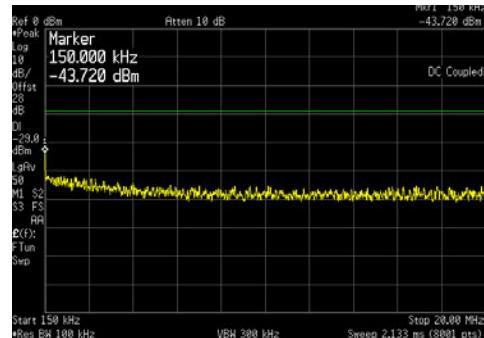
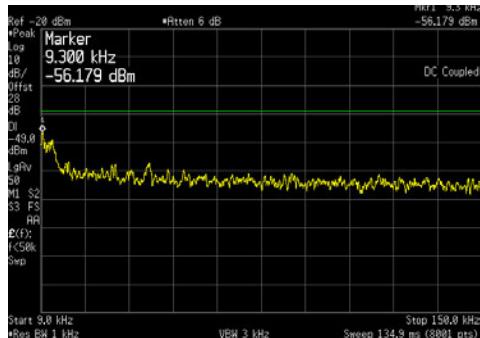
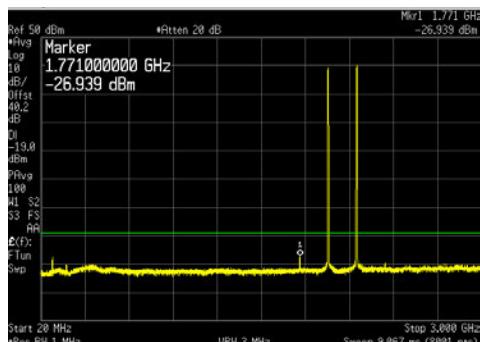


LTE5 Channel Bandwidth \_ QPSK\_Middle Channels (1962.5 &2155MHz) Simultaneously:  
9kHz to 150kHz

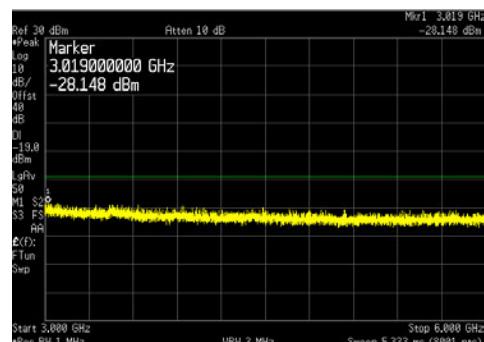
150kHz to 20MHz



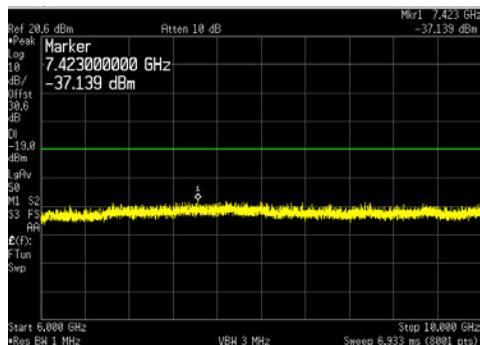
## 20MHz to 3GHz



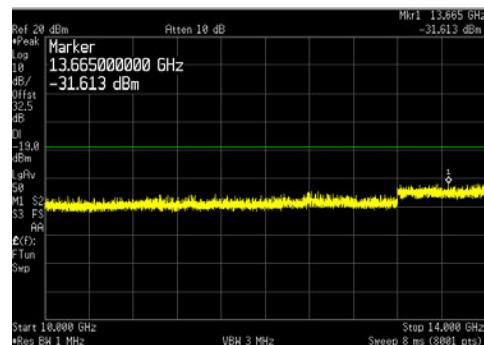
## 3GHz to 6GHz



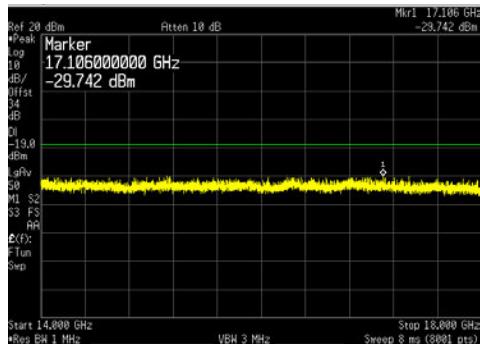
## 6GHz to 10GHz



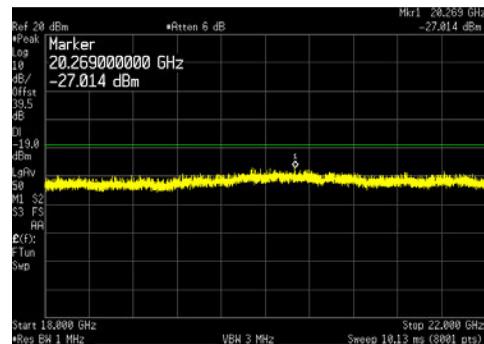
## 10GHz to 14GHz



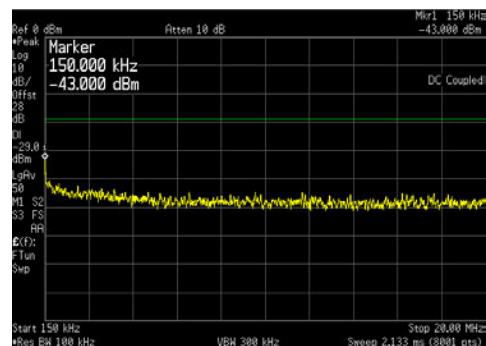
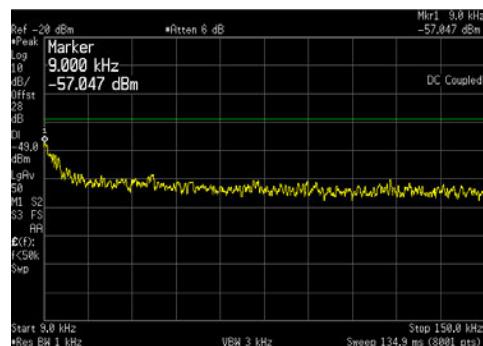
## 14GHz to 18GHz



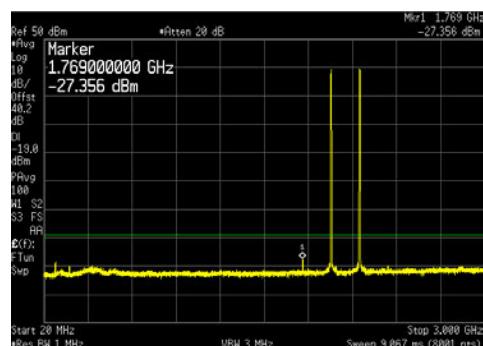
## 18GHz to 22GHz



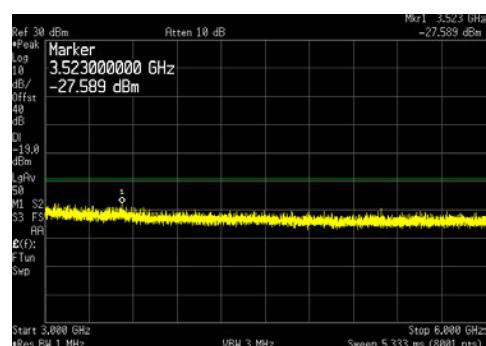
LTE5 Channel Bandwidth \_ 16QAM\_Middle Channels (1962.5 &2155MHz) Simultaneously:  
9kHz to 150kHz



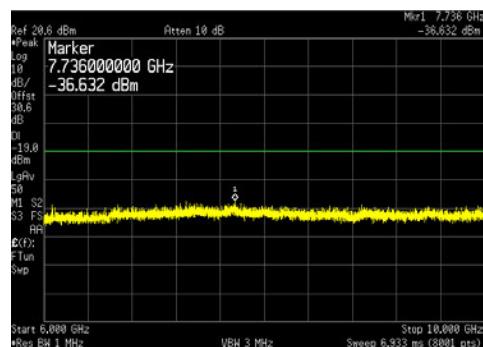
## 20MHz to 3GHz



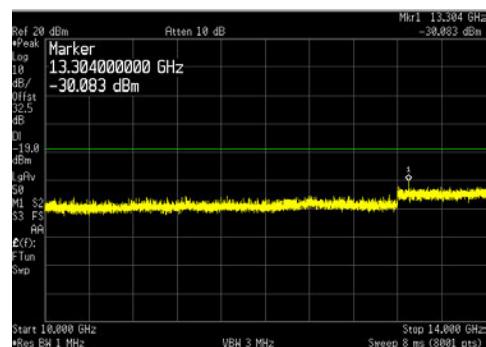
## 3GHz to 6GHz



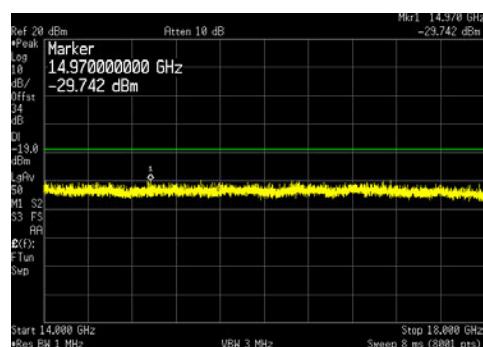
## 6GHz to 10GHz



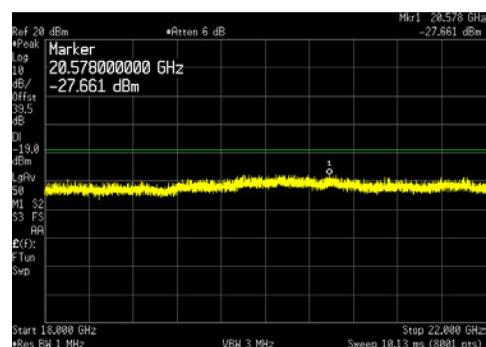
## 10GHz to 14GHz



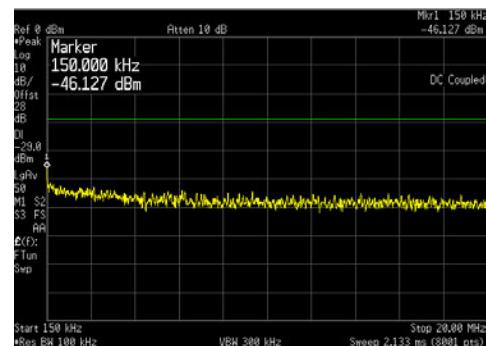
## 14GHz to 18GHz



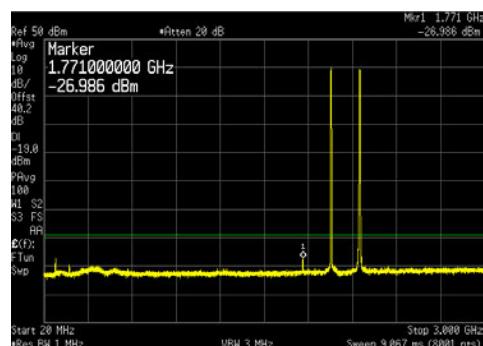
## 18GHz to 22GHz



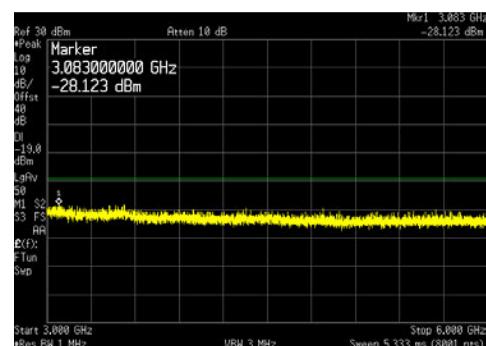
LTE5 Channel Bandwidth \_ 64QAM \_ Middle Channels (1962.5 & 2155MHz) Simultaneously:  
9kHz to 150kHz



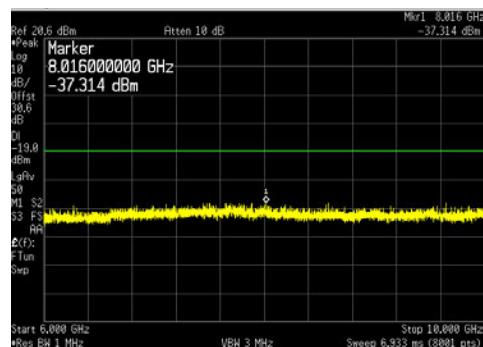
## 20MHz to 3GHz



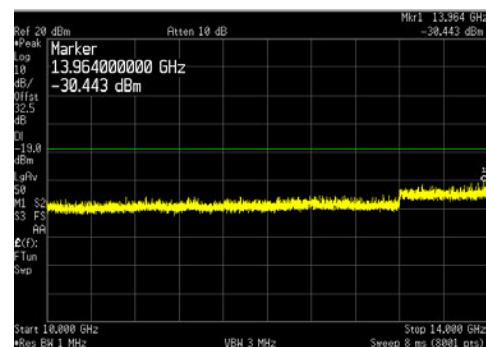
## 3GHz to 6GHz



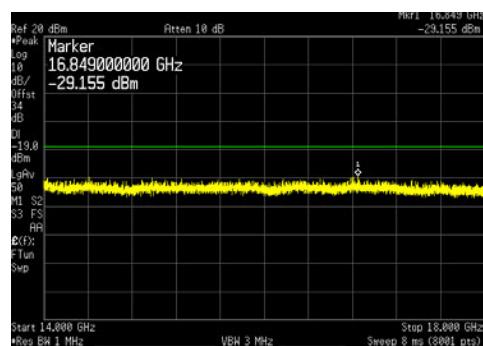
## 6GHz to 10GHz



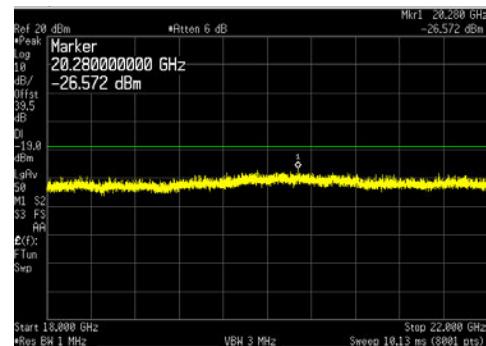
## 10GHz to 14GHz



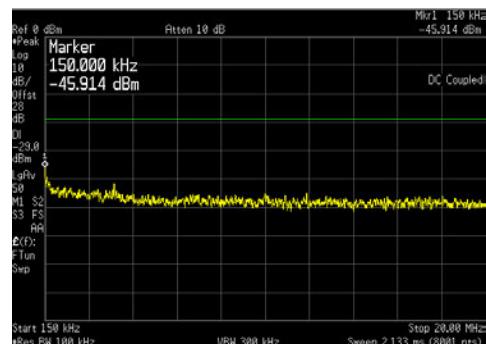
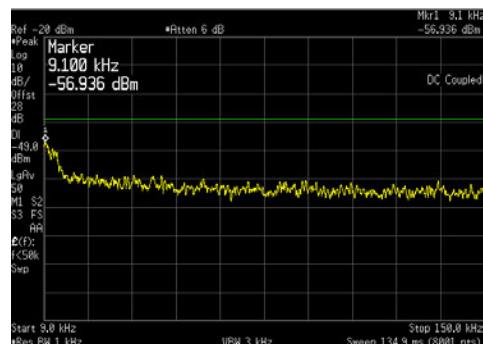
## 14GHz to 18GHz



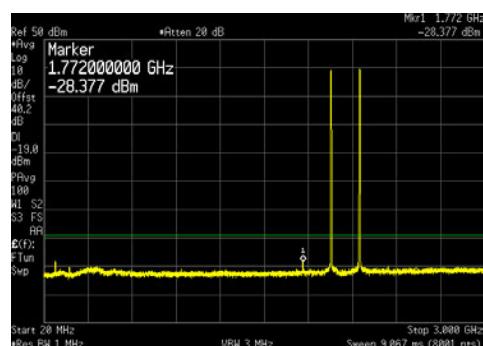
## 18GHz to 22GHz



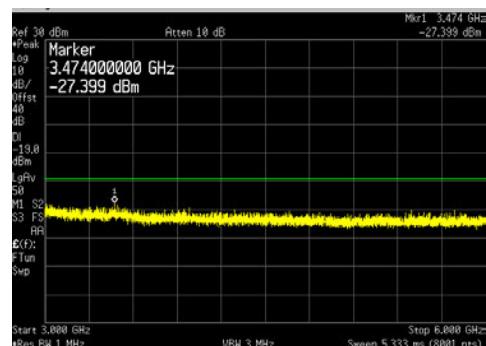
LTE5 Channel Bandwidth \_ 256QAM \_ Middle Channels (1962.5 & 2155MHz) Simultaneously:  
9kHz to 150kHz



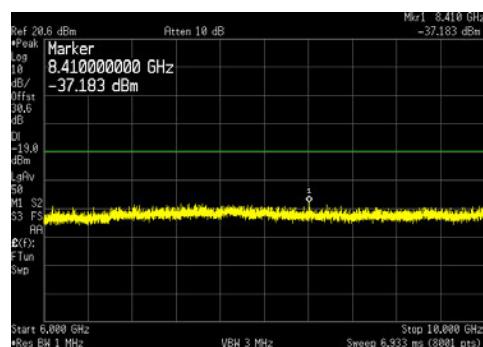
## 20MHz to 3GHz



## 3GHz to 6GHz



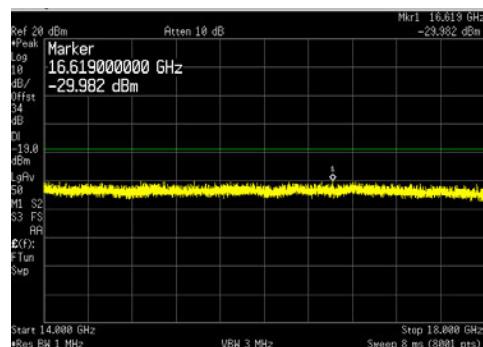
## 6GHz to 10GHz



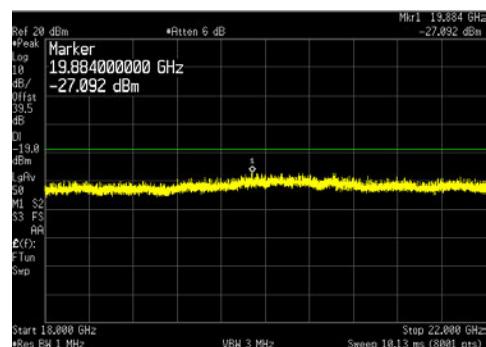
## 10GHz to 14GHz

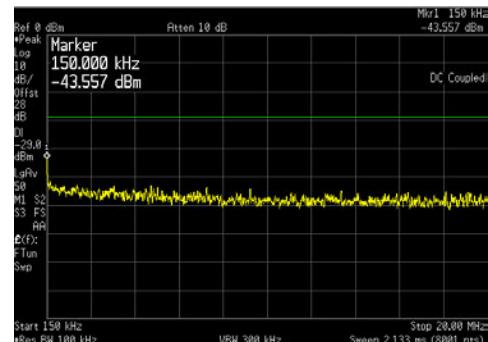
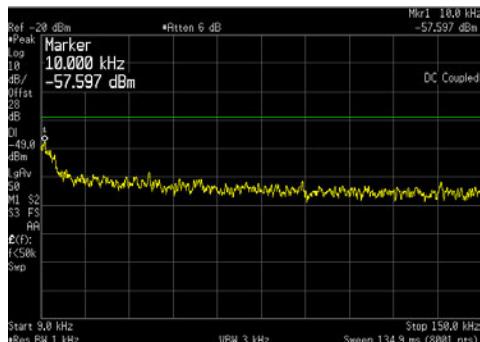


## 14GHz to 18GHz

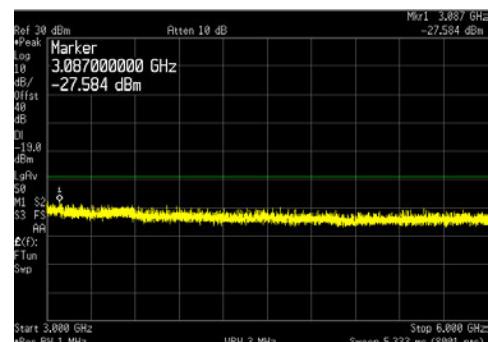
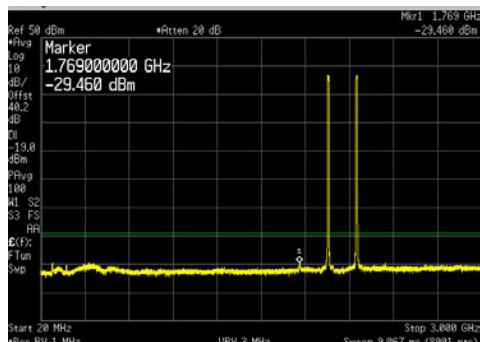


## 18GHz to 22GHz

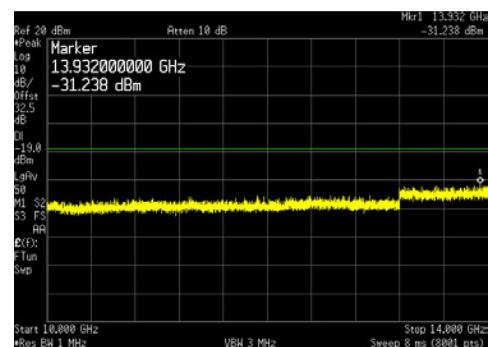
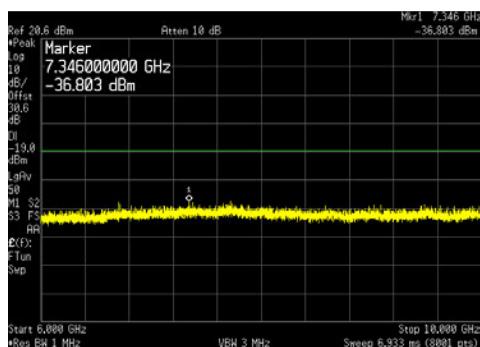




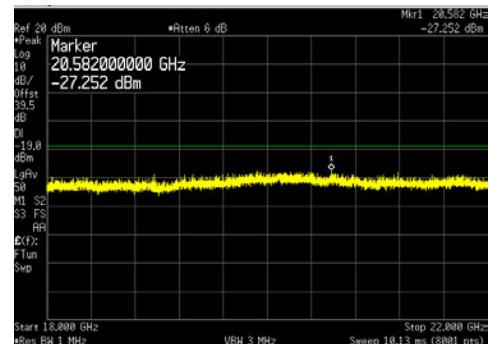
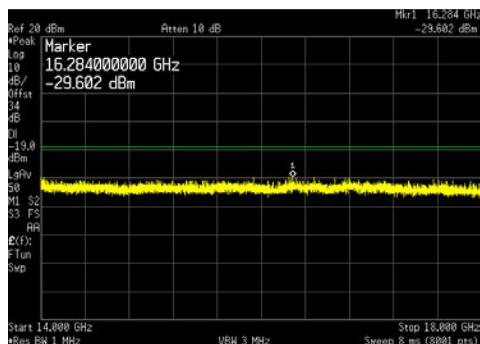
20MHz to 3GHz



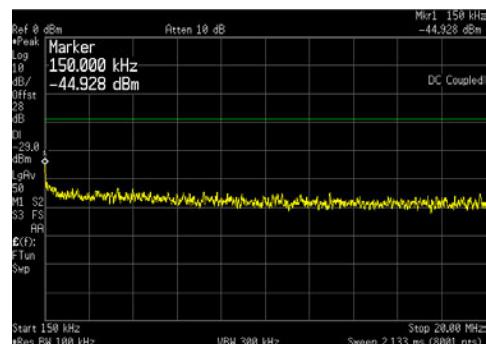
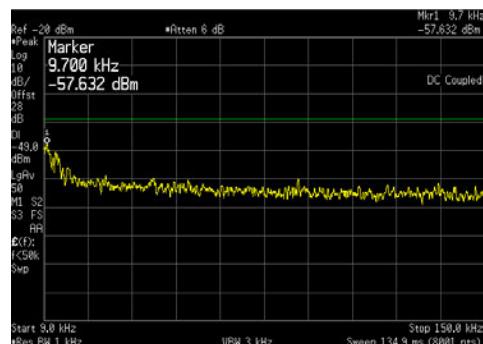
6GHz to 10GHz



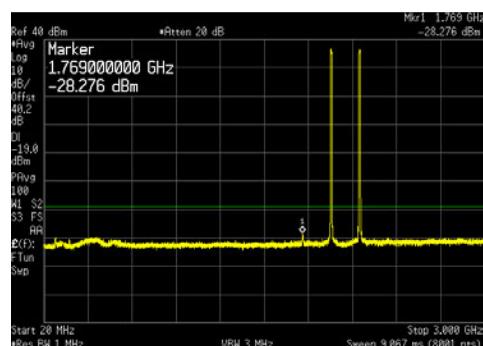
14GHz to 18GHz



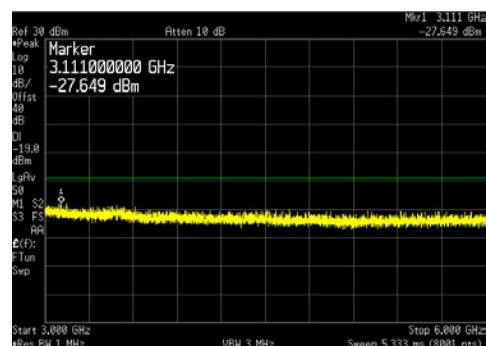
LTE10 Channel Bandwidth \_ 16QAM \_ Middle Channels (1962.5 & 2155MHz) Simultaneously:  
9kHz to 150kHz



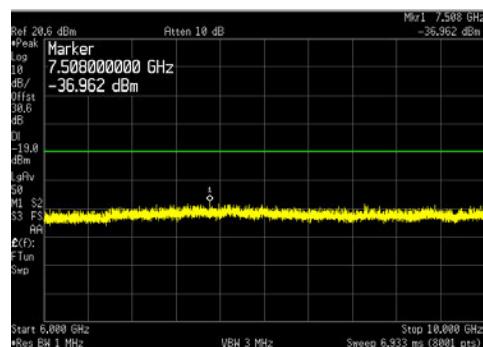
## 20MHz to 3GHz



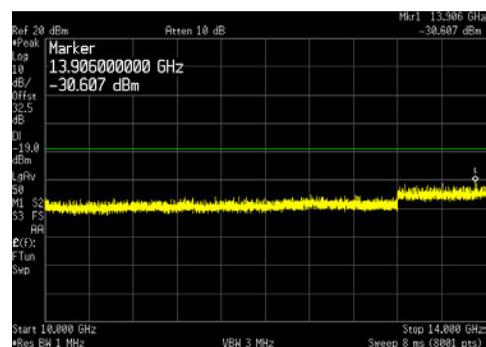
## 3GHz to 6GHz



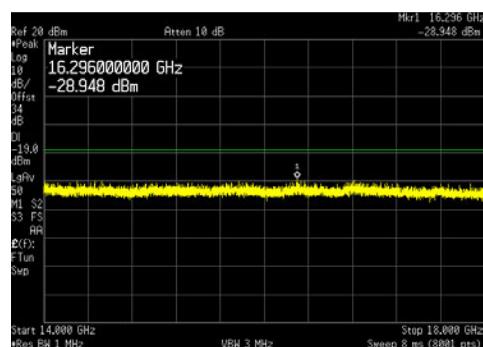
## 6GHz to 10GHz



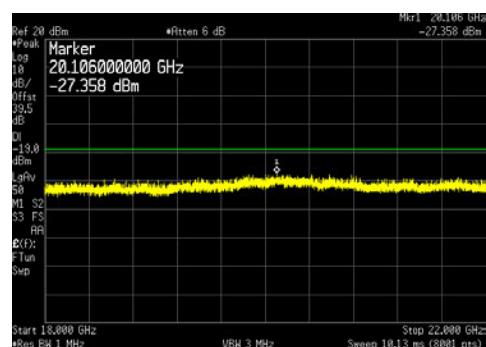
## 10GHz to 14GHz



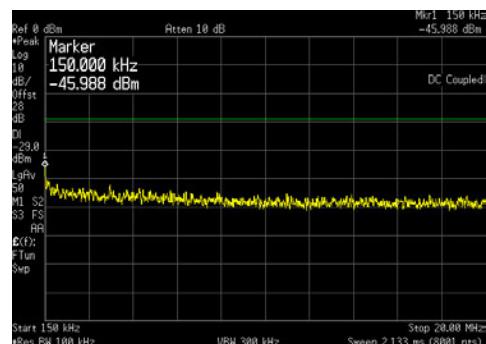
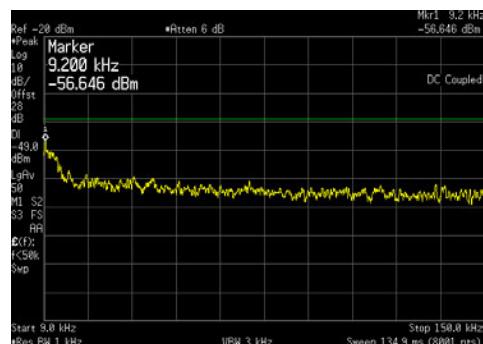
## 14GHz to 18GHz



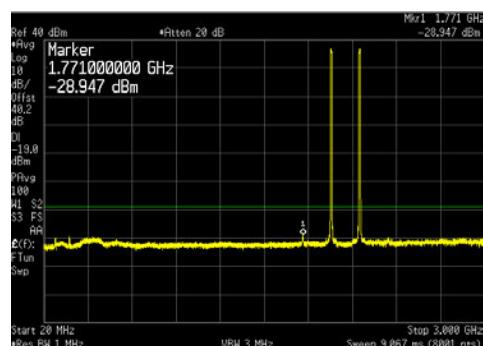
## 18GHz to 22GHz



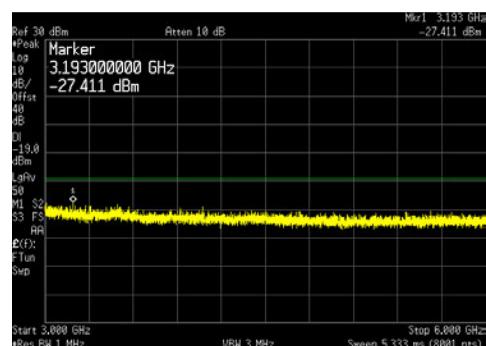
LTE10 Channel Bandwidth \_ 64QAM \_ Middle Channels (1962.5 & 2155MHz) Simultaneously:  
9kHz to 150kHz



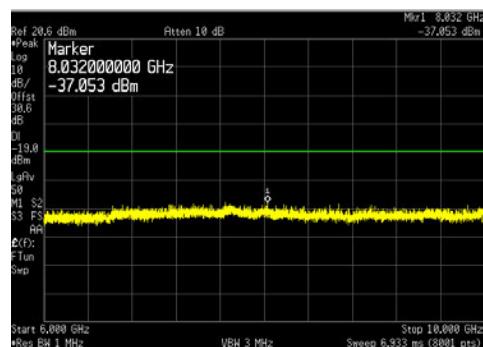
## 20MHz to 3GHz



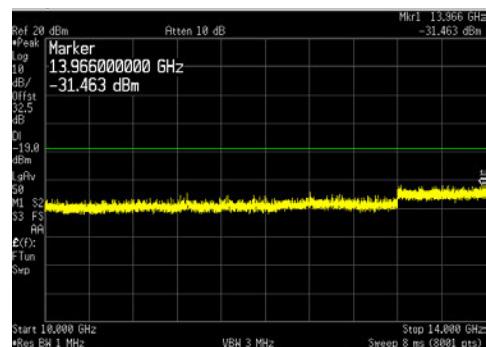
## 3GHz to 6GHz



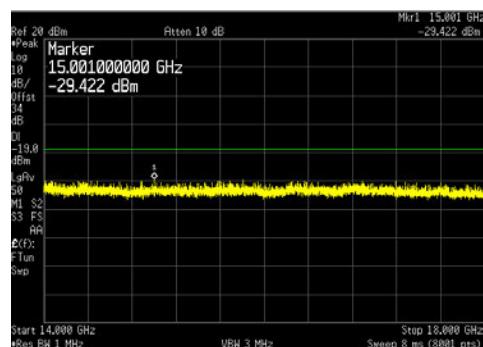
## 6GHz to 10GHz



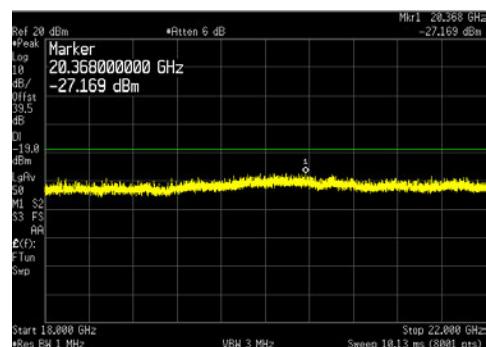
## 10GHz to 14GHz



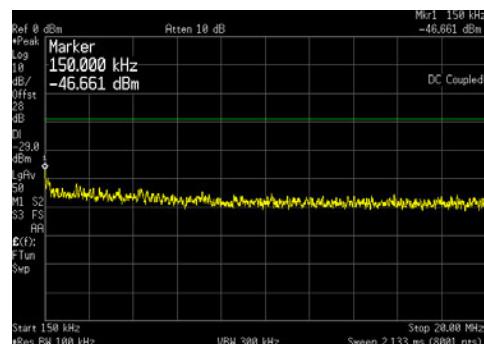
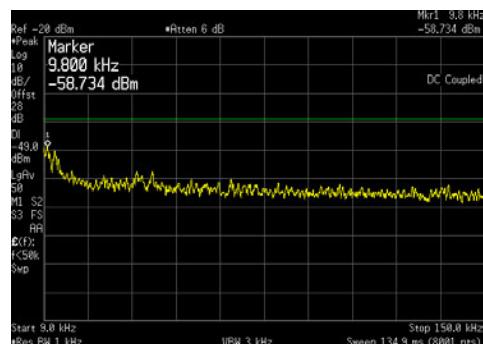
## 14GHz to 18GHz



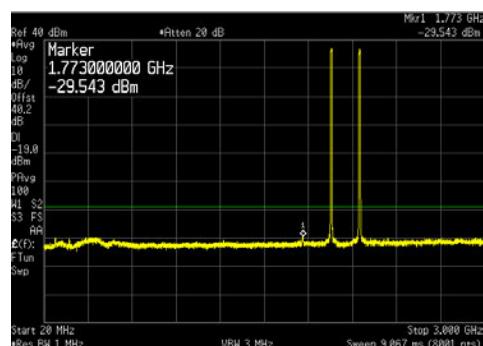
## 18GHz to 22GHz



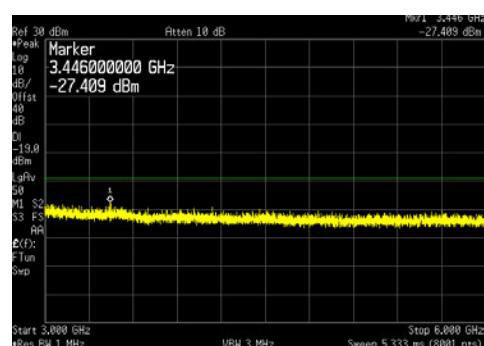
LTE10 Channel Bandwidth \_ 256QAM \_ Middle Channels (1962.5 & 2155MHz) Simultaneously:  
9kHz to 150kHz



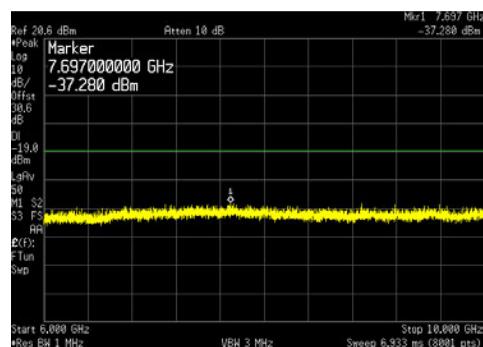
## 20MHz to 3GHz



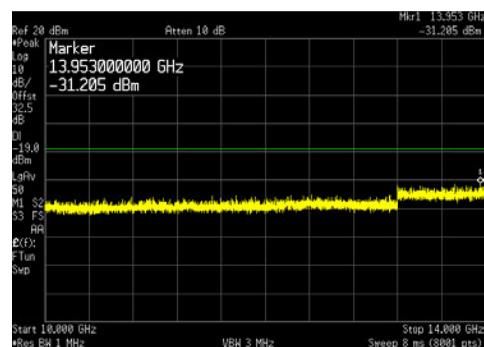
## 3GHz to 6GHz



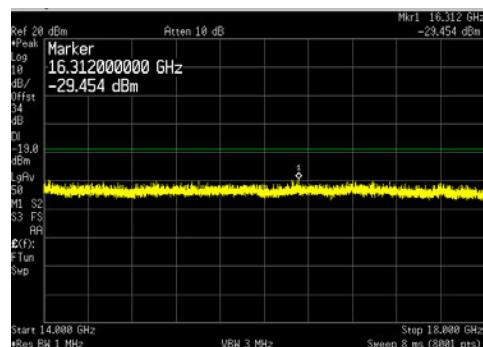
## 6GHz to 10GHz



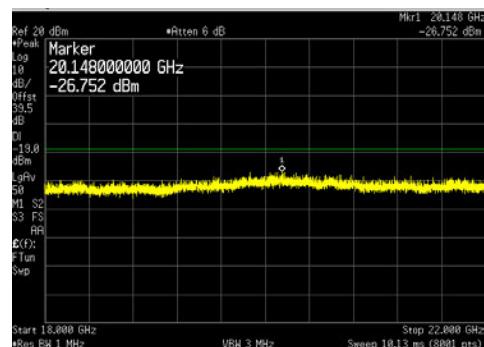
## 10GHz to 14GHz



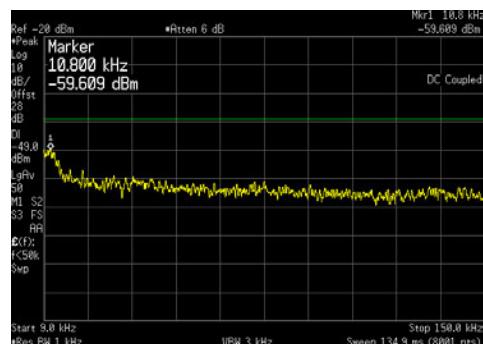
## 14GHz to 18GHz



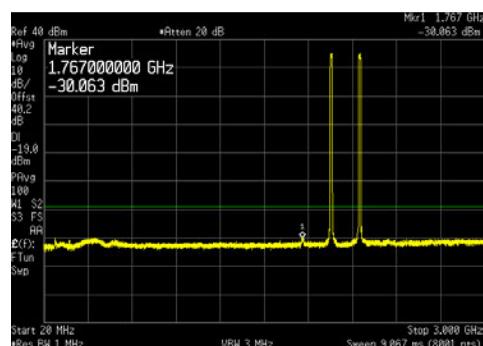
## 18GHz to 22GHz



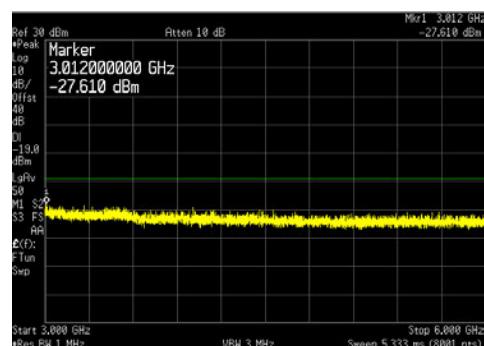
LTE15 Channel Bandwidth \_ QPSK \_ Middle Channels (1962.5 & 2155MHz) Simultaneously:  
9kHz to 150kHz



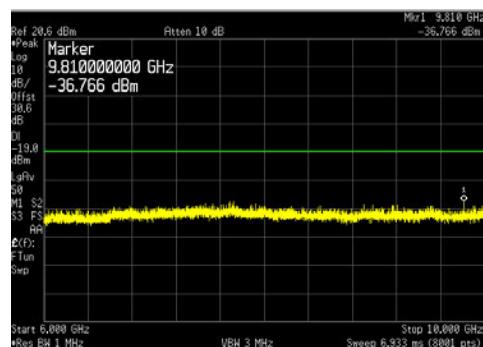
## 20MHz to 3GHz



## 3GHz to 6GHz



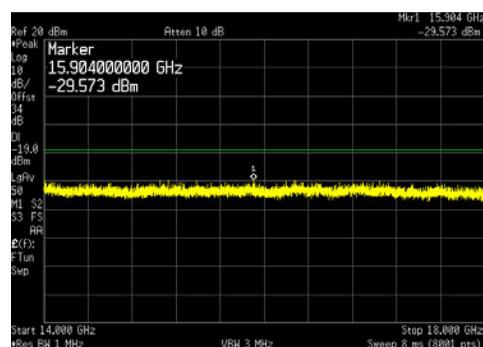
## 6GHz to 10GHz



## 10GHz to 14GHz



## 14GHz to 18GHz

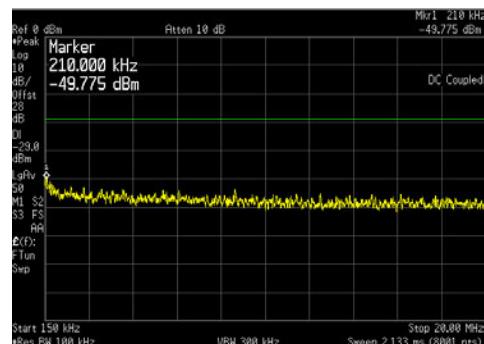
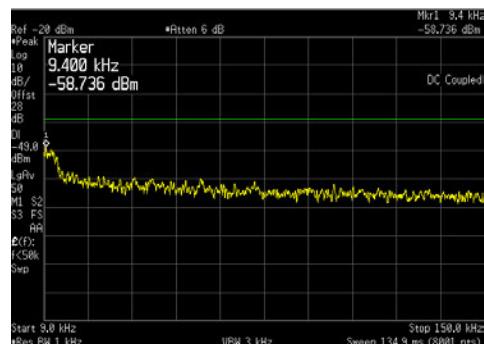


## 18GHz to 22GHz

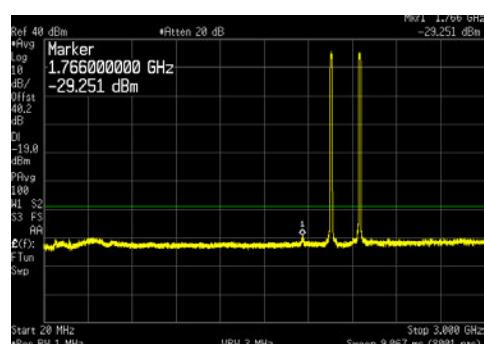


LTE15 Channel Bandwidth \_ 16QAM \_ Middle Channels (1962.5 & 2155MHz) Simultaneously:  
9kHz to 150kHz

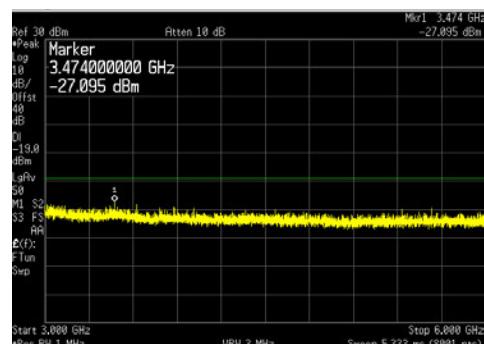
150kHz to 20MHz



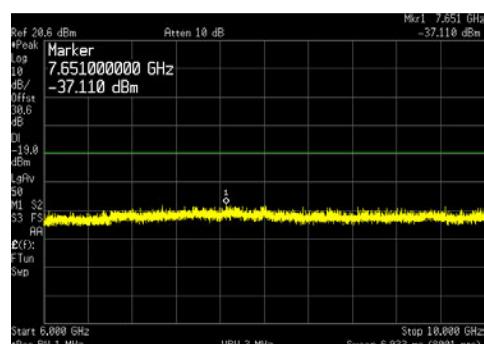
20MHz to 3GHz



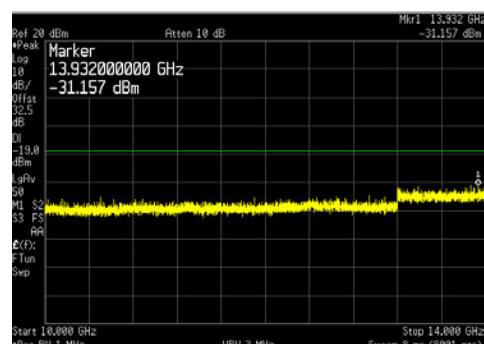
3GHz to 6GHz



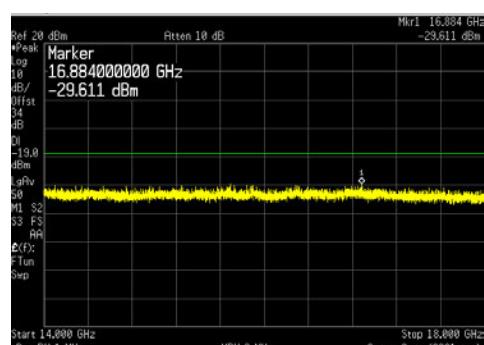
6GHz to 10GHz



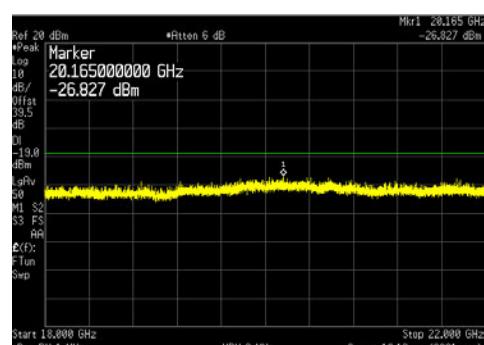
10GHz to 14GHz



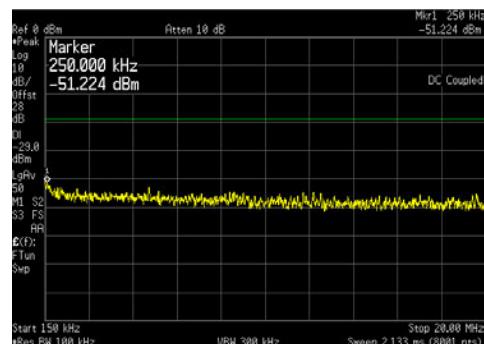
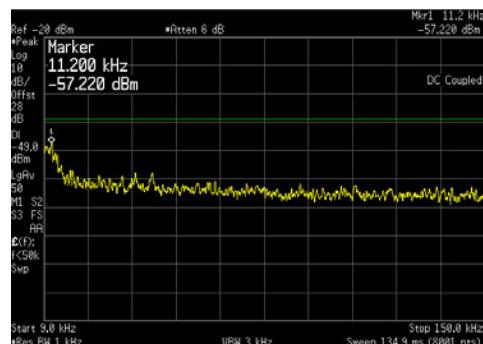
14GHz to 18GHz



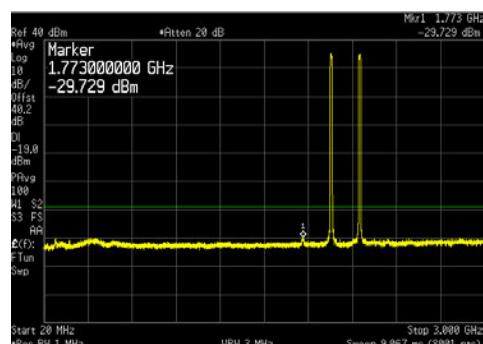
18GHz to 22GHz



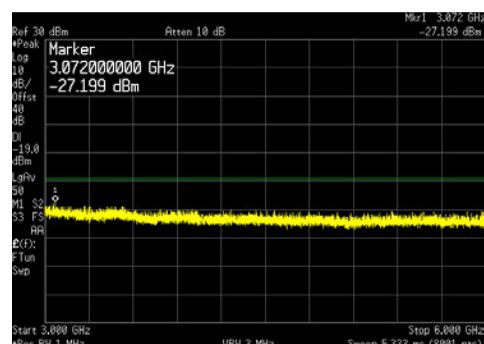
LTE15 Channel Bandwidth \_ 64QAM \_ Middle Channels (1962.5 & 2155MHz) Simultaneously:  
9kHz to 150kHz



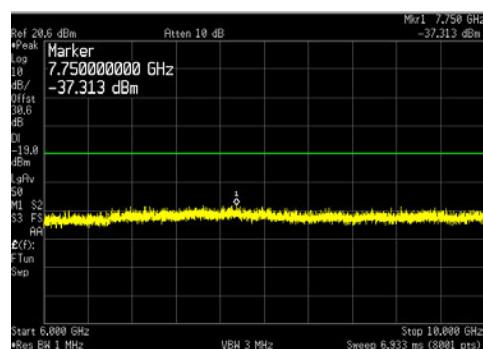
## 20MHz to 3GHz



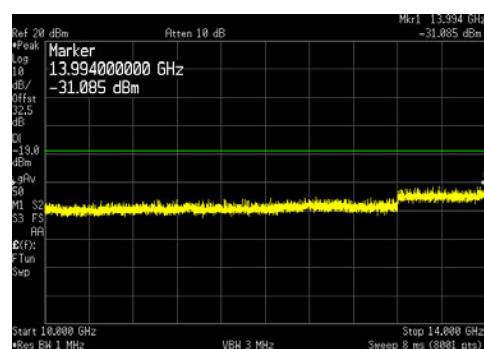
## 3GHz to 6GHz



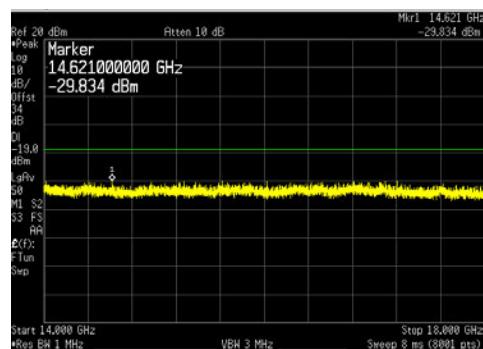
## 6GHz to 10GHz



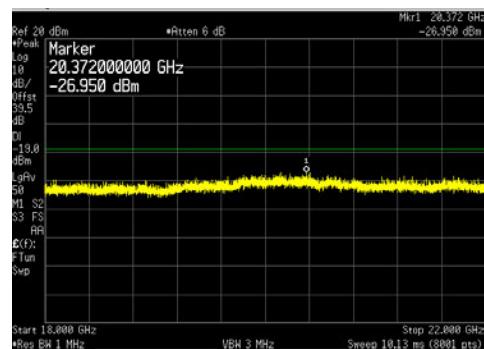
## 10GHz to 14GHz



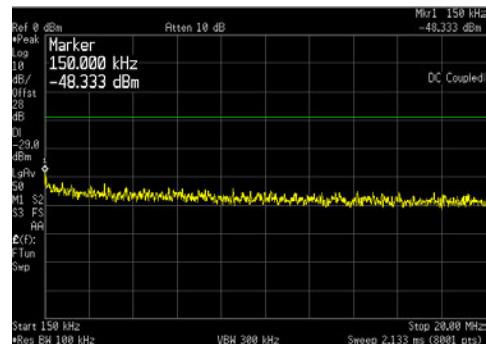
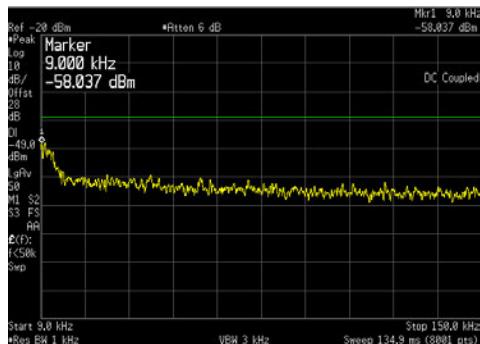
## 14GHz to 18GHz



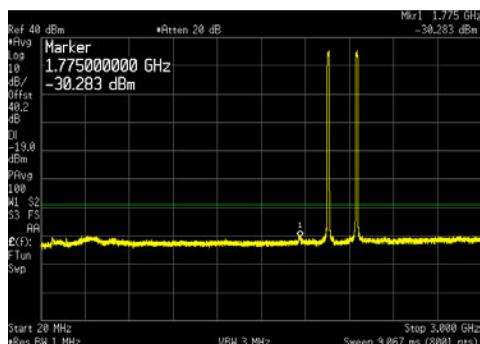
## 18GHz to 22GHz



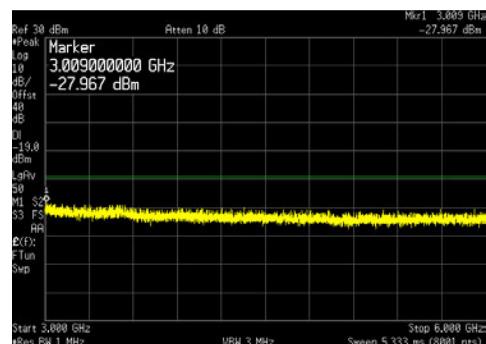
LTE15 Channel Bandwidth \_ 256QAM \_ Middle Channels (1962.5 & 2155MHz) Simultaneously:  
9kHz to 150kHz



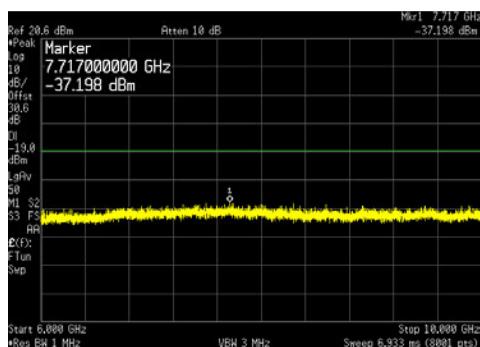
## 20MHz to 3GHz



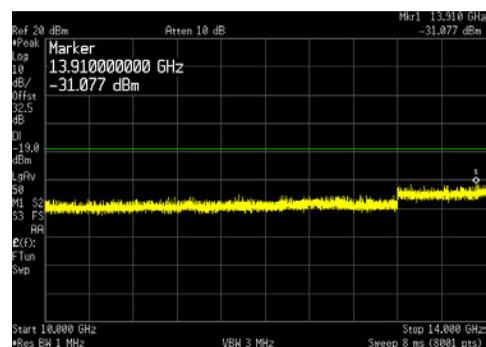
## 3GHz to 6GHz



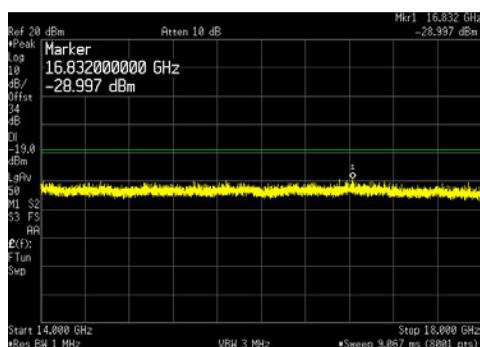
## 6GHz to 10GHz



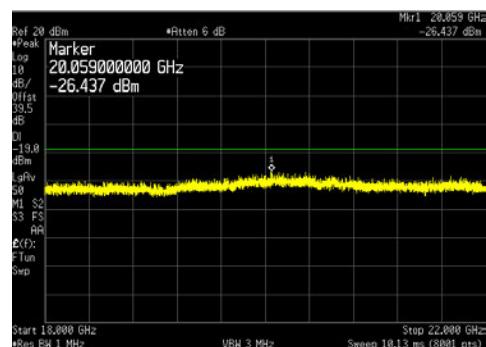
## 10GHz to 14GHz



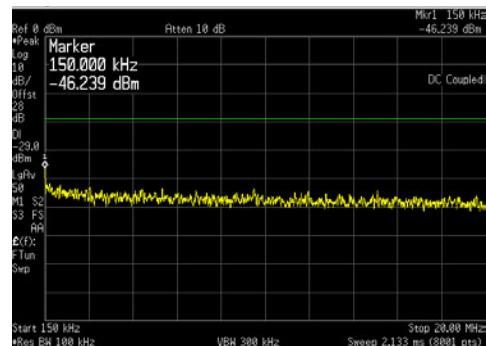
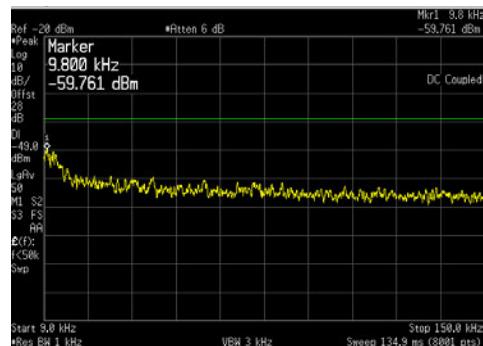
## 14GHz to 18GHz



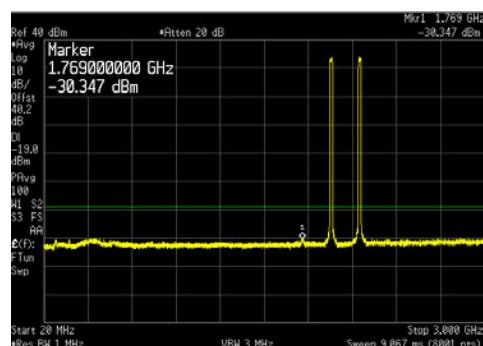
## 18GHz to 22GHz



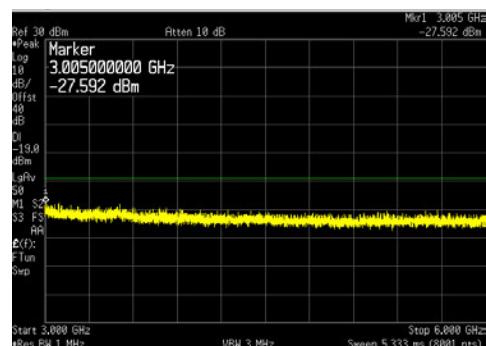
LTE20 Channel Bandwidth \_ QPSK \_ Middle Channels (1962.5 & 2155MHz) Simultaneously:  
9kHz to 150kHz



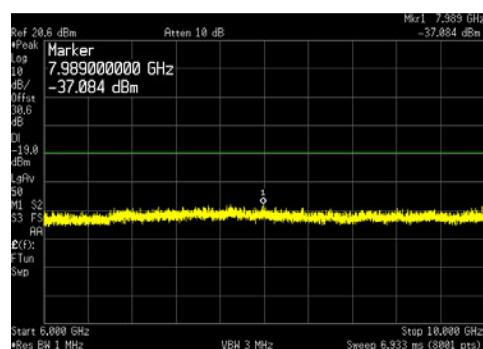
## 20MHz to 3GHz



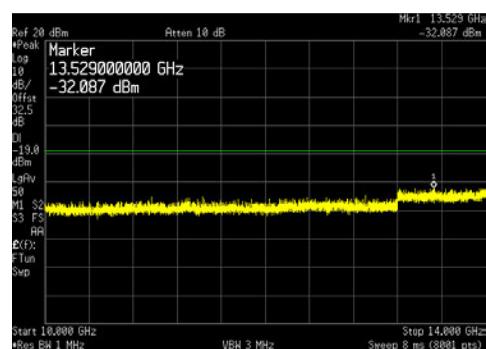
## 3GHz to 6GHz



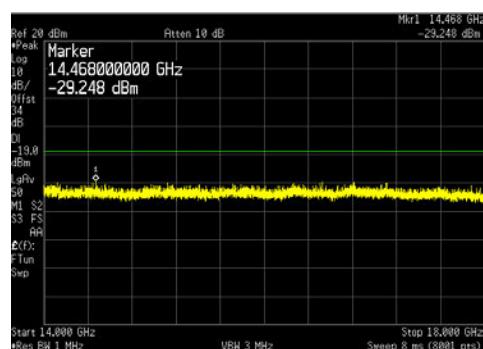
## 6GHz to 10GHz



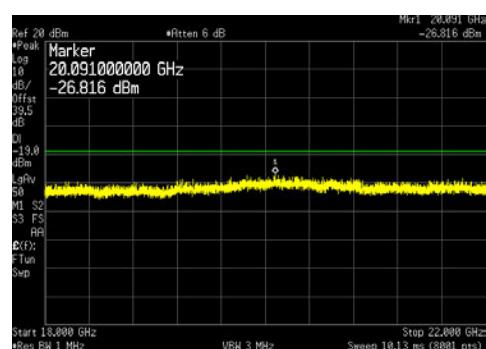
## 10GHz to 14GHz



## 14GHz to 18GHz

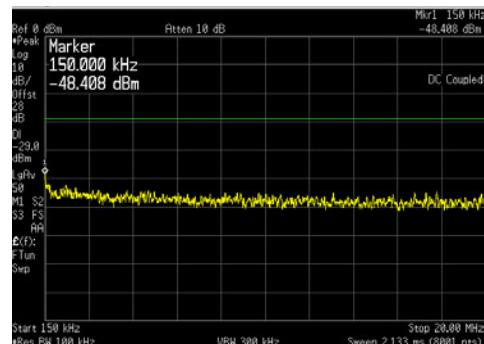
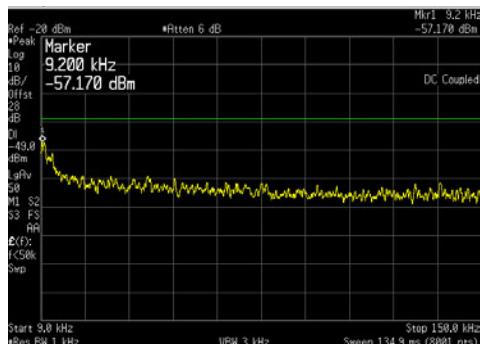


## 18GHz to 22GHz

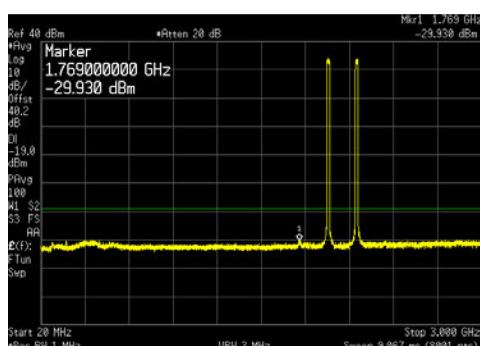


LTE20 Channel Bandwidth \_ 16QAM \_ Middle Channels (1962.5 & 2155MHz) Simultaneously:  
9kHz to 150kHz

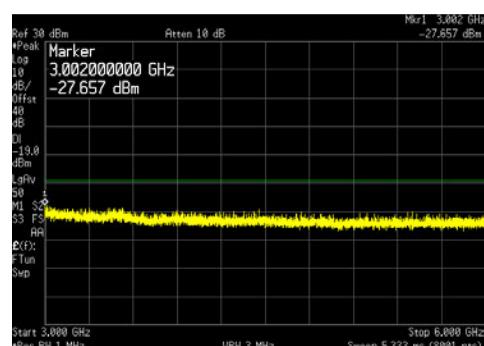
150kHz to 20MHz



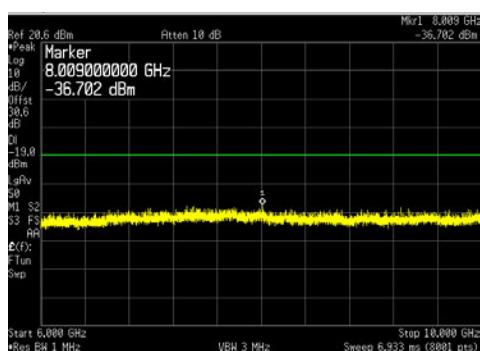
## 20MHz to 3GHz



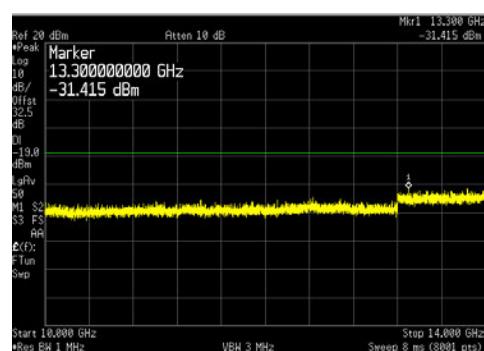
## 3GHz to 6GHz



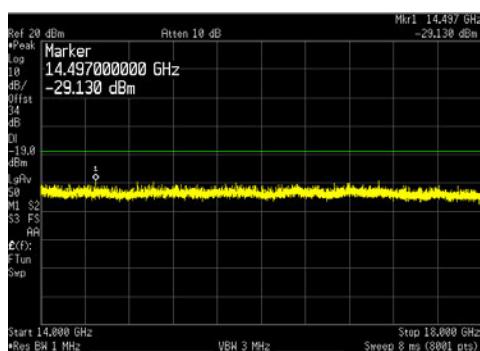
## 6GHz to 10GHz



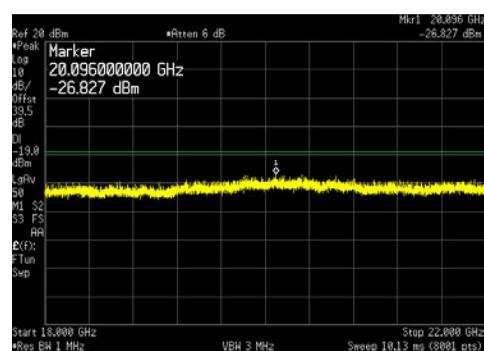
## 10GHz to 14GHz

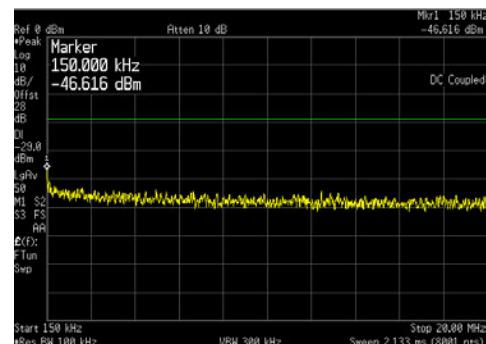
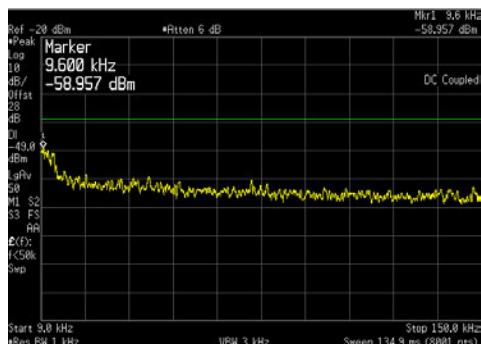


## 14GHz to 18GHz

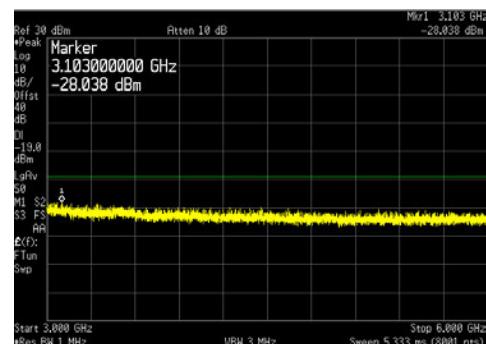
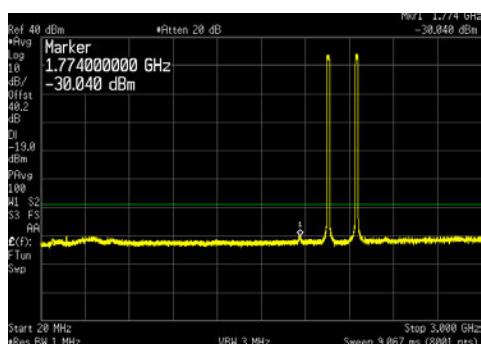


## 18GHz to 22GHz

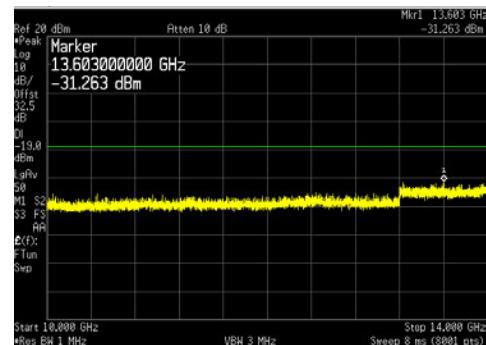
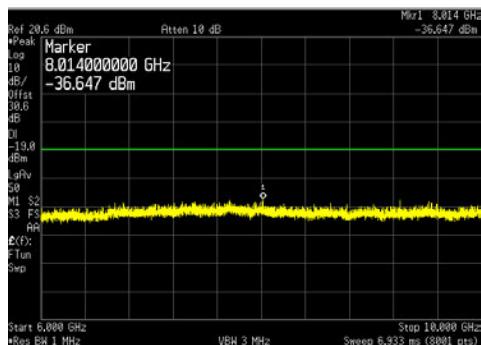




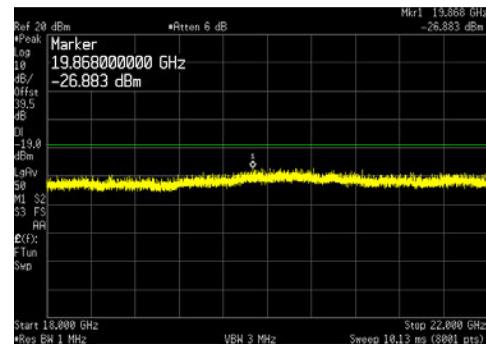
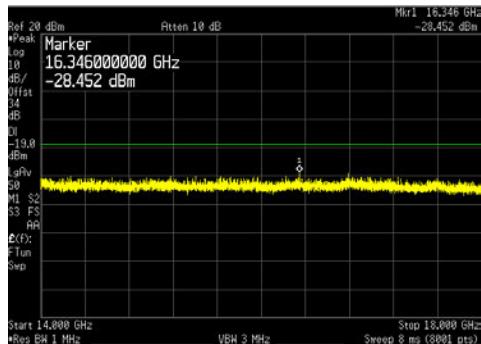
20MHz to 3GHz



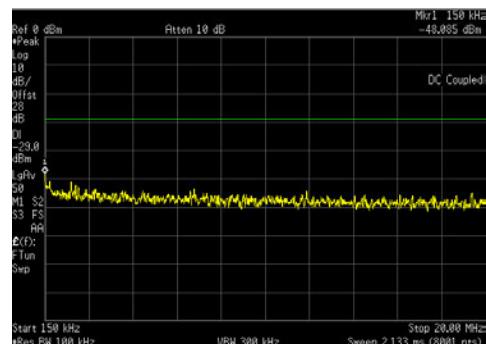
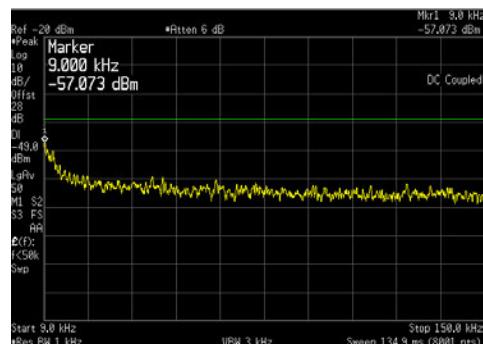
6GHz to 10GHz



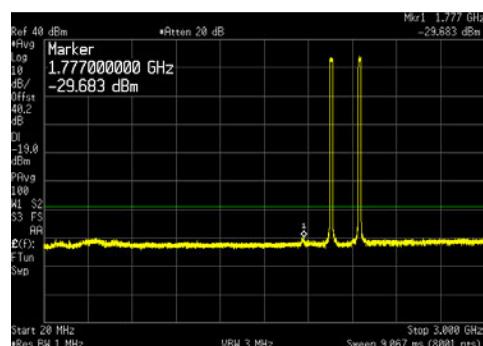
14GHz to 18GHz



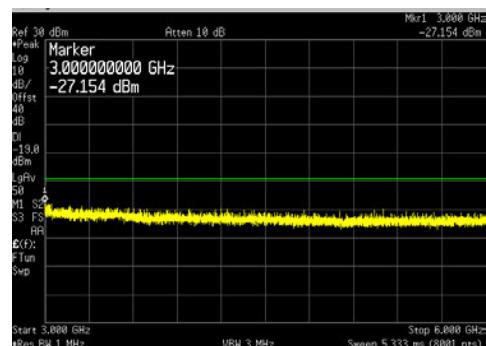
LTE20 Channel Bandwidth \_ 256QAM \_ Middle Channels (1962.5 & 2155MHz) Simultaneously:  
9kHz to 150kHz



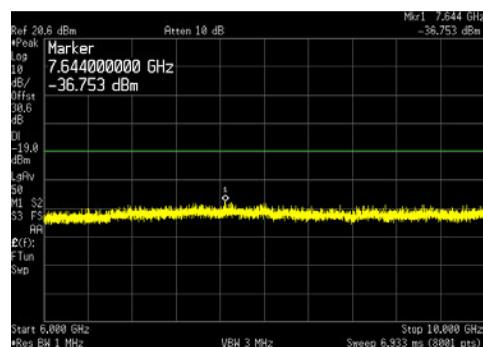
## 20MHz to 3GHz



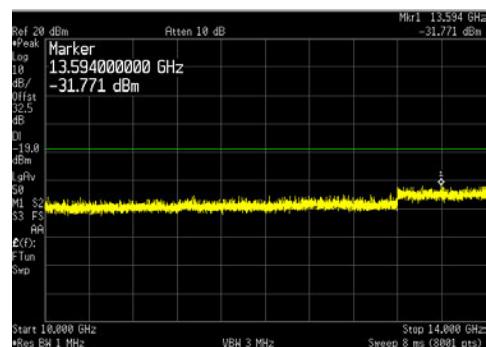
## 3GHz to 6GHz



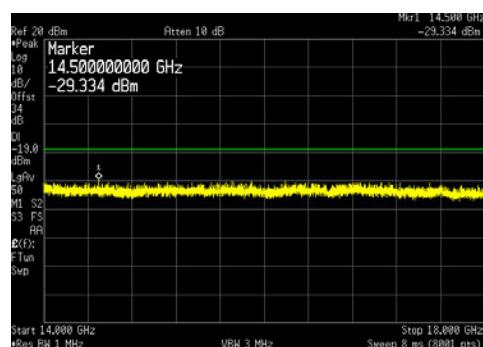
## 6GHz to 10GHz



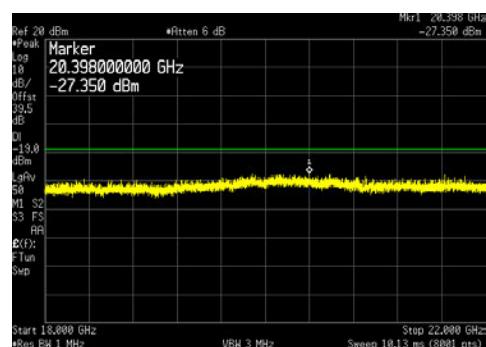
## 10GHz to 14GHz



## 14GHz to 18GHz



## 18GHz to 22GHz



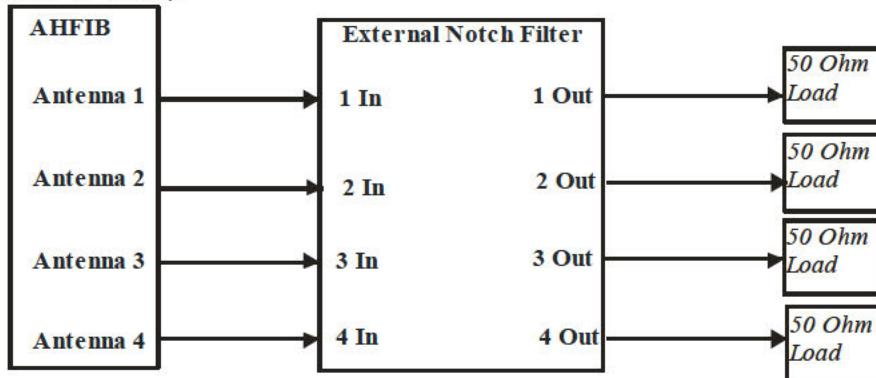
### Transmitter Radiated Spurious Emissions (AWS-4 Band Out of Band Emission Requirement)

During radiated emission testing all antenna ports of the base station were terminated with 50 ohm termination blocks via the external RF notch filter as shown in the diagram below.

The radiated emission limit for FCC part 27.1134(e)(i) and RSS 170 requirement was calculated for the AHFIB operating in four port MIMO for the AWS band as follows:

$$\begin{aligned} -100.6 \text{dBW}/4\text{kHz} (\text{EIRP Limit}) + 30\text{dB} (\text{dBW to dBm}) + 24\text{dB} (\text{BW conversion } 10 \log[1\text{MHz}/4\text{kHz}]) - 0\text{dBi} (\text{Antenna Gain}) \\ = -46.6 \text{dBm}/1\text{MHz} \text{ or at a max field strength of } 50.8 \text{dBuV/m at 3 meters.} \end{aligned}$$

A BTS antenna gain of 0dBi is used since the radiated emissions being measured are off the RRH hardware (all antenna ports are terminated into RF loads).



The 3GPP Band 25 and the 3GPP Band 66 transmitters were enabled simultaneously at maximum power using QPSK modulation on all four ports for this test. The test includes channel bandwidth with the highest spectral density (LTE5) for both frequency bands. The bottom, middle and top frequency channels for the PCS band were enabled. The top frequency channel for the AWS band was enabled on each antenna port. The carrier configuration for the radiated emission testing is provided below. Final maximized peak radiated emissions were measured in these modes.

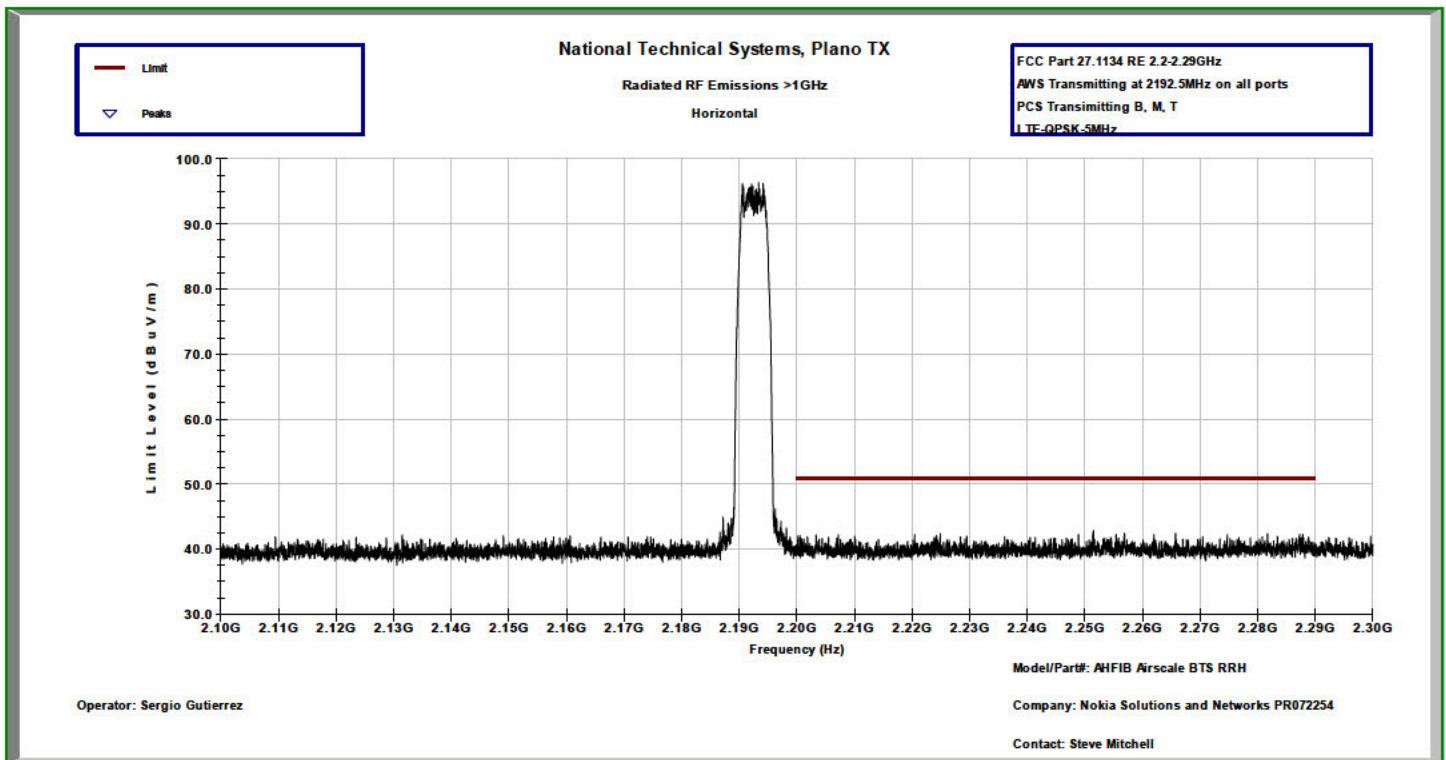
Transmit Frequencies used in Radiated Emission Testing for 2200 to 2290MHz:

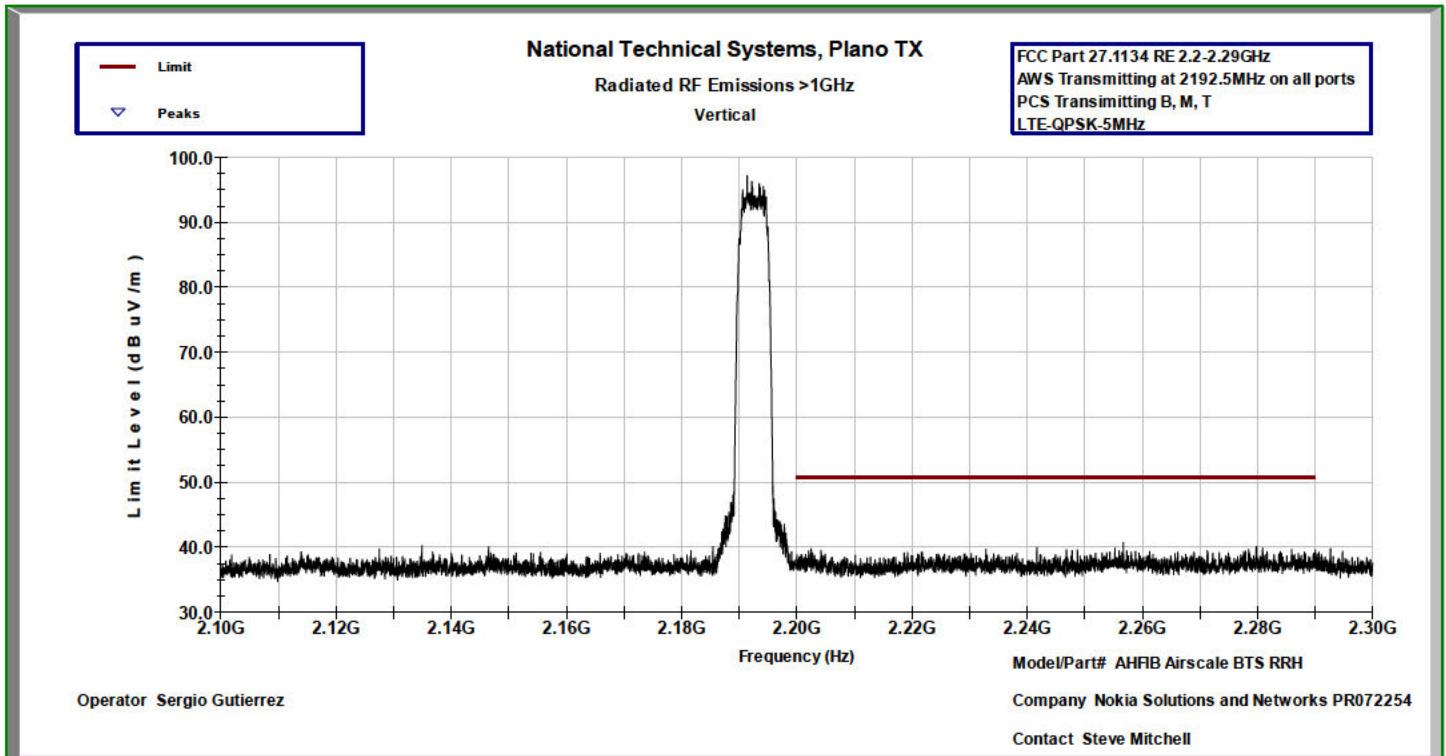
Frequency Band	Antenna Port	RF Bandwidth	EARFCN	Transmit Frequency
PCS	1	5 MHz	8065 (Bottom Channel)	1932.5 MHz
PCS	2	5 MHz	8365 (Middle Channel)	1962.5 MHz
PCS	3	5 MHz	8365 (Middle Channel)	1962.5 MHz
PCS	4	5 MHz	8665 (Top Channel)	1992.5 MHz
AWS	1	5 MHz	67261 (Top Channel with NF)	2192.5 MHz
AWS	2	5 MHz	67261 (Top Channel with NF)	2192.5 MHz
AWS	3	5 MHz	67261 (Top Channel with NF)	2192.5 MHz
AWS	4	5 MHz	67261 (Top Channel with NF)	2192.5 MHz

Frequency MHz	Polarity V/H	Peaks Raw dBuV/m	Antenna dB	Cables dB	PreAmp dB	Peaks dBuV/m	Limit dBuV/m	Margin dB
2251.49	H	46.669	27.578	2.933	-34.333	42.847	50.8	-7.953
2251.3	H	44.166	27.578	2.932	-34.333	42.802	50.8	-7.998
2250.4	H	42.681	27.578	2.931	-34.334	42.588	50.8	-8.212
2265.75	H	46.219	27.578	2.947	-34.311	42.433	50.8	-8.367
2252.2	H	44.991	27.578	2.933	-34.332	42.411	50.8	-8.389
2256.88	H	46.205	27.578	2.938	-34.324	42.397	50.8	-8.403
2256.7	H	44.548	27.578	2.938	-34.325	42.375	50.8	-8.425
2249.5	H	43.169	27.578	2.93	-34.335	42.374	50.8	-8.426
2224.9	H	46.228	27.58	2.905	-34.342	42.371	50.8	-8.429
2265.7	H	43.038	27.578	2.947	-34.311	42.367	50.8	-8.433
2281.72	H	46.087	27.577	2.964	-34.286	42.341	50.8	-8.459
2281.9	H	44.189	27.577	2.964	-34.286	42.301	50.8	-8.499
2287.3	H	46.003	27.577	2.97	-34.278	42.271	50.8	-8.529
2255.8	H	43.803	27.578	2.937	-34.326	42.266	50.8	-8.534
2248.91	H	46.062	27.579	2.93	-34.335	42.235	50.8	-8.565
2255.44	H	46.034	27.578	2.937	-34.327	42.222	50.8	-8.578
2220.45	H	46.077	27.58	2.9	-34.343	42.214	50.8	-8.586
2274.72	H	45.968	27.577	2.957	-34.297	42.205	50.8	-8.595
2262	H	45.993	27.578	2.943	-34.316	42.197	50.8	-8.603
2207.2	H	46.074	27.581	2.886	-34.346	42.194	50.8	-8.606
2256.69	V	44.525	27.578	2.938	-34.325	40.716	50.8	-10.084
2279.81	V	43.836	27.577	2.962	-34.289	40.085	50.8	-10.715
2241.69	V	43.81	27.579	2.922	-34.337	39.974	50.8	-10.826
2280.89	V	43.618	27.577	2.963	-34.288	39.87	50.8	-10.93
2255.22	V	43.652	27.578	2.936	-34.327	39.839	50.8	-10.961
2202.47	V	43.664	27.581	2.882	-34.348	39.778	50.8	-11.022
2232.85	V	43.523	27.579	2.913	-34.34	39.676	50.8	-11.124
2285.93	V	43.383	27.577	2.968	-34.28	39.648	50.8	-11.152
2278.46	V	43.383	27.577	2.961	-34.291	39.629	50.8	-11.171
2246.81	V	43.455	27.579	2.928	-34.336	39.625	50.8	-11.175
2248.71	V	43.409	27.579	2.93	-34.335	39.582	50.8	-11.218
2204.2	V	43.373	27.581	2.883	-34.347	39.49	50.8	-11.31
2271.26	V	43.221	27.577	2.953	-34.302	39.449	50.8	-11.351
2258.81	V	43.171	27.578	2.94	-34.321	39.367	50.8	-11.433
2261.28	V	43.125	27.578	2.943	-34.318	39.328	50.8	-11.472
2283.93	V	43.054	27.577	2.966	-34.283	39.314	50.8	-11.486
2288.11	V	42.986	27.577	2.971	-34.276	39.256	50.8	-11.544
2268.97	V	43.013	27.578	2.951	-34.306	39.235	50.8	-11.565
2266.14	V	43.014	27.578	2.948	-34.31	39.229	50.8	-11.571
2221.78	V	43.089	27.58	2.902	-34.343	39.228	50.8	-11.572

Frequency	Polarity	AVE Raw	Antenna	Cables	PreAmp	AVE	Limit	Margin	Tower	Turntable
MHz	V/H	dBuV/m	dB	dB	dB	dBuV/m	dBuV/m	dB	cm	Degrees
2266.73	H	33.753	27.578	2.948	-34.309	29.969	50.8	-20.831	199	0
2251.6	H	33.774	27.578	2.933	-34.333	29.953	50.8	-20.847	199	0
2220.11	H	33.806	27.58	2.9	-34.343	29.943	50.8	-20.857	199.9	0
2255.35	V	31.521	27.578	2.937	-34.327	27.709	50.8	-23.091	200.1	124.8
2278.46	V	31.218	27.577	2.961	-34.291	27.465	50.8	-23.335	200.2	0
2234.16	V	31.139	27.579	2.915	-34.339	27.294	50.8	-23.506	200.1	359.1

The highest radiated emissions detected were more than 20dB below the three meter limit of 50.8dBuV/m (equivalent to -46.6dBm EIRP). Since all maximized measurements were more than 20dB below these levels, substitution measurements were not performed. TILE software was used for all preliminary scans and plots that are included on the following pages.





Radiated Emissions – 2100-2300MHz – Vertical at 3m

Frequency Stability/Accuracy

See the results in Appendix B.