

FCC §2.1051, § 27.53:Spurious Emissions at Antenna Terminal

Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.
----------------	--

FCC §2.1051, § 27.53:Out of band emission, Band Edge

Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.
----------------	---

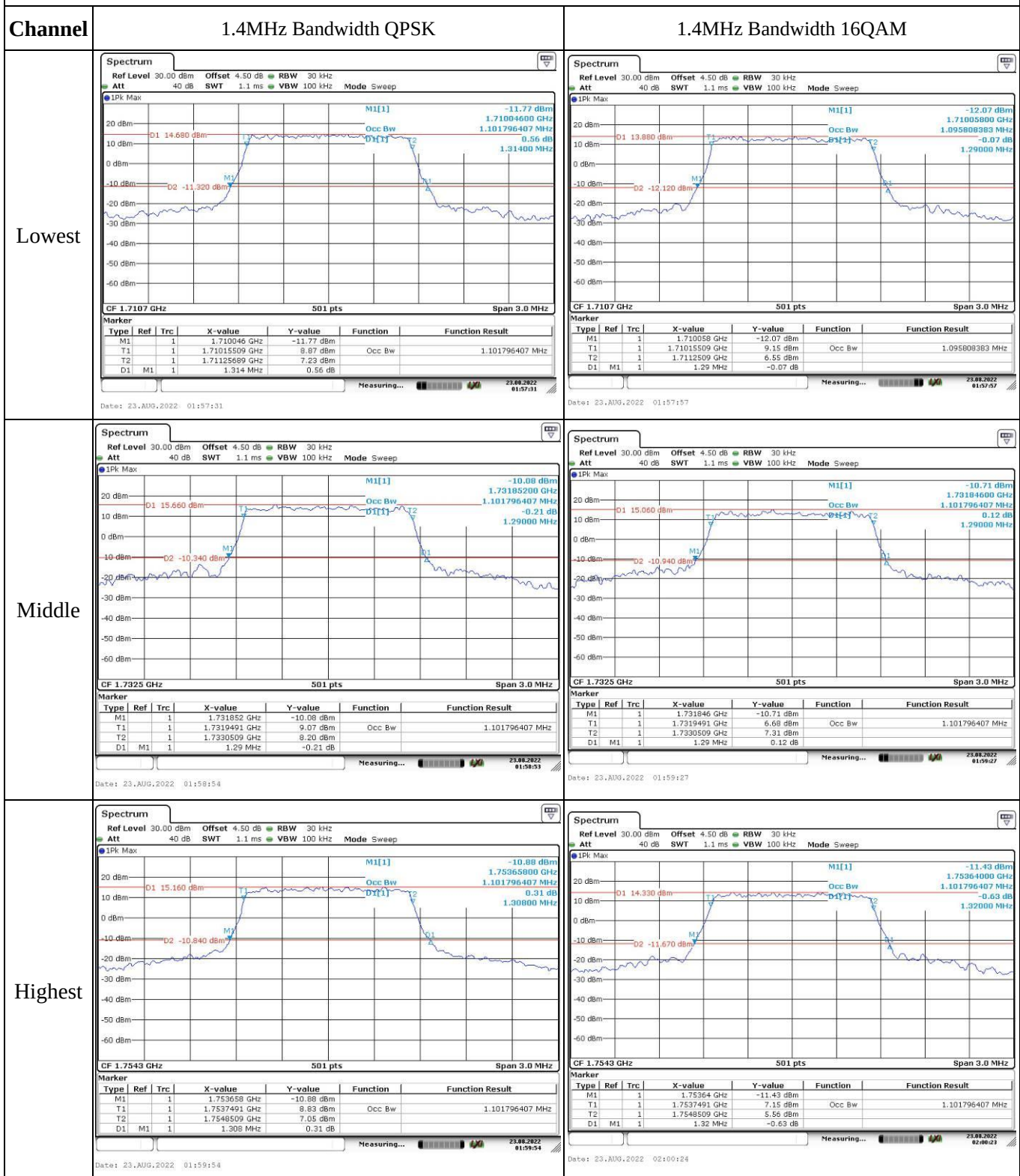
FCC §2.1055, §27.54: Frequency Stability

Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	1711.112	1710.00	1754.021	1755
	-20	3.85	1711.083	1710.00	1754.079	1755
	-10	3.85	1711.173	1710.00	1754.055	1755
	0	3.85	1711.091	1710.00	1754.028	1755
	10	3.85	1711.148	1710.00	1754.033	1755
	20	3.85	1711.138	1710.00	1754.022	1755
	30	3.85	1711.114	1710.00	1754.041	1755
	40	3.85	1711.096	1710.00	1754.063	1755
	50	3.85	1711.172	1710.00	1754.067	1755
Frequency Stability vs. Voltage	20	3.5	1711.138	1710.00	1754.078	1755
	20	4.4	1711.167	1710.00	1754.027	1755
Result:					Pass	

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	1711.099	1710.00	1754.073	1755
	-20	3.85	1711.140	1710.00	1754.046	1755
	-10	3.85	1711.163	1710.00	1754.095	1755
	0	3.85	1711.174	1710.00	1754.078	1755
	10	3.85	1711.149	1710.00	1754.077	1755
	20	3.85	1711.138	1710.00	1754.022	1755
	30	3.85	1711.138	1710.00	1754.098	1755
	40	3.85	1711.153	1710.00	1754.013	1755
	50	3.85	1711.171	1710.00	1754.015	1755
Frequency Stability vs. Voltage	20	3.5	1711.167	1710.00	1754.054	1755
	20	4.4	1711.089	1710.00	1754.030	1755
Result:					Pass	

Test Plots:

Occupied Bandwidth



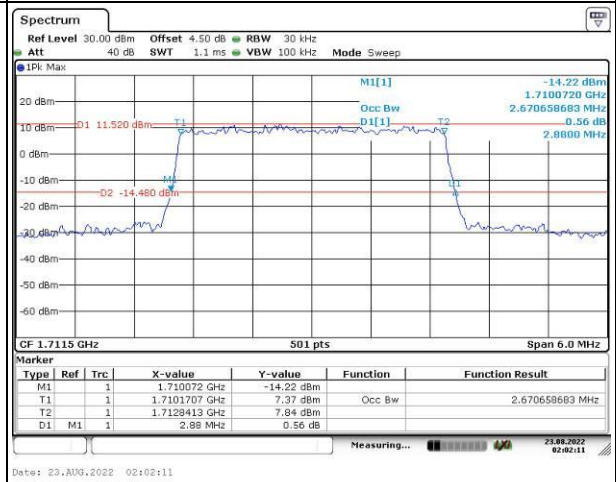
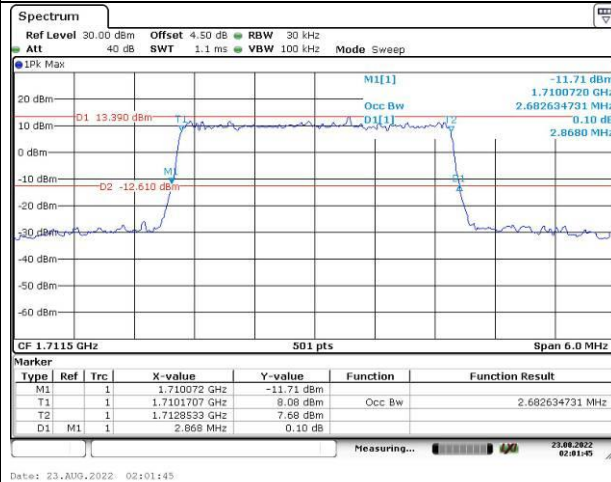
Occupied Bandwidth

Channel

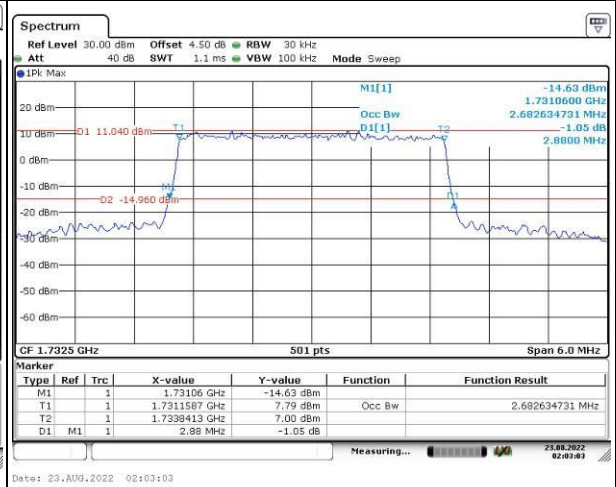
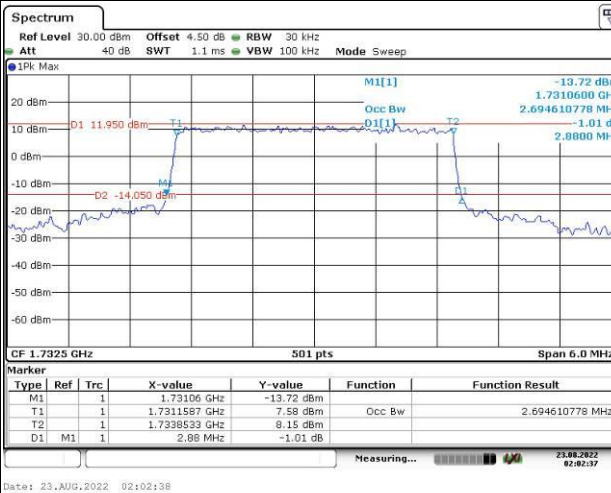
3MHz Bandwidth QPSK

3MHz Bandwidth 16QAM

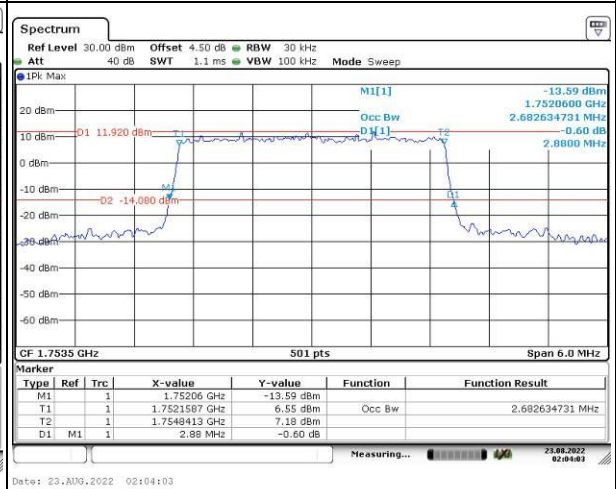
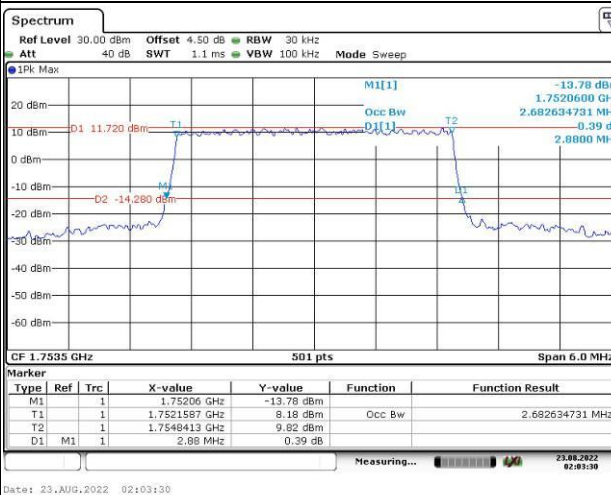
Lowest



Middle



Highest



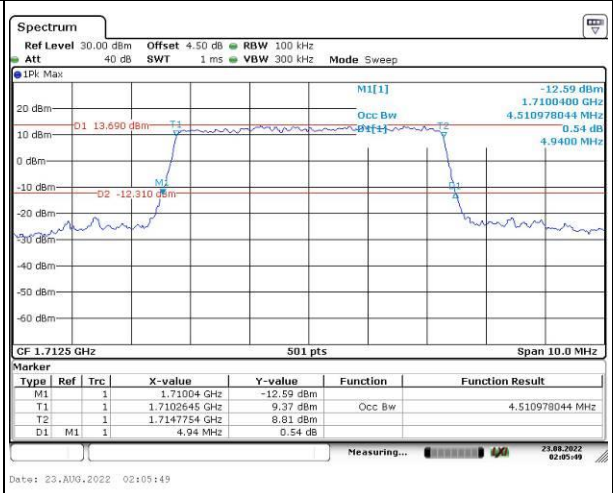
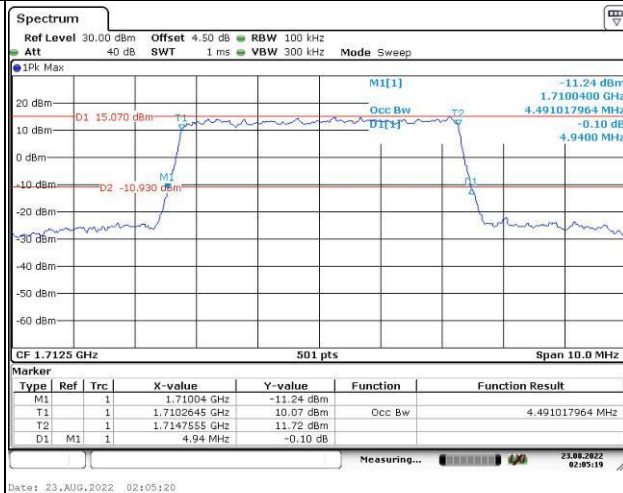
Occupied Bandwidth

Channel

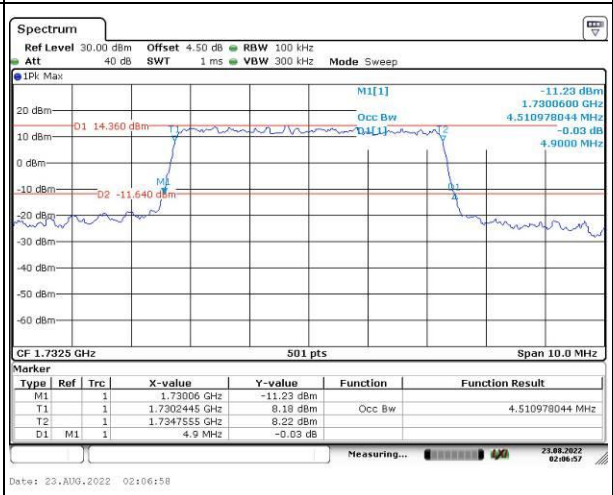
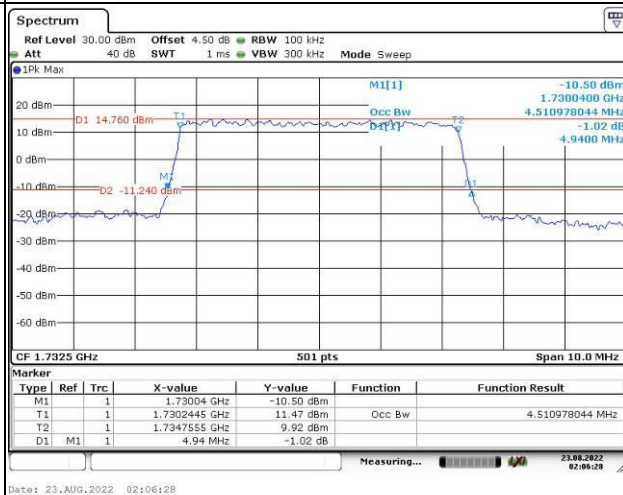
5MHz Bandwidth QPSK

5MHz Bandwidth 16QAM

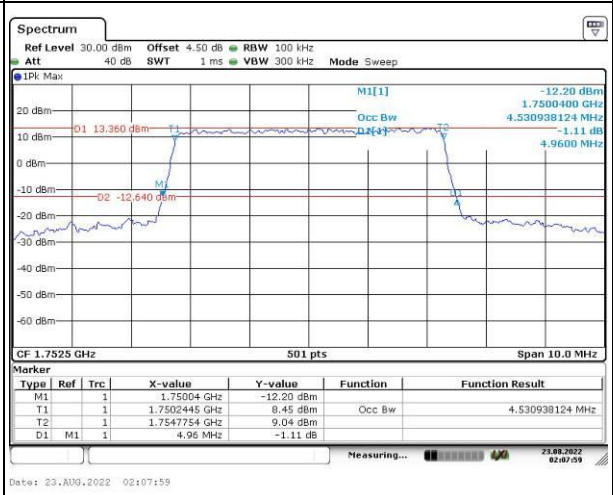
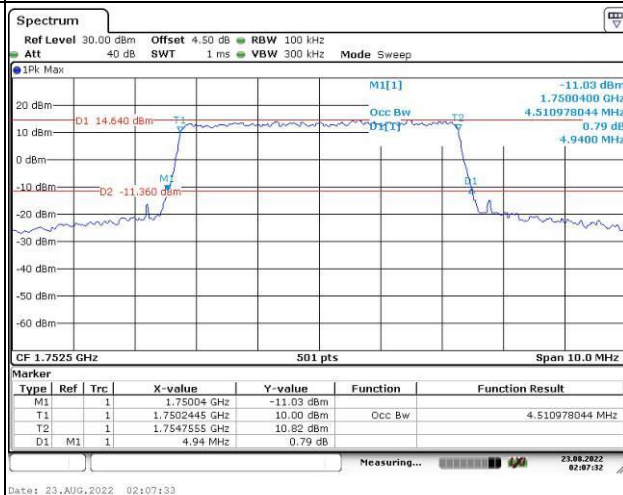
Lowest



Middle



Highest



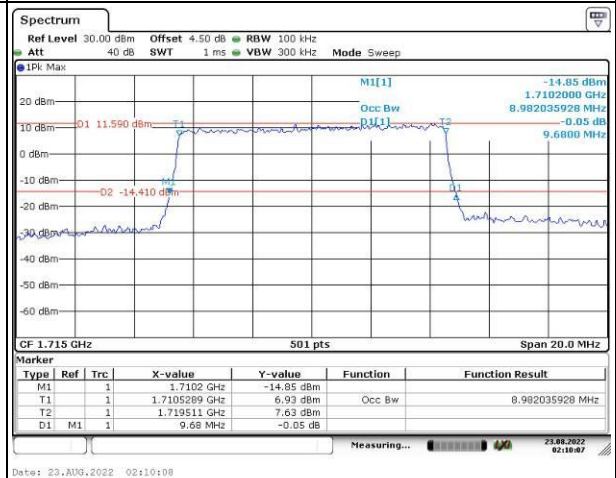
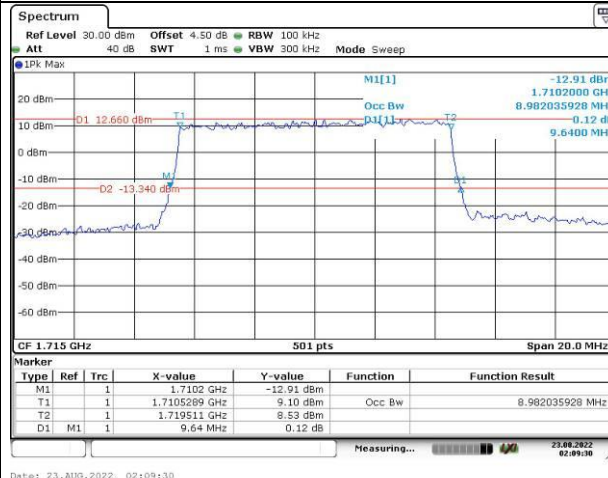
Occupied Bandwidth

Channel

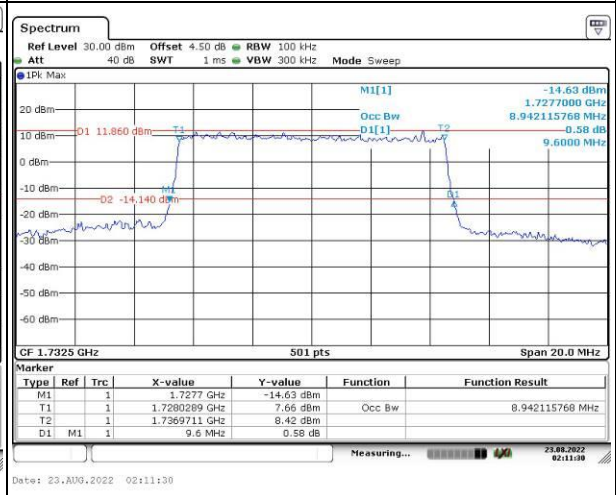
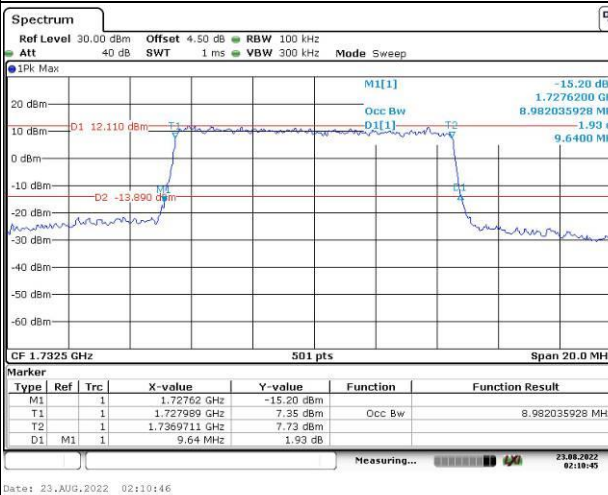
10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

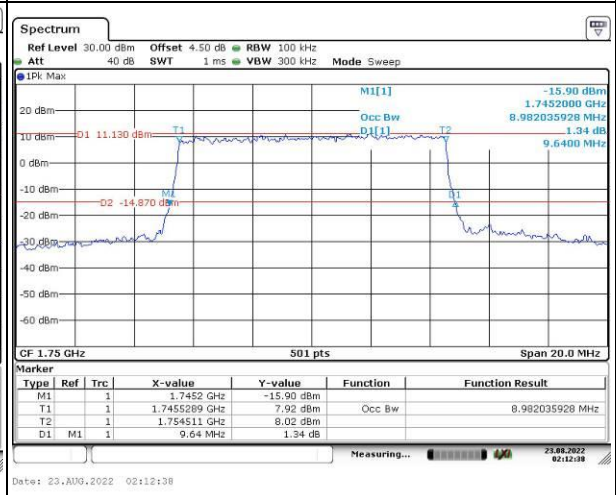
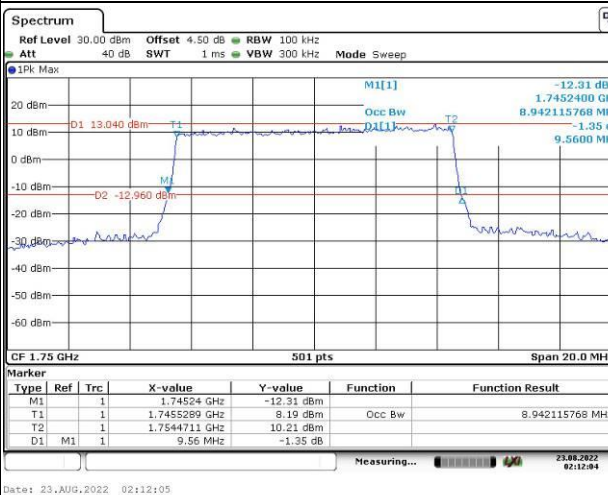
Lowest



Middle



Highest



Channel

15MHz Bandwidth 16QAM

Spectrum

Ref Level 30.00 dBm Offset 4.50 dB BW 300 kHz
Alt 40 dB SWT 1 ms VBW 1 MHz Mode Sweep

• 1PK Max

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-60 dBm

M1[1] -10.60 dBm
1.7101200 GHz
Occ Bw 13.473053892 MHz
D1[1] 1.03 dB
14.7600 MHz

D1 15.920 dBm
D2 -10.080 dBm
M2

CF 1.7175 GHz S01 pts Span 30.0 MHz

Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1			1	1.71012 GHz	-10.60 dBm		
T1			1	1.7100533 GHz	10.97 dBm		
T2			1	1.72493263 GHz	10.79 dBm	Occ Bw	13.473053892 MHz
D1	M1		1	14.76 MHz	1.03 dB		

Measuring...

23.08.2022 02:11:48

Date: 23.AUG.2022 02:13:49

Spectrum

Ref Level 30.00 dBm Offset 4.50 dB RBW 300 kHz
 Att 40 dB SWT 1 ms VBW 1 MHz Mode Sweep

1PK Max

NI[1] 9.79 dBm
 1.7102400 GHz
 13.532934132 MHz
 0.34 dB
 14.6400 MHz

Occ Bw
 D1[1]

CF 1.7175 GHz 501 pts Span 30.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.71024 GHz	-9.79 dBm		
T1		1	1.7107294 GHz	9.45 dBm	Occ Bw	13.532934132 MHz
T2		1	1.7243263 GHz	9.56 dBm		
D1	M1	1	14.64 MHz	0.34 dB		

Measuring... 21.08.2022 02:14:15

Date: 23.AUG.2022 02:14:16

Spectrum

Ref Level 30.00 dBm Offset 4.50 dB RBW 300 kHz
 Att 40 dB SWT 1 ms VBW 1 MHz Mode Sweep

1 PK Max

20 dBm
 10 dBm
 0 dBm
 -10 dBm
 -20 dBm
 -30 dBm
 -40 dBm
 -50 dBm
 -60 dBm

O1 15.500 dBm
 D2 -10.500 dBm

M1[1]
 Occ Bw
 B111

-9.29 dB
 1.7251200 GHz
 13.532934132 MHz
 -0.57
 14.7600 MHz

CF 1.7325 GHz 501 pts Span 30.0 MHz

Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1	1			1.72512 GHz	-9.29 dBm		
T1	1			1.725335 GHz	10.85 dBm	Occ Bw	13.532934132 MHz
T2	1			1.7292665 GHz	9.66 dBm		
D1	M1	1		14.76 MHz	-0.57 dB		

Measuring... 23.08.2022 02:14:48

Date: 23.AUG.2022 02:14:48

Spectrum

Ref Level 30.00 dBm Offset 4.50 dB RBW 300 kHz
 Att 40 dB SWT 1 ms VBW 1 MHz Mode Sweep

1PK Max

20 dBm
 10 dBm
 0 dBm
 -10 dBm
 -20 dBm
 -30 dBm
 -40 dBm
 -50 dBm
 -60 dBm

O1 15.180 dBm
 O2 -10.820 dBm
 M1
 M2
 M3
 M4
 M5
 M6
 M7
 M8
 M9
 M10
 M11
 M12
 M13
 M14
 M15
 M16
 M17
 M18
 M19
 M20
 M21
 M22
 M23
 M24
 M25
 M26
 M27
 M28
 M29
 M30
 M31
 M32
 M33
 M34
 M35
 M36
 M37
 M38
 M39
 M40
 M41
 M42
 M43
 M44
 M45
 M46
 M47
 M48
 M49
 M50
 M51
 M52
 M53
 M54
 M55
 M56
 M57
 M58
 M59
 M60
 M61
 M62
 M63
 M64
 M65
 M66
 M67
 M68
 M69
 M70
 M71
 M72
 M73
 M74
 M75
 M76
 M77
 M78
 M79
 M80
 M81
 M82
 M83
 M84
 M85
 M86
 M87
 M88
 M89
 M90
 M91
 M92
 M93
 M94
 M95
 M96
 M97
 M98
 M99
 M100
 M101
 M102
 M103
 M104
 M105
 M106
 M107
 M108
 M109
 M110
 M111
 M112
 M113
 M114
 M115
 M116
 M117
 M118
 M119
 M120
 M121
 M122
 M123
 M124
 M125
 M126
 M127
 M128
 M129
 M130
 M131
 M132
 M133
 M134
 M135
 M136
 M137
 M138
 M139
 M140
 M141
 M142
 M143
 M144
 M145
 M146
 M147
 M148
 M149
 M150
 M151
 M152
 M153
 M154
 M155
 M156
 M157
 M158
 M159
 M160
 M161
 M162
 M163
 M164
 M165
 M166
 M167
 M168
 M169
 M170
 M171
 M172
 M173
 M174
 M175
 M176
 M177
 M178
 M179
 M180
 M181
 M182
 M183
 M184
 M185
 M186
 M187
 M188
 M189
 M190
 M191
 M192
 M193
 M194
 M195
 M196
 M197
 M198
 M199
 M200
 M201
 M202
 M203
 M204
 M205
 M206
 M207
 M208
 M209
 M210
 M211
 M212
 M213
 M214
 M215
 M216
 M217
 M218
 M219
 M220
 M221
 M222
 M223
 M224
 M225
 M226
 M227
 M228
 M229
 M230
 M231
 M232
 M233
 M234
 M235
 M236
 M237
 M238
 M239
 M240
 M241
 M242
 M243
 M244
 M245
 M246
 M247
 M248
 M249
 M250
 M251
 M252
 M253
 M254
 M255
 M256
 M257
 M258
 M259
 M260
 M261
 M262
 M263
 M264
 M265
 M266
 M267
 M268
 M269
 M270
 M271
 M272
 M273
 M274
 M275
 M276
 M277
 M278
 M279
 M280
 M281
 M282
 M283
 M284
 M285
 M286
 M287
 M288
 M289
 M290
 M291
 M292
 M293
 M294
 M295
 M296
 M297
 M298
 M299
 M300
 M301
 M302
 M303
 M304
 M305
 M306
 M307
 M308
 M309
 M310
 M311
 M312
 M313
 M314
 M315
 M316
 M317
 M318
 M319
 M320
 M321
 M322
 M323
 M324
 M325
 M326
 M327
 M328
 M329
 M330
 M331
 M332
 M333
 M334
 M335
 M336
 M337
 M338
 M339
 M340
 M341
 M342
 M343
 M344
 M345
 M346
 M347
 M348
 M349
 M350
 M351
 M352
 M353
 M354
 M355
 M356
 M357
 M358
 M359
 M360
 M361
 M362
 M363
 M364
 M365
 M366
 M367
 M368
 M369
 M370
 M371
 M372
 M373
 M374
 M375
 M376
 M377
 M378
 M379
 M380
 M381
 M382
 M383
 M384
 M385
 M386
 M387
 M388
 M389
 M390
 M391
 M392
 M393
 M394
 M395
 M396
 M397
 M398
 M399
 M400
 M401
 M402
 M403
 M404
 M405
 M406
 M407
 M408
 M409
 M410
 M411
 M412
 M413
 M414
 M415
 M416
 M417
 M418
 M419
 M420
 M421
 M422
 M423
 M424
 M425
 M426
 M427
 M428
 M429
 M430
 M431
 M432
 M433
 M434
 M435
 M436
 M437
 M438
 M439
 M440
 M441
 M442
 M443
 M444
 M445
 M446
 M447
 M448
 M449
 M450
 M451
 M452
 M453
 M454
 M455
 M456
 M457
 M458
 M459
 M460
 M461
 M462
 M463
 M464
 M465
 M466
 M467
 M468
 M469
 M470
 M471
 M472
 M473
 M474
 M475
 M476
 M477
 M478
 M479
 M480
 M481
 M482
 M483
 M484
 M485
 M486
 M487
 M488
 M489
 M490
 M491
 M492
 M493
 M494
 M495
 M496
 M497
 M498

Spectrum

Ref Level 30.00 dBm Offset 4.50 dB RBW 300 kHz
Att 40 dB SWT 1 ms VBW 1 MHz Mode Sweep

IPK Max

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm

O1 15.520 dBm
O2 -10.480 dBm
M1[1]
T2
Occ Bw
D1[1]
-11.07 dB
1.740180 GHz
13.473053892 MHz
0.11 Hz
14.0200 MHz

CF 1.7475 GHz 501 pts Span 30.0 MHz

Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1	1			1.74019 GHz	-11.07 dBm		
T1	1			1.7407934 GHz	10.33 dBm		
T2	1			1.7542665 GHz	12.25 dBm		
O1	M1	1		14.82 MHz	0.11 dB		

Measuring... 23.08.2022 02:15:47

Date: 23.08.2022 02:15:48

Spectrum

Ref Level 30.00 dBm Offset 4.50 dB RBW 300 kHz
 Att 40 dB SWT 1 ms VBW 1 MHz Mode Sweep

1PK Max

M1[1] -11.40 dBm
 1.7401800 GHz
 13.532934132 MHz
 0.52 dB
 15.4600 MHz

M2 -11.020 dBm

CF 1.7475 GHz 501 pts Span 30.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1	1	1	1.74018 GHz	-11.40 dBm		
T1	1	1	1.7407934 GHz	9.76 dBm	Occ Bw	13.532934132 MHz
T2	1	1	1.7543263 GHz	10.33 dBm		
D1	M1	1	15.48 MHz	0.52 dB		

Measuring...

25.02.2022 02:10:18

Date: 25.AUG.2022 02:16:19

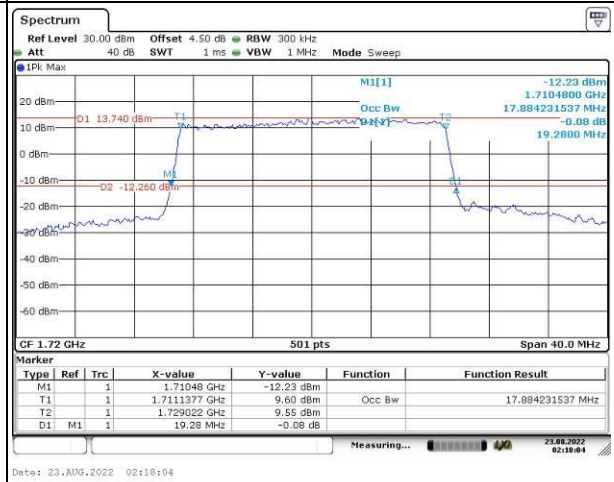
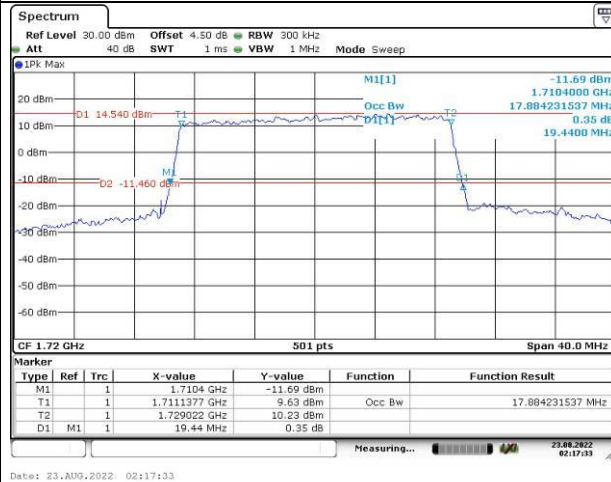
Occupied Bandwidth

Channel

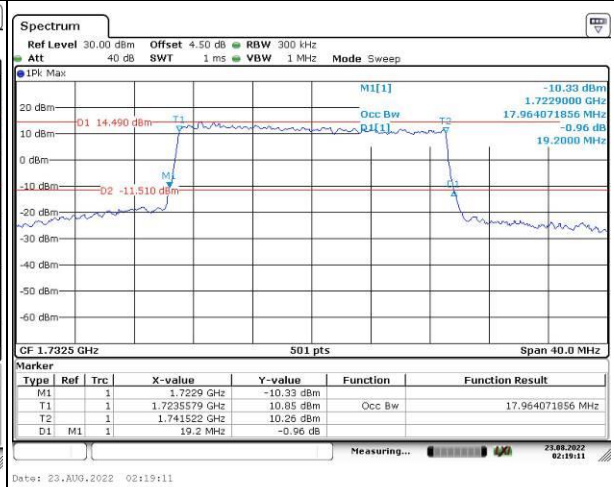
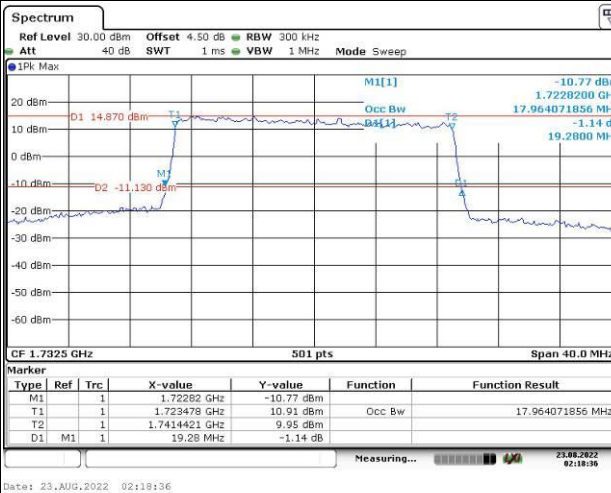
20MHz Bandwidth QPSK

20MHz Bandwidth 16QAM

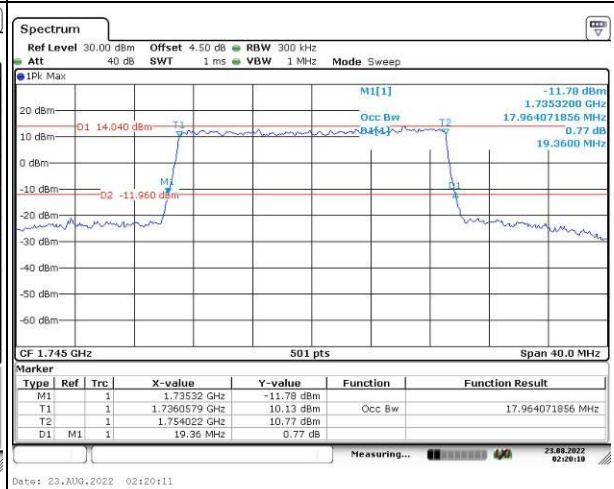
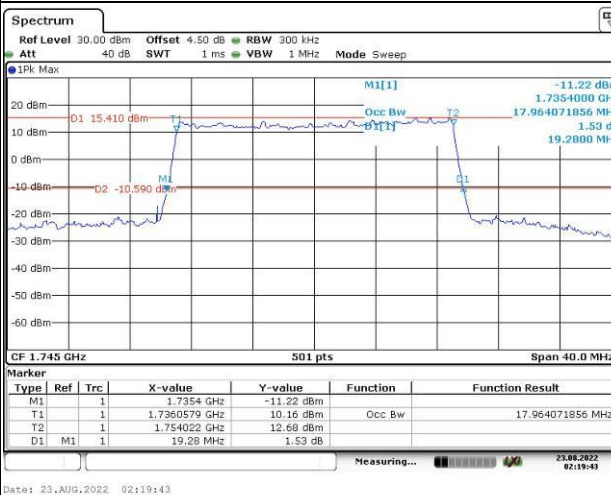
Lowest



Middle



Highest

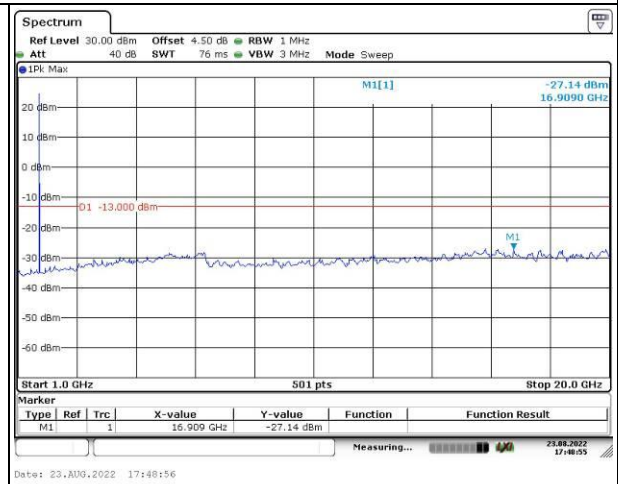
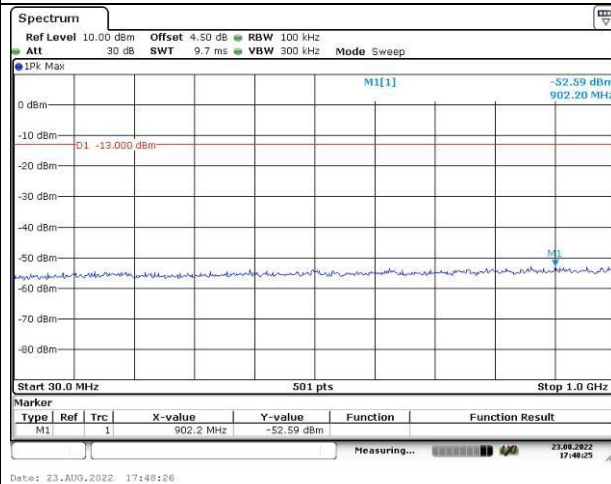


Spurious Emissions at Antenna Terminal

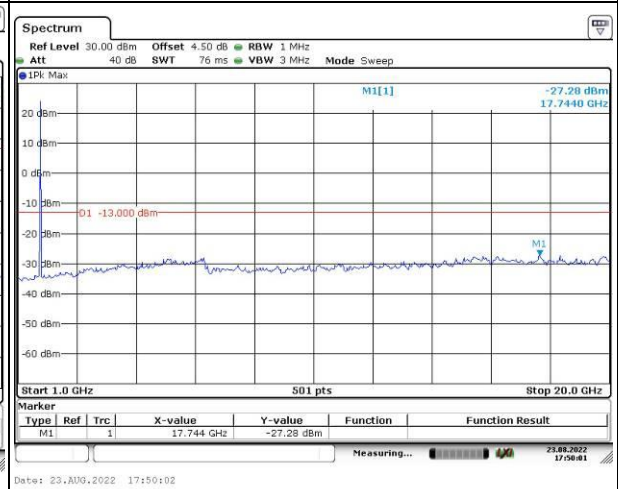
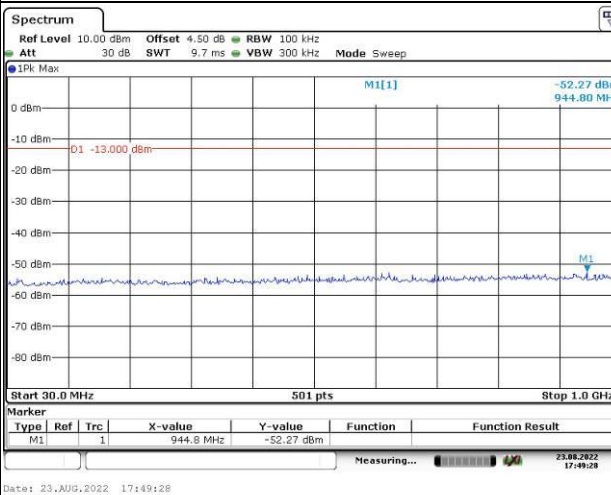
Channel

1.4MHz Bandwidth QPSK

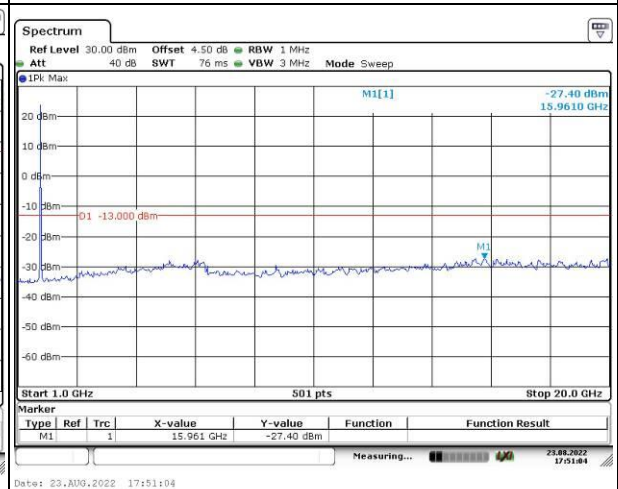
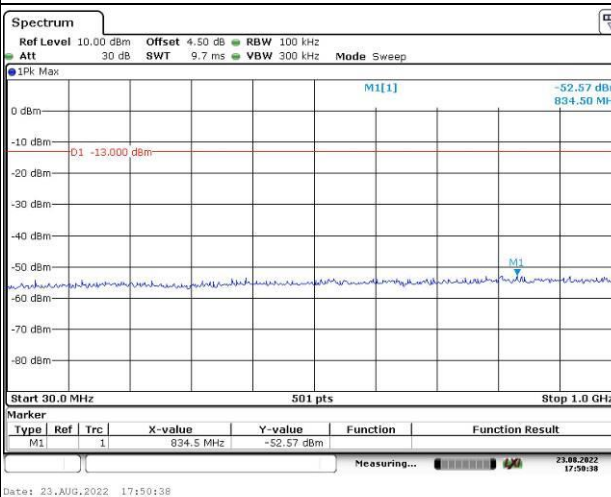
Lowest



Middle



Highest

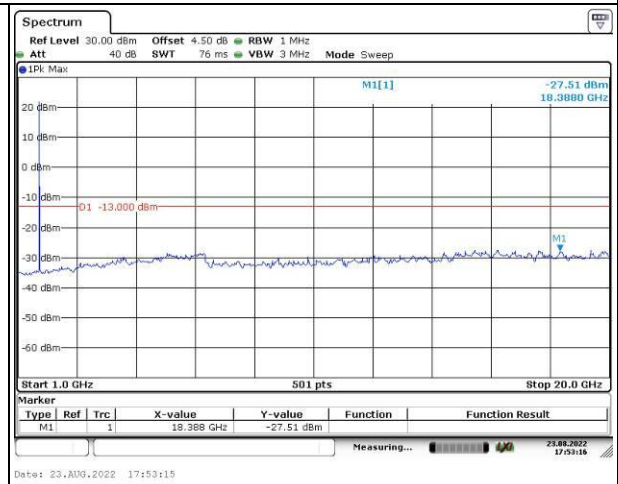
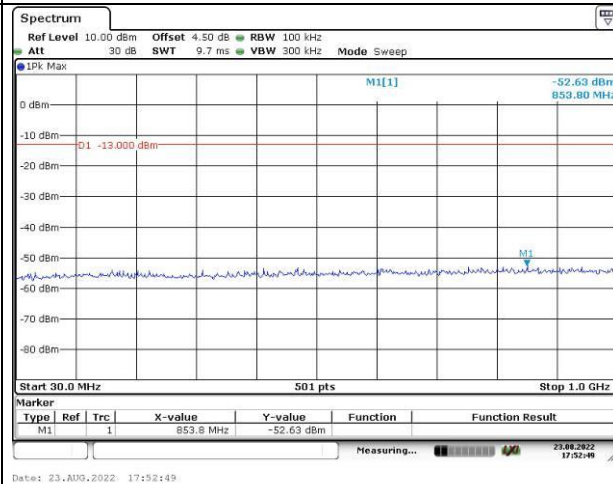


Spurious Emissions at Antenna Terminal

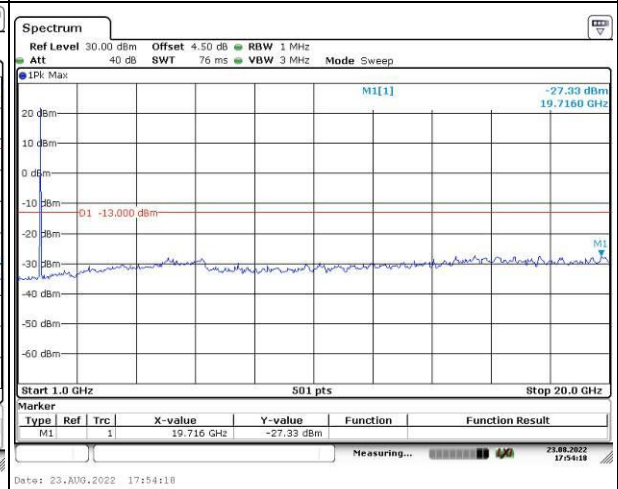
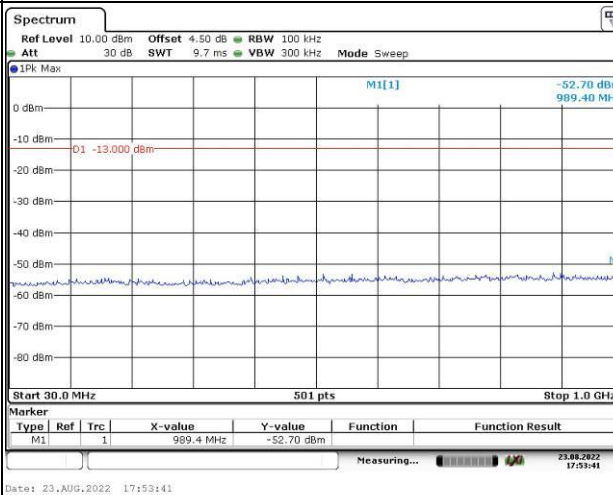
Channel

3MHz Bandwidth QPSK

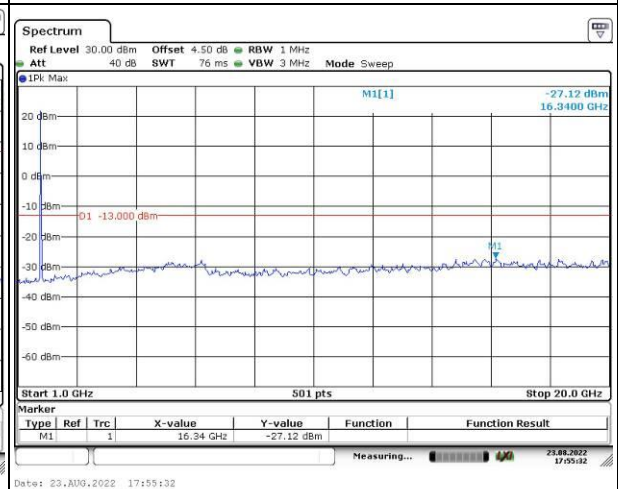
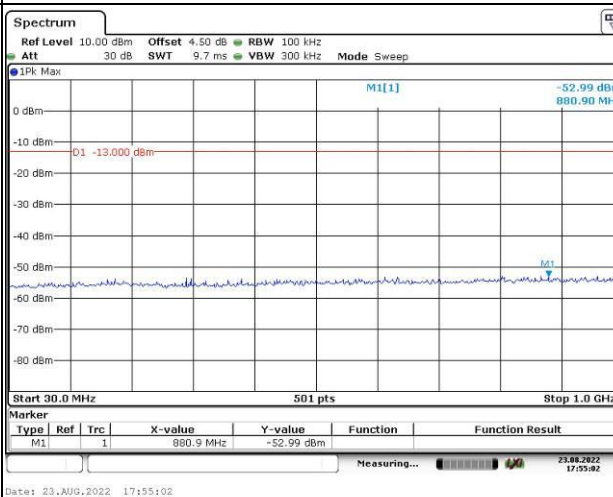
Lowest



Middle



Highest

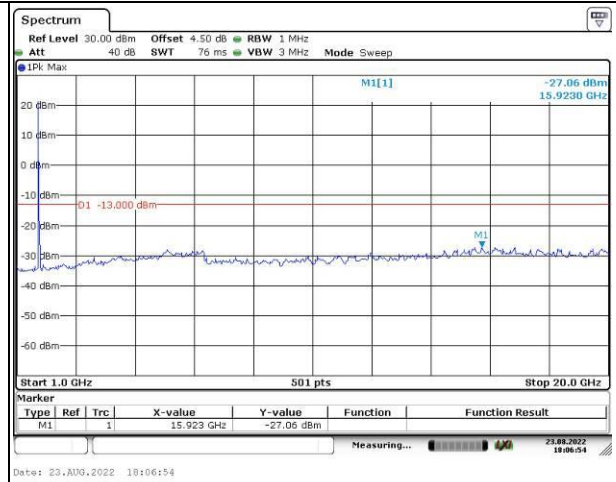
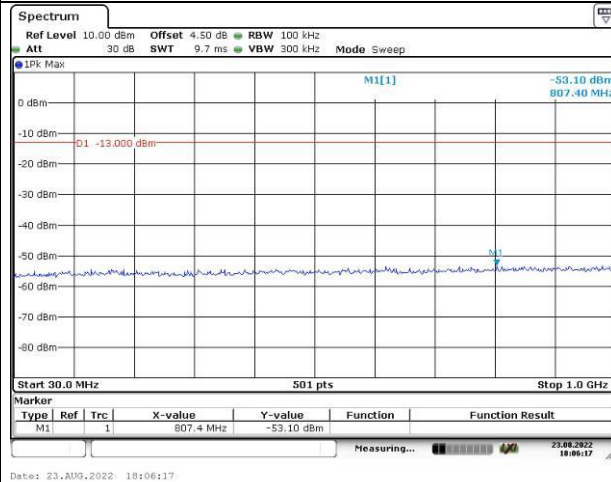


Spurious Emissions at Antenna Terminal

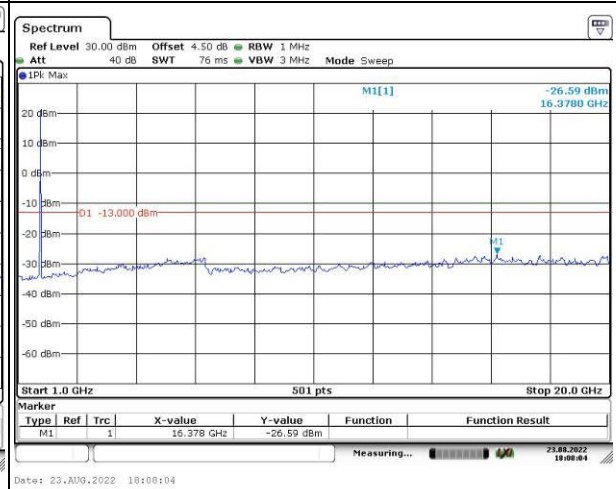
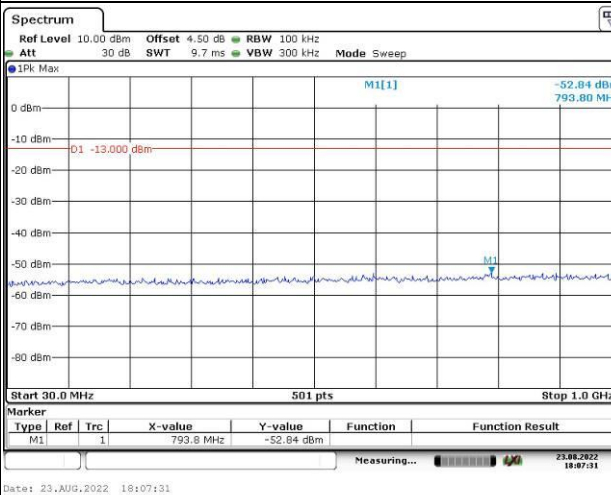
Channel

5MHz Bandwidth QPSK

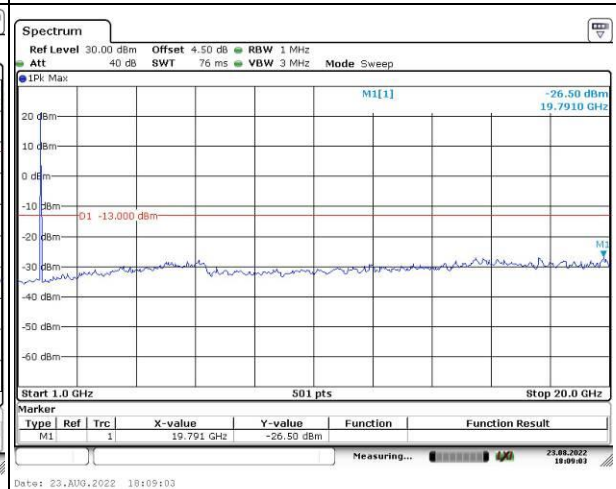
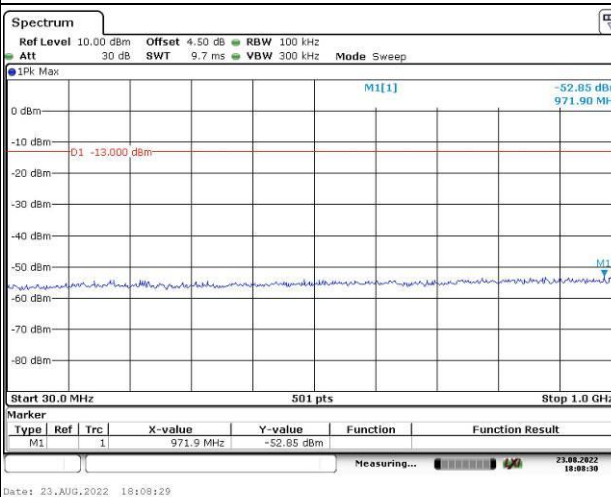
Lowest



Middle



Highest

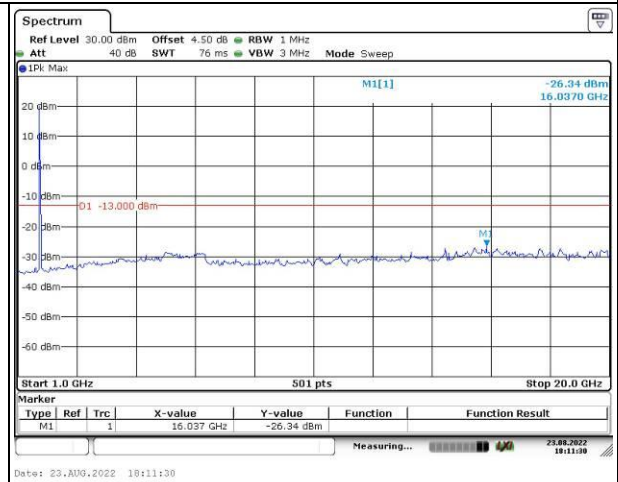
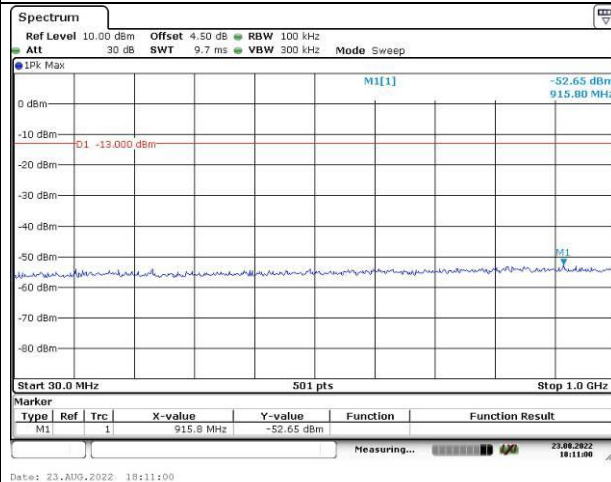


Spurious Emissions at Antenna Terminal

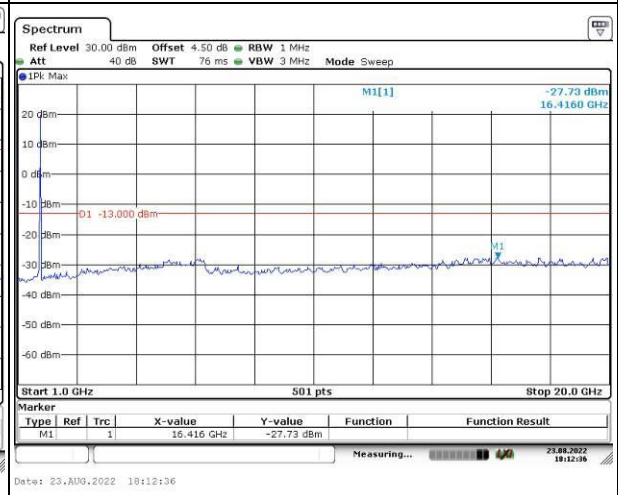
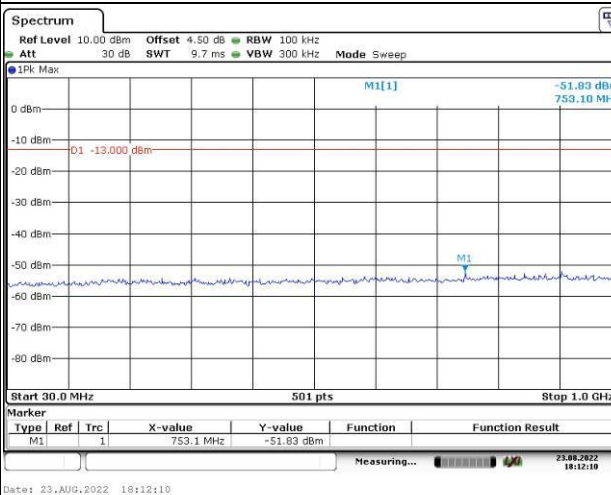
Channel

10MHz Bandwidth QPSK

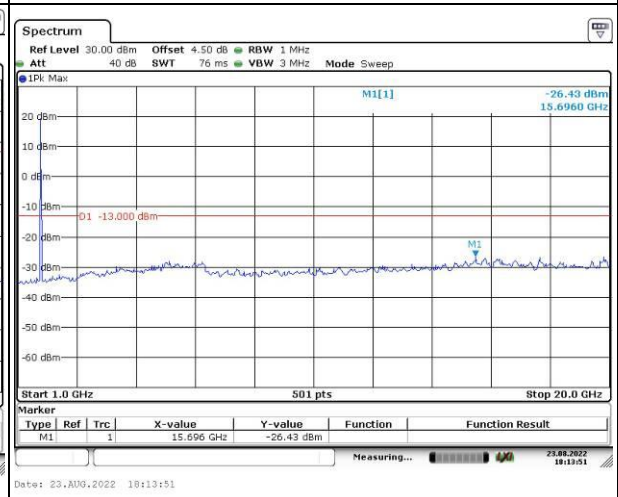
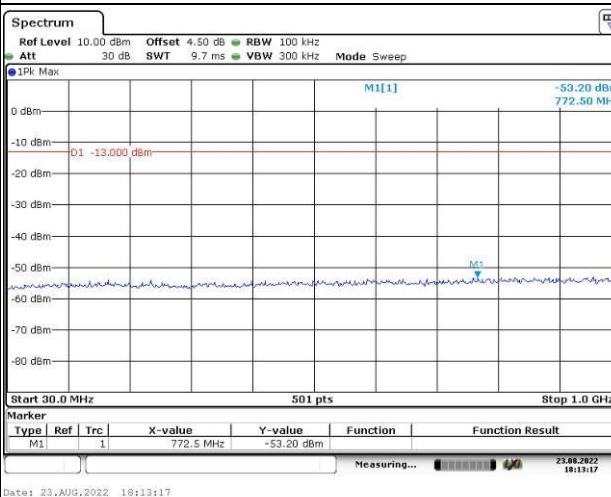
Lowest



Middle



Highest

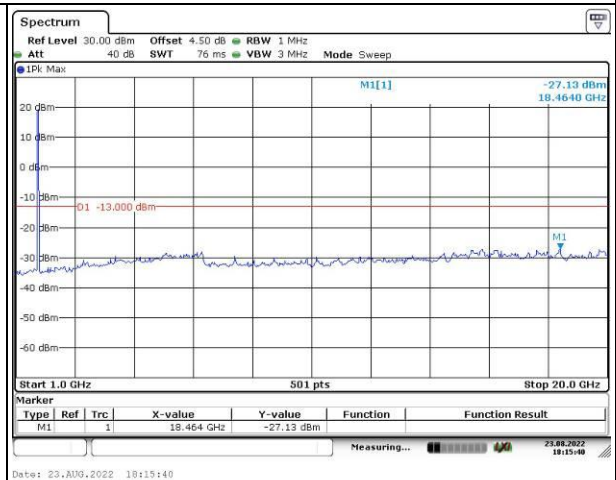
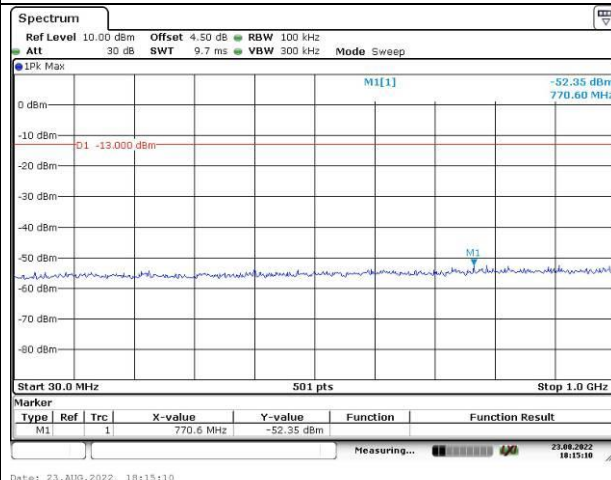


Spurious Emissions at Antenna Terminal

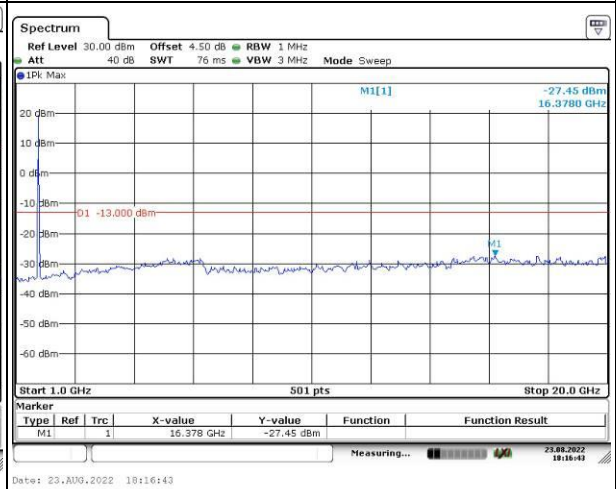
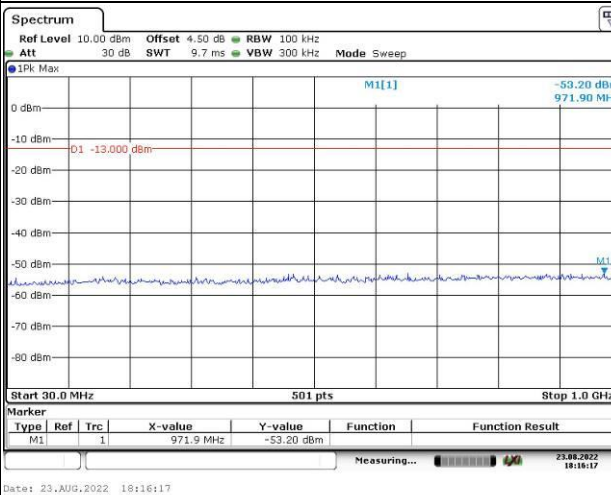
Channel

15MHz Bandwidth QPSK

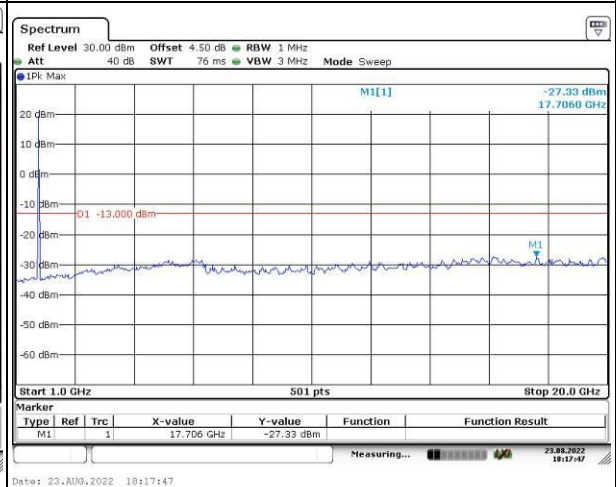
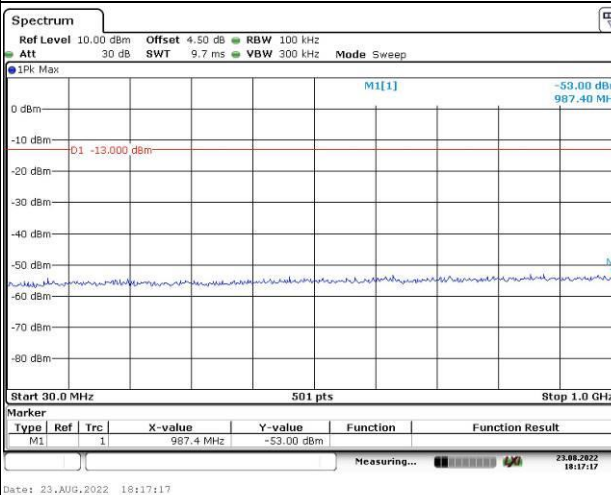
Lowest



Middle



Highest

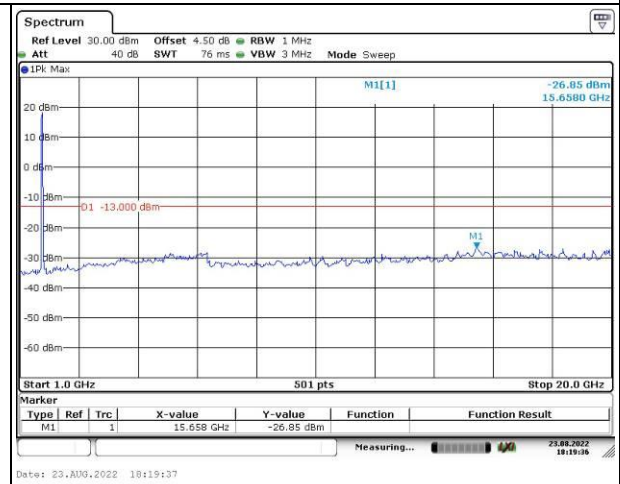
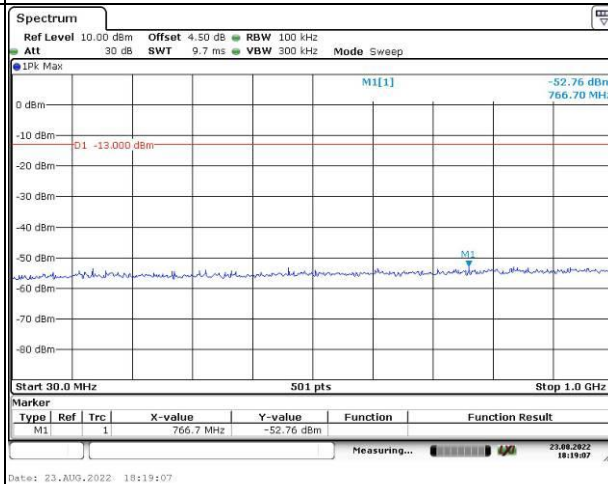


Spurious Emissions at Antenna Terminal

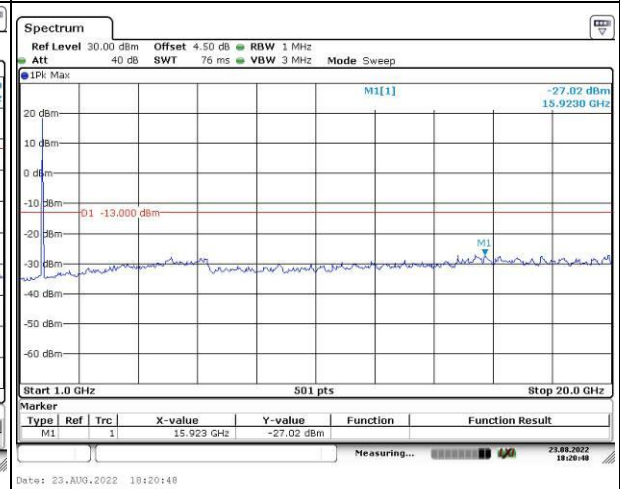
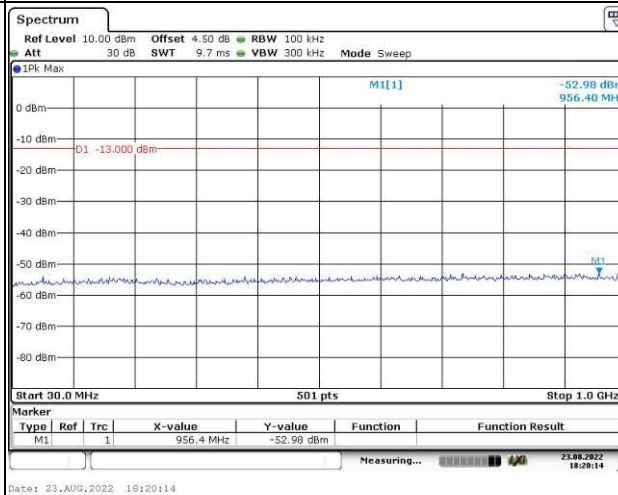
Channel

20MHz Bandwidth QPSK

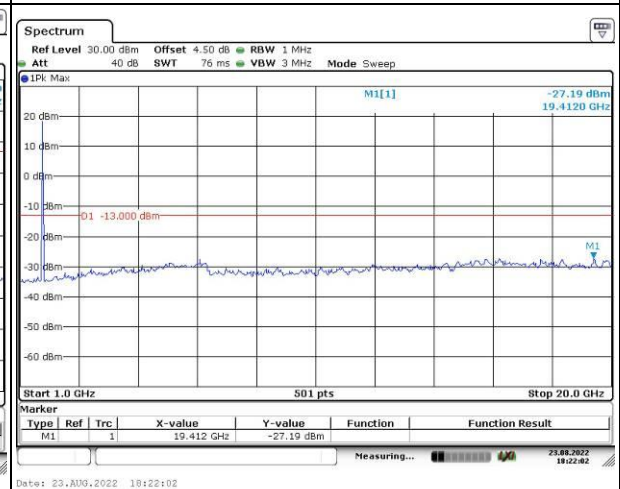
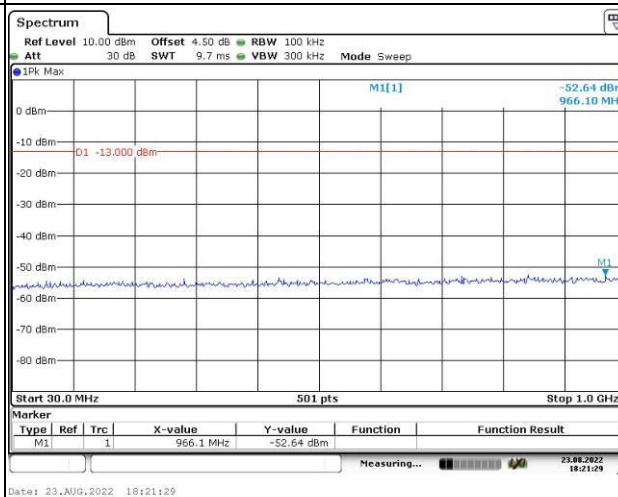
Lowest



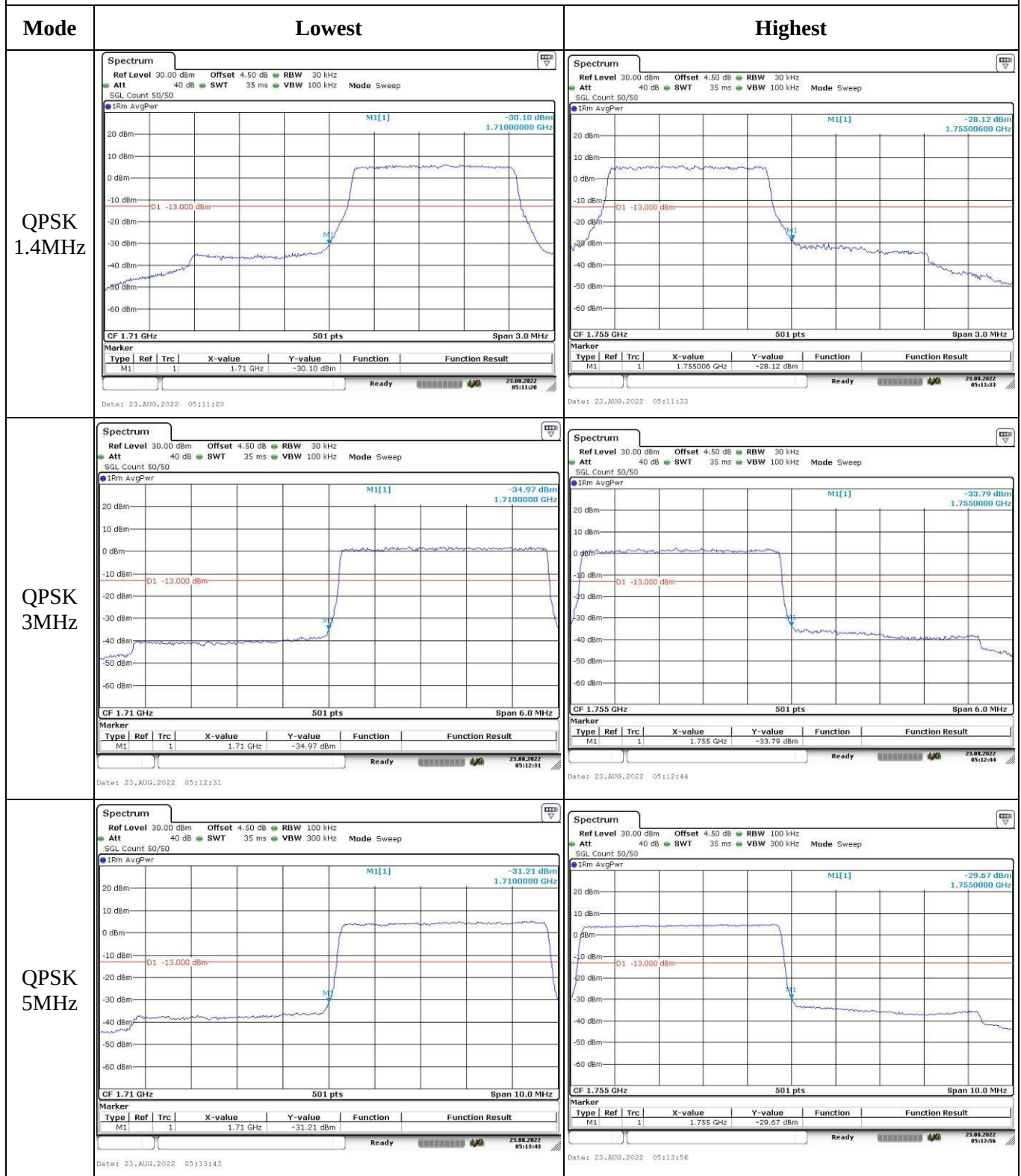
Middle



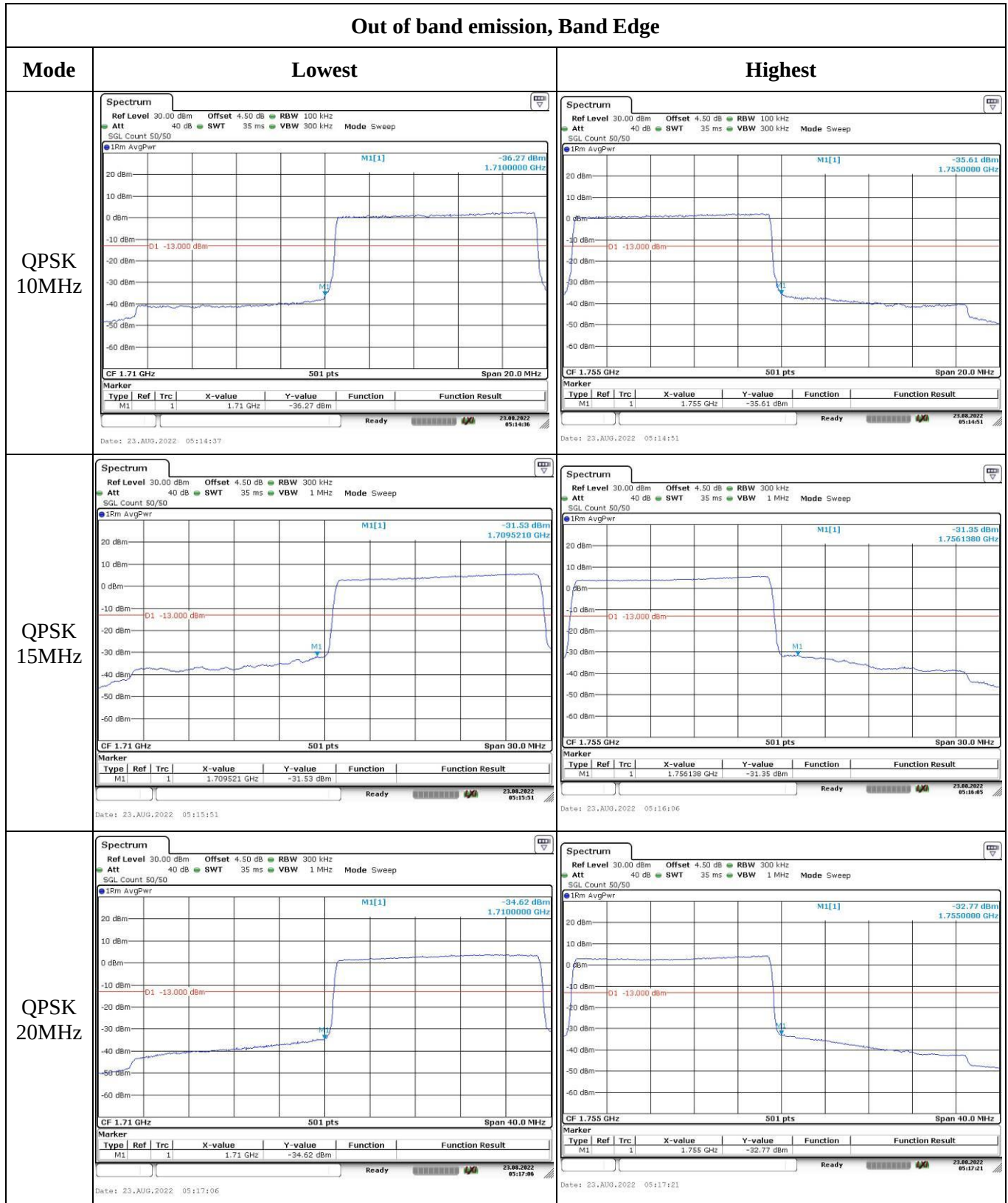
Highest



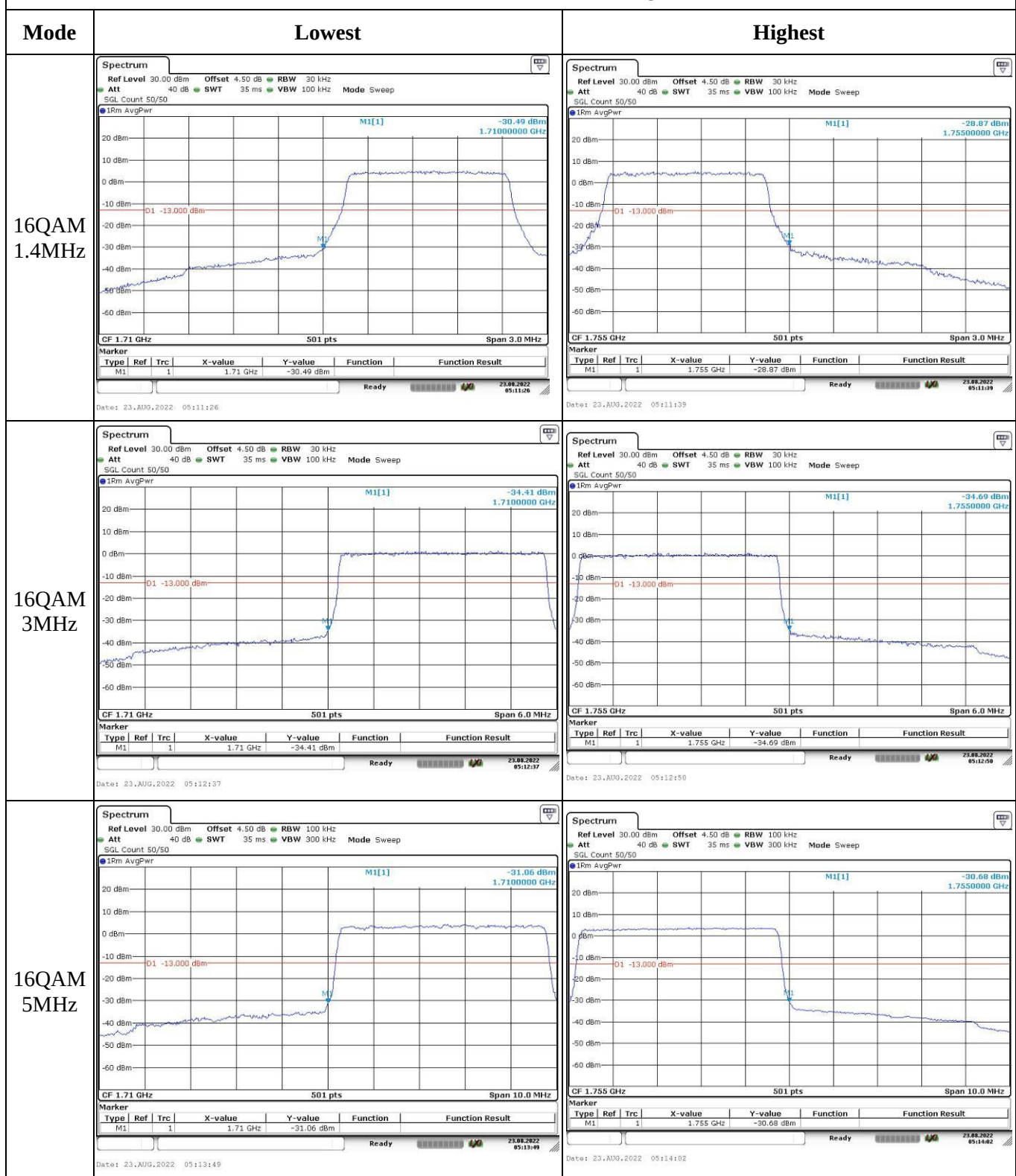
Out of band emission, Band Edge



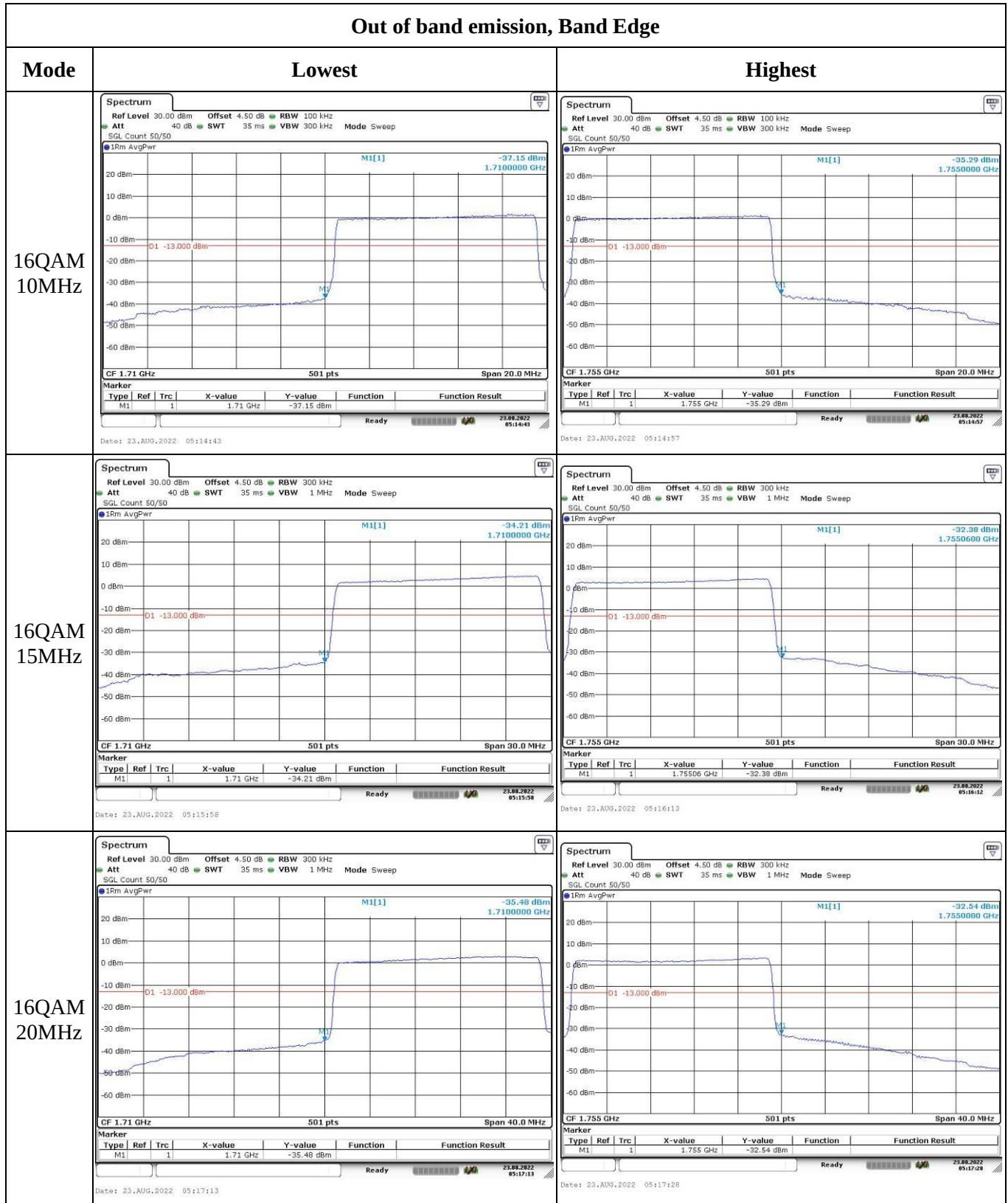
Out of band emission, Band Edge



Out of band emission, Band Edge



Out of band emission, Band Edge



4.7 Antenna Port Test Data and Results for LTE Band 5

Serial Number:	CR22070052-RF-S1	Test Date:	2022-08-23~2022-08-25
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	25.3~25.8	Relative Humidity: (%)	51~59	ATM Pressure: (kPa)	100.2~100.8
----------------------	-----------	------------------------------	-------	------------------------	-------------

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2022-07-15	2023-07-14
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
YINSAIGE	Coaxial Cable	SS402	SJ0100003	Each time	N/A
Unknown	Coaxial tee connector	Unknown	2204004	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2022-07-15	2023-07-14
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2022-04-06	2023-04-05
UNI-T	Multimeter	UT39A+	C210582554	2021-09-30	2022-09-29
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A

* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

EUT Information@ LTE Band 5▲:

Antenna Gain (dBi):	-0.78	Antenna Gain (dBd):	-2.93	Path Loss L _C (dB):	0.2
Operation Voltage(V _{DC}):					
Lowest:	3.5	Normal:	3.85	Highest:	4.4

Test Frequency For Each Mode:

Operation Bandwidth	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
1.4MHz	824.7	836.5	848.3
3MHz	825.5	836.5	847.5
5MHz	826.5	836.5	846.5
10MHz	829	836.5	844

Test Data:**FCC §2.1046; § 22.913 (a)****RF Output Power:**

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
1.4MHz QPSK	RB1#0	23.03	22.89	22.63	20.06	38.45
	RB1#3	23.19	23.09	22.8		
	RB1#5	23.04	22.85	22.62		
	RB3#0	23.05	22.93	22.72		
	RB3#3	23.05	22.97	22.54		
	RB6#0	22.2	22	21.78		
1.4MHz 16QAM	RB1#0	22.14	21.9	21.58	19.15	38.45
	RB1#3	22.28	22.08	21.74		
	RB1#5	22.18	21.93	21.56		
	RB3#0	21.96	21.99	21.85		
	RB3#3	21.94	22	21.88		
	RB6#0	21.15	20.91	20.8		
3MHz QPSK	RB1#0	23.08	22.92	22.74	19.95	38.45
	RB1#8	23.07	22.92	22.67		
	RB1#14	23.02	22.87	22.67		
	RB6#0	22.1	21.95	21.7		
	RB6#9	22.1	21.89	21.71		
	RB15#0	22.09	21.92	21.74		
3MHz 16QAM	RB1#0	22.53	22.09	21.79	19.4	38.45
	RB1#8	22.53	22.05	21.77		
	RB1#14	22.49	22.03	21.69		
	RB6#0	21.1	20.94	20.69		
	RB6#9	21.08	20.93	20.64		
	RB15#0	21.07	20.86	20.79		
5MHz QPSK	RB1#0	22.96	22.85	22.69	19.93	38.45
	RB1#13	23.06	22.92	22.79		
	RB1#24	22.95	22.74	22.6		
	RB15#0	22.12	21.94	21.81		
	RB15#10	22.04	21.93	21.79		
	RB25#0	22.08	21.87	21.76		
5MHz 16QAM	RB1#0	22.01	21.79	22.01	19.02	38.45
	RB1#13	22.15	21.85	22.11		
	RB1#24	22.06	21.69	21.9		
	RB15#0	21.11	20.97	20.78		
	RB15#10	21.02	20.94	20.77		
	RB25#0	21.07	20.94	20.78		
10MHz QPSK	RB1#0	23.04	22.98	22.87	20.08	38.45

	RB1#25	23.21	23.06	22.92		
	RB1#49	22.99	22.82	22.74		
	RB25#0	22.2	21.97	22.07		
	RB25#25	22.09	21.93	21.86		
	RB50#0	22.11	21.94	21.98		
10MHz 16QAM	RB1#0	22.52	22.13	21.87	19.57	38.45
	RB1#25	22.7	22.17	21.98		
	RB1#49	22.56	22.02	21.72		
	RB25#0	21.23	20.98	21.12		
	RB25#25	21.13	20.92	20.94		
	RB50#0	21.13	20.91	21.01		

Note: ERP=Conducted Power(dBm) - Cable loss(dB) + Antenna Gain(dBd)

Result: **Pass**

Peak-to-average Ratio(PAR)

Test Bandwidth & Modulation	Resource Block & RB offset	Peak-to-average Ratio(dB)			Limit (dB)
		Lowest Channel	Middle Channel	Highest Channel	
10MHz QPSK	RB1#0	4.12	4.75	4.61	13
	RB50#0	4.93	4.93	5.19	13
10MHz 16QAM	RB1#0	5.1	5.51	5.57	13
	RB50#0	5.94	5.94	6.03	13
				Result:	Pass

FCC §2.1049, §22.905:Occupied Bandwidth

Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
1.4MHz QPSK	1.108	1.096	1.102	1.338	1.302	1.308
1.4MHz 16QAM	1.102	1.108	1.09	1.284	1.326	1.29
3MHz QPSK	2.683	2.683	2.683	2.868	2.88	2.868
3MHz 16QAM	2.683	2.683	2.683	2.868	2.904	2.892
5MHz QPSK	4.511	4.491	4.531	4.98	4.94	4.94
5MHz 16QAM	4.511	4.511	4.491	4.96	4.96	4.92
10MHz QPSK	8.942	8.942	8.982	9.6	9.64	9.68
10MHz 16QAM	8.942	8.942	8.942	9.6	9.56	9.6

Note: The test plots please refer to the Plots of Occupied Bandwidth