




TEST REPORT

Eurofins KCTL Co.,Ltd. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-70-5008-1021 FAX: 82-505-299-8311 www.kctl.co.kr	Report No.: KR23-SRF0161 Page (1) of (167)	 KCTL
<p>1. Client</p> <ul style="list-style-type: none"> ◦ Name : Samsung Electronics Co., Ltd. ◦ Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea ◦ Date of Receipt : 2023-03-23 <p>2. Use of Report : Certification</p> <p>3. Name of Product / Model : Smart wearable / SM-R965U (FCC), SM-R965F (ISED)</p> <p>4. Manufacturer / Country of Origin : Samsung Electronics Co., Ltd. / Vietnam</p> <p>5. FCC ID : A3LSMR965 (SM-R965U, SM-R965F)</p> <p>6. IC Certificate No. : 649E-SMR965 (SM-R965F)</p> <p>7. Date of Test : 2023-03-29 to 2023-05-17</p> <p>8. Location of Test : <input checked="" type="checkbox"/> Permanent Testing Lab <input type="checkbox"/> On Site Testing (Address:65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea)</p> <p>9. Test method used : FCC Part 2 / RSS-Gen Issue 5 FCC Part 22 subpart H / RSS-132 Issue 4 FCC Part 24 subpart E / RSS-133 Issue 6 FCC Part 27 subpart C / RSS-130 Issue 2, RSS-139 Issue 4, RSS-199 Issue 3</p> <p>10. Test Result : Refer to the test result in the test report</p>		
Affirmation	Tested by Name : Kwonse Kim (Signature)	Technical Manager Name : Seungyong Kim (Signature)
2023-05-22		
Eurofins KCTL Co.,Ltd.		
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REPORT REVISION HISTORY

Date	Revision	Page No
2023-05-22	Originally issued	-

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General remarks for test reports

Statement concerning the uncertainty of the measurement systems used for the tests

(may be required by the product standard or client)

Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:

Procedure number, issue date and title:

Calculations leading to the reported values are on file with the testing laboratory that conducted the testing.

Statement not required by the standard or client used for type testing

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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
Factory 1	: AG TECH CO.,LTD
Address	: Lot G3, Que Vo Industrial Park(Expanded Area), Nam son Ward, Bac Ninh Province, Vietnam
Factory 2	: ALMUS VINA
Address	: Lot CN07A, Phu Ha Industrial Park, Ha Thach Commune, Phu Tho Town, Phu Tho Province, Vietnam
Laboratory	: Eurofins KCTL Co.,Ltd.
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 CAB Identifier: KR0040 ISED Number: 8035A KOLAS No.: KT231

2. Device information

Equipment under test	: Smart wearable
Model	: SM-R965U(FCC), SM-R965F(ISED)
Derivative model	: SM-R965F(FCC)
Modulation technique	: QPSK, 16QAM
Power source	: DC 3.88 V
Antenna specification	: Metal Antenna
Frequency range	: LTE Band 2 : 1 850.7 MHz ~ 1 909.3 MHz LTE Band 4 : 1 710.7 MHz ~ 1 754.3 MHz LTE Band 5 : 824.7 MHz ~ 848.3 MHz LTE Band 7 : 2 502.5 MHz ~ 2 567.5 MHz LTE Band 12 : 699.7 MHz ~ 715.3 MHz LTE Band 13 : 779.5 MHz ~ 784.5 MHz LTE Band 25 : 1 850.7 MHz ~ 1 914.3 MHz LTE Band 26 : 824.7 MHz ~ 848.3 MHz LTE Band 66 : 1 710.7 MHz ~ 1 779.3 MHz LTE Band 71 : 665.5 MHz ~ 695.5 MHz
Bandwidth	: LTE Band 2 : 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 4 : 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 5 : 1.4 MHz, 3 MHz, 5 MHz, 10 MHz LTE Band 7 : 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 12 : 1.4 MHz, 3 MHz, 5 MHz, 10 MHz LTE Band 13 : 5 MHz, 10 MHz LTE Band 25 : 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 26 : 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz LTE Band 66 : 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 71 : 5 MHz, 10 MHz, 15 MHz, 20 MHz
Software version	: SM-R965U_R965U.001, SM-R965F_R965F.001
Hardware version	: REV1.0
Test device serial No.	: Conducted : R3AW2003HAR, R3AW2003KCK Radiated : R3AW30137VJ, R3AW301381P
Operation temperature	: -20 °C ~ 50 °C

Note.

1. Due to marketing purpose, the model SM-R965F will be filed for ISED approval and the test reports remain valid for Model SM-R965F ISED submission.
2. The product equality letter includes detailed information about the differences between SM-R965U and SM-R965F model.

2.1. Accessory information

Equipment	Manufacturer	Model	Serial No.	Power source	FCC ID & IC
Wireless charger	Samsung Electronics Co., Ltd.	EP-OR900	-	5.0 V, 2.0 A	FCC ID : A3LEPOR900 IC : 649E-EPOR900

2.2. Frequency/channel operations

This device contains the following capabilities:

WLAN (11a/b/g/n), Bluetooth (BDR/EDR/BLE), LTE B2/4/5/7/12/13/25/26/66/71,
 WCDMA 850/1700/1900

LTE Band 2

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

Table 2.2.1. 1.4M BW

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

Table 2.2.2. 3M BW

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

Table 2.2.3. 5M BW

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

Table 2.2.4. 10M BW

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

Table 2.2.5. 15M BW

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

Table 2.2.6. 20M BW

LTE Band 4

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

Table 2.2.7. 1.4M BW

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

Table 2.2.8. 3M BW

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

Table 2.2.9. 5M BW

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

Table 2.2.10. 10M BW

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

Table 2.2.11. 15M BW

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

Table 2.2.12. 20M BW

LTE Band 5

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

Table 2.2.13. 1.4M BW

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

Table 2.2.14. 3M BW

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

Table 2.2.15. 5M BW

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

Table 2.2.16. 10M BW

LTE Band 7

Ch.	Frequency (MHz)
20775	2 502.5
21100	2 535.0
21425	2 567.5

Table 2.2.17. 5M BW

Ch.	Frequency (MHz)
20800	2 505.0
21100	2 535.0
21400	2 565.0

Table 2.2.18. 10M BW

Ch.	Frequency (MHz)
20825	2 507.5
21100	2 535.0
21375	2 562.5

Table 2.2.19. 15M BW

Ch.	Frequency (MHz)
20850	2 510.0
21100	2 535.0
21350	2 560.0

Table 2.2.20. 20M BW

LTE Band 12

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

Table 2.2.21. 1.4M BW

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

Table 2.2.22. 3M BW

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

Table 2.2.23. 5M BW

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

Table 2.2.24. 10M BW

LTE Band 13

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

Table 2.2.25. 5M BW

Ch.	Frequency (MHz)
-	-
23230	782.0
-	-

Table 2.2.26. 10M BW

LTE Band 25

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

Table 2.2.27. 1.4M BW

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

Table 2.2.28. 3M BW

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

Table 2.2.29. 5M BW

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

Table 2.2.30. 10M BW

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

Table 2.2.31. 15M BW

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

Table 2.2.32. 20M BW

LTE Band 26

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

Table 2.2.33. 1.4M BW

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

Table 2.2.34. 3M BW

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

Table 2.2.35. 5M BW

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

Table 2.2.36. 10M BW

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

Table 2.2.37. 15M BW

LTE Band 66

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

Table 2.2.38. 1.4M BW

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

Table 2.2.39. 3M BW

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

Table 2.2.40. 5M BW

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

Table 2.2.41. 10M BW

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

Table 2.2.42. 15M BW

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

Table 2.2.43. 20M BW

LTE Band 71

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

Table 2.2.44. 5M BW

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

Table 2.2.45. 10M BW

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

Table 2.2.46. 15M BW

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

Table 2.2.47. 20M BW

Notes:

- LTE Band 66(1 710 - 1 780 MHz) overlaps the entire frequency range of LTE Band 4(1 710 - 1 755 MHz) 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.
 LTE Band 25(1 850.7 - 1 914.3 MHz) overlaps the entire frequency range of LTE Band 2(1 850.7 - 1 909.3 MHz) 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 Part27.

3. Maximum ERP/EIRP power

LTE Band 5

Mode	Tx frequency (MHz)	Emission designator	ERP	
			Max. power (dBm)	Max. power (W)
LTE Band 5	824.7 ~ 848.3	1M10G7D	14.36	0.027
		1M11W7D	13.41	0.022
	825.5 ~ 847.5	2M71G7D	14.06	0.025
		2M71W7D	12.96	0.020
	826.5 ~ 846.5	4M53G7D	14.53	0.028
		4M53W7D	13.38	0.022
	829.0 ~ 844.0	8M99G7D	14.18	0.026
		9M02W7D	13.09	0.020

LTE Band 7

Mode	Tx frequency (MHz)	Emission designator	EIRP	
			Max. power (dBm)	Max. power (W)
LTE Band 7	2 502.5 ~ 2 567.5	4M55G7D	13.60	0.023
		4M57W7D	12.49	0.018
	2 505.0 ~ 2 565.0	9M04G7D	13.46	0.022
		9M07W7D	12.52	0.018
	2 507.5 ~ 2 562.5	13M6G7D	13.16	0.021
		13M5W7D	12.39	0.017
	2 510.0 ~ 2 560.0	18M0G7D	12.86	0.019
		18M1W7D	12.05	0.016

LTE Band 12

Mode	Tx frequency (MHz)	Emission designator	ERP	
			Max. power (dBm)	Max. power (W)
LTE Band 12	699.7 ~ 715.3	1M10G7D	14.26	0.027
		1M10W7D	13.25	0.021
	700.5 ~ 714.5	2M71G7D	14.39	0.027
		2M71W7D	13.35	0.022
	701.5 ~ 713.5	4M55G7D	14.62	0.029
		4M53W7D	13.45	0.022
	704.0 ~ 711.0	9M02G7D	14.55	0.029
		9M04W7D	13.62	0.023

LTE Band 13

Mode	Tx frequency (MHz)	Emission designator	ERP	
			Max. power (dBm)	Max. power (W)
LTE Band 13	779.5 ~ 784.5	4M53G7D	14.61	0.029
		4M55W7D	13.79	0.024
	782.0	8M97G7D	14.97	0.031
		8M97W7D	14.02	0.025

LTE Band 25/2

Mode	Tx frequency (MHz)	Emission designator	EIRP	
			Max. power (dBm)	Max. power (W)
LTE Band 25	1 850.7 ~ 1 914.3	1M10G7D	15.98	0.040
		1M10W7D	14.97	0.031
	1 851.5 ~ 1 913.5	2M71G7D	16.27	0.042
		2M71W7D	15.19	0.033
	1 852.5 ~ 1 912.5	4M53G7D	16.39	0.044
		4M56W7D	15.59	0.036
	1 855.0 ~ 1 910.0	9M02G7D	16.81	0.048
		8M99W7D	15.49	0.035
	1 857.5 ~ 1 907.5	13M5G7D	16.94	0.049
		13M5W7D	15.73	0.037
	1 860.0 ~ 1 905.0	18M0G7D	16.58	0.045
		18M1W7D	15.45	0.035

LTE Band 26

Mode	Tx frequency (MHz)	Emission designator	ERP	
			Max. power (dBm)	Max. power (W)
LTE Band 26	824.7 ~ 848.3	1M11G7D	13.09	0.020
		1M11W7D	11.85	0.015
	825.5 ~ 847.5	2M72G7D	13.19	0.021
		2M71W7D	12.07	0.016
	826.5 ~ 846.5	4M55G7D	13.37	0.022
		4M53W7D	12.28	0.017
	829.0 ~ 844.0	9M02G7D	13.17	0.021
		9M04W7D	12.32	0.017
	831.5 ~ 841.5	13M5G7D	13.50	0.022
		13M5W7D	12.45	0.018

LTE Band 66/4

Mode	Tx frequency (MHz)	Emission designator	EIRP	
			Max. power (dBm)	Max. power (W)
LTE Band 66/4	1 710.7 ~ 1 779.3	1M11G7D	16.51	0.045
		1M10W7D	15.52	0.036
	1 711.5 ~ 1 778.5	2M71G7D	16.36	0.043
		2M71W7D	15.66	0.037
	1 712.5 ~ 1 777.5	4M55G7D	16.82	0.048
		4M55W7D	15.83	0.038
	1 715.0 ~ 1 775.0	9M02G7D	17.16	0.052
		9M02W7D	16.25	0.042
	1 717.5 ~ 1 772.5	13M5G7D	17.52	0.056
		13M6W7D	16.47	0.044
	1 720.0 ~ 1 770.0	18M1G7D	17.78	0.060
		18M0W7D	16.79	0.048

LTE Band 71

Mode	Tx frequency (MHz)	Emission designator	ERP	
			Max. power (dBm)	Max. power (W)
LTE Band 71	665.5 ~ 695.5	4M56G7D	12.96	0.020
		4M56W7D	11.58	0.014
	668.0 ~ 693.0	8M99G7D	13.01	0.020
		8M99W7D	11.79	0.015
	670.5 ~ 690.5	13M5G7D	12.93	0.020
		13M6W7D	11.94	0.016
	673.0 ~ 688.0	18M1G7D	12.86	0.019
		18M0W7D	11.67	0.015

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(5.5) RSS-199(4.4)	Conducted Output Power	N/A	Conducted	Pass	
2.1049	RSS-Gen(6.7)	Occupied Bandwidth & 26 dB Bandwidth	N/A		Pass	
2.1051 22.917(a) 24.238(a) 27.53(c)(2) 27.53(g),(h),(m)(4)	RSS-130(4.7) RSS-132(5.5) RSS-133(6.5) RSS-139(5.6) RSS-199(4.5)	Band Edge Emissions at Antenna Terminal	<43 + 10Log ₁₀ (P) dB for all out of band emissions,		Pass	
		Spurious Emissions at Antenna Terminal	<65 + 10Log ₁₀ (P) dB, Undesirable emissions must meet the limits detailed in 27.53(m)		Pass	
24.232(d) 27.50(d)(5)	RSS-130(4.6) RSS-132(5.4) RSS-133(6.4) RSS-139(5.5)	Peak to Average Power Ratio	< 13 dB		Pass	
2.1055 22.355	RSS-132(5.3)	Frequency stability	< 2.5 ppm (FCC), Emission must remain in band (IC)		Pass	
24.235	RSS-133(6.3)		Emission must remain in band (FCC), < 2.5 ppm (IC)			
27.54	RSS-130(4.5) RSS-139(5.4) RSS-199(4.3)		Emission must remain in band			
22.913(a)(5)	RSS-132(5.4)	Effective Radiated Power	< 7 Watts max. ERP (FCC) < 3 Watts max. ERP (IC)		Radiated	Pass
27.50(b)(10) 27.50(c)(10)	RSS-130(4.6)		< 3 Watts max. ERP			Pass
24.232(c) 27.50(h)	RSS-133(6.4) RSS-199(4.4)	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP	Pass		
27.50(d)(4)	RSS-139(5.5)		< 1 Watts max. EIRP	Pass		
2.1053 22.917(a) 24.238(a) 27.53(c)(2), 27.53(f),(g),(h),(m)(4)	RSS-130(4.7) RSS-132(5.5) RSS-133(6.5) RSS-139(5.6) RSS-199(4.5)	Radiated Spurious Emissions	<43 + 10Log ₁₀ (P) dB for all out of band emissions, <-70 dBW/MHz EIRP - Wideband <-80 dBW/MHz EIRP- Narrowband Undesirable emissions must meet the limits detailed in 27.53(m)	Pass		

Notes:

- 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
 - ◆ KDB 971168 D02 v02r02

4.1. Worst case orientation

- 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.
- The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z and all of the radiated tests have been performed with the accessories as below. It was determined that below orientation was worst case orientation for each band.

Band	Strap	With charger	Without charger		
		X-axis	X-axis	Y-axis	Z-axis
LTE B5	With strap	O	-	-	-
	Without strap	-	-	-	-
LTE B7	With strap	-	-	-	-
	Without strap	O	-	-	-
LTE B12	With strap	O	-	-	-
	Without strap	-	-	-	-
LTE B13	With strap	O	-	-	-
	Without strap	-	-	-	-
LTE B25/2	With strap	-	-	O	-
	Without strap	-	-	-	-
LTE B26	With strap	O	-	-	-
	Without strap	-	-	-	-
LTE B66/4	With strap	-	-	O	-
	Without strap	-	-	-	-
LTE B71	With strap	O	-	-	-
	Without strap	-	-	-	-

- In the case of radiated spurious emissions, only the worst case bandwidth results were reported.

4. Test Condition

- The measurement was performed with various configurations then worst results are reported.
- 1) Radiated measurement

Test Description	Modulation	RB size	Test Channel
Effective Radiated Power	QPSK, 16QAM	1	Low, Mid, High
Equivalent Isotropic Radiated Power			
Radiated Spurious Emissions	QPSK		

LTE Band	Bandwidth (MHz)	RB size	RB offset
B5	5	1	0, 13, 24
B7	5	1	0, 13, 24
B12	5	1	0, 13, 24
B13	10	1	0, 25, 49
B25/2	15	1	0, 38, 74
B26	15	1	0, 38, 74
B66/4	20	1	0, 50, 99
B71	10	1	0, 25, 49

2) Conducted measurement

Test Description	Modulation	RB size	Test Channel
OBW & 26 dB BW	QPSK, 16QAM	Full	Low, Mid, High
PAPR	QPSK, 16QAM	Full	Mid
Band Edge	QPSK	1	Low, High
		Full	
Spurious Emissions	QPSK	1	Low, Mid, High

LTE Band	Bandwidth (MHz)	RB size	RB offset
B5	1.4, 3, 5, 10	1	0, 5, 14, 24, 49
		Full	0
B7	5, 10, 15, 20	1	24, 49, 74, 99
		Full	0
B12	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
B26	1.4, 3, 5, 10, 15	1	0, 5, 14, 24, 49, 74
		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	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 or 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 (\pm)	
Conducted RF power	0.9 dB	
Conducted spurious emissions	1.3 dB	
Radiated spurious emissions	Below 1 000 MHz	2.4 dB
	1 000 MHz ~ 18 000 MHz	2.4 dB
	Above 1 8000 MHz	2.6 dB



6. Measurement results explanation example

Frequency (MHz)	Factor(dB)	Frequency (MHz)	Factor(dB)
30	10.06	11 000	13.44
50	10.79	12 000	13.17
100	10.97	13 000	13.07
200	10.43	14 000	13.10
300	10.57	15 000	13.42
400	10.88	16 000	12.87
500	10.92	17 000	13.21
600	10.40	18 000	12.92
700	10.28	19 000	12.56
800	10.39	20 000	12.60
900	10.63	21 000	12.84
1 000	10.85	22 000	12.08
2 000	11.25	23 000	12.56
3 000	11.46	24 000	12.19
4 000	11.85	25 000	13.66
5 000	11.86	26 000	13.07
6 000	12.10	26 500	13.95
7 000	12.04	27 000	13.59
8 000	12.88	28 000	13.54
9 000	12.73	29 000	14.32
10 000	13.05	30 000	14.48

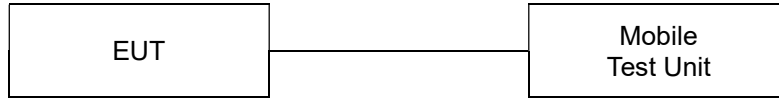
Note.

Offset(dB) = RF cable loss(dB) + Directional Coupler(dB)

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

Radio Standards Specifications – Section 130, 132, 133, 139, 199

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 $\pm 2\%$) by performing the measurement over the on/off burst cycles and then correcting (increasing) the measured level by a factor equal to $[10\log (1/\text{duty cycle})]$. 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	22.83	22.66	23.00
			1	3	0	22.81	22.64	22.98
			1	5	0	22.82	22.69	23.03
			3	0	0	22.83	22.69	22.89
			3	1	0	22.82	22.69	22.91
			3	3	0	22.82	22.66	22.89
		16QAM	1	0	1	22.12	21.94	21.75
			1	3	1	22.10	21.81	21.80
			1	5	1	22.13	21.84	21.78
			3	0	1	21.84	21.63	21.90
			3	1	1	21.84	21.64	21.83
			3	3	1	21.83	21.65	21.85
	3	QPSK	1	0	0	22.89	22.80	23.04
			1	8	0	22.90	22.83	23.05
			1	14	0	22.85	22.76	23.05
			8	0	1	21.94	21.78	21.99
			8	4	1	21.92	21.76	22.00
			8	7	1	21.96	21.76	22.01
		16QAM	15	0	1	21.90	21.72	21.94
			1	0	1	22.06	21.51	21.98
			1	8	1	22.08	21.52	21.99
			1	14	1	21.83	21.50	21.97
			8	0	2	21.03	20.71	21.00
			8	4	2	21.03	20.73	20.99
	5	QPSK	8	7	2	21.01	20.70	21.00
			8	7	2	21.01	20.70	21.00
			15	0	2	20.92	20.77	20.91
			1	0	0	22.92	22.71	22.98
			1	12	0	22.94	22.69	22.98
			1	24	0	22.93	22.66	22.98
		16QAM	12	0	1	21.94	21.73	21.91
			12	7	1	21.92	21.71	21.92
			12	13	1	21.89	21.72	21.92
			25	0	1	21.90	21.72	21.88
			1	0	1	21.71	21.69	21.89
			1	12	1	21.79	21.68	21.96
16QAM	1	24	1	21.72	21.62	21.89		
	12	0	2	20.88	20.68	20.90		
	12	7	2	20.86	20.72	20.91		
	12	13	2	20.87	20.68	20.91		
	25	0	2	20.88	20.67	20.99		

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power		
						Frequency (MHz)		
						Low	Middle	High
LTE Band 2	10	QPSK	1	0	0	22.87	22.80	22.92
			1	25	0	22.87	22.77	22.96
			1	49	0	22.87	22.77	22.96
			25	0	1	21.95	21.73	21.90
			25	12	1	21.92	21.72	21.90
			25	25	1	21.91	21.70	21.87
			50	0	1	21.89	21.72	21.86
		16QAM	1	0	1	22.01	21.66	21.95
			1	25	1	22.01	21.59	21.89
			1	49	1	22.01	21.60	21.86
			25	0	2	20.91	20.77	20.93
			25	12	2	20.90	20.75	20.93
			25	25	2	20.90	20.73	20.90
			50	0	2	20.97	20.72	20.90
	15	QPSK	1	0	0	22.93	22.85	22.89
			1	36	0	22.91	22.82	22.89
			1	74	0	22.90	22.79	22.86
			36	0	1	21.92	21.80	21.83
			36	18	1	21.90	21.79	21.89
			36	37	1	21.89	21.79	21.85
			75	0	1	21.92	21.76	21.91
		16QAM	1	0	1	21.56	21.70	21.92
			1	36	1	22.08	21.67	22.02
			1	74	1	21.96	21.70	21.93
			36	0	2	20.88	20.85	20.84
			36	18	2	20.91	20.83	20.79
			36	37	2	20.90	20.79	20.79
			75	0	2	20.91	20.76	20.83
	20	QPSK	1	0	0	22.88	22.79	22.87
			1	49	0	22.86	22.73	22.84
			1	99	0	22.90	22.93	22.82
			50	0	1	21.83	21.87	21.85
			50	24	1	21.78	21.73	21.83
			50	50	1	21.78	21.71	21.78
			100	0	1	21.84	21.85	21.84
		16QAM	1	0	1	21.82	21.94	21.97
			1	49	1	21.79	21.89	21.89
			1	99	1	21.76	21.79	21.83
			50	0	2	20.81	20.71	20.85
			50	24	2	20.79	20.72	20.81
			50	50	2	20.80	20.64	20.77
			100	0	2	20.86	20.75	20.84

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power		
						Frequency (MHz)		
						Low	Middle	High
LTE Band 4	1.4	QPSK	1	0	0	22.71	22.56	23.06
			1	3	0	22.72	22.53	23.00
			1	5	0	22.75	22.57	23.01
			3	0	0	22.69	22.59	22.97
			3	1	0	22.69	22.57	22.97
			3	3	0	22.67	22.58	22.99
		6	0	1	21.69	21.62	21.98	
		16QAM	1	0	1	21.75	21.57	22.19
			1	3	1	21.80	21.61	22.18
			1	5	1	21.81	21.60	22.18
			3	0	1	21.59	21.53	21.91
			3	1	1	21.55	21.51	21.88
			3	3	1	21.54	21.52	21.88
		6	0	2	20.84	20.55	21.06	
	3	QPSK	1	0	0	22.72	22.56	23.05
			1	8	0	22.69	22.54	23.03
			1	14	0	22.70	22.57	23.02
			8	0	1	21.73	21.59	22.00
			8	4	1	21.74	21.61	22.03
			8	7	1	21.71	21.59	22.00
		15	0	1	21.67	21.52	21.94	
		16QAM	1	0	1	21.74	21.56	21.94
			1	8	1	21.72	21.61	22.03
			1	14	1	21.71	21.62	21.98
			8	0	2	20.82	20.56	20.99
			8	4	2	20.81	20.55	20.90
			8	7	2	20.86	20.52	20.97
			15	0	2	20.61	20.61	20.90
	15		0	2	20.61	20.61	20.90	
	5	QPSK	1	0	0	22.68	22.56	23.02
			1	12	0	22.69	22.56	22.91
			1	24	0	22.64	22.57	22.92
			12	0	1	21.66	21.55	21.98
			12	7	1	21.64	21.56	21.94
			12	13	1	21.66	21.56	21.92
		25	0	1	21.67	21.53	21.93	
		16QAM	1	0	1	21.57	21.59	21.90
			1	12	1	21.57	21.50	21.92
			1	24	1	21.54	21.51	21.87
			12	0	2	20.63	20.54	20.95
			12	7	2	20.63	20.54	20.94
			12	13	2	20.64	20.53	20.95
25			0	2	20.65	20.54	20.93	
25	0		2	20.65	20.54	20.93		

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power		
						Frequency (MHz)		
						Low	Middle	High
LTE Band 4	10	QPSK	1	0	0	22.71	22.62	23.03
			1	25	0	22.69	22.63	23.01
			1	49	0	22.64	22.56	22.99
			25	0	1	21.68	21.55	22.00
			25	12	1	21.64	21.55	21.98
			25	25	1	21.66	21.53	21.95
			50	0	1	21.65	21.52	21.93
		16QAM	1	0	1	21.82	21.59	22.07
			1	25	1	21.82	21.64	22.08
			1	49	1	21.72	21.56	22.02
			25	0	2	20.63	20.61	21.01
			25	12	2	20.60	20.59	20.98
			25	25	2	20.63	20.57	20.98
			50	0	2	20.71	20.55	21.00
	15	QPSK	1	0	0	22.71	22.73	23.01
			1	36	0	22.69	22.72	22.94
			1	74	0	22.63	22.63	22.84
			36	0	1	21.63	21.64	21.98
			36	18	1	21.66	21.60	21.97
			36	37	1	21.61	21.58	21.90
			75	0	1	21.68	21.60	21.98
		16QAM	1	0	1	21.89	21.58	22.16
			1	36	1	21.82	21.64	22.16
			1	74	1	21.80	21.57	22.12
			36	0	2	20.64	20.64	20.94
			36	18	2	20.66	20.66	20.88
			36	37	2	20.57	20.61	20.86
			75	0	2	20.64	20.64	20.95
	20	QPSK	1	0	0	22.82	23.01	22.96
			1	49	0	22.75	22.66	22.89
			1	99	0	22.69	22.61	22.83
			50	0	1	21.73	21.95	21.86
			50	24	1	21.70	21.58	21.84
			50	50	1	21.66	21.57	21.80
			100	0	1	21.74	21.82	21.81
		16QAM	1	0	1	21.74	21.82	22.02
			1	49	1	21.64	21.81	21.96
			1	99	1	21.52	21.63	21.82
			50	0	2	20.70	20.62	20.84
			50	24	2	20.67	20.56	20.85
			50	50	2	20.66	20.54	20.81
			100	0	2	20.74	20.60	20.87

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power		
						Frequency (MHz)		
						Low	Middle	High
LTE Band 5	1.4	QPSK	1	0	0	22.86	22.84	22.66
			1	3	0	22.85	22.82	22.64
			1	5	0	22.85	22.86	22.66
			3	0	0	22.81	22.79	22.62
			3	1	0	22.82	22.79	22.60
			3	3	0	22.78	22.80	22.61
		16QAM	6	0	1	21.84	21.86	21.72
			1	0	1	21.66	21.75	21.75
			1	3	1	21.75	21.75	21.73
			1	5	1	21.71	21.70	21.80
			3	0	1	21.71	21.70	21.71
			3	1	1	21.72	21.70	21.69
	3	QPSK	3	3	1	21.67	21.72	21.66
			6	0	2	20.92	20.94	20.81
			1	0	0	23.08	22.87	22.70
			1	8	0	23.05	22.89	22.66
			1	14	0	23.00	22.85	22.63
			8	0	1	22.12	21.87	21.71
		16QAM	8	4	1	22.12	21.86	21.70
			8	7	1	22.08	21.85	21.69
			15	0	1	22.05	21.83	21.67
			1	0	1	22.20	21.99	21.57
			1	8	1	22.17	21.87	21.64
			1	14	1	22.15	21.94	21.59
		8	0	2	21.18	20.82	20.69	
		8	4	2	21.21	20.81	20.67	
		8	7	2	21.17	20.82	20.68	
		15	0	2	21.07	20.80	20.68	

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power		
						Frequency (MHz)		
						Low	Middle	High
LTE Band 5	5	QPSK	1	0	0	23.09	22.82	22.54
			1	12	0	23.03	22.84	22.59
			1	24	0	23.05	22.78	22.60
			12	0	1	22.04	21.85	21.69
			12	7	1	22.01	21.81	21.65
			12	13	1	22.01	21.77	21.68
			25	0	1	22.03	21.78	21.70
		16QAM	1	0	1	22.06	21.77	21.72
			1	12	1	21.93	21.70	21.66
			1	24	1	21.91	21.76	21.71
			12	0	2	21.03	20.83	20.71
			12	7	2	20.98	20.83	20.68
			12	13	2	20.99	20.79	20.67
			25	0	2	20.99	20.75	20.69
	10	QPSK	1	0	0	23.02	22.92	22.64
			1	25	0	23.03	23.10	22.63
			1	49	0	22.95	22.89	22.57
			25	0	1	21.99	22.00	21.68
			25	12	1	21.97	21.84	21.67
			25	25	1	21.92	21.81	21.58
			50	0	1	21.95	21.99	21.67
		16QAM	1	0	1	22.37	21.97	21.82
			1	25	1	22.22	21.85	21.73
			1	49	1	22.12	21.89	21.66
			25	0	2	21.01	20.86	20.68
			25	12	2	20.98	20.82	20.67
			25	25	2	20.91	20.84	20.64
			50	0	2	21.03	20.80	20.69

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power		
						Frequency (MHz)		
						Low	Middle	High
LTE Band 7	5	QPSK	1	0	0	22.35	22.51	22.22
			1	12	0	22.37	22.47	22.23
			1	24	0	22.38	22.47	22.23
			12	0	1	21.31	21.46	21.19
			12	7	1	21.31	21.46	21.21
			12	13	1	21.33	21.46	21.21
			25	0	1	21.30	21.46	21.19
		16QAM	1	0	1	21.36	21.55	21.28
			1	12	1	21.25	21.64	21.21
			1	24	1	21.28	21.64	21.23
			12	0	2	20.31	20.55	20.29
			12	7	2	20.31	20.55	20.29
			12	13	2	20.30	20.55	20.26
			25	0	2	20.32	20.49	20.24
	10	QPSK	1	0	0	22.36	22.52	22.29
			1	25	0	22.33	22.55	22.21
			1	49	0	22.37	22.53	22.23
			25	0	1	21.34	21.45	21.19
			25	12	1	21.33	21.45	21.16
			25	25	1	21.32	21.42	21.14
			50	0	1	21.32	21.42	21.12
		16QAM	1	0	1	21.53	21.56	21.35
			1	25	1	21.52	21.61	21.35
			1	49	1	21.46	21.67	21.22
			25	0	2	20.37	20.58	20.23
			25	12	2	20.37	20.55	20.22
			25	25	2	20.37	20.56	20.23
			50	0	2	20.43	20.49	20.24

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power		
						Frequency (MHz)		
						Low	Middle	High
LTE Band 7	15	QPSK	1	0	0	22.41	22.64	22.22
			1	36	0	22.44	22.54	22.26
			1	74	0	22.40	22.53	22.18
			36	0	1	21.46	21.57	21.28
			36	18	1	21.48	21.58	21.26
			36	37	1	21.43	21.51	21.24
			75	0	1	21.46	21.45	21.26
		16QAM	1	0	1	21.76	21.65	21.67
			1	36	1	21.74	21.69	21.55
			1	74	1	21.69	21.63	21.57
			36	0	2	20.50	20.66	20.27
			36	18	2	20.46	20.62	20.25
			36	37	2	20.45	20.62	20.22
			75	0	2	20.47	20.64	20.27
	20	QPSK	1	0	0	22.50	22.59	22.23
			1	49	0	22.54	22.57	22.23
			1	99	0	22.45	22.42	22.17
			50	0	1	21.42	21.44	21.17
			50	24	1	21.41	21.42	21.13
			50	50	1	21.38	21.42	21.14
			100	0	1	21.43	21.44	21.14
		16QAM	1	0	1	21.54	21.77	21.44
			1	49	1	21.51	21.70	21.43
			1	99	1	21.42	21.69	21.41
			50	0	2	20.46	20.52	20.17
			50	24	2	20.45	20.48	20.18
			50	50	2	20.38	20.41	20.16
			100	0	2	20.49	20.48	20.21

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power		
						Frequency (MHz)		
						Low	Middle	High
LTE Band 12	1.4	QPSK	1	0	0	22.99	23.11	22.95
			1	3	0	22.95	23.12	22.93
			1	5	0	23.00	23.11	22.96
			3	0	0	22.97	23.00	22.90
			3	1	0	22.95	23.00	22.89
			3	3	0	22.94	23.00	22.89
		6	0	1	21.91	22.01	21.93	
		16QAM	1	0	1	22.02	22.05	22.20
			1	3	1	21.83	21.89	22.21
			1	5	1	22.03	21.92	22.22
			3	0	1	21.77	22.16	21.79
			3	1	1	21.74	22.13	21.96
	3		3	1	21.73	22.08	22.00	
	3	QPSK	6	0	2	20.98	21.06	21.07
			1	0	0	22.96	23.15	23.04
			1	8	0	22.92	23.11	22.97
			1	14	0	22.92	23.04	22.98
			8	0	1	21.95	22.07	21.96
			8	4	1	21.96	22.06	21.95
		16QAM	8	7	1	21.94	22.06	21.97
			15	0	1	21.82	22.01	21.96
			1	0	1	21.83	21.95	21.97
			1	8	1	21.83	22.00	21.94
			1	14	1	21.75	21.97	21.89
8			0	2	21.10	21.01	20.99	
8	4	2	21.04	21.04	21.00			
8	7	2	21.06	20.99	20.97			
15	0	2	20.96	21.04	20.94			

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power		
						Frequency (MHz)		
						Low	Middle	High
LTE Band 12	5	QPSK	1	0	0	22.99	23.02	22.90
			1	12	0	22.93	23.04	22.97
			1	24	0	22.95	23.05	22.93
			12	0	1	21.93	22.04	21.95
			12	7	1	21.90	22.00	21.95
			12	13	1	21.89	22.04	21.90
			25	0	1	21.88	22.02	21.93
		16QAM	1	0	1	21.82	22.24	22.01
			1	12	1	22.15	22.21	21.84
			1	24	1	21.99	22.23	21.92
			12	0	2	20.92	21.02	21.00
			12	7	2	20.91	21.02	21.00
			12	13	2	20.92	21.09	20.99
			25	0	2	20.95	20.99	20.99
	10	QPSK	1	0	0	22.98	23.08	22.98
			1	25	0	22.99	23.09	22.95
			1	49	0	22.97	23.01	22.89
			25	0	1	21.95	22.05	21.87
			25	12	1	21.92	22.00	21.87
			25	25	1	21.87	21.98	21.81
			50	0	1	21.91	21.99	21.84
		16QAM	1	0	1	22.12	22.01	22.03
			1	25	1	22.19	21.97	21.96
			1	49	1	22.18	22.03	21.98
			25	0	2	20.89	21.10	20.90
			25	12	2	20.92	21.04	20.90
			25	25	2	20.91	21.04	20.85
			50	0	2	20.97	20.99	20.90

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power		
						Frequency (MHz)		
						Low	Middle	High
LTE Band 13	5	QPSK	1	0	0	23.24	23.20	23.27
			1	12	0	23.33	23.11	23.21
			1	24	0	23.26	23.08	23.17
			12	0	1	22.37	22.20	22.32
			12	7	1	22.31	22.16	22.28
			12	13	1	22.32	22.12	22.28
			25	0	1	22.32	22.11	22.29
		16QAM	1	0	1	22.16	22.15	22.14
			1	12	1	22.17	22.04	22.29
			1	24	1	22.02	22.04	22.22
			12	0	2	21.35	21.15	21.33
			12	7	2	21.24	21.16	21.20
			12	13	2	21.30	21.04	21.28
			25	0	2	21.34	21.10	21.33
	10	QPSK	1	0	0	-	23.11	-
			1	25	0	-	23.20	-
			1	49	0	-	23.09	-
			25	0	1	-	22.21	-
			25	12	1	-	22.16	-
			25	25	1	-	22.15	-
			50	0	1	-	22.15	-
		16QAM	1	0	1	-	22.21	-
			1	25	1	-	22.24	-
			1	49	1	-	22.18	-
			25	0	2	-	21.15	-
			25	12	2	-	21.13	-
			25	25	2	-	21.10	-
			50	0	2	-	21.19	-

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power		
						Frequency (MHz)		
						Low	Middle	High
LTE Band 25	1.4	QPSK	1	0	0	22.83	22.60	23.00
			1	3	0	22.84	22.57	23.01
			1	5	0	22.84	22.59	23.00
			3	0	0	22.82	22.60	22.95
			3	1	0	22.81	22.56	22.95
			3	3	0	22.81	22.56	22.98
		6	0	1	21.83	21.58	22.01	
		16QAM	1	0	1	22.04	21.45	22.06
			1	3	1	21.89	21.51	22.08
			1	5	1	22.02	21.49	22.11
			3	0	1	21.85	21.64	21.97
			3	1	1	21.64	21.59	21.78
			3	3	1	21.82	21.60	22.01
		6	0	2	21.00	20.71	21.10	
	3	QPSK	1	0	0	22.82	22.66	23.06
			1	8	0	22.80	22.64	23.08
			1	14	0	22.79	22.63	23.05
			8	0	1	21.90	21.64	22.05
			8	4	1	21.87	21.62	22.04
			8	7	1	21.81	21.62	22.04
		15	0	1	21.79	21.56	21.94	
		16QAM	1	0	1	21.88	21.74	21.92
			1	8	1	21.91	21.71	21.92
			1	14	1	21.97	21.66	21.92
			8	0	2	20.97	20.67	21.00
			8	4	2	21.03	20.66	21.01
			8	7	2	20.99	20.67	21.03
			15	0	2	20.87	20.63	21.02
	15		0	2	20.87	20.63	21.02	
	5	QPSK	1	0	0	22.88	22.60	22.95
			1	12	0	22.76	22.62	23.02
			1	24	0	22.85	22.61	22.90
			12	0	1	21.80	21.57	21.95
			12	7	1	21.81	21.58	21.92
			12	13	1	21.80	21.57	21.90
		25	0	1	21.81	21.56	21.99	
		16QAM	1	0	1	21.87	21.47	21.78
			1	12	1	21.80	21.49	21.79
			1	24	1	21.70	21.48	21.94
			12	0	2	20.81	20.51	20.93
			12	7	2	20.79	20.57	20.92
			12	13	2	20.76	20.54	20.94
			25	0	2	20.86	20.55	20.97
	25		0	2	20.86	20.55	20.97	

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power		
						Frequency (MHz)		
						Low	Middle	High
LTE Band 25	10	QPSK	1	0	0	22.74	22.69	22.98
			1	25	0	22.83	22.68	23.03
			1	49	0	22.80	22.61	23.02
			25	0	1	21.78	21.55	21.90
			25	12	1	21.79	21.59	21.88
			25	25	1	21.77	21.52	21.89
			50	0	1	21.76	21.54	21.88
		16QAM	1	0	1	21.94	21.87	22.02
			1	25	1	21.95	21.75	21.95
			1	49	1	21.88	21.65	21.95
			25	0	2	20.79	20.64	20.88
			25	12	2	20.77	20.63	20.90
			25	25	2	20.76	20.59	20.93
			50	0	2	20.88	20.58	20.90
	15	QPSK	1	0	0	22.81	22.71	22.99
			1	36	0	22.80	22.67	22.94
			1	74	0	22.80	22.64	22.94
			36	0	1	21.77	21.61	21.90
			36	18	1	21.76	21.59	21.89
			36	37	1	21.74	21.56	21.90
			75	0	1	21.80	21.62	21.90
		16QAM	1	0	1	21.85	21.83	21.84
			1	36	1	21.99	21.78	21.73
			1	74	1	21.98	21.78	21.84
			36	0	2	20.82	20.69	20.86
			36	18	2	20.81	20.71	20.86
			36	37	2	20.81	20.68	20.85
			75	0	2	20.78	20.66	20.87
	20	QPSK	1	0	0	22.81	23.01	22.92
			1	49	0	22.81	22.59	22.91
			1	99	0	22.78	22.53	22.81
			50	0	1	21.82	21.92	21.79
			50	24	1	21.80	21.58	21.77
			50	50	1	21.76	21.54	21.75
			100	0	1	21.79	21.84	21.78
		16QAM	1	0	1	21.86	21.67	22.01
			1	49	1	21.85	21.67	21.94
			1	99	1	21.75	21.63	21.94
			50	0	2	20.77	20.62	20.83
			50	24	2	20.78	20.61	20.83
			50	50	2	20.80	20.55	20.76
			100	0	2	20.88	20.60	20.88

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power			
						Frequency (MHz)			
						Low	Middle	High	
LTE Band 26	1.4	QPSK	1	0	0	22.87	22.91	22.67	
			1	3	0	22.82	22.76	22.55	
			1	5	0	22.98	22.86	22.59	
			3	0	0	22.93	22.67	22.65	
			3	1	0	22.91	22.75	22.63	
			3	3	0	22.85	22.66	22.70	
		6	0	1	21.87	21.81	21.72		
		16QAM	1	0	1	21.79	21.75	21.66	
			1	3	1	21.62	21.50	21.74	
			1	5	1	21.63	21.85	21.79	
			3	0	1	21.76	21.70	21.56	
			3	1	1	21.75	21.68	21.58	
			3	3	1	21.65	21.66	21.58	
		6	0	2	20.97	20.78	20.76		
		3	QPSK	1	0	0	22.88	22.85	22.69
				1	8	0	22.84	22.74	22.67
				1	14	0	22.84	22.86	22.65
				8	0	1	21.88	21.90	21.63
	8			4	1	21.73	21.88	21.67	
	8			7	1	21.78	21.75	21.65	
	15		0	1	21.75	21.84	21.65		
	16QAM		1	0	1	21.74	21.65	21.59	
			1	8	1	21.71	21.61	21.70	
			1	14	1	21.77	21.74	21.66	
			8	0	2	20.93	20.79	20.65	
			8	4	2	20.83	20.71	20.61	
			8	7	2	20.94	20.68	20.61	
	15		0	2	20.87	20.75	20.64		
	5		QPSK	1	0	0	23.01	22.87	22.67
				1	12	0	22.86	22.85	22.68
				1	24	0	22.94	22.84	22.56
				12	0	1	21.82	21.71	21.64
		12		7	1	21.80	21.82	21.64	
		12		13	1	21.90	21.78	21.63	
		25	0	1	21.84	21.68	21.66		
		16QAM	1	0	1	21.70	21.76	21.73	
			1	12	1	21.72	21.60	21.64	
			1	24	1	21.60	21.71	21.68	
			12	0	2	20.88	20.68	20.68	
			12	7	2	20.89	20.79	20.66	
			12	13	2	20.79	20.71	20.66	
		25	0	2	20.91	20.76	20.70		

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power		
						Frequency (MHz)		
						Low	Middle	High
LTE Band 26	10	QPSK	1	0	0	23.13	22.92	22.84
			1	25	0	23.00	22.90	22.77
			1	49	0	22.99	22.75	22.72
			25	0	1	21.99	21.87	21.70
			25	12	1	21.95	21.83	21.64
			25	25	1	21.83	21.78	21.65
			50	0	1	21.85	21.81	21.66
		16QAM	1	0	1	22.16	21.70	21.86
			1	25	1	22.08	21.72	21.81
			1	49	1	22.03	21.78	21.79
			25	0	2	20.89	20.79	20.74
			25	12	2	20.92	20.81	20.71
			25	25	2	20.90	20.88	20.66
			50	0	2	20.92	20.85	20.69
	15	QPSK	1	0	0	23.14	23.09	22.93
			1	36	0	22.97	22.88	22.83
			1	74	0	22.91	22.78	22.82
			36	0	1	22.16	21.96	21.80
			36	18	1	21.92	21.73	21.78
			36	37	1	21.86	21.77	21.75
			75	0	1	22.04	21.91	21.80
		16QAM	1	0	1	21.88	21.82	22.00
			1	36	1	21.80	21.63	22.00
			1	74	1	21.85	21.77	21.93
			36	0	2	20.97	20.91	20.80
			36	18	2	20.95	20.83	20.76
			36	37	2	20.94	20.87	20.72
			75	0	2	20.96	20.80	20.78

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power		
						Frequency (MHz)		
						Low	Middle	High
LTE Band 66	1.4	QPSK	1	0	0	22.89	22.87	22.89
			1	3	0	22.87	22.93	22.90
			1	5	0	22.91	22.98	22.87
			3	0	0	22.84	22.90	22.84
			3	1	0	22.83	22.89	22.81
			3	3	0	22.80	22.92	22.81
		6	0	1	21.88	21.93	21.86	
		16QAM	1	0	1	21.91	22.02	21.94
			1	3	1	21.95	21.96	21.87
			1	5	1	21.74	21.93	21.73
			3	0	1	21.80	21.87	21.71
			3	1	1	21.88	21.98	21.78
			3	3	1	21.87	21.96	21.75
		6	0	2	21.05	20.96	20.88	
	3	QPSK	1	0	0	22.84	23.01	22.92
			1	8	0	22.85	22.91	22.83
			1	14	0	22.85	22.91	22.86
			8	0	1	21.88	21.92	21.87
			8	4	1	21.87	21.95	21.87
			8	7	1	21.86	21.91	21.87
		15	0	1	21.80	21.85	21.81	
		16QAM	1	0	1	21.97	21.96	21.84
			1	8	1	21.60	21.89	21.62
			1	14	1	21.93	21.87	21.83
			8	0	2	21.02	20.93	20.85
			8	4	2	20.96	20.91	20.88
			8	7	2	20.98	20.91	20.84
			15	0	2	20.87	20.92	20.78
	15		0	2	20.87	20.92	20.78	
	5	QPSK	1	0	0	22.92	22.92	22.85
			1	12	0	22.94	22.91	22.82
			1	24	0	22.87	22.92	22.81
			12	0	1	21.83	21.88	21.79
			12	7	1	21.82	21.86	21.78
			12	13	1	21.80	21.89	21.80
		25	0	1	21.80	21.88	21.80	
		16QAM	1	0	1	21.80	21.64	21.82
			1	12	1	21.78	21.63	21.67
			1	24	1	21.78	21.62	21.65
			12	0	2	20.80	20.92	20.78
			12	7	2	20.80	20.96	20.78
			12	13	2	20.77	20.91	20.78
			25	0	2	20.85	20.86	20.84
	25		0	2	20.85	20.86	20.84	

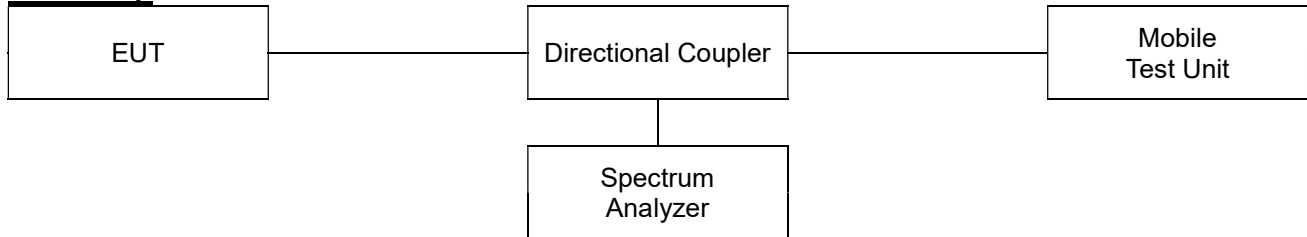
Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power		
						Frequency (MHz)		
						Low	Middle	High
LTE Band 66	10	QPSK	1	0	0	22.91	23.04	22.97
			1	25	0	22.82	23.02	22.92
			1	49	0	22.79	22.94	22.88
			25	0	1	21.82	21.89	21.85
			25	12	1	21.80	21.86	21.81
			25	25	1	21.78	21.88	21.79
			50	0	1	21.79	21.85	21.81
		16QAM	1	0	1	22.06	21.92	21.85
			1	25	1	21.78	21.82	21.80
			1	49	1	22.03	21.78	21.84
			25	0	2	20.85	20.98	20.90
			25	12	2	20.84	20.93	20.80
			25	25	2	20.84	20.86	20.84
			50	0	2	20.92	20.91	20.82
	15	QPSK	1	0	0	22.92	23.05	23.03
			1	36	0	22.86	23.03	22.97
			1	74	0	22.84	23.00	22.93
			36	0	1	21.91	21.99	21.95
			36	18	1	21.87	21.95	21.95
			36	37	1	21.87	21.95	21.90
			75	0	1	21.89	21.96	21.97
		16QAM	1	0	1	21.82	21.84	22.06
			1	36	1	22.10	21.83	22.03
			1	74	1	21.99	21.77	21.80
			36	0	2	20.95	21.02	20.93
			36	18	2	20.93	21.02	20.89
			36	37	2	20.90	20.95	20.87
			75	0	2	20.95	20.98	20.94
	20	QPSK	1	0	0	22.85	23.04	23.01
			1	49	0	22.84	22.94	22.98
			1	99	0	22.68	22.85	22.89
			50	0	1	21.79	21.92	21.91
			50	24	1	21.76	21.87	21.87
			50	50	1	21.73	21.85	21.83
			100	0	1	21.76	21.89	21.86
		16QAM	1	0	1	21.83	22.22	22.20
			1	49	1	21.78	22.03	22.17
			1	99	1	21.74	22.12	22.11
			50	0	2	20.80	20.94	20.94
			50	24	2	20.78	20.91	20.89
			50	50	2	20.75	20.87	20.83
			100	0	2	20.78	20.93	20.92

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power		
						Frequency (MHz)		
						Low	Middle	High
LTE Band 71	5	QPSK	1	0	0	22.95	22.90	22.87
			1	12	0	22.91	22.86	22.89
			1	24	0	22.83	22.84	22.80
			12	0	1	21.94	21.94	21.86
			12	7	1	21.93	21.86	21.86
			12	13	1	21.88	21.87	21.82
		25	0	1	21.95	21.89	21.83	
		16QAM	1	0	1	21.92	21.79	21.83
			1	12	1	21.77	21.78	21.82
			1	24	1	21.82	21.76	21.74
			12	0	2	21.02	20.99	20.72
			12	7	2	20.91	20.88	20.89
			12	13	2	20.91	20.85	20.83
			25	0	2	20.96	20.86	20.85
	10		QPSK	1	0	0	23.08	23.03
		1		25	0	22.96	22.97	22.89
		1		49	0	22.94	22.88	22.83
		25		0	1	21.97	21.93	21.89
		25		12	1	21.97	21.90	21.83
		25		25	1	21.89	21.86	21.81
		50		0	1	21.92	21.88	21.85
		16QAM	1	0	1	22.34	22.06	21.87
			1	25	1	22.27	21.98	21.74
			1	49	1	21.92	21.93	21.72
			25	0	2	20.99	21.01	20.97
			25	12	2	20.95	20.94	20.89
			25	25	2	20.88	20.92	20.93
			50	0	2	20.97	20.89	20.88

Test Band	Bandwidth (MHz)	Test mode	RB size	RB offset	MPR	Maximum power		
						Frequency (MHz)		
						Low	Middle	High
LTE Band 71	15	QPSK	1	0	0	23.13	23.07	22.99
			1	36	0	22.96	23.05	22.89
			1	74	0	22.84	22.94	22.79
			36	0	1	22.01	21.97	21.94
			36	18	1	22.00	21.90	21.90
			36	37	1	21.91	21.86	21.84
			75	0	1	21.97	21.92	21.91
		16QAM	1	0	1	22.40	21.91	22.10
			1	36	1	22.02	21.66	22.00
			1	74	1	22.23	21.57	21.90
			36	0	2	21.05	21.01	20.91
			36	18	2	20.97	20.98	20.88
			36	37	2	20.95	20.91	20.83
			75	0	2	20.97	20.92	20.87
	20	QPSK	1	0	0	23.06	23.15	22.98
			1	49	0	23.00	22.91	22.87
			1	99	0	22.84	22.81	22.73
			50	0	1	21.96	22.09	21.93
			50	24	1	21.92	21.86	21.89
			50	50	1	21.81	21.80	21.79
			100	0	1	21.91	21.99	21.88
		16QAM	1	0	1	22.16	22.20	21.95
			1	49	1	22.11	22.13	21.85
			1	99	1	21.76	21.96	21.67
			50	0	2	20.99	20.95	20.91
			50	24	2	20.91	20.91	20.87
			50	50	2	20.85	20.79	20.82
			100	0	2	20.94	20.92	20.93

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 $\geq 3 \times$ 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).

<p>Eurofins KCTL Co.,Ltd. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-70-5008-1021 FAX: 82-505-299-8311 www.kctl.co.kr</p>	<p>Report No.: KR23-SRF0161 Page (37) of (167)</p>	 
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- 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 $1.5 \times \text{OBW}$ 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 $\geq 3 \times \text{RBW}$.
- 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 upper 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 (MHz)	Frequency (MHz)	Test mode	26dB bandwidth (MHz)	99 % bandwidth (MHz)
LTE Band 5	1.4	824.7	QPSK	1.33	1.09
			16QAM	1.36	1.10
		836.5	QPSK	1.35	1.10
			16QAM	1.34	1.10
		848.3	QPSK	1.33	1.09
			16QAM	1.35	1.10
	3	825.5	QPSK	3.06	2.70
			16QAM	3.11	2.71
		836.5	QPSK	3.12	2.70
			16QAM	3.09	2.70
		847.5	QPSK	3.17	2.71
			16QAM	3.12	2.71
	5	826.5	QPSK	5.42	4.53
			16QAM	5.33	4.53
		836.5	QPSK	5.38	4.53
			16QAM	5.40	4.53
		846.5	QPSK	5.42	4.53
			16QAM	5.35	4.52
	10	829.0	QPSK	10.12	8.99
			16QAM	10.27	9.02
		836.5	QPSK	10.17	8.97
			16QAM	10.32	8.97
		844.0	QPSK	10.14	8.99
			16QAM	9.99	8.99

Test Band	Bandwidth (MHz)	Frequency (MHz)	Test mode	26dB bandwidth (MHz)	99 % bandwidth (MHz)
LTE Band 7	5	2 502.5	QPSK	5.38	4.52
			16QAM	5.38	4.52
		2 535.0	QPSK	5.36	4.52
			16QAM	5.41	4.57
		2 567.5	QPSK	5.40	4.55
			16QAM	5.37	4.55
	10	2 505.0	QPSK	9.84	8.99
			16QAM	10.37	9.07
		2 535.0	QPSK	10.09	8.99
			16QAM	10.27	8.97
		2 565.0	QPSK	9.87	9.04
			16QAM	9.89	8.97
	15	2 507.5	QPSK	15.51	13.56
			16QAM	14.87	13.52
		2 535.0	QPSK	15.14	13.49
			16QAM	15.06	13.52
		2 562.5	QPSK	15.02	13.45
			16QAM	15.02	13.41
	20	2 510.0	QPSK	19.83	18.03
			16QAM	19.58	18.08
		2 535.0	QPSK	19.53	17.98
			16QAM	19.78	17.98
		2 560.0	QPSK	19.88	17.93
			16QAM	19.88	17.93

Test Band	Bandwidth (MHz)	Frequency (MHz)	Test mode	26dB bandwidth (MHz)	99 % bandwidth (MHz)
LTE Band 12	1.4	699.7	QPSK	1.34	1.10
			16QAM	1.34	1.10
		707.5	QPSK	1.35	1.10
			16QAM	1.35	1.10
		715.3	QPSK	1.35	1.10
			16QAM	1.33	1.09
	3	700.5	QPSK	3.09	2.71
			16QAM	3.09	2.71
		707.5	QPSK	3.09	2.70
			16QAM	3.06	2.71
		714.5	QPSK	3.09	2.71
			16QAM	3.09	2.70
	5	701.5	QPSK	5.46	4.55
			16QAM	5.31	4.53
		707.5	QPSK	5.42	4.55
			16QAM	5.43	4.53
		713.5	QPSK	5.33	4.52
			16QAM	5.28	4.53
	10	704.0	QPSK	10.17	8.99
			16QAM	10.29	9.02
707.5		QPSK	10.09	9.02	
		16QAM	9.99	9.04	
711.0		QPSK	9.89	8.97	
		16QAM	10.22	8.99	
LTE Band 13	5	779.5	QPSK	5.32	4.51
			16QAM	5.23	4.51
		782.0	QPSK	5.36	4.53
			16QAM	5.28	4.55
		784.5	QPSK	5.41	4.53
			16QAM	5.33	4.55
	10	782.0	QPSK	9.82	8.97
			16QAM	10.09	8.97

Test Band	Bandwidth (MHz)	Frequency (MHz)	Test mode	26dB bandwidth (MHz)	99 % bandwidth (MHz)
LTE Band 25/2	1.4	1 850.7	QPSK	1.32	1.10
			16QAM	1.30	1.09
		1 882.5	QPSK	1.33	1.10
			16QAM	1.33	1.10
		1 914.3	QPSK	1.34	1.10
			16QAM	1.34	1.10
	3	1 851.5	QPSK	3.11	2.70
			16QAM	3.08	2.70
		1 882.5	QPSK	3.12	2.70
			16QAM	3.09	2.70
		1 913.5	QPSK	3.12	2.71
			16QAM	3.08	2.70
	5	1 852.5	QPSK	5.35	4.53
			16QAM	5.37	4.53
		1 882.5	QPSK	5.30	4.52
			16QAM	5.40	4.56
		1 912.5	QPSK	5.33	4.51
			16QAM	5.47	4.55
	10	1 855.0	QPSK	10.14	9.02
			16QAM	10.27	8.99
		1 882.5	QPSK	10.02	8.99
			16QAM	10.27	8.99
		1 910.0	QPSK	9.72	8.97
			16QAM	9.97	8.97
	15	1 857.5	QPSK	15.40	13.52
			16QAM	15.02	13.49
		1 882.5	QPSK	14.91	13.49
			16QAM	15.44	13.49
		1 907.5	QPSK	14.91	13.45
			16QAM	15.10	13.49
20	1 860.0	QPSK	19.83	18.03	
		16QAM	19.78	18.08	
	1 882.5	QPSK	20.28	17.98	
		16QAM	20.28	18.03	
	1 905.0	QPSK	19.73	17.93	
		16QAM	20.08	17.93	

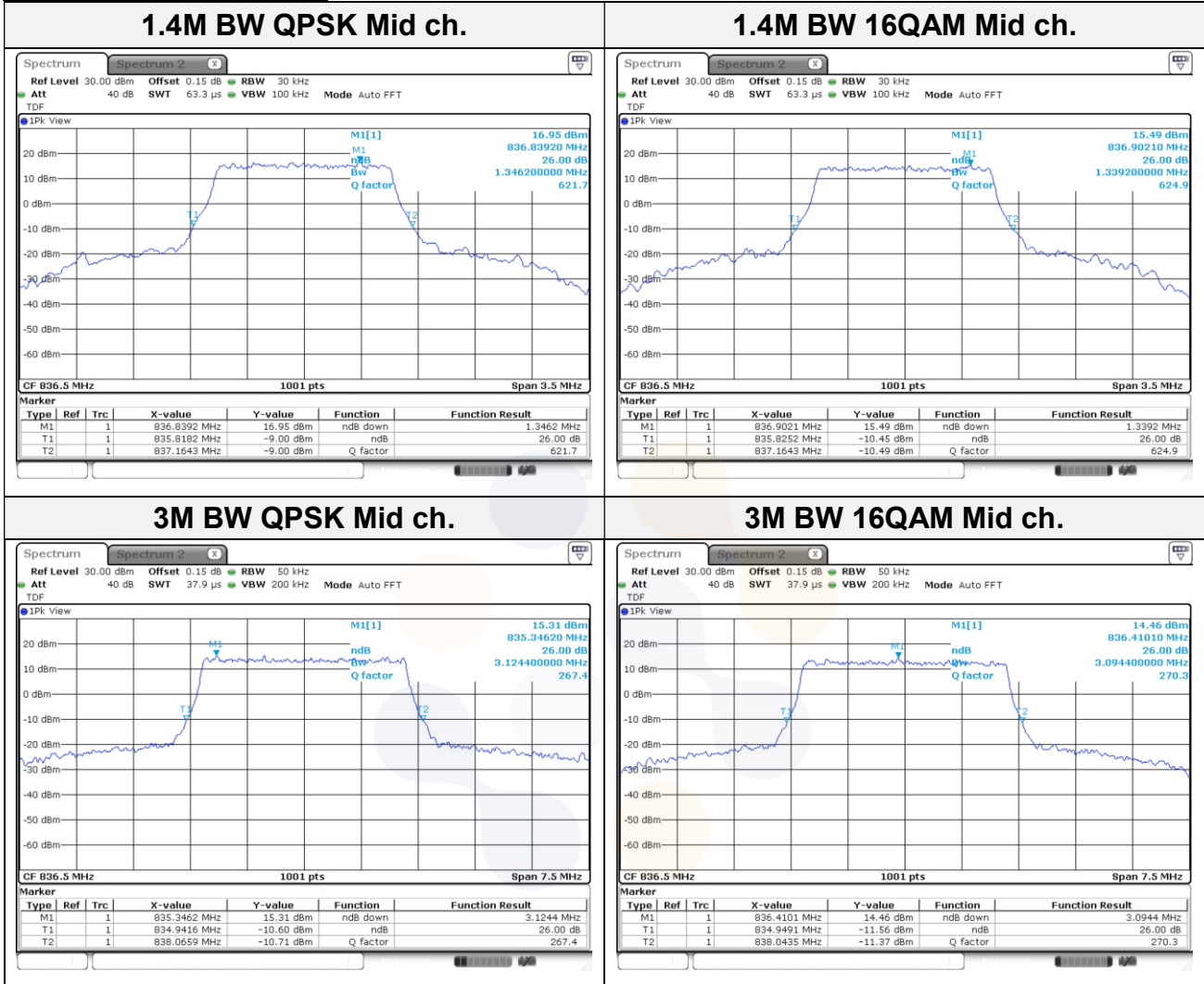
Test Band	Bandwidth (MHz)	Frequency (MHz)	Test mode	26dB bandwidth (MHz)	99 % bandwidth (MHz)
LTE Band 26	1.4	824.7	QPSK	1.35	1.10
			16QAM	1.33	1.09
		836.5	QPSK	1.35	1.11
			16QAM	1.33	1.11
		848.3	QPSK	1.36	1.11
			16QAM	1.31	1.09
	3	825.5	QPSK	3.12	2.72
			16QAM	3.12	2.71
		836.5	QPSK	3.11	2.71
			16QAM	3.09	2.70
		847.5	QPSK	3.16	2.71
			16QAM	3.09	2.71
	5	826.5	QPSK	5.36	4.55
			16QAM	5.38	4.52
		836.5	QPSK	5.46	4.52
			16QAM	5.41	4.52
		846.5	QPSK	5.40	4.53
			16QAM	5.27	4.53
	10	829.0	QPSK	10.27	9.02
			16QAM	10.17	9.04
		836.5	QPSK	10.32	8.97
			16QAM	9.99	8.99
		844.0	QPSK	10.14	8.99
			16QAM	10.19	8.99
15	831.5	QPSK	14.95	13.49	
		16QAM	14.69	13.52	
	836.5	QPSK	15.17	13.52	
		16QAM	15.10	13.49	
	841.5	QPSK	15.32	13.49	
		16QAM	15.06	13.49	

Test Band	Bandwidth (MHz)	Frequency (MHz)	Test mode	26dB bandwidth (MHz)	99 % bandwidth (MHz)
LTE Band 66/4	1.4	1 710.7	QPSK	1.34	1.10
			16QAM	1.32	1.10
		1 745.0	QPSK	1.34	1.11
			16QAM	1.33	1.09
		1 779.3	QPSK	1.34	1.10
			16QAM	1.34	1.10
	3	1 711.5	QPSK	3.11	2.70
			16QAM	3.09	2.71
		1 745.0	QPSK	3.09	2.70
			16QAM	3.08	2.71
		1 778.5	QPSK	3.15	2.71
			16QAM	3.12	2.71
	5	1 712.5	QPSK	5.43	4.55
			16QAM	5.42	4.52
		1 745.0	QPSK	5.26	4.52
			16QAM	5.38	4.55
		1 777.5	QPSK	5.43	4.52
			16QAM	5.36	4.53
	10	1 715.0	QPSK	10.17	8.99
			16QAM	10.09	8.99
		1 745.0	QPSK	10.29	8.99
			16QAM	10.07	9.02
		1 775.0	QPSK	10.44	9.02
			16QAM	10.14	9.02
	15	1 717.5	QPSK	15.44	13.45
			16QAM	15.40	13.49
		1 745.0	QPSK	15.17	13.45
			16QAM	15.36	13.56
		1 772.5	QPSK	15.02	13.49
			16QAM	15.29	13.45
20	1 720.0	QPSK	19.93	17.98	
		16QAM	19.73	18.03	
	1 745.0	QPSK	19.73	18.08	
		16QAM	19.88	17.98	
	1 770.0	QPSK	19.98	18.03	
		16QAM	19.83	18.03	

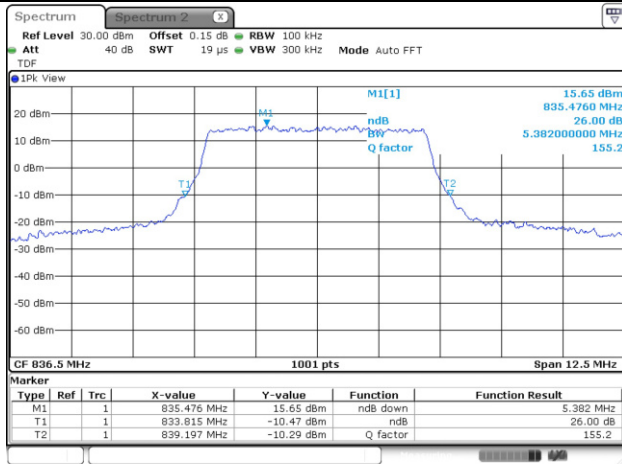
Test Band	Bandwidth (MHz)	Frequency (MHz)	Test mode	26dB bandwidth (MHz)	99 % bandwidth (MHz)
LTE Band 71	5	665.5	QPSK	5.33	4.56
			16QAM	5.33	4.53
		680.5	QPSK	5.33	4.52
			16QAM	5.38	4.56
		695.5	QPSK	5.35	4.51
			16QAM	5.42	4.52
	10	668.0	QPSK	9.99	8.97
			16QAM	9.84	8.99
		680.5	QPSK	10.29	8.99
			16QAM	10.42	8.97
		693.0	QPSK	10.12	8.97
			16QAM	10.12	8.97
	15	670.5	QPSK	15.29	13.49
			16QAM	14.95	13.52
		680.5	QPSK	15.36	13.49
			16QAM	15.36	13.56
		690.5	QPSK	15.25	13.49
			16QAM	15.10	13.49
	20	673.0	QPSK	19.88	17.98
			16QAM	20.33	18.03
		680.5	QPSK	19.63	18.03
			16QAM	20.28	17.98
		688.0	QPSK	19.98	18.08
			16QAM	19.88	17.98

26 dB Bandwidth

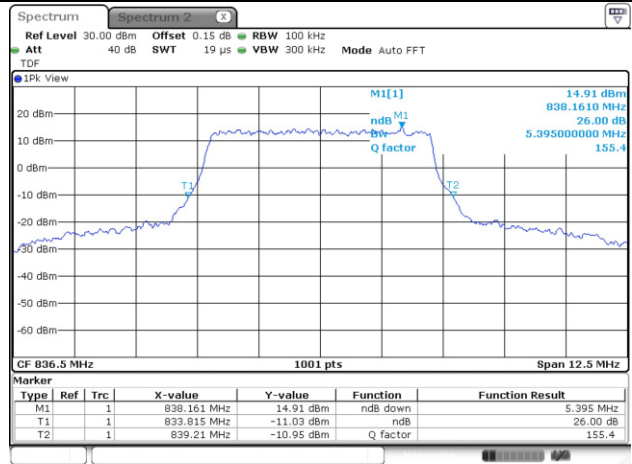
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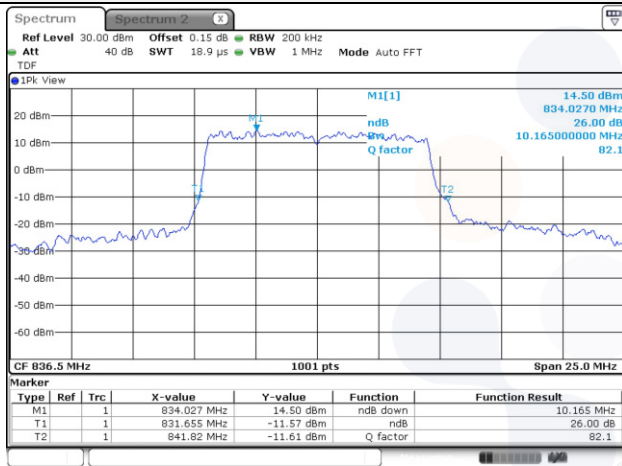
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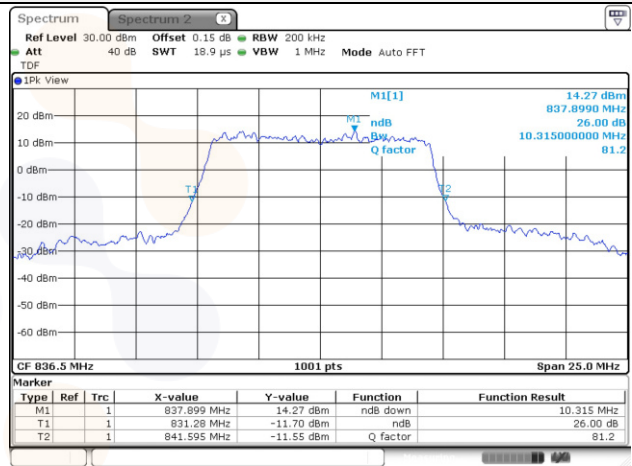
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10M BW QPSK Mid ch.

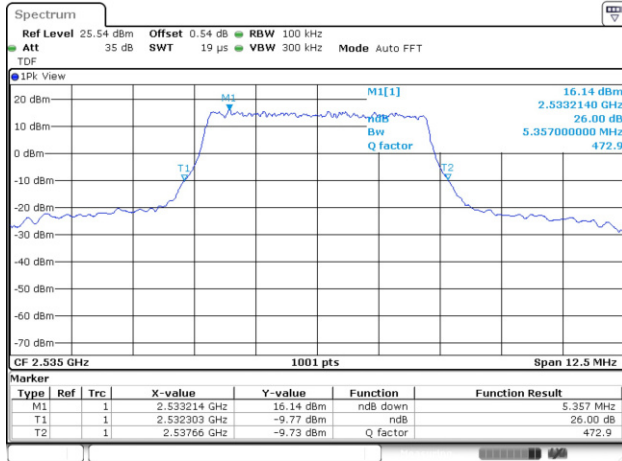


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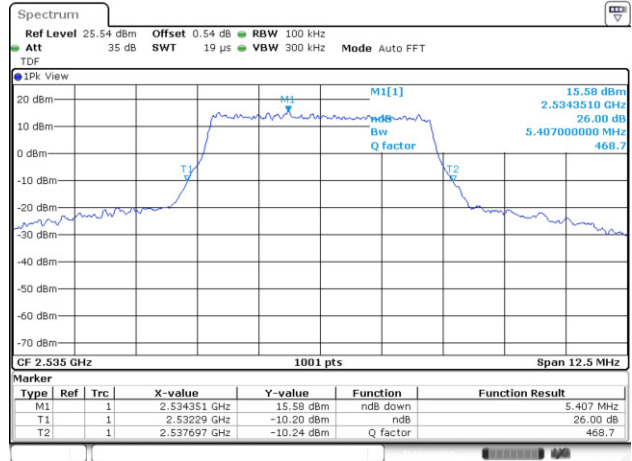


Test mode: LTE Band 7

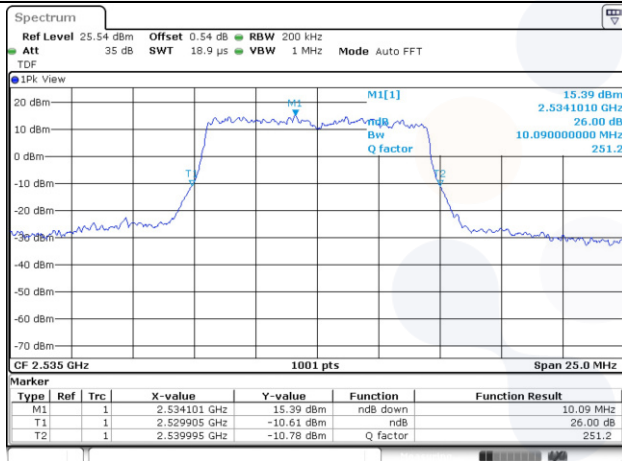
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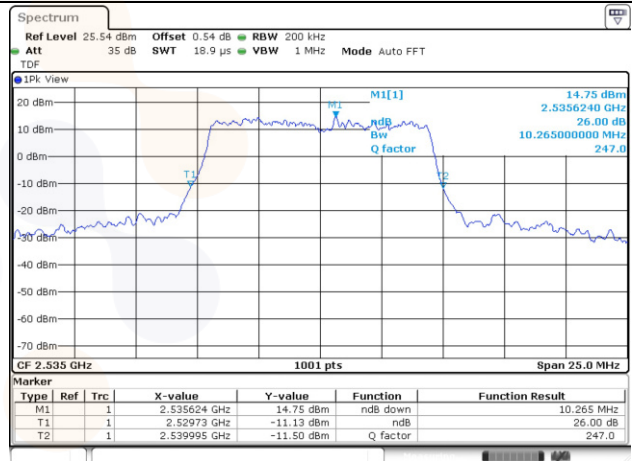
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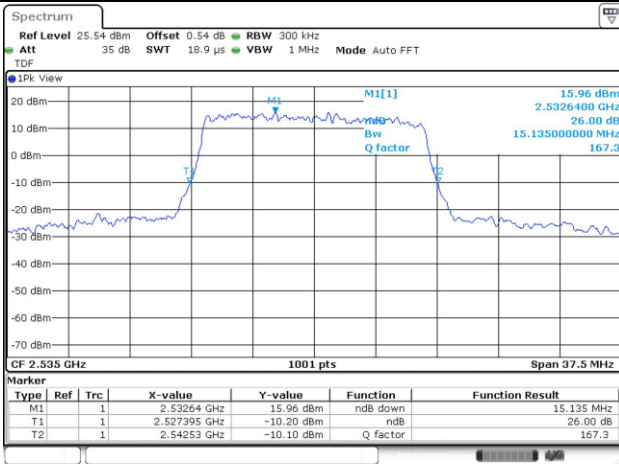
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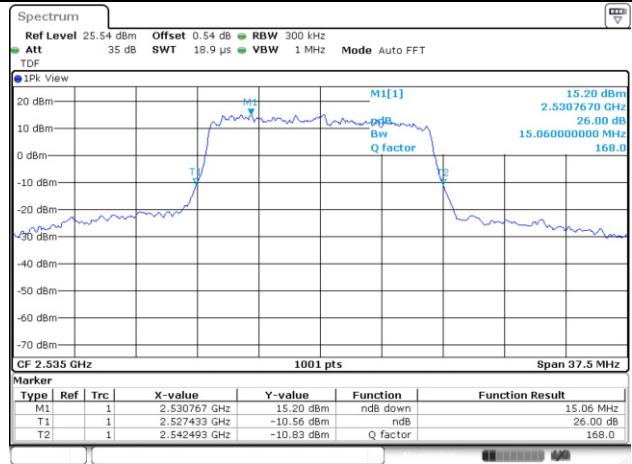
10M BW 16QAM Mid ch.



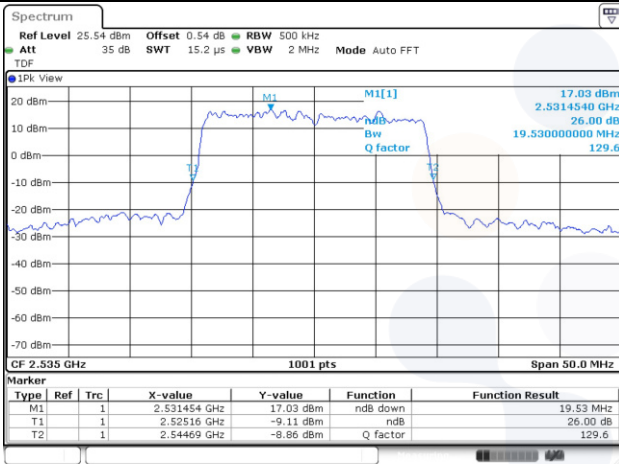
15M BW QPSK Mid ch.



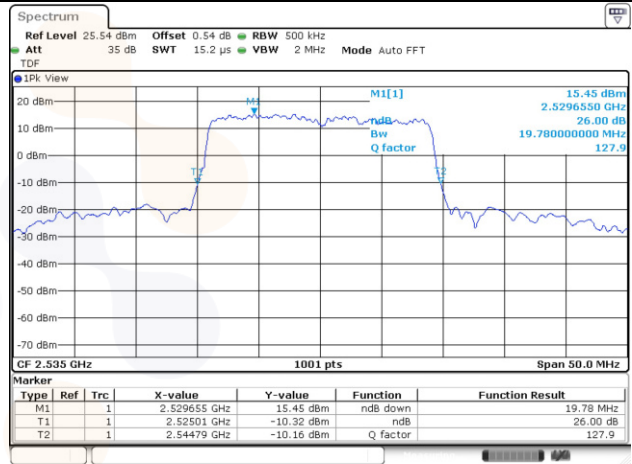
15M BW 16QAM Mid ch.



20M BW QPSK Mid ch.

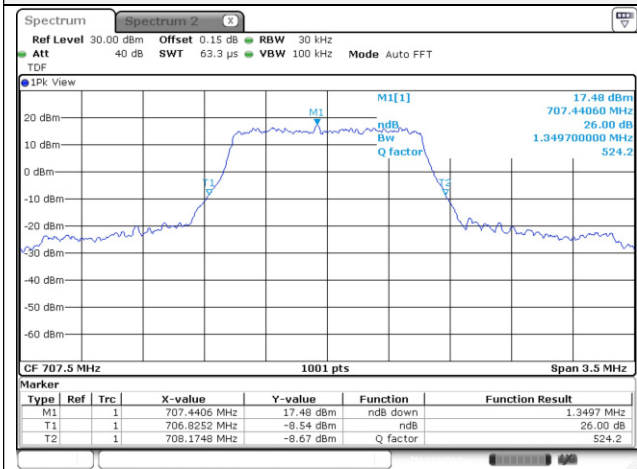


20M BW 16QAM Mid ch.

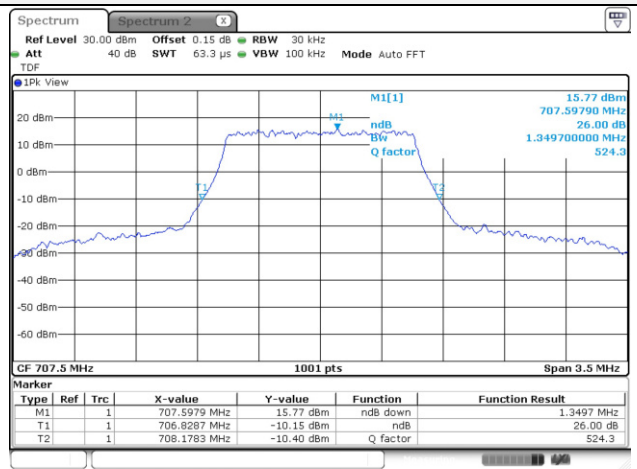


Test mode: LTE Band 12

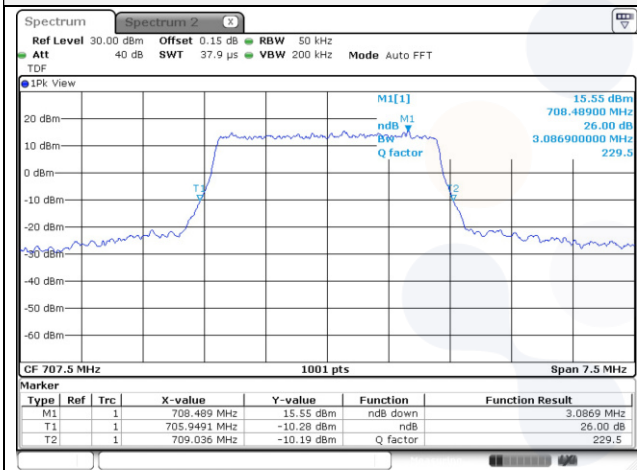
1.4M BW QPSK Mid ch.



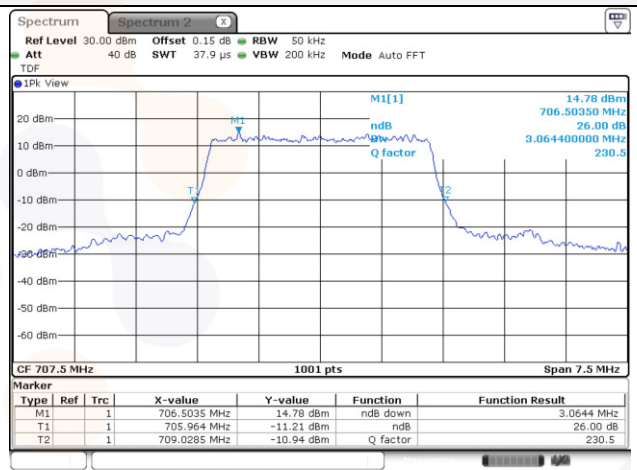
1.4M BW 16QAM Mid ch.



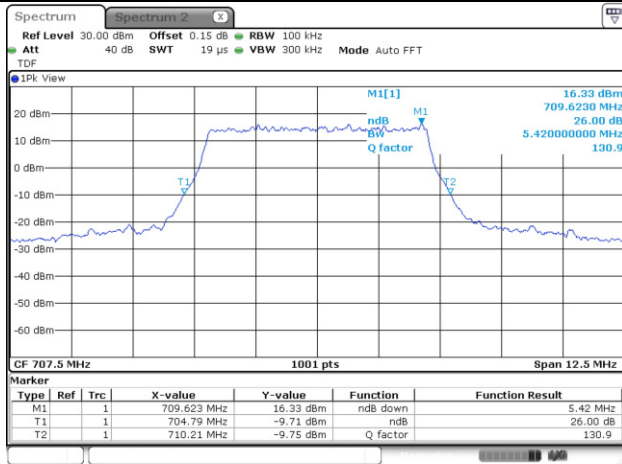
3M BW QPSK Mid ch.



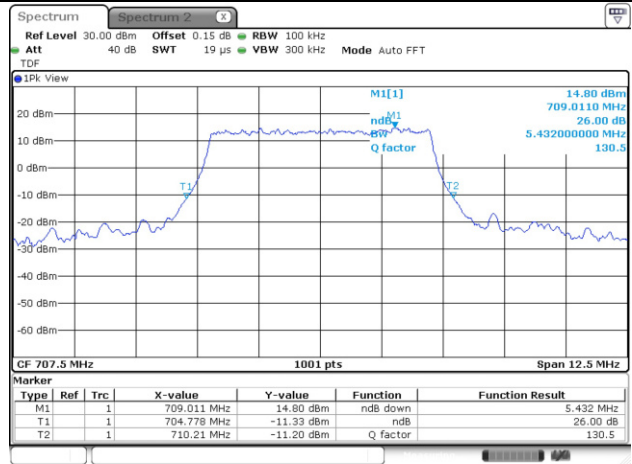
3M BW 16QAM Mid ch.



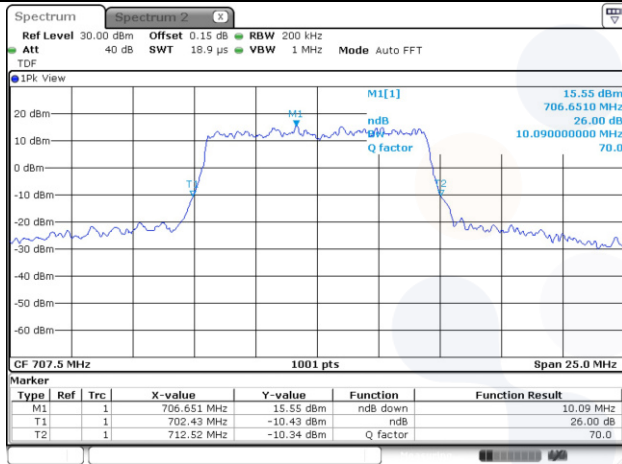
5M BW QPSK Mid ch.



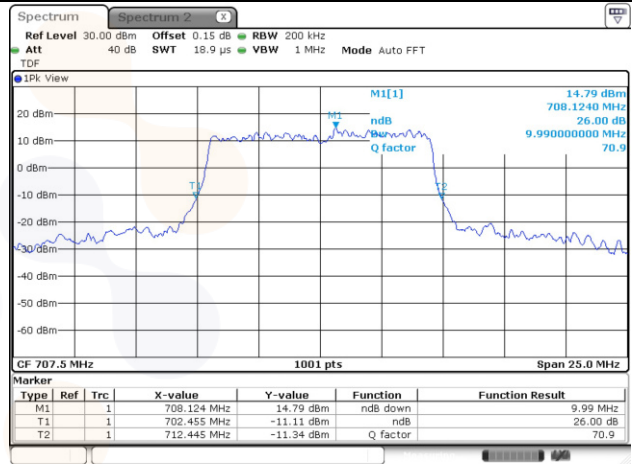
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10M BW QPSK Mid ch.

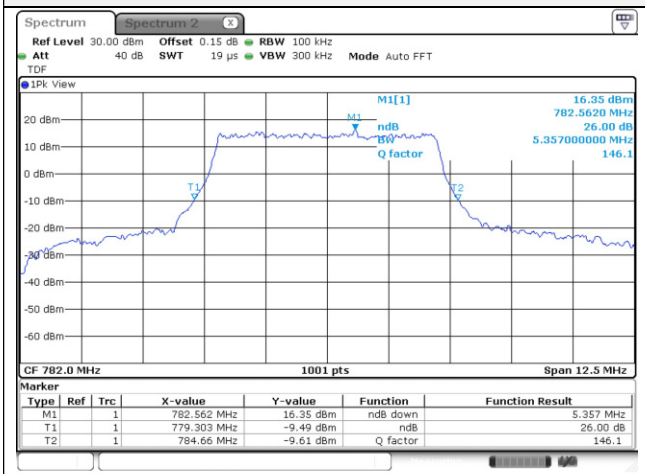


10M BW 16QAM Mid ch.

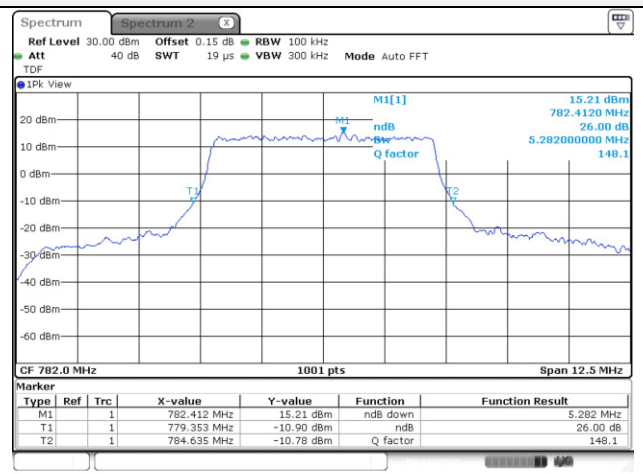


Test mode: LTE Band 13

5M BW QPSK Mid ch.



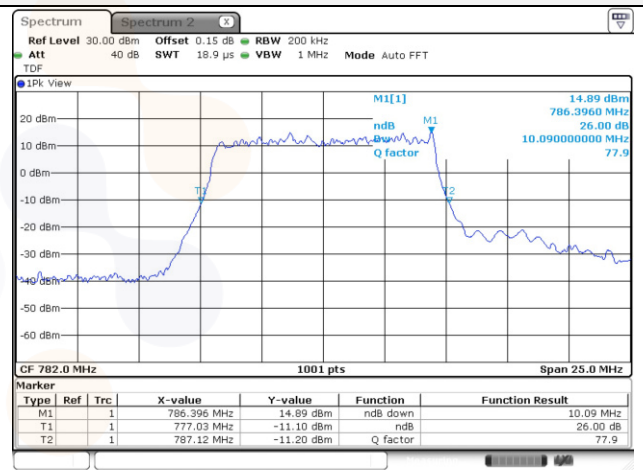
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10M BW QPSK Mid ch.

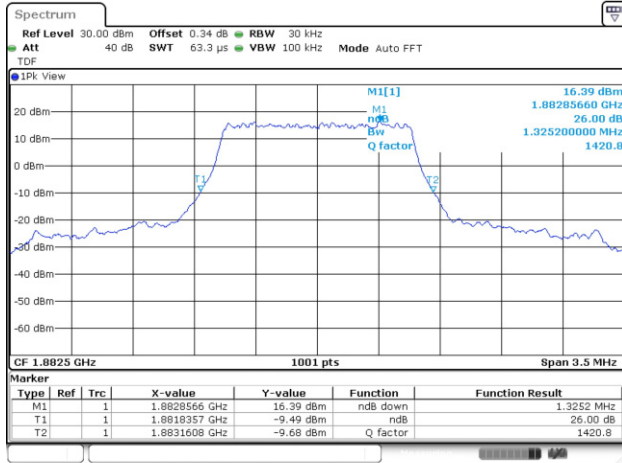


10M BW 16QAM Mid ch.

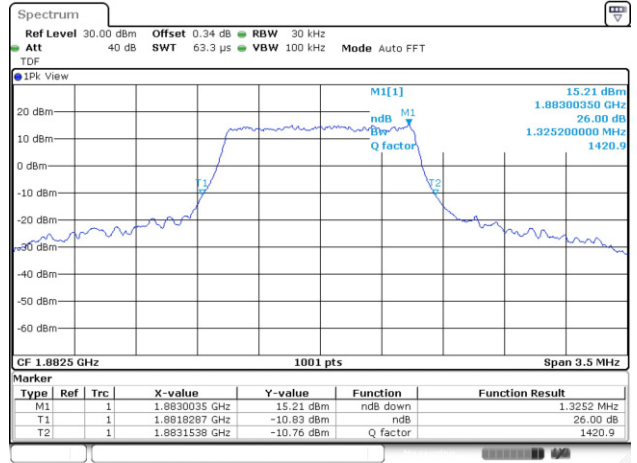


Test mode: LTE Band 25/2

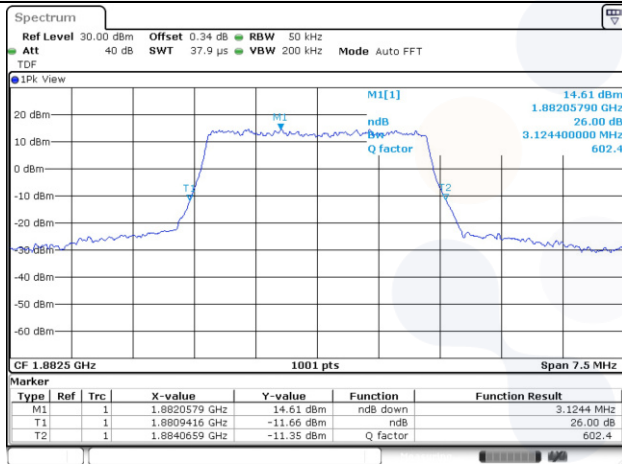
1.4M BW QPSK Mid ch.



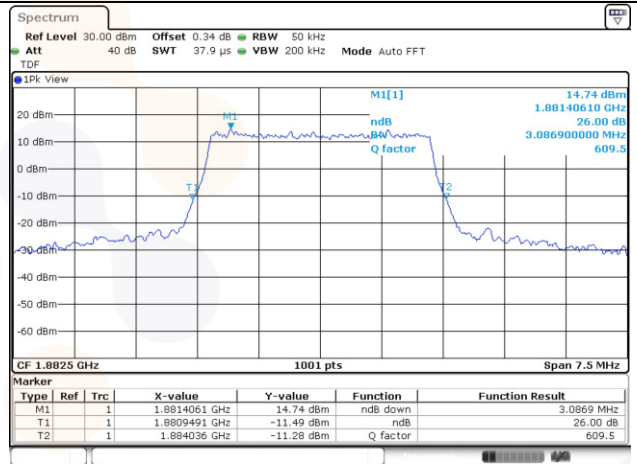
1.4M BW 16QAM Mid ch.



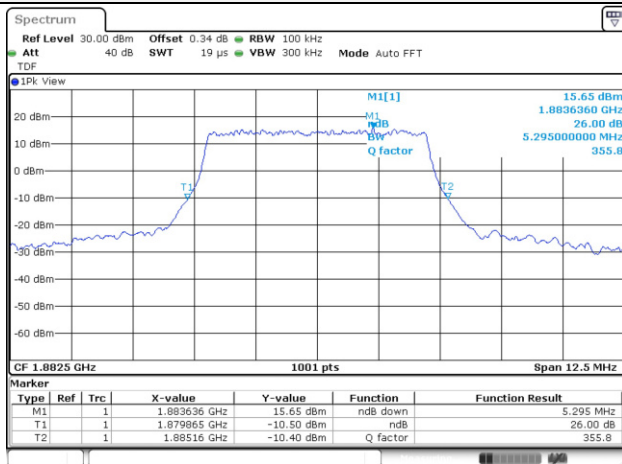
3M BW QPSK Mid ch.



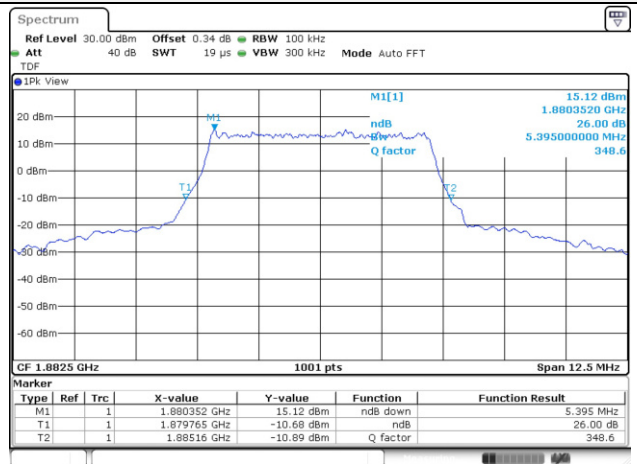
3M BW 16QAM Mid ch.



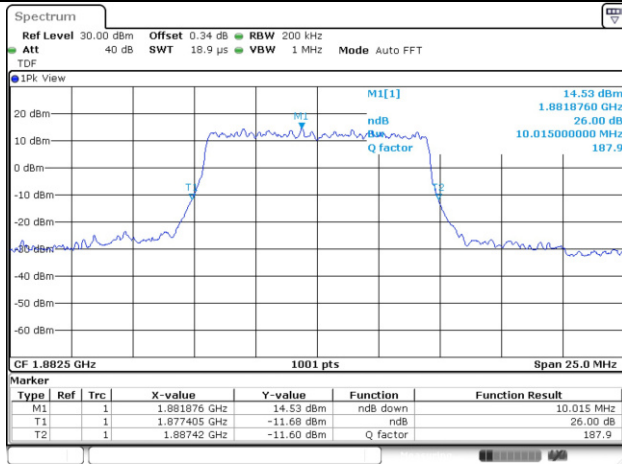
5M BW QPSK Mid ch.



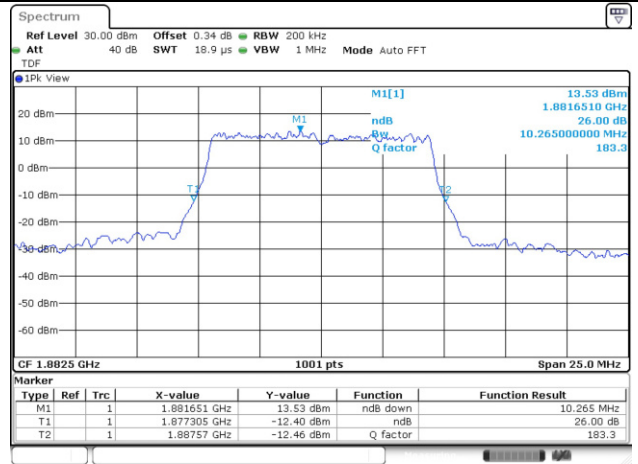
5M BW 16QAM Mid ch.



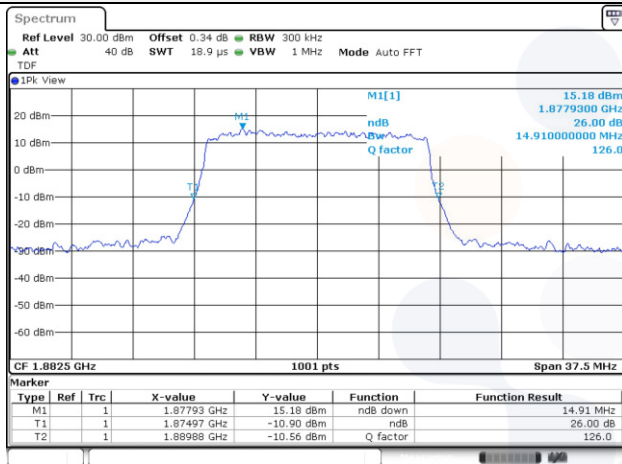
10M BW QPSK Mid ch.



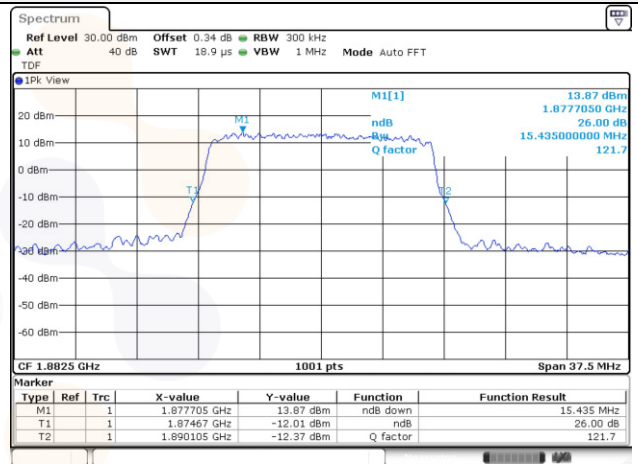
10M BW 16QAM Mid ch.



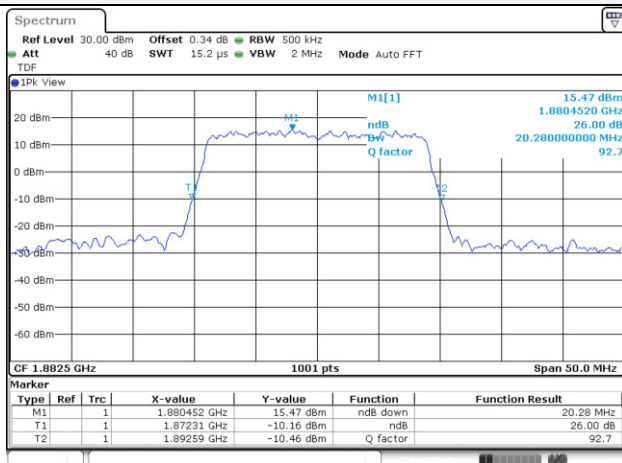
15M BW QPSK Mid ch.



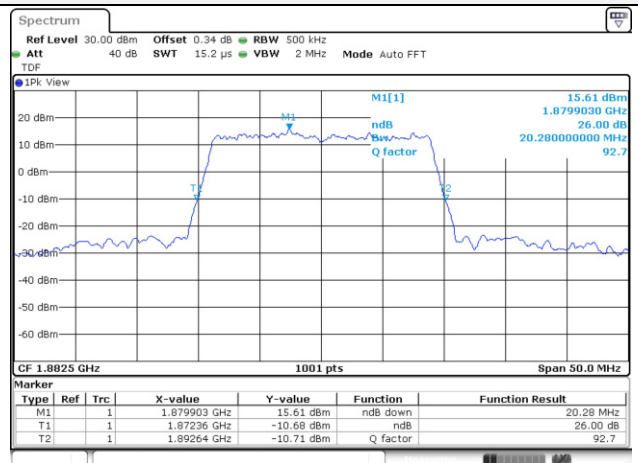
15M BW 16QAM Mid ch.



20M BW QPSK Mid ch.

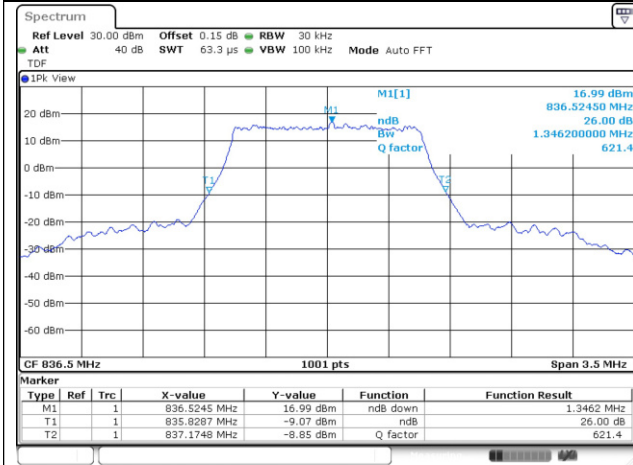


20M BW 16QAM Mid ch.

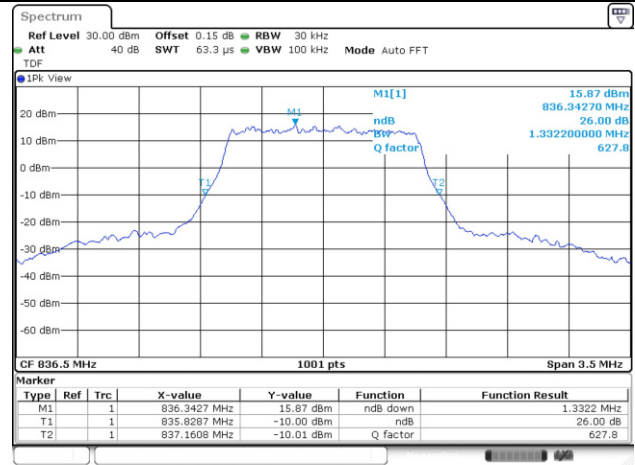


Test mode: LTE Band 26

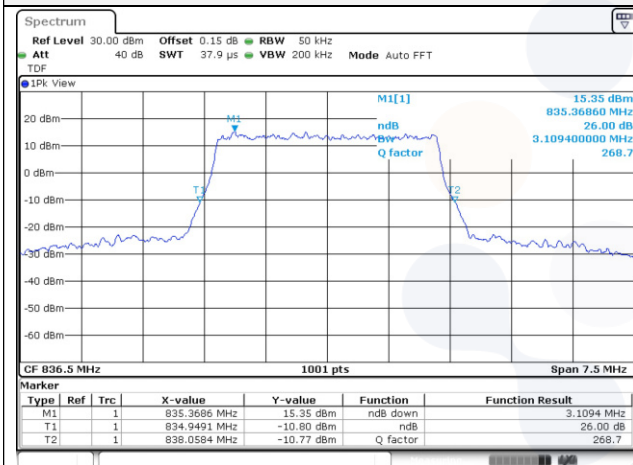
1.4M BW QPSK Mid ch.



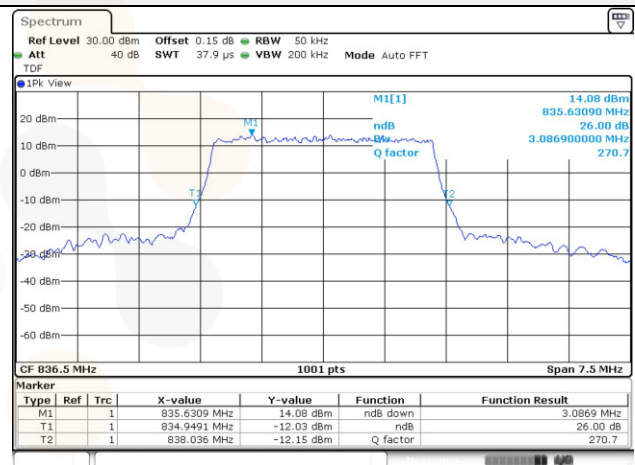
1.4M BW 16QAM Mid ch.



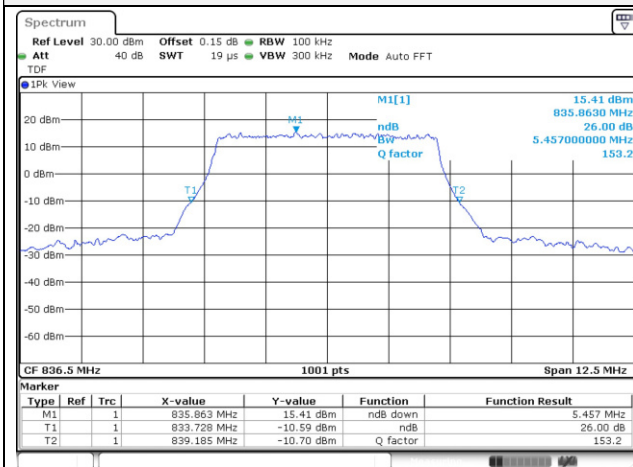
3M BW QPSK Mid ch.



3M BW 16QAM Mid ch.



5M BW QPSK Mid ch.



5M BW 16QAM Mid ch.

