

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR21-SRF0162

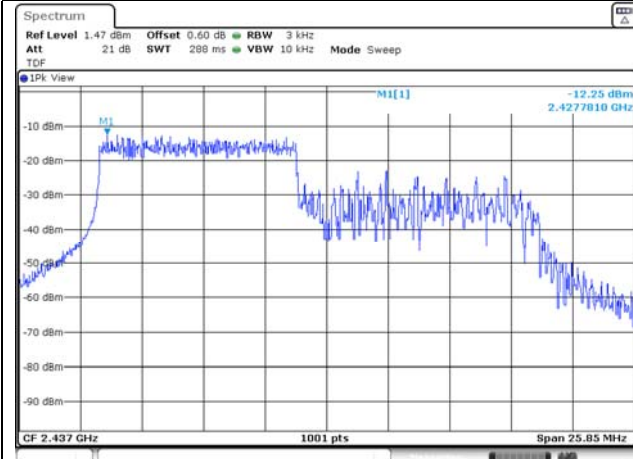
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106T / 2 437 MHz

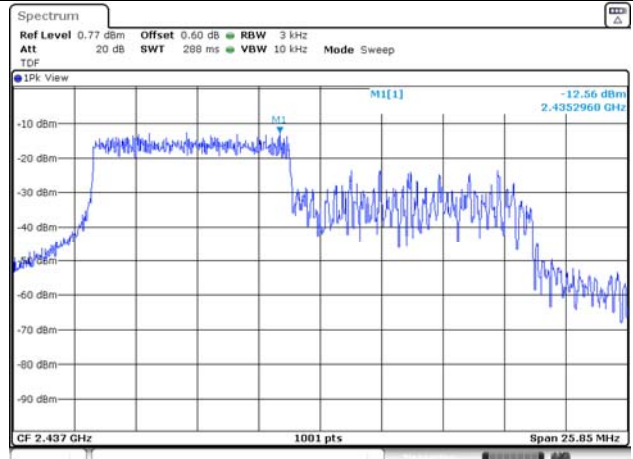
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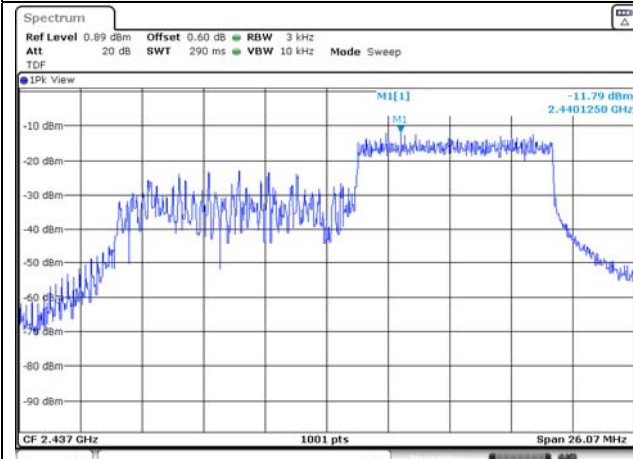


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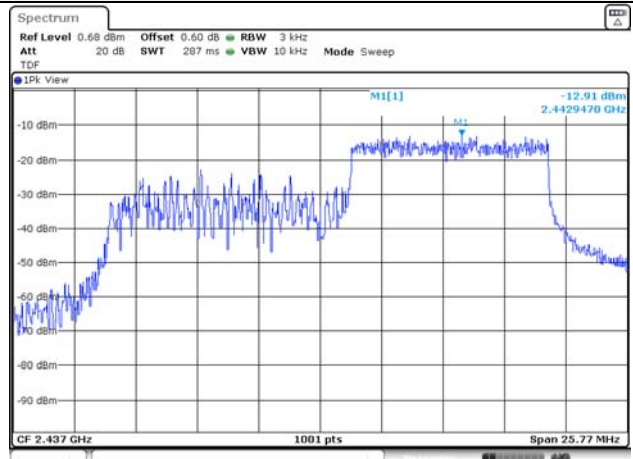
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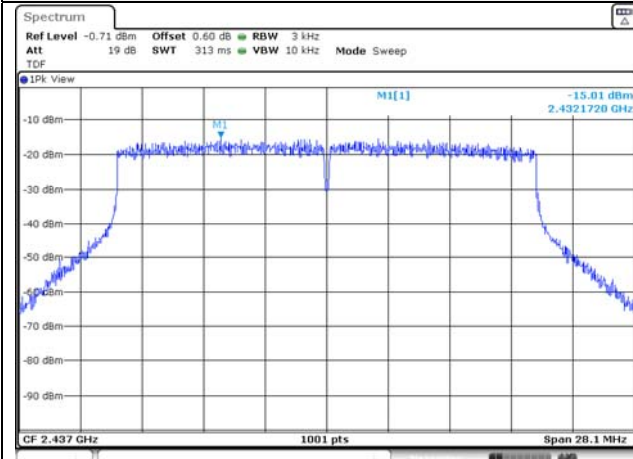


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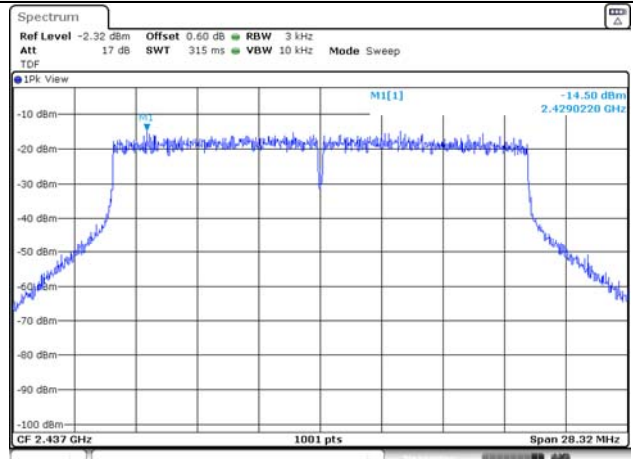


SU / 2 437 MHz

ANT 1



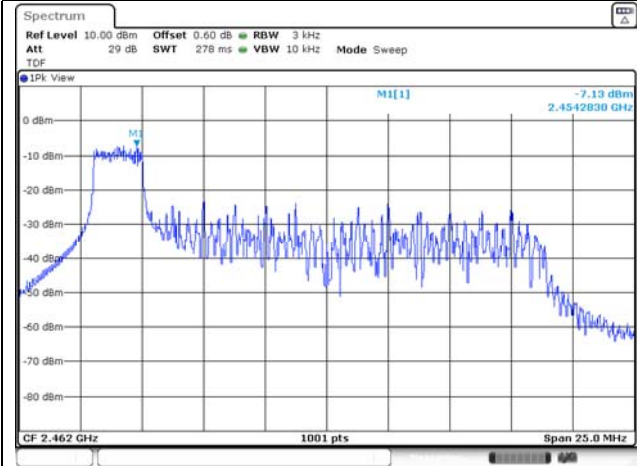
ANT 2



26T / 2 462 MHz

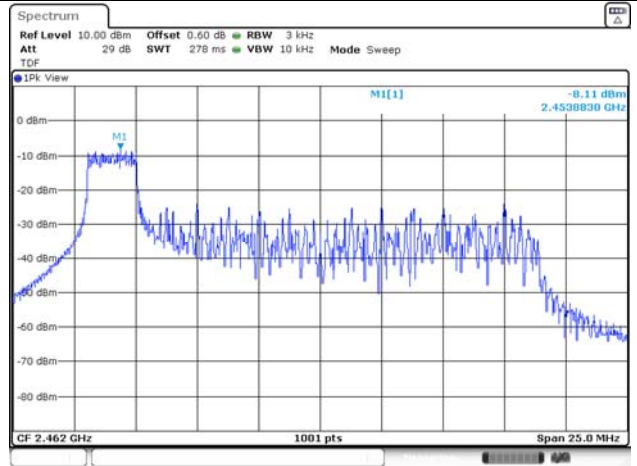
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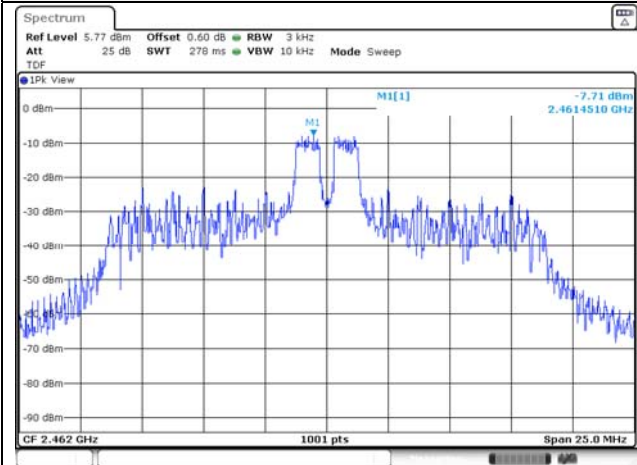


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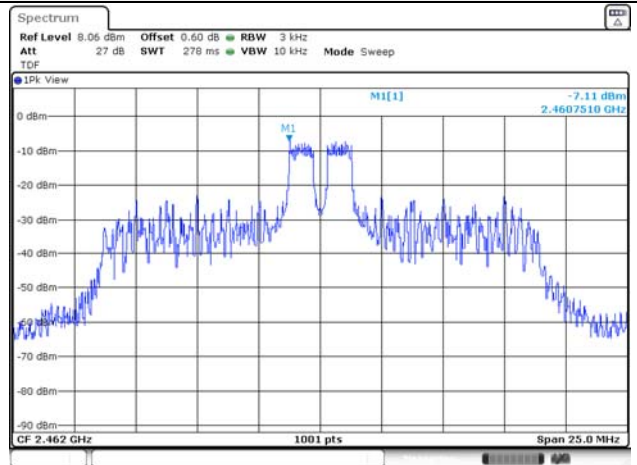
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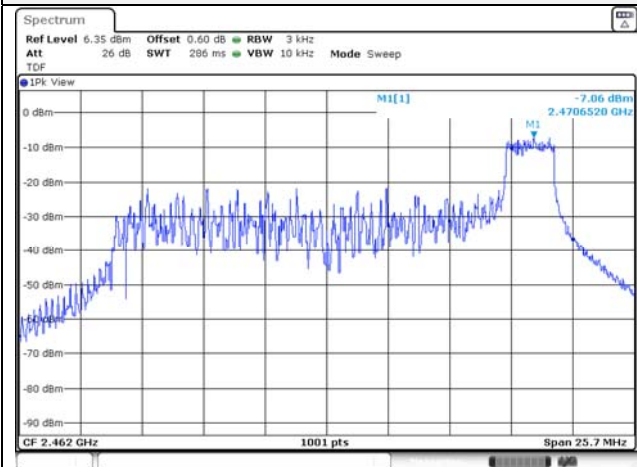
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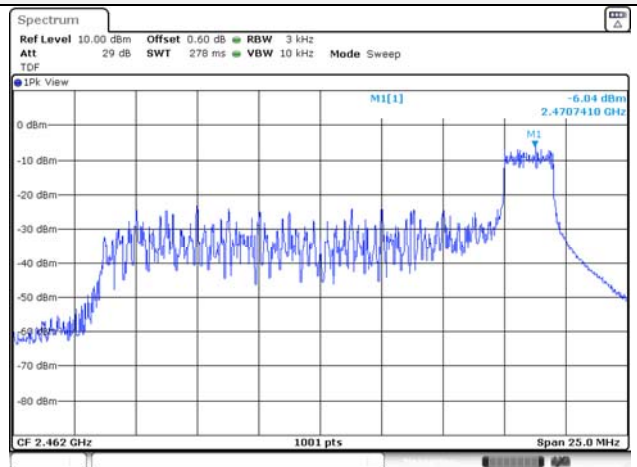
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RU offset 8



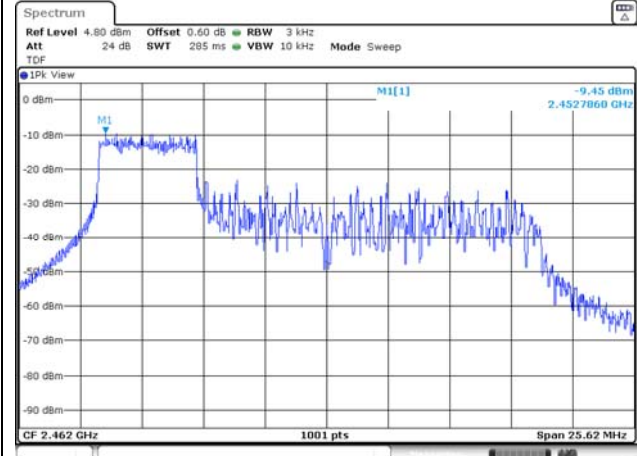
RU offset 8



52T / 2 462 MHz

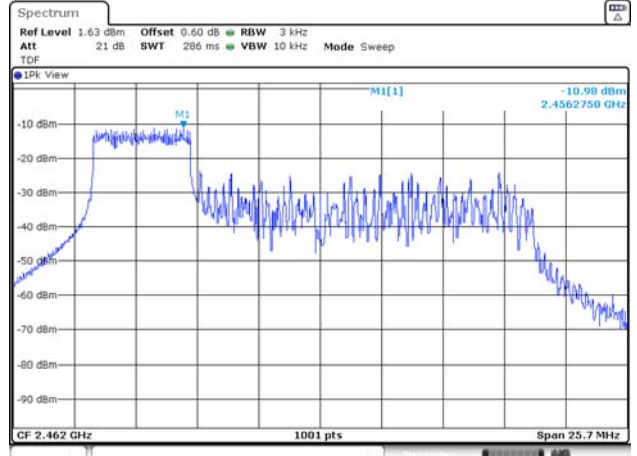
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RU offset 37

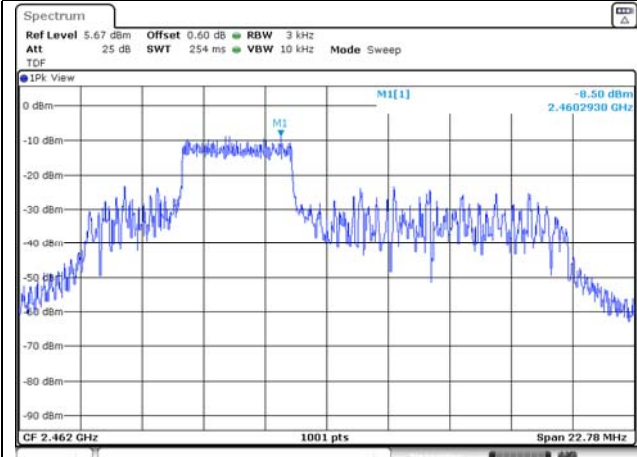


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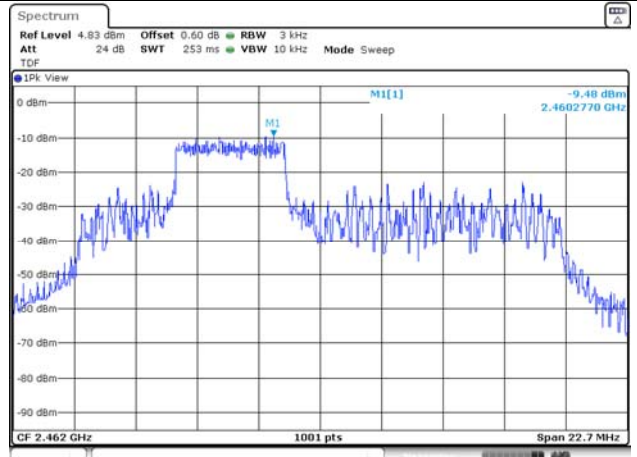
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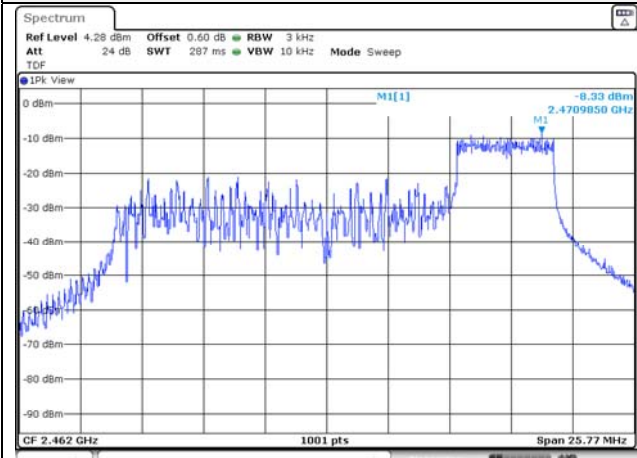
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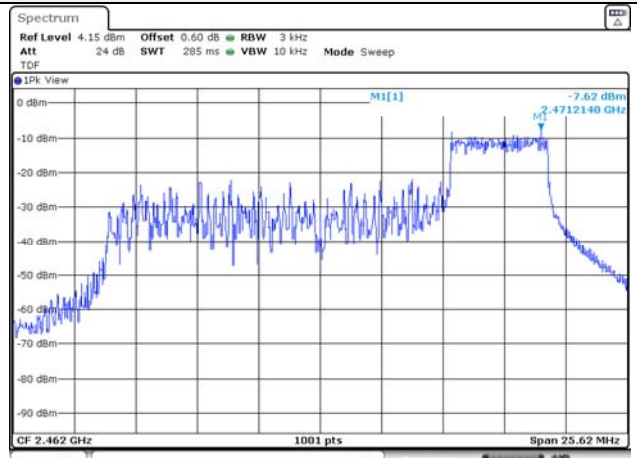
RU offset 38



RU offset 40



RU offset 40



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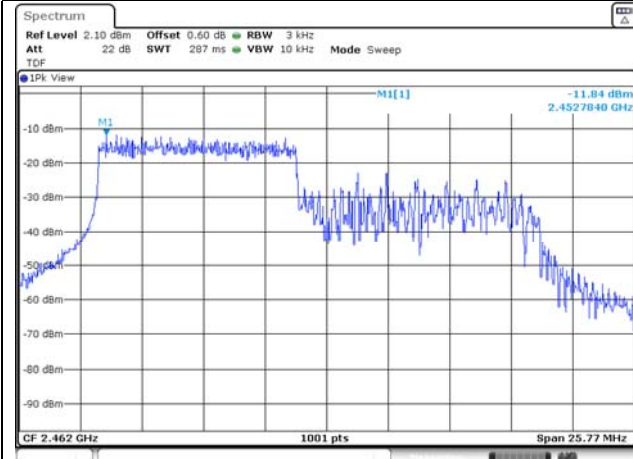
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106T / 2 462 MHz

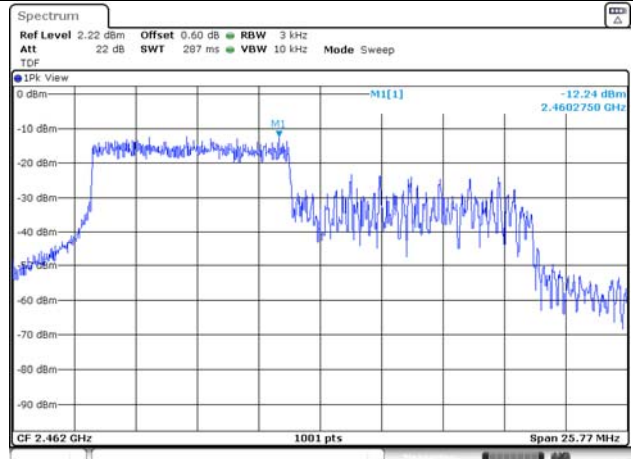
ANT 1

RU offset 53

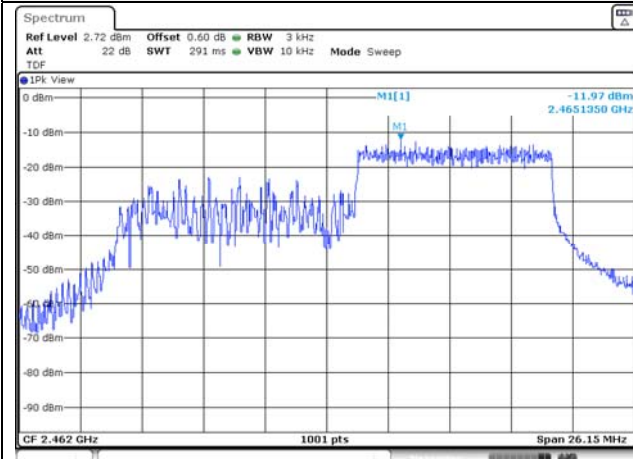


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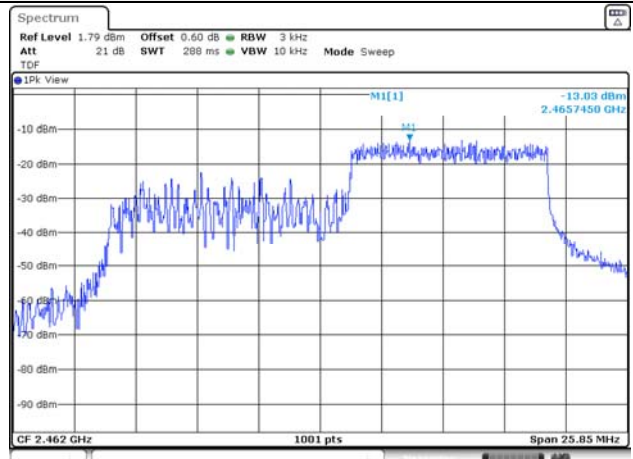
RU offset 53



RU offset 54

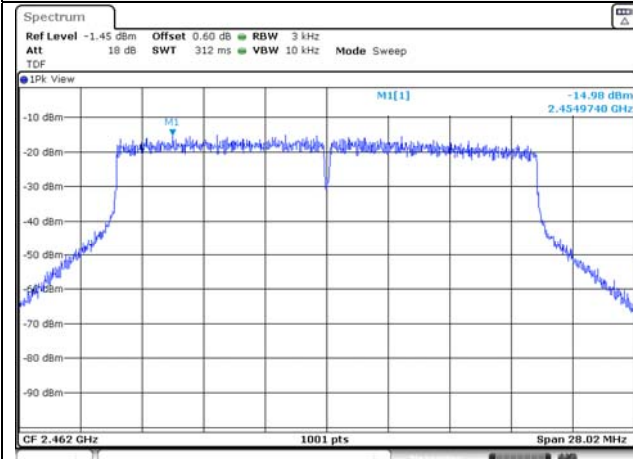


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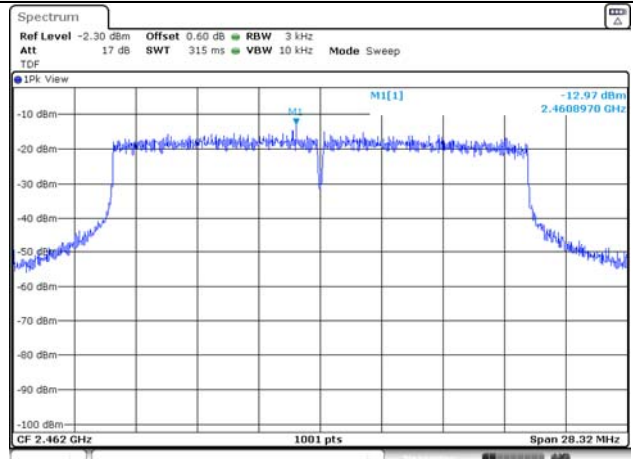


SU / 2 462 MHz

ANT 1



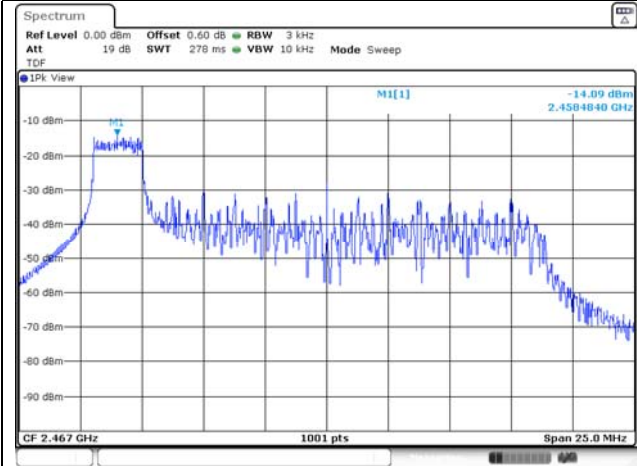
ANT 2



26T / 2 467 MHz

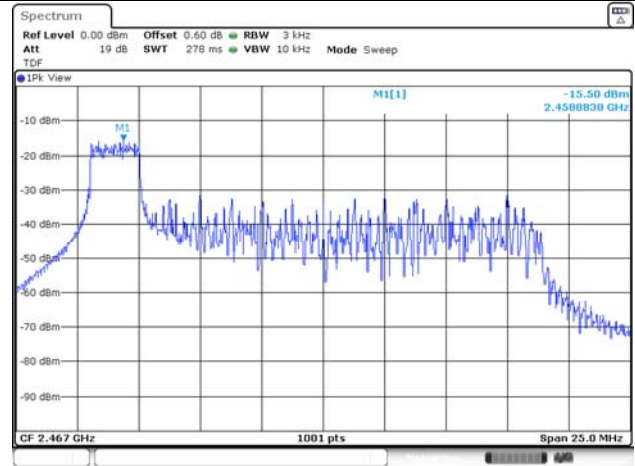
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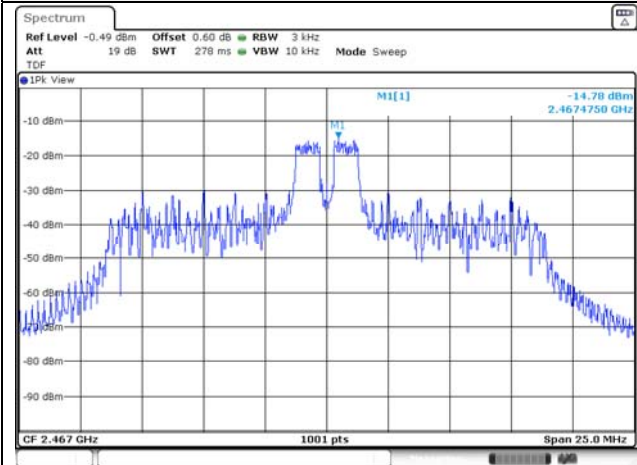


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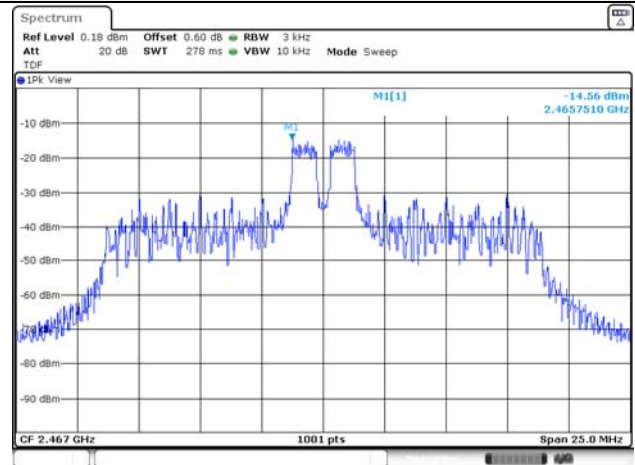
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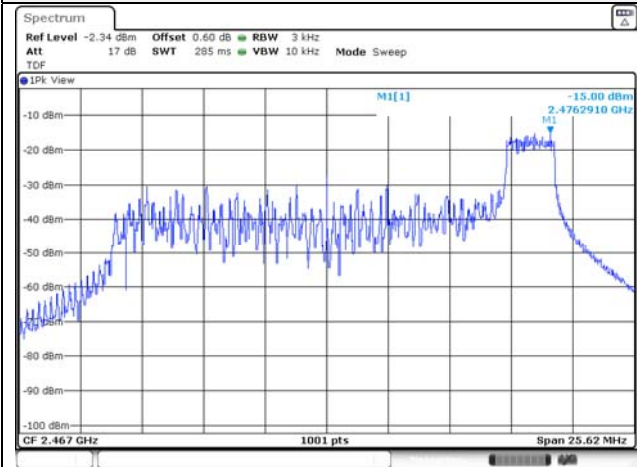
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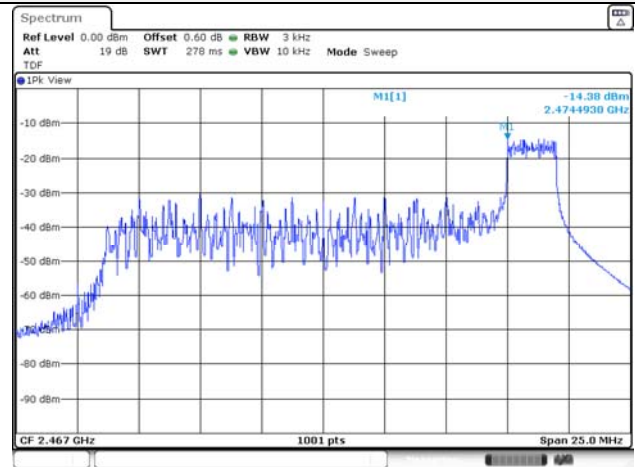
RU offset 4



RU offset 8



RU offset 8



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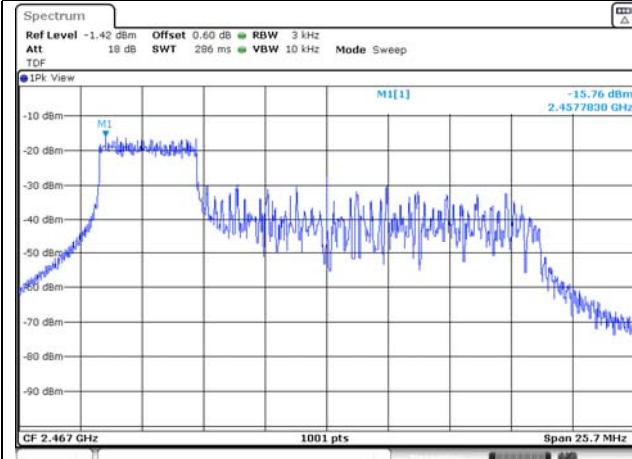
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52T / 2 467 MHz

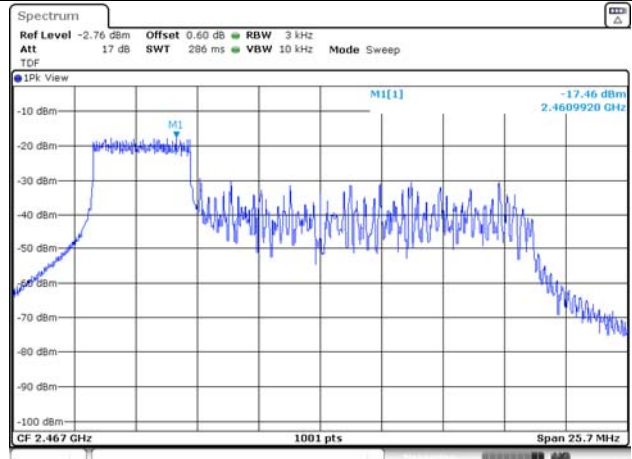
ANT 1

RU offset 37

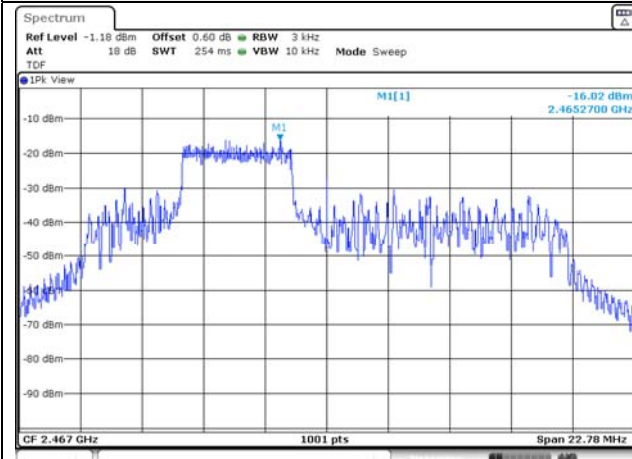


ANT 2

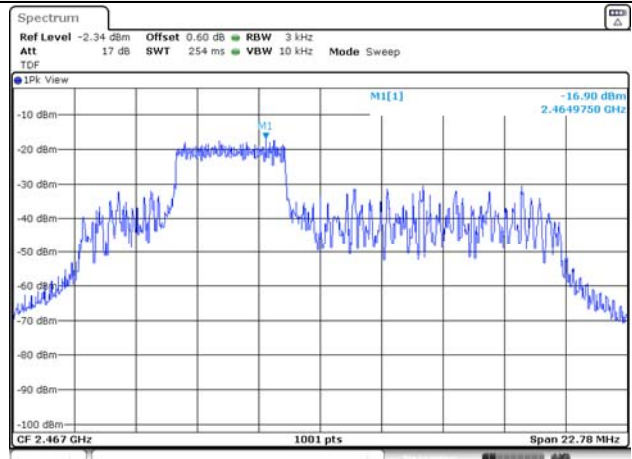
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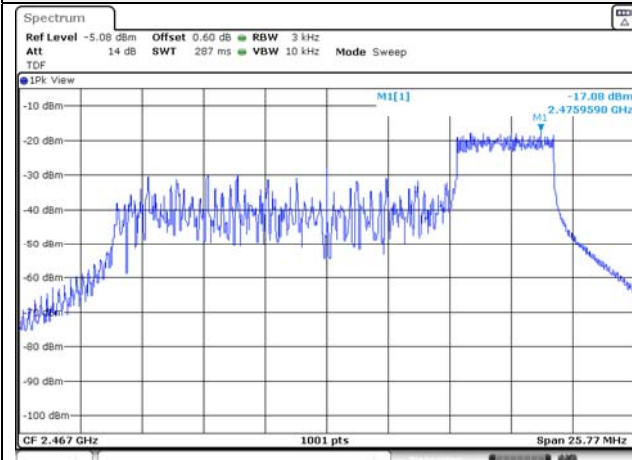
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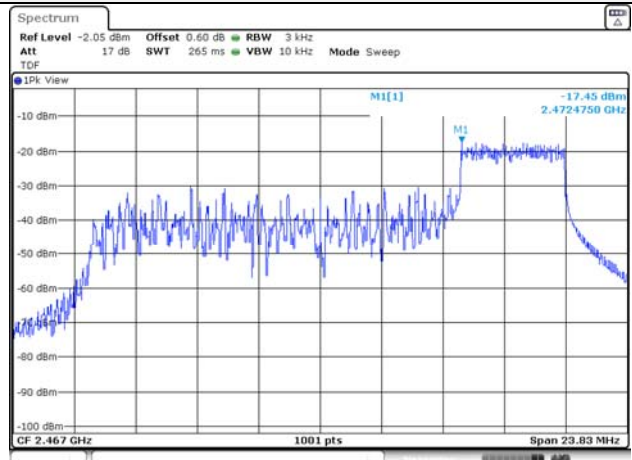
RU offset 38



RU offset 40



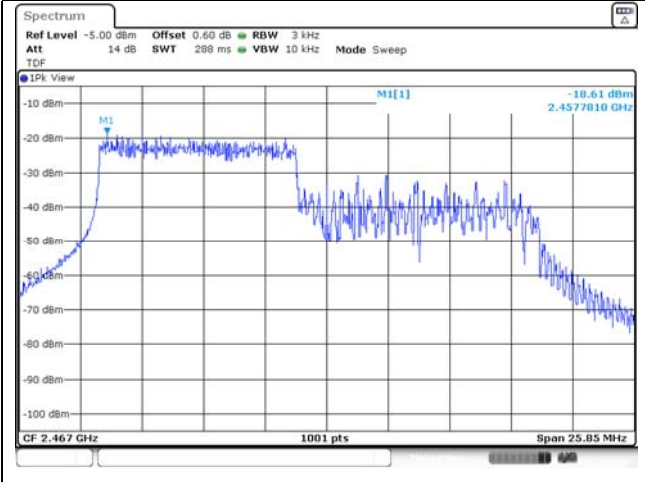
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106T / 2 467 MHz

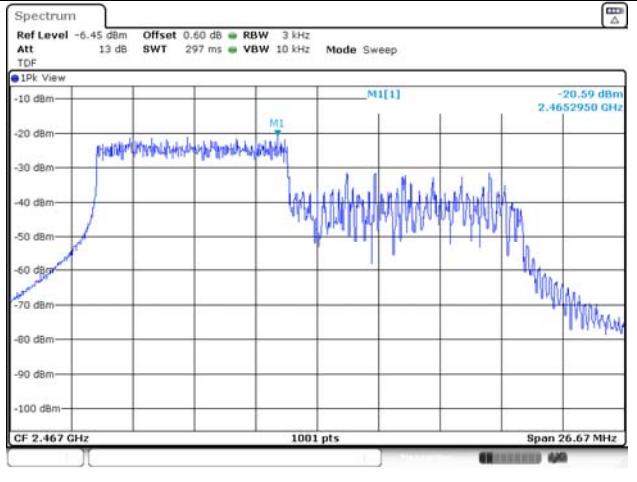
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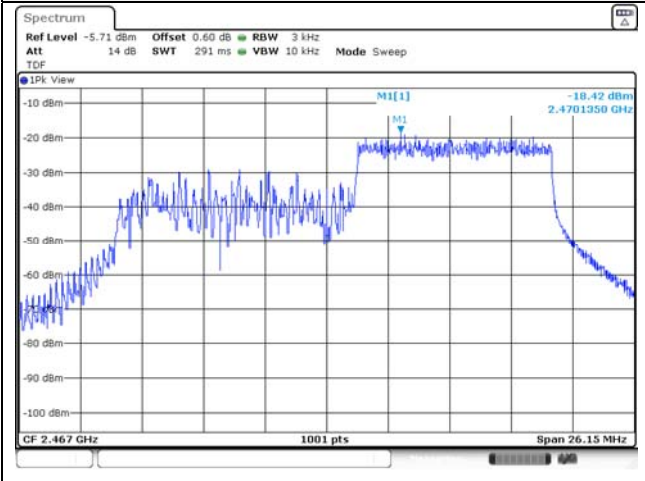


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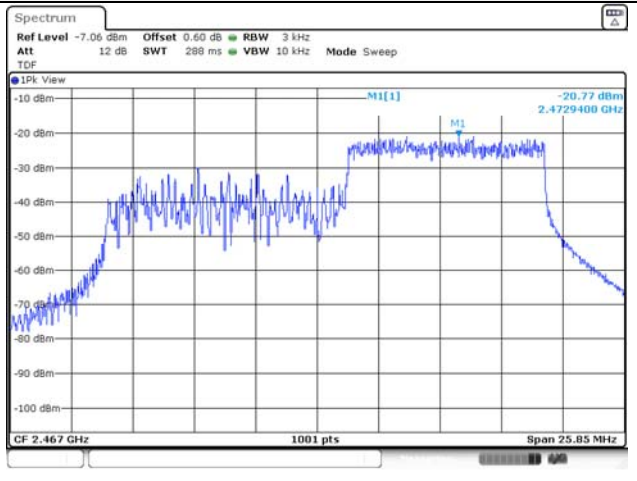
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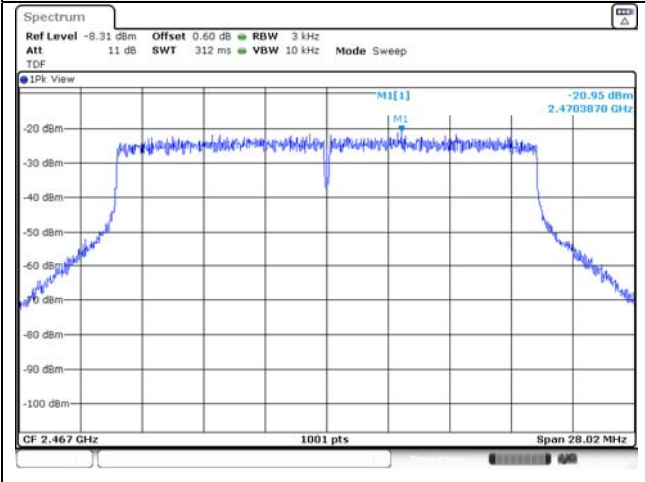


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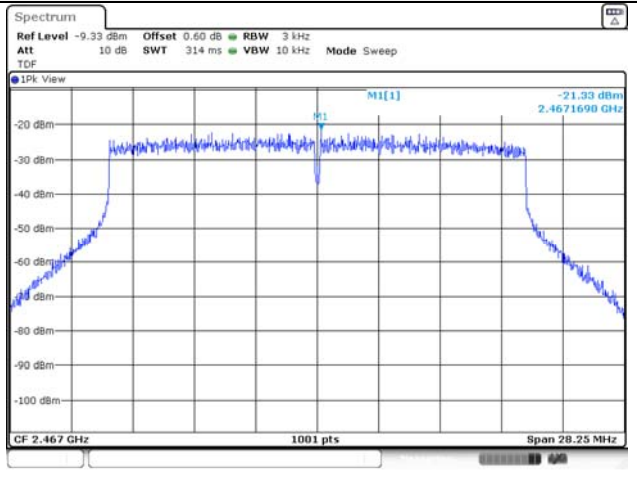


SU / 2 467 MHz

ANT 1



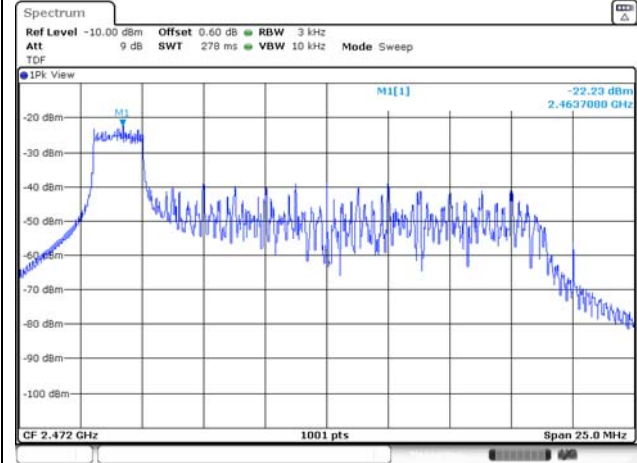
ANT 2



26T / 2 472 MHz

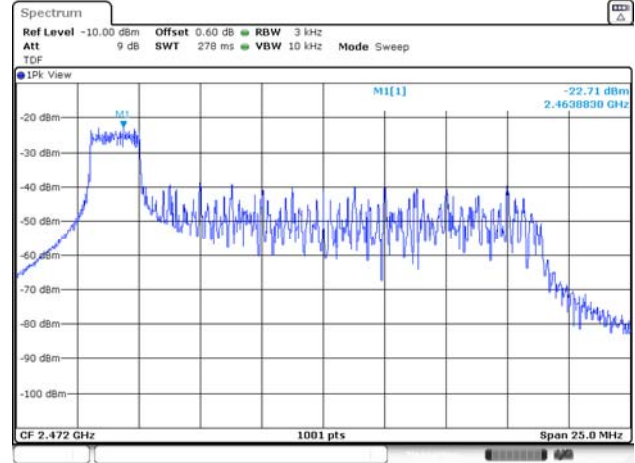
ANT 1

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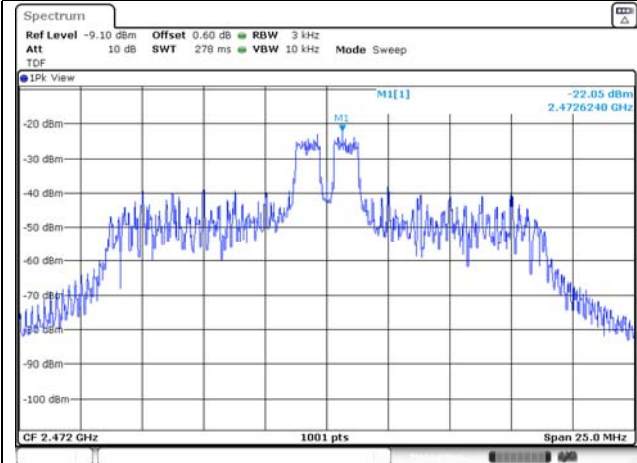


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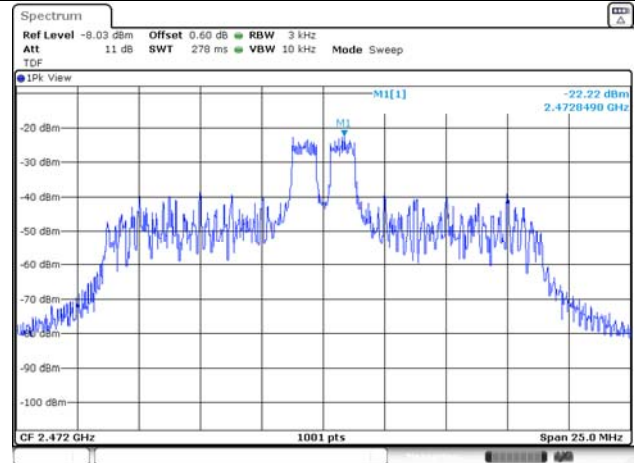
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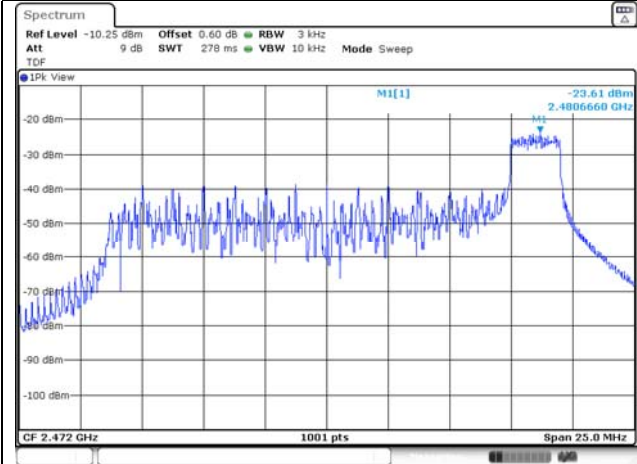
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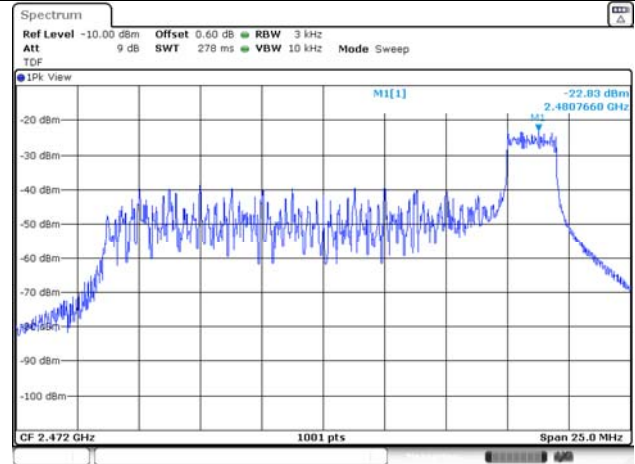
RU offset 4



RU offset 8



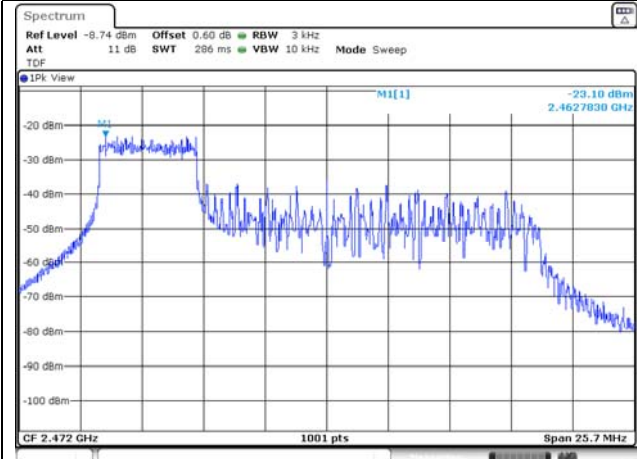
RU offset 8



52T / 2 472 MHz

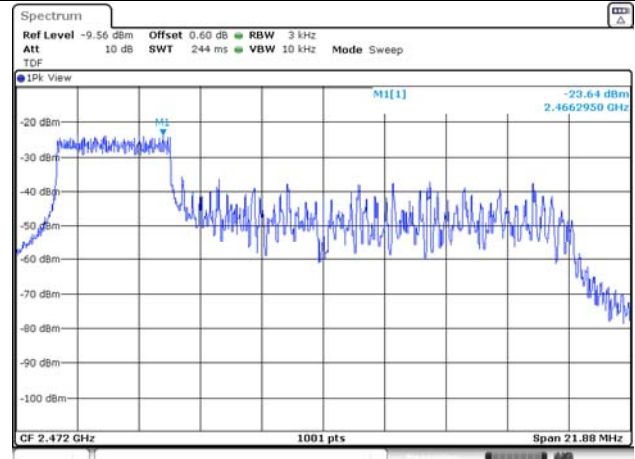
ANT 1

RU offset 37

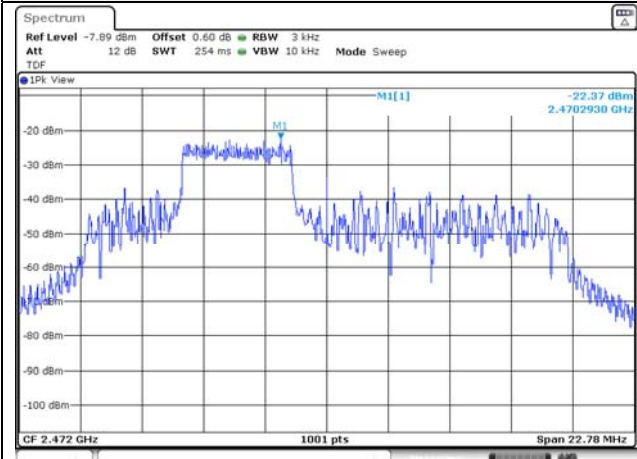


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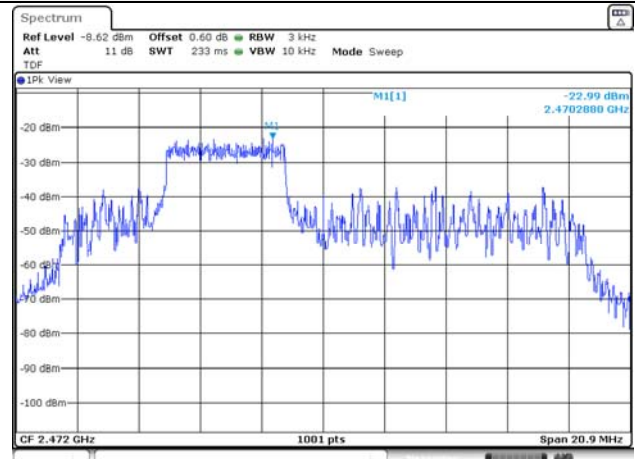
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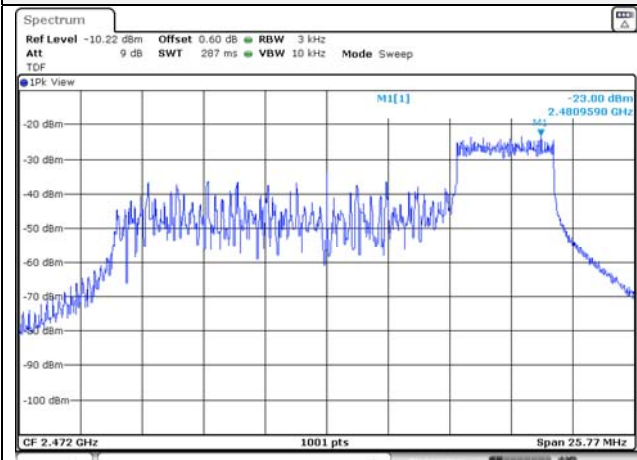
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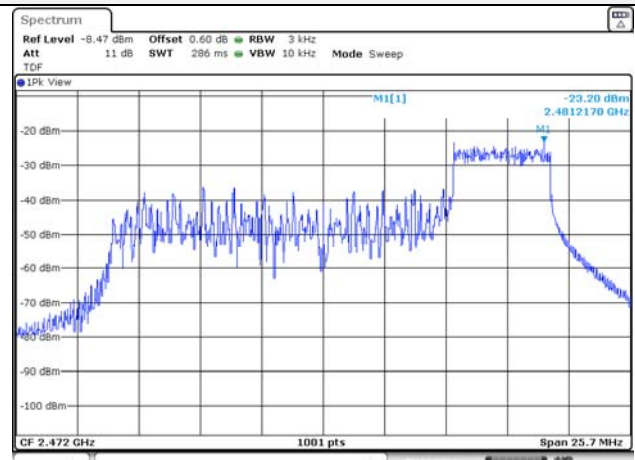
RU offset 38



RU offset 40



RU offset 40



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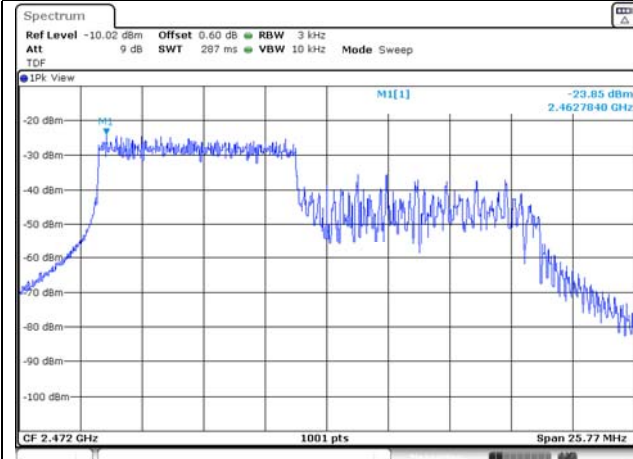
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106T / 2 472 MHz

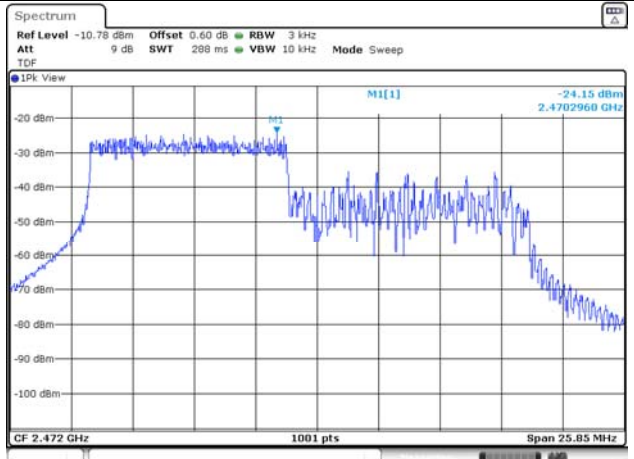
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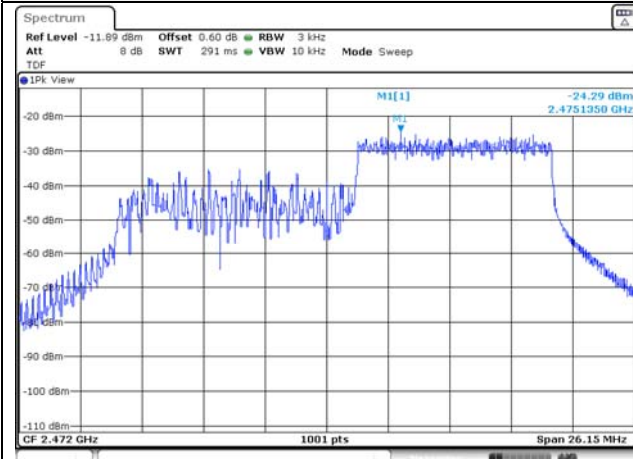


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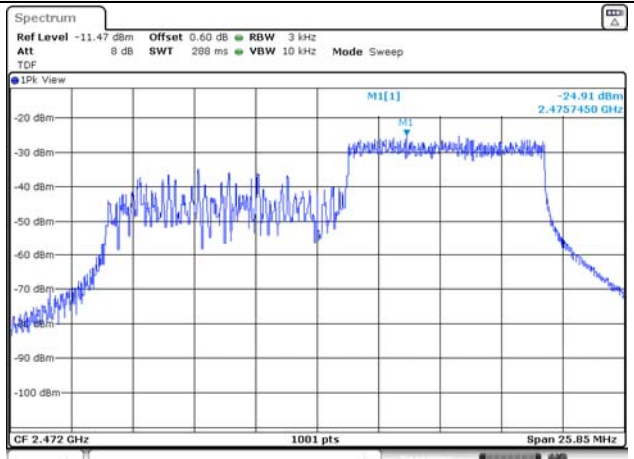
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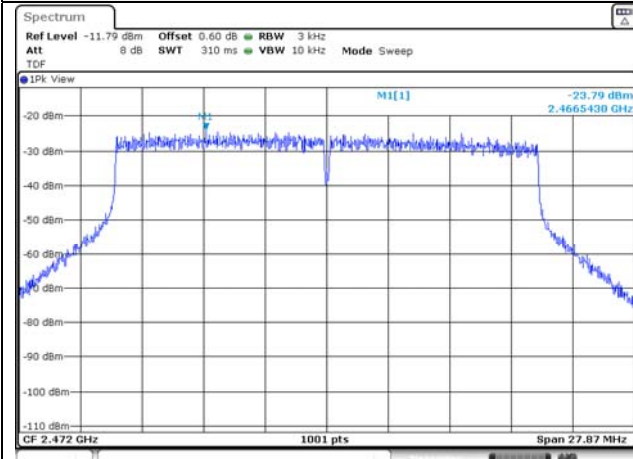


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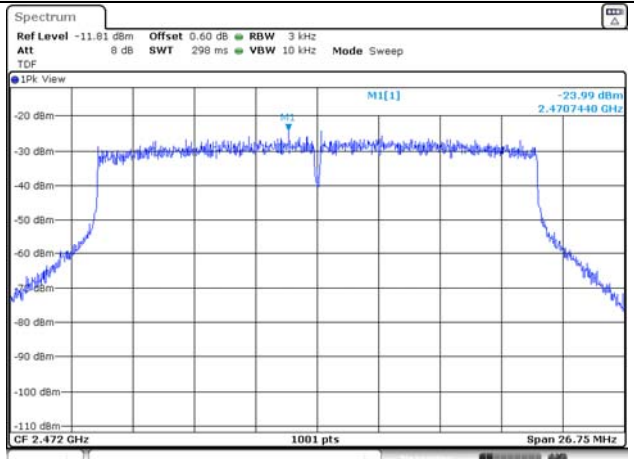


SU / 2 472 MHz

ANT 1

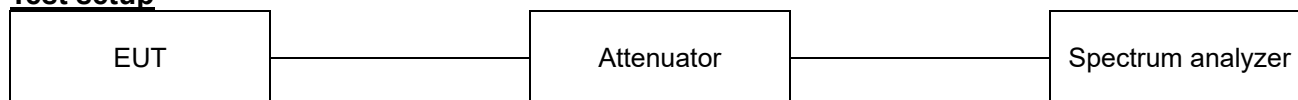


ANT 2



7.3. 6 dB Bandwidth(DTS Channel Bandwidth) & 99% Bandwidth

Test setup



Limit

According to §15.247(a)(2) and RSS-247(5.2), Systems using digital modulation techniques may operate in the 902–928 MHz, 2 400–2 483.5 MHz, and 5 725–5 850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test procedure

ANSI C63.10 - Section 11.8.2

Test settings

DTS bandwidth

One of the following procedures may be used to determine the modulated DTS bandwidth.

Option 1

- 1) Set RBW = 100 kHz.
- 2) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- 3) Detector = Peak.
- 4) Trace mode = max hold.
- 5) Sweep = auto couple.
- 6) Allow the trace to stabilize.
- 7) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Option 2

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described in 11.8.1 (i.e., RBW = 100 kHz, VBW $\geq 3 \times$ RBW, and peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.

Occupied bandwidth (or 99% emission bandwidth)

- ♦ The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- ♦ The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emissions skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.
- ♦ The detector of the spectrum analyzer shall be set to "Sample". However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or "Max hold") may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.
- ♦ The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted

Notes: it may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms, The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

Test results**SISO**

Frequency(MHz)	Tone	RU Offset	6 dB bandwidth(MHz)		99% bandwidth(MHz)	
			ANT 1	ANT 2	ANT 1	ANT 2
2 412	26T	0	17.13	2.20	18.63	18.48
		4	2.75	2.75	17.28	17.18
		8	2.15	2.15	18.38	18.58
	52T	37	17.13	17.13	18.28	18.28
		38	13.94	15.13	17.23	17.03
		40	17.08	17.08	18.18	18.03
	106T	53	17.83	17.23	18.43	18.38
		54	17.13	17.18	18.23	18.33
	SU	-	18.83	18.48	18.93	18.93
2 437	26T	0	2.15	2.20	18.53	18.58
		4	2.75	2.70	17.28	17.33
		8	15.83	2.15	18.58	18.73
	52T	37	17.13	17.13	18.13	18.38
		38	15.18	15.18	17.23	17.23
		40	17.13	17.13	18.03	18.28
	106T	53	17.23	17.23	18.33	18.38
		54	17.18	17.38	18.33	18.33
	SU	-	18.63	18.83	18.93	18.93
2 462	26T	0	2.15	2.15	18.48	18.18
		4	2.70	2.70	16.93	17.33
		8	17.13	2.20	18.68	18.58
	52T	37	17.08	17.13	18.18	18.43
		38	15.18	15.18	17.08	17.18
		40	17.13	15.88	18.33	18.03
	106T	53	17.23	17.23	18.23	18.28
		54	17.18	17.38	18.33	18.38
	SU	-	18.08	18.83	18.93	18.93
2 467	26T	0	2.20	2.15	18.48	18.58
		4	7.69	2.75	17.38	17.28
		8	17.13	2.15	18.68	18.53
	52T	37	17.13	17.18	18.28	18.38
		38	15.18	15.23	17.23	17.18
		40	17.18	17.13	18.38	18.23
	106T	53	17.23	17.23	18.28	18.28
		54	17.88	17.43	18.38	18.38
	SU	-	18.23	18.93	18.93	18.93
2 472	26T	0	2.15	2.15	18.53	18.43
		4	2.75	2.75	17.28	17.28
		8	2.20	15.88	18.68	18.73
	52T	37	17.13	17.13	18.28	18.33
		38	15.18	15.18	17.23	17.08
		40	17.18	17.13	18.38	18.18
	106T	53	17.23	17.23	18.28	18.28
		54	17.43	17.43	18.38	18.33
	SU	-	18.73	18.68	18.93	18.88

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**MIMO**

Frequency(MHz)	Tone	RU Offset	6 dB bandwidth(MHz)		99% bandwidth(MHz)	
			ANT 1	ANT 2	ANT 1	ANT 2
2 412	26T	0	2.20	2.15	18.48	18.43
		4	13.84	2.75	17.33	17.08
		8	2.15	2.15	18.48	18.23
	52T	37	17.13	17.03	18.33	18.13
		38	15.18	15.13	17.28	17.13
		40	17.18	17.08	18.33	18.08
	106T	53	18.13	17.78	18.33	18.28
		54	17.38	17.18	18.28	18.33
	SU	-	18.88	18.98	18.93	18.93
	2 437	26T	0	2.20	2.15	18.58
4			7.69	2.70	17.38	17.23
8			2.15	2.15	18.53	18.43
52T		37	17.13	17.08	18.28	18.33
		38	15.18	15.13	17.28	17.18
		40	17.13	17.08	18.38	18.18
106T		53	17.23	17.23	18.28	18.28
		54	17.38	17.18	18.33	18.33
SU		-	18.73	18.88	18.93	18.93
2 462		26T	0	2.15	2.15	18.58
	4		8.89	2.70	17.33	17.18
	8		17.13	2.20	18.58	18.43
	52T	37	17.08	17.13	18.28	18.38
		38	15.18	15.13	17.28	17.08
		40	17.18	17.08	18.43	18.23
	106T	53	17.18	17.18	18.38	18.23
		54	17.43	17.23	18.33	18.38
	SU	-	18.68	18.88	18.93	18.98
	2 467	26T	0	2.15	2.15	18.63
4			8.99	2.70	17.38	17.18
8			17.08	2.20	18.58	18.38
52T		37	17.13	17.13	18.28	18.23
		38	15.18	15.18	17.43	17.18
		40	17.18	15.88	18.43	18.18
106T		53	17.23	17.78	18.28	18.23
		54	17.43	17.23	18.38	18.33
SU		-	18.68	18.83	18.93	18.88
2 472		26T	0	2.15	2.15	18.58
	4		8.94	2.70	17.38	17.18
	8		15.83	2.20	18.53	18.43
	52T	37	17.13	14.59	18.33	18.23
		38	15.18	13.94	17.28	17.13
		40	17.18	17.13	18.38	18.18
	106T	53	17.18	17.23	18.28	18.18
		54	17.43	17.23	18.38	18.28
	SU	-	18.58	17.83	18.93	18.78

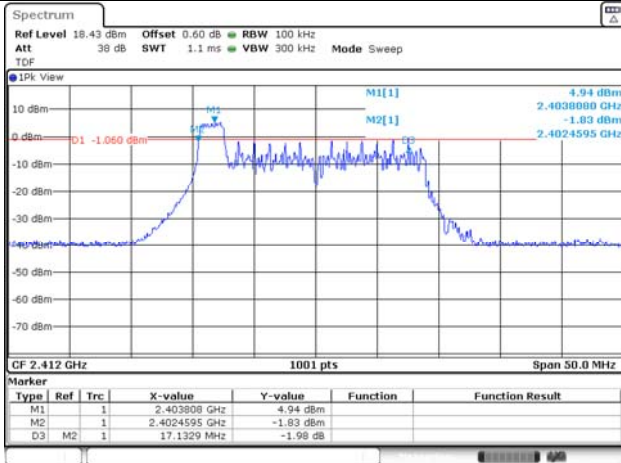
SISO

6 dB bandwidth

26T / 2 412 MHz

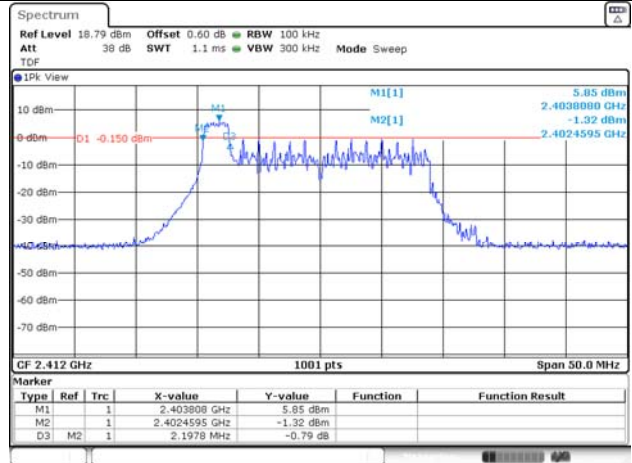
ANT 1

RU offset 0

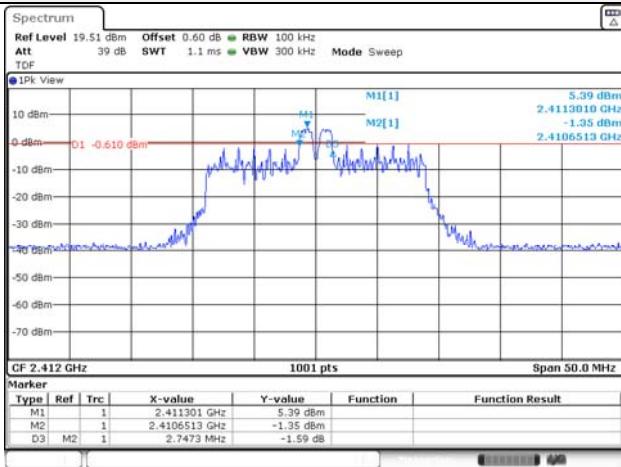


ANT 2

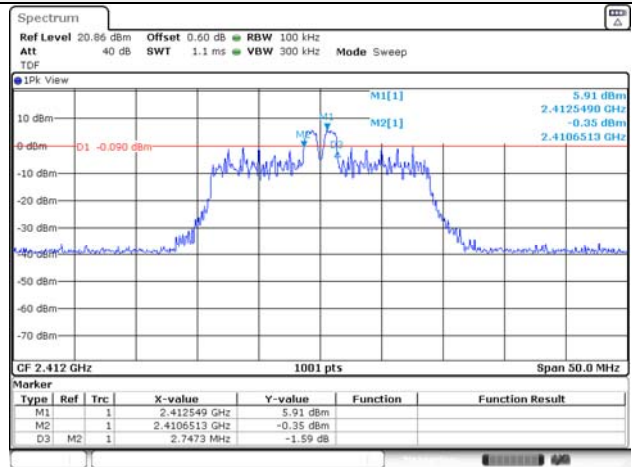
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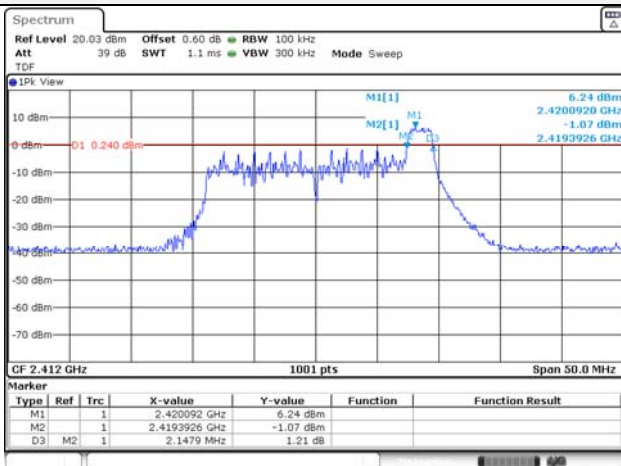
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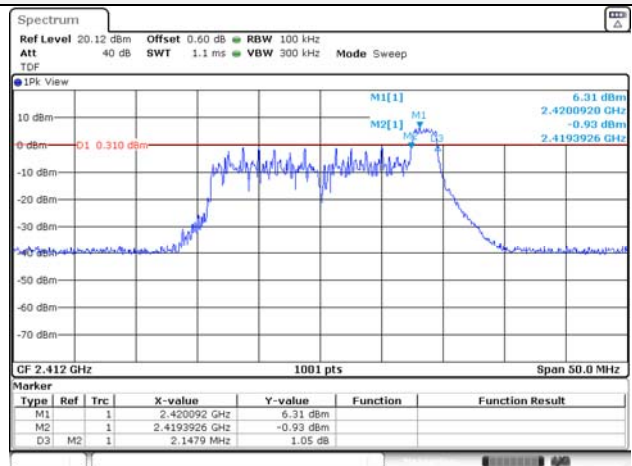
RU offset 4



RU offset 8



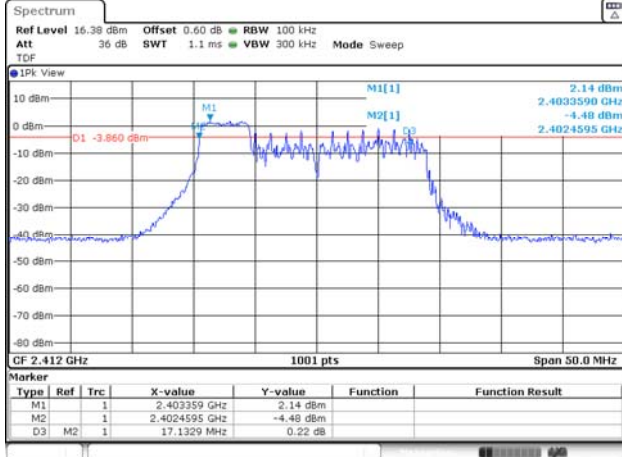
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52T / 2 412 MHz

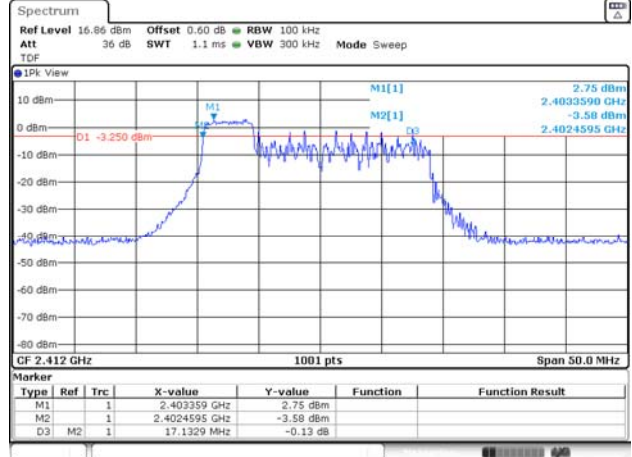
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RU offset 37

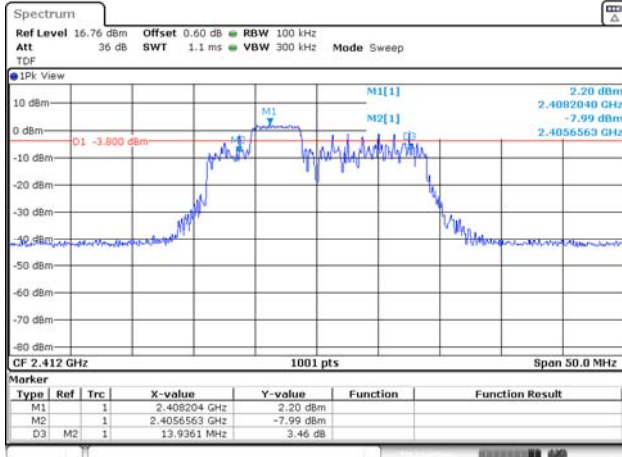


ANT 2

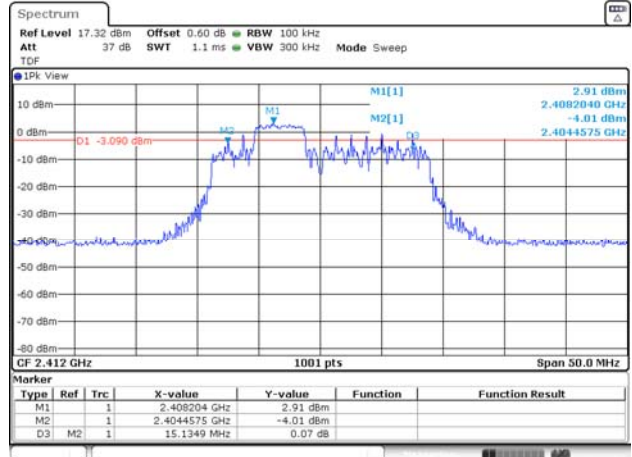
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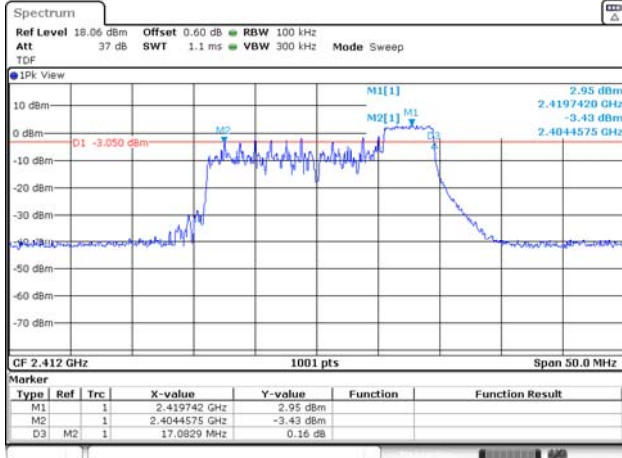
RU offset 38



RU offset 38



RU offset 40



RU offset 40

