TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (Band 4)
TEST RESULTS:	PASS

LTE QPSK MODULATION. BW = 5 MHz

Frequency stability over temperature variations

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
50	3.19	0.0018	0.00000018
40	5.85	0.0034	0.00000034
30	0.19	0.0001	0.00000001
20	4.02	0.0023	0.00000023
10	3.78	0.0022	0.00000022
0	0.89	0.0005	0.00000005
-10	0.39	0.0002	0.00000002
-20	5.69	0.0033	0.00000033
-30	4.88	0.0028	0.00000028

Frequency stability over voltage variations

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.37	-4.42	-0.0026	-0.00000026
Vmin	3.23	2.53	0.0015	0.00000015

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (Band 12)
TEST RESULTS:	PASS

LTE QPSK MODULATION. BW = 5 MHz

Frequency stability over temperature variations

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
50	-2.26	-0.0032	-0.00000032
40	0.26	0.0004	0.00000004
30	-1.6	-0.0023	-0.00000023
20	-3.25	-0.0046	-0.00000046
10	-0.87	-0.0012	-0.00000012
0	-1.53	-0.0022	-0.00000022
-10	-2.83	-0.0040	-0.00000040
-20	-4.33	-0.0061	-0.00000061
-30	-2.49	-0.0035	-0.00000035

Frequency stability over voltage variations

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.37	-1.29	-0.0018	-0.00000018
Vmin	3.23	0.63	0.0009	0.00000009

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#03 (Band 13)
TEST RESULTS:	PASS

LTE QPSK MODULATION. BW = 10 MHz

Frequency stability over temperature variations

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
50	-0.31	-0.0004	-0.00000004
40	-0.56	-0.0007	-0.00000007
30	-2.06	-0.0026	-0.00000026
20	-1.59	-0.0020	-0.00000020
10	-1.53	-0.0020	-0.00000020
0	5.62	0.0072	0.00000072
-10	-9.21	-0.0118	-0.00000118
-20	-2.3	-0.0029	-0.00000029
-30	-9.41	-0.0120	-0.00000120

Frequency stability over voltage variations

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.37	-0.1	-0.0001	-0.00000001
Vmin	3.23	-2.96	-0.0038	-0.00000038

TEST A.4: OCCUPIED BANDWIDTH

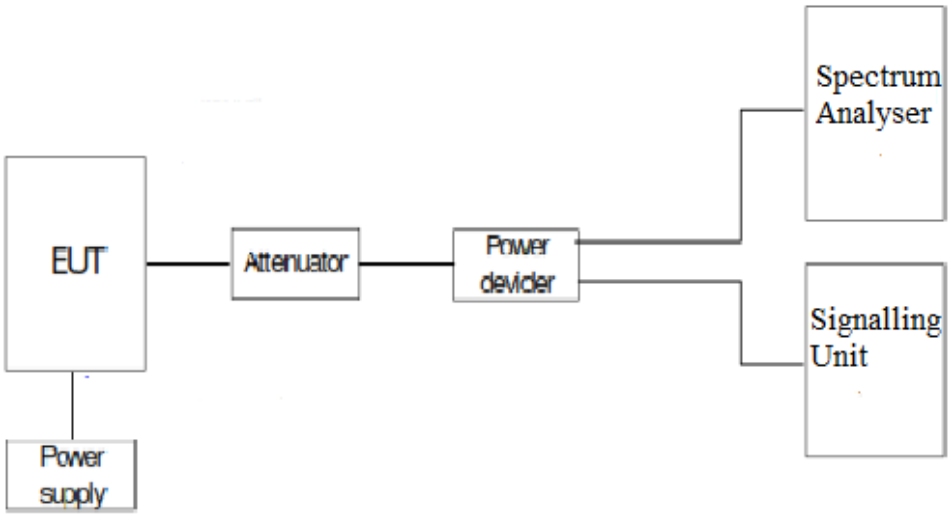
LIMITS:	Product standard:	FCC Part 27 / IC RSS-199
	Test standard:	FCC § 2.1049 / RSS-199 Clause 4.2

LIMITS

Reference only.

TEST SETUP	

The occupied bandwidth measurement was performed at the output terminals of the EUT using an attenuator, power splitter and spectrum analyzer. The EUT was controlled via the Universal Radio Communication tester R&S CMW500 selecting maximum transmission power of the EUT and different modes of modulation. The 99% occupied bandwidth and the -26 dBc bandwidth were measured directly using the built-in bandwidth measuring option of spectrum analyzer.



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (Band 4)
TEST RESULTS:	PASS

LTE QPSK MODULATION. BW = 5 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (MHz)	1.11	1.11	1.12
-26 dBc bandwidth (MHz)	1.38	1.46	1.39

LTE 16QAM MODULATION. BW = 5 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (MHz)	1.12	1.12	1.12
-26 dBc bandwidth (MHz)	1.45	1.39	1.49

LTE QPSK MODULATION. BW = 10 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (MHz)	1.11	1.11	1.11
-26 dBc bandwidth (MHz)	1.44	1.48	1.45

LTE 16QAM MODULATION. BW = 10 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (MHz)	1.12	1.12	1.12
-26 dBc bandwidth (MHz)	1.47	1.49	1.51

TEST RESULTS (Cont):	

LTE QPSK MODULATION. BW = 15 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (MHz)	1.13	1.11	1.11
-26 dBc bandwidth (MHz)	1.45	1.47	1.51

LTE 16QAM MODULATION. BW = 15 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (MHz)	1.12	1.12	1.14
-26 dBc bandwidth (MHz)	1.47	1.48	1.56

LTE QPSK MODULATION. BW = 20 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (MHz)	1.12	1.11	1.11
-26 dBc bandwidth (MHz)	1.42	1.49	1.49

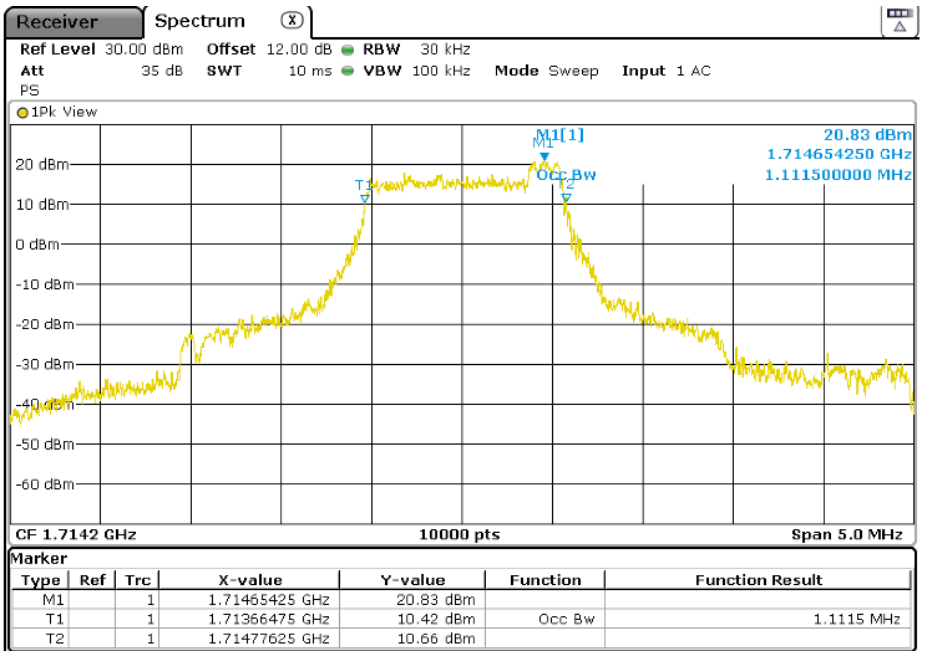
LTE 16QAM MODULATION. BW = 20 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (MHz)	1.11	1.13	1.12
-26 dBc bandwidth (MHz)	1.46	1.52	1.48

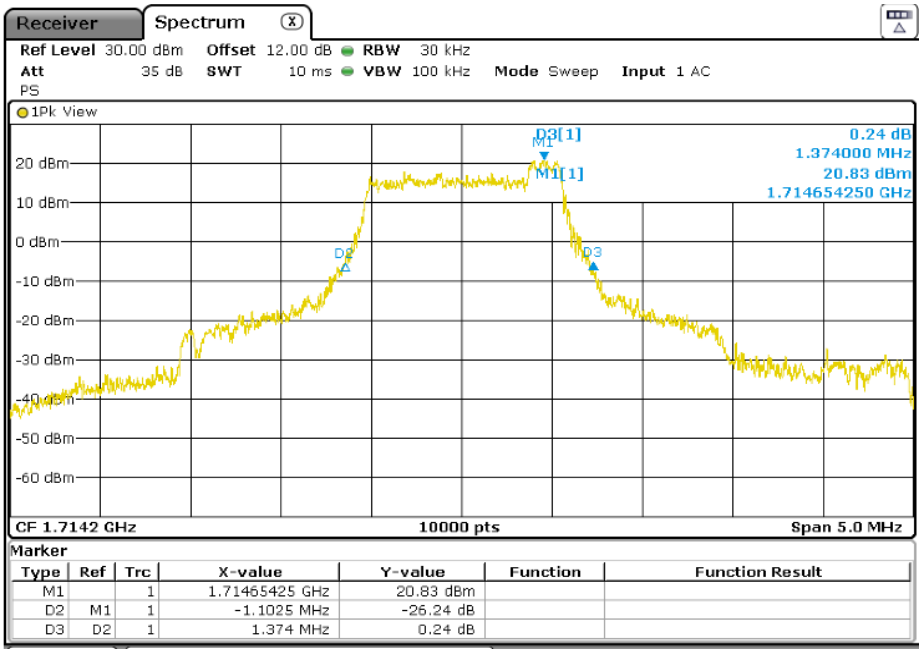
TEST RESULTS (Cont):	

LTE QPSK MODULATION. BW = 5 MHz

Lowest Channel 99% Occupied Bandwidth

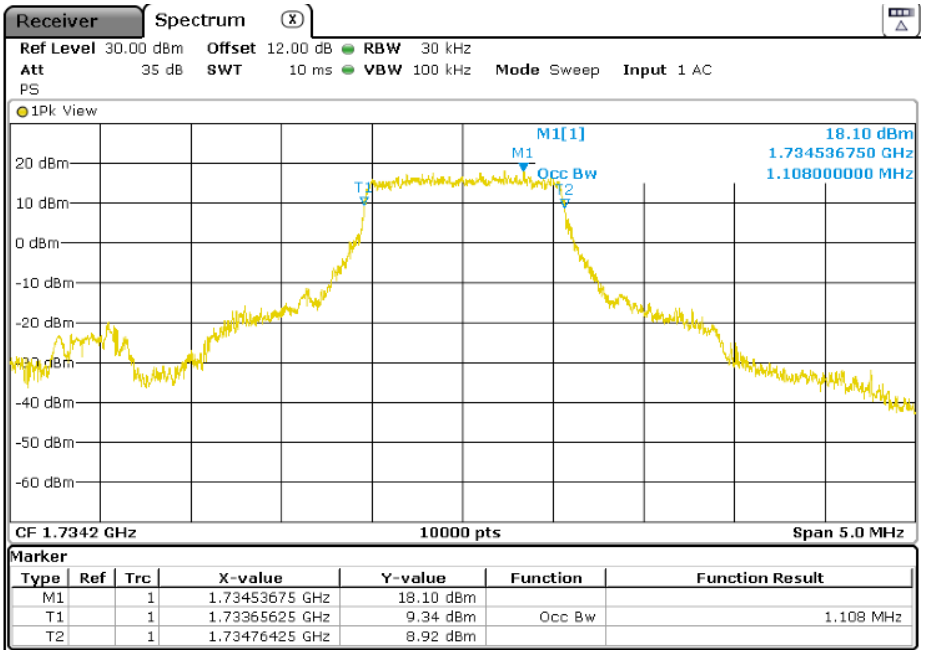


Lowest Channel -26dBc Bandwidth

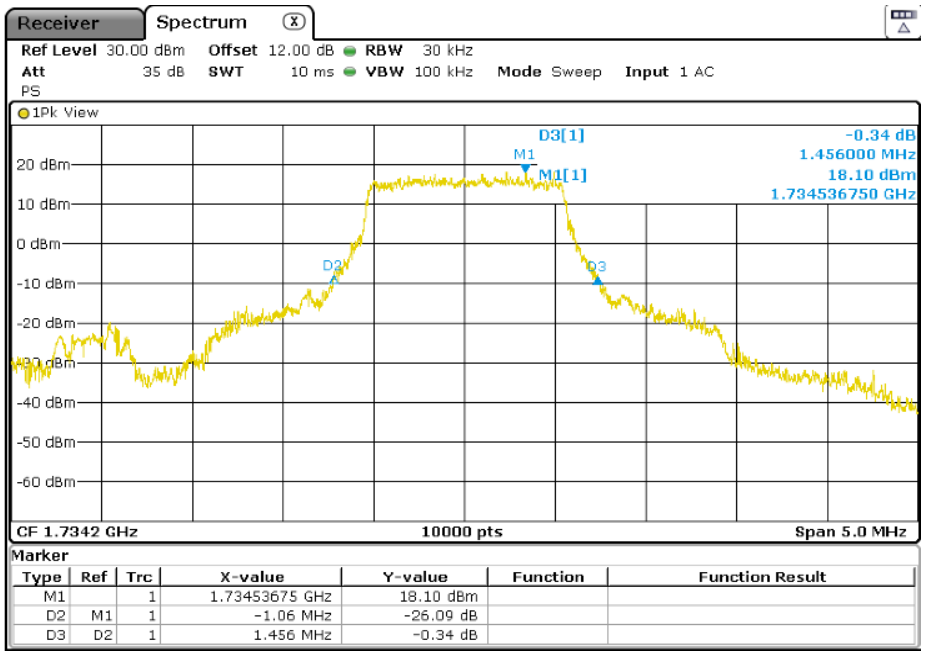


TEST RESULTS (Cont):	

Middle Channel 99% Occupied Bandwidth

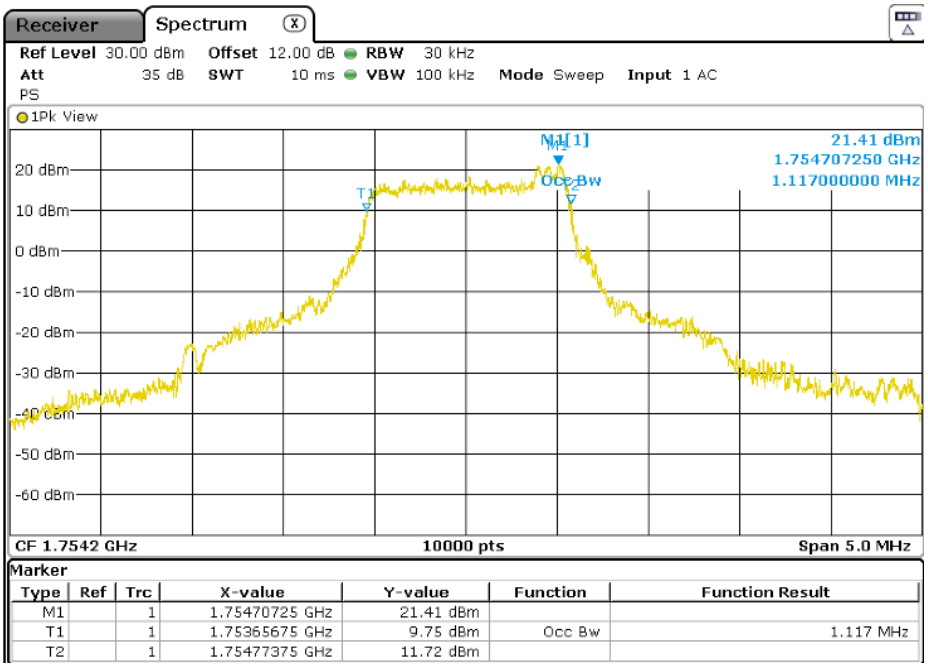


Middle Channel -26dBc Bandwidth

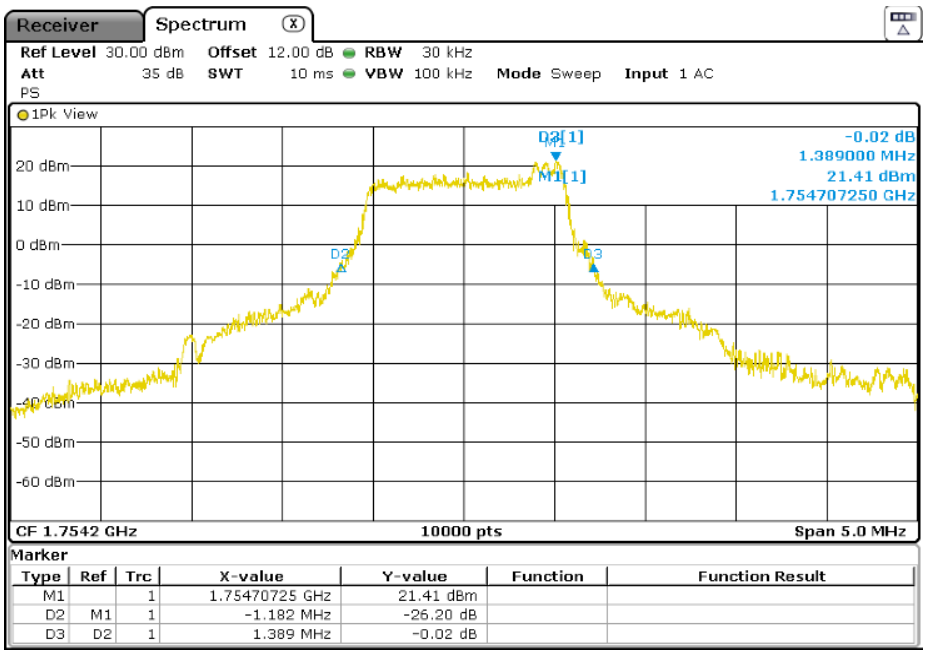


TEST RESULTS (Cont):	

Highest Channel 99% Occupied Bandwidth



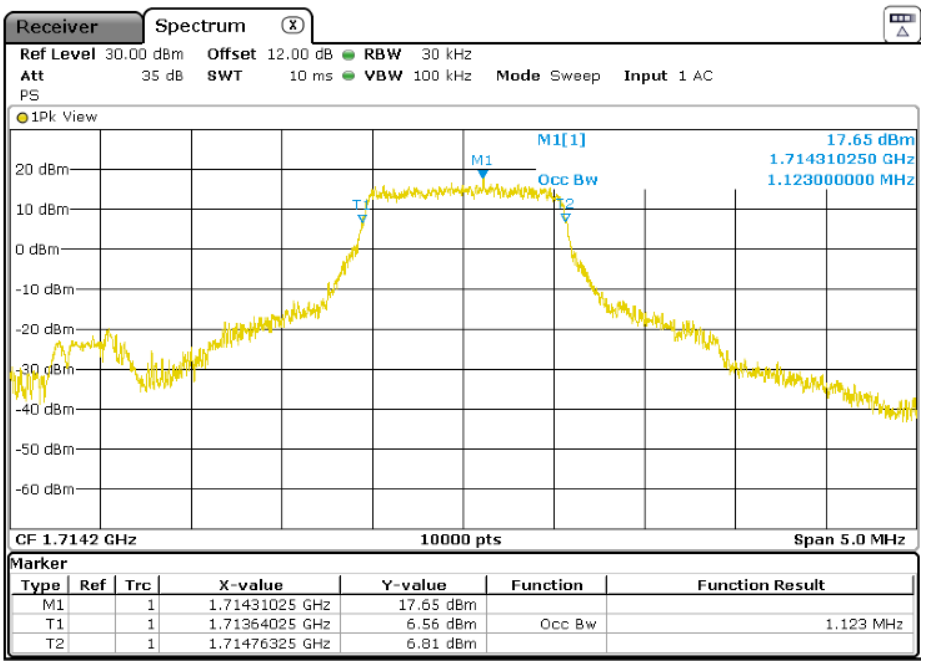
Highest Channel -26dBc Bandwidth



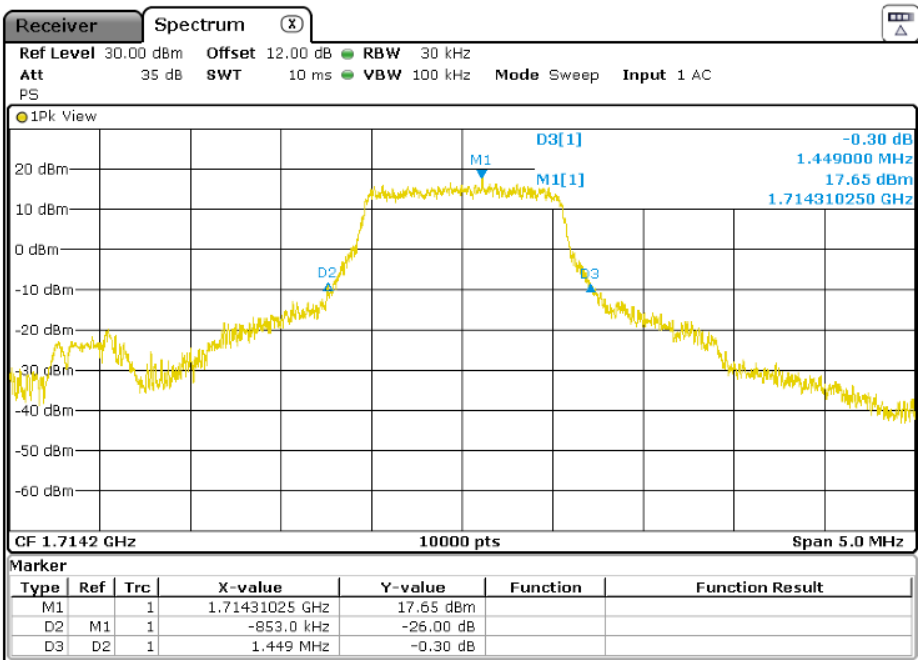
TEST RESULTS (Cont):	

LTE 16QAM MODULATION. BW = 5 MHz

Lowest Channel 99% Occupied Bandwidth

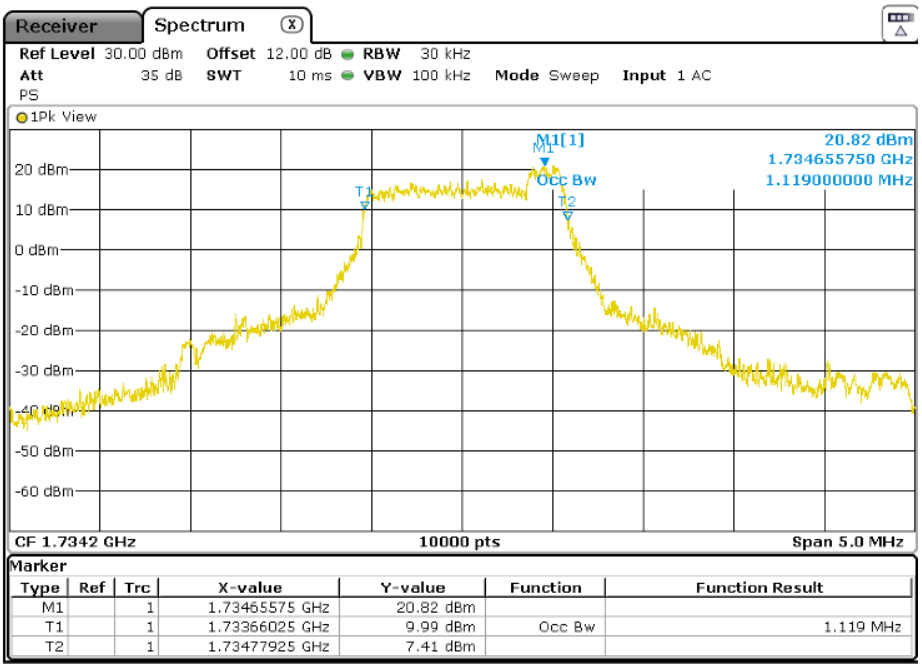


Lowest Channel -26dBc Bandwidth

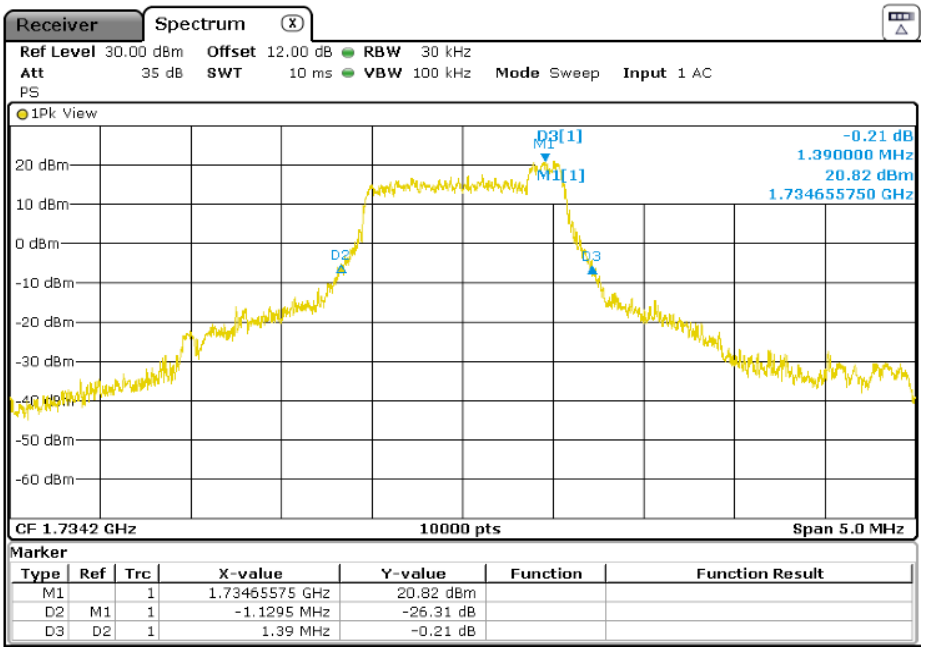


TEST RESULTS (Cont):	

Middle Channel 99% Occupied Bandwidth

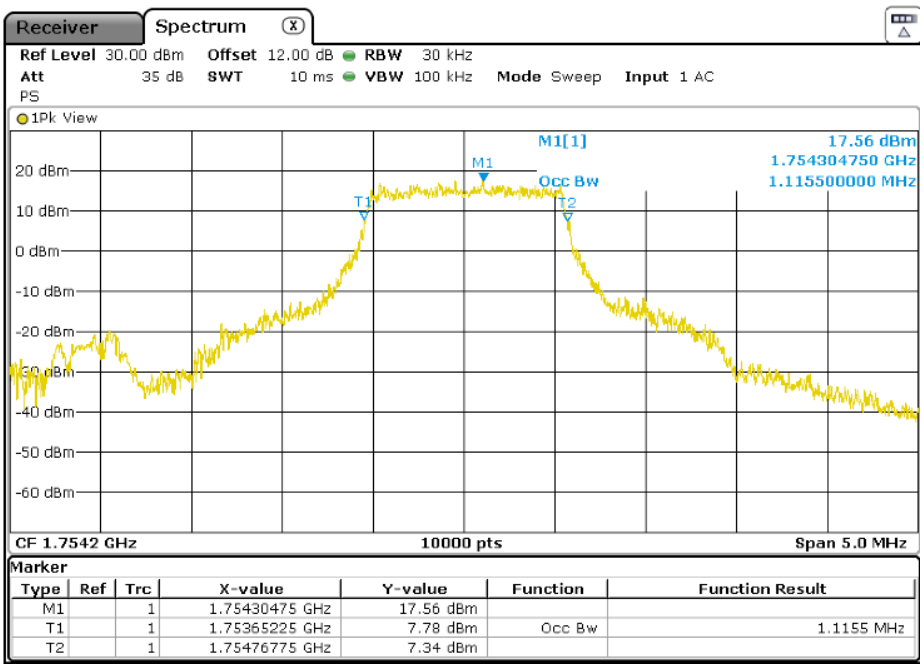


Middle Channel -26dBc Bandwidth

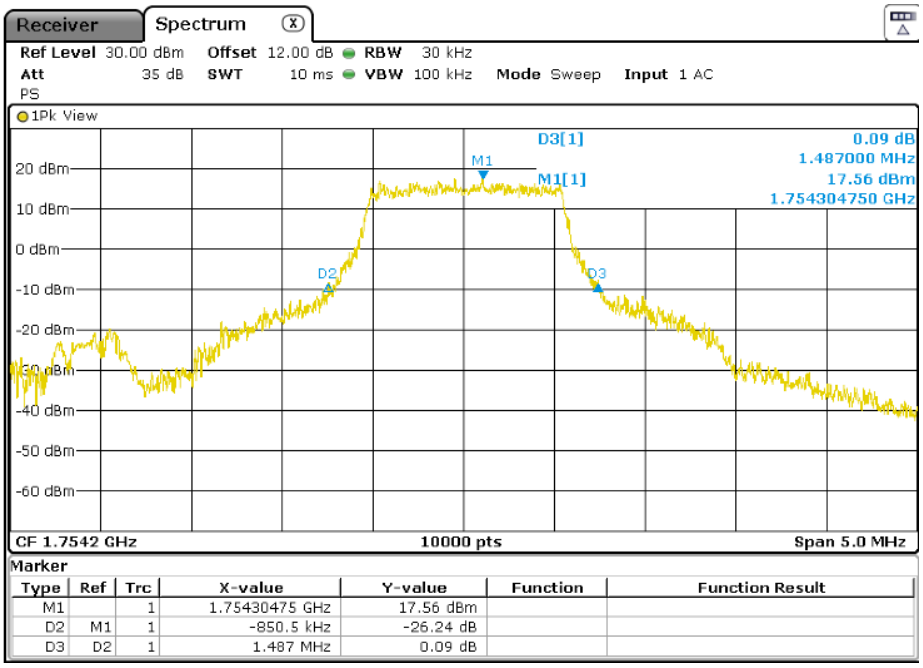


TEST RESULTS (Cont):	

Highest Channel 99% Occupied Bandwidth



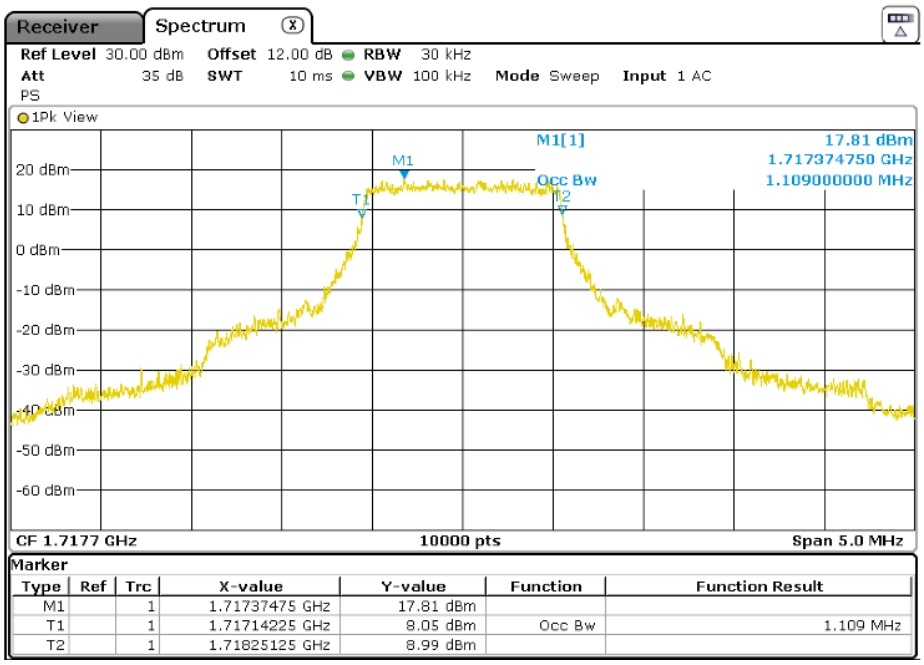
Highest Channel -26dBc Bandwidth



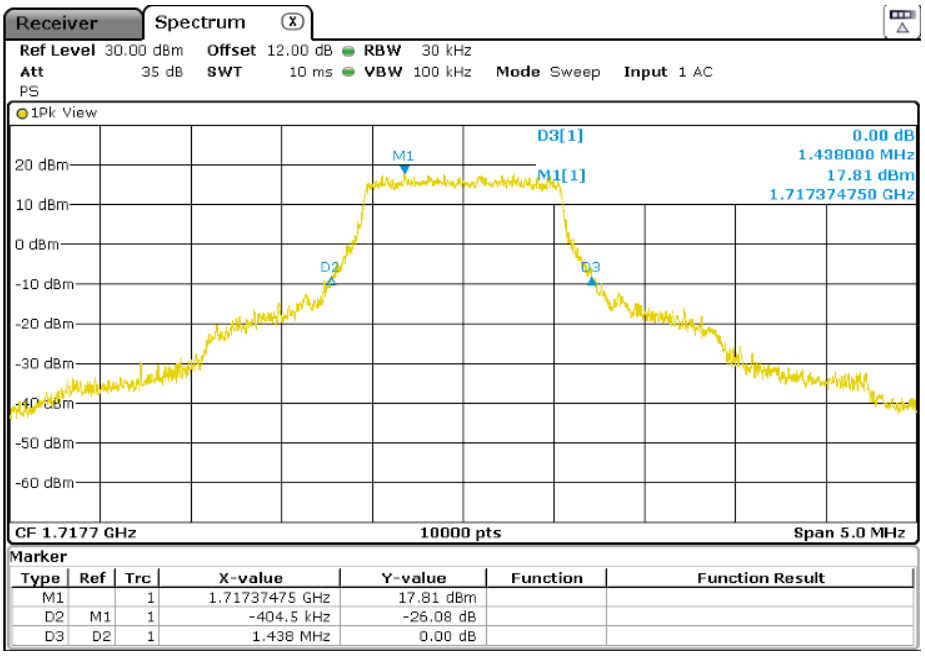
TEST RESULTS (Cont):	

LTE QPSK MODULATION. BW = 10 MHz

Lowest Channel 99% Occupied Bandwidth

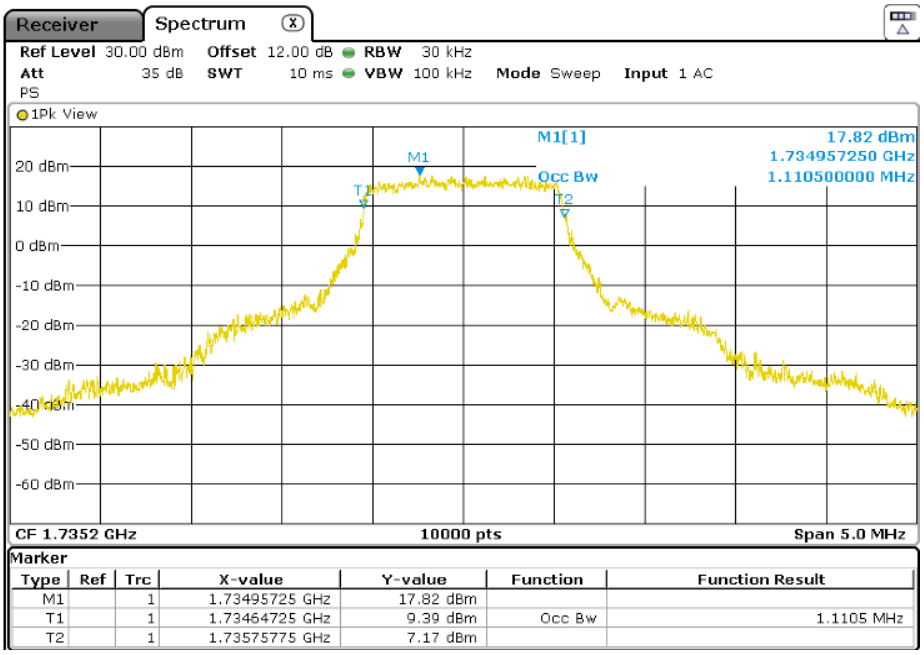


Lowest Channel -26dBc Bandwidth

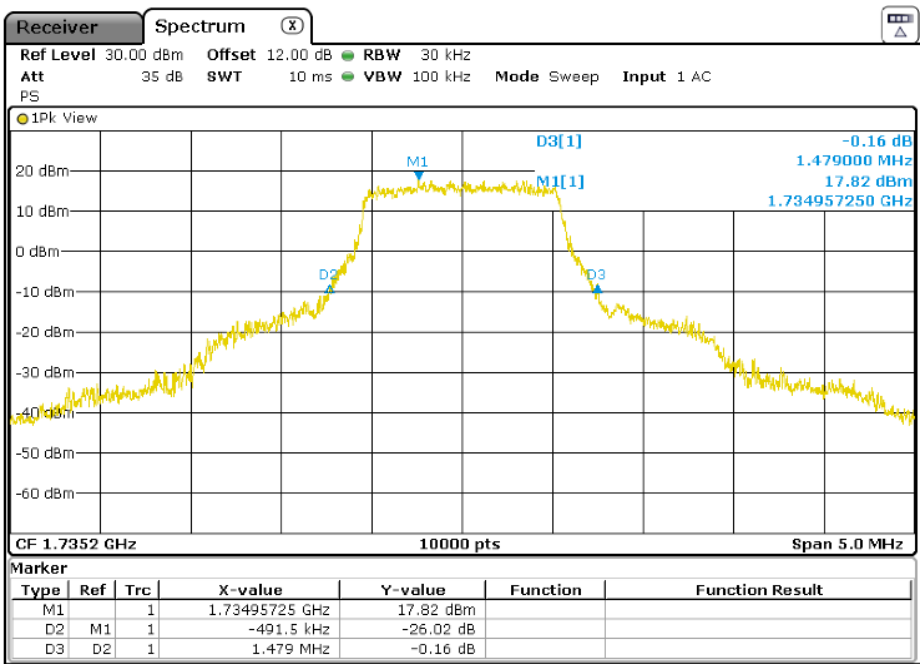


TEST RESULTS (Cont):	

Middle Channel 99% Occupied Bandwidth

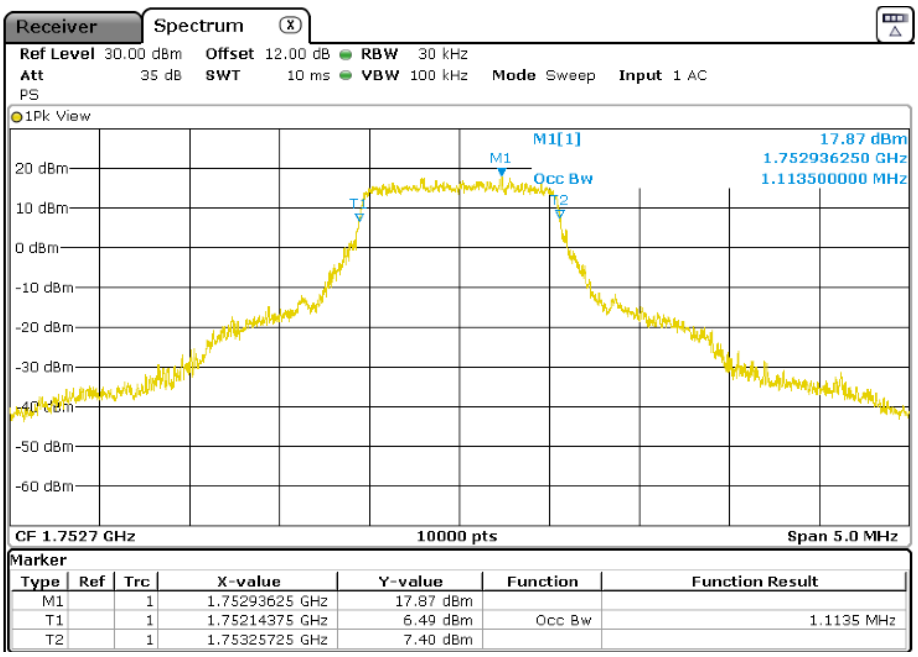


Middle Channel -26dBc Bandwidth

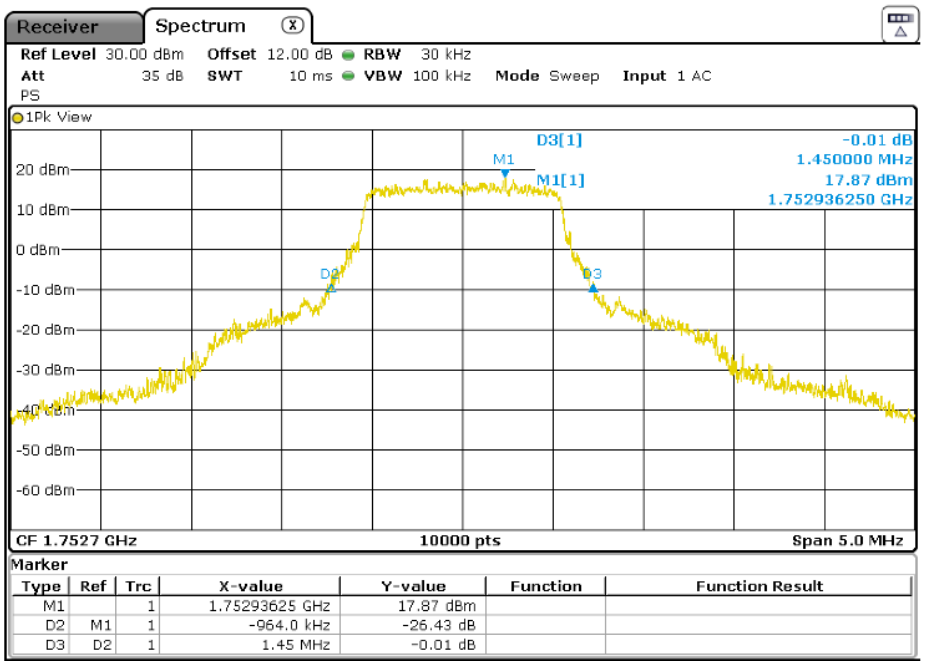


TEST RESULTS (Cont):	

Highest Channel 99% Occupied Bandwidth



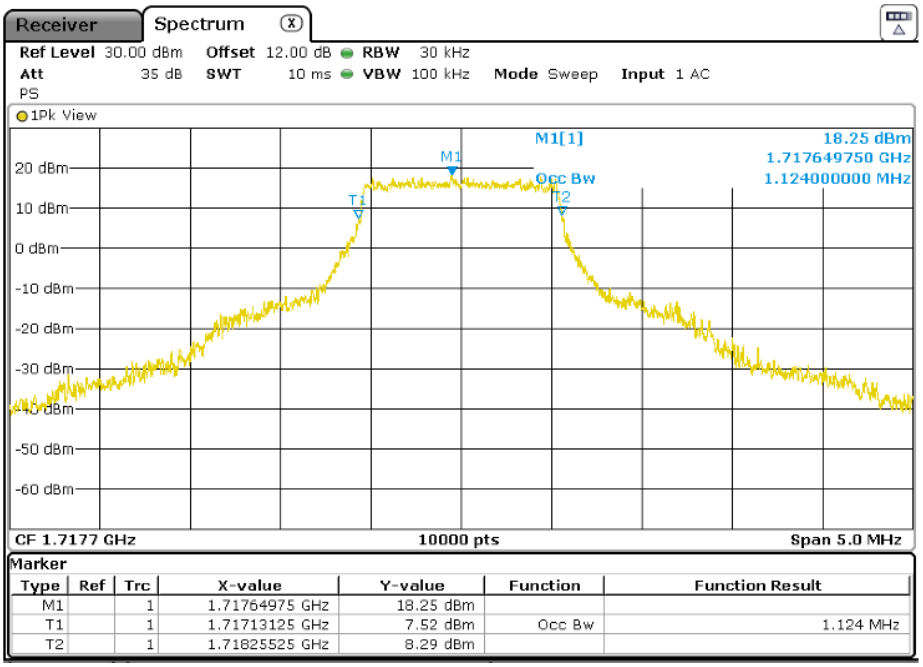
Highest Channel -26dBc Bandwidth



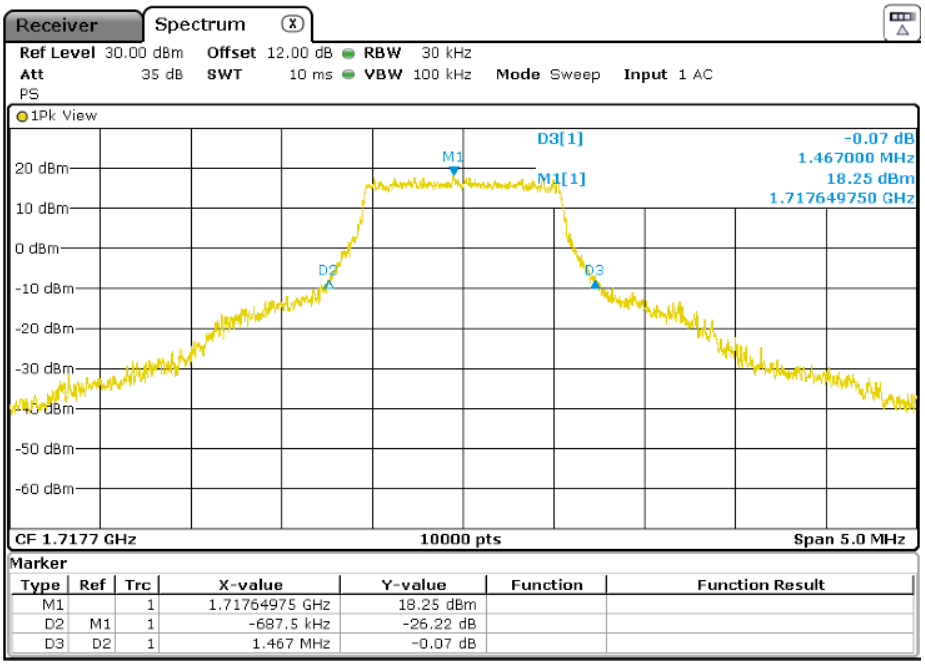
TEST RESULTS (Cont):	

LTE 16QAM MODULATION. BW = 10 MHz

Lowest Channel 99% Occupied Bandwidth

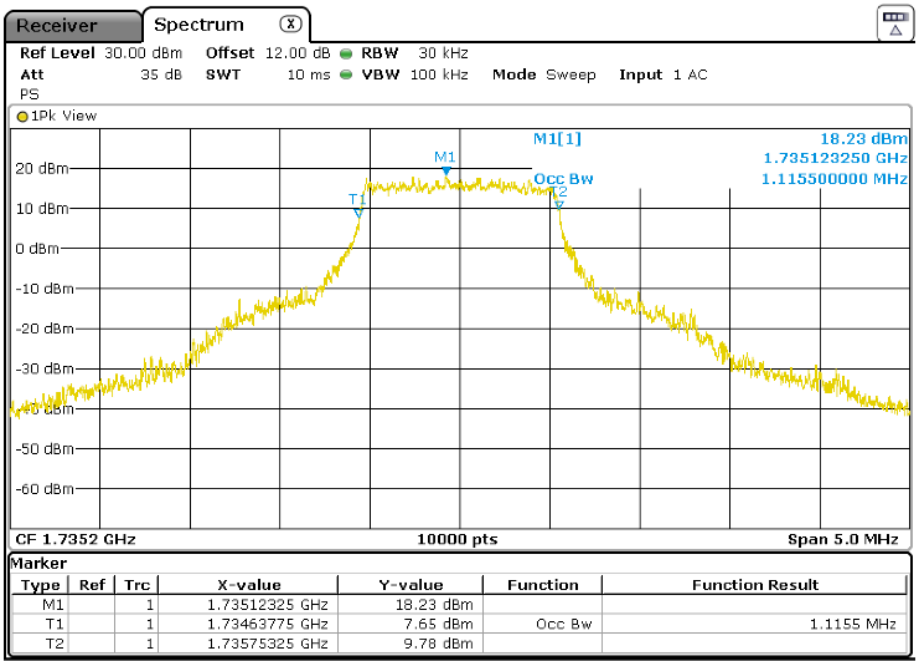


Lowest Channel -26dBc Bandwidth

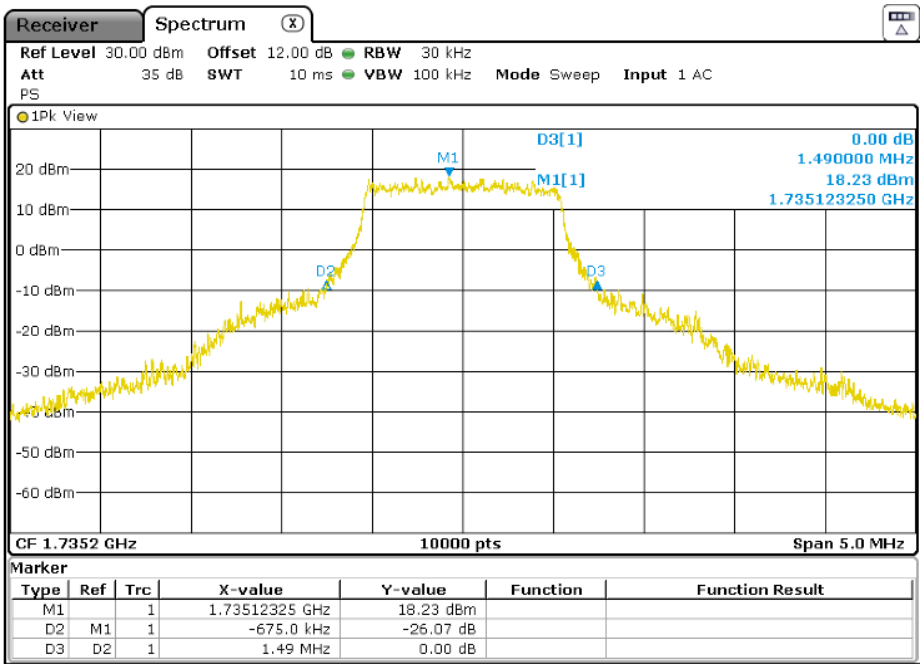


TEST RESULTS (Cont):	

Middle Channel 99% Occupied Bandwidth

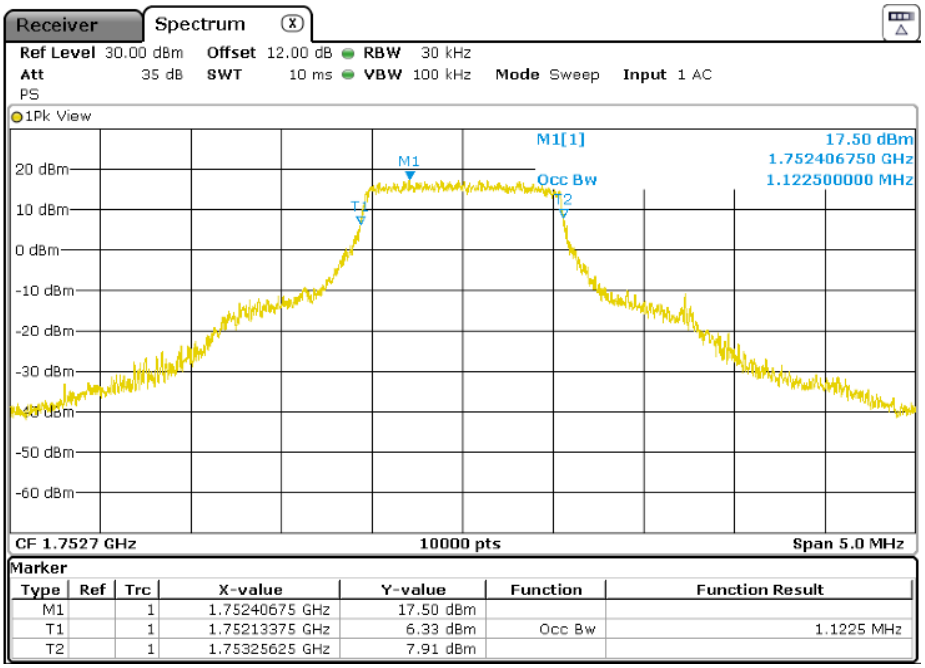


Middle Channel -26dBc Bandwidth

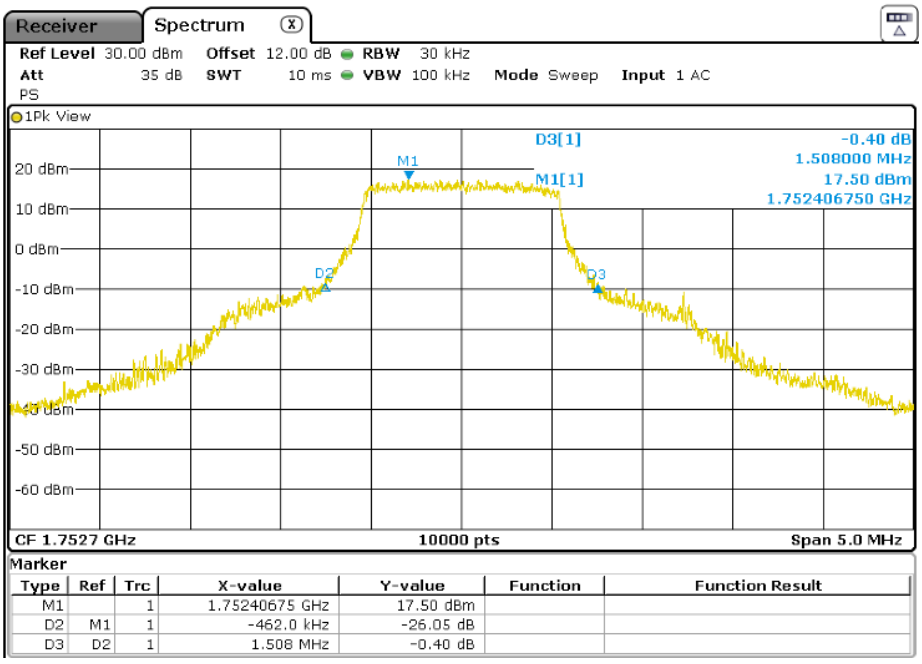


TEST RESULTS (Cont):	

Highest Channel 99% Occupied Bandwidth



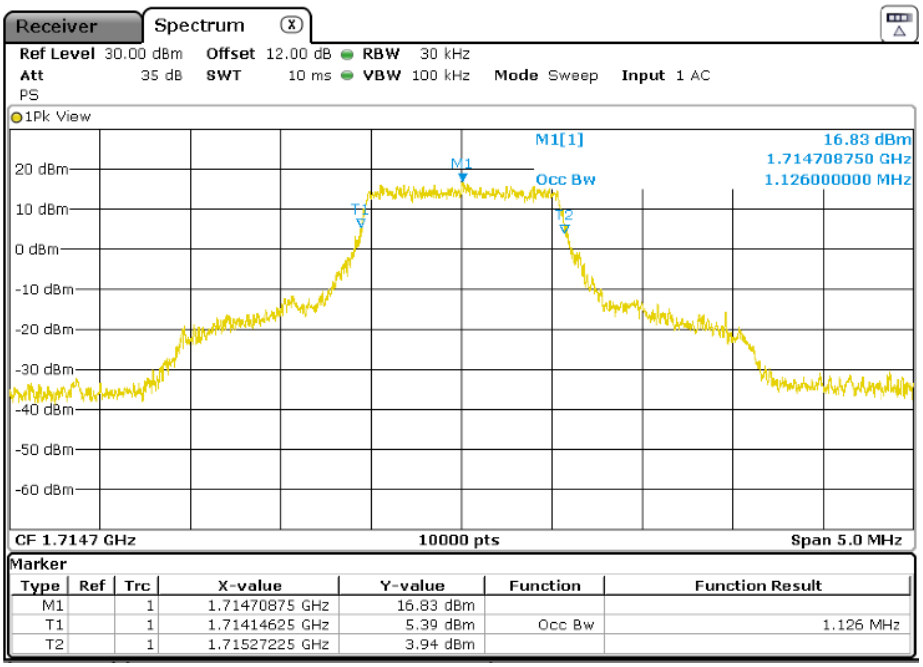
Highest Channel -26dBc Bandwidth



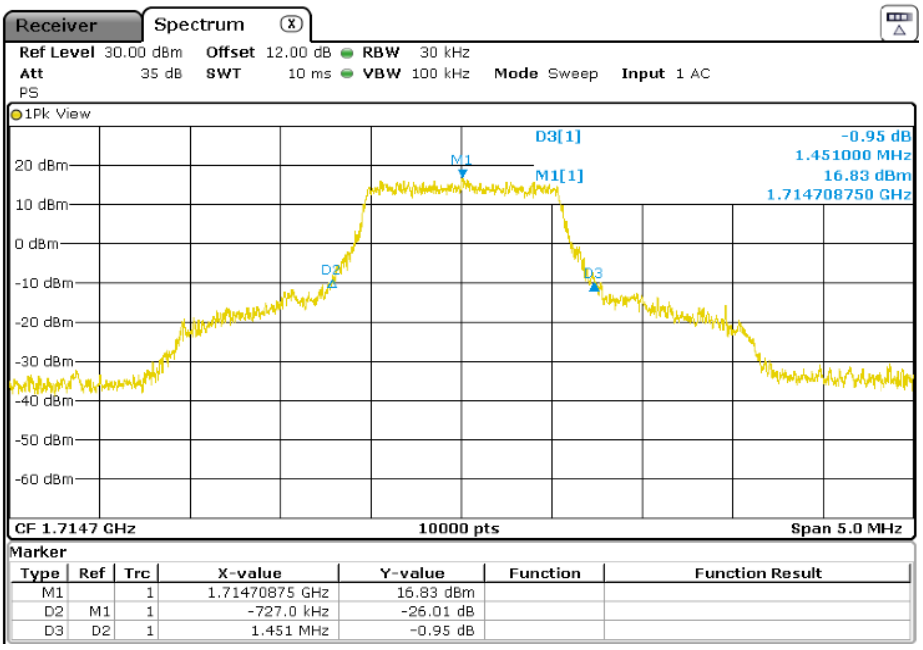
TEST RESULTS (Cont):	

LTE QPSK MODULATION. BW = 15 MHz

Lowest Channel 99% Occupied Bandwidth

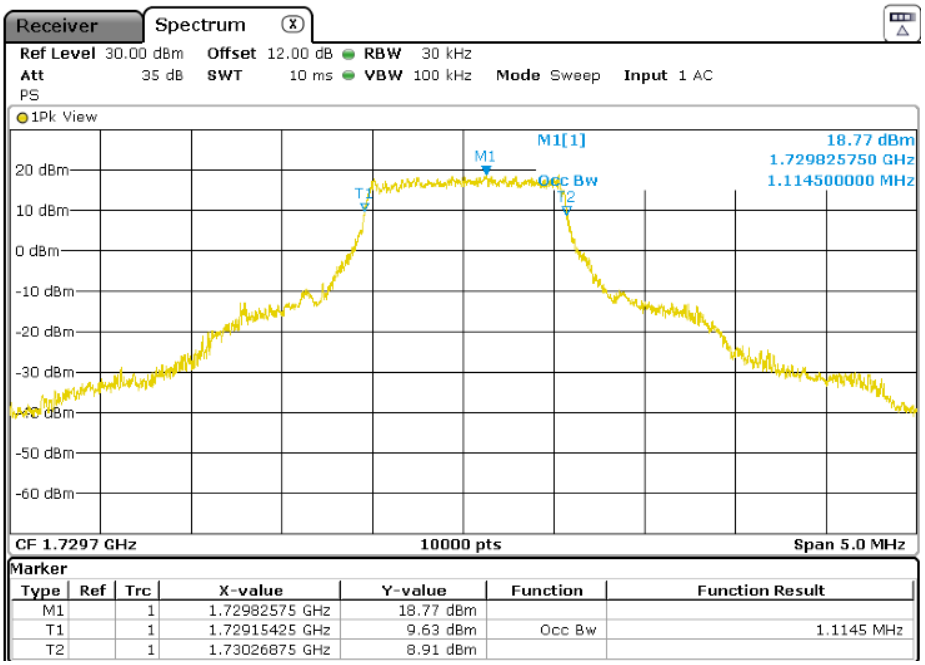


Lowest Channel -26dBc Bandwidth

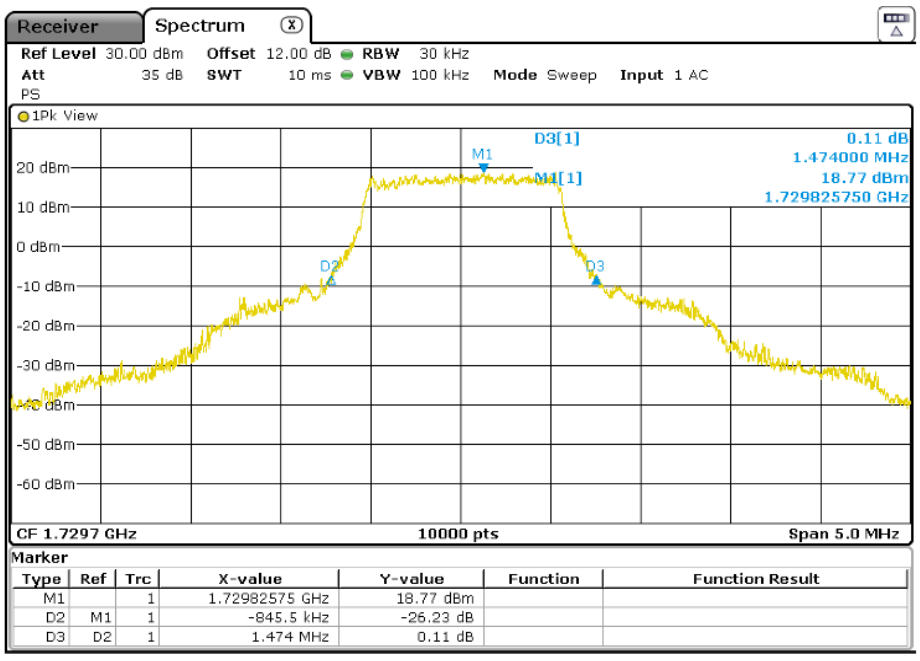


TEST RESULTS (Cont):	

Middle Channel 99% Occupied Bandwidth

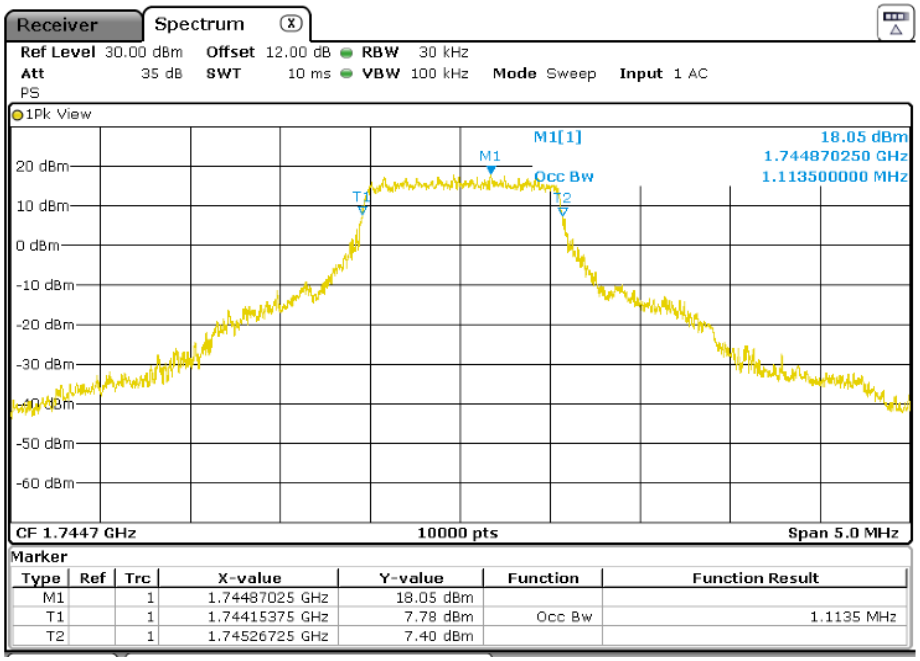


Middle Channel -26dBc Bandwidth

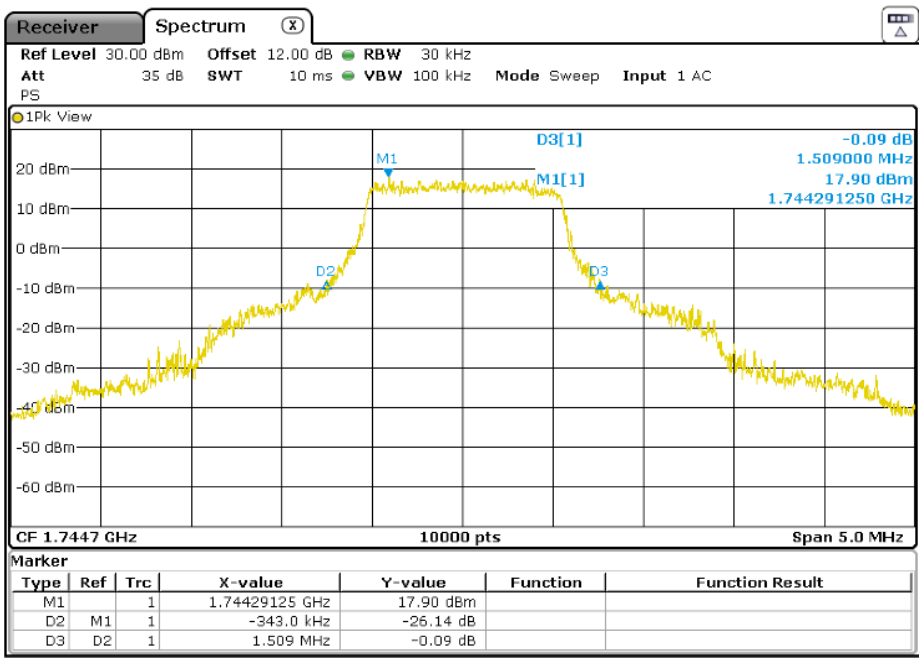


TEST RESULTS (Cont):	

Highest Channel 99% Occupied Bandwidth



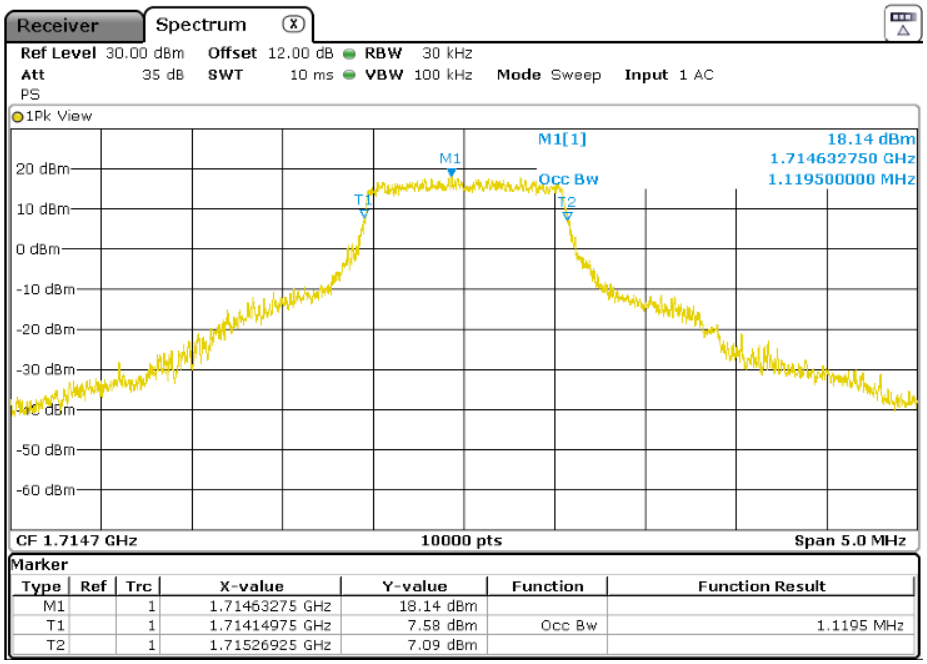
Highest Channel -26dBc Bandwidth



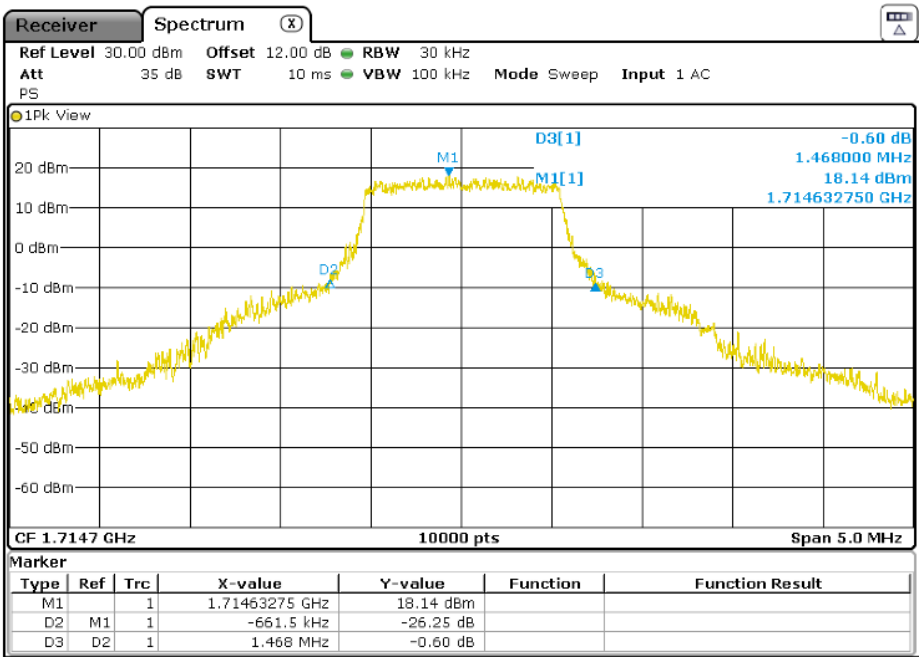
TEST RESULTS (Cont):	

LTE 16QAM MODULATION. BW = 15 MHz

Lowest Channel 99% Occupied Bandwidth

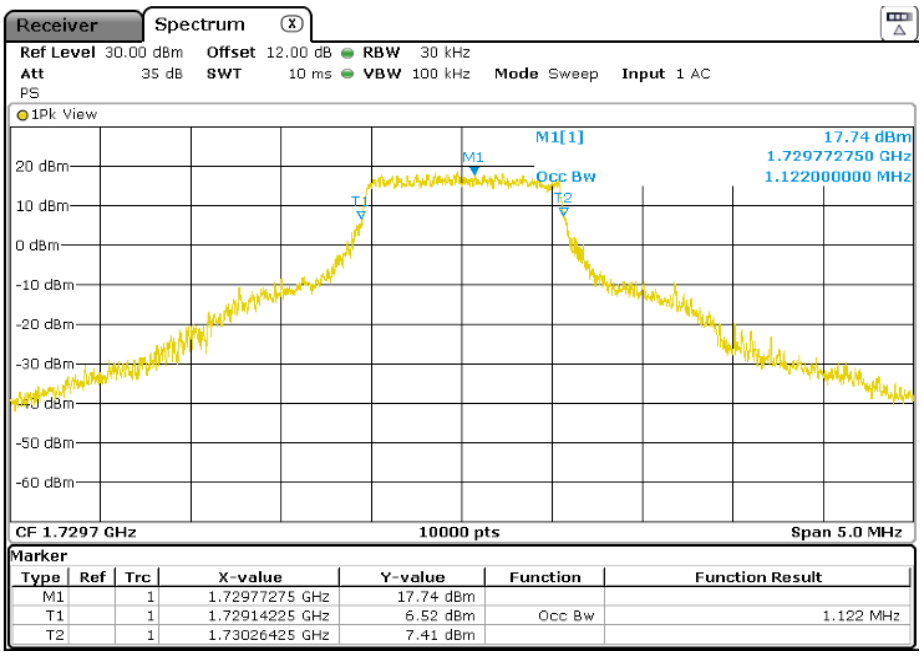


Lowest Channel -26dBc Bandwidth

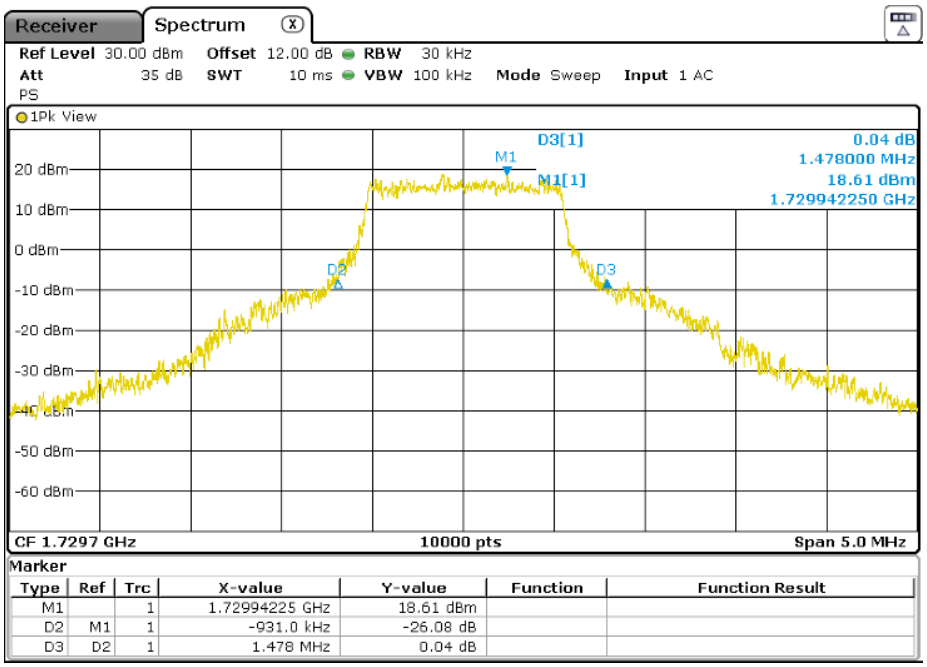


TEST RESULTS (Cont):	

Middle Channel 99% Occupied Bandwidth

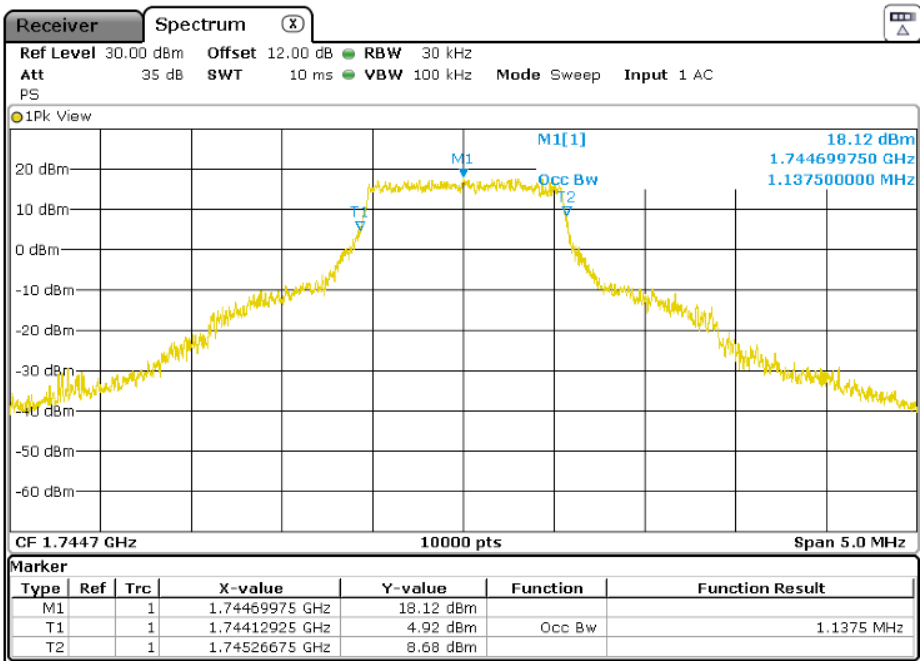


Middle Channel -26dBc Bandwidth

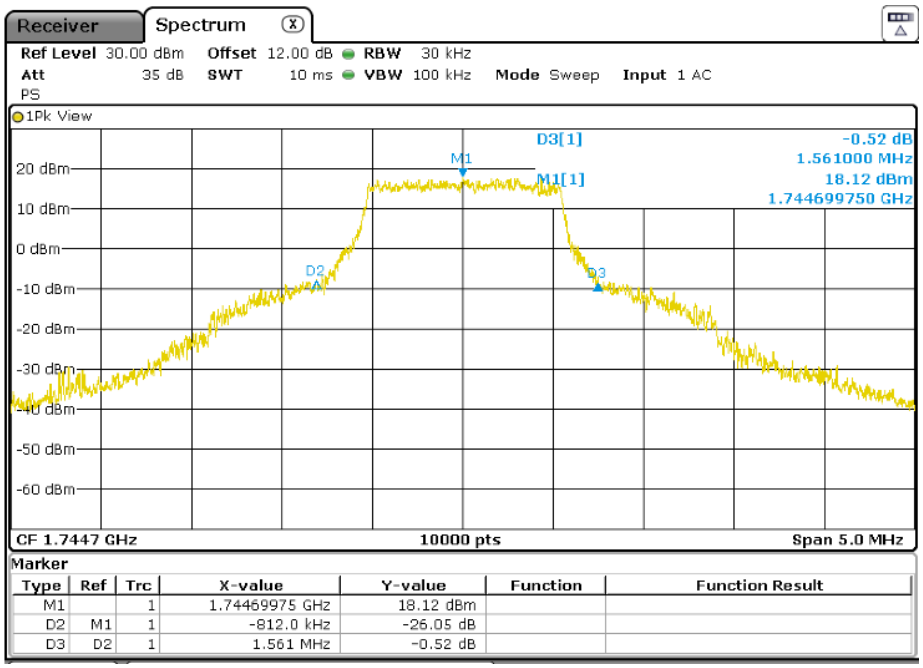


TEST RESULTS (Cont):	

Highest Channel 99% Occupied Bandwidth



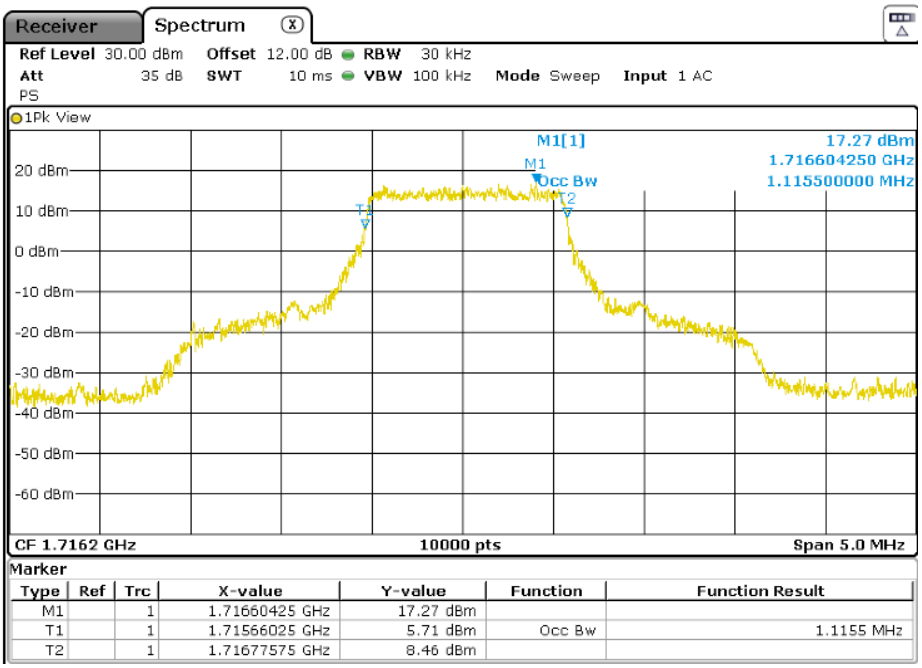
Highest Channel -26dBc Bandwidth



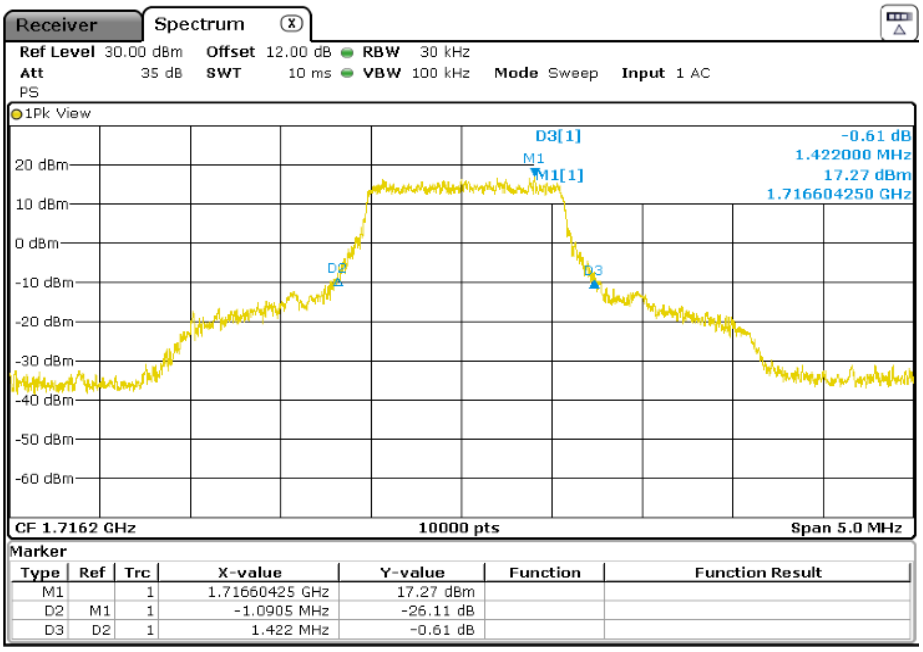
TEST RESULTS (Cont):	

LTE QPSK MODULATION. BW = 20 MHz

Lowest Channel 99% Occupied Bandwidth

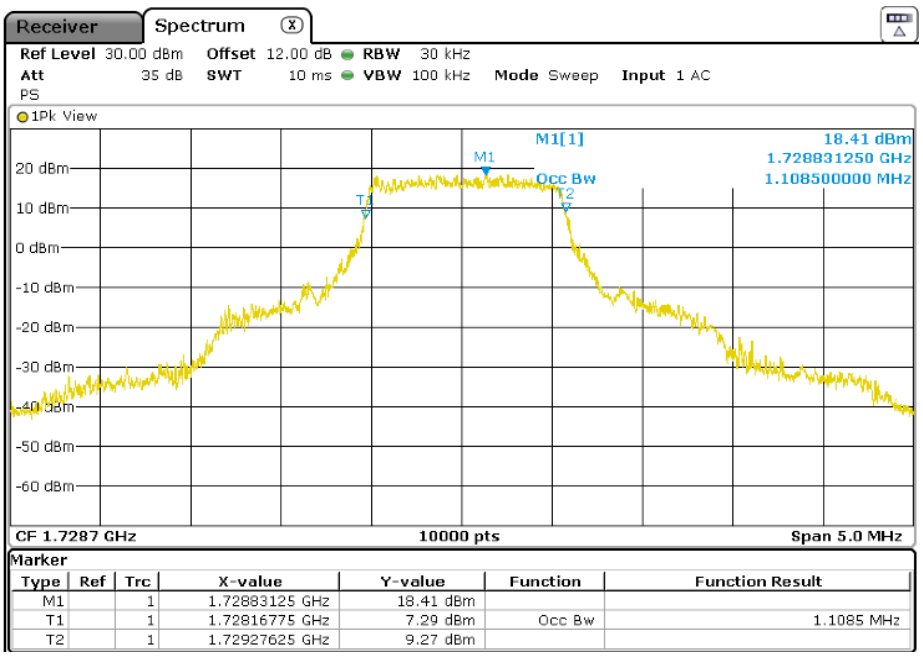


Lowest Channel -26dBc Bandwidth

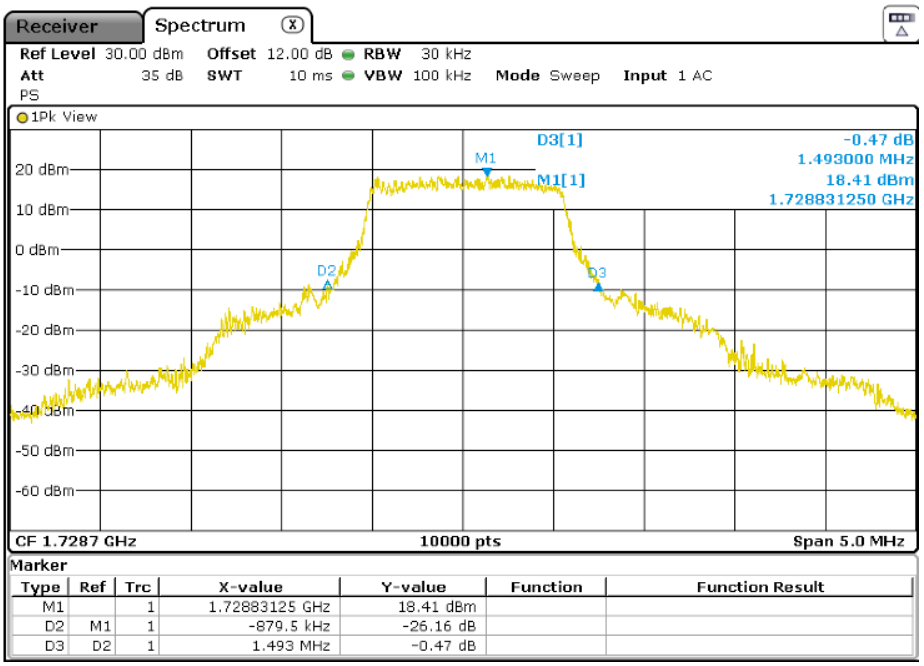


TEST RESULTS (Cont):	

Middle Channel 99% Occupied Bandwidth

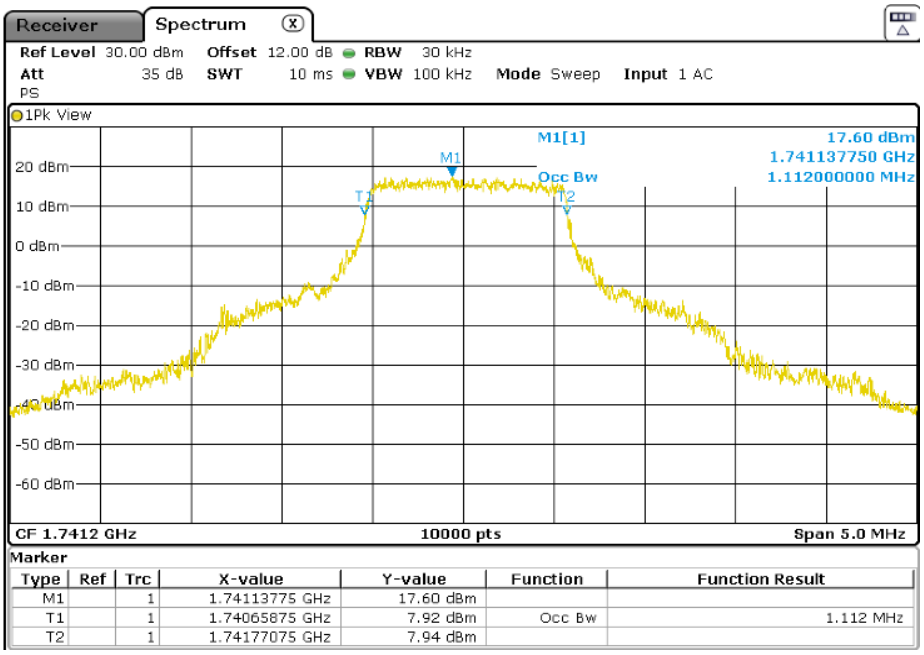


Middle Channel -26dBc Bandwidth

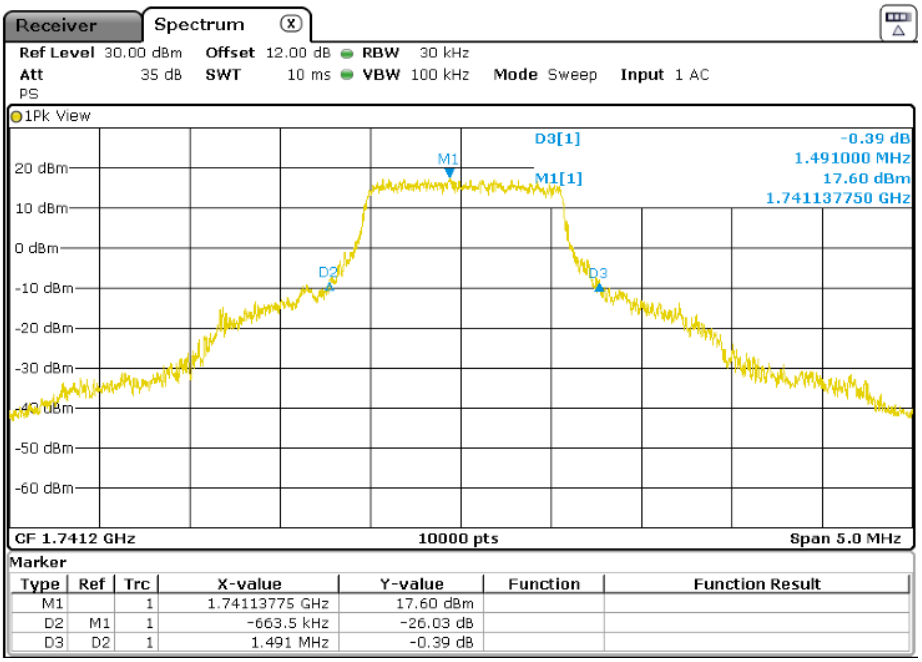


TEST RESULTS (Cont):	

Highest Channel 99% Occupied Bandwidth



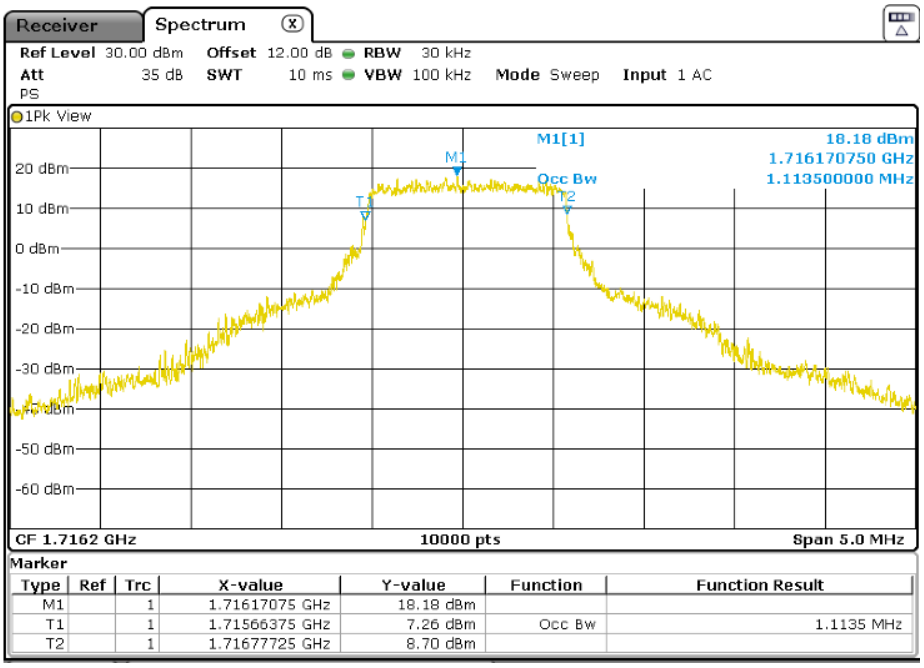
Highest Channel -26dBc Bandwidth



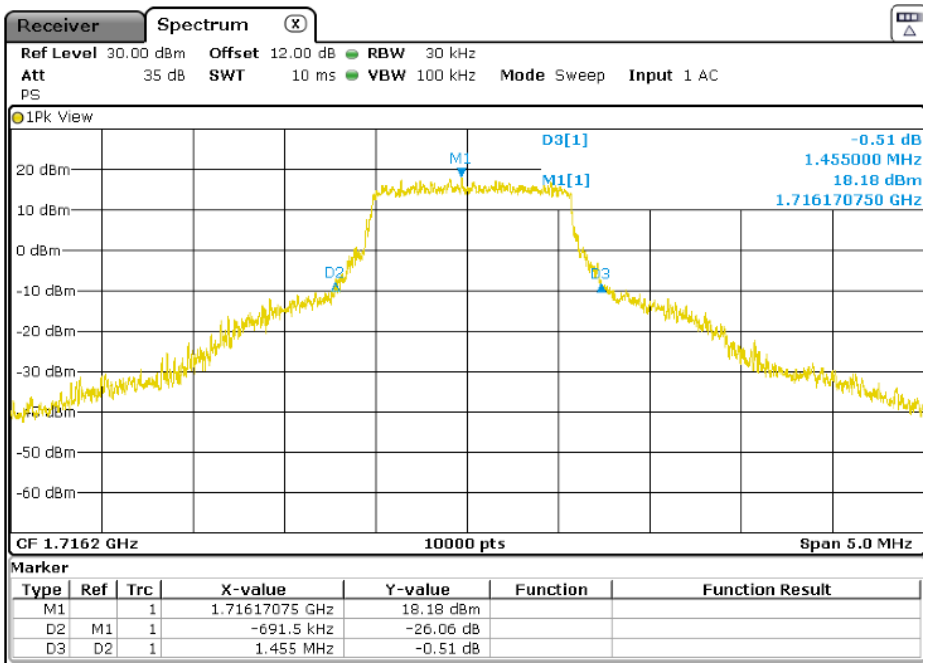
TEST RESULTS (Cont):	

LTE 16QAM MODULATION. BW = 20 MHz

Lowest Channel 99% Occupied Bandwidth

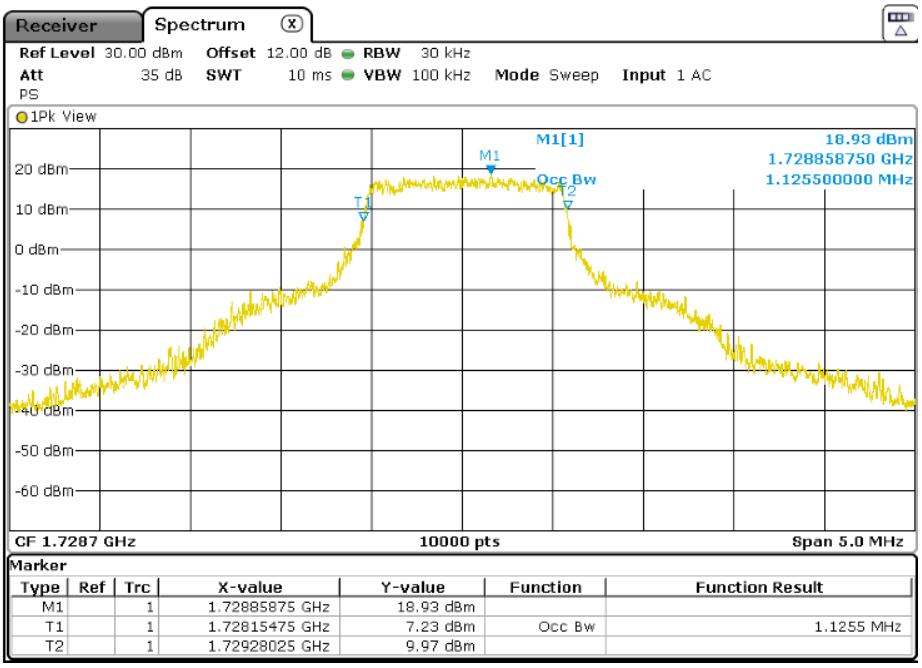


Lowest Channel -26dBc Bandwidth

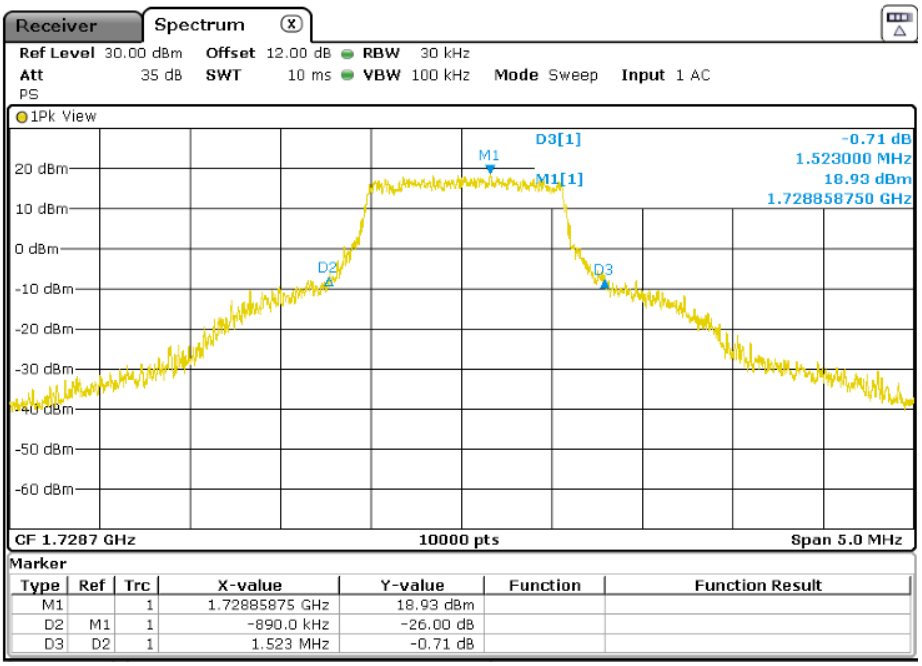


TEST RESULTS (Cont):	

Middle Channel 99% Occupied Bandwidth

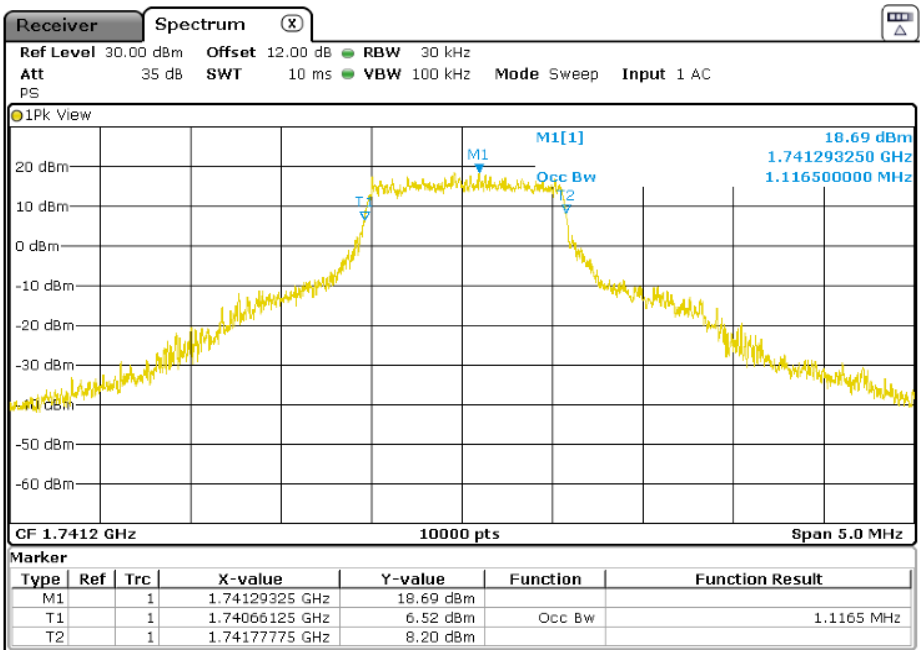


Middle Channel -26dBc Bandwidth

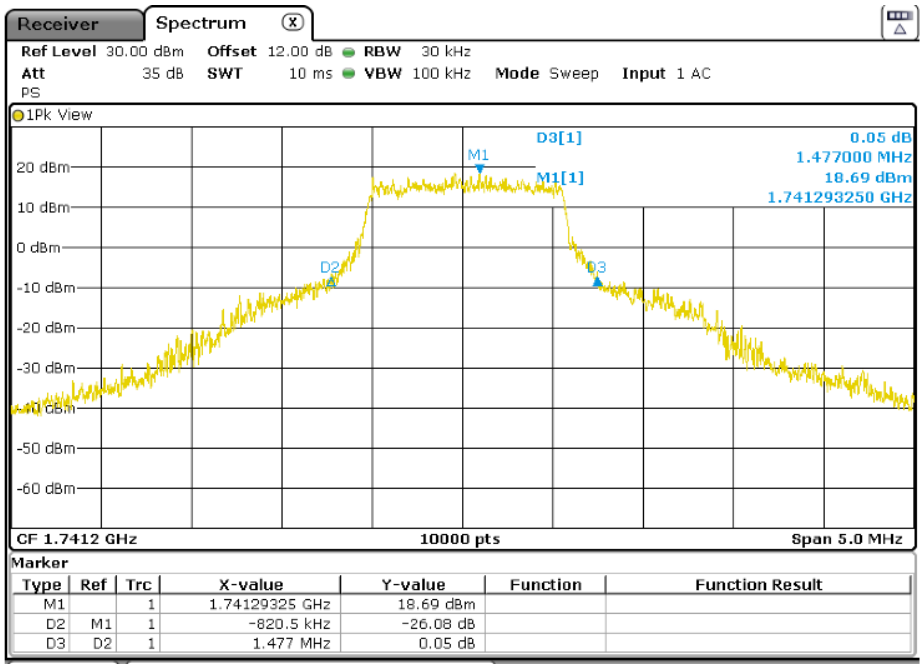


TEST RESULTS (Cont):	

Highest Channel 99% Occupied Bandwidth



Highest Channel -26dBc Bandwidth



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (Band 12)
TEST RESULTS:	PASS

LTE QPSK MODULATION. BW = 5 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (MHz)	1.12	1.12	1.11
-26 dBc bandwidth (MHz)	1.45	1.47	1.45

LTE 16QAM MODULATION. BW = 5 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (MHz)	1.12	1.12	1.11
-26 dBc bandwidth (MHz)	1.45	1.44	1.45

LTE QPSK MODULATION. BW = 10 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (MHz)	1.11	1.12	1.11
-26 dBc bandwidth (MHz)	1.43	1.45	1.47

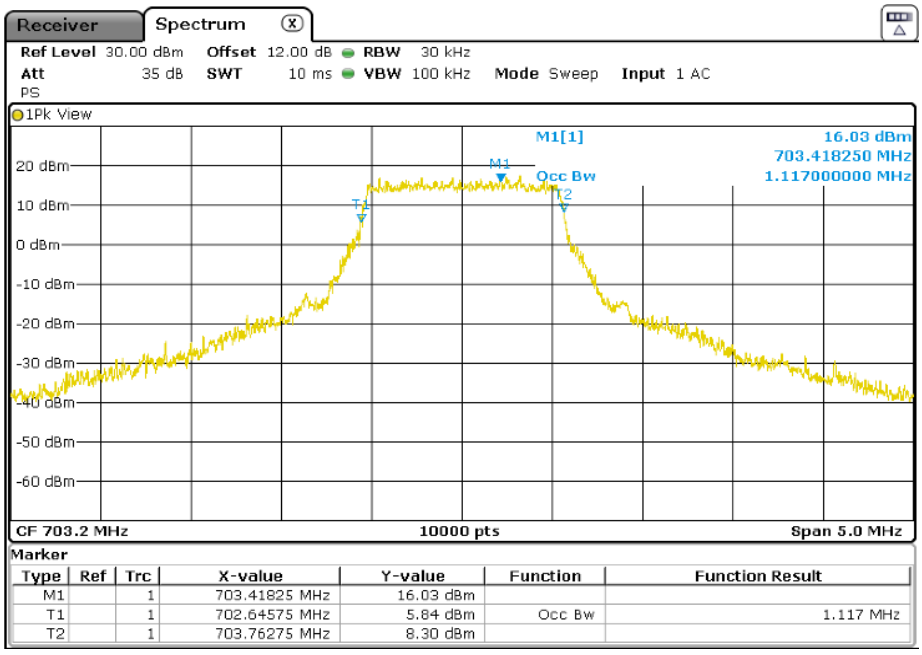
LTE 16QAM MODULATION. BW = 10 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (MHz)	1.11	1.11	1.11
-26 dBc bandwidth (MHz)	1.44	1.46	1.45

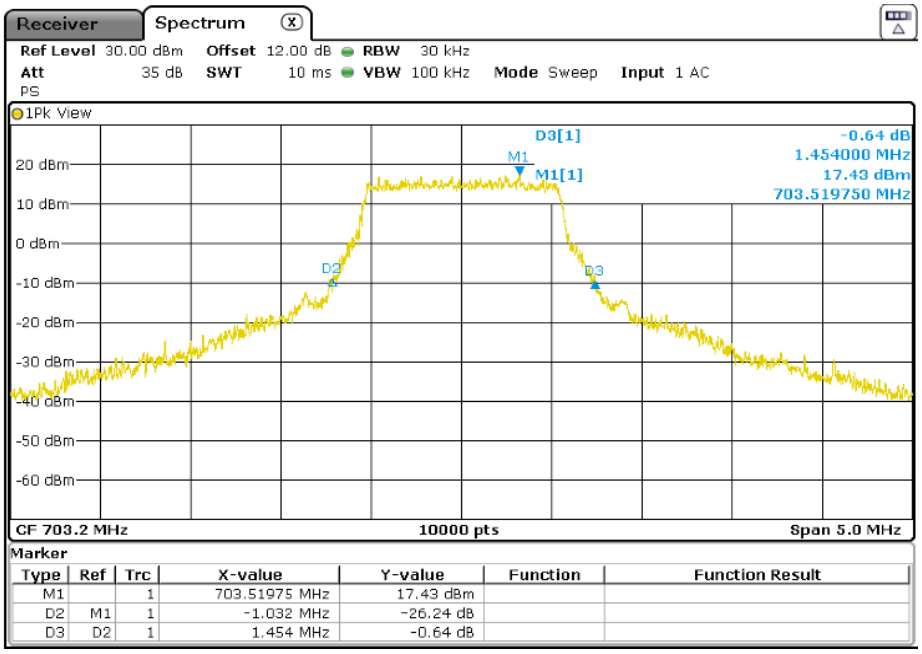
TEST RESULTS (Cont):	

LTE QPSK MODULATION. BW = 5 MHz

Lowest Channel 99% Occupied Bandwidth

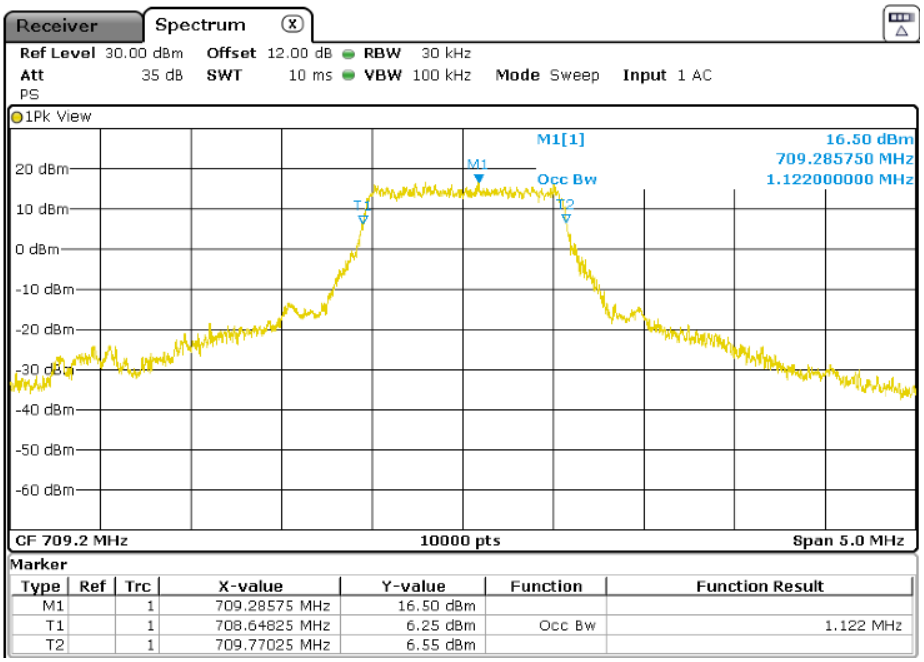


Lowest Channel -26dBc Bandwidth

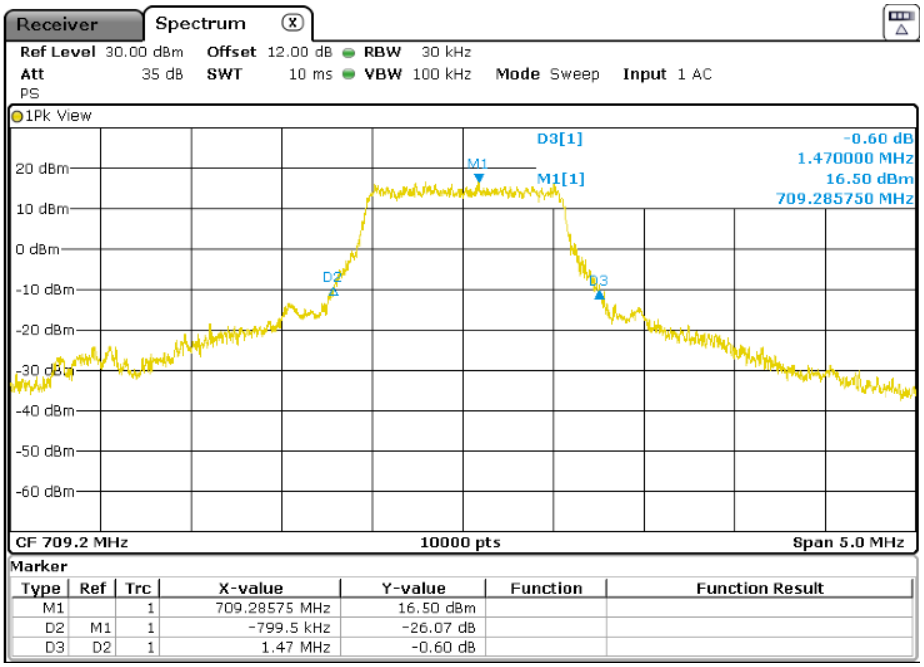


TEST RESULTS (Cont):	

Middle Channel 99% Occupied Bandwidth

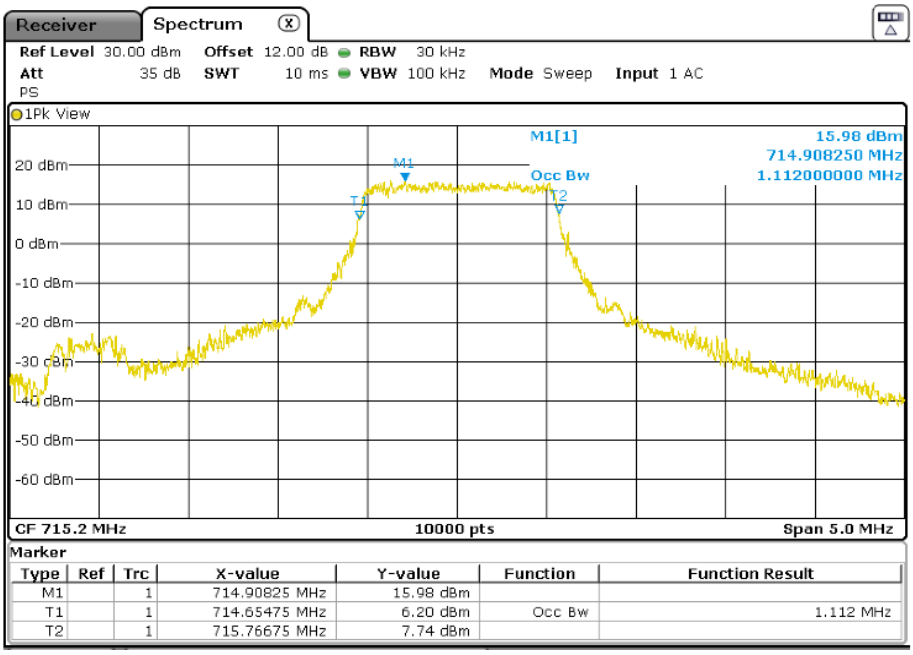


Middle Channel -26dBc Bandwidth

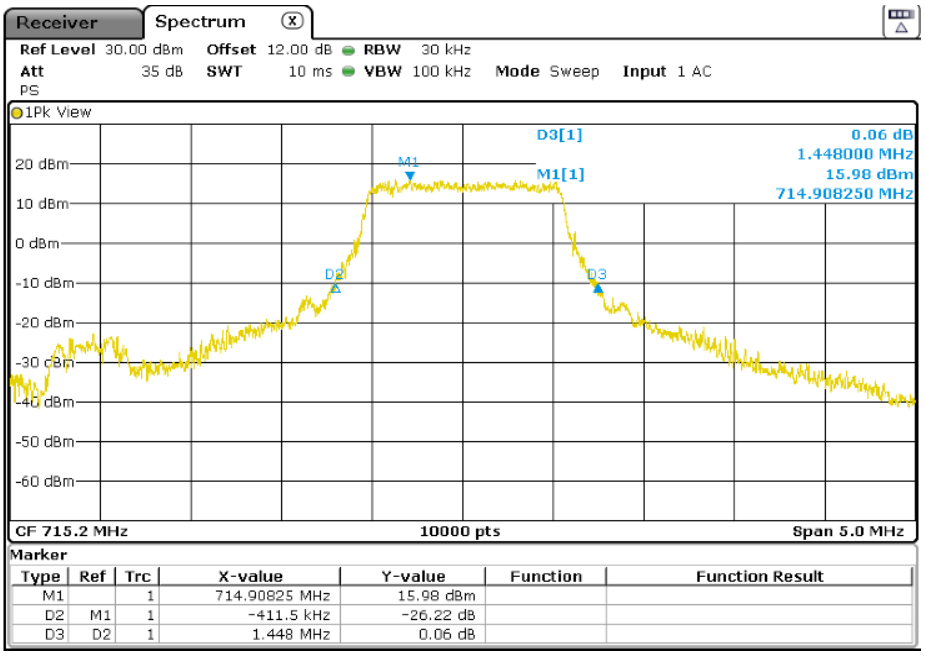


TEST RESULTS (Cont):	

Highest Channel 99% Occupied Bandwidth



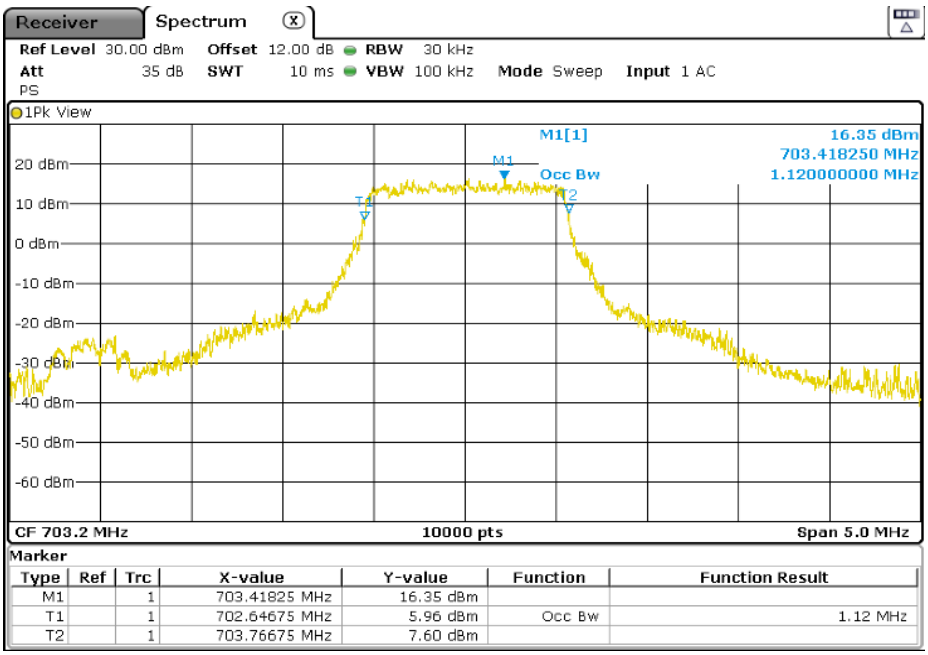
Highest Channel -26dBc Bandwidth



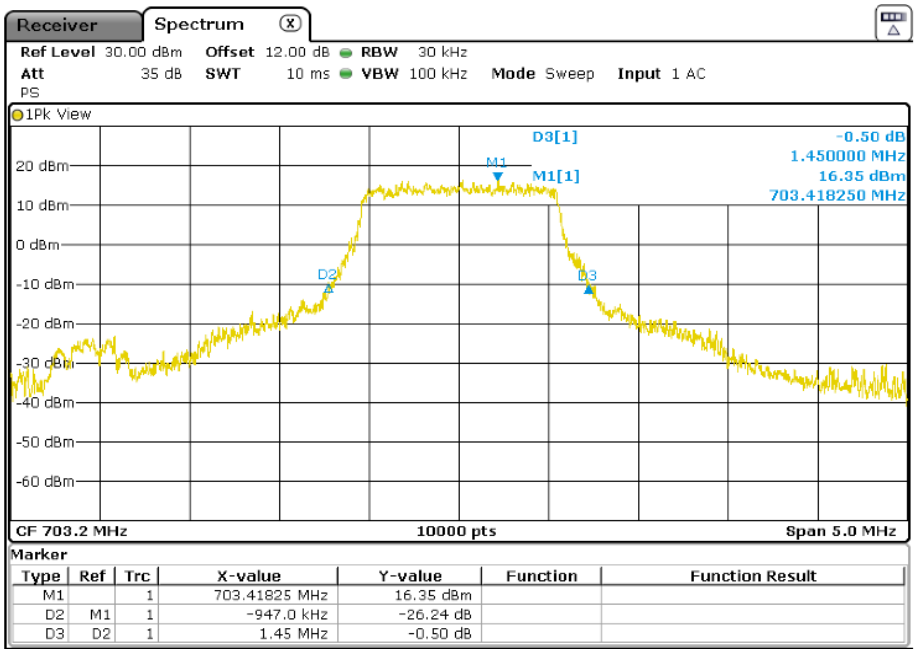
TEST RESULTS (Cont):	

LTE 16QAM MODULATION. BW = 5 MHz

Lowest Channel 99% Occupied Bandwidth

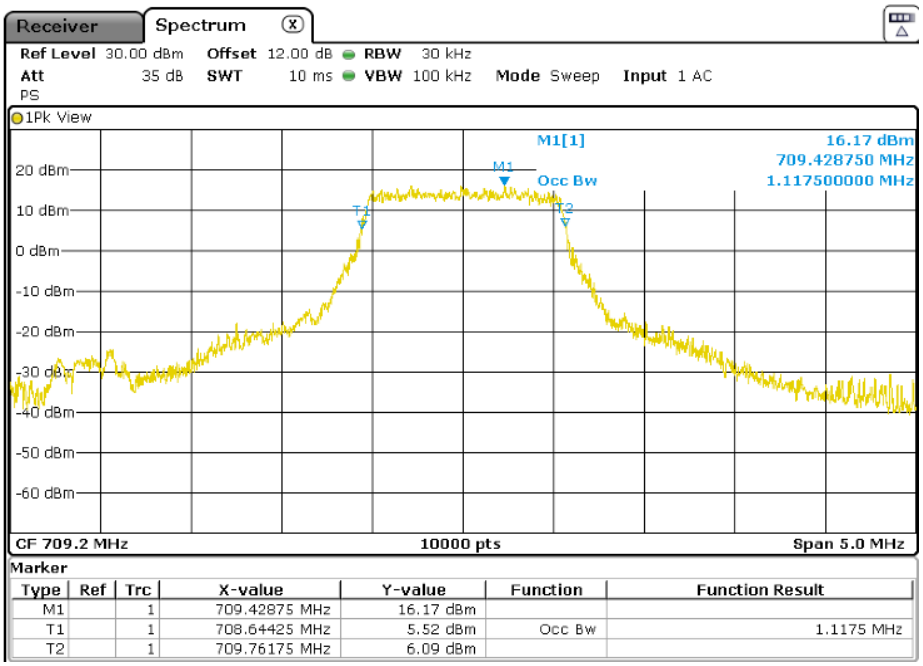


Lowest Channel -26dBc Bandwidth

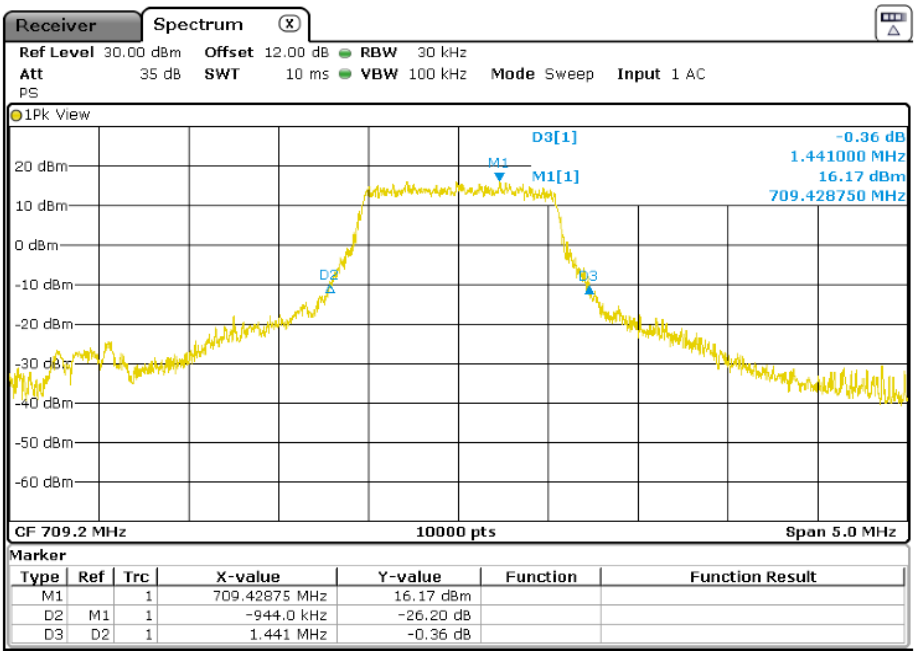


TEST RESULTS (Cont):	

Middle Channel 99% Occupied Bandwidth

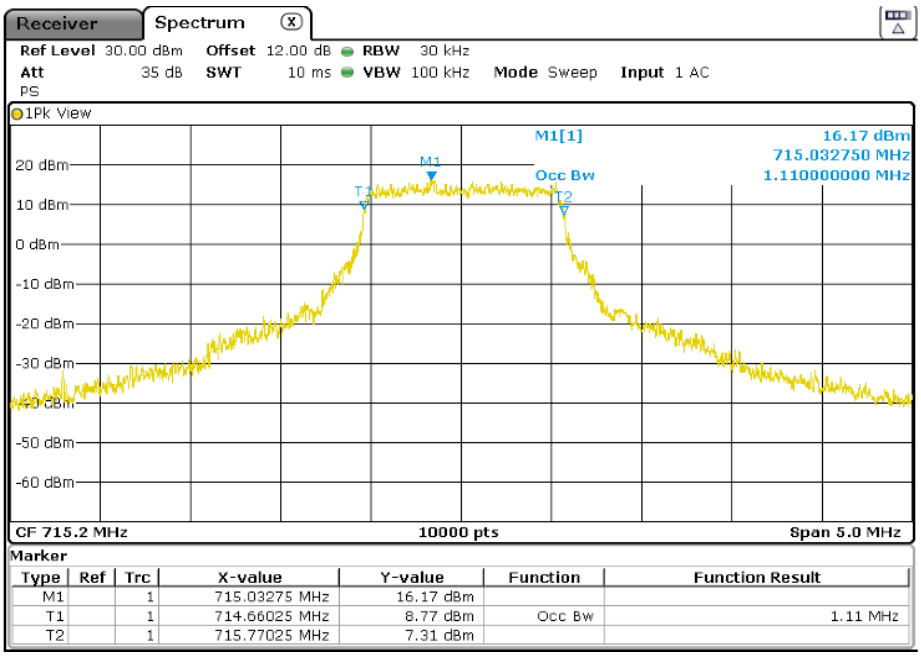


Middle Channel -26dBc Bandwidth

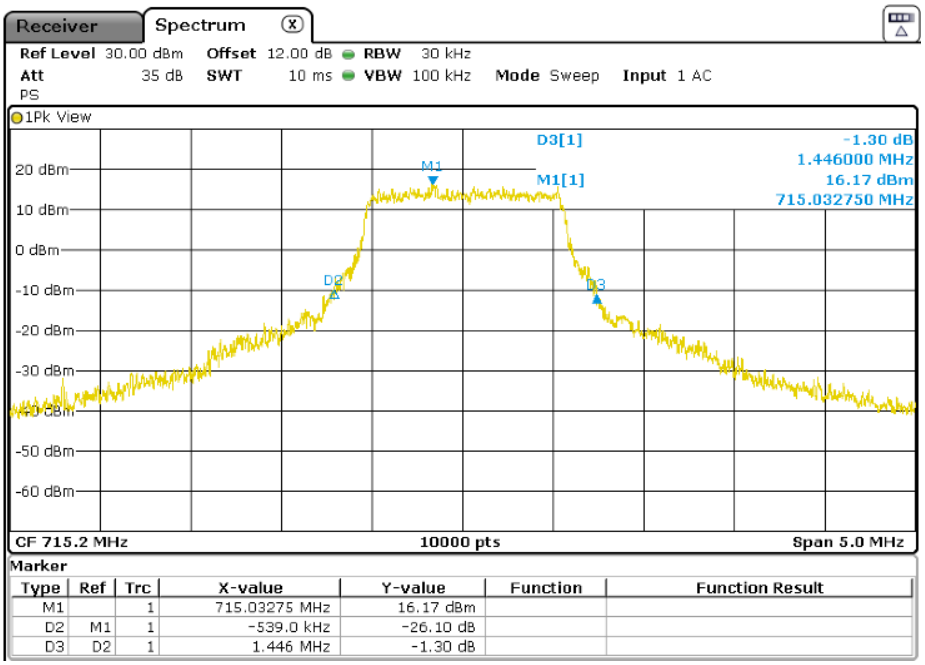


TEST RESULTS (Cont):	

Highest Channel 99% Occupied Bandwidth



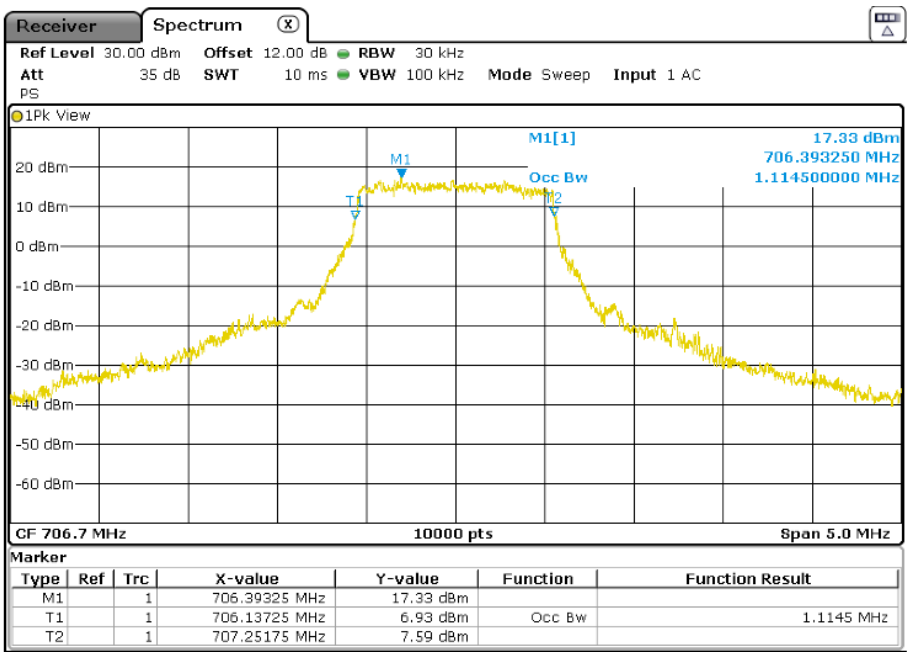
Highest Channel -26dBc Bandwidth



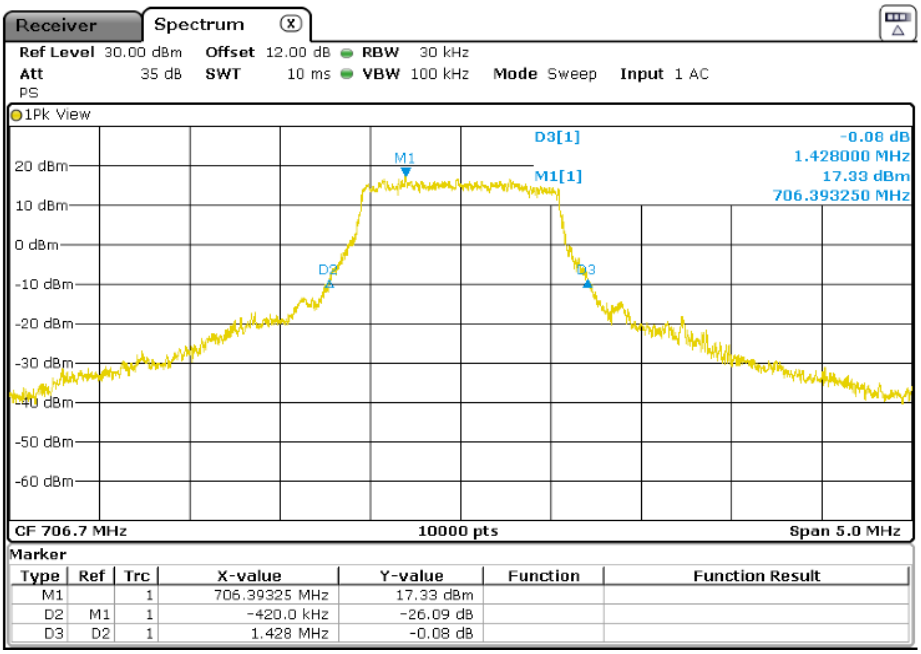
TEST RESULTS (Cont):	

LTE QPSK MODULATION. BW = 10 MHz

Lowest Channel 99% Occupied Bandwidth

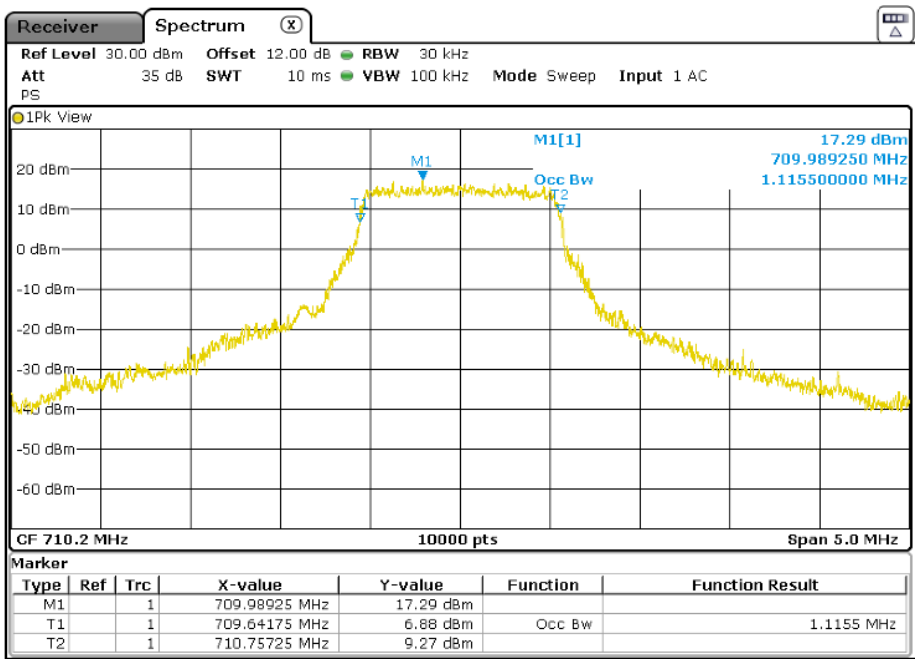


Lowest Channel -26dBc Bandwidth

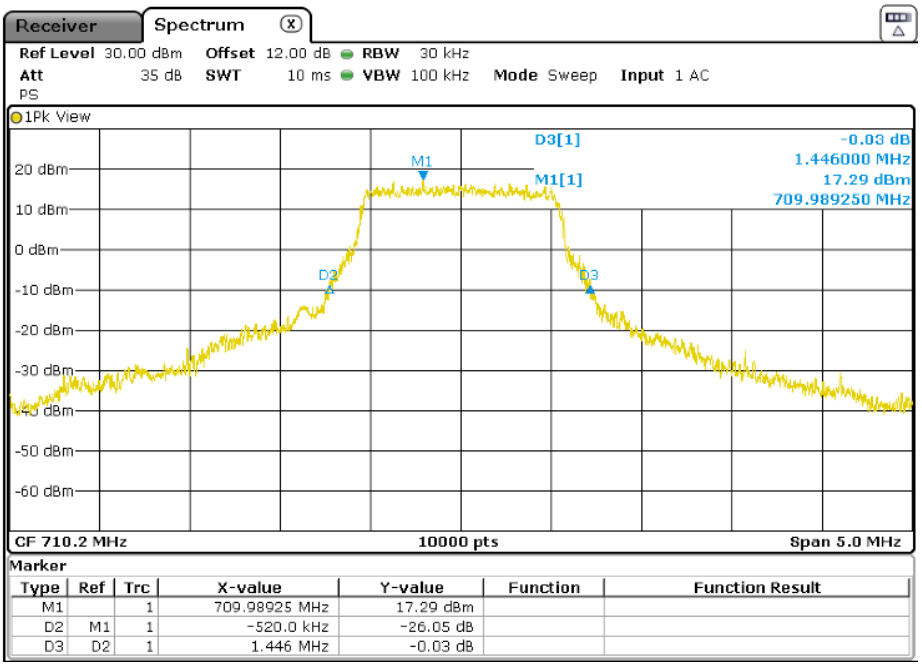


TEST RESULTS (Cont):	

Middle Channel 99% Occupied Bandwidth

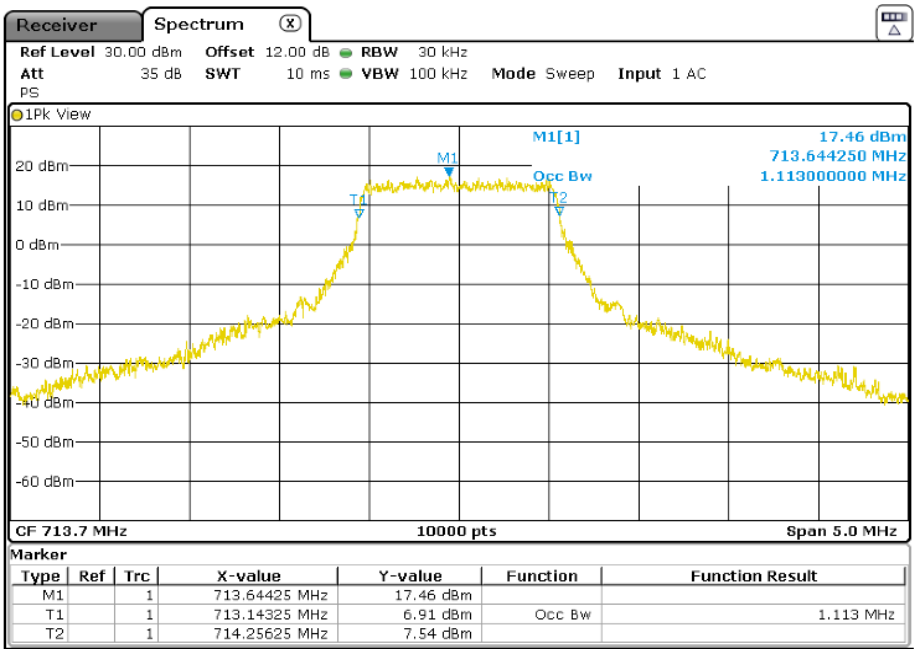


Middle Channel -26dBc Bandwidth

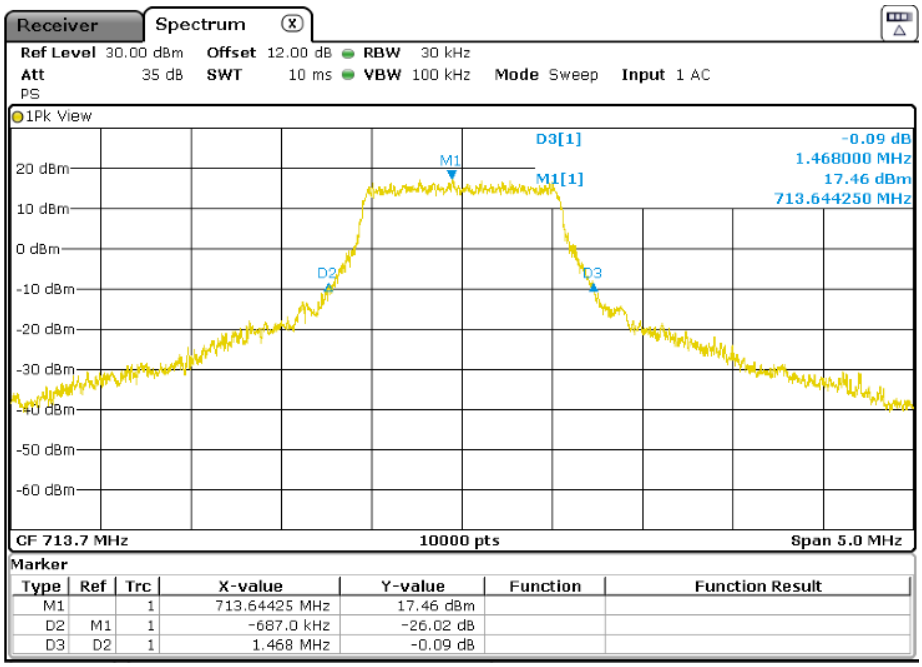


TEST RESULTS (Cont):	

Highest Channel 99% Occupied Bandwidth



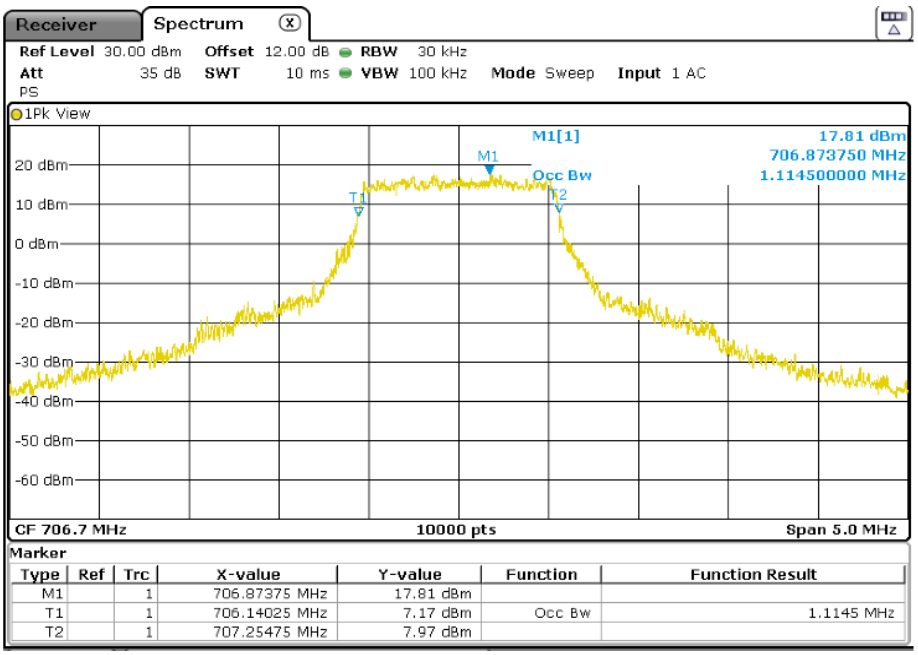
Highest Channel -26dBc Bandwidth



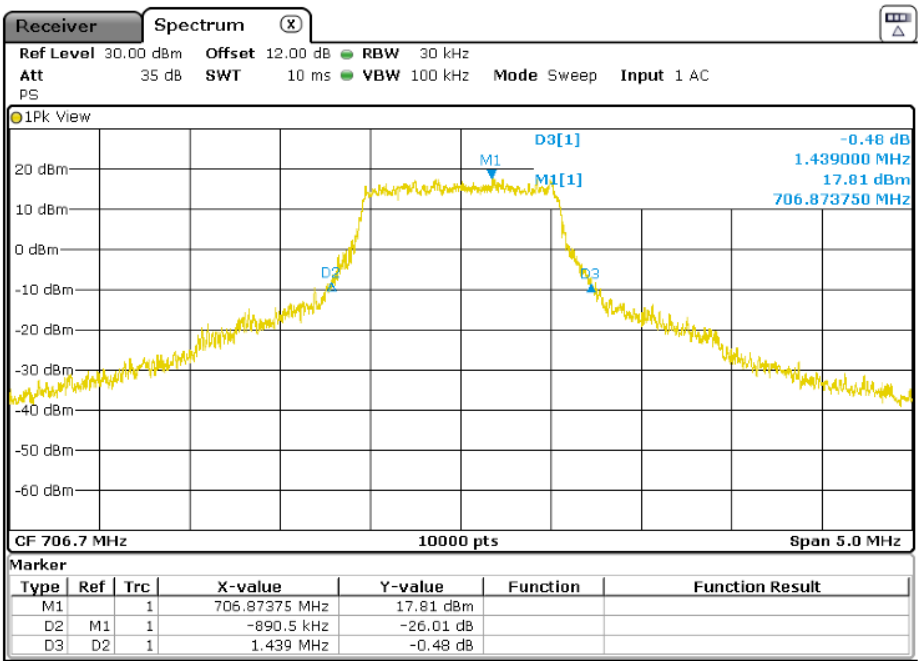
TEST RESULTS (Cont):	

LTE 16QAM MODULATION. BW = 10 MHz

Lowest Channel 99% Occupied Bandwidth

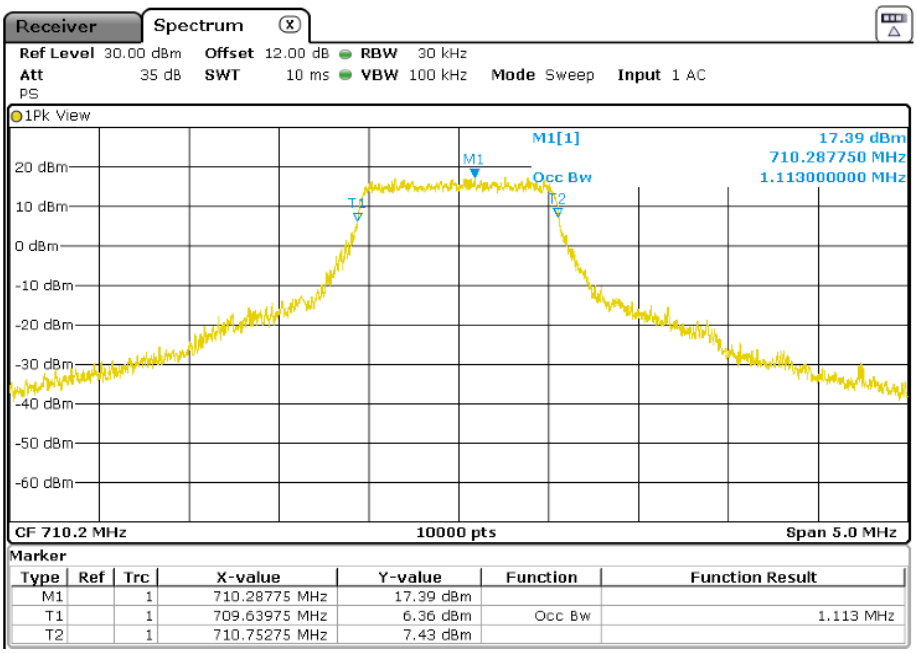


Lowest Channel -26dBc Bandwidth

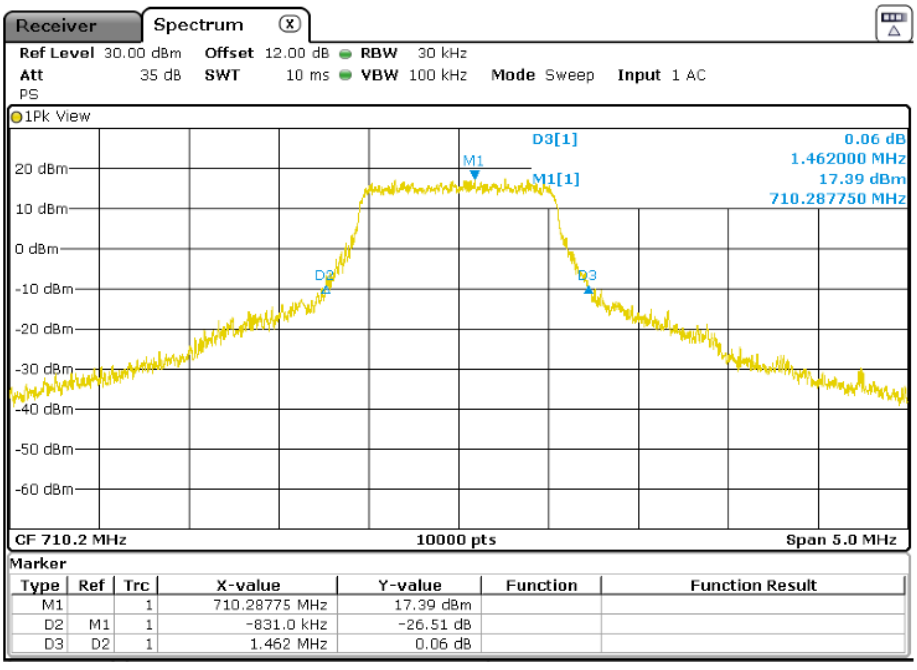


TEST RESULTS (Cont):	

Middle Channel 99% Occupied Bandwidth

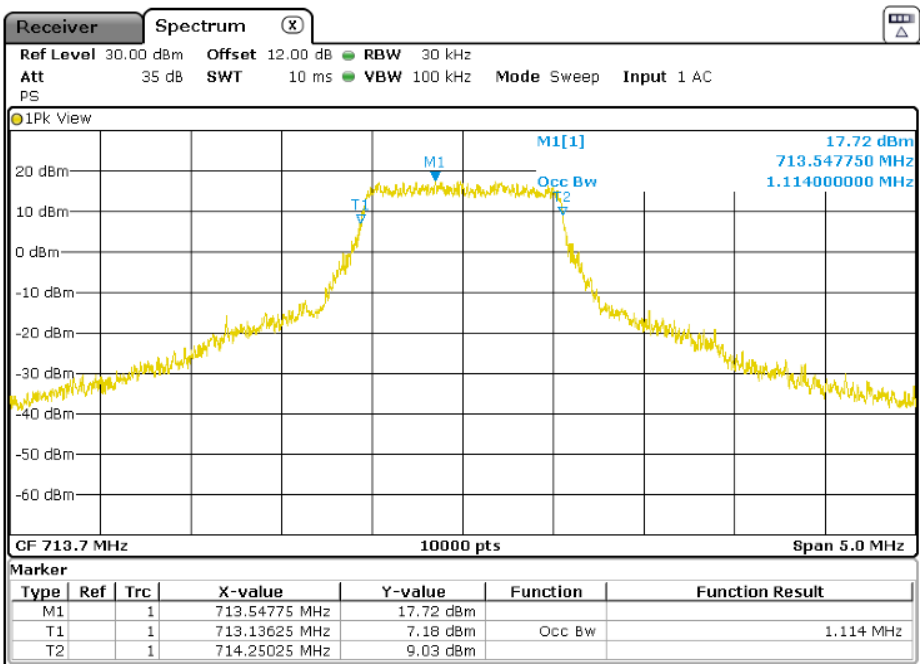


Middle Channel -26dBc Bandwidth

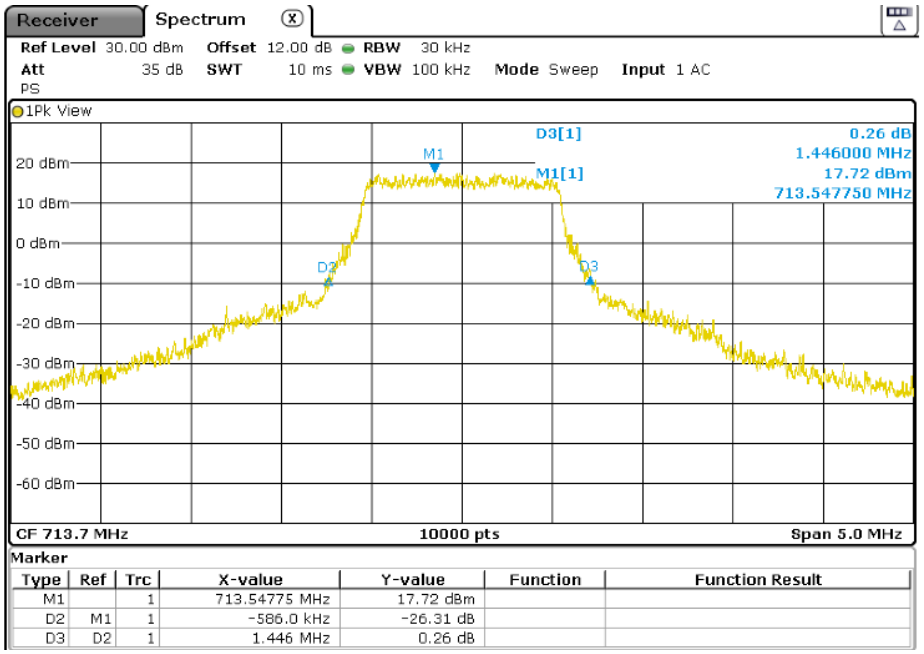


TEST RESULTS (Cont):	

Highest Channel 99% Occupied Bandwidth



Highest Channel -26dBc Bandwidth



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#03 (Band 13)
TEST RESULTS:	PASS

LTE QPSK MODULATION. BW = 5 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (MHz)	1.11	1.11	1.11
-26 dBc bandwidth (MHz)	1.46	1.45	1.45

LTE 16QAM MODULATION. BW = 5 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (MHz)	1.11	1.11	1.11
-26 dBc bandwidth (MHz)	1.43	1.42	1.44

LTE QPSK MODULATION. BW = 10 MHz

Channel	Middle
99% Occupied bandwidth (MHz)	1.11
-26 dBc bandwidth (MHz)	1.39

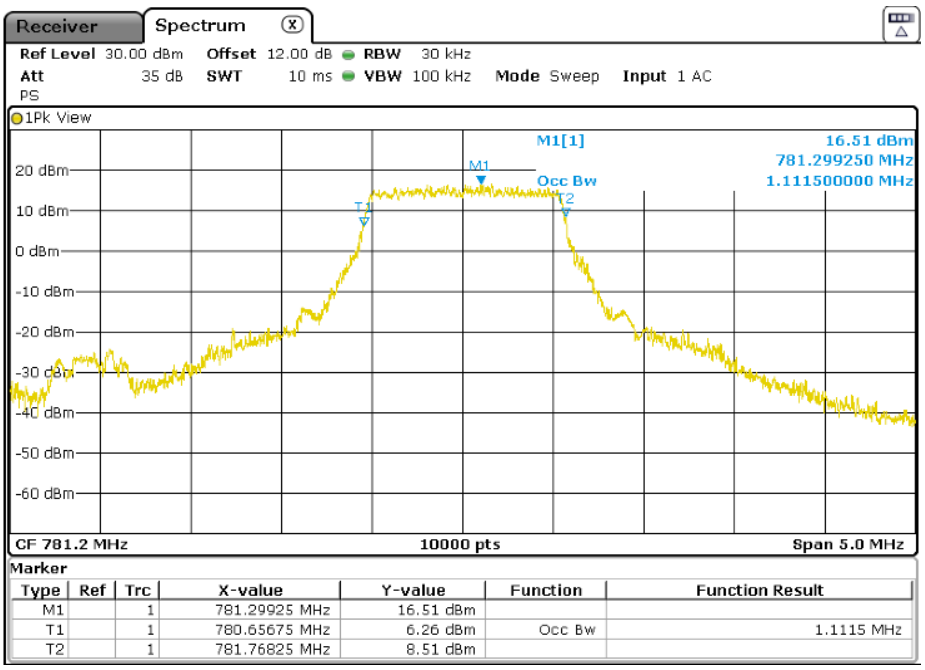
LTE 16QAM MODULATION. BW = 10 MHz

Channel	Middle
99% Occupied bandwidth (MHz)	1.11
-26 dBc bandwidth (MHz)	1.47

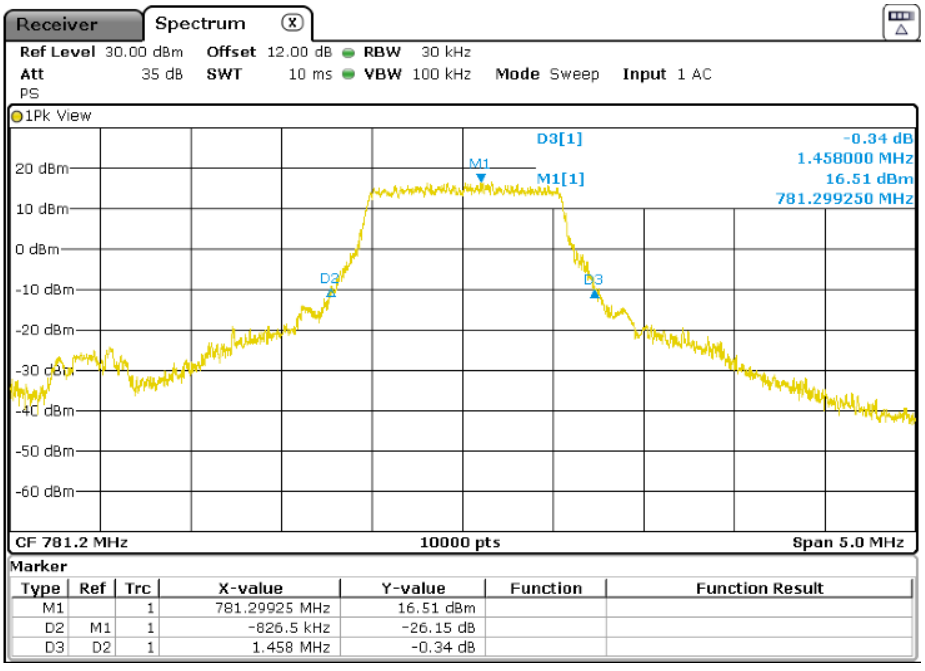
TEST RESULTS (Cont):	

LTE QPSK MODULATION. BW = 5 MHz

Lowest Channel 99% Occupied Bandwidth

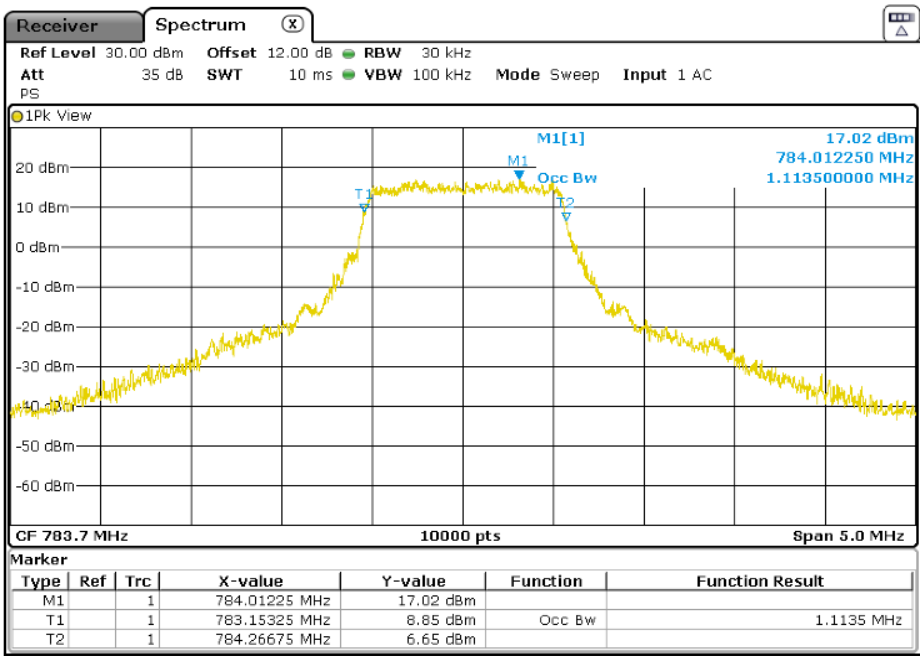


Lowest Channel -26dBc Bandwidth

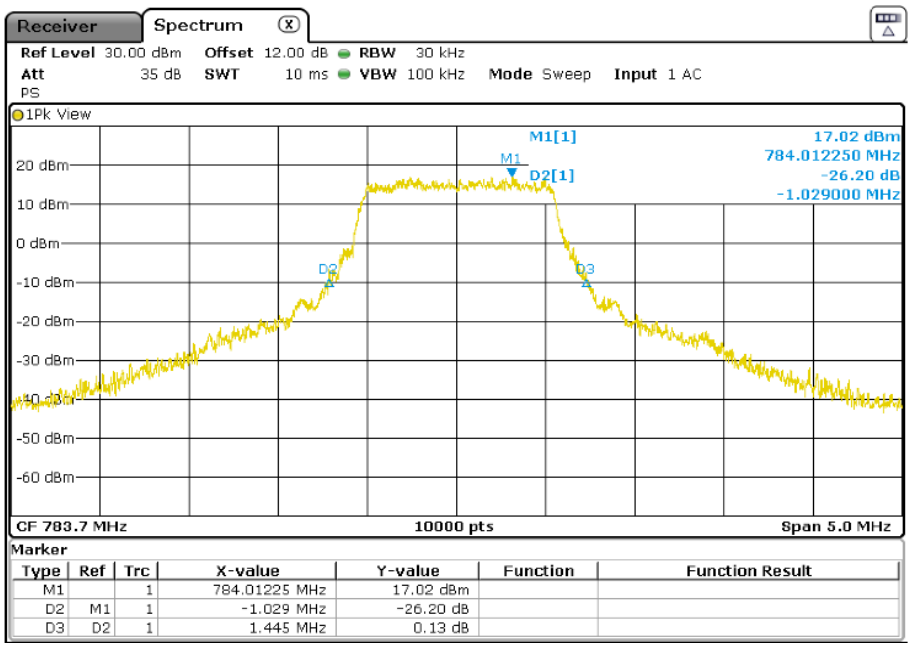


TEST RESULTS (Cont):	

Middle Channel 99% Occupied Bandwidth

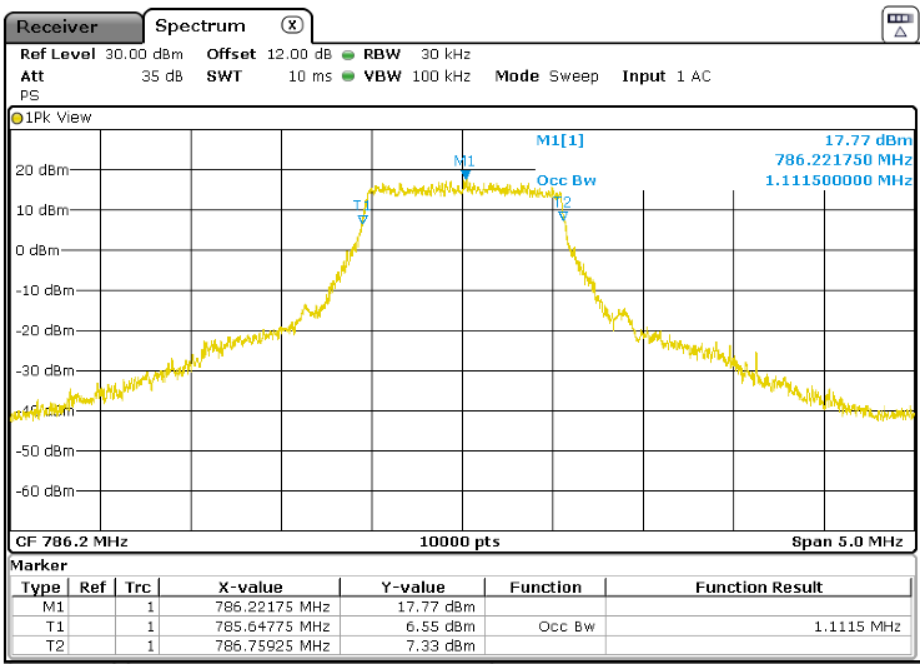


Middle Channel -26dBc Bandwidth

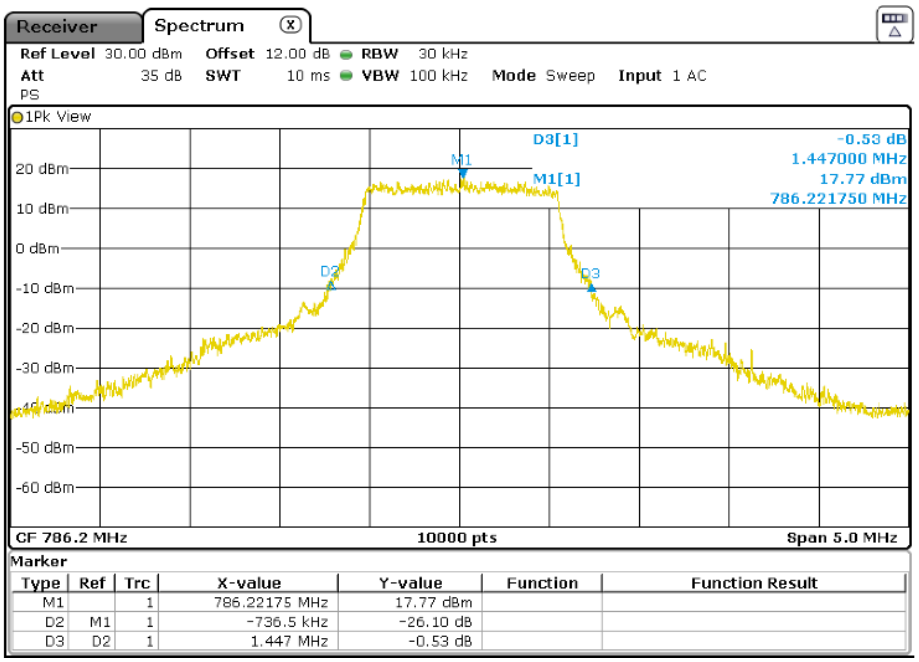


TEST RESULTS (Cont):	

Highest Channel 99% Occupied Bandwidth



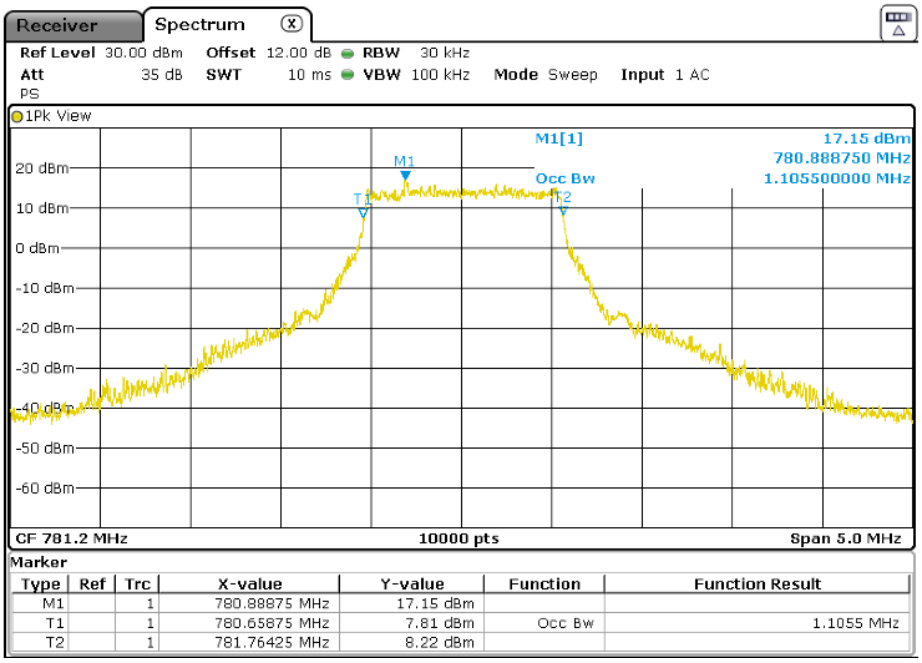
Highest Channel -26dBc Bandwidth



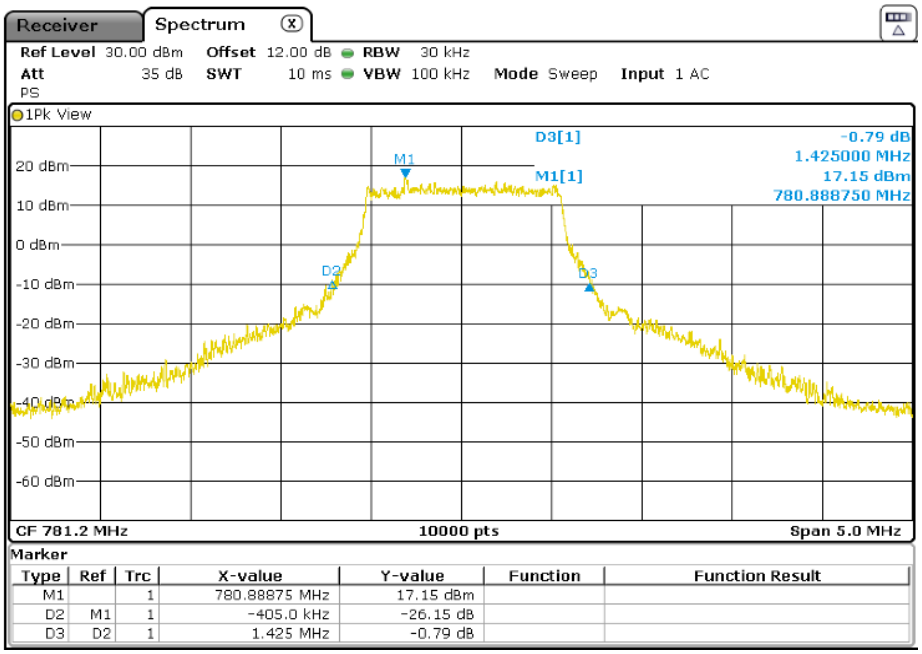
TEST RESULTS (Cont):	

LTE 16QAM MODULATION. BW = 5 MHz

Lowest Channel 99% Occupied Bandwidth

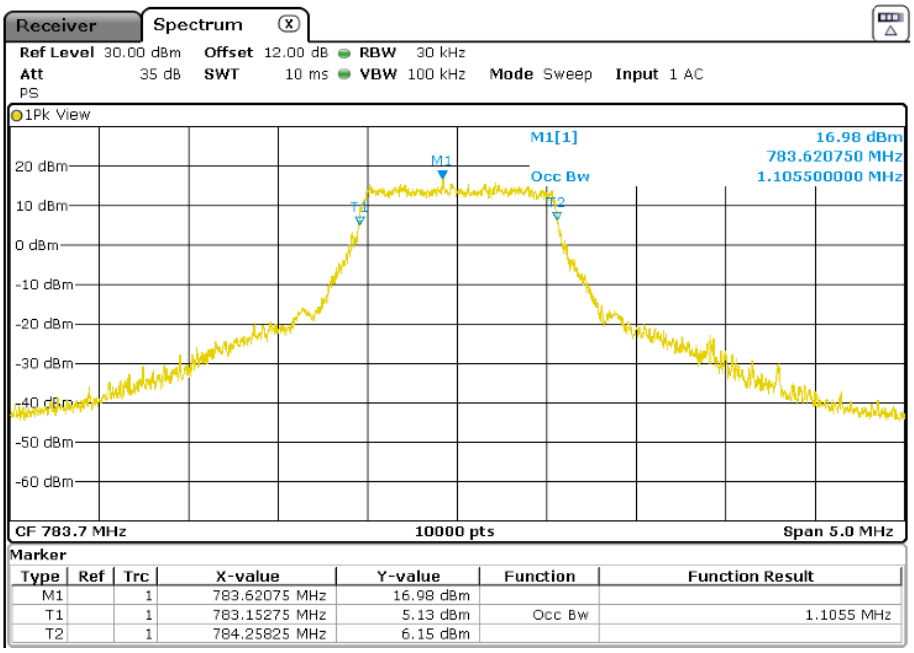


Lowest Channel -26dBc Bandwidth

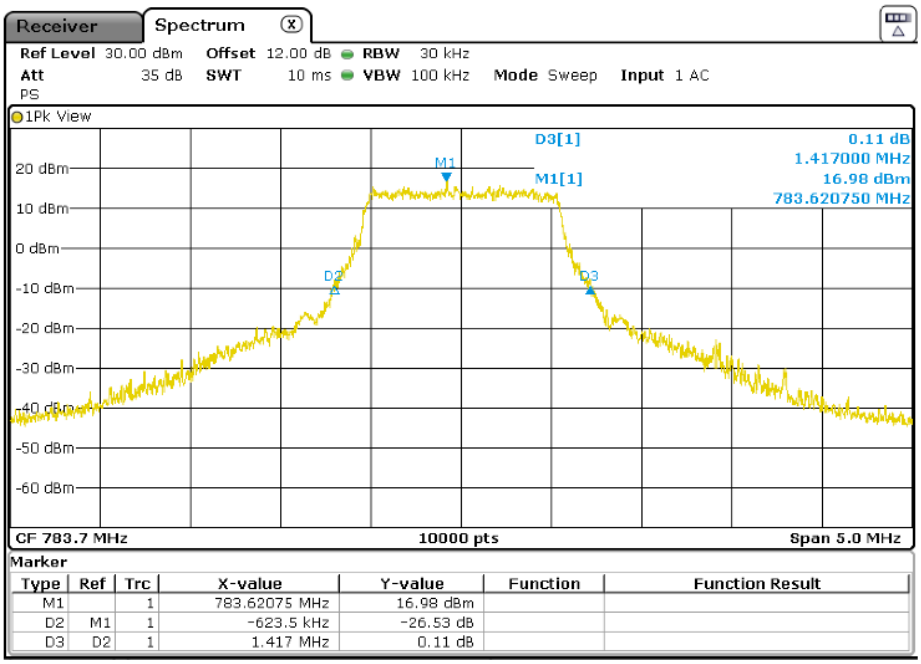


TEST RESULTS (Cont):	

Middle Channel 99% Occupied Bandwidth

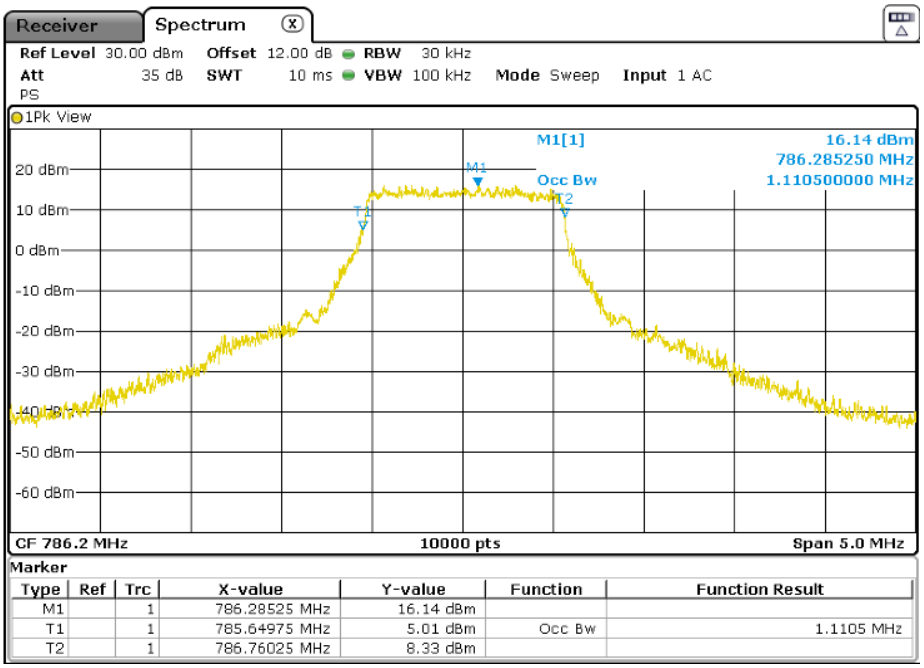


Middle Channel -26dBc Bandwidth

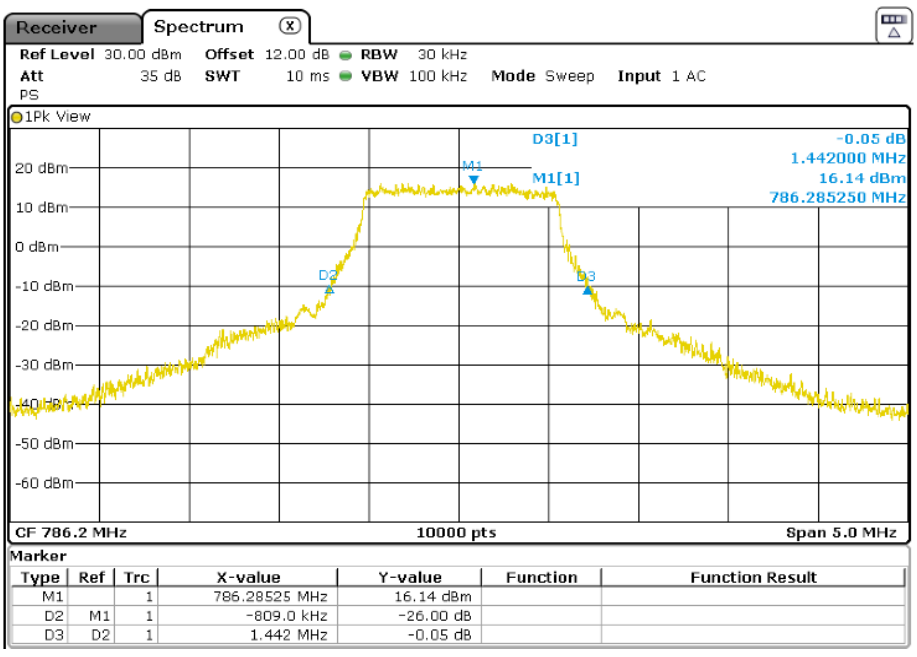


TEST RESULTS (Cont):	

Highest Channel 99% Occupied Bandwidth



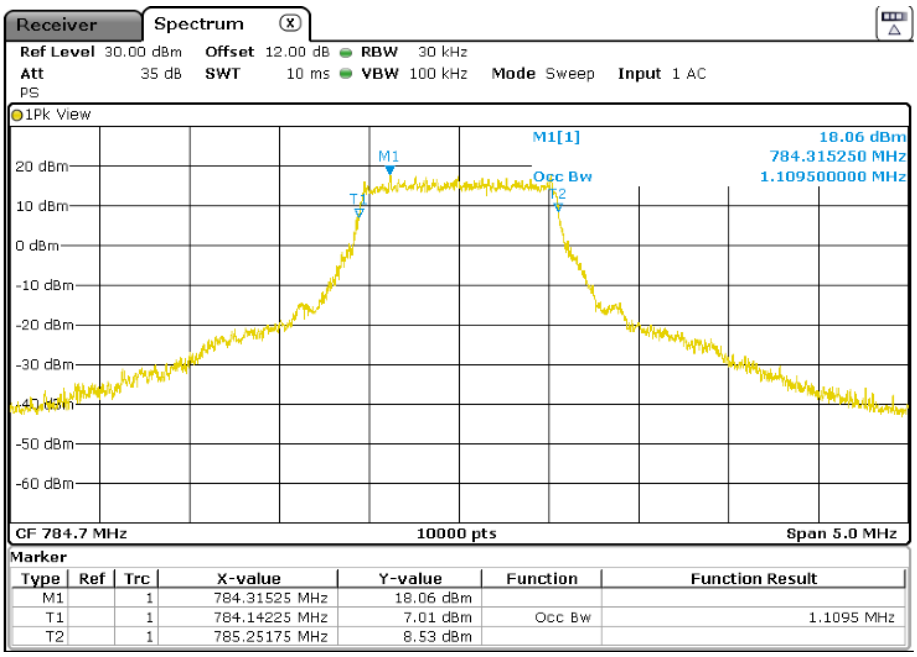
Highest Channel -26dBc Bandwidth



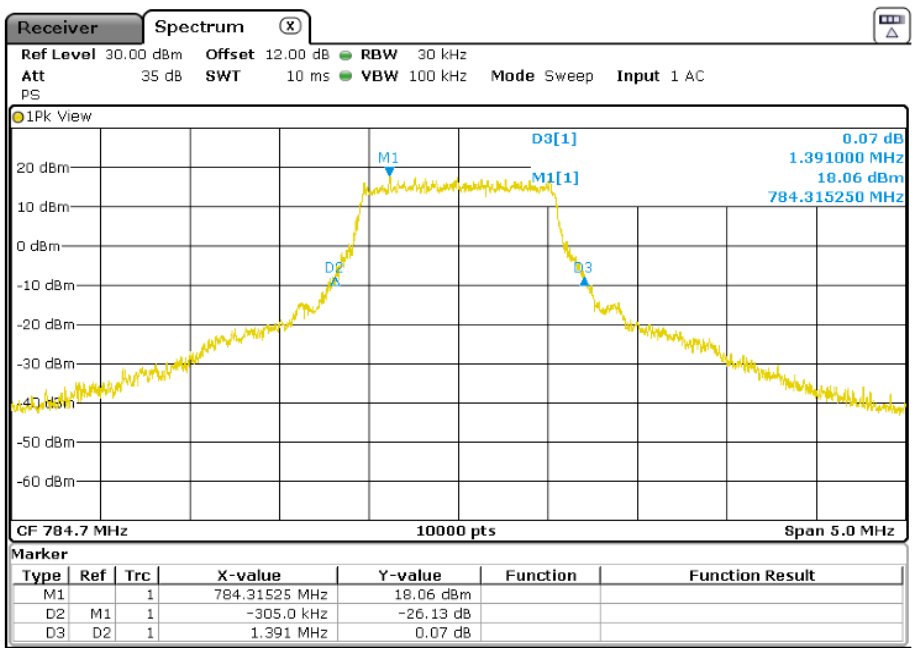
TEST RESULTS (Cont):	

LTE QPSK MODULATION. BW = 10 MHz

Middle Channel 99% Occupied Bandwidth



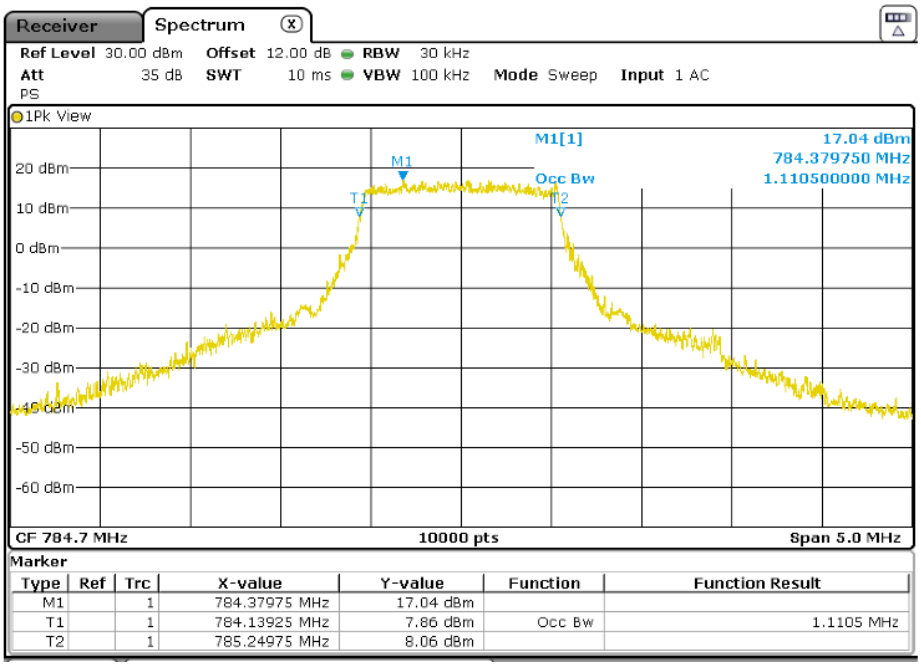
Middle Channel -26dBc Bandwidth



TEST RESULTS (Cont):	

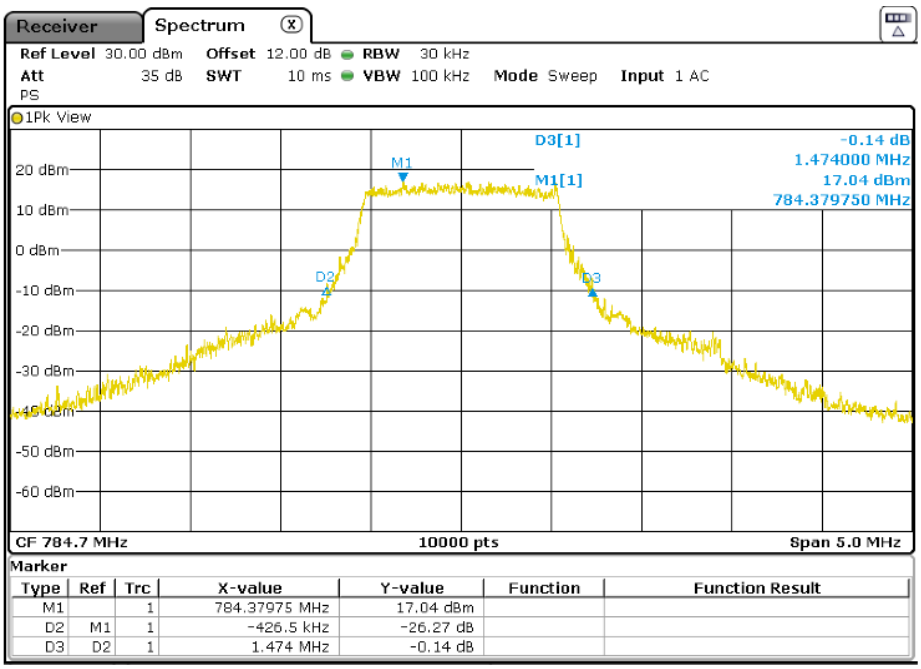
LTE 16QAM MODULATION. BW = 10 MHz

Middle Channel 99% Occupied Bandwidth



Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	784.37975 MHz	17.04 dBm		
T1		1	784.13925 MHz	7.86 dBm	Occ Bw	1.1105 MHz
T2		1	785.24975 MHz	8.06 dBm		

Middle Channel -26dBc Bandwidth



Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	784.37975 MHz	17.04 dBm		
D2	M1	1	-426.5 kHz	-26.27 dB		
D3	D2	1	1.474 MHz	-0.14 dB		