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1. Equipment List

Conducted Emission					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Duedate (yyyy-mm-dd)
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2017/5/10	2020/5/9
LISN	Rohde & Schwarz	ENV216	SEM007-01	2018/9/2	2019/9/2
LISN	ETS-LINDGREN	Feb-16	SEM007-02	2019/3/2	2020/3/1
Measurement Software	AUDIX	e3 V5.4.1221d	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2018/7/12	2019/7/11
2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	EMC0122	2019/2/11	2020/2/10
EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2019/3/2	2020/3/1

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Duedate (yyyy-mm-dd)
DC Power Supply	Agilent Technologies Inc	66311B	W009-09	2018/9/15	2019/9/15
Signal Analyzer	Rohde & Schwarz	FSV	W025-05	2019/1/13	2020/1/12
Coaxial Cable	SGS	N/A	SEM031-01	2018/7/13	2019/7/12
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2018/9/2	2019/9/2
Temperature Chamber	GIANT FORCE	ICT-150-40-CP-AR	W027-03	2018/11/27	2019/11/27
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2018/9/2	2019/9/2

2. Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Total RF power, conducted	±0.75dB
2	RF power density, conducted	±2.84dB
3	Spurious emissions, conducted	±0.75dB
4	Conduct emission test	±3.12 dB(9KHz- 30MHz)

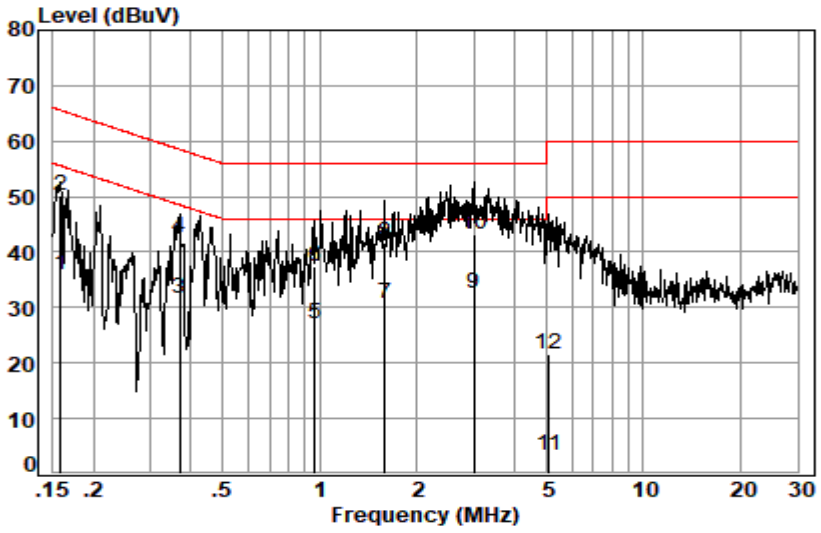
3. AC Power Line Conducted Emissions

Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

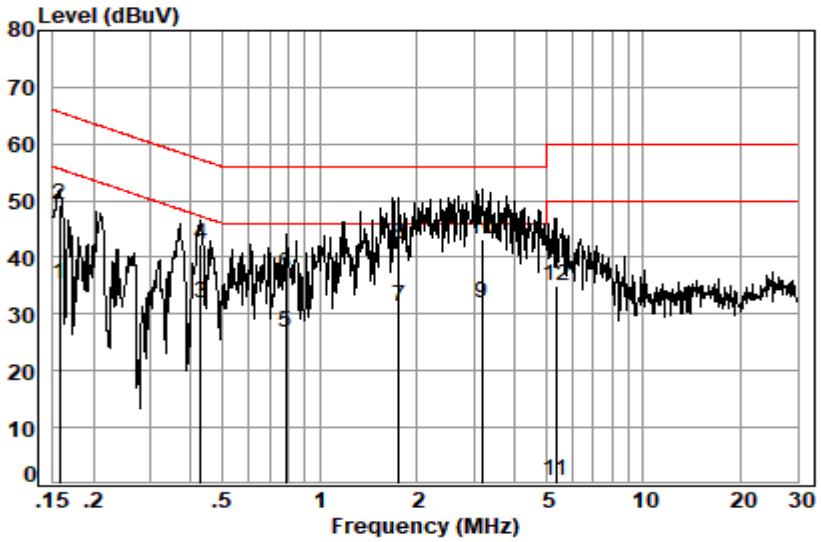
Live line:



Site : Shielding Room
Condition: Line
Job No. : 14418CR
Test mode: c

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1582	0.01	9.66	26.25	35.92	55.56	-19.64	Average
2	0.1582	0.01	9.66	40.67	50.34	65.56	-15.22	QP
3	0.3692	0.05	9.67	21.84	31.56	48.52	-16.96	Average
4	0.3692	0.05	9.67	32.74	42.46	58.52	-16.06	QP
5	0.9684	0.09	9.74	17.18	27.01	46.00	-18.99	Average
6	0.9684	0.09	9.74	27.45	37.28	56.00	-18.72	QP
7	1.5851	0.14	9.73	20.88	30.75	46.00	-15.25	Average
8	1.5851	0.14	9.73	31.70	41.57	56.00	-14.43	QP
9	2.9935	0.16	9.71	22.69	32.56	46.00	-13.44	Average
10	2.9935	0.16	9.71	33.46	43.33	56.00	-12.67	QP
11	5.1118	0.17	9.74	-6.70	3.21	50.00	-46.79	Average
12	5.1118	0.17	9.74	11.73	21.64	60.00	-38.36	QP

Neutral line:



Site : Shielding Room
Condition: Neutral
Job No. : 14418CR
Test mode: c

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1573	0.01	9.63	25.68	35.32	55.60	-20.28	Average
2	0.1573	0.01	9.63	39.76	49.40	65.60	-16.20	QP
3	0.4282	0.05	9.65	22.33	32.03	47.29	-15.26	Average
4	0.4282	0.05	9.65	32.51	42.21	57.29	-15.08	QP
5	0.7876	0.08	9.70	17.06	26.84	46.00	-19.16	Average
6	0.7876	0.08	9.70	27.21	36.99	56.00	-19.01	QP
7	1.7623	0.15	9.69	21.60	31.44	46.00	-14.56	Average
8	1.7623	0.15	9.69	32.58	42.42	56.00	-13.58	QP
9	3.1731	0.16	9.68	22.07	31.91	46.00	-14.09	Average
10	3.1731	0.16	9.68	33.38	43.22	56.00	-12.78	QP
11	5.3615	0.17	9.72	-9.32	0.57	50.00	-49.43	Average
12	5.3615	0.17	9.72	25.05	34.94	60.00	-25.06	QP

Remarks:

1. *The following Quasi-Peak and Average measurements were performed on the EUT:*
2. *Final Test Level =Receiver Reading + LISN Factor + Cable Loss.*

4. Conducted Peak Output Power

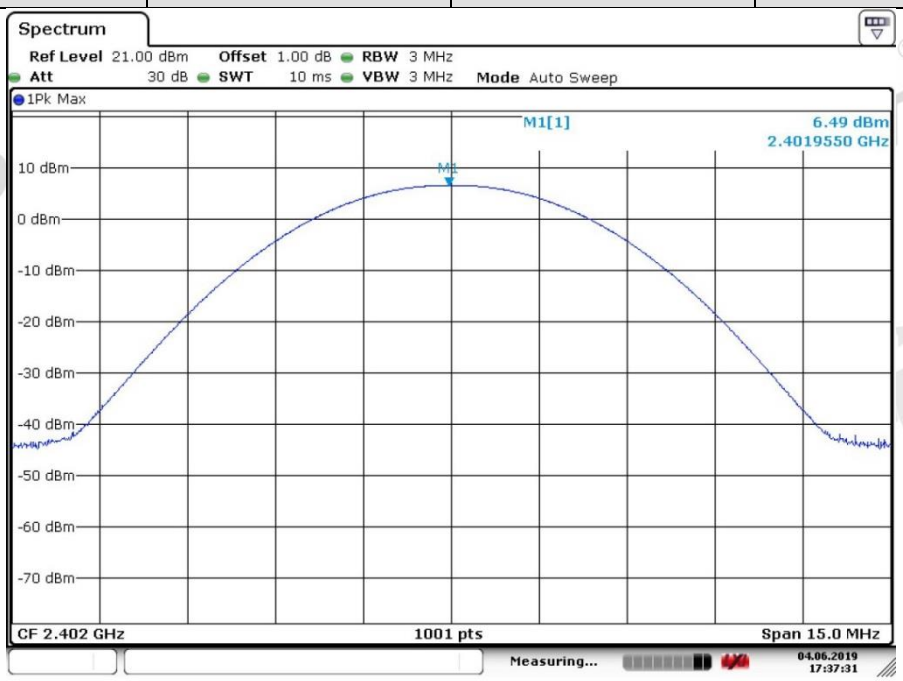
4.1. Test Results

Measurement Data of Peak power:

GFSK mode			
Test channel	**Peak Output Power (dBm)**	**Limit (dBm)**	**Result**
Lowest	6.49	20.97	Pass
Middle	5.50	20.97	Pass
Highest	6.77	20.97	Pass
π/4DQPSK mode			
Test channel	**Peak Output Power (dBm)**	**Limit (dBm)**	**Result**
Lowest	6.43	20.97	Pass
Middle	5.29	20.97	Pass
Highest	6.64	20.97	Pass
8DPSK mode			
Test channel	**Peak Output Power (dBm)**	**Limit (dBm)**	**Result**
Lowest	6.12	20.97	Pass
Middle	5.15	20.97	Pass
Highest	6.47	20.97	Pass

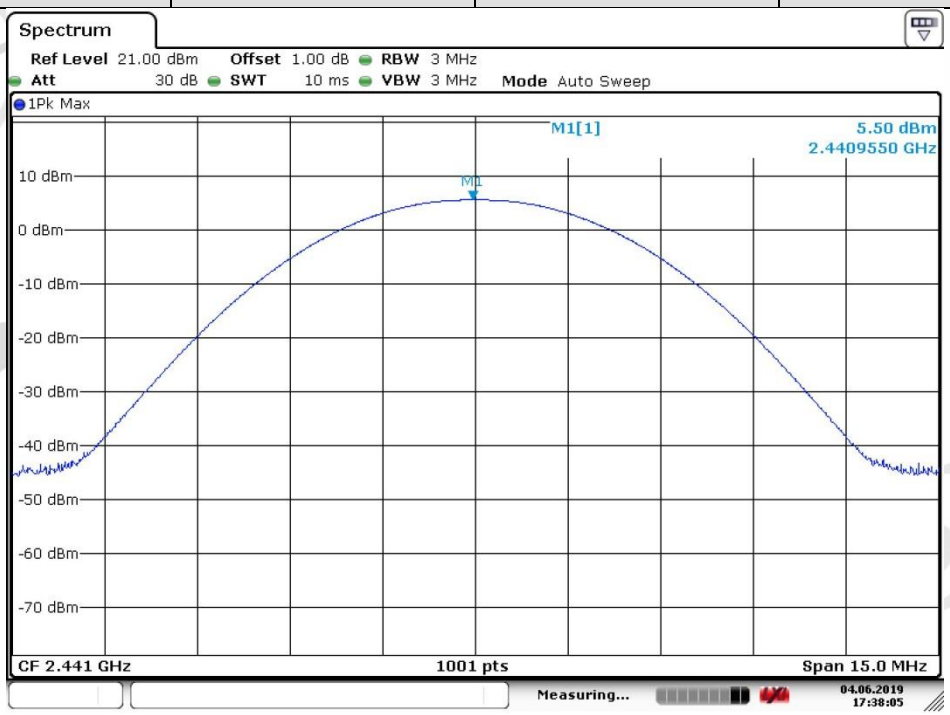
4.2. Test plots

Test mode:	GFSK	Test channel:	Lowest



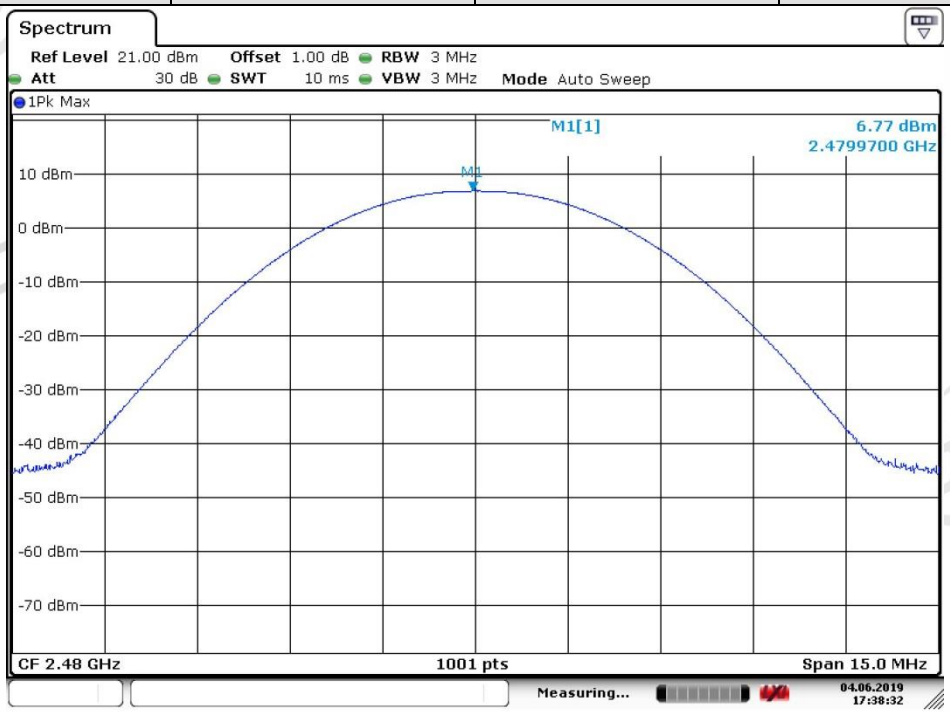
Date: 4.JUN.2019 17:37:31

Test mode:	GFSK	Test channel:	Middle



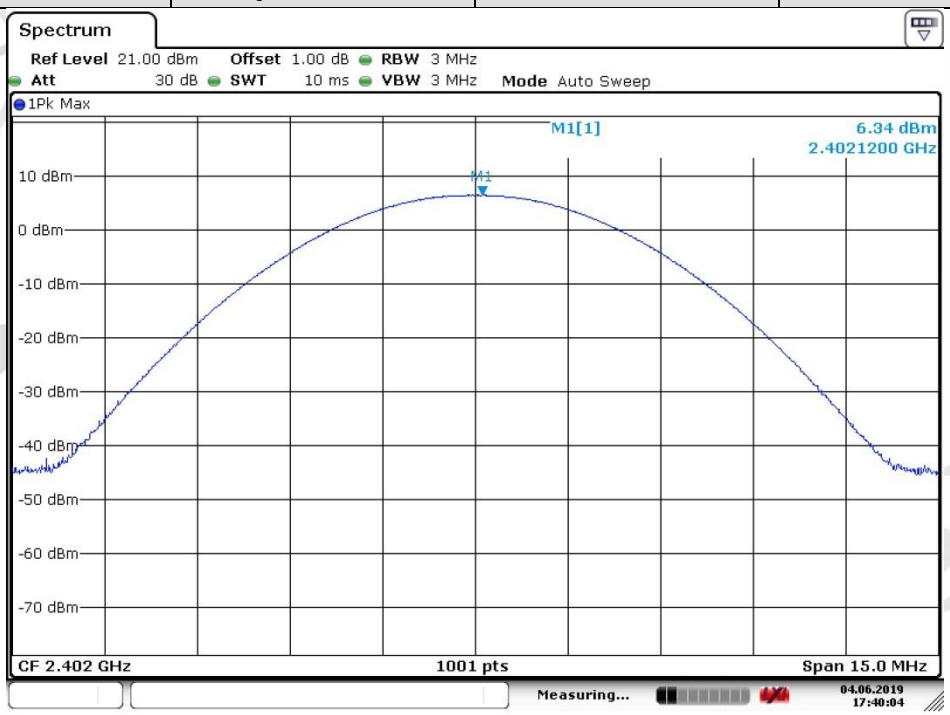
Date: 4.JUN.2019 17:38:05

Test mode:	GFSK	Test channel:	Highest



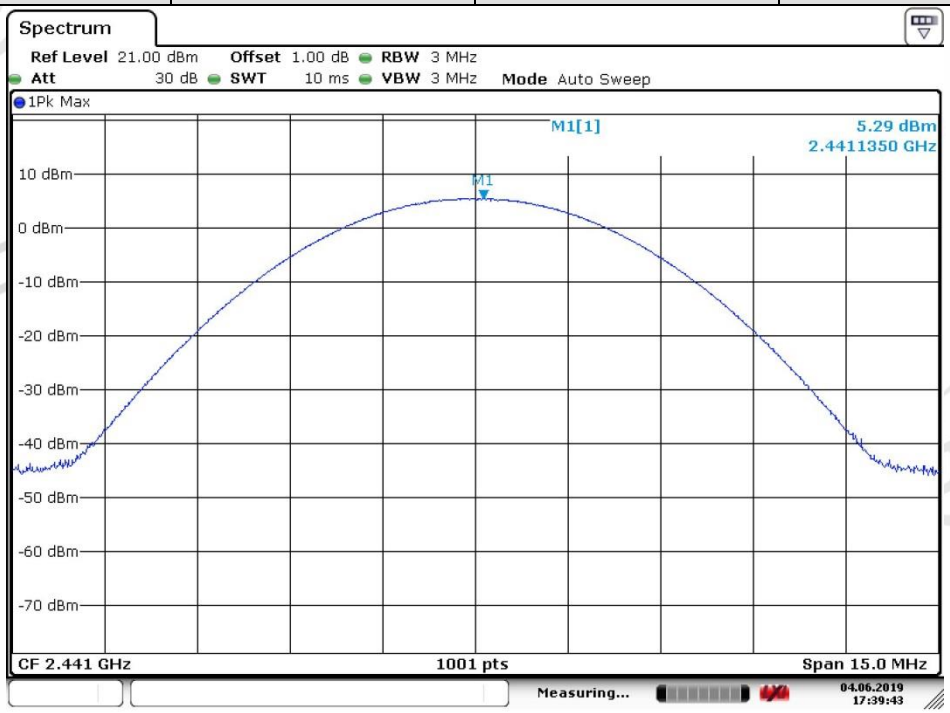
Date: 4.JUN.2019 17:38:32

Test mode:	π/4DQPSK	Test channel:	Lowest

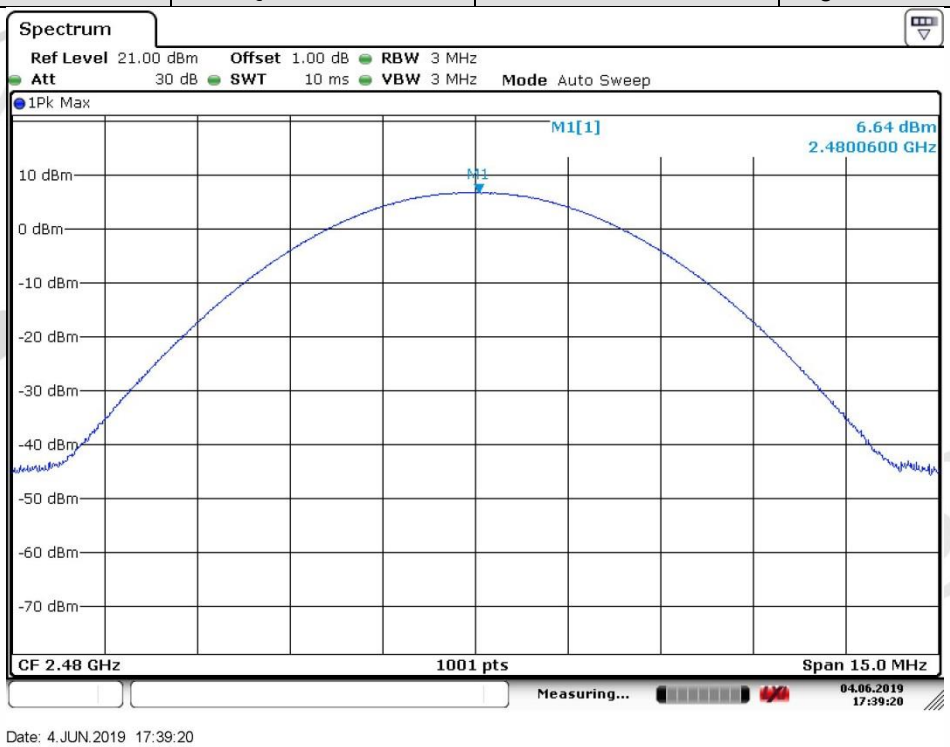


Date: 4.JUN.2019 17:40:04

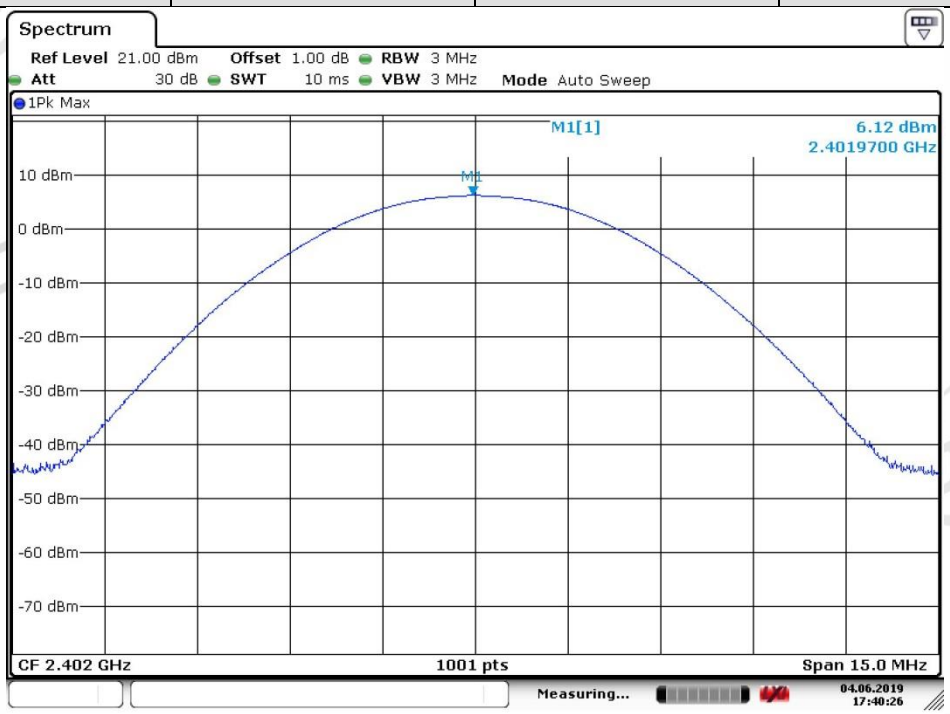
Test mode:	π/4DQPSK	Test channel:	Middle



Test mode:	π/4DQPSK	Test channel:	Highest

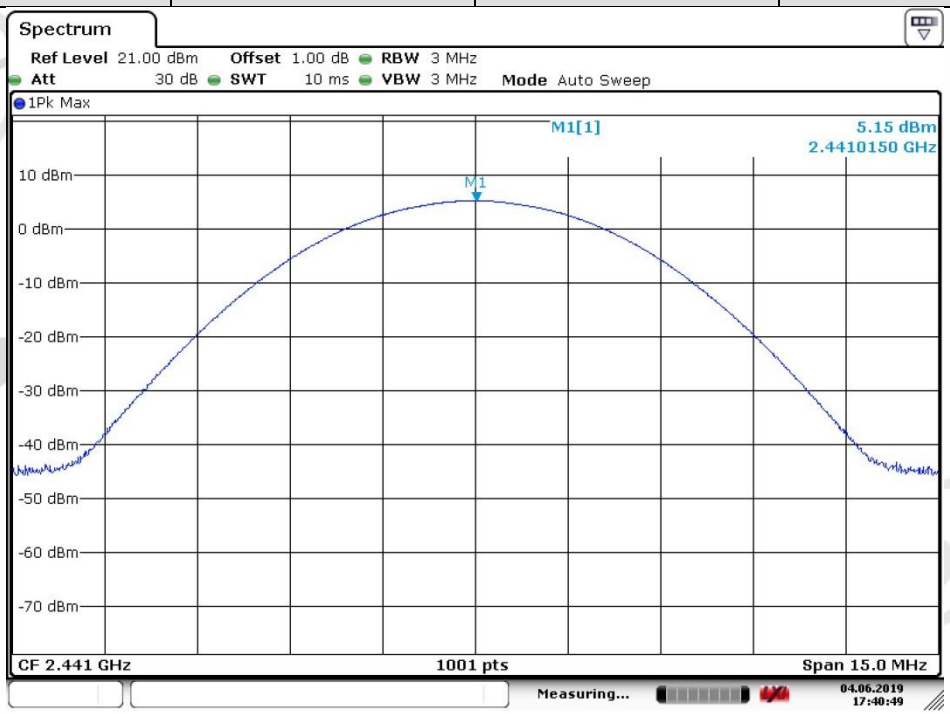


Test mode:	8DPSK	Test channel:	Lowest



Date: 4.JUN.2019 17:40:26

Test mode:	8DPSK	Test channel:	Middle



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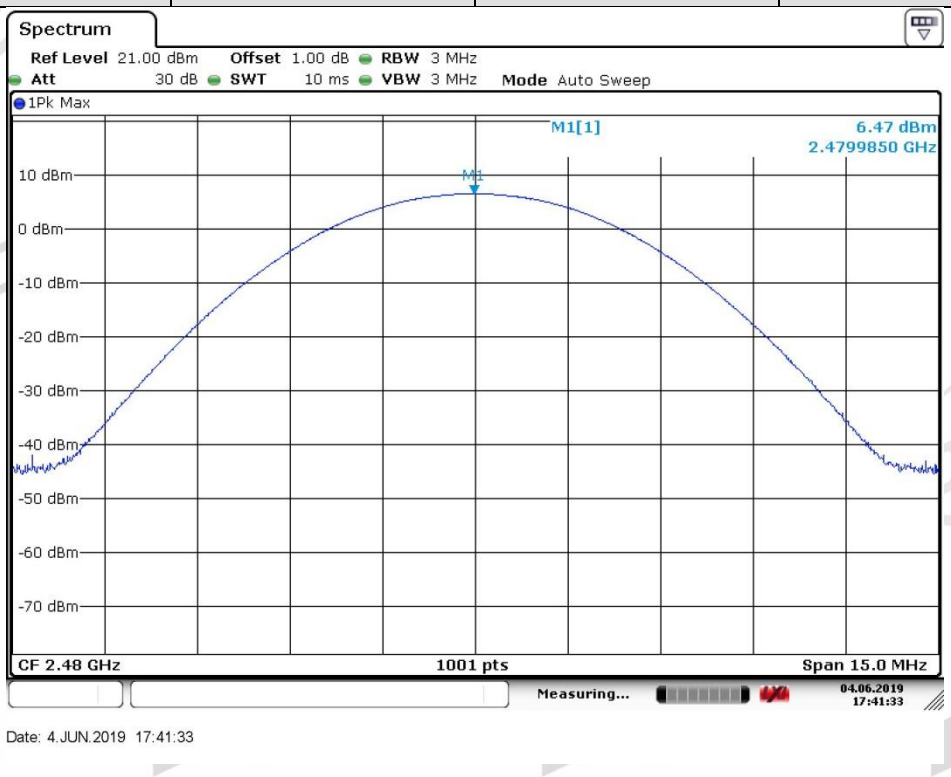
Test mode:	8DPSK	Test channel:	Highest



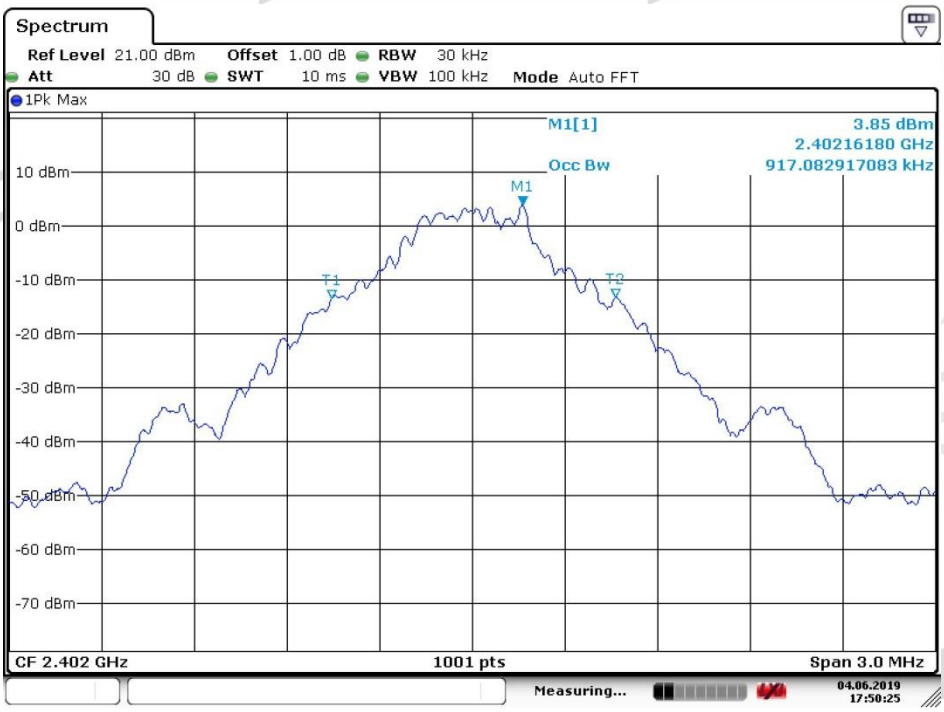
5. 20dB Emission Bandwidth & 99% Occupied Bandwidth

5.1. Test Results

Mode	Test Channel	99% Occupied Bandwidth (KHz)	20dB Emission Bandwidth (KHz)	Result
GFSK	Lowest	917.1	1001.0	Pass
	Middle	905.1	971.0	Pass
	Highest	914.1	998.0	Pass
π/4DQPSK	Lowest	1180.8	1282.7	Pass
	Middle	1162.8	1282.7	Pass
	Highest	1174.8	1282.7	Pass
8DPSK	Lowest	1174.8	1282.7	Pass
	Middle	1165.8	1276.7	Pass
	Highest	1174.8	1282.7	Pass

5.2. Test plots

GFSK _Lowest Channel



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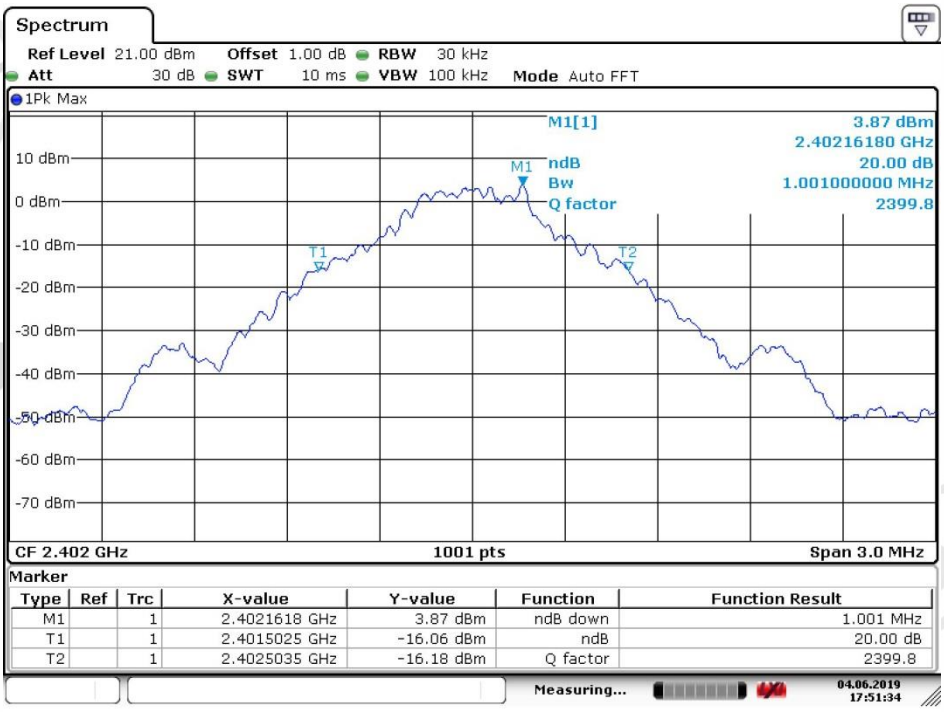
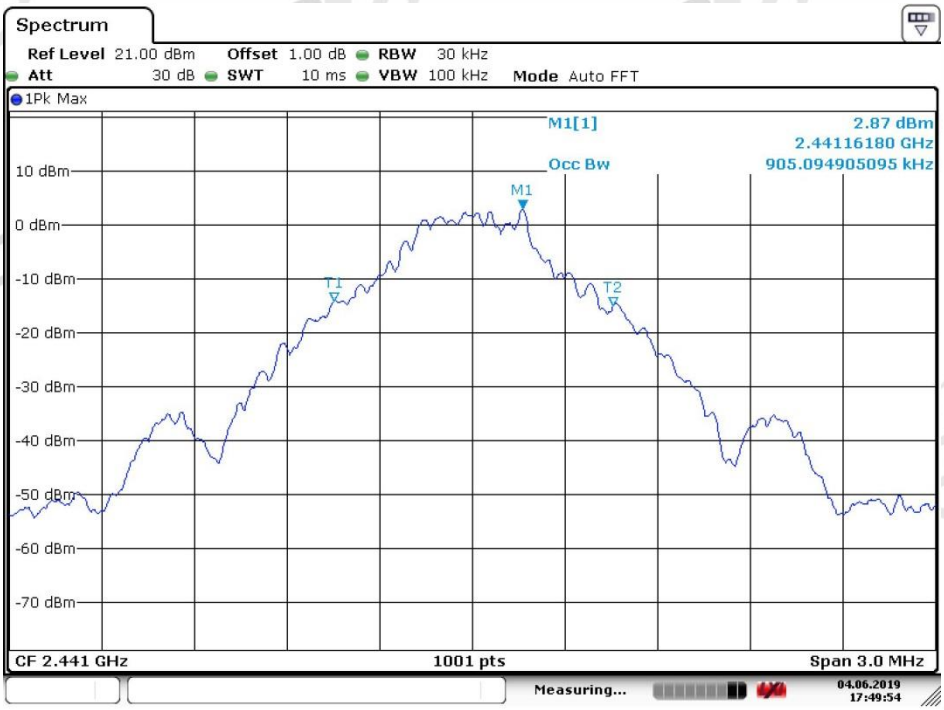


Marker

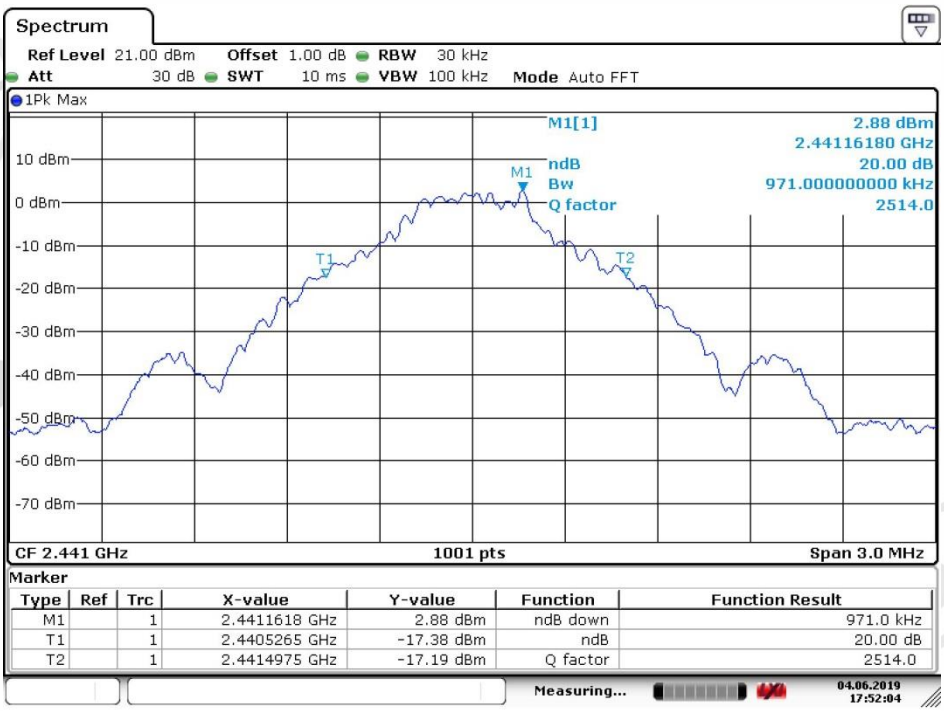
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4021618 GHz	3.87 dBm	ndB down	1.001 MHz
T1		1	2.4015025 GHz	-16.06 dBm	ndB	20.00 dB
T2		1	2.4025035 GHz	-16.18 dBm	Q factor	2399.8

Date: 4.JUN.2019 17:51:34

GFSK _Middle Channel



Date: 4.JUN.2019 17:49:54

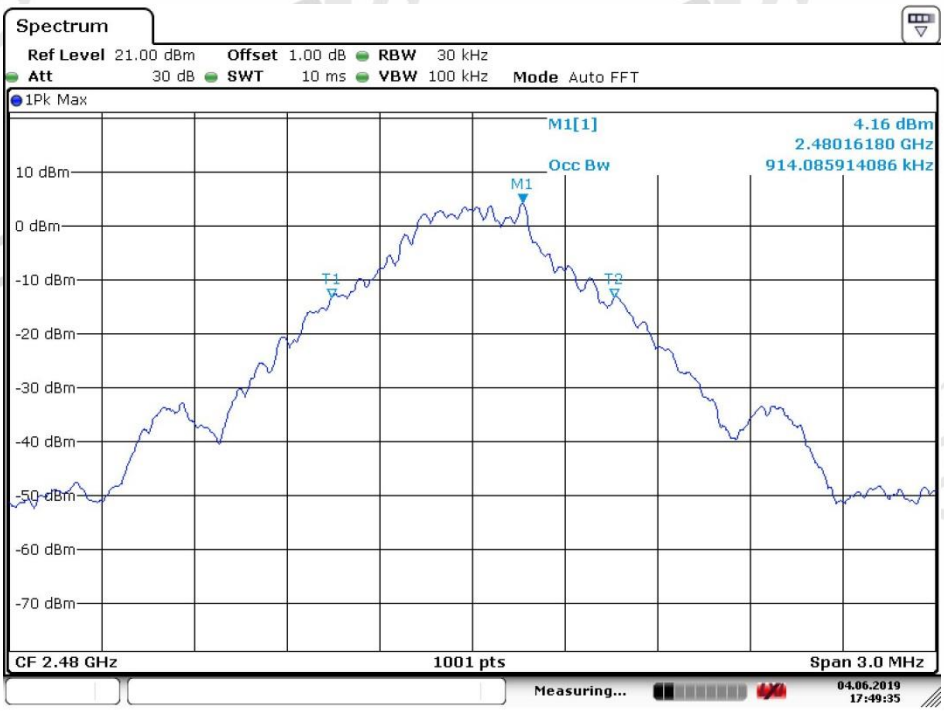


Marker

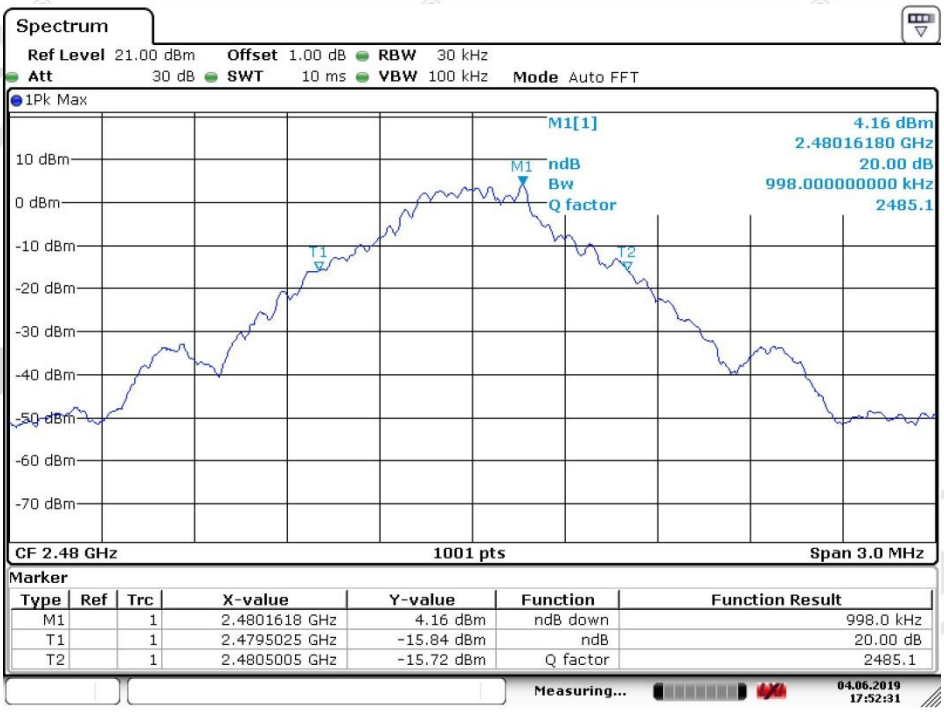
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4411618 GHz	2.88 dBm	ndB down	971.0 kHz
T1		1	2.4405265 GHz	-17.38 dBm	ndB	20.00 dB
T2		1	2.4414975 GHz	-17.19 dBm	Q factor	2514.0

Date: 4.JUN.2019 17:52:04

GFSK _Highest Channel



Date: 4.JUN.2019 17:49:35

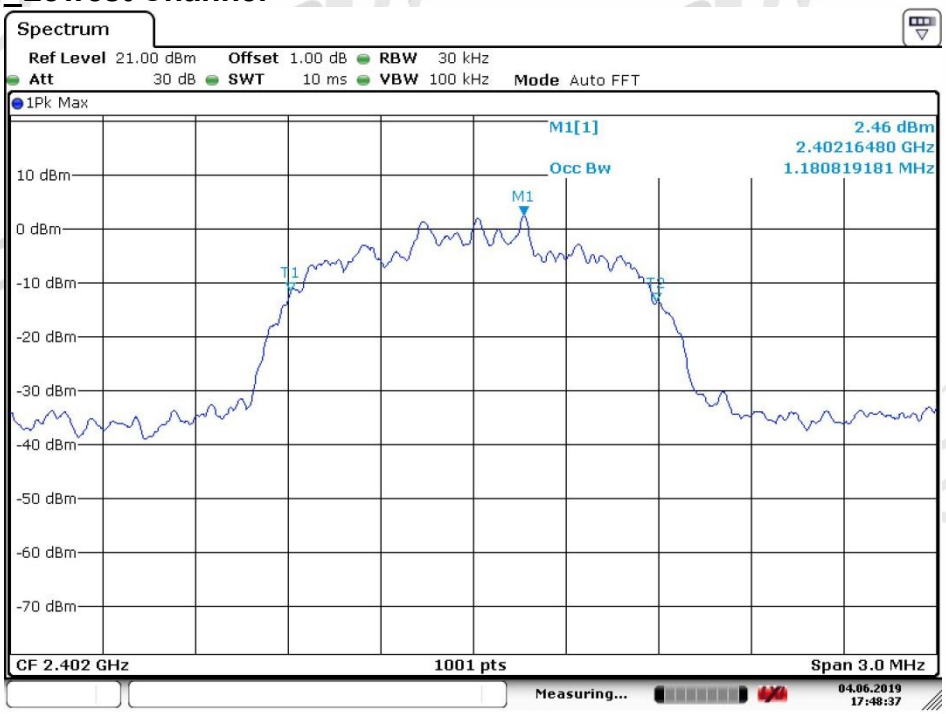


Marker

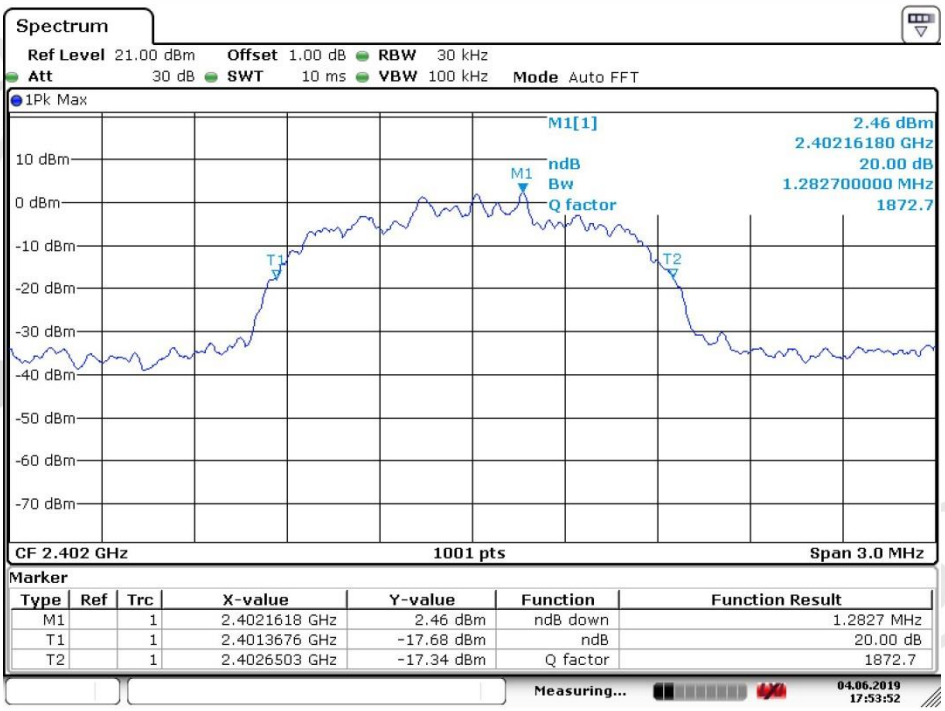
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4801618 GHz	4.16 dBm	ndB down	998.0 kHz
T1		1	2.4795025 GHz	-15.84 dBm	ndB	20.00 dB
T2		1	2.4805005 GHz	-15.72 dBm	Q factor	2485.1

Date: 4.JUN.2019 17:52:31

π/4DQPSK _Lowest Channel

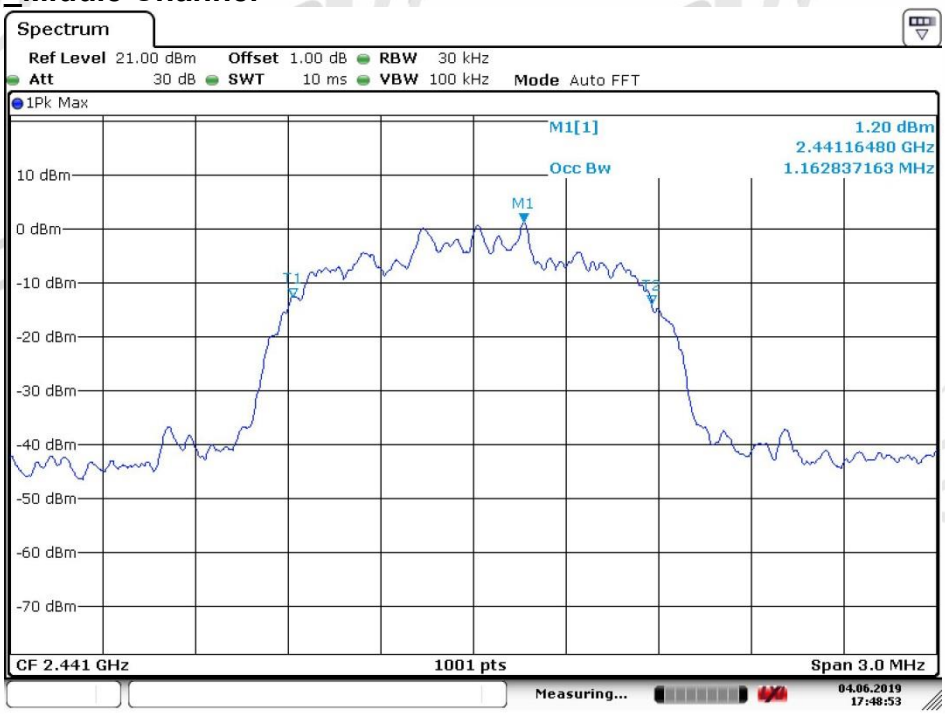


Date: 4.JUN.2019 17:48:37



Date: 4.JUN.2019 17:53:53

π/4DQPSK _Middle Channel



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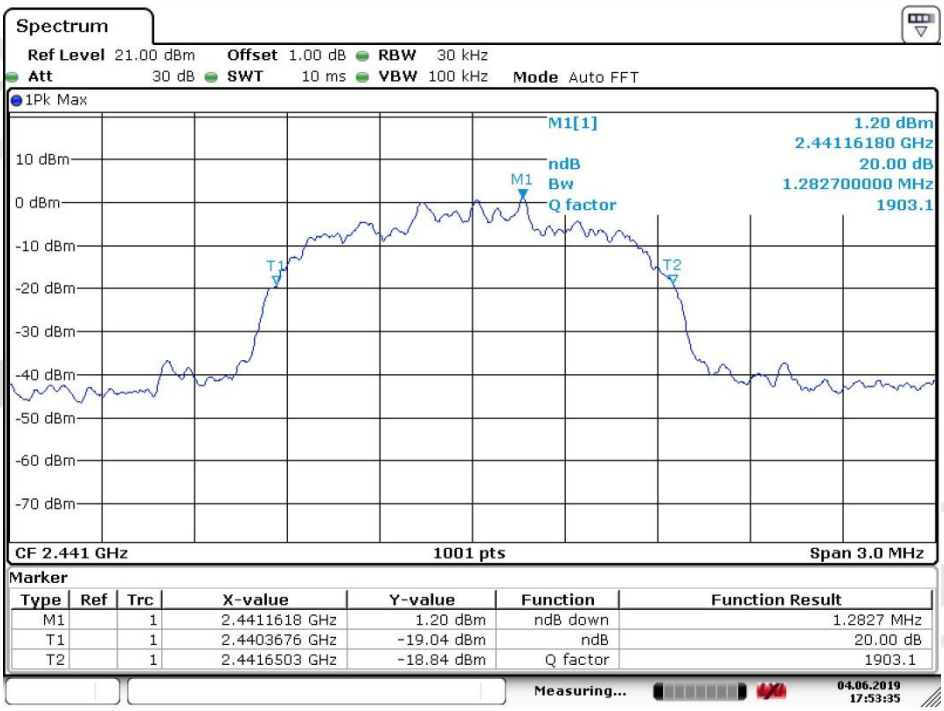

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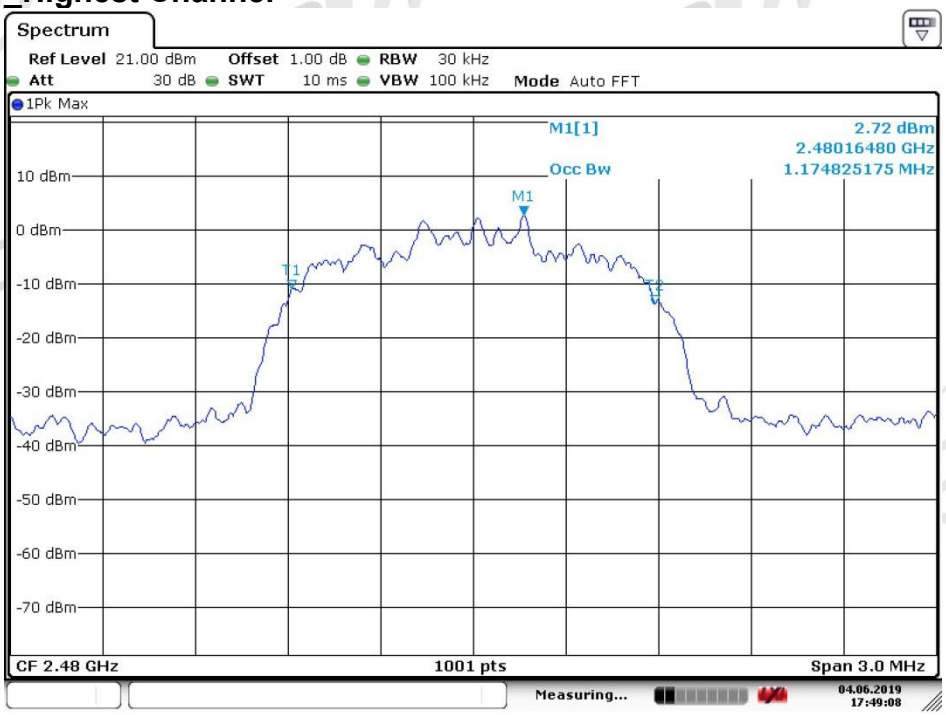
π/4DQPSK _Highest Channel



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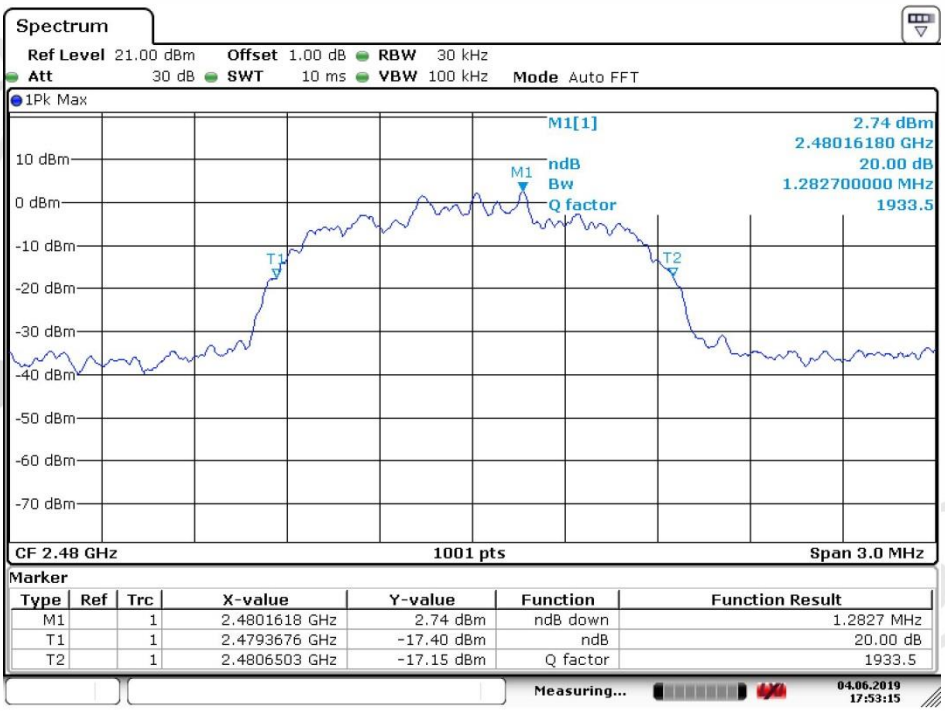
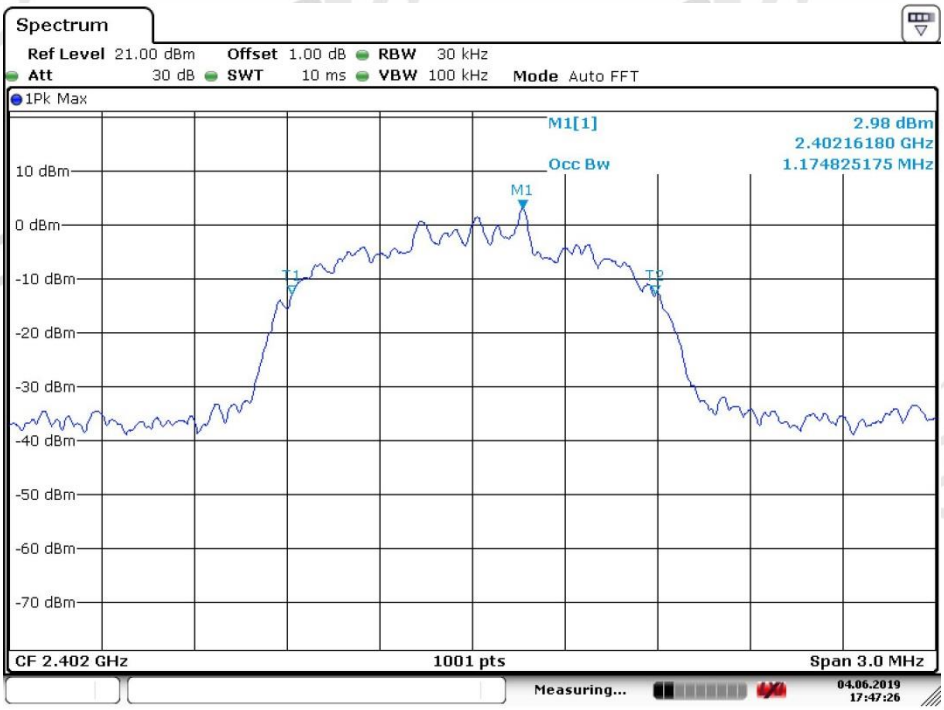


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4801618 GHz	2.74 dBm	ndB down	1.2827 MHz
T1		1	2.4793676 GHz	-17.40 dBm	ndB	20.00 dB
T2		1	2.4806503 GHz	-17.15 dBm	Q factor	1933.5

Date: 4.JUN.2019 17:53:16

8DPSK_Lowest Channel



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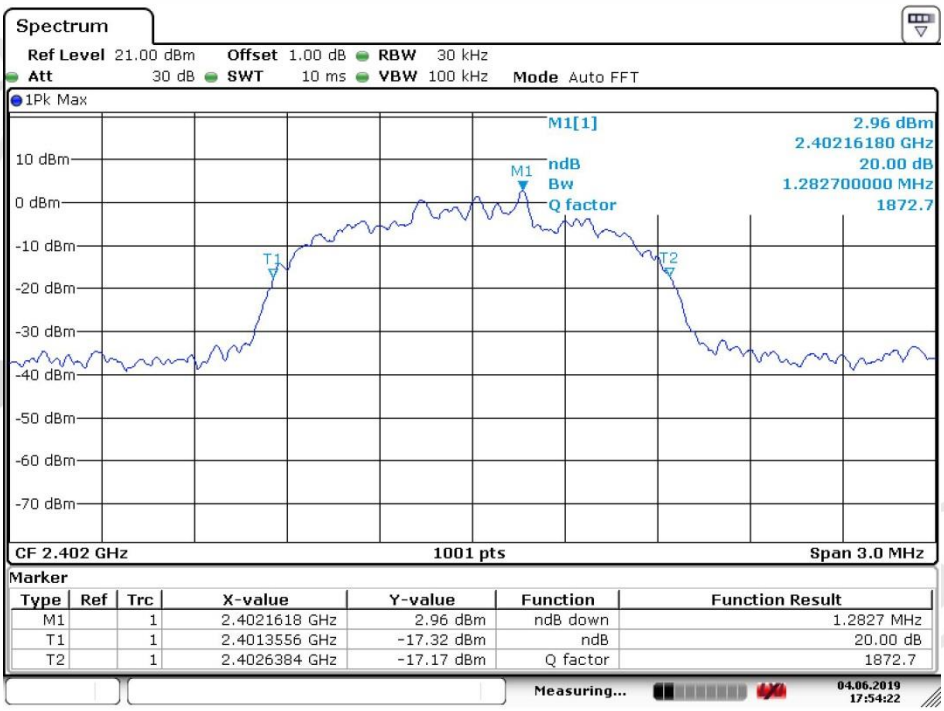
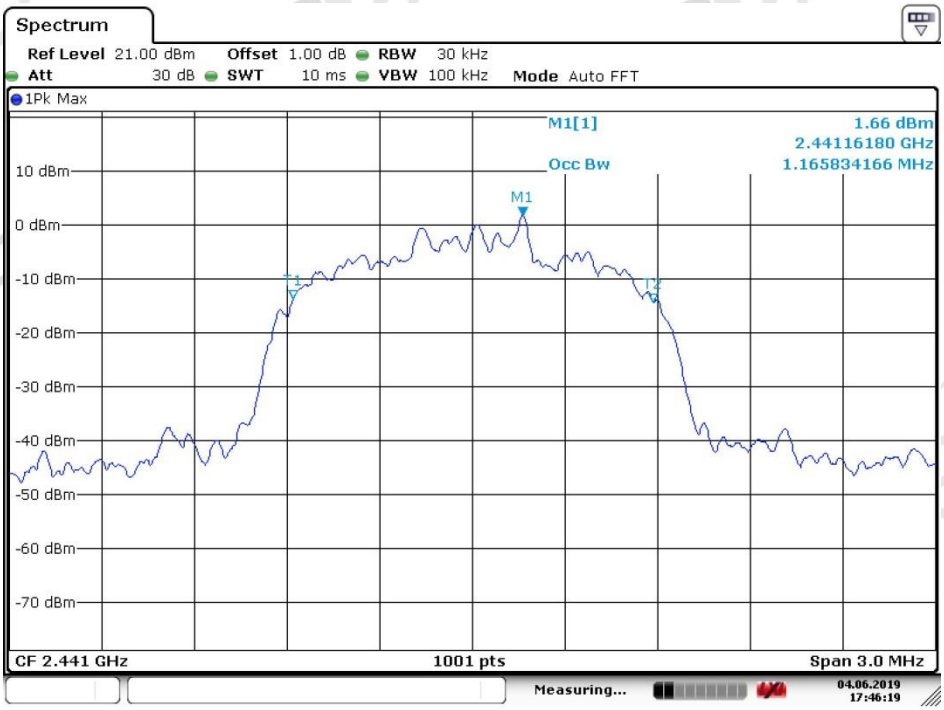


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4021618 GHz	2.96 dBm	ndB down	1.2827 MHz
T1		1	2.4013556 GHz	-17.32 dBm	ndB	20.00 dB
T2		1	2.4026384 GHz	-17.17 dBm	Q factor	1872.7

Date: 4.JUN.2019 17:54:22

8DPSK _Middle Channel



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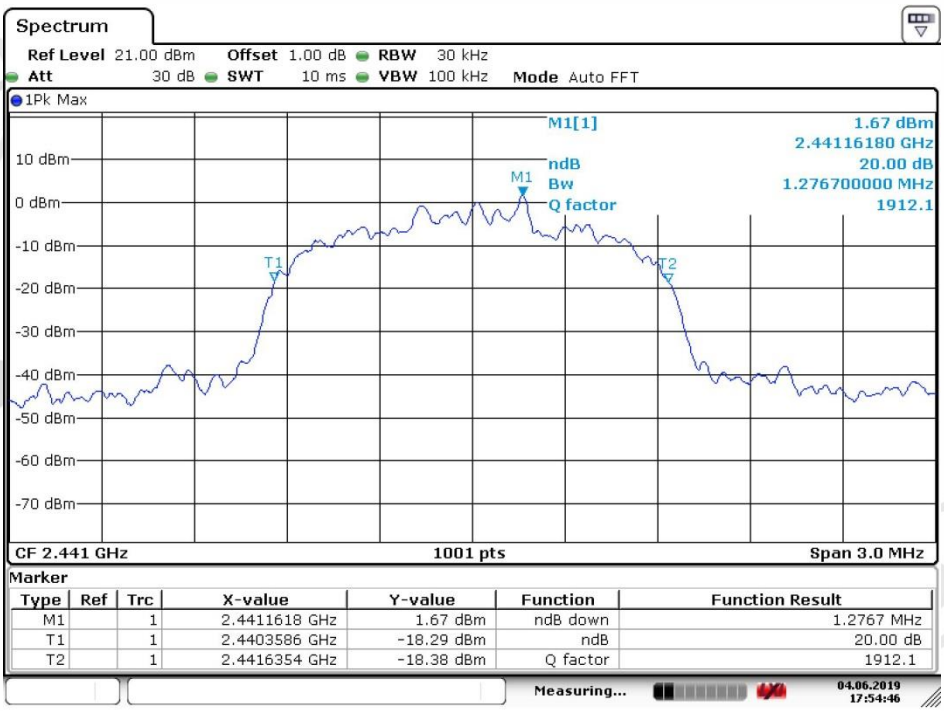
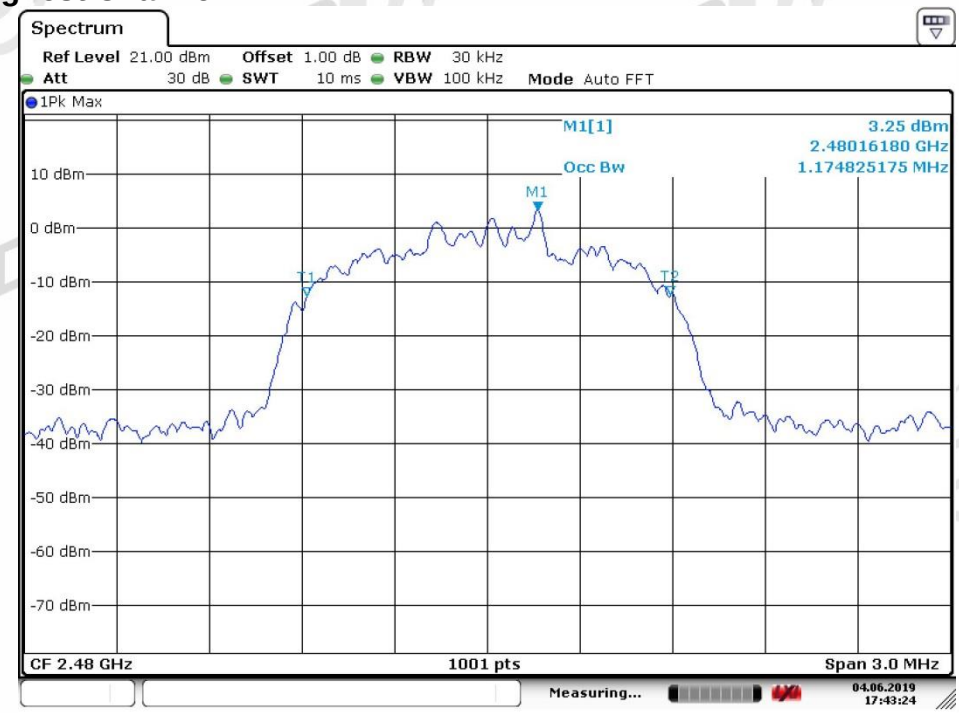


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4411618 GHz	1.67 dBm	ndB down	1.2767 MHz
T1		1	2.4403586 GHz	-18.29 dBm	ndB	20.00 dB
T2		1	2.4416354 GHz	-18.38 dBm	Q factor	1912.1

Date: 4.JUN.2019 17:54:46

8DPSK_Highest Channel



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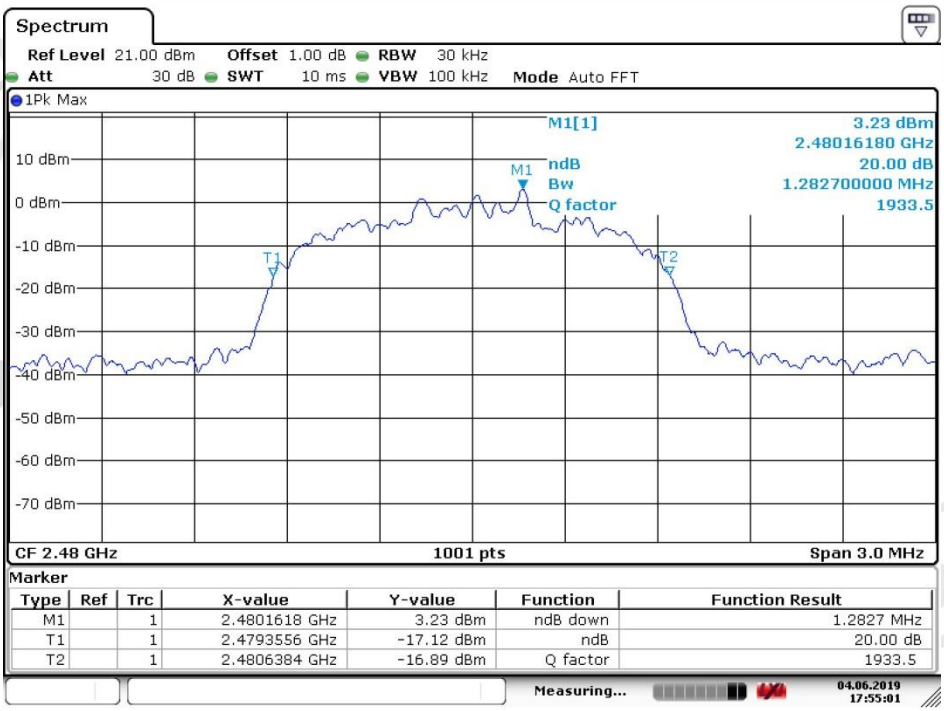

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