

BAND EDGE COMPLIANCE (CONDUCTED) TEST

47 CFR FCC Part 15.247(d) Band Edge Compliance (Conducted) Limits

The EUT shows compliance to the requirements of this section, which states in any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator (EUT) is operating, the radio frequency power that is produced by the EUT shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power.

47 CFR FCC Part 15.247(d) Band Edge Compliance (Conducted) Test Instrumentation

Instrument	Model	S/No	Cal Due Date	Cal Interval
Agilent Spectrum Analyzer	E4404A	MY45304746	14 Nov 2014	1 year
Agilent DC Power Supply	E3620A	MY40000448	Output Monitor	Output Monitor

47 CFR FCC Part 15.247(d) Band Edge Compliance (Conducted) Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 300kHz.
5. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(d) Band Edge Compliance (Conducted) Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with specified modulation and data rate.
2. The frequency span of the spectrum analyser was set to wide enough to capture the lower band edge of the transmission band, 2.400GHz and any spurious emissions at the band edge.
3. The spectrum analyser was set to max hold to capture any spurious emissions within the span. The signal capturing was continuous until no further spurious emissions were detected.
4. Repeat steps 1 to 3 with all possible modulations and data rates.
5. The steps 2 to 4 were repeated with the frequency span of the spectrum analyser was set to wide enough to capture the upper band edge frequency of the transmission band, 2.4835GHz and the any spurious emissions at the band-edge.



BAND EDGE COMPLIANCE (CONDUCTED) TEST

47 CFR FCC Part 15.247(d) Band Edge Compliance (Conducted) Results

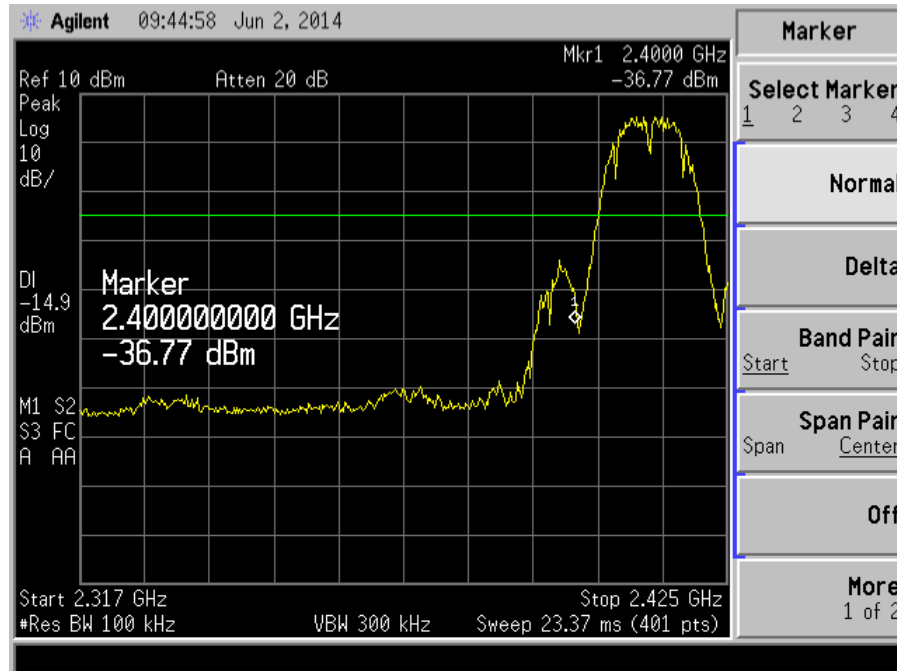
Test Input Power	12Vdc	Temperature	21°C
Attached Plots	1891 – 1920	Relative Humidity	53%
		Atmospheric Pressure	1030mbar
		Tested By	Kyaw Soe Hein

No significant signal was found and they were below the specified limit.

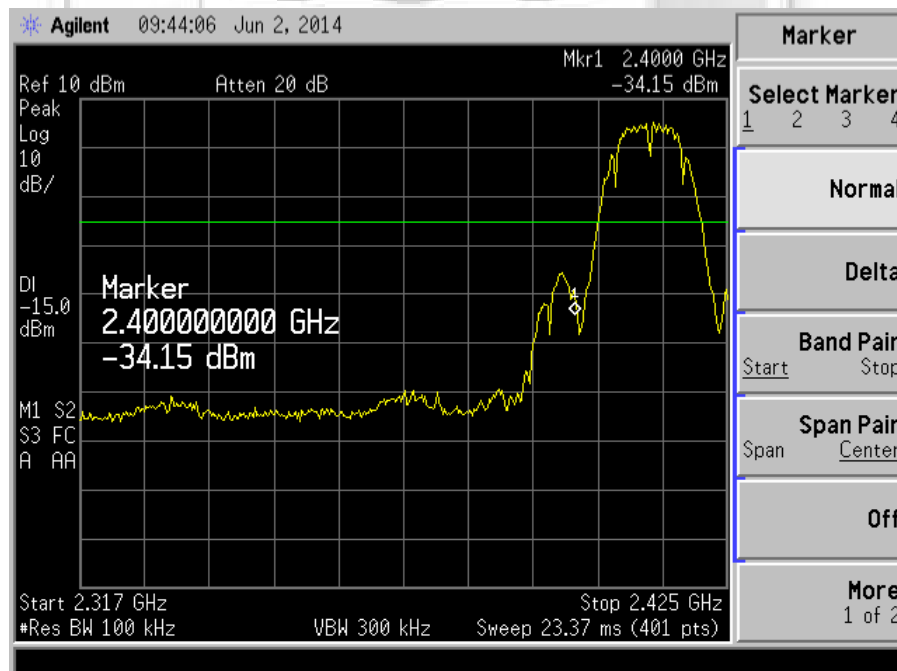


BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots
802.11b



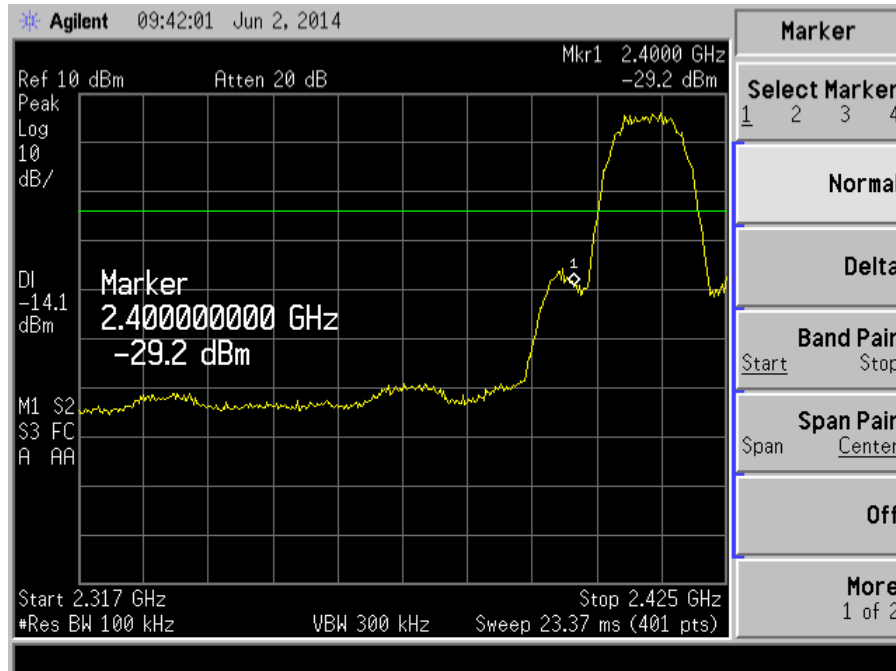
Plot 1891 – Lower Band Edge at 2.4000GHz @ CCK 1Mbps



Plot 1892 – Lower Band Edge at 2.4000GHz @ CCK 2Mbps

BAND EDGE COMPLIANCE (CONDUCTED) TEST

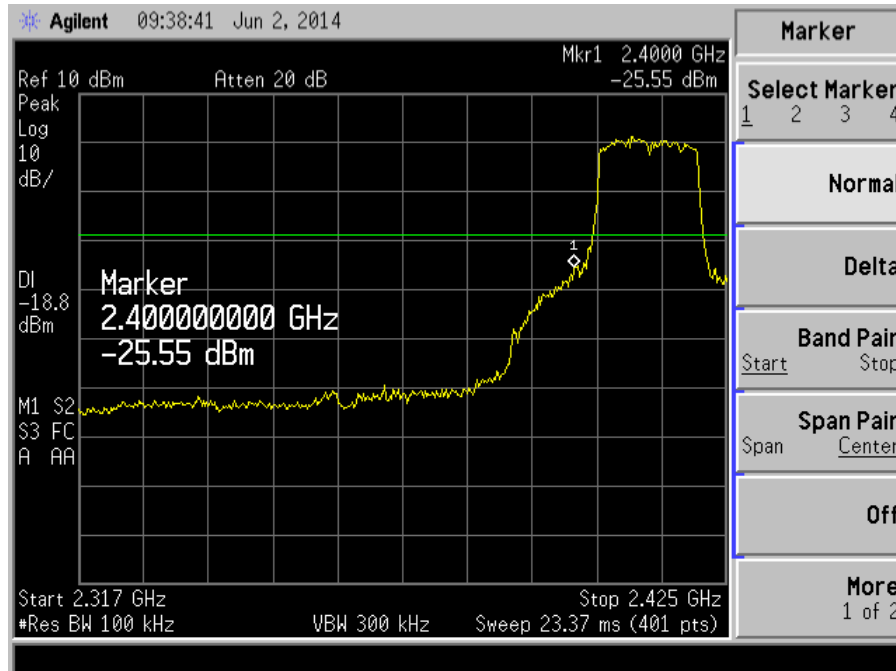
Band Edge Compliance (Conducted) Plots
802.11b



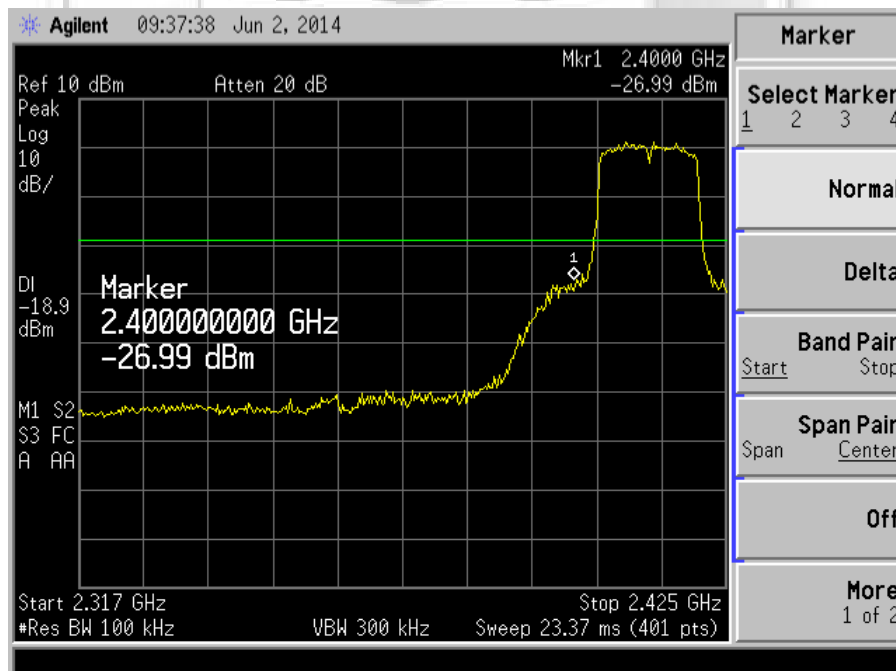
Plot 1893 – Lower Band Edge at 2.4000GHz @ CCK 11Mbps

BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots
802.11g



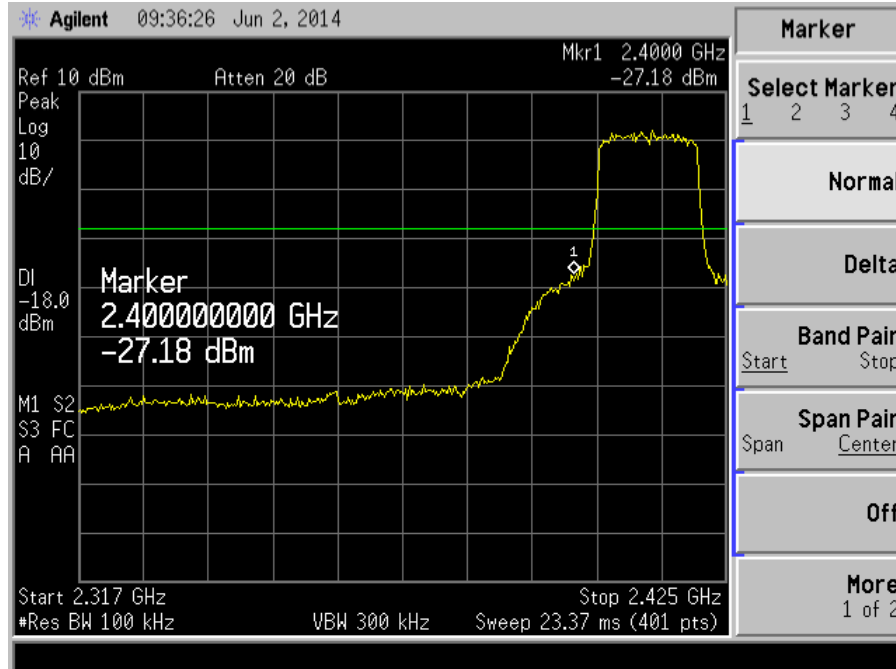
Plot 1894 – Lower Band Edge at 2.4000GHz @ OFDM 9Mbps



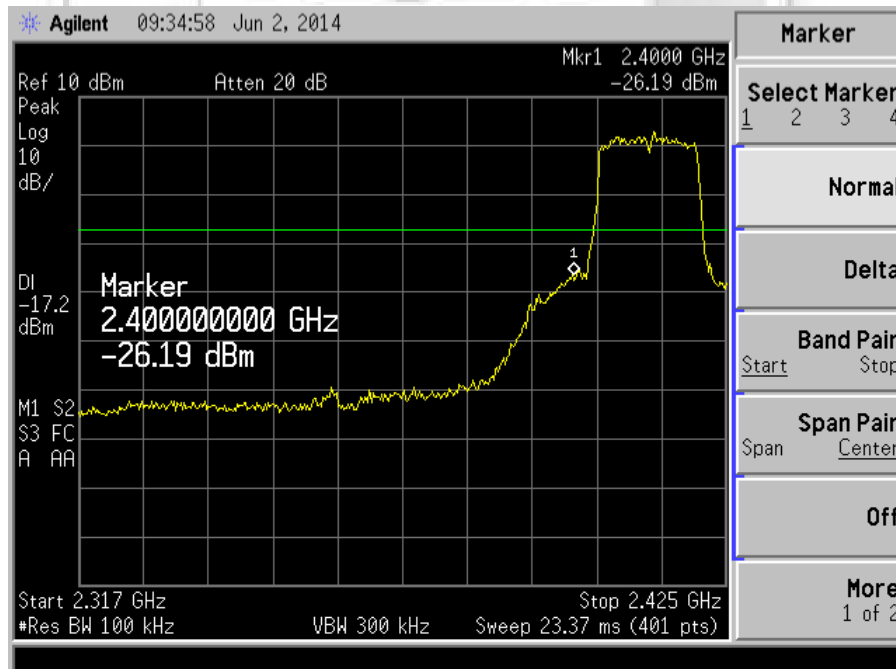
Plot 1895 – Lower Band Edge at 2.4000GHz @ OFDM 18Mbps

BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots
802.11g



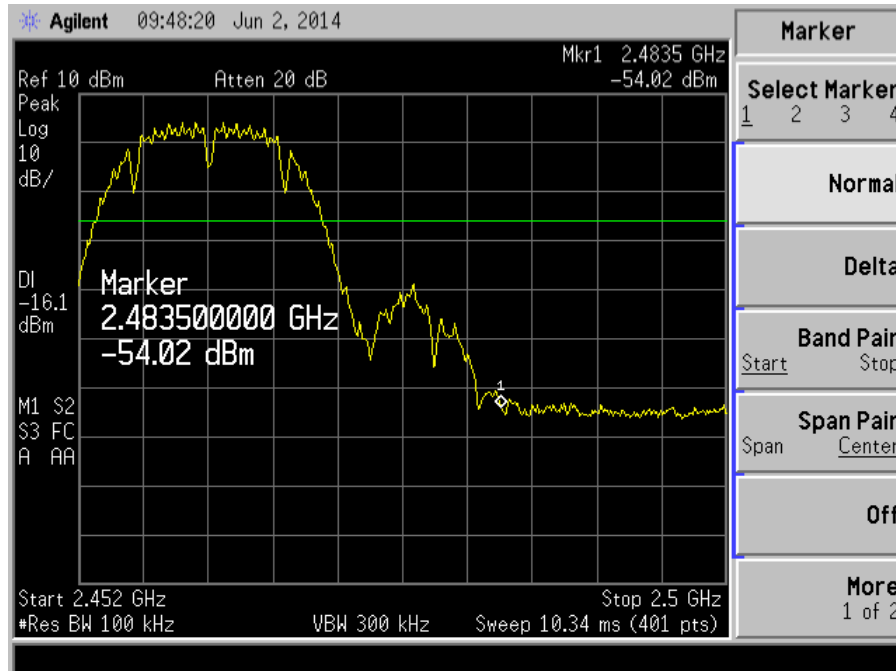
Plot 1896 – Lower Band Edge at 2.4000GHz @ OFDM 36Mbps



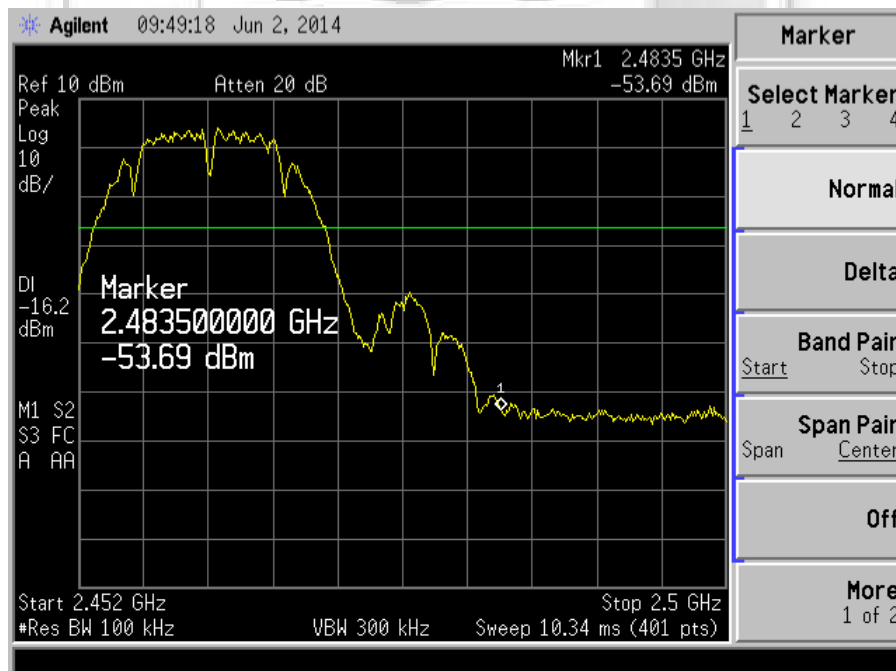
Plot 1897 – Lower Band Edge at 2.4000GHz @ OFDM 54Mbps

BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots
802.11b



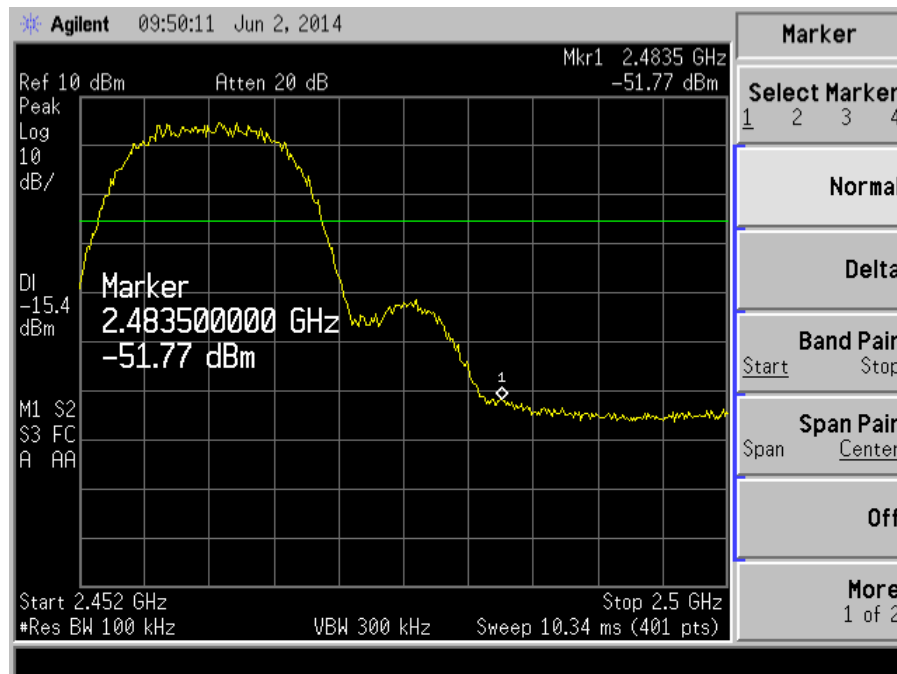
Plot 1898 – Upper Band Edge at 2.4835GHz @ CCK 1Mbps



Plot 1899 – Upper Band Edge at 2.4835GHz @ CCK 2Mbps

BAND EDGE COMPLIANCE (CONDUCTED) TEST

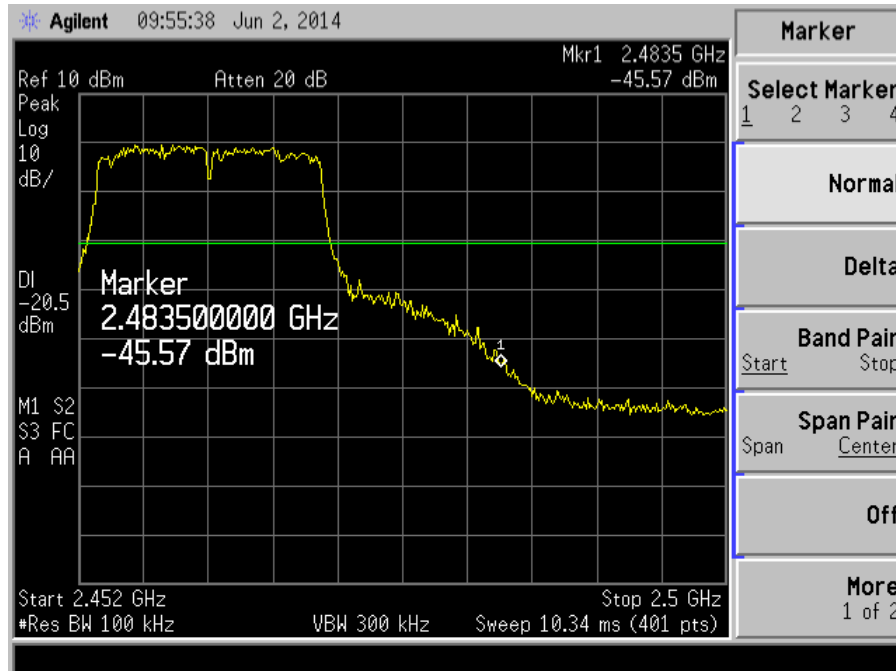
Band Edge Compliance (Conducted) Plots
802.11b



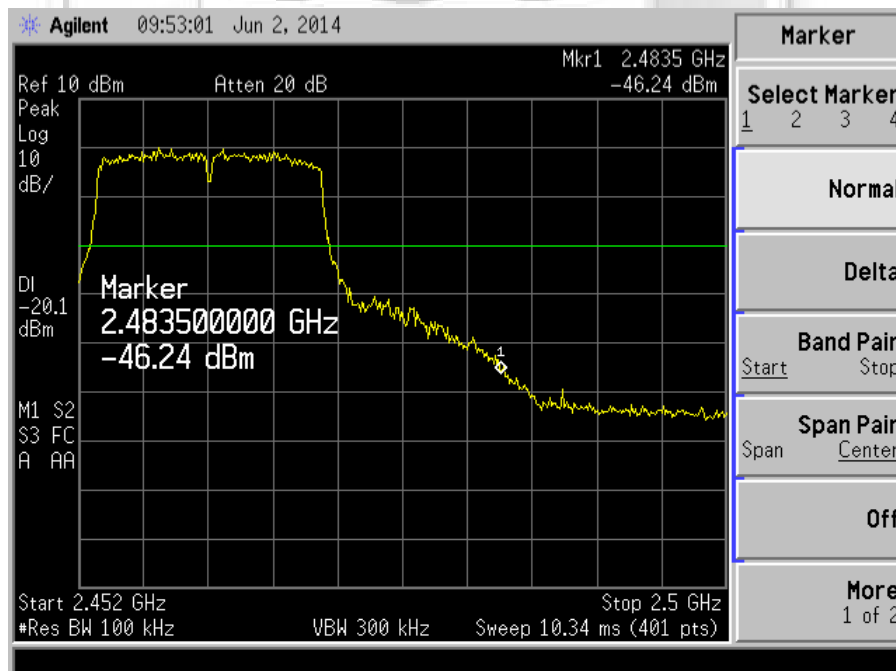
Plot 1900 – Upper Band Edge at 2.4835GHz @ CCK 11Mbps

BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots
802.11g



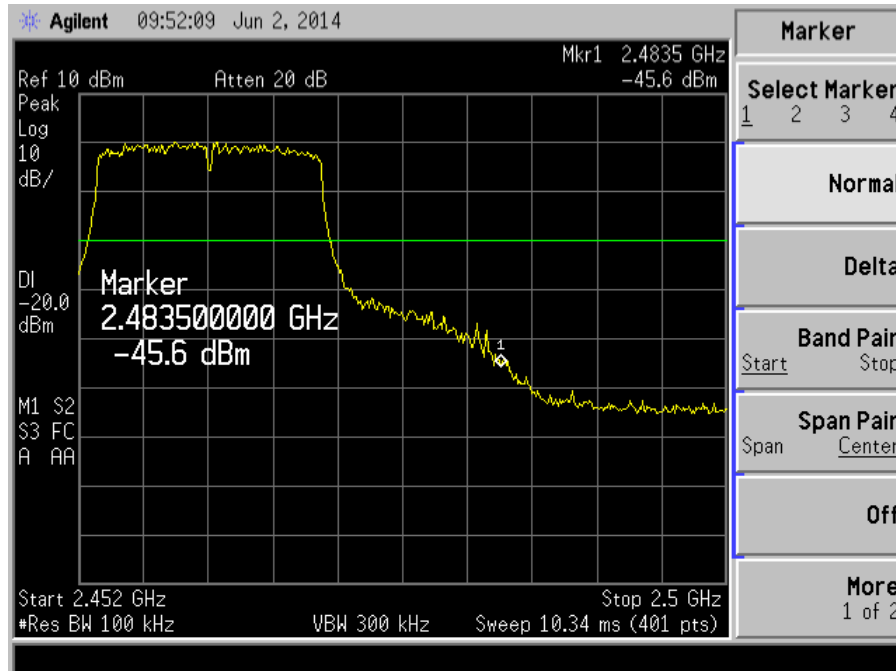
Plot 1901 – Upper Band Edge at 2.4835GHz @ OFDM 9Mbps



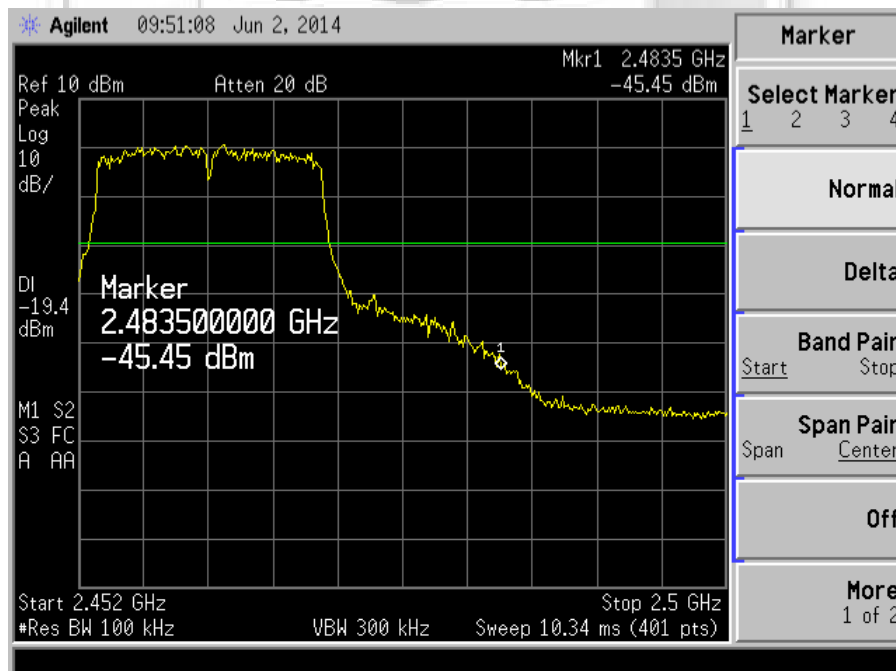
Plot 1902 – Upper Band Edge at 2.4835GHz @ OFDM 18Mbps

BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots
802.11g



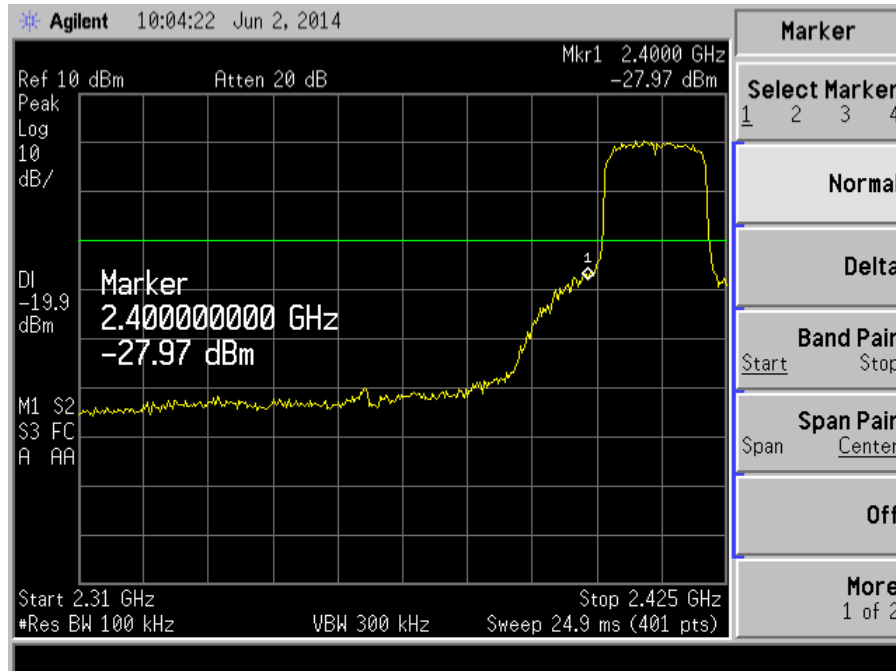
Plot 1903 – Upper Band Edge at 2.4835GHz @ OFDM 36Mbps



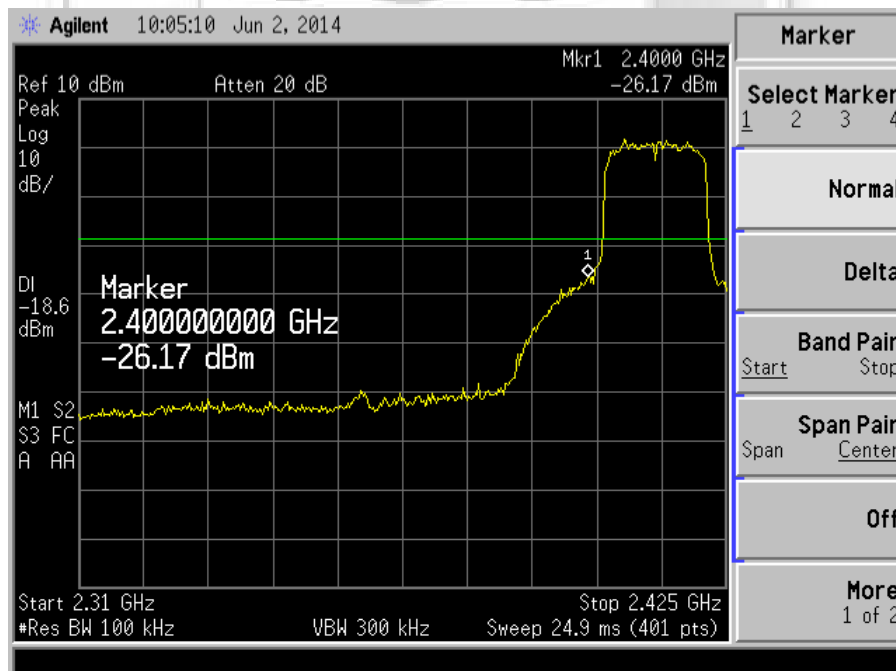
Plot 1904 – Upper Band Edge at 2.4835GHz @ OFDM 54Mbps

BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots
802.11n (20MHz)



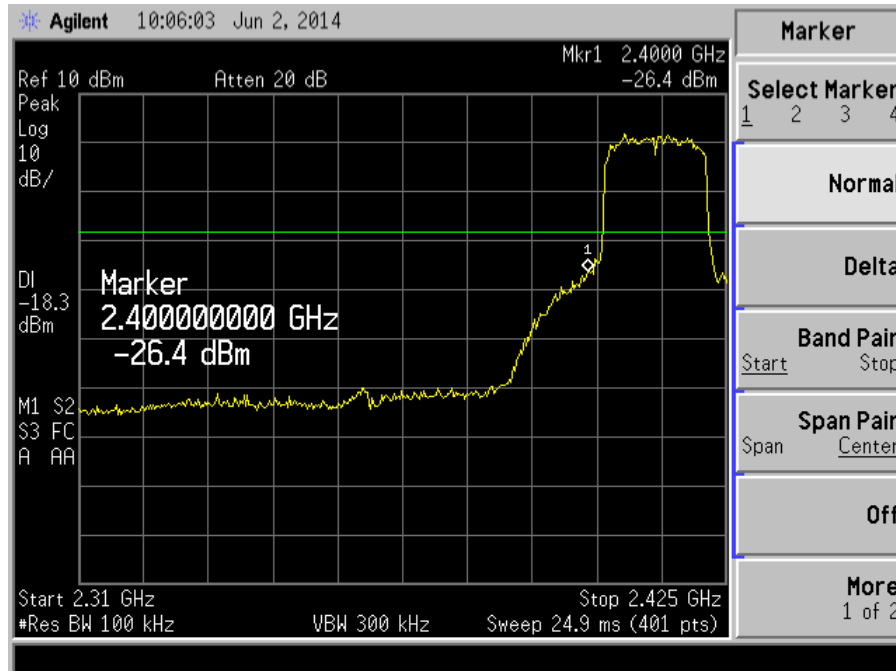
Plot 1905 - Lower Band Edge at 2.4000GHz @ MCS8-13Mbps



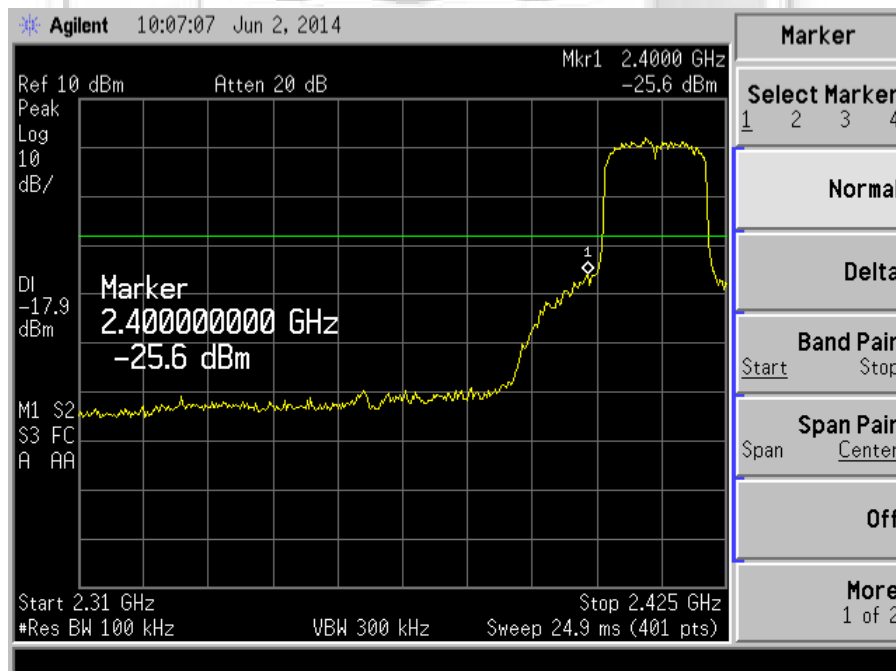
Plot 1906 - Lower Band Edge at 2.4000GHz @ MCS10- 39Mbps

BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots
802.11n (20MHz)



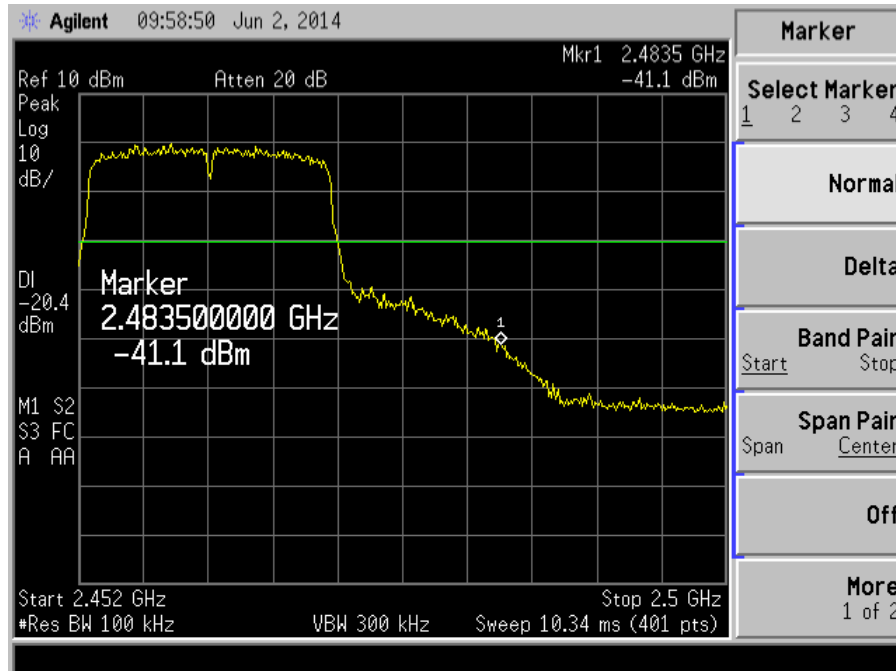
Plot 1907 – Lower Band Edge at 2.4000GHz @ MCS12-78Mbps



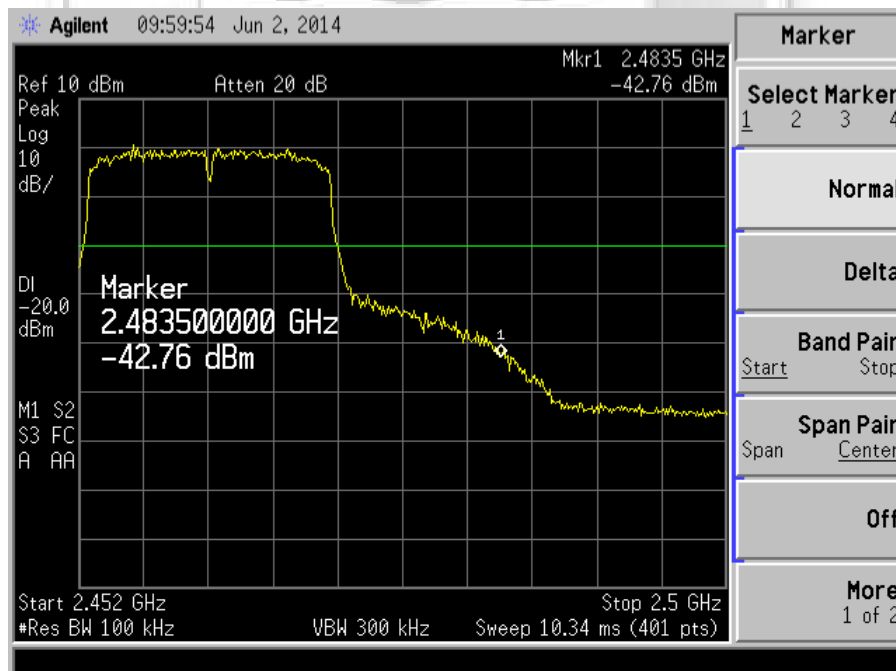
Plot 1908 – Lower Band Edge at 2.4000GHz @ MCS15-130Mbps

BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots
802.11n (20MHz)



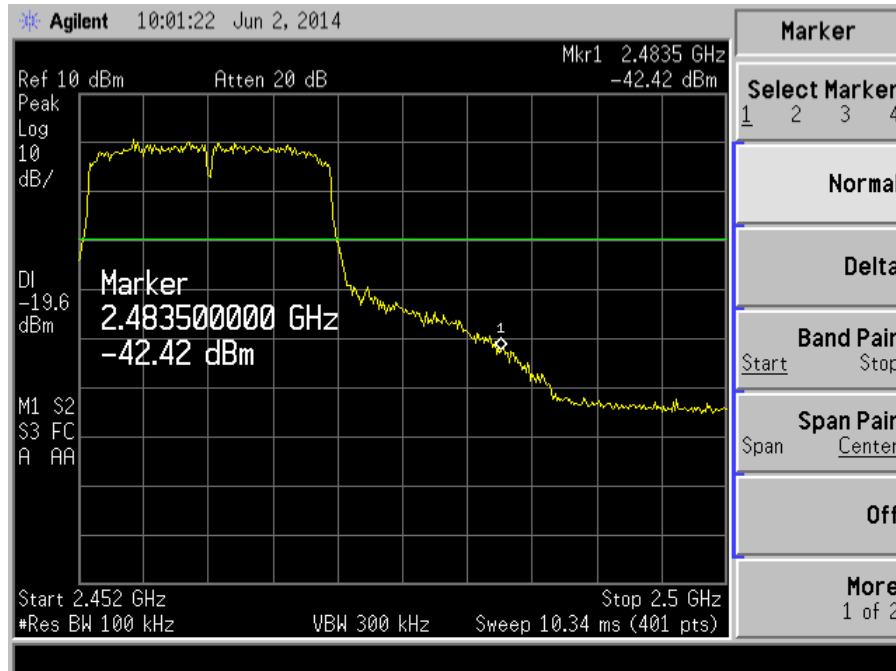
Plot 1909 – Upper Band Edge at 2.4835GHz @ MSC8-13Mbps



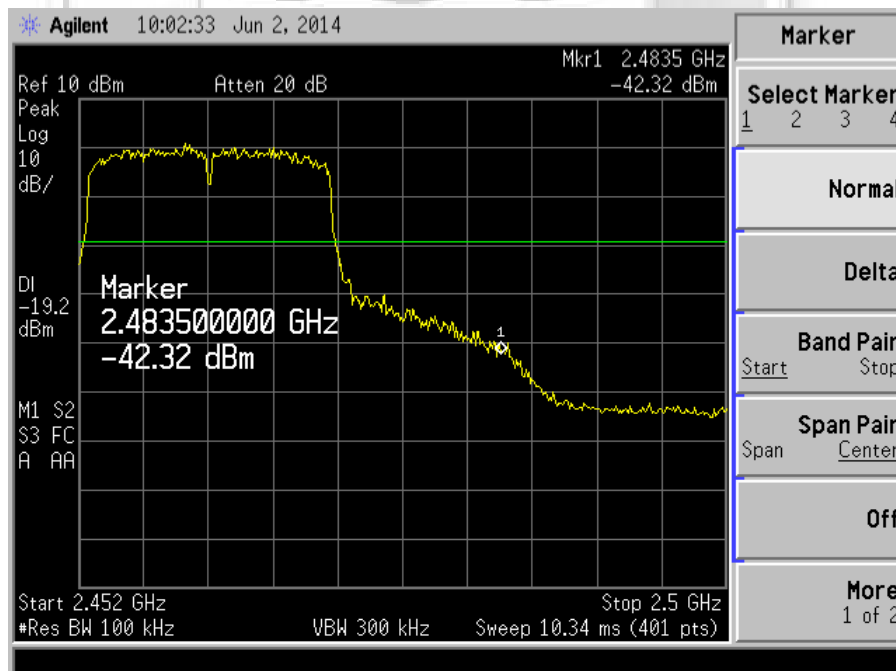
Plot 1910 – Upper Band Edge at 2.4835GHz @ MSC10-39Mbps

BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots
802.11n (20MHz)



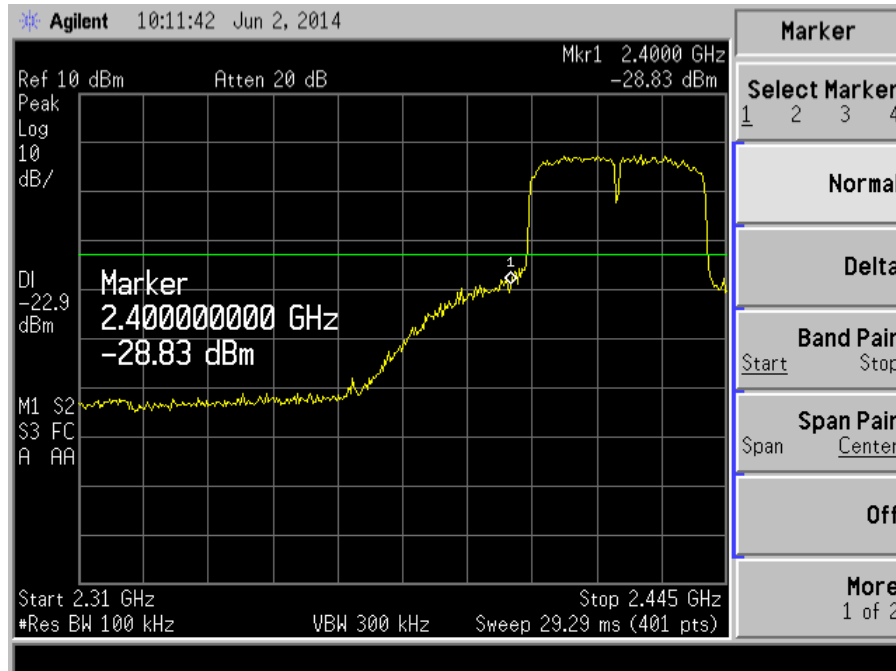
Plot 1911 – Upper Band Edge at 2.4835GHz @ MSC12-78Mbps



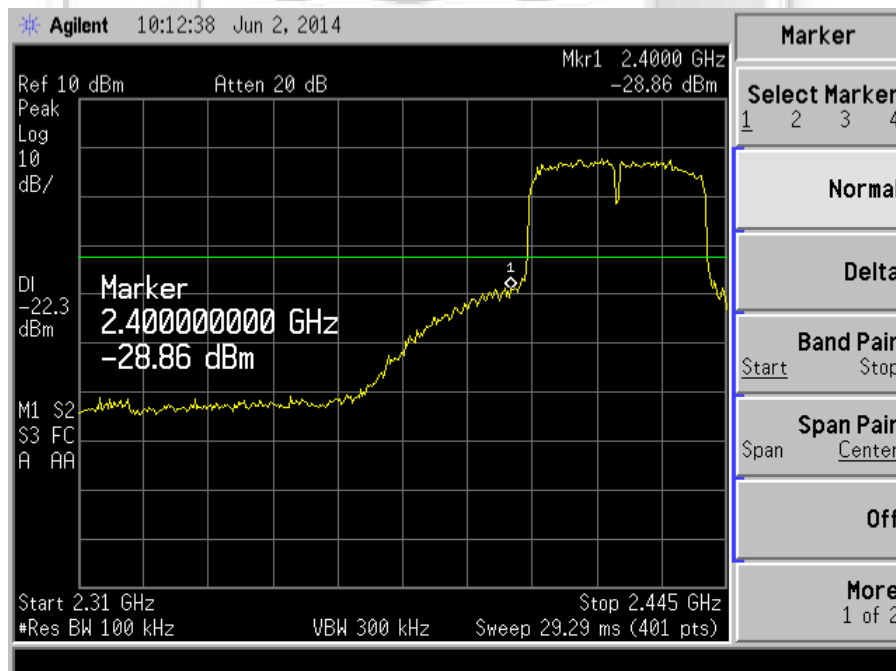
Plot 1912 – Upper Band Edge at 2.4835GHz @ MSC15-130Mbps

BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots
802.11n (40MHz)



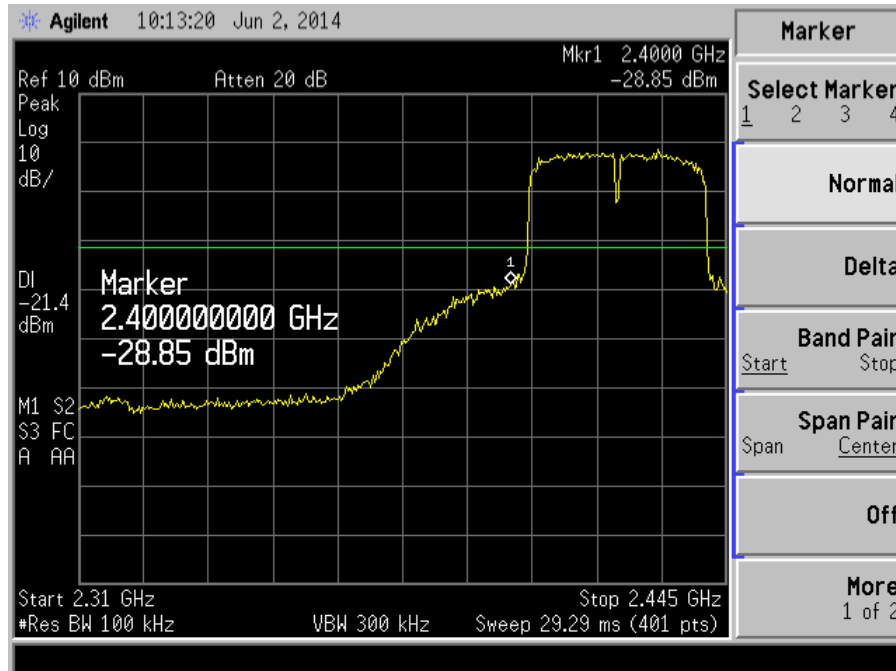
Plot 1913 – Lower Band Edge at 2.4000GHz @ MCS8-27Mbps



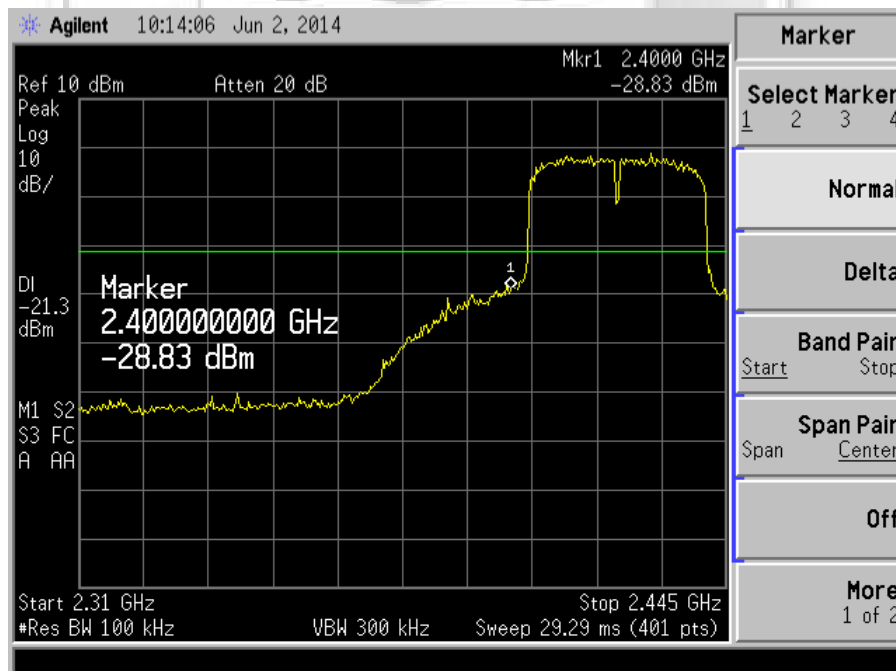
Plot 1914 – Lower Band Edge at 2.4000GHz @ MCS10- 81Mbps

BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots
802.11n (40MHz)



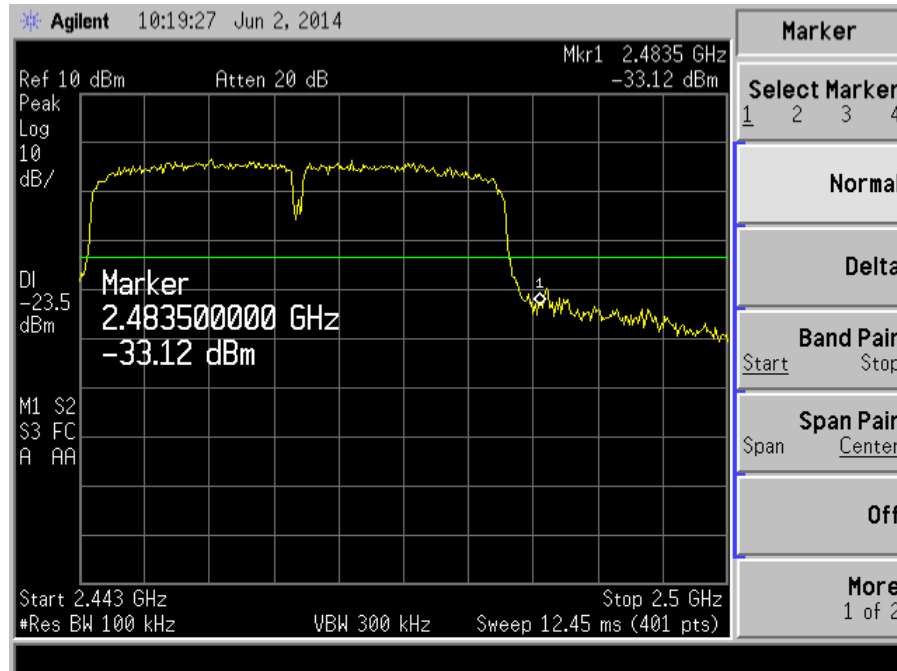
Plot 1915 – Lower Band Edge at 2.4000GHz @ MCS12-162Mbps



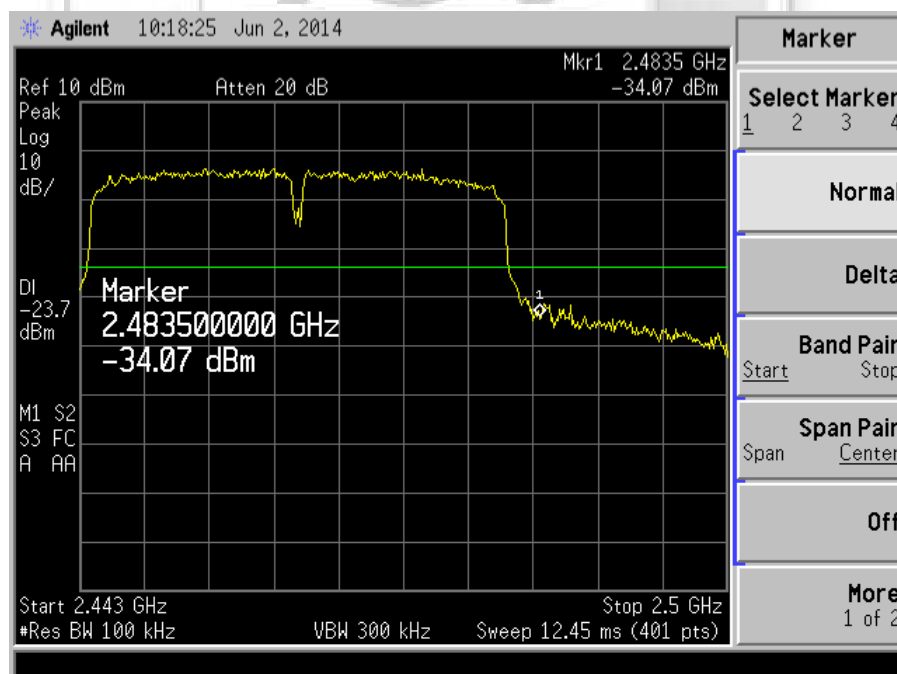
Plot 1916 – Lower Band Edge at 2.4000GHz @ MCS15-270Mbps

BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots
802.11n (40MHz)



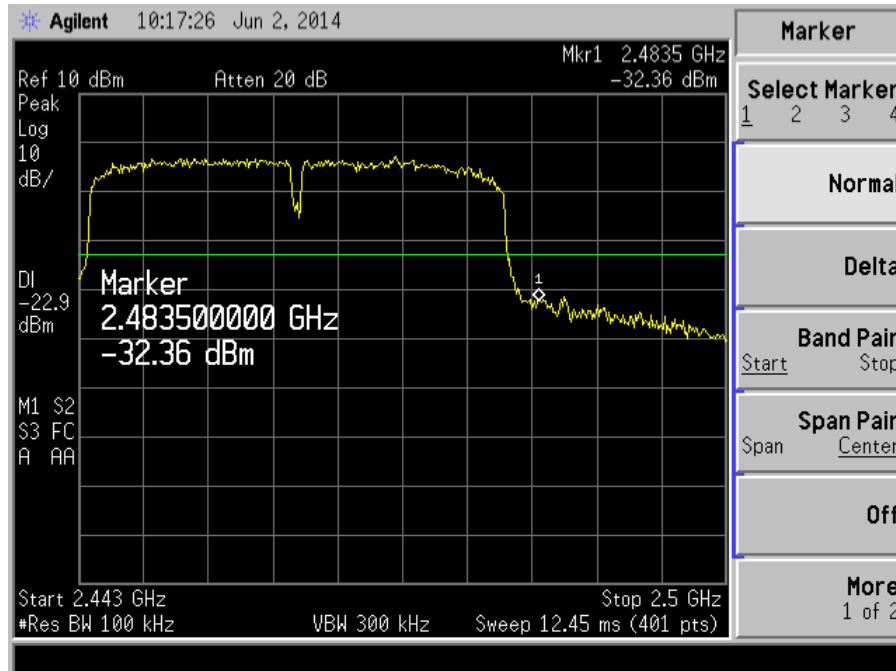
Plot 1917 – Upper Band Edge at 2.4835GHz @ MSC8-27Mbps



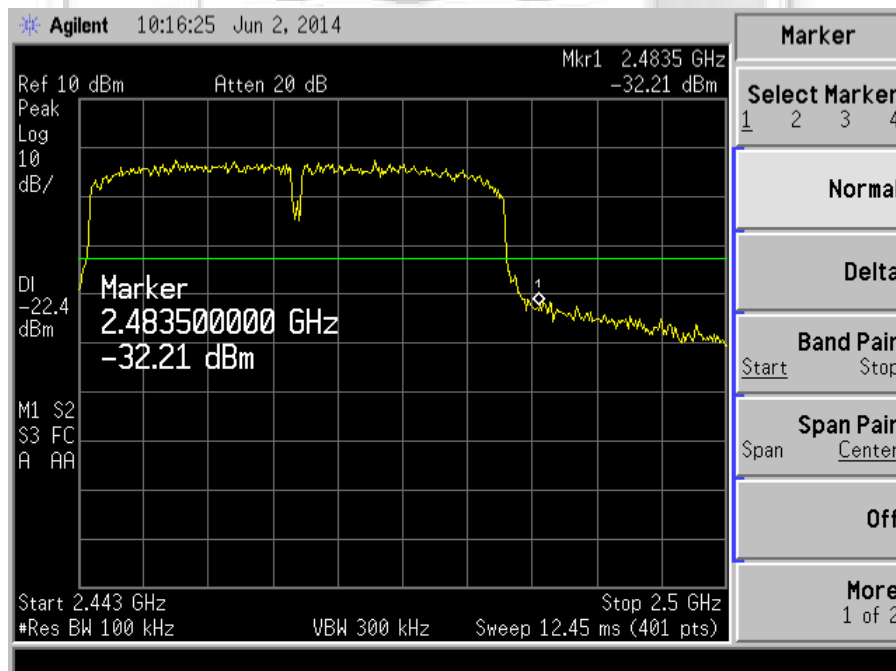
Plot 1918 – Upper Band Edge at 2.4835GHz @ MSC10-81Mbps

BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots
802.11n (40MHz)



Plot 1919 – Upper Band Edge at 2.4835GHz @ MSC12-162Mbps



Plot 1920 – Upper Band Edge at 2.4835GHz @ MSC15-270Mbps

BAND EDGE COMPLIANCE (RADIATED) TEST

47 CFR FCC Part 15.247(d) Band Edge Compliance (Radiated) Limits

The EUT shows compliance to the requirements of this section, which states in any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator (EUT) is operating, the radio frequency power that is produced by the EUT shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power. In addition, radiated emissions which fall in the restricted bands shall comply to the radiated emission limits specified in 15.209.

47 CFR FCC Part 15.247(d) Band Edge Compliance (Radiated) Test Instrumentation

Instrument	Model	S/No	Cal Due Date	Cal Interval
Agilent Spectrum Analyzer	E7405A	MY45106084	01 Aug 2014	1 year
Schaffner Bilog Antenna -(30MHz-2GHz) BL3 (Ref)	CBL6112B	2549	23 Jan 2015	1 year
Com-Power Preamplifier (1MHz-1GHz)	PAM-103	441056	16 Aug 2014	1 year
R&S Preamplifier (1GHz -18GHz)	SCU18	102191	14 Mar 2015	1 year
EMCO Horn Antenna(1GHz-18GHz)	3115	9901-5671	13 Mar 2015	1 year
Agilent DC Power Supply	E3620A	MY40000448	Output Monitor	Output Monitor

47 CFR FCC Part 15.247(d) Band Edge Compliance (Radiated) Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 300kHz to show compliance of spurious at band edges are at least 20dB below the carriers. For restricted band spurious at band edges, peak and average measurement plots were taken using the following setting:
 - a. Peak Plot:
RBW = VBW = 1MHz
 - b. Average Plot
RBW = 1MHz, VBW = 10Hz
4. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(d) Band Edge Compliance (Radiated) Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with specified modulation and data rate.
2. The frequency span of the spectrum analyser was set to wide enough to capture the lower band edge of the transmission band, 2.400GHz and any spurious emissions at the band edge.
3. The spectrum analyser was set to max hold to capture any spurious emissions within the span. The signal capturing was continuous until no further spurious emissions were detected.
4. Repeat steps 1 to 3 with all possible modulations and data rates.
5. The steps 2 to 4 were repeated with the frequency span of the spectrum analyser was set to wide enough to capture the upper band edge frequency of the transmission band, 2.4835GHz and the any spurious emissions at the band-edge.



BAND EDGE COMPLIANCE (RADIATED) TEST

47 CFR FCC Part 15.247(d) Band Edge Compliance (Radiated) Results

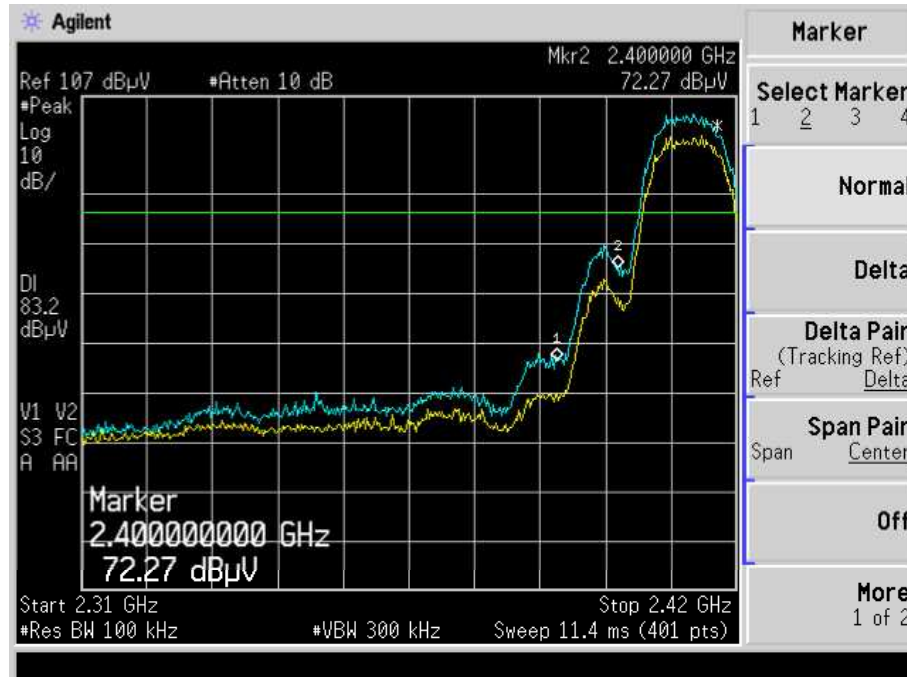
Test Input Power	12Vdc	Temperature	23°C
Attached Plots	1921 – 1944	Relative Humidity	54%
		Atmospheric Pressure	1030mbar
		Tested By	Kyaw Soe Hein

No significant signal was found and they were below the specified limit.



BAND EDGE COMPLIANCE (RADIATED) TEST

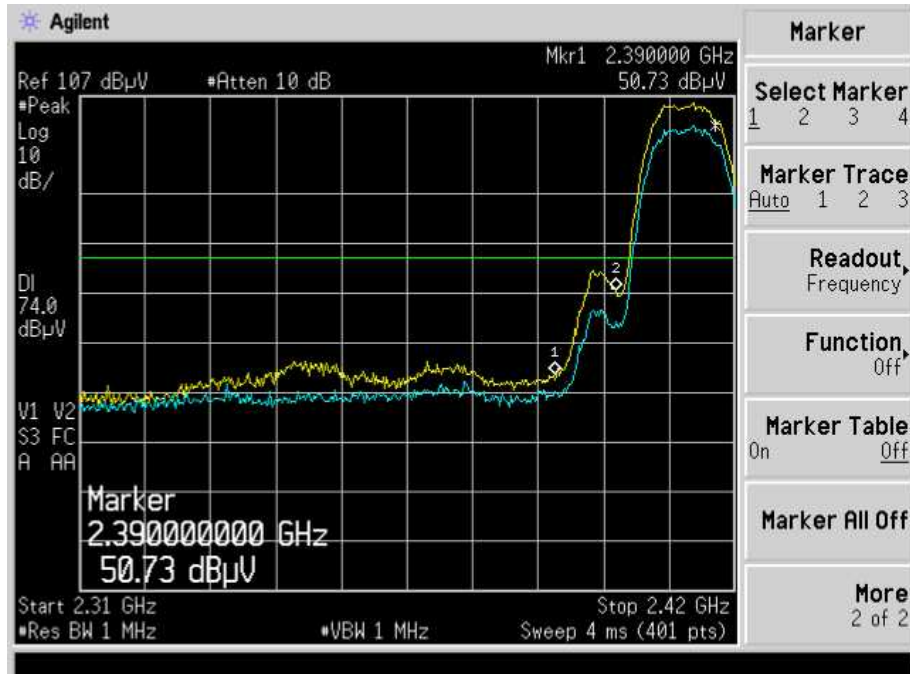
Band Edge Compliance (Radiated) Plots (20dB Delta from Carrier at Band Edge)



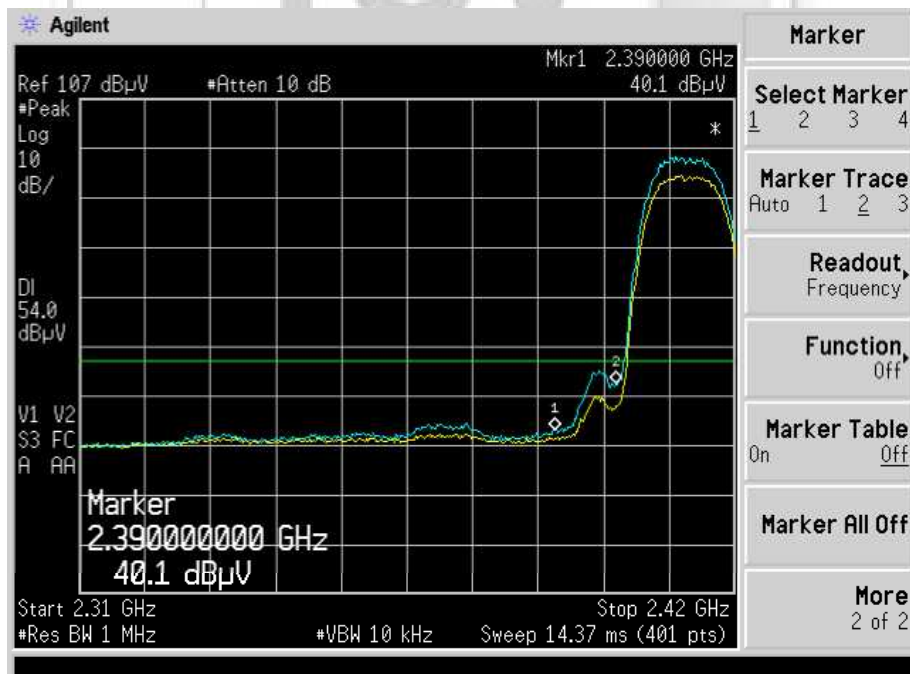
Plot 1921 – Lower Band Edge at 2.4000GHz @ CCK 11Mbps (Worst)

BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (Restricted Band)



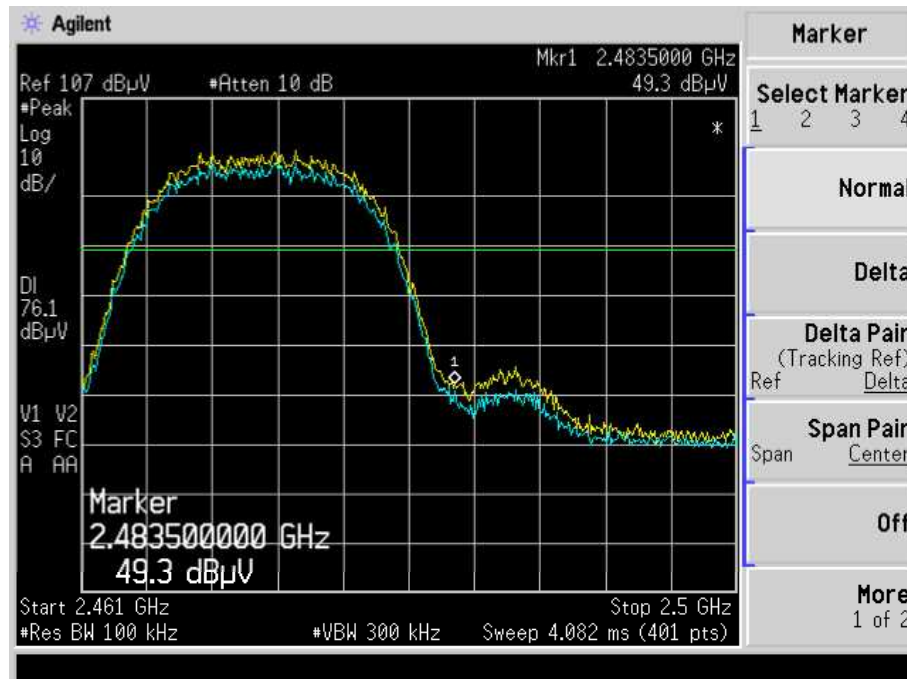
Plot 1922 – Peak Plot at Lower Band Edge at 2.4000GHz @ CCK 11Mbps (Worst)



Plot 1923 – Average Plot at Lower Band Edge at 2.4000GHz @ CCK 11Mbps (Worst)

BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (20dB Delta from Carrier at Band Edge)

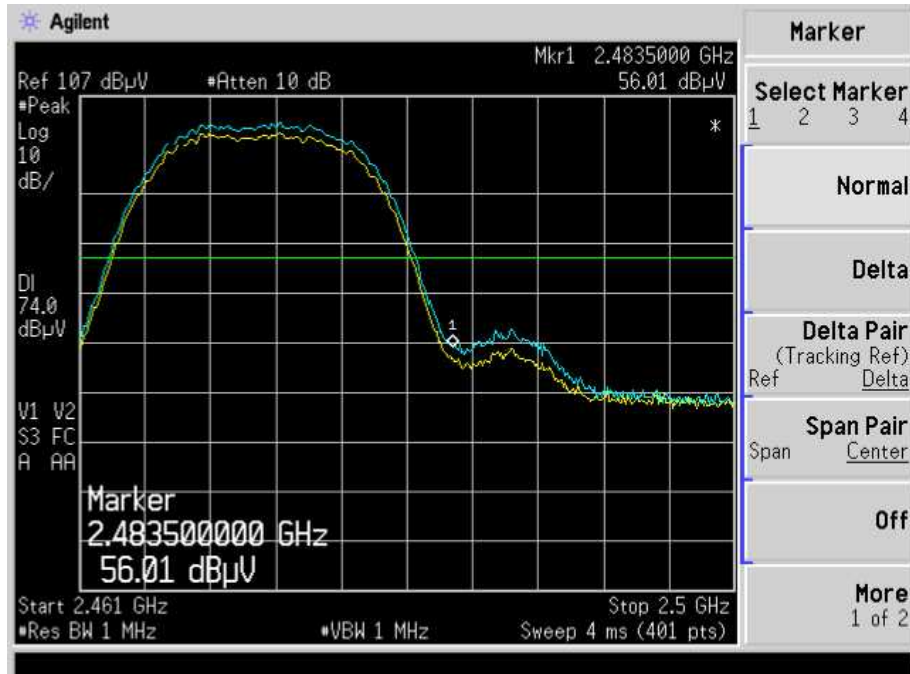


Plot 1924 – Upper Band Edge at 2.4835GHz @ CCK 11Mbps (Worst)

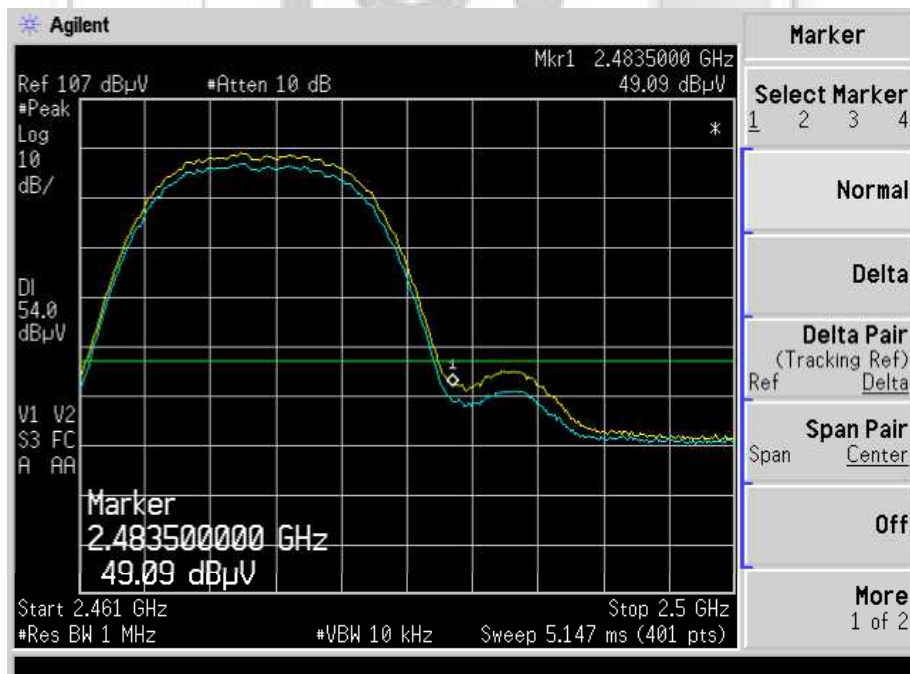


BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (Restricted Band)



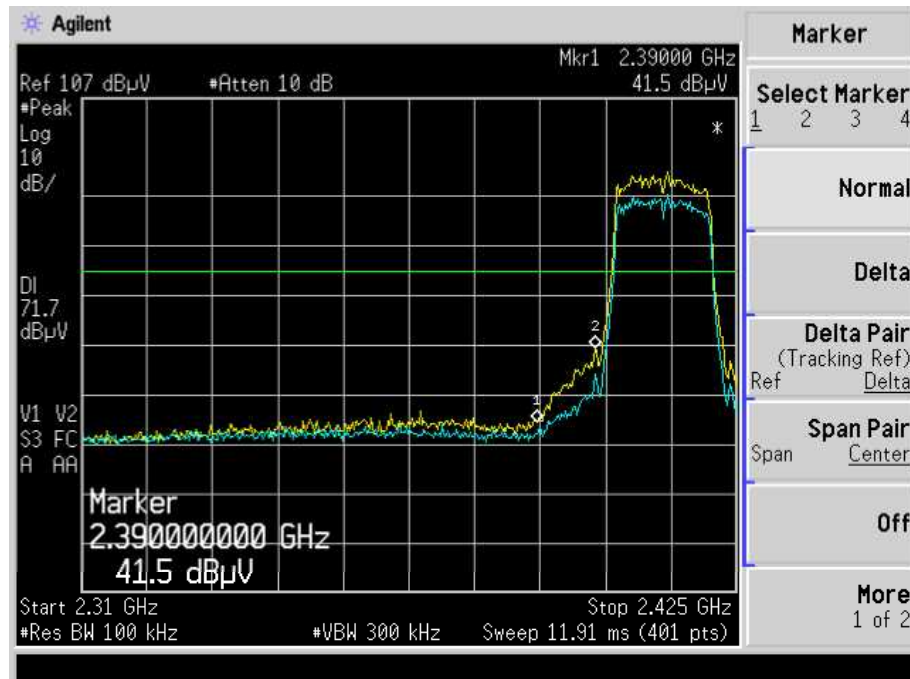
Plot 1925 – Peak Plot at Upper Band Edge at 2.4835GHz @ CCK 11Mbps (Worst)



Plot 1926 – Average Plot at Upper Band Edge at 2.4835GHz @ CCK 11Mbps (Worst)

BAND EDGE COMPLIANCE (RADIATED) TEST

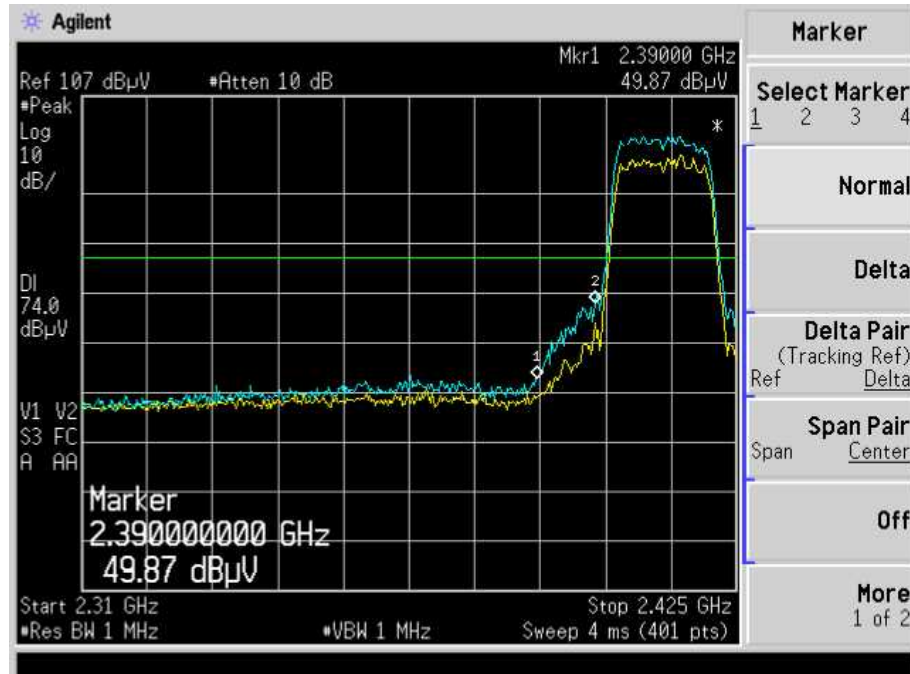
Band Edge Compliance (Radiated) Plots (20dB Delta from Carrier at Band Edge)



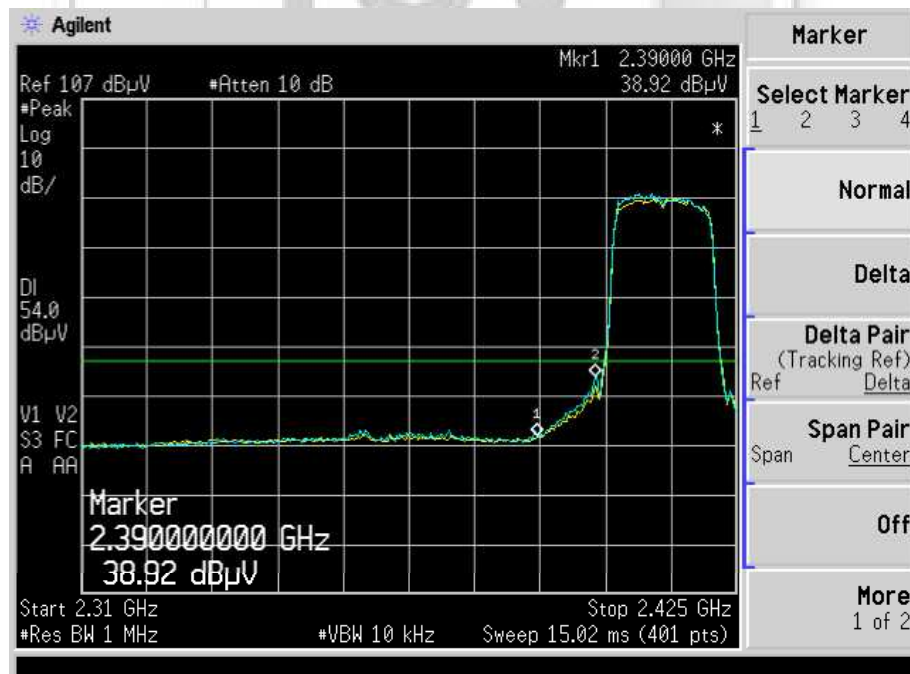
Plot 1927 – Lower Band Edge at 2.4000GHz @ 64QAM 54Mbps (Worst)

BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (Restricted Band)



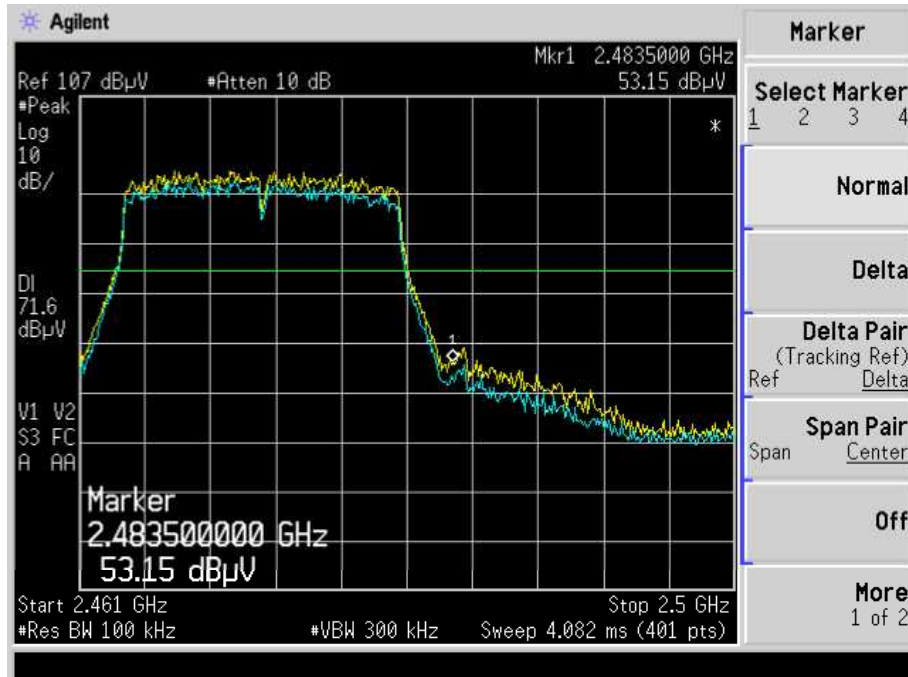
Plot 1928 – Peak Plot at Lower Band Edge at 2.4000GHz @ 64QAM 54Mbps (Worst)



Plot 1929 – Average Plot at Lower Band Edge at 2.4000GHz @ 64QAM 54Mbps (Worst)

BAND EDGE COMPLIANCE (RADIATED) TEST

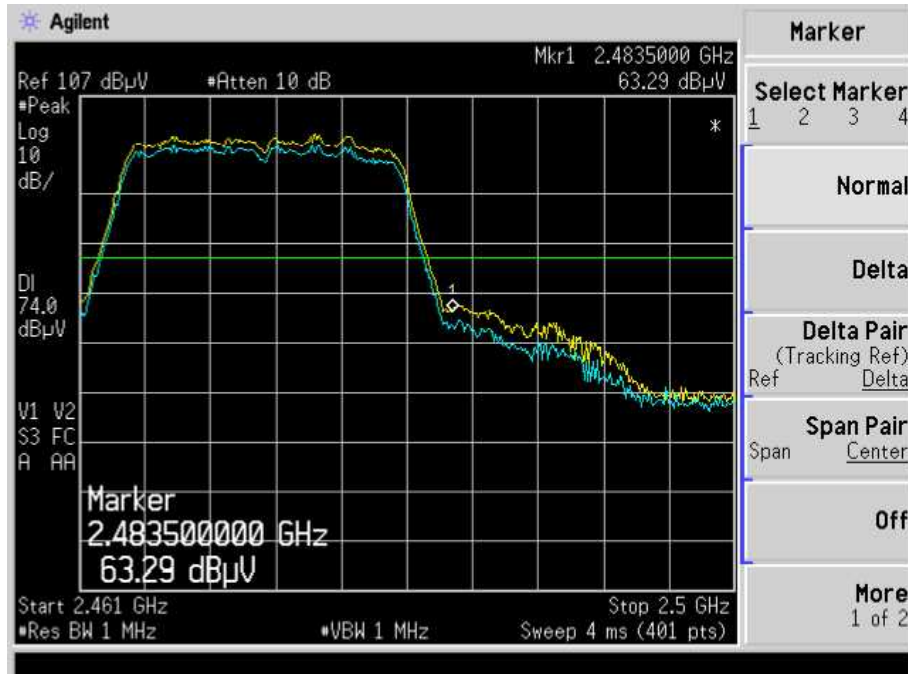
Band Edge Compliance (Radiated) Plots (20dB Delta from Carrier at Band Edge)



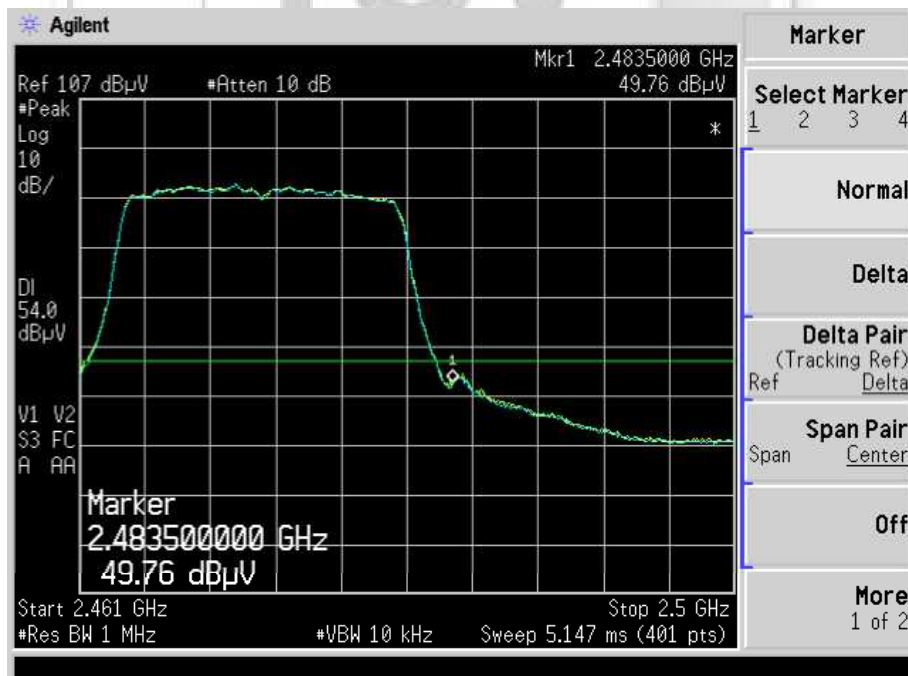
Plot 1930 – Upper Band Edge at 2.4835GHz @ 64QAM 54Mbps (Worst)

BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (Restricted Band)



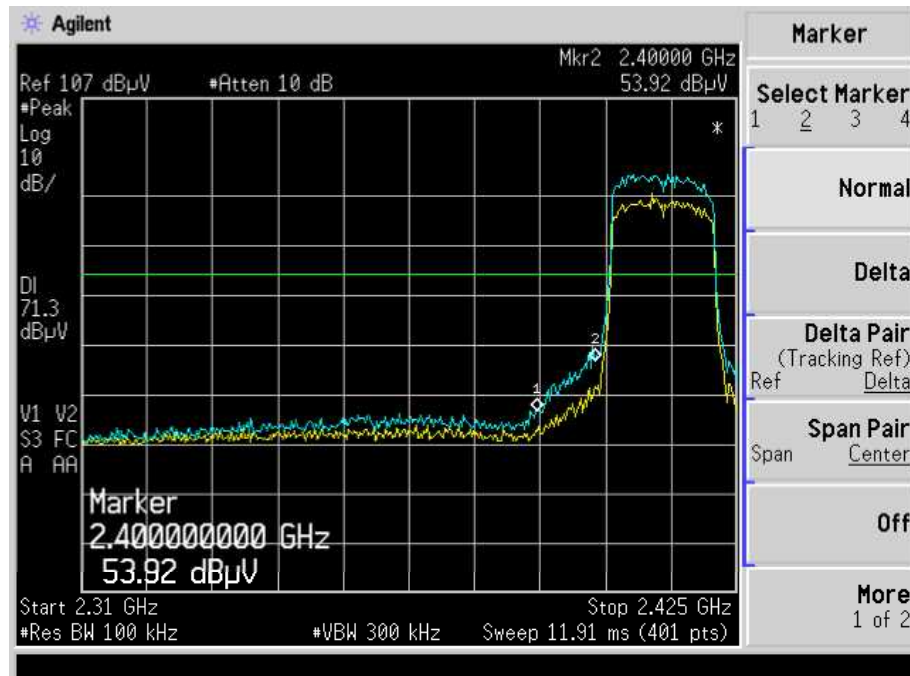
Plot 1931 – Peak Plot at Upper Band Edge at 2.4835GHz @ 64QAM 54Mbps (Worst)



Plot 1932 – Average Plot at Upper Band Edge at 2.4835GHz @ 64QAM 54Mbps (Worst)

BAND EDGE COMPLIANCE (RADIATED) TEST

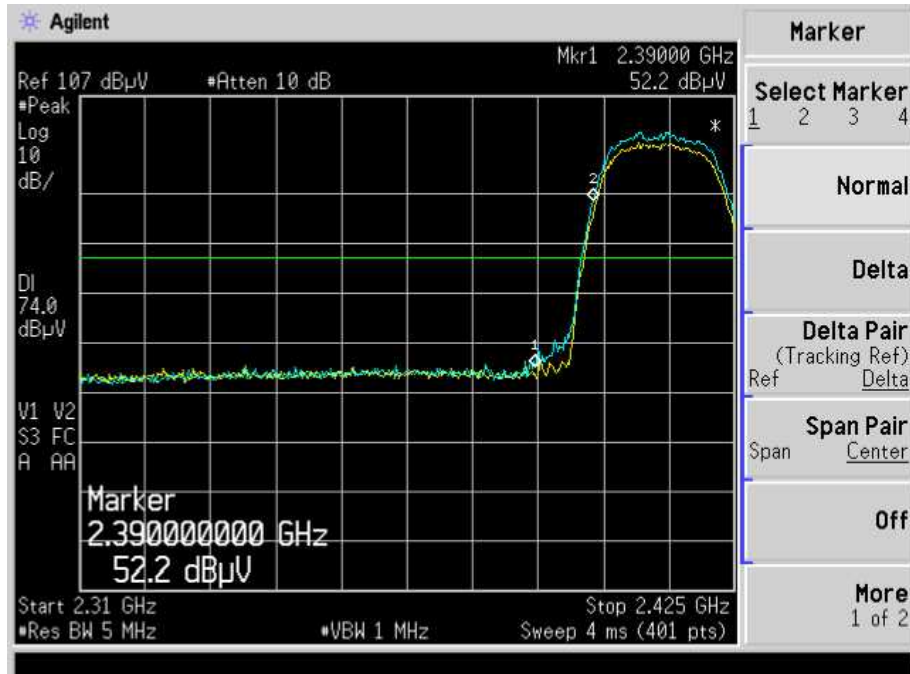
Band Edge Compliance (Radiated) Plots (20dB Delta from Carrier at Band Edge)



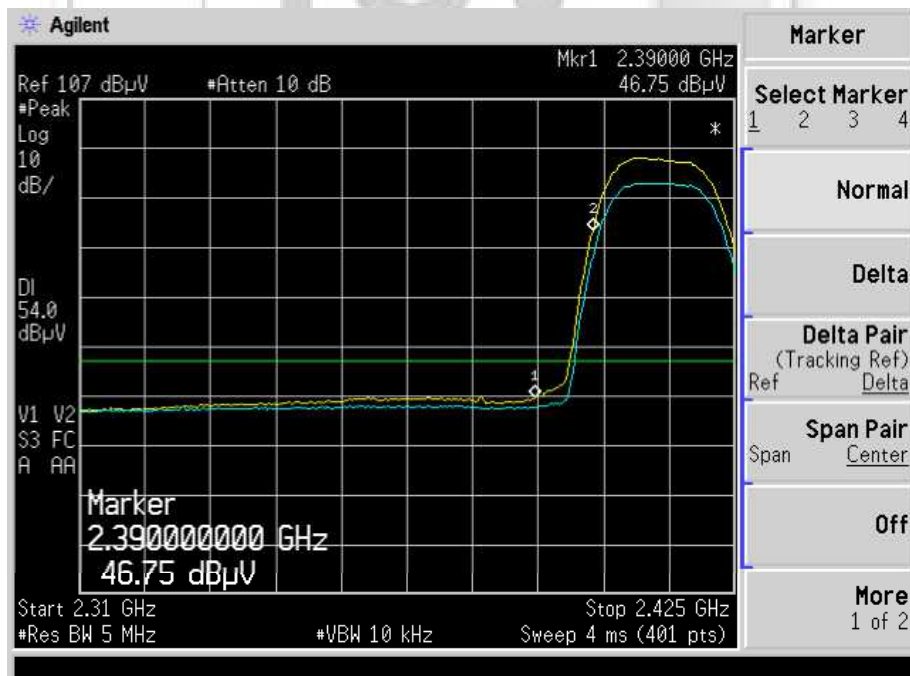
Plot 1933 – Lower Band Edge at 2.4000GHz @ 64QAM 130Mbps (Worst)

BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (Restricted Band)



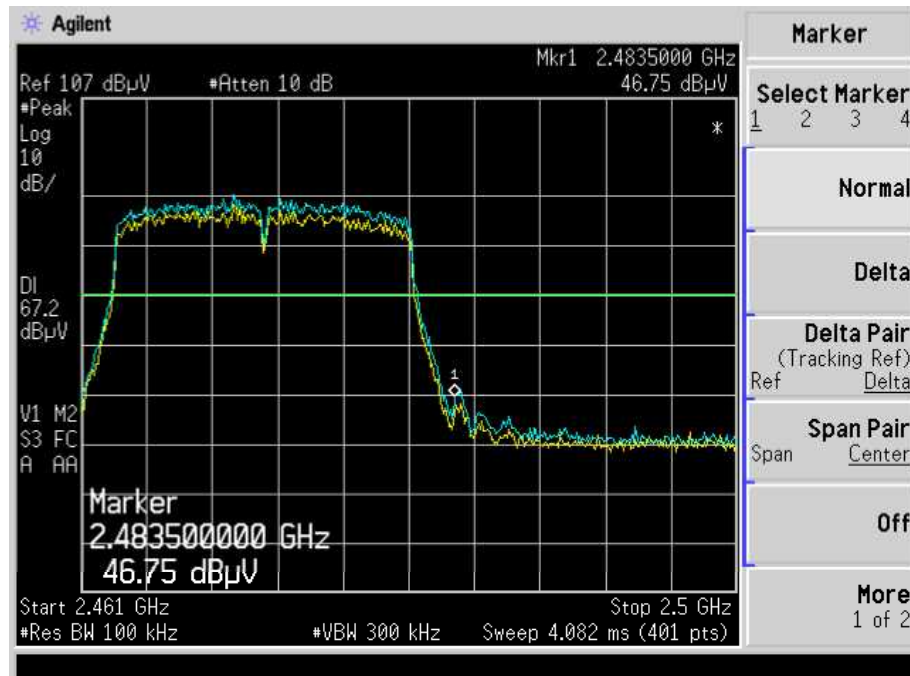
Plot 1934 – Peak Plot at Lower Band Edge at 2.4000GHz @ 64QAM 130Mbps (Worst)



Plot 1935 – Average Plot at Lower Band Edge at 2.4000GHz @ 64QAM 130Mbps (Worst)

BAND EDGE COMPLIANCE (RADIATED) TEST

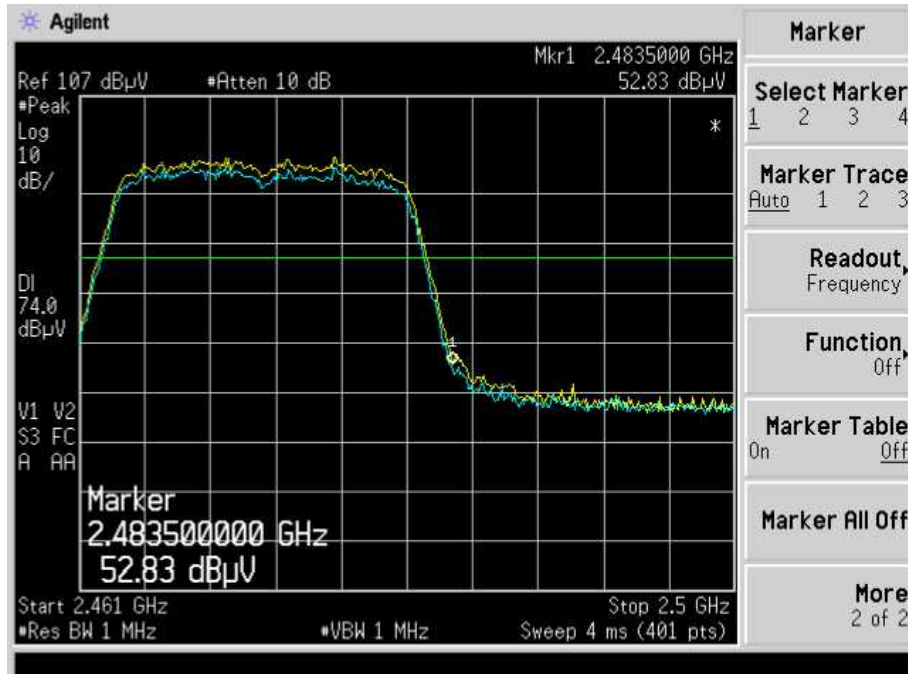
Band Edge Compliance (Radiated) Plots (20dB Delta from Carrier at Band Edge)



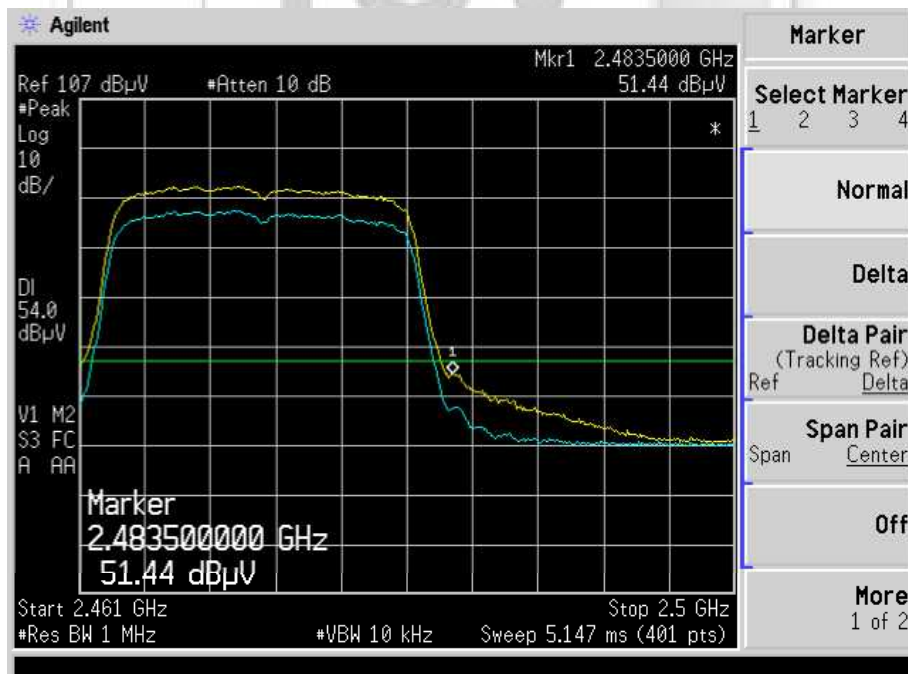
Plot 1936 – Upper Band Edge at 2.4835GHz @ 64QAM 130Mbps (Worst)

BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (Restricted Band)



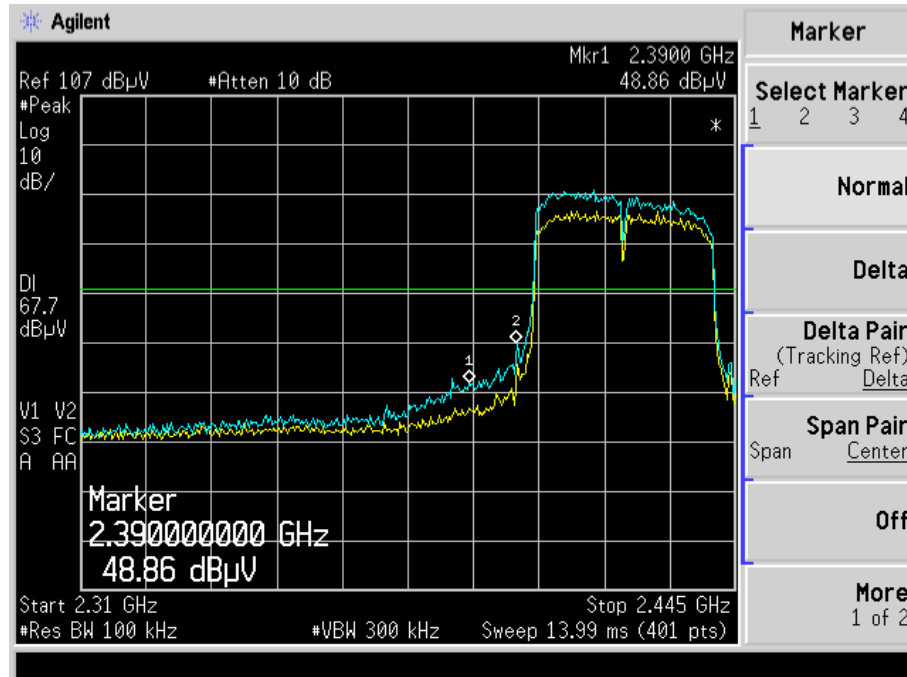
Plot 1937 – Peak Plot at Upper Band Edge at 2.4835GHz @ 64QAM 130Mbps (Worst)



Plot 1938 – Average Plot at Upper Band Edge at 2.4835GHz @ 64QAM 130Mbps (Worst)

BAND EDGE COMPLIANCE (RADIATED) TEST

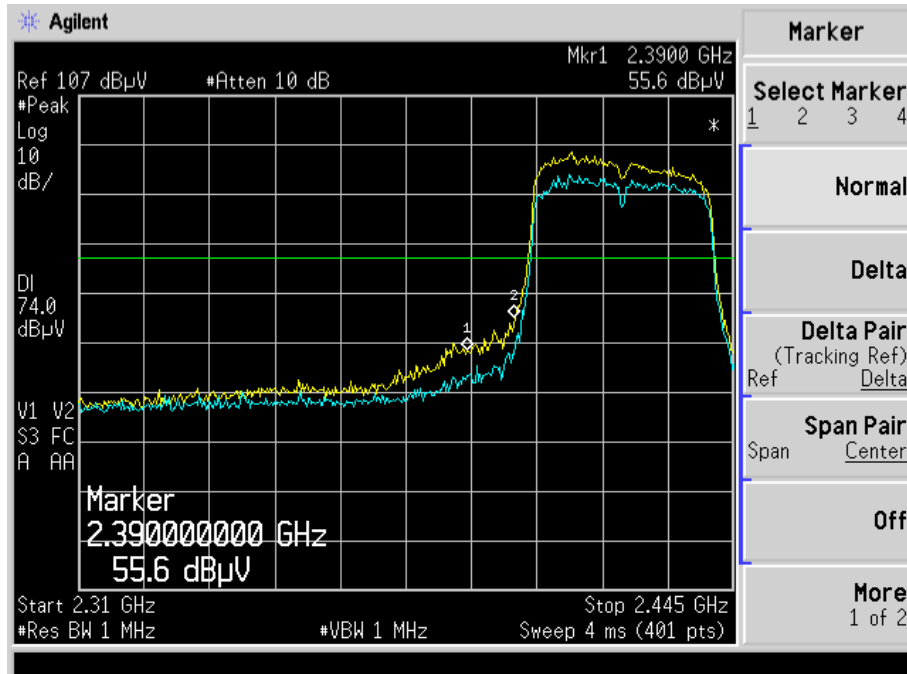
Band Edge Compliance (Radiated) Plots (20dB Delta from Carrier at Band Edge)



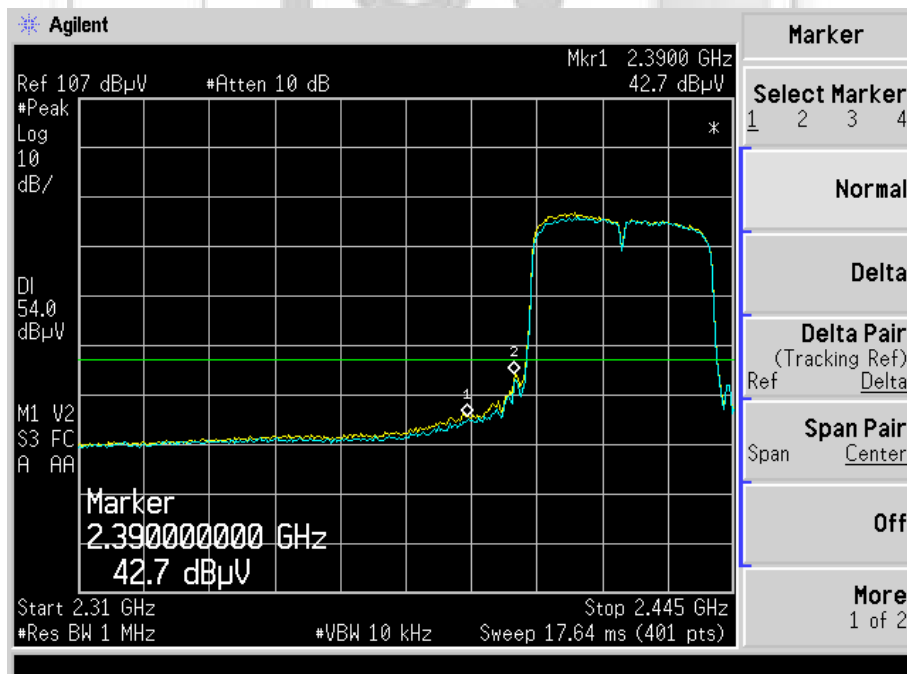
Plot 1939- Lower Band Edge at 2.4000GHz @ 64QAM 270Mbps (Worst)

BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (Restricted Band)



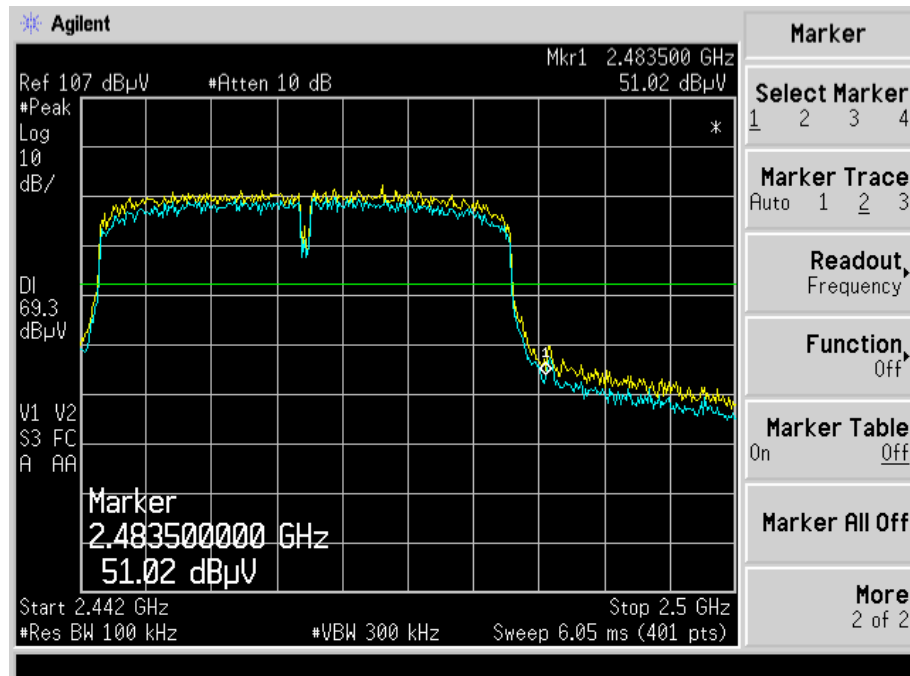
Plot 1940 – Peak Plot at Lower Band Edge at 2.4000GHz @ 64QAM 270Mbps (Worst)



Plot 1941 – Average Plot at Lower Band Edge at 2.4000GHz @ 64QAM 270Mbps (Worst)

BAND EDGE COMPLIANCE (RADIATED) TEST

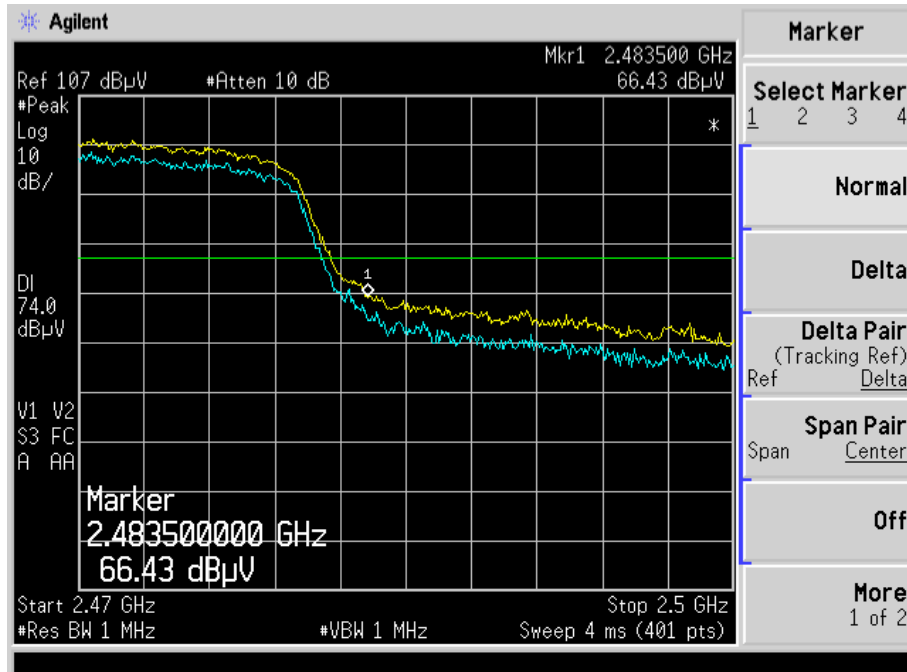
Band Edge Compliance (Radiated) Plots (20dB Delta from Carrier at Band Edge)



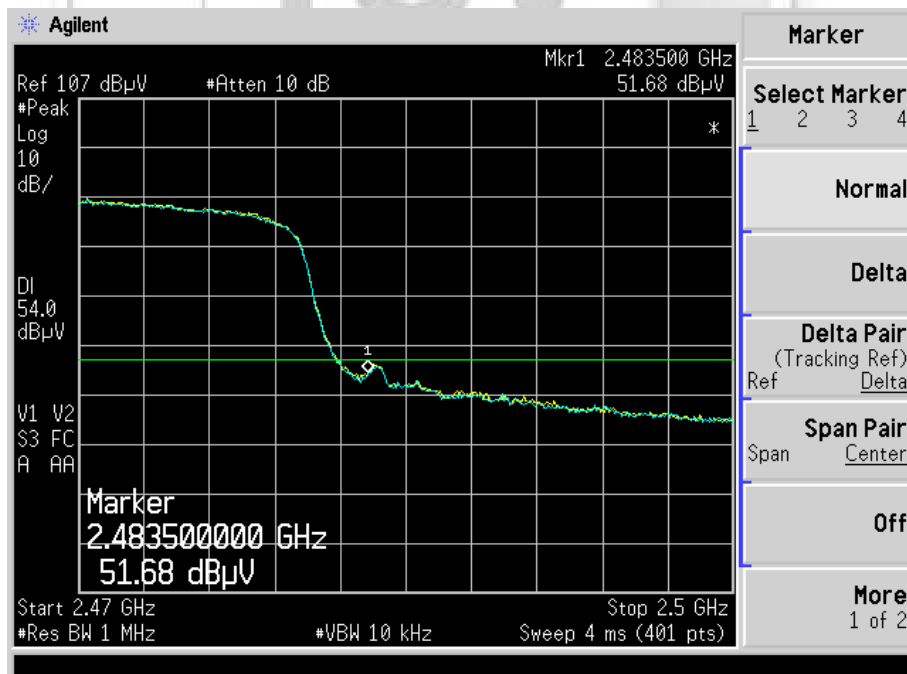
Plot 1942 – Upper Band Edge at 2.4835GHz @ 64QAM 270Mbps (Worst)

BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (Restricted Band)



Plot 1943 – Peak Plot at Upper Band Edge at 2.4835GHz @ 64QAM 270Mbps (Worst)



Plot 1944 – Average Plot at Upper Band Edge at 2.4835GHz @ 64QAM 270Mbps (Worst)

PEAK POWER SPECTRAL DENSITY TEST

47 CFR FCC Part 15.247(e) Peak Power Spectral Density Limits

The EUT shows compliance to the requirements of this section, which states the peak power spectral density conducted from the intentional radiator (EUT) to the antenna shall not be greater than 8dBm (6.3mW) in any 3kHz band during any time interval of continuous transmission.

47 CFR FCC Part 15.247(e) Peak Power Spectral Density Test Instrumentation

Instrument	Model	S/No	Cal Due Date	Cal Interval
Agilent Spectrum Analyzer	E4404A	MY45304746	14 Nov 2014	1 year
Agilent DC Power Supply	E3620A	MY40000448	Output Monitor	Output Monitor

47 CFR FCC Part 15.247(e) Peak Power Spectral Density Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum via a low-loss coaxial cable.
4. The resolution bandwidth (RBW), video bandwidth (VBW) and span of the spectrum analyser were set to the following:
RBW = 3kHz
VBW = 9kHz
Span = 1.5 times the channel bandwidth
Sweep time = auto couple
5. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(e) Peak Power Spectral Density Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode at lower channel with specified modulation and data rate.
2. The peak of the transmitting frequency was detected with the marker peak function of the spectrum analyser.
3. The peak power density of the transmitting frequency was plotted and recorded.
4. Repeat steps 1 to 3 with all possible modulations and data rates.
5. The steps 2 to 4 were repeated with the transmitting frequency was set to middle and upper channel respectively.

PEAK POWER SPECTRAL DENSITY TEST

47 CFR FCC Part 15.247(e) Peak Power Spectral Density Results

Test Input Power	12Vdc	Temperature	22°C
Attached Plots	1945 – 1953	Relative Humidity	54%
	802.11b	Atmospheric Pressure	1030mbar
		Tested By	Kyaw Soe Hein

Channel	Channel Frequency (GHz)	Peak Power Spectral Density (mW)	Limit (mW)	Modulation @ Data Rate
1 (lower ch)	2.412	0.0556	6.3	DBPSK @ 1Mbps
		0.2425	6.3	DQPSK @ 2Mbps
		0.2075	6.3	CCK @ 11Mbps
6 (mid ch)	2.437	0.0453	6.3	DBPSK @ 1Mbps
		0.1936	6.3	DQPSK @ 2Mbps
		0.1793	6.3	CCK @ 11Mbps
11 (upper ch)	2.462	0.0393	6.3	DBPSK @ 1Mbps
		0.2023	6.3	DQPSK @ 2Mbps
		0.1457	6.3	CCK @ 11Mbps

Test Input Power	12Vdc	Temperature	22°C
Attached Plots	1954 – 1965	Relative Humidity	54%
	802.11g	Atmospheric Pressure	1030mbar
		Tested By	Kyaw Soe Hein

Channel	Channel Frequency (GHz)	Peak Power Spectral Density (mW)	Limit (mW)	Modulation @ Data Rate
1 (lower ch)	2.412	0.0486	6.3	BPSK @ 9Mbps
		0.0588	6.3	QPSK @ 18Mbps
		0.0906	6.3	16QAM @ 36Mbps
		0.0730	6.3	64QAM @ 54Mbps
6 (mid ch)	2.437	0.0566	6.3	BPSK @ 9Mbps
		0.0566	6.3	QPSK @ 18Mbps
		0.0838	6.3	16QAM @ 36Mbps
		0.0720	6.3	64QAM @ 54Mbps
11 (upper ch)	2.462	0.0334	6.3	BPSK @ 9Mbps
		0.0404	6.3	QPSK @ 18Mbps
		0.0590	6.3	16QAM @ 36Mbps
		0.0492	6.3	64QAM @ 54Mbps

PEAK POWER SPECTRAL DENSITY TEST

47 CFR FCC Part 15.247(e) Peak Power Spectral Density Results

Test Input Power	12Vdc	Temperature	22°C
Attached Plots	1966 – 1977	Relative Humidity	54%
	802.11n (20MHz)	Atmospheric Pressure	1030mbar
		Tested By	Kyaw Soe Hein

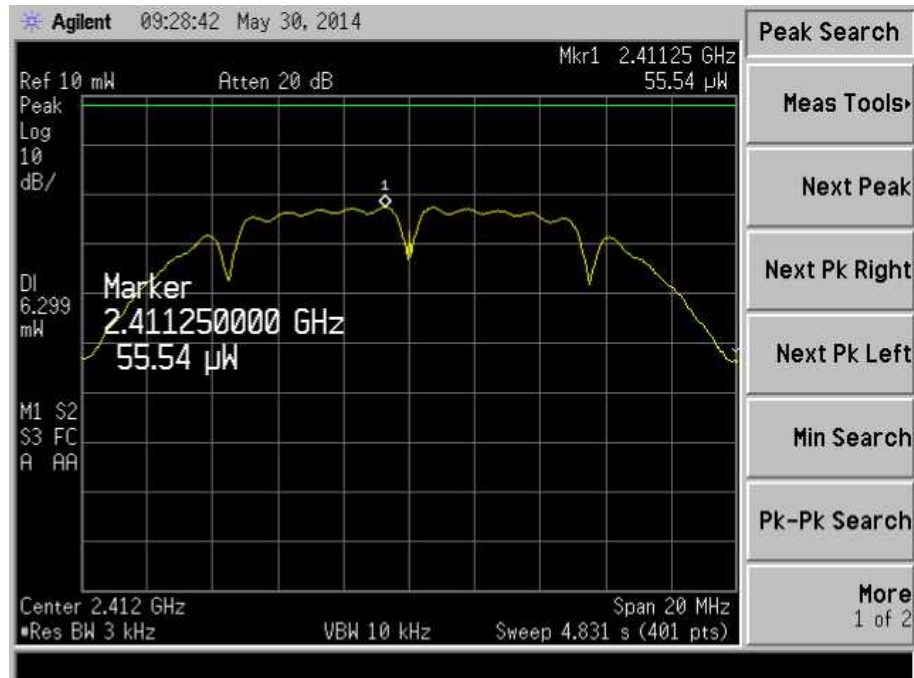
Channel	Channel Frequency (GHz)	Peak Power Spectral Density (mW)	Limit (mW)	Modulation @ Data Rate
1 (lower ch)	2.412	0.0508	6.3	MCS8 @ 13Mbps
		0.0619	6.3	MCS10 @ 39Mbps
		0.0651	6.3	MCS12 @ 78Mbps
		0.0716	6.3	MCS15 @ 130Mbps
6 (mid ch)	2.437	0.0456	6.3	MCS8 @ 13Mbps
		0.0541	6.3	MCS10 @ 39Mbps
		0.0516	6.3	MCS12 @ 78Mbps
		0.0634	6.3	MCS15 @ 130Mbps
11 (upper ch)	2.462	0.0450	6.3	MCS8 @ 13Mbps
		0.0456	6.3	MCS10 @ 39Mbps
		0.0426	6.3	MCS12 @ 78Mbps
		0.0484	6.3	MCS15 @ 130Mbps

Test Input Power	12Vdc	Temperature	22°C
Attached Plots	1978 - 1989	Relative Humidity	54%
	802.11n (40MHz)	Atmospheric Pressure	1030mbar
		Tested By	Kyaw Soe Hein

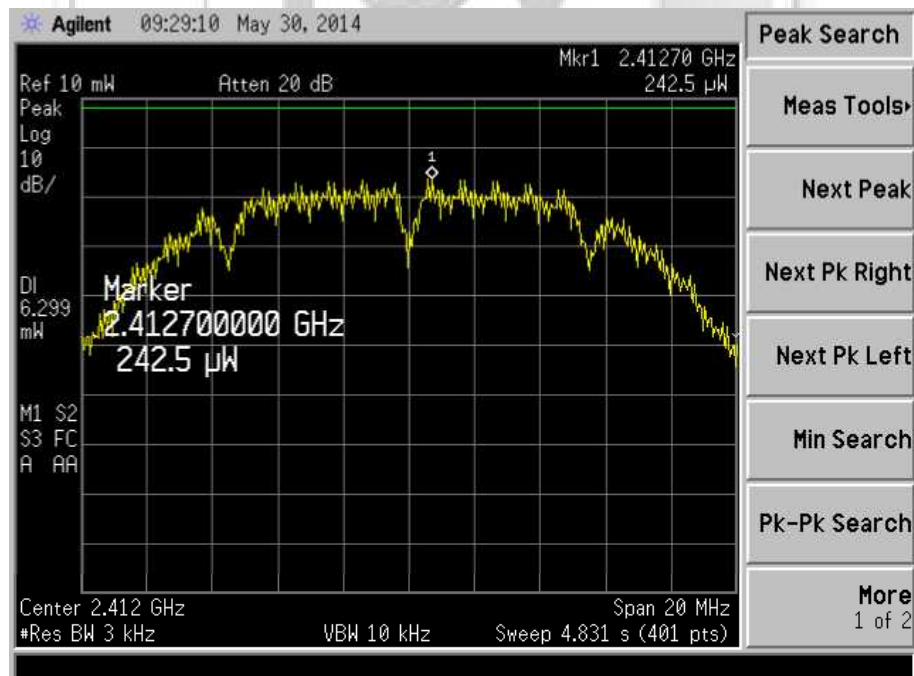
Channel	Channel Frequency (GHz)	Peak Power Spectral Density (mW)	Limit (mW)	Modulation @ Data Rate
3 (lower ch)	2.422	0.0307	6.3	MCS8 @ 13Mbps
		0.0396	6.3	MCS10 @ 39Mbps
		0.0351	6.3	MCS12 @ 78Mbps
		0.0356	6.3	MCS15 @ 130Mbps
7 (mid ch)	2.442	0.0380	6.3	MCS8 @ 13Mbps
		0.0381	6.3	MCS10 @ 39Mbps
		0.0305	6.3	MCS12 @ 78Mbps
		0.0321	6.3	MCS15 @ 130Mbps
11 (upper ch)	2.462	0.0296	6.3	MCS8 @ 13Mbps
		0.0295	6.3	MCS10 @ 39Mbps
		0.0281	6.3	MCS12 @ 78Mbps
		0.0297	6.3	MCS15 @ 130Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11b



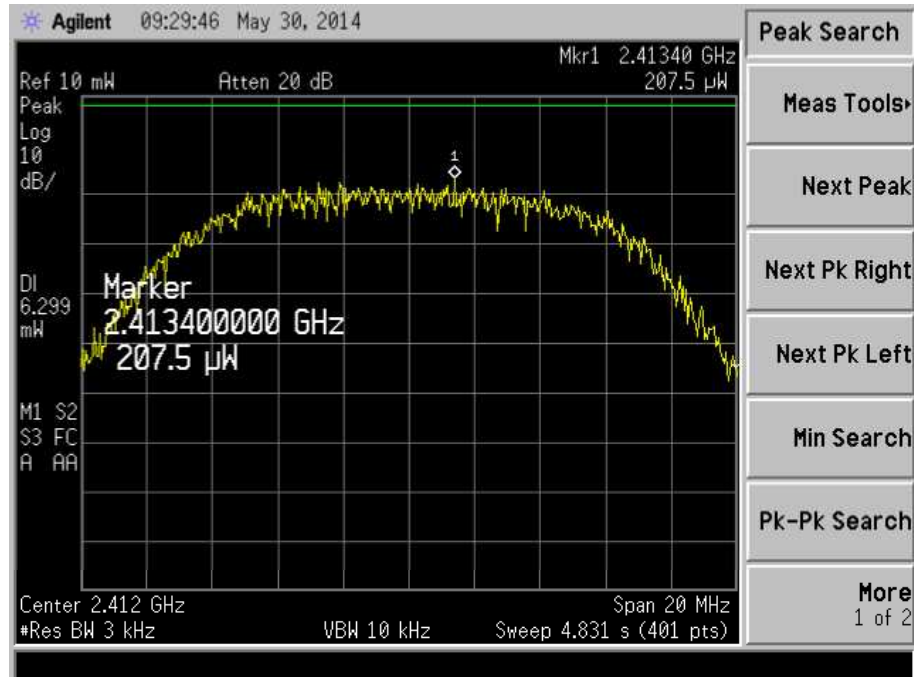
Plot 1945 – Channel 1 (lower ch) @ DBPSK 1Mbps



Plot 1946 – Channel 1 (lower ch) @ DQPSK 2Mbps

PEAK POWER SPECTRAL DENSITY TEST

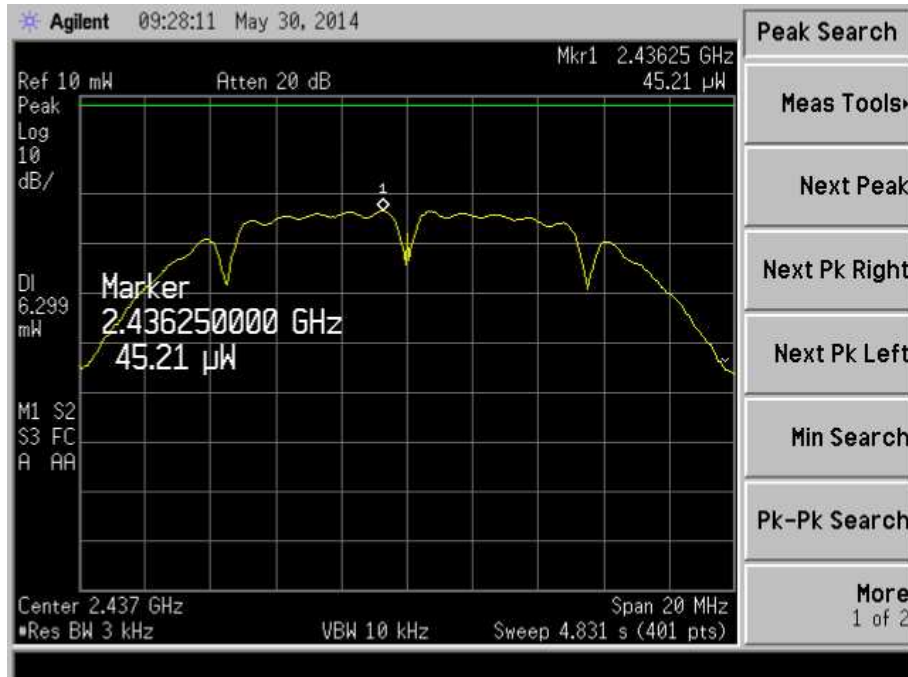
Peak Power Spectral Density Plots – 802.11b



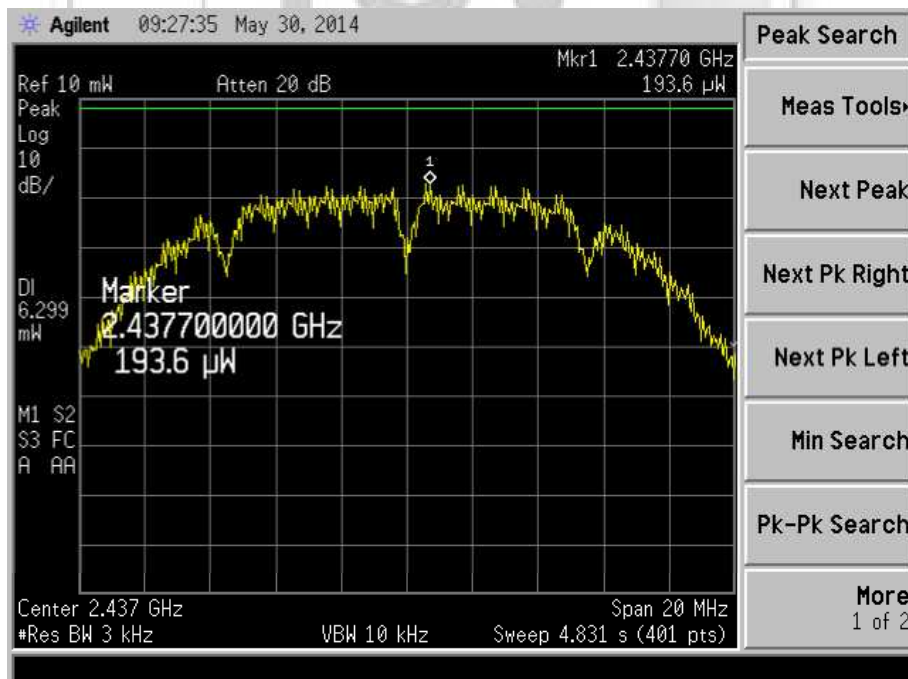
Plot 1947 – Channel 1 (lower ch) @ CCK 11Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11b



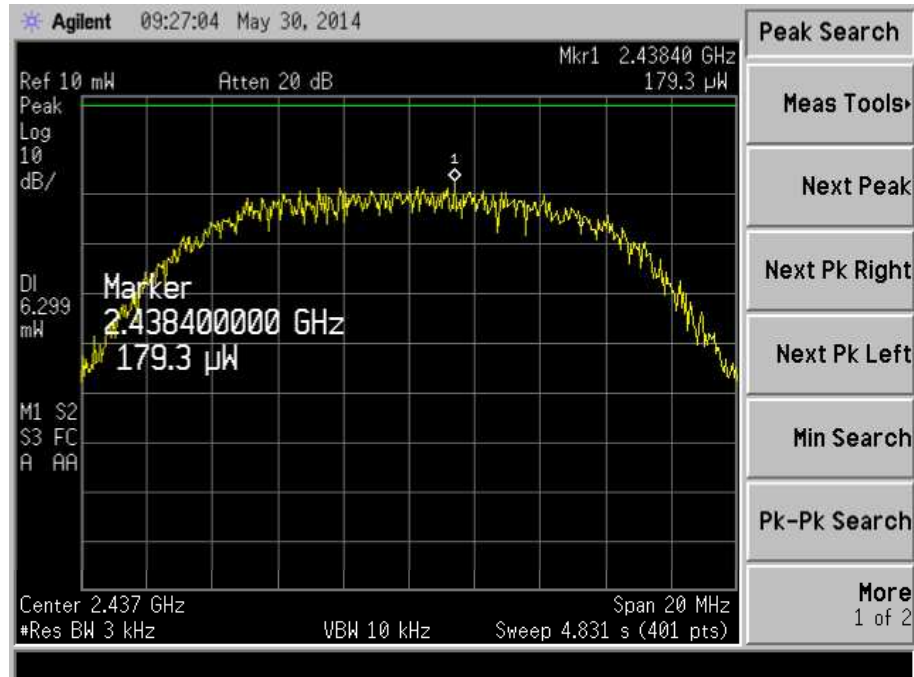
Plot 1948 – Channel 6 (middle ch) @ DBPSK 1Mbps



Plot 1949 – Channel 6 (middle ch) @ DQPSK 2Mbps

PEAK POWER SPECTRAL DENSITY TEST

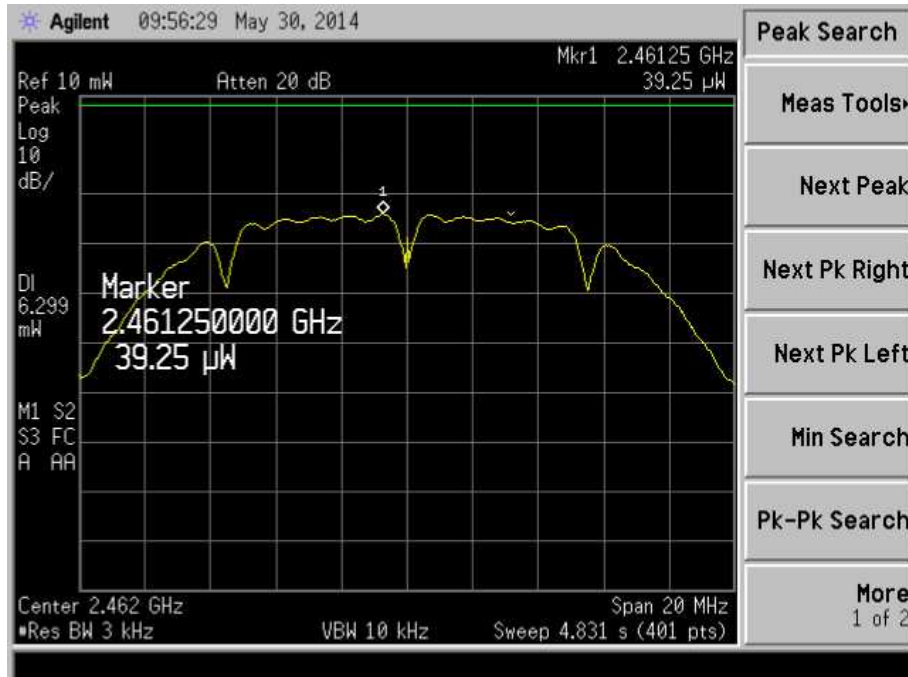
Peak Power Spectral Density Plots – 802.11b



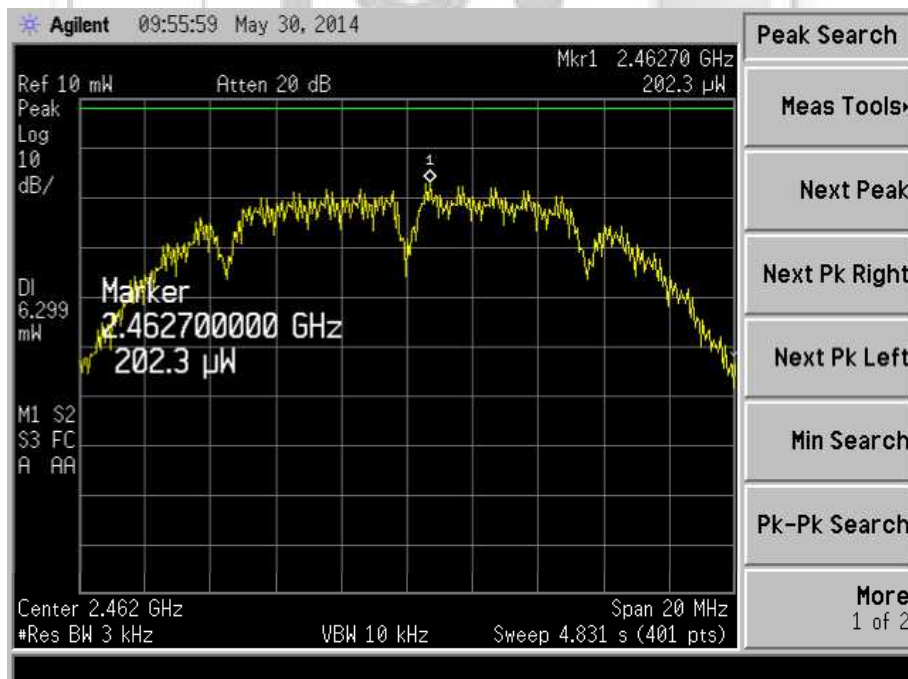
Plot 1950 – Channel 6 (middle ch) @ CCK 11Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11b



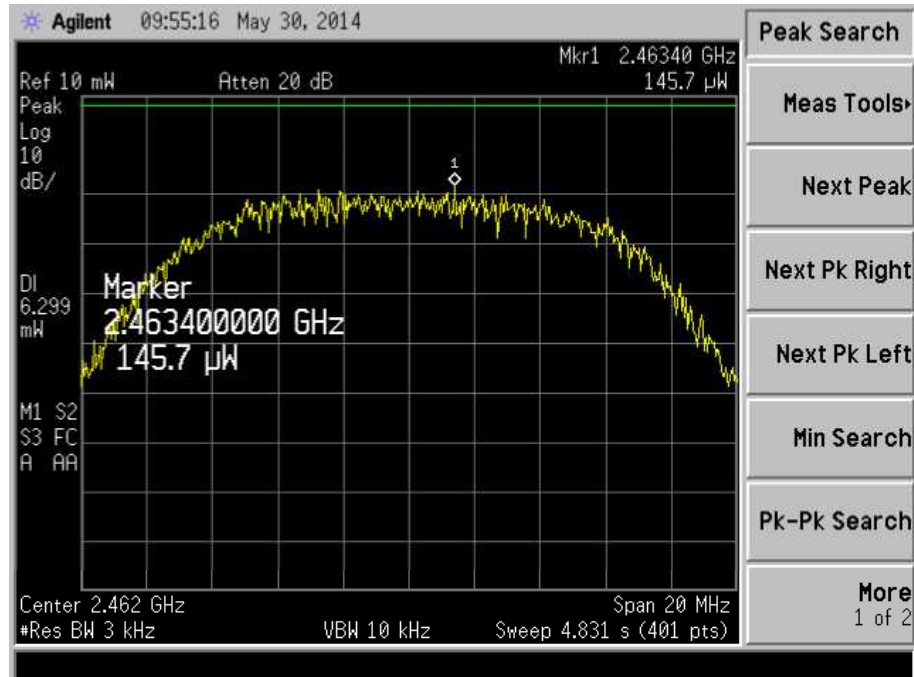
Plot 1951 – Channel 11 (upper ch) @ DBPSK 1Mbps



Plot 1952 – Channel 11 (upper ch) @ DQPSK 2Mbps

PEAK POWER SPECTRAL DENSITY TEST

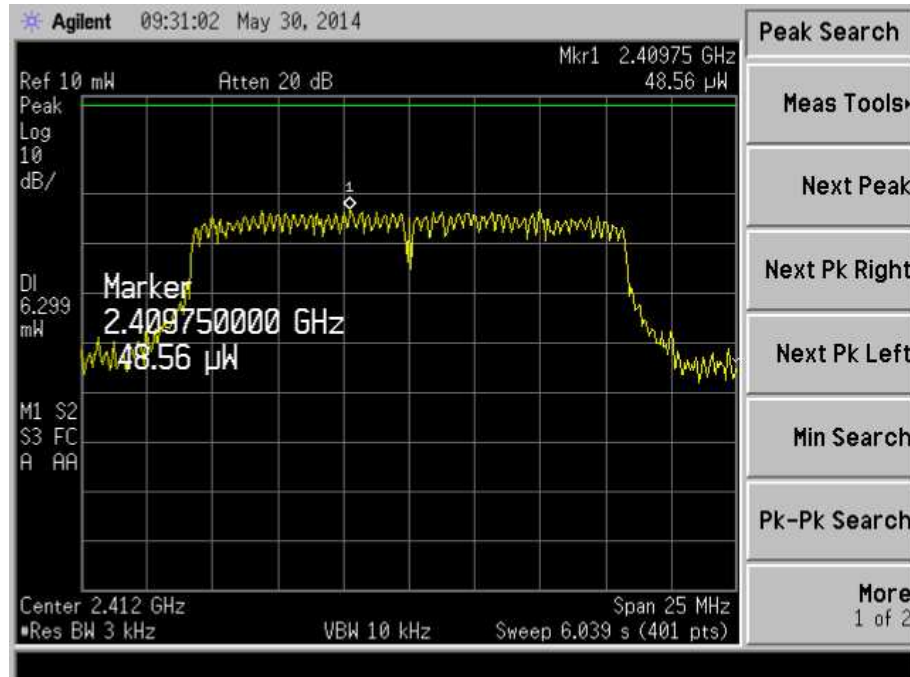
Peak Power Spectral Density Plots – 802.11b



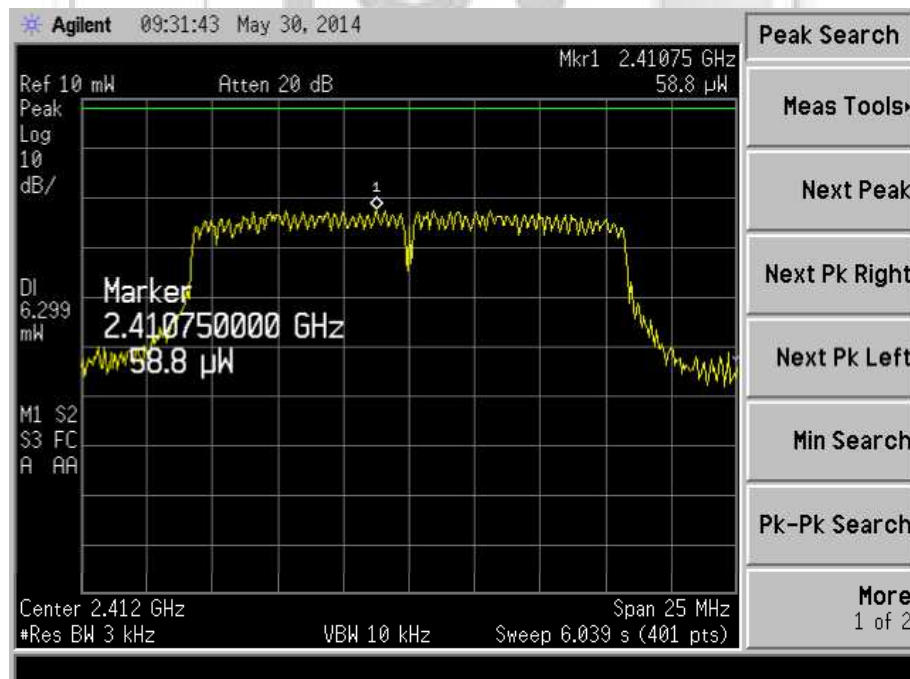
Plot 1953 – Channel 11 (upper ch) @ CCK 11Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11g



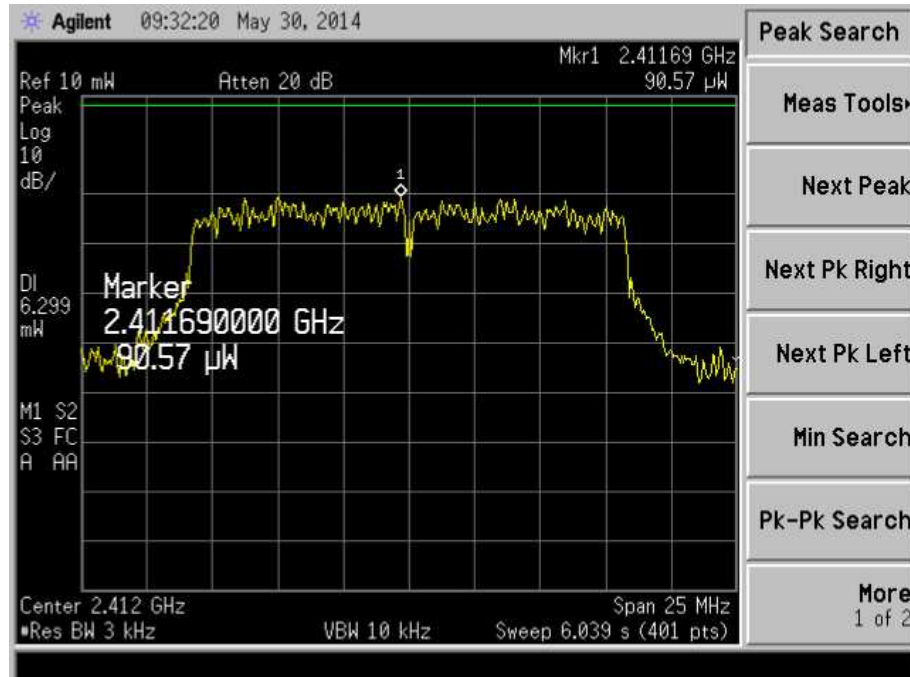
Plot 1954 – Channel 1 (lower ch) @ BPSK 9Mbps



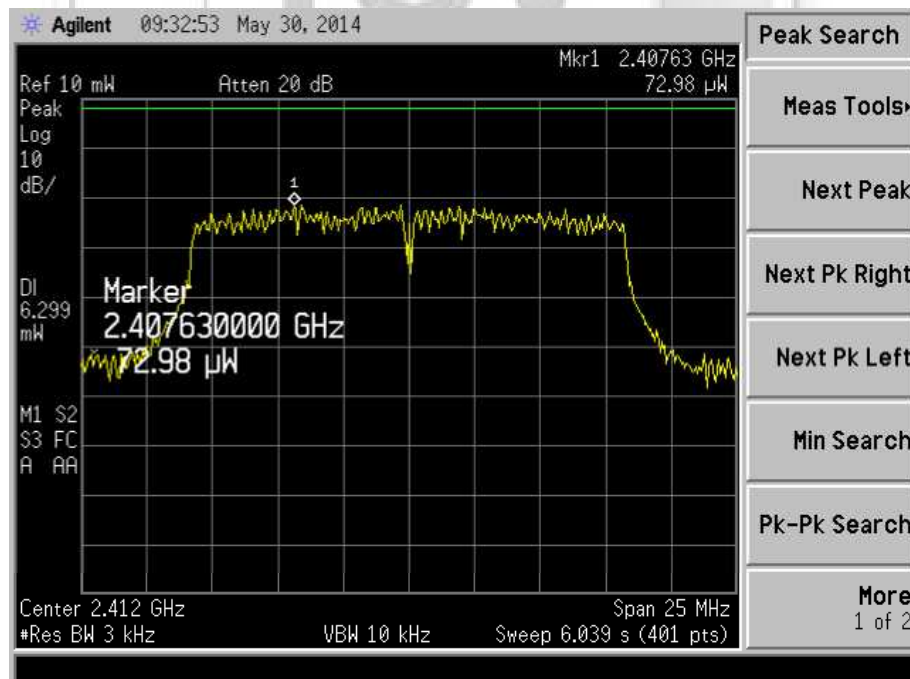
Plot 1955 – Channel 1 (lower ch) @ QPSK 18Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11g



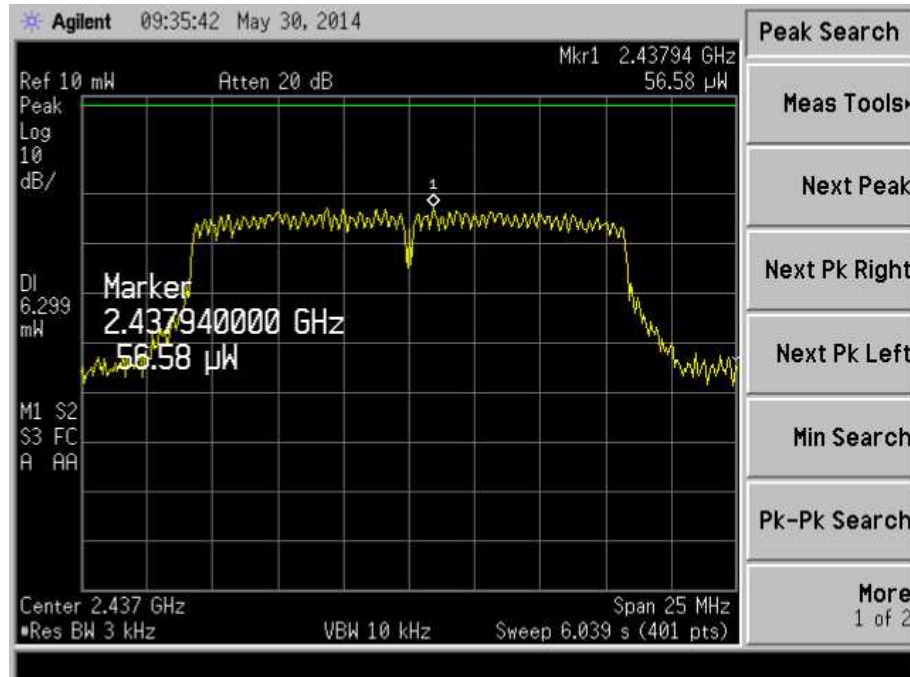
Plot 1956 – Channel 1 (lower ch) @ 16QAM 36Mbps



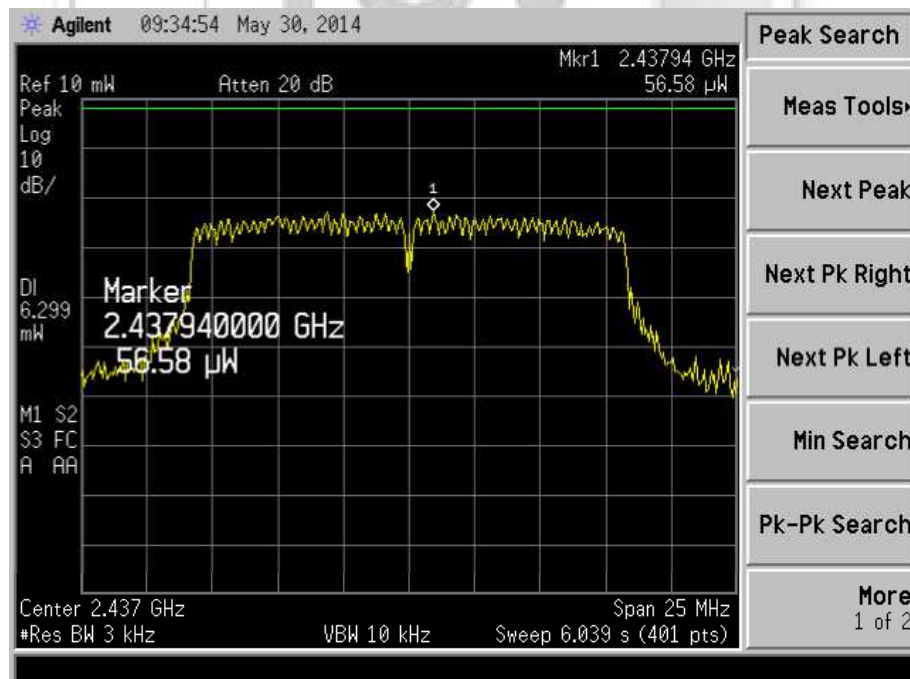
Plot 1957 – Channel 1 (lower ch) @ 64QAM 54Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11g



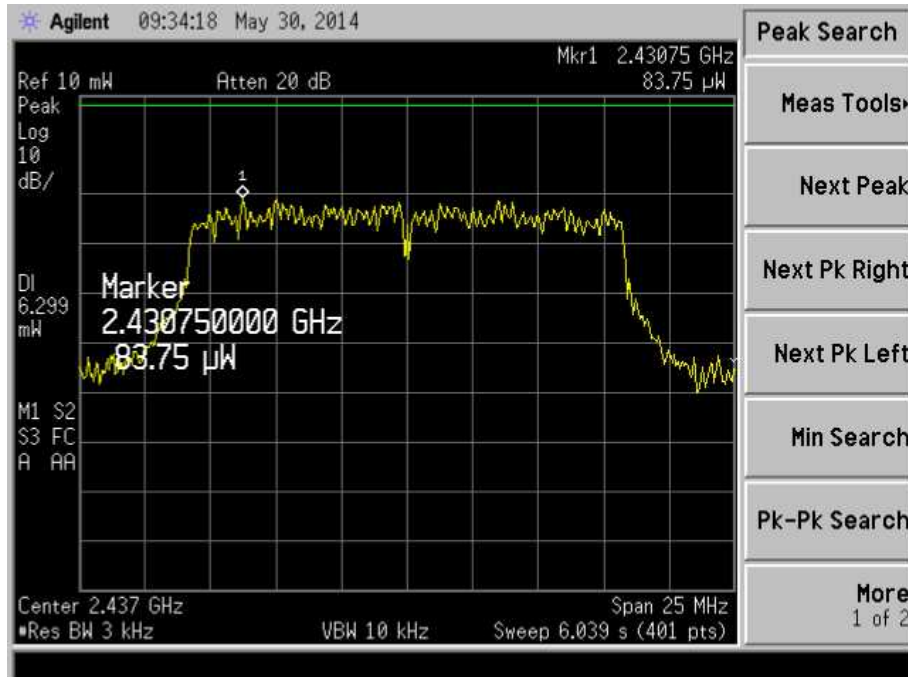
Plot 1958 – Channel 6 (middle ch) @ BPSK 9Mbps



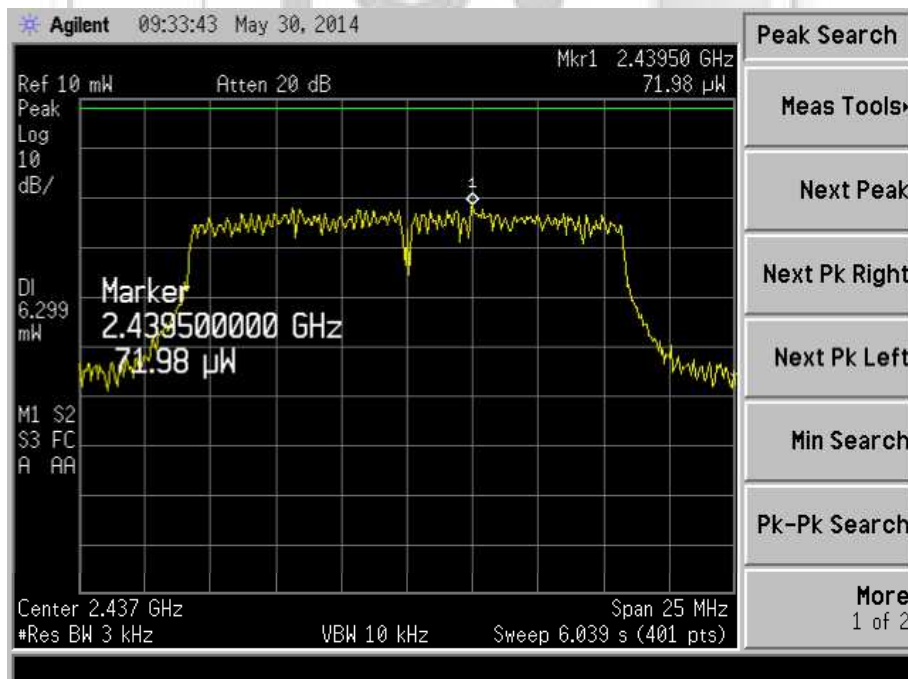
Plot 1959 – Channel 6 (middle ch) @ QPSK 18Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11g



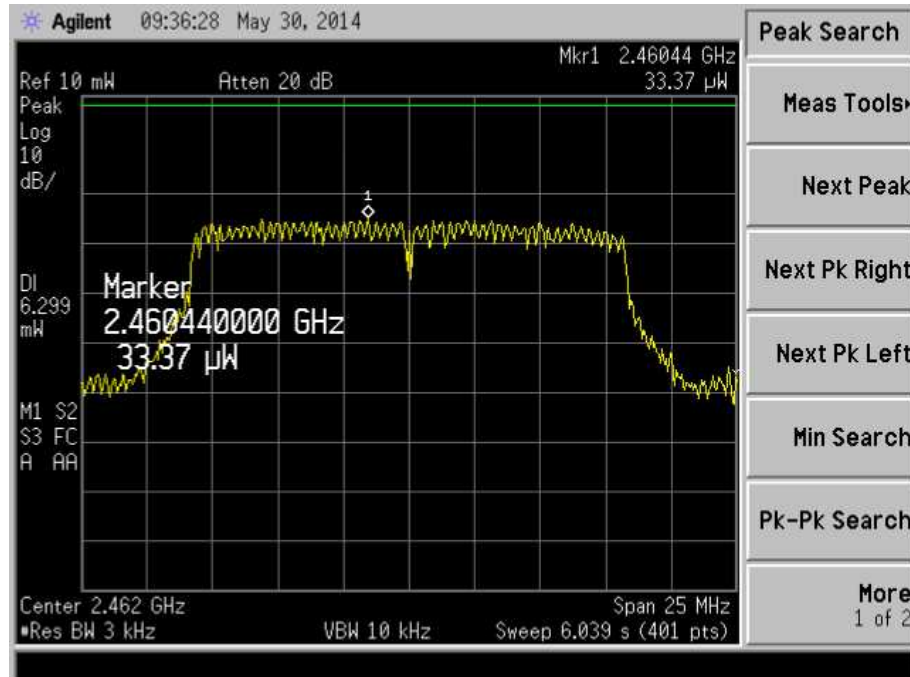
Plot 1960 – Channel 6 (middle ch) @ 16QAM 36Mbps



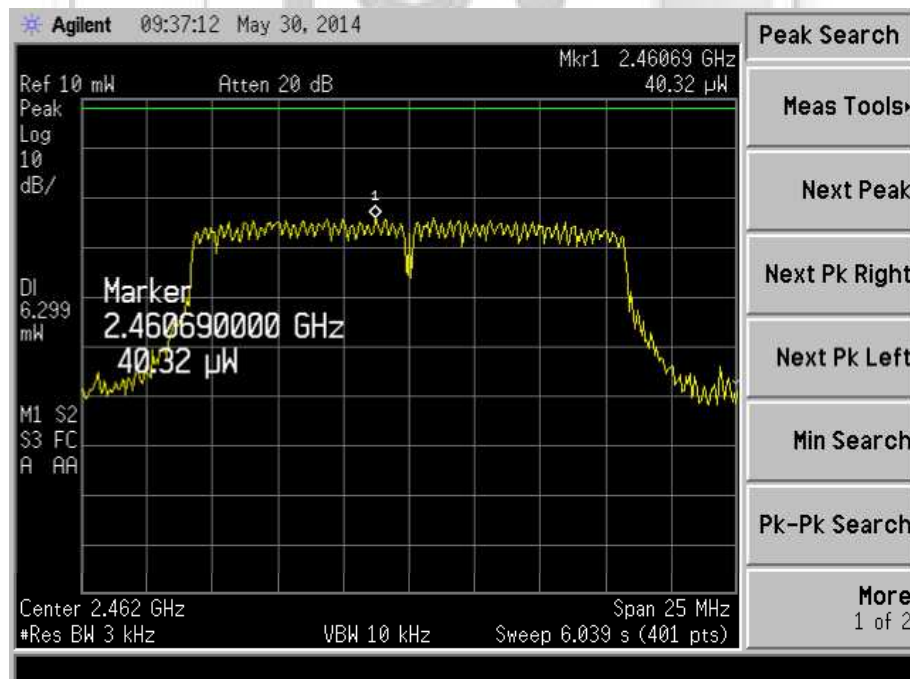
Plot 1961 – Channel 6 (middle ch) @ 64QAM 54Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11g



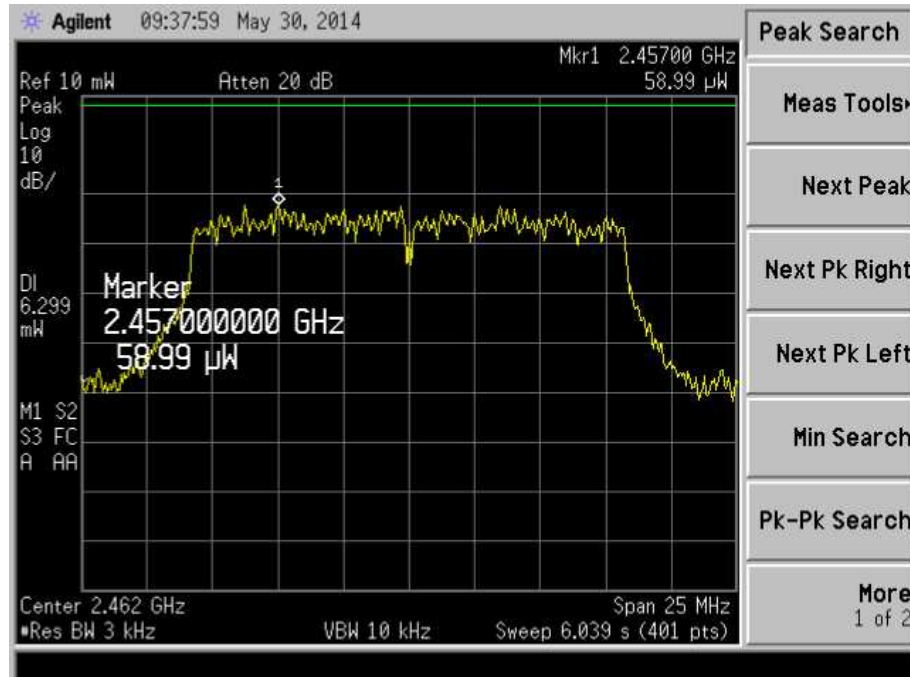
Plot 1962 – Channel 11 (upper ch) @ BPSK 9Mbps



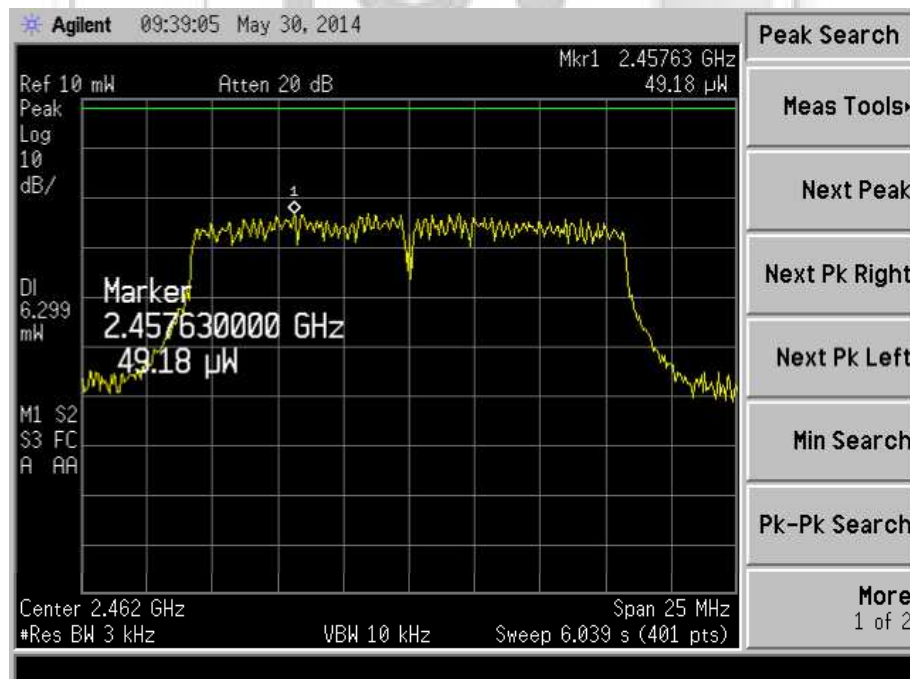
Plot 1963 – Channel 11 (upper ch) @ QPSK 18Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11g



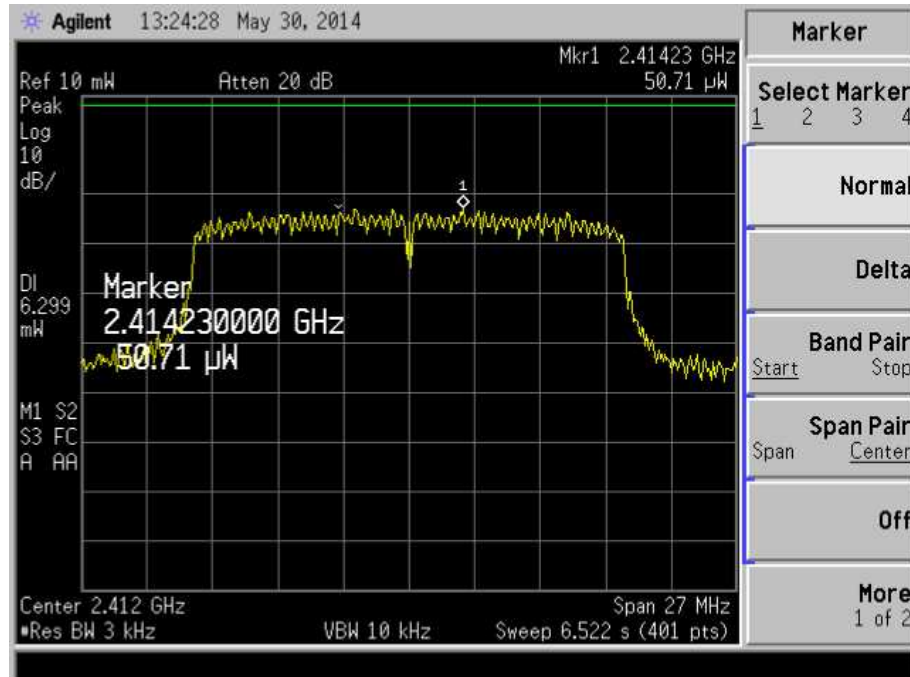
Plot 1964 – Channel 11 (upper ch) @ 16QAM 36Mbps



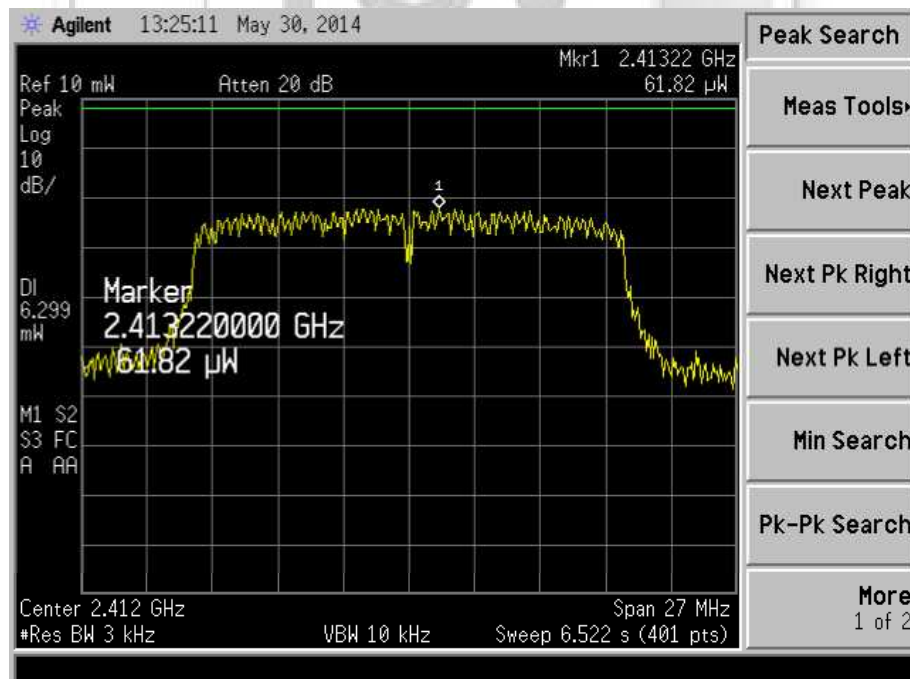
Plot 1965 – Channel 11 (upper ch) @ 64QAM 54Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11n (20MHz)



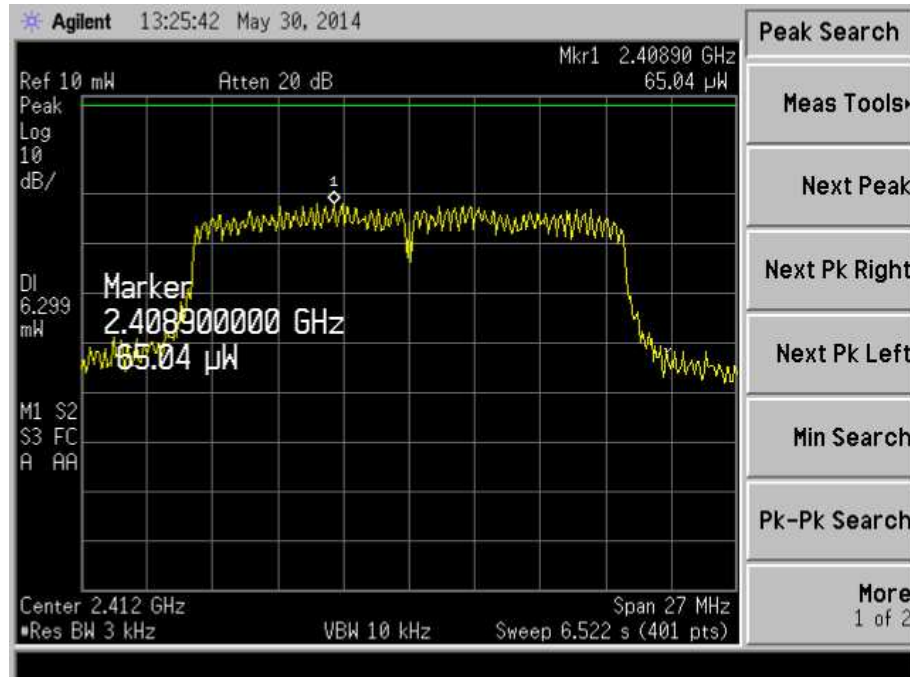
Plot 1966 – Channel 1 (lower ch) @ MCS8 13Mbps



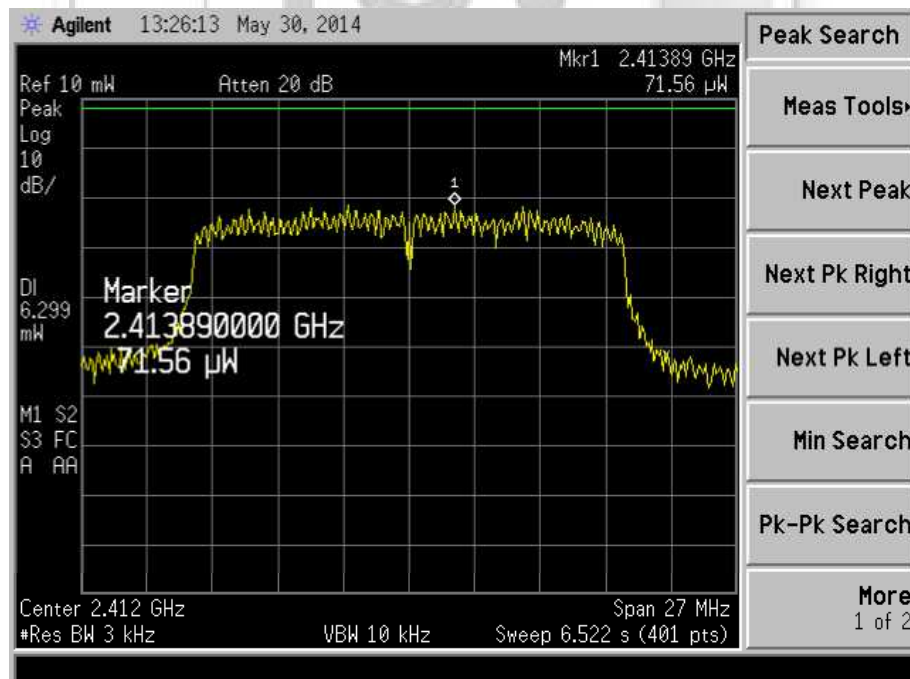
Plot 1967 – Channel 1 (lower ch) @ MCS10 39Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11n (20MHz)



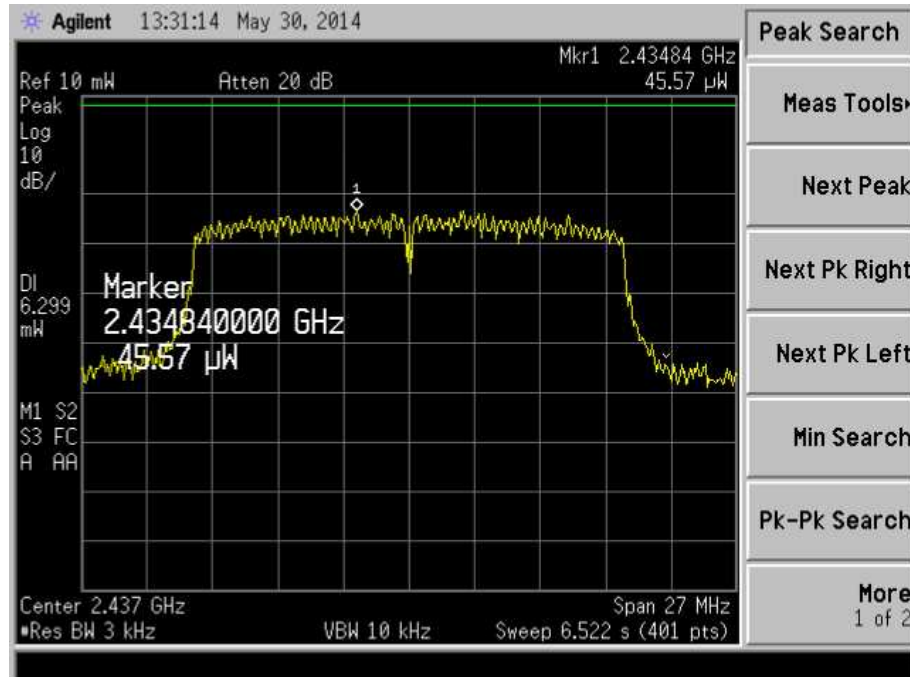
Plot 1968 – Channel 1 (lower ch) @ MCS12 78Mbps



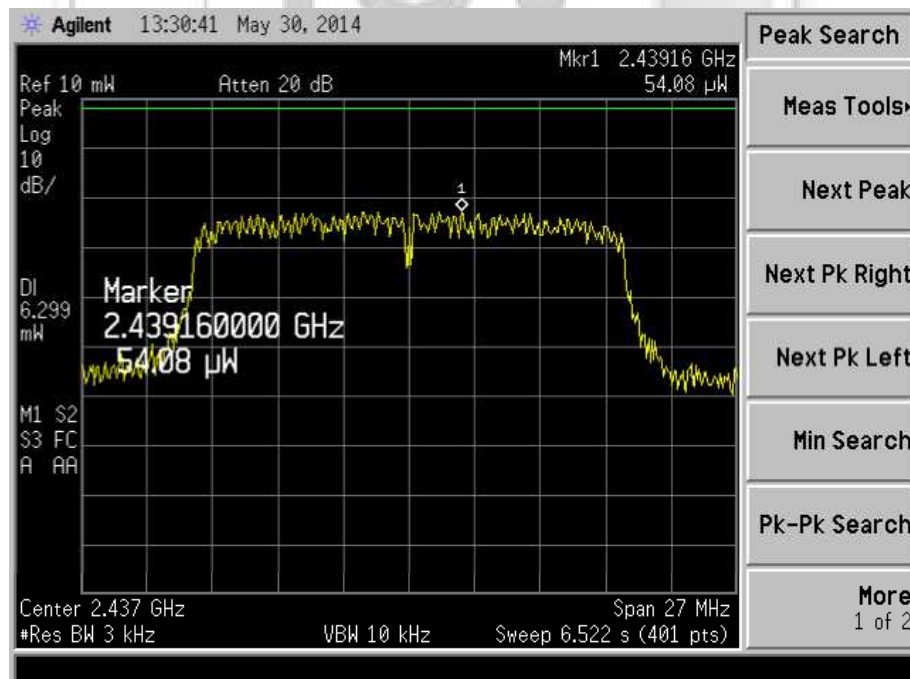
Plot 1969 – Channel 1 (lower ch) @ MCS15 130Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11n (20MHz)



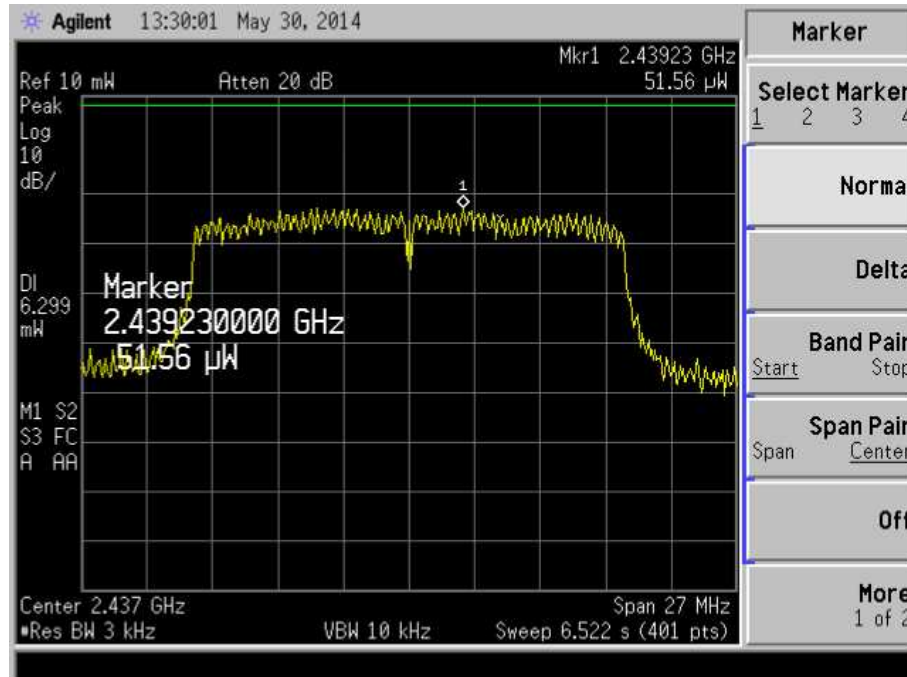
Plot 1970 – Channel 6 (middle ch) @ MCS8 13Mbps



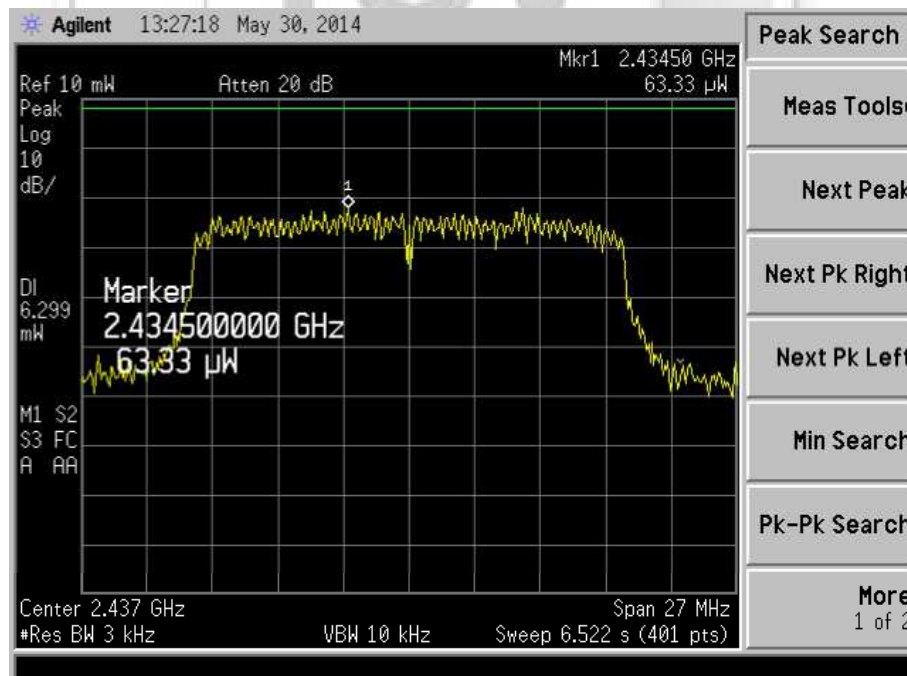
Plot 1971 – Channel 6 (middle ch) @ MCS10 39Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11n (20MHz)



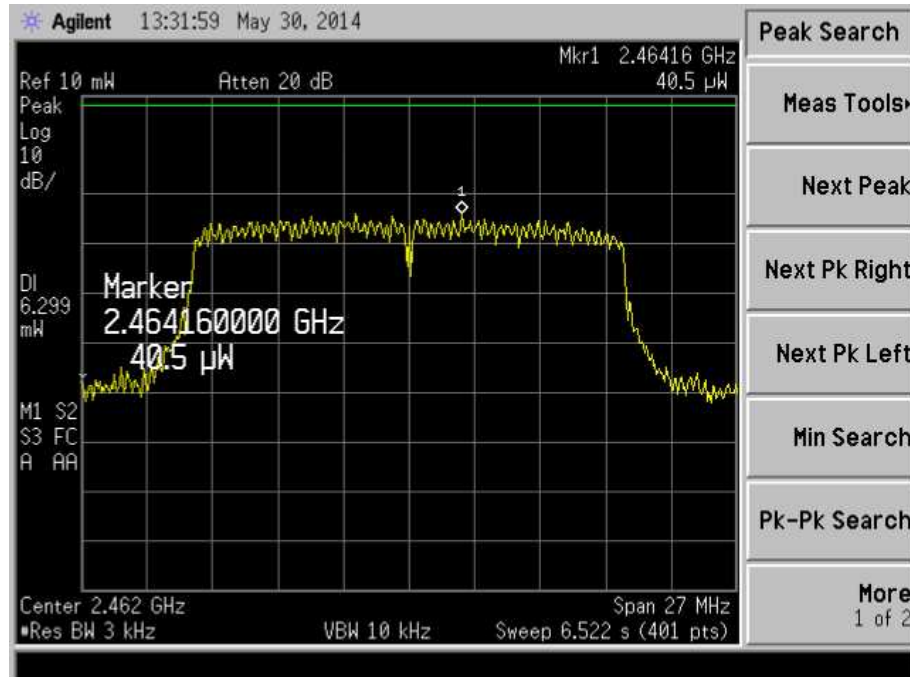
Plot 1972 – Channel 6 (middle ch) @ MCS12 78Mbps



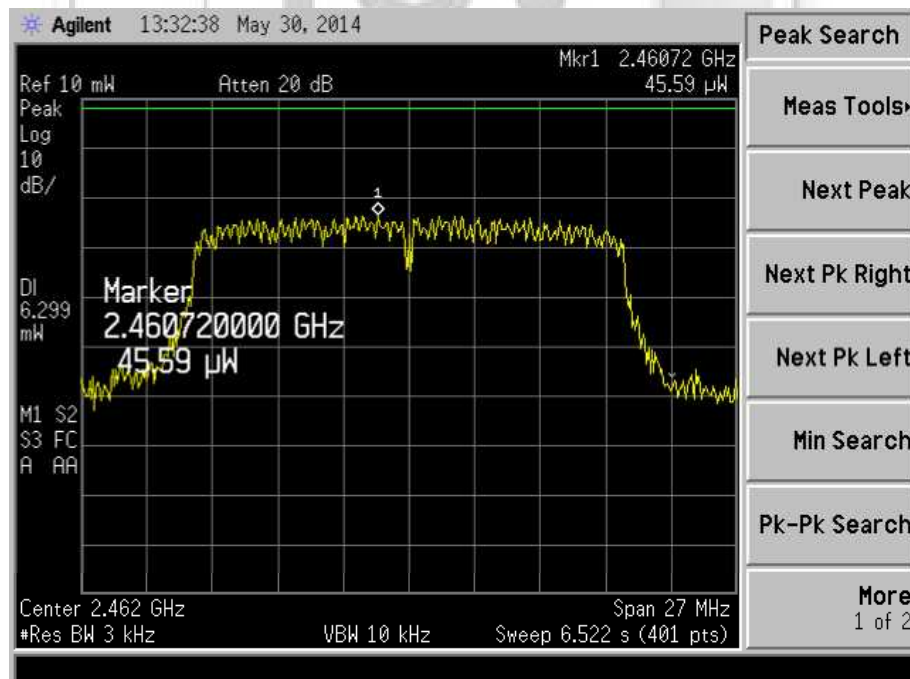
Plot 1973 – Channel 6 (middle ch) @ MCS15 130Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11n (20MHz)



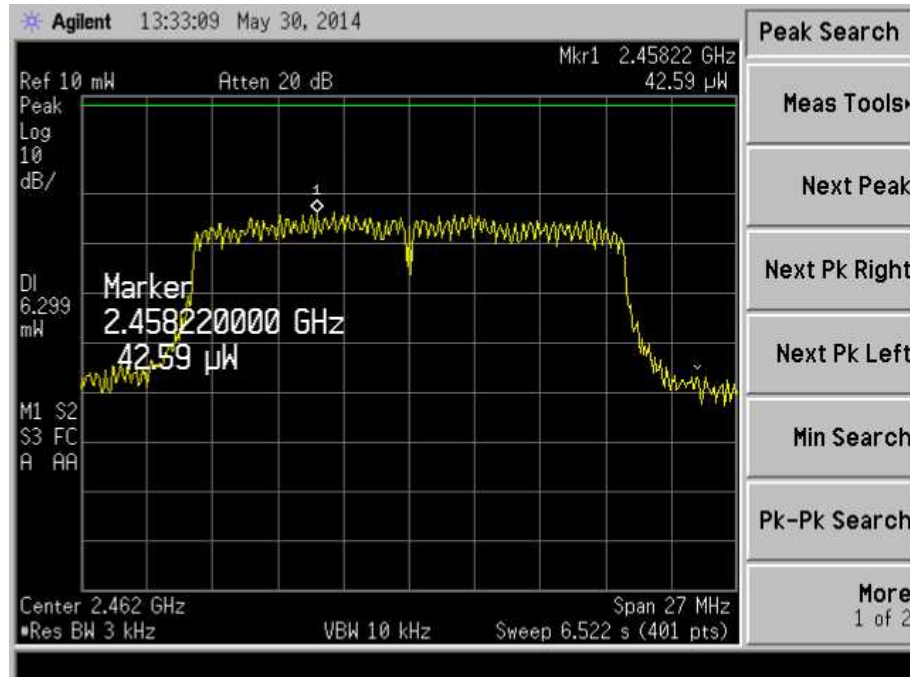
Plot 1974 – Channel 11 (upper ch) @ MCS8 13Mbps



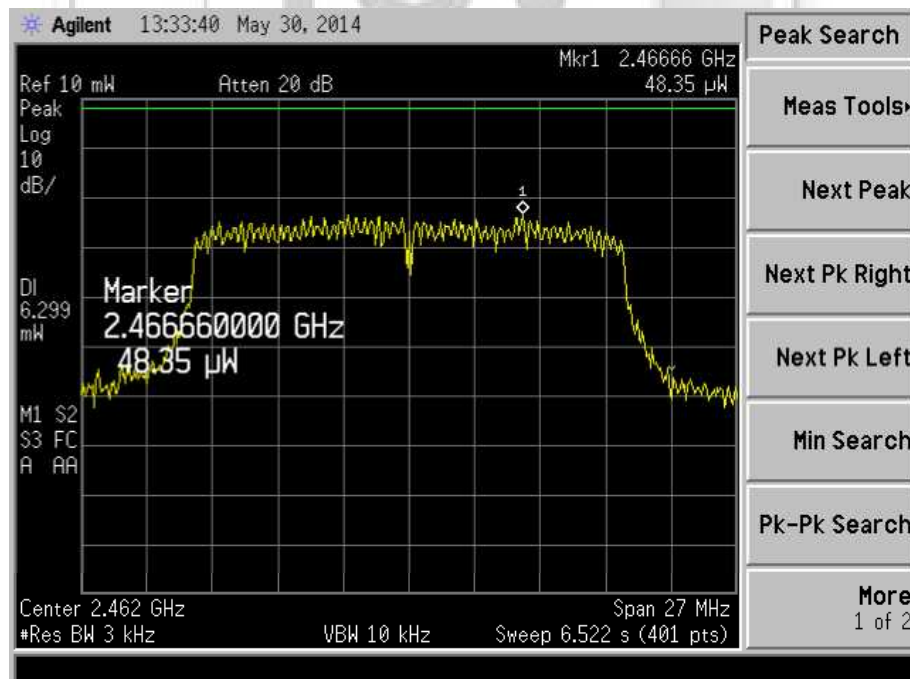
Plot 1975 – Channel 11 (upper ch) @ MCS10 39Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11n (20MHz)



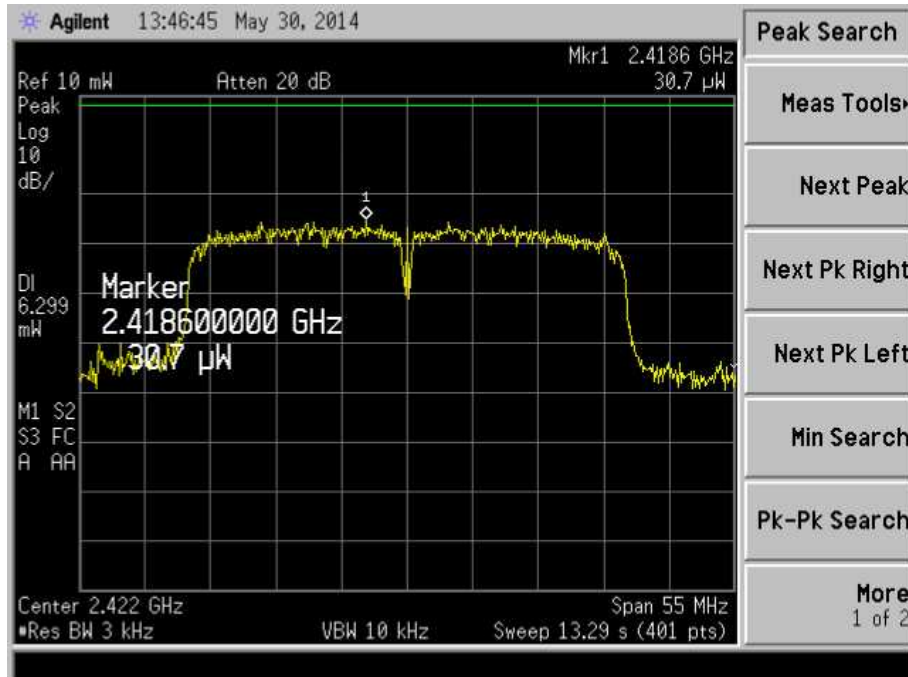
Plot 1976 – Channel 11 (upper ch) @ MCS12 78Mbps



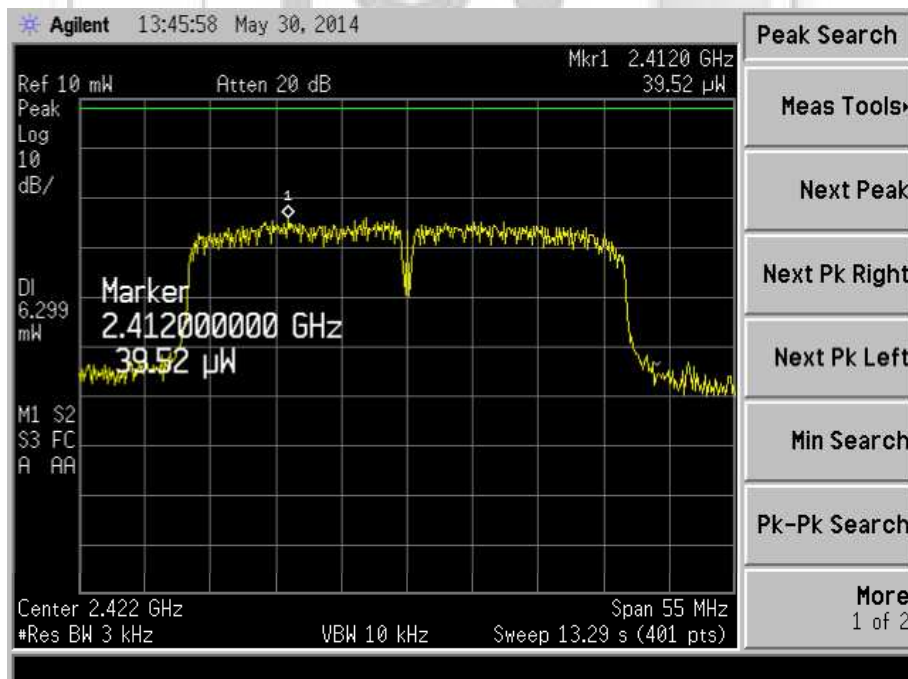
Plot 1977 – Channel 11 (upper ch) @ MCS15 130Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11n (40MHz)



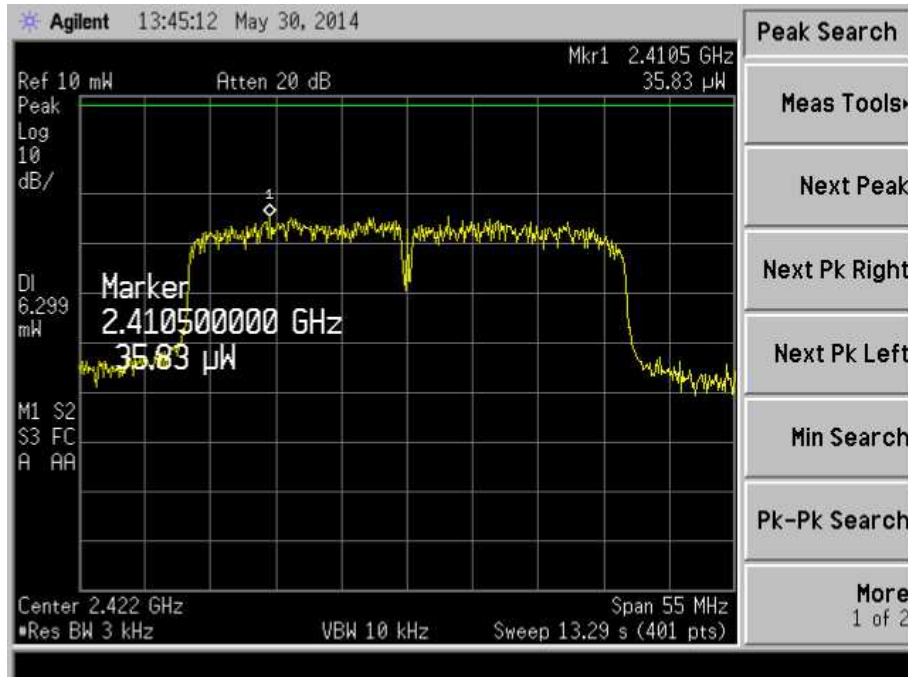
Plot 1978 – Channel 3 (lower ch) @ MCS8 27Mbps



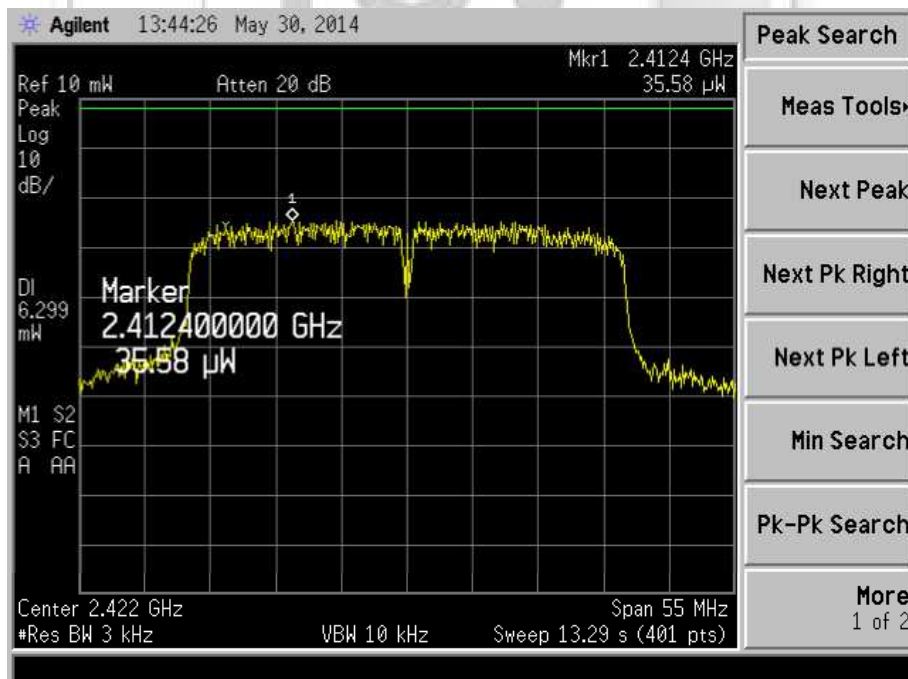
Plot 1979 – Channel 3 (lower ch) @ MCS10 81Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11n (20MHz)



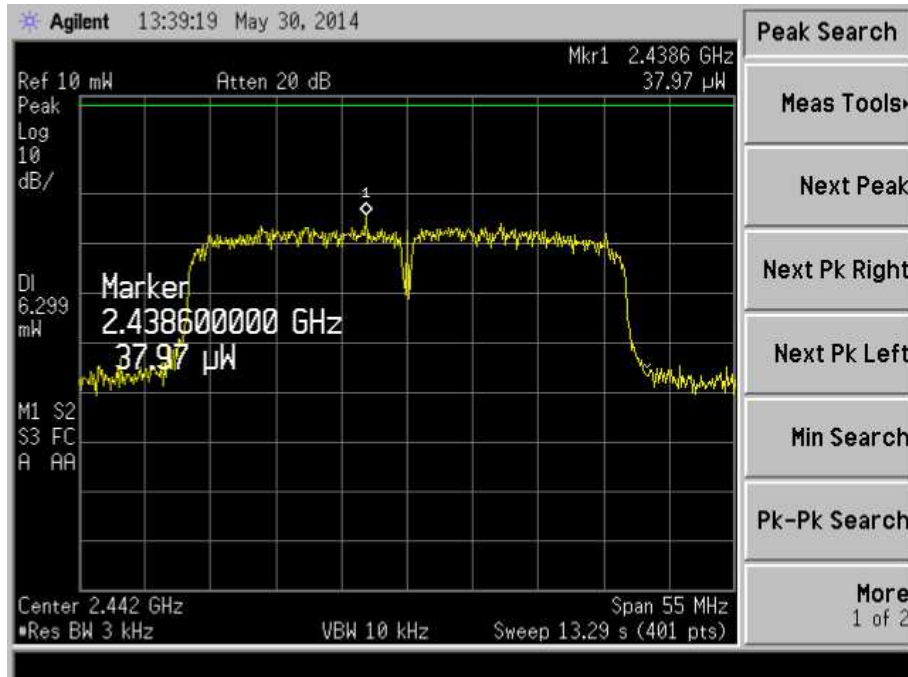
Plot 1980 – Channel 3 (lower ch) @ MCS12 162Mbps



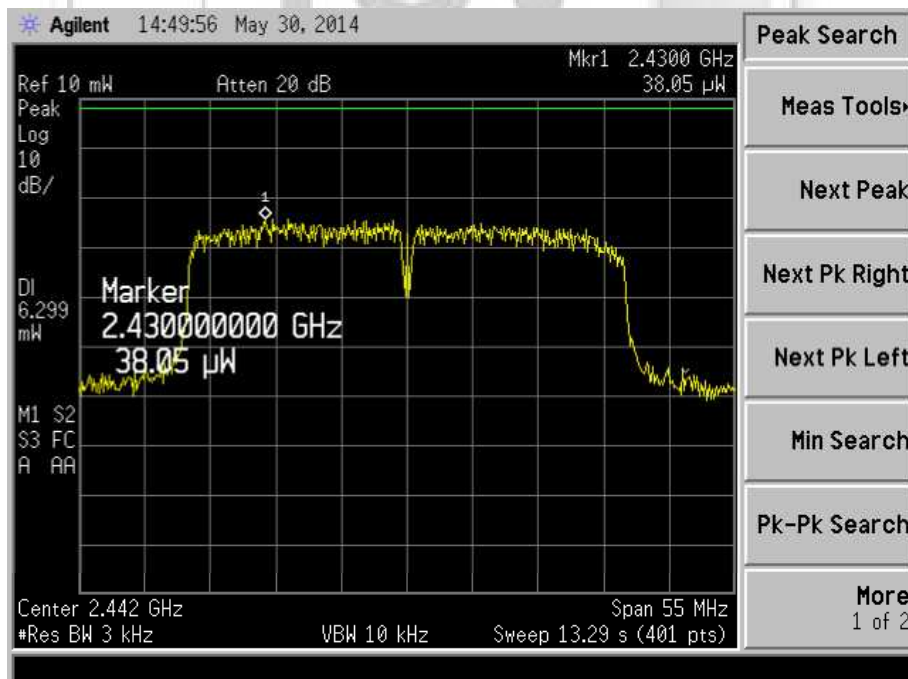
Plot 1981 – Channel 3 (lower ch) @ MCS15 270Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11n (40MHz)



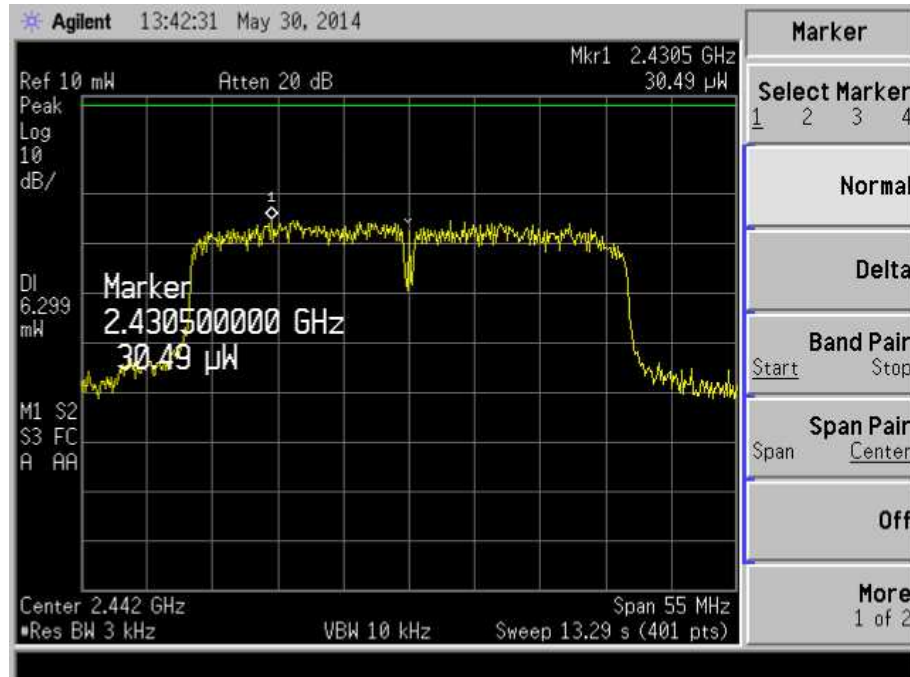
Plot 1982 – Channel 7 (middle ch) @ MCS8 27Mbps



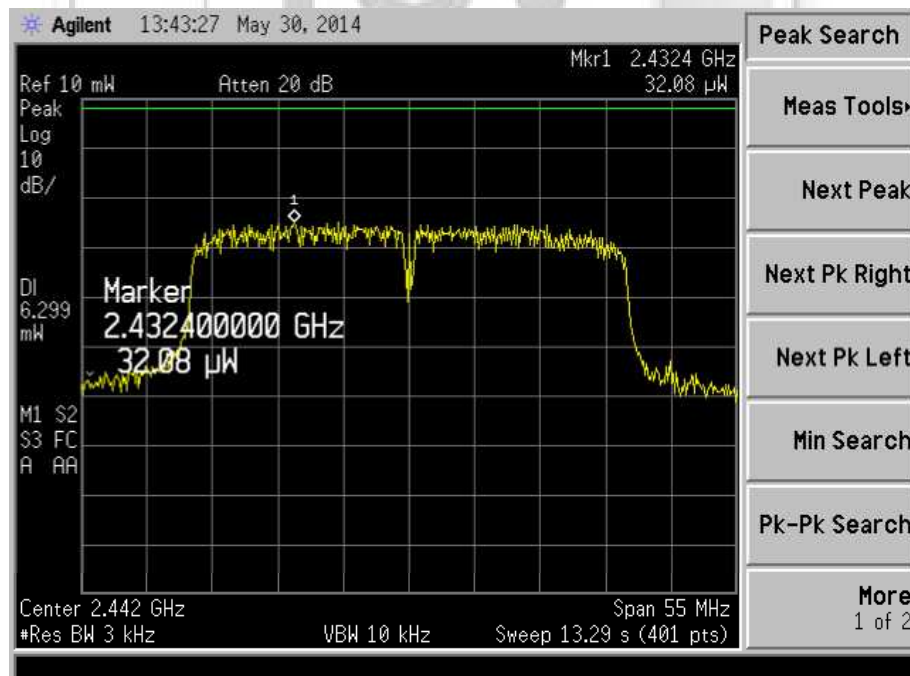
Plot 1983 – Channel 7 (middle ch) @ MCS10 81Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11n (40MHz)



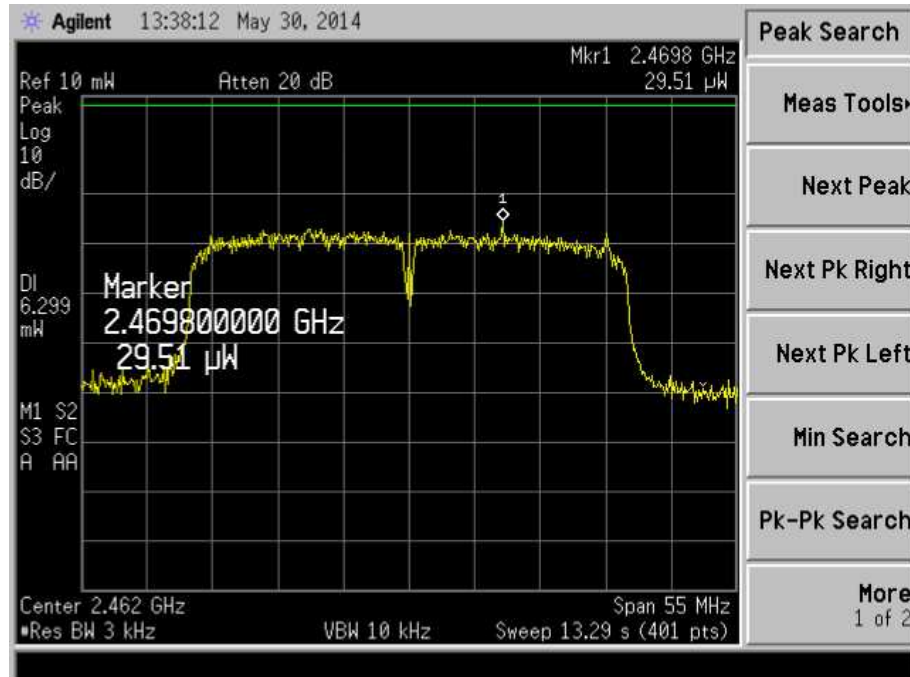
Plot 1984 – Channel 7 (middle ch) @ MCS12 162Mbps



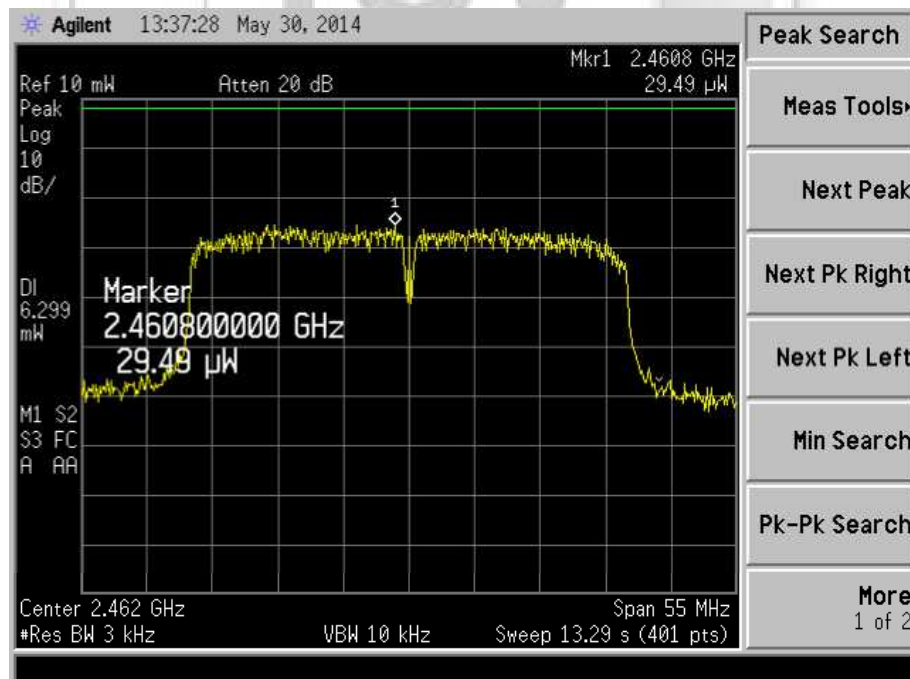
Plot 1985 – Channel 7 (middle ch) @ MCS15 270Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11n (40MHz)



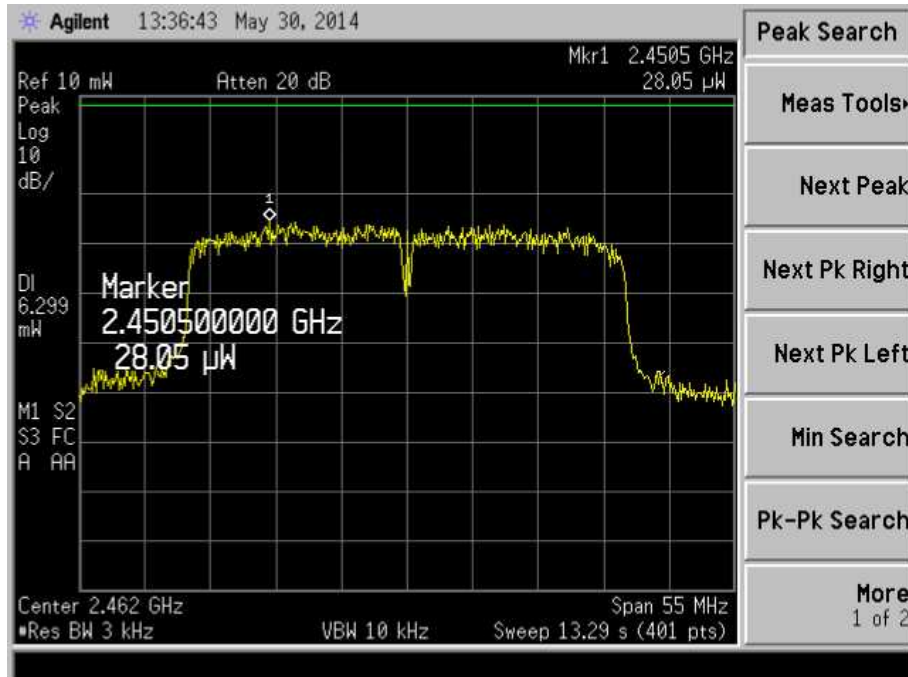
Plot 1986 – Channel 11 (upper ch) @ MCS8 27Mbps



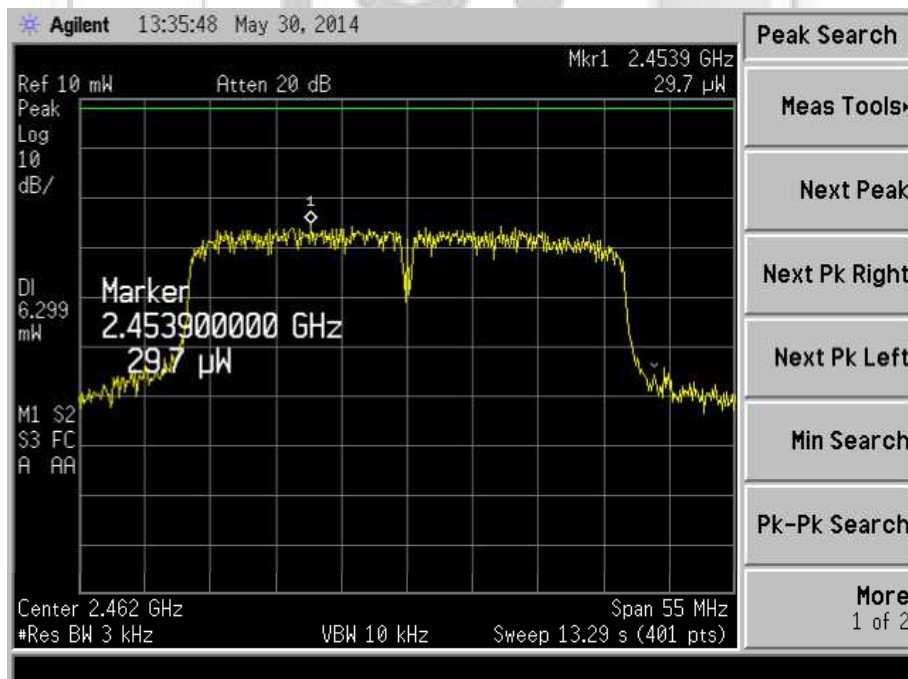
Plot 1987 – Channel 11 (upper ch) @ MCS10 81Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11n (40MHz)



Plot 1988 – Channel 11 (upper ch) @ MCS12 162Mbps



Plot 1989 – Channel 11 (upper ch) @ MCS15 270Mbps

MAXIMUM PERMISSIBLE EXPOSURE (MPE) TEST

47 CFR FCC Part 1.1310 Maximum Permissible Exposure (MPE) Limits

The EUT shows compliance to the requirements of this section, which states the MPE limits for general population / uncontrolled exposure are as shown below:

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (min)
0.3 - 1.34	614	1.63	100 ^{Note 2}	30
1.34 - 30	824 / f	2.19 / f	180 / f ² ^{Note 2}	30
30 - 300	27.5	0.073	0.2	30
300 - 1500	-	-	f / 1500	30
1500 - 100000	-	-	1.0	30
Notes				
1. f = frequency in MHz				
2. Plane wave equivalent power density				

47 CFR FCC Part 1.1310 Maximum Permissible Exposure Computation

The power density at 20cm distance was computed from the following formula:

$$\begin{aligned}
 S &= (30GP) / (377d^2) \\
 \text{where } S &= \text{Power density in W/m}^2 \\
 P &= 0.1524W \text{ (maximum peak measured from Maximum Peak Power)} \\
 d &= \text{Test distance at 0.2m} \\
 G &= \text{Numerical isotropic gain, 1.00 (0.0dBi)}
 \end{aligned}$$

Substituting the relevant parameters into the formula:

$$\begin{aligned}
 S &= [(30GP) / 377d^2] \\
 &= 0.3032 \text{ W/m}^2 \\
 &= 0.0303 \text{ mW/cm}^2
 \end{aligned}$$

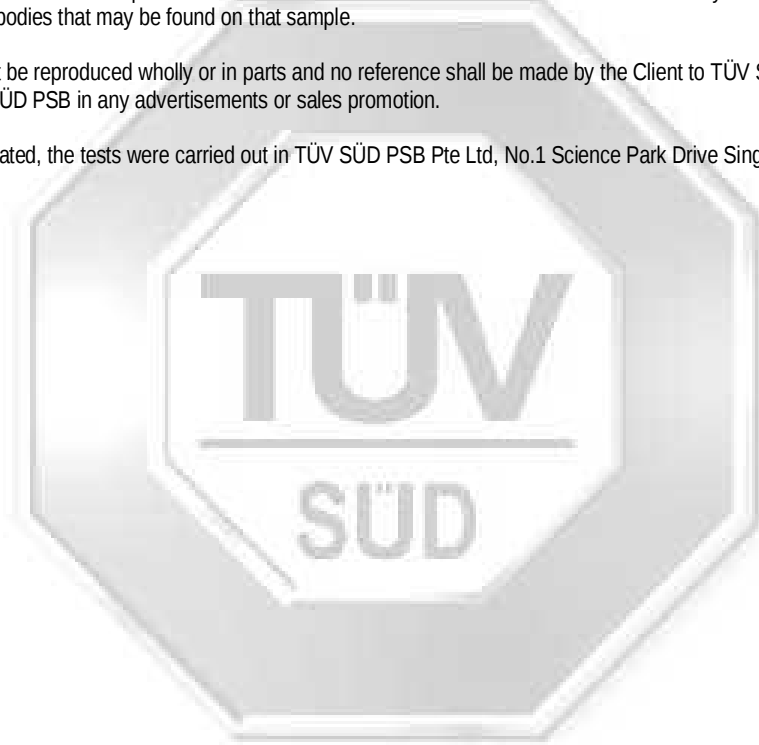
∴ The power density of the EUT at 20cm distance is 0.0303 mW/cm² based on the above computation and found to be lower than the power density limit of 1.0mW/cm².



Please note that this Report is issued under the following terms :

1. This report applies to the sample of the specific product/equipment given at the time of its testing/calibration. The results are not used to indicate or imply that they are applicable to other similar items. In addition, such results must not be used to indicate or imply that TÜV SÜD PSB approves, recommends or endorses the manufacturer, supplier or user of such product/equipment, or that TÜV SÜD PSB in any way "guarantees" the later performance of the product/equipment. Unless otherwise stated in this report, no tests were conducted to determine long term effects of using the specific product/equipment.
2. The sample/s mentioned in this report is/are submitted/supplied/manufactured by the Client. TÜV SÜD PSB therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.
3. Nothing in this report shall be interpreted to mean that TÜV SÜD PSB has verified or ascertained any endorsement or marks from any other testing authority or bodies that may be found on that sample.
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5. Unless otherwise stated, the tests were carried out in TÜV SÜD PSB Pte Ltd, No.1 Science Park Drive Singapore 118221.

July 2011

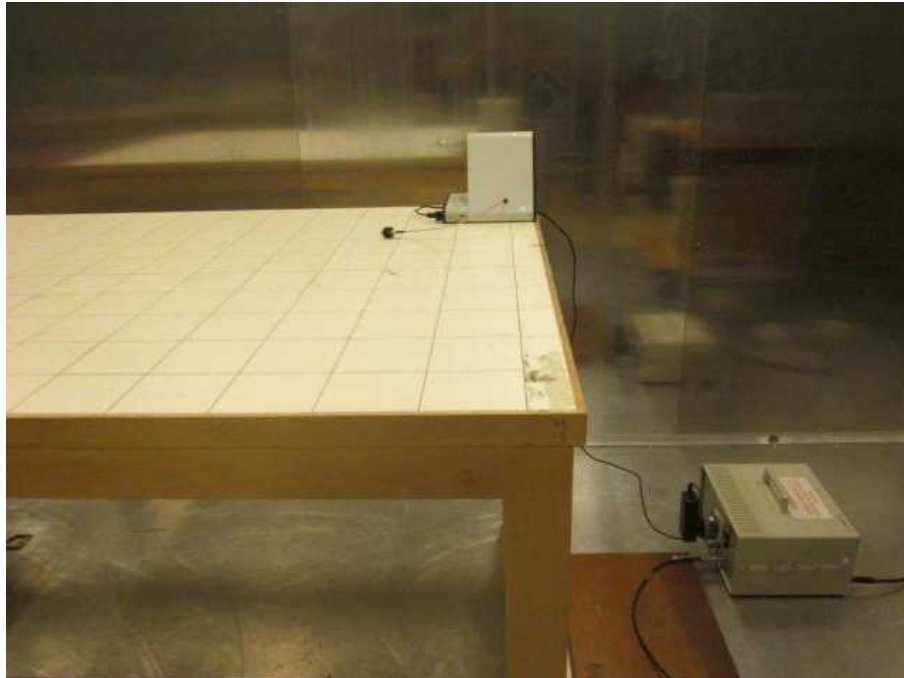


ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

ANNEX A
TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

TEST SETUP



Conducted Emissions Test Setup (Front View)



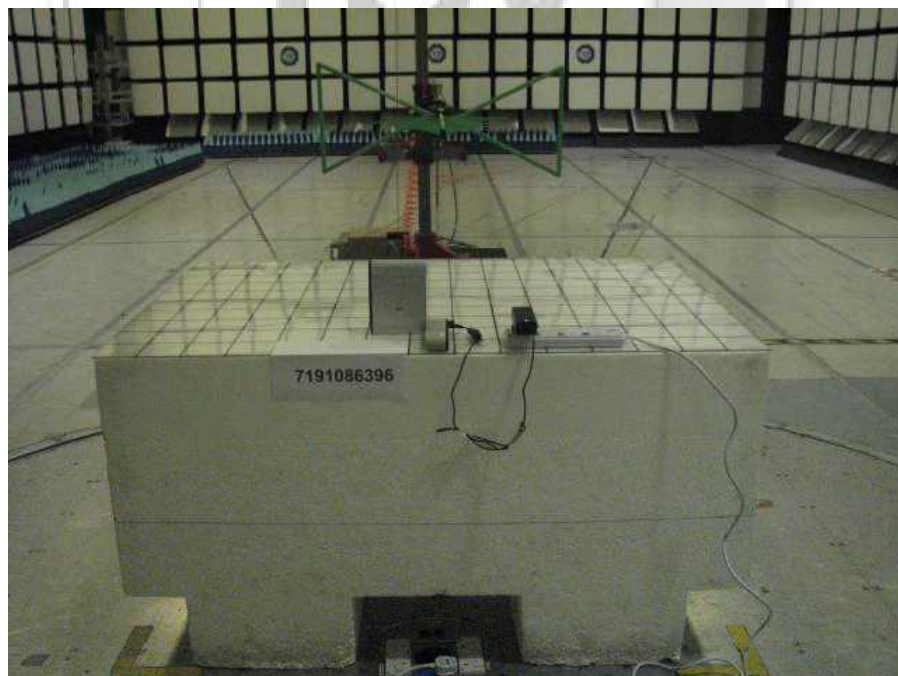
Conducted Emissions Test Setup (Rear View)

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

TEST SETUP



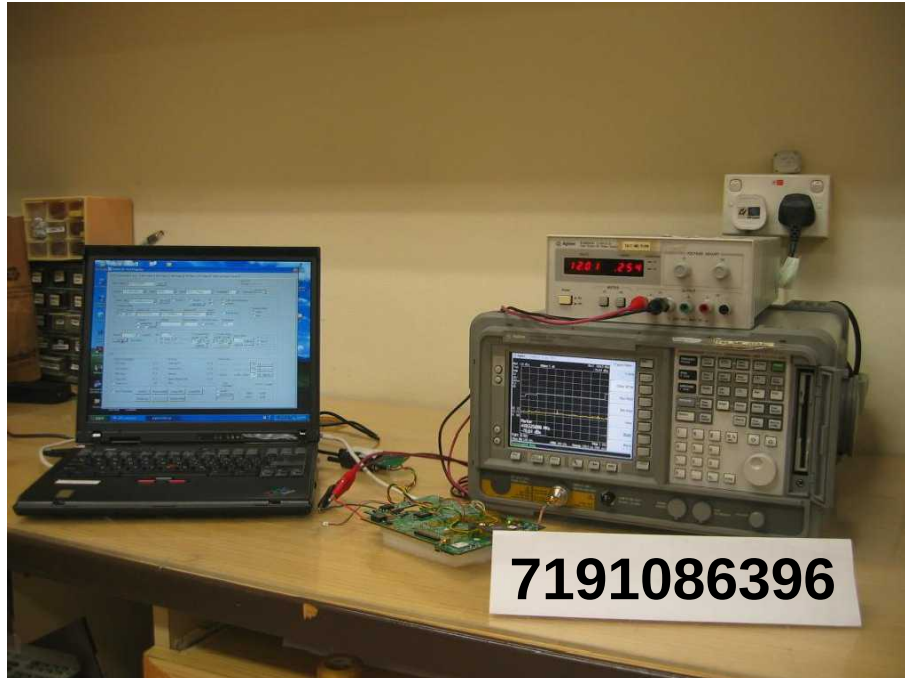
Radiated Emissions Test Setup (Front View)



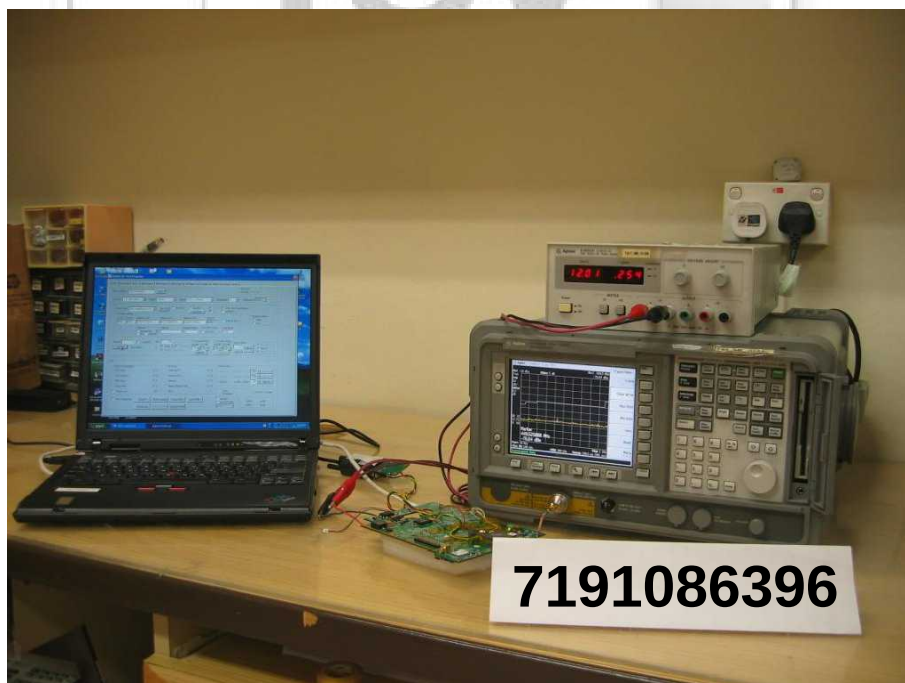
Radiated Emissions Test Setup (Rear View)

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

TEST SETUP



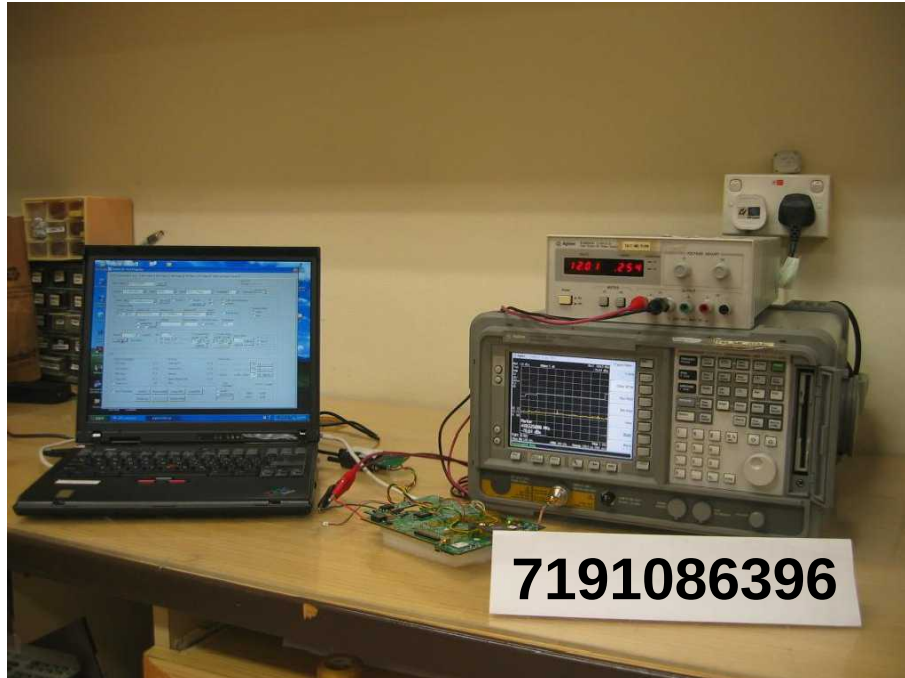
Spectrum Bandwidth (6dB Bandwidth Measurement) Test Setup



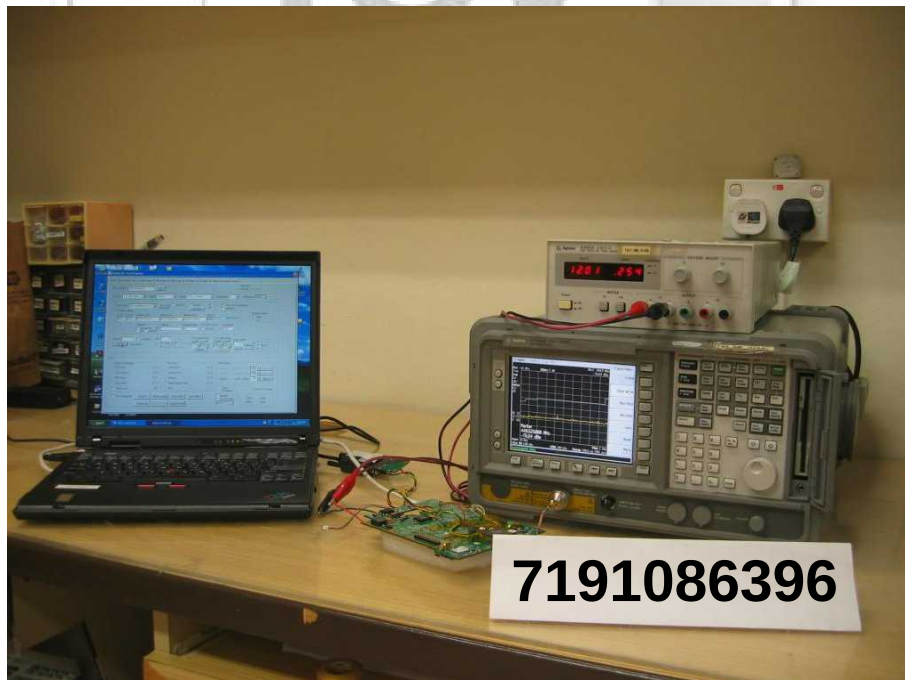
Maximum Peak Power Test Setup

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

TEST SETUP



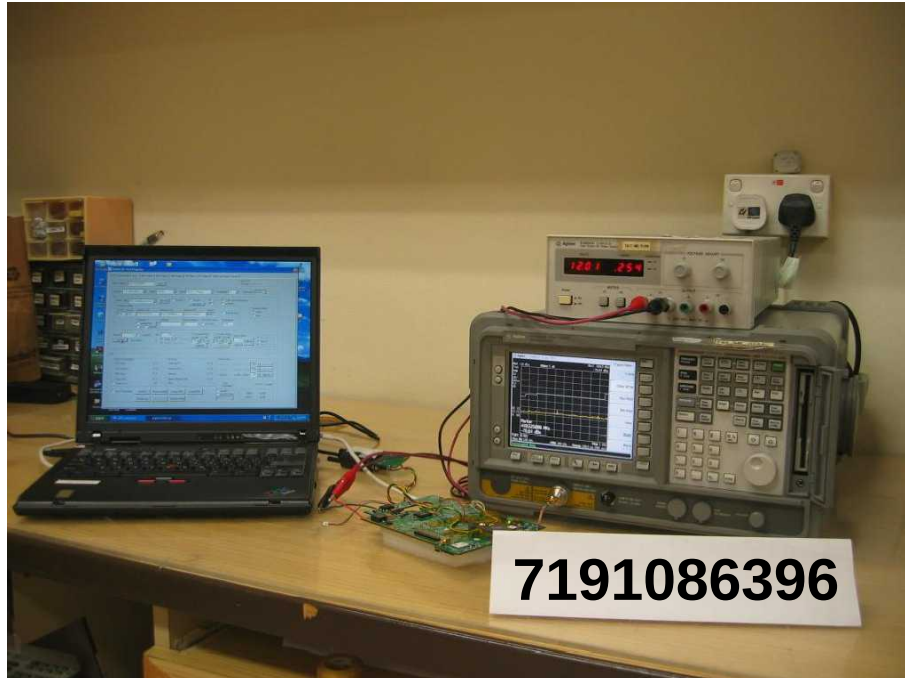
RF Conducted Spurious Emissions (Non-Restricted Bands) Test Setup



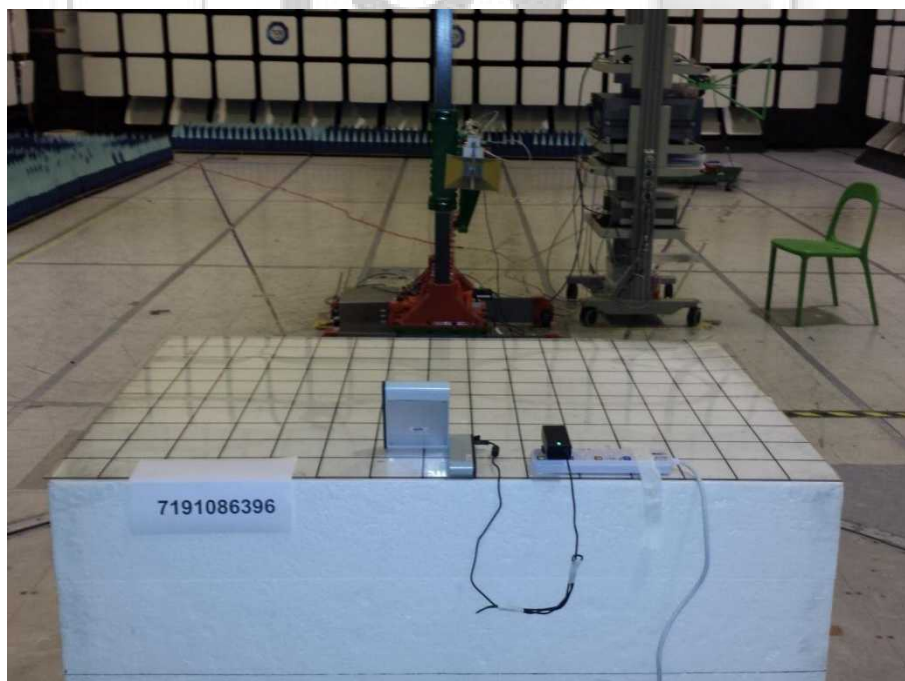
RF Conducted Spurious Emissions (Restricted Bands) Test Setup

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

TEST SETUP



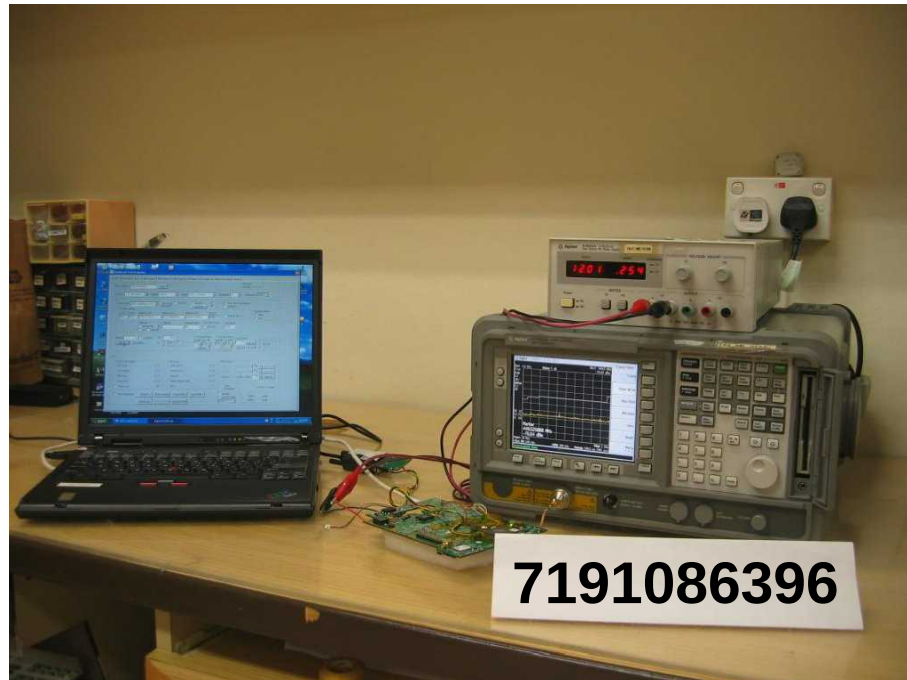
Band Edge Compliance (Conducted) Test Setup



Band Edge Compliance (Radiated) Test Setup

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

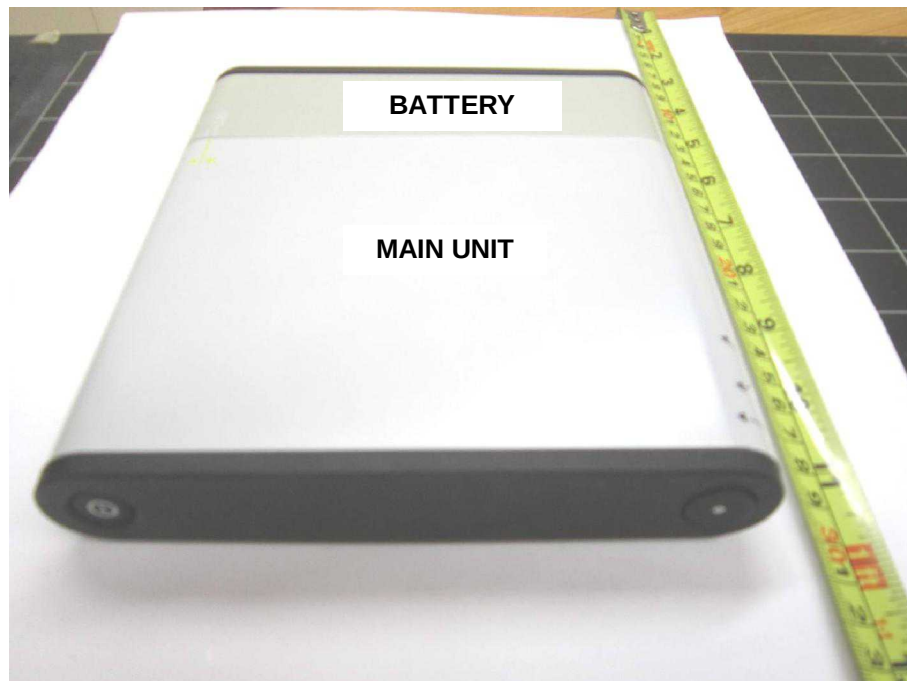
TEST SETUP



Peak Power Spectral Density Test Setup

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS



Front View



Rear View

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS



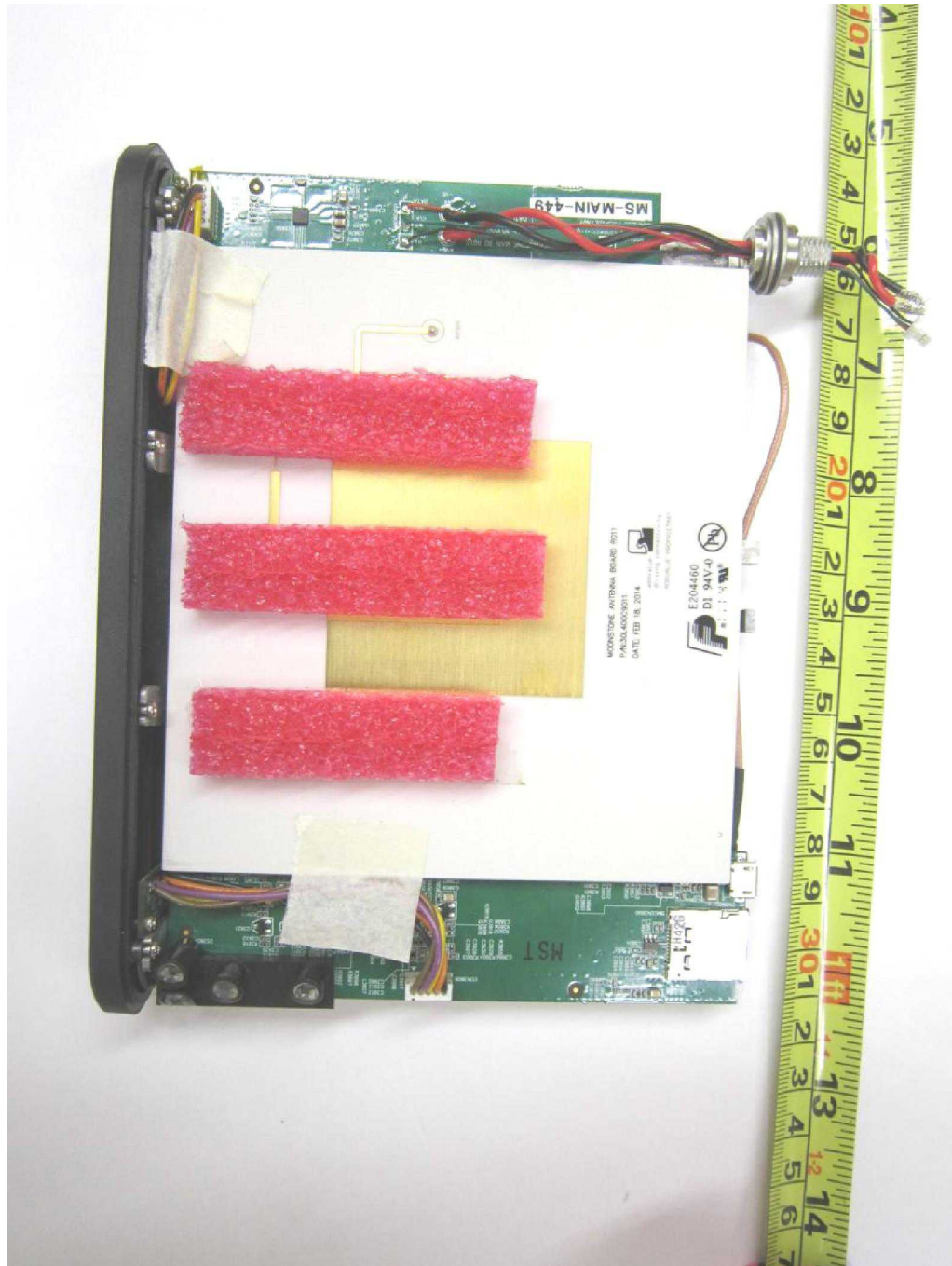
Front View



Rear View

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS



EUT Internal View 1

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

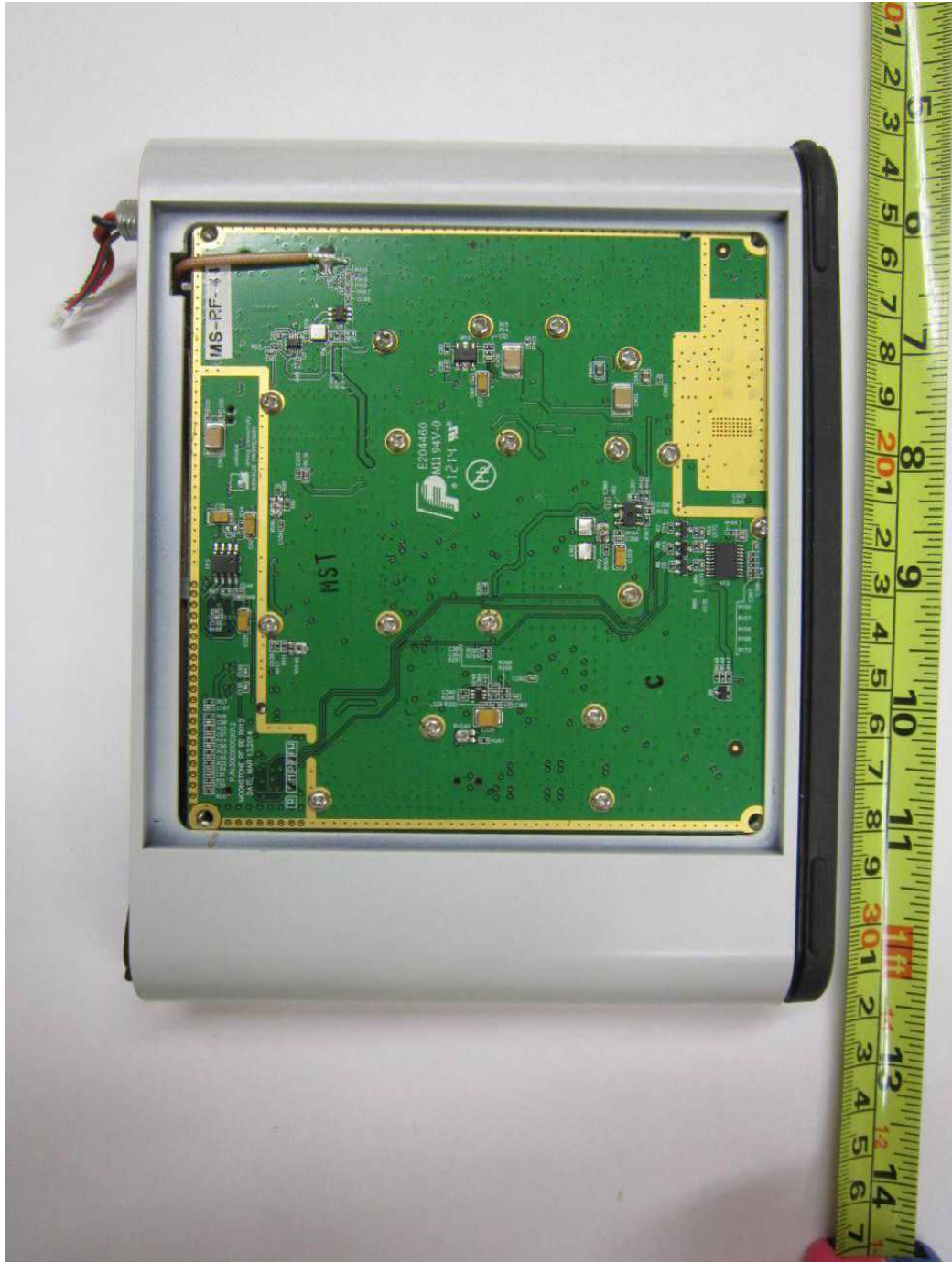
EUT PHOTOGRAPHS



EUT Internal View 2

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

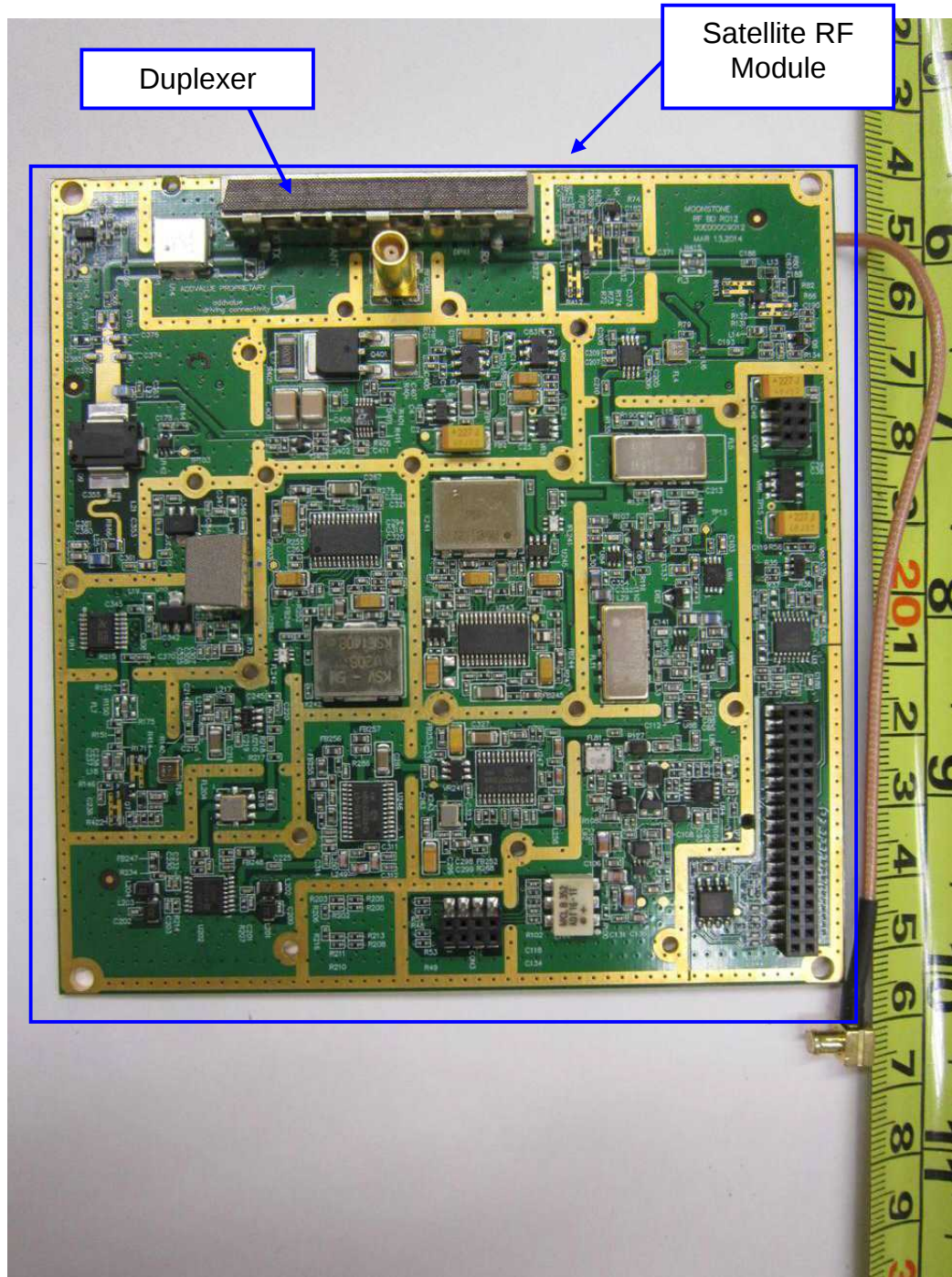
EUT PHOTOGRAPHS



EUT Internal View 3

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

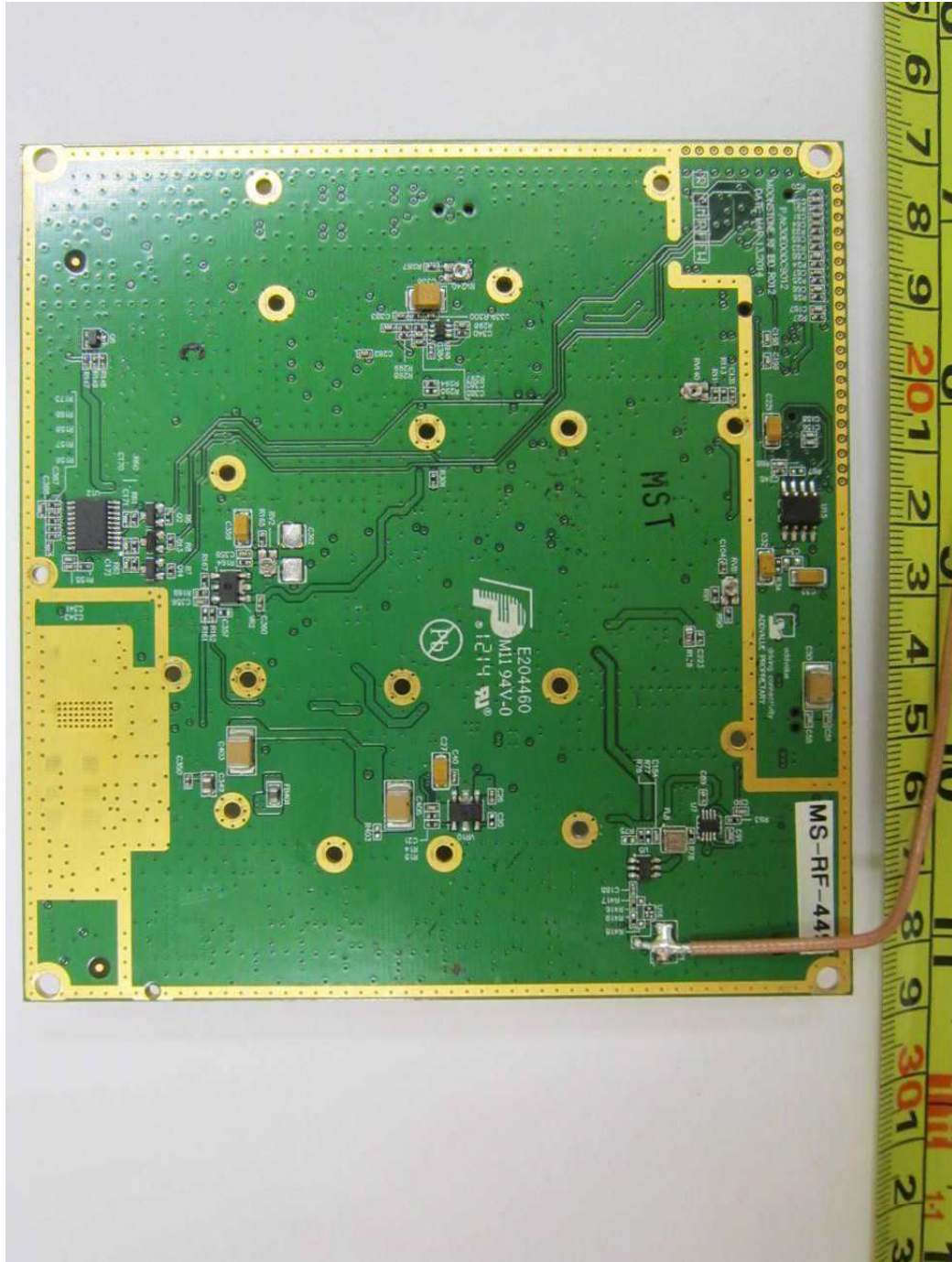
EUT PHOTOGRAPHS



RF PCBA Component Side

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

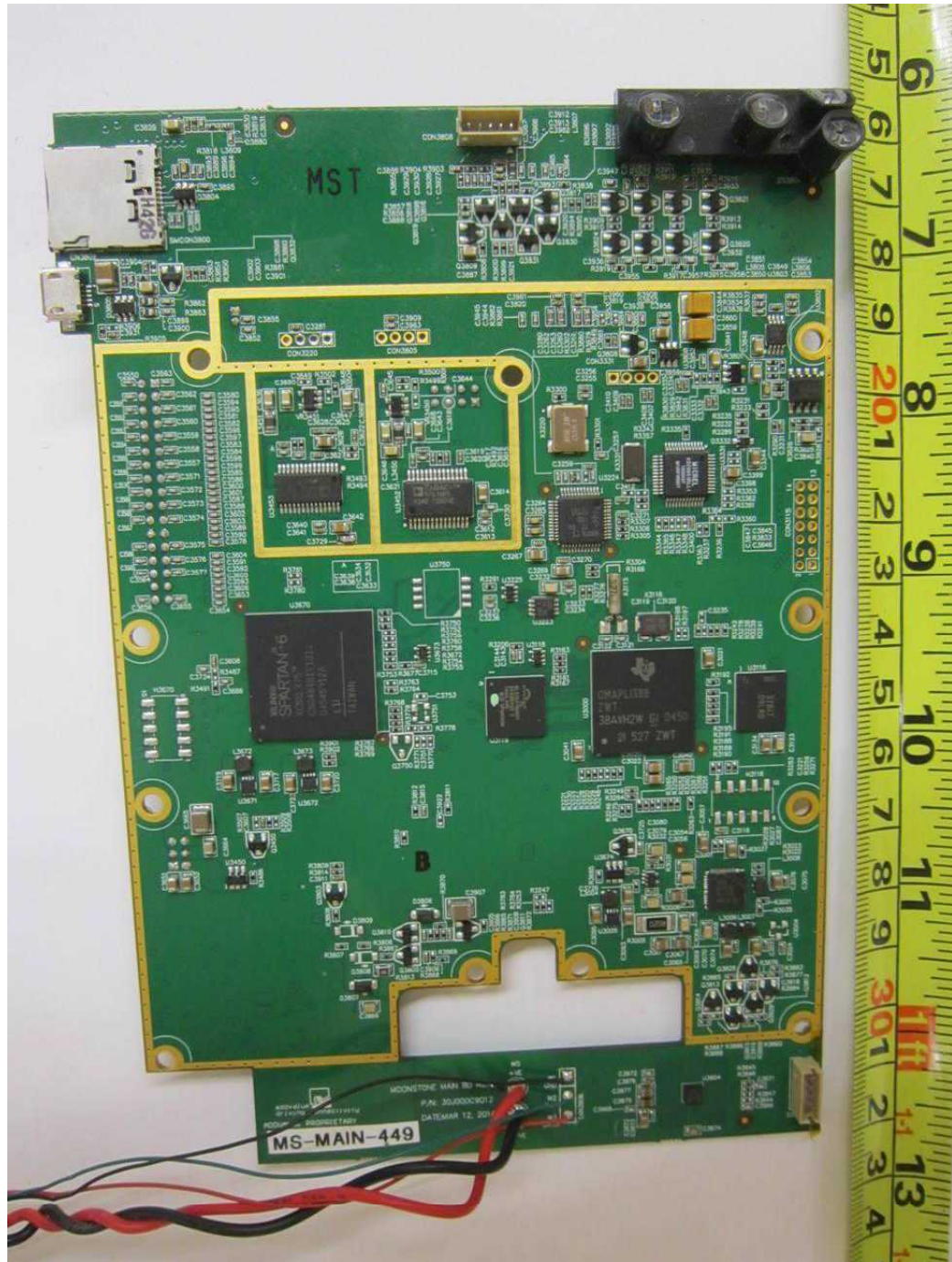
EUT PHOTOGRAPHS



RF PCBA Trace Side

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

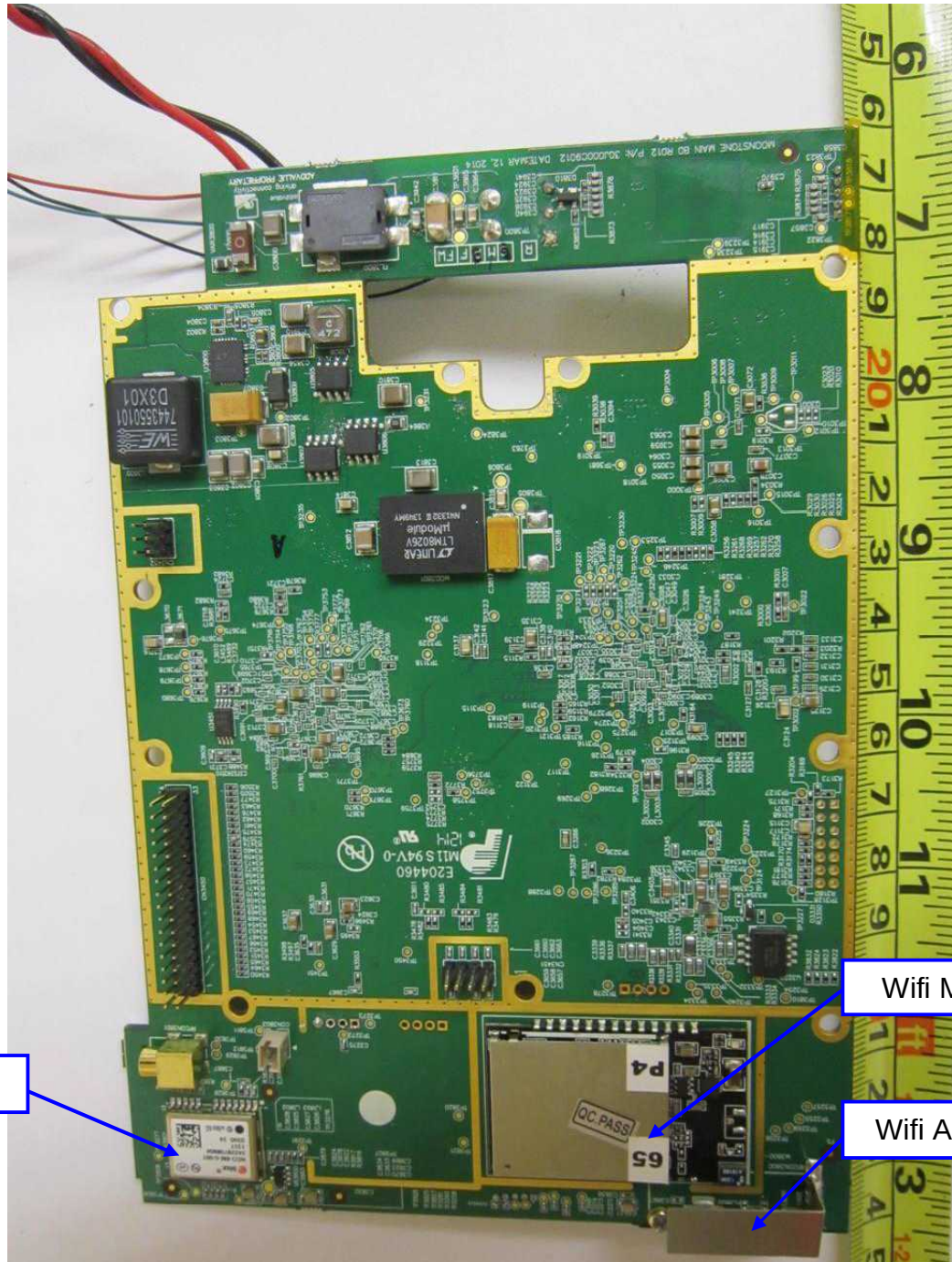
EUT PHOTOGRAPHS



Base-Band PCBA Component Side

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS



Base-Band PCBA Trace Side

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

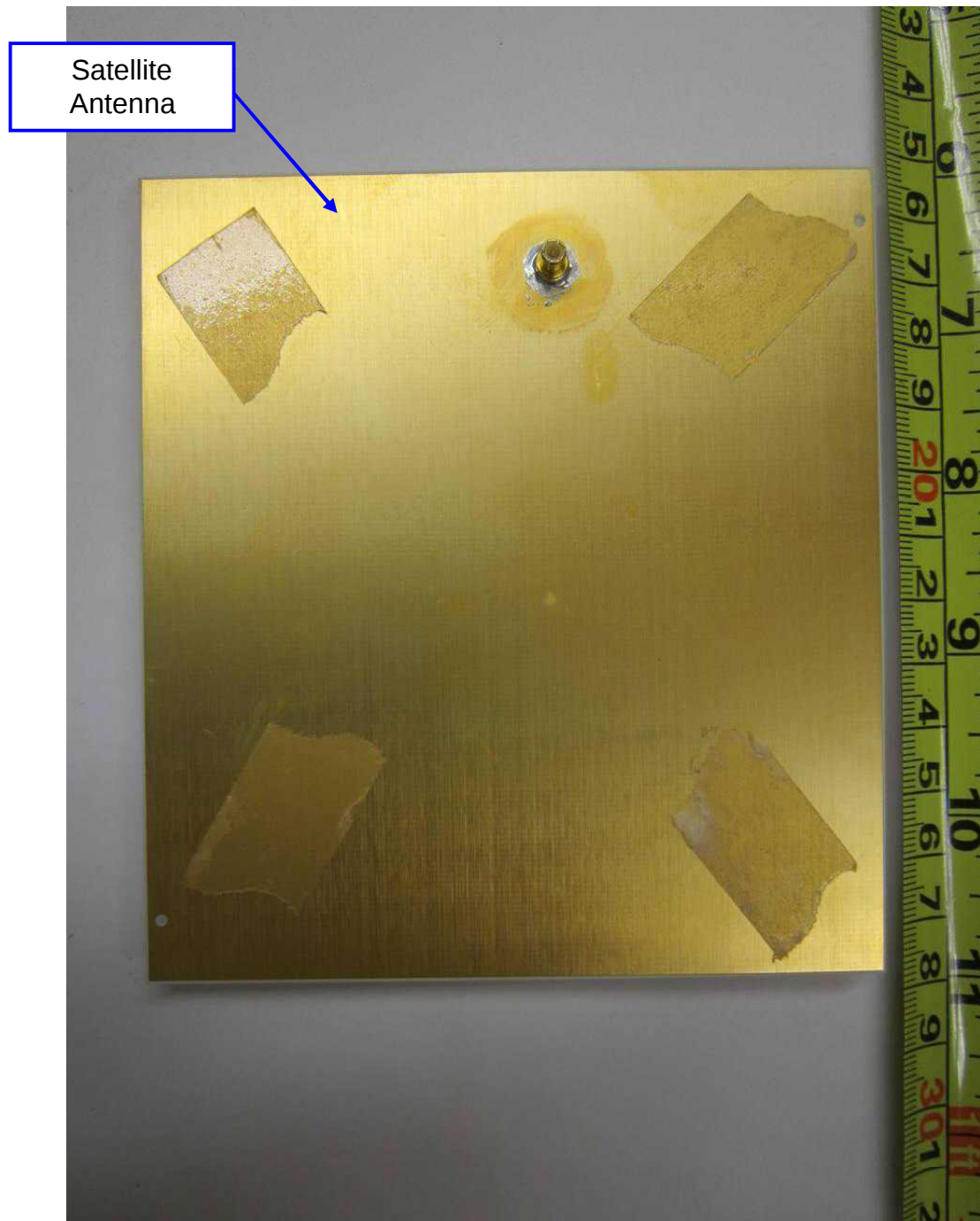
EUT PHOTOGRAPHS



Antenna PCBA Component Side

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

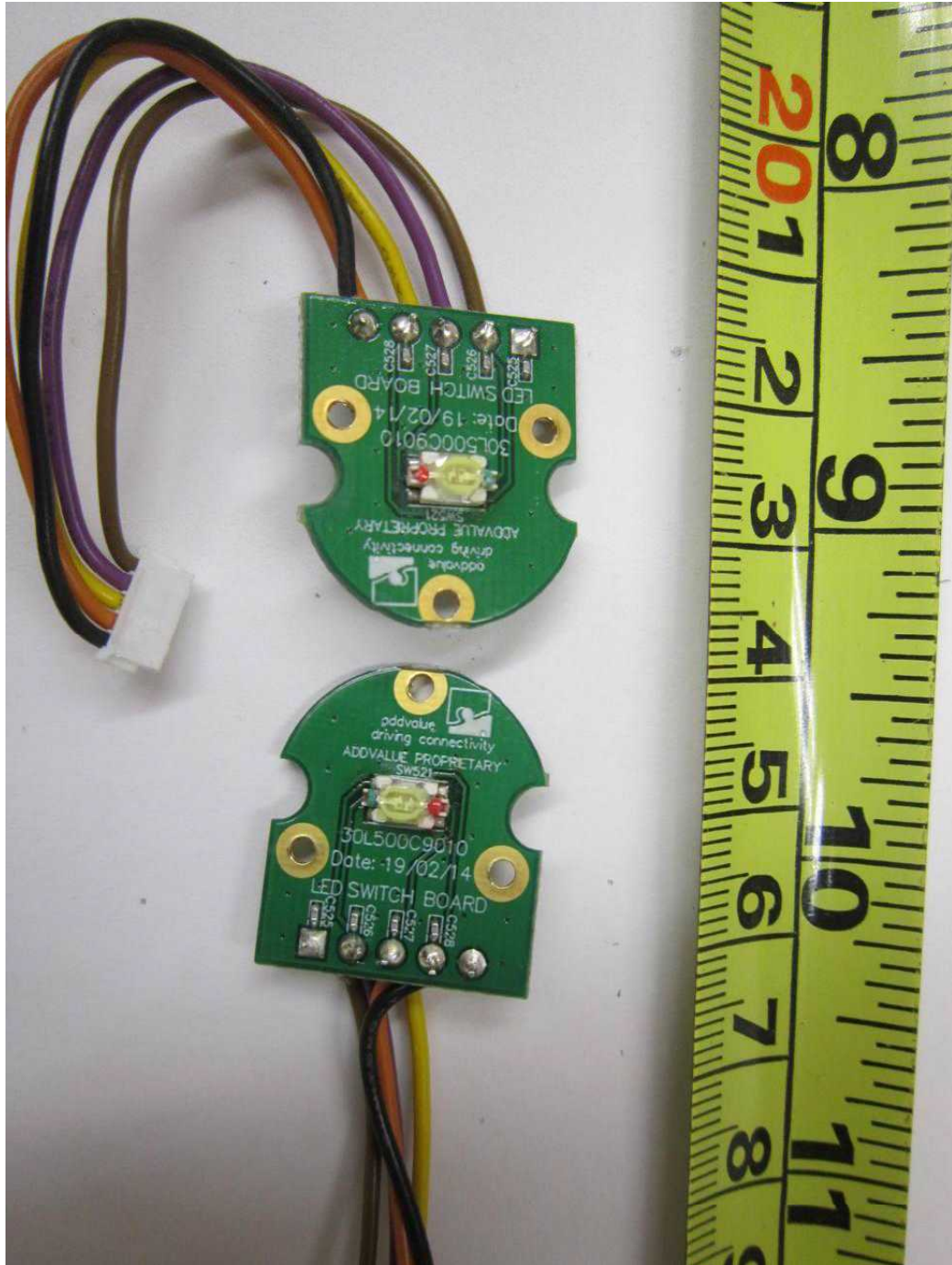
EUT PHOTOGRAPHS



Antenna PCB Trace Side

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

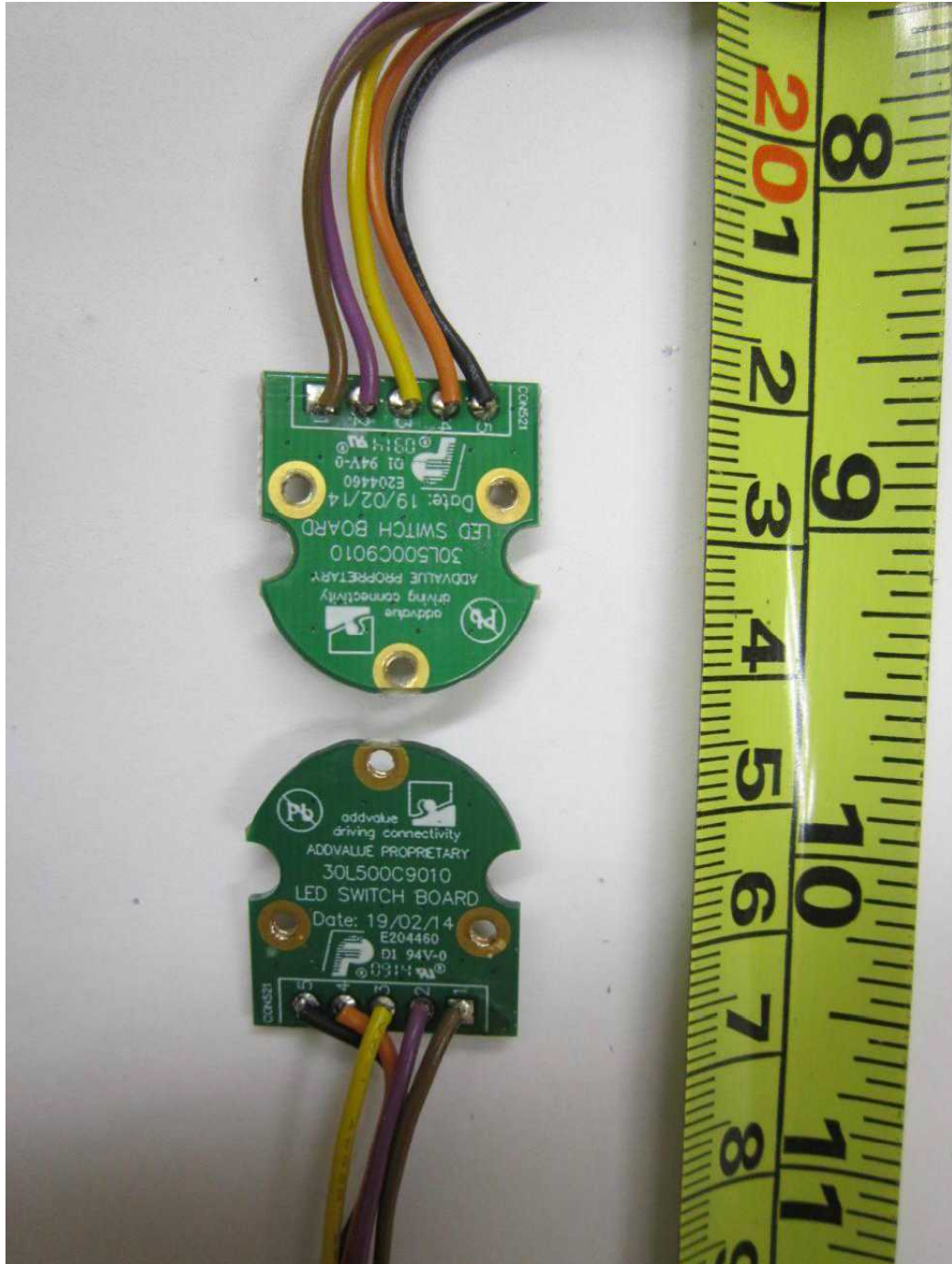
EUT PHOTOGRAPHS



Power Switch & Pointing Mode Switch PCBA Component Side

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

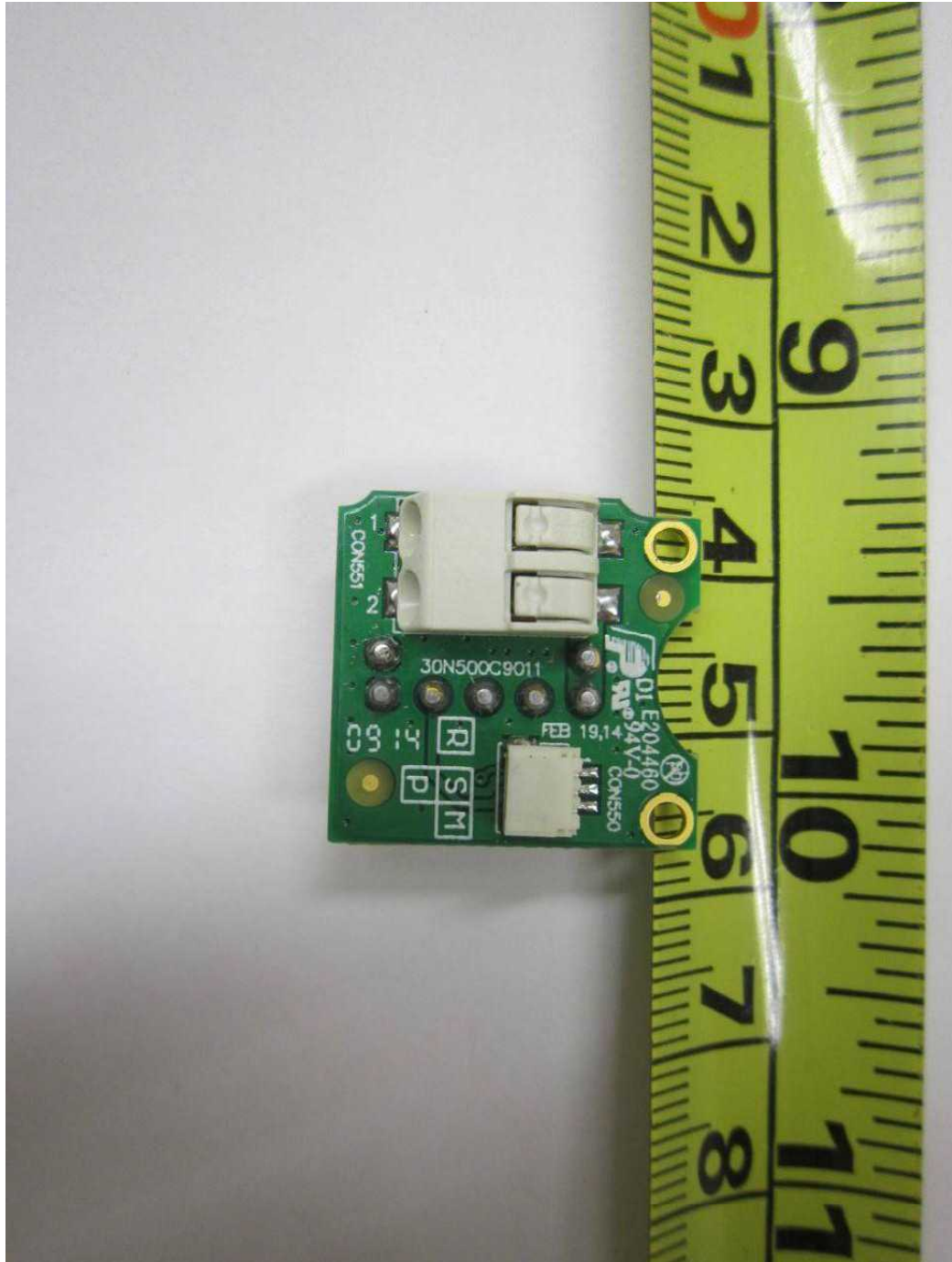
EUT PHOTOGRAPHS



Power Switch & Pointing Mode Switch PCBA Trace Side

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS



Battery Contact PCBA Component Side

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

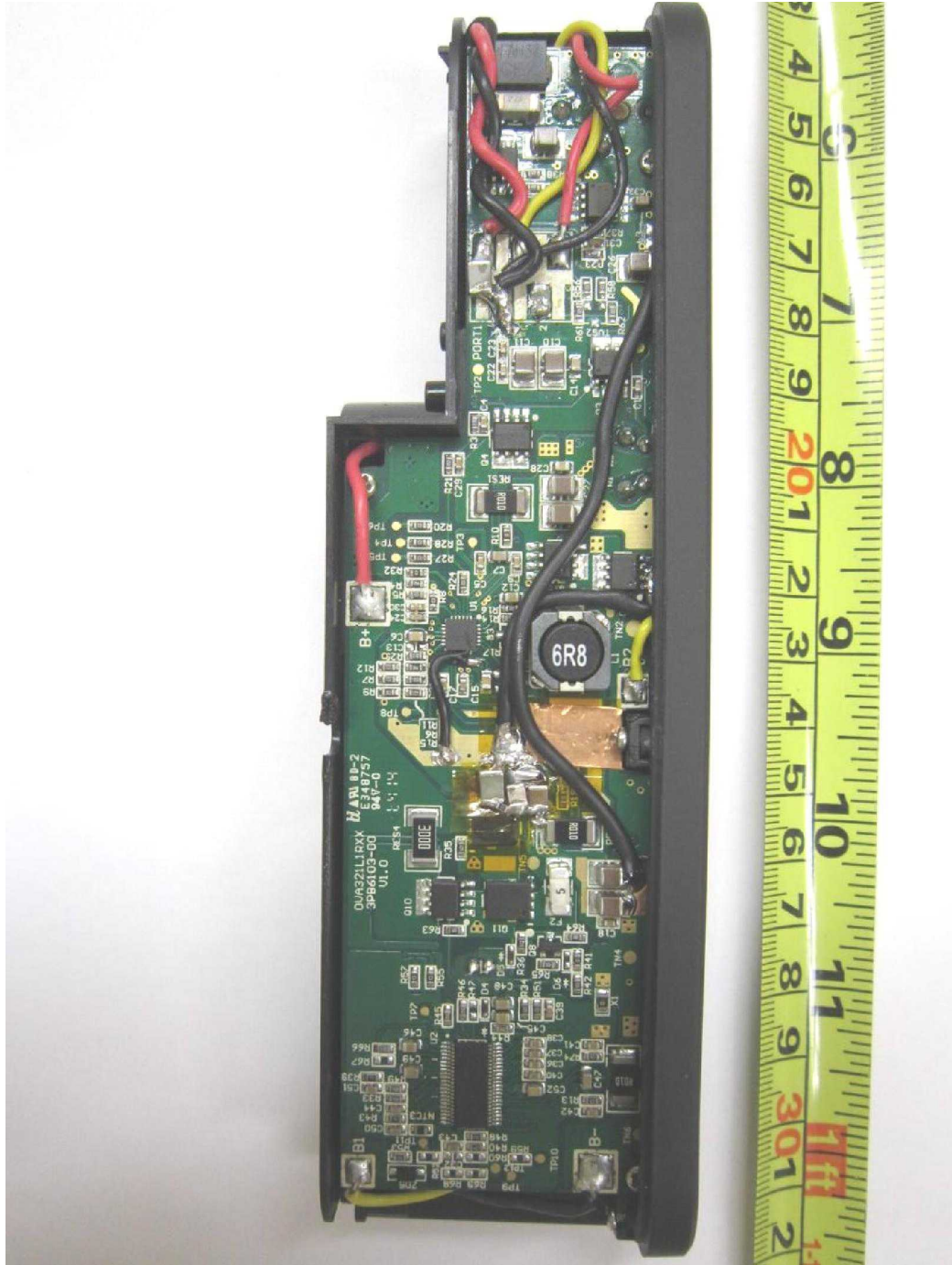
EUT PHOTOGRAPHS



Battery Contact PCBA Trace Side

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS



Battery Pack PCBA Component Side

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

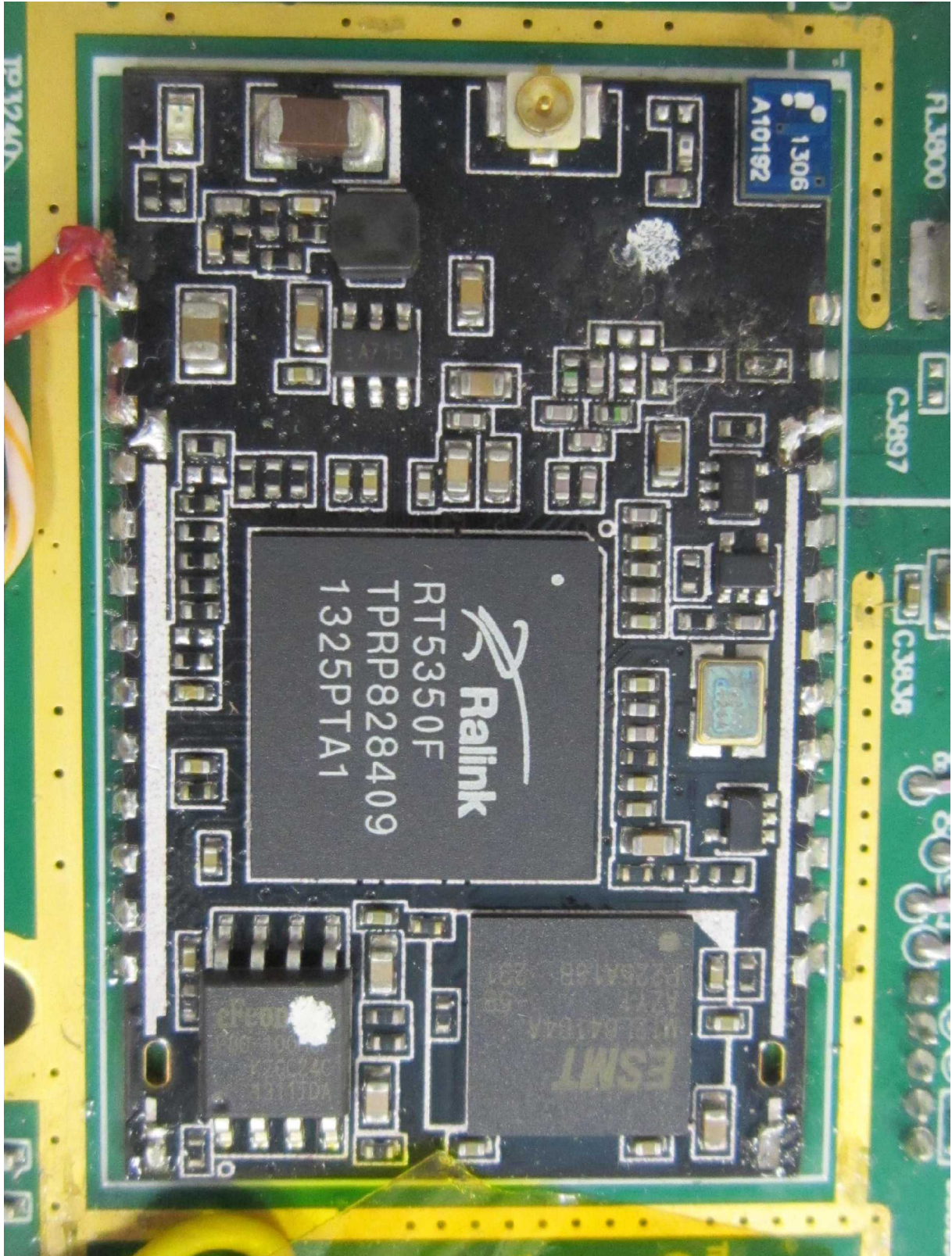
EUT PHOTOGRAPHS



Battery Pack

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS



Wifi Module with RF Shield Removed



ANNEX B USER MANUAL TECHNICAL DESCRIPTION BLOCK & CIRCUIT DIAGRAMS



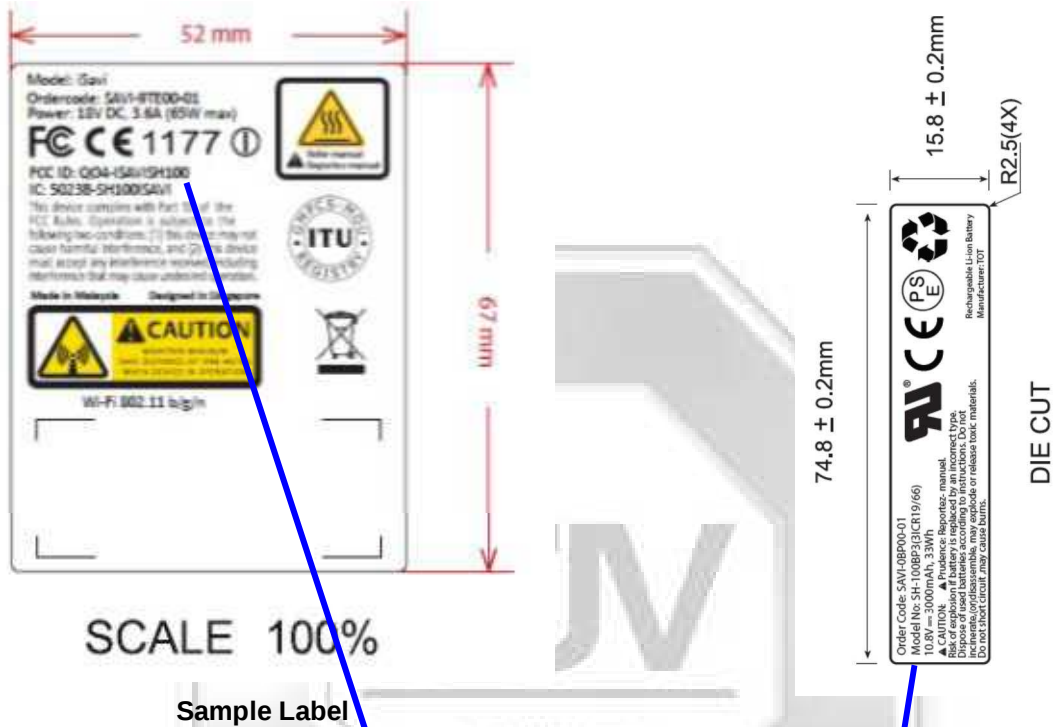
ANNEX C FCC LABEL & POSITION



ANNEX C FCC LABEL & POSITION

Labelling requirements per Section 2.925 & 15.19

The label shown will be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time of purchase.



Physical Location of FCC Label on EUT