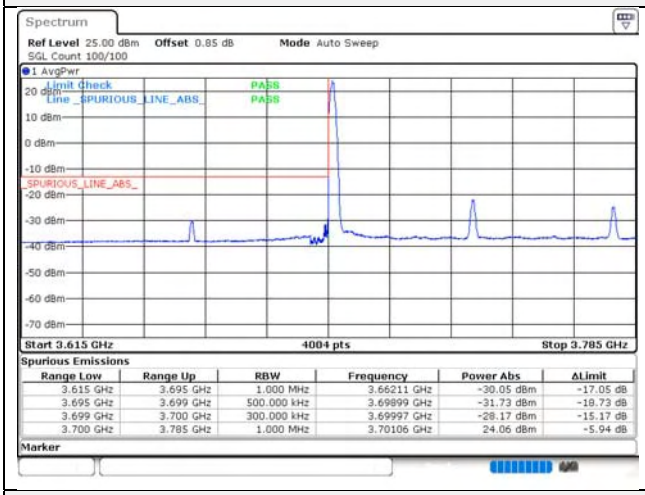
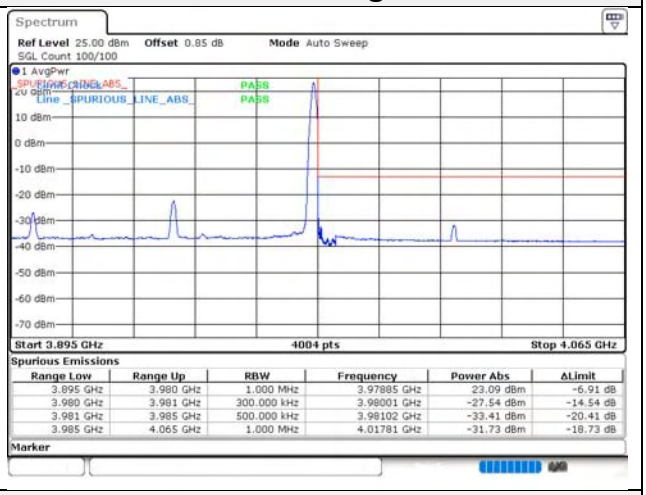
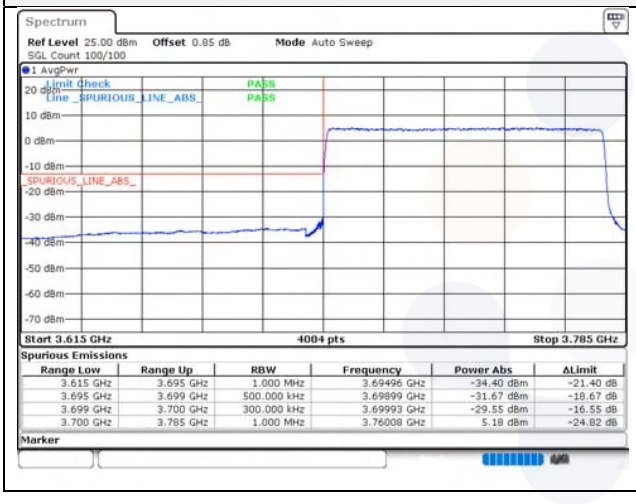
80M BW QPSK Low ch. 1RB



80M BW QPSK High ch. 1RB

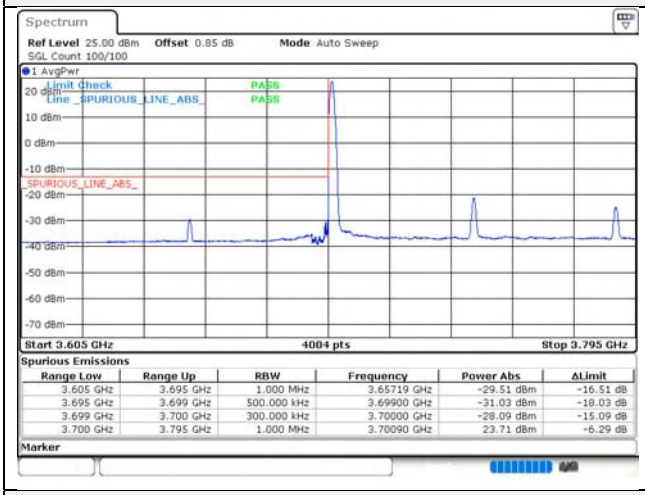


80M BW QPSK Low ch. FRB

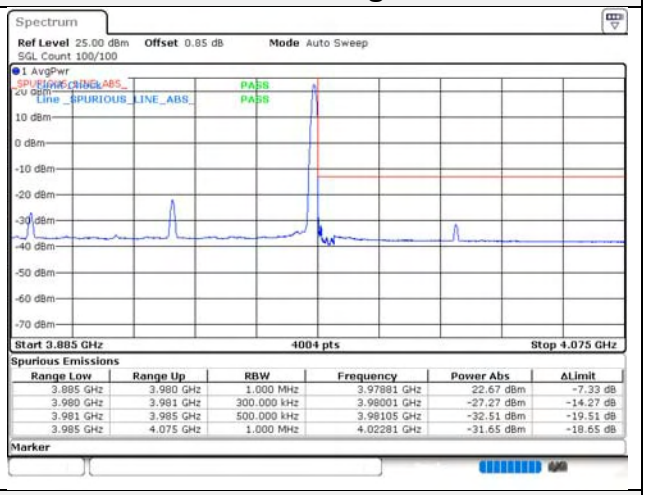


80M BW QPSK High ch. FRB

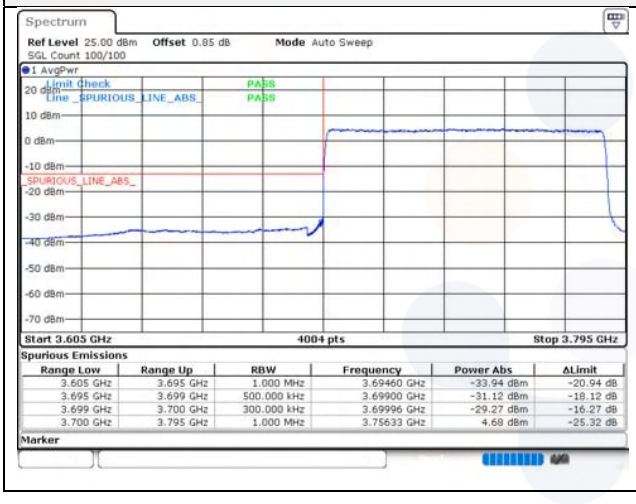
90M BW QPSK Low ch. 1RB



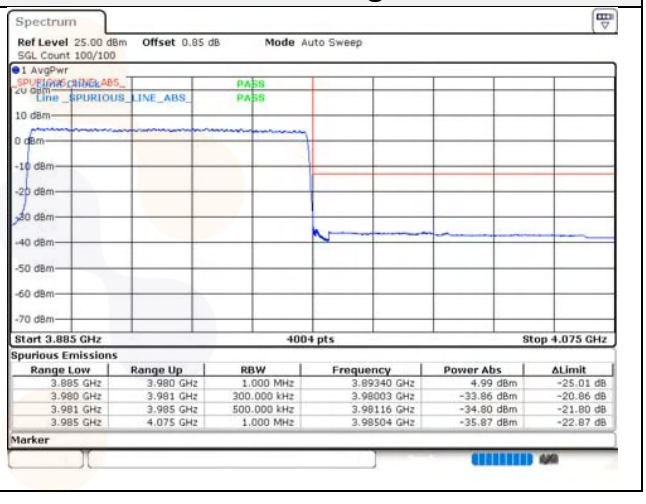
90M BW QPSK High ch. 1RB



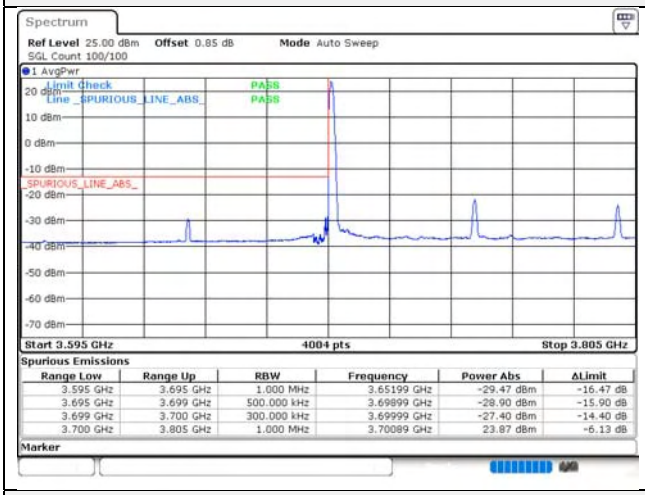
90M BW QPSK Low ch. FRB



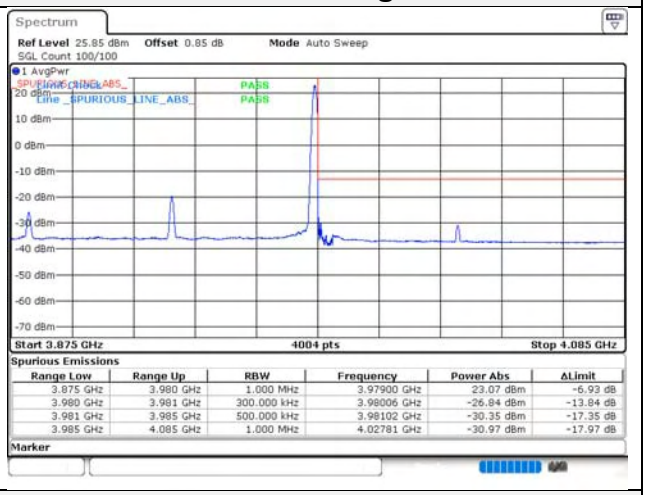
90M BW QPSK High ch. FRB



100M BW QPSK Low ch. 1RB



100M BW QPSK High ch. 1RB



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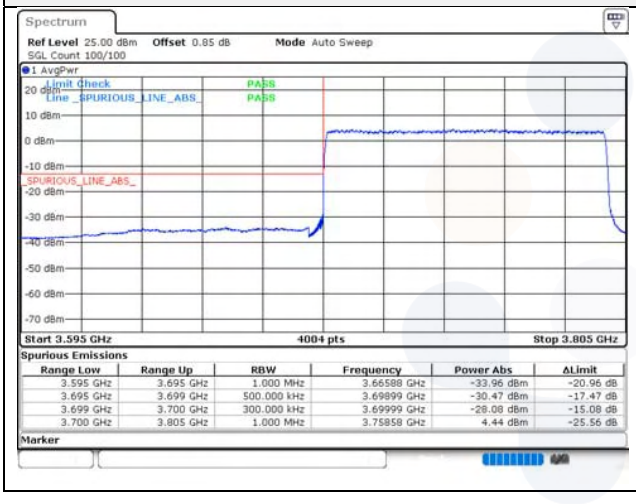
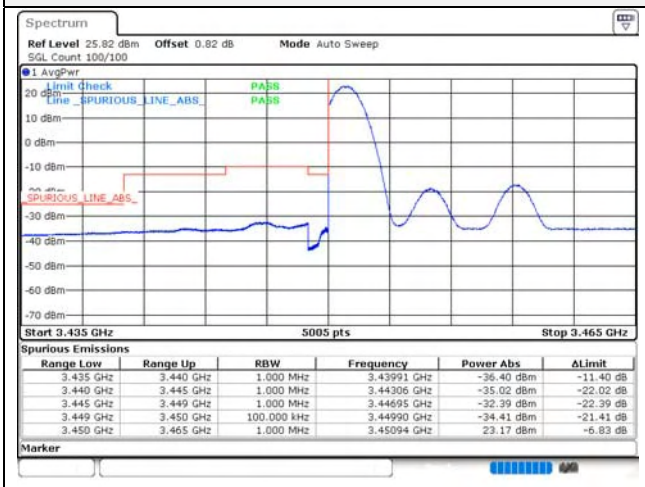


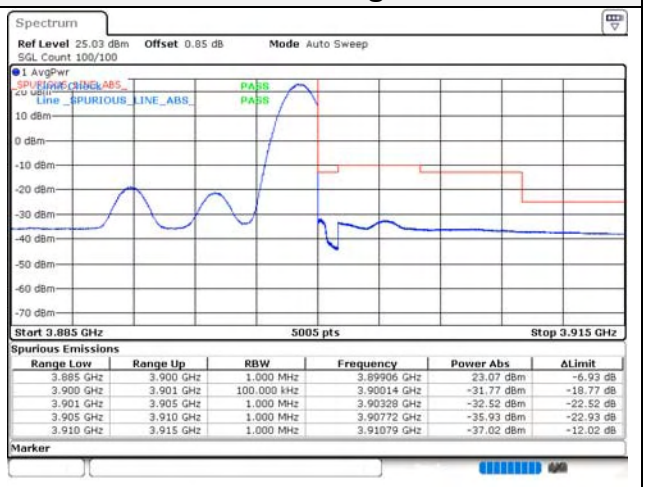
100M BW QPSK High ch. FRB

Test mode: NR n77 (PC3 – IC)

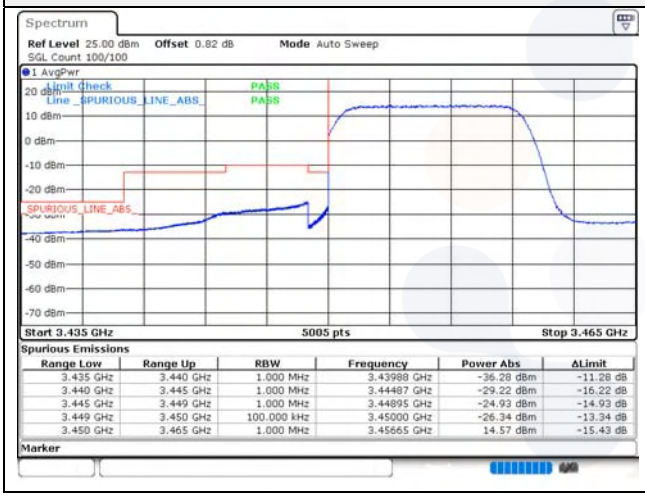
10M BW QPSK Low ch. 1RB



10M BW QPSK High ch. 1RB



10M BW QPSK Low ch. FRB



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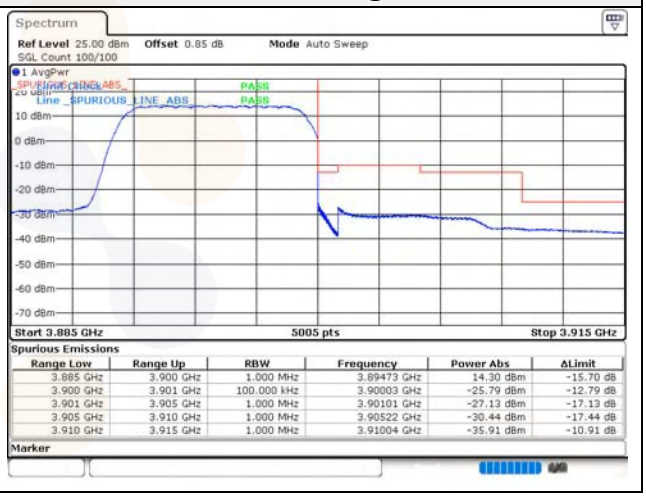
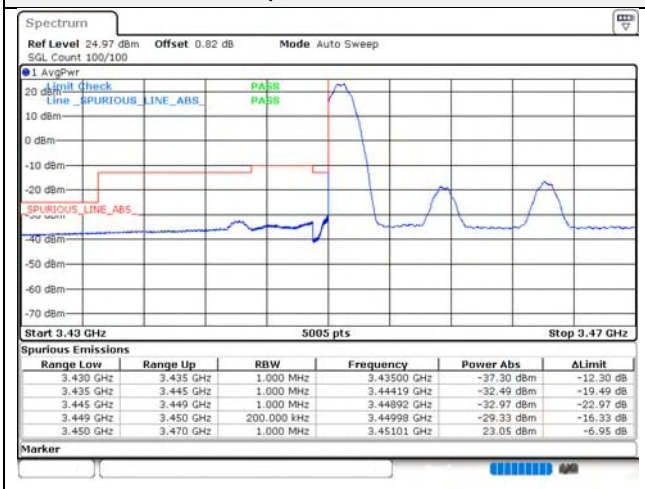
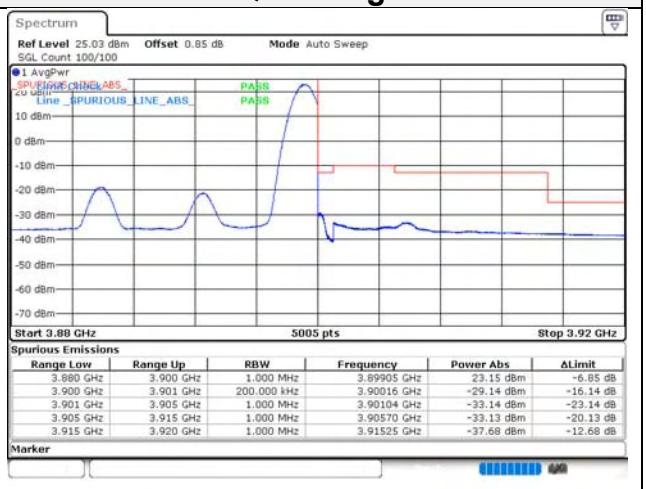


15M BW QPSK Low ch. 1RB



15M BW QPSK High ch. 1RB



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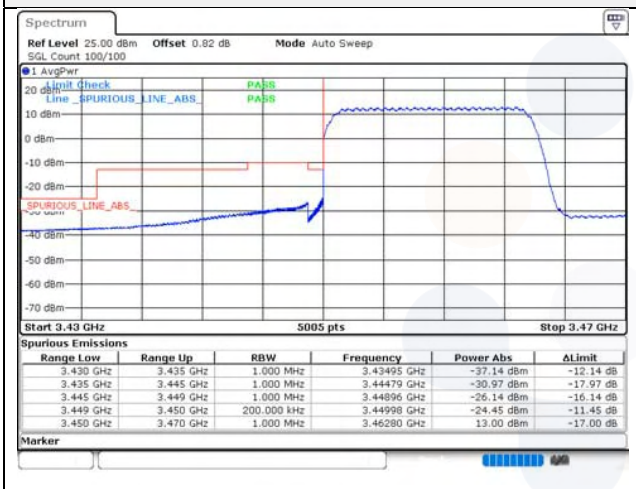
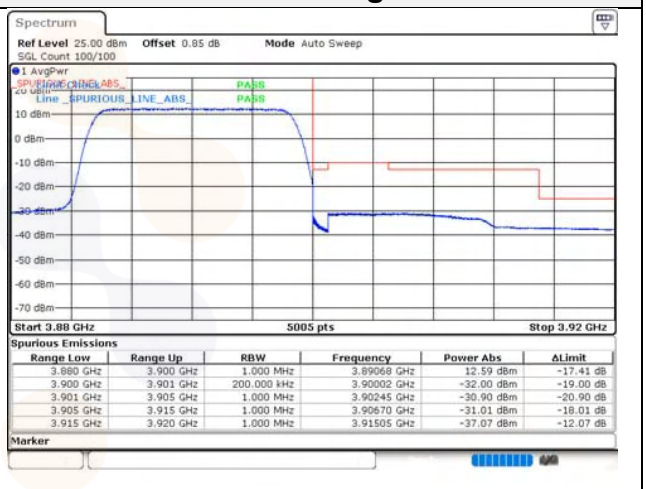


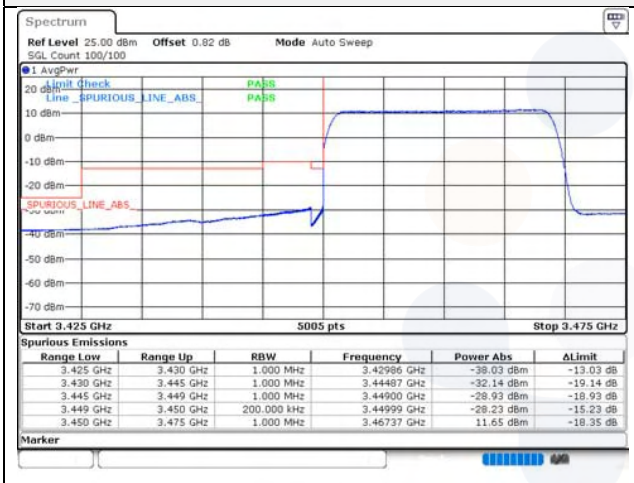
15M BW QPSK High ch. FRB



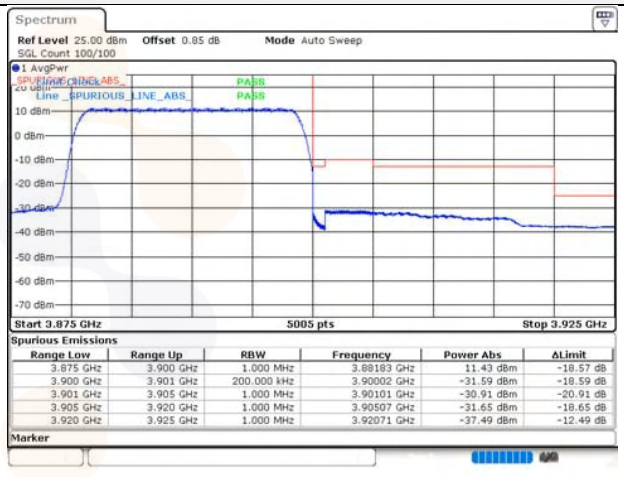
20M BW QPSK Low ch. 1RB

20M BW QPSK High ch. 1RB

20M BW QPSK Low ch. FRB

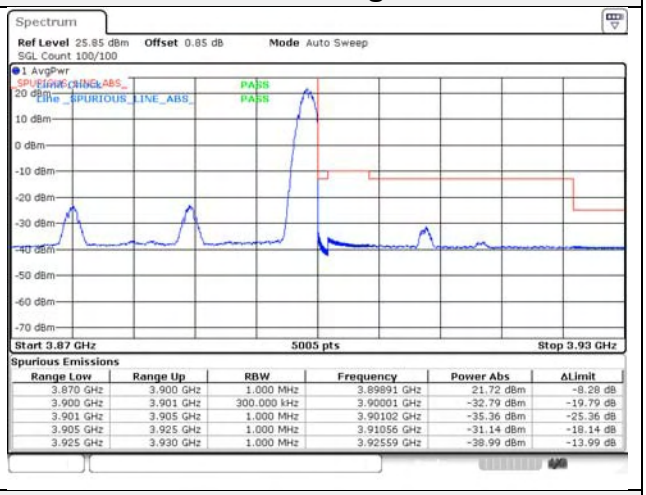


20M BW QPSK High ch. FRB

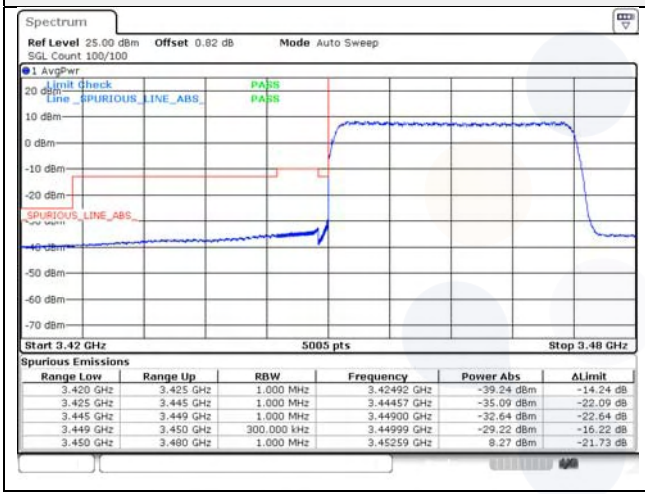


25M BW QPSK Low ch. 1RB

25M BW QPSK High ch. 1RB

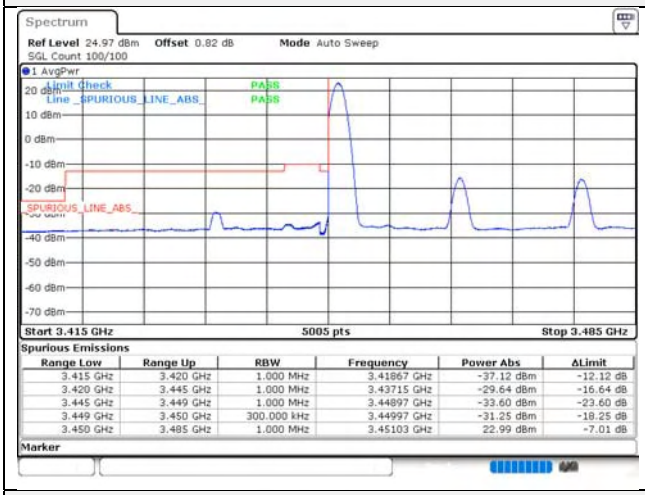


25M BW QPSK Low ch. FRB



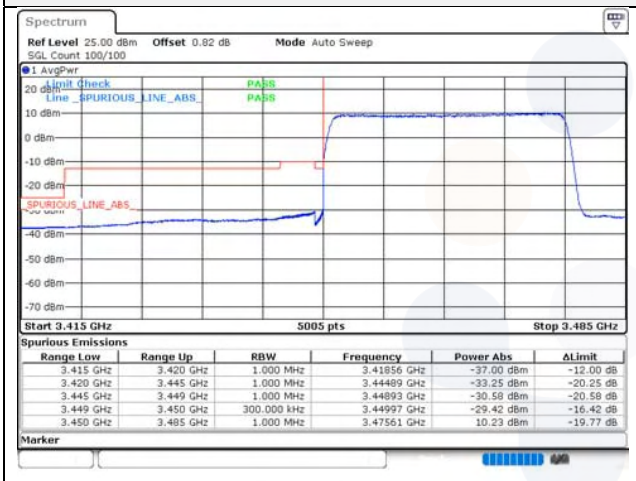
25M BW QPSK High ch. FRB

30M BW QPSK Low ch. 1RB



30M BW QPSK High ch. 1RB

30M BW QPSK Low ch. FRB

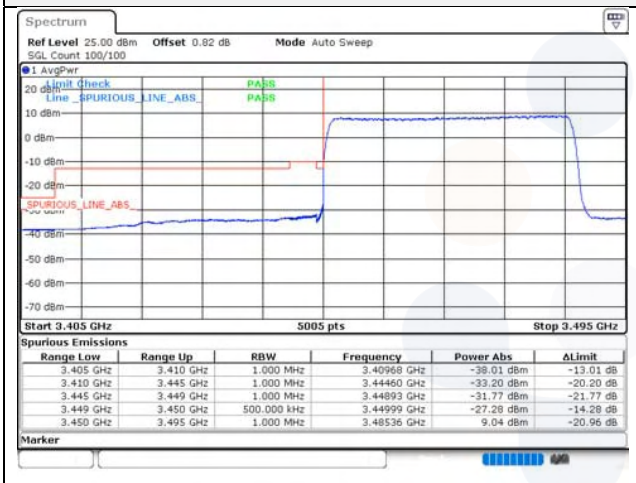


30M BW QPSK High ch. FRB

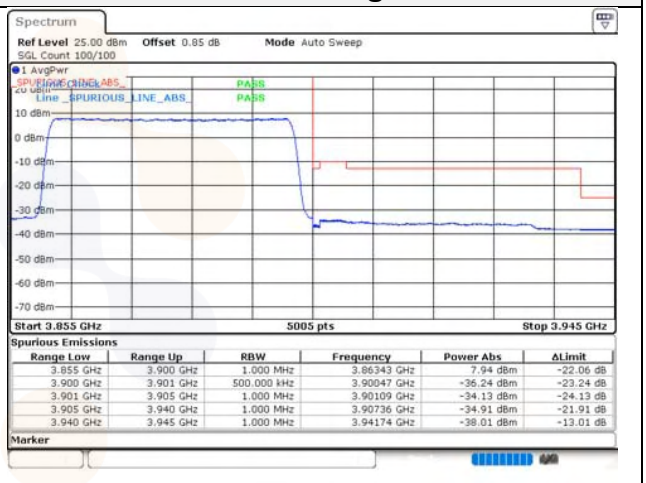
40M BW QPSK Low ch. 1RB

40M BW QPSK High ch. 1RB

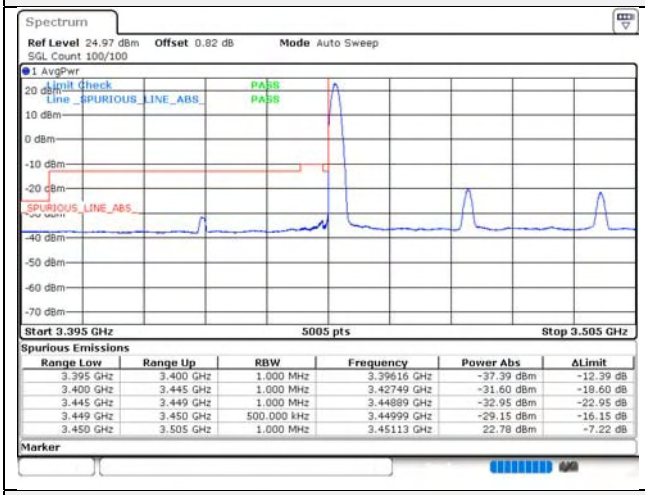
40M BW QPSK Low ch. FRB



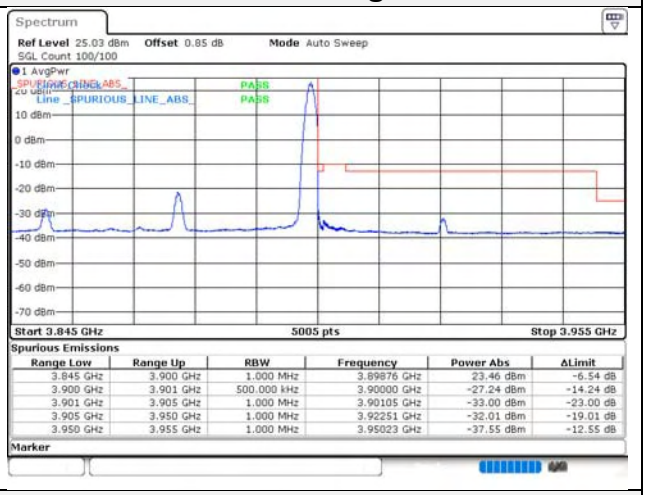
40M BW QPSK High ch. FRB



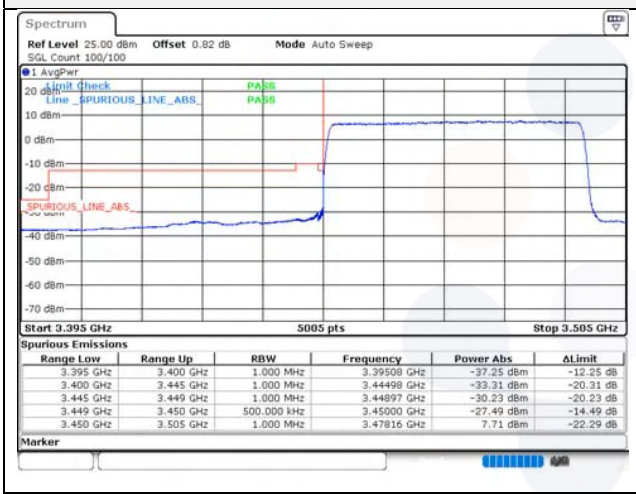
50M BW QPSK Low ch. 1RB



50M BW QPSK High ch. 1RB



50M BW QPSK Low ch. FRB



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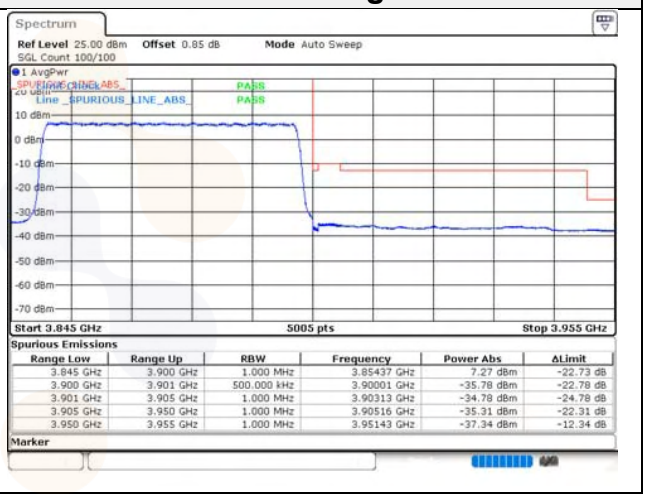
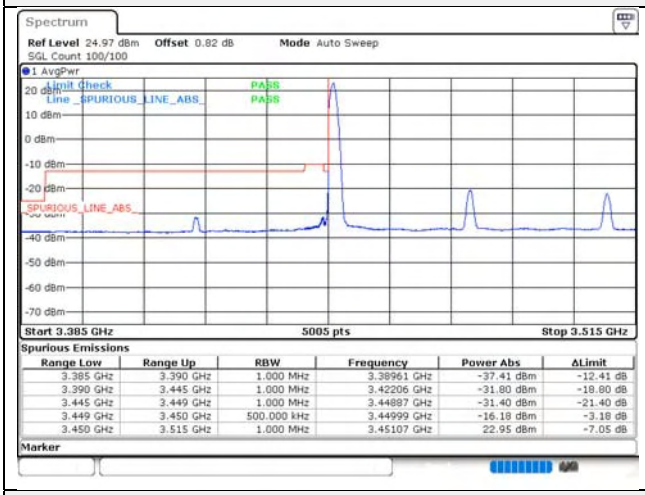
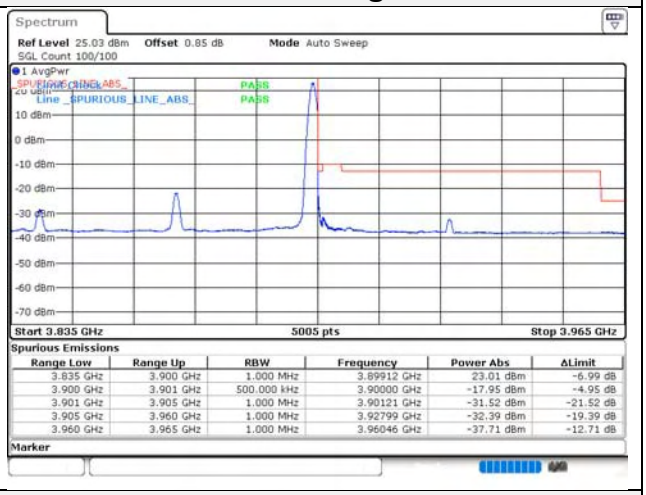


60M BW QPSK Low ch. 1RB



60M BW QPSK High ch. 1RB



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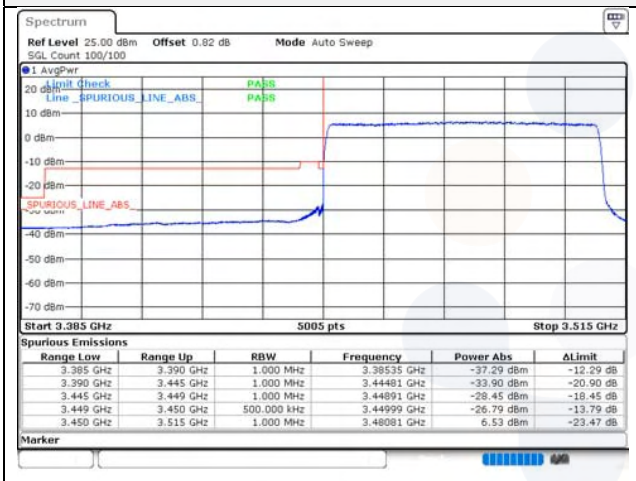
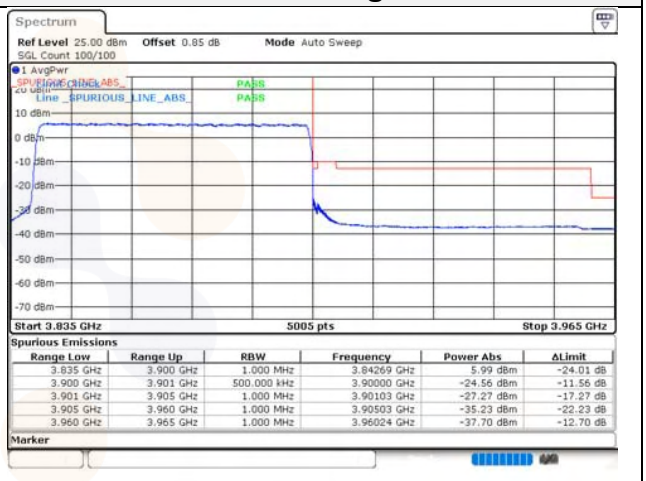
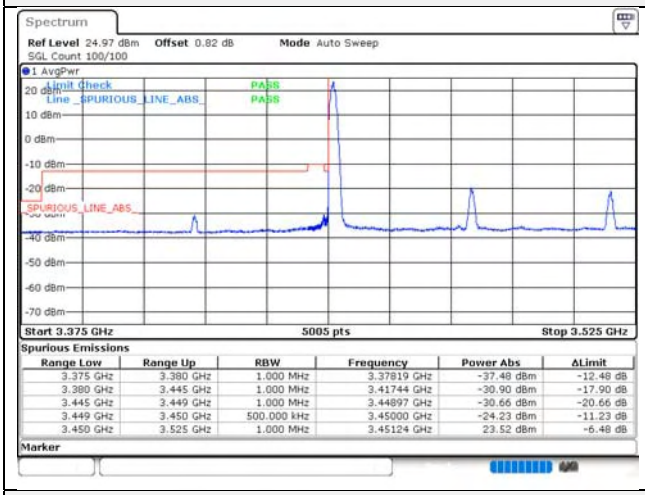


60M BW QPSK High ch. FRB



70M BW QPSK Low ch. 1RB



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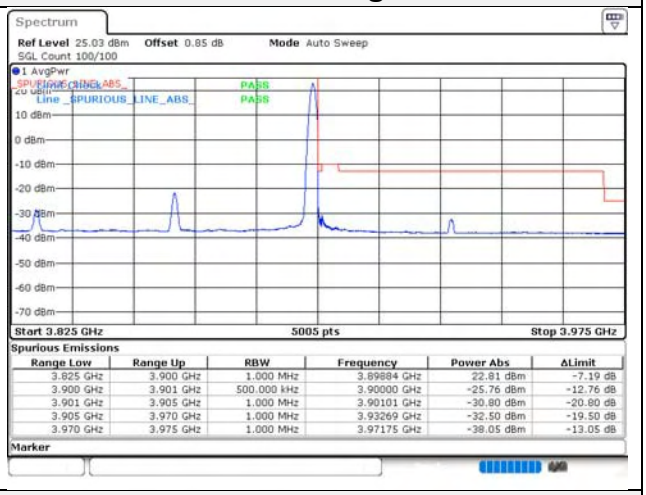
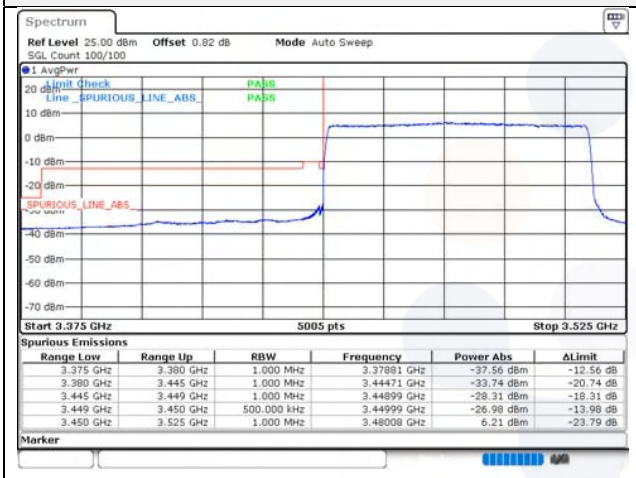
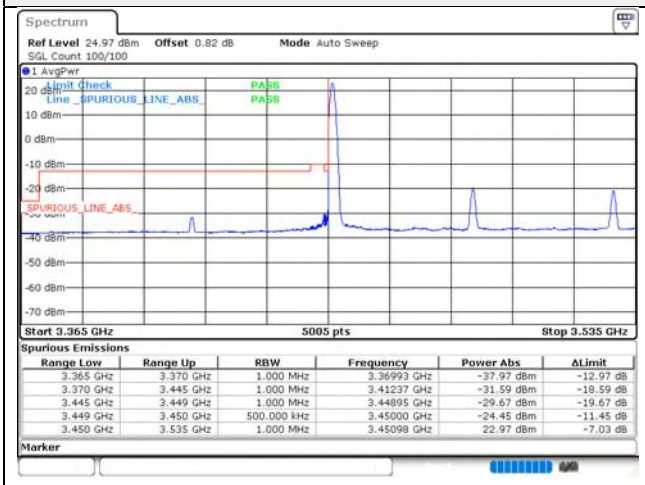


70M BW QPSK Low ch. FRB

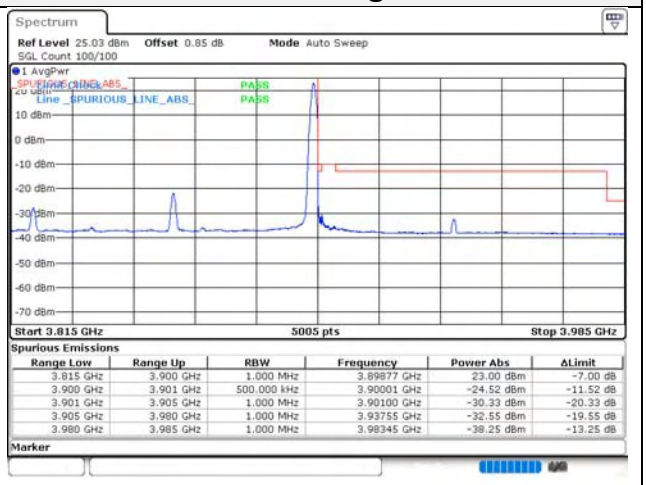


70M BW QPSK High ch. FRB

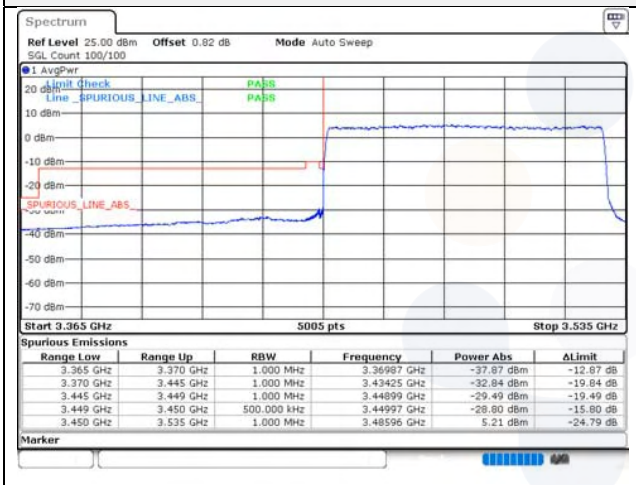
80M BW QPSK Low ch. 1RB



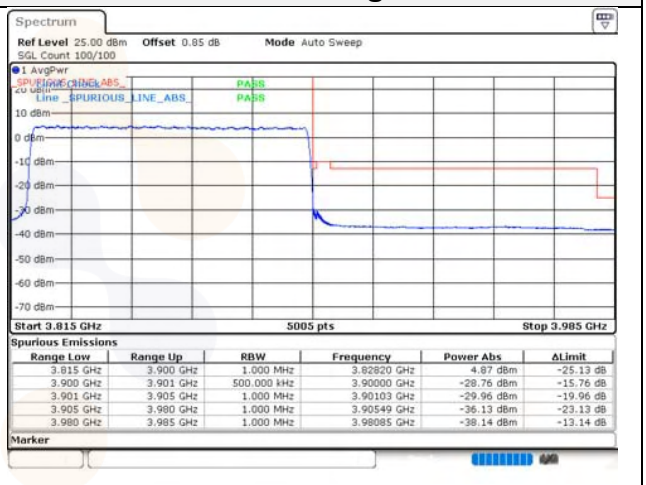
80M BW QPSK High ch. 1RB



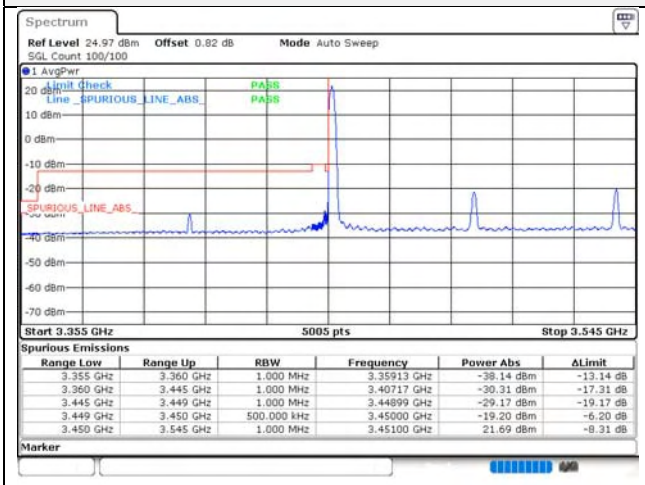
80M BW QPSK Low ch. FRB



80M BW QPSK High ch. FRB



90M BW QPSK Low ch. 1RB



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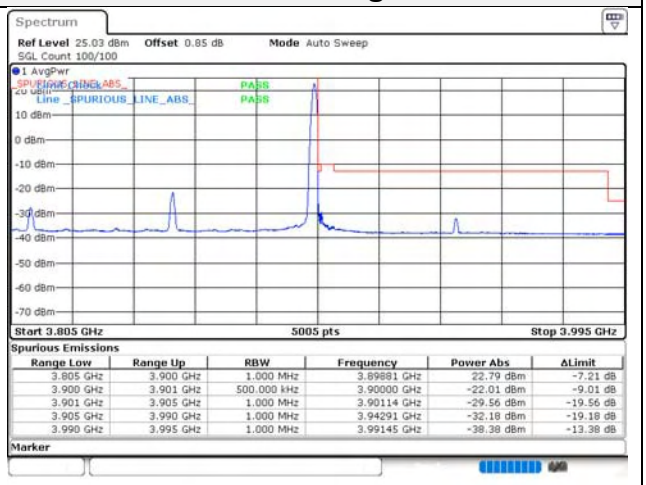

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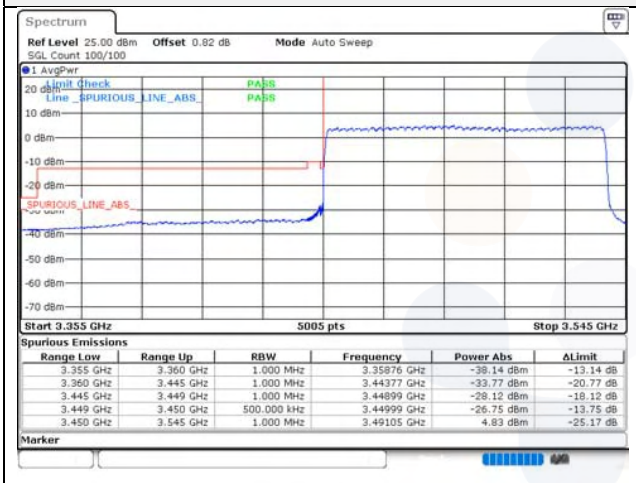
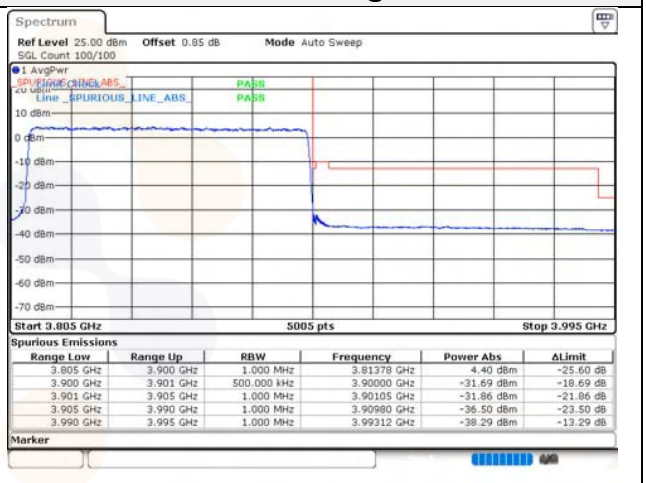
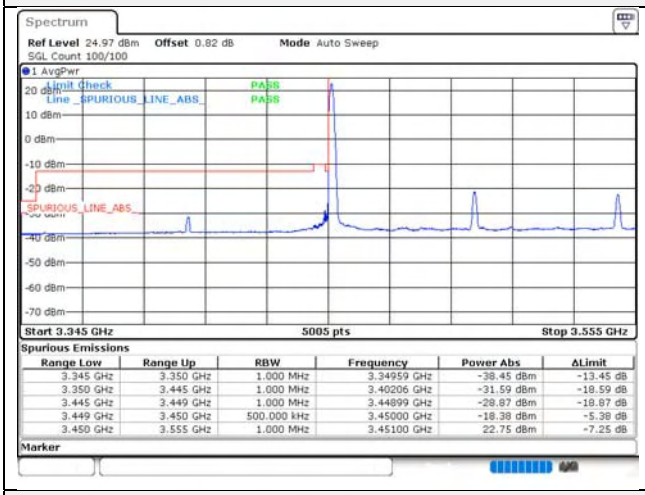


90M BW QPSK High ch. FRB



100M BW QPSK Low ch. 1RB



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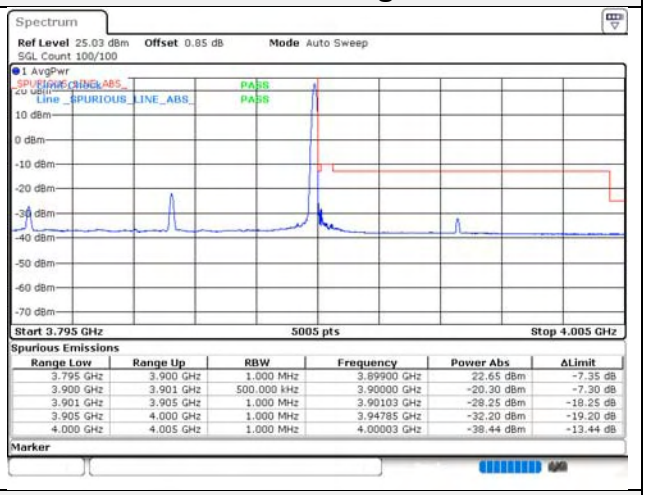

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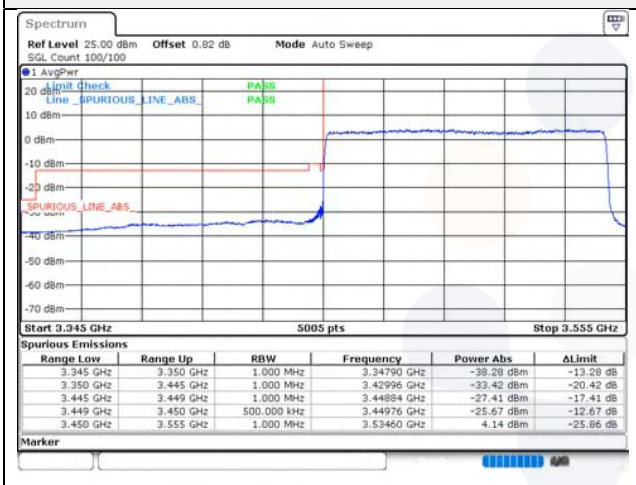
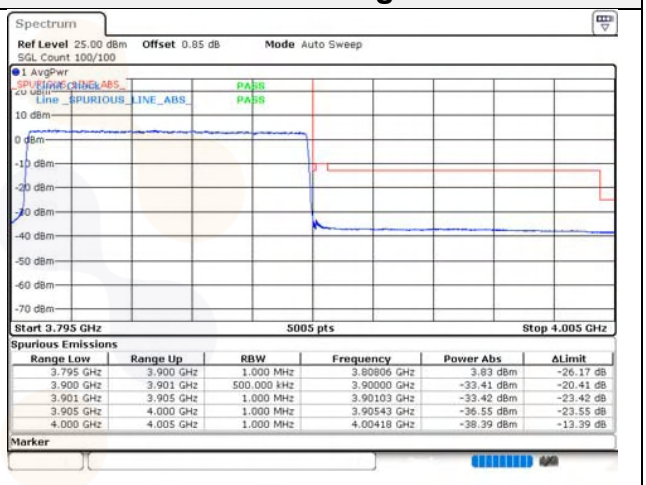
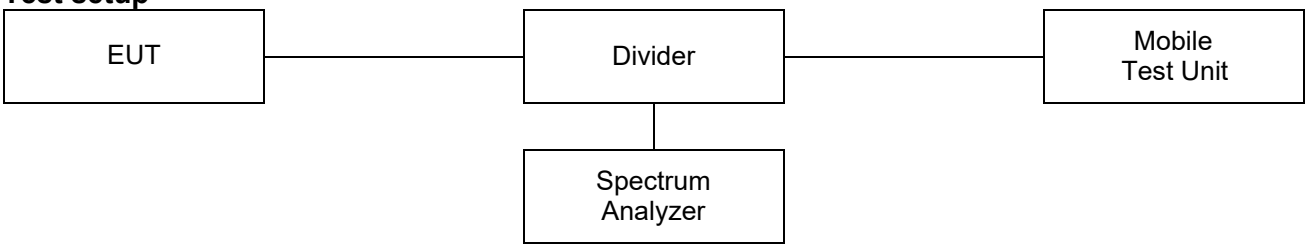


100M BW QPSK High ch. FRB



7.4 Spurious Emissions at Antenna Terminal

Test setup



Limit

According to §22.917(a), §24.238(a) and RSS-132(5.5), RSS-133(6.5),

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log($P_{[Watts]}$) ㏈.

According to §27.53(a),

For operations in the 2305–2320 ㎒ band and the 2345–2360 ㎒ band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power P (with averaging performed only during periods of transmission) within the licensed band(s) of operation, in watts, by the following amounts:

(4) For mobile and portable stations operating in the 2305–2315 ㎒ and 2350–2360 ㎒ bands:

(i) By a factor of not less than: 43 + 10 log (P) ㏈ on all frequencies between 2305 and 2320 ㎒ and on all frequencies between 2345 and 2360 ㎒ that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) ㏈ on all frequencies between 2320 and 2324 ㎒and on all frequencies between 2341 and 2345 ㎒ , not less than 61 + 10 log (P) ㏈ on all frequencies between 2324 and 2328 ㎒ and on all frequencies between 2337 and 2341 ㎒ , and not less than 67 + 10 log (P) ㏈ on all frequencies between 2328 and 2337 ㎒ ;

(ii) By a factor of not less than 43 + 10 log (P) ㏈ on all frequencies between 2300 and 2305 ㎒, 55 + 10 log (P) ㏈ on all frequencies between 2296 and 2300 ㎒, 61 + 10 log (P) ㏈ on all frequencies between 2292 and 2296 ㎒ , 67 + 10 log (P) ㏈ on all frequencies between 2288 and 2292 ㎒, and 70 + 10 log (P) ㏈ below 2288 ㎒;

(iii) By a factor of not less than 43 + 10 log (P) ㏈ on all frequencies between 2360 and 2365 ㎒, and not less than 70 + 10 log (P) ㏈ above 2365 ㎒.

According to §27.53(g), and RSS-130(4.7)
For operations in the 600 ㎒ band and the 698-746 ㎒ band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10log($P_{[Watts]}$) ㏈.

According to §27.53(h) and RSS-139(5.6),
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10log($P_{[Watts]}$) ㏈.

According to §27.53(l)(2),
The following emission limits apply to stations transmitting in the 3700-3980 ㎒ band:

(3) For mobile operations in the 3700-3980 ㎒ band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 ㏈m/㎒.

According to §27.53(n)(2),
The following emission limits apply to stations transmitting in the 3450-3550 ㎒ band:

(3) For mobile operations in the 3450-3550 ㎒ band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 ㏈m/㎒.

According to RSS-192(5.6)
Subscriber equipment shall have the TRP or conducted power (per antenna), where applicable, of unwanted emission not exceeding the following:

c. The limits in table 6
d. a limit of -30 dBm/MHz in the frequency range greater than (B+5) MHz from the edge of the frequency band

Table 6: Unwanted emission limits for subscriber equipment

Frequency block group (B)	Offset frequency from the edge of the frequency block group (MHz)			
	0 to 1	1 to 5	5 to B	>B
10MHz, 20MHz, 30MHz and 40MHz	-13 dBm/1% of B	-10 dBm/MHz	-13 dBm/MHz	-25 dBm/MHz
>40MHz	-13 dB m/400 kHz	-10 dBm/MHz	-13 dBm/MHz	-25 dBm/MHz

According to §27.53(m)(4),
The attenuation factor shall be not less than 40 + 10log($P_{[Watts]}$) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10log($P_{[Watts]}$) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10log($P_{[Watts]}$) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10log($P_{[Watts]}$) dB on all frequencies between 2490.5 MHzand 2496 MHz and 55 + 10log($P_{[Watts]}$) dB at or below 2490.5 MHz .

According to RSS-199 (5.6),
Table 5: Unwanted emission limits for subscriber equipment other than fixed subscriber equipment

Offset from the edge of the frequency block or frequency block group (MHz)	Unwanted emission limits
0-1	-10 dBm/(2% of OB*)
1-5	-10 dBm/MHz
5-X**	-13 dBm/MHz
≥X	-25 dBm/MHz

*OB is the occupied bandwidth
** X is 6 MHz or the equipment occupied bandwidth, whichever is greater
In additions to complying with the limits in table 5, subscriber equipment other than fixed subscriber equipment shall not exceed -13 dB m/ MHz on all frequencies between 2490.5 MHz and 2496 MHz , and -25 dBm/MHz at or below 2490.5 MHz.

Test procedure

971168 D01 v03r01 - Section 6
ANSI 63.26-2015 – Section 5.7

Test settings

1) Start frequency was set to 30 ㎒ and stop frequency was set to at least 10th the fundamental frequency.
2) Detector = RMS
3) Sweep time = auto couple.
4) Trace mode = trace average
5) Allow trace to fully stabilize.
6) Please see test notes below RBW and VBW settings.

Notes:

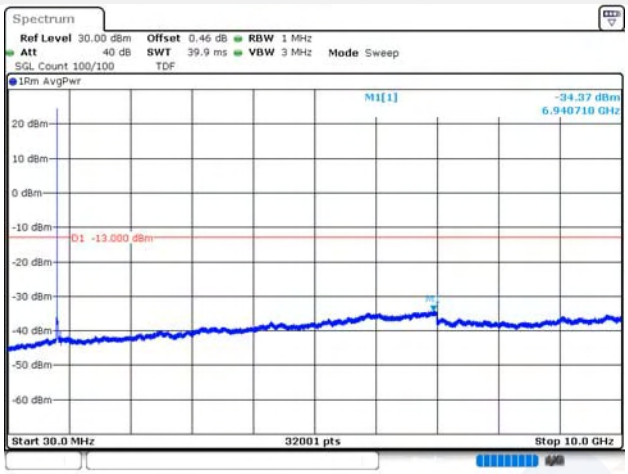
1. Per 22.917(b), 24.238(b), 27.53(a)(5), 27.53(c), 27.53(g), 27.53(h)(3), 27.53(l)(2), 27.53(n)(2), 27.53(m)(6) and RSS-130(4.7), RSS-132(5.5), RSS-133(6.5), RSS-139(5.6), RSS-192(5.6), RSS-195(5.6), RSS-199(5.6), compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 ㎑ or greater for frequencies less than 1 ㎓ and 1 ㎒ or greater for frequencies greater than 1 ㎓ .

   The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 ㏈ below the transmitter power.

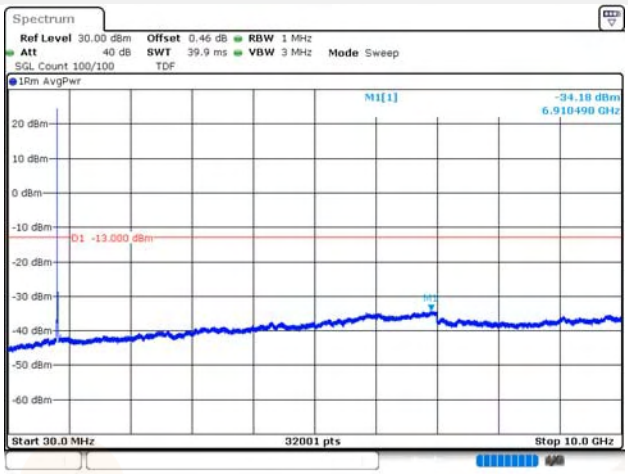
Test results

Test mode: NR n5

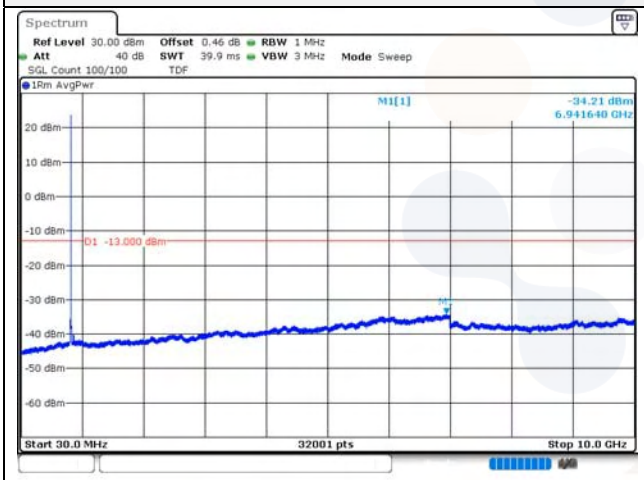
5M BW QPSK Low ch.



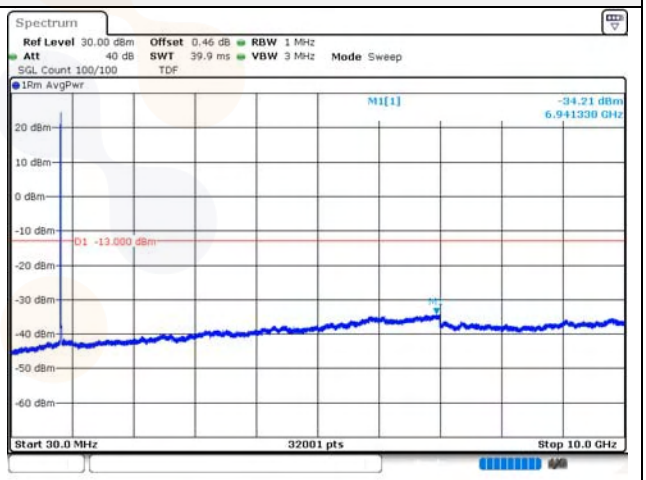
10M BW QPSK Low ch.



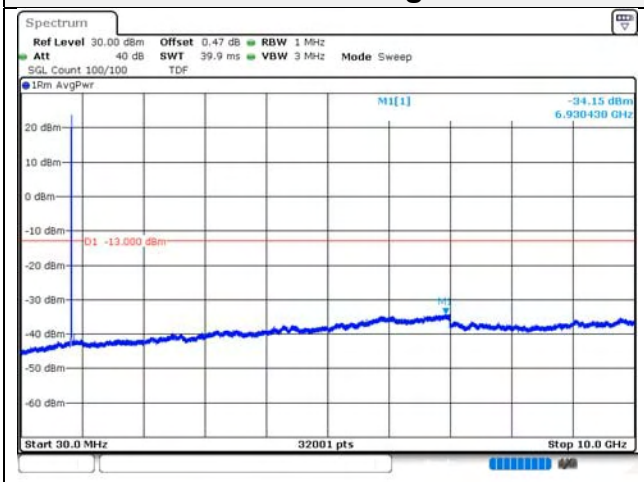
5M BW QPSK Mid ch.



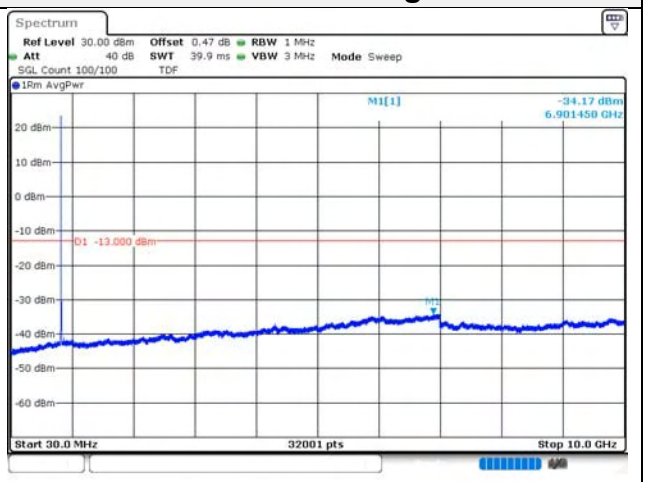
10M BW QPSK Mid ch.



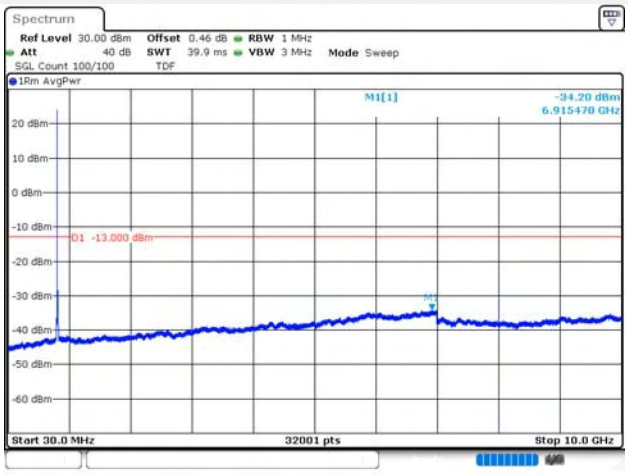
5M BW QPSK High ch.



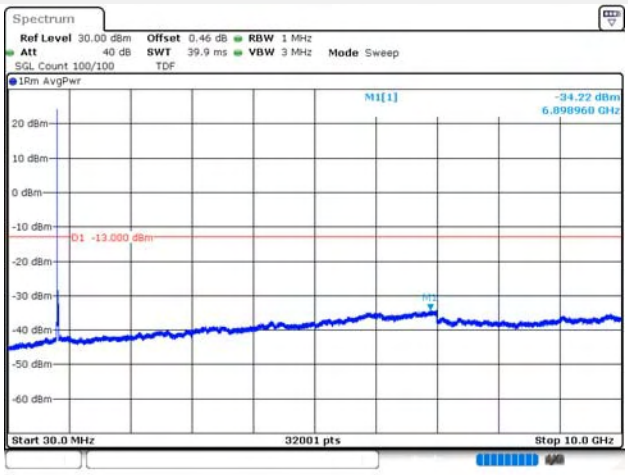
10M BW QPSK High ch.



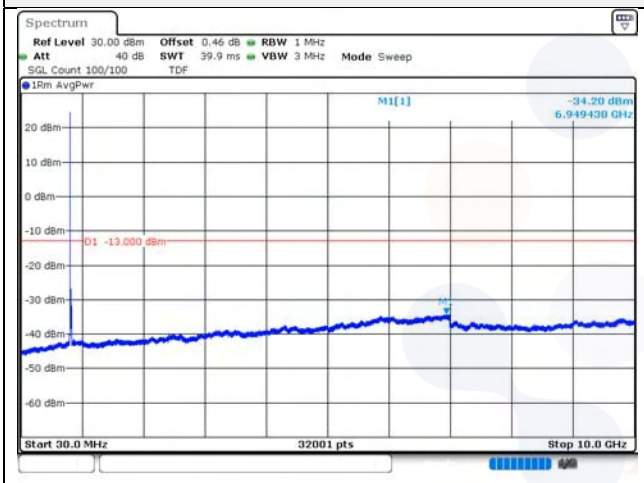
15M BW QPSK Low ch.



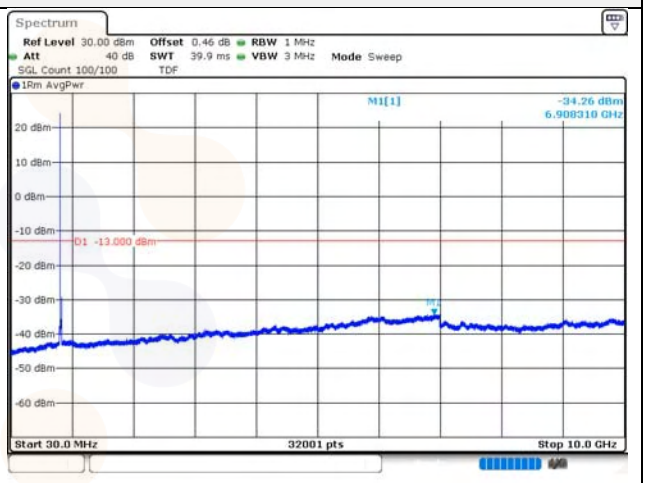
20M BW QPSK Low ch.



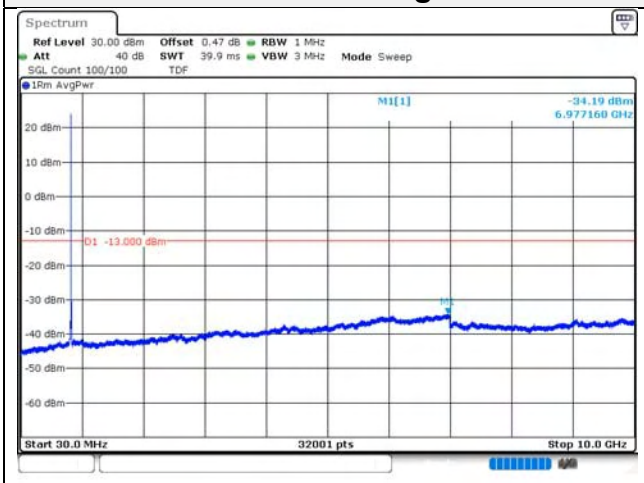
15M BW QPSK Mid ch.



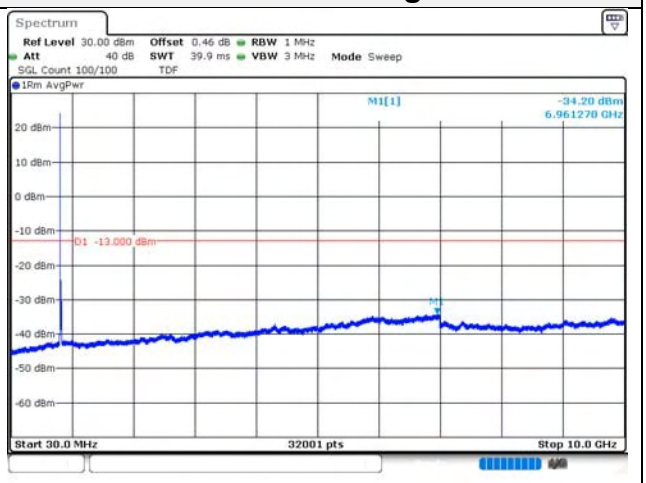
20M BW QPSK Mid ch.



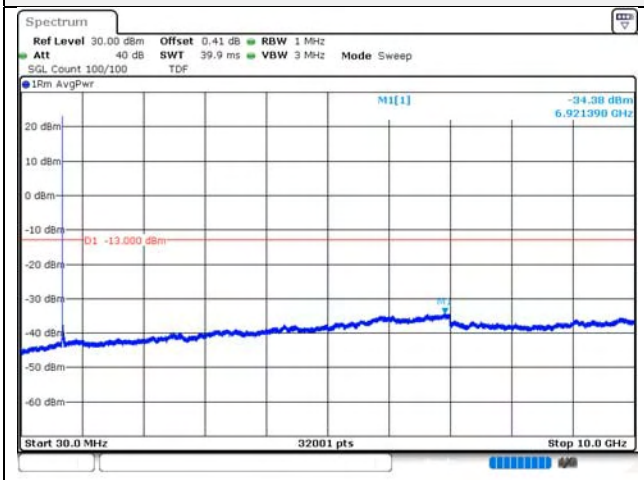
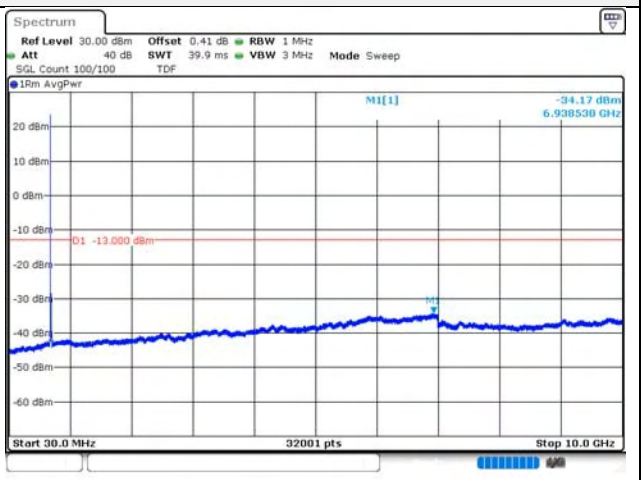
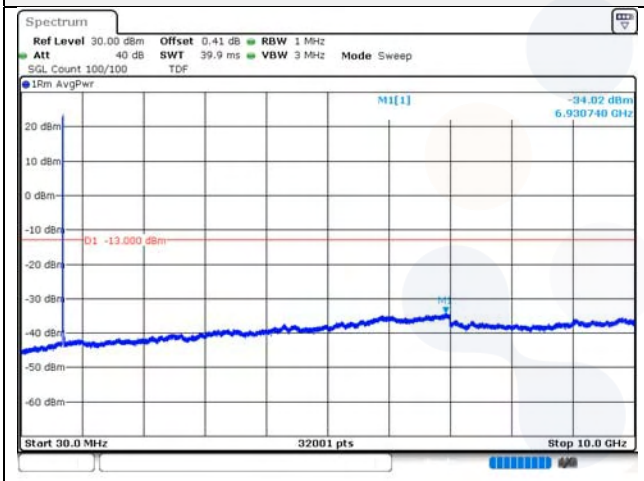
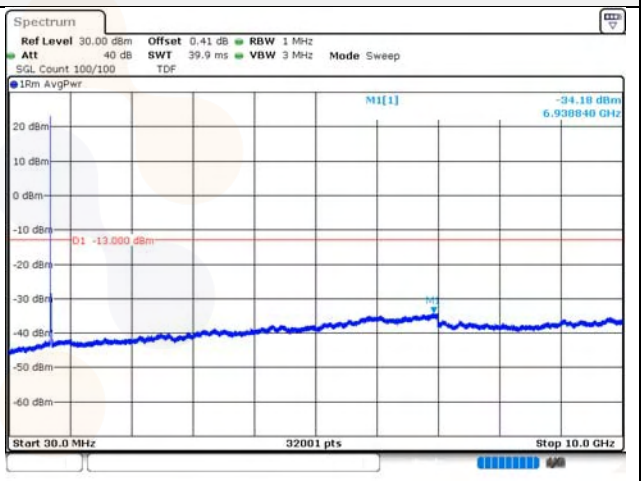
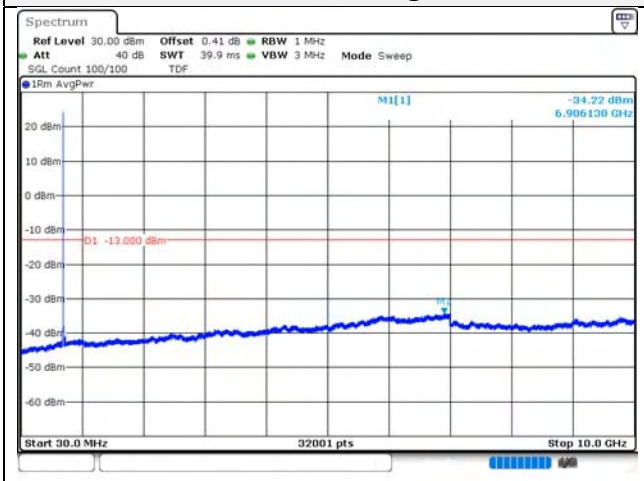
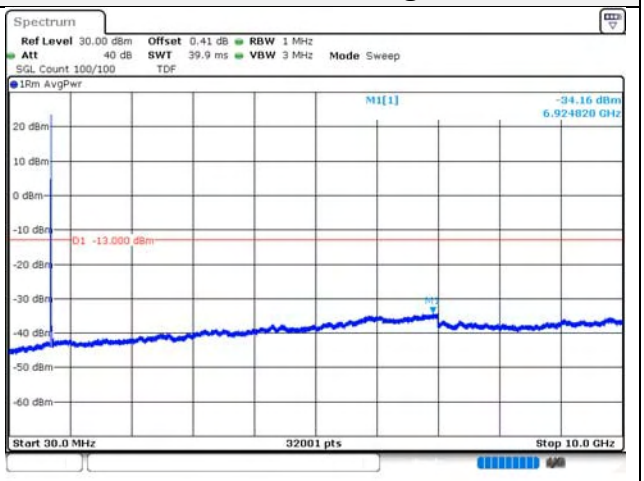
15M BW QPSK High ch.

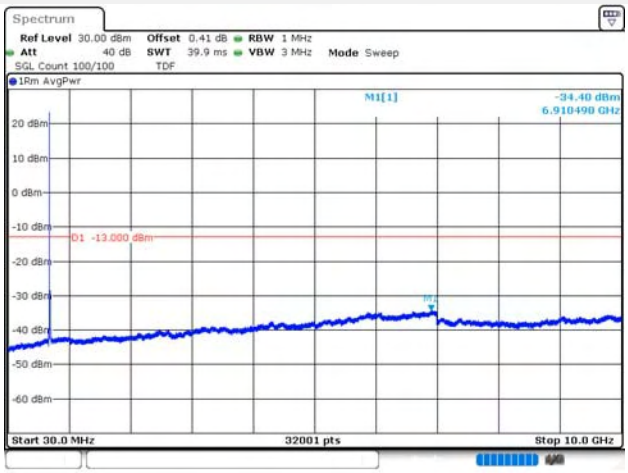
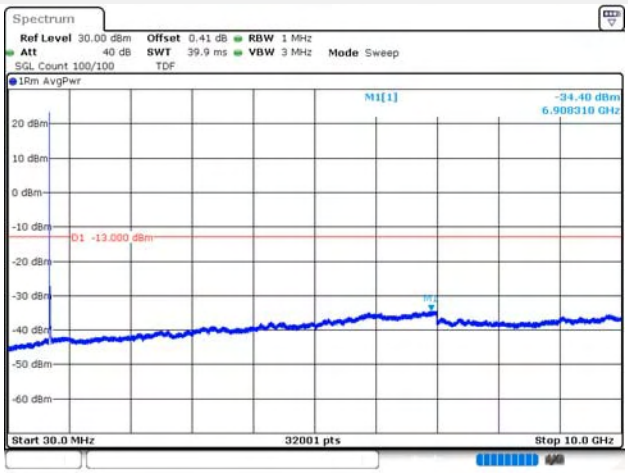
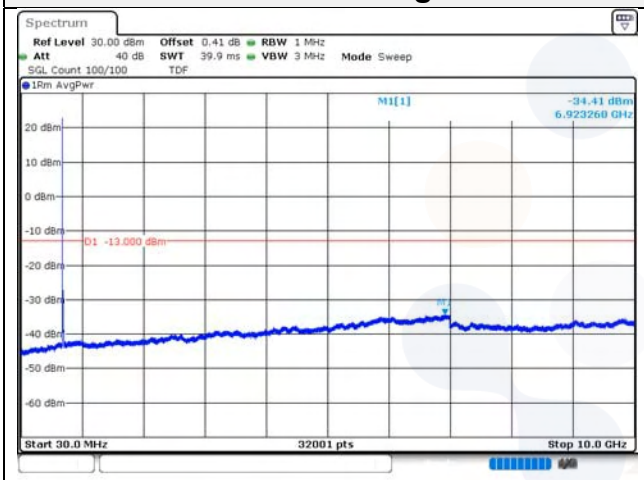


20M BW QPSK High ch.

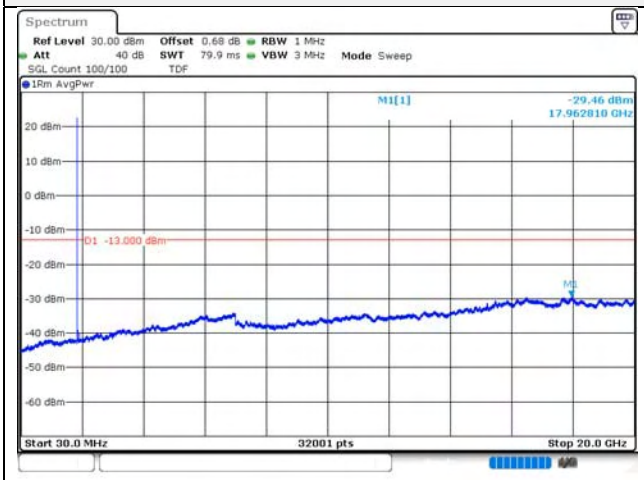
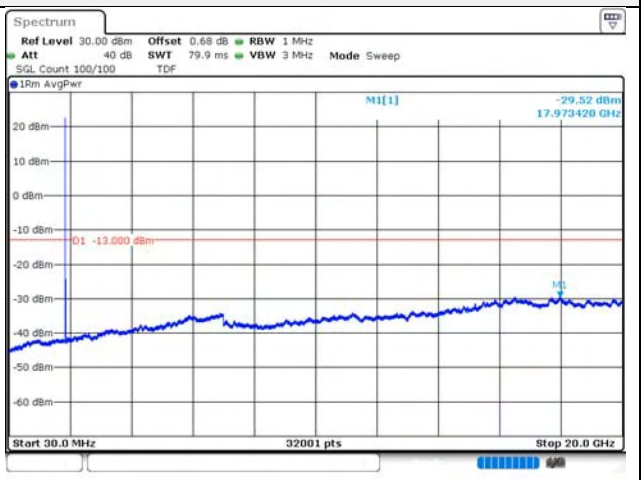
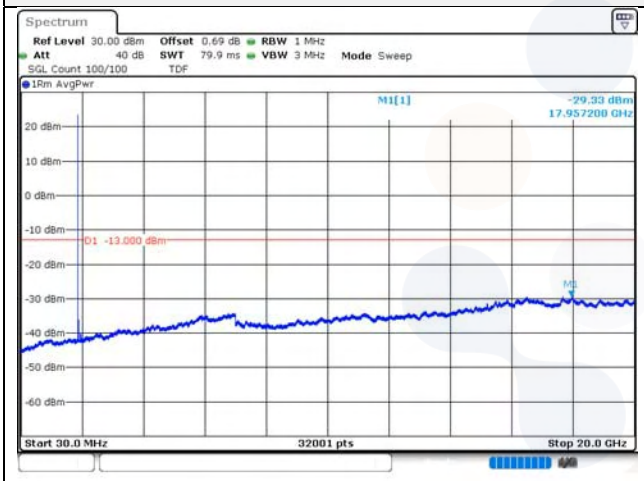
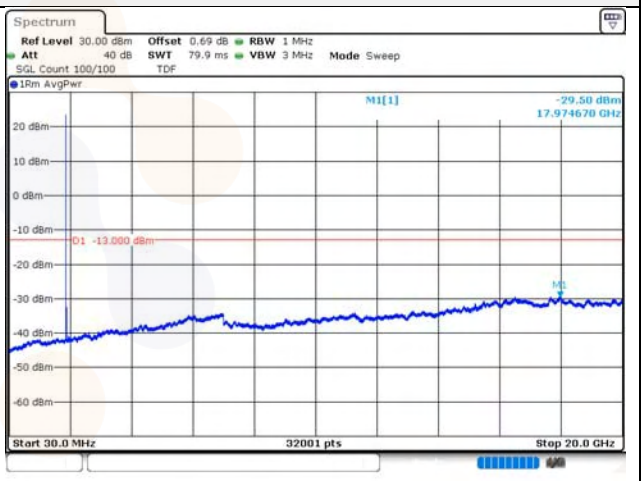
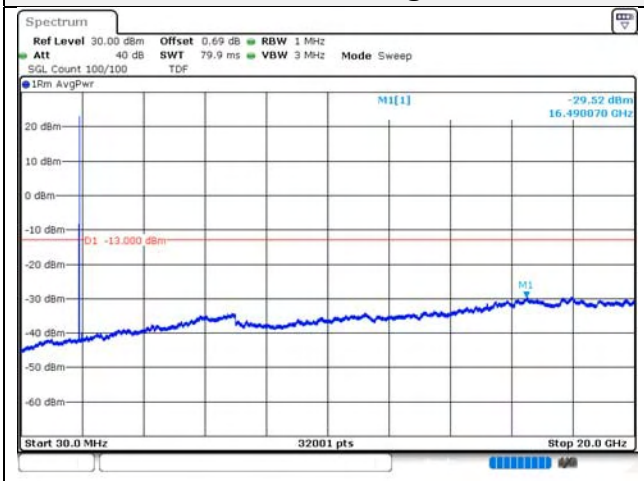
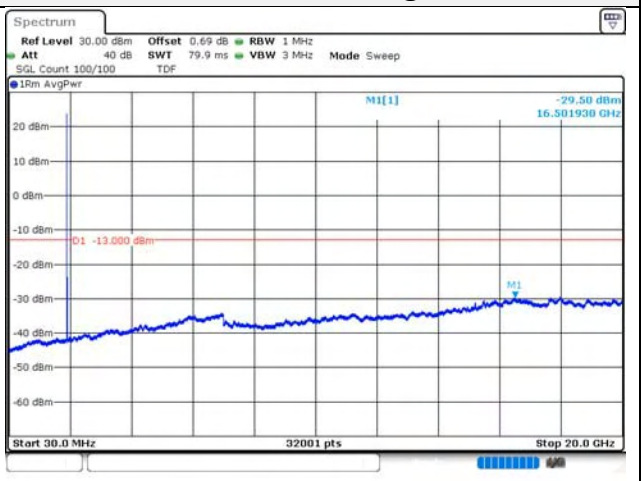


Test mode: NR n12

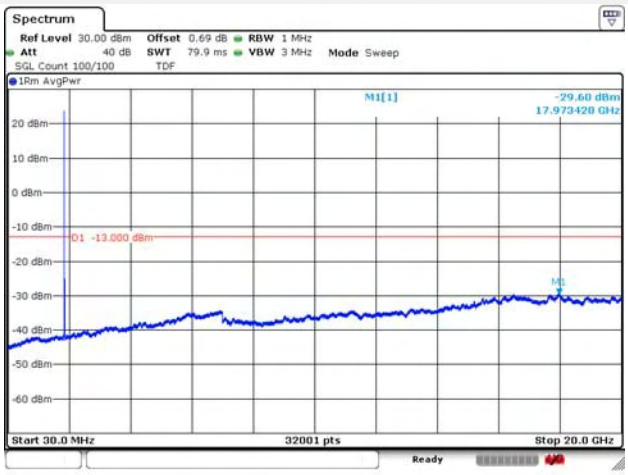
5M BW QPSK Low ch.	10M BW QPSK Low ch.
	
5M BW QPSK Mid ch.	**10M BW QPSK Mid ch.**
	
5M BW QPSK High ch.	**10M BW QPSK High ch.**
	

15M BW QPSK Low ch.	15M BW QPSK Mid ch.
	
15M BW QPSK High ch.	**-**
	Blank

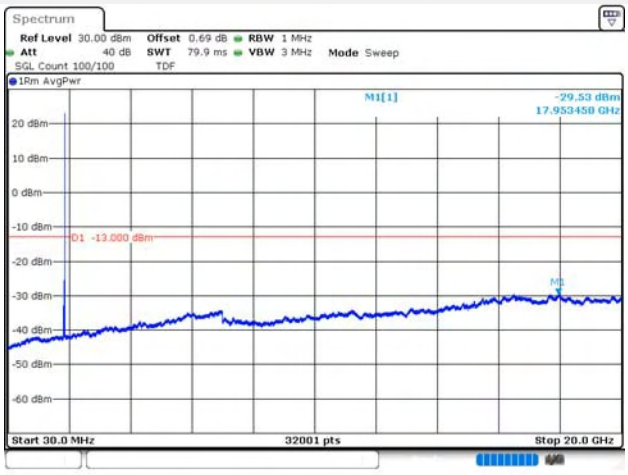
Test mode: NR n25/2

5M BW QPSK Low ch.	10M BW QPSK Low ch.
	
5M BW QPSK Mid ch.	**10M BW QPSK Mid ch.**
	
5M BW QPSK High ch.	**10M BW QPSK High ch.**
	

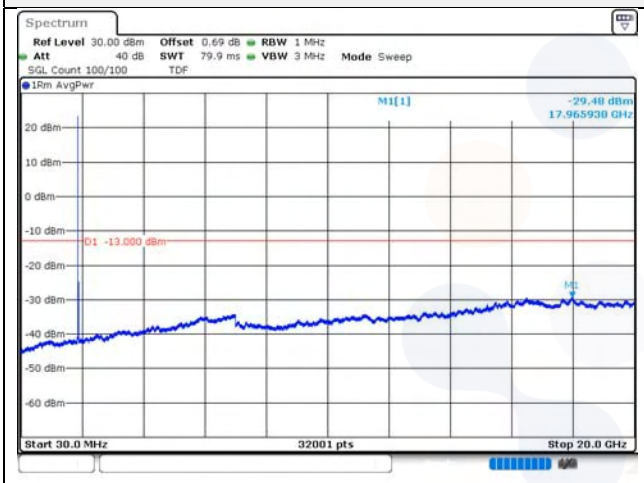
15M BW QPSK Low ch.



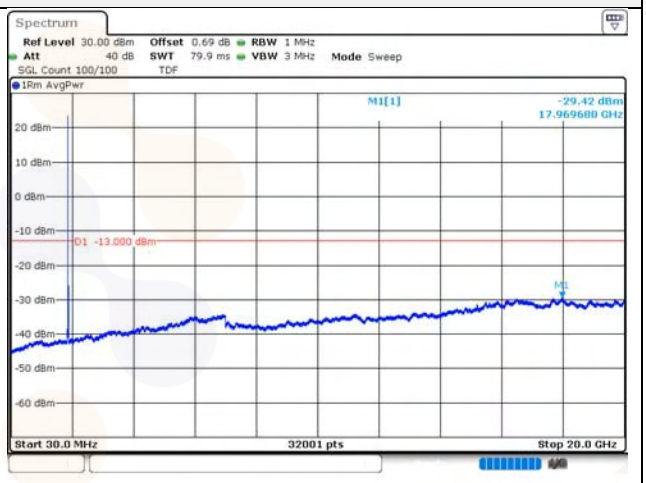
20M BW QPSK Low ch.



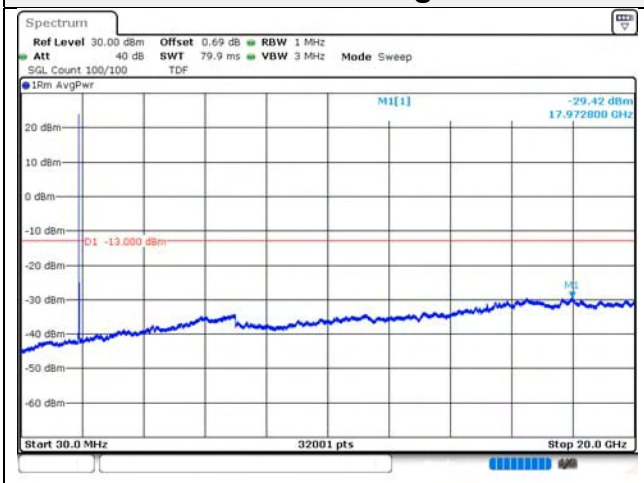
15M BW QPSK Mid ch.



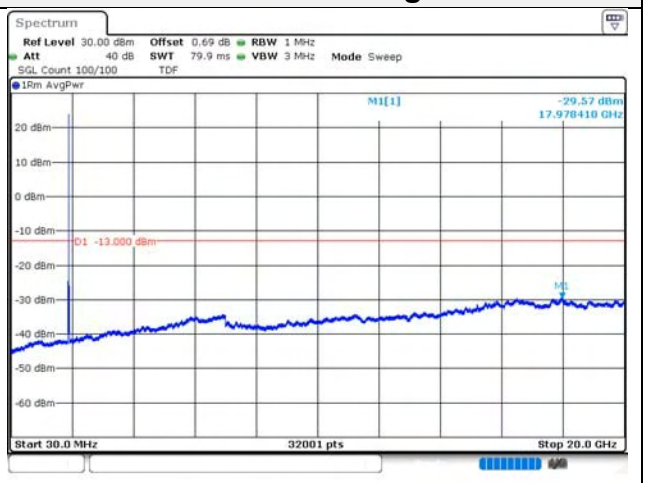
20M BW QPSK Mid ch.



15M BW QPSK High ch.

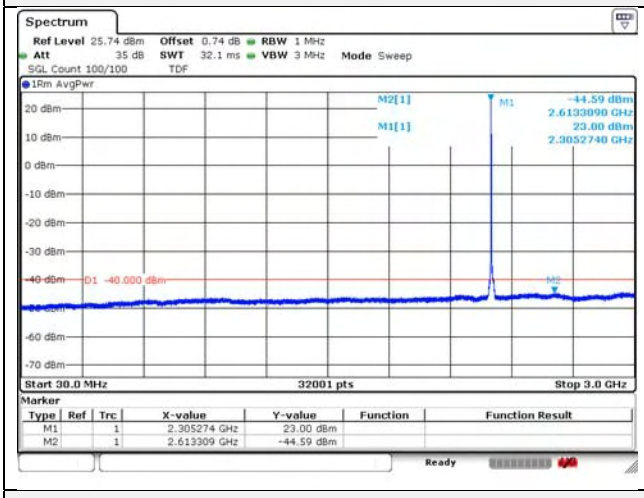


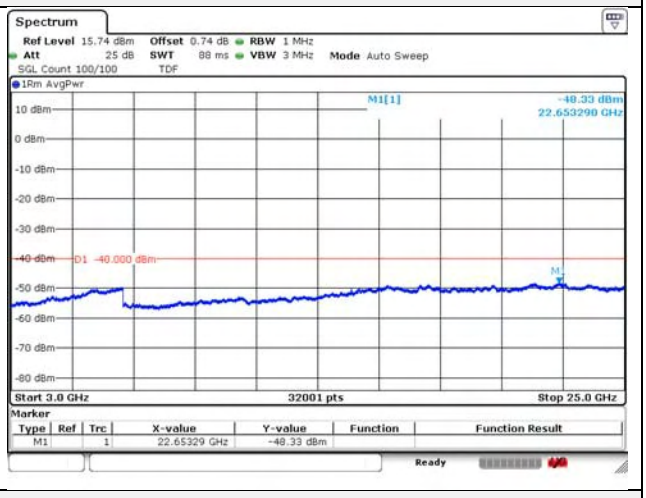
20M BW QPSK High ch.



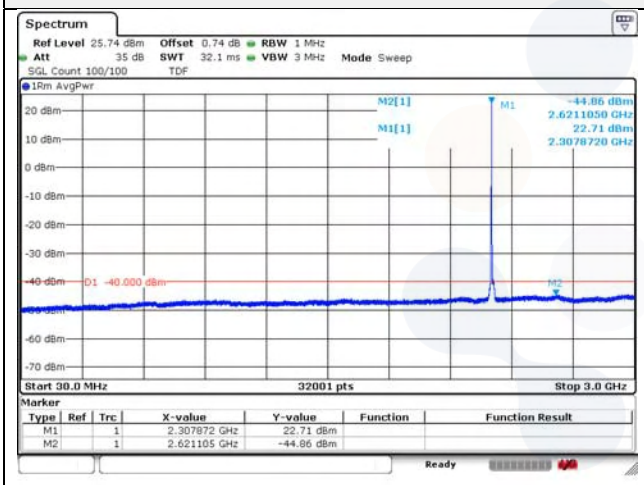
Test mode: NR n30

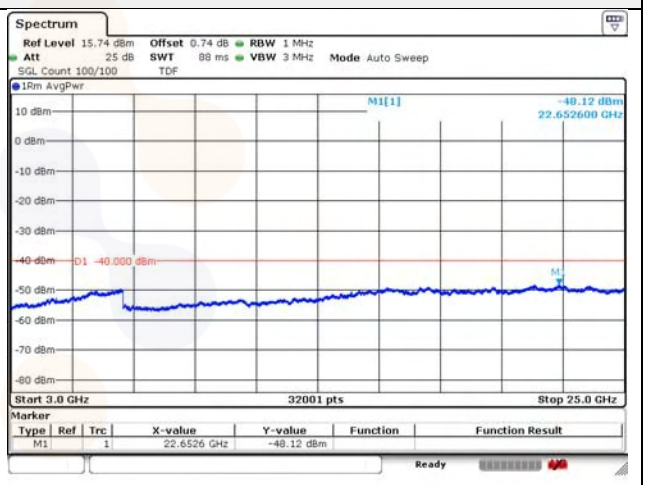
5M BW QPSK Low ch.



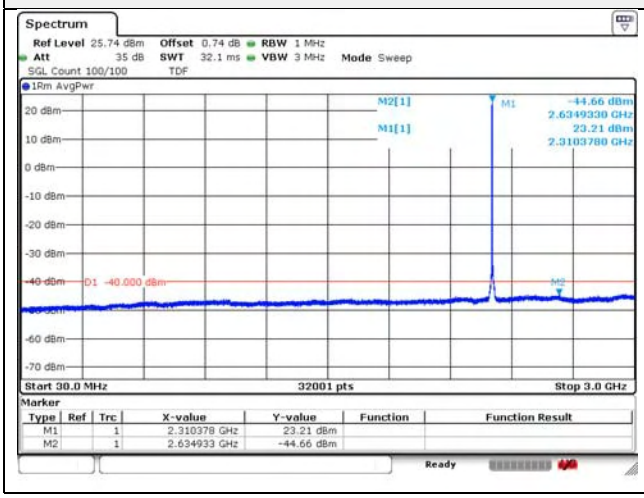


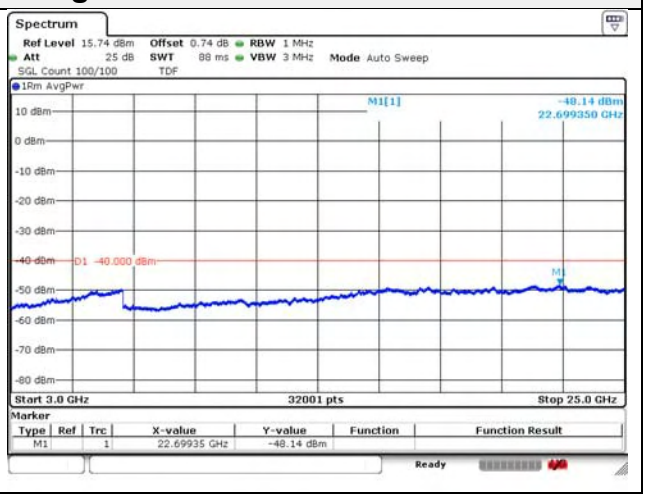
5M BW QPSK Mid ch.



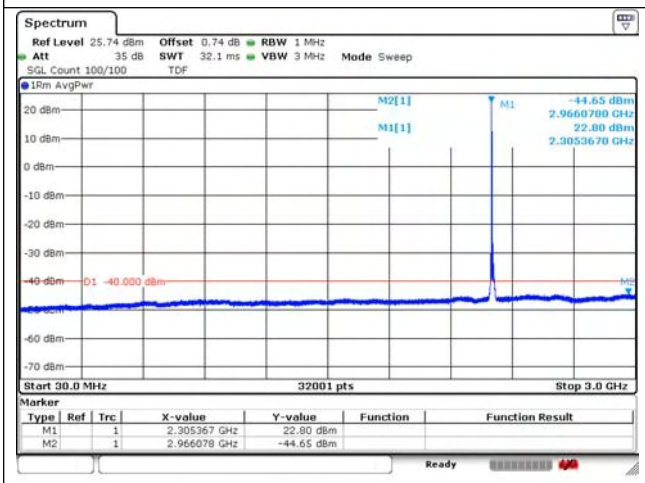


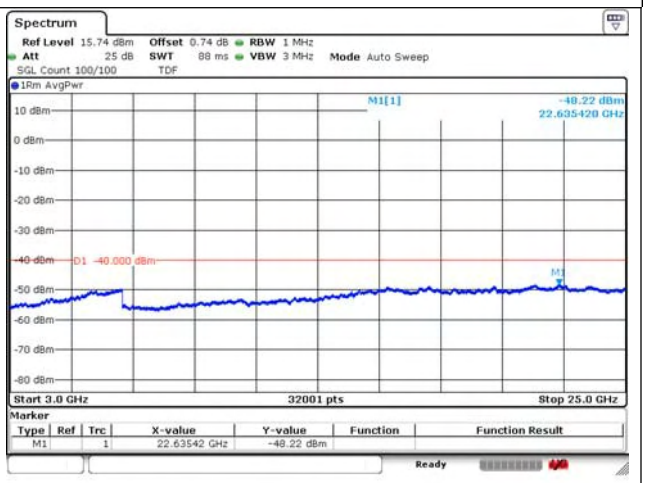
5M BW QPSK High ch.





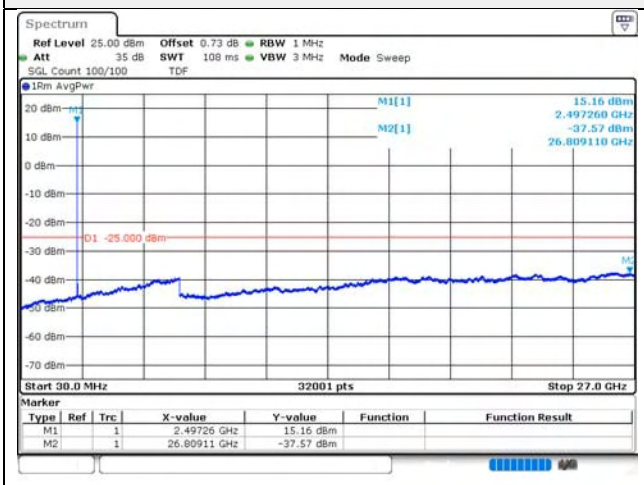
10M BW QPSK Mid ch.



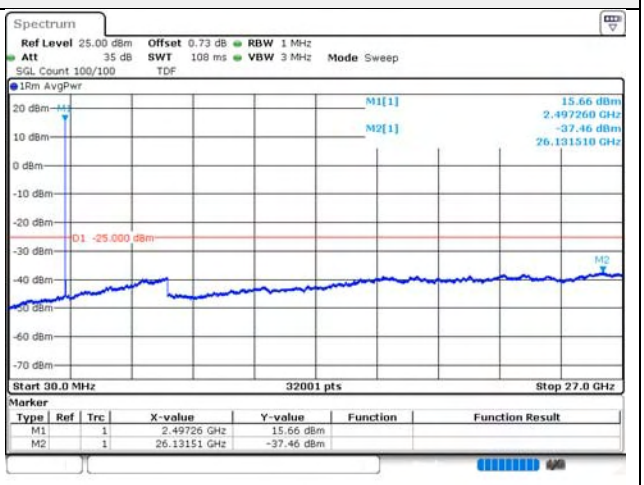


Test mode: NR n41 (PC2)

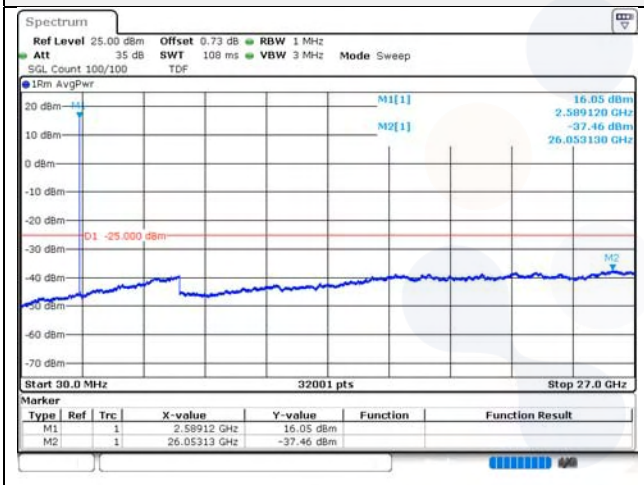
10M BW QPSK Low ch.



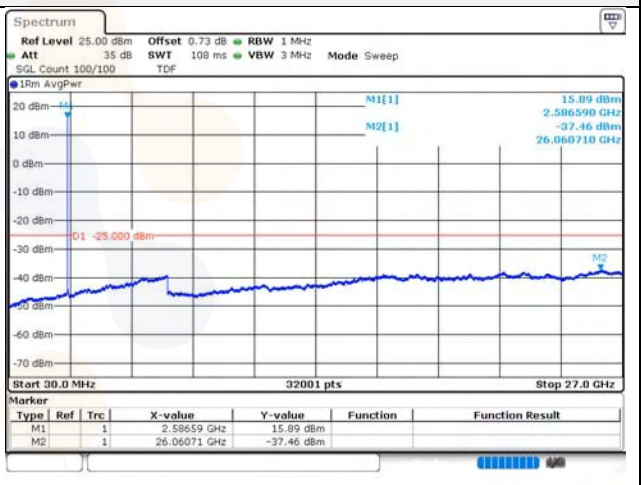
15M BW QPSK Low ch.



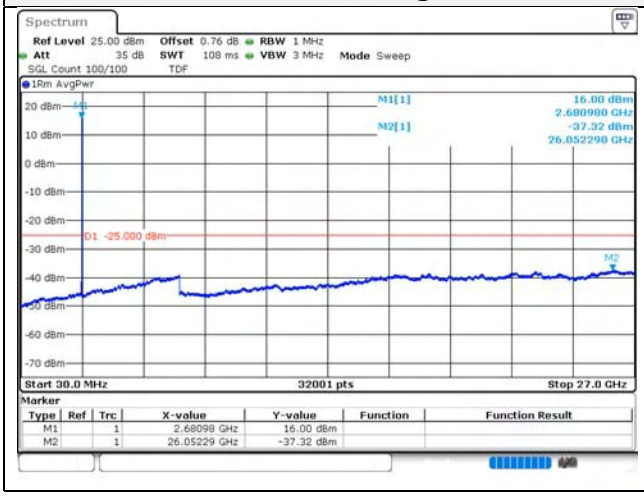
10M BW QPSK Mid ch.



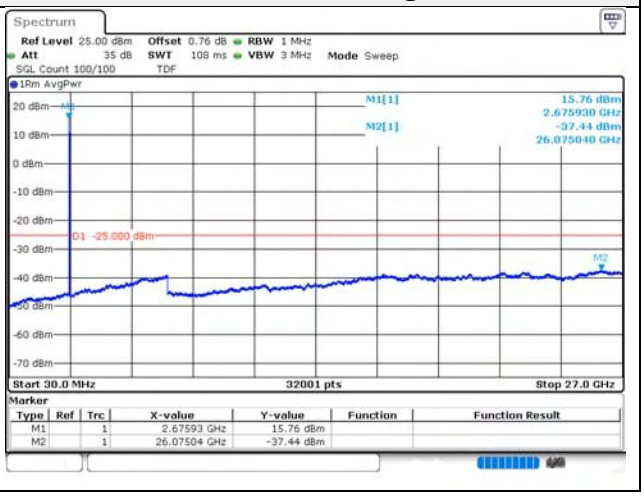
15M BW QPSK Mid ch.



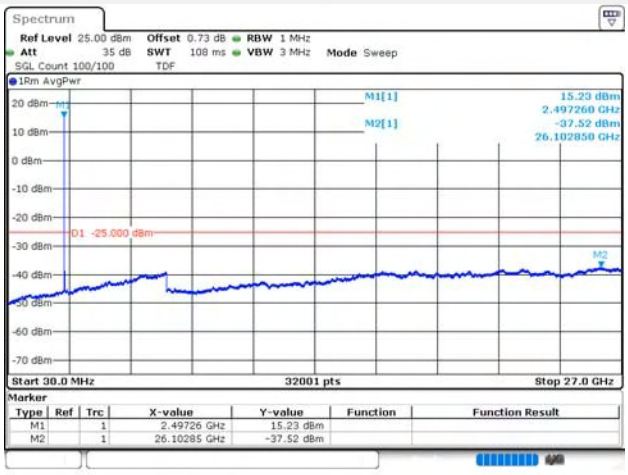
10M BW QPSK High ch.



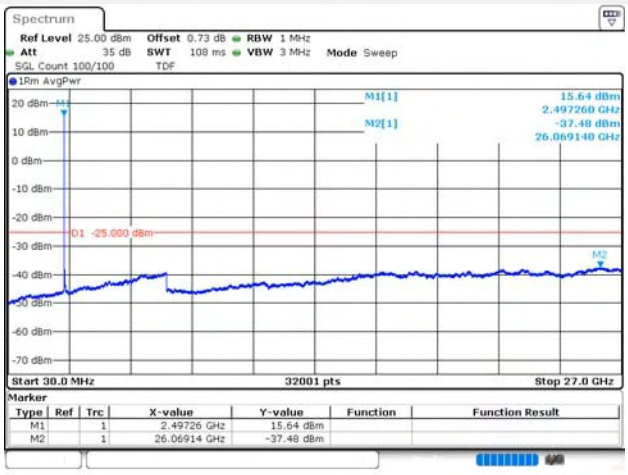
15M BW QPSK High ch.



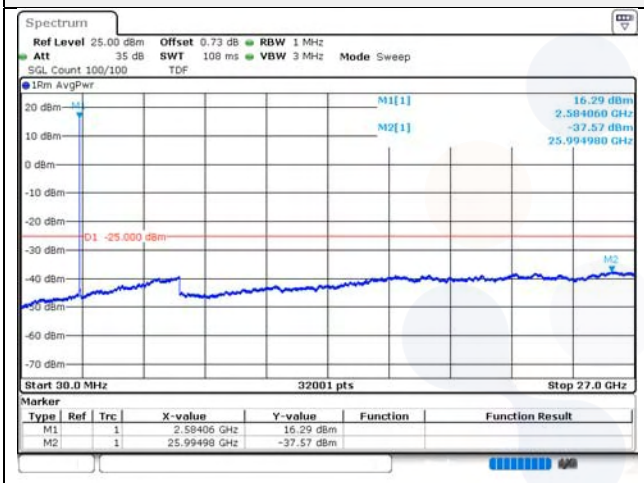
20M BW QPSK Low ch.



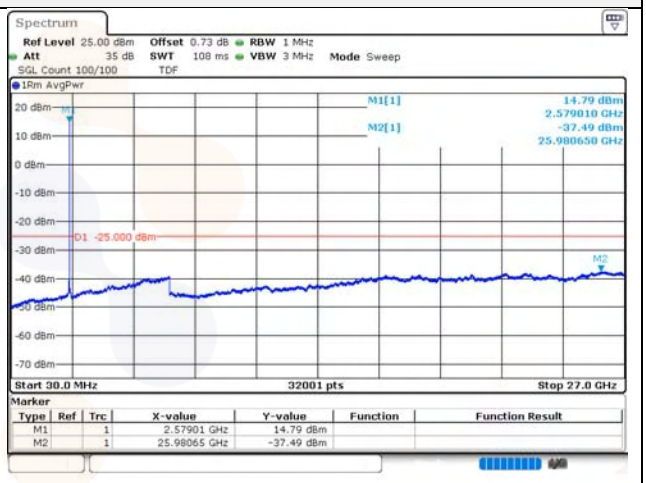
30M BW QPSK Low ch.



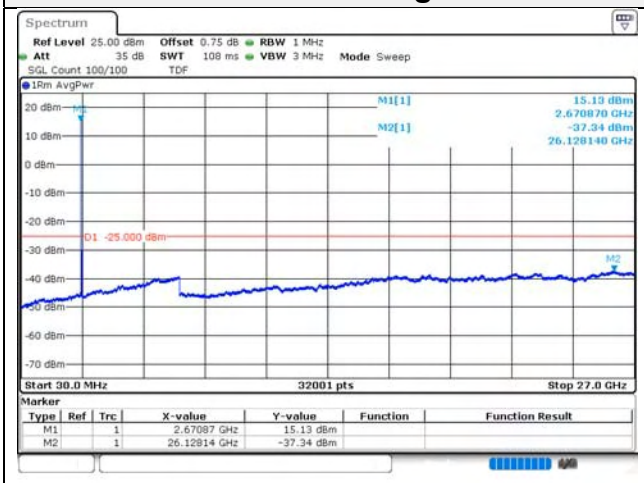
20M BW QPSK Mid ch.



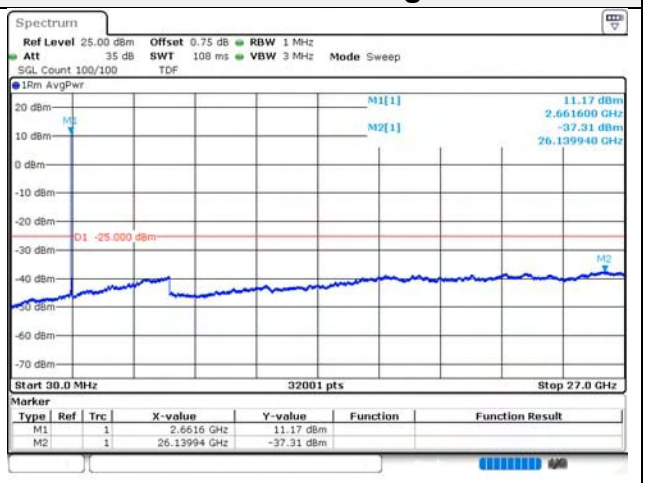
30M BW QPSK Mid ch.



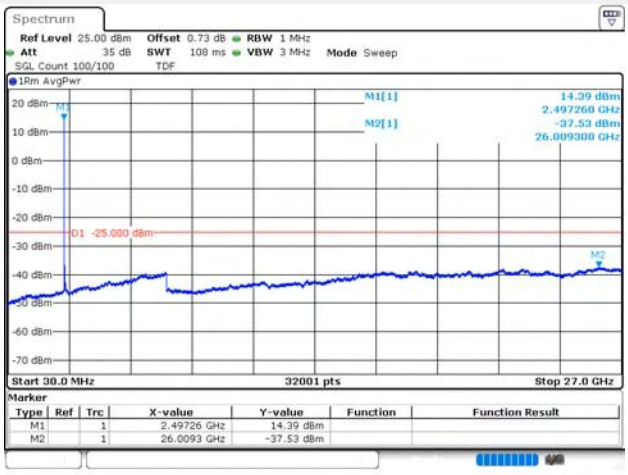
20M BW QPSK High ch.



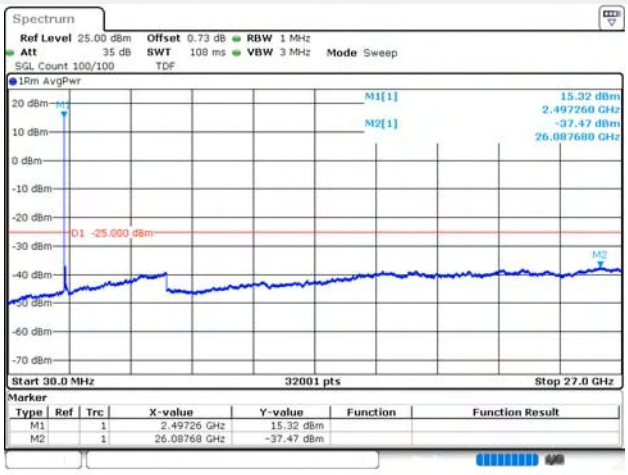
30M BW QPSK High ch.



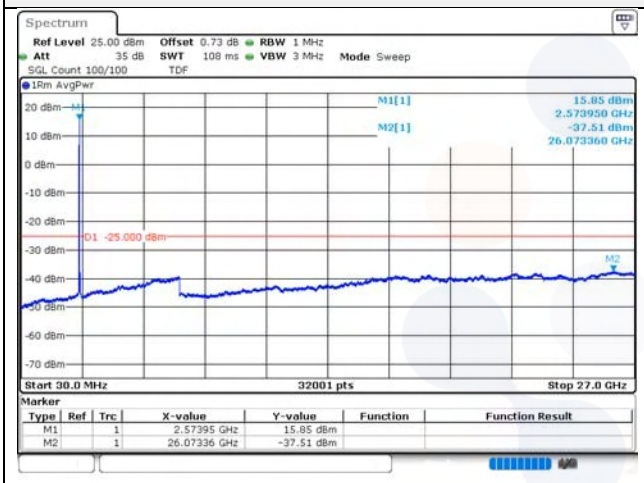
40M BW QPSK Low ch.



50M BW QPSK Low ch.



40M BW QPSK Mid ch.



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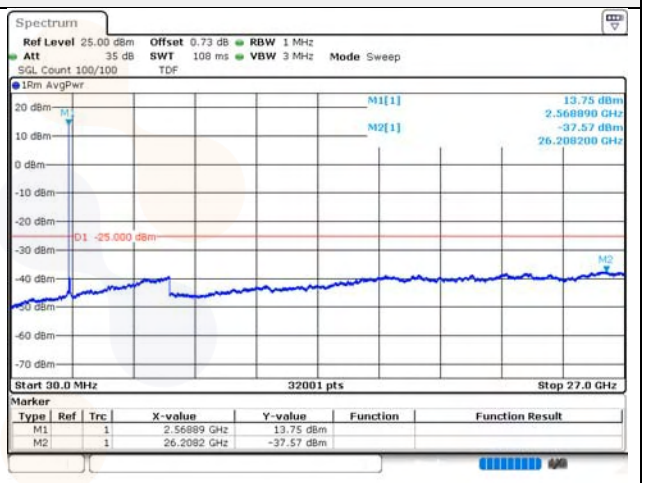

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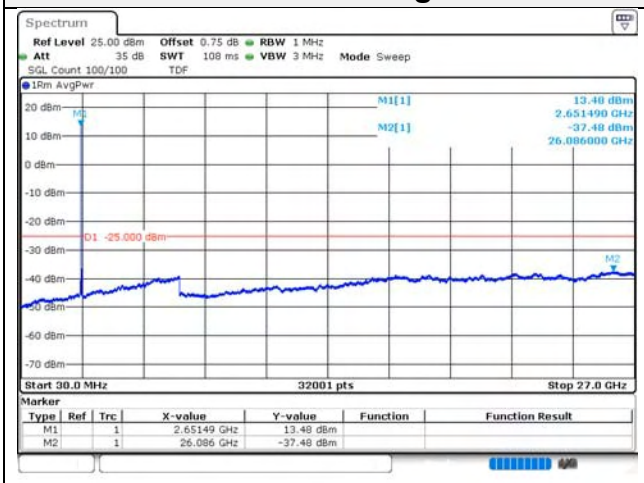
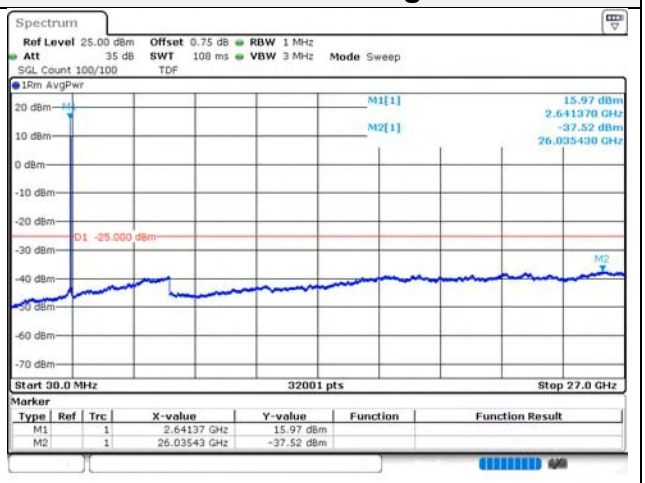
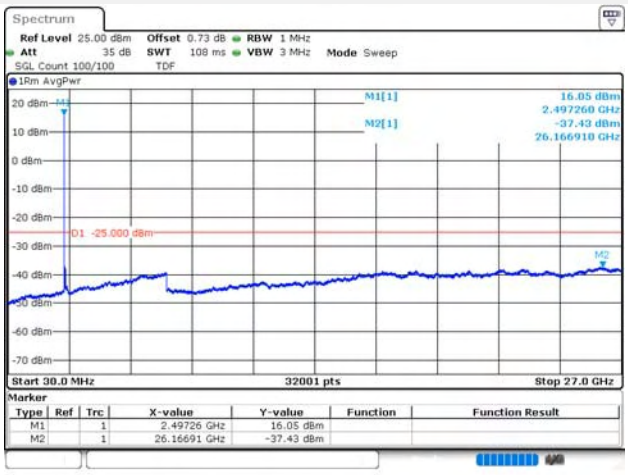


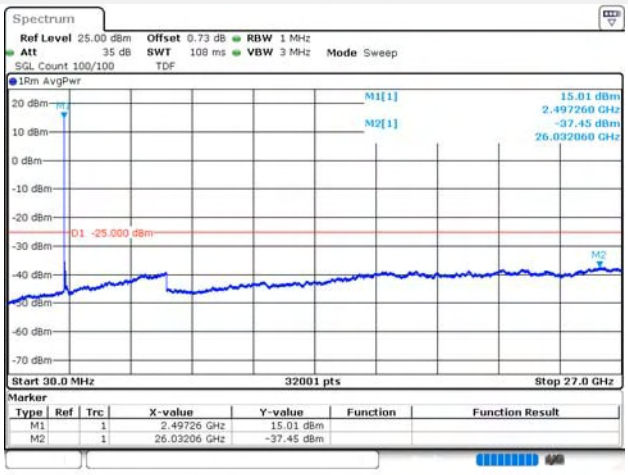
50M BW QPSK High ch.



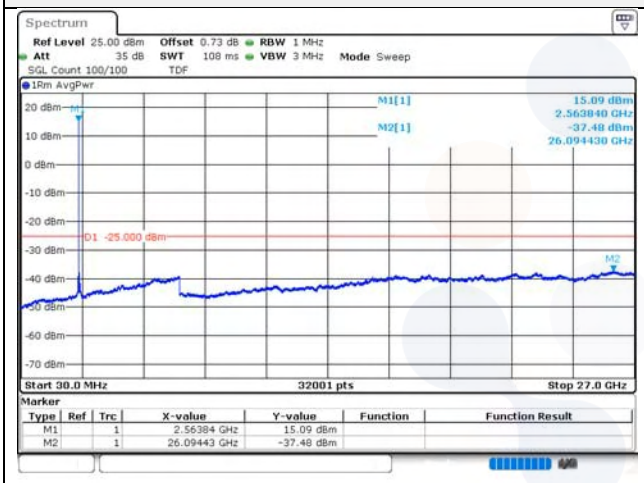
60M BW QPSK Low ch.



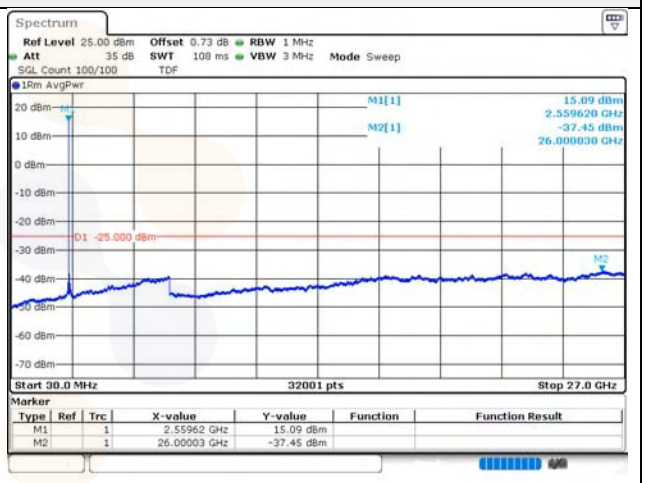
70M BW QPSK Low ch.



60M BW QPSK Mid ch.



70M BW QPSK Mid ch.



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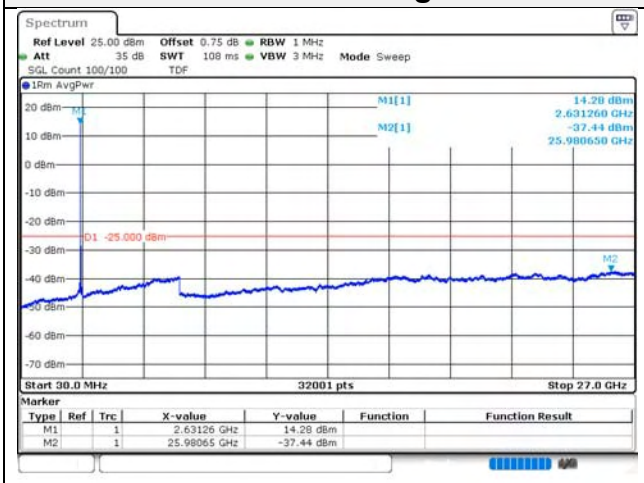

70M BW QPSK High ch.