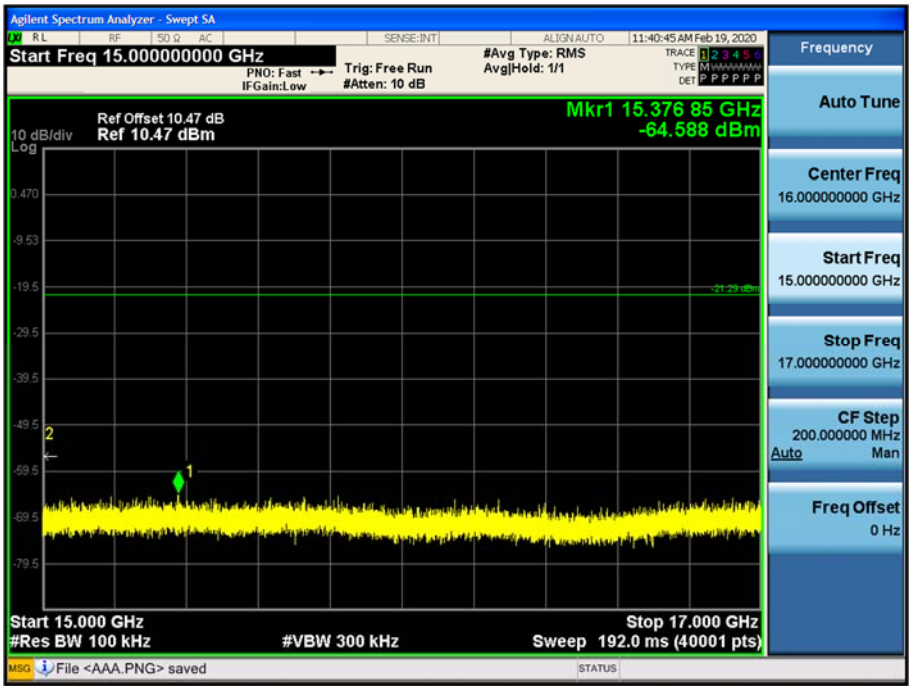
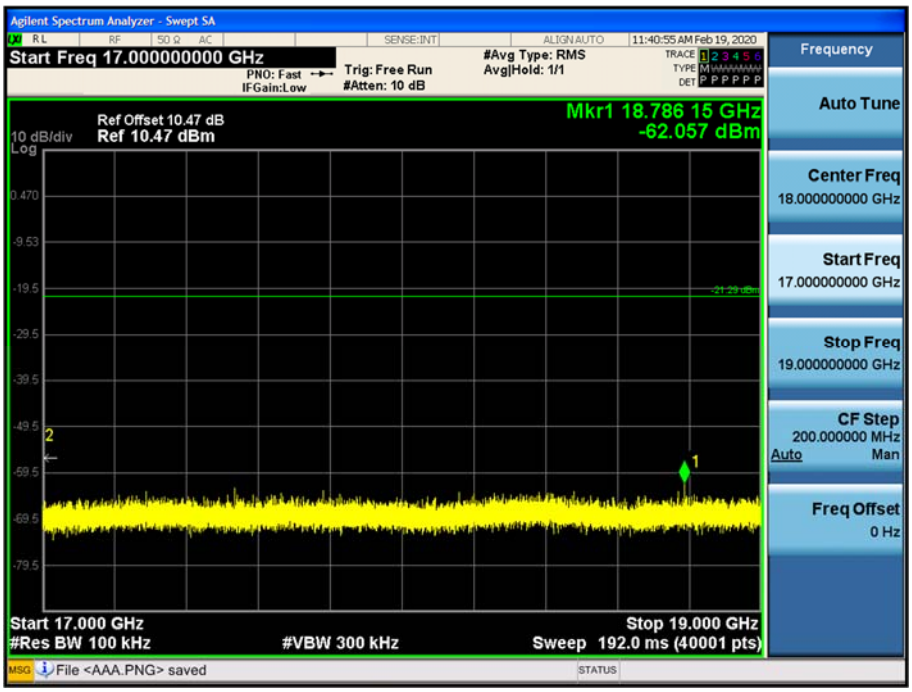
15 GHz ~ 17 GHz

Conducted Spurious Emission (High-CH 39)



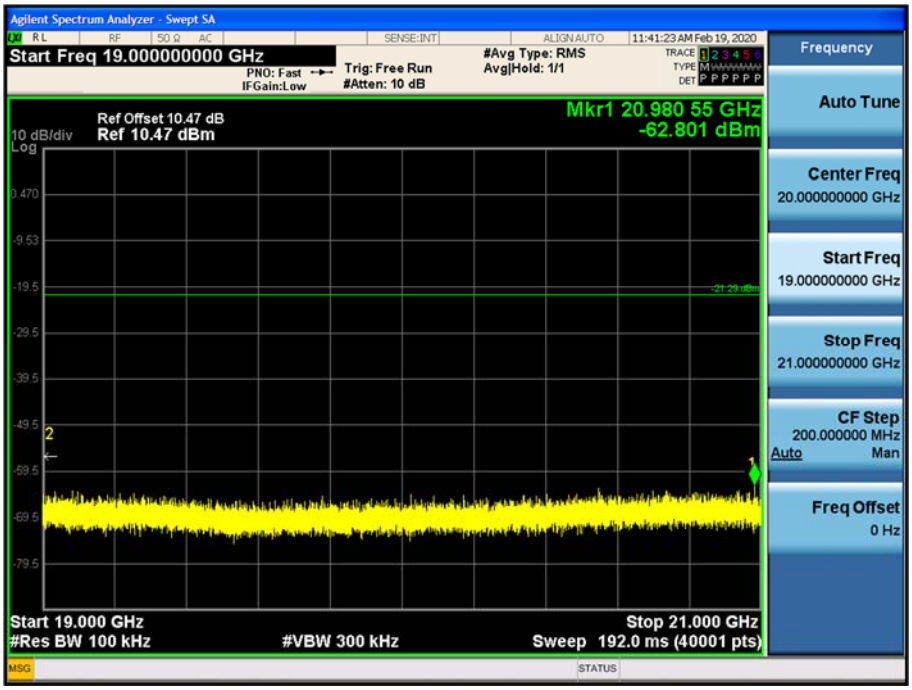
17 GHz ~ 19 GHz

Conducted Spurious Emission (High-CH 39)



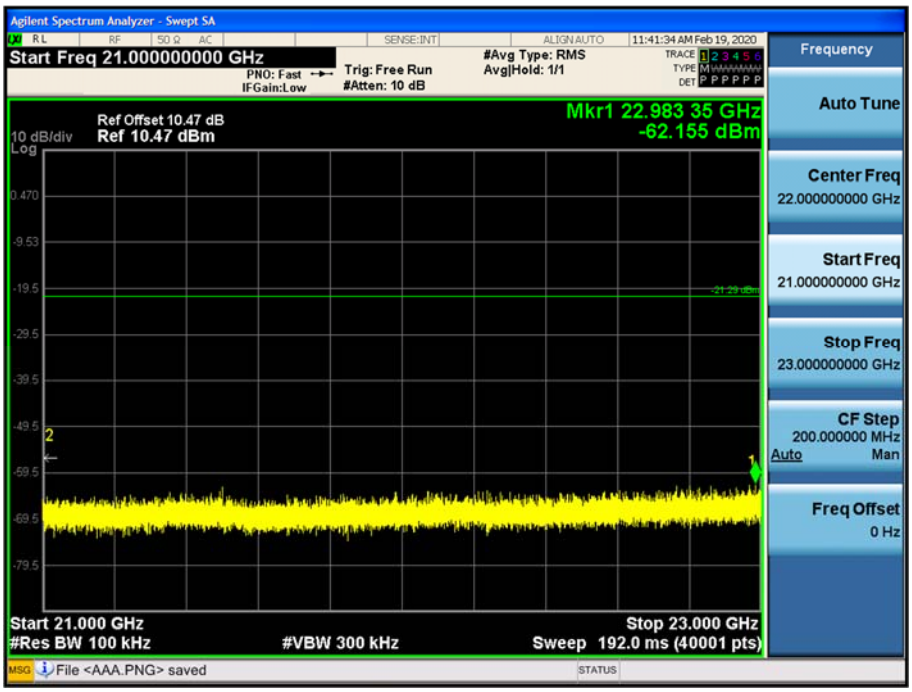
19 GHz ~ 21 GHz

Conducted Spurious Emission (High-CH 39)



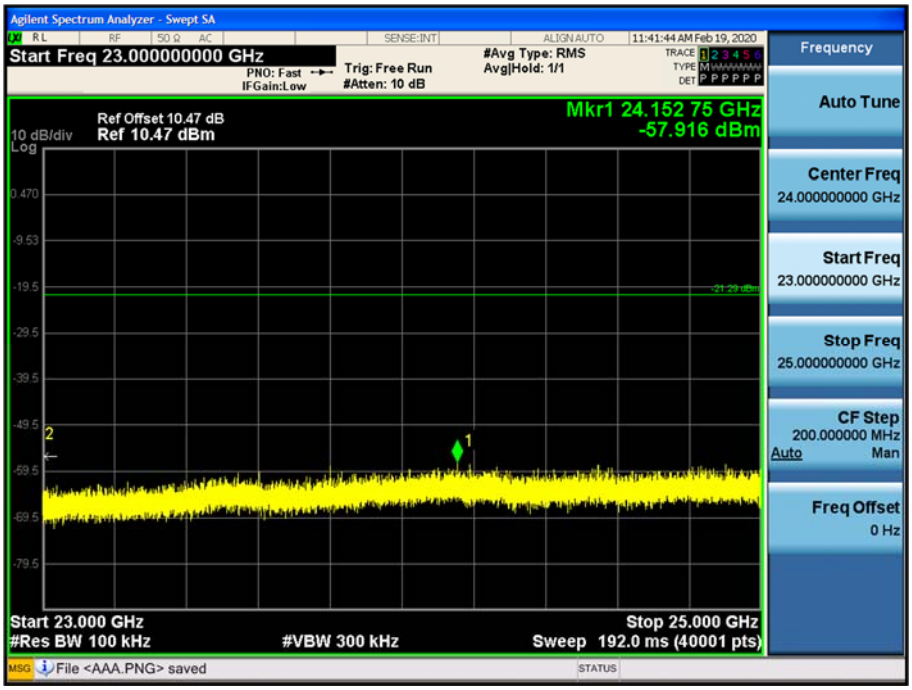
21 GHz ~ 23 GHz

Conducted Spurious Emission (High-CH 39)



23 GHz ~ 25 GHz

Conducted Spurious Emission (High-CH 39)



9.6 RADIATED SPURIOUS EMISSIONS

Frequency Range : 9 kHz – 30MHz

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							

Note:

1. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
2. Distance extrapolation factor = 40log (specific distance / test distance) (dB)
3. Limit line = specific Limits (dBuV) + Distance extrapolation factor
4. Radiated test is performed with hopping off.

Frequency Range : Below 1 GHz

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							

Note:

1. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.

Frequency Range : Above 1 GHz

Mode : 1M Bit/s (255 Byte)

Operation Mode: CH Low

Frequency [MHz]	Reading [dBuV]	Duty Cycle Correction Factor [dB]	AN.+C.L-A.G+D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4804	55.69	0.00	-0.15	V	55.54	73.98	18.44	PK
4804	55.69	-23.99	-0.15	V	31.55	53.98	22.43	AV
7206	49.25	0.00	9.23	V	58.48	73.98	15.51	PK
7206	49.25	-23.99	9.23	V	34.49	53.98	19.50	AV
4804	54.91	0.00	-0.15	H	54.76	73.98	19.22	PK
4804	54.91	-23.99	-0.15	H	30.77	53.98	23.21	AV
7206	50.33	0.00	9.23	H	59.56	73.98	14.43	PK
7206	50.33	-23.99	9.23	H	35.57	53.98	18.42	AV

Operation Mode: CH Mid

Frequency [MHz]	Reading [dBuV]	Duty Cycle Correction Factor [dB]	AN.+C.L-A.G+D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4880	55.53	0.00	0.33	V	55.86	73.98	18.12	PK
4880	55.53	-23.99	0.33	V	31.87	53.98	22.11	AV
7320	48.65	0.00	8.89	V	57.54	73.98	16.44	PK
7320	48.65	-23.99	8.89	V	33.55	53.98	20.43	AV
4880	54.88	0.00	0.33	H	55.21	73.98	18.77	PK
4880	54.88	-23.99	0.33	H	31.22	53.98	22.76	AV
7320	49.46	0.00	8.89	H	58.35	73.98	15.63	PK
7320	49.46	-23.99	8.89	H	34.36	53.98	19.62	AV

Operation Mode: CH High

Frequency [MHz]	Reading [dBuV]	Duty Cycle Correction Factor [dB]	AN.+C.L-A.G+D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4960	58.56	0.00	0.33	V	58.89	73.98	15.09	PK
4960	58.56	-23.99	0.33	V	34.90	53.98	19.08	AV
7440	48.05	0.00	9.43	V	57.48	73.98	16.50	PK
7440	48.05	-23.99	9.43	V	33.49	53.98	20.49	AV
4960	57.86	0.00	0.33	H	58.19	73.98	15.79	PK
4960	57.86	-23.99	0.33	H	34.20	53.98	19.78	AV
7440	48.99	0.00	9.43	H	58.42	73.98	15.56	PK
7440	48.99	-23.99	9.43	H	34.43	53.98	19.55	AV

Note:

1. Duty Cycle Correction Factor(AFH mode – minimum channel number case - 20 channels)

   a. Longest Tx on time : $\Delta t = \tau$ [ms] = 2.105 ms

   b. Time to cycle through all channels= $\Delta t = \tau$ [ms] x 20 channels = 42.10 ms

   c. 100 ms/ Δt [ms] = H → Round up to next highest integer, H ' = 3

   d. Worst Case Dwell Time = τ [ms] x H ' = 6.315 ms

   e. Duty Cycle Correction(AFH) = 20log (Worst Case Dwell Time/ 100ms) dB = -23.99 dB

   f. We applied DCCF in the test result which hopping channel number is 20.

Mode : 2M Bit/s (255 Byte)

Operation Mode: CH Low

Frequency [MHz]	Reading [dBuV]	Duty Cycle Correction Factor [dB]	AN.+C.L-A.G+D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4804	54.43	0.00	-0.15	V	54.28	73.98	19.70	PK
4804	54.43	-25.51	-0.15	V	28.77	53.98	25.21	AV
7206	49.86	0.00	9.23	V	59.09	73.98	14.90	PK
7206	49.86	-25.51	9.23	V	33.58	53.98	20.41	AV
9608	54.50	0.00	-2.50	V	52.00	73.98	21.98	PK
9608	54.50	-25.51	-2.50	V	26.49	53.98	27.49	AV
4804	53.92	0.00	-0.15	H	53.77	73.98	20.21	PK
4804	53.92	-25.51	-0.15	H	28.26	53.98	25.72	AV
7206	51.39	0.00	9.23	H	60.62	73.98	13.37	PK
7206	51.39	-25.51	9.23	H	35.11	53.98	18.88	AV

Operation Mode: CH Mid

Frequency [MHz]	Reading [dBuV]	Duty Cycle Correction Factor [dB]	AN.+C.L-A.G+D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4880	53.69	0.00	0.33	V	54.02	73.98	19.96	PK
4880	53.69	-25.51	0.33	V	28.51	53.98	25.47	AV
7320	48.79	0.00	8.89	V	57.68	73.98	16.30	PK
7320	48.79	-25.51	8.89	V	32.17	53.98	21.81	AV
4880	52.55	0.00	0.33	H	52.88	73.98	21.10	PK
4880	52.55	-25.51	0.33	H	27.37	53.98	26.61	AV
7320	49.82	0.00	8.89	H	58.71	73.98	15.27	PK
7320	49.82	-25.51	8.89	H	33.20	53.98	20.78	AV

Operation Mode: CH High

Frequency [MHz]	Reading [dBuV]	Duty Cycle Correction Factor [dB]	AN.+C.L-A.G+D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4960	55.62	0.00	0.33	V	55.95	73.98	18.03	PK
4960	55.62	-25.51	0.33	V	30.44	53.98	23.54	AV
7440	49.12	0.00	9.43	V	58.55	73.98	15.43	PK
7440	49.12	-25.51	9.43	V	33.04	53.98	20.94	AV
4960	54.61	0.00	0.33	H	54.94	73.98	19.04	PK
4960	54.61	-25.51	0.33	H	29.43	53.98	24.55	AV
7440	49.94	0.00	9.43	H	59.37	73.98	14.61	PK
7440	49.94	-25.51	9.43	H	33.86	53.98	20.12	AV

Note:

1. Duty Cycle Correction Factor(AFH mode – minimum channel number case - 20 channels)

   a. Longest Tx on time : $\Delta t = \tau$ [ms] = 1.06 ms

   b. Time to cycle through all channels= $\Delta t = \tau$ [ms] x 20 channels = 21.20 ms

   c. 100 ms/ Δt [ms] = H → Round up to next highest integer, H ' = 5

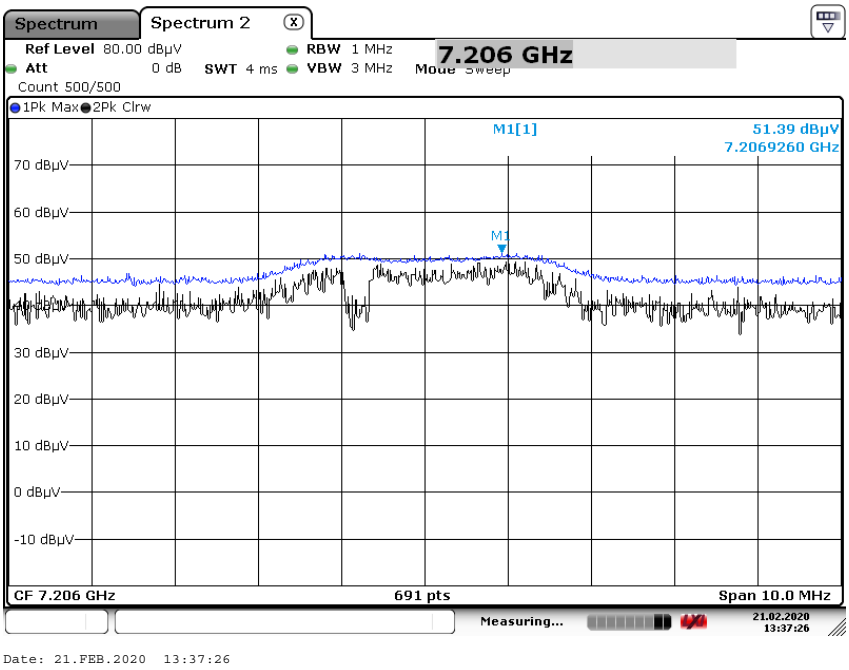
   d. Worst Case Dwell Time = τ [ms] x H ' = 5.3 ms

   e. Duty Cycle Correction(AFH) = 20log (Worst Case Dwell Time/ 100ms) dB = -25.51 dB

   f. We applied DCCF in the test result which hopping channel number is 20.

▣ 2M Bit/s 255 Byte Test Plots (Worst case : Z-H)

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



Note:

Plot of worst case are only reported.

9.7 RADIATED RESTRICTED BAND EDGES

Mode : 1M Bit/s (255 Byte)

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	20.11	0.00	33.62	H	53.73	73.98	20.25	PK
2390.0	9.65	0.24	33.62	H	43.51	53.98	10.48	AV
2390.0	20.51	0.00	33.62	V	54.13	73.98	19.85	PK
2390.0	9.71	0.24	33.62	V	43.57	53.98	10.41	AV

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	25.95	0.00	33.12	H	59.07	73.98	14.91	PK
2483.5	10.16	0.24	33.12	H	43.52	53.98	10.46	AV
2483.5	26.32	0.00	33.12	V	59.44	73.98	14.54	PK
2483.5	10.35	0.24	33.12	V	43.71	53.98	10.27	AV

Mode : 2M Bit/s (255 Byte)

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	20.16	0.00	33.62	H	53.78	73.98	20.20	PK
2390.0	9.68	0.46	33.62	H	43.76	53.98	10.22	AV
2390.0	20.68	0.00	33.62	V	54.30	73.98	19.68	PK
2390.0	9.73	0.46	33.62	V	43.81	53.98	10.17	AV

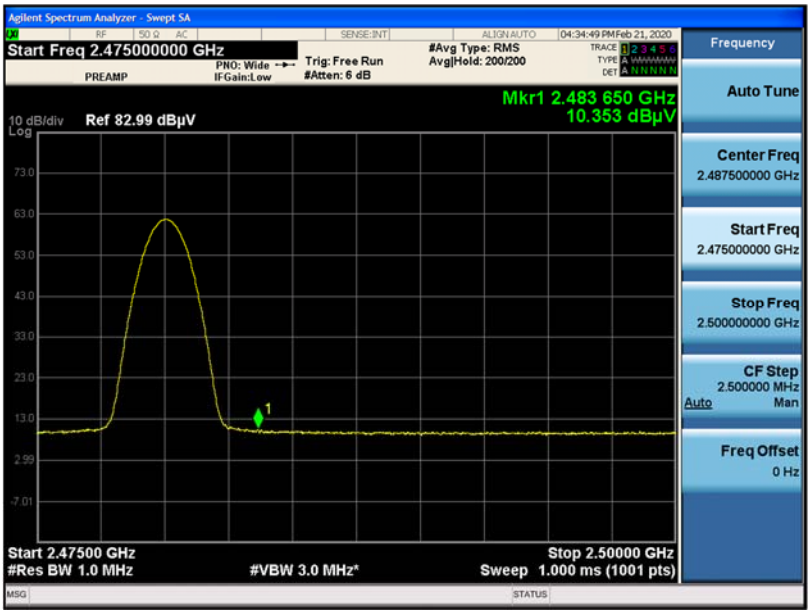
Operating Frequency 2480 MHz

Channel No. 39

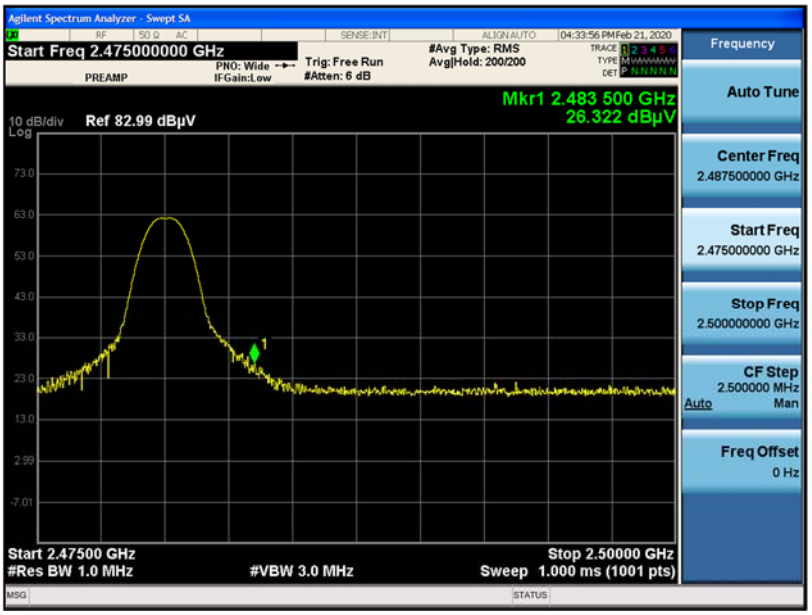
Frequency [MHz]	Reading [dBuV/m]	Duty Cycle Factor [dB]	A.F.+C.L+D.F [dB]	Ant. Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	26.54	0.00	33.12	H	59.66	73.98	14.32	PK
2483.5	11.32	0.46	33.12	H	44.90	53.98	9.08	AV
2483.5	27.00	0.00	33.12	V	60.12	73.98	13.86	PK
2483.5	11.46	0.46	33.12	V	45.04	53.98	8.95	AV

▣ Mode : 1M Bit/s (255 Byte) Test Plots (Worst case : Z-V)

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

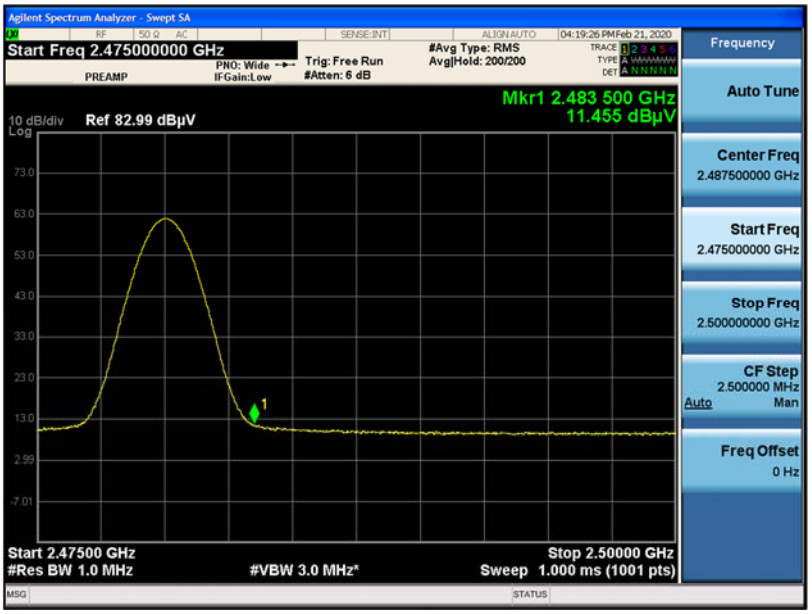


Radiated Restricted Band Edges plot – Peak Reading (Ch.39)

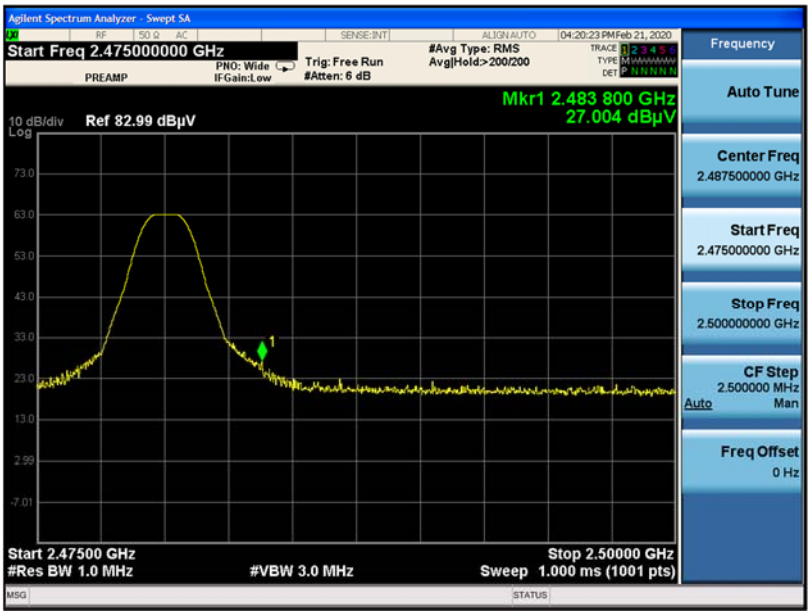


▣ **Mode : 2M Bit/s (255 Byte) Test Plots (Worst case : Z-V)**

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



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



Note:

Plot of worst case are only reported.

9.8 POWERLINE CONDUCTED EMISSIONS

Conducted Emissions (Line 1)

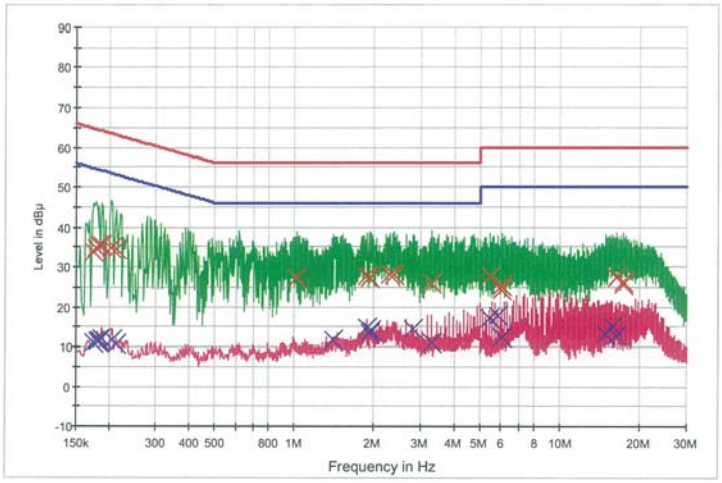
BT_LE MODE N 1 / 2

HCT TEST Report

Common Information

EUT:	T7
Manufacturer:	VC Inc.
Test Site:	SHIELD ROOM
Operating Conditions:	BT_LE MOED N

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.174000	33.6	9.000	Off	N	9.8	31.2	64.8
0.178000	34.8	9.000	Off	N	9.8	29.8	64.6
0.184000	35.3	9.000	Off	N	9.8	29.0	64.3
0.188000	35.6	9.000	Off	N	9.8	28.5	64.1
0.204000	34.7	9.000	Off	N	9.8	28.8	63.4
0.212000	34.4	9.000	Off	N	9.8	28.8	63.1
1.018000	27.3	9.000	Off	N	9.8	28.7	56.0
1.870000	27.6	9.000	Off	N	9.9	28.4	56.0
1.910000	27.3	9.000	Off	N	9.9	28.7	56.0
2.302000	28.0	9.000	Off	N	9.9	28.0	56.0
2.358000	27.9	9.000	Off	N	9.9	28.1	56.0
3.282000	26.0	9.000	Off	N	9.9	30.0	56.0
5.414000	27.6	9.000	Off	N	10.0	32.4	60.0
6.008000	24.3	9.000	Off	N	10.1	35.7	60.0
6.068000	25.4	9.000	Off	N	10.1	34.6	60.0
16.350000	27.3	9.000	Off	N	10.5	32.7	60.0
17.266000	26.2	9.000	Off	N	10.5	33.8	60.0
17.352000	25.7	9.000	Off	N	10.5	34.3	60.0

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BT_LE MODE N 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.174000	11.0	9.000	Off	N	9.8	43.8	54.8
0.180000	11.4	9.000	Off	N	9.8	43.1	54.5
0.184000	11.7	9.000	Off	N	9.8	42.6	54.3
0.188000	12.0	9.000	Off	N	9.8	42.2	54.1
0.206000	11.7	9.000	Off	N	9.8	41.7	53.4
0.212000	10.8	9.000	Off	N	9.8	42.3	53.1
1.408000	11.6	9.000	Off	N	9.9	34.4	46.0
1.870000	14.8	9.000	Off	N	9.9	31.2	46.0
1.910000	13.4	9.000	Off	N	9.9	32.6	46.0
1.950000	14.2	9.000	Off	N	9.9	31.8	46.0
2.796000	14.3	9.000	Off	N	9.9	31.7	46.0
3.282000	11.2	9.000	Off	N	9.9	34.8	46.0
5.414000	17.1	9.000	Off	N	10.0	32.9	50.0
5.810000	17.9	9.000	Off	N	10.1	32.1	50.0
6.008000	12.3	9.000	Off	N	10.1	37.7	50.0
14.908000	13.2	9.000	Off	N	10.4	36.8	50.0
15.830000	15.0	9.000	Off	N	10.5	35.0	50.0
16.350000	12.8	9.000	Off	N	10.5	37.2	50.0

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Conducted Emissions (Line 2)

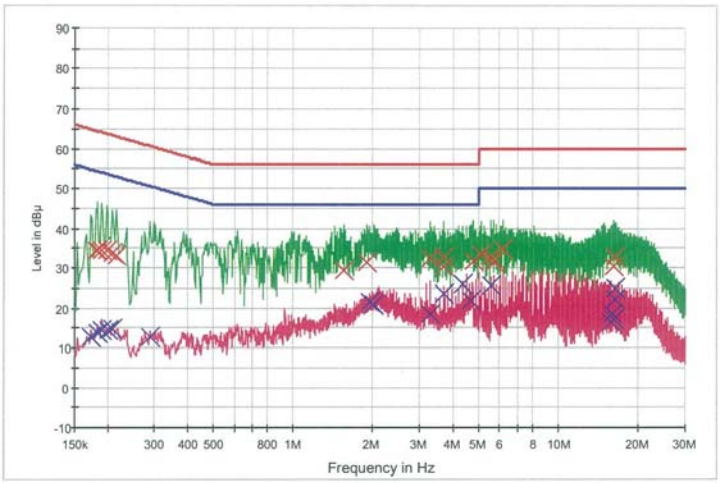
BT_LE MODE L1 1 / 2

HCT TEST Report

Common Information

EUT:	T7
Manufacturer:	VC Inc.
Test Site:	SHIELD ROOM
Operating Conditions:	BT_LE MOED L1

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.180000	34.3	9.000	Off	L1	9.8	30.2	64.5
0.184000	34.4	9.000	Off	L1	9.8	30.0	64.3
0.190000	34.6	9.000	Off	L1	9.8	29.5	64.0
0.198000	34.4	9.000	Off	L1	9.8	29.2	63.7
0.208000	33.9	9.000	Off	L1	9.8	29.4	63.3
0.216000	33.0	9.000	Off	L1	9.8	30.0	63.0
1.548000	29.4	9.000	Off	L1	9.9	26.6	56.0
1.908000	31.5	9.000	Off	L1	9.9	24.5	56.0
3.292000	32.4	9.000	Off	L1	9.9	23.6	56.0
3.696000	32.6	9.000	Off	L1	10.0	23.4	56.0
3.702000	30.5	9.000	Off	L1	10.0	25.5	56.0
4.756000	31.6	9.000	Off	L1	10.0	24.4	56.0
5.150000	33.2	9.000	Off	L1	10.0	26.8	60.0
5.548000	32.8	9.000	Off	L1	10.0	27.2	60.0
5.686000	31.2	9.000	Off	L1	10.0	28.8	60.0
6.204000	34.9	9.000	Off	L1	10.1	25.1	60.0
16.144000	30.3	9.000	Off	L1	10.4	29.7	60.0
16.372000	32.7	9.000	Off	L1	10.4	27.3	60.0

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BT_LE MODE L1 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.172000	12.6	9.000	Off	L1	9.8	42.3	54.9
0.182000	13.8	9.000	Off	L1	9.8	40.6	54.4
0.190000	14.6	9.000	Off	L1	9.8	39.5	54.0
0.200000	14.5	9.000	Off	L1	9.8	39.1	53.6
0.208000	14.6	9.000	Off	L1	9.8	38.7	53.3
0.290000	12.7	9.000	Off	L1	9.8	37.8	50.5
1.946000	21.5	9.000	Off	L1	9.9	24.5	46.0
2.024000	20.7	9.000	Off	L1	9.9	25.3	46.0
3.292000	18.4	9.000	Off	L1	9.9	27.6	46.0
3.696000	23.6	9.000	Off	L1	10.0	22.4	46.0
4.356000	25.9	9.000	Off	L1	10.0	20.1	46.0
4.698000	21.7	9.000	Off	L1	10.0	24.3	46.0
5.548000	25.7	9.000	Off	L1	10.0	24.3	50.0
15.852000	16.5	9.000	Off	L1	10.4	33.5	50.0
16.036000	18.6	9.000	Off	L1	10.4	31.4	50.0
16.144000	17.0	9.000	Off	L1	10.4	33.0	50.0
16.306000	22.1	9.000	Off	L1	10.4	27.9	50.0
16.372000	24.9	9.000	Off	L1	10.4	25.1	50.0

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10. LIST OF TEST EQUIPMENT

Conducted Test

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216 / LISN	09/11/2019	Annual	102245
Rohde & Schwarz	ESCI / Test Receiver	06/18/2019	Annual	100033
ESPAC	SU-642 /Temperature Chamber	03/12/2019	Annual	0093008124
Agilent	N9020A / Signal Analyzer	05/23/2019	Annual	MY51110085
Agilent	N9020A / Signal Analyzer	05/24/2019	Annual	MY52090906
Agilent	N9030A / Signal Analyzer	01/13/2020	Annual	MY49431210
Rohde & Schwarz	OSP 120 / Power Measurement Set	07/24/2019	Annual	101231
Agilent	N1911A / Power Meter	04/10/2019	Annual	MY45100523
Agilent	N1921A / Power Sensor	04/10/2019	Annual	MY52260025
Agilent	87300B / Directional Coupler	11/11/2019	Annual	3116A03621
Hewlett Packard	11667B / Power Splitter	05/24/2019	Annual	05001
Hewlett Packard	E3632A / DC Power Supply	06/18/2019	Annual	KR75303960
Agilent	8493C / Attenuator(10 dB)	07/02/2019	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

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

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-EP / 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	04/26/2019	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	03/22/2019	Biennial	760
Schwarzbeck	VULB 9160 / TRILOG Antenna	08/09/2018	Biennial	9160-3368
Schwarzbeck	BBHA 9120D / Horn Antenna	04/29/2019	Biennial	9120D-937
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	11/29/2019	Biennial	BBHA9170541
Rohde & Schwarz	FSP(9 kHz ~ 30 GHz) / Spectrum Analyzer	05/09/2019	Annual	100854
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/26/2019	Annual	101068-SZ
Agilent	N9020A / Signal Analyzer	05/23/2019	Annual	MY51110085
Wainwright Instruments	WHK3.0/18G-10EF / High Pass Filter	05/23/2019	Annual	8
Wainwright Instruments	WHKX7.0/18G-8SS / High Pass Filter	05/03/2019	Annual	29
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	06/19/2019	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	02/10/2020	Annual	1
Api tech.	18B-03 / Attenuator (3 dB)	06/04/2019	Annual	1
Agilent	8493C-10 / Attenuator(10 dB)	07/15/2019	Annual	08285
CERNEX	CBLU1183540 / Power Amplifier	07/01/2019	Annual	22964
CERNEX	CBL06185030 / Power Amplifier	07/01/2019	Annual	22965
CERNEX	CBL18265035 / Power Amplifier	12/26/2019	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	06/18/2019	Annual	25956

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
3. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5(Version : 2017).

11. ANNEX A_ TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-2002-FC019-P