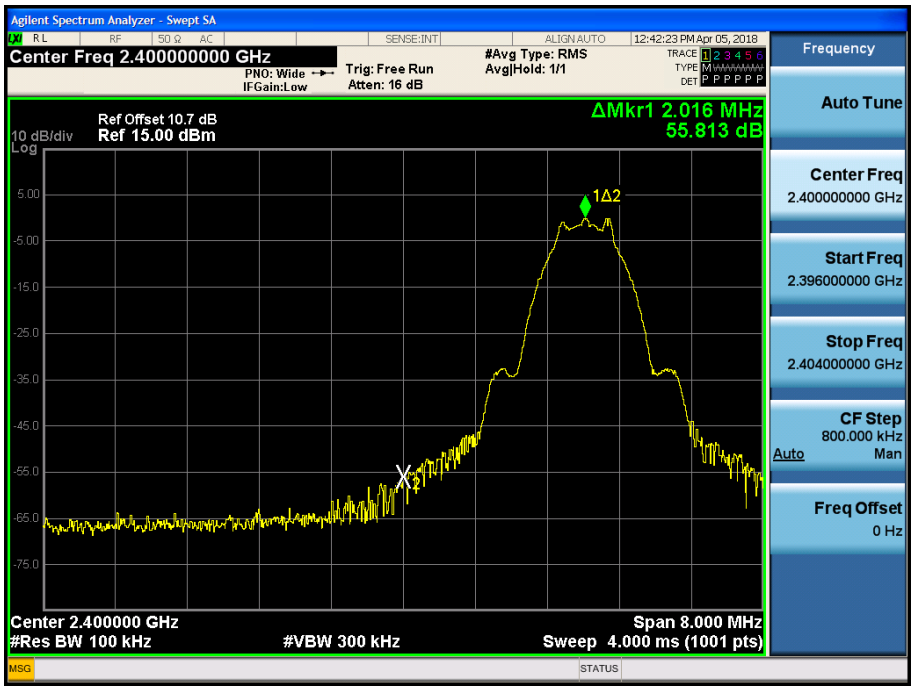
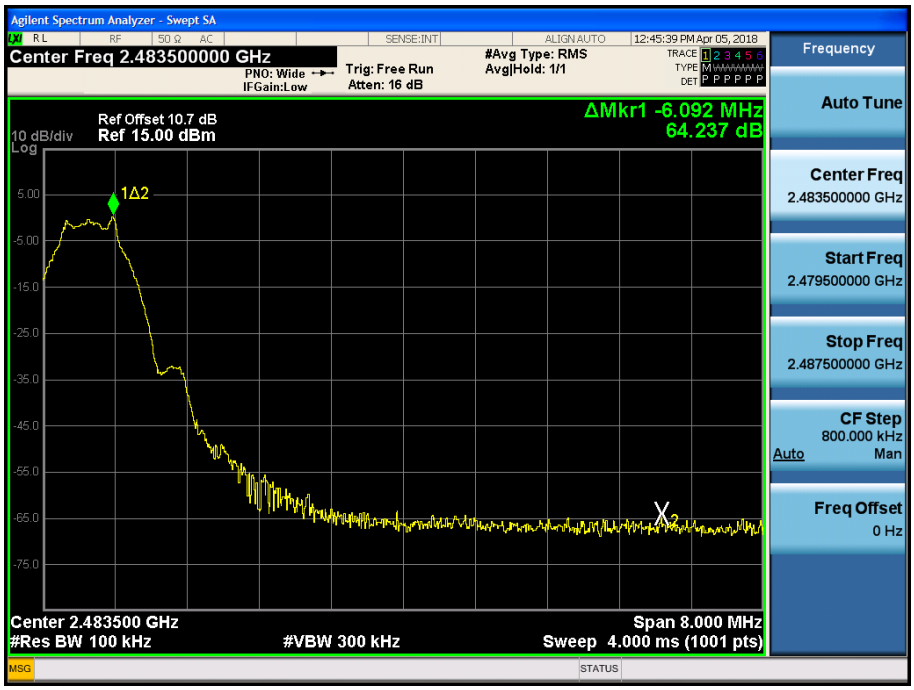
▣ 5.0 LE 1M: 255 Byte RESULT PLOTS

BandEdge (Low-CH 0)

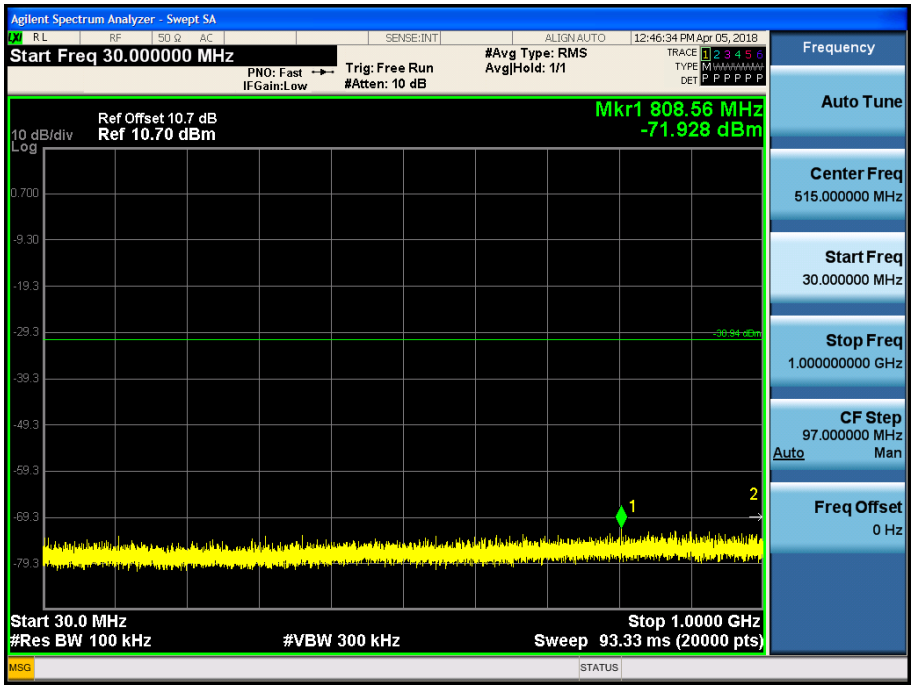


BandEdge (High-CH 39)



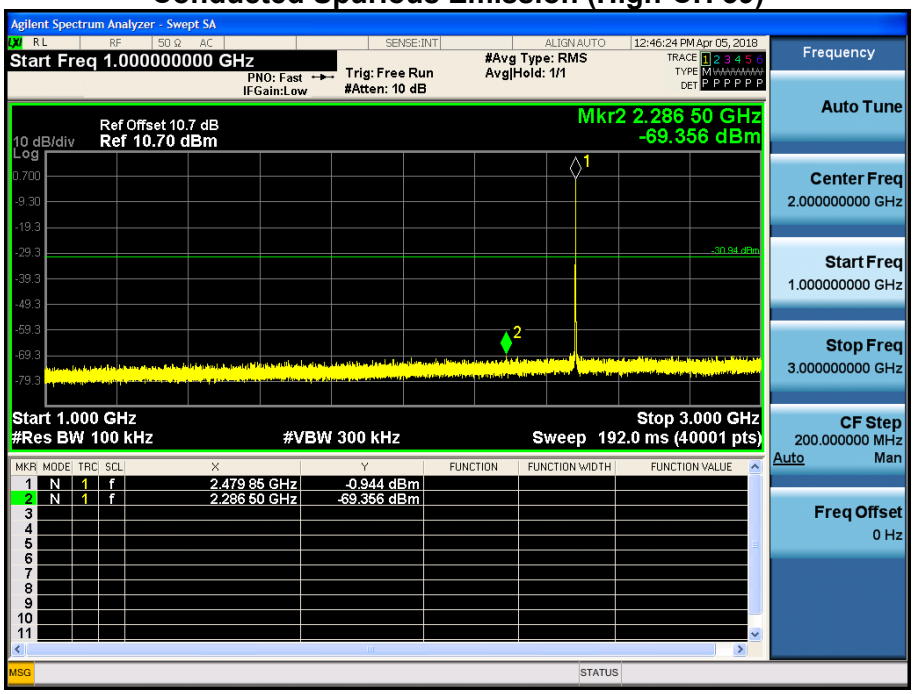
30 MHz ~ 1 GHz

Conducted Spurious Emission (High-CH 39)



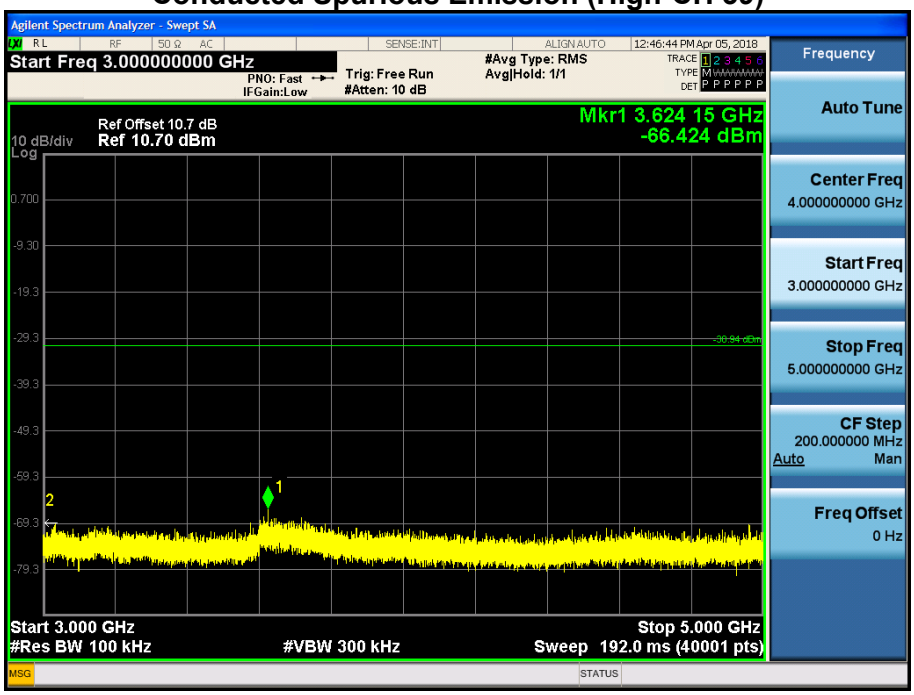
1 GHz ~ 3 GHz

Conducted Spurious Emission (High-CH 39)



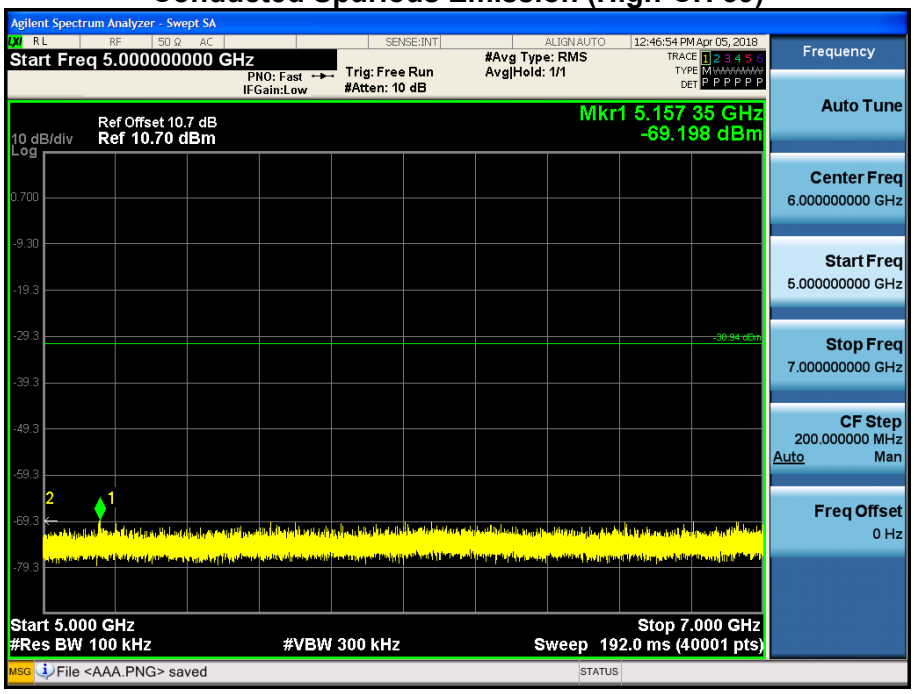
3 GHz ~ 5 GHz

Conducted Spurious Emission (High-CH 39)



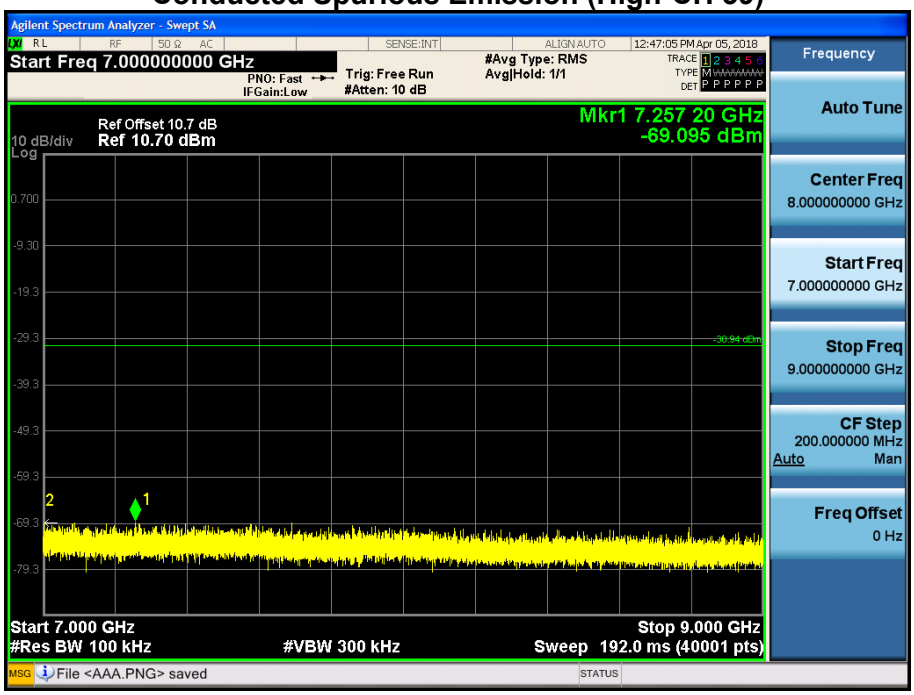
5 GHz ~ 7 GHz

Conducted Spurious Emission (High-CH 39)



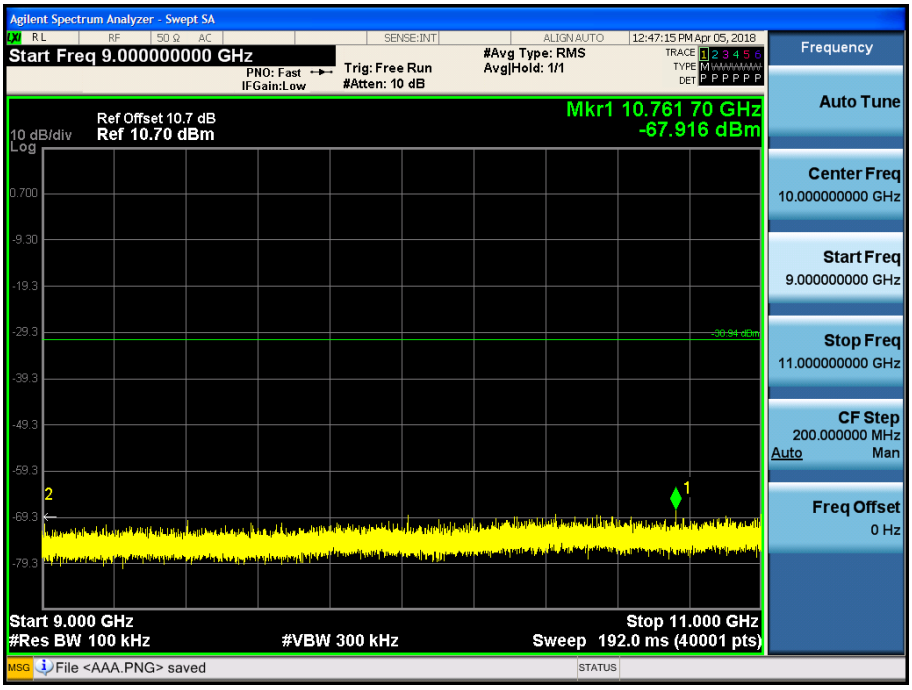
7 GHz ~ 9 GHz

Conducted Spurious Emission (High-CH 39)



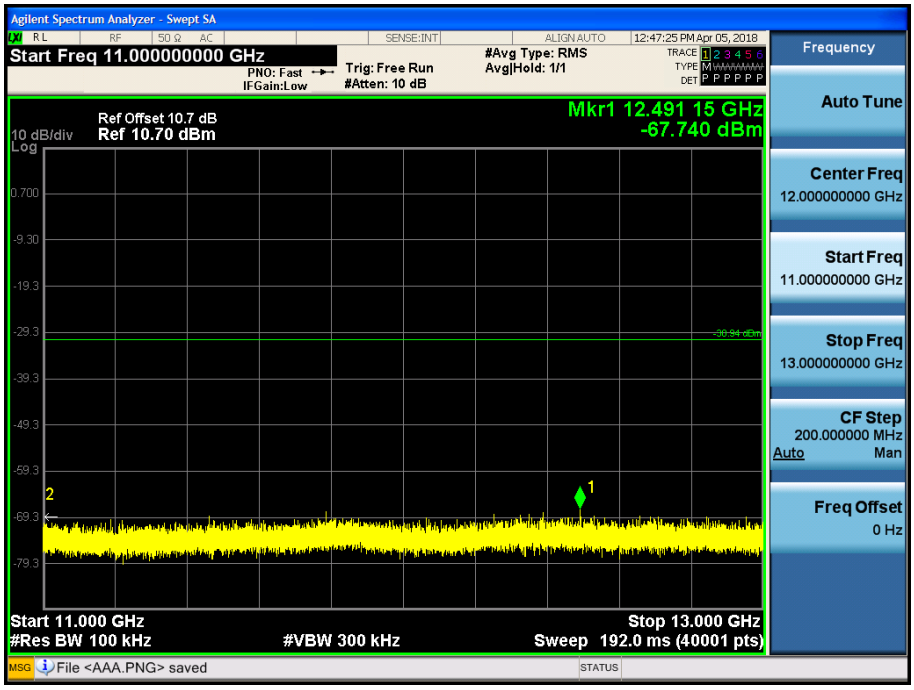
9 GHz ~ 11 GHz

Conducted Spurious Emission (High-CH 39)



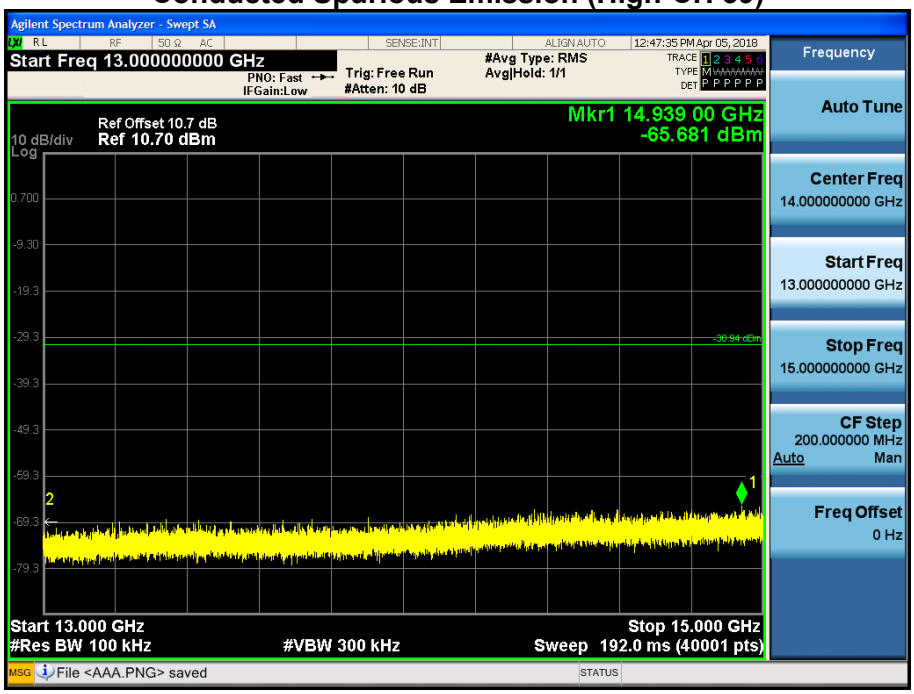
11 GHz ~ 13 GHz

Conducted Spurious Emission (High-CH 39)



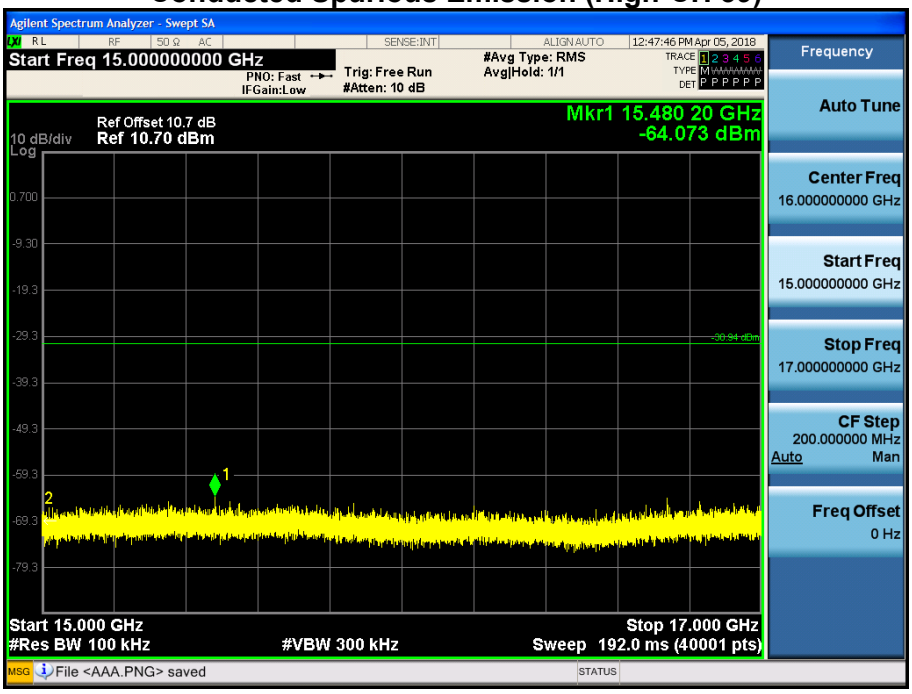
13 GHz ~ 15 GHz

Conducted Spurious Emission (High-CH 39)



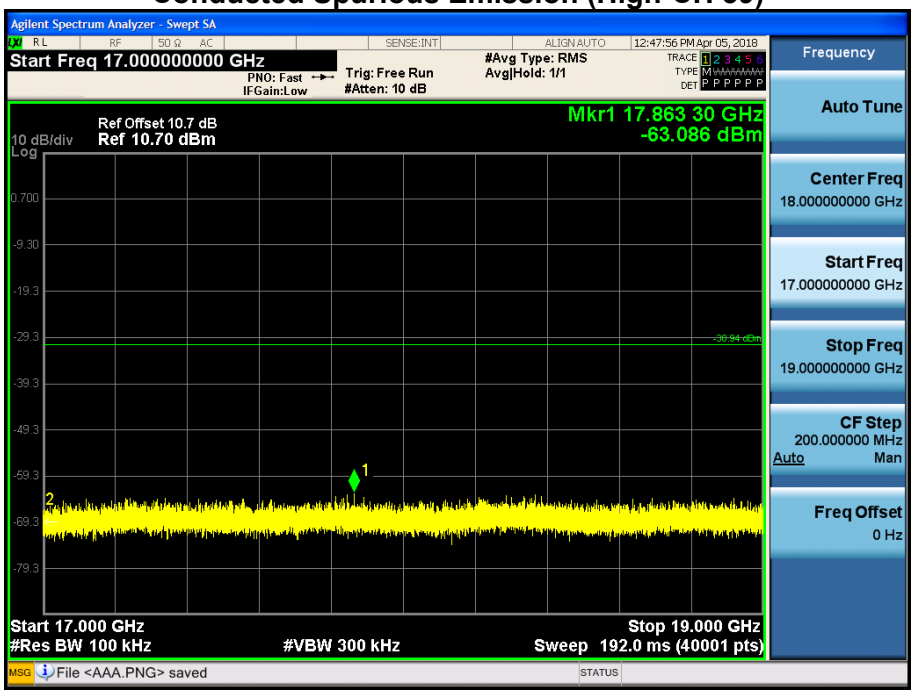
15 GHz ~ 17 GHz

Conducted Spurious Emission (High-CH 39)



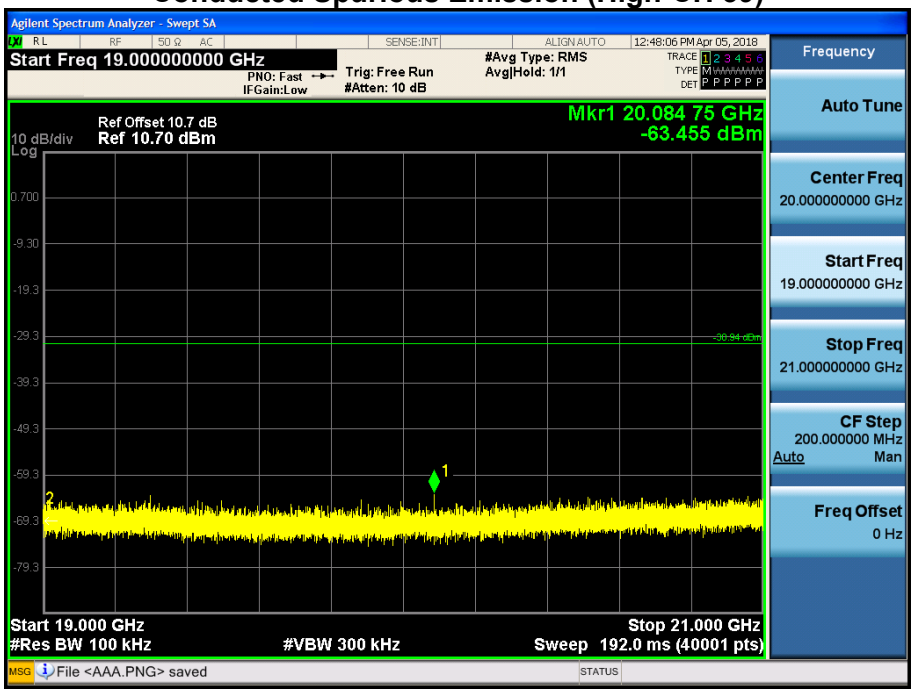
17 GHz ~ 19 GHz

Conducted Spurious Emission (High-CH 39)



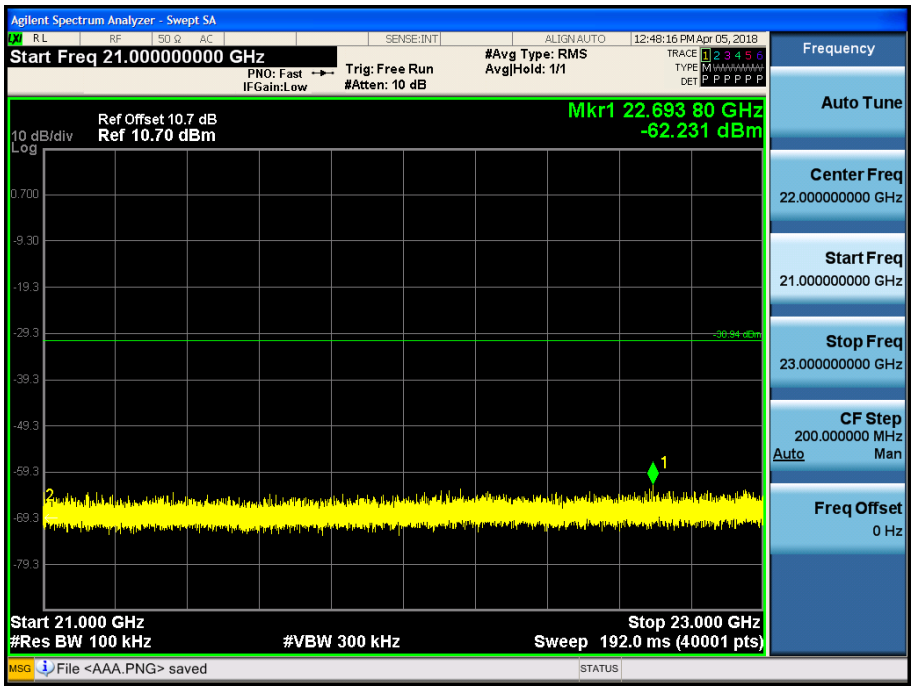
19 GHz ~ 21 GHz

Conducted Spurious Emission (High-CH 39)



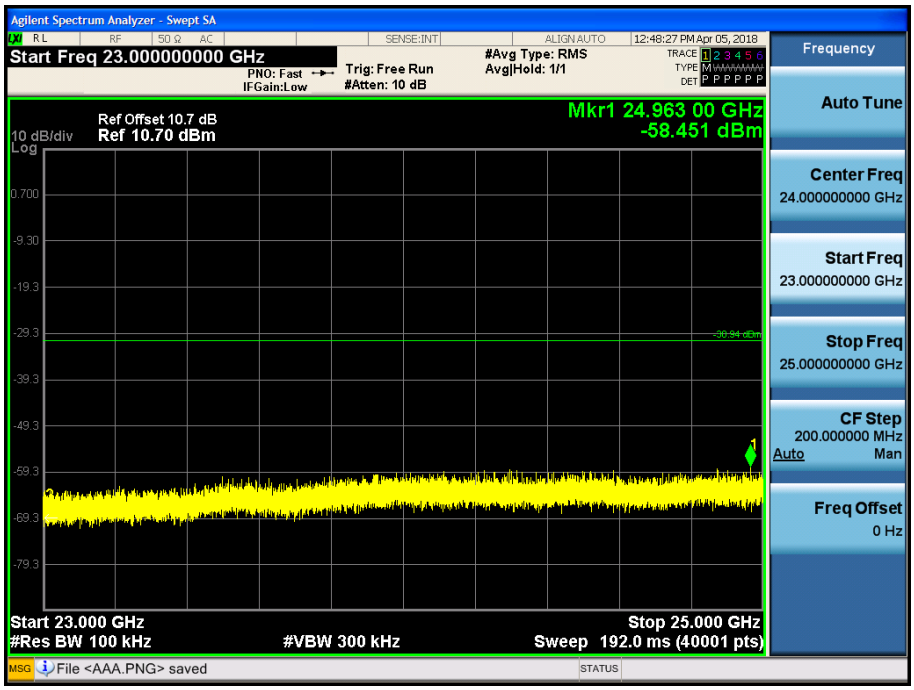
21 GHz ~ 23 GHz

Conducted Spurious Emission (High-CH 39)



23 GHz ~ 25 GHz

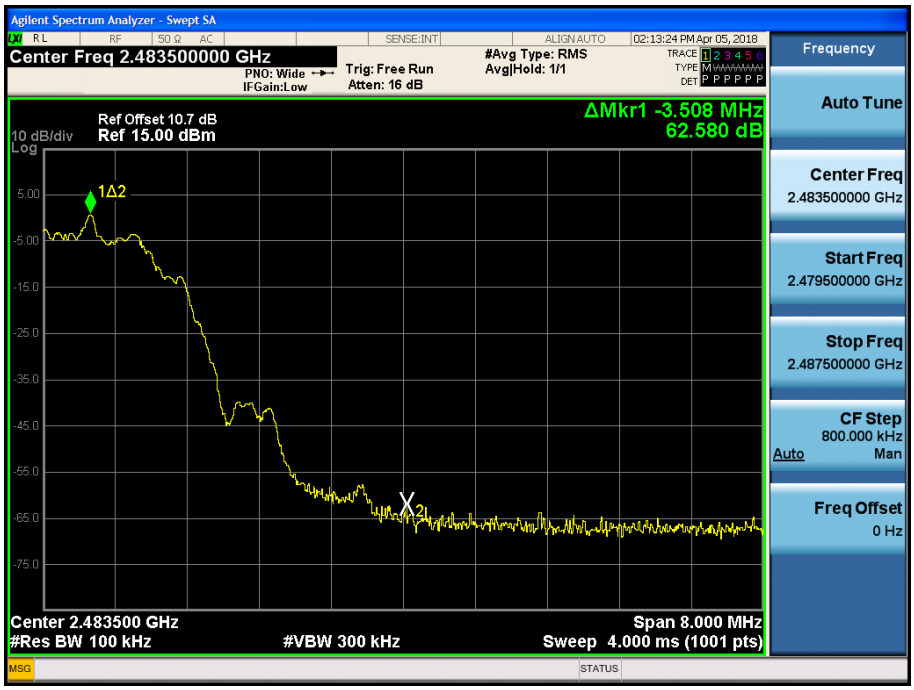
Conducted Spurious Emission (High-CH 39)



▣ 5.0 LE 2M: 37 Byte RESULT PLOTS

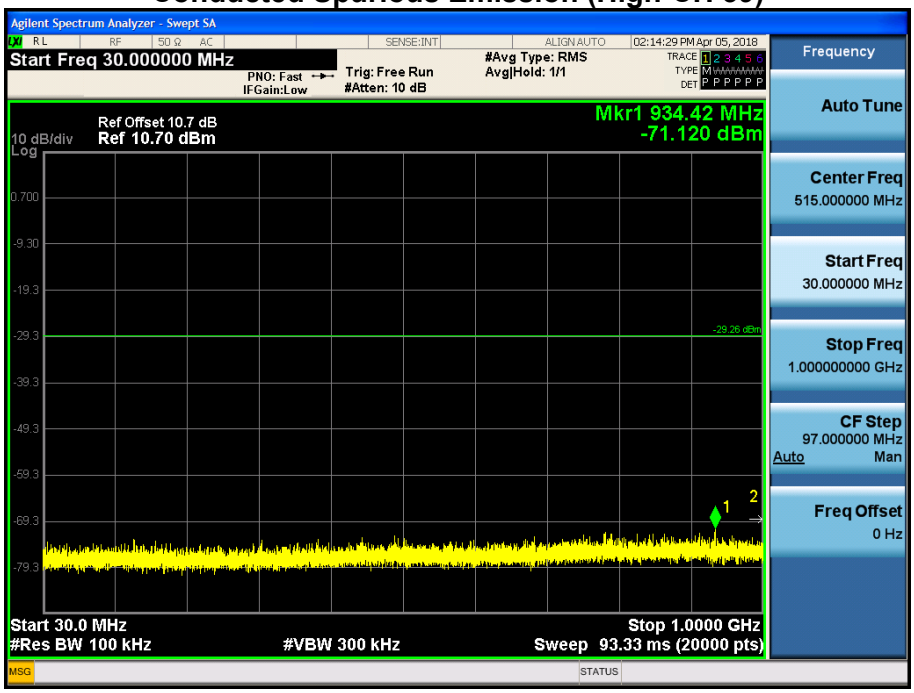
BandEdge (Low-CH 0)

BandEdge (High-CH 39)



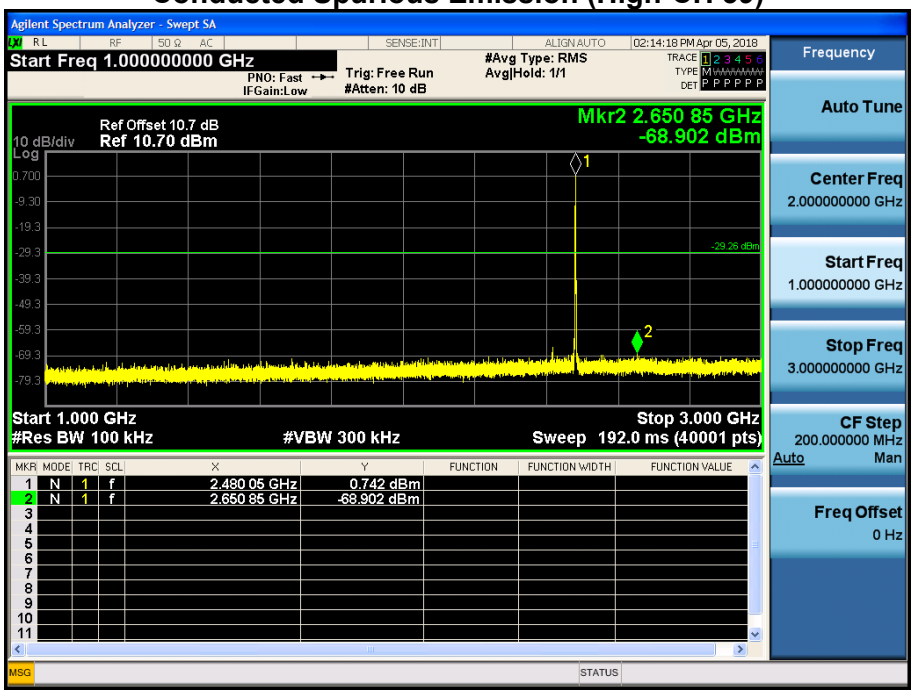
30 MHz ~ 1 GHz

Conducted Spurious Emission (High-CH 39)



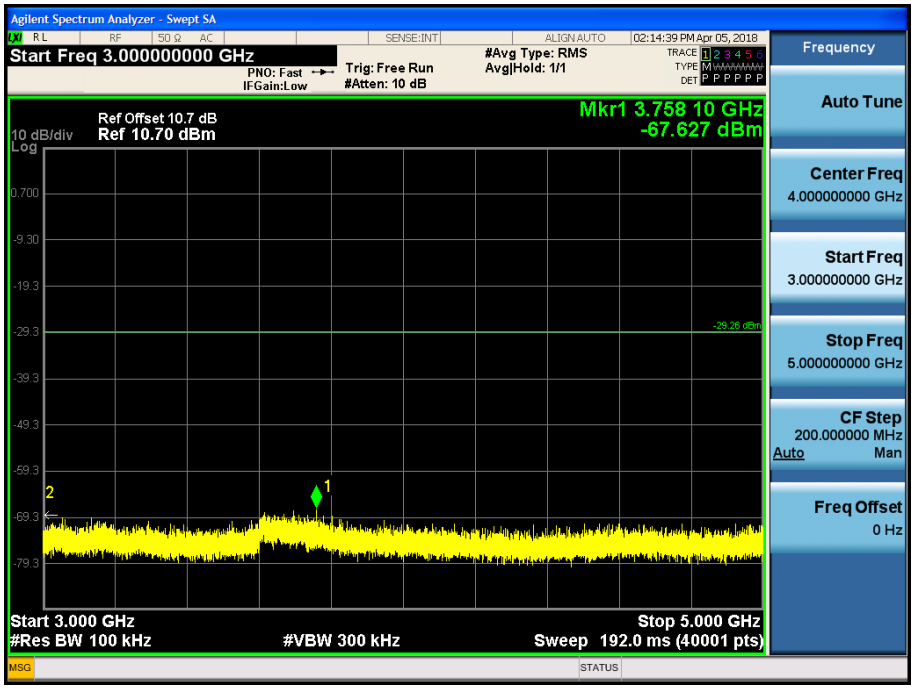
1 GHz ~ 3 GHz

Conducted Spurious Emission (High-CH 39)



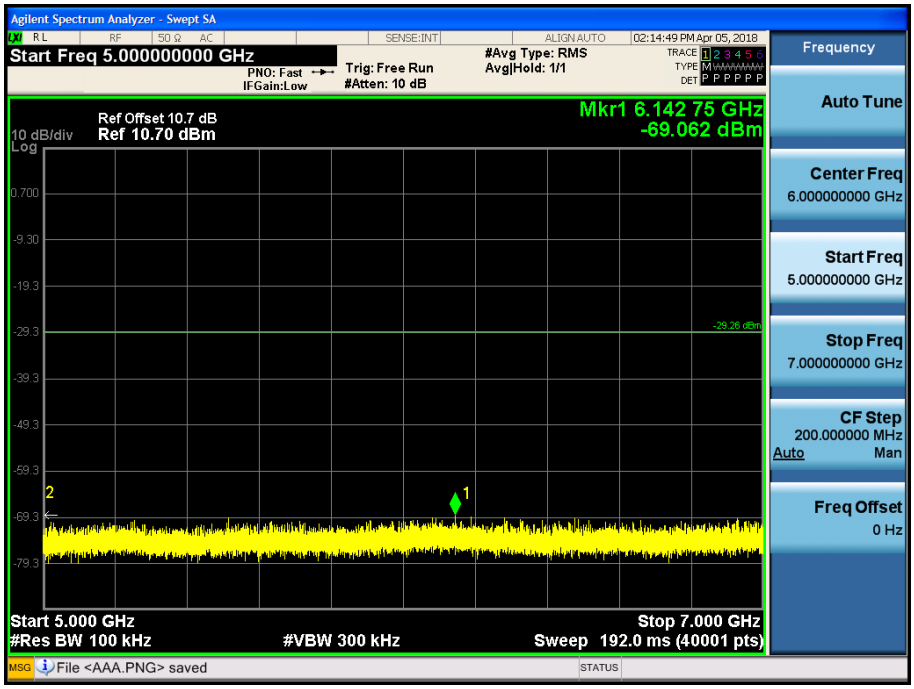
3 GHz ~ 5 GHz

Conducted Spurious Emission (High-CH 39)



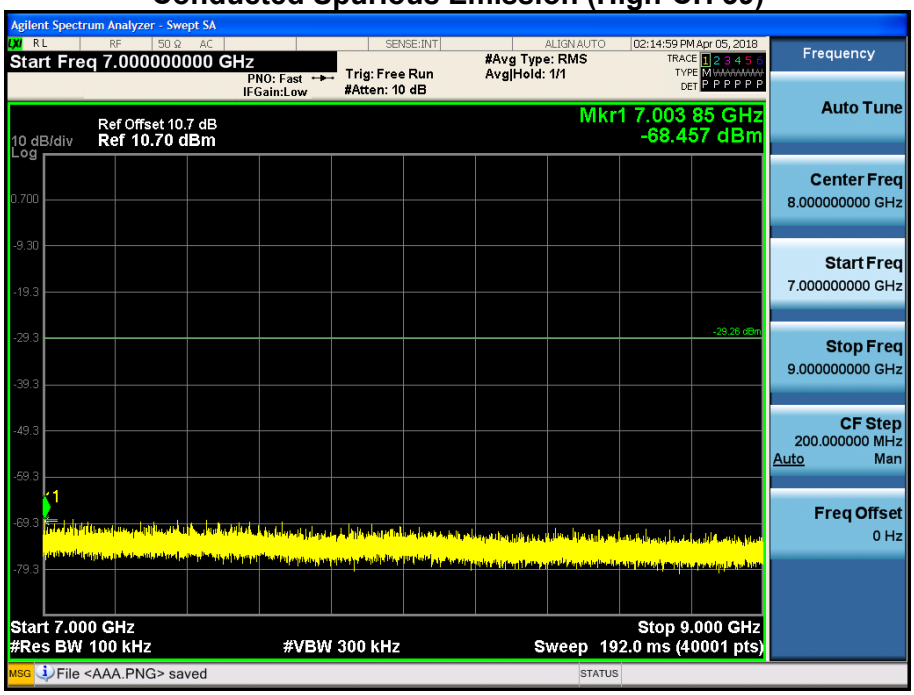
5 GHz ~ 7 GHz

Conducted Spurious Emission (High-CH 39)



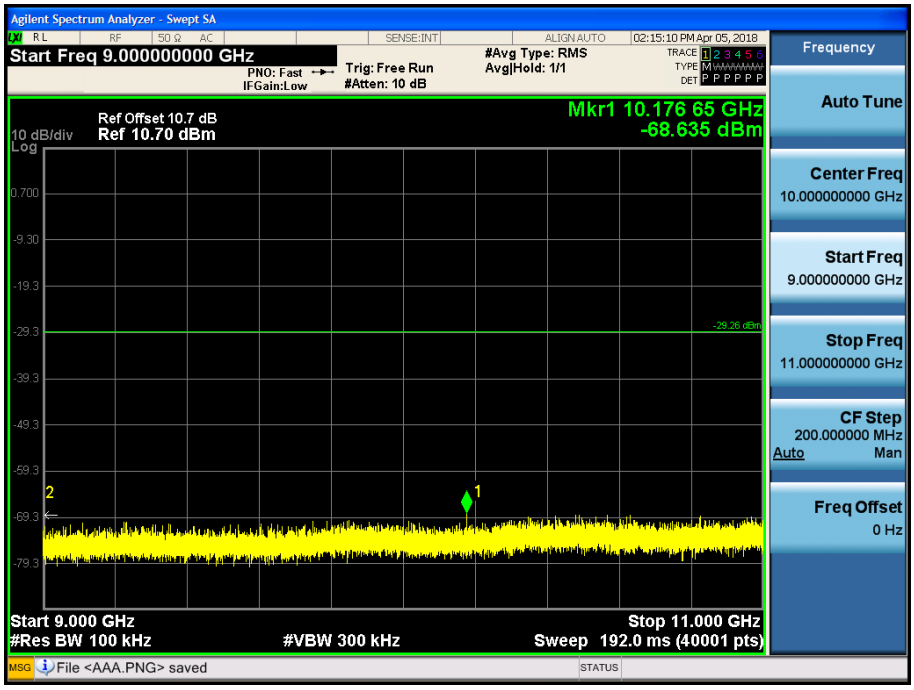
7 GHz ~ 9 GHz

Conducted Spurious Emission (High-CH 39)



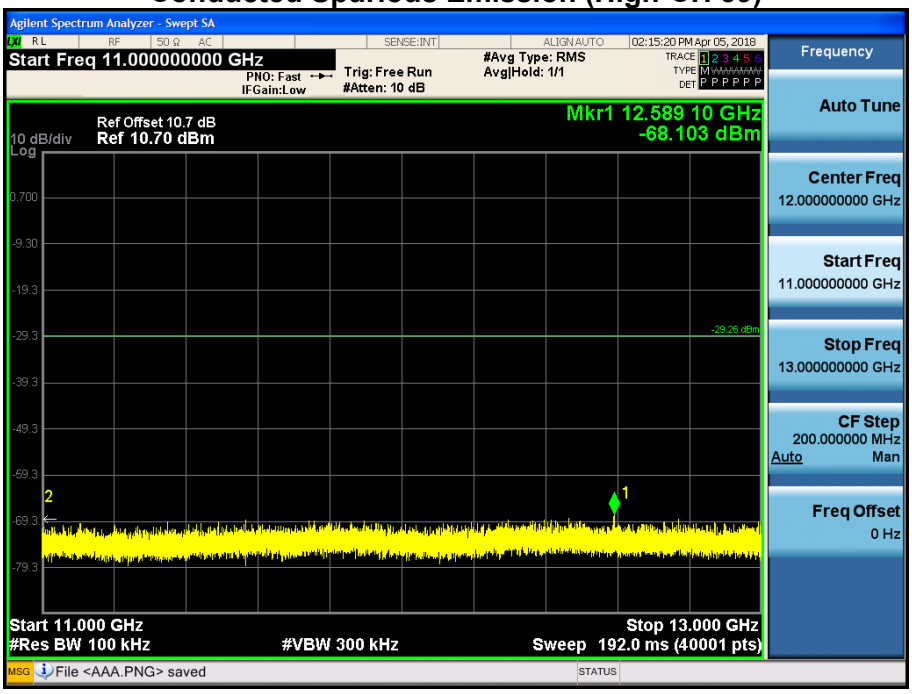
9 GHz ~ 11 GHz

Conducted Spurious Emission (High-CH 39)



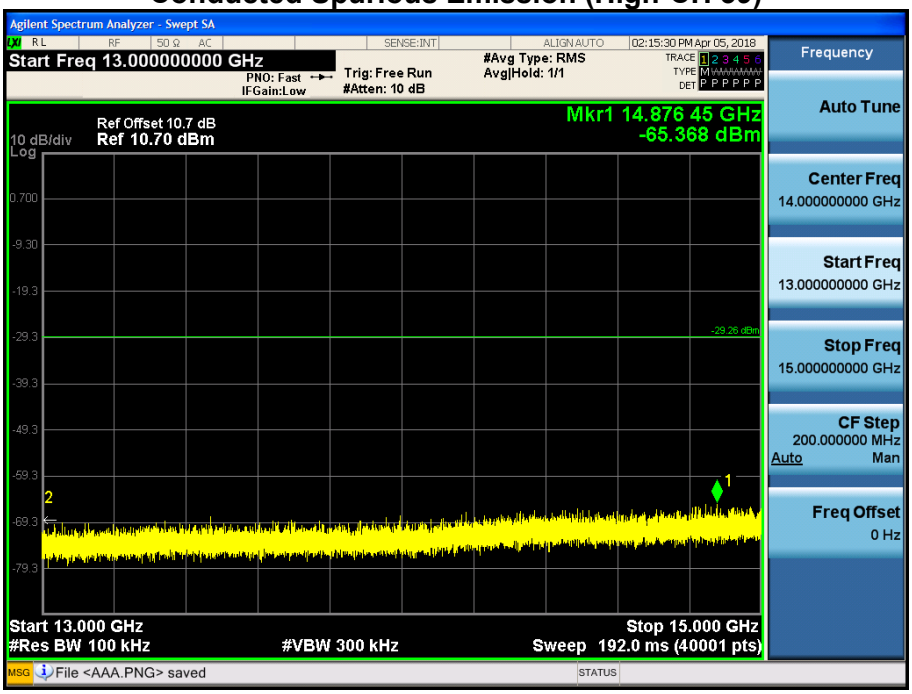
11 GHz ~ 13 GHz

Conducted Spurious Emission (High-CH 39)



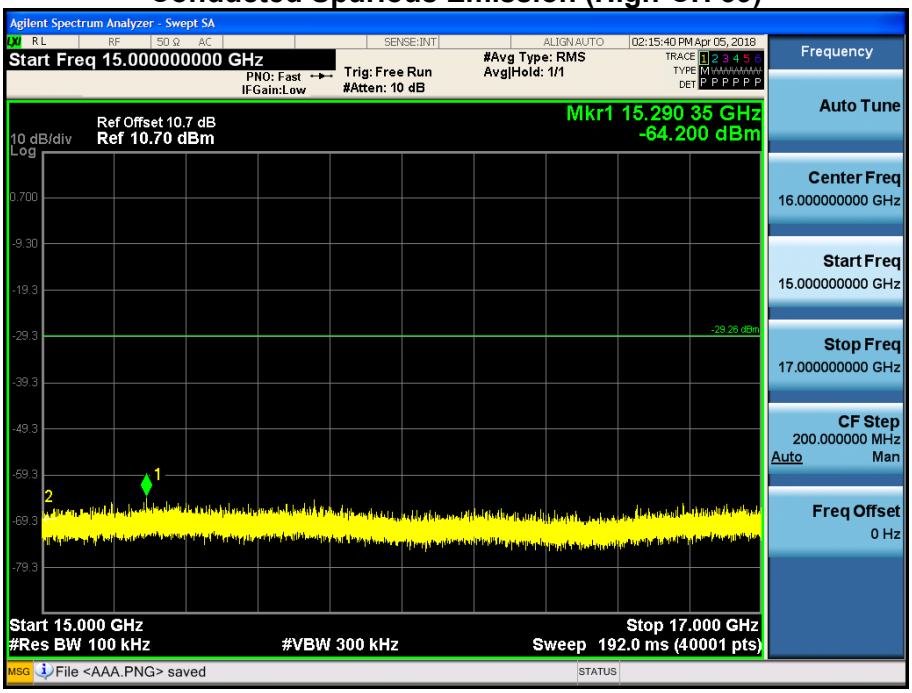
13 GHz ~ 15 GHz

Conducted Spurious Emission (High-CH 39)



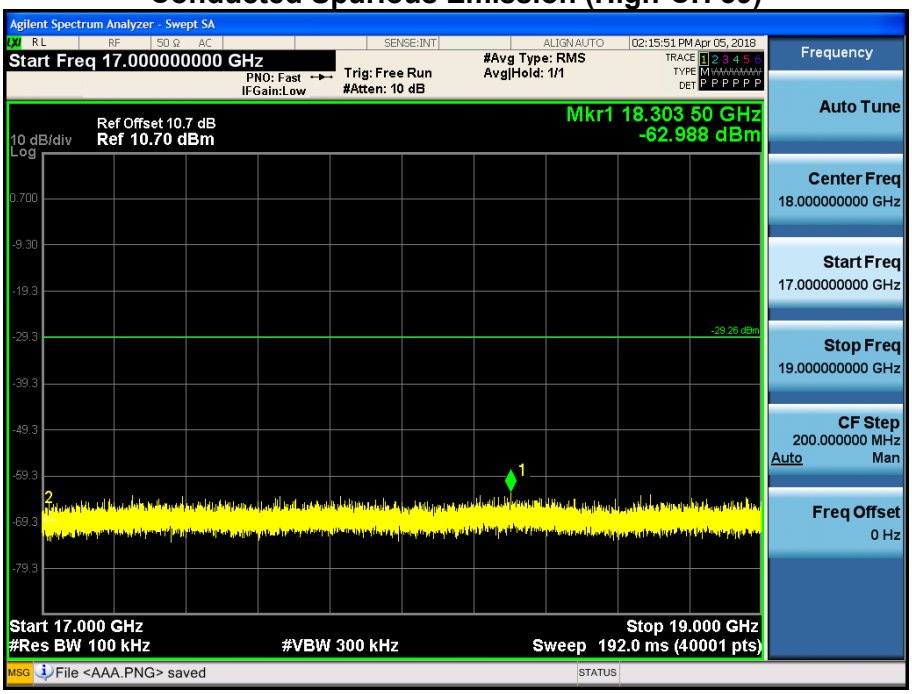
15 GHz ~ 17 GHz

Conducted Spurious Emission (High-CH 39)



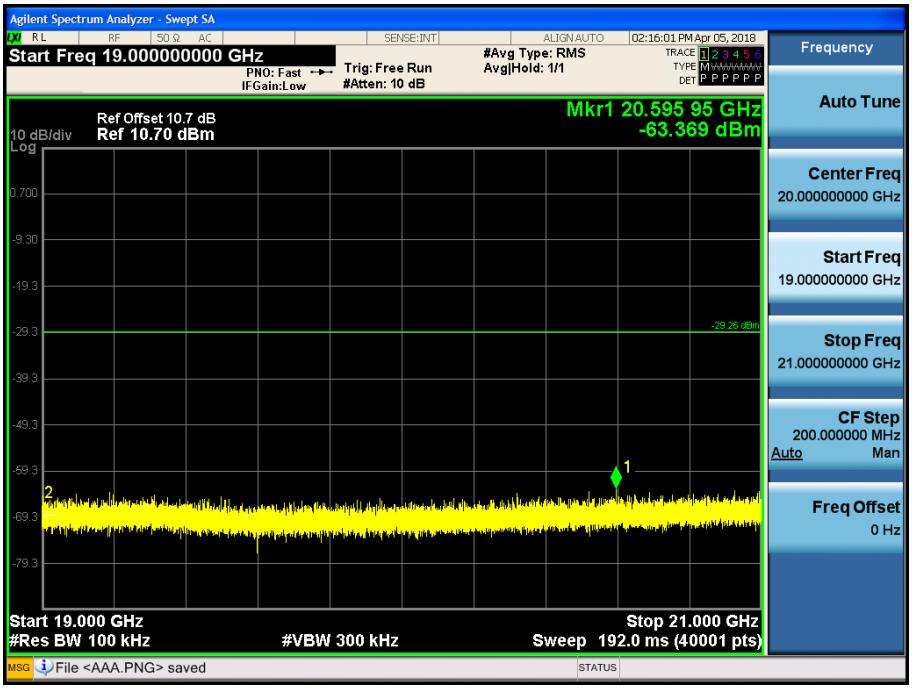
17 GHz ~ 19 GHz

Conducted Spurious Emission (High-CH 39)



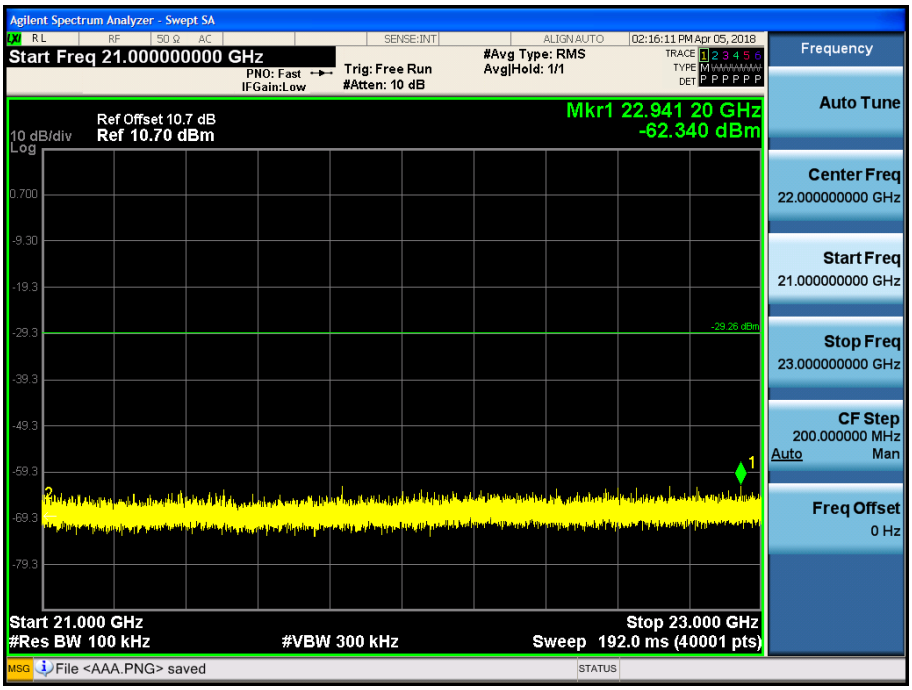
19 GHz ~ 21 GHz

Conducted Spurious Emission (High-CH 39)



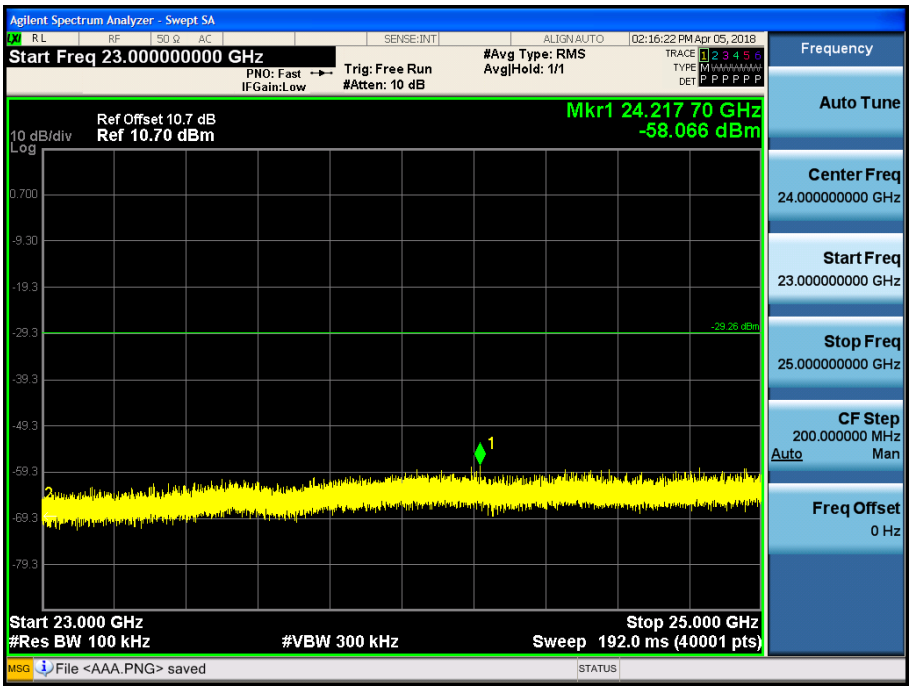
21 GHz ~ 23 GHz

Conducted Spurious Emission (High-CH 39)



23 GHz ~ 25 GHz

Conducted Spurious Emission (High-CH 39)



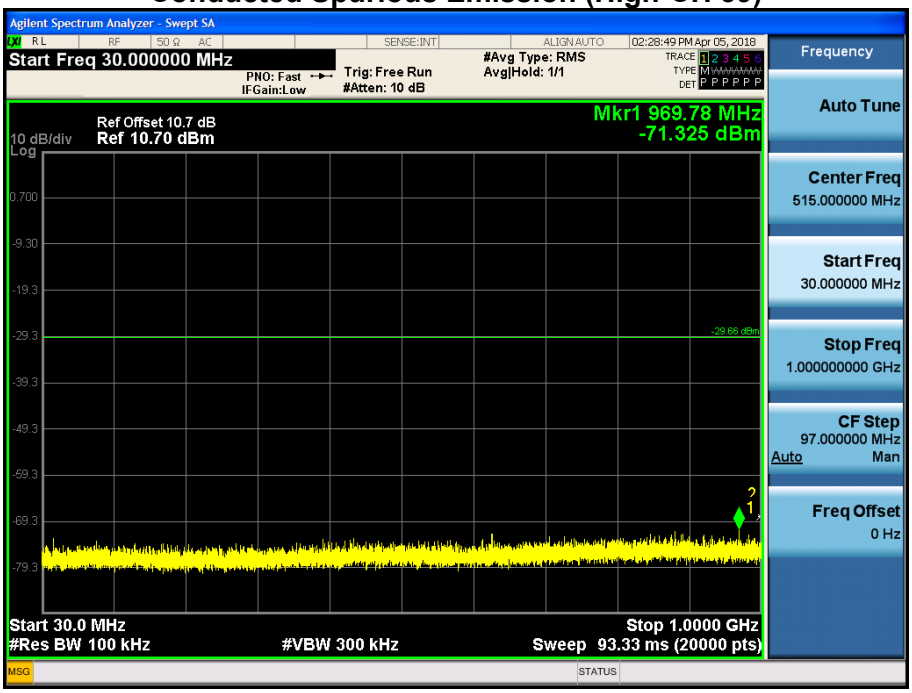
▣ 5.0 LE 2M: 255 Byte RESULT PLOTS

BandEdge (Low-CH 0)

BandEdge (High-CH 39)

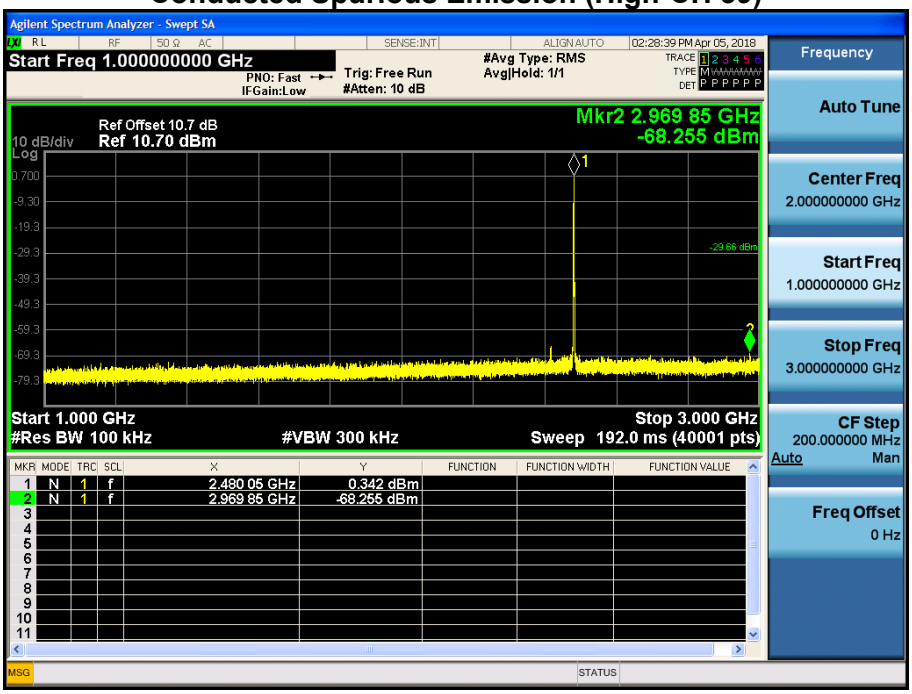
30 MHz ~ 1 GHz

Conducted Spurious Emission (High-CH 39)



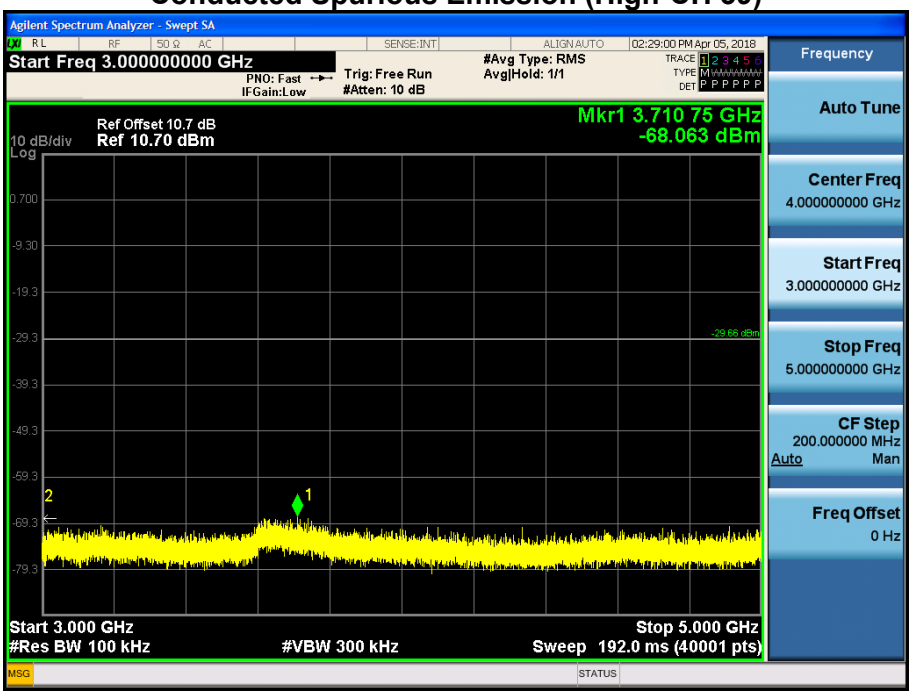
1 GHz ~ 3 GHz

Conducted Spurious Emission (High-CH 39)



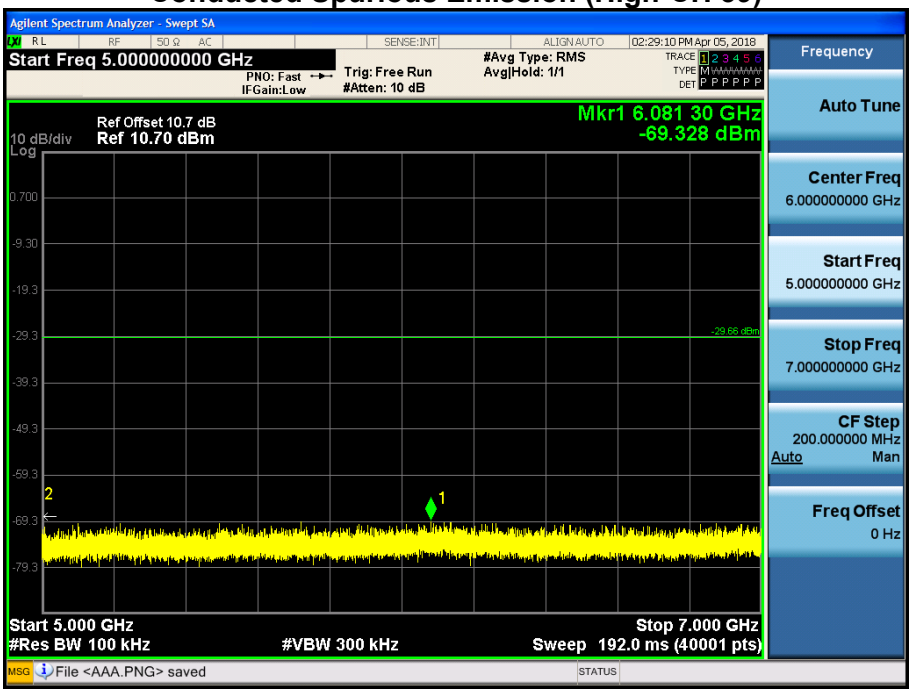
3 GHz ~ 5 GHz

Conducted Spurious Emission (High-CH 39)



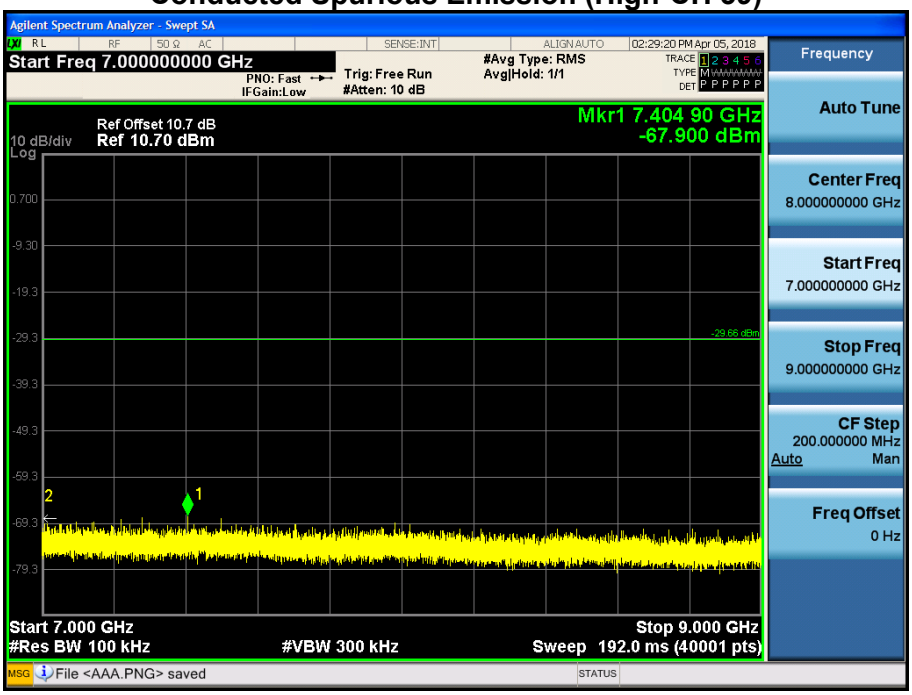
5 GHz ~ 7 GHz

Conducted Spurious Emission (High-CH 39)



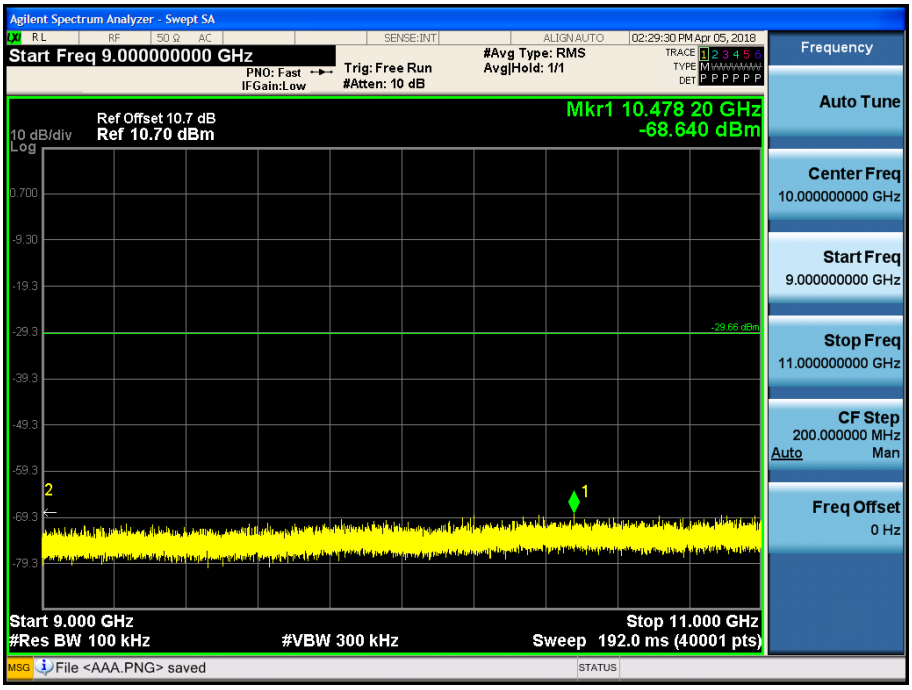
7 GHz ~ 9 GHz

Conducted Spurious Emission (High-CH 39)



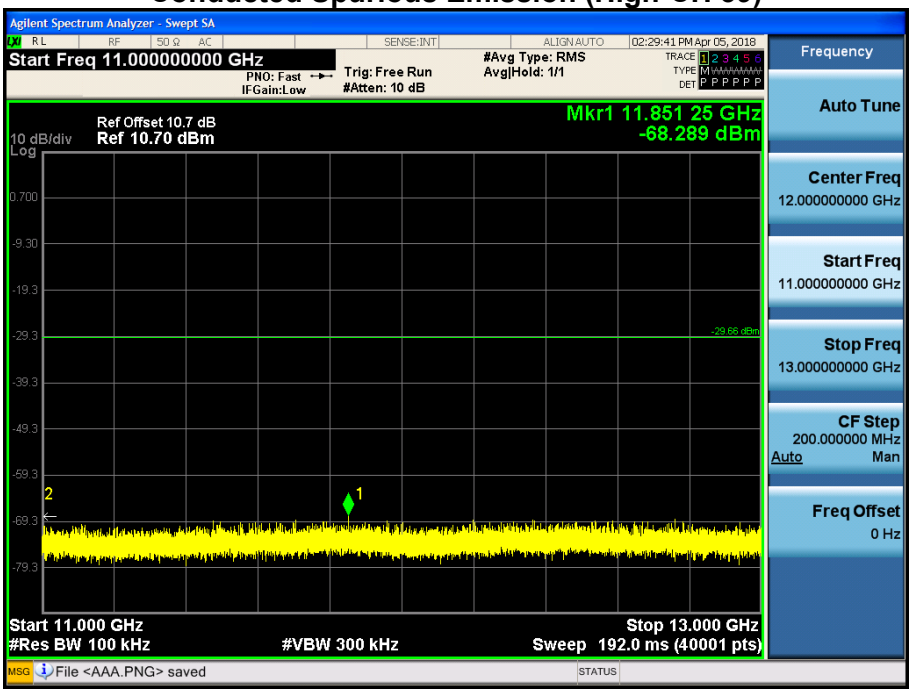
9 GHz ~ 11 GHz

Conducted Spurious Emission (High-CH 39)



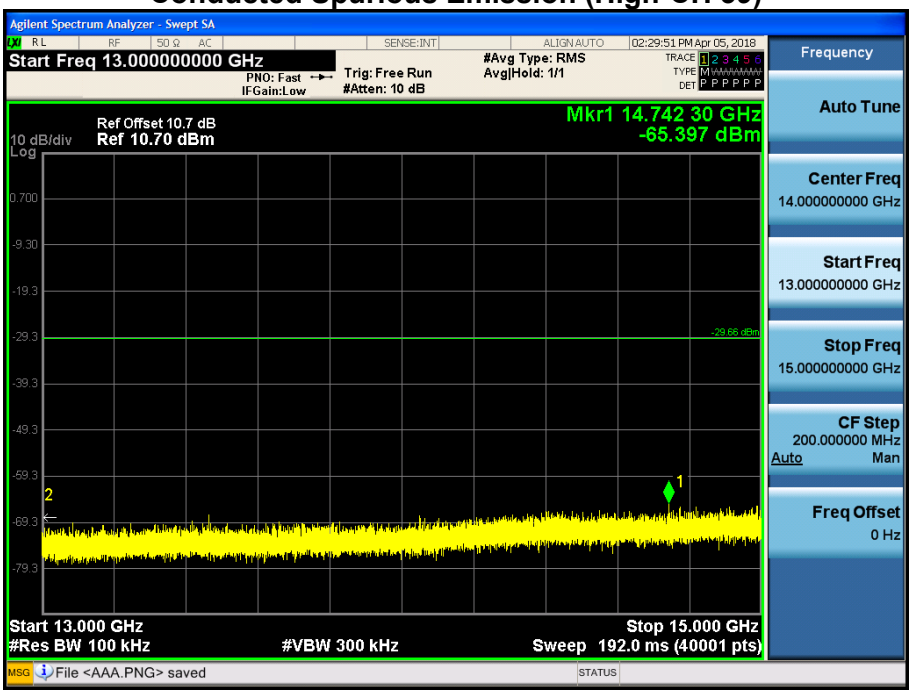
11 GHz ~ 13 GHz

Conducted Spurious Emission (High-CH 39)



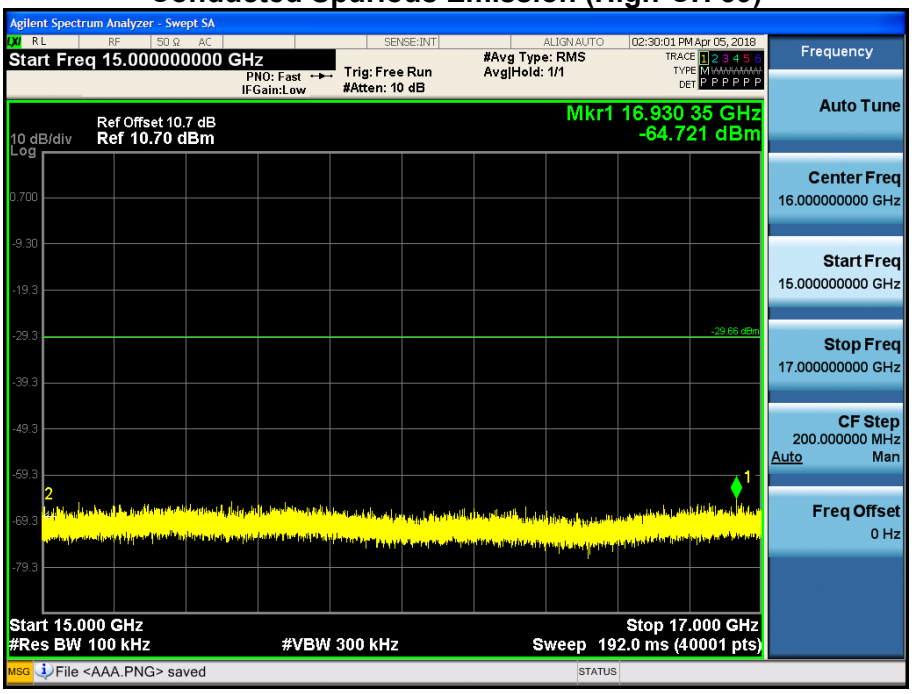
13 GHz ~ 15 GHz

Conducted Spurious Emission (High-CH 39)



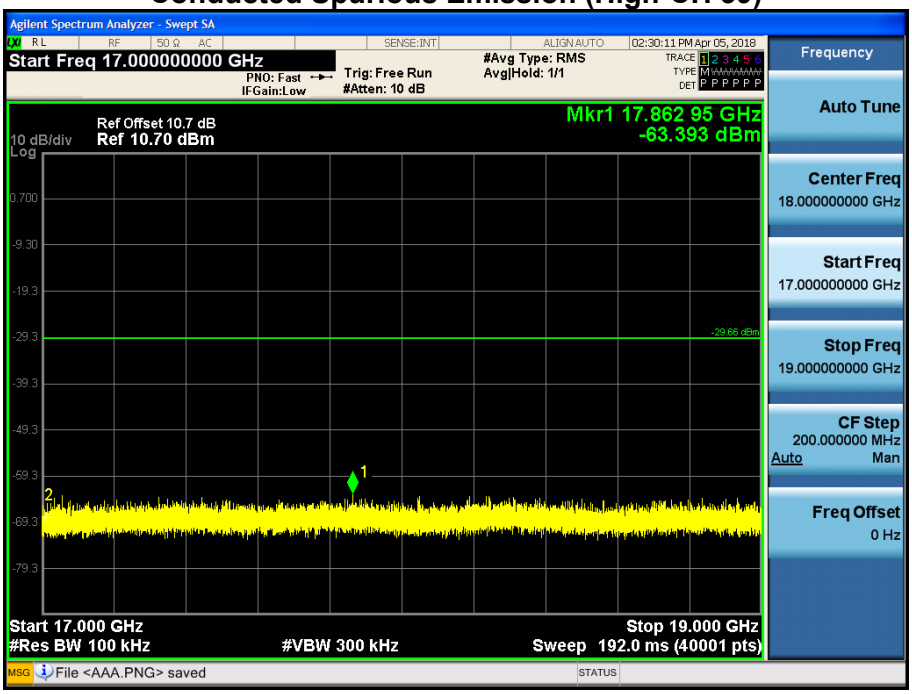
15 GHz ~ 17 GHz

Conducted Spurious Emission (High-CH 39)



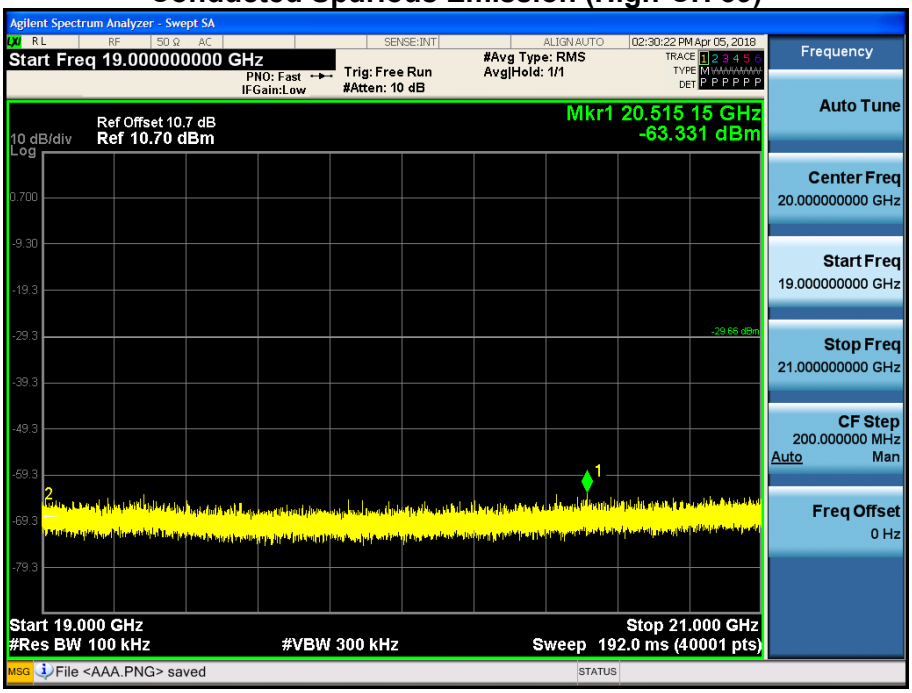
17 GHz ~ 19 GHz

Conducted Spurious Emission (High-CH 39)



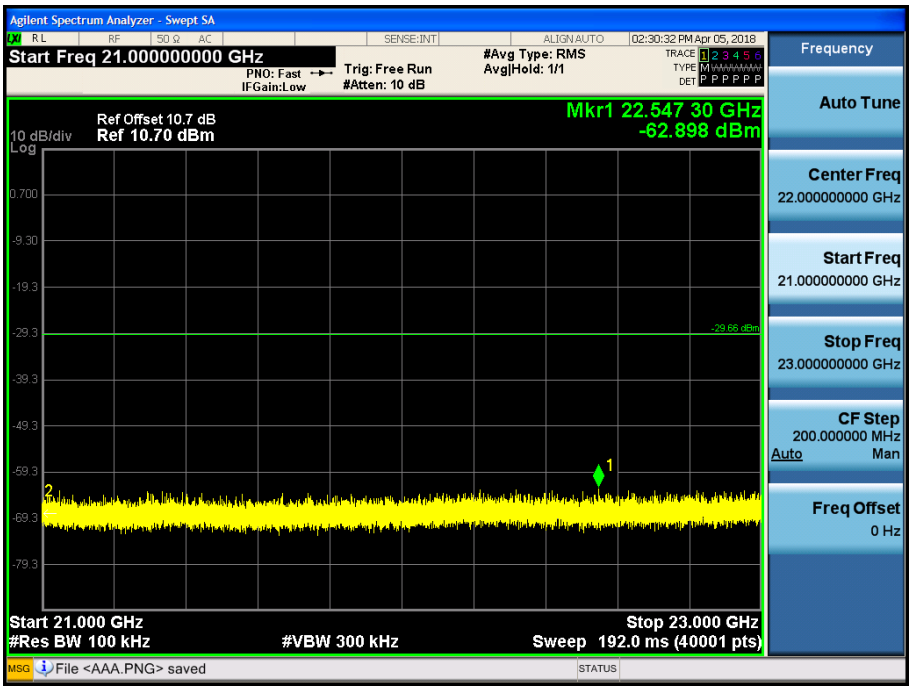
19 GHz ~ 21 GHz

Conducted Spurious Emission (High-CH 39)



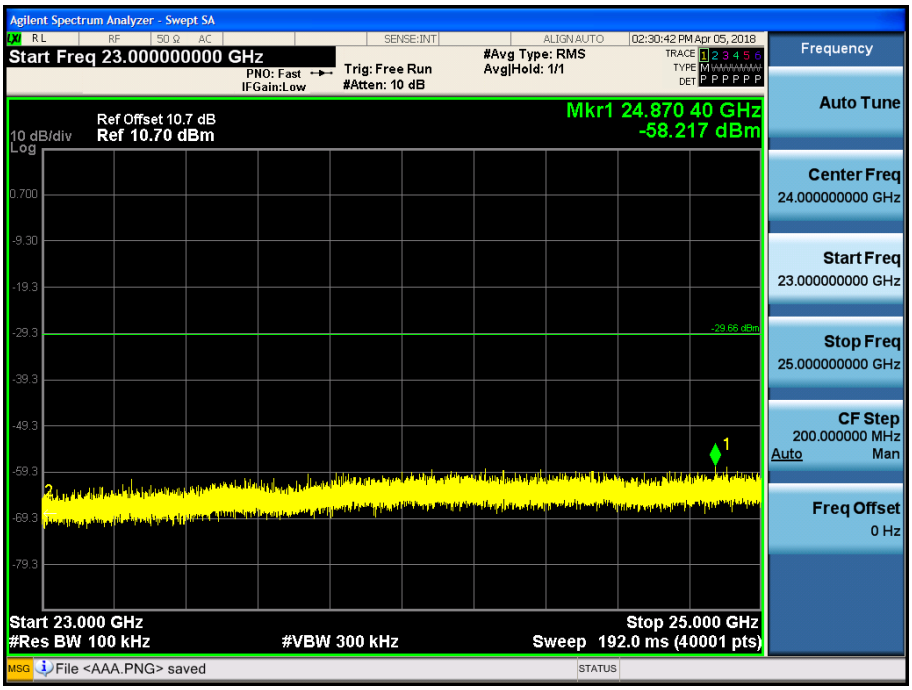
21 GHz ~ 23 GHz

Conducted Spurious Emission (High-CH 39)



23 GHz ~ 25 GHz

Conducted Spurious Emission (High-CH 39)



9.6 RADIATED MEASUREMENT.

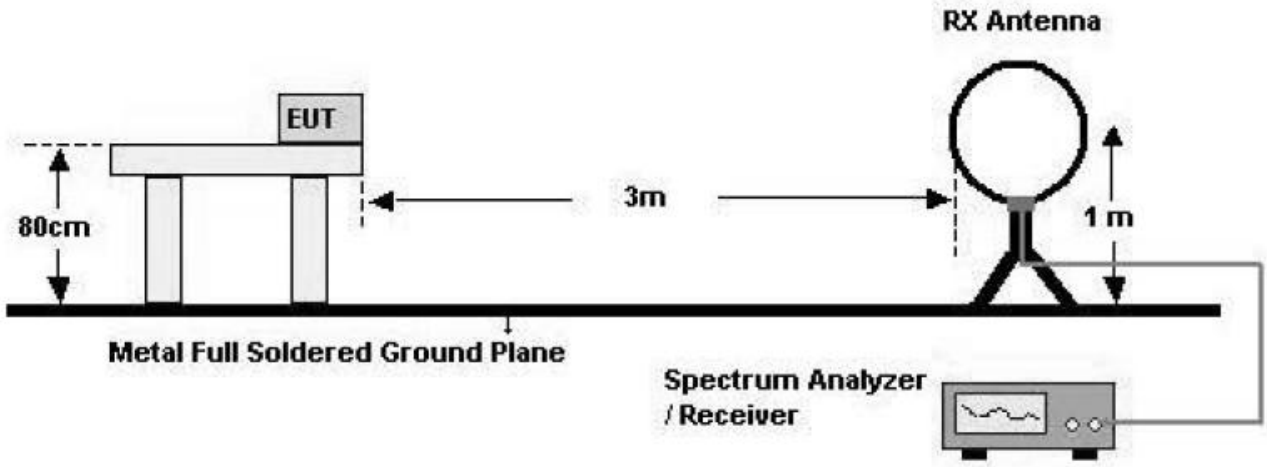
9.6.1 RADIATED SPURIOUS EMISSIONS.

Test Requirements and limit, §15.205, §15.209

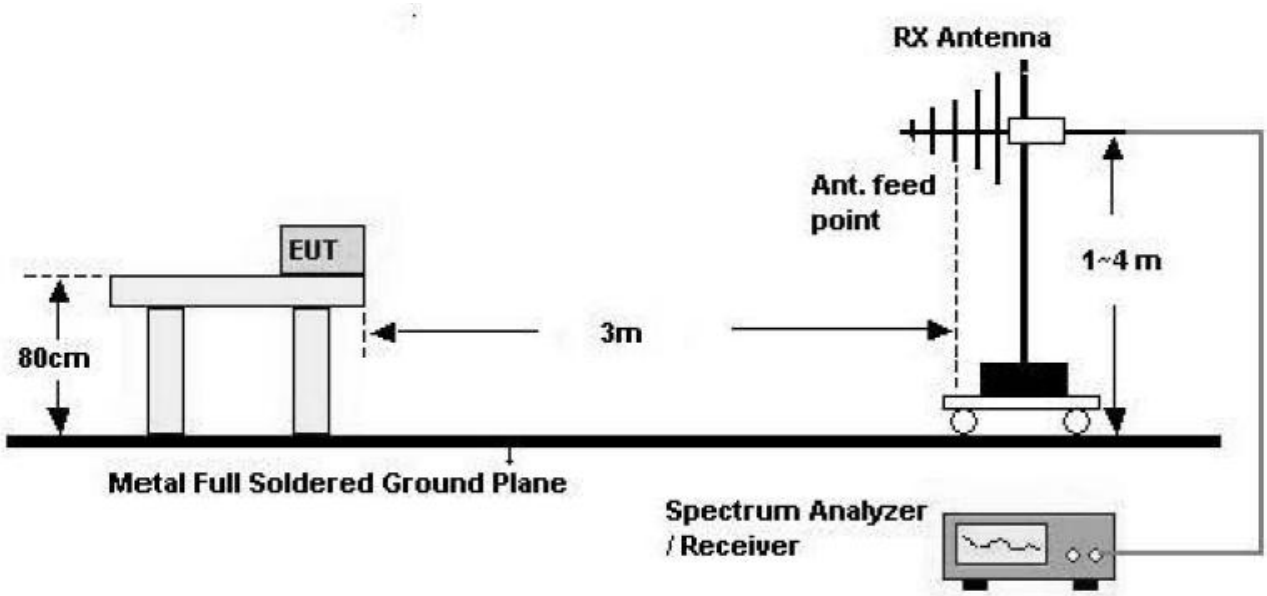
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

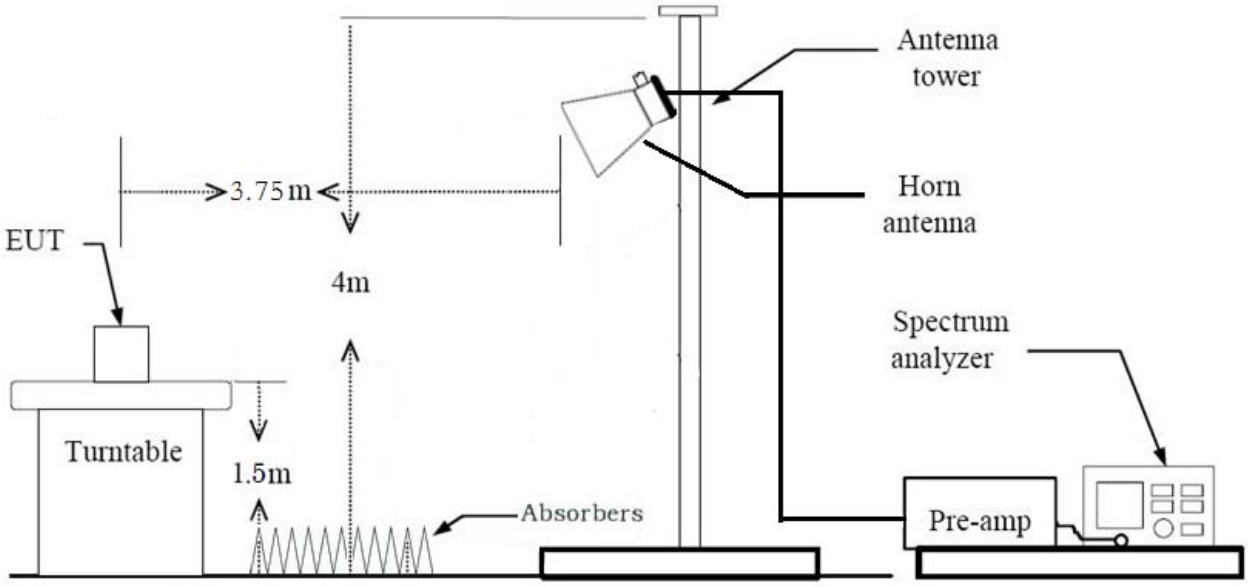
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



TEST PROCEDURE USED

Method 12.1 in KDB 558074 v04

Spectrum Setting

- Peak

Peak emission levels are measured by setting the instrument as follows:

RBW = cf. Table 1.

VBW ≥ 3 x RBW.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweeps to continue until the trace stabilizes.

(Note that the required measurement time may be longer for low duty cycle applications).

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

- Average (duty cycle < 98%, duty cycle variations are less than ±2%)

Set RBW = 1 MHz

Set VBW ≥ 3 x RBW

Detector = RMS.

Averaging type = power (*i.e.*, RMS).

Sweep time = auto.

Trace mode = average (at least 100 traces).

A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle.

Note :

1. We are performed the RSE and radiated band edge using standard radiated method(RMS).
2. According to SVSWR requirement in ANSI 63.4-2014, We performed the radiated test at 3.75 m distance from center of turn table. So, we applied the distance factor(reference distance : 3 m).
3. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

LE Mode	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
Bluetooth Version : 4.2 LE: 37 Byte	0.3914	0.6245	0.6268	2.03
Bluetooth Version : 4.2 LE: 255 Byte	2.1350	2.5000	0.8540	0.69
Bluetooth Version : 5.0 LE 1M: 37 Byte	0.3914	0.6245	0.6268	2.03
Bluetooth Version : 5.0 LE 1M: 255 Byte	2.1350	2.5000	0.8540	0.69
Bluetooth Version : 5.0 LE 2M: 37 Byte	0.2052	0.6245	0.3286	4.83
Bluetooth Version : 5.0 LE 2M: 255 Byte	1.0800	1.8750	0.5760	2.40

TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB
No Critical peaks found							

Notes:

1. Measuring frequencies from 9 kHz to the 30MHz.
2. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
3. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
4. Limit line = specific Limits (dBuV) + Distance extrapolation factor
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

TEST RESULTS

Below 1 GHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB
No Critical peaks found							

Notes:

1. Measuring frequencies from 30 MHz to the 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Above 1 GHz

Operation Mode: CH.0

Frequency [MHz]	Reading [dBuV/m]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G.+D.F. [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4804	51.18	0	2.07	V	53.25	73.98	20.73	PK
4804	39.08	2.03	2.07	V	43.18	53.98	10.80	AV
7206	50.62	0	9.57	V	60.19	73.98	13.79	PK
7206	38.32	2.03	9.57	V	49.92	53.98	4.06	AV
4804	51.27	0	2.07	H	53.34	73.98	20.64	PK
4804	39.09	2.03	2.07	H	43.19	53.98	10.79	AV
7206	50.75	0	9.57	H	60.32	73.98	13.66	PK
7206	38.48	2.03	9.57	H	50.08	53.98	3.90	AV

*A.F. : Antenna Factor / C.L. : Cable Loss / A.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor + Duty Cycle Factor
5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. 4.2 LE: 37 Byte

Operation Mode: CH.19

Frequency [MHz]	Reading [dBuV/m]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G.+D.F. [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4880	50.87	0	2.56	V	53.43	73.98	20.55	PK
4880	38.79	2.03	2.56	V	43.38	53.98	10.60	AV
7320	49.87	0	9.72	V	59.59	73.98	14.39	PK
7320	38.25	2.03	9.72	V	50	53.98	3.98	AV
4880	51.43	0	2.56	H	53.99	73.98	19.99	PK
4880	38.84	2.03	2.56	H	43.43	53.98	10.55	AV
7320	50.53	0	9.72	H	60.25	73.98	13.73	PK
7320	38.46	2.03	9.72	H	50.21	53.98	3.77	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor + Duty Cycle Factor
5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. 4.2 LE: 37 Byte

Operation Mode: CH.39

Frequency [MHz]	Reading [dBuV/m]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G.+D.F. [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4960	51.23	0	2.66	V	53.89	73.98	20.09	PK
4960	38.90	2.03	2.66	V	43.59	53.98	10.39	AV
7440	49.44	0	10.20	V	59.64	73.98	14.34	PK
7440	37.77	2.03	10.20	V	50	53.98	3.98	AV
4960	50.57	0	2.66	H	53.23	73.98	20.75	PK
4960	38.89	2.03	2.66	H	43.58	53.98	10.40	AV
7440	49.52	0	10.20	H	59.72	73.98	14.26	PK
7440	37.74	2.03	10.20	H	49.97	53.98	4.01	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor + Duty Cycle Factor
5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. 4.2 LE: 37 Byte

Operation Mode: CH.0

Frequency [MHz]	Reading [dBuV/m]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G.+D.F. [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4804	50.79	0	2.07	V	52.86	73.98	21.12	PK
4804	39.91	2.03	2.07	V	44.01	53.98	9.97	AV
7206	49.68	0	9.57	V	59.25	73.98	14.73	PK
7206	38.25	2.03	9.57	V	49.85	53.98	4.13	AV
4804	50.54	0	2.07	H	52.61	73.98	21.37	PK
4804	38.89	2.03	2.07	H	42.99	53.98	10.99	AV
7206	48.67	0	9.57	H	58.24	73.98	15.74	PK
7206	38.21	2.03	9.57	H	49.81	53.98	4.17	AV

*A.F. : Antenna Factor / C.L. : Cable Loss / A.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor + Duty Cycle Factor
5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. 5.0 LE 1M: 37 Byte

Operation Mode: CH.19

Frequency [MHz]	Reading [dBuV/m]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G.+D.F. [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4880	49.92	0	2.56	V	52.48	73.98	21.50	PK
4880	38.71	2.03	2.56	V	43.3	53.98	10.68	AV
7320	48.61	0	9.72	V	58.33	73.98	15.65	PK
7320	38.20	2.03	9.72	V	49.95	53.98	4.03	AV
4880	50.02	0	2.56	H	52.58	73.98	21.40	PK
4880	38.79	2.03	2.56	H	43.38	53.98	10.60	AV
7320	50.20	0	9.72	H	59.92	73.98	14.06	PK
7320	38.45	2.03	9.72	H	50.2	53.98	3.78	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor + Duty Cycle Factor
5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. 5.0 LE 1M: 37 Byte

Operation Mode: CH.39

Frequency [MHz]	Reading [dBuV/m]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G.+D.F. [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4960	50.88	0	2.66	V	53.54	73.98	20.44	PK
4960	38.76	2.03	2.66	V	43.45	53.98	10.53	AV
7440	48.94	0	10.20	V	59.14	73.98	14.84	PK
7440	37.78	2.03	10.20	V	50.01	53.98	3.97	AV
4960	50.35	0	2.66	H	53.01	73.98	20.97	PK
4960	38.79	2.03	2.66	H	43.48	53.98	10.50	AV
7440	48.62	0	10.20	H	58.82	73.98	15.16	PK
7440	37.70	2.03	10.20	H	49.93	53.98	4.05	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor + Duty Cycle Factor
5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. 5.0 LE 1M: 37 Byte

Operation Mode: CH.0

Frequency [MHz]	Reading [dBuV/m]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G.+D.F. [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4804	50.76	0	2.07	V	52.83	73.98	21.15	PK
4804	39.02	4.83	2.07	V	45.92	53.98	8.06	AV
7206	49.84	0	9.57	V	59.41	73.98	14.57	PK
7206	*38.29	0	9.57	V	47.86	53.98	6.12	AV
4804	50.44	0	2.07	H	52.51	73.98	21.47	PK
4804	38.95	4.83	2.07	H	45.85	53.98	8.13	AV
7206	50.78	0	9.57	H	60.35	73.98	13.63	PK
7206	*38.35	0	9.57	H	47.92	53.98	6.06	AV

*A.F. : Antenna Factor / C.L. : Cable Loss / A.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor + Duty Cycle Factor
5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. 5.0 LE 2M: 37 Byte
8. [Note] “ * ” : Ambient value

Operation Mode: CH.19

Frequency [MHz]	Reading [dBuV/m]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G.+D.F. [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4880	49.99	0	2.56	V	52.55	73.98	21.43	PK
4880	38.73	4.83	2.56	V	46.12	53.98	7.86	AV
7320	48.28	0	9.72	V	58	73.98	15.98	PK
7320	*38.31	0	9.72	V	48.03	53.98	5.95	AV
4880	50.76	0	2.56	H	53.32	73.98	20.66	PK
4880	38.85	4.83	2.56	H	46.24	53.98	7.74	AV
7320	51.00	0	9.72	H	60.72	73.98	13.26	PK
7320	*38.43	0	9.72	H	48.15	53.98	5.83	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor + Duty Cycle Factor
5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. 5.0 LE 2M: 37 Byte
8. [Note] “*” : Ambient value

Operation Mode: CH.39

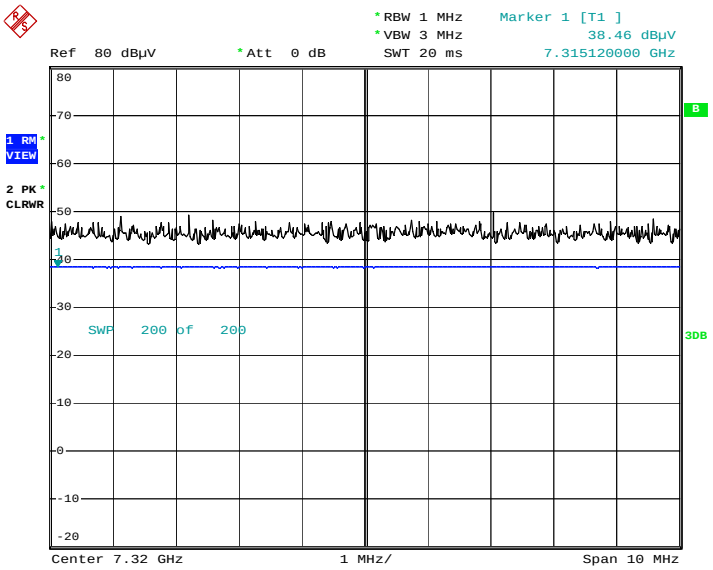
Frequency [MHz]	Reading [dBuV/m]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G.+D.F. [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4960	50.34	0	2.66	V	53.00	73.98	20.98	PK
4960	38.89	4.83	2.66	V	46.38	53.98	7.60	AV
7440	48.67	0	10.20	V	58.87	73.98	15.11	PK
7440	*37.55	0	10.20	V	47.75	53.98	6.23	AV
4960	50.12	0	2.66	H	52.78	73.98	21.20	PK
4960	38.82	4.83	2.66	H	46.31	53.98	7.67	AV
7440	48.60	0	10.20	H	58.8	73.98	15.18	PK
7440	*37.61	0	10.20	H	47.81	53.98	6.17	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor + Duty Cycle Factor
5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. 5.0 LE 2M: 37 Byte
8. [Note] “*” : Ambient value

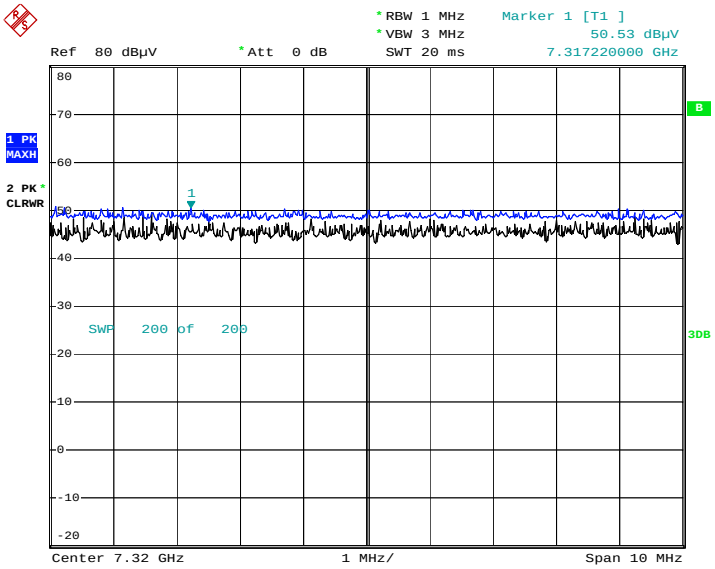
▣ RESULT PLOTS (Worst case : H)_4.2 LE: 37 Byte

Radiated Spurious Emissions plot – Average Reading (Ch.0 3rd Harmonic)



Date: 1.MAR.2003 02:20:41

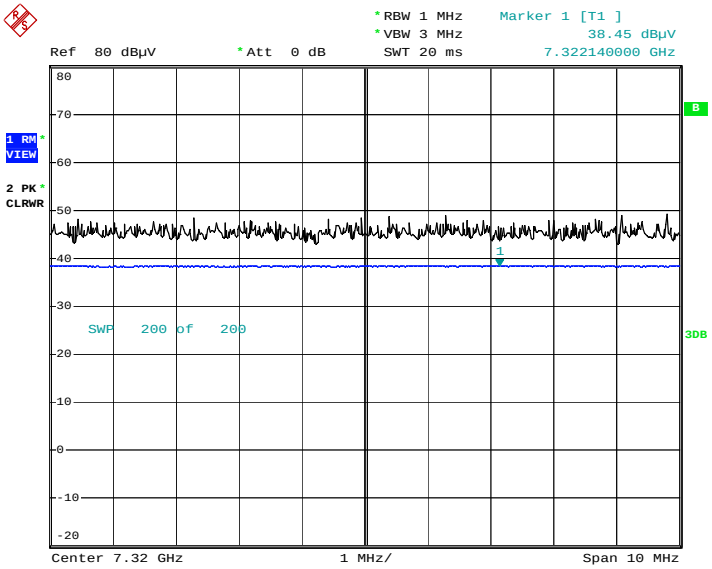
Radiated Spurious Emissions plot – Peak Reading (Ch.0 3rd Harmonic)



Date: 1.MAR.2003 01:57:48

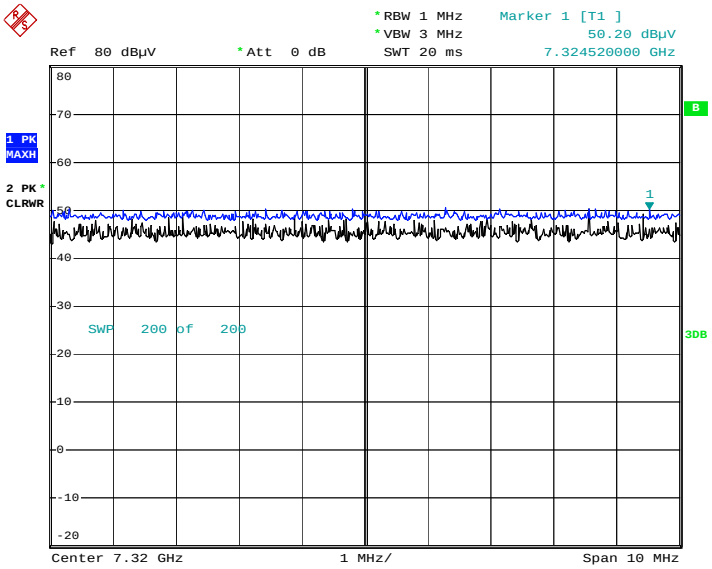
▣ RESULT PLOTS (Worst case : X-H)_ 5.0 LE 1M: 37 Byte

Radiated Spurious Emissions plot – Average Reading (Ch.0 3rd Harmonic)



Date: 1.MAR.2003 02:00:09

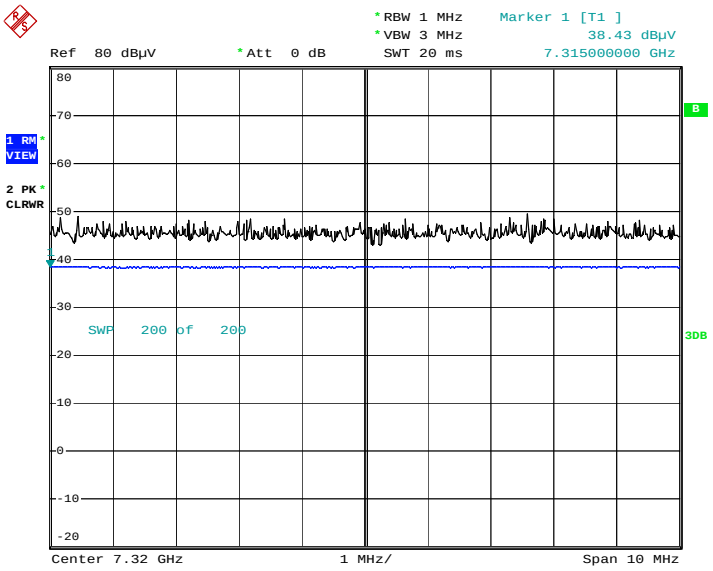
Radiated Spurious Emissions plot – Peak Reading (Ch.0 3rd Harmonic)



Date: 1.MAR.2003 02:00:32

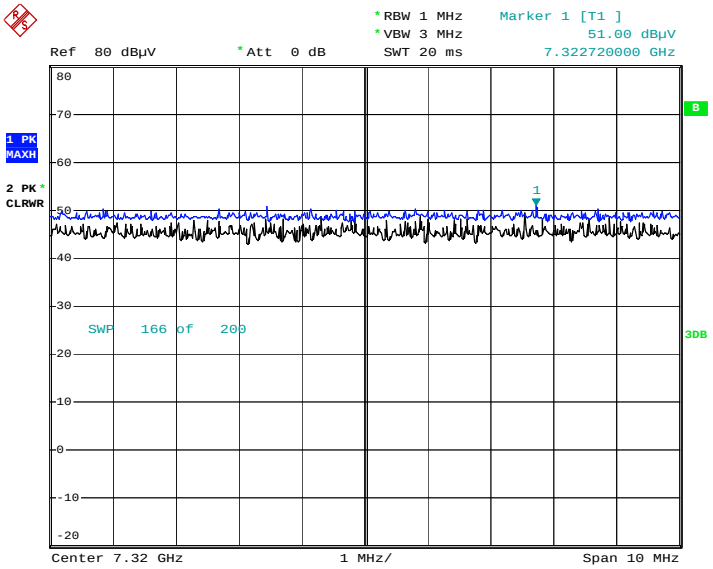
▣ RESULT PLOTS (Worst case : X-H)_ 5.0 LE 2M: 37 Byte

Radiated Spurious Emissions plot – Average Reading (Ch.0 3rd Harmonic)



Date: 1.MAR.2003 02:03:31

Radiated Spurious Emissions plot – Peak Reading (Ch.0 3rd Harmonic)



Date: 1.MAR.2003 02:03:49

Note : Only the worst case plots for Radiated Spurious Emissions.

9.6.2 RADIATED RESTRICTED BAND EDGES

Test Requirements and limit, §15.247(d) §15.205, §15.209

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Operation Mode	BT_LE
Operating Frequency	2402 MHz
Channel No.	0

Frequency [MHz]	Reading [dBuV/m]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F. [dB]	Ant. Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	15.48	0.00	35.36	H	50.84	73.98	23.14	PK
2390.0	3.74	2.03	35.36	H	41.13	53.98	12.85	AV
2390.0	15.43	0.00	35.36	V	50.79	73.98	23.19	PK
2390.0	3.72	2.03	35.36	V	41.11	53.98	12.87	AV

Notes:

1. Frequency range of measurement = 2310 MHz ~ 2390 MHz
2. Total = Reading Value + Antenna Factor + Cable Loss + Duty Cycle Factor + Distance Factor
3. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. 4.2 LE: 37 Byte

Operation Mode	BT_LE
Operating Frequency	2480 MHz
Channel No.	39

Frequency [MHz]	Reading [dBuV/m]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F. [dB]	Ant. Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	16.40	0.00	35.73	H	52.13	73.98	21.85	PK
2483.5	4.12	2.03	35.73	H	41.88	53.98	12.10	AV
2483.5	16.29	0.00	35.73	V	52.02	73.98	21.96	PK
2483.5	4.11	2.03	35.73	V	41.87	53.98	12.11	AV

Notes:

1. Frequency range of measurement = 2483.5 MHz ~ 2500 MHz
2. Total = Reading Value + Antenna Factor + Cable Loss + Duty Cycle Factor + Distance Factor
3. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. 4.2 LE: 37 Byte

Operation Mode BT_LE
Operating Frequency 2402 MHz
Channel No. 0

Frequency [MHz]	Reading [dBuV/m]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F. [dB]	Ant. Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	15.98	0.00	35.36	H	51.34	73.98	22.64	PK
2390.0	4.38	2.03	35.36	H	41.77	53.98	12.21	AV
2390.0	15.85	0.00	35.36	V	51.21	73.98	22.77	PK
2390.0	4.31	2.03	35.36	V	41.70	53.98	12.28	AV

Notes:

1. Frequency range of measurement = 2310 MHz ~ 2390 MHz
2. Total = Reading Value + Antenna Factor + Cable Loss + Duty Cycle Factor + Distance Factor
3. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. 5.0 LE 1M: 37 Byte

Operation Mode BT_LE
Operating Frequency 2480 MHz
Channel No. 39

Frequency [MHz]	Reading [dBuV/m]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F. [dB]	Ant. Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	16.15	0.00	35.73	H	51.88	73.98	22.10	PK
2483.5	4.01	2.03	35.73	H	41.77	53.98	12.21	AV
2483.5	16.08	0.00	35.73	V	51.81	73.98	22.17	PK
2483.5	4.00	2.03	35.73	V	41.76	53.98	12.22	AV

Notes:

1. Frequency range of measurement = 2483.5 MHz ~ 2500 MHz
2. Total = Reading Value + Antenna Factor + Cable Loss + Duty Cycle Factor + Distance Factor
3. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. 5.0 LE 1M: 37 Byte

Operation Mode BT_LE
Operating Frequency 2402 MHz
Channel No. 0

Frequency [MHz]	Reading [dBuV/m]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F. [dB]	Ant. Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	15.85	0.00	35.36	H	51.21	73.98	22.77	PK
2390.0	4.74	4.83	35.36	H	44.93	53.98	9.05	AV
2390.0	15.77	0.00	35.36	V	51.13	73.98	22.85	PK
2390.0	4.72	4.83	35.36	V	44.91	53.98	9.07	AV

Notes:

1. Frequency range of measurement = 2310 MHz ~ 2390 MHz
2. Total = Reading Value + Antenna Factor + Cable Loss + Duty Cycle Factor + Distance Factor
3. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. 5.0 LE 2M: 37 Byte

Operation Mode BT_LE
Operating Frequency 2480 MHz
Channel No. 39

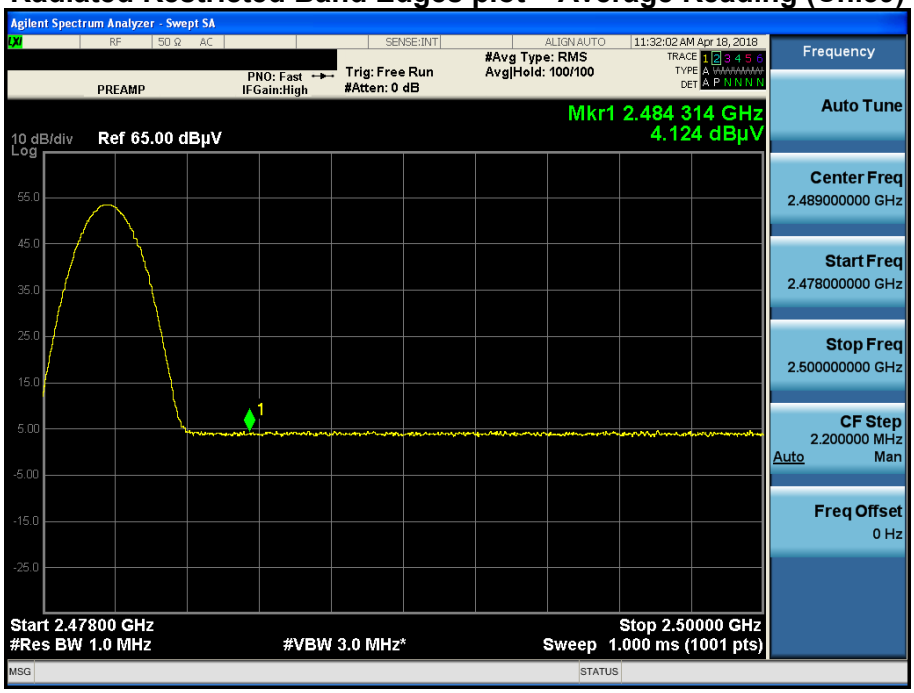
Frequency [MHz]	Reading [dBuV/m]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F. [dB]	Ant. Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	15.60	0.00	35.73	H	51.33	73.98	22.65	PK
2483.5	3.64	4.83	35.73	H	44.20	53.98	9.79	AV
2483.5	15.50	0.00	35.73	V	51.23	73.98	22.75	PK
2483.5	3.63	4.83	35.73	V	44.19	53.98	9.79	AV

Notes:

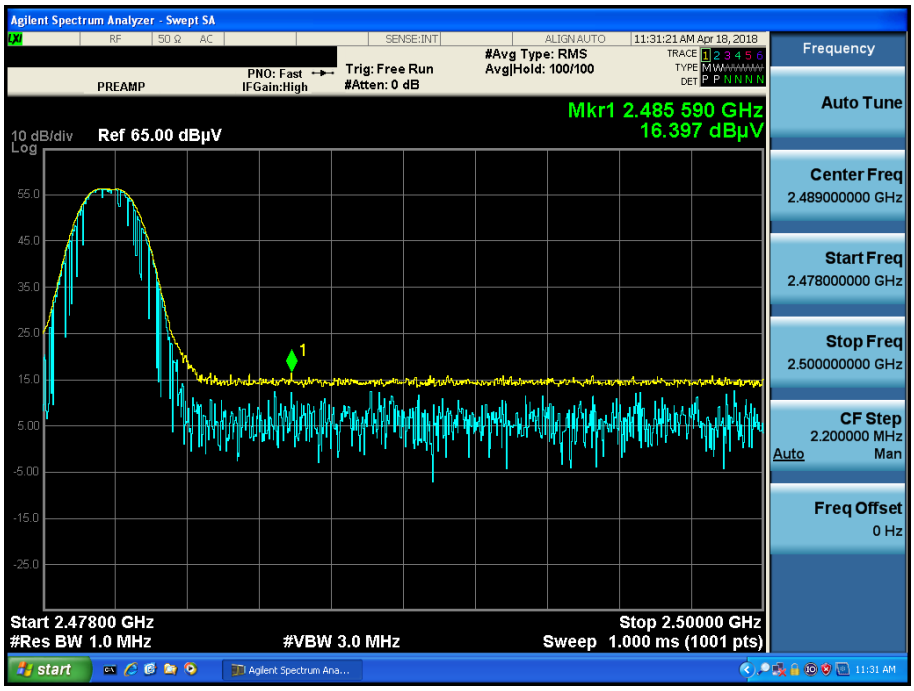
1. Frequency range of measurement = 2483.5 MHz ~ 2500 MHz
2. Total = Reading Value + Antenna Factor + Cable Loss + Duty Cycle Factor + Distance Factor
3. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. 5.0 LE 2M: 37 Byte

▣ RESULT PLOTS (Worst case : X-H) _4.2 LE: 37 Byte

Radiated Restricted Band Edges plot – Average Reading (Ch.39)

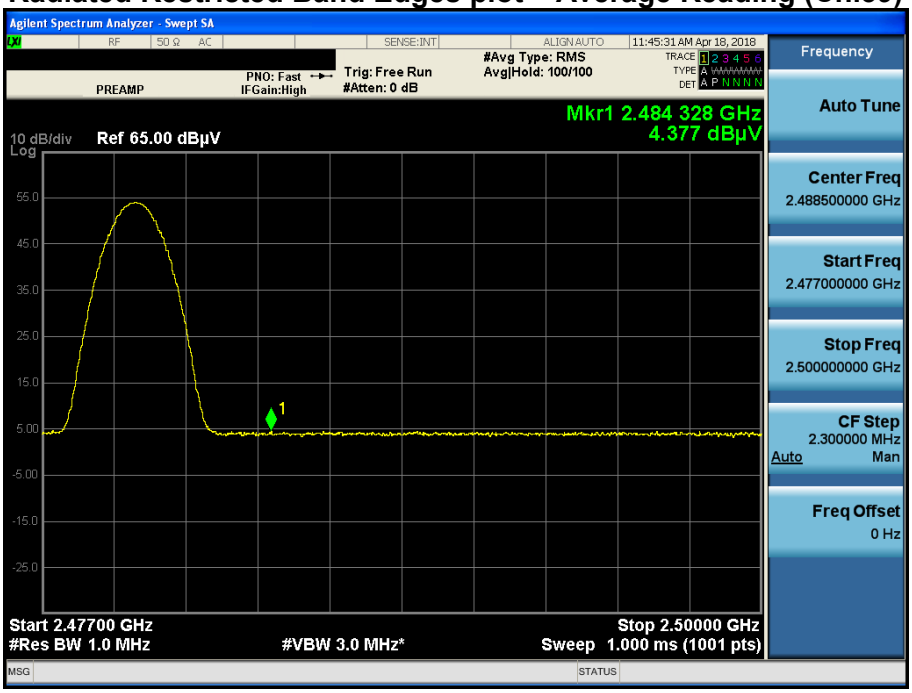


Radiated Restricted Band Edges plot – Peak Reading (Ch.39)

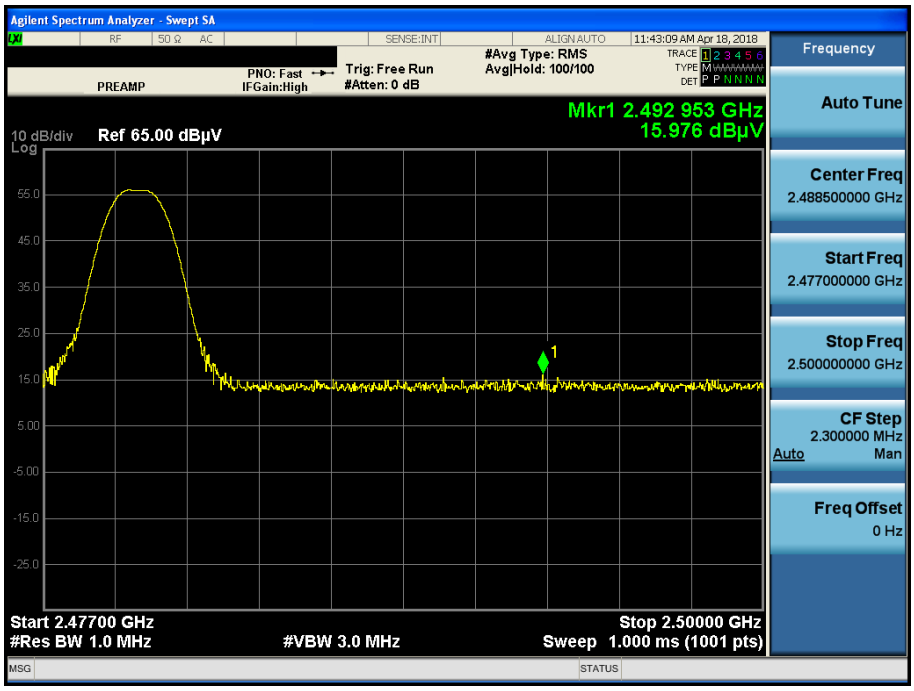


▣ RESULT PLOTS (Worst case : X-H)_ 5.0 LE 1M: 37 Byte

Radiated Restricted Band Edges plot – Average Reading (Ch.39)

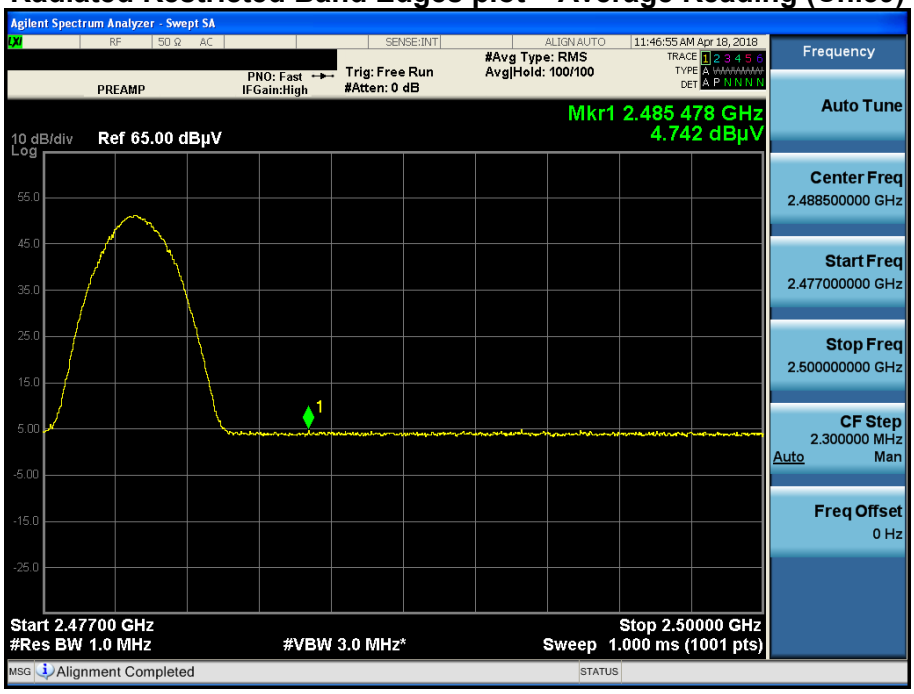


Radiated Restricted Band Edges plot – Peak Reading (Ch.39)

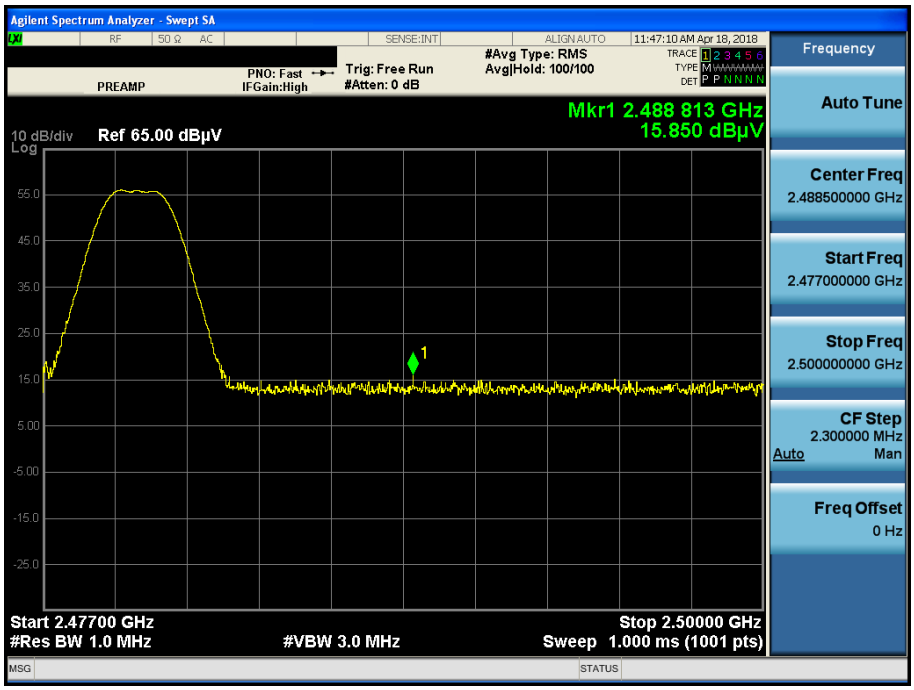


▣ RESULT PLOTS (Worst case : X-H)_ 5.0 LE 2M: 37 Byte

Radiated Restricted Band Edges plot – Average Reading (Ch.39)



Radiated Restricted Band Edges plot – Peak Reading (Ch.39)



Note : Only the worst case plots for Radiated Restricted Band Edges.

9.7 POWERLINE CONDUCTED EMISSIONS

Test Requirements and limit, §15.207

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.

Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor

▣ RESULT PLOTS

Conducted Emissions (Line 1)

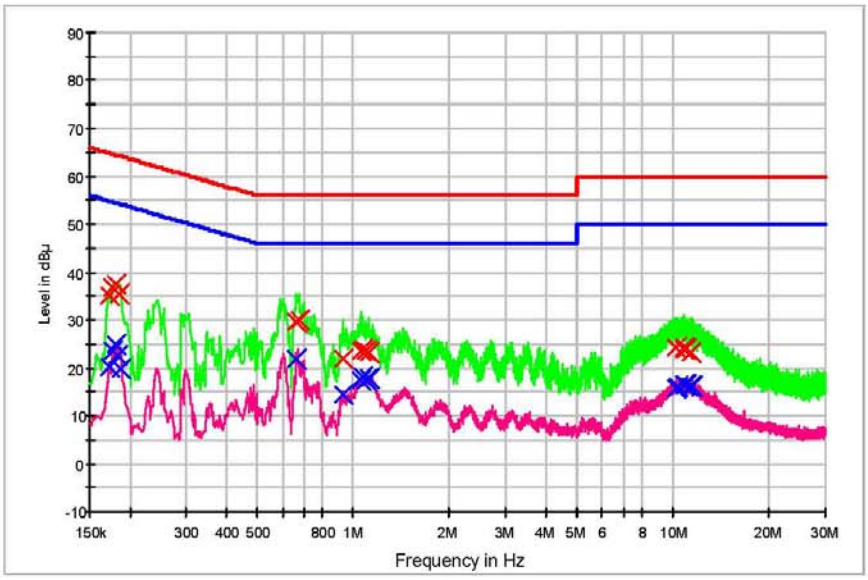
EMI Auto Test(20) 1 / 2

HCT TEST Report

Common Information

EUT:	SM-G885F
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	BT LE MODE

FCC CLASS B_Exten Cable



FCC CLASS B_QP
Preview Result 2-AVG
FCC CLASS B_AV
Final Result 1-QPK
Preview Result 1-PK+
Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.172000	35.1	9.000	Off	N	9.7	29.7	64.9
0.176000	36.9	9.000	Off	N	9.7	27.8	64.7
0.180000	37.3	9.000	Off	N	9.7	27.2	64.5
0.186000	35.5	9.000	Off	N	9.7	28.7	64.2
0.666000	29.8	9.000	Off	N	9.7	26.2	56.0
0.676000	29.8	9.000	Off	N	9.7	26.2	56.0
0.928000	21.8	9.000	Off	N	9.8	34.2	56.0
1.052000	23.6	9.000	Off	N	9.8	32.4	56.0
1.066000	23.9	9.000	Off	N	9.8	32.1	56.0
1.070000	23.8	9.000	Off	N	9.8	32.2	56.0
1.100000	23.5	9.000	Off	N	9.8	32.5	56.0
1.126000	23.4	9.000	Off	N	9.8	32.6	56.0
10.244000	24.1	9.000	Off	N	10.3	35.9	60.0
10.788000	24.2	9.000	Off	N	10.3	35.8	60.0
10.796000	24.3	9.000	Off	N	10.3	35.7	60.0
10.828000	23.8	9.000	Off	N	10.3	36.2	60.0
10.966000	23.9	9.000	Off	N	10.3	36.1	60.0
11.370000	23.4	9.000	Off	N	10.3	36.6	60.0

2018-04-12 오후 9:00:44

EMI Auto Test(20) 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.172000	20.2	9.000	Off	N	9.7	34.7	54.9
0.176000	23.5	9.000	Off	N	9.7	31.2	54.7
0.180000	24.8	9.000	Off	N	9.7	29.7	54.5
0.184000	22.5	9.000	Off	N	9.7	31.8	54.3
0.188000	19.8	9.000	Off	N	9.7	34.3	54.1
0.666000	21.9	9.000	Off	N	9.7	24.1	46.0
0.928000	14.3	9.000	Off	N	9.8	31.7	46.0
1.052000	17.6	9.000	Off	N	9.8	28.4	46.0
1.066000	18.1	9.000	Off	N	9.8	27.9	46.0
1.070000	18.0	9.000	Off	N	9.8	28.0	46.0
1.100000	17.6	9.000	Off	N	9.8	28.4	46.0
1.126000	17.7	9.000	Off	N	9.8	28.3	46.0
10.170000	15.9	9.000	Off	N	10.3	34.1	50.0
10.312000	16.1	9.000	Off	N	10.3	33.9	50.0
10.796000	16.6	9.000	Off	N	10.3	33.4	50.0
10.966000	16.4	9.000	Off	N	10.3	33.6	50.0
11.370000	16.1	9.000	Off	N	10.3	33.9	50.0
11.460000	16.2	9.000	Off	N	10.3	33.8	50.0

2018-04-12 오후 9:00:44

Conducted Emissions (Line 2)

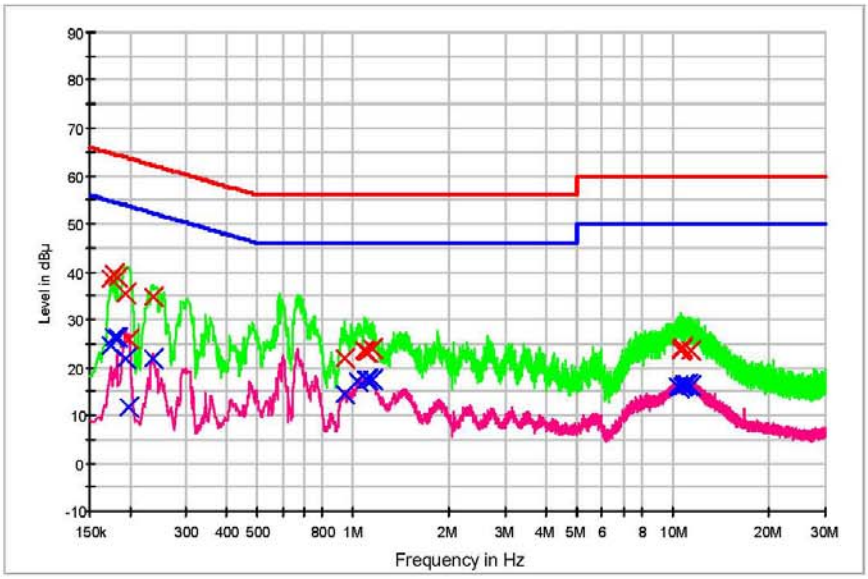
EMI Auto Test(20) 1 / 2

HCT TEST Report

Common Information

EUT:	SM-G885F
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	BT LE MODE

FCC CLASS B_Exten Cable



FCC CLASS B_QP
Preview Result 2-AVG
FCC CLASS B_AV
Final Result 1-QPK
Preview Result 1-PK+
Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.174000	38.5	9.000	Off	L1	9.7	26.3	64.8
0.178000	39.5	9.000	Off	L1	9.7	25.1	64.6
0.182000	38.8	9.000	Off	L1	9.7	25.6	64.4
0.194000	35.5	9.000	Off	L1	9.7	28.3	63.9
0.198000	25.9	9.000	Off	L1	9.7	37.8	63.7
0.236000	34.8	9.000	Off	L1	9.7	27.4	62.2
0.942000	21.8	9.000	Off	L1	9.8	34.2	56.0
1.082000	23.7	9.000	Off	L1	9.8	32.3	56.0
1.092000	23.4	9.000	Off	L1	9.8	32.6	56.0
1.106000	23.3	9.000	Off	L1	9.8	32.7	56.0
1.110000	23.2	9.000	Off	L1	9.8	32.8	56.0
1.144000	23.8	9.000	Off	L1	9.8	32.2	56.0
10.532000	23.9	9.000	Off	L1	10.2	36.1	60.0
10.574000	23.7	9.000	Off	L1	10.2	36.3	60.0
10.614000	24.0	9.000	Off	L1	10.2	36.0	60.0
10.750000	23.8	9.000	Off	L1	10.2	36.2	60.0
10.778000	24.3	9.000	Off	L1	10.2	35.7	60.0
11.392000	23.5	9.000	Off	L1	10.2	36.5	60.0

2018-04-12 오후 9:10:01

EMI Auto Test(20) 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.174000	24.6	9.000	Off	L1	9.7	30.1	54.8
0.178000	26.4	9.000	Off	L1	9.7	28.1	54.6
0.182000	26.2	9.000	Off	L1	9.7	28.2	54.4
0.194000	21.9	9.000	Off	L1	9.7	32.0	53.9
0.198000	11.7	9.000	Off	L1	9.7	42.0	53.7
0.236000	21.9	9.000	Off	L1	9.7	30.4	52.2
0.942000	14.3	9.000	Off	L1	9.8	31.7	46.0
1.036000	17.3	9.000	Off	L1	9.8	28.7	46.0
1.092000	17.5	9.000	Off	L1	9.8	28.5	46.0
1.106000	17.3	9.000	Off	L1	9.8	28.7	46.0
1.110000	17.4	9.000	Off	L1	9.8	28.6	46.0
1.144000	17.5	9.000	Off	L1	9.8	28.5	46.0
10.362000	16.0	9.000	Off	L1	10.2	34.0	50.0
10.418000	15.9	9.000	Off	L1	10.2	34.1	50.0
10.778000	16.3	9.000	Off	L1	10.2	33.7	50.0
10.898000	16.5	9.000	Off	L1	10.2	33.5	50.0
11.048000	16.4	9.000	Off	L1	10.2	33.6	50.0
11.394000	16.2	9.000	Off	L1	10.2	33.8	50.0

2018-04-12 오후 9:10:01

10. LIST OF TEST EQUIPMENT

10.1 LIST OF TEST EQUIPMENT(Conducted Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216 / LISN	12/20/2017	Annual	102245
Rohde & Schwarz	ESCI / Test Receiver	06/27/2017	Annual	100033
ESPAC	SU-642 /Temperature Chamber	03/30/2018	Annual	0093008124
Agilent	N9020A / Signal Analyzer	06/13/2017	Annual	MY51110085
Agilent	N9030A / Signal Analyzer	11/22/2017	Annual	MY49431210
Agilent	87300B / Directional Coupler	11/20/2017	Annual	3116A03621
Hewlett Packard	11667B / Power Splitter	06/12/2017	Annual	05001
Hewlett Packard	E3632A / DC Power Supply	06/30/2017	Annual	KR75303960
Agilent	8493C / Attenuator(10 dB)	07/10/2017	Annual	07560
Rohde & Schwarz	EMC32 / Software	N/A	N/A	N/A
HCT CO., LTD.	FCC WLAN&BT&BLE Conducted Test Software v3.0	N/A	N/A	N/A

10.2 LIST OF TEST EQUIPMENT(Radiated Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p
Innco system	MA4640 /800-XP-ET / Antenna Position Tower	N/A	N/A	N/A
Audix	EM1000 / Controller	N/A	N/A	060520
Audix	Turn Table	N/A	N/A	N/A
Rohde & Schwarz	Loop Antenna	04/06/2017	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	04/06/2017	Biennial	760
Schwarzbeck	BBHA 9120D / Horn Antenna	06/30/2017	Biennial	9120D-1300
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	12/04/2017	Biennial	BBHA9170541
Rohde & Schwarz	FSP(9 kHz ~ 30 GHz) / Spectrum Analyzer	07/27/2017	Annual	100843
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/27/2017	Annual	101068-SZ
Wainwright Instruments	F6_HPF3.0 / High Pass Filter	01/03/2018	Annual	F6
Wainwright Instruments	WHKX8-6090-7000-18000-40SS / High Pass Filter	10/27/2017	Annual	24
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	06/30/2017	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	01/03/2018	Annual	2
Api tech.	18B-03 / Attenuator (3 dB)	06/12/2017	Annual	1
Agilent	8493C-10 / Attenuator(10 dB)	07/19/2017	Annual	08285
CERNEX	CBLU1183540B-01 / Power Amplifier	12/26/2017	Annual	25540
CERNEX	CBL06185030 / Power Amplifier	03/28/2018	Annual	28550
CERNEX	CBL18265035 / Power Amplifier	01/10/2018	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	06/30/2017	Annual	25956