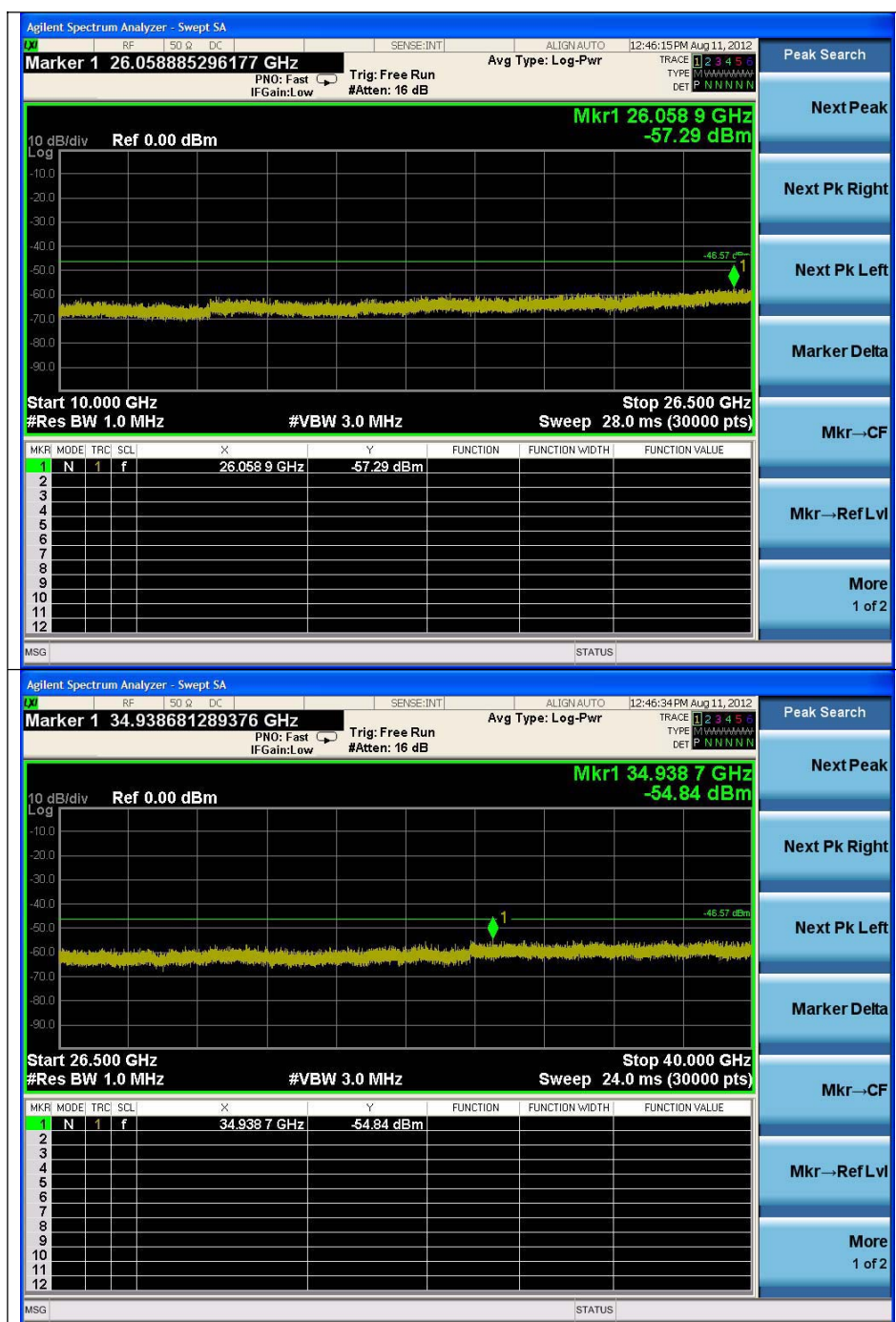




Note:

Offset (dB) = Power Divider (dB) + Attenuator (dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	offset (dB)	Reading values (dB m)	Result (dB m)
5 850.0	16.97	-69.00	-52.03
5 850.5	16.97	-67.41	-50.44
7 767.3	18.91	-56.01	-37.10
26 058.9	Noise level	-	-
34 938.7	Noise level	-	-

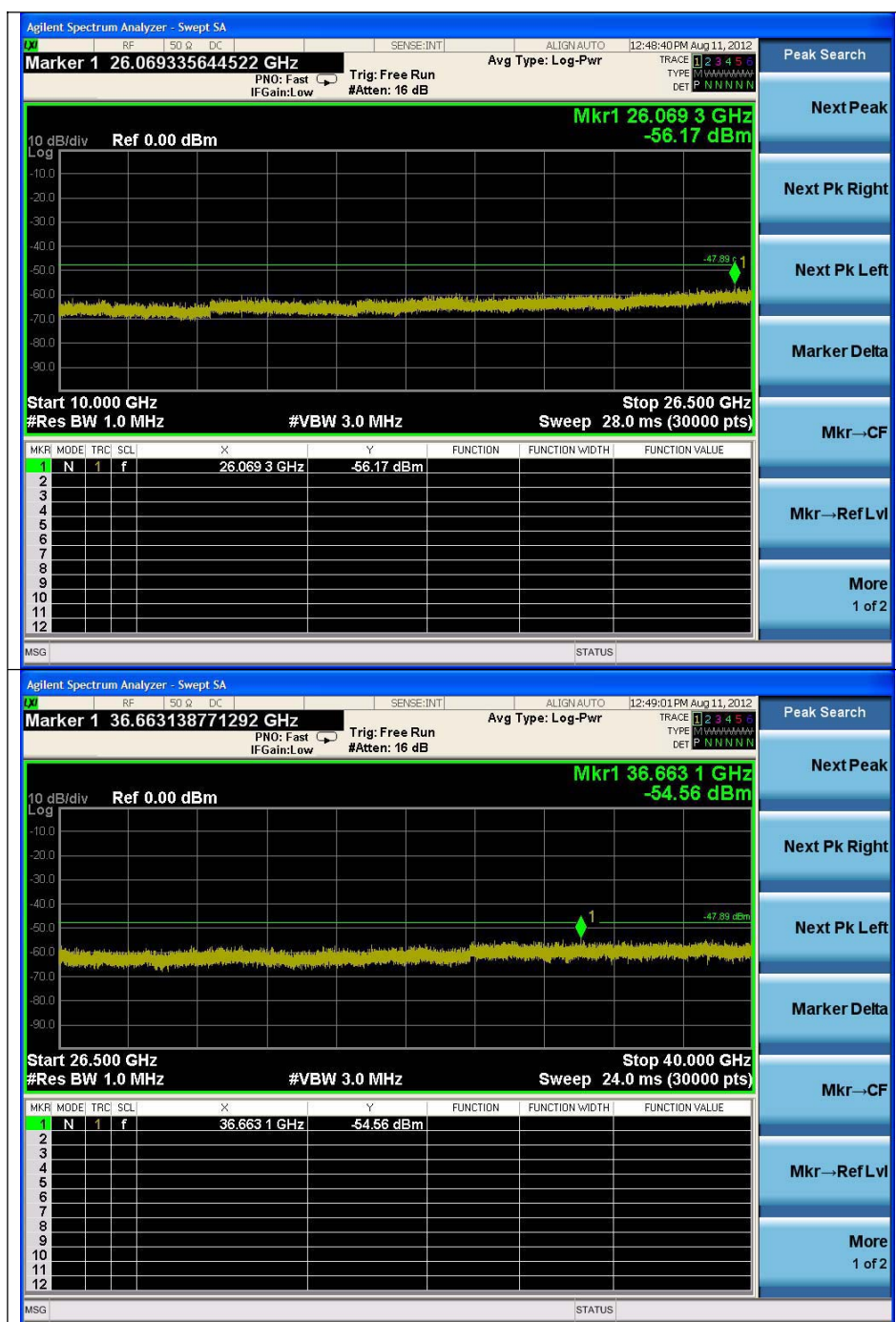
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OFDM : 802.11n_HT40(MCS0)

Low Channel



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Note:

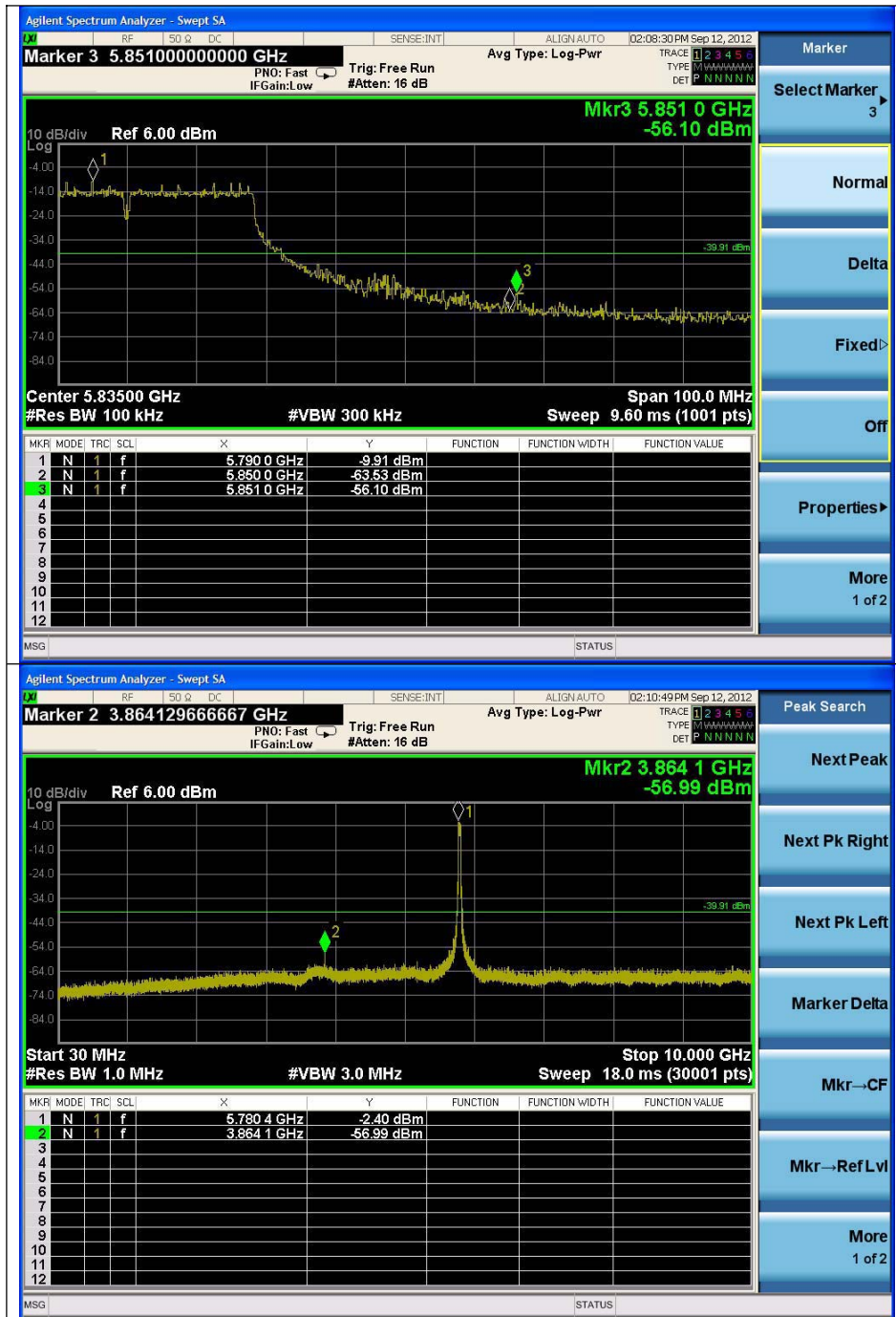
Offset (dB) = Power Divider (dB) + Attenuator (dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

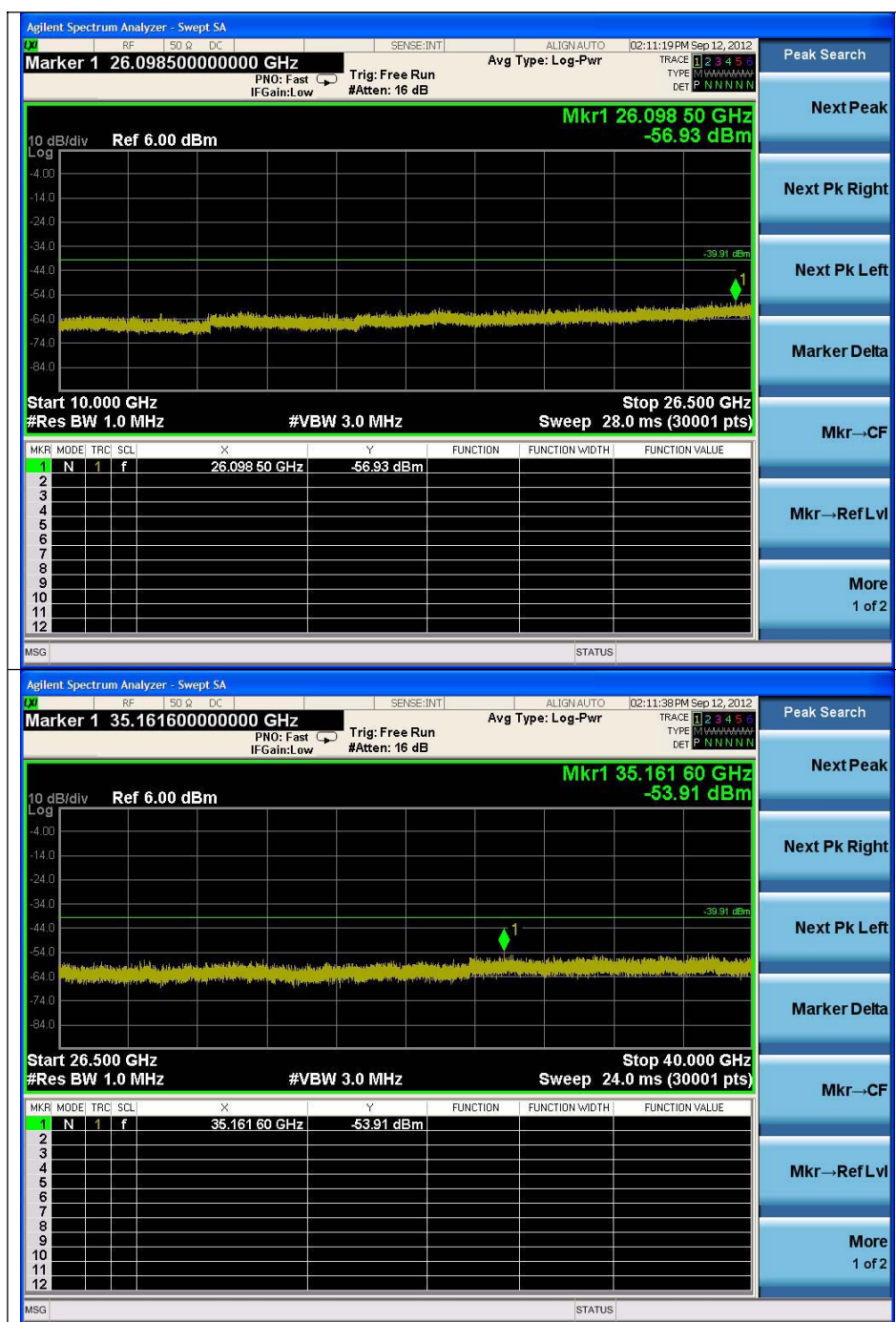
Frequency (MHz)	offset (dB)	Reading values (dB m)	Result (dB m)
5 725.0	16.97	-57.92	-40.95
7 673.9	18.91	-56.70	-37.79
26 069.3	Noise level	-	-
36 663.1	Noise level	-	-

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High Channel



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Note:

Offset (dB) = Power Divider (dB) + Attenuator (dB) + Cable loss (dB)

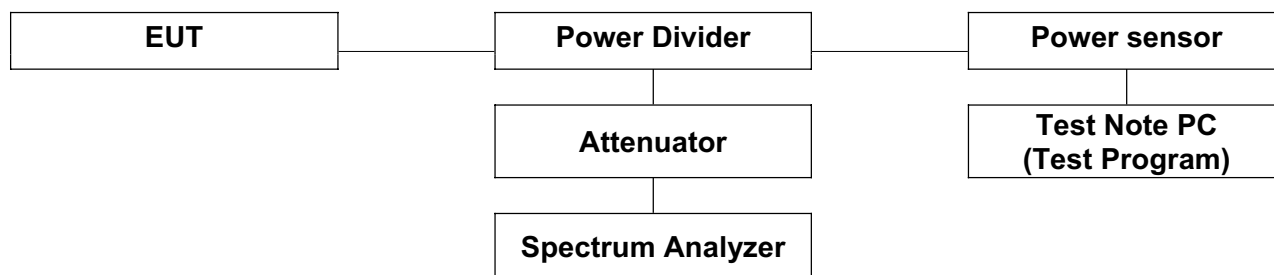
Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	offset (dB)	Reading values (dB m)	Result (dB m)
3 864.1	9.56	-56.99	-47.43
5 850.0	10.50	-63.60	-53.10
5 851.0	10.50	-56.10	-45.60
26 098.5	Noise level	-	-
35 161.6	Noise level	-	-

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3.6. 6 dB Bandwidth Measurement

3.1. Test Setup



3.2. Limit

According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902 ~928 MHz, 2 400 ~ 2 483.5 MHz, and 5 725 ~ 5 825 MHz bands. The minimum of 6 dB Bandwidth shall be at least 500 kHz

3.3. Test Procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

The test follows section 5.1 of FCC KDB Publication 558074

1. Set resolution bandwidth (RBW) = 1 – 5 % of the emission bandwidth (EBW).
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 point (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. Compare the resultant bandwidth with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is 1 – 5 %.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

3.4. Test Results

Ambient temperature : (24 ± 2) °C
Relative humidity : 47 % R.H.

Operation Mode	Data Rate (Mbps)	Channel	Channel Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
DSSS (802.11b)	1	Low	2 412	9.20	0.5
		Middle	2 437	9.55	
		High	2 462	9.05	
OFDM (802.11g)	6	Low	2 412	15.90	
		Middle	2 437	16.10	
		High	2 462	16.10	
OFDM (802.11n_HT20)	MCS0	Low	2 412	17.30	
		Middle	2 437	17.40	
		High	2 462	17.55	
OFDM (802.11a)	6	Low	5 745	16.65	
		Middle	5 785	16.60	
		High	5 825	16.60	
OFDM (802.11n_HT20)	MCS0	Low	5 745	17.75	
		Middle	5 785	17.80	
		High	5 825	17.80	
OFDM (802.11n_HT40)	MCS0	Low	5 755	35.95	
		High	5 795	35.80	

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6 dB Bandwidth

DSSS : 802.11b

Low Channel



Middle Channel



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High Channel



OFDM : 802.11g

Low Channel



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Middle Channel



High Channel



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OFDM : 802.11n_HT20

Low Channel



Middle Channel



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High Channel



OFDM : 802.11a

Low Channel



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Middle Channel



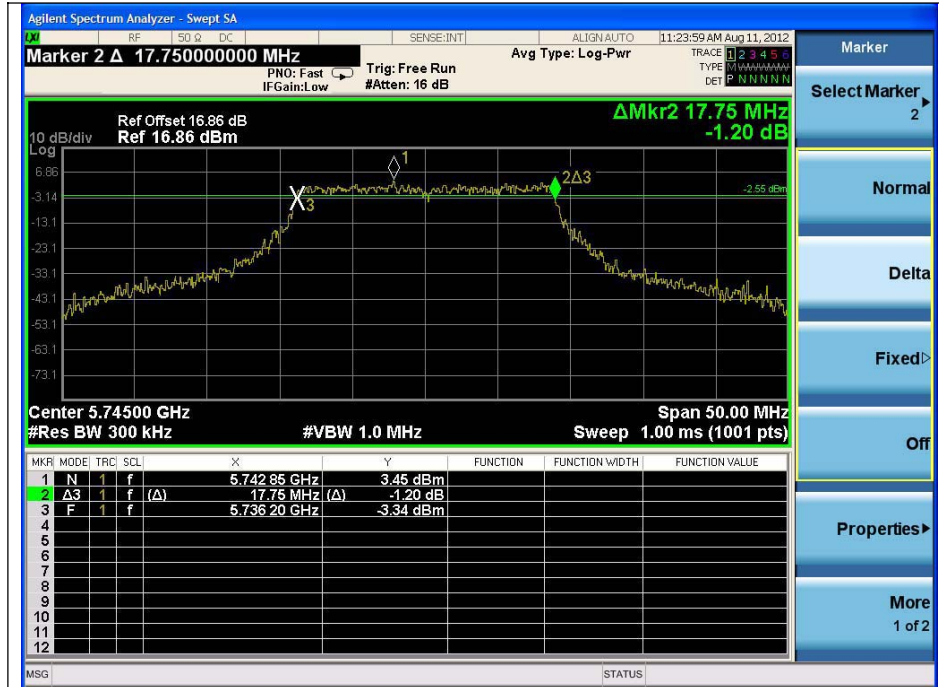
High Channel



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OFDM : 802.11n_HT20

Low Channel



Middle Channel



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High Channel



OFDM : 802.11n_HT40

Low Channel



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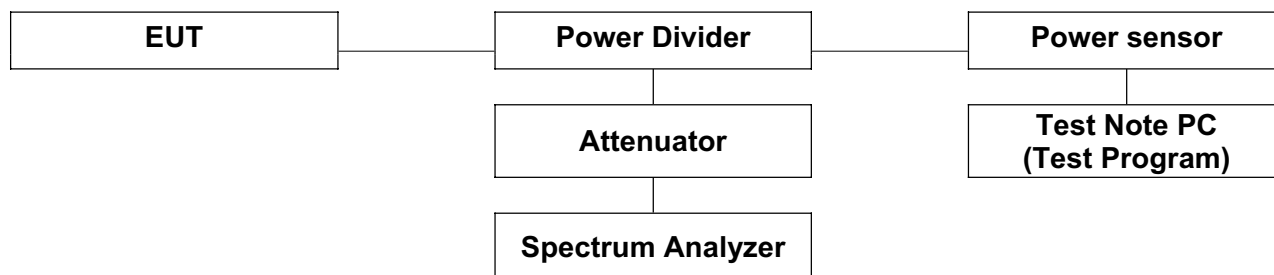
High Channel



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4. Maximum Peak Output Power Measurement

4.1. Test Setup



4.2. Limit

According to §15.247(b)(3), for systems using digital modulation in the 902 ~ 928 MHz, 2 400 ~2 483.5 MHz, and 5 725 ~ 5 850 MHz band: 1 Watt. As an alternative to a peak power measurement, compliance with the one watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antenna elements. The average must not include any intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

According to §15.247(b)(4), the conducted output power limit specified in paragraph(b) of this section is based on the use of antenna with directional gains that do not exceed 6 dBi. Except as shown in paragraph(c) of this section, if transmitting antenna of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraph (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.3. Test Procedure

4.3.1. 11b, g, n_HT20

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power sensor.
3. Test program : (S/W name : R&S Power Viewer, Version : 3.2.0)
4. Measure peak & average power each channel.

4.3.2. 11n_HT40

Peak measurements are recorded using the PK2 measurement procedure in section 5.2 of KDB 558074.

1. This procedure provides an integrated measurement alternative when the maximum available RBW < EBW.
2. Set the RBW = 1 MHz
3. Set the VBW = 3 MHz
4. Set the span to a value that is 5 – 30 % greater than the EBW.
5. Detector = Peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges (for some analyzers, this may require a manual override to ensure use of peak detector). If the spectrum analyzer does not have a band power function, sum the spectrum levels (in linear power units) at 1 MHz intervals extending across the EBW of the spectrum.

Average measurements are recorded using the AVG2 measurement procedure in section 5.2 of KDB 558074.

1. Set the analyzer span to 5 - 30 % greater than the EBW.
2. Set the RBW = 1 MHz.
3. Set the VBW $\geq$ 3 MHz.
4. Detector = power average (RMS) or sample.
5. Ensure that the number of measurement points in the sweep $\geq 2 \times (\text{span/RBW})$.
6. Sweep time : auto couple.
7. Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges to determine the maximum conducted output power of the EUT over the EBW. If the analyzer does not have a band power function, sum the spectral levels(in Linear power units) at 1 MHz intervals extending across the entire EBW.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

4.4. Test Results

Ambient temperature : (24 ± 2) °C
Relative humidity : 47 % R.H.

Mode	Channel	Channel Frequency (MHz)	Data Rate (Mbps)	Attenuator + Cable offset (dB)	Average power Result (dB m)	Peak Power Result (dB m)
DSSS (802.11b)	Low	2 412	1	9.00	15.64	18.98
			2		15.59	18.92
			5.5		15.56	18.92
			11		15.30	18.74
	Middle	2 437	1	9.00	14.90	18.25
			2		14.87	18.23
			5.5		14.88	18.00
			11		14.63	18.36
	High	2 462	1	9.03	15.65	18.52
			2		15.55	18.50
			5.5		15.49	18.47
			11		15.22	18.45
OFDM (802.11g)	Low	2 412	6	9.00	12.46	23.05
			9		12.30	22.99
			12		12.09	22.52
			18		11.90	22.54
			24		11.71	22.60
			36		11.33	22.52
			48		10.97	22.46
			54		10.82	22.62
	Middle	2 437	6	9.00	12.25	22.93
			9		12.19	22.92
			12		12.02	22.52
			18		11.85	22.42
			24		11.64	22.47
			36		11.28	22.40
			48		10.88	22.36
			54		10.81	22.31
	High	2 462	6	9.03	12.49	22.93
			9		12.20	22.89
			12		12.17	22.40
			18		11.83	22.42
			24		11.64	22.36
			36		11.28	22.35
			48		10.98	22.23
			54		10.86	22.27

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Mode	Channel	Channel Frequency (MHz)	Data rate (Mbps)	Attenuator + Cable offset (dB)	Average power Result (dB m)	Peak Power Result (dB m)
OFDM (802.11n_HT20)	Low	2 412	MCS0	9.00	12.30	22.75
			MCS1		11.98	22.73
			MCS2		11.76	22.71
			MCS3		11.52	22.48
			MCS4		11.23	22.36
			MCS5		10.85	22.73
			MCS6		10.77	22.51
			MCS7		10.65	22.44
	Middle	2 437	MCS0	9.00	12.15	22.65
			MCS1		11.91	22.63
			MCS2		11.72	22.60
			MCS3		11.51	22.41
			MCS4		11.18	22.28
			MCS5		10.85	22.54
			MCS6		10.77	22.34
			MCS7		10.60	22.32
	High	2 462	MCS0	9.03	12.09	22.54
			MCS1		11.94	22.50
			MCS2		11.69	22.52
			MCS3		11.55	22.40
			MCS4		11.21	22.20
			MCS5		10.89	22.11
			MCS6		10.71	22.37
			MCS7		10.59	22.26

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Mode	Channel	Channel Frequency (MHz)	Data Rate (Mbps)	Attenuator + Cable offset (dB)	Average power Result (dB m)	Peak Power Result (dB m)
OFDM (802.11a)	Low	5 745	6	11.06	12.54	24.37
			9		12.43	24.26
			12		12.33	24.11
			18		12.22	23.95
			24		12.10	23.85
			36		11.93	23.74
			48		11.88	23.52
			54		11.75	23.22
	Middle	5 785	6	11.06	12.44	24.24
			9		12.31	23.95
			12		12.22	23.86
			18		12.11	23.82
			24		12.03	23.74
			36		11.93	23.60
			48		11.84	23.43
			54		11.77	23.31
	High	5 825	6	11.10	12.62	24.32
			9		12.53	24.11
			12		12.43	24.00
			18		12.30	23.95
			24		12.00	23.83
			36		11.95	23.74
			48		11.83	23.60
			54		11.77	23.43

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Mode	Channel	Channel Frequency (MHz)	Data Rate (Mbps)	Attenuator + Cable offset (dB)	Average power Result (dBm)	Peak Power Result (dBm)
OFDM (802.11n_HT20)	Low	5 745	MCS0	11.06	12.33	23.81
			MCS1		12.20	23.43
			MCS2		12.10	23.33
			MCS3		12.00	23.05
			MCS4		11.83	22.69
			MCS5		11.77	22.54
			MCS6		11.65	22.43
			MCS7		11.54	22.20
	Middle	5 785	MCS0	11.06	12.26	23.83
			MCS1		12.15	23.66
			MCS2		12.00	23.54
			MCS3		11.95	23.43
			MCS4		11.83	23.23
			MCS5		11.63	23.11
			MCS6		11.50	23.03
			MCS7		11.43	22.95
	High	5 825	MCS0	11.10	12.44	23.84
			MCS1		12.35	23.65
			MCS2		12.22	23.43
			MCS3		12.10	23.40
			MCS4		11.93	23.22
			MCS5		11.88	23.15
			MCS6		11.74	23.03
			MCS7		11.70	23.00

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Mode	Channel	Channel Frequency (MHz)	Data Rate (Mbps)	Attenuator + Cable offset (dB)	Average power Result (dB m)	Peak Power Result (dB m)
OFDM (802.11n_HT40)	Low	5 755	MCS0	16.86	12.91	19.78
			MCS1		12.88	19.66
			MCS2		12.70	19.65
			MCS3		12.61	19.43
			MCS4		12.43	19.31
			MCS5		12.33	19.25
			MCS6		12.25	19.11
			MCS7		12.13	19.03
	High	5 795	MCS0	16.86	12.90	19.57
			MCS1		12.88	19.43
			MCS2		12.74	19.33
			MCS3		12.65	19.23
			MCS4		12.43	19.10
			MCS5		12.22	19.03
			MCS6		12.11	18.93
			MCS7		12.03	18.77

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802.11an_HT40

Peak output power

Low Channel (5 755 MHz)



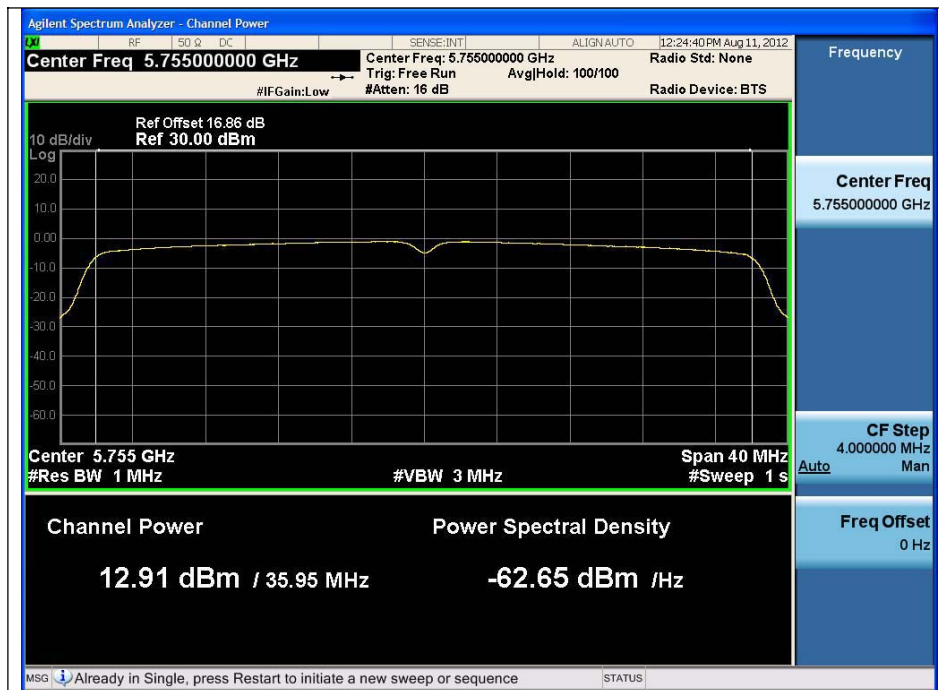
High Channel (5 795 MHz)



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Average output power

Low Channel (5 755 MHz)



High Channel (5 795 MHz)



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