  <b>Test Engineer:</b> 25546  <b>Configuration:</b> EUT / Z-Position  <b>Location:</b> Chamber 1  <b>Mode:</b> LTE_QPSK Band 2 Fundamentals, 20MHz Bandwidth</p> <p><b>Test Equipment:</b>                  Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables                  Substitution: Horn 3115[00167211], 8.5m SMA-type Cable</p> <table border="1"> <thead> <tr> <th>f MHz</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> </thead> <tbody> <tr> <td colspan="9"><b>Low Ch</b></td> </tr> <tr> <td>1860.00</td> <td>13.51</td> <td>V</td> <td>4.5</td> <td>9.5</td> <td>18.55</td> <td>33.0</td> <td>-14.4</td> <td></td> </tr> <tr> <td>1860.00</td> <td>16.50</td> <td>H</td> <td>4.5</td> <td>9.5</td> <td>21.55</td> <td>33.0</td> <td>-11.5</td> <td></td> </tr> <tr> <td colspan="9"><b>Mid Ch</b></td> </tr> <tr> <td>1880.00</td> <td>10.81</td> <td>V</td> <td>4.5</td> <td>9.4</td> <td>15.69</td> <td>33.0</td> <td>-17.3</td> <td></td> </tr> <tr> <td>1880.00</td> <td>13.84</td> <td>H</td> <td>4.5</td> <td>9.4</td> <td>18.72</td> <td>33.0</td> <td>-14.3</td> <td></td> </tr> <tr> <td colspan="9"><b>High Ch</b></td> </tr> <tr> <td>1900.00</td> <td>13.08</td> <td>V</td> <td>4.5</td> <td>9.2</td> <td>17.79</td> <td>33.0</td> <td>-15.2</td> <td></td> </tr> <tr> <td>1900.00</td> <td>15.71</td> <td>H</td> <td>4.5</td> <td>9.2</td> <td>20.42</td> <td>33.0</td> <td>-12.6</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	<b>Low Ch</b>									1860.00	13.51	V	4.5	9.5	18.55	33.0	-14.4		1860.00	16.50	H	4.5	9.5	21.55	33.0	-11.5		<b>Mid Ch</b>									1880.00	10.81	V	4.5	9.4	15.69	33.0	-17.3		1880.00	13.84	H	4.5	9.4	18.72	33.0	-14.3		<b>High Ch</b>									1900.00	13.08	V	4.5	9.2	17.79	33.0	-15.2		1900.00	15.71	H	4.5	9.2	20.42	33.0	-12.6	
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LTE Band 2  20MHz  16QAM	<p><b>UL Verification Services, Inc.</b>  <b>High Frequency Substitution Measurement</b></p> <p><b>Company:</b> Samsung  <b>Project #:</b> 4790160849  <b>Date:</b> 12/17/2021  <b>Test Engineer:</b> 25546  <b>Configuration:</b> EUT / Z-Position  <b>Location:</b> Chamber 1  <b>Mode:</b> LTE_16QAM Band 2 Fundamentals, 20MHz Bandwidth</p> <p><b>Test Equipment:</b>                  Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables                  Substitution: Horn 3115[00167211], 8.5m SMA-type Cable</p> <table border="1"> <thead> <tr> <th>f MHz</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> </thead> <tbody> <tr> <td colspan="9"><b>Low Ch</b></td> </tr> <tr> <td>1860.00</td> <td>12.43</td> <td>V</td> <td>4.5</td> <td>9.5</td> <td>17.47</td> <td>33.0</td> <td>-15.5</td> <td></td> </tr> <tr> <td>1860.00</td> <td>15.26</td> <td>H</td> <td>4.5</td> <td>9.5</td> <td>20.31</td> <td>33.0</td> <td>-12.7</td> <td></td> </tr> <tr> <td colspan="9"><b>Mid Ch</b></td> </tr> <tr> <td>1880.00</td> <td>9.66</td> <td>V</td> <td>4.5</td> <td>9.4</td> <td>14.54</td> <td>33.0</td> <td>-18.5</td> <td></td> </tr> <tr> <td>1880.00</td> <td>13.52</td> <td>H</td> <td>4.5</td> <td>9.4</td> <td>18.40</td> <td>33.0</td> <td>-14.6</td> <td></td> </tr> <tr> <td colspan="9"><b>High Ch</b></td> </tr> <tr> <td>1900.00</td> <td>12.53</td> <td>V</td> <td>4.5</td> <td>9.2</td> <td>17.24</td> <td>33.0</td> <td>-15.8</td> <td></td> </tr> <tr> <td>1900.00</td> <td>15.07</td> <td>H</td> <td>4.5</td> <td>9.2</td> <td>19.78</td> <td>33.0</td> <td>-13.2</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	<b>Low Ch</b>									1860.00	12.43	V	4.5	9.5	17.47	33.0	-15.5		1860.00	15.26	H	4.5	9.5	20.31	33.0	-12.7		<b>Mid Ch</b>									1880.00	9.66	V	4.5	9.4	14.54	33.0	-18.5		1880.00	13.52	H	4.5	9.4	18.40	33.0	-14.6		<b>High Ch</b>									1900.00	12.53	V	4.5	9.2	17.24	33.0	-15.8		1900.00	15.07	H	4.5	9.2	19.78	33.0	-13.2	
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**LTE Band 12**

LTE Band 12  10MHz  QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement										
	<b>Company:</b>		Samsung								
	<b>Project #:</b>		4790160849								
	<b>Date:</b>		12/13/2021								
	<b>Test Engineer:</b>		19568								
	<b>Configuration:</b>		EUT, Z-Position								
	<b>Location:</b>		Chamber 1								
	<b>Mode:</b>		LTE_QPSK Band 12 Fundamentals, 10MHz Bandwidth								
	<b>Test Equipment:</b>		Receiving: VULB9163-750, and Chamber 1 SMA Cables								
			Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes			
Low Ch											
704.00	23.17	V	2.8	-1.4	19.02	34.8	-15.7				
704.00	11.18	H	2.8	-1.4	7.04	34.8	-27.7				
Mid Ch											
707.50	23.35	V	2.8	-1.4	19.19	34.8	-15.6				
707.50	11.25	H	2.8	-1.4	7.08	34.8	-27.7				
High Ch											
711.00	23.36	V	2.8	-1.4	19.19	34.8	-15.6				
711.00	11.07	H	2.8	-1.4	6.90	34.8	-27.9				

LTE Band 12  10MHz  16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement										
	<b>Company:</b>		Samsung								
	<b>Project #:</b>		4790160849								
	<b>Date:</b>		12/13/2021								
	<b>Test Engineer:</b>		19568								
	<b>Configuration:</b>		EUT, Z-Position								
	<b>Location:</b>		Chamber 1								
	<b>Mode:</b>		LTE_16QAM Band 12 Fundamentals, 10MHz Bandwidth								
	<b>Test Equipment:</b>		Receiving: VULB9163-750, and Chamber 1 SMA Cables								
			Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes			
Low Ch											
704.00	21.10	V	2.8	-1.4	16.95	34.8	-17.8				
704.00	8.96	H	2.8	-1.4	4.82	34.8	-30.0				
Mid Ch											
707.50	20.77	V	2.8	-1.4	16.61	34.8	-18.2				
707.50	8.96	H	2.8	-1.4	4.79	34.8	-30.0				
High Ch											
711.00	21.08	V	2.8	-1.4	16.91	34.8	-17.9				
711.00	8.77	H	2.8	-1.4	4.60	34.8	-30.2				

LTE Band 12  5MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																																																																									
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**LTE Band 26 (Part 90)**

LTE Band 26  15MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																				
	Company: Samsung Project #: 4790160849 Date: 12/13/2021 Test Engineer: 19568 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 26 Fundamentals, 15MHz Bandwidth																																				
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LTE Band 26  10MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																				
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LTE Band 26  5MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																																														
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LTE Band 26  3MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																																														
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LTE Band 26  1.4MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																																														
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**LTE Band 26 (Part 22)**

LTE Band 26  15MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/13/2021 <b>Test Engineer:</b> 19568 <b>Configuration:</b> EUT, Z-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_QPSK Band 26 Fundamentals, 15MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	<b>Straddle Ch</b>								
	824.00	24.84	V	3.0	-1.3	20.50	38.5	-18.0	
	824.00	12.22	H	3.0	-1.3	7.88	38.5	-30.6	
	<b>Mid Ch</b>								
	831.50	25.10	V	3.0	-1.3	20.81	38.5	-17.7	
	831.50	12.30	H	3.0	-1.3	8.01	38.5	-30.5	
<b>High Ch</b>									
841.50	23.75	V	3.0	-1.2	19.54	38.5	-19.0		
841.50	12.68	H	3.0	-1.2	8.47	38.5	-30.0		
LTE Band 26  15MHz  16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/13/2021 <b>Test Engineer:</b> 19568 <b>Configuration:</b> EUT, Z-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_16QAM Band 26 Fundamentals, 15MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	<b>Straddle Ch</b>								
	824.00	22.99	V	3.0	-1.3	18.65	38.5	-19.8	
	824.00	10.42	H	3.0	-1.3	6.08	38.5	-32.4	
	<b>Mid Ch</b>								
	831.50	23.16	V	3.0	-1.3	18.87	38.5	-19.6	
	831.50	10.40	H	3.0	-1.3	6.11	38.5	-32.4	
<b>High Ch</b>									
841.50	21.42	V	3.0	-1.2	17.21	38.5	-21.3		
841.50	10.48	H	3.0	-1.2	6.27	38.5	-32.2		

LTE Band 26  10MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/13/2021 <b>Test Engineer:</b> 19568 <b>Configuration:</b> EUT, Z-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_QPSK Band 26 Fundamentals, 10MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	<b>Straddle Ch</b>								
	824.00	24.77	V	3.0	-1.3	20.43	38.5	-18.1	
	824.00	13.03	H	3.0	-1.3	8.69	38.5	-29.8	
	<b>Low Ch</b>								
	829.00	24.93	V	3.0	-1.3	20.62	38.5	-17.9	
	829.00	12.21	H	3.0	-1.3	7.90	38.5	-30.6	
	<b>Mid Ch</b>								
	831.50	24.84	V	3.0	-1.3	20.55	38.5	-18.0	
831.50	12.31	H	3.0	-1.3	8.02	38.5	-30.5		
<b>High Ch</b>									
844.00	23.51	V	3.0	-1.2	19.31	38.5	-19.2		
844.00	13.61	H	3.0	-1.2	9.41	38.5	-29.1		
LTE Band 26  10MHz  16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/13/2021 <b>Test Engineer:</b> 19568 <b>Configuration:</b> EUT, Z-Position <b>Location:</b> Chamber 1 <b>Mode:</b> LTE_16QAM Band 26 Fundamentals, 10MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	<b>Straddle Ch</b>								
	824.00	22.61	V	3.0	-1.3	18.27	38.5	-20.2	
	824.00	9.75	H	3.0	-1.3	5.41	38.5	-33.1	
	<b>Low Ch</b>								
	829.00	23.02	V	3.0	-1.3	18.71	38.5	-19.8	
	829.00	10.01	H	3.0	-1.3	5.70	38.5	-32.8	
	<b>Mid Ch</b>								
	831.50	23.03	V	3.0	-1.3	18.74	38.5	-19.8	
831.50	10.50	H	3.0	-1.3	6.21	38.5	-32.3		
<b>High Ch</b>									
844.00	21.58	V	3.0	-1.2	17.38	38.5	-21.1		
844.00	10.90	H	3.0	-1.2	6.70	38.5	-31.8		

		UL Verification Services, Inc. High Frequency Substitution Measurement							
LTE Band 26  5MHz  QPSK	Company:		Samsung						
	Project #:		4790160849						
	Date:		12/13/2021						
	Test Engineer:		19568						
	Configuration:		EUT, Z-Position						
	Location:		Chamber 1						
	Mode:		LTE_QPSK Band 26 Fundamentals, 5MHz Bandwidth						
	<b>Test Equipment:</b>		Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable						
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Straddle Ch								
	824.00	24.77	V	3.0	-1.3	20.43	38.5	-18.1	
	824.00	12.30	H	3.0	-1.3	7.96	38.5	-30.5	
	Low Ch								
	826.50	24.78	V	3.0	-1.3	20.46	38.5	-18.0	
826.50	12.32	H	3.0	-1.3	7.99	38.5	-30.5		
Mid Ch									
831.50	24.89	V	3.0	-1.3	20.60	38.5	-17.9		
831.50	12.48	H	3.0	-1.3	8.19	38.5	-30.3		
High Ch									
846.50	23.61	V	3.0	-1.1	19.43	38.5	-19.1		
846.50	13.23	H	3.0	-1.1	9.05	38.5	-29.4		
		UL Verification Services, Inc. High Frequency Substitution Measurement							
Company:		Samsung							
Project #:		4790160849							
Date:		12/13/2021							
Test Engineer:		19568							
Configuration:		EUT, Z-Position							
Location:		Chamber 1							
Mode:		LTE_16QAM Band 26 Fundamentals, 5MHz Bandwidth							
<b>Test Equipment:</b>		Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	
Low Ch									
824.00	22.64	V	3.0	-1.3	18.30	38.5	-20.2		
824.00	9.90	H	3.0	-1.3	5.56	38.5	-32.9		
Low Ch									
826.50	22.83	V	3.0	-1.3	18.51	38.5	-20.0		
826.50	9.85	H	3.0	-1.3	5.52	38.5	-33.0		
Mid Ch									
831.50	22.49	V	3.0	-1.3	18.20	38.5	-20.3		
831.50	10.44	H	3.0	-1.3	6.15	38.5	-32.3		
High Ch									
846.50	21.59	V	3.0	-1.1	17.41	38.5	-21.1		
846.50	11.02	H	3.0	-1.1	6.84	38.5	-31.7		

		UL Verification Services, Inc. High Frequency Substitution Measurement							
LTE Band 26  3MHz  QPSK	Company:		Samsung						
	Project #:		4790160849						
	Date:		12/13/2021						
	Test Engineer:		19568						
	Configuration:		EUT, Z-Position						
	Location:		Chamber 1						
	Mode:		LTE_QPSK Band 26 Fundamentals, 3MHz Bandwidth						
	<b>Test Equipment:</b>		Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable						
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Straddle Ch								
	824.00	24.63	V	3.0	-1.3	20.29	38.5	-18.2	
	824.00	12.56	H	3.0	-1.3	8.22	38.5	-30.3	
	Low Ch								
	825.50	24.86	V	3.0	-1.3	20.53	38.5	-18.0	
825.50	12.60	H	3.0	-1.3	8.27	38.5	-30.2		
Mid Ch									
831.50	25.04	V	3.0	-1.3	20.75	38.5	-17.8		
831.50	13.04	H	3.0	-1.3	8.75	38.5	-29.7		
High Ch									
847.50	23.34	V	3.0	-1.1	19.17	38.5	-19.3		
847.50	13.60	H	3.0	-1.1	9.43	38.5	-29.1		
		UL Verification Services, Inc. High Frequency Substitution Measurement							
LTE Band 26  3MHz  16QAM	Company:		Samsung						
	Project #:		4790160849						
	Date:		12/13/2021						
	Test Engineer:		19568						
	Configuration:		EUT, Z-Position						
	Location:		Chamber 1						
	Mode:		LTE_16QAM Band 26 Fundamentals, 3MHz Bandwidth						
	<b>Test Equipment:</b>		Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable						
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Straddle Ch								
	824.00	22.51	V	3.0	-1.3	18.17	38.5	-20.3	
	824.00	10.52	H	3.0	-1.3	6.18	38.5	-32.3	
	Low Ch								
	825.50	22.87	V	3.0	-1.3	18.54	38.5	-20.0	
825.50	11.15	H	3.0	-1.3	6.82	38.5	-31.7		
Mid Ch									
831.50	22.92	V	3.0	-1.3	18.63	38.5	-19.9		
831.50	10.76	H	3.0	-1.3	6.47	38.5	-32.0		
High Ch									
847.50	21.54	V	3.0	-1.1	17.37	38.5	-21.1		
847.50	11.62	H	3.0	-1.1	7.45	38.5	-31.0		

		UL Verification Services, Inc. High Frequency Substitution Measurement							
LTE Band 26  1.4MHz  QPSK	Company:		Samsung						
	Project #:		4790160849						
	Date:		12/13/2021						
	Test Engineer:		19568						
	Configuration:		EUT, Z-Position						
	Location:		Chamber 1						
	Mode:		LTE_QPSK Band 26 Fundamentals, 1.4MHz Bandwidth						
	<b>Test Equipment:</b>		Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable						
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Straddle Ch								
824.00	24.59	V	3.0	-1.3	20.25	38.5	-18.2		
824.00	12.61	H	3.0	-1.3	8.27	38.5	-30.2		
Low Ch									
824.70	24.83	V	3.0	-1.3	20.49	38.5	-18.0		
824.70	12.55	H	3.0	-1.3	8.22	38.5	-30.3		
Mid Ch									
831.50	25.07	V	3.0	-1.3	20.78	38.5	-17.7		
831.50	12.89	H	3.0	-1.3	8.60	38.5	-29.9		
High Ch									
848.30	23.70	V	3.1	-1.1	19.53	38.5	-19.0		
848.30	13.90	H	3.1	-1.1	9.73	38.5	-28.8		
		UL Verification Services, Inc. High Frequency Substitution Measurement							
Company:		Samsung							
Project #:		4790160849							
Date:		12/13/2021							
Test Engineer:		19568							
Configuration:		EUT, Z-Position							
Location:		Chamber 1							
Mode:		LTE_16QAM Band 26 Fundamentals, 1.4MHz Bandwidth							
<b>Test Equipment:</b>		Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	
Straddle Ch									
824.00	22.67	V	3.0	-1.3	18.33	38.5	-20.2		
824.00	10.65	H	3.0	-1.3	6.31	38.5	-32.2		
Low Ch									
824.70	22.61	V	3.0	-1.3	18.27	38.5	-20.2		
824.70	10.31	H	3.0	-1.3	5.98	38.5	-32.5		
Mid Ch									
831.50	22.63	V	3.0	-1.3	18.34	38.5	-20.2		
831.50	10.75	H	3.0	-1.3	6.46	38.5	-32.0		
High Ch									
848.30	23.78	V	3.1	-1.1	19.61	38.5	-18.9		
848.30	10.51	H	3.1	-1.1	6.34	38.5	-32.2		
		UL Verification Services, Inc. High Frequency Substitution Measurement							
Company:		Samsung							
Project #:		4790160849							
Date:		12/13/2021							
Test Engineer:		19568							
Configuration:		EUT, Z-Position							
Location:		Chamber 1							
Mode:		LTE_16QAM Band 26 Fundamentals, 1.4MHz Bandwidth							
<b>Test Equipment:</b>		Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	
Straddle Ch									
824.00	22.67	V	3.0	-1.3	18.33	38.5	-20.2		
824.00	10.65	H	3.0	-1.3	6.31	38.5	-32.2		
Low Ch									
824.70	22.61	V	3.0	-1.3	18.27	38.5	-20.2		
824.70	10.31	H	3.0	-1.3	5.98	38.5	-32.5		
Mid Ch									
831.50	22.63	V	3.0	-1.3	18.34	38.5	-20.2		
831.50	10.75	H	3.0	-1.3	6.46	38.5	-32.0		
High Ch									
848.30	23.78	V	3.1	-1.1	19.61	38.5	-18.9		
848.30	10.51	H	3.1	-1.1	6.34	38.5	-32.2		



**LTE Band 41**

LTE Band 41  20MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/14/2021 <b>Test Engineer:</b> 25546 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 2 <b>Mode:</b> LTE_QPSK Band 41 Fundamentals, 20MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2506.00	15.67	V	5.2	10.2	20.62	33.0	-12.4	
	2506.00	16.52	H	5.2	10.2	21.48	33.0	-11.5	
	Mid Ch								
	2593.00	16.43	V	5.3	10.1	21.21	33.0	-11.8	
	2593.00	16.04	H	5.3	10.1	20.82	33.0	-12.2	
High Ch									
2680.00	15.42	V	5.4	10.2	20.18	33.0	-12.8		
2680.00	17.53	H	5.4	10.2	22.29	33.0	-10.7		

LTE Band 41  20MHz  16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/14/2021 <b>Test Engineer:</b> 25546 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 2 <b>Mode:</b> LTE_16QAM Band 41 Fundamentals, 20MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2506.00	14.41	V	5.2	10.2	19.36	33.0	-13.6	
	2506.00	14.32	H	5.2	10.2	19.28	33.0	-13.7	
	Mid Ch								
	2593.00	15.37	V	5.3	10.1	20.15	33.0	-12.8	
	2593.00	14.94	H	5.3	10.1	19.72	33.0	-13.3	
High Ch									
2680.00	13.93	V	5.4	10.2	18.69	33.0	-14.3		
2680.00	15.84	H	5.4	10.2	20.60	33.0	-12.4		

LTE Band 41  15MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/20/2021 <b>Test Engineer:</b> 19227 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 2 <b>Mode:</b> LTE_QPSK Band 41 Fundamentals, 15MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2503.50	14.83	V	5.2	10.2	19.79	33.0	-13.2	
	2503.50	15.57	H	5.2	10.2	20.53	33.0	-12.5	
	Mid Ch								
	2593.00	15.65	V	5.3	10.1	20.43	33.0	-12.6	
	2593.00	17.50	H	5.3	10.1	22.28	33.0	-10.7	
High Ch									
2682.50	16.77	V	5.4	10.2	21.53	33.0	-11.5		
2682.50	18.34	H	5.4	10.2	23.10	33.0	-9.9		
LTE Band 41  15MHz  16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/14/2021 <b>Test Engineer:</b> 25546 <b>Configuration:</b> EUT / X-Position <b>Location:</b> Chamber 2 <b>Mode:</b> LTE_16QAM Band 41 Fundamentals, 15MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2503.50	14.38	V	5.2	10.2	19.34	33.0	-13.7	
	2503.50	13.97	H	5.2	10.2	18.93	33.0	-14.1	
	Mid Ch								
	2593.00	14.54	V	5.3	10.1	19.32	33.0	-13.7	
	2593.00	15.39	H	5.3	10.1	20.17	33.0	-12.8	
High Ch									
2682.50	14.60	V	5.4	10.2	19.36	33.0	-13.6		
2682.50	16.53	H	5.4	10.2	21.29	33.0	-11.7		

LTE Band 41  10MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/8/2021 <b>Test Engineer:</b> 25546 <b>Configuration:</b> EUT / X-Position <b>Location:</b> Chamber 2 <b>Mode:</b> LTE_QPSK Band 41 Fundamentals, 10MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2501.00	15.59	V	5.2	10.2	20.56	33.0	-12.4	
	2501.00	16.74	H	5.2	10.2	21.71	33.0	-11.3	
	Mid Ch								
	2593.00	16.36	V	5.3	10.1	21.14	33.0	-11.9	
	2593.00	17.84	H	5.3	10.1	22.62	33.0	-10.4	
High Ch									
2685.00	16.60	V	5.4	10.2	21.36	33.0	-11.6		
2685.00	18.03	H	5.4	10.2	22.79	33.0	-10.2		
LTE Band 41  10MHz  16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/21/2021 <b>Test Engineer:</b> 19227 <b>Configuration:</b> EUT, X-Position <b>Location:</b> Chamber 2 <b>Mode:</b> LTE_16QAM Band 41 Fundamentals, 10MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2501.00	13.83	V	5.2	10.2	18.80	33.0	-14.2	
	2501.00	15.03	H	5.2	10.2	20.00	33.0	-13.0	
	Mid Ch								
	2593.00	15.27	V	5.3	10.1	20.05	33.0	-12.9	
	2593.00	16.17	H	5.3	10.1	20.95	33.0	-12.0	
High Ch									
2685.00	15.44	V	5.4	10.2	20.20	33.0	-12.8		
2685.00	16.61	H	5.4	10.2	21.37	33.0	-11.6		

LTE Band 41  5MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/8/2021 <b>Test Engineer:</b> 25546 <b>Configuration:</b> EUT / X-Position <b>Location:</b> Chamber 2 <b>Mode:</b> LTE_QPSK Band 41 Fundamentals, 5MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2498.50	15.97	V	5.2	10.2	20.94	33.0	-12.1	
	2498.50	17.11	H	5.2	10.2	22.08	33.0	-10.9	
	Mid Ch								
	2593.00	15.70	V	5.3	10.1	20.48	33.0	-12.5	
	2593.00	17.71	H	5.3	10.1	22.49	33.0	-10.5	
High Ch									
2687.50	16.30	V	5.4	10.2	21.07	33.0	-11.9		
2687.50	17.90	H	5.4	10.2	22.66	33.0	-10.3		
LTE Band 41  5MHz  16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/8/2021 <b>Test Engineer:</b> 25546 <b>Configuration:</b> EUT / X-Position <b>Location:</b> Chamber 2 <b>Mode:</b> LTE_16QAM Band 41 Fundamentals, 5MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2498.50	14.73	V	5.2	10.2	19.70	33.0	-13.3	
	2498.50	14.93	H	5.2	10.2	19.90	33.0	-13.1	
	Mid Ch								
	2593.00	13.95	V	5.3	10.1	18.73	33.0	-14.3	
	2593.00	15.95	H	5.3	10.1	20.73	33.0	-12.3	
High Ch									
2687.50	14.36	V	5.4	10.2	19.13	33.0	-13.9		
2687.50	16.15	H	5.4	10.2	20.91	33.0	-12.1		

**LTE Band 66 (Main ANT)**

LTE Band 66  20MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/8/2021 <b>Test Engineer:</b> 25546 <b>Configuration:</b> EUT / Y-Position <b>Location:</b> Chamber 2 <b>Mode:</b> LTE_QPSK Band 66 Fundamentals, 20MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1720.00	15.25	V	4.3	9.6	20.55	30.0	-9.5	
	1720.00	10.67	H	4.3	9.6	15.97	30.0	-14.0	
	Mid Ch								
	1745.00	16.88	V	4.3	9.7	22.23	30.0	-7.8	
	1745.00	11.09	H	4.3	9.7	16.44	30.0	-13.6	
High Ch									
1770.00	16.25	V	4.4	9.7	21.59	30.0	-8.4		
1770.00	10.65	H	4.4	9.7	15.99	30.0	-14.0		

LTE Band 66  20MHz  16QAM	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>								
	<b>Company:</b> Samsung <b>Project #:</b> 4790160849 <b>Date:</b> 12/8/2021 <b>Test Engineer:</b> 25546 <b>Configuration:</b> EUT / Y-Position <b>Location:</b> Chamber 2 <b>Mode:</b> LTE_16QAM Band 66 Fundamentals, 20MHz Bandwidth								
	<b>Test Equipment:</b> Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1720.00	14.70	V	4.3	9.6	20.00	30.0	-10.0	
	1720.00	9.62	H	4.3	9.6	14.92	30.0	-15.1	
	Mid Ch								
	1745.00	14.51	V	4.3	9.7	19.86	30.0	-10.1	
	1745.00	9.24	H	4.3	9.7	14.59	30.0	-15.4	
High Ch									
1770.00	14.71	V	4.4	9.7	20.05	30.0	-10.0		
1770.00	8.71	H	4.4	9.7	14.05	30.0	-16.0		

LTE Band 66  15MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																																																																									
	<p> <b>Company:</b> Samsung  <b>Project #:</b> 4790160849  <b>Date:</b> 12/7/2021  <b>Test Engineer:</b> 25546  <b>Configuration:</b> EUT / Y-Position  <b>Location:</b> Chamber 2  <b>Mode:</b> LTE_QPSK Band 66 Fundamentals, 15MHz Bandwidth                 </p> <p> <b>Test Equipment:</b>                      Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables                      Substitution: Horn 3115[00161451], 8.5m SMA-type Cable                 </p> <table border="1"> <thead> <tr> <th>f MHz</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> </thead> <tbody> <tr> <td colspan="9"><b>Low Ch</b></td> </tr> <tr> <td>1717.50</td> <td>17.00</td> <td>V</td> <td>4.3</td> <td>9.6</td> <td>22.30</td> <td>30.0</td> <td>-7.7</td> <td></td> </tr> <tr> <td>1717.50</td> <td>11.35</td> <td>H</td> <td>4.3</td> <td>9.6</td> <td>16.64</td> <td>30.0</td> <td>-13.4</td> <td></td> </tr> <tr> <td colspan="9"><b>Mid Ch</b></td> </tr> <tr> <td>1745.00</td> <td>17.02</td> <td>V</td> <td>4.3</td> <td>9.7</td> <td>22.37</td> <td>30.0</td> <td>-7.6</td> <td></td> </tr> <tr> <td>1745.00</td> <td>10.42</td> <td>H</td> <td>4.3</td> <td>9.7</td> <td>15.77</td> <td>30.0</td> <td>-14.2</td> <td></td> </tr> <tr> <td colspan="9"><b>High Ch</b></td> </tr> <tr> <td>1772.50</td> <td>16.84</td> <td>V</td> <td>4.4</td> <td>9.7</td> <td>22.18</td> <td>30.0</td> <td>-7.8</td> <td></td> </tr> <tr> <td>1772.50</td> <td>10.11</td> <td>H</td> <td>4.4</td> <td>9.7</td> <td>15.45</td> <td>30.0</td> <td>-14.6</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	<b>Low Ch</b>									1717.50	17.00	V	4.3	9.6	22.30	30.0	-7.7		1717.50	11.35	H	4.3	9.6	16.64	30.0	-13.4		<b>Mid Ch</b>									1745.00	17.02	V	4.3	9.7	22.37	30.0	-7.6		1745.00	10.42	H	4.3	9.7	15.77	30.0	-14.2		<b>High Ch</b>									1772.50	16.84	V	4.4	9.7	22.18	30.0	-7.8		1772.50	10.11	H	4.4	9.7	15.45	30.0	-14.6
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LTE Band 66  10MHz  QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																																																																									
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	<p> <b>Company:</b> Samsung  <b>Project #:</b> 4790160849  <b>Date:</b> 12/3/2021  <b>Test Engineer:</b> 25546  <b>Configuration:</b> EUT / Y-Position  <b>Location:</b> Chamber 2  <b>Mode:</b> LTE_16QAM Band 66 Fundamentals, 1.4MHz Bandwidth                 </p> <p> <b>Test Equipment:</b>                      Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables                      Substitution: Horn 3115[00161451], 8.5m SMA-type Cable                 </p> <table border="1"> <thead> <tr> <th>f MHz</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> </thead> <tbody> <tr> <td colspan="9"><b>Low Ch</b></td> </tr> <tr> <td>1710.70</td> <td>14.84</td> <td>V</td> <td>4.3</td> <td>9.6</td> <td>20.13</td> <td>30.0</td> <td>-9.9</td> <td></td> </tr> <tr> <td>1710.70</td> <td>8.43</td> <td>H</td> <td>4.3</td> <td>9.6</td> <td>13.74</td> <td>30.0</td> <td>-16.3</td> <td></td> </tr> <tr> <td colspan="9"><b>Mid Ch</b></td> </tr> <tr> <td>1745.00</td> <td>15.73</td> <td>V</td> <td>4.3</td> <td>9.7</td> <td>21.08</td> <td>30.0</td> <td>-8.9</td> <td></td> </tr> <tr> <td>1745.00</td> <td>7.01</td> <td>H</td> <td>4.3</td> <td>9.7</td> <td>12.36</td> <td>30.0</td> <td>-17.6</td> <td></td> </tr> <tr> <td colspan="9"><b>High Ch</b></td> </tr> <tr> <td>1779.30</td> <td>14.66</td> <td>V</td> <td>4.4</td> <td>9.7</td> <td>20.00</td> <td>30.0</td> <td>-10.0</td> <td></td> </tr> <tr> <td>1779.30</td> <td>7.71</td> <td>H</td> <td>4.4</td> <td>9.7</td> <td>13.05</td> <td>30.0</td> <td>-17.0</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	<b>Low Ch</b>									1710.70	14.84	V	4.3	9.6	20.13	30.0	-9.9		1710.70	8.43	H	4.3	9.6	13.74	30.0	-16.3		<b>Mid Ch</b>									1745.00	15.73	V	4.3	9.7	21.08	30.0	-8.9		1745.00	7.01	H	4.3	9.7	12.36	30.0	-17.6		<b>High Ch</b>									1779.30	14.66	V	4.4	9.7	20.00	30.0	-10.0		1779.30	7.71	H	4.4	9.7	13.05	30.0	-17.0
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**LTE Band 66 (Sub ANT) – Spot Check**

LTE Band 66 20MHz QPSK	<b>UL Verification Services, Inc.</b> <b>High Frequency Substitution Measurement</b>																																																																																																		
	<b>Company:</b> Samsung																																																																																																		
	<b>Project #:</b> 4790160849																																																																																																		
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	<b>Test Engineer:</b> 19568																																																																																																		
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## 9.6. FIELD STRENGTH OF SPURIOUS RADIATION

### RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53 and §90.691

### LIMIT

Part 22.917(a) & Part 24.238(a) & Part 27.53(h) 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.

Part 27.53:

(c)(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB.

(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to  $-70$  dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and  $-80$  dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log(P)$  dB.

(h) The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

(m) (4) For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log(P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log(P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log(P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than  $43 + 10 \log(P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log(P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Part 90.691(a):

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $116 \log_{10}(f/6.1)$  decibels or  $50 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz. (NOTE : Use 100kHz reference bandwidth)

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

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**TEST PROCEDURE**

ANSI / TIA / EIA 603 E Clause 2.2.12; ESU40 setting reference to 971168 D01 v03r01

For peak power measurement with a ESU40:

- a) Set the RBW = 100 KHz for emission below 1GHz and 1MHz for emissions above 1GHz
- b) Set VBW  $\geq 3 \times$  RBW;
- c) Set span  $\geq 1.5$  times the OBW;
- d) Sweep time = auto couple;
- e) Detector = rms;
- f) Ensure that the number of measurement points  $\geq$  span/RBW;
- g) Trace mode = average(WCDMA, LTE FDD, NR), Maxhold(GSM, LTE TDD);

**NOTE**

5G NR: All Waveforms (CP-OFDM vs DFT-s OFDM) and modulations ( $\pi/2$  BPSK, QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

**RESULTS**

See the following pages.

NOTE : Please refer to section 5.4 for bandwidth and RB setting about LTE,NR bands.

**9.6.1. SPURIOUS RADIATION PLOTS**

**GSM850**

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
Company:		Samsung								
Project #:		4790160849								
Date:		12/17/2021								
Test Engineer:		19568								
Configuration:		EUT, Y-Position								
Location:		Chamber 2								
Mode:		GPRS 850 MHz Harmonics								
Test Voltage:		AC 120 V, 60 Hz								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
<b>Low Ch, 824.2MHz</b>										
1648.40	-13.2	V	3.0	40.9	1.0	-53.1	-13.0	-40.1		
2472.60	-5.2	V	3.0	41.5	1.0	-45.7	-13.0	-32.7		
3296.80	-2.6	V	3.0	42.3	1.0	-43.9	-13.0	-30.9		
4121.00	-9.1	V	3.0	42.4	1.0	-50.5	-13.0	-37.5		
4945.20	-8.0	V	3.0	43.0	1.0	-50.0	-13.0	-37.0		
1648.40	-10.8	H	3.0	40.9	1.0	-50.7	-13.0	-37.7		
2472.60	-0.9	H	3.0	41.5	1.0	-41.5	-13.0	-28.5		
3296.80	-6.4	H	3.0	42.3	1.0	-47.7	-13.0	-34.7		
4121.00	-8.4	H	3.0	42.4	1.0	-49.8	-13.0	-36.8		
4945.20	-7.7	H	3.0	43.0	1.0	-49.7	-13.0	-36.7		
<b>Mid Ch, 836.6MHz</b>										
1673.20	3.9	V	3.0	40.9	1.0	-36.0	-13.0	-23.0		
2509.80	6.9	V	3.0	41.6	1.0	-33.7	-13.0	-20.7		
3346.40	13.1	V	3.0	42.3	1.0	-28.2	-13.0	-15.2		
4183.00	4.5	V	3.0	42.5	1.0	-36.9	-13.0	-23.9		
5019.60	6.2	V	3.0	43.0	1.0	-35.8	-13.0	-22.8		
1673.20	2.4	H	3.0	40.9	1.0	-37.5	-13.0	-24.5		
2509.80	5.9	H	3.0	41.6	1.0	-34.7	-13.0	-21.7		
3346.40	9.6	H	3.0	42.3	1.0	-31.7	-13.0	-18.7		
4183.00	6.6	H	3.0	42.5	1.0	-34.8	-13.0	-21.8		
5019.60	9.4	H	3.0	43.0	1.0	-32.7	-13.0	-19.7		
<b>High Ch, 848.8MHz</b>										
1697.60	-13.0	V	3.0	40.9	1.0	-52.9	-13.0	-39.9		
2546.40	0.0	V	3.0	41.6	1.0	-40.6	-13.0	-27.6		
3395.20	-7.5	V	3.0	42.3	1.0	-48.8	-13.0	-35.8		
4244.00	-9.2	V	3.0	42.5	1.0	-50.7	-13.0	-37.7		
5092.80	-7.8	V	3.0	43.0	1.0	-49.8	-13.0	-36.8		
1697.60	-11.8	H	3.0	40.9	1.0	-51.7	-13.0	-38.7		
2546.40	0.0	H	3.0	41.6	1.0	-40.6	-13.0	-27.6		
3395.20	-8.3	H	3.0	42.3	1.0	-49.6	-13.0	-36.6		
4244.00	-8.6	H	3.0	42.5	1.0	-50.1	-13.0	-37.1		
5092.80	-7.8	H	3.0	43.0	1.0	-49.8	-13.0	-36.8		

GSM850  
GPRS

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4790160849							
Date:		12/20/2021							
Test Engineer:		19568							
Configuration:		EUT, Y-Position							
Location:		Chamber 2							
Mode:		EGPRS 850 MHz Harmonics							
Test Voltage:		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 824.2MHz</b>									
1648.40	-14.6	V	3.0	40.9	1.0	-54.6	-13.0	-41.6	
2472.60	-11.6	V	3.0	41.5	1.0	-52.2	-13.0	-39.2	
3296.80	-8.3	V	3.0	42.3	1.0	-49.6	-13.0	-36.6	
4121.00	-9.5	V	3.0	42.4	1.0	-50.9	-13.0	-37.9	
4945.20	-8.1	V	3.0	43.0	1.0	-50.1	-13.0	-37.1	
1648.40	-12.3	H	3.0	40.9	1.0	-52.2	-13.0	-39.2	
2472.60	-11.0	H	3.0	41.5	1.0	-51.6	-13.0	-38.6	
3296.80	-8.6	H	3.0	42.3	1.0	-49.9	-13.0	-36.9	
4121.00	-9.2	H	3.0	42.4	1.0	-50.6	-13.0	-37.6	
4945.20	-7.7	H	3.0	43.0	1.0	-49.7	-13.0	-36.7	
<b>Mid Ch, 836.6MHz</b>									
1673.20	-10.8	V	3.0	40.9	1.0	-50.7	-13.0	-37.7	
2509.80	-5.5	V	3.0	41.6	1.0	-46.1	-13.0	-33.1	
3346.40	-5.3	V	3.0	42.3	1.0	-46.6	-13.0	-33.6	
4183.00	-9.3	V	3.0	42.5	1.0	-50.8	-13.0	-37.8	
5019.60	-7.8	V	3.0	43.0	1.0	-49.8	-13.0	-36.8	
1673.20	-12.0	H	3.0	40.9	1.0	-51.9	-13.0	-38.9	
2509.80	-11.8	H	3.0	41.6	1.0	-52.4	-13.0	-39.4	
3346.40	-7.2	H	3.0	42.3	1.0	-48.5	-13.0	-35.5	
4183.00	-8.9	H	3.0	42.5	1.0	-50.3	-13.0	-37.3	
5019.60	-7.5	H	3.0	43.0	1.0	-49.5	-13.0	-36.5	
<b>High Ch, 848.8MHz</b>									
1697.60	-14.6	V	3.0	40.9	1.0	-54.5	-13.0	-41.5	
2546.40	-10.1	V	3.0	41.6	1.0	-50.8	-13.0	-37.8	
3395.20	-8.4	V	3.0	42.3	1.0	-49.7	-13.0	-36.7	
4244.00	-9.2	V	3.0	42.5	1.0	-50.7	-13.0	-37.7	
5092.80	-7.9	V	3.0	43.0	1.0	-49.9	-13.0	-36.9	
1697.60	-13.3	H	3.0	40.9	1.0	-53.2	-13.0	-40.2	
2546.40	-10.4	H	3.0	41.6	1.0	-51.0	-13.0	-38.0	
3395.20	-8.4	H	3.0	42.3	1.0	-49.7	-13.0	-36.7	
4244.00	-9.0	H	3.0	42.5	1.0	-50.5	-13.0	-37.5	
5092.80	-7.7	H	3.0	43.0	1.0	-49.7	-13.0	-36.7	

GSM850  
EGPRS

**GSM1900**

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4790160849							
Date:		12/23/2021							
Test Engineer:		25546							
Configuration:		EUT, X-Position							
Location:		Chamber 2							
Mode:		GPRS 1900 MHz Harmonics							
Test Voltage:		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 1850.2MHz</b>									
3700.40	7.4	V	3.0	42.3	1.0	-33.9	-13.0	-20.9	
5550.60	14.4	V	3.0	43.1	1.0	-27.8	-13.0	-14.8	
7400.80	12.9	V	3.0	42.7	1.0	-28.8	-13.0	-15.8	
9251.00	4.1	V	3.0	41.8	1.0	-36.7	-13.0	-23.7	
11101.20	1.3	V	3.0	41.6	1.0	-39.3	-13.0	-26.3	
3700.40	6.9	H	3.0	42.3	1.0	-34.4	-13.0	-21.4	
5550.60	16.1	H	3.0	43.1	1.0	-26.1	-13.0	-13.1	
7400.80	13.3	H	3.0	42.7	1.0	-28.4	-13.0	-15.4	
9251.00	1.1	H	3.0	41.8	1.0	-39.7	-13.0	-26.7	
11101.20	1.1	H	3.0	41.6	1.0	-39.5	-13.0	-26.5	
<b>Mid Ch, 1880MHz</b>									
3760.00	11.3	V	3.0	42.3	1.0	-30.0	-13.0	-17.0	
5640.00	17.3	V	3.0	43.2	1.0	-24.8	-13.0	-11.8	
7520.00	15.8	V	3.0	42.7	1.0	-25.9	-13.0	-12.9	
9400.00	8.9	V	3.0	41.7	1.0	-31.7	-13.0	-18.7	
11280.00	2.1	V	3.0	41.7	1.0	-38.5	-13.0	-25.5	
3760.00	10.5	H	3.0	42.3	1.0	-30.8	-13.0	-17.8	
5640.00	18.5	H	3.0	43.2	1.0	-23.6	-13.0	-10.6	
7520.00	16.5	H	3.0	42.7	1.0	-25.2	-13.0	-12.2	
9400.00	5.8	H	3.0	41.7	1.0	-34.8	-13.0	-21.8	
11280.00	1.7	H	3.0	41.7	1.0	-38.9	-13.0	-25.9	
<b>High Ch, 1909.8MHz</b>									
3819.60	13.0	V	3.0	42.3	1.0	-28.4	-13.0	-15.4	
5729.40	15.1	V	3.0	43.2	1.0	-27.0	-13.0	-14.0	
7639.20	16.5	V	3.0	42.6	1.0	-25.1	-13.0	-12.1	
9549.00	11.3	V	3.0	41.5	1.0	-29.2	-13.0	-16.2	
11458.80	4.5	V	3.0	41.7	1.0	-36.2	-13.0	-23.2	
3819.60	12.0	H	3.0	42.3	1.0	-29.3	-13.0	-16.3	
5729.40	14.5	H	3.0	43.2	1.0	-27.7	-13.0	-14.7	
7639.20	18.1	H	3.0	42.6	1.0	-23.6	-13.0	-10.6	
9549.00	7.6	H	3.0	41.5	1.0	-33.0	-13.0	-20.0	
11458.80	2.3	H	3.0	41.7	1.0	-38.4	-13.0	-25.4	

GSM1900  
GPRS



UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4790160849							
Date:		12/23/2021							
Test Engineer:		25546							
Configuration:		EUT, X-Position							
Location:		Chamber 2							
Mode:		EGPRS 1900 MHz Harmonics							
Test Voltage:		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3700.40	0.6	V	3.0	42.3	1.0	-40.7	-13.0	-27.7	
5550.60	-0.9	V	3.0	43.1	1.0	-43.1	-13.0	-30.1	
7400.80	4.3	V	3.0	42.7	1.0	-37.4	-13.0	-24.4	
9251.00	-1.3	V	3.0	41.8	1.0	-42.1	-13.0	-29.1	
11101.20	1.0	V	3.0	41.6	1.0	-39.6	-13.0	-26.6	
3700.40	-3.2	H	3.0	42.3	1.0	-44.6	-13.0	-31.6	
5550.60	7.7	H	3.0	43.1	1.0	-34.5	-13.0	-21.5	
7400.80	4.6	H	3.0	42.7	1.0	-37.2	-13.0	-24.2	
9251.00	-2.8	H	3.0	41.8	1.0	-43.6	-13.0	-30.6	
11101.20	1.1	H	3.0	41.6	1.0	-39.5	-13.0	-26.5	
Mid Ch, 1880MHz									
3760.00	4.3	V	3.0	42.3	1.0	-37.0	-13.0	-24.0	
5640.00	8.5	V	3.0	43.2	1.0	-33.7	-13.0	-20.7	
7520.00	7.6	V	3.0	42.7	1.0	-34.1	-13.0	-21.1	
9400.00	0.6	V	3.0	41.7	1.0	-40.0	-13.0	-27.0	
11280.00	1.1	V	3.0	41.7	1.0	-39.6	-13.0	-26.6	
3760.00	3.7	H	3.0	42.3	1.0	-37.6	-13.0	-24.6	
5640.00	10.3	H	3.0	43.2	1.0	-31.9	-13.0	-18.9	
7520.00	8.4	H	3.0	42.7	1.0	-33.3	-13.0	-20.3	
9400.00	-1.5	H	3.0	41.7	1.0	-42.1	-13.0	-29.1	
11280.00	1.2	H	3.0	41.7	1.0	-39.4	-13.0	-26.4	
High Ch, 1909.8MHz									
3819.60	5.4	V	3.0	42.3	1.0	-35.9	-13.0	-22.9	
5729.40	7.3	V	3.0	43.2	1.0	-34.9	-13.0	-21.9	
7639.20	8.0	V	3.0	42.6	1.0	-33.6	-13.0	-20.6	
9549.00	1.8	V	3.0	41.5	1.0	-38.7	-13.0	-25.7	
11458.80	1.5	V	3.0	41.7	1.0	-39.2	-13.0	-26.2	
3819.60	5.2	H	3.0	42.3	1.0	-36.1	-13.0	-23.1	
5729.40	6.4	H	3.0	43.2	1.0	-35.8	-13.0	-22.8	
7639.20	9.8	H	3.0	42.6	1.0	-31.8	-13.0	-18.8	
9549.00	-0.3	H	3.0	41.5	1.0	-40.8	-13.0	-27.8	
11458.80	1.4	H	3.0	41.7	1.0	-39.3	-13.0	-26.3	

GSM1900  
EGPRS

**WCDMA Band 5**

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		Samsung							
<b>Project #:</b>		4790160849							
<b>Date:</b>		12/21/2021							
<b>Test Engineer:</b>		19227							
<b>Configuration:</b>		EUT / AC Adapter, Z-Position							
<b>Location:</b>		Chamber 2							
<b>Mode:</b>		Rel99 Band 5 Harmonics							
<b>Test Voltage:</b>		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 826.4MHz</b>									
1652.80	-16.0	V	3.0	40.9	1.0	-55.9	-13.0	-42.9	
2479.20	-13.1	V	3.0	41.6	1.0	-53.7	-13.0	-40.7	
3305.60	-10.2	V	3.0	42.3	1.0	-51.5	-13.0	-38.5	
1652.80	-16.7	H	3.0	40.9	1.0	-56.6	-13.0	-43.6	
2479.20	-13.4	H	3.0	41.6	1.0	-54.0	-13.0	-41.0	
3305.60	-10.2	H	3.0	42.3	1.0	-51.5	-13.0	-38.5	
<b>Mid Ch, 836.6MHz</b>									
1673.20	-15.9	V	3.0	40.9	1.0	-55.8	-13.0	-42.8	
2509.80	-13.0	V	3.0	41.6	1.0	-53.6	-13.0	-40.6	
3346.40	-9.9	V	3.0	42.3	1.0	-51.2	-13.0	-38.2	
1673.20	-16.6	H	3.0	40.9	1.0	-56.5	-13.0	-43.5	
2509.80	-13.3	H	3.0	41.6	1.0	-53.9	-13.0	-40.9	
3346.40	-9.8	H	3.0	42.3	1.0	-51.1	-13.0	-38.1	
<b>High Ch, 846.6MHz</b>									
1693.20	-15.9	V	3.0	40.9	1.0	-55.8	-13.0	-42.8	
2539.80	-12.9	V	3.0	41.6	1.0	-53.6	-13.0	-40.6	
3386.40	-9.8	V	3.0	42.3	1.0	-51.1	-13.0	-38.1	
1693.20	-16.5	H	3.0	40.9	1.0	-56.5	-13.0	-43.5	
2539.80	-13.2	H	3.0	41.6	1.0	-53.9	-13.0	-40.9	
3386.40	-9.8	H	3.0	42.3	1.0	-51.1	-13.0	-38.1	

Band 5  
REL99

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		Samsung							
<b>Project #:</b>		4790160849							
<b>Date:</b>		12/21/2021							
<b>Test Engineer:</b>		19227							
<b>Configuration:</b>		EUT / AC Adapter, Z-Position							
<b>Location:</b>		Chamber 2							
<b>Mode:</b>		HSDPA Band 5 Harmonics							
<b>Test Voltage:</b>		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 826.4MHz</b>									
1652.80	-7.6	V	3.0	40.9	1.0	-47.6	-13.0	-34.6	
2479.20	-4.8	V	3.0	41.6	1.0	-45.4	-13.0	-32.4	
3305.60	-1.8	V	3.0	42.3	1.0	-43.1	-13.0	-30.1	
1652.80	-8.3	H	3.0	40.9	1.0	-48.3	-13.0	-35.3	
2479.20	-5.1	H	3.0	41.6	1.0	-45.7	-13.0	-32.7	
3305.60	-1.9	H	3.0	42.3	1.0	-43.2	-13.0	-30.2	
<b>Mid Ch, 836.6MHz</b>									
1673.20	-7.7	V	3.0	40.9	1.0	-47.6	-13.0	-34.6	
2509.80	-4.7	V	3.0	41.6	1.0	-45.3	-13.0	-32.3	
3346.40	-1.7	V	3.0	42.3	1.0	-43.0	-13.0	-30.0	
1673.20	-8.3	H	3.0	40.9	1.0	-48.2	-13.0	-35.2	
2509.80	-5.0	H	3.0	41.6	1.0	-45.6	-13.0	-32.6	
3346.40	-1.6	H	3.0	42.3	1.0	-42.9	-13.0	-29.9	
<b>High Ch, 846.6MHz</b>									
1693.20	-7.5	V	3.0	40.9	1.0	-47.4	-13.0	-34.4	
2539.80	-4.6	V	3.0	41.6	1.0	-45.3	-13.0	-32.3	
3386.40	-1.5	V	3.0	42.3	1.0	-42.8	-13.0	-29.8	
1693.20	-8.2	H	3.0	40.9	1.0	-48.2	-13.0	-35.2	
2539.80	-4.9	H	3.0	41.6	1.0	-45.6	-13.0	-32.6	
3386.40	-1.5	H	3.0	42.3	1.0	-42.8	-13.0	-29.8	

Band 5  
HSDPA

**WCDMA Band 4**

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		Samsung							
<b>Project #:</b>		4790160849							
<b>Date:</b>		12/22/2021							
<b>Test Engineer:</b>		19227							
<b>Configuration:</b>		EUT / AC Adapter, Y-Position							
<b>Location:</b>		Chamber 2							
<b>Mode:</b>		Rel99 Band 4 Harmonics							
<b>Test Votage:</b>		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 1712.4MHz</b>									
3424.80	-9.0	V	3.0	42.3	1.0	-50.3	-13.0	-37.3	
5137.20	-9.3	V	3.0	43.1	1.0	-51.4	-13.0	-38.4	
6849.60	-6.7	V	3.0	43.0	1.0	-48.6	-13.0	-35.6	
3424.80	-8.9	H	3.0	42.3	1.0	-50.2	-13.0	-37.2	
5137.20	-9.1	H	3.0	43.1	1.0	-51.2	-13.0	-38.2	
6849.60	-6.5	H	3.0	43.0	1.0	-48.5	-13.0	-35.5	
<b>Mid Ch, 1732.6MHz</b>									
3465.20	-6.3	V	3.0	42.3	1.0	-47.6	-13.0	-34.6	
5197.80	-9.1	V	3.0	43.1	1.0	-51.1	-13.0	-38.1	
6930.40	-6.6	V	3.0	43.0	1.0	-48.6	-13.0	-35.6	
3465.20	-7.3	H	3.0	42.3	1.0	-48.6	-13.0	-35.6	
5197.80	-8.9	H	3.0	43.1	1.0	-51.0	-13.0	-38.0	
6930.40	-6.5	H	3.0	43.0	1.0	-48.4	-13.0	-35.4	
<b>High Ch, 1752.6MHz</b>									
3505.20	-6.5	V	3.0	42.3	1.0	-47.8	-13.0	-34.8	
5257.80	-9.1	V	3.0	43.1	1.0	-51.1	-13.0	-38.1	
7010.40	-6.4	V	3.0	42.9	1.0	-48.3	-13.0	-35.3	
3505.20	-7.2	H	3.0	42.3	1.0	-48.5	-13.0	-35.5	
5257.80	-8.9	H	3.0	43.1	1.0	-51.0	-13.0	-38.0	
7010.40	-6.2	H	3.0	42.9	1.0	-48.1	-13.0	-35.1	

Band 4  
REL99

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		Samsung							
<b>Project #:</b>		4790160849							
<b>Date:</b>		12/22/2021							
<b>Test Engineer:</b>		19227							
<b>Configuration:</b>		EUT / AC Adapter, Y-Position							
<b>Location:</b>		Chamber 2							
<b>Mode:</b>		HSDPA Band 4 Harmonics							
<b>Test Votage:</b>		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 1712.4MHz</b>									
3424.80	-9.0	V	3.0	42.3	1.0	-50.3	-13.0	-37.3	
5137.20	-9.3	V	3.0	43.1	1.0	-51.4	-13.0	-38.4	
6849.60	-6.7	V	3.0	43.0	1.0	-48.6	-13.0	-35.6	
3424.80	-8.9	H	3.0	42.3	1.0	-50.2	-13.0	-37.2	
5137.20	-9.2	H	3.0	43.1	1.0	-51.2	-13.0	-38.2	
6849.60	-6.5	H	3.0	43.0	1.0	-48.5	-13.0	-35.5	
<b>Mid Ch, 1732.6MHz</b>									
3465.20	-8.3	V	3.0	42.3	1.0	-49.6	-13.0	-36.6	
5197.80	-9.0	V	3.0	43.1	1.0	-51.1	-13.0	-38.1	
6930.40	-6.6	V	3.0	43.0	1.0	-48.6	-13.0	-35.6	
3465.20	-8.4	H	3.0	42.3	1.0	-49.7	-13.0	-36.7	
5197.80	-8.9	H	3.0	43.1	1.0	-51.0	-13.0	-38.0	
6930.40	-6.5	H	3.0	43.0	1.0	-48.4	-13.0	-35.4	
<b>High Ch, 1752.6MHz</b>									
3505.20	-6.6	V	3.0	42.3	1.0	-47.9	-13.0	-34.9	
5257.80	-9.0	V	3.0	43.1	1.0	-51.1	-13.0	-38.1	
7010.40	-6.4	V	3.0	42.9	1.0	-48.3	-13.0	-35.3	
3505.20	-7.3	H	3.0	42.3	1.0	-48.6	-13.0	-35.6	
5257.80	-8.4	H	3.0	43.1	1.0	-50.5	-13.0	-37.5	
7010.40	-6.2	H	3.0	42.9	1.0	-48.1	-13.0	-35.1	

Band 4  
HSDPA

**WCDMA Band 2**

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		Samsung							
<b>Project #:</b>		4790160849							
<b>Date:</b>		12/21/2021							
<b>Test Engineer:</b>		25546							
<b>Configuration:</b>		EUT, Z-Position							
<b>Location:</b>		Chamber 2							
<b>Mode:</b>		Rel99 Band 2 Harmonics							
<b>Test Votage:</b>		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 1852.4MHz</b>									
3704.80	-10.7	V	3.0	42.3	1.0	-52.0	-13.0	-39.0	
5557.20	-8.4	V	3.0	43.1	1.0	-50.6	-13.0	-37.6	
7409.60	-6.5	V	3.0	42.7	1.0	-48.2	-13.0	-35.2	
3704.80	-9.1	H	3.0	42.3	1.0	-50.4	-13.0	-37.4	
5557.20	-8.4	H	3.0	43.1	1.0	-50.5	-13.0	-37.5	
7409.60	-6.4	H	3.0	42.7	1.0	-48.1	-13.0	-35.1	
<b>Mid Ch, 1880MHz</b>									
3760.00	-10.2	V	3.0	42.3	1.0	-51.5	-13.0	-38.5	
5640.00	-8.1	V	3.0	43.2	1.0	-50.2	-13.0	-37.2	
7520.00	-6.5	V	3.0	42.7	1.0	-48.2	-13.0	-35.2	
3760.00	-8.0	H	3.0	42.3	1.0	-49.3	-13.0	-36.3	
5640.00	-8.1	H	3.0	43.2	1.0	-50.2	-13.0	-37.2	
7520.00	-6.5	H	3.0	42.7	1.0	-48.2	-13.0	-35.2	
<b>High Ch, 1907.6MHz</b>									
3815.20	-8.7	V	3.0	42.3	1.0	-50.0	-13.0	-37.0	
5722.80	-8.3	V	3.0	43.2	1.0	-50.4	-13.0	-37.4	
7630.40	-6.5	V	3.0	42.6	1.0	-48.1	-13.0	-35.1	
3815.20	-6.3	H	3.0	42.3	1.0	-47.6	-13.0	-34.6	
5722.80	-8.3	H	3.0	43.2	1.0	-50.4	-13.0	-37.4	
7630.40	-6.5	H	3.0	42.6	1.0	-48.1	-13.0	-35.1	

Band 2  
REL99

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		Samsung							
<b>Project #:</b>		4790160849							
<b>Date:</b>		12/22/2021							
<b>Test Engineer:</b>		19227							
<b>Configuration:</b>		EUT, Z-Position							
<b>Location:</b>		Chamber 2							
<b>Mode:</b>		HSDPA Band 2 Harmonics							
<b>Test Votage:</b>		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 1852.4MHz</b>									
3704.80	-10.4	V	3.0	42.3	1.0	-51.8	-13.0	-38.8	
5557.20	-8.4	V	3.0	43.1	1.0	-50.6	-13.0	-37.6	
7409.60	-6.5	V	3.0	42.7	1.0	-48.2	-13.0	-35.2	
3704.80	-8.8	H	3.0	42.3	1.0	-50.1	-13.0	-37.1	
5557.20	-8.4	H	3.0	43.1	1.0	-50.6	-13.0	-37.6	
7409.60	-6.4	H	3.0	42.7	1.0	-48.2	-13.0	-35.2	
<b>Mid Ch, 1880MHz</b>									
3760.00	-10.4	V	3.0	42.3	1.0	-51.7	-13.0	-38.7	
5640.00	-8.1	V	3.0	43.2	1.0	-50.2	-13.0	-37.2	
7520.00	-6.6	V	3.0	42.7	1.0	-48.3	-13.0	-35.3	
3760.00	-8.3	H	3.0	42.3	1.0	-49.6	-13.0	-36.6	
5640.00	-8.1	H	3.0	43.2	1.0	-50.2	-13.0	-37.2	
7520.00	-6.6	H	3.0	42.7	1.0	-48.2	-13.0	-35.2	
<b>High Ch, 1907.6MHz</b>									
3815.20	-9.4	V	3.0	42.3	1.0	-50.7	-13.0	-37.7	
5722.80	-8.3	V	3.0	43.2	1.0	-50.5	-13.0	-37.5	
7630.40	-6.5	V	3.0	42.6	1.0	-48.1	-13.0	-35.1	
3815.20	-6.9	H	3.0	42.3	1.0	-48.3	-13.0	-35.3	
5722.80	-8.3	H	3.0	43.2	1.0	-50.5	-13.0	-37.5	
7630.40	-6.5	H	3.0	42.6	1.0	-48.1	-13.0	-35.1	

Band 2  
HSDPA

**LTE Band 2 (Main ANT)**

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		Samsung							
<b>Project #:</b>		4790160849							
<b>Date:</b>		12/15/2021							
<b>Test Engineer:</b>		25546							
<b>Configuration:</b>		EUT / Z-Position							
<b>Location:</b>		Chamber 1							
<b>Mode:</b>		LTE_QPSK Band 2 Harmonics, 1.4MHz Bandwidth							
<b>Test Voltage:</b>		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 1850.7MHz</b>									
3701.40	-6.6	V	3.0	45.8	1.0	-51.4	-13.0	-38.4	
5552.10	-8.0	V	3.0	45.7	1.0	-52.7	-13.0	-39.7	
7402.80	-6.4	V	3.0	44.6	1.0	-50.0	-13.0	-37.0	
3701.40	-4.4	H	3.0	45.8	1.0	-49.2	-13.0	-36.2	
5552.10	-7.7	H	3.0	45.7	1.0	-52.5	-13.0	-39.5	
7402.80	-6.5	H	3.0	44.6	1.0	-50.0	-13.0	-37.0	
<b>Mid Ch, 1880MHz</b>									
3760.00	-3.7	V	3.0	45.8	1.0	-48.5	-13.0	-35.5	
5640.00	-7.3	V	3.0	45.7	1.0	-52.0	-13.0	-39.0	
7520.00	-6.3	V	3.0	44.5	1.0	-49.8	-13.0	-36.8	
3760.00	-0.6	H	3.0	45.8	1.0	-45.5	-13.0	-32.5	
5640.00	-7.5	H	3.0	45.7	1.0	-52.2	-13.0	-39.2	
7520.00	-6.3	H	3.0	44.5	1.0	-49.8	-13.0	-36.8	
<b>High Ch, 1909.3MHz</b>									
3818.60	-0.1	V	3.0	45.8	1.0	-45.0	-13.0	-32.0	
5727.90	-6.1	V	3.0	45.7	1.0	-50.9	-13.0	-37.9	
7637.20	-6.2	V	3.0	44.4	1.0	-49.7	-13.0	-36.7	
3818.60	1.9	H	3.0	45.8	1.0	-42.9	-13.0	-29.9	
5727.90	-5.2	H	3.0	45.7	1.0	-49.9	-13.0	-36.9	
7637.20	-6.2	H	3.0	44.4	1.0	-49.7	-13.0	-36.7	

LTE  
 Band 2  
 1.4MHz  
 QPSK

**LTE Band 2 (Sub ANT)**

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		Samsung							
<b>Project #:</b>		2021-12-17							
<b>Date:</b>		12/17/2021							
<b>Test Engineer:</b>		25546							
<b>Configuration:</b>		EUT / AC Adapter, Z-Position							
<b>Location:</b>		Chamber 2							
<b>Mode:</b>		LTE_QPSK Band 2 Harmonics, 20MHz Bandwidth							
<b>Test Voltage:</b>		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 1860MHz</b>									
3720.00	-5.3	V	3.0	42.3	1.0	-46.6	-13.0	-33.6	
5580.00	-7.1	V	3.0	43.1	1.0	-49.2	-13.0	-36.2	
7440.00	-5.4	V	3.0	42.7	1.0	-47.1	-13.0	-34.1	
9300.00	-3.8	V	3.0	41.7	1.0	-44.5	-13.0	-31.5	
11160.00	0.4	V	3.0	41.6	1.0	-40.2	-13.0	-27.2	
3720.00	-1.3	H	3.0	42.3	1.0	-42.6	-13.0	-29.6	
5580.00	-6.7	H	3.0	43.1	1.0	-48.8	-13.0	-35.8	
7440.00	-5.4	H	3.0	42.7	1.0	-47.1	-13.0	-34.1	
9300.00	-4.0	H	3.0	41.7	1.0	-44.8	-13.0	-31.8	
11160.00	0.6	H	3.0	41.6	1.0	-40.0	-13.0	-27.0	
<b>Mid Ch, 1880MHz</b>									
3760.00	-5.1	V	3.0	42.3	1.0	-46.4	-13.0	-33.4	
5640.00	-6.2	V	3.0	43.2	1.0	-48.4	-13.0	-35.4	
7520.00	-5.8	V	3.0	42.7	1.0	-47.5	-13.0	-34.5	
9400.00	-3.1	V	3.0	41.7	1.0	-43.8	-13.0	-30.8	
11280.00	0.1	V	3.0	41.7	1.0	-40.5	-13.0	-27.5	
3760.00	-1.0	H	3.0	42.3	1.0	-42.3	-13.0	-29.3	
5640.00	-4.5	H	3.0	43.2	1.0	-46.7	-13.0	-33.7	
7520.00	-5.7	H	3.0	42.7	1.0	-47.4	-13.0	-34.4	
9400.00	-2.4	H	3.0	41.7	1.0	-43.1	-13.0	-30.1	
11280.00	1.2	H	3.0	41.7	1.0	-39.5	-13.0	-26.5	
<b>High Ch, 1900MHz</b>									
3800.00	-4.7	V	3.0	42.3	1.0	-46.0	-13.0	-33.0	
5700.00	-4.5	V	3.0	43.2	1.0	-46.7	-13.0	-33.7	
7600.00	-5.6	V	3.0	42.6	1.0	-47.3	-13.0	-34.3	
9500.00	-3.2	V	3.0	41.6	1.0	-43.8	-13.0	-30.8	
11400.00	1.0	V	3.0	41.7	1.0	-39.7	-13.0	-26.7	
3800.00	-10.2	H	3.0	42.3	1.0	-51.5	-13.0	-38.5	
5700.00	-3.4	H	3.0	43.2	1.0	-45.6	-13.0	-32.6	
7600.00	-4.6	H	3.0	42.6	1.0	-46.2	-13.0	-33.2	
9500.00	-3.2	H	3.0	41.6	1.0	-43.7	-13.0	-30.7	
11400.00	0.7	H	3.0	41.7	1.0	-40.0	-13.0	-27.0	

LTE  
Band 2  
20MHz  
QPSK

**LTE Band 12**

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		Samsung							
<b>Project #:</b>		4790160849							
<b>Date:</b>		12/15/2021							
<b>Test Engineer:</b>		19568							
<b>Configuration:</b>		EUT, Y-Position							
<b>Location:</b>		Chamber 1							
<b>Mode:</b>		LTE_QPSK Band 12 Harmonics, 1.4MHz Bandwidth							
<b>Test Votage:</b>		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 699.7MHz</b>									
1399.40	-17.0	V	3.0	45.8	1.0	-61.8	-13.0	-48.8	
2099.10	-5.5	V	3.0	45.4	1.0	-49.8	-13.0	-36.8	
2798.80	-10.6	V	3.0	45.5	1.0	-55.1	-13.0	-42.1	
3498.50	-7.9	V	3.0	45.7	1.0	-52.7	-13.0	-39.7	
4198.20	-9.0	V	3.0	45.9	1.0	-53.9	-13.0	-40.9	
1399.40	-18.2	H	3.0	45.8	1.0	-63.0	-13.0	-50.0	
2099.10	-2.8	H	3.0	45.4	1.0	-47.2	-13.0	-34.2	
2798.80	-10.8	H	3.0	45.5	1.0	-55.3	-13.0	-42.3	
3498.50	-7.8	H	3.0	45.7	1.0	-52.5	-13.0	-39.5	
4198.20	-9.3	H	3.0	45.9	1.0	-54.2	-13.0	-41.2	
<b>Mid Ch, 707.5MHz</b>									
1415.00	-16.9	V	3.0	45.8	1.0	-61.7	-13.0	-48.7	
2122.50	-10.8	V	3.0	45.4	1.0	-55.2	-13.0	-42.2	
2830.00	0.0	V	3.0	45.5	1.0	-44.5	-13.0	-31.5	
3537.50	0.0	V	3.0	45.8	1.0	-44.8	-13.0	-31.8	
4245.00	0.0	V	3.0	45.9	1.0	-44.9	-13.0	-31.9	
1415.00	0.0	H	3.0	45.8	1.0	-44.8	-13.0	-31.8	
2122.50	-11.9	H	3.0	45.4	1.0	-56.3	-13.0	-43.3	
2830.00	-10.6	H	3.0	45.5	1.0	-55.2	-13.0	-42.2	
3537.50	-7.5	H	3.0	45.8	1.0	-52.3	-13.0	-39.3	
4245.00	-9.1	H	3.0	45.9	1.0	-54.0	-13.0	-41.0	
<b>High Ch, 715.3MHz</b>									
1430.60	-16.3	V	3.0	45.8	1.0	-61.1	-13.0	-48.1	
2145.90	-10.6	V	3.0	45.4	1.0	-55.0	-13.0	-42.0	
2861.20	-10.5	V	3.0	45.5	1.0	-55.0	-13.0	-42.0	
3576.50	-7.0	V	3.0	45.8	1.0	-51.7	-13.0	-38.7	
4291.80	-8.9	V	3.0	45.9	1.0	-53.8	-13.0	-40.8	
1430.60	-16.4	H	3.0	45.8	1.0	-61.2	-13.0	-48.2	
2145.90	-10.7	H	3.0	45.4	1.0	-55.1	-13.0	-42.1	
2861.20	-10.5	H	3.0	45.5	1.0	-55.0	-13.0	-42.0	
3576.50	-6.8	H	3.0	45.8	1.0	-51.6	-13.0	-38.6	
4291.80	-9.0	H	3.0	45.9	1.0	-53.9	-13.0	-40.9	

LTE  
 Band 12  
 1.4MHz  
 QPSK

**LTE Band 26 (Part 90)**

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
LTE Band 26  1.4MHz  QPSK	Company: Samsung										
	Project #: 4790160849										
	Date: 12/22/2021										
	Test Engineer: 19227										
	Configuration: EUT / AC Adapter, Z-Position										
	Location: Chamber 2										
	Mode: LTE_QPSK Band 26 Harmonics, 1.4MHz Bandwidth										
	Test Votage: AC 120 V, 60 Hz										
	<b>Low Ch, 814.7MHz</b>										
		1629.40	-16.1	V	3.0	40.9	1.0	-56.0	-13.0	-43.0	
		2444.10	-13.2	V	3.0	41.5	1.0	-53.7	-13.0	-40.7	
		3258.80	-10.5	V	3.0	42.3	1.0	-51.8	-13.0	-38.8	
		1629.40	-16.8	H	3.0	40.9	1.0	-56.7	-13.0	-43.7	
		2444.10	-13.5	H	3.0	41.5	1.0	-54.0	-13.0	-41.0	
		3258.80	-10.4	H	3.0	42.3	1.0	-51.7	-13.0	-38.7	
	<b>Mid Ch, 823.3Mhz</b>										
		1646.60	-16.0	V	3.0	40.9	1.0	-55.9	-13.0	-42.9	
		2469.90	-13.0	V	3.0	41.5	1.0	-53.6	-13.0	-40.6	
	3293.20	-10.2	V	3.0	42.3	1.0	-51.5	-13.0	-38.5		
	1646.60	-16.2	H	3.0	40.9	1.0	-56.1	-13.0	-43.1		
	2469.90	-13.4	H	3.0	41.5	1.0	-54.0	-13.0	-41.0		
	3293.20	-10.3	H	3.0	42.3	1.0	-51.6	-13.0	-38.6		

**LTE Band 26 (Straddle)**

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
LTE Band 26  1.4MHz  QPSK	Company: Samsung										
	Project #: 4790160849										
	Date: 12/21/2021										
	Test Engineer: 19227										
	Configuration: EUT / AC Adapter, Z-Position										
	Location: Chamber 2										
	Mode: LTE_QPSK Band 26 Harmonics, 1.4MHz Bandwidth										
	Test Votage: AC 120 V, 60 Hz										
	<b>Mid Ch, 824Mhz</b>										
		1648.00	-16.1	V	3.0	40.9	1.0	-56.0	-13.0	-43.0	
		2472.00	-13.1	V	3.0	41.5	1.0	-53.7	-13.0	-40.7	
		3296.00	-10.3	V	3.0	42.3	1.0	-51.6	-13.0	-38.6	
		1648.00	-16.8	H	3.0	40.9	1.0	-56.8	-13.0	-43.8	
		2472.00	-13.5	H	3.0	41.5	1.0	-54.1	-13.0	-41.1	
		3296.00	-10.3	H	3.0	42.3	1.0	-51.6	-13.0	-38.6	



**LTE Band 26 (Part 22)**

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement											
LTE Band 26  15MHz  QPSK		Company: Samsung Project #: 4790160849 Date: 12/22/2021 Test Engineer: 19227 Configuration: EUT / AC Adapter, Z-Position Location: Chamber 2 Mode: LTE_QPSK Band 26 Harmonics, 15MHz Bandwidth Test Votage: AC 120 V, 60 Hz									
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
		<b>Mid Ch, 831.5MHz</b>									
		1663.00	-15.9	V	3.0	40.9	1.0	-55.8	-13.0	-42.8	
		2494.50	-13.1	V	3.0	41.6	1.0	-53.7	-13.0	-40.7	
		3326.00	-10.1	V	3.0	42.3	1.0	-51.4	-13.0	-38.4	
		1663.00	-16.7	H	3.0	40.9	1.0	-56.6	-13.0	-43.6	
		2494.50	-13.4	H	3.0	41.6	1.0	-54.0	-13.0	-41.0	
		3326.00	-10.1	H	3.0	42.3	1.0	-51.4	-13.0	-38.4	
		<b>High Ch, 841.5MHz</b>									
1683.00	-15.9	V	3.0	40.9	1.0	-55.9	-13.0	-42.9			
2524.50	-12.9	V	3.0	41.6	1.0	-53.5	-13.0	-40.5			
3366.00	-9.8	V	3.0	42.3	1.0	-51.1	-13.0	-38.1			
1683.00	-16.5	H	3.0	40.9	1.0	-56.4	-13.0	-43.4			
2524.50	-13.3	H	3.0	41.6	1.0	-53.9	-13.0	-40.9			
3366.00	-9.3	H	3.0	42.3	1.0	-50.6	-13.0	-37.6			

**LTE Band 41**

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		Samsung							
<b>Project #:</b>		4790160849							
<b>Date:</b>		12/22/2021							
<b>Test Engineer:</b>		25546							
<b>Configuration:</b>		EUT / Z-Position							
<b>Location:</b>		Chamber 2							
<b>Mode:</b>		LTE_QPSK Band 41 Harmonics, 15MHz Bandwidth							
<b>Test Votage:</b>		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2503.5MHz</b>									
5007.00	-4.4	V	3.0	43.0	1.0	-46.4	-25.0	-21.4	
7510.50	-5.1	V	3.0	42.7	1.0	-46.8	-25.0	-21.8	
10014.00	-8.4	V	3.0	41.1	1.0	-48.5	-25.0	-23.5	
12517.50	-6.4	V	3.0	42.3	1.0	-47.8	-25.0	-22.8	
15021.00	-8.2	V	3.0	43.9	1.0	-51.1	-25.0	-26.1	
5007.00	-3.1	H	3.0	43.0	1.0	-45.1	-25.0	-20.1	
7510.50	-5.7	H	3.0	42.7	1.0	-47.4	-25.0	-22.4	
10014.00	-2.6	H	3.0	41.1	1.0	-42.8	-25.0	-17.8	
12517.50	-6.6	H	3.0	42.3	1.0	-47.9	-25.0	-22.9	
15021.00	-7.9	H	3.0	43.9	1.0	-50.8	-25.0	-25.8	
<b>Mid Ch, 2593MHz</b>									
5186.00	7.0	V	3.0	43.1	1.0	-35.0	-25.0	-10.0	
7779.00	0.2	V	3.0	42.5	1.0	-41.4	-25.0	-16.4	
10372.00	-4.0	V	3.0	41.3	1.0	-44.3	-25.0	-19.3	
12965.00	-8.6	V	3.0	42.6	1.0	-50.2	-25.0	-25.2	
15558.00	-8.0	V	3.0	43.8	1.0	-50.7	-25.0	-25.7	
5186.00	4.9	H	3.0	43.1	1.0	-37.1	-25.0	-12.1	
7779.00	4.5	H	3.0	42.5	1.0	-37.0	-25.0	-12.0	
10372.00	-2.7	H	3.0	41.3	1.0	-43.0	-25.0	-18.0	
12965.00	-8.0	H	3.0	42.6	1.0	-49.6	-25.0	-24.6	
15558.00	-7.6	H	3.0	43.8	1.0	-50.3	-25.0	-25.3	
<b>High Ch, 2682.5MHz</b>									
5365.00	7.1	V	3.0	43.1	1.0	-35.0	-25.0	-10.0	
8047.50	0.0	V	3.0	42.4	1.0	-41.4	-25.0	-16.4	
10730.00	-4.4	V	3.0	41.4	1.0	-44.8	-25.0	-19.8	
13412.50	-8.0	V	3.0	42.9	1.0	-49.9	-25.0	-24.9	
16095.00	-7.0	V	3.0	43.6	1.0	-49.6	-25.0	-24.6	
5365.00	9.6	H	3.0	43.1	1.0	-32.5	-25.0	-7.5	
8047.50	0.6	H	3.0	42.4	1.0	-40.8	-25.0	-15.8	
10730.00	0.2	H	3.0	41.4	1.0	-40.3	-25.0	-15.3	
13412.50	-4.0	H	3.0	42.9	1.0	-45.9	-25.0	-20.9	
16095.00	-6.9	H	3.0	43.6	1.0	-49.5	-25.0	-24.5	

LTE  
Band 41  
15MHz  
QPSK

**LTE Band 66 (Main ANT)**

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement											
LTE Band 66  5MHz  QPSK		Company: Samsung Project #: 4790160849 Date: 12/22/2021 Test Engineer: 25546 Configuration: EUT / AC Adapter. X-Position Location: Chamber 2 Mode: LTE_QPSK Band 66 Harmonics, 5MHz Bandwidth Test Voltage: AC 120 V, 60 Hz									
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
		Low Ch, 1712.5MHz									
		3425.00	-7.4	V	3.0	42.3	1.0	-48.7	-13.0	-35.7	
		5137.50	-8.7	V	3.0	43.1	1.0	-50.8	-13.0	-37.8	
		6850.00	-6.5	V	3.0	43.0	1.0	-48.5	-13.0	-35.5	
		3425.00	-5.7	H	3.0	42.3	1.0	-47.0	-13.0	-34.0	
		5137.50	-8.8	H	3.0	43.1	1.0	-50.9	-13.0	-37.9	
		6850.00	-6.4	H	3.0	43.0	1.0	-48.4	-13.0	-35.4	
		Mid Ch, 1745MHz									
3490.00	-0.5	V	3.0	42.3	1.0	-41.8	-13.0	-28.8			
5235.00	-8.9	V	3.0	43.1	1.0	-51.0	-13.0	-38.0			
6980.00	-6.1	V	3.0	42.9	1.0	-48.1	-13.0	-35.1			
3490.00	1.9	H	3.0	42.3	1.0	-39.4	-13.0	-26.4			
5235.00	-8.6	H	3.0	43.1	1.0	-50.7	-13.0	-37.7			
6980.00	-6.2	H	3.0	42.9	1.0	-48.1	-13.0	-35.1			
High Ch, 1777.5MHz											
3555.00	-3.6	V	3.0	42.3	1.0	-44.9	-13.0	-31.9			
5332.50	-8.2	V	3.0	43.1	1.0	-50.3	-13.0	-37.3			
7110.00	-6.3	V	3.0	42.9	1.0	-48.2	-13.0	-35.2			
3555.00	-0.1	H	3.0	42.3	1.0	-41.4	-13.0	-28.4			
5332.50	-7.8	H	3.0	43.1	1.0	-49.9	-13.0	-36.9			
7110.00	-6.5	H	3.0	42.9	1.0	-48.4	-13.0	-35.4			

**LTE Band 66 (Sub ANT)**

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		Samsung							
<b>Project #:</b>		4790160849							
<b>Date:</b>		12/21/2021							
<b>Test Engineer:</b>		25546							
<b>Configuration:</b>		EUT, Y-Position							
<b>Location:</b>		Chamber 1							
<b>Mode:</b>		LTE_QPSK Band 66 Harmonics, 20MHz Bandwidth							
<b>Test Voltage:</b>		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 1720MHz</b>									
3440.00	-0.7	V	3.0	45.7	1.0	-45.5	-13.0	-32.5	
5160.00	-9.1	V	3.0	45.8	1.0	-53.9	-13.0	-40.9	
6880.00	-5.7	V	3.0	44.9	1.0	-49.6	-13.0	-36.6	
8600.00	-4.8	V	3.0	43.8	1.0	-47.6	-13.0	-34.6	
10320.00	-1.2	V	3.0	42.7	1.0	-42.8	-13.0	-29.8	
3440.00	7.2	H	3.0	45.7	1.0	-37.5	-13.0	-24.5	
5160.00	-0.3	H	3.0	45.8	1.0	-45.1	-13.0	-32.1	
6880.00	2.4	H	3.0	44.9	1.0	-41.4	-13.0	-28.4	
8600.00	3.5	H	3.0	43.8	1.0	-39.3	-13.0	-26.3	
10320.00	-1.4	H	3.0	42.7	1.0	-43.1	-13.0	-30.1	
<b>Mid Ch, 1745MHz</b>									
3490.00	3.8	V	3.0	45.7	1.0	-40.9	-13.0	-27.9	
5235.00	0.4	V	3.0	45.8	1.0	-44.3	-13.0	-31.3	
6980.00	2.3	V	3.0	44.8	1.0	-41.5	-13.0	-28.5	
8725.00	4.4	V	3.0	43.7	1.0	-38.3	-13.0	-25.3	
10470.00	-1.1	V	3.0	42.7	1.0	-42.9	-13.0	-29.9	
3490.00	5.1	H	3.0	45.7	1.0	-39.6	-13.0	-26.6	
5235.00	1.7	H	3.0	45.8	1.0	-43.1	-13.0	-30.1	
6980.00	2.7	H	3.0	44.8	1.0	-41.1	-13.0	-28.1	
8725.00	3.6	H	3.0	43.7	1.0	-39.1	-13.0	-26.1	
10470.00	-1.3	H	3.0	42.7	1.0	-43.1	-13.0	-30.1	
<b>High Ch, 1770MHz</b>									
3540.00	1.7	V	3.0	45.8	1.0	-43.0	-13.0	-30.0	
5310.00	-7.3	V	3.0	45.8	1.0	-52.0	-13.0	-39.0	
7080.00	-5.7	V	3.0	44.7	1.0	-49.5	-13.0	-36.5	
8850.00	-4.8	V	3.0	43.6	1.0	-47.4	-13.0	-34.4	
10620.00	-0.9	V	3.0	42.8	1.0	-42.6	-13.0	-29.6	
3540.00	3.9	H	3.0	45.8	1.0	-40.9	-13.0	-27.9	
5310.00	-6.4	H	3.0	45.8	1.0	-51.2	-13.0	-38.2	
7080.00	-5.8	H	3.0	44.7	1.0	-49.5	-13.0	-36.5	
8850.00	-4.6	H	3.0	43.6	1.0	-47.2	-13.0	-34.2	
10620.00	-1.0	H	3.0	42.8	1.0	-42.8	-13.0	-29.8	

LTE  
Band 66  
20MHz  
QPSK

**END OF REPORT**