
Agilent Spectrum Analyzer - Swept SA
Center Freq 13.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 65/100
02:31:39 AM Apr 26, 2019
Ref Offset 18.01 dB
10 dB/div
Log
Ref 25.00 dBm
Mkr1 25.509 9 GHz
-28.305 dBm
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 27.00 GHz
Sweep 69.33 ms (40001 pts)
Frequency
Auto Tune
Center Freq
13.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
27.000000000 GHz
CF Step
2.697000000 GHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

6.2.1.1.2 Test Bandwidth = 20+20

6.2.1.1.2.1 Test Channel = LCH

6.1.1.1.2.1.1 PCC Test RB = 1 # 0 & SCC Test RB = 0


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 67/100
02:10:03 AM Apr 26, 2019
Ref Offset 18 dB
10 dB/div
Log
Ref 25.00 dBm
Mkr1 25.324 5 GHz
-29.397 dBm
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 27.00 GHz
Sweep 69.33 ms (40001 pts)
Frequency
Auto Tune
Center Freq
13.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
27.000000000 GHz
CF Step
2.697000000 GHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

6.2.1.1.2.2 Test Channel = MCH

6.1.1.1.2.2.1 PCC Test RB = 1 # 0 & SCC Test RB = 0


Agilent Spectrum Analyzer - Swept SA
Center Freq 15.075000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 42/100
02:13:52 AM Apr 26, 2019
Ref Offset 18.01 dB
10 dB/div
Log
Ref 0.00 dBm
Mkr1 150.00 kHz
-55.087 dBm
Start 150 kHz
#Res BW 10 kHz
#VBW 30 kHz
Stop 30.00 MHz
Sweep 285.3 ms (5001 pts)
DC Coupled
Frequency
Auto Tune
Center Freq
15.075000 MHz
Start Freq
150.000 kHz
Stop Freq
30.000000 MHz
CF Step
2.985000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 67/100
02:14:13 AM Apr 26, 2019
Ref Offset 18.01 dB
10 dB/div
Log
Ref 25.00 dBm
Mkr1 25.440 5 GHz
-29.011 dBm
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 27.00 GHz
Sweep 69.33 ms (40001 pts)
Frequency
Auto Tune
Center Freq
13.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
27.000000000 GHz
CF Step
2.697000000 GHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

6.2.1.1.2.3 Test Channel = HCH

6.1.1.1.2.3.1 PCC Test RB = 1 # 0 & SCC Test RB = 0


Agilent Spectrum Analyzer - Swept SA
Center Freq 15.075000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 42/100
02:18:04 AM Apr 26, 2019
Ref Offset 18.01 dB
10 dB/div
Log
Ref 0.00 dBm
Mkr1 161.94 kHz
-53.794 dBm
Start 150 kHz
#Res BW 10 kHz
#VBW 30 kHz
Stop 30.00 MHz
Sweep 285.3 ms (5001 pts)
DC Coupled
Frequency
Auto Tune
Center Freq
15.075000 MHz
Start Freq
150.000 kHz
Stop Freq
30.000000 MHz
CF Step
2.985000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 65/100
02:18:25 AM Apr 26, 2019
Ref Offset 18.01 dB
10 dB/div
Log
Ref 25.00 dBm
Mkr1 25.781 6 GHz
-29.216 dBm
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 27.00 GHz
Sweep 69.33 ms (40001 pts)
Frequency
Auto Tune
Center Freq
13.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
27.000000000 GHz
CF Step
2.697000000 GHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

6.2.1.2 Test Mode = LTE/TM2

6.2.1.2.1 Test Bandwidth = 15+15

6.2.1.2.1.1 Test Channel = LCH

6.1.1.2.1.1.1 PCC Test RB = 1 # 0 & SCC Test RB = 0


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 68/100
02:24:18 AM Apr 26, 2019
Ref Offset 18 dB
10 dB/div
Log
Ref 25.00 dBm
Mkr1 25.318 4 GHz
-29.015 dBm
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 27.00 GHz
Sweep 69.33 ms (40001 pts)
Frequency
Auto Tune
Center Freq
13.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
27.000000000 GHz
CF Step
2.697000000 GHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

6.2.1.2.1.2 Test Channel = MCH

6.1.1.2.1.2.1 PCC Test RB = 1 # 0 & SCC Test RB = 0


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 67/100
02:28:30 AM Apr 26, 2019
Ref Offset 18.01 dB
10 dB/div
Log
Ref 25.00 dBm
Mkr1 24.931 4 GHz
-29.528 dBm
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 27.00 GHz
Sweep 69.33 ms (40001 pts)
Frequency
Auto Tune
Center Freq
13.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
27.000000000 GHz
CF Step
2.697000000 GHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

6.2.1.2.1.3 Test Channel = HCH

6.1.1.2.1.3.1 PCC Test RB = 1 # 0 & SCC Test RB = 0


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 74/100
02:32:41 AM Apr 26, 2019
Ref Offset 18.01 dB
10 dB/div
Log
Ref 25.00 dBm
Mkr1 25.429 0 GHz
-29.063 dBm
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 27.00 GHz
Sweep 69.33 ms (40001 pts)
Frequency
Auto Tune
Center Freq
13.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
27.000000000 GHz
CF Step
2.697000000 GHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

6.2.1.2.2 Test Bandwidth = 20+20

6.2.1.2.2.1 Test Channel = LCH

6.1.1.2.2.1.1 PCC Test RB = 1 # 0 & SCC Test RB = 0


Agilent Spectrum Analyzer - Swept SA
Center Freq 15.075000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 42/100
02:10:42 AM Apr 26, 2019
Ref Offset 18 dB
10 dB/div
Log
Ref 0.00 dBm
Mkr1 150.00 kHz
-53.749 dBm
Start 150 kHz
#Res BW 10 kHz
#VBW 30 kHz
Stop 30.00 MHz
Sweep 285.3 ms (5001 pts)
DC Coupled
Frequency
Auto Tune
Center Freq
15.075000 MHz
Start Freq
150.000 kHz
Stop Freq
30.000000 MHz
CF Step
2.985000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 67/100
02:11:04 AM Apr 26, 2019
Ref Offset 18 dB
10 dB/div
Log
Ref 25.00 dBm
Mkr1 25.441 8 GHz
-29.331 dBm
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 27.00 GHz
Sweep 69.33 ms (40001 pts)
Frequency
Auto Tune
Center Freq
13.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
27.000000000 GHz
CF Step
2.697000000 GHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

6.2.1.2.2.2 Test Channel = MCH

6.1.1.2.2.2.1 PCC Test RB = 1 # 0 & SCC Test RB = 0


Agilent Spectrum Analyzer - Swept SA
Center Freq 15.075000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 42/100
02:14:53 AM Apr 26, 2019
Ref Offset 18.01 dB
10 dB/div
Log
Ref 0.00 dBm
Mkr1 161.94 kHz
-55.359 dBm
Start 150 kHz
#Res BW 10 kHz
#VBW 30 kHz
Stop 30.00 MHz
Sweep 285.3 ms (5001 pts)
DC Coupled
Frequency
Auto Tune
Center Freq
15.075000 MHz
Start Freq
150.000 kHz
Stop Freq
30.000000 MHz
CF Step
2.985000 MHz
Auto
Man
Freq Offset
0 Hz

6.2.1.2.2.3 Test Channel = HCH

6.1.1.2.2.3.1 PCC Test RB = 1 # 0 & SCC Test RB = 0


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 67/100
02:19:26 AM Apr 26, 2019
Ref Offset 18.01 dB
10 dB/div
Log
Ref 25.00 dBm
Mkr1 25.443 8 GHz
-29.200 dBm
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 27.00 GHz
Sweep 69.33 ms (40001 pts)
Frequency
Auto Tune
Center Freq
13.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
27.000000000 GHz
CF Step
2.697000000 GHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

7Appendix_G: Field Strength of Spurious Radiation

Note: We tested all modes, but the data presented below is the worst case.

9kHz~150kHz, RBW = 200Hz, VBW = 600 Hz, Detector: PK

150kHz~30MHz, RBW = 9kHz, VBW = 30k Hz, Detector: PK

30MHz~1GHz, RBW = 100 kHz, VBW = 300 kHz. Detector: PK

Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

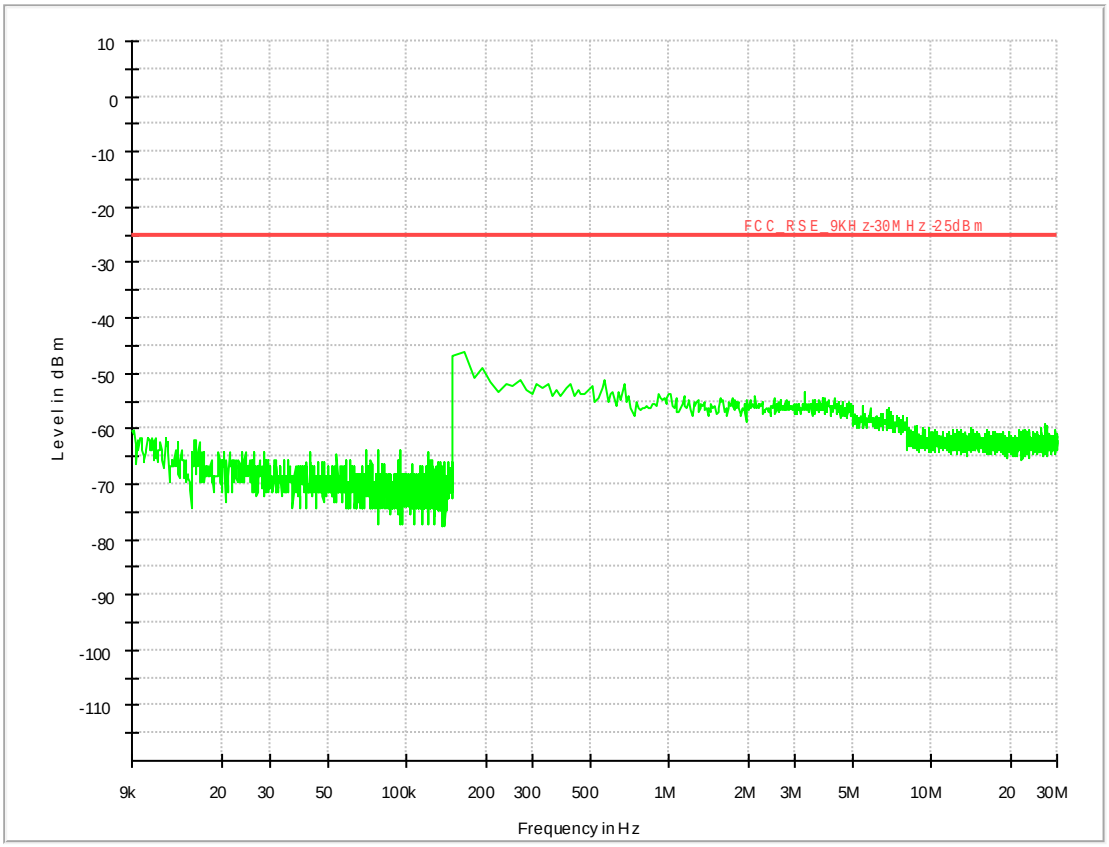
Part I - Test Plots

7.1 For LTE

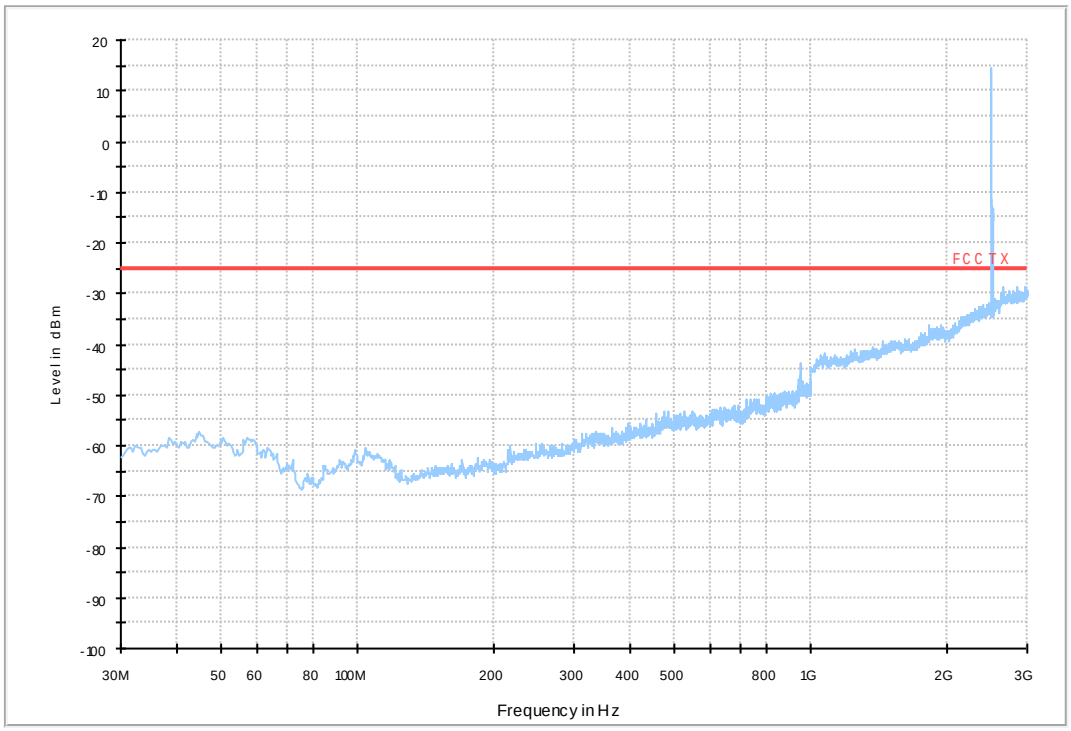
7.1.1 Test Band = CA_7C

7.1.1.1 Test Bandwidth = 15+15

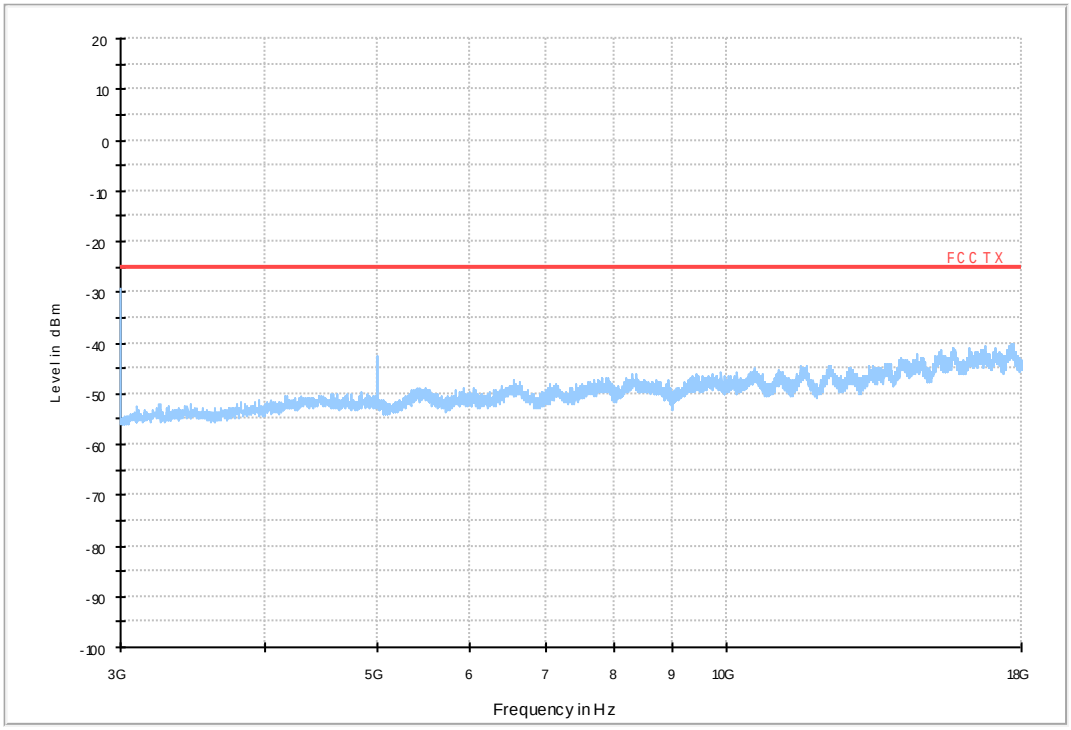
CA_7C/TM1_Ant1

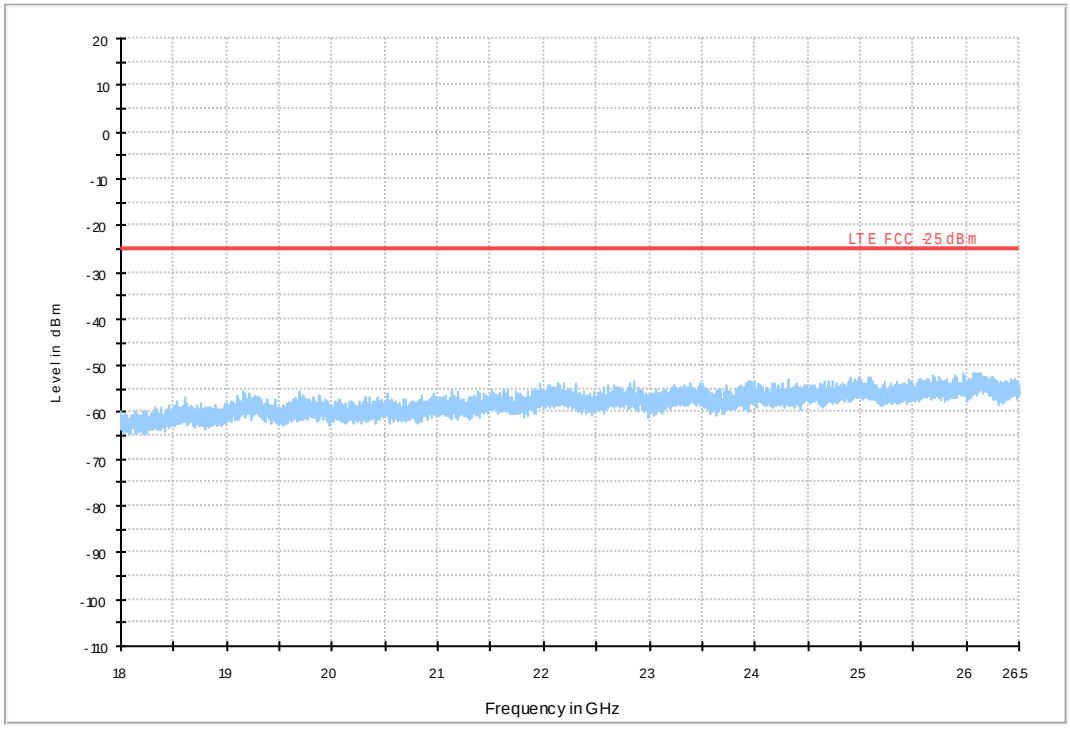


LTE Band 7 RSE-TX-DIRECTOR ABOVE 1.5G_L -25dBm limit

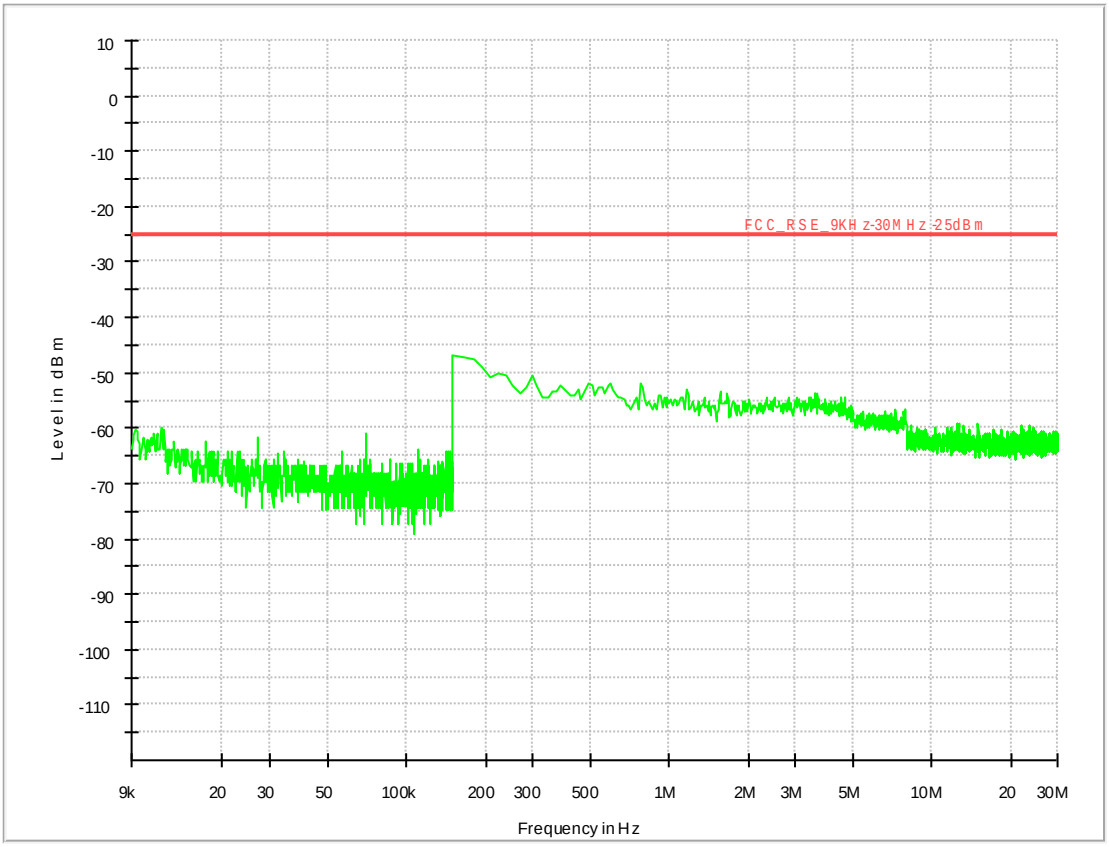


LTE FDD Band 7 RSE-TX-DIRECTOR ABOVE 1.5G_H -25dBm limit

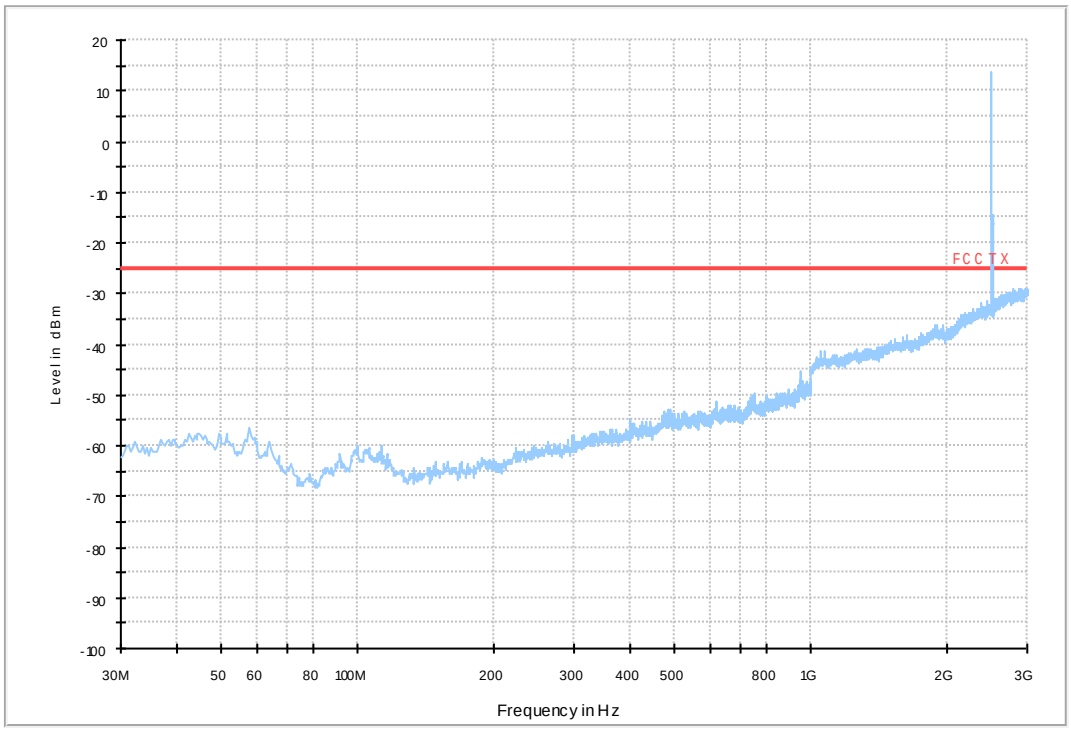




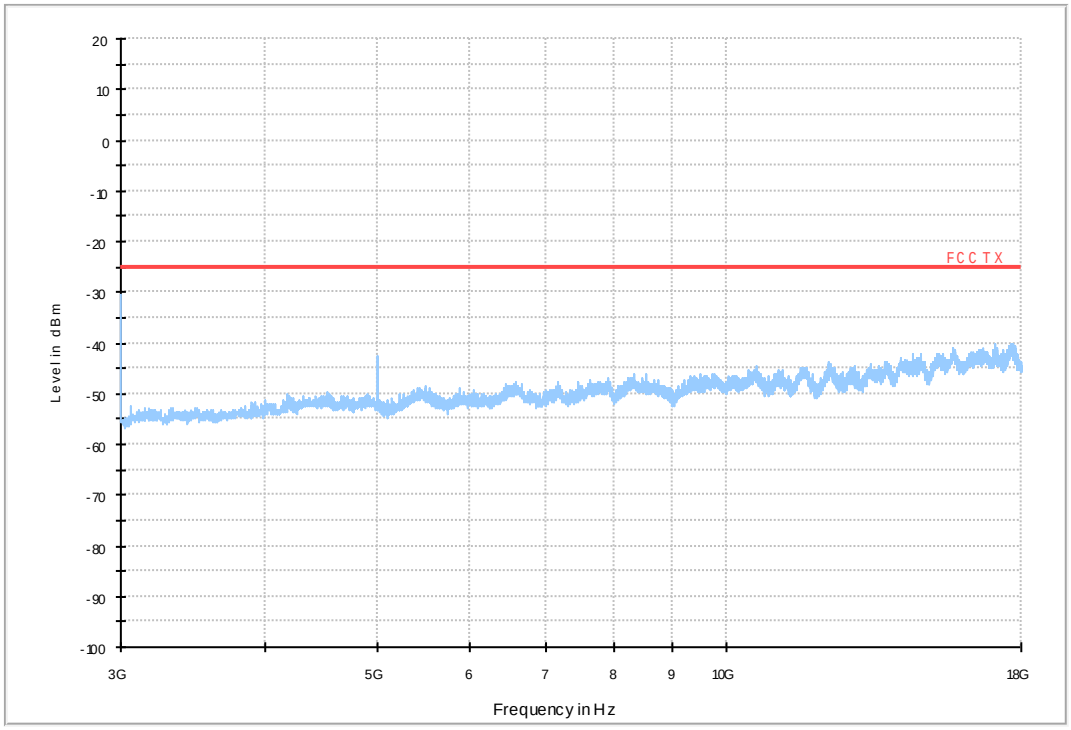
CA_7C/TM1_Ant2

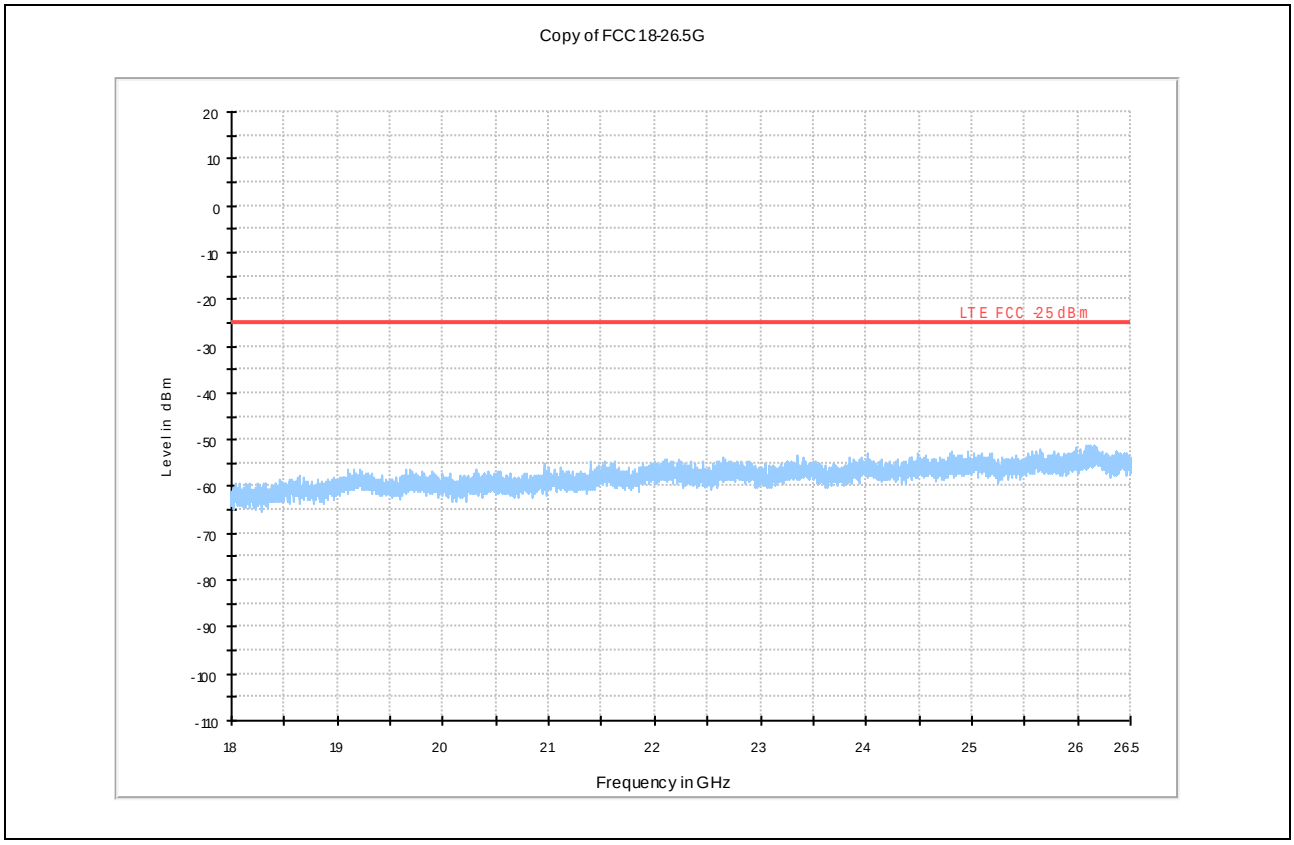


LTE Band 7 RSE-TX-DIRECTOR ABOVE 1.5G_L -25dBm limit



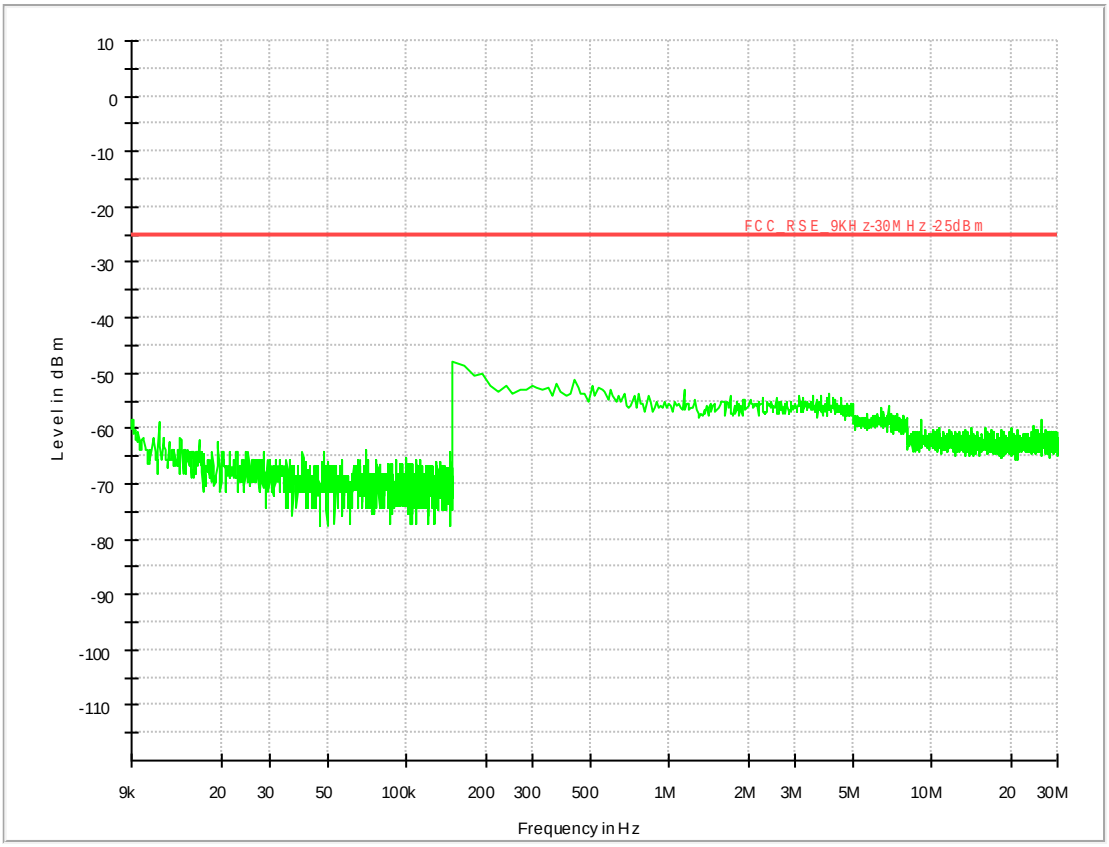
LTE FDD Band 7 RSE-TX-DIRECTOR ABOVE 1.5G_H -25dBm limit



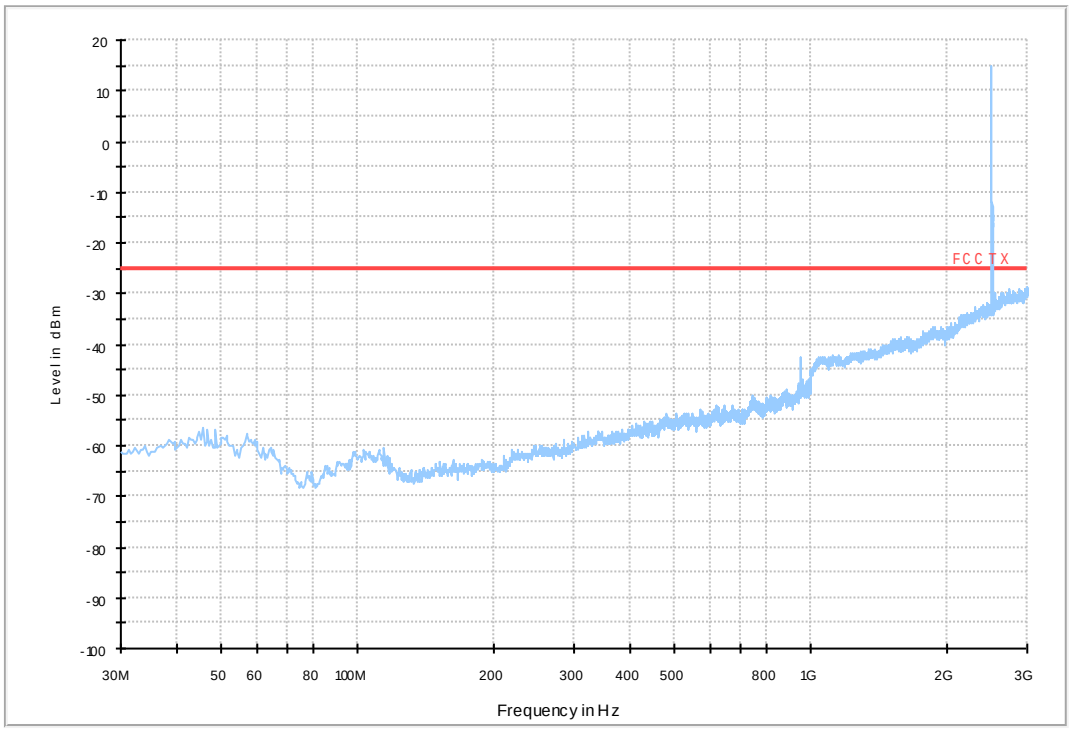


7.1.1.2 Test Bandwidth = 20+20

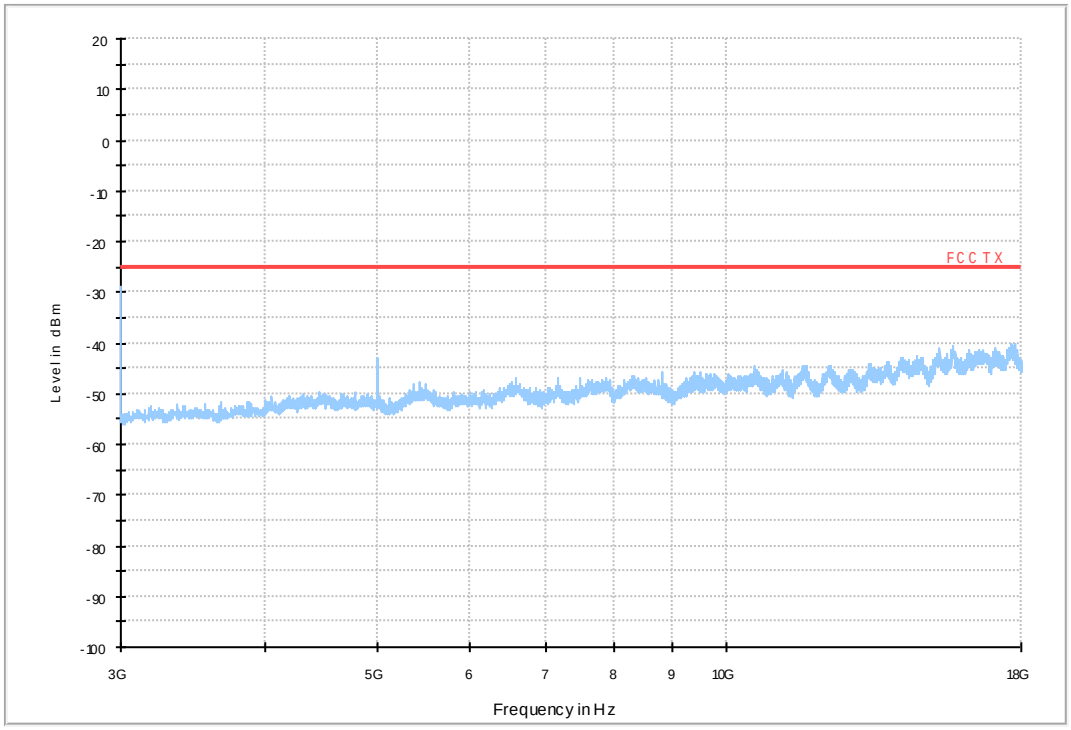
CA_7C/TM1_Ant1

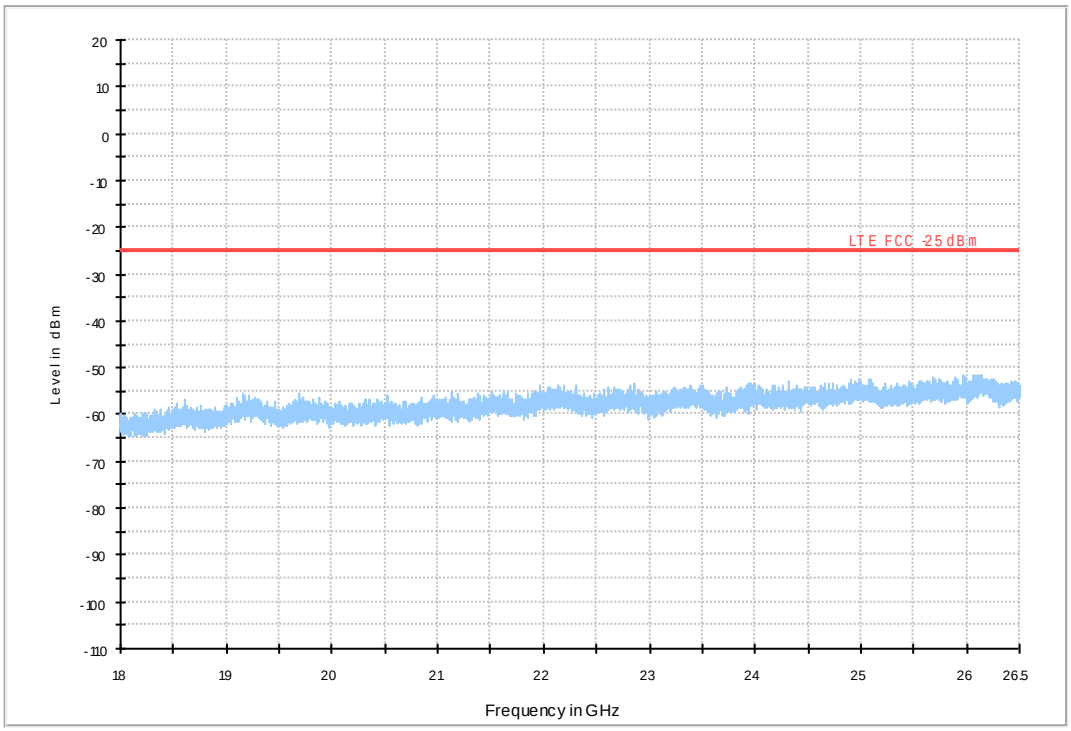


LTE Band 7 RSE-TX-DIRECTOR ABOVE 1.5G_L -25dBm limit

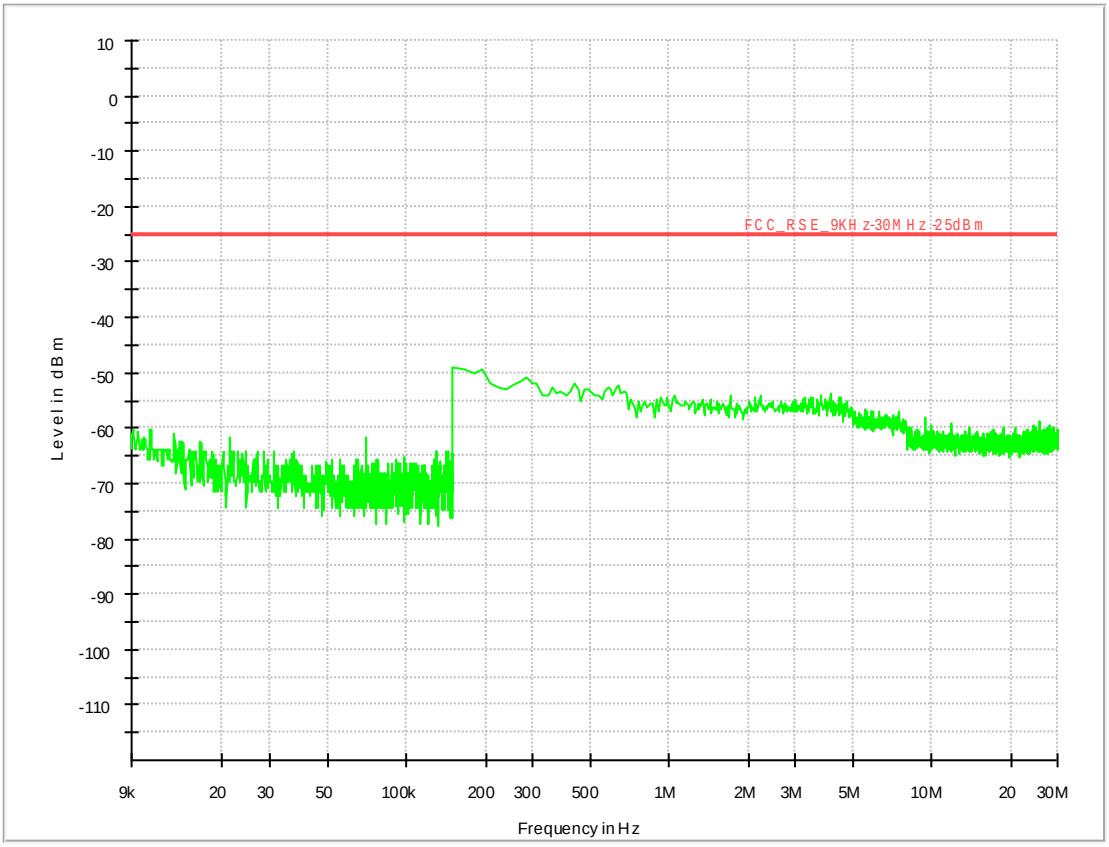


LTE FDD Band 7 RSE-TX-DIRECTOR ABOVE 1.5G_H -25dBm limit

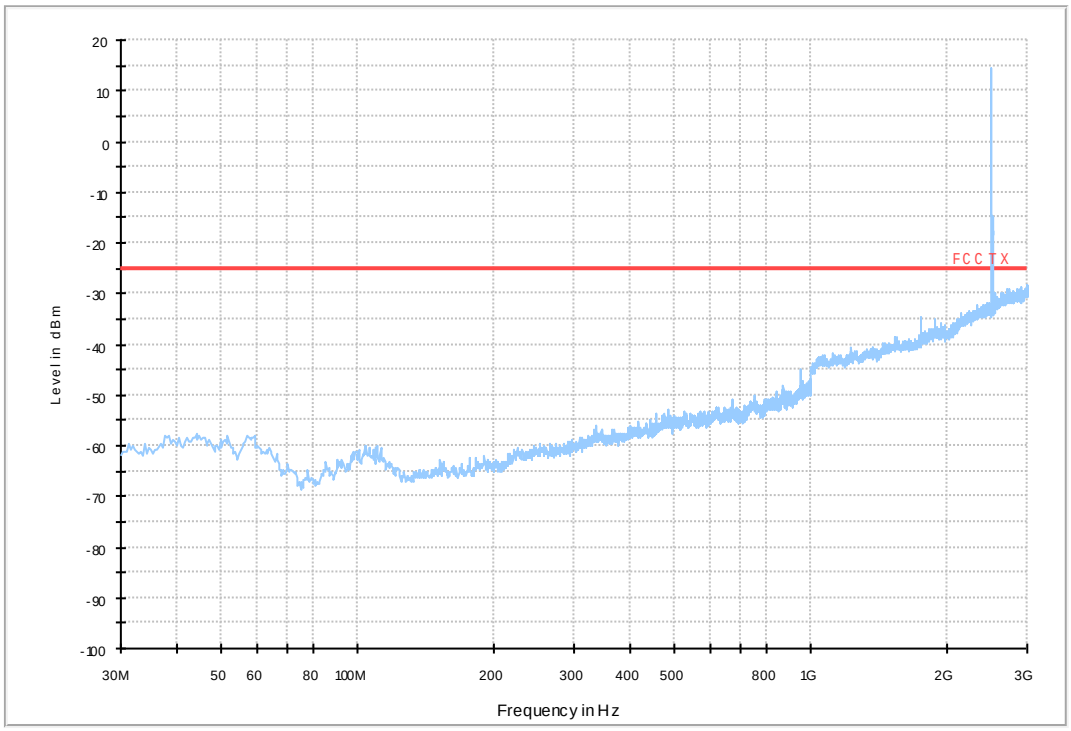




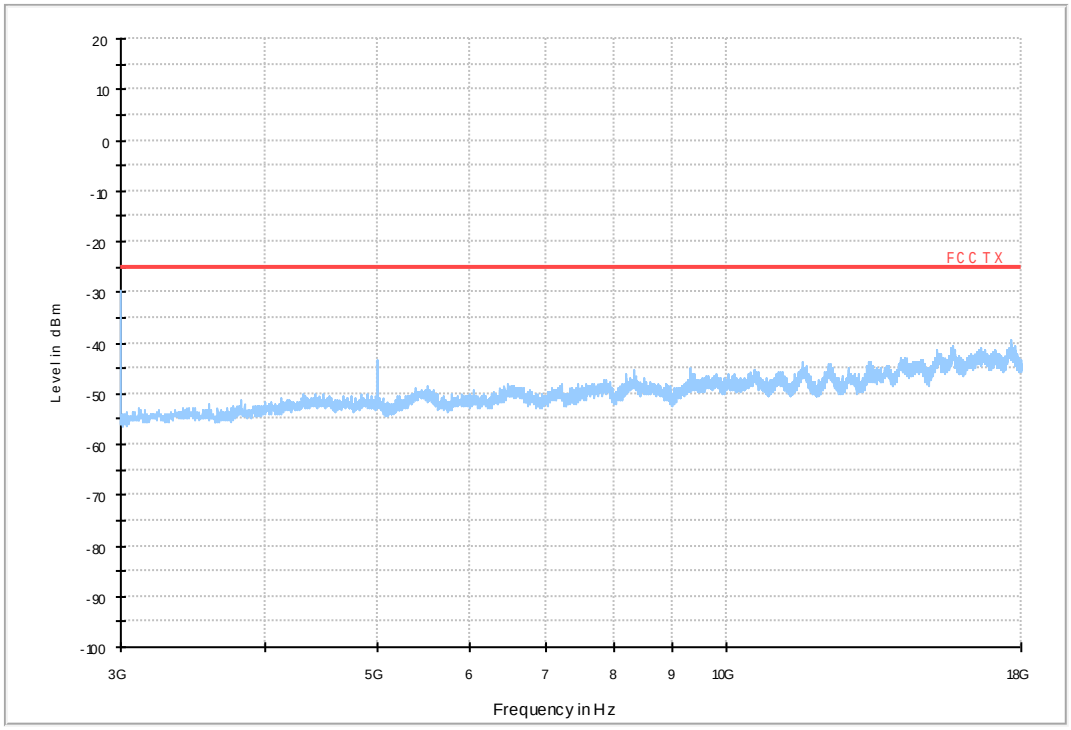
CA_7C/TM1_Ant2

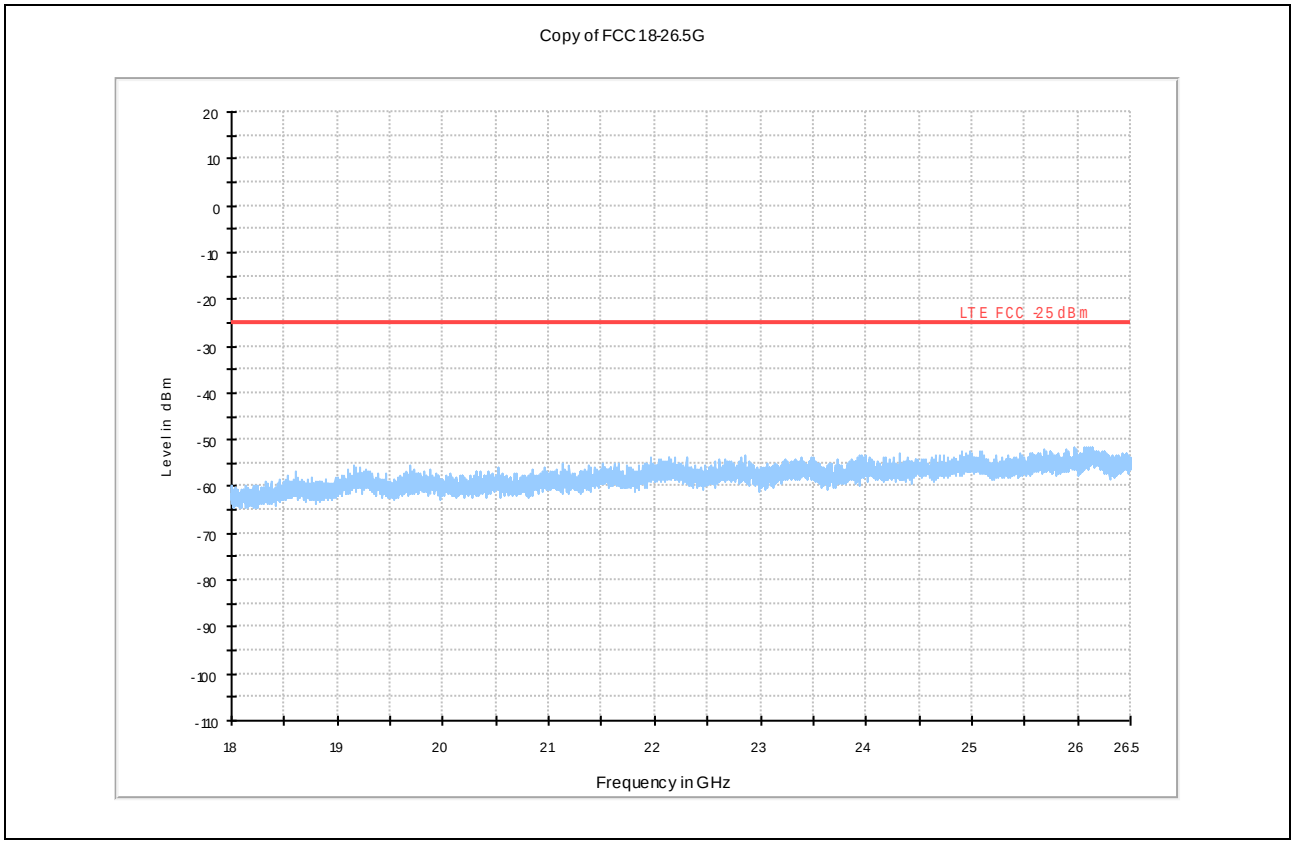


LTE Band 7 RSE-TX-DIRECTOR ABOVE 1.5G_L -25dBm limit



LTE FDD Band 7 RSE-TX-DIRECTOR ABOVE 1.5G_H -25dBm limit





8Appendix_H: Frequency Stability

8.1 For LTE

8.1.1Frequency Error vs. Voltage:

Test Band	Test Mode	Test Bandwidth (MHz)	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
CA_7C	LTE/TM1	15+15	LCH	TN	VL	-27.25000	-0.01087	PASS
					VN	-40.41000	-0.01612	PASS
					VH	-36.49000	-0.01455	PASS
			MCH	TN	VL	-6.95000	-0.00275	PASS
					VN	-21.03000	-0.00832	PASS
					VH	-8.74000	-0.00346	PASS
			HCH	TN	VL	-6.07000	-0.00238	PASS
					VN	-13.38000	-0.00525	PASS
					VH	-9.53000	-0.00374	PASS
		20+20	LCH	TN	VL	-29.31000	-0.01168	PASS
					VN	-42.17000	-0.01680	PASS
					VH	-40.93000	-0.01631	PASS
			MCH	TN	VL	-13.72000	-0.00543	PASS
					VN	-21.53000	-0.00853	PASS
					VH	-12.56000	-0.00497	PASS
			HCH	TN	VL	-5.11000	-0.00201	PASS
					VN	-7.32000	-0.00288	PASS
					VH	-2.52000	-0.00099	PASS
	LTE/TM2	15+15	LCH	TN	VL	-10.19000	-0.00406	PASS
					VN	-30.86000	-0.01231	PASS
					VH	-14.79000	-0.00590	PASS
			MCH	TN	VL	-6.64000	-0.00263	PASS
					VN	-10.01000	-0.00396	PASS
					VH	-4.92000	-0.00195	PASS
			HCH	TN	VL	-0.40000	-0.00016	PASS
					VN	-6.69000	-0.00263	PASS
					VH	-1.97000	-0.00077	PASS
		20+20	LCH	TN	VL	-12.25000	-0.00488	PASS
					VN	-31.61000	-0.01259	PASS
					VH	-18.84000	-0.00751	PASS
			MCH	TN	VL	-4.48000	-0.00177	PASS

Test Band	Test Mode	Test Bandwidth (MHz)	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
					VN	-12.57000	-0.00498	PASS
					VH	-4.55000	-0.00180	PASS
			HCH	TN	VL	-3.42000	-0.00135	PASS
					VN	-5.06000	-0.00199	PASS
					VH	-2.39000	-0.00094	PASS

8.1.2Frequency Error vs. Temperature:

Test Band	Test Mode	Test Bandwidth (MHz)	Test Channel	Test Volt.	Test Temp	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
CA_7C	LTE/TM1	15+15	LCH	VN	-30	-39.28000	-0.01567	PASS
					-20	-36.76000	-0.01466	PASS
					-10	-39.40000	-0.01571	PASS
					0	-38.19000	-0.01523	PASS
					10	-41.46000	-0.01653	PASS
					20	-40.41000	-0.01612	PASS
					30	-35.05000	-0.01398	PASS
					40	-37.47000	-0.01494	PASS
					50	-39.67000	-0.01582	PASS
			MCH	VN	-30	-18.80000	-0.00744	PASS
					-20	-18.73000	-0.00741	PASS
					-10	-20.20000	-0.00799	PASS
					0	-17.41000	-0.00689	PASS
					10	-19.03000	-0.00753	PASS
					20	-21.03000	-0.00832	PASS
					30	-15.25000	-0.00603	PASS
					40	-19.03000	-0.00753	PASS
					50	-17.29000	-0.00684	PASS
			HCH	VN	-30	-13.07000	-0.00513	PASS
					-20	-7.91000	-0.00311	PASS
					-10	-6.22000	-0.00244	PASS
					0	-14.71000	-0.00577	PASS
					10	-14.08000	-0.00553	PASS
					20	-13.38000	-0.00525	PASS
					30	-12.66000	-0.00497	PASS
					40	-13.40000	-0.00526	PASS
					50	-9.28000	-0.00364	PASS

Test Band	Test Mode	Test Bandwidth (MHz)	Test Channel	Test Volt.	Test Temp	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
			LCH	VN	-30	-42.73000	-0.01702	PASS
					-20	-42.82000	-0.01706	PASS
					-10	-44.43000	-0.01770	PASS
					0	-40.64000	-0.01619	PASS
					10	-43.59000	-0.01737	PASS
					20	-42.17000	-0.01680	PASS
					30	-42.53000	-0.01694	PASS
					40	-46.79000	-0.01864	PASS
					50	-44.20000	-0.01761	PASS
			MCH	VN	-30	-17.58000	-0.00696	PASS
					-20	-25.51000	-0.01010	PASS
					-10	-20.81000	-0.00824	PASS
					0	-18.10000	-0.00717	PASS
		20+20			10	-22.92000	-0.00908	PASS
					20	-21.53000	-0.00853	PASS
					30	-19.38000	-0.00767	PASS
					40	-21.69000	-0.00859	PASS
					50	-17.41000	-0.00689	PASS
			HCH	VN	-30	-13.35000	-0.00526	PASS
					-20	-13.66000	-0.00538	PASS
					-10	-23.56000	-0.00927	PASS
					0	-11.67000	-0.00459	PASS
					10	-14.68000	-0.00578	PASS
					20	-7.32000	-0.00288	PASS
					30	-15.18000	-0.00598	PASS
					40	-3.55000	-0.00140	PASS
					50	-16.62000	-0.00654	PASS
	LTE/TM2	15+15	LCH	VN	-30	-27.27000	-0.01088	PASS
					-20	-29.37000	-0.01171	PASS
					-10	-27.82000	-0.01109	PASS
					0	-24.85000	-0.00991	PASS
					10	-30.97000	-0.01235	PASS
					20	-30.86000	-0.01231	PASS
					30	-27.61000	-0.01101	PASS
					40	-30.84000	-0.01230	PASS
					50	-27.68000	-0.01104	PASS
			MCH	VN	-30	-11.66000	-0.00461	PASS
					-20	-15.84000	-0.00627	PASS
					-10	-11.00000	-0.00435	PASS

Test Band	Test Mode	Test Bandwidth (MHz)	Test Channel	Test Volt.	Test Temp	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
					0	-12.35000	-0.00489	PASS
					10	-12.79000	-0.00506	PASS
					20	-10.01000	-0.00396	PASS
					30	-11.47000	-0.00454	PASS
					40	-11.54000	-0.00457	PASS
					50	-11.70000	-0.00463	PASS
			HCH	VN	-30	-6.19000	-0.00243	PASS
					-20	-5.82000	-0.00228	PASS
					-10	-7.42000	-0.00291	PASS
					0	-8.94000	-0.00351	PASS
					10	-5.69000	-0.00223	PASS
					20	-6.69000	-0.00263	PASS
					30	-8.17000	-0.00321	PASS
					40	-10.56000	-0.00415	PASS
					50	-2.50000	-0.00098	PASS
		20+20	LCH	VN	-30	-29.11000	-0.01160	PASS
					-20	-30.11000	-0.01200	PASS
					-10	-30.97000	-0.01234	PASS
					0	-30.87000	-0.01230	PASS
					10	-31.57000	-0.01258	PASS
					20	-31.61000	-0.01259	PASS
					30	-30.20000	-0.01203	PASS
					40	-34.02000	-0.01355	PASS
					50	-31.03000	-0.01236	PASS
			MCH	VN	-30	-11.89000	-0.00471	PASS
					-20	-20.14000	-0.00798	PASS
					-10	-10.51000	-0.00416	PASS
					0	-11.92000	-0.00472	PASS
					10	-12.49000	-0.00495	PASS
					20	-12.57000	-0.00498	PASS
					30	-11.93000	-0.00472	PASS
					40	-14.42000	-0.00571	PASS
					50	-12.56000	-0.00497	PASS
			HCH	VN	-30	-7.37000	-0.00290	PASS
					-20	-8.07000	-0.00318	PASS
					-10	-17.71000	-0.00697	PASS
					0	-5.98000	-0.00235	PASS
					10	-5.42000	-0.00213	PASS
					20	-5.06000	-0.00199	PASS

Test Band	Test Mode	Test Bandwidth (MHz)	Test Channel	Test Volt.	Test Temp	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
					30	-3.43000	-0.00135	PASS
					40	-5.82000	-0.00229	PASS
					50	-12.57000	-0.00495	PASS

END