TEST REPORT

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KCTL

1. Client

- Name : Samsung Electronics Co., Ltd.
- Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
- Date of Receipt : 2020-04-03

2. Use of Report : Certification

3. Name of Product and Model : Smart Wearable / SM-R855U

4. Manufacturer and Country of Origin: Samsung Electronics Co., Ltd. / Vietnam

5. FCC ID : A3LSMR855

6. IC Certification No. : 649E-SMR855

7. Date of Test : 2020-04-14 to 2020-05-20

8. Location of Test : ■ Permanent Testing Lab □ On Site Testing (Address: Address of testing location)

9. Test method used : FCC Part 2 / RSS-Gen Issue 5
FCC Part 22 subpart H / RSS-132 Issue 3
FCC Part 24 subpart E / RSS-133 Issue 6
FCC Part 27 subpart C / RSS-130 Issue 2, RSS-139 Issue 3

10. Test Results : Refer to the test result in the test report

Affirmation	Tested by Name : Kwonse Kim (Signature)	Technical Manager Name : Seungyong Kim (Signature)

2020-05-25

KCTL Inc.

REPORT REVISION HISTORY

Date	Revision	Page No
2020-05-24	Originally issued	-
2020-05-25	Updated	6, 131, 185

Note. The report No. KR20-SRF0136 is superseded by the report No. KR20-SRF0136-A.

General remarks for test reports

Nothing significant to report.

CONTENTS

1. General information

Client	:	Samsung Electronics Co., Ltd.
Address	:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Manufacturer	:	Samsung Electronics Co., Ltd.
Address	:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Laboratory	:	KCTL Inc.
Address	:	65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea
Accreditations	:	FCC Site Designation No: KR0040, FCC Site Registration No: 687132 VCCI Registration No. : R-20080, G-20078, C-20059, T-20056 Industry Canada Registration No. : 8035A KOLAS No.: KT231

2. Device information

Equipment under test	:	Smart Wearable
Model	:	SM-R855U
Derivative model	:	SM-R855F
Modulation technique	:	Bluetooth(BDR/EDR)_ GFSK, π/4DQPSK, 8DPSK Bluetooth(BLE)_GFSK WIFI(802.11b/g/n20)_DSSS, OFDM LTE_QPSK, 16QAM
Number of channels	:	Bluetooth(BDR/EDR)_79 ch Bluetooth(BLE)_40 ch WIFI(802.11b/g/n20)_13 ch
Power source	:	DC 3.85 V
Antenna specification	:	LTE/WCDMA_PIFA (Housing metal) Antenna WIFI/Bluetooth(BDR/EDR/BLE)_LDS Antenna
Antenna gain	:	WIFI/Bluetooth(BDR/EDR/BLE) : -6.34 dBi

Frequency range	:	Bluetooth(BDR/EDR/BLE)_2 402 ㎒ ~ 2 480 ㎒
		WIFI(802.11b/g/n20)_2 412 ㎒ ~ 2 472 ㎒
		LTE Band 2_1 850.7 ㎒ ~ 1 909.3 ㎒
		LTE Band 4_1 710.7 ㎒ ~ 1 754.3 ㎒
		LTE Band 5_824.7 ㎒ ~ 848.3 ㎒
		LTE Band 12_699.7 ㎒ ~ 715.3 ㎒
		LTE Band 13_779.5 ㎒ ~ 784.5 ㎒
		LTE Band 25_1 850.7 ㎒ ~ 1 914.3 ㎒
		LTE Band 26_824.7 ㎒ ~ 848.3 ㎒, 814.7 ㎒ ~ 823.3 ㎒
		LTE Band 66_1 710.7 ㎒ ~ 1 779.3 ㎒
		LTE Band 71_665.5 ㎒ ~ 688.0 ㎒
		WCDMA 850_826.4 ㎒ ~ 846.6 ㎒
		WCDMA 1700_1 712.4 ㎒ ~ 1 752.6 ㎒
		WCDMA 1900_1 852.4 ㎒ ~ 1 907.6 ㎒
Software version	:	SM-R855U_R855U.001, SM-R855F_R855F.001
Hardware version	:	REV1.0
Test device serial No.	:	Conducted(R3AN300BVQH)
		Radiated(R3AN300B2AP, R3AN300AZXW, R3AN301WD1E)
Operation temperature	:	-30 ℃ ~ 50 ℃

2.1. Accessory information

Equipment	Manufacturer	Model	Serial No.	Power source	FCC ID & IC
Wireless charger	Samsung Electronics Co., Ltd.	EP-OR825	-	DC 5.0 V, 1.0 A	A3LEPOR825 / 649E-EPOR825

2.2. Model Information

The difference between basic model (SM-R855U) and derivative model (SM-R855F) is:

H/W is identical with the basic model and software is as follows.
a. RF Supported Band is Different.
(R855U: 3G (B2, B4, B5), 4G (B2, B4, B5, B12, B13, B25, B26, B66, B71))
(R855F: 3G (B1, B2, B4, B5, B8), 4G (B1, B2, B3, B4, B5, B7, B8, B12, B13, B20, B25, B28, B66))
- In EUR R855F : 3G (B1, B5, B8), 4G(B1, B3, B5, B7, B8, B20, B28)
b. All other protocol part is same.
c. All other features of Volte, SUPL is same.
d. In USA & Canada, 4G (B7) disabled by MCC code.
Because device doesn't support B7 roaming in USA & Canada.

2.3. Frequency/channel operations

This device contains the following capabilities:
2.4㎓ WIFI(802.11b/g/n(HT20)), Bluetooth(BDR/EDR/BLE), LTE Band 2, LTE Band 4, LTE Band 5, LTE Band 12, LTE Band 13, LTE Band 25, LTE Band 26, LTE Band 66, LTE Band 71, WCDMA 850, WCDMA 1700, WCDMA 1900

LTE Band 2

Ch.	Frequency (㎒)
18607	1 850.7
18900	1 880.0
19193	1 909.3

Table 2.3.1. 1.4M BW

Ch.	Frequency (㎒)
18615	1 851.5
18900	1 880.0
19185	1 908.5

Table 2.3.2. 3M BW

Ch.	Frequency (㎒)
18625	1 852.5
18900	1 880.0
19175	1 907.5

Table 2.3.3. 5M BW

Ch.	Frequency (㎒)
18650	1 855.0
18900	1 880.0
19150	1 905.0

Table 2.3.4. 10M BW

Ch.	Frequency (㎒)
18675	1 857.5
18900	1 880.0
19125	1 902.5

Table 2.3.5. 15M BW

Ch.	Frequency (㎒)
18700	1 860.0
18900	1 880.0
19100	1 900.0

Table 2.3.6. 20M BW

LTE Band 4

Ch.	Frequency (㎒)
19957	1 710.7
20175	1 732.5
20393	1 754.3

Table 2.3.7. 1.4M BW

Ch.	Frequency (㎒)
19965	1 711.5
20175	1 732.5
20385	1 753.5

Table 2.3.8. 3M BW

Ch.	Frequency (㎒)
19975	1 712.5
20175	1 732.5
20375	1 752.5

Table 2.3.9. 5M BW

Ch.	Frequency (㎒)
20000	1 715.0
20175	1 732.5
20350	1 750.0

Table 2.3.10. 10M BW

Ch.	Frequency (㎒)
20025	1 717.5
20175	1 732.5
20325	1 747.5

Table 2.3.11. 15M BW

Ch.	Frequency (㎒)
20050	1 720.0
20175	1 732.5
20300	1 745.0

Table 2.3.12. 20M BW

LTE Band 5

Ch.	Frequency (㎒)
20407	824.7
20525	836.5
20643	848.3

Table 2.3.13. 1.4M BW

Ch.	Frequency (㎒)
20415	825.5
20525	836.5
20635	847.5

Table 2.3.14. 3M BW

Ch.	Frequency (㎒)
20425	826.5
20525	836.5
20625	846.5

Table 2.3.15. 5M BW

Ch.	Frequency (㎒)
20450	829.0
20525	836.5
20600	844.0

Table 2.3.16. 10M BW

LTE Band 12

Ch.	Frequency (㎒)
23017	699.7
23095	707.5
23173	715.3

Table 2.3.17. 1.4M BW

Ch.	Frequency (㎒)
23025	700.5
23095	707.5
23165	714.5

Table 2.3.18. 3M BW

Ch.	Frequency (㎒)
23035	701.5
23095	707.5
23155	713.5

Table 2.3.19. 5M BW

Ch.	Frequency (㎒)
23060	704.0
23095	707.5
23130	711.0

Table 2.3.20. 10M BW

LTE Band 13

Ch.	Frequency (㎒)
23205	779.5
23230	782.0
23255	784.5

Table 2.3.21. 5M BW

Ch.	Frequency (㎒)
-	-
23230	782.0
-	-

Table 2.3.22. 10M BW

LTE Band 25

Ch.	Frequency (MHz)
26047	1 850.7
26365	1 882.5
26683	1 914.3

Table 2.3.23. 1.4M BW

Ch.	Frequency (MHz)
26055	1 851.5
26365	1 882.5
26675	1 913.5

Table 2.3.24. 3M BW

Ch.	Frequency (MHz)
26065	1 852.5
26365	1 882.5
26665	1 912.5

Table 2.3.25. 5M BW

Ch.	Frequency (MHz)
26090	1 855.0
26365	1 882.5
26640	1 910.0

Table 2.3.26. 10M BW

Ch.	Frequency (MHz)
26115	1 857.5
26365	1 882.5
26615	1 907.5

Table 2.3.27. 15M BW

Ch.	Frequency (MHz)
26140	1 860.0
26365	1 882.5
26590	1 905.0

Table 2.3.28. 20M BW

LTE Band 26

Ch.	Frequency (MHz)
26797	824.7
26915	836.5
27033	848.3

Table 2.3.29. 1.4M BW

Ch.	Frequency (MHz)
26805	825.5
26915	836.5
27025	847.5

Table 2.3.30. 3M BW

Ch.	Frequency (MHz)
26815	826.5
26915	836.5
27015	846.5

Table 2.3.31. 5M BW

Ch.	Frequency (MHz)
26840	829.0
26915	836.5
26990	844.0

Table 2.3.32. 10M BW

Ch.	Frequency (MHz)
26865	831.5
26915	836.5
26965	841.5

Table 2.3.33. 15M BW

LTE Band 66

Ch.	Frequency (MHz)
131979	1 710.7
132322	1 745.0
132665	1 779.3

Table 2.3.34. 1.4M BW

Ch.	Frequency (MHz)
131987	1 711.5
132322	1 745.0
132657	1 778.5

Table 2.3.35. 3M BW

Ch.	Frequency (MHz)
131997	1 712.5
132322	1 745.0
132647	1 777.5

Table 2.3.36. 5M BW

Ch.	Frequency (MHz)
132022	1 715.0
132322	1 745.0
132622	1 775.0

Table 2.3.37. 10M BW

Ch.	Frequency (MHz)
132047	1 717.5
132322	1 745.0
132597	1 772.5

Table 2.3.38. 15M BW

Ch.	Frequency (MHz)
132072	1 720.0
132322	1 745.0
132572	1 770.0

Table 2.3.39. 20M BW

LTE Band 71

Ch.	Frequency (㎒)
133147	665.5
133297	680.5
133447	695.5

Table 2.3.40. 5M BW

Ch.	Frequency (㎒)
133172	668.0
133297	680.5
133422	693.0

Table 2.3.41. 10M BW

Ch.	Frequency (㎒)
133197	670.5
133297	680.5
133397	690.5

Table 2.3.42. 15M BW

Ch.	Frequency (㎒)
133222	673.0
133297	680.5
133372	688.0

Table 2.3.43. 20M BW

Notes:

1. Higher band (824 - 849 ㎒) of Band 26 to cover LTE Band 5 (824 - 849 ㎒) and they have same maximum tune-up power. Therefore, test data provided in this report covers Band 5 as well as Band 26 subpart to Part22.
   As for 814 - 824 ㎒, the lower band (814 - 824 ㎒) of Band 26 is not supported in Canada.

2. LTE Band 66(1 710 – 1 780 ㎒) overlaps the entire frequency range of LTE Band 4(1 710 – 1 755 ㎒) and they have same maximum tune-up power. Therefore, test data provided in this report covers Band 4 as well as Band 66 subpart to Part27.

3. LTE Band 25(1 850 - 1 915 ㎒) overlaps the entire frequency range of LTE Band 2(1 850 - 1 910 ㎒) and they have same maximum tune-up power. Therefore, test data provided in this report covers Band 2 as well as Band 25 subpart to Part24.

3. Maximum ERP/EIRP power

LTE Band 12

Mode	Tx frequency (㎒)	Emission designator	ERP	
			Max. power (dBm)	Max. power (W)
LTE Band 12	699.7 ~ 715.3	1M10G7D	13.37	0.022
		1M10W7D	12.13	0.016
	700.5 ~ 714.5	2M73G7D	13.75	0.024
		2M71W7D	12.58	0.018
	701.5 ~ 713.5	4M53G7D	**14.59**	**0.029**
		4M53W7D	13.17	0.021
	704.0 ~ 711.0	9M02G7D	13.86	0.024
		8M99W7D	12.50	0.018

LTE Band 13

Mode	Tx frequency (㎒)	Emission designator	ERP	
			Max. power (dBm)	Max. power (W)
LTE Band 13	779.5 ~ 784.5	4M55G7D	11.39	0.014
		4M53W7D	10.12	0.010
	782.0	8M99G7D	**11.59**	**0.014**
		8M99W7D	9.59	0.009

LTE Band 25/2

Mode	Tx frequency (㎒)	Emission designator	EIRP	
			Max. power (dBm)	Max. power (W)
LTE Band 25/2	1 850.7 ~ 1 914.3	1M11G7D	17.31	0.054
		1M10W7D	16.28	0.042
	1 851.5 ~ 1 913.5	2M71G7D	17.50	0.056
		2M71W7D	16.19	0.042
	1 852.5 ~ 1 912.5	4M57G7D	17.44	0.055
		4M56W7D	15.94	0.039
	1 855.0 ~ 1 910.0	9M04G7D	17.43	0.055
		9M07W7D	16.10	0.041
	1 857.5 ~ 1 907.5	13M5G7D	**18.65**	**0.073**
		13M5W7D	17.16	0.052
	1 860.0 ~ 1 905.0	18M1G7D	17.81	0.060
		18M0W7D	16.71	0.047

LTE Band 26/5

Mode	Tx frequency (㎒)	Emission designator	ERP (FCC)		EIRP (IC)	
			Max. power (dBm)	Max. power (W)	Max. power (dBm)	Max. power (W)
LTE Band 26/5	824.7 ~ 848.3	1M10G7D	12.86	0.019	15.01	0.032
		1M10W7D	11.59	0.014	13.74	0.024
	825.5 ~ 847.5	2M71G7D	13.24	0.021	15.39	0.035
		2M70W7D	11.50	0.014	13.65	0.023
	826.5 ~ 846.5	4M56G7D	12.97	0.020	15.12	0.033
		4M53W7D	11.73	0.015	13.88	0.024
	829.0 ~ 844.0	9M02G7D	13.13	0.021	15.28	0.034
		9M04W7D	11.98	0.016	14.13	0.026
	831.5 ~ 841.5	13M5G7D	**13.71**	**0.023**	**15.86**	**0.039**
		13M5W7D	12.66	0.018	14.81	0.030

LTE Band 66/4

Mode	Tx frequency (㎒)	Emission designator	EIRP	
			Max. power (dBm)	Max. power (W)
LTE Band 66/4	1 710.7 ~ 1 779.3	1M10G7D	14.05	0.025
		1M10W7D	12.82	0.019
	1 711.5 ~ 1 778.5	2M73G7D	13.83	0.024
		2M71W7D	12.94	0.020
	1 712.5 ~ 1 777.5	4M56G7D	14.05	0.025
		4M53W7D	12.68	0.019
	1 715.0 ~ 1 775.0	8M99G7D	**14.28**	**0.027**
		8M99W7D	13.17	0.021
	1 717.5 ~ 1 772.5	13M5G7D	13.96	0.025
		13M5W7D	12.18	0.017
	1 720.0 ~ 1 770.0	18M1G7D	14.02	0.025
		18M1W7D	12.88	0.019

LTE Band 71

Mode	Tx frequency (㎒)	Emission designator	EIRP	
			Max. power (dBm)	Max. power (W)
LTE Band 71	666.5 ~ 695.5	4M56G7D	12.81	0.019
		4M57W7D	11.69	0.015
	668.0 ~ 693.0	9M04G7D	13.64	0.023
		9M04W7D	12.26	0.017
	670.5 ~ 690.5	13M6G7D	**13.98**	**0.025**
		13M5W7D	12.43	0.017
	673.0 ~ 688.0	18M0G7D	13.29	0.021
		18M0W7D	11.47	0.014

4. Summary of tests

FCC Part section(s)	RSS Section(s)	Parameter	Test Limit	Test Condition	Test results
2.1046	RSS-130(4.6) RSS-132(5.4) RSS-133(4.1) RSS-139(4.1)	Conducted Output Power	N/A	Conducted	Pass
2.1049	RSS-Gen(6.7) RSS-132(2.3)	Occupied Bandwidth & 26 dB Bandwidth	N/A		Pass
2.1051 22.917(a) 24.238(a) 27.53(c),(f),(g),(h)	RSS-130(4.7) RSS-132(5.5) RSS-133(6.5) RSS-139(6.6)	Band Edge Emissions at Antenna Terminal	<43 + 10Log10(P) dB for all out of band emissions, <65 + 10Log10(P) dB		Pass
		Spurious Emissions at Antenna Terminal			Pass
24.232(d) 27.50(d)(5)	RSS-133(6.4) RSS-139(6.5)	Peak to Average Power Ratio	< 13 dB		Pass
2.1055 22.355	RSS-132(5.3) RSS-133(6.3)	Frequency stability	< 2.5 ppm		Pass
24.235	RSS-130(4.5)		Emission must remain in band		
27.54	RSS-139(6.4)				
22.913(a)(5)	RSS-132(5.4)	Effective Radiated Power	< 7 Watts max. ERP (FCC) <11.5 Watts max. EIRP (IC)	Radiated	Pass
27.50(b)(10) 27.50(c)(10)	RSS-130(4.6)		< 3 Watts max. ERP		Pass
24.232(c)	RSS-133(6.4)	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP		Pass
27.50(d)(4)	RSS-139(6.5)		< 1 Watts max. EIRP		Pass
2.1053 22.917(a) 24.238(a) 27.53(c),(f),(g),(h)	RSS-130(4.7) RSS-132(5.5) RSS-133(6.5) RSS-139(6.6)	Radiated Spurious Emissions	<43 + 10Log10(P) dB for all out of band emissions, <-70 dBW/MHz EIRP - Wideband <-80 dBW/MHz EIRP- Narrowband		Pass

Notes:

1. The test procedure(s) in this report were performed in accordance as following.
   - ANSI C63.26-2015
   - ANSI/TIA-603-E-2016
   - KDB 971168 D01 v03r01

4.1. Worst case orientation

1. All modes of operation were investigated and the worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations in the test data.
2. All final radiated testing was performed with the EUT in worst case orientation.
3. All the radiated tests have been performed two modes (with charger and without charger) and the with charger is the worst case mode.
4. The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z. It was determined that **X** orientation was worst-case orientation.
   Therefore, all final radiated testing was performed with the EUT in **X** orientation.

Test condition	LTE Band	Modulation	Bandwidth (㎒)	RB size	RB offset
Radiated	B12	QPSK	5	1	0, 13, 24
	B13		10	1	0, 25, 49
	B25/2		15	1	0, 38, 74
	B26/5		15	1	0, 38, 74
	B66/4		10	1	0, 25, 49
	B71		15	1	0, 38, 74
Conducted	B12	QPSK 16QAM	1.4, 3, 5, 10	1	0, 5, 14, 24, 49
				Full	0
	B13		5, 10	1	0, 24, 49
				Full	0
	B25/2		1.4, 3, 5, 10, 15, 20	1	0, 5, 14, 24, 49, 74, 99
				Full	0
	B66/4		1.4, 3, 5, 10, 15, 20	1	0, 5, 14, 24, 49, 74, 99
				Full	0
	B71		5, 10, 15, 20	1	0, 24, 49, 74, 99
				Full	0

5. Measurement uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014.

All measurement uncertainty values are shown with a coverage factor of k=2 to indicated a 95 % level of confidence. The measurement data shown herein meets of exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded uncertainty (±)	
Conducted RF power	1.3 dB	
Conducted spurious emissions	1.3 dB	
Radiated spurious emissions	30 MHz ~ 1 GHz	3.7 dB
	Above 1 GHz	5.7 dB

6. Measurement results explanation example

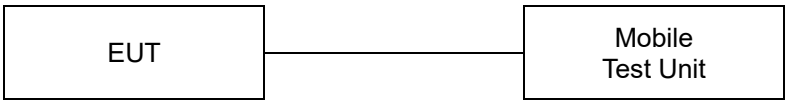
Frequency (㎒)	Factor(㏈)	Frequency (㎒)	Factor(㏈)
30	4.90	11 000	7.37
50	5.57	12 000	7.29
100	6.04	13 000	7.41
200	6.16	14 000	7.64
300	6.21	15 000	7.66
400	6.23	16 000	7.95
500	6.45	17 000	7.25
600	6.45	18 000	7.77
700	6.54	19 000	7.90
800	6.52	20 000	8.06
900	6.56	21 000	8.05
1 000	6.52	22 000	8.11
2 000	6.65	23 000	8.25
3 000	6.75	24 000	8.30
4 000	6.96	25 000	8.31
5 000	7.04	26 000	8.48
6 000	7.18	26 500	8.51
7 000	7.20	27 000	9.06
8 000	7.25	28 000	9.43
9 000	7.29	29 000	9.50
10 000	7.32	30 000	9.38

Note.
Offset(㏈) = RF cable loss(㏈) + Divider(㏈)

7. Test results

7.1. Conducted output power

Test setup



Test procedure

971168 D01 v03r01 – Section 5.2
ANSI C63.26-2015 – Section 5.2.4.2
CFR 47, - Section §2.1046

Test settings

When an average power meter is used to perform RF output power measurements, the fundamental condition that measurement be performed only over durations of active transmissions at maximum output power level applies. Thus, an average power meter can always be used to perform the measurement when the EUT can be configured to transmit continuously.

If the EUT cannot be configured to transmit continuously (i.e., burst duty cycle < 98%), then the following options can be implemented to facilitate measurement of the average power with an average power meter:

a) A gated average power meter can be used to perform the measurement if the gating parameters can be adjusted such that the power is measured only during active transmission bursts at maximum output power levels.
b) A conventional average power meter with no signal gating capability can also be used if the measured burst duty cycle is constant (i.e., duty cycle variations are less than or equal to ± 2%) by performing the measurement over the on/off burst cycles and then correcting (increasing) the measured level by a factor equal to [10log (1/duty cycle)]. See 5.2.4.3.4 for guidance with respect to measuring the transmitter duty cycle.

See item r) of 4.1 for more information regarding power meter functional requirements and limitations, and consult the instrumentation-specific application literature for proper set-up and use.

Test results

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power Frequency (MHz)		
						Low	Middle	High
LTE Band 2	1.4	QPSK	1	0	0	22.27	21.79	21.95
			1	3	0	22.22	21.85	21.97
			1	5	0	22.24	21.83	22.00
			3	0	0	22.13	21.94	22.02
			3	1	0	22.10	21.95	22.02
			3	3	0	22.09	21.95	22.03
			6	0	1	20.96	20.75	20.83
		16QAM	1	0	1	20.69	20.49	20.52
			1	3	1	20.74	20.46	20.47
			1	5	1	20.74	20.54	20.59
			3	0	1	20.94	20.61	20.69
			3	1	1	20.81	20.49	20.72
			3	3	1	20.92	20.64	20.67
			6	0	2	19.95	19.71	19.74
	3	QPSK	1	0	0	21.99	21.95	21.99
			1	8	0	21.98	21.87	21.92
			1	14	0	22.08	21.91	22.08
			8	0	1	20.87	20.66	20.76
			8	4	1	20.86	20.64	20.79
			8	7	1	20.86	20.64	20.78
			15	0	1	20.90	20.65	20.80
		16QAM	1	0	1	20.46	20.75	20.56
			1	8	1	20.51	20.70	20.60
			1	14	1	20.53	20.60	20.64
			8	0	2	19.93	19.57	19.67
			8	4	2	19.92	19.61	19.67
			8	7	2	19.89	19.59	19.68
			15	0	2	19.86	19.64	19.70
	5	QPSK	1	0	0	22.09	21.94	21.95
			1	12	0	22.06	21.92	21.90
			1	24	0	22.09	21.92	21.93
			12	0	1	20.81	20.71	20.80
			12	7	1	20.86	20.74	20.85
			12	13	1	20.88	20.75	20.82
			25	0	1	20.90	20.72	20.82
		16QAM	1	0	1	20.63	20.70	20.54
			1	12	1	20.65	20.84	20.57
			1	24	1	20.65	20.73	20.60
			12	0	2	19.82	19.61	19.72
			12	7	2	19.83	19.64	19.69
			12	13	2	19.83	19.62	19.75
			25	0	2	19.90	19.72	19.82
	10	QPSK	1	0	0	21.99	21.87	22.03
			1	25	0	21.96	21.94	22.03
			1	49	0	22.04	21.88	22.08
			25	0	1	20.91	20.77	20.87
			25	12	1	20.92	20.75	20.84
			25	25	1	20.94	20.75	20.84
			50	0	1	20.90	20.76	20.85
		16QAM	1	0	1	20.65	20.63	20.58
			1	25	1	20.77	20.63	20.63
			1	49	1	20.64	20.57	20.61
			25	0	2	19.92	19.76	19.83
			25	12	2	19.90	19.80	19.83
			25	25	2	19.91	19.74	19.85
			50	0	2	19.96	19.77	19.86
	15	QPSK	1	0	0	22.14	21.94	22.12
			1	36	0	22.17	21.89	22.15
			1	74	0	22.16	21.93	22.08
			36	0	1	20.99	20.76	20.88
			36	18	1	20.98	20.75	20.90
			36	37	1	21.02	20.76	20.90
			75	0	1	20.99	20.79	20.89
		16QAM	1	0	1	20.71	20.62	20.51
			1	36	1	20.71	20.62	20.80
			1	74	1	20.69	20.60	20.47
			36	0	2	19.93	19.77	19.87
			36	18	2	19.98	19.78	19.85
			36	37	2	20.00	19.82	19.84
			75	0	2	20.00	19.77	19.84
	20	QPSK	1	0	0	22.01	21.97	22.03
			1	49	0	22.13	21.96	22.02
			1	99	0	**22.28**	21.98	22.09
			50	0	1	20.87	20.82	20.81
			50	24	1	20.85	20.71	20.85
			50	50	1	20.91	20.78	20.86
			100	0	1	20.90	20.80	20.87
		16QAM	1	0	1	20.93	20.63	20.61
			1	49	1	20.97	20.47	20.66
			1	99	1	20.92	20.50	20.64
			50	0	2	19.89	19.75	19.80
			50	24	2	19.88	19.76	19.82
			50	50	2	19.90	19.74	19.85
			100	0	2	19.90	19.77	19.84

Test Band	Bandwidth (㎒)	Test mode	RB size	RB offset	MPR	Maximum power Frequency (㎒)		
						Low	Middle	High
LTE Band 4	1.4	QPSK	1	0	0	21.94	22.08	21.93
			1	3	0	21.97	22.08	21.88
			1	5	0	21.96	22.12	21.97
			3	0	0	22.03	22.08	21.92
			3	1	0	22.00	22.10	21.94
			3	3	0	22.02	22.09	21.89
			6	0	1	20.86	20.98	20.78
		16QAM	1	0	1	20.65	20.90	20.60
			1	3	1	20.70	20.84	20.42
			1	5	1	20.67	20.90	20.62
			3	0	1	20.62	20.83	20.77
			3	1	1	20.64	20.83	20.72
			3	3	1	20.71	20.70	20.76
			6	0	2	19.85	19.96	19.78
	3	QPSK	1	0	0	22.00	22.09	21.97
			1	8	0	21.99	22.07	21.95
			1	14	0	21.98	22.08	21.99
			8	0	1	20.83	20.93	20.77
			8	4	1	20.84	20.88	20.78
			8	7	1	20.84	20.90	20.80
			15	0	1	20.84	20.95	20.79
		16QAM	1	0	1	20.47	20.93	20.72
			1	8	1	20.50	20.88	20.74
			1	14	1	20.43	20.87	20.79
			8	0	2	19.84	19.83	19.70
			8	4	2	19.81	19.82	19.75
			8	7	2	19.85	19.89	19.76
			15	0	2	19.85	19.93	19.71
	5	QPSK	1	0	0	22.15	22.09	21.84
			1	12	0	22.11	22.06	21.81
			1	24	0	22.19	22.10	21.82
			12	0	1	20.91	20.99	20.78
			12	7	1	20.87	20.95	20.77
			12	13	1	20.89	20.96	20.81
			25	0	1	20.86	21.00	20.78
		16QAM	1	0	1	20.64	21.12	20.77
			1	12	1	20.74	20.94	20.71
			1	24	1	20.79	20.90	20.72
			12	0	2	19.72	19.79	19.71
			12	7	2	19.76	19.76	19.75
			12	13	2	19.75	19.81	19.70
			25	0	2	19.93	19.94	19.75
	10	QPSK	1	0	0	22.00	22.19	22.04
			1	25	0	22.00	22.16	22.10
			1	49	0	22.07	22.17	22.11
			25	0	1	20.87	20.96	20.88
			25	12	1	20.85	20.97	20.88
			25	25	1	20.92	20.92	20.88
			50	0	1	20.89	20.97	20.89
		16QAM	1	0	1	20.67	20.64	20.73
			1	25	1	20.56	20.59	20.62
			1	49	1	20.84	20.97	20.80
			25	0	2	19.87	19.98	19.89
			25	12	2	19.86	19.98	19.93
			25	25	2	19.86	19.98	19.90
			50	0	2	19.90	19.99	19.93
	15	QPSK	1	0	0	21.97	22.10	22.04
			1	36	0	21.98	22.14	22.13
			1	74	0	22.06	22.14	22.10
			36	0	1	20.89	21.03	20.86
			36	18	1	20.90	20.99	20.92
			36	37	1	20.91	20.99	20.89
			75	0	1	20.91	20.99	20.87
		16QAM	1	0	1	20.66	21.06	20.81
			1	36	1	20.66	20.86	20.75
			1	74	1	20.52	21.04	20.62
			36	0	2	19.84	19.99	19.83
			36	18	2	19.84	20.05	19.79
			36	37	2	19.83	19.98	19.78
			75	0	2	19.90	19.98	19.86
	20	QPSK	1	0	0	22.08	22.12	22.14
			1	49	0	22.16	**22.20**	22.11
			1	99	0	22.10	22.12	22.11
			50	0	1	20.90	20.96	20.89
			50	24	1	20.93	21.06	20.87
			50	50	1	20.93	21.00	20.89
			100	0	1	20.91	21.04	20.91
		16QAM	1	0	1	20.94	20.83	20.75
			1	49	1	20.75	20.72	20.72
			1	99	1	20.71	20.93	20.75
			50	0	2	19.86	19.98	19.80
			50	24	2	19.86	19.97	19.82
			50	50	2	19.87	19.96	19.80
			100	0	2	19.90	20.05	19.87

Test Band	Bandwidth (㎒)	Test mode	RB size	RB offset	MPR	Maximum power Frequency (㎒)		
						Low	Middle	High
LTE Band 5	1.4	QPSK	1	0	0	22.41	22.31	22.31
			1	3	0	22.39	22.28	22.23
			1	5	0	22.37	22.30	22.31
			3	0	0	22.34	22.29	22.22
			3	1	0	22.41	22.35	22.25
			3	3	0	22.39	22.34	22.25
			6	0	1	21.35	21.28	21.07
		16QAM	1	0	1	21.11	21.07	20.99
			1	3	1	21.05	21.12	20.99
			1	5	1	21.04	21.03	21.06
			3	0	1	21.06	20.97	21.08
			3	1	1	21.11	20.98	21.10
			3	3	1	21.05	21.03	21.09
			6	0	2	20.19	20.17	20.08
	3	QPSK	1	0	0	22.36	22.42	22.39
			1	8	0	22.30	22.40	22.32
			1	14	0	22.37	22.29	22.25
			8	0	1	21.06	21.07	21.04
			8	4	1	21.09	21.06	21.06
			8	7	1	21.08	21.06	21.06
			15	0	1	21.16	21.15	21.11
		16QAM	1	0	1	21.16	21.00	21.43
			1	8	1	21.02	20.97	21.38
			1	14	1	20.99	20.94	21.31
			8	0	2	20.21	20.02	19.96
			8	4	2	20.15	20.05	19.94
			8	7	2	20.12	20.04	20.03
			15	0	2	20.20	20.18	20.01
	5	QPSK	1	0	0	22.24	22.25	22.17
			1	12	0	22.24	22.27	22.30
			1	24	0	22.34	22.23	22.21
			12	0	1	21.09	21.08	21.09
			12	7	1	21.07	21.08	21.12
			12	13	1	21.07	21.08	21.09
			25	0	1	21.11	21.10	21.10
		16QAM	1	0	1	21.17	21.09	20.82
			1	12	1	21.16	21.03	20.70
			1	24	1	20.91	20.81	20.92
			12	0	2	20.02	20.00	20.05
			12	7	2	20.05	20.18	20.13
			12	13	2	20.04	20.16	20.06
			25	0	2	20.08	20.05	20.07
	10	QPSK	1	0	0	22.29	**22.43**	22.26
			1	25	0	22.21	22.30	22.32
			1	49	0	22.16	22.31	22.34
			25	0	1	21.11	21.15	21.11
			25	12	1	21.14	21.07	21.05
			25	25	1	21.13	21.09	21.08
			50	0	1	21.08	21.14	21.12
		16QAM	1	0	1	20.90	21.08	21.06
			1	25	1	20.97	20.88	21.39
			1	49	1	20.95	20.92	21.10
			25	0	2	20.08	20.15	20.14
			25	12	2	20.07	20.17	20.10
			25	25	2	20.11	20.11	20.10
			50	0	2	20.17	20.14	20.19

Test Band	Bandwidth (㎒)	Test mode	RB size	RB offset	MPR	Maximum power Frequency (㎒)		
						Low	Middle	High
LTE Band 12	1.4	QPSK	1	0	0	22.18	22.16	22.18
			1	3	0	22.20	22.29	22.18
			1	5	0	22.30	22.31	22.18
			3	0	0	22.27	22.23	22.23
			3	1	0	22.21	22.28	22.17
			3	3	0	22.26	22.29	22.24
			6	0	1	21.10	21.12	21.06
		16QAM	1	0	1	21.04	21.18	20.63
			1	3	1	20.90	20.99	20.70
			1	5	1	20.88	21.19	20.72
			3	0	1	21.08	21.14	20.88
			3	1	1	21.07	21.06	20.89
			3	3	1	21.09	21.10	20.91
			6	0	2	20.09	20.22	19.95
	3	QPSK	1	0	0	22.13	22.31	22.12
			1	8	0	22.12	22.26	22.12
			1	14	0	22.10	22.27	22.19
			8	0	1	21.04	21.15	21.06
			8	4	1	21.03	21.12	21.06
			8	7	1	21.05	21.12	21.04
			15	0	1	21.06	21.13	21.01
		16QAM	1	0	1	20.60	20.92	21.00
			1	8	1	20.54	20.84	20.97
			1	14	1	20.51	20.89	21.00
			8	0	2	20.04	20.07	19.96
			8	4	2	19.97	19.99	19.92
			8	7	2	19.94	20.01	19.93
			15	0	2	19.96	20.11	19.92
	5	QPSK	1	0	0	22.26	22.35	22.14
			1	12	0	22.19	22.17	22.13
			1	24	0	22.13	22.17	22.10
			12	0	1	21.07	21.12	21.03
			12	7	1	21.03	21.10	20.99
			12	13	1	21.01	21.08	21.00
			25	0	1	21.03	21.09	20.99
		16QAM	1	0	1	20.83	20.92	20.71
			1	12	1	20.83	20.87	20.76
			1	24	1	20.84	20.83	20.68
			12	0	2	19.89	20.02	19.98
			12	7	2	19.92	20.01	20.02
			12	13	2	19.86	19.98	19.93
			25	0	2	19.94	20.06	20.00
	10	QPSK	1	0	0	22.29	**22.41**	22.26
			1	25	0	22.24	22.34	22.17
			1	49	0	22.16	22.30	22.13
			25	0	1	21.17	21.19	21.07
			25	12	1	21.15	21.18	21.02
			25	25	1	21.11	21.09	21.01
			50	0	1	21.12	21.13	21.01
		16QAM	1	0	1	20.97	21.05	21.08
			1	25	1	20.94	20.91	20.95
			1	49	1	20.58	21.01	21.05
			25	0	2	20.08	20.21	20.06
			25	12	2	20.10	20.18	20.03
			25	25	2	20.07	20.19	20.03
			50	0	2	20.15	20.15	20.02
LTE Band 13	5	QPSK	1	0	0	22.41	22.37	22.38
			1	12	0	22.32	22.34	22.36
			1	24	0	22.33	22.41	22.38
			12	0	1	21.26	21.25	21.16
			12	7	1	21.23	21.21	21.16
			12	13	1	21.21	21.21	21.17
			25	0	1	21.27	21.27	21.15
		16QAM	1	0	1	21.44	21.09	20.95
			1	12	1	20.97	20.95	20.93
			1	24	1	20.93	20.97	20.96
			12	0	2	20.26	20.35	20.13
			12	7	2	20.21	20.28	20.10
			12	13	2	20.22	20.26	20.12
			25	0	2	20.30	20.28	20.21
	10	QPSK	1	0	0	-	**22.46**	-
			1	25	0	-	22.34	-
			1	49	0	-	22.33	-
			25	0	1	-	21.29	-
			25	12	1	-	21.24	-
			25	25	1	-	21.22	-
			50	0	1	-	21.26	-
		16QAM	1	0	1	-	21.01	-
			1	25	1	-	20.81	-
			1	49	1	-	20.81	-
			25	0	2	-	20.30	-
			25	12	2	-	20.21	-
			25	25	2	-	20.23	-
			50	0	2	-	20.30	-

Test Band	Bandwidth (㎒)	Test mode	RB size	RB offset	MPR	Maximum power Frequency (㎒)		
						Low	Middle	High
LTE Band 25	1.4	QPSK	1	0	0	22.38	22.09	22.03
			1	3	0	22.36	22.04	22.03
			1	5	0	22.39	21.97	22.00
			3	0	0	22.24	22.05	22.03
			3	1	0	22.27	22.02	22.06
			3	3	0	22.23	22.04	22.09
			6	0	1	20.99	20.84	20.91
		16QAM	1	0	1	21.00	20.42	20.97
			1	3	1	21.05	20.55	20.69
			1	5	1	20.93	20.71	20.81
			3	0	1	20.99	20.62	20.69
			3	1	1	21.03	20.69	20.84
			3	3	1	20.99	20.64	20.84
			6	0	2	20.16	19.87	19.84
	3	QPSK	1	0	0	22.10	22.00	22.07
			1	8	0	22.21	22.03	22.05
			1	14	0	22.13	22.02	22.08
			8	0	1	21.03	20.87	20.91
			8	4	1	21.06	20.89	20.88
			8	7	1	21.03	20.85	20.90
			15	0	1	21.02	20.86	20.91
		16QAM	1	0	1	20.65	20.57	20.74
			1	8	1	20.63	20.46	20.87
			1	14	1	20.60	20.63	20.83
			8	0	2	20.06	19.79	19.93
			8	4	2	20.05	19.80	19.85
			8	7	2	20.11	19.80	19.88
			15	0	2	20.05	19.86	19.85
	5	QPSK	1	0	0	22.20	21.99	22.05
			1	12	0	22.20	21.97	22.04
			1	24	0	22.23	22.01	22.03
			12	0	1	21.00	20.86	20.94
			12	7	1	21.00	20.86	20.95
			12	13	1	21.04	20.86	20.92
			25	0	1	21.02	20.84	20.90
		16QAM	1	0	1	20.92	20.76	20.54
			1	12	1	20.84	20.61	20.55
			1	24	1	20.99	20.63	20.58
			12	0	2	19.99	19.75	19.86
			12	7	2	19.98	19.72	19.84
			12	13	2	20.00	19.76	19.88
			25	0	2	20.03	19.79	19.89
	10	QPSK	1	0	0	22.14	22.00	22.00
			1	25	0	22.18	21.98	22.05
			1	49	0	22.24	22.03	22.07
			25	0	1	21.06	20.85	20.89
			25	12	1	21.05	20.85	20.89
			25	25	1	21.02	20.87	20.88
			50	0	1	21.03	20.85	20.90
		16QAM	1	0	1	20.64	20.50	20.79
			1	25	1	20.77	20.58	20.57
			1	49	1	20.56	20.56	20.79
			25	0	2	20.07	19.88	19.96
			25	12	2	20.07	19.88	19.96
			25	25	2	20.04	19.85	19.95
			50	0	2	20.13	19.84	19.91
	15	QPSK	1	0	0	22.16	22.07	22.11
			1	36	0	22.19	22.09	22.08
			1	74	0	22.19	22.05	22.13
			36	0	1	21.01	20.85	20.96
			36	18	1	21.07	20.86	20.91
			36	37	1	21.01	20.87	20.95
			75	0	1	21.04	20.87	20.92
		16QAM	1	0	1	20.66	20.31	20.60
			1	36	1	20.80	20.33	20.65
			1	74	1	20.66	20.33	20.66
			36	0	2	19.98	19.89	19.88
			36	18	2	20.00	19.88	19.90
			36	37	2	20.03	19.89	19.88
			75	0	2	20.03	19.83	19.84
	20	QPSK	1	0	0	22.08	21.99	22.08
			1	49	0	22.15	21.99	22.15
			1	99	0	**22.39**	22.00	22.19
			50	0	1	20.92	20.83	20.90
			50	24	1	20.93	20.84	20.91
			50	50	1	20.95	20.85	20.93
			100	0	1	20.92	20.85	20.88
		16QAM	1	0	1	20.96	20.79	20.87
			1	49	1	20.98	20.69	20.89
			1	99	1	20.96	20.76	21.01
			50	0	2	19.91	19.81	19.87
			50	24	2	19.93	19.83	19.88
			50	50	2	19.94	19.82	19.85
			100	0	2	19.93	19.83	19.94

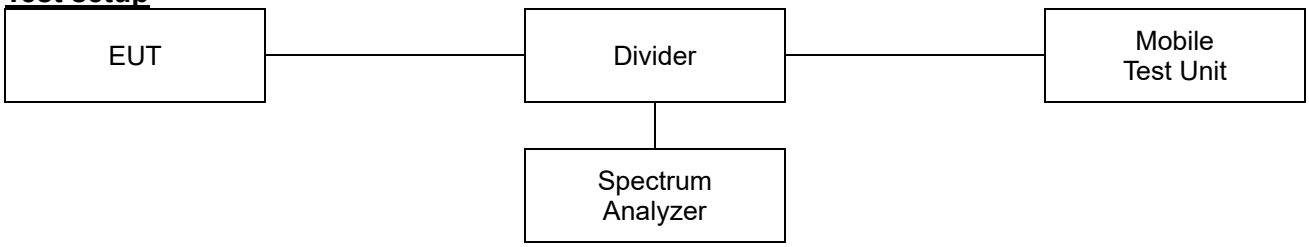
Test Band	Bandwidth (㎒)	Test mode	RB size	RB offset	MPR	Maximum power Frequency (㎒)		
						Low	Middle	High
LTE Band 26	1.4	QPSK	1	0	0	22.79	22.69	22.61
			1	3	0	22.78	22.72	22.59
			1	5	0	22.81	22.76	22.59
			3	0	0	22.76	22.71	22.52
			3	1	0	22.81	22.73	22.56
			3	3	0	22.82	22.71	22.53
			6	0	1	21.79	21.70	21.35
		16QAM	1	0	1	21.56	21.48	21.46
			1	3	1	21.52	21.48	21.47
			1	5	1	21.38	21.50	21.46
			3	0	1	21.45	21.41	21.24
			3	1	1	21.55	21.43	21.37
			3	3	1	21.50	21.47	21.28
			6	0	2	20.61	20.44	20.40
	3	QPSK	1	0	0	22.54	22.58	22.60
			1	8	0	22.51	22.51	22.53
			1	14	0	22.56	22.57	22.60
			8	0	1	21.55	21.54	21.30
			8	4	1	21.53	21.52	21.31
			8	7	1	21.51	21.55	21.38
			15	0	1	21.53	21.51	21.37
		16QAM	1	0	1	21.37	21.22	21.48
			1	8	1	21.40	21.27	21.27
			1	14	1	21.22	21.23	21.49
			8	0	2	20.32	20.23	20.29
			8	4	2	20.34	20.30	20.17
			8	7	2	20.49	20.25	20.19
			15	0	2	20.54	20.28	20.31
	5	QPSK	1	0	0	22.52	22.49	22.42
			1	12	0	22.52	22.46	22.34
			1	24	0	22.49	22.48	22.42
			12	0	1	21.53	21.49	21.32
			12	7	1	21.48	21.43	21.30
			12	13	1	21.45	21.45	21.31
			25	0	1	21.49	21.49	21.36
		16QAM	1	0	1	21.60	21.53	21.17
			1	12	1	21.44	21.46	21.15
			1	24	1	20.99	21.11	21.05
			12	0	2	20.35	20.48	20.29
			12	7	2	20.44	20.53	20.29
			12	13	2	20.43	20.55	20.29
			25	0	2	20.50	20.54	20.35
	10	QPSK	1	0	0	22.58	22.55	22.53
			1	25	0	22.53	22.53	22.56
			1	49	0	22.55	22.48	22.53
			25	0	1	21.59	21.49	21.34
			25	12	1	21.55	21.54	21.33
			25	25	1	21.56	21.51	21.31
			50	0	1	21.51	21.50	21.31
		16QAM	1	0	1	21.21	21.08	21.39
			1	25	1	21.23	21.13	21.33
			1	49	1	21.04	21.15	21.35
			25	0	2	20.35	20.09	20.32
			25	12	2	20.25	20.14	20.36
			25	25	2	20.28	20.15	20.34
			50	0	2	20.41	20.16	20.38
	15	QPSK	1	0	0	22.62	22.52	22.50
			1	36	0	22.49	**22.53**	22.50
			1	74	0	22.46	22.53	22.49
			36	0	1	21.43	21.56	21.31
			36	18	1	21.39	21.54	21.29
			36	37	1	21.34	21.55	21.27
			75	0	1	21.41	21.55	21.27
		16QAM	1	0	1	21.11	21.00	21.03
			1	36	1	21.05	21.02	21.06
			1	74	1	21.08	20.98	21.06
			36	0	2	20.33	20.29	20.32
			36	18	2	20.30	20.31	20.33
			36	37	2	20.29	20.26	20.33
			75	0	2	20.33	20.31	20.29

Test Band	Bandwidth (㎒)	Test mode	RB size	RB offset	MPR	Maximum power Frequency (㎒)		
						Low	Middle	High
LTE Band 66	1.4	QPSK	1	0	0	22.08	22.18	22.12
			1	3	0	21.98	22.26	22.09
			1	5	0	22.00	22.23	22.21
			3	0	0	22.05	22.13	22.07
			3	1	0	22.07	22.12	22.10
			3	3	0	22.08	22.12	22.11
			6	0	1	20.94	21.00	20.98
		16QAM	1	0	1	20.80	21.02	20.71
			1	3	1	20.79	20.97	20.81
			1	5	1	20.73	21.01	21.01
			3	0	1	20.88	20.91	20.82
			3	1	1	20.88	20.95	20.84
			3	3	1	20.92	20.97	20.82
			6	0	2	19.94	20.00	19.99
	3	QPSK	1	0	0	22.12	22.28	22.20
			1	8	0	22.11	22.26	22.16
			1	14	0	22.10	22.23	22.14
			8	0	1	20.98	21.02	21.03
			8	4	1	20.91	20.98	20.99
			8	7	1	20.95	20.99	20.99
			15	0	1	20.91	21.04	20.99
		16QAM	1	0	1	20.83	21.12	21.19
			1	8	1	20.80	21.10	21.18
			1	14	1	20.71	21.09	21.16
			8	0	2	20.09	20.00	19.87
			8	4	2	20.05	19.99	19.94
			8	7	2	20.01	19.98	19.93
			15	0	2	19.99	20.10	19.91
	5	QPSK	1	0	0	22.09	22.19	22.04
			1	12	0	22.11	22.19	22.03
			1	24	0	22.10	22.21	22.10
			12	0	1	20.88	20.96	20.96
			12	7	1	20.90	21.01	20.96
			12	13	1	20.93	20.98	20.96
			25	0	1	20.90	21.00	20.96
		16QAM	1	0	1	20.68	21.09	20.94
			1	12	1	20.61	21.07	20.94
			1	24	1	20.74	21.06	20.98
			12	0	2	19.86	19.83	19.95
			12	7	2	19.84	19.87	19.92
			12	13	2	19.80	19.85	19.95
			25	0	2	19.97	19.95	19.99
	10	QPSK	1	0	0	22.25	22.34	22.31
			1	25	0	22.30	22.35	22.31
			1	49	0	22.23	22.18	22.31
			25	0	1	20.90	20.95	20.95
			25	12	1	20.90	20.97	20.96
			25	25	1	20.89	20.96	20.94
			50	0	1	20.89	21.00	20.97
		16QAM	1	0	1	20.92	21.00	20.97
			1	25	1	20.91	21.02	21.11
			1	49	1	20.89	20.82	21.13
			25	0	2	19.90	20.04	20.12
			25	12	2	19.94	20.08	20.05
			25	25	2	19.94	20.03	20.07
			50	0	2	19.99	20.02	20.00
	15	QPSK	1	0	0	22.26	22.23	22.29
			1	36	0	22.32	22.24	22.31
			1	74	0	22.27	22.29	22.27
			36	0	1	20.94	21.02	21.04
			36	18	1	20.92	21.02	21.02
			36	37	1	20.95	21.03	20.99
			75	0	1	20.93	21.02	21.04
		16QAM	1	0	1	20.96	20.83	21.11
			1	36	1	20.91	20.91	21.11
			1	74	1	20.93	20.93	21.10
			36	0	2	19.91	20.06	19.98
			36	18	2	19.96	20.08	19.99
			36	37	2	19.95	20.07	19.98
			75	0	2	20.00	20.06	20.01
	20	QPSK	1	0	0	22.04	22.27	22.18
			1	49	0	22.12	**22.35**	22.24
			1	99	0	22.08	22.19	22.18
			50	0	1	20.87	20.98	20.94
			50	24	1	20.92	21.07	20.97
			50	50	1	20.90	21.01	20.94
			100	0	1	20.88	21.05	20.94
		16QAM	1	0	1	21.10	21.15	20.99
			1	49	1	21.14	21.07	20.99
			1	99	1	21.14	21.23	21.01
			50	0	2	19.93	19.98	19.95
			50	24	2	19.88	19.97	19.94
			50	50	2	19.89	19.98	19.96
			100	0	2	19.97	20.04	19.96

Test Band	Bandwidth (㎒)	Test mode	RB size	RB offset	MPR	Maximum power Frequency (㎒)		
						Low	Middle	High
LTE Band 71	5	QPSK	1	0	0	22.86	22.73	22.50
			1	12	0	22.83	22.80	22.40
			1	24	0	22.87	22.69	22.41
			12	0	1	21.61	21.58	21.47
			12	7	1	21.59	21.60	21.45
			12	13	1	21.61	21.59	21.44
			25	0	1	21.61	21.55	21.45
		16QAM	1	0	1	21.46	21.56	21.24
			1	12	1	21.53	21.50	21.17
			1	24	1	21.45	21.59	21.17
			12	0	2	20.60	20.44	20.50
			12	7	2	20.58	20.44	20.44
			12	13	2	20.55	20.44	20.37
			25	0	2	20.58	20.48	20.43
	10	QPSK	1	0	0	22.71	22.76	22.77
			1	25	0	22.66	22.71	22.71
			1	49	0	22.69	22.63	22.63
			25	0	1	21.61	21.60	21.51
			25	12	1	21.62	21.51	21.52
			25	25	1	21.61	21.50	21.46
			50	0	1	21.57	21.57	21.45
		16QAM	1	0	1	21.66	21.39	21.25
			1	25	1	21.59	21.28	21.20
			1	49	1	21.58	21.23	21.09
			25	0	2	20.61	20.54	20.53
			25	12	2	20.59	20.56	20.52
			25	25	2	20.57	20.54	20.52
			50	0	2	20.64	20.54	20.51
	15	QPSK	1	0	0	22.75	22.75	22.71
			1	36	0	22.68	22.72	22.64
			1	74	0	22.64	22.67	22.57
			36	0	1	21.65	21.62	21.57
			36	18	1	21.62	21.60	21.50
			36	37	1	21.59	21.56	21.43
			75	0	1	21.61	21.56	21.48
		16QAM	1	0	1	21.35	21.47	21.42
			1	36	1	21.30	21.47	21.30
			1	74	1	21.20	21.33	21.27
			36	0	2	20.57	20.55	20.51
			36	18	2	20.60	20.58	20.44
			36	37	2	20.56	20.52	20.41
			75	0	2	20.63	20.54	20.44
	20	QPSK	1	0	0	22.72	**22.88**	22.77
			1	49	0	22.63	22.74	22.64
			1	99	0	22.54	22.61	22.56
			50	0	1	21.58	21.59	21.53
			50	24	1	21.58	21.58	21.53
			50	50	1	21.50	21.51	21.48
			100	0	1	21.51	21.53	21.50
		16QAM	1	0	1	21.27	21.38	21.43
			1	49	1	21.27	21.34	21.30
			1	99	1	21.09	21.23	21.26
			50	0	2	20.54	20.59	20.50
			50	24	2	20.48	20.54	20.47
			50	50	2	20.42	20.57	20.37
			100	0	2	20.58	20.56	20.46

7.2. 99% Occupied Bandwidth & 26 dB Bandwidth

Test setup



Limit

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

Test procedure

971168 D01 v03r01 – Section 4.2 and 4.3
ANSI C63.26-2015 – Section 5.4.3 and 5.4.4

Test settings

◆ **26dB Bandwidth**

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.

b) The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set ≥ 3 × RBW.

c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation.
See guidance provided in 4.2.3.

d) The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target "−X dB" requirement, i.e., if the requirement calls for measuring the −26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.

e) Set spectrum analyzer detection mode to peak, and the trace mode to max hold.

f) Determine the reference value by either of the following:
   1) Set the EUT to transmit a modulated signal. Allow the trace to stabilize.
   Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
   2) Set the EUT to transmit an unmodulated carrier. Set the spectrum analyzer marker to the level of the carrier.

g) Determine the "−X dB amplitude" as equal to (Reference Value − X). Alternatively, this calculation can be performed on the spectrum analyzer using the delta-marker measurement function.

h) If the reference value was determined using an unmodulated carrier, turn the EUT modulation on, then either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise the trace from step f) shall be used for step i).

i) Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the "−X dB amplitude" determined in step f). If a marker is below this "−X dB amplitude" value it should be as close as possible to this value. The OBW is the positive frequency difference between the two markers.

j) The spectral envelope can cross the "−X dB amplitude" at multiple points. The lowest or highest frequency shall be selected as the frequencies that are the farthest away from the center frequency at which the spectral envelope crosses the "−X dB amplitude."

k) The OBW shall be reported by providing plot(s) of the measuring instrument display, to include markers depicting the relevant frequency and amplitude information (e.g., marker table). The frequency and amplitude axis and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

◆ 99% Occupied Bandwidth

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (typically a span of 1.5 × OBW is sufficient).

b) The nominal IF filter 3 dB bandwidth (RBW) shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set ≥ 3 × RBW.

c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.

d) Set the detection mode to peak, and the trace mode to max-hold.

e) If the instrument does not have a 99% OBW function, recover the trace data points and sum directly in linear power terms. Place the recovered amplitude data points, beginning at the lowest frequency, in a running sum until 0.5% of the total is reached. Record that frequency as the lower OBW frequency. Repeat the process until 99.5% of the total is reached and record that frequency as the u pper OBW frequency. The 99% power OBW can be determined by computing the difference these two frequencies.

f) The OBW shall be reported and plot(s) of the measuring instrument display shall be provided with the test report. The frequency and amplitude axis and scale shall be clearly labeled. Tabular data can be reported in addition to the plot(s).

Notes:

1. The EUT was setup to maximum output power as its lowest and highest channel with all bandwidth, Modulation.

Test results

Test Band	Bandwidth (㎒)	Frequency (㎒)	Test mode	26㏈ bandwidth (㎒)	99 % bandwidth (㎒)
LTE Band 12	1.4	699.7	QPSK	1.33	1.10
			16QAM	1.33	1.10
		707.5	QPSK	1.32	1.10
			16QAM	1.34	1.10
		715.3	QPSK	1.34	1.10
			16QAM	1.32	1.09
	3	700.5	QPSK	3.09	2.71
			16QAM	3.09	2.70
		707.5	QPSK	3.12	2.71
			16QAM	3.10	2.70
		714.5	QPSK	3.10	2.73
			16QAM	3.12	2.71
	5	701.5	QPSK	5.38	4.53
			16QAM	5.35	4.53
		707.5	QPSK	5.32	4.52
			16QAM	5.28	4.52
		713.5	QPSK	5.33	4.53
			16QAM	5.43	4.52
	10	704.0	QPSK	10.24	8.94
			16QAM	10.22	8.99
		707.5	QPSK	10.22	9.02
			16QAM	10.39	8.97
		711.0	QPSK	10.37	8.99
			16QAM	10.29	8.99
LTE Band 13	5	779.5	QPSK	5.35	4.53
			16QAM	5.32	4.53
		782.0	QPSK	5.36	4.50
			16QAM	5.35	4.52
		784.5	QPSK	5.36	4.55
			16QAM	5.42	4.53
	10	782.0	QPSK	10.34	8.99
			16QAM	10.24	8.99

Test Band	Bandwidth (㎒)	Frequency (㎒)	Test mode	26㏈ bandwidth (㎒)	99 % bandwidth (㎒)
LTE Band 25/2	1.4	1 850.7	QPSK	1.34	1.11
			16QAM	1.33	1.09
		1 882.5	QPSK	1.33	1.10
			16QAM	1.32	1.09
		1 914.3	QPSK	1.34	1.09
			16QAM	1.33	1.10
	3	1 851.5	QPSK	3.12	2.71
			16QAM	3.09	2.70
		1 882.5	QPSK	3.09	2.70
			16QAM	3.10	2.70
		1 913.5	QPSK	3.12	2.70
			16QAM	3.09	2.71
	5	1 852.5	QPSK	5.41	4.57
			16QAM	5.45	4.52
		1 882.5	QPSK	5.47	4.55
			16QAM	5.42	4.56
		1 912.5	QPSK	5.30	4.51
			16QAM	5.35	4.53
	10	1 855.0	QPSK	10.47	9.04
			16QAM	10.37	9.07
		1 882.5	QPSK	10.29	9.02
			16QAM	10.22	8.99
		1 910.0	QPSK	10.04	9.04
			16QAM	10.27	9.02
	15	1 857.5	QPSK	15.10	13.49
			16QAM	15.32	13.52
		1 882.5	QPSK	15.44	13.52
			16QAM	14.99	13.49
		1 907.5	QPSK	15.25	13.49
			16QAM	15.10	13.49
	20	1 860.0	QPSK	20.03	17.98
			16QAM	20.18	17.98
		1 882.5	QPSK	20.18	18.08
			16QAM	20.13	17.98
		1 905.0	QPSK	19.98	18.03
			16QAM	19.88	17.93

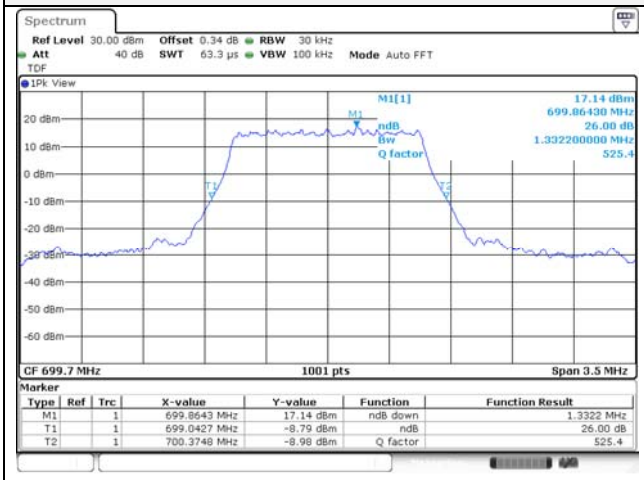
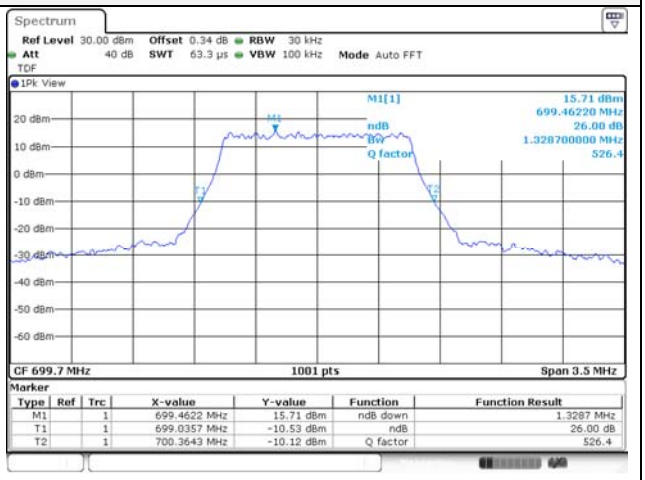
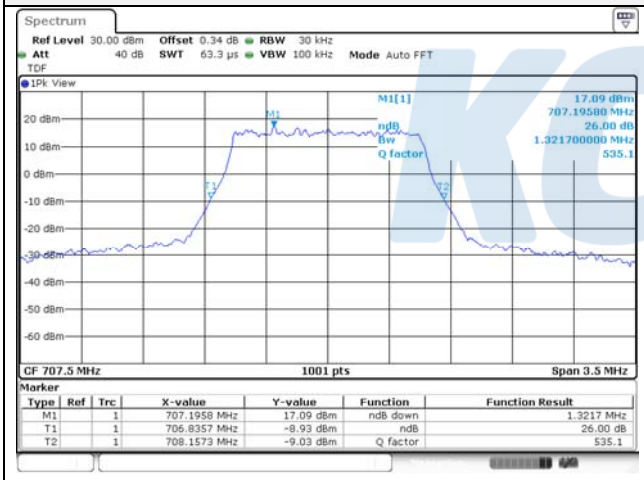
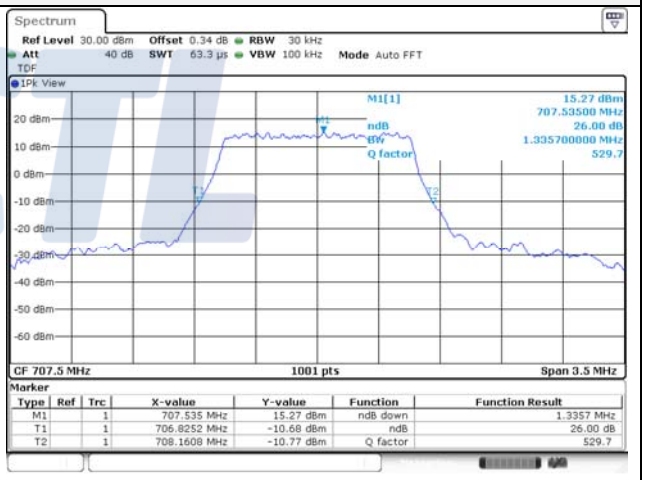
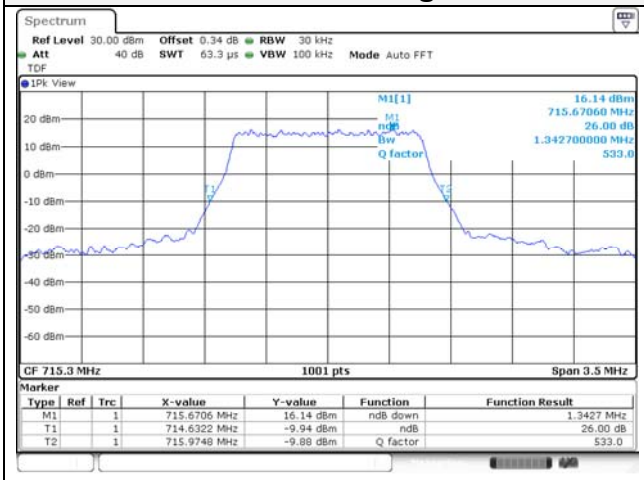
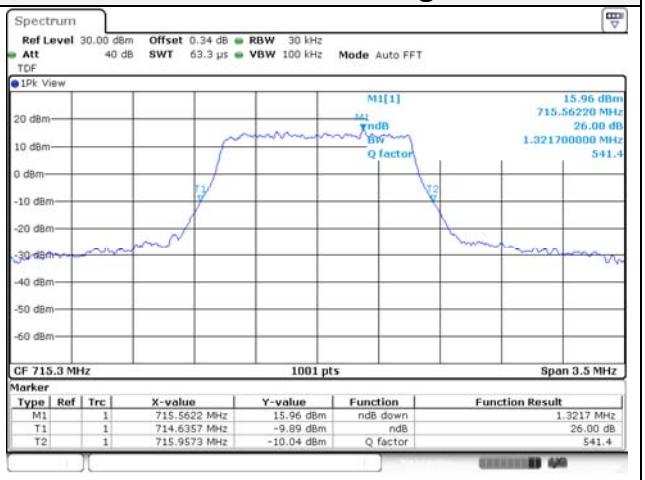
Test Band	Bandwidth (㎒)	Frequency (㎒)	Test mode	26㏈ bandwidth (㎒)	99 % bandwidth (㎒)
LTE Band 26/5	1.4	824.7	QPSK	1.34	1.10
			16QAM	1.33	1.09
		836.5	QPSK	1.33	1.10
			16QAM	1.33	1.09
		848.3	QPSK	1.31	1.10
			16QAM	1.32	1.10
	3	825.5	QPSK	3.09	2.70
			16QAM	3.09	2.70
		836.5	QPSK	3.11	2.71
			16QAM	3.10	2.70
		847.5	QPSK	3.07	2.71
			16QAM	3.09	2.70
	5	826.5	QPSK	5.37	4.56
			16QAM	5.36	4.53
		836.5	QPSK	5.32	4.53
			16QAM	5.37	4.53
		846.5	QPSK	5.37	4.52
			16QAM	5.32	4.51
	10	829.0	QPSK	10.27	8.99
			16QAM	10.49	9.04
		836.5	QPSK	10.59	9.02
			16QAM	10.27	9.04
		844.0	QPSK	10.29	8.99
			16QAM	10.37	8.99
	15	831.5	QPSK	15.21	13.52
			16QAM	15.21	13.49
		836.5	QPSK	15.36	13.52
			16QAM	15.55	13.49
		841.5	QPSK	15.25	13.49
			16QAM	15.14	13.49

Test Band	Bandwidth (㎒)	Frequency (㎒)	Test mode	26㏈ bandwidth (㎒)	99 % bandwidth (㎒)
LTE Band 66/4	1.4	1 710.7	QPSK	1.35	1.10
			16QAM	1.33	1.10
		1 745.0	QPSK	1.36	1.10
			16QAM	1.34	1.10
		1 779.3	QPSK	1.33	1.09
			16QAM	1.34	1.10
	3	1 711.5	QPSK	3.12	2.71
			16QAM	3.09	2.71
		1 745.0	QPSK	3.10	2.71
			16QAM	3.09	2.70
		1 778.5	QPSK	3.14	2.73
			16QAM	3.09	2.70
	5	1 712.5	QPSK	5.45	4.56
			16QAM	5.37	4.53
		1 745.0	QPSK	5.35	4.53
			16QAM	5.38	4.53
		1 777.5	QPSK	5.36	4.52
			16QAM	5.28	4.51
	10	1 715.0	QPSK	10.39	8.99
			16QAM	10.27	8.99
		1 745.0	QPSK	10.34	8.99
			16QAM	10.22	8.99
		1 775.0	QPSK	10.27	8.97
			16QAM	10.24	8.99
	15	1 717.5	QPSK	15.29	13.45
			16QAM	15.21	13.49
		1 745.0	QPSK	15.02	13.49
			16QAM	15.36	13.49
		1 772.5	QPSK	15.29	13.45
			16QAM	15.17	13.49
	20	1 720.0	QPSK	19.98	18.08
			16QAM	19.73	17.93
		1 745.0	QPSK	19.68	17.93
			16QAM	19.83	18.08
		1 770.0	QPSK	19.88	18.08
			16QAM	19.73	18.03

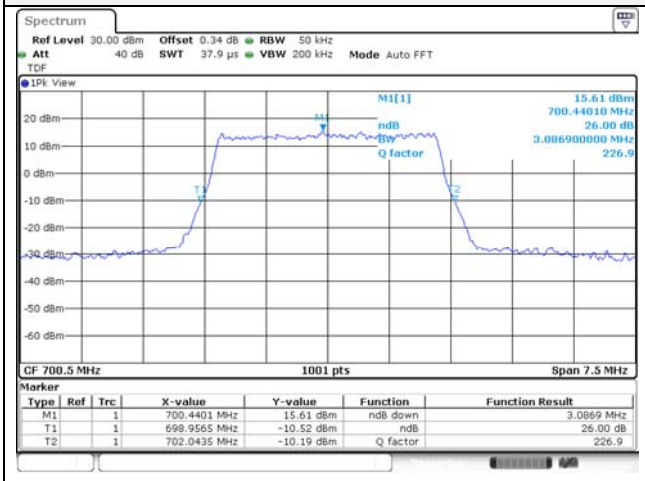
Test Band	Bandwidth (㎒)	Frequency (㎒)	Test mode	26㏈ bandwidth (㎒)	99 % bandwidth (㎒)
LTE Band 71	5	665.5	QPSK	5.43	4.56
			16QAM	5.41	4.57
		680.5	QPSK	5.45	4.53
			16QAM	5.45	4.56
		695.5	QPSK	5.46	4.55
			16QAM	5.47	4.56
	10	668.0	QPSK	10.34	9.02
			16QAM	10.56	9.02
		680.5	QPSK	10.27	9.04
			16QAM	10.19	9.04
		693.0	QPSK	10.22	8.99
			16QAM	10.29	8.99
	15	670.5	QPSK	15.17	13.45
			16QAM	15.21	13.45
		680.5	QPSK	15.14	13.60
			16QAM	15.21	13.49
		690.5	QPSK	15.14	13.45
			16QAM	14.61	13.49
	20	673.0	QPSK	19.93	17.98
			16QAM	19.68	17.98
		680.5	QPSK	19.93	18.03
			16QAM	20.03	17.98
		688.0	QPSK	19.73	17.98
			16QAM	19.68	17.98

26dB Bandwidth

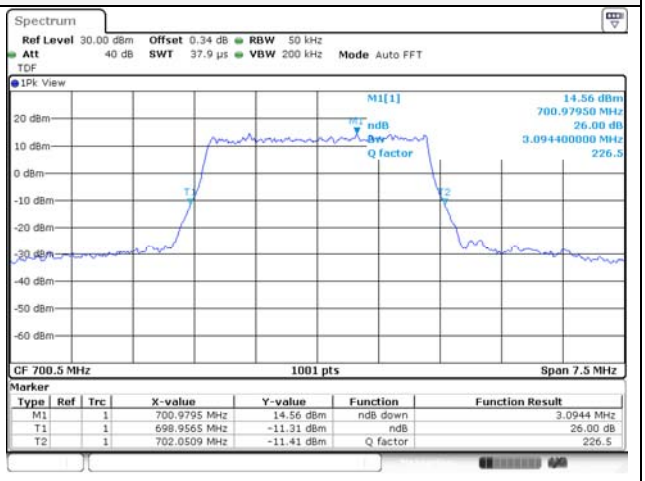
Test mode: LTE Band 12

1.4M BW QPSK Low ch.	1.4M BW 16QAM Low ch.
	
1.4M BW QPSK Mid ch.	**1.4M BW 16QAM Mid ch.**
	
1.4M BW QPSK High ch.	**1.4M BW 16QAM High ch.**
	

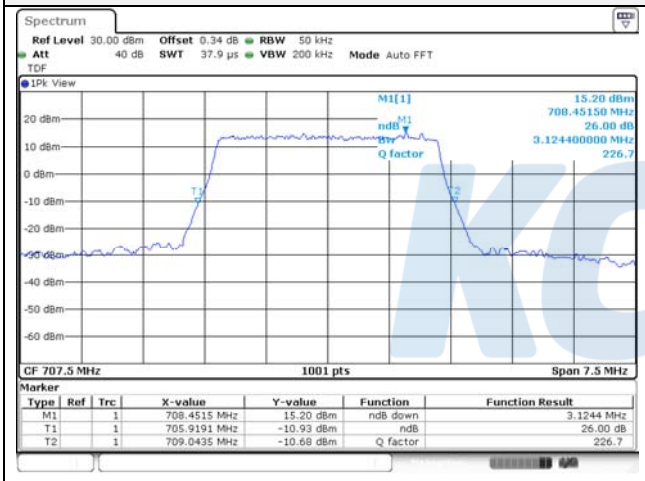
3M BW QPSK Low ch.



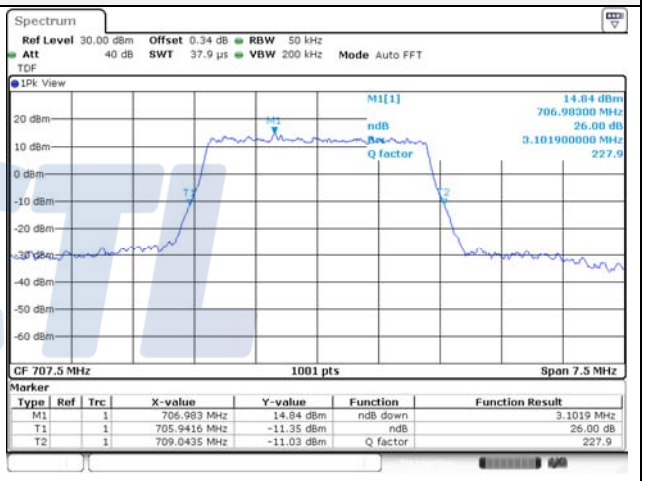
3M BW 16QAM Low ch.



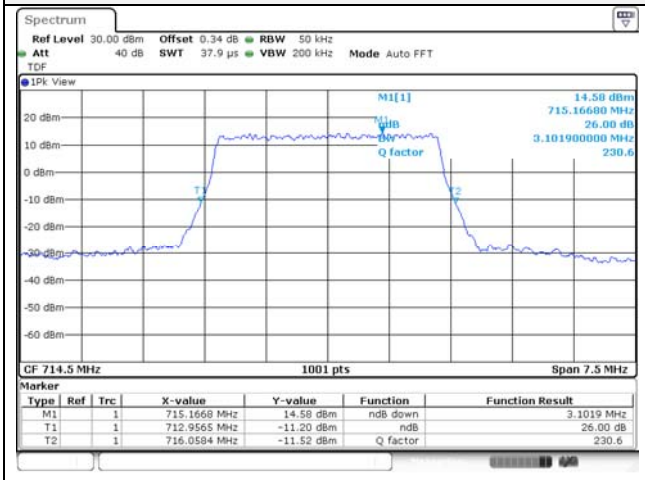
3M BW QPSK Mid ch.



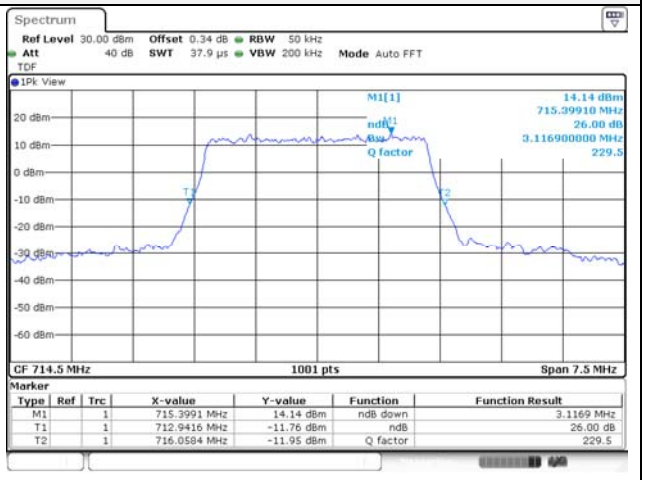
3M BW 16QAM Mid ch.



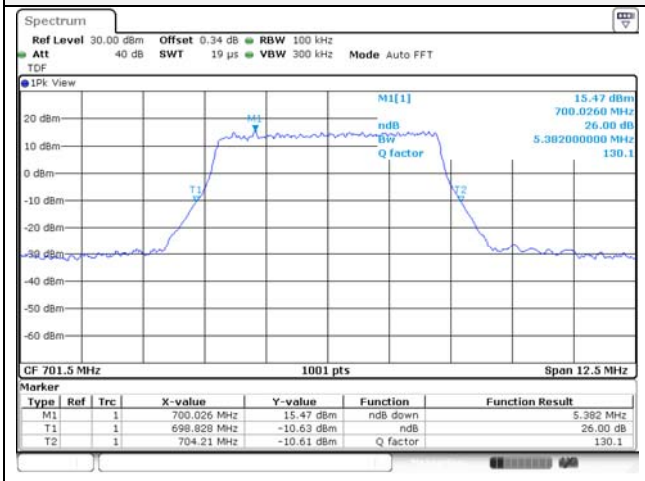
3M BW QPSK High ch.



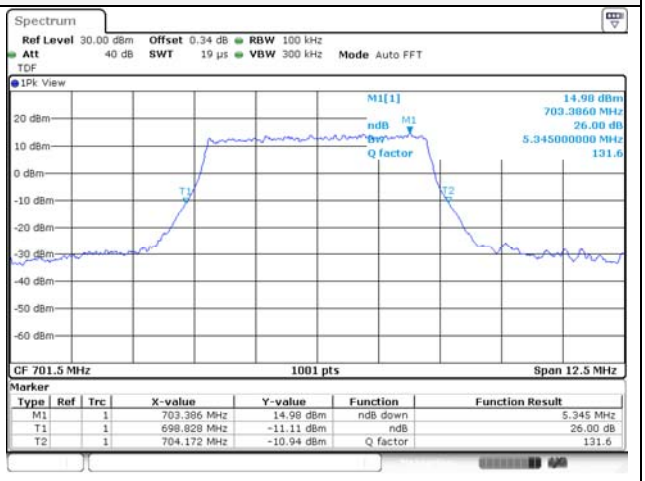
3M BW 16QAM High ch.



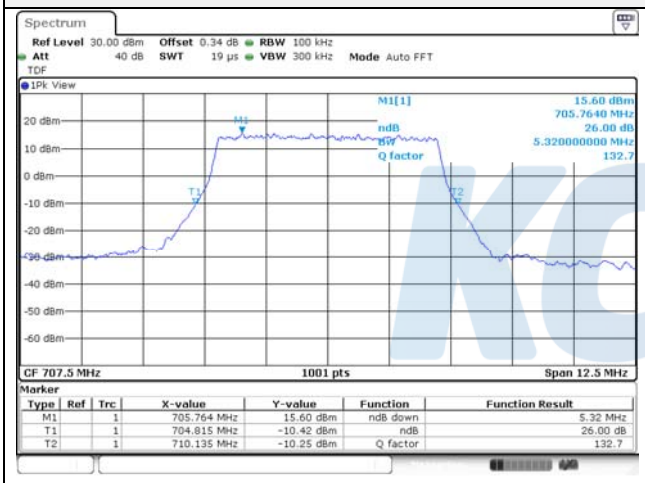
5M BW QPSK Low ch.



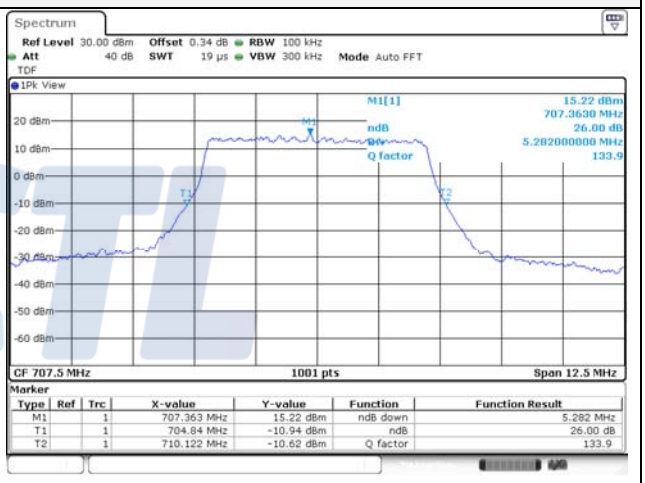
5M BW 16QAM Low ch.



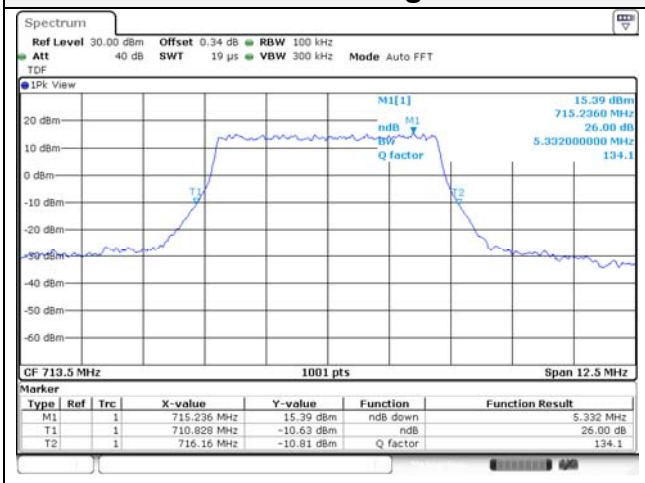
5M BW QPSK Mid ch.



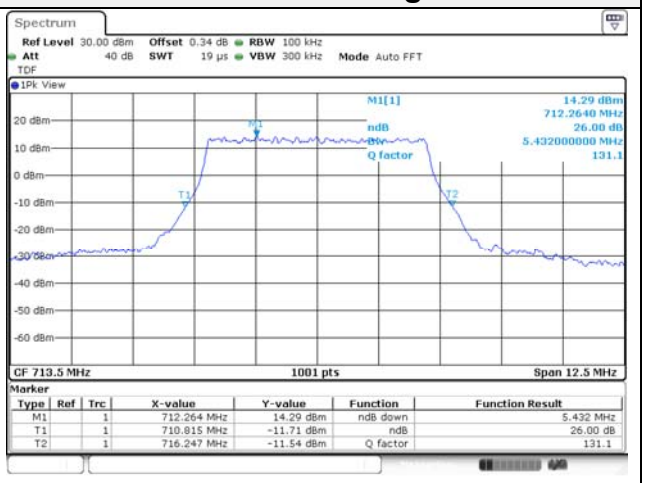
5M BW 16QAM Mid ch.



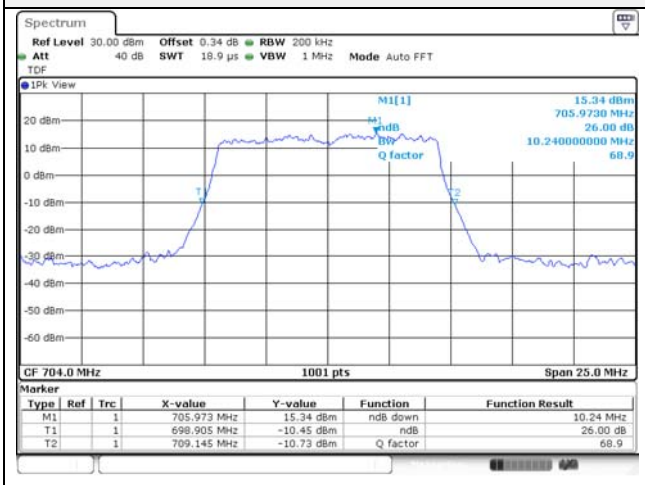
5M BW QPSK High ch.



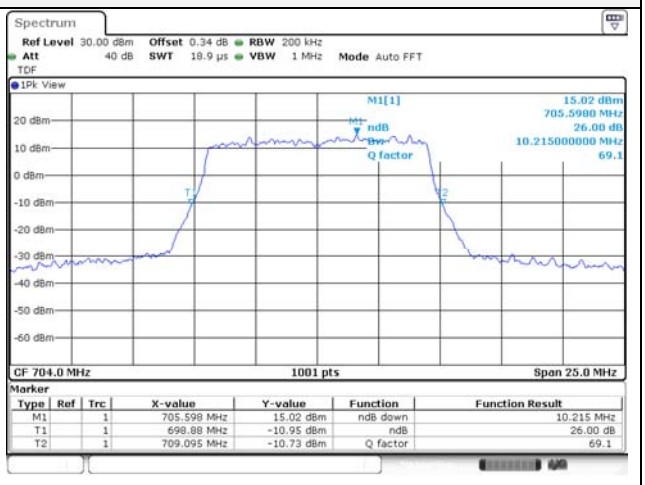
5M BW 16QAM High ch.



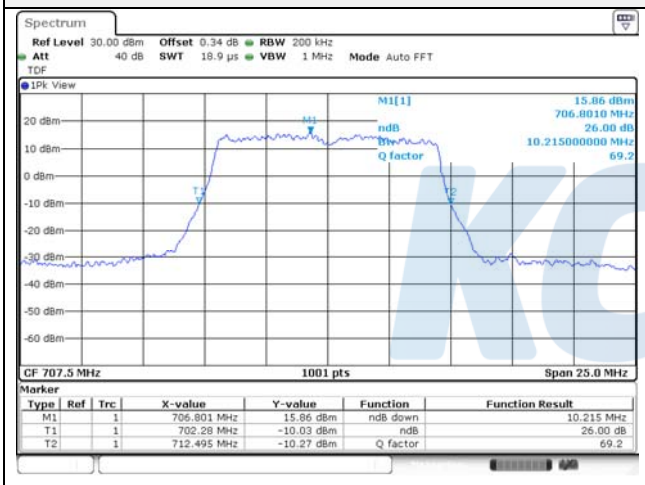
10M BW QPSK Low ch.



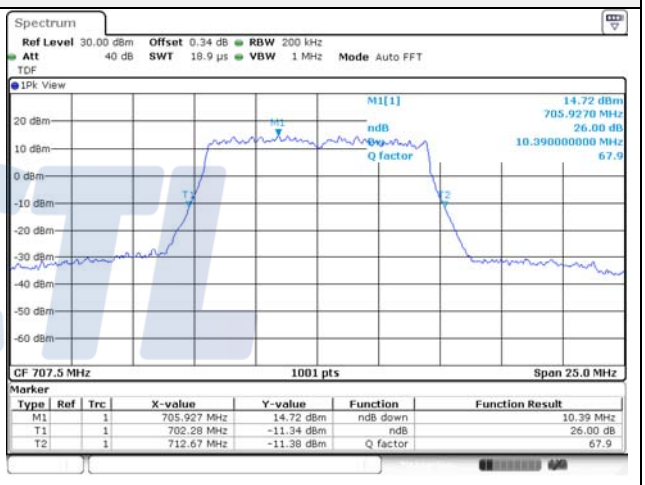
10M BW 16QAM Low ch.



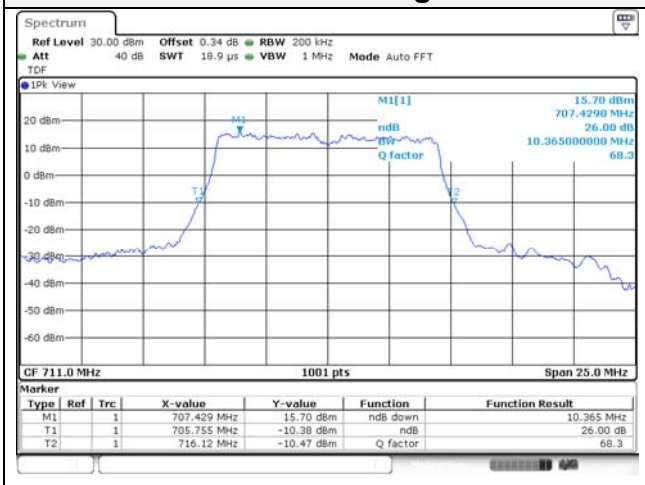
10M BW QPSK Mid ch.



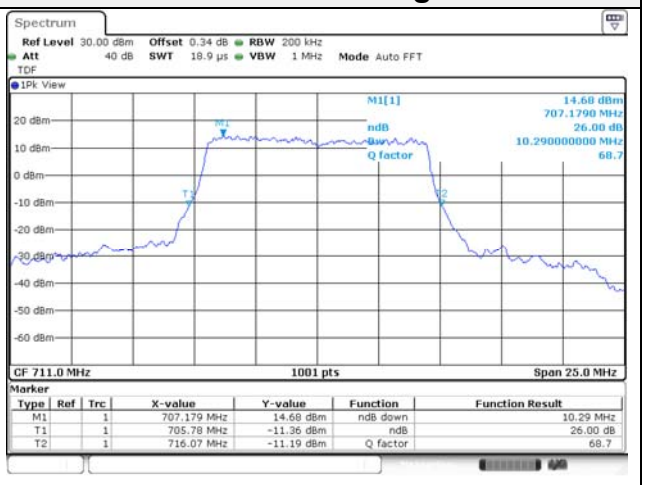
10M BW 16QAM Mid ch.



10M BW QPSK High ch.

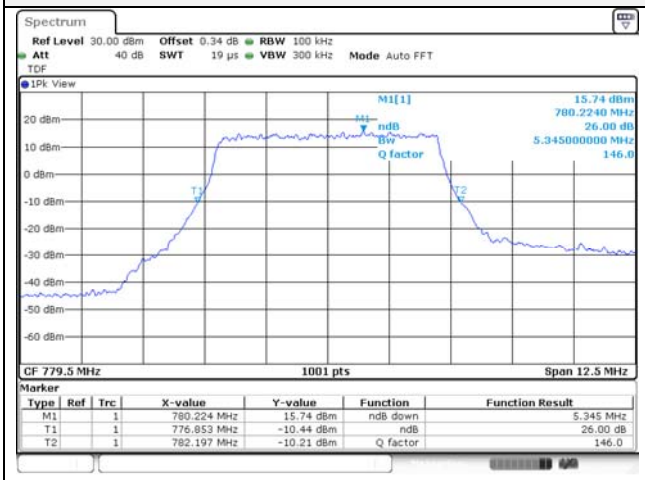


10M BW 16QAM High ch.

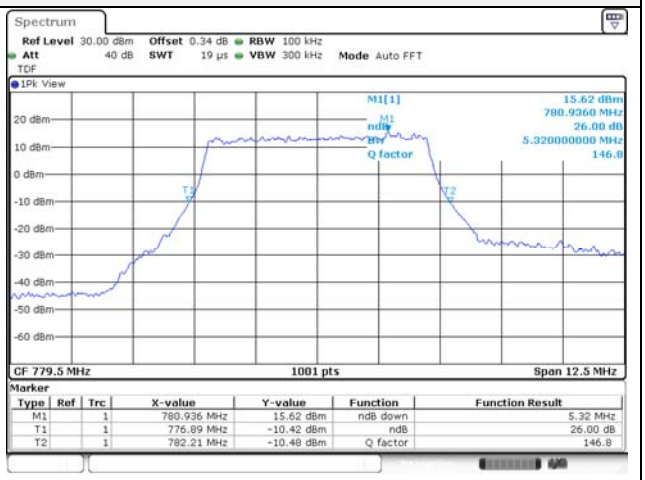


Test mode: LTE Band 13

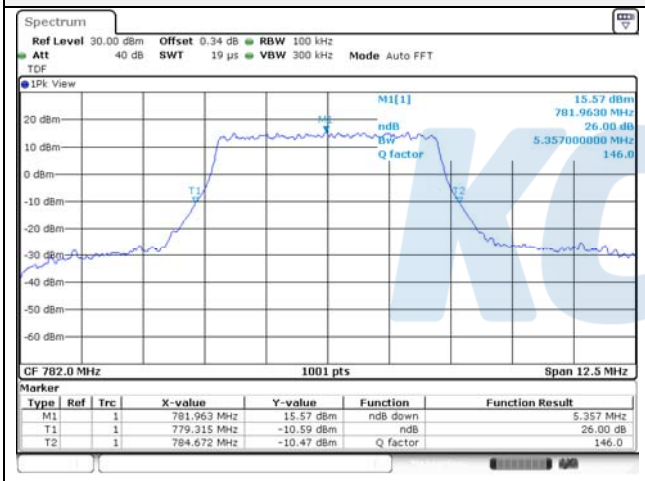
5M BW QPSK Low ch.



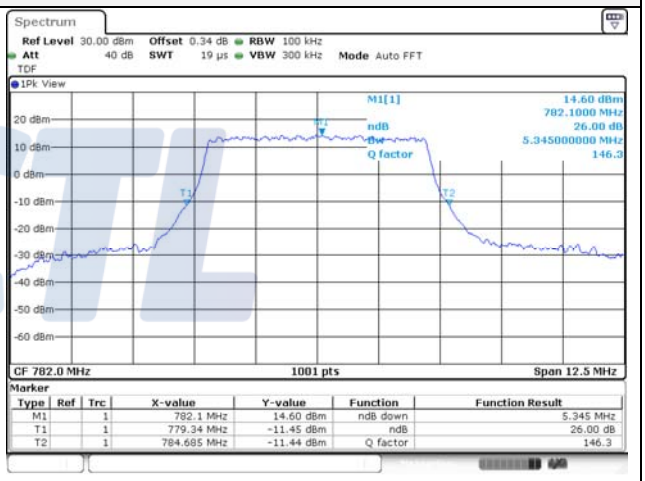
5M BW 16QAM Low ch.



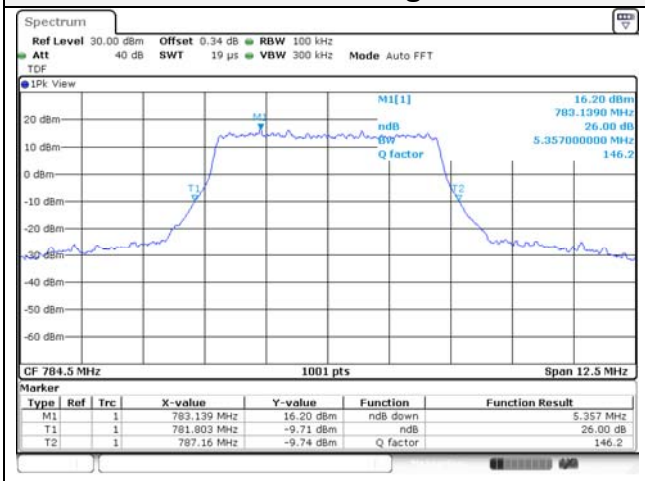
5M BW QPSK Mid ch.



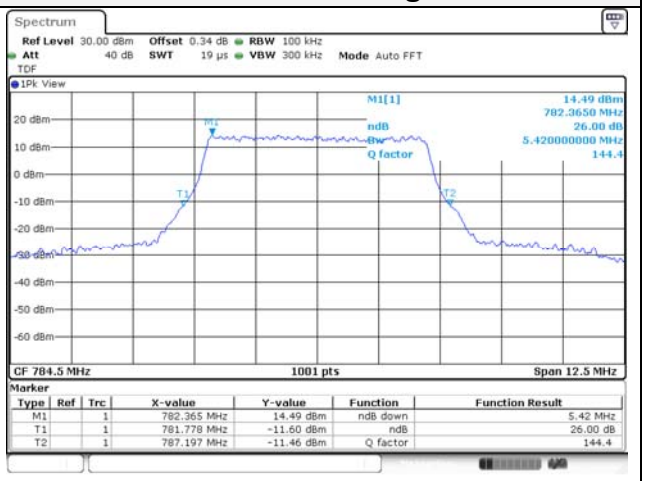
5M BW 16QAM Mid ch.



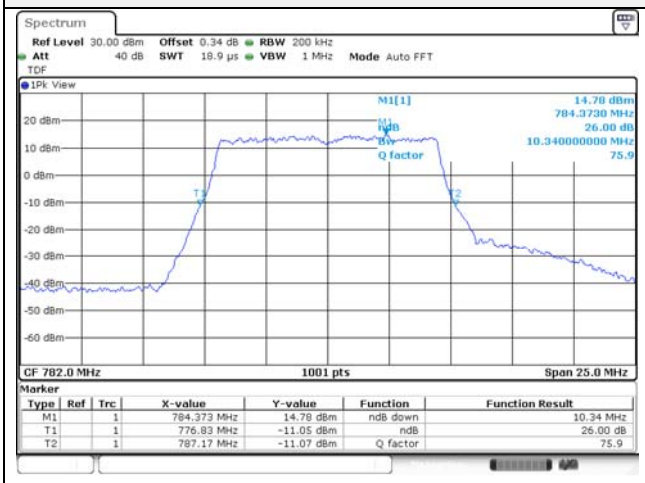
5M BW QPSK High ch.

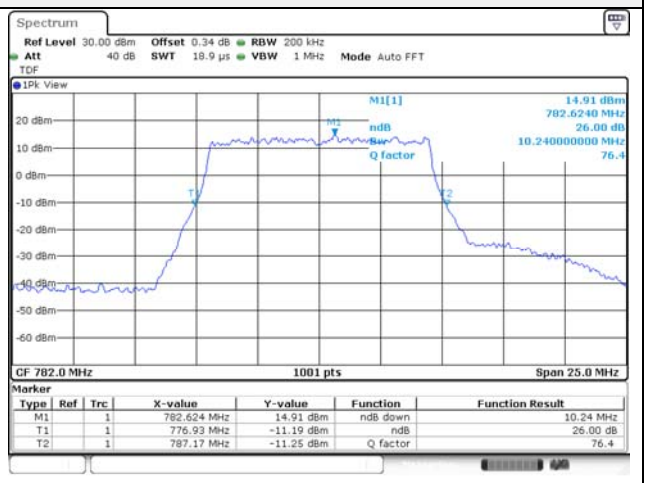


5M BW 16QAM High ch.



10M BW QPSK Mid ch.	10M BW 16QAM Mid ch.

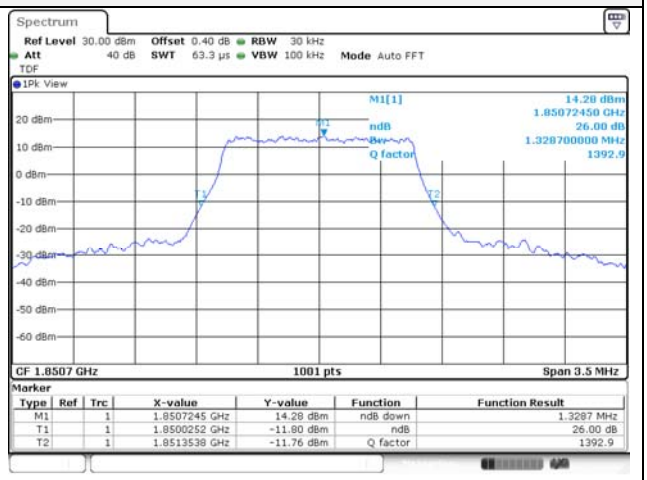




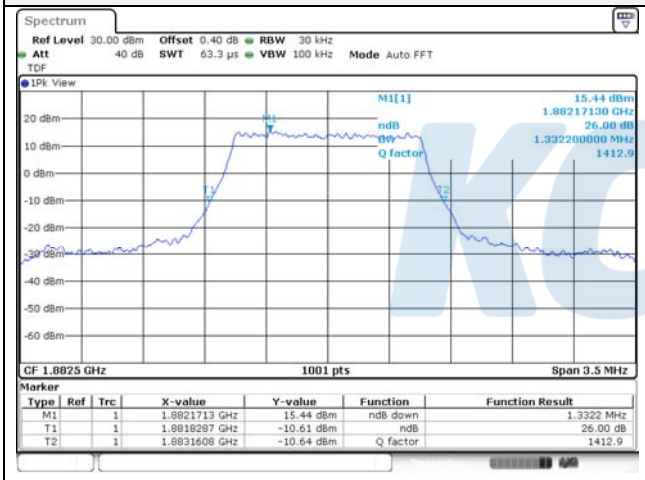
Test mode: LTE Band 25/2

1.4M BW QPSK Low ch.

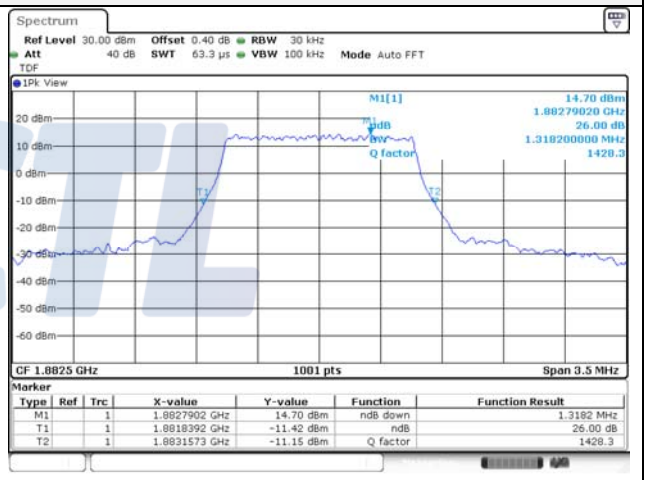
1.4M BW 16QAM Low ch.



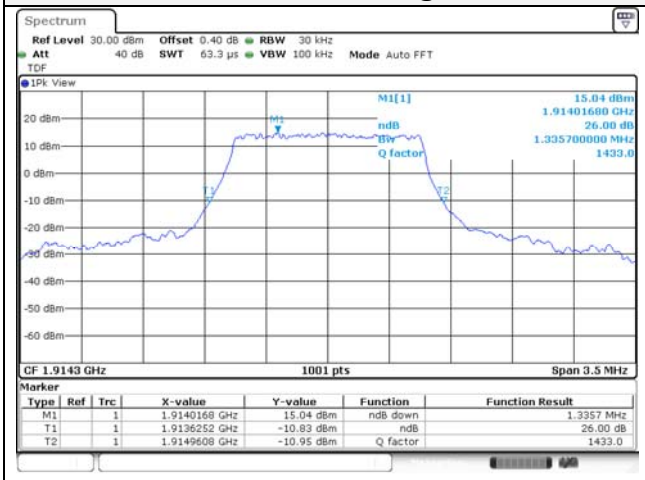
1.4M BW QPSK Mid ch.



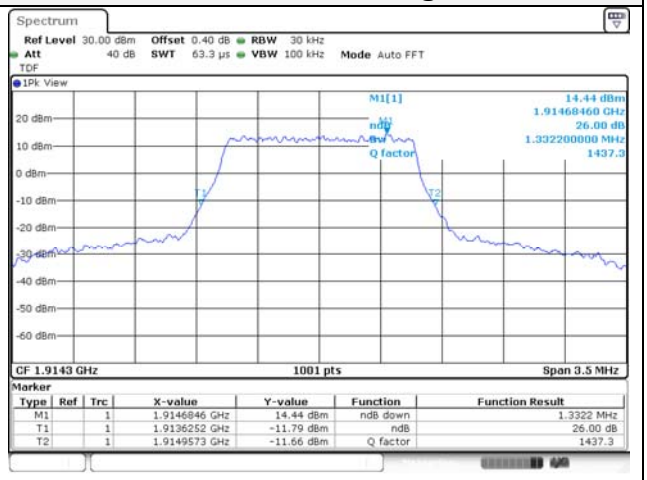
1.4M BW 16QAM Mid ch.



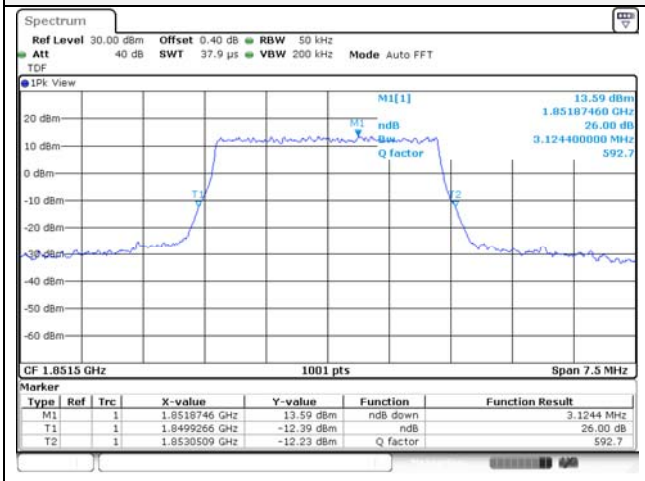
1.4M BW QPSK High ch.



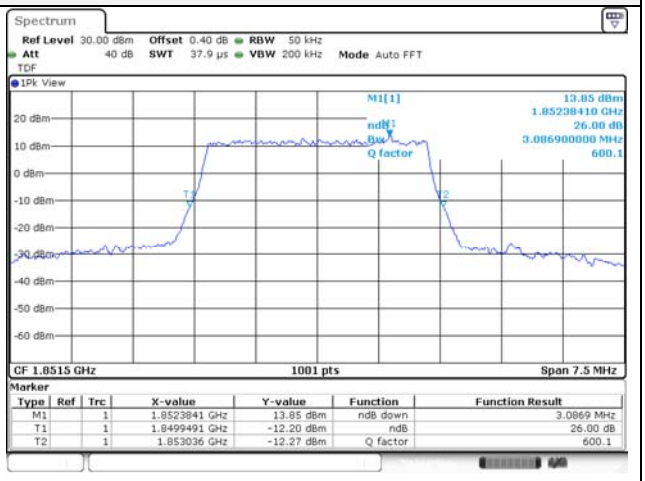
1.4M BW 16QAM High ch.



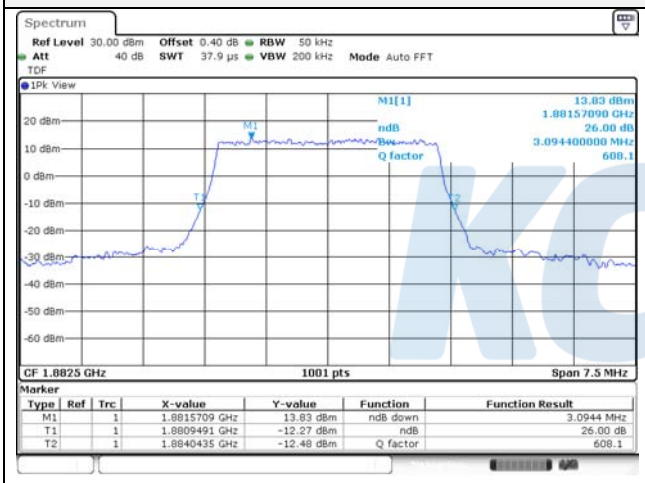
3M BW QPSK Low ch.



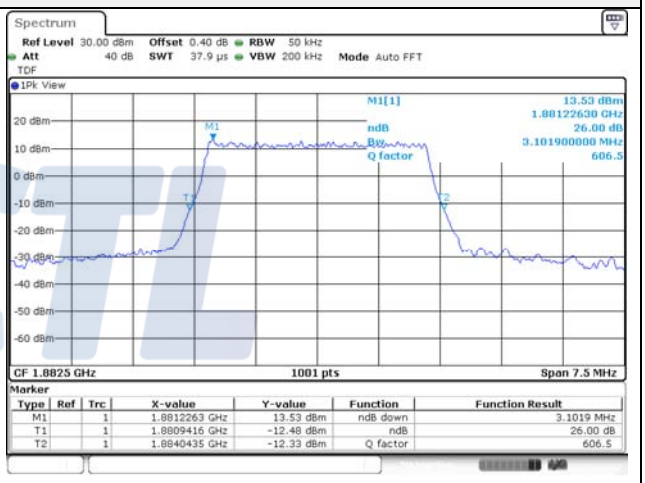
3M BW 16QAM Low ch.



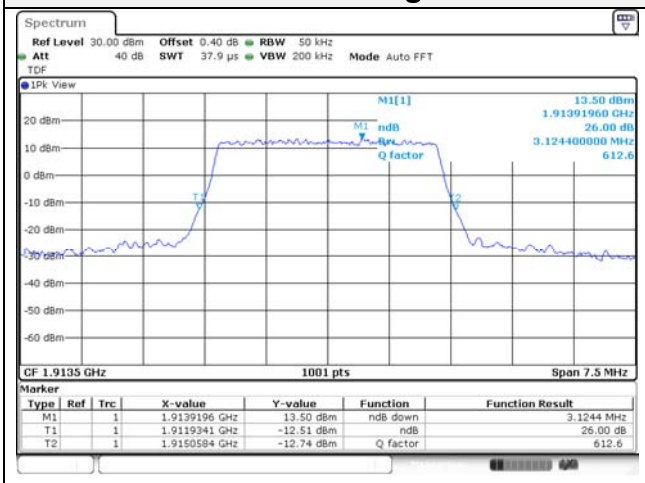
3M BW QPSK Mid ch.



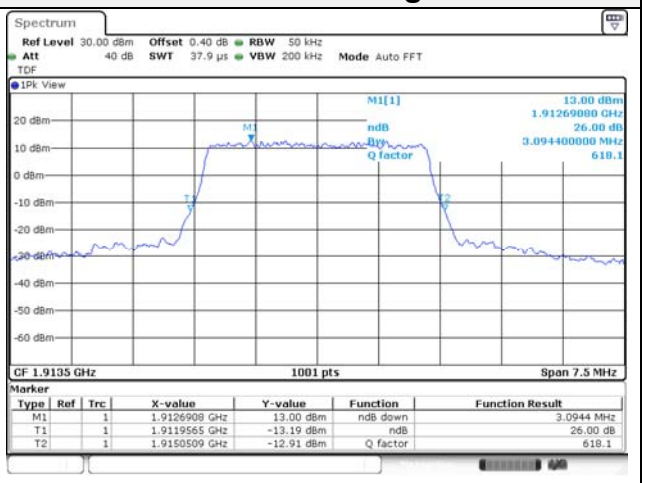
3M BW 16QAM Mid ch.



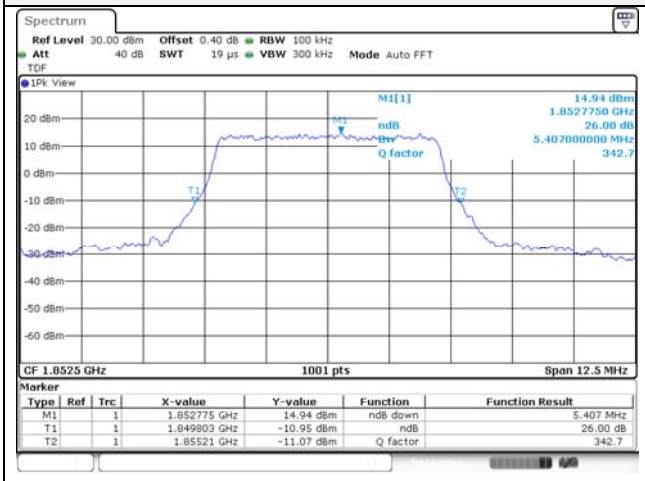
3M BW QPSK High ch.



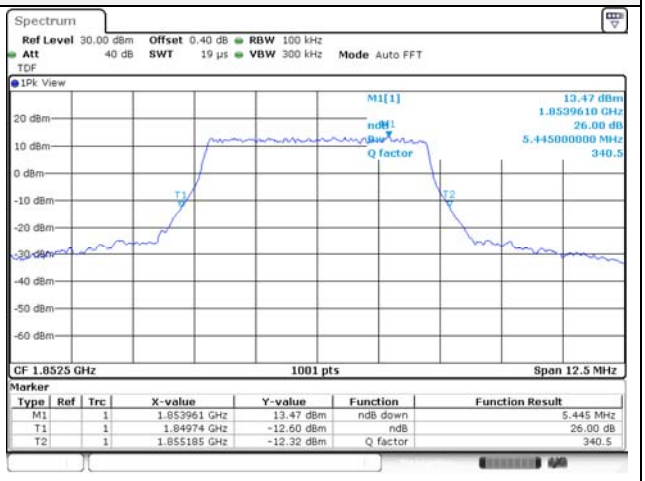
3M BW 16QAM High ch.



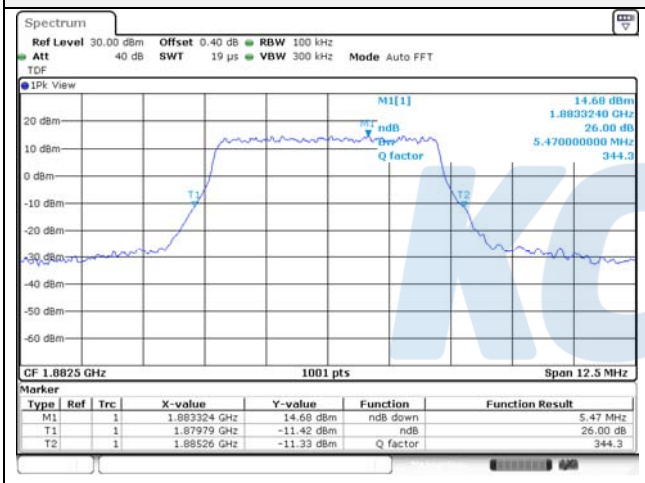
5M BW QPSK Low ch.



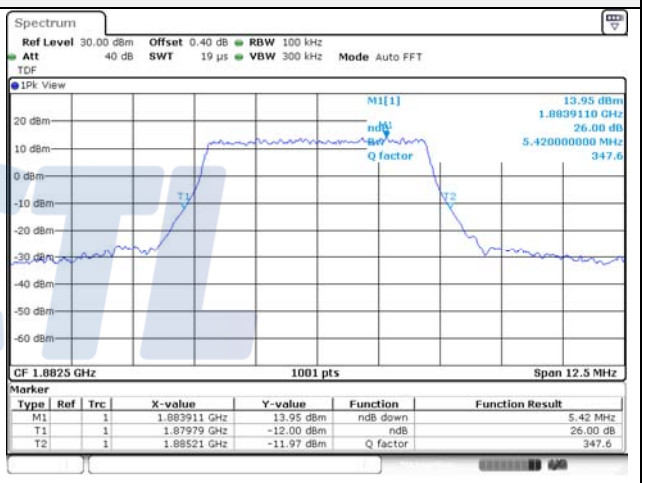
5M BW 16QAM Low ch.



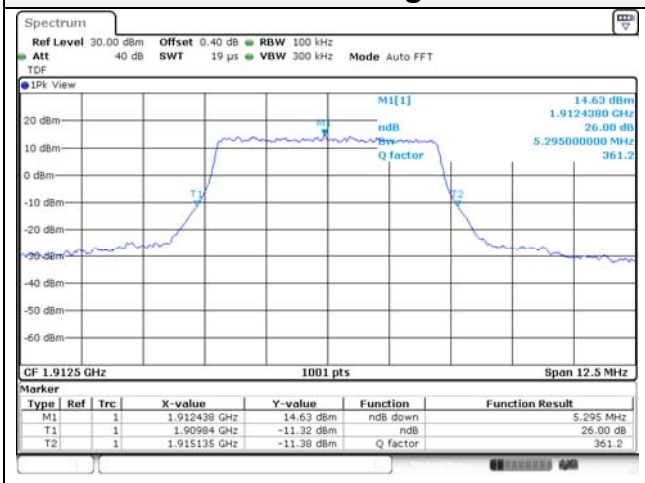
5M BW QPSK Mid ch.



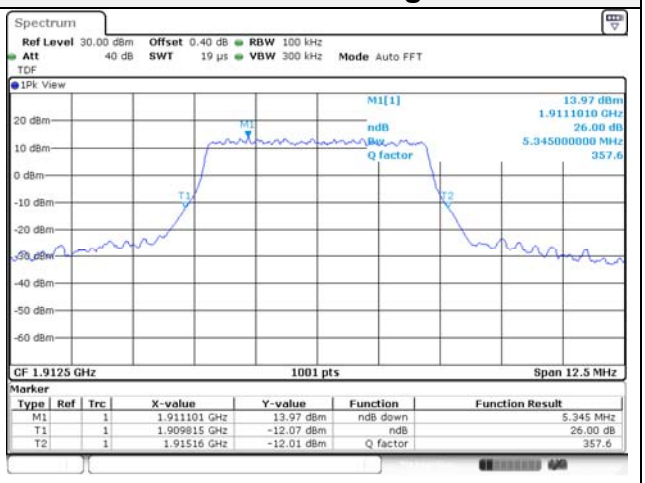
5M BW 16QAM Mid ch.



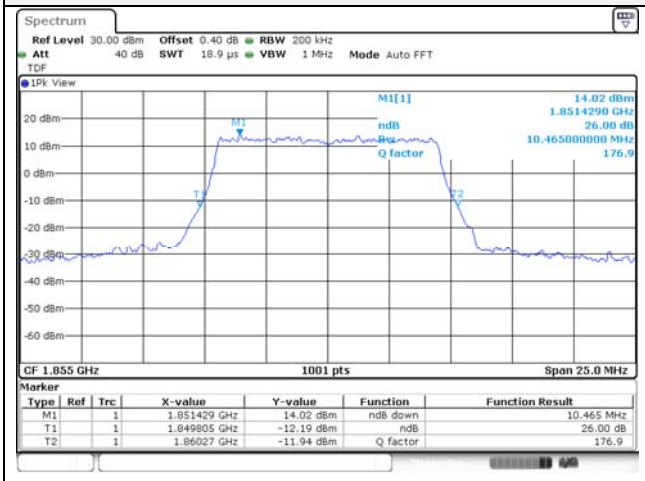
5M BW QPSK High ch.



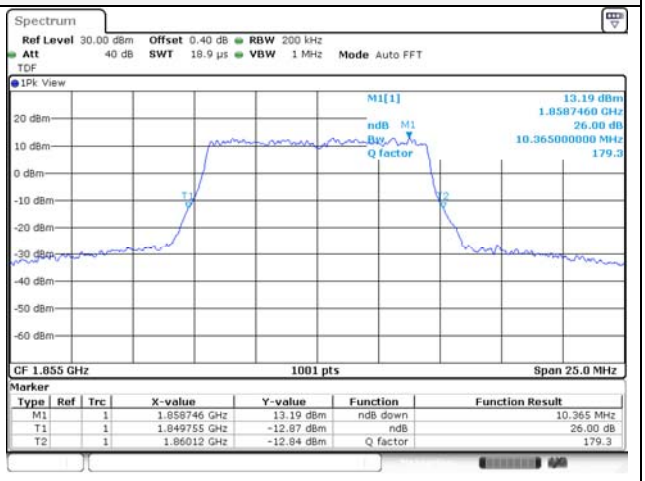
5M BW 16QAM High ch.



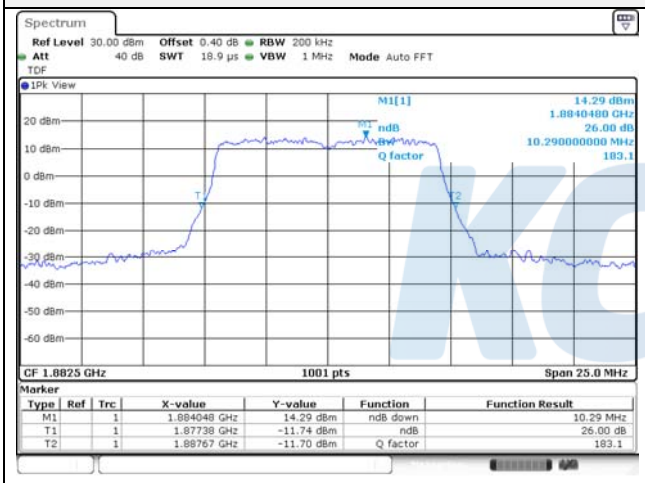
10M BW QPSK Low ch.



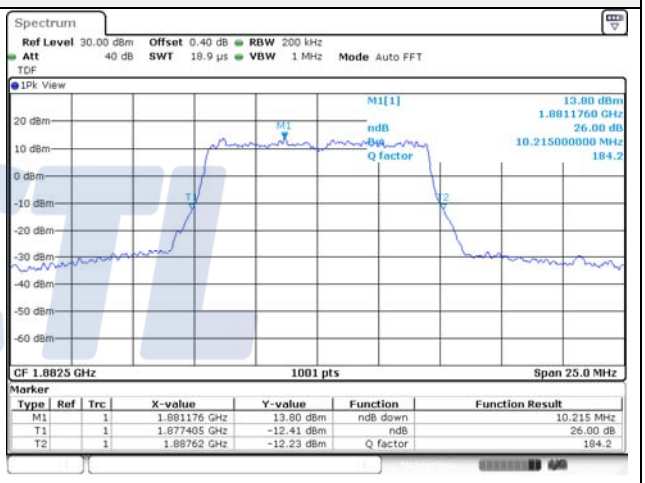
10M BW 16QAM Low ch.



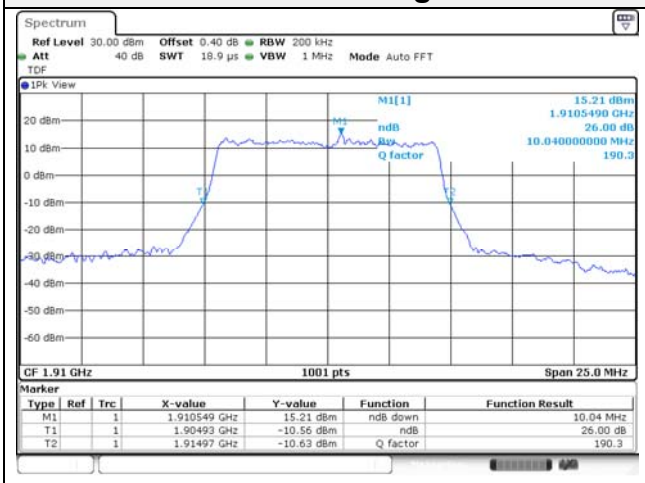
10M BW QPSK Mid ch.



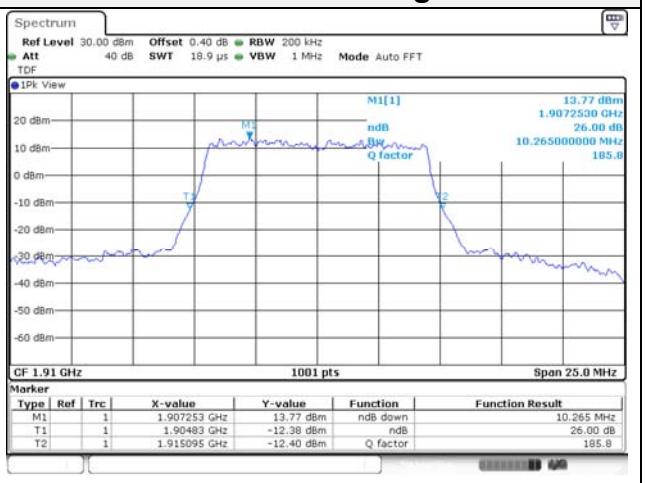
10M BW 16QAM Mid ch.



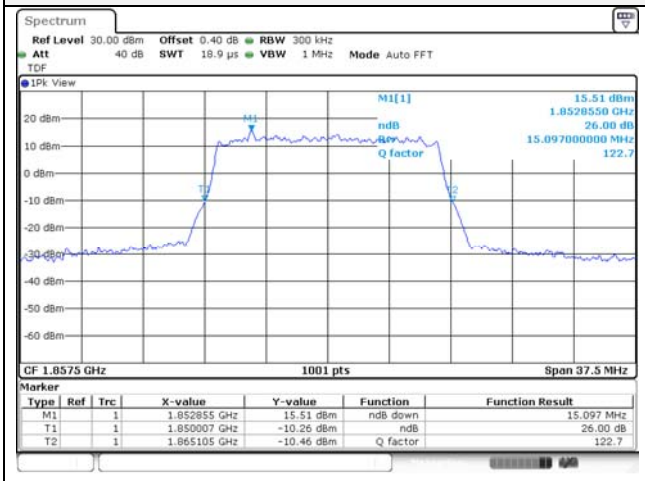
10M BW QPSK High ch.



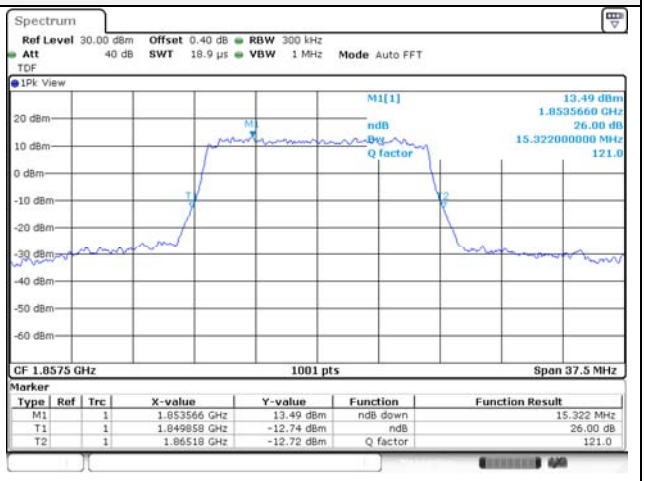
10M BW 16QAM High ch.



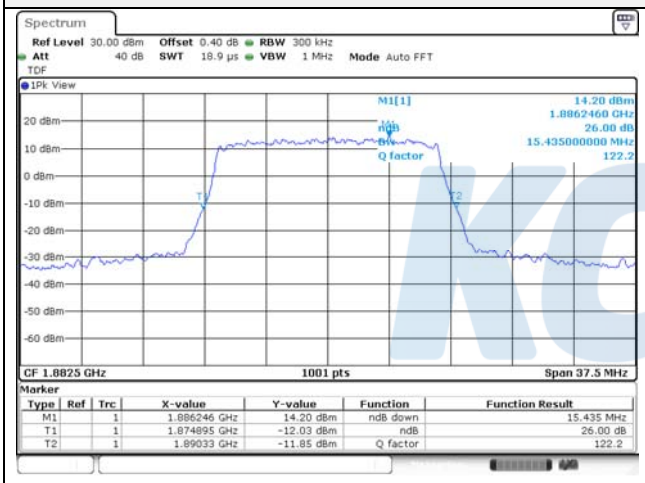
15M BW QPSK Low ch.



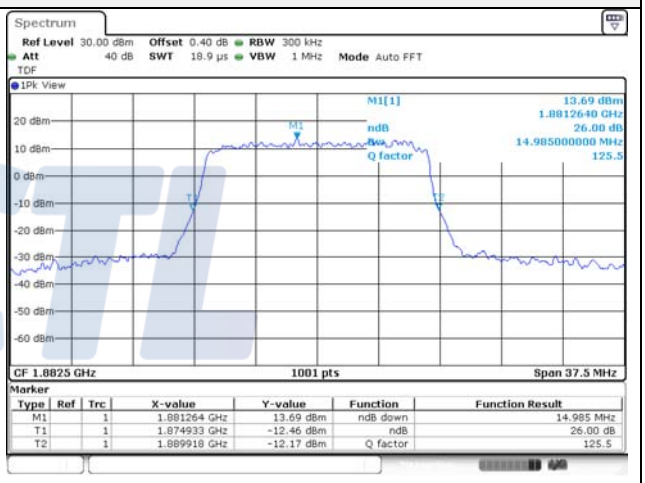
15M BW 16QAM Low ch.



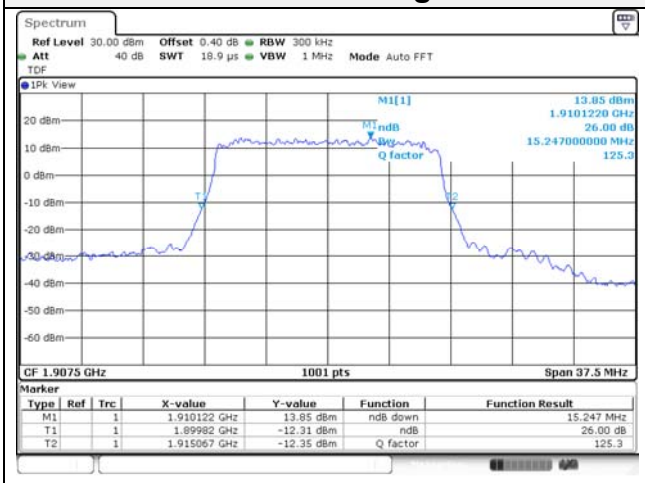
15M BW QPSK Mid ch.



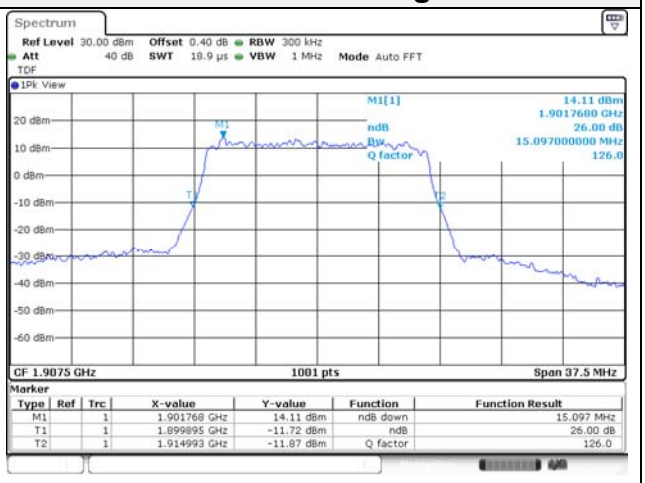
15M BW 16QAM Mid ch.



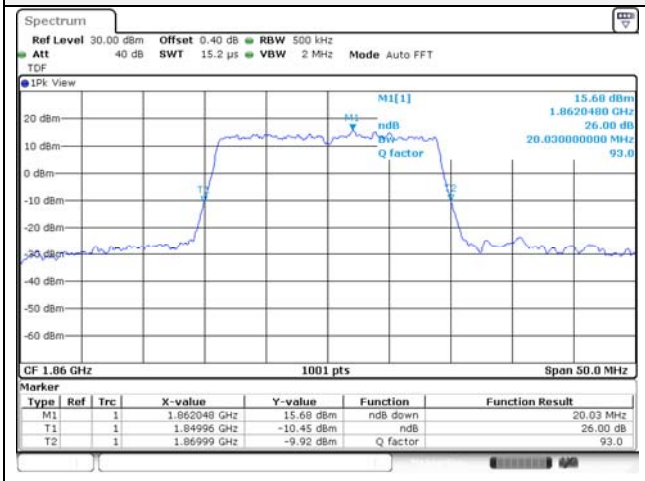
15M BW QPSK High ch.



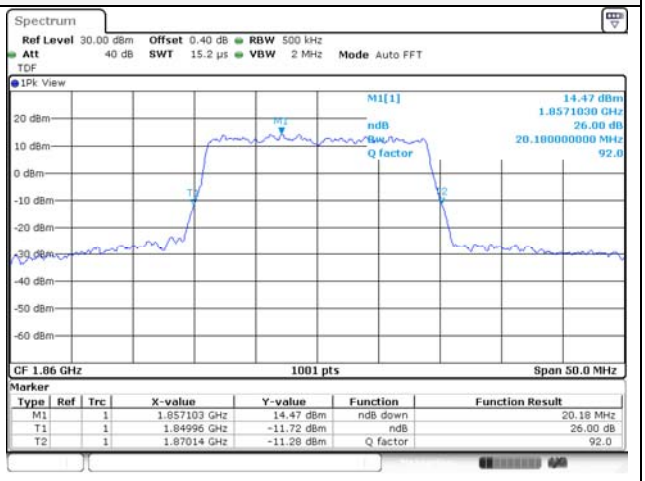
15M BW 16QAM High ch.



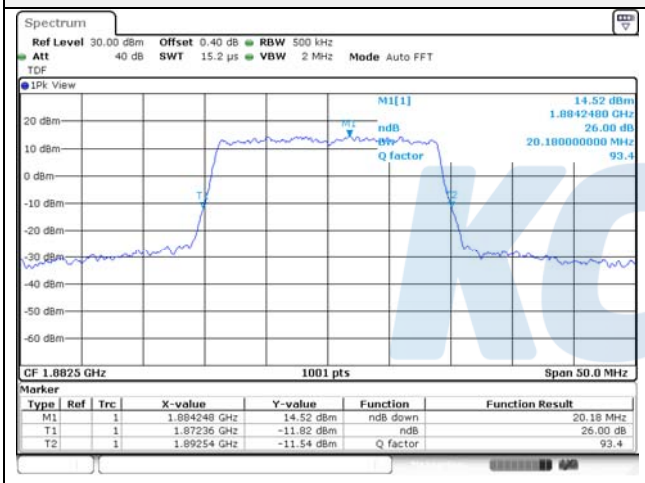
20M BW QPSK Low ch.



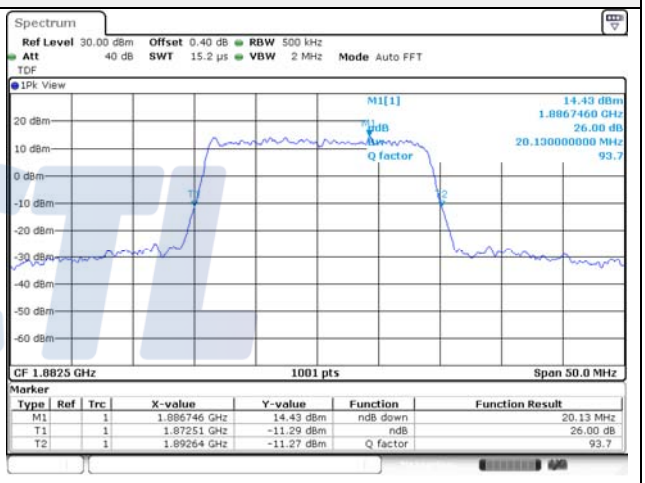
20M BW 16QAM Low ch.



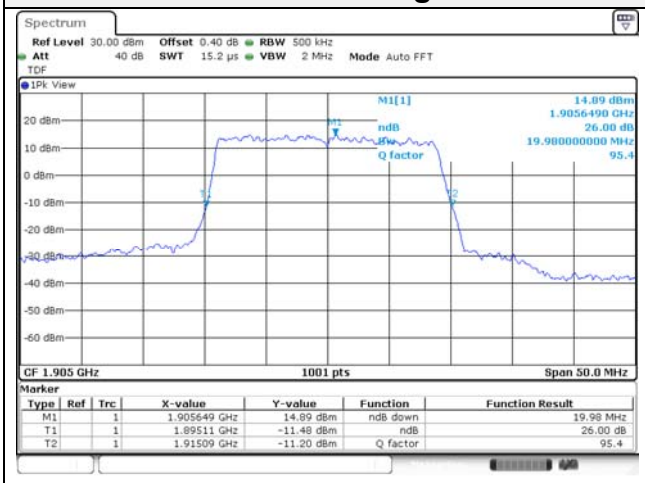
20M BW QPSK Mid ch.



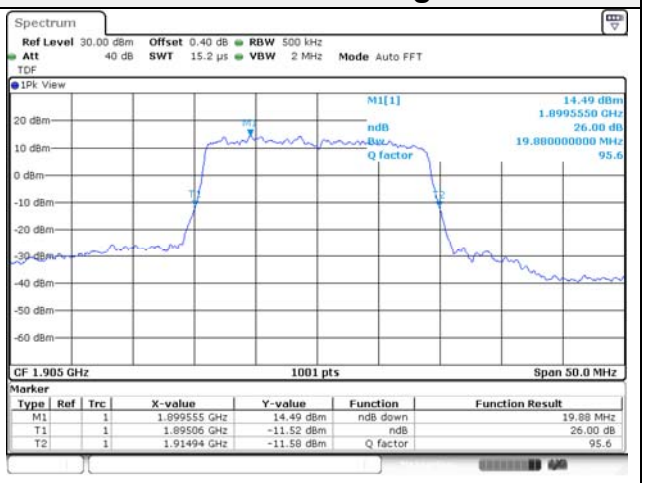
20M BW 16QAM Mid ch.



20M BW QPSK High ch.

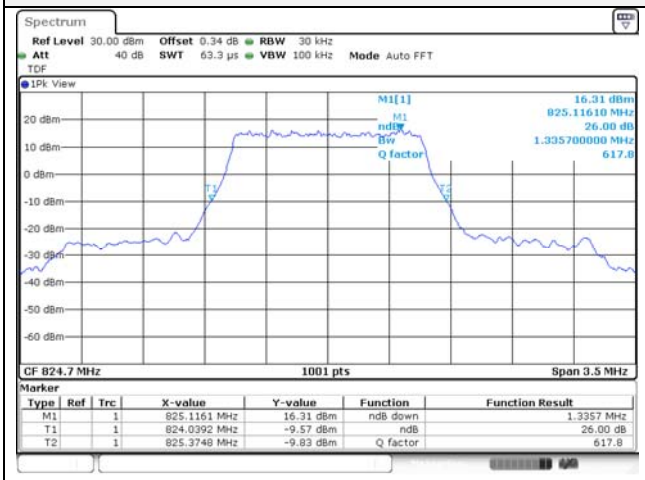


20M BW 16QAM High ch.

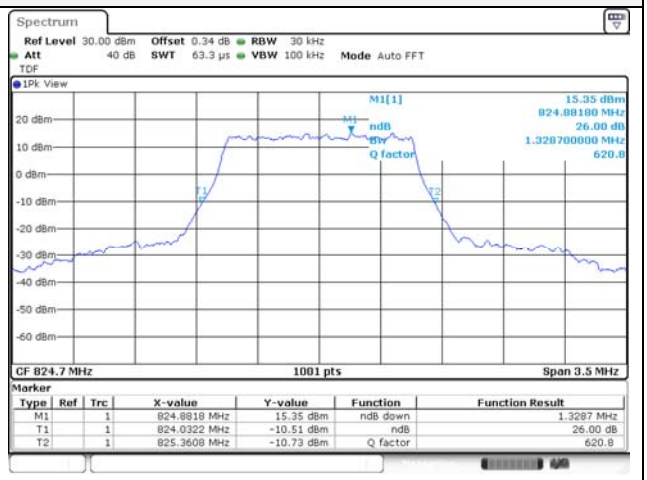


Test mode: LTE Band 26/5

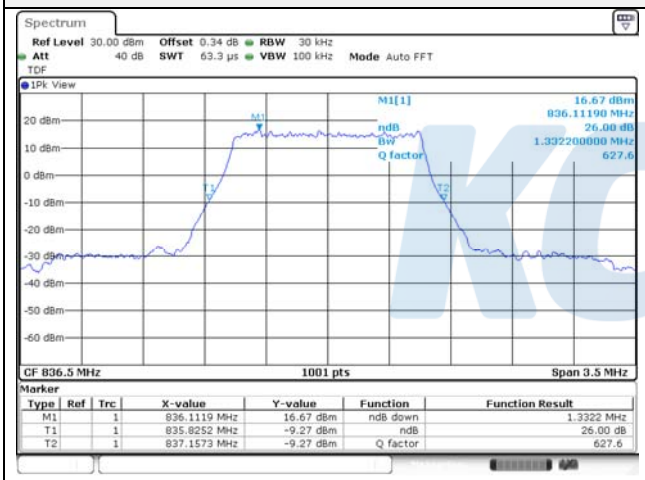
1.4M BW QPSK Low ch.



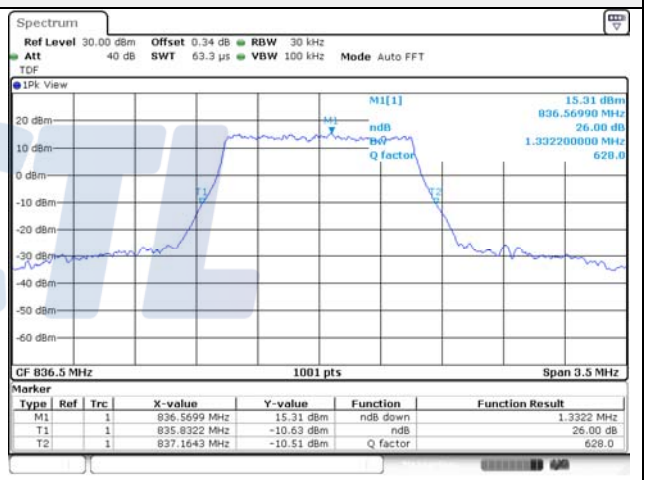
1.4M BW 16QAM Low ch.



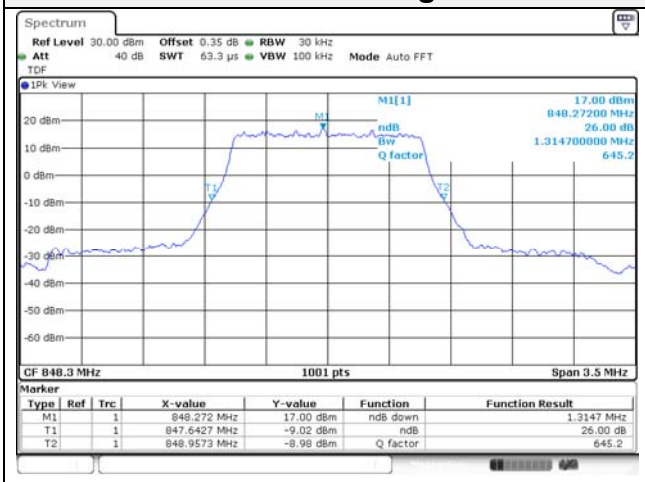
1.4M BW QPSK Mid ch.



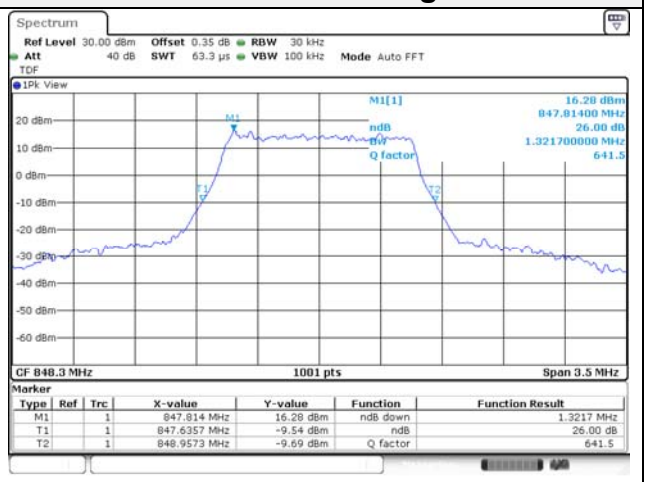
1.4M BW 16QAM Mid ch.



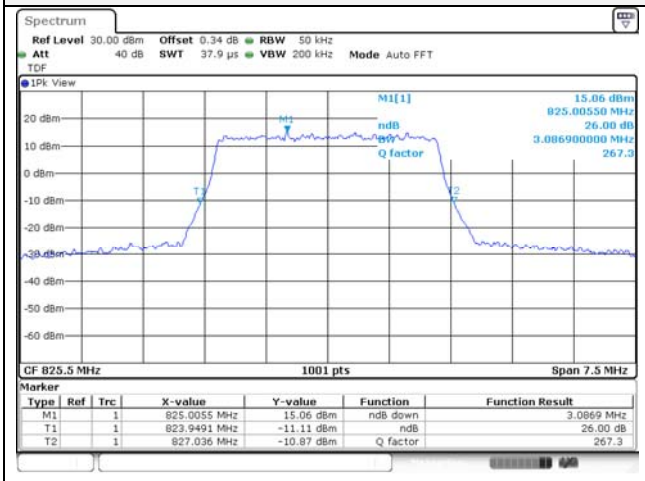
1.4M BW QPSK High ch.



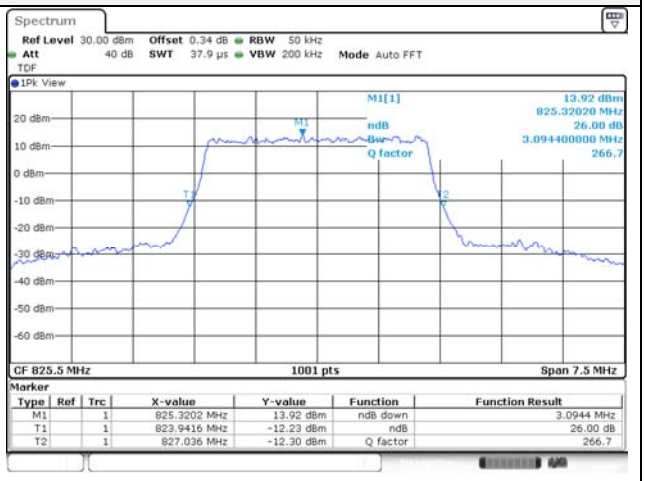
1.4M BW 16QAM High ch.



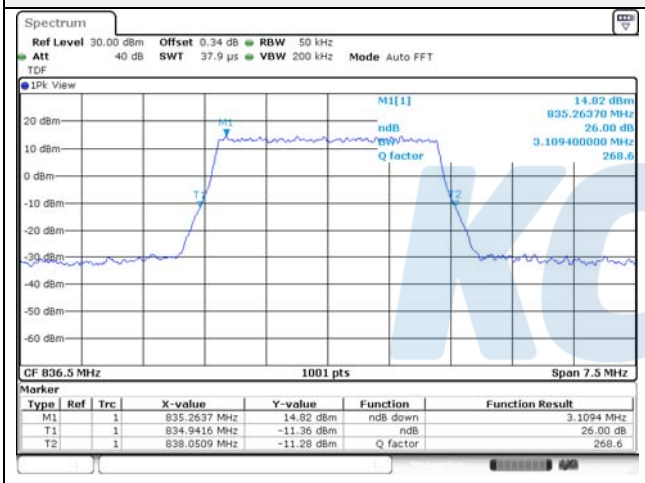
3M BW QPSK Low ch.



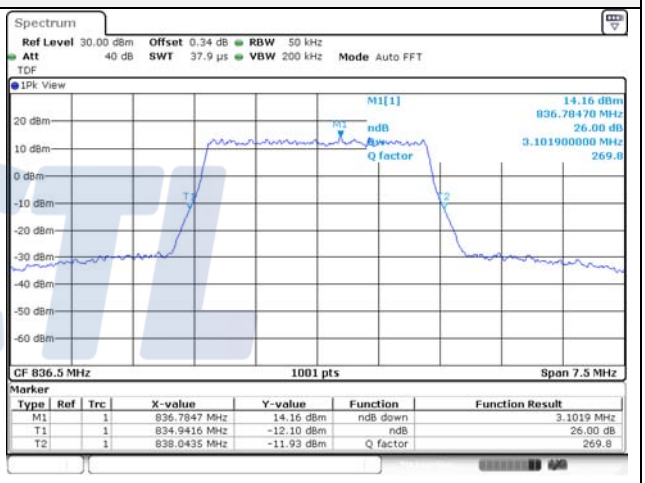
3M BW 16QAM Low ch.



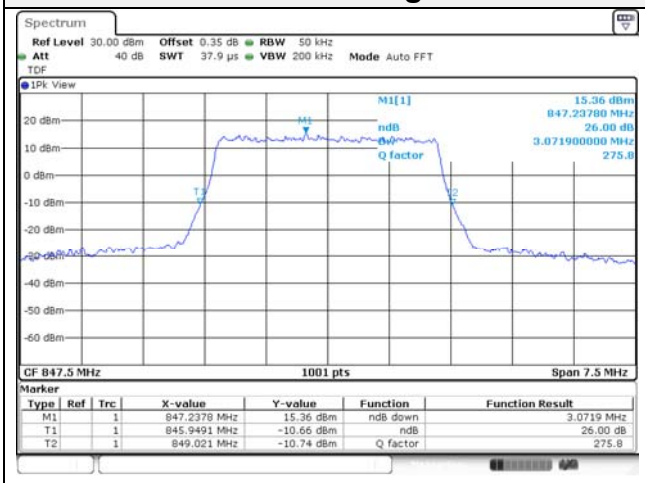
3M BW QPSK Mid ch.



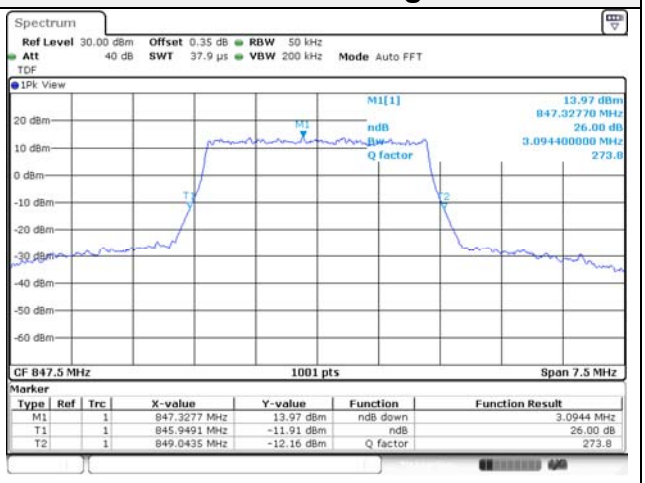
3M BW 16QAM Mid ch.



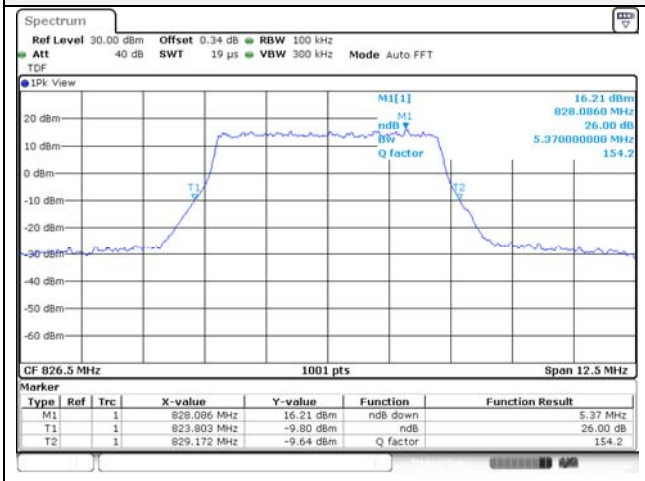
3M BW QPSK High ch.



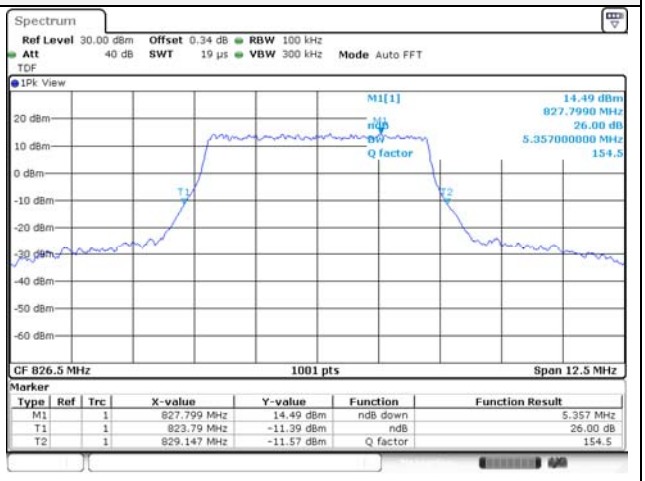
3M BW 16QAM High ch.



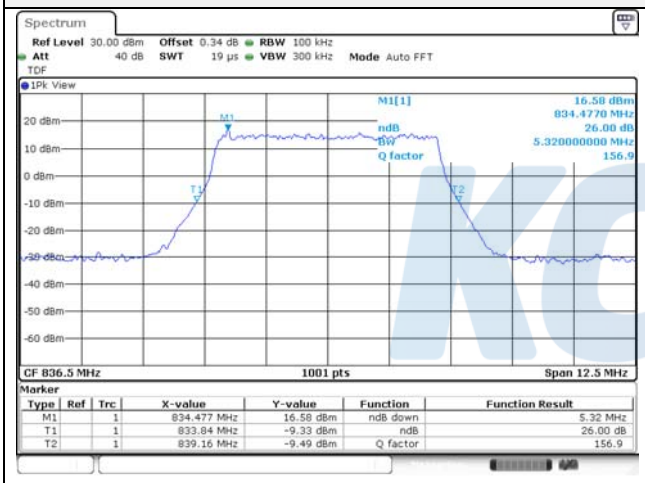
5M BW QPSK Low ch.



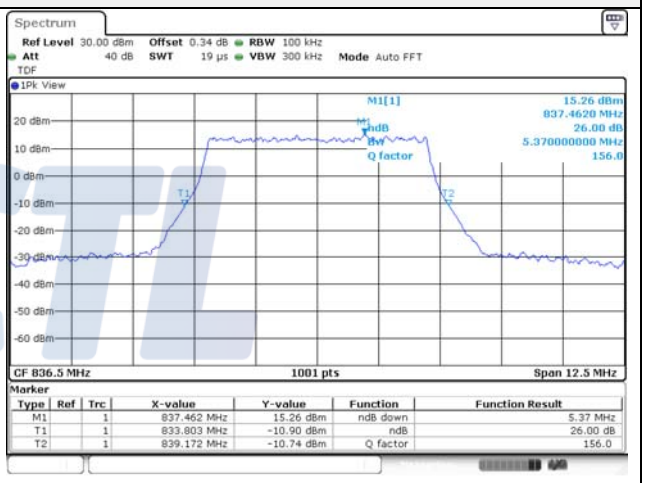
5M BW 16QAM Low ch.



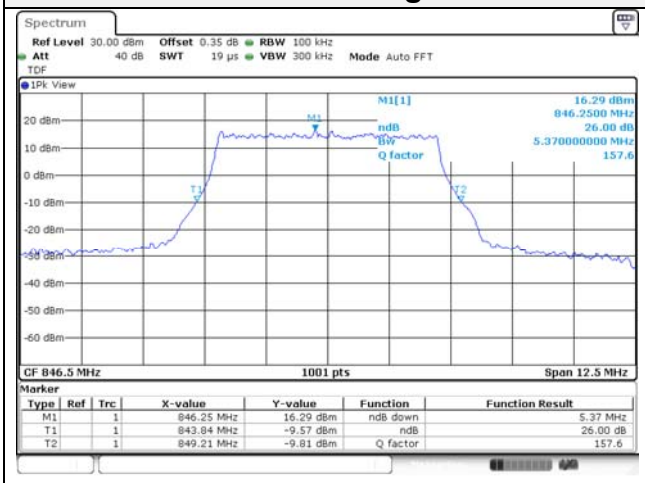
5M BW QPSK Mid ch.



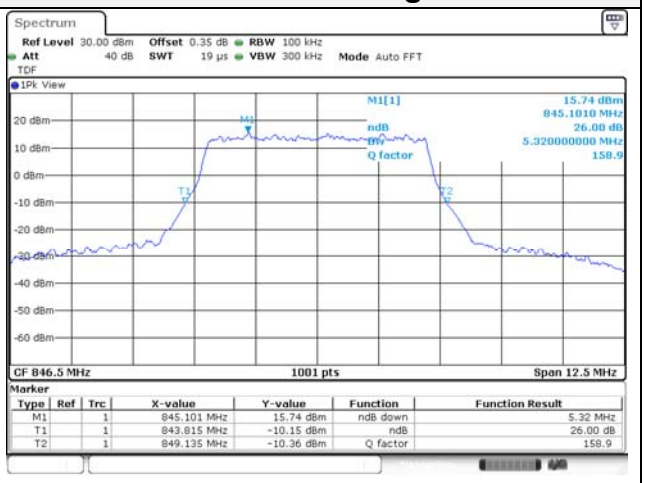
5M BW 16QAM Mid ch.



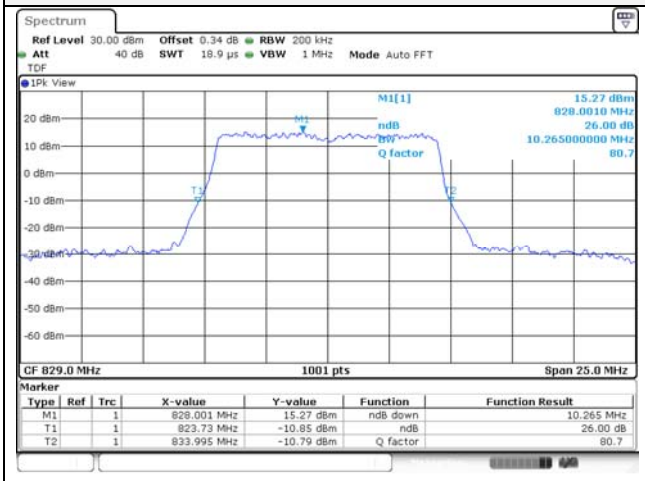
5M BW QPSK High ch.



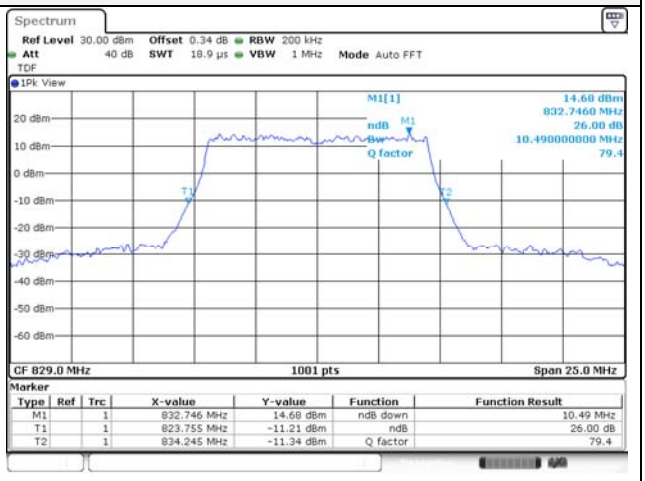
5M BW 16QAM High ch.



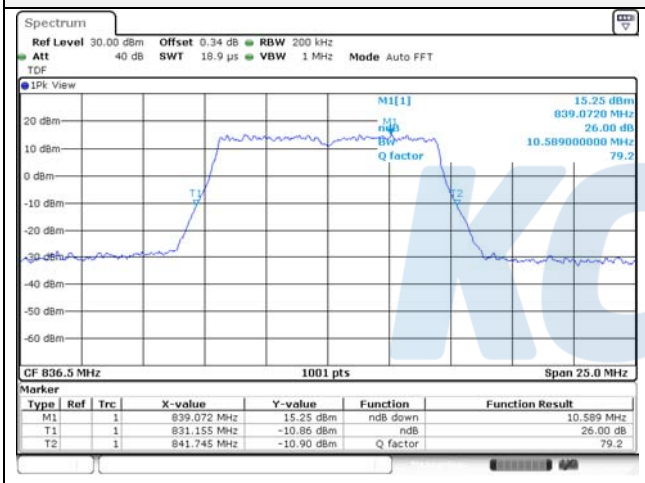
10M BW QPSK Low ch.



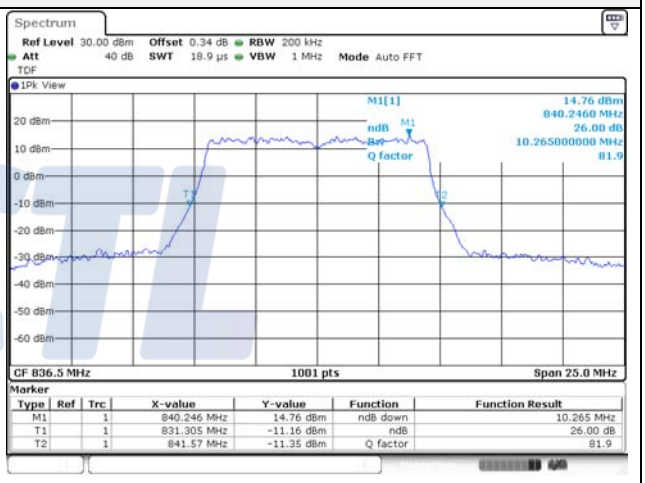
10M BW 16QAM Low ch.



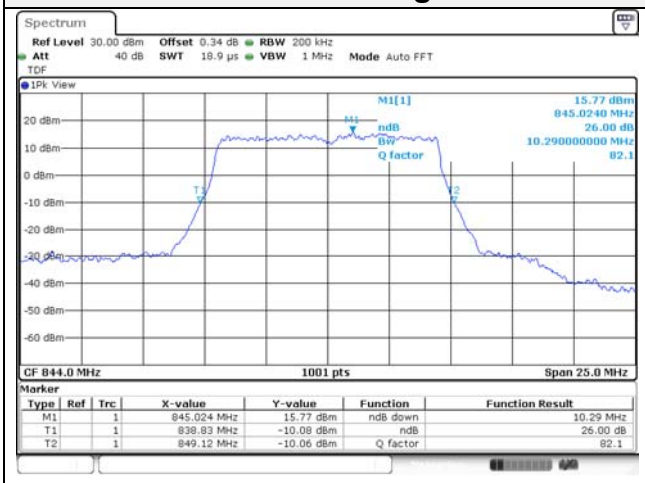
10M BW QPSK Mid ch.



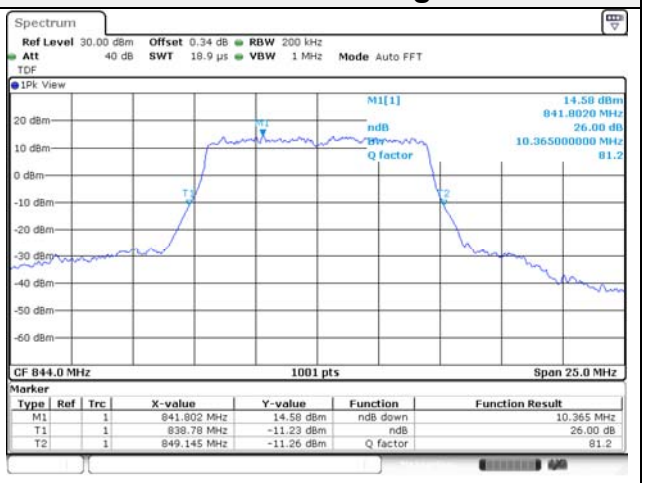
10M BW 16QAM Mid ch.



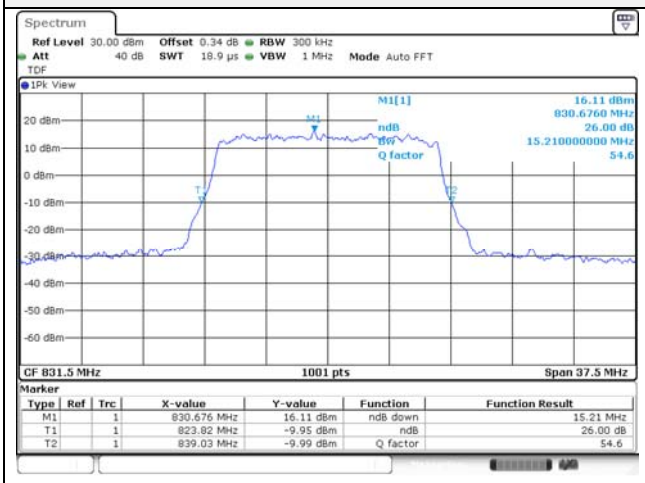
10M BW QPSK High ch.



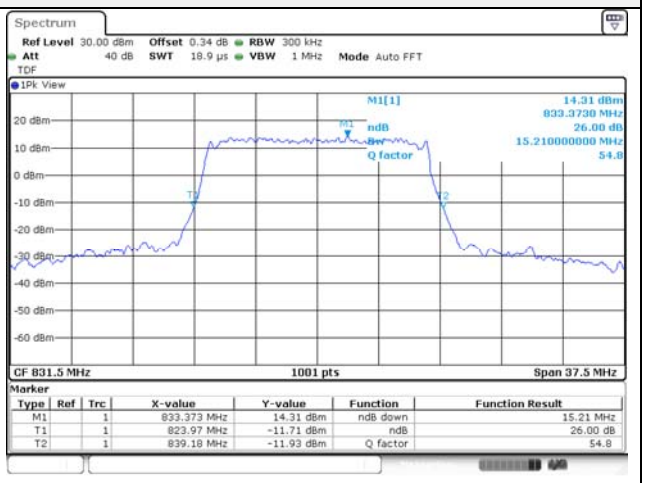
10M BW 16QAM High ch.



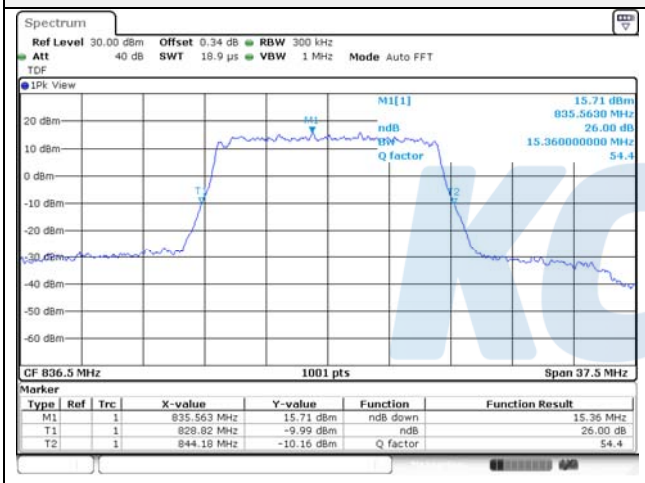
15M BW QPSK Low ch.



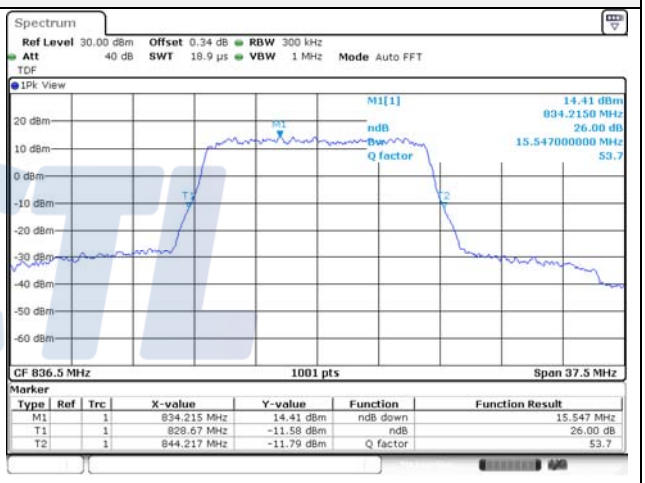
15M BW 16QAM Low ch.



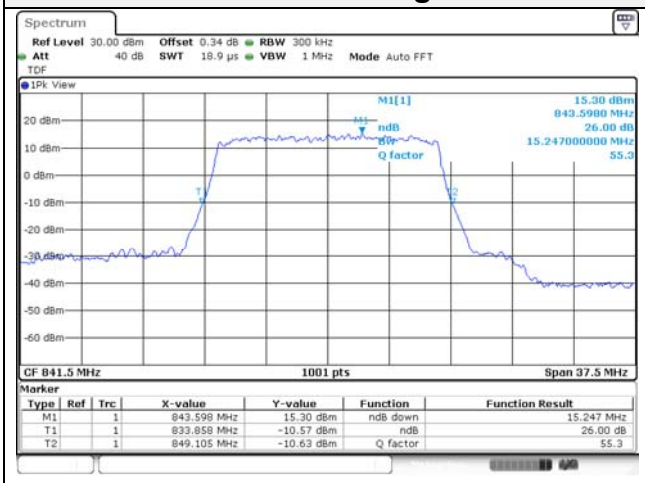
15M BW QPSK Mid ch.



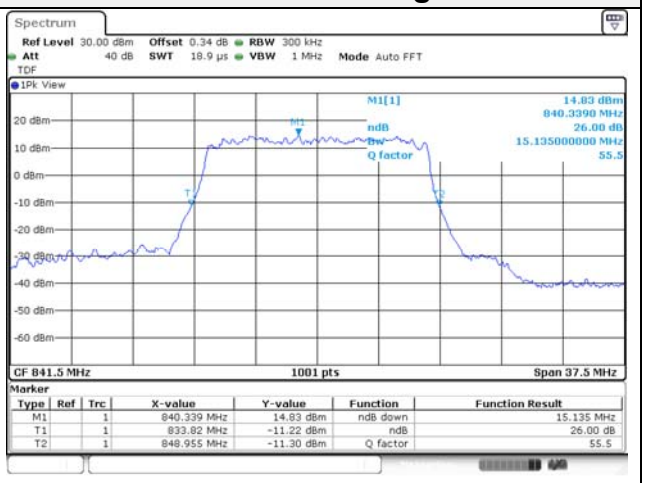
15M BW 16QAM Mid ch.



15M BW QPSK High ch.

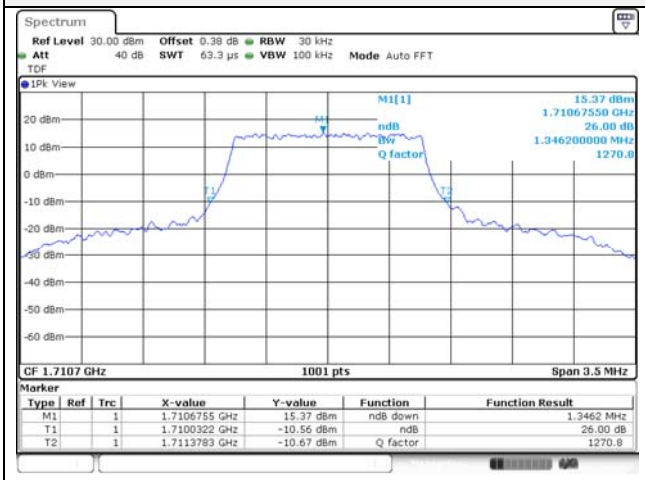


15M BW 16QAM High ch.

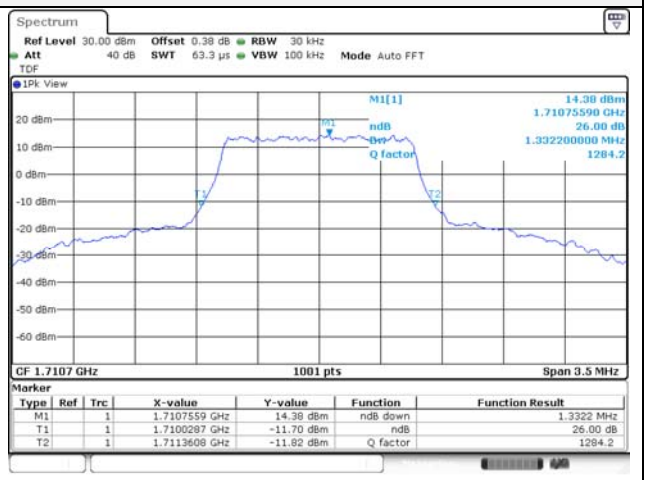


Test mode: LTE Band 66/4

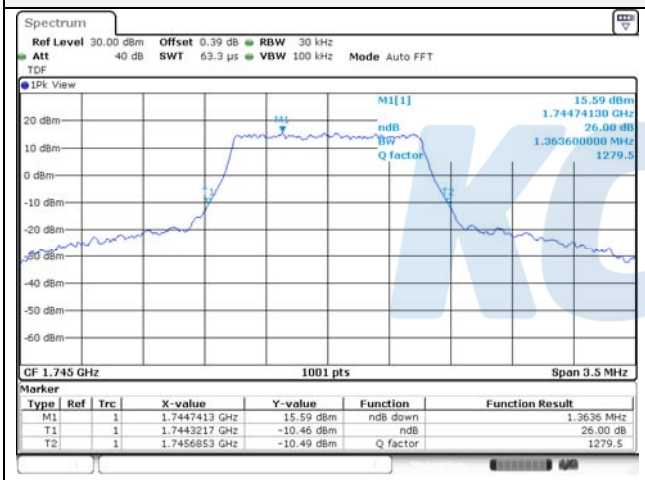
1.4M BW QPSK Low ch.



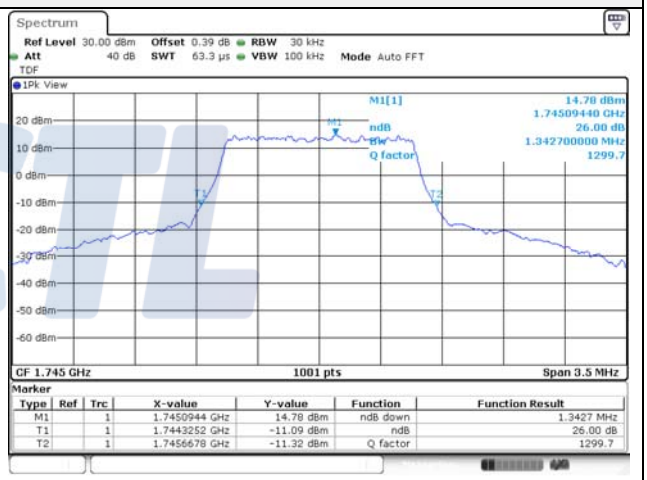
1.4M BW 16QAM Low ch.



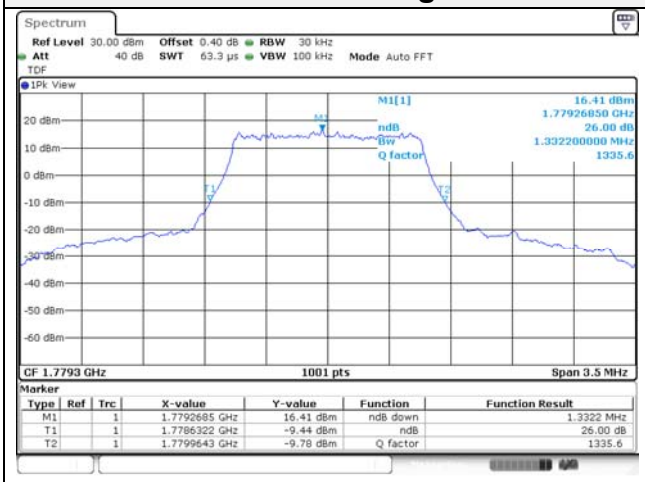
1.4M BW QPSK Mid ch.



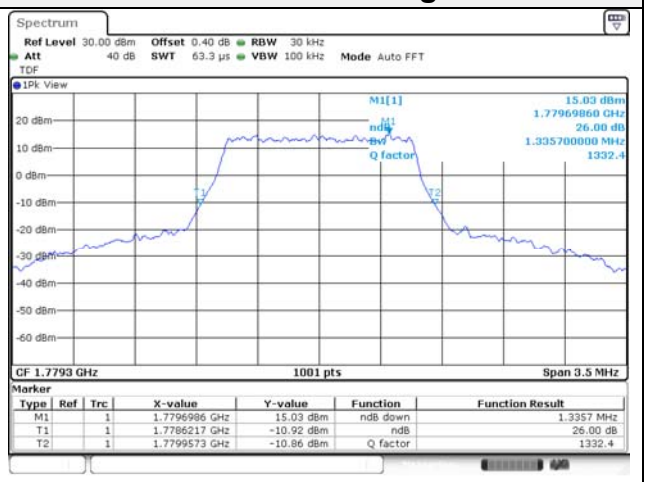
1.4M BW 16QAM Mid ch.



1.4M BW QPSK High ch.



1.4M BW 16QAM High ch.



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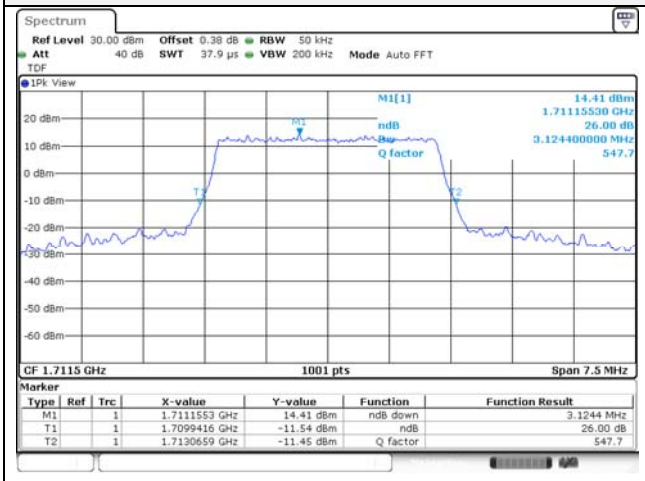

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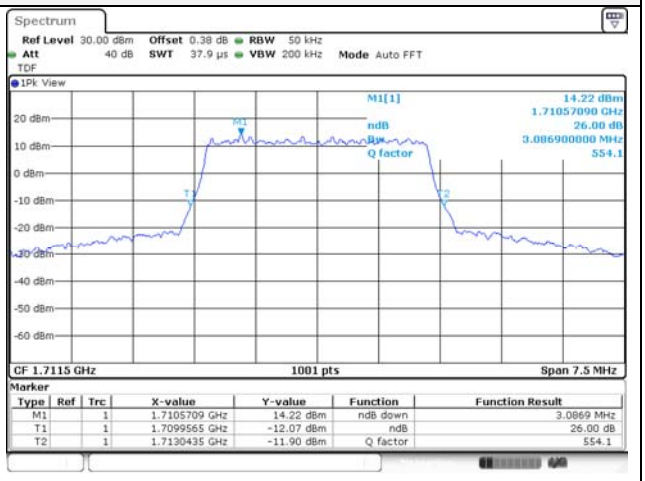
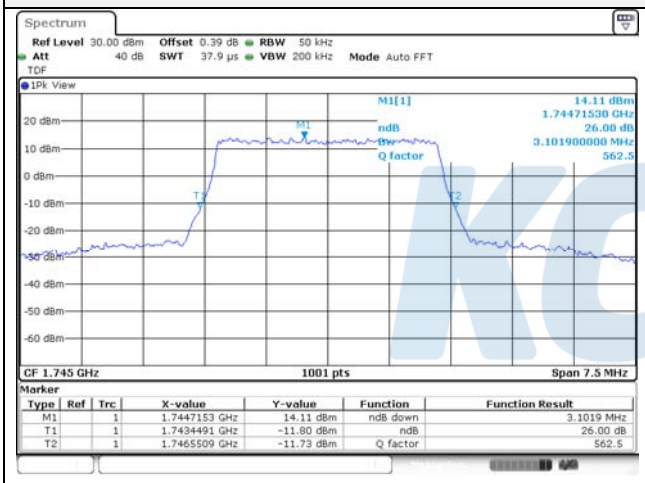


3M BW QPSK Mid ch.



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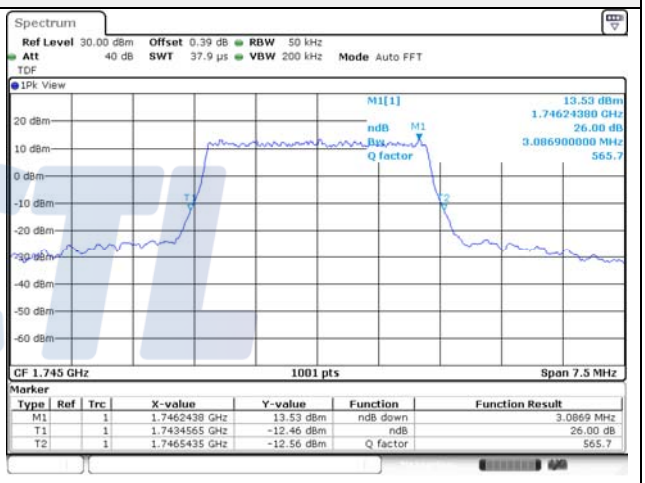

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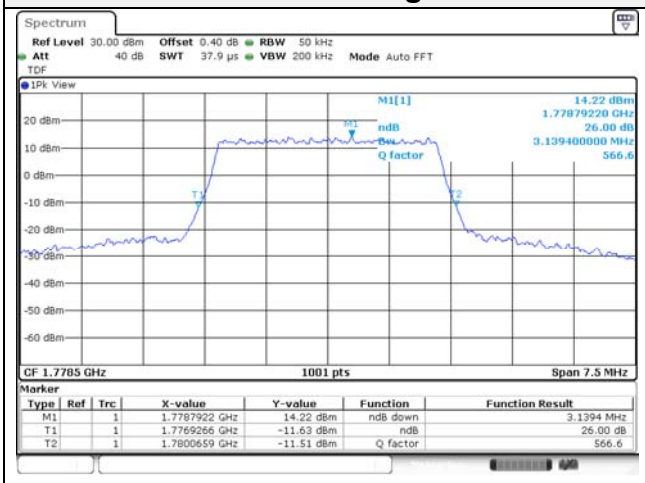

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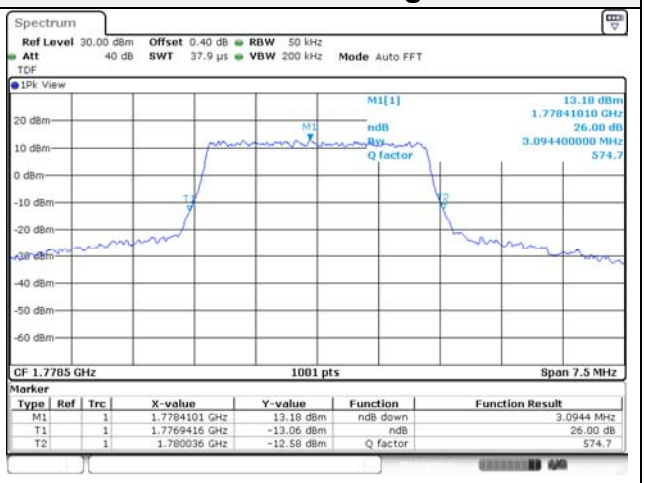

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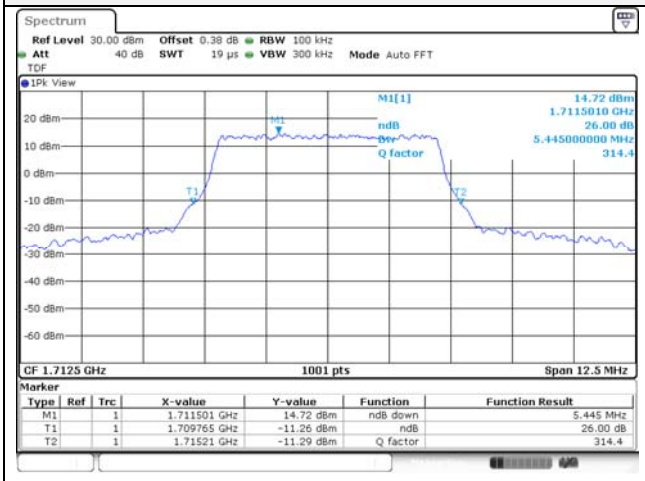
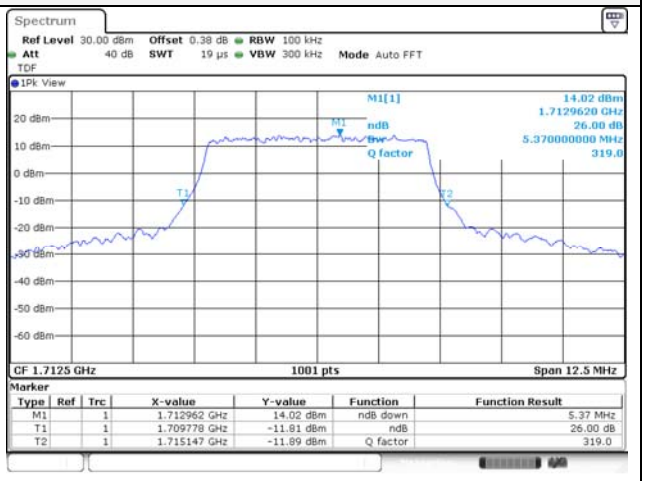


5M BW 16QAM Low ch.



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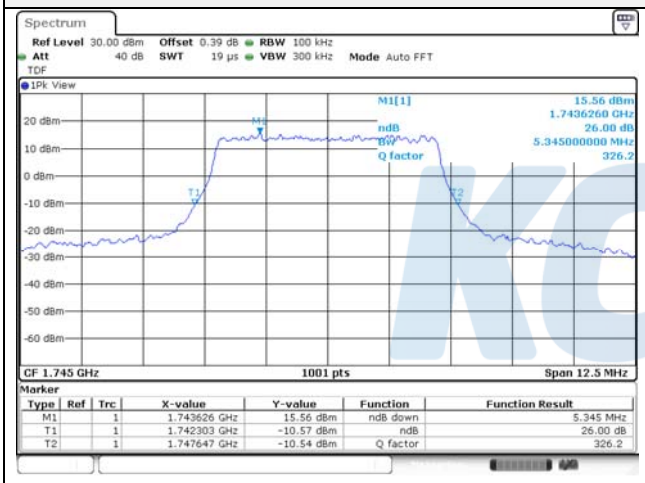

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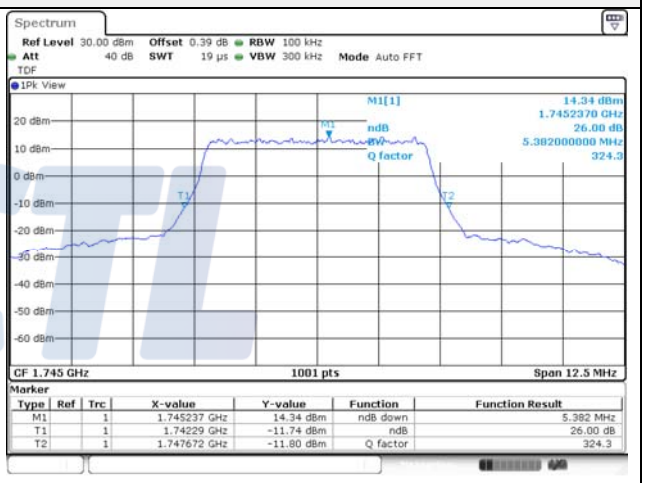

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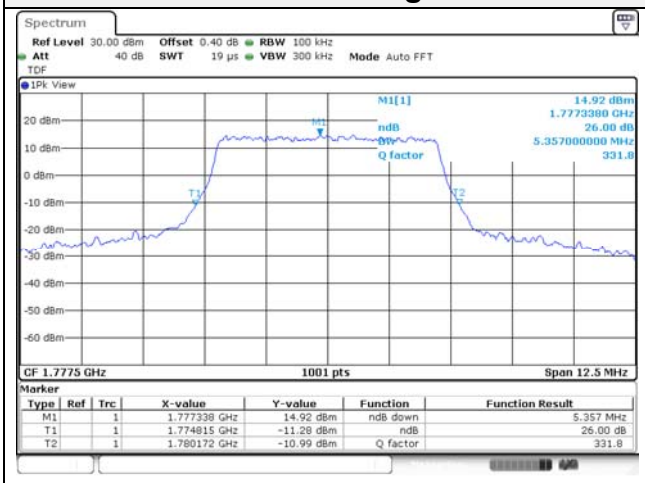
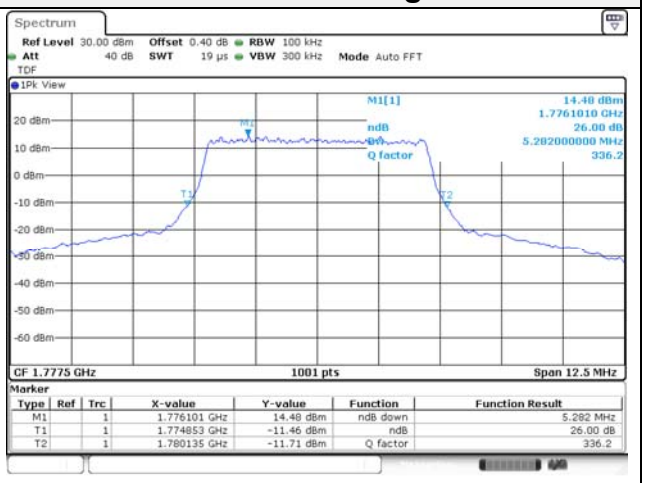
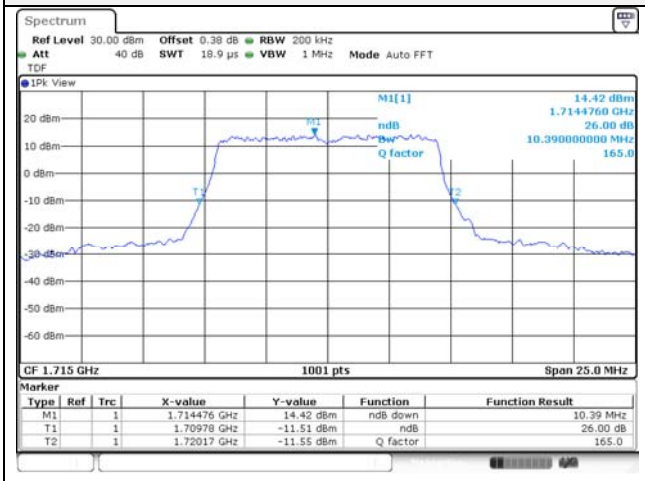


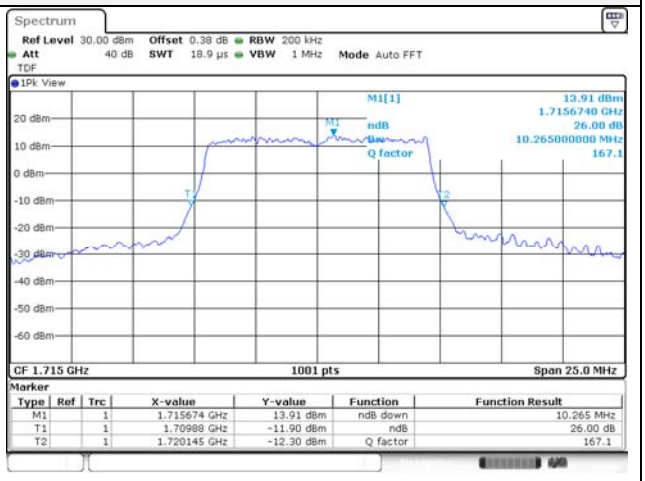
5M BW 16QAM High ch.



10M BW QPSK Low ch.



10M BW 16QAM Low ch.



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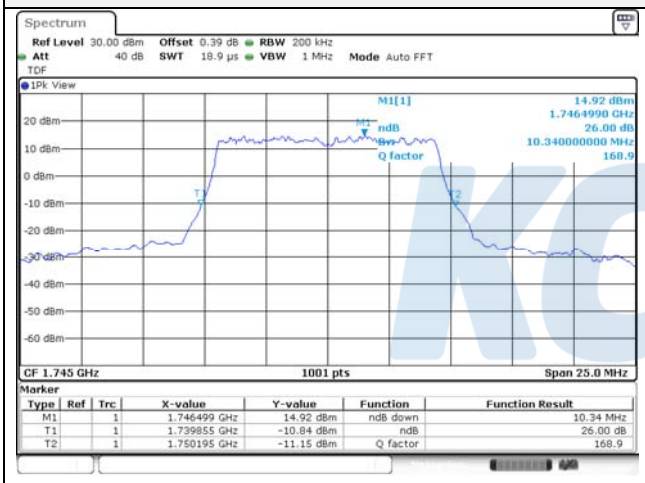

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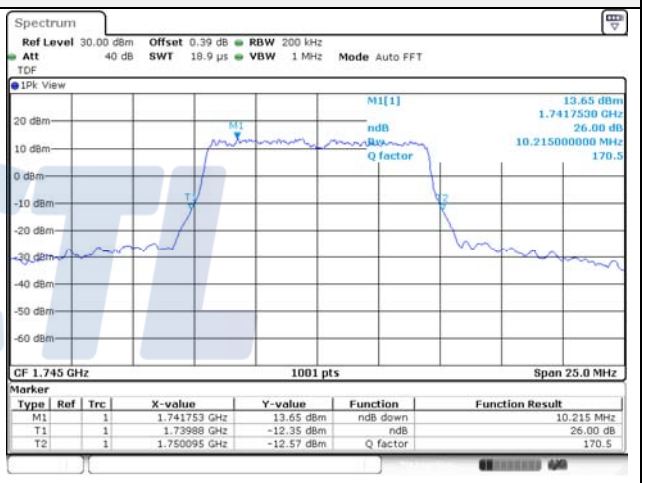

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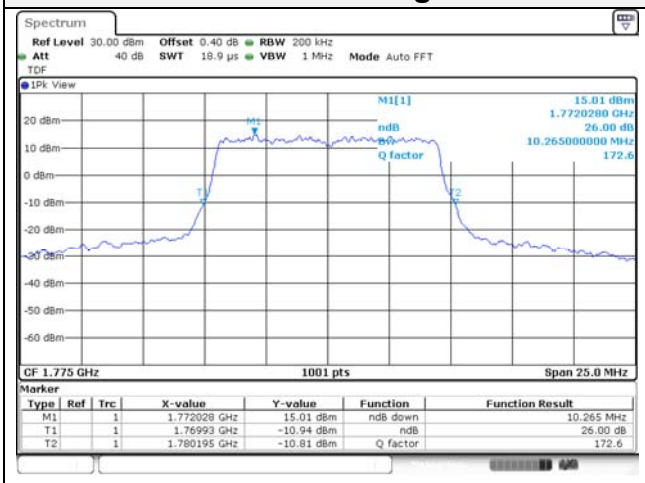

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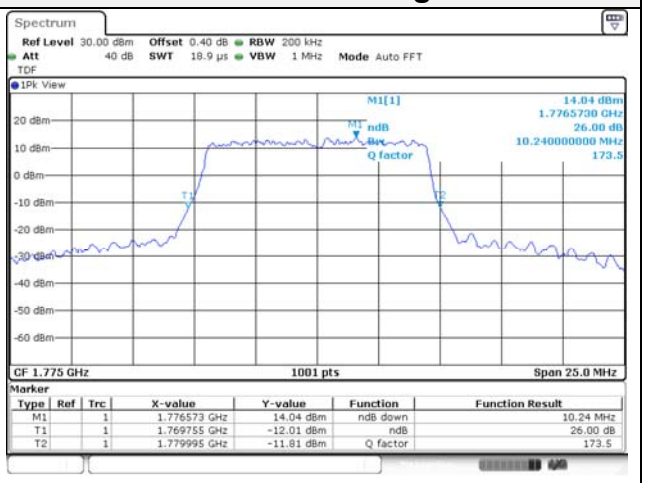

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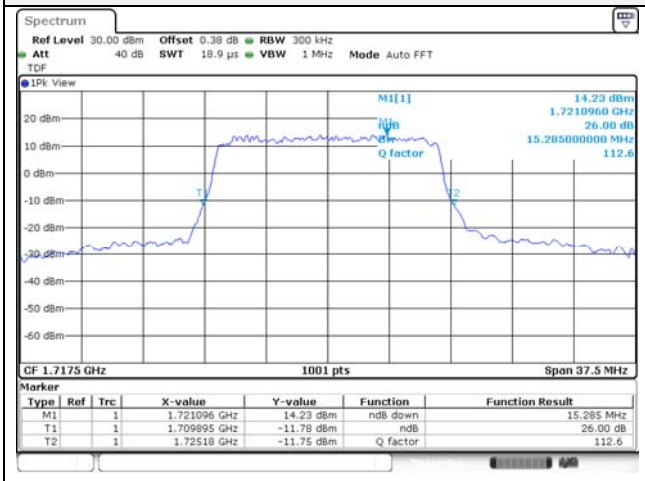
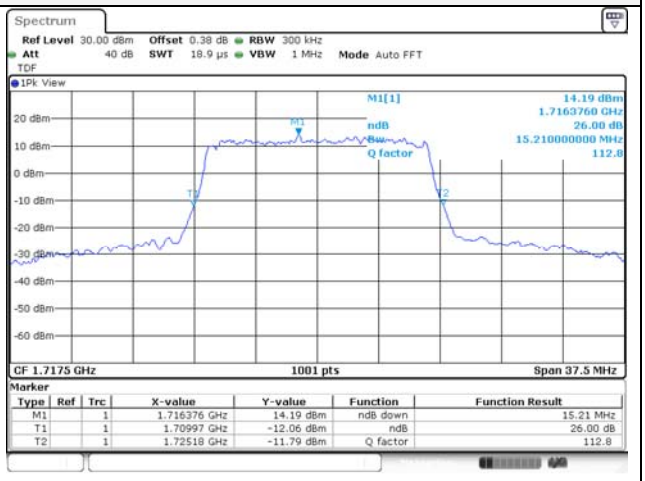
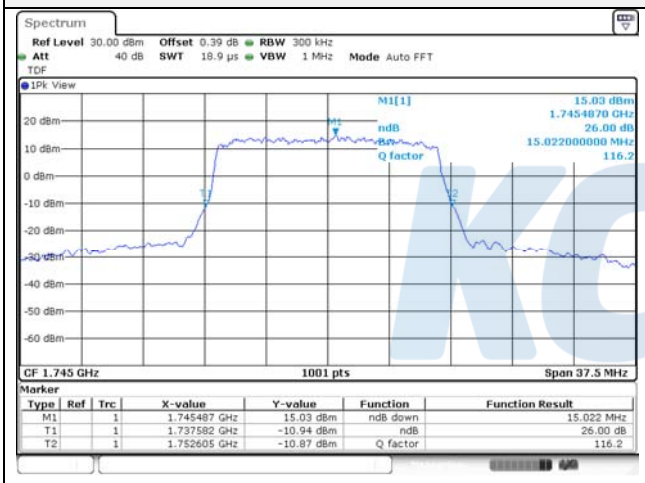


15M BW 16QAM Low ch.



15M BW QPSK Mid ch.



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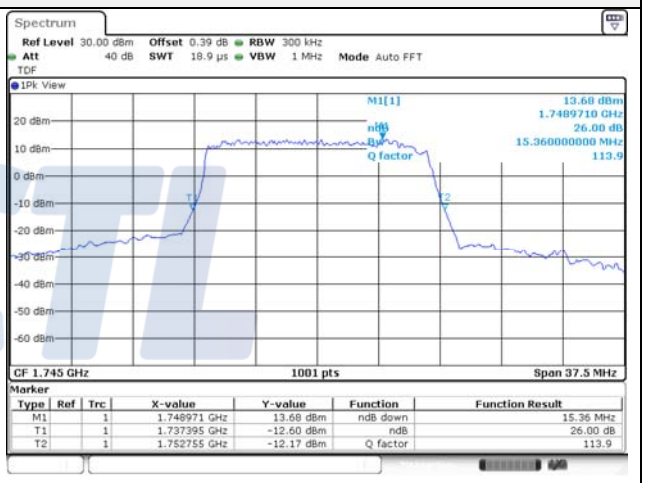

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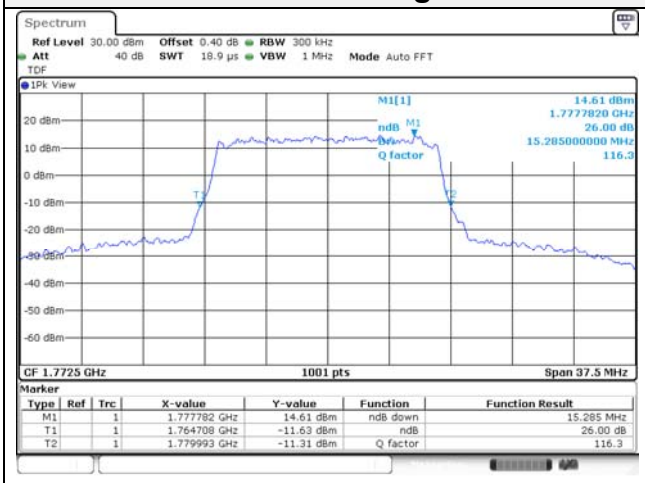

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