

4.7 Time of Occupancy (Dwell Time)

Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. Set center frequency of spectrum analyzer=operating frequency with 1MHz RBW and VBW $\geq$ RBW, Span 0Hz.

Test Configuration



Test Results

Modulation	Packet	Burst time (ms)	Dwell time (s)	Limit (s)	Result
GFSK	DH1	0.43	0.137	0.40	Pass
	DH3	1.62	0.259		
	DH5	2.81	0.300		
$\pi/4$ DQPSK	2-DH1	0.49	0.157	0.40	Pass
	2-DH3	1.68	0.269		
	2-DH5	2.87	0.306		
8DPSK	3-DH1	0.42	0.134	0.40	Pass
	3-DH3	1.66	0.266		
	3-DH5	2.75	0.293		

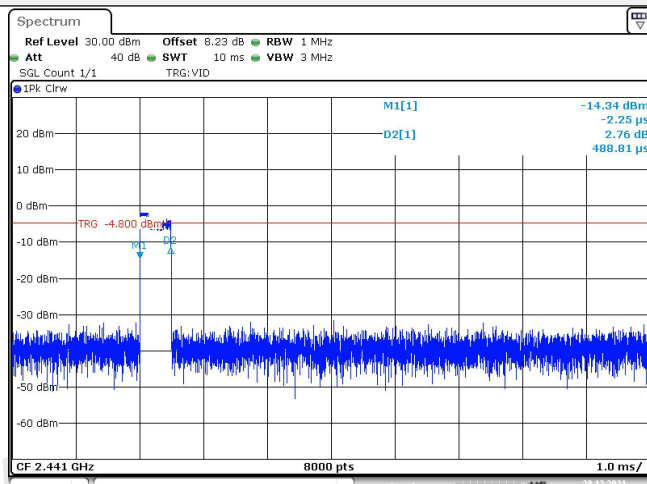
Note: We have tested all mode at high, middle and low channel, and recorded worst case at middle channel.

Dwell time = Pulse time (ms) $\times$ (1600 $\div$ 2 $\div$ 79) $\times$ 31.6 Second for DH1, 2-DH1, 3-DH1

Dwell time = Pulse time (ms) $\times$ (1600 $\div$ 4 $\div$ 79) $\times$ 31.6 Second for DH3, 2-DH3, 3-DH3

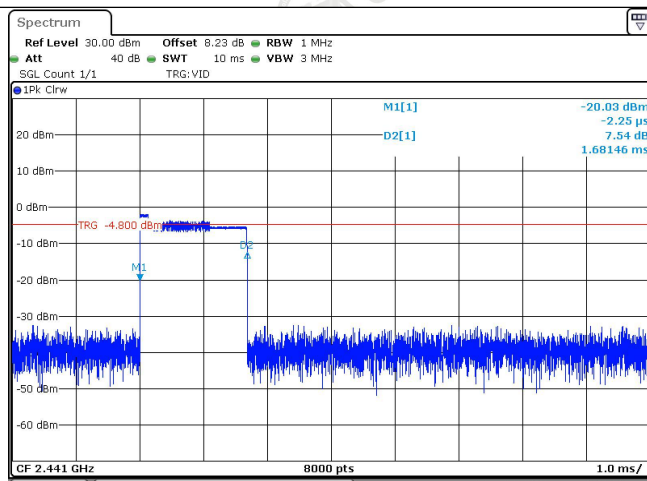
Dwell time = Pulse time (ms) $\times$ (1600 $\div$ 6 $\div$ 79) $\times$ 31.6 Second for DH5, 2-DH5, 3-DH5

Test plot as follows:

$\pi/4$ DQPSK Modulation

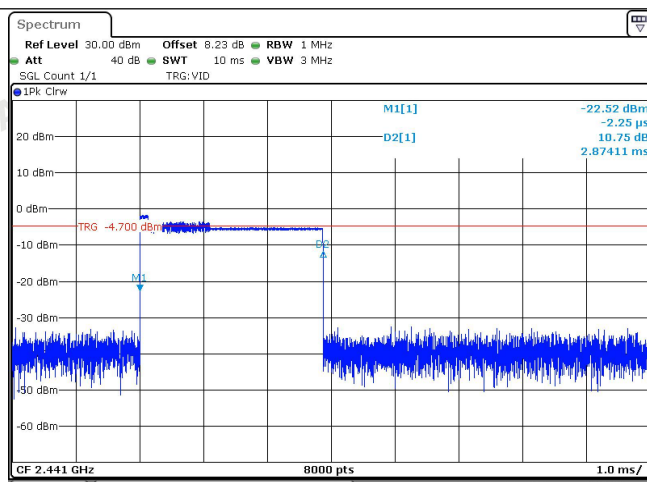
Date: 28, DEC, 2021 13:18:15

2-DH1 burst time



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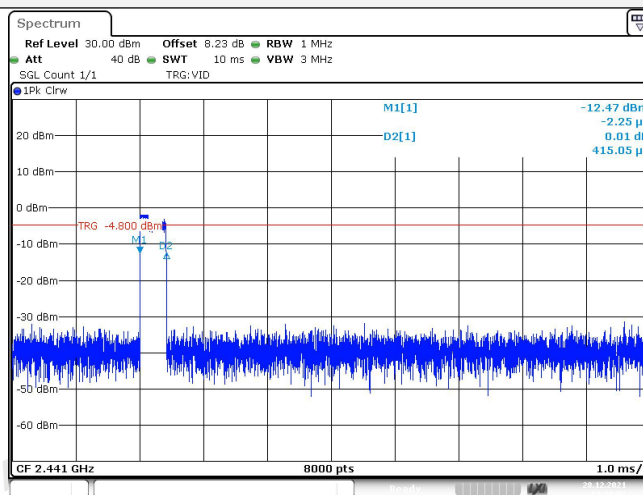
2-DH3 burst time



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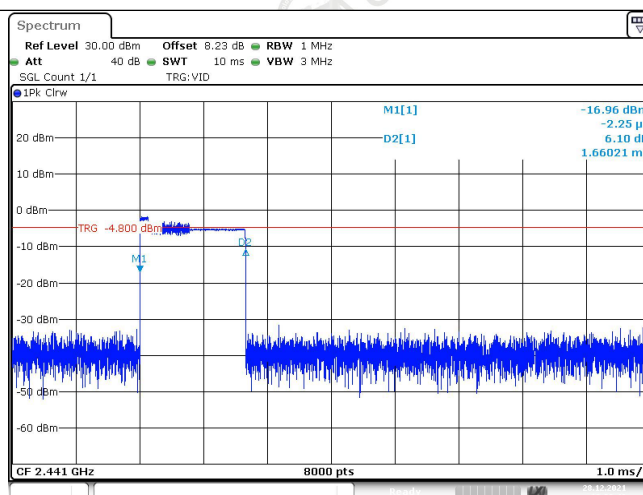
2-DH5 burst time

8DPSK Modulation



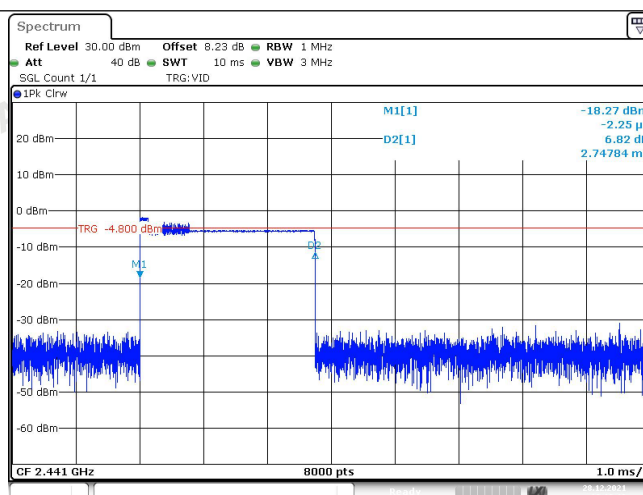
Date: 26, DEC, 2021 13:20:02

3-DH1 burst time



Date: 26, DEC, 2021 13:20:48

3-DH3 burst time



Date: 26, DEC, 2021 13:10:18

3-DH5 burst time

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4.8 Out-of-band Emissions

Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

Test Procedure

Connect the transmitter output to spectrum analyzer using a low loss RF cable, and set the spectrum analyzer to RBW=100 kHz, VBW= 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, band edge and out-of-band emissions.

Test Configuration

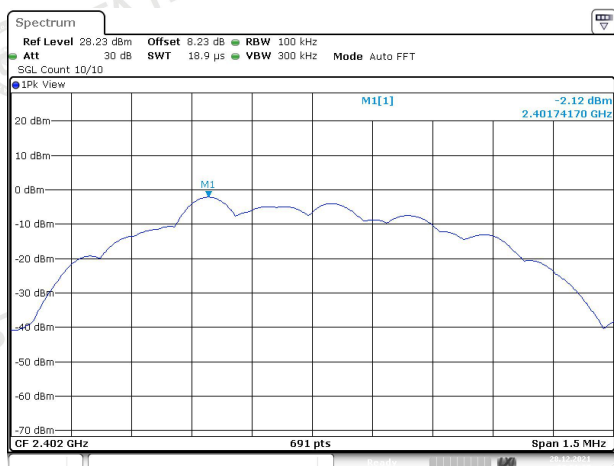


Test Results

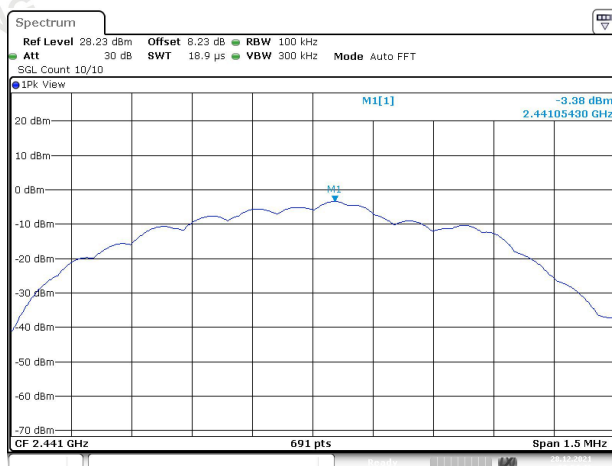
Remark: The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and band edge measurement data.

We measured all conditions (DH1, DH3, DH5) and recorded worst case at DH5

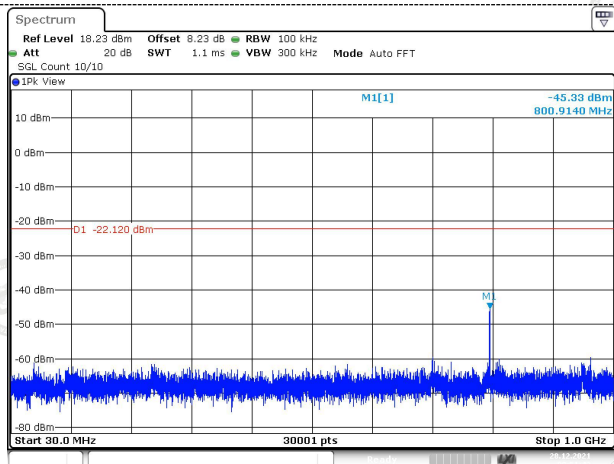
Test plot as follows:

GFSK(CH00)

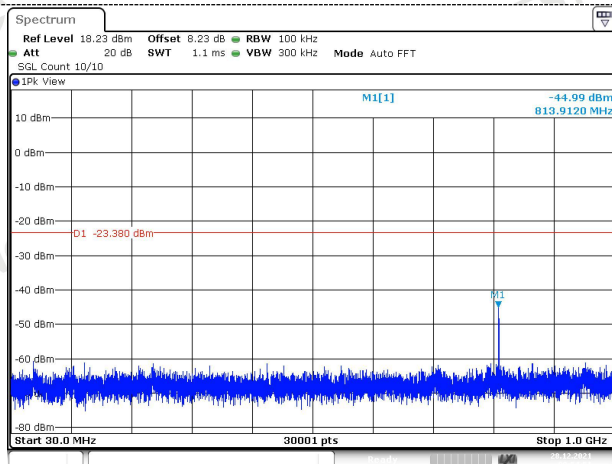
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GFSK(CH39)

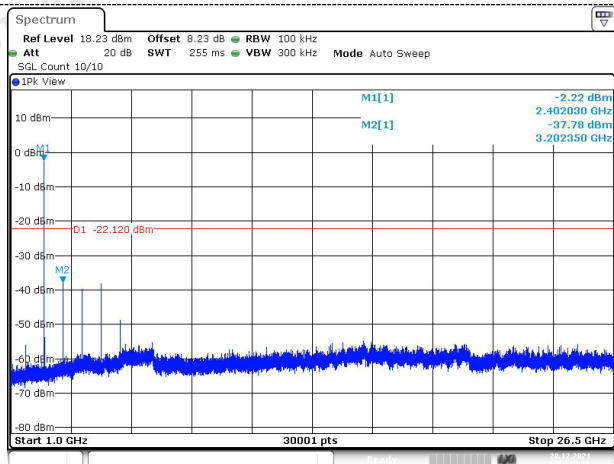
Date: 28.DEC.2021 09:54:46

reference

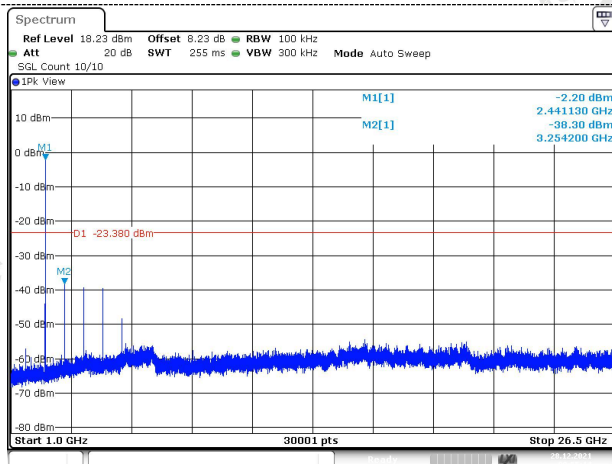
Date: 28.DEC.2021 09:51:42

reference

Date: 28.DEC.2021 09:54:51

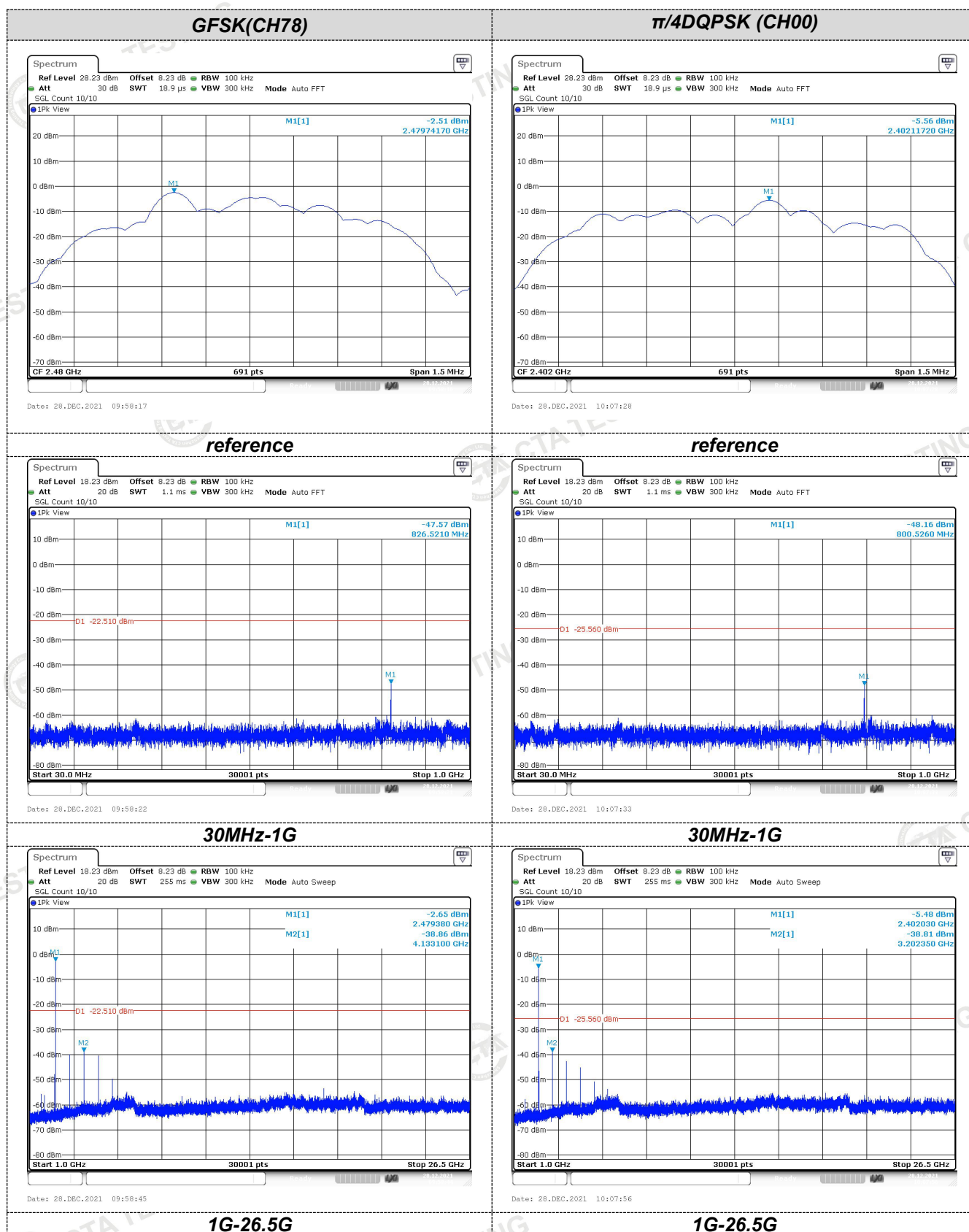
30MHz-1G

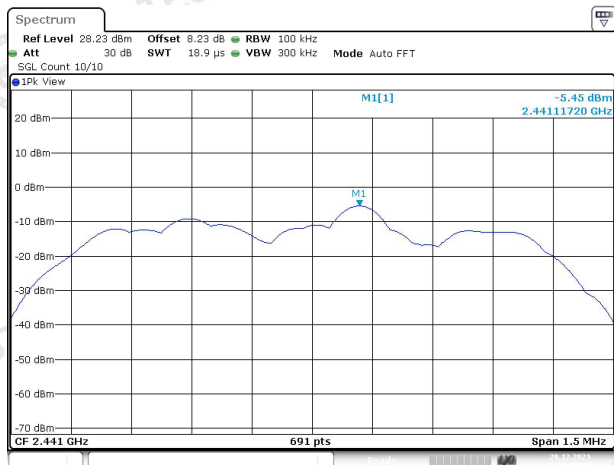
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30MHz-1G

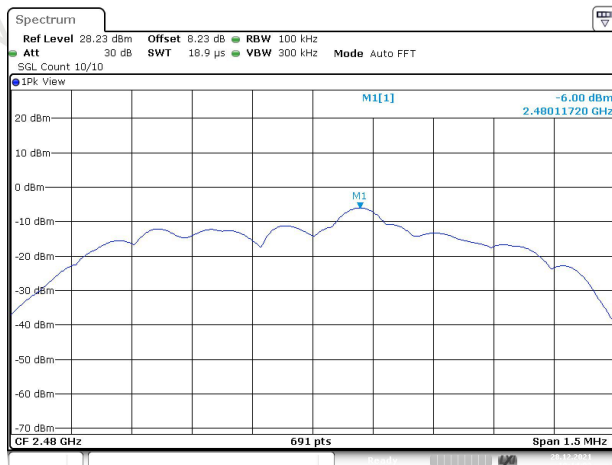
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1G-26.5G**1G-26.5G**



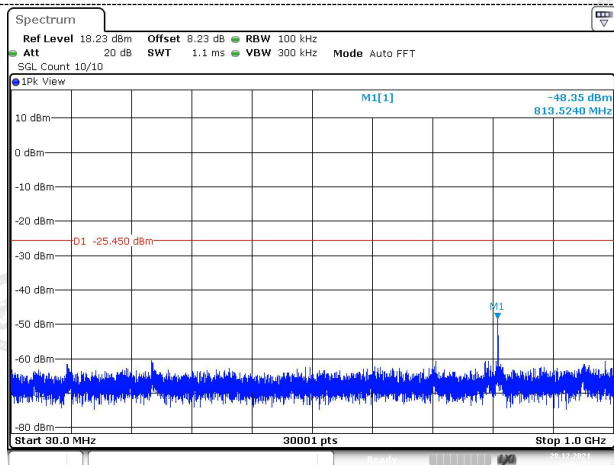
$\pi/4$ DQPSK (CH39)

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 $\pi/4$ DQPSK (CH78)

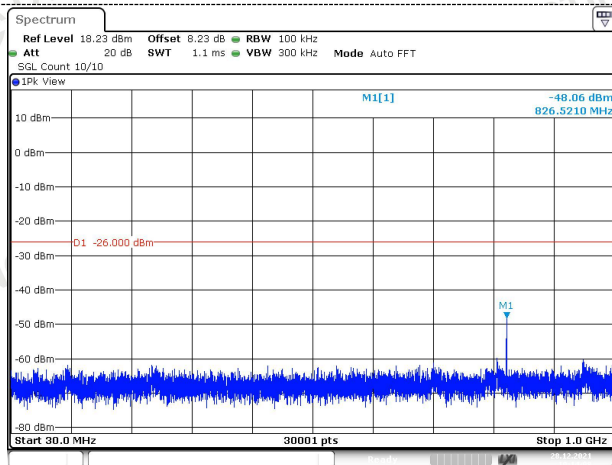
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reference



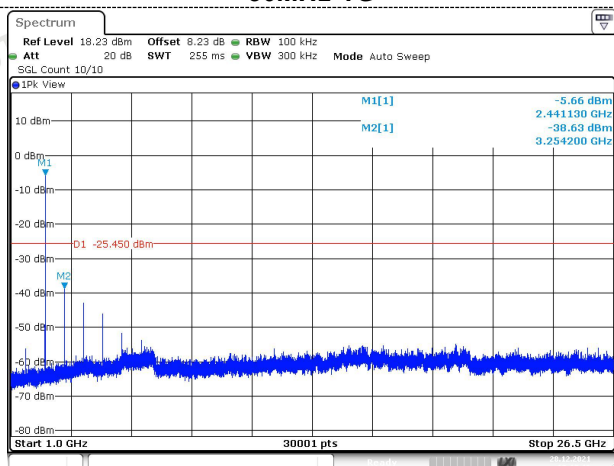
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reference



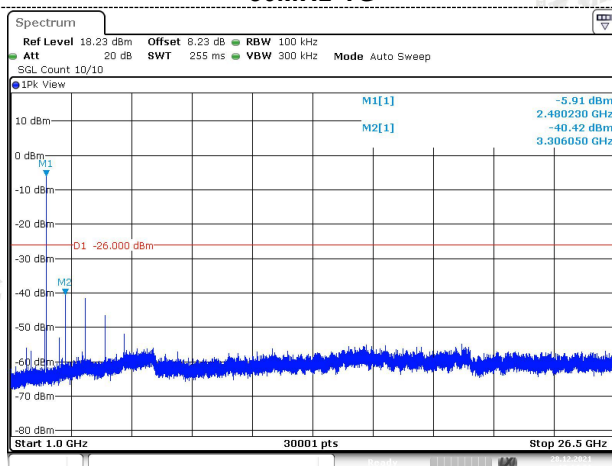
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30MHz-1G



Date: 28.DEC.2021 10:10:15

30MHz-1G



Date: 28.DEC.2021 10:14:31

1G-26.5G

1G-26.5G