

Test Report No.50159679 001

Appendix D: Radiated and Mains Spurious Emission Data

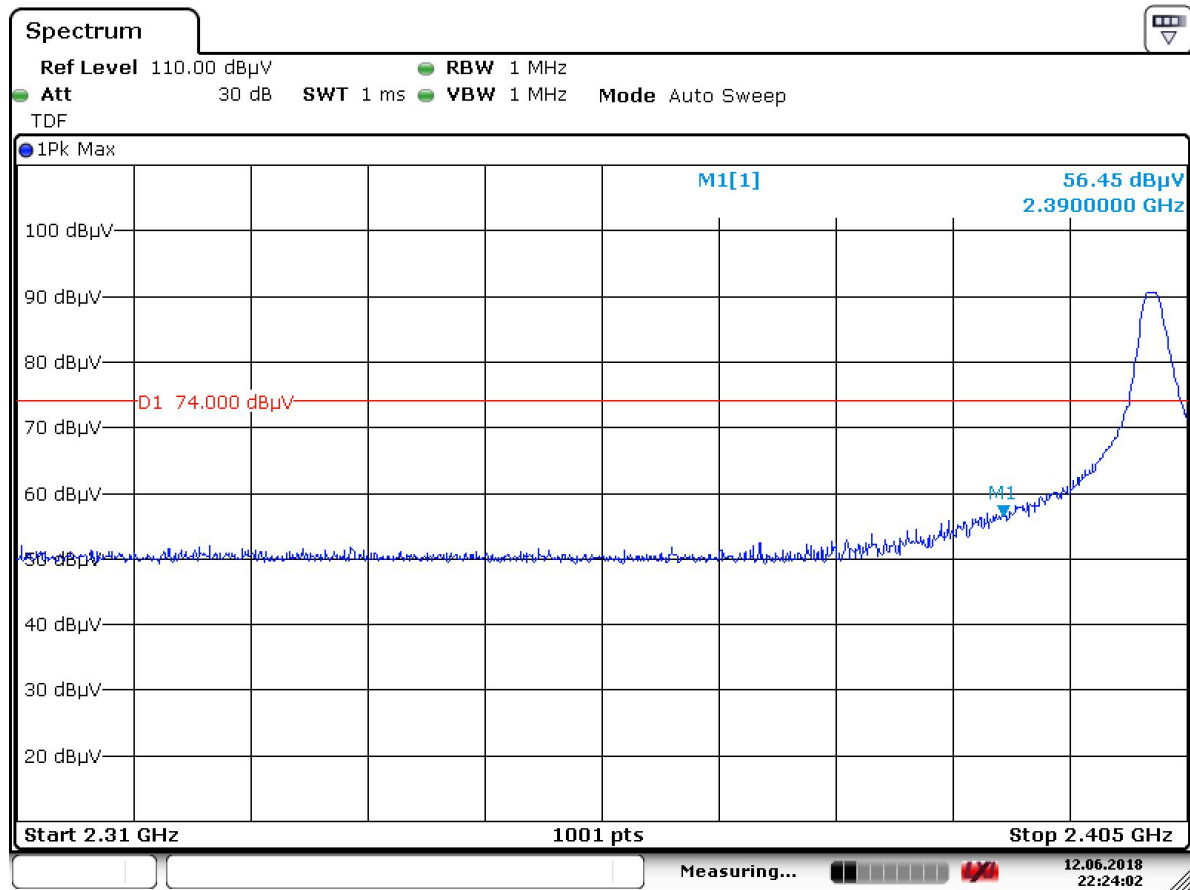
(File: 50159679AppendixD)

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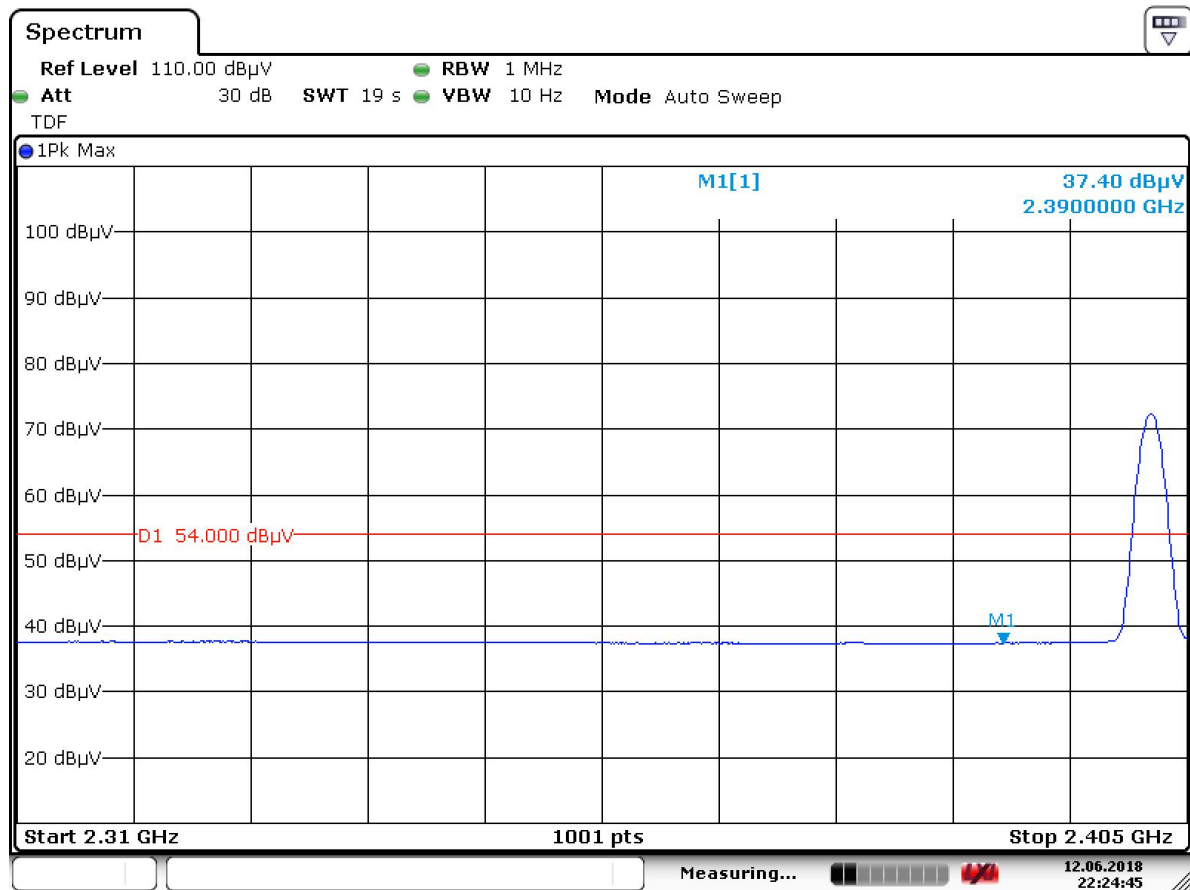
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Spurious Emissions, Band Edges, 2.35-2.5G

Low Channel (Horizontal)



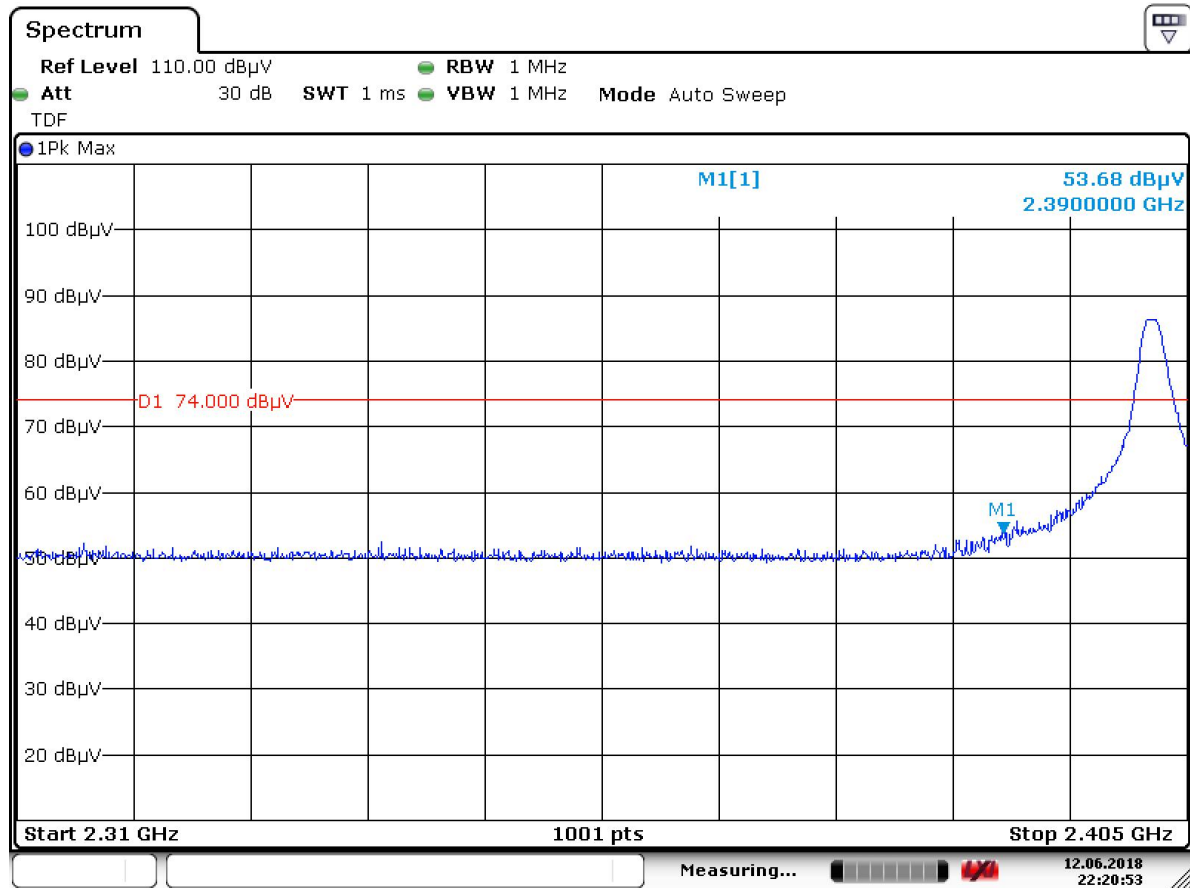
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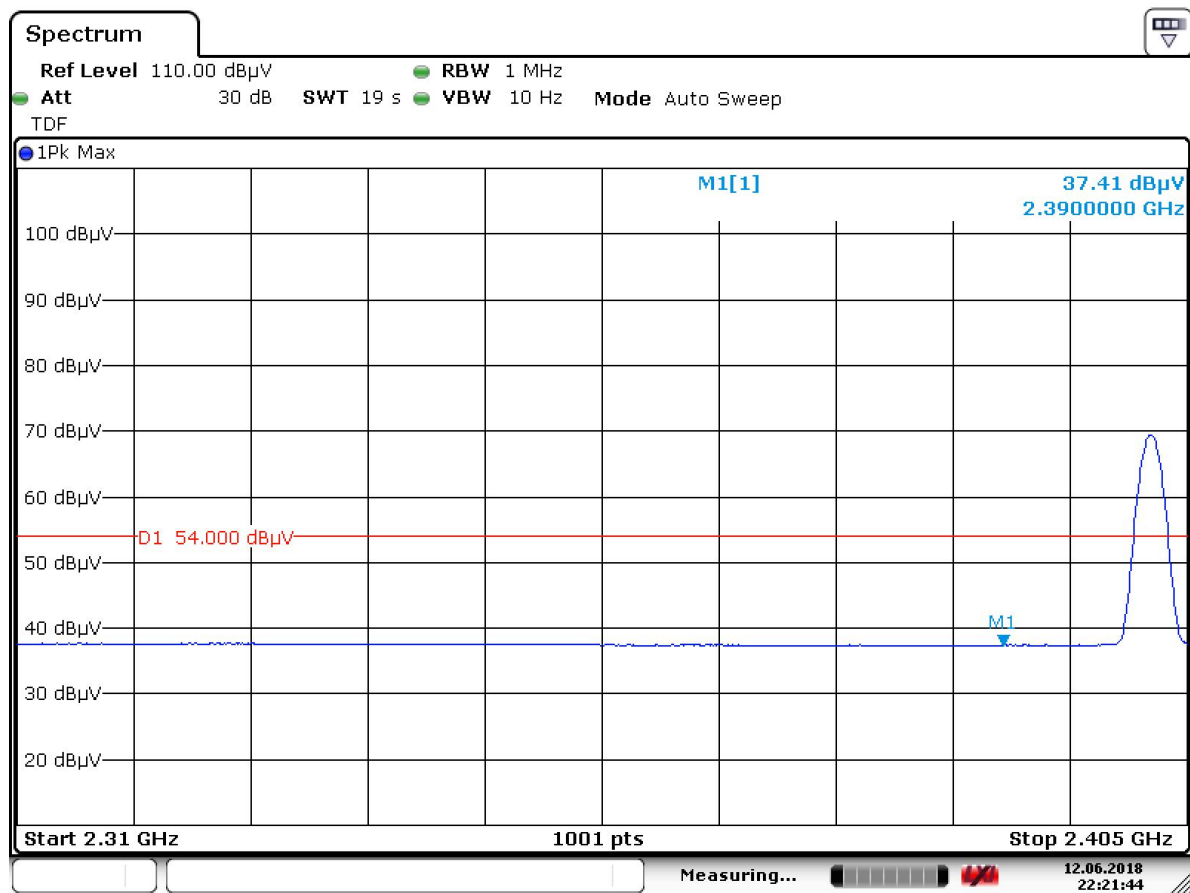
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Spurious Emissions, Band Edge, 2.35-2.5G

Low Channel (Vertical)



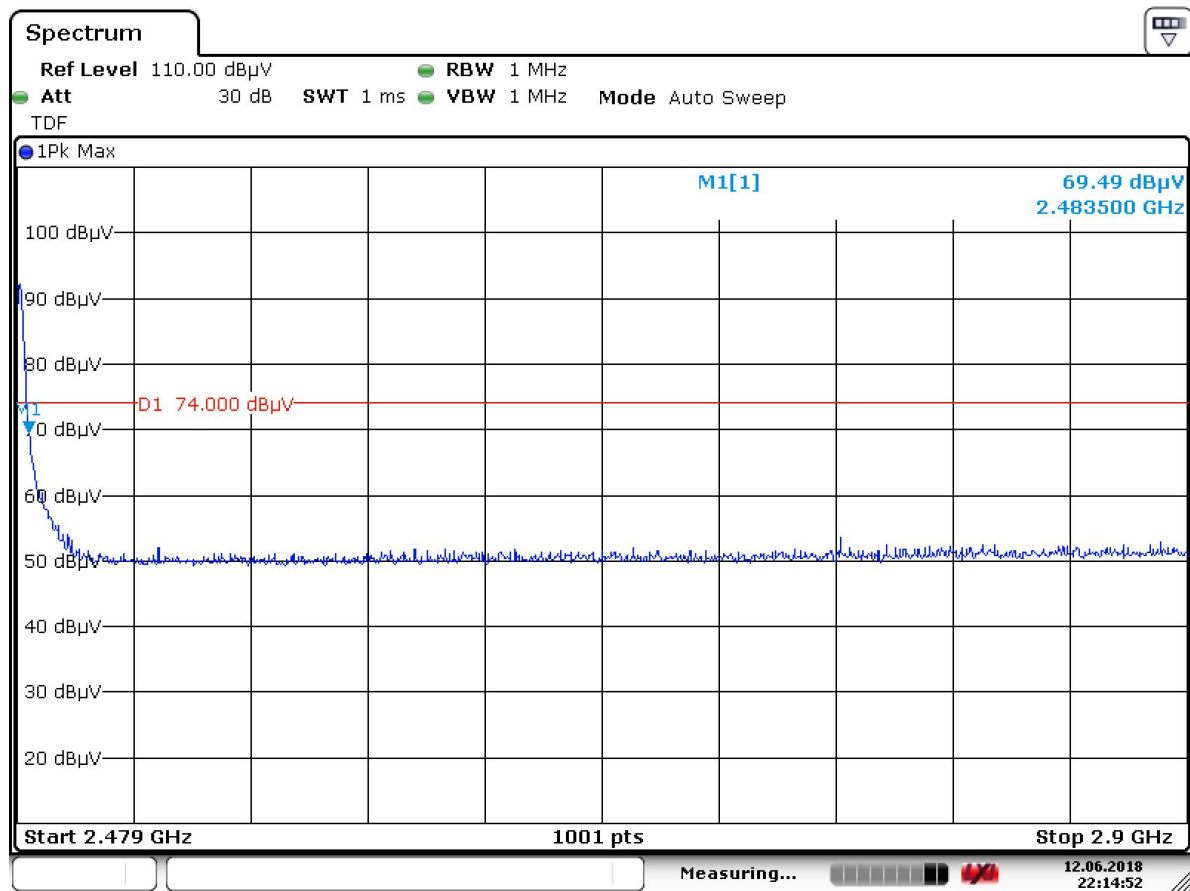
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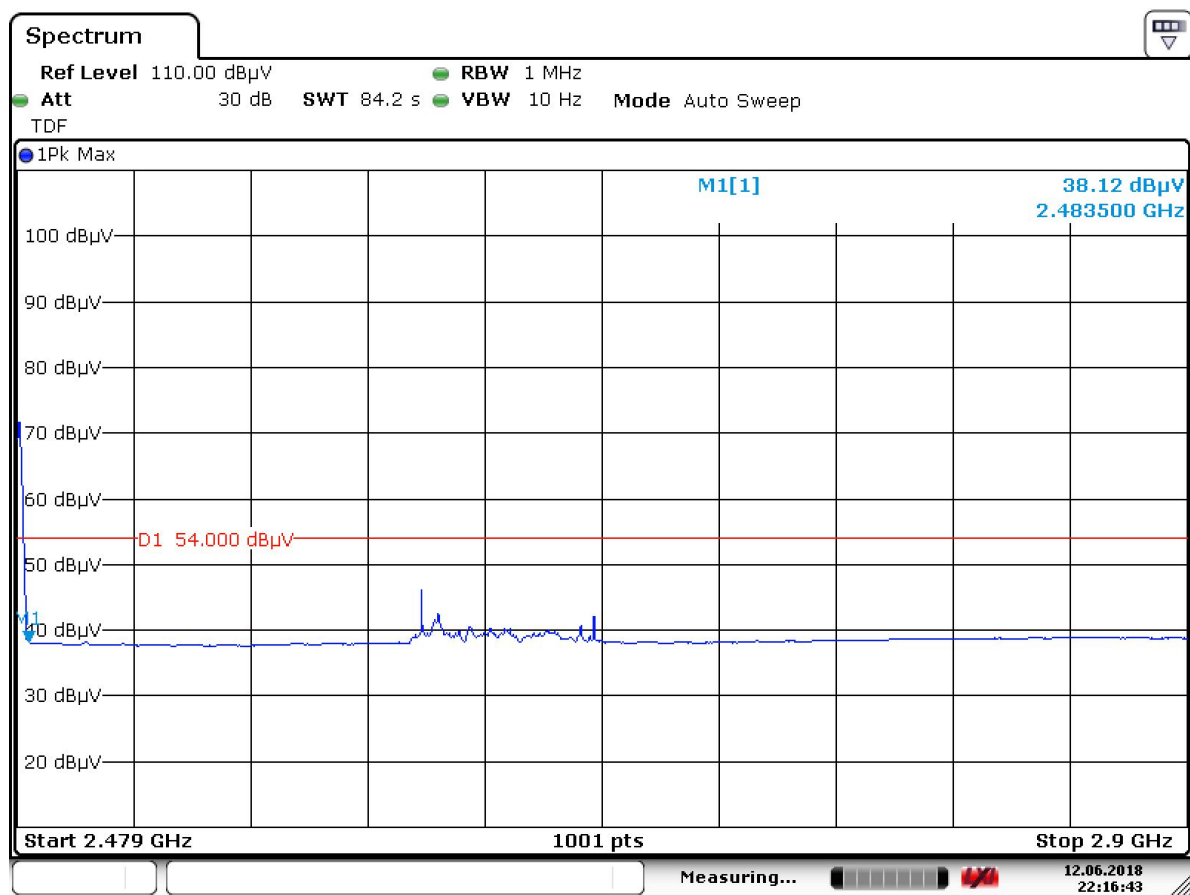
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Spurious Emissions, Band Edge, 2.35-2.5G

High Channel (Horizontal)



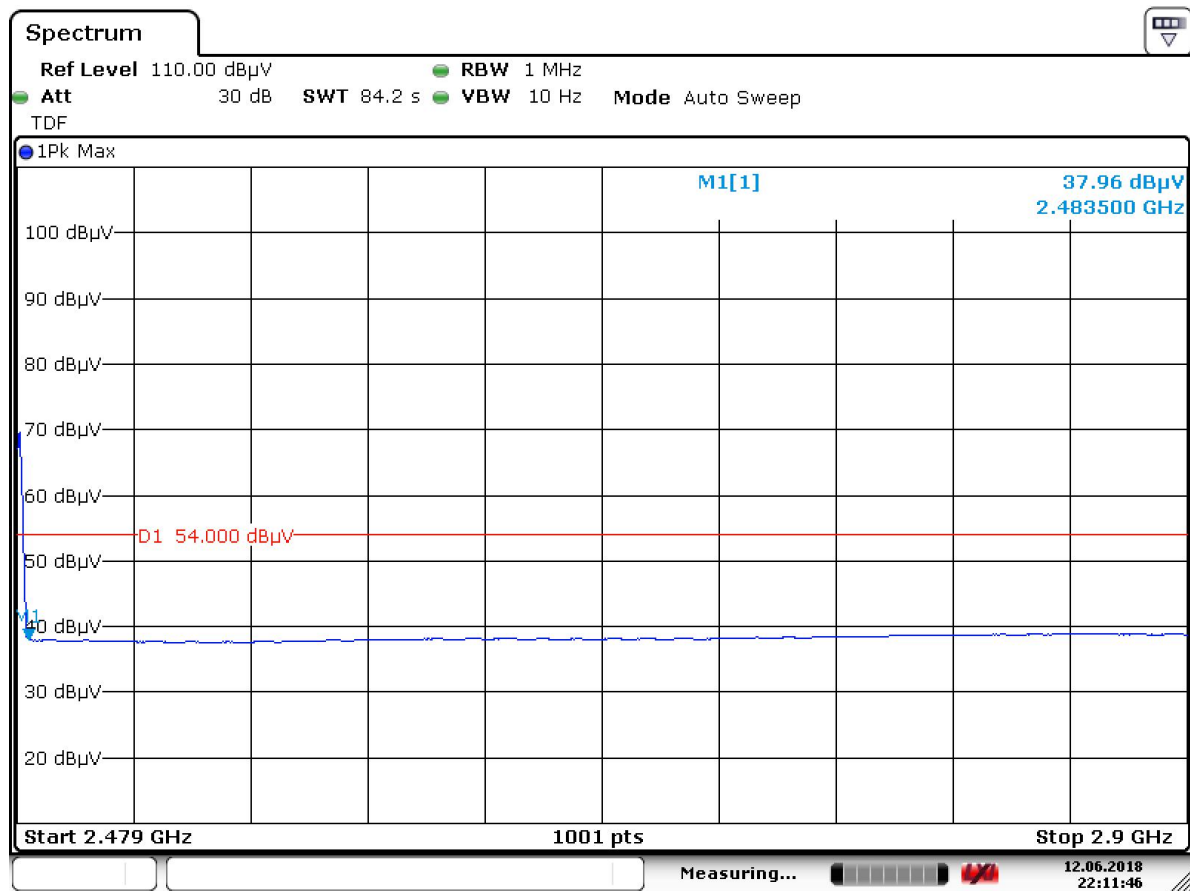
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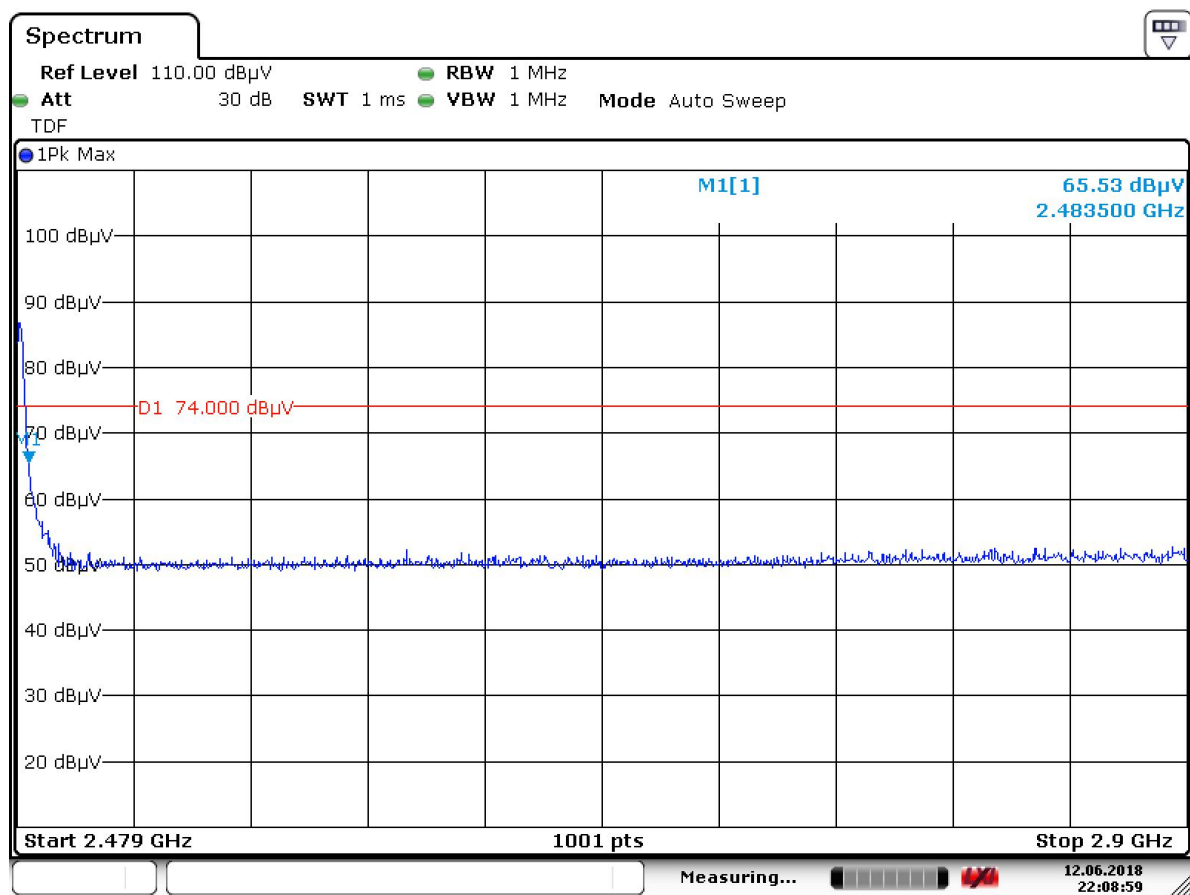
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Spurious Emissions, Band Edge, 2.35-2.5G

High Channel (Vertical)



Date: 12.JUN.2018 22:11:46



Date: 12.JUN.2018 22:08:59

Spurious Emissions, Band Edge, 2.35-2.5G

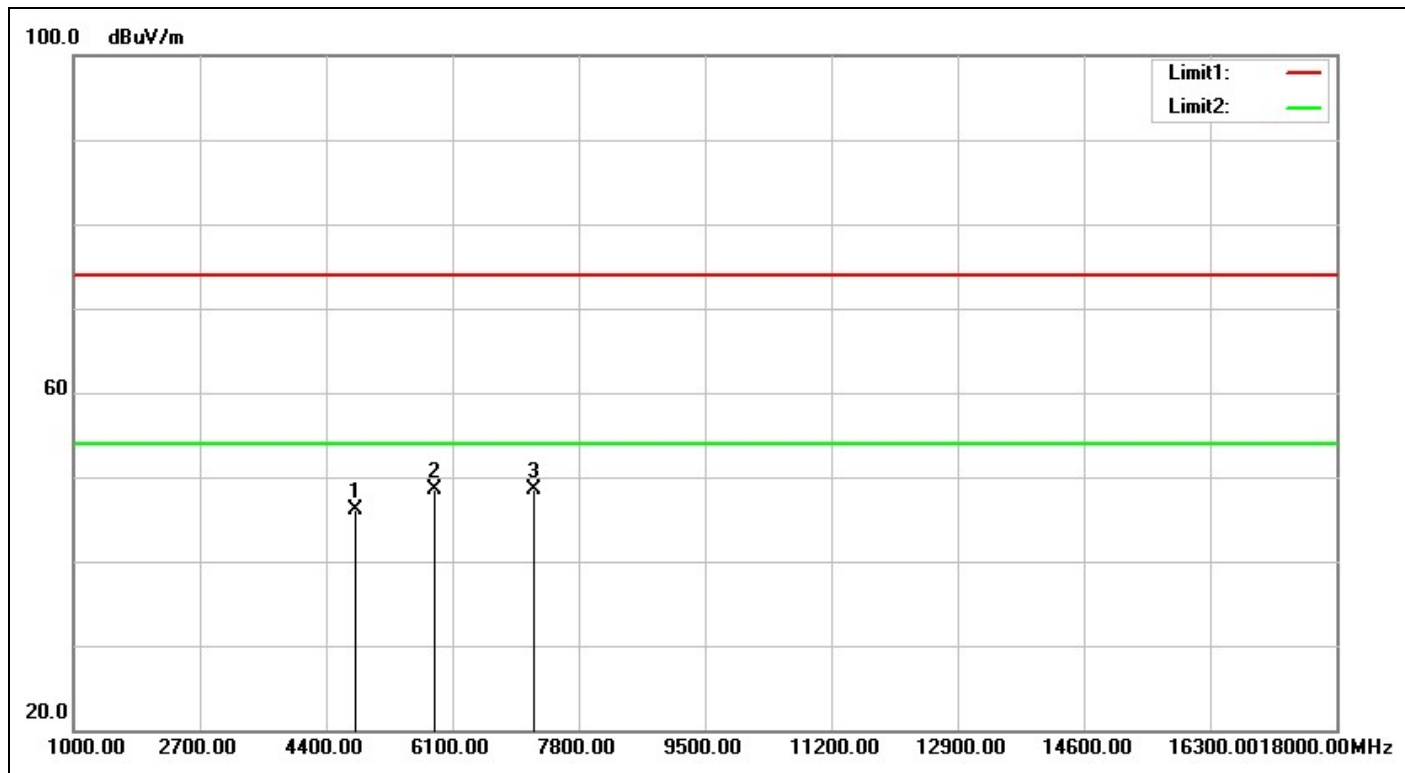
Spurious Emissions, TX Mode, 1-18G



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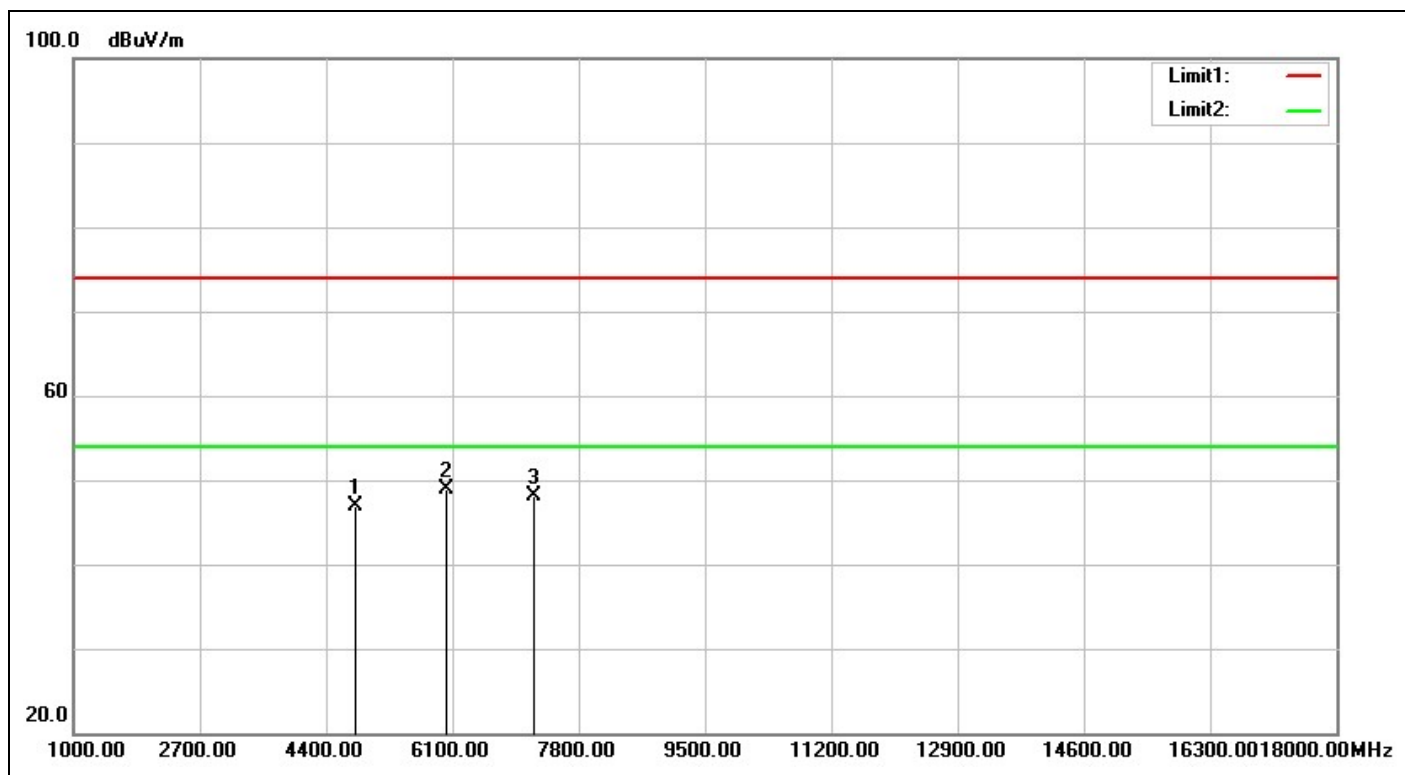
11F., No.758, Sec.4 Bade Road. Songshan Dist, Taipei City 105

Tel:+886-2172-7000 fax:+886-2528-0018



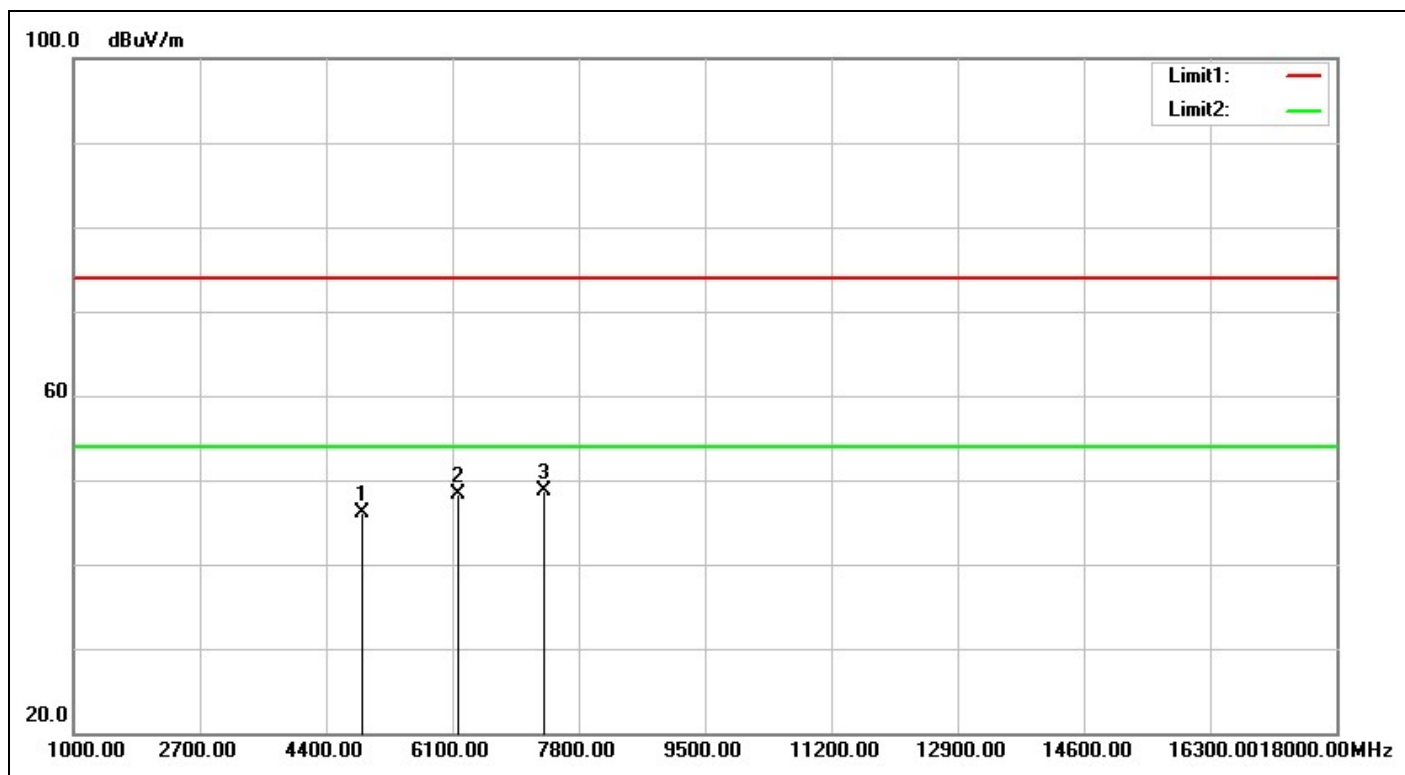
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Test item:	Radiation Emission	Test Time:	2018/6/12 21:06:43
Applicant:	AMPAK	Test Rating:	DC 5V
Product:	BLE SiP	Temp.(°C)/Hum.(%)	21(°C)/55%
Model No.:	WSDT-752B_SC	Test Engineer:	Kevin.Kuo
Test Mode:	TX-2402		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	4804.000	-3.37	49.40	46.03	74.00	-27.97	peak	100	211	
2	5862.000	1.51	46.92	48.43	74.00	-25.57	peak	100	77	
3	7206.000	4.31	44.19	48.50	74.00	-25.50	peak	100	36	



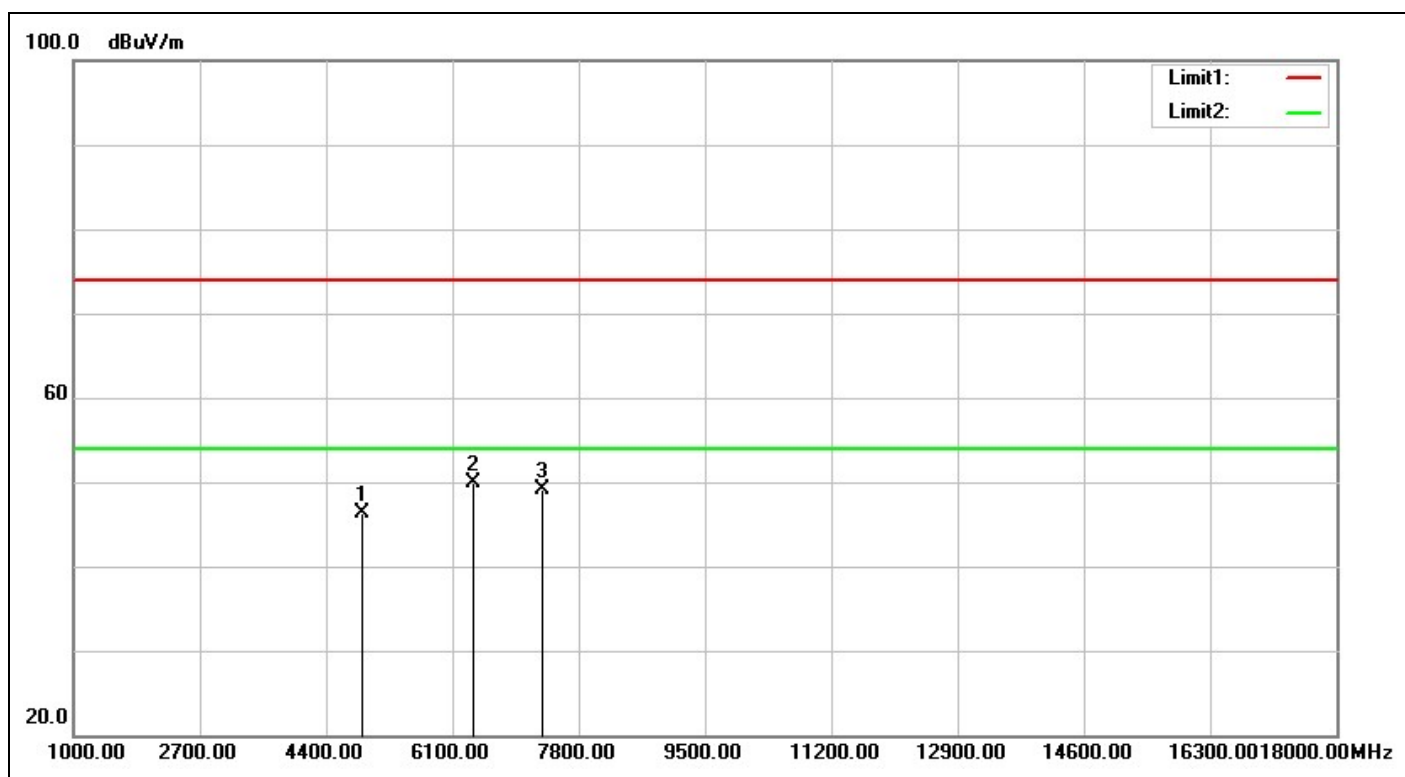
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Test Standard:	FCC Above 1G PEAK	Ant. Polarization:	Vertical
Test item:	Radiation Emission	Test Time:	2018/6/12 21:05:22
Applicant:	AMPAK	Test Rating:	DC 5V
Product:	BLE SiP	Temp.(°C)/Hum.(%)	21(°C)/55%
Model No.:	WSDT-752B_SC	Test Engineer:	Kevin.Kuo
Test Mode:	TX-2402		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	4804.000	-3.37	50.20	46.83	74.00	-27.17	peak	100	21	
2	6015.000	2.45	46.41	48.86	74.00	-25.14	peak	100	214	
3	7206.000	4.31	43.76	48.07	74.00	-25.93	peak	100	254	



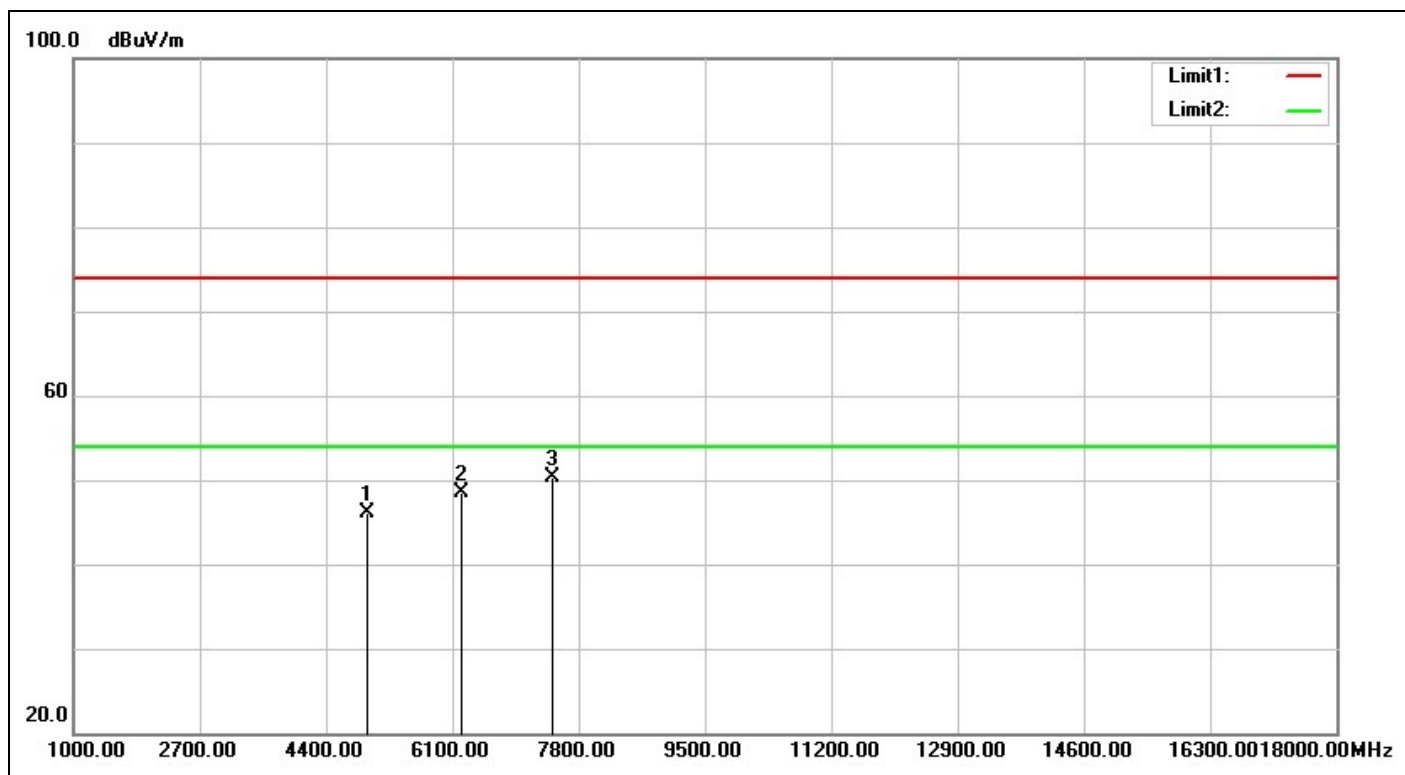
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Test item:	Radiation Emission	Test Time:	2018/6/12 21:08:50
Applicant:	AMPAK	Test Rating:	DC 5V
Product:	BLE SiP	Temp.(°C)/Hum.(%)	21(°C)/55%
Model No.:	WSDT-752B_SC	Test Engineer:	Kevin.Kuo
Test Mode:	TX-2440		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	4880.000	-3.25	49.27	46.02	74.00	-27.98	peak	100	21	
2	6185.000	3.15	45.07	48.22	74.00	-25.78	peak	100	0	
3	7320.000	4.57	44.16	48.73	74.00	-25.27	peak	100	335	



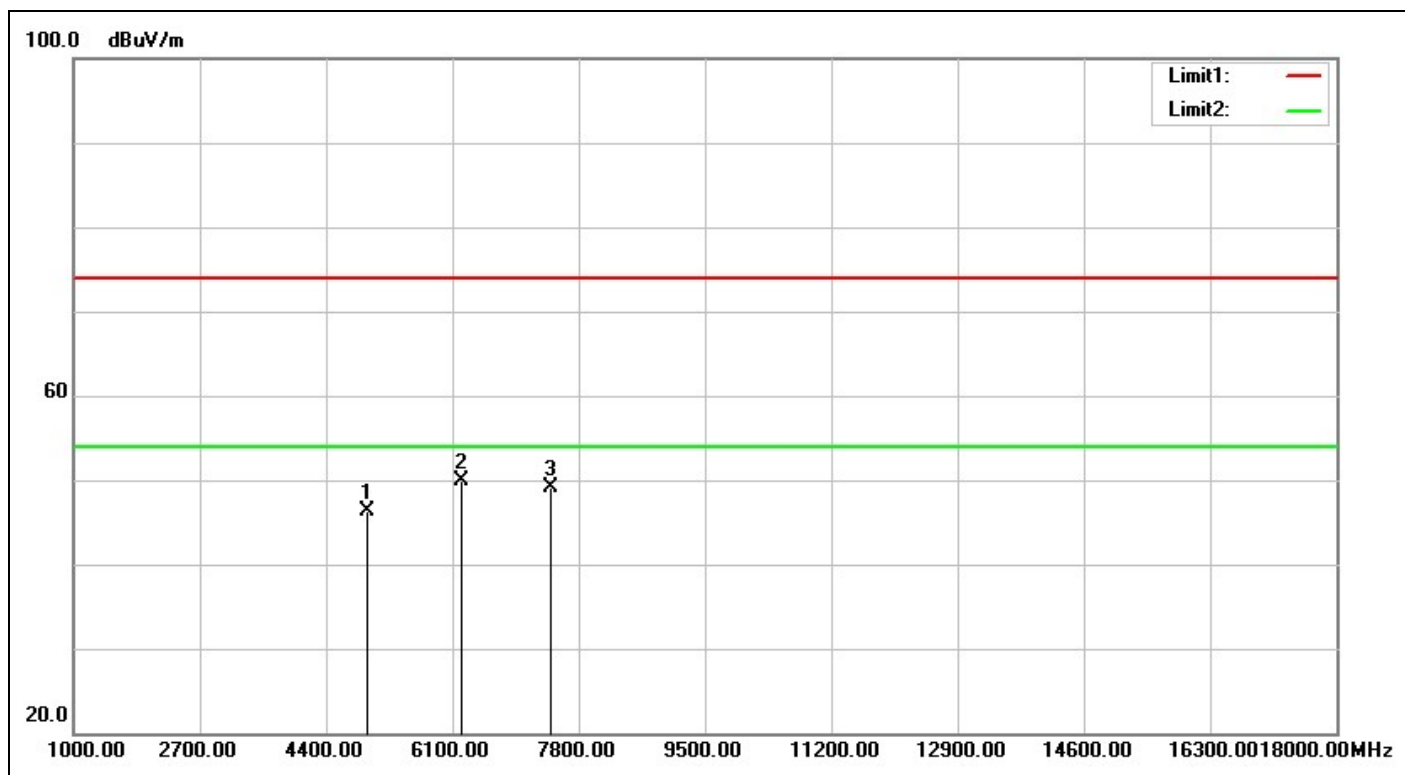
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Test item:	Radiation Emission	Test Time:	2018/6/12 21:09:52
Applicant:	AMPAK	Test Rating:	DC 5V
Product:	BLE SiP	Temp.(°C)/Hum.(%)	21(°C)/55%
Model No.:	WSDT-752B_SC	Test Engineer:	Kevin.Kuo
Test Mode:	TX-2440		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	4880.000	-3.25	49.63	46.38	74.00	-27.62	peak	100	102	
2	6389.000	4.00	45.88	49.88	74.00	-24.12	peak	100	85	
3	7320.000	4.57	44.49	49.06	74.00	-24.94	peak	100	112	



Service No.:	114078507	Test Distance:	3m
Test Standard:	FCC Above 1G PEAK	Ant. Polarization:	Horizontal
Test item:	Radiation Emission	Test Time:	2018/6/12 21:12:39
Applicant:	AMPAK	Test Rating:	DC 5V
Product:	BLE SiP	Temp.(°C)/Hum.(%)	21(°C)/55%
Model No.:	WSDT-752B_SC	Test Engineer:	Kevin.Kuo
Test Mode:	TX-2480		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	4960.000	-3.12	49.23	46.11	74.00	-27.89	peak	100	147	
2	6219.000	3.29	45.24	48.53	74.00	-25.47	peak	100	175	
3	7440.000	4.85	45.49	50.34	74.00	-23.66	peak	100	214	



Service No.:	114078507	Test Distance:	3m
Test Standard:	FCC Above 1G PEAK	Ant. Polarization:	Vertical
Test item:	Radiation Emission	Test Time:	2018/6/12 21:13:42
Applicant:	AMPAK	Test Rating:	DC 5V
Product:	BLE SiP	Temp.(°C)/Hum.(%):	21(°C)/55%
Model No.:	WSDT-752B_SC	Test Engineer:	Kevin.Kuo
Test Mode:	TX-2480		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	4960.000	-3.12	49.34	46.22	74.00	-27.78	peak	100	102	
2	6219.000	3.29	46.65	49.94	74.00	-24.06	peak	100	263	
3	7440.000	4.85	44.16	49.01	74.00	-24.99	peak	100	224	

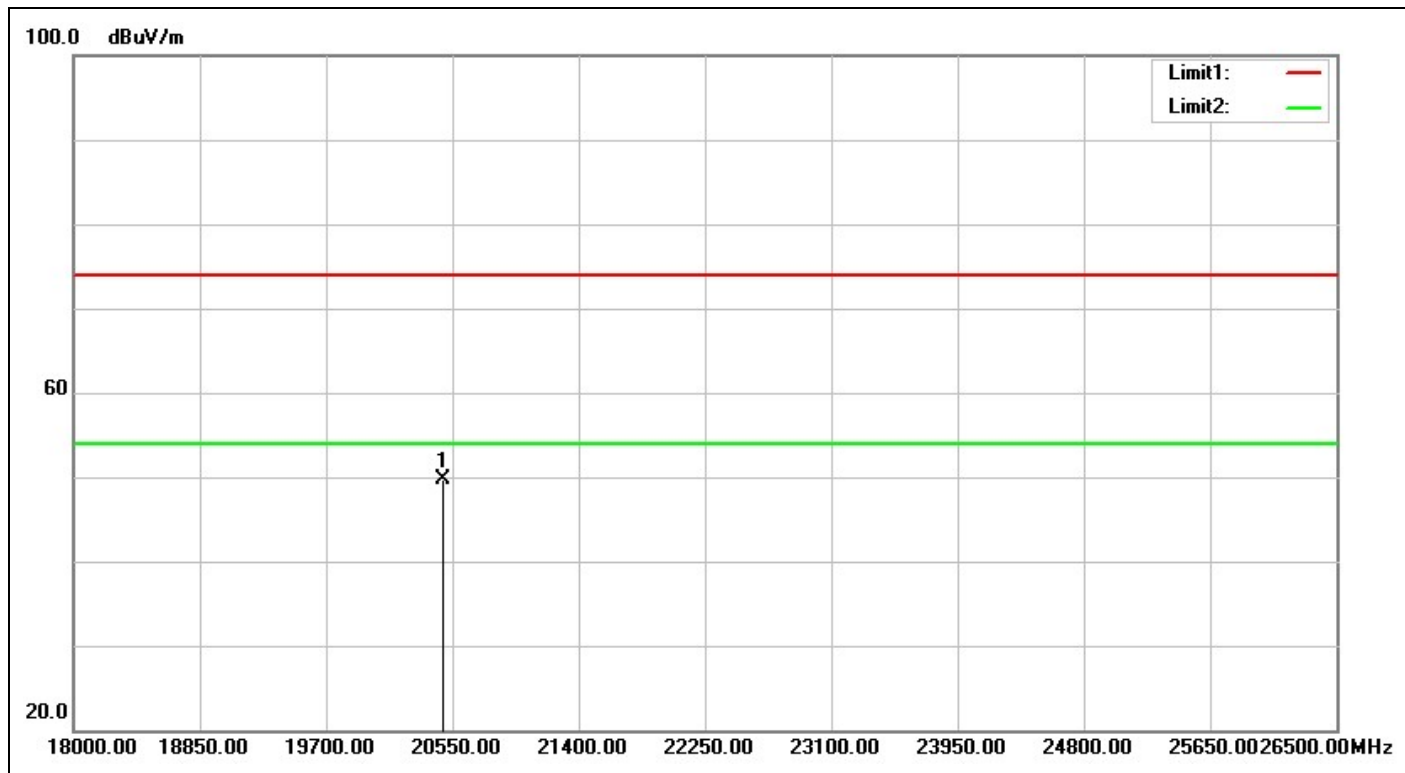
Spurious Emissions, TX Mode, 18-26G



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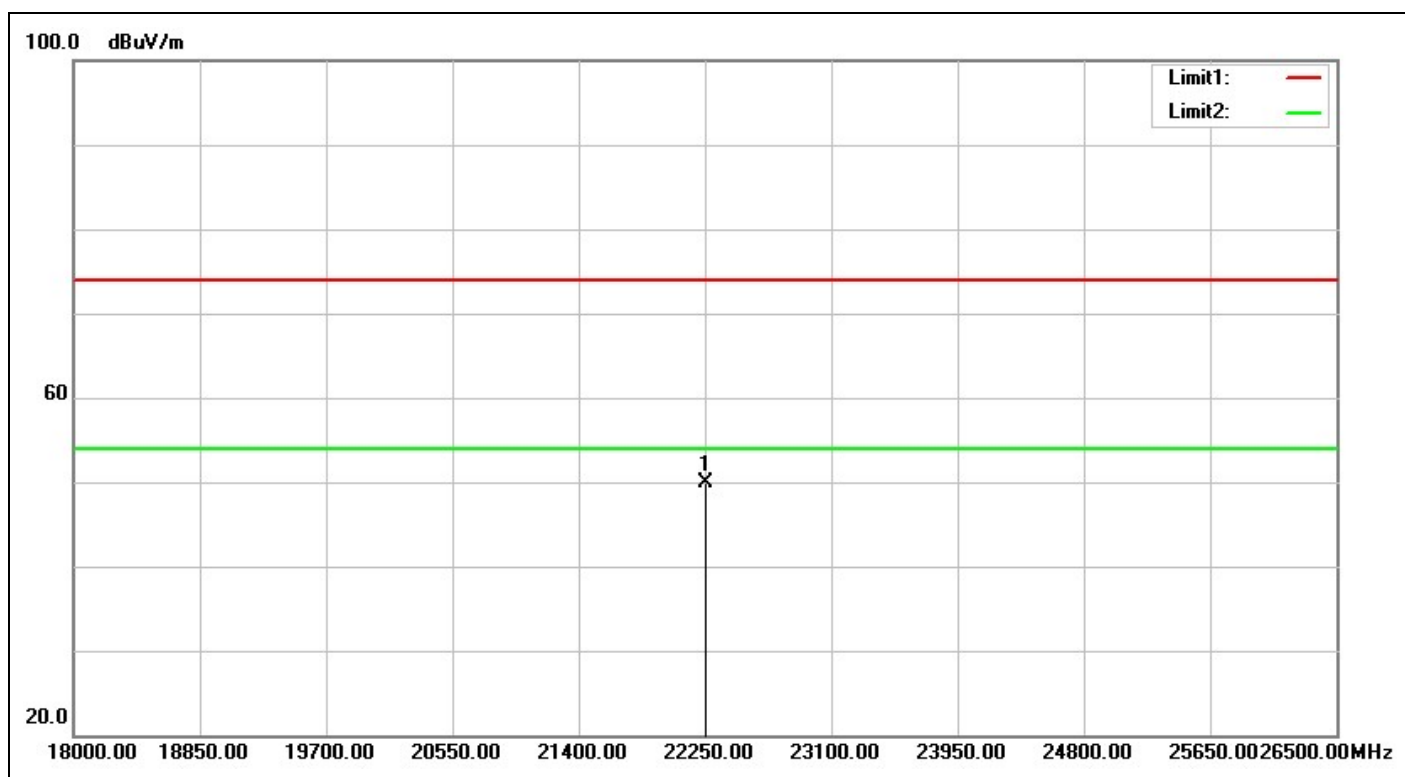
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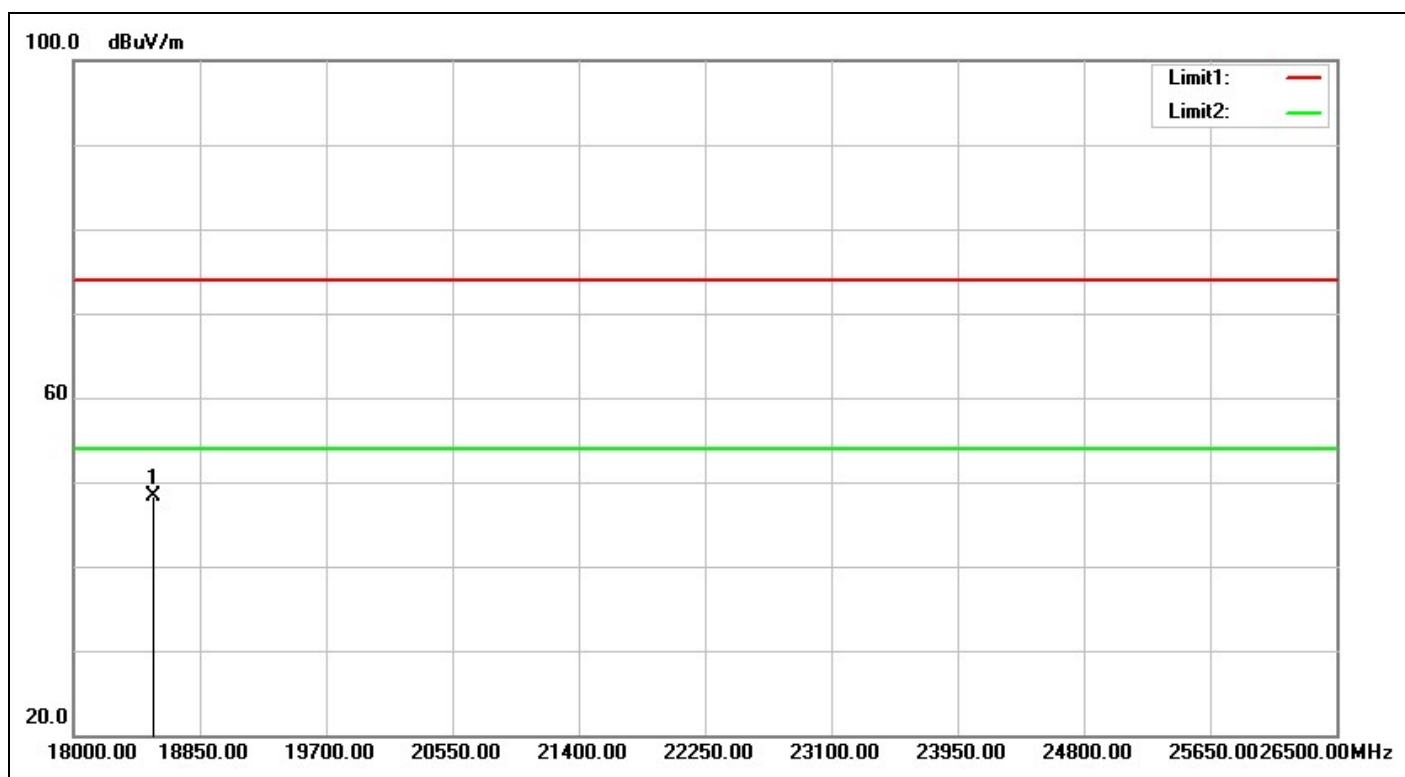
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Test Standard:	FCC Above 1G PEAK	Ant. Polarization:	Horizontal
Test item:	Radiation Emission	Test Time:	2018/6/12 22:19:45
Applicant:	AMPAK	Test Rating:	DC 5V
Product:	BLE SiP	Temp.(°C)/Hum.(%):	21(°C)/55%
Model No.:	WSDT-752B_SC	Test Engineer:	Kevin.Kuo
Test Mode:	TX-2402		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	20482.000	31.39	18.22	49.61	74.00	-24.39	peak	100	91	



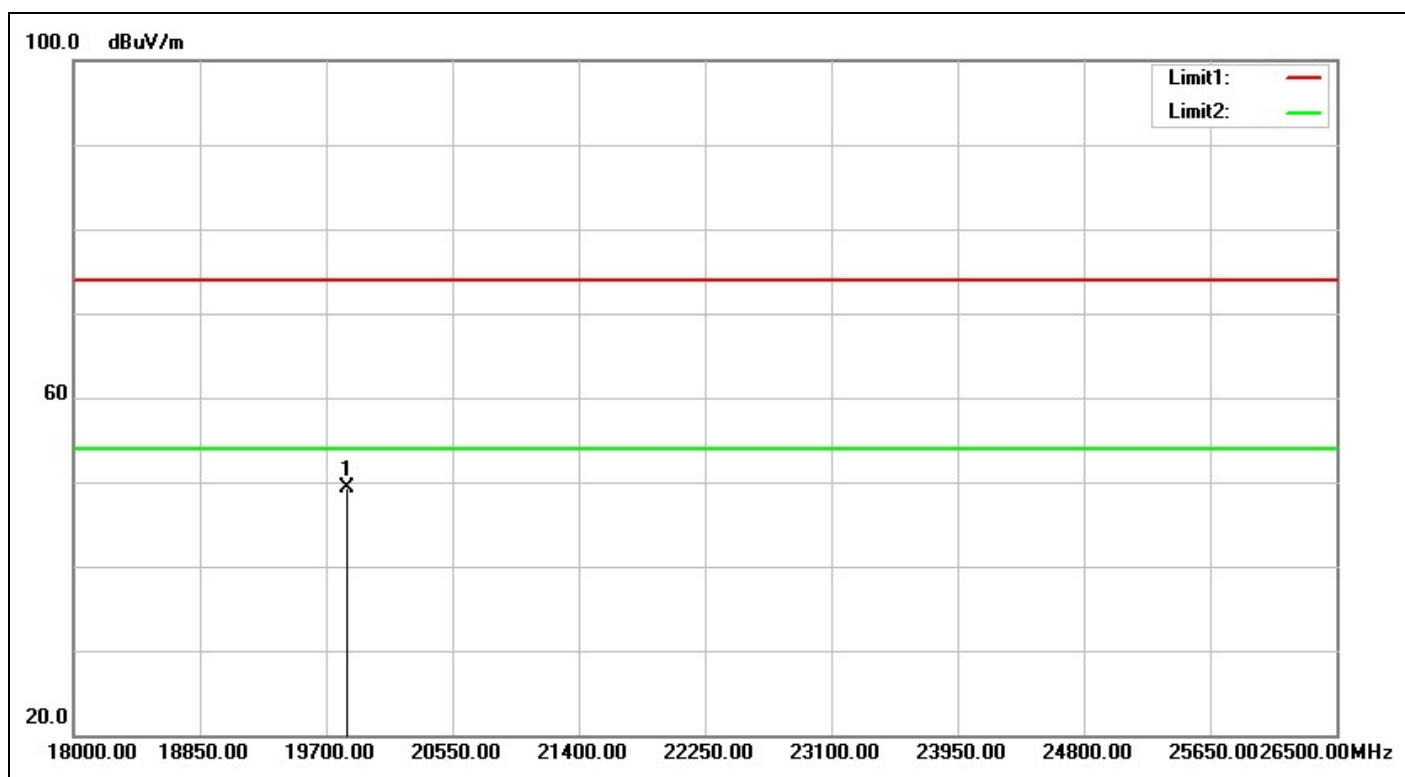
Service No.:	114078507	Test Distance:	3m
Test Standard:	FCC Above 1G PEAK	Ant. Polarization:	Vertical
Test item:	Radiation Emission	Test Time:	2018/6/12 22:20:48
Applicant:	AMPAK	Test Rating:	DC 5V
Product:	BLE SiP	Temp.(°C)/Hum.(%):	21(°C)/55%
Model No.:	WSDT-752B_SC	Test Engineer:	Kevin.Kuo
Test Mode:	TX-2402		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	22258.500	32.62	17.24	49.86	74.00	-24.14	peak	100	222	



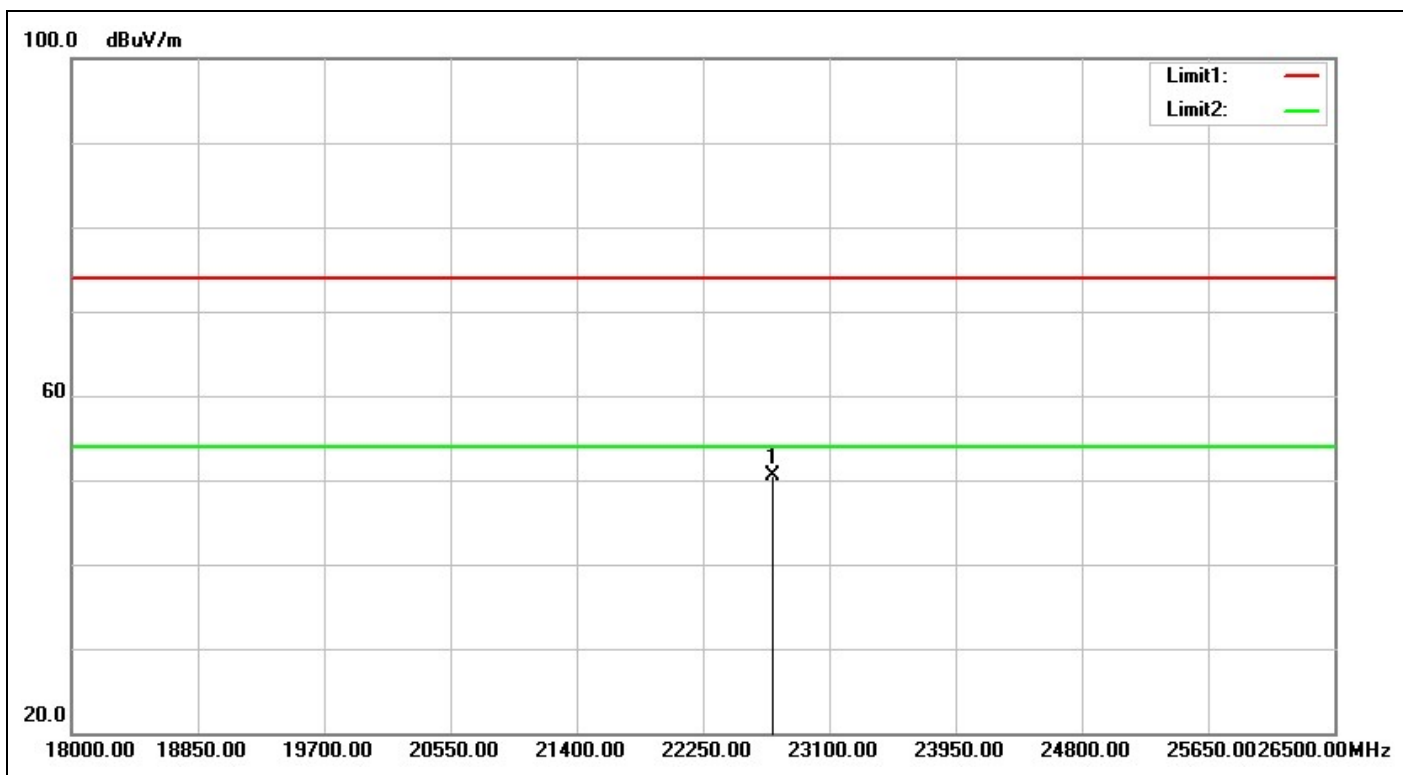
Service No.:	114078507	Test Distance:	3m
Test Standard:	FCC Above 1G PEAK	Ant. Polarization:	Horizontal
Test item:	Radiation Emission	Test Time:	2018/6/12 22:22:09
Applicant:	AMPAK	Test Rating:	DC 5V
Product:	BLE SiP	Temp.(°C)/Hum.(%):	21(°C)/55%
Model No.:	WSDT-752B_SC	Test Engineer:	Kevin.Kuo
Test Mode:	TX-2440		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	18535.500	28.60	19.80	48.40	74.00	-25.60	peak	100	321	



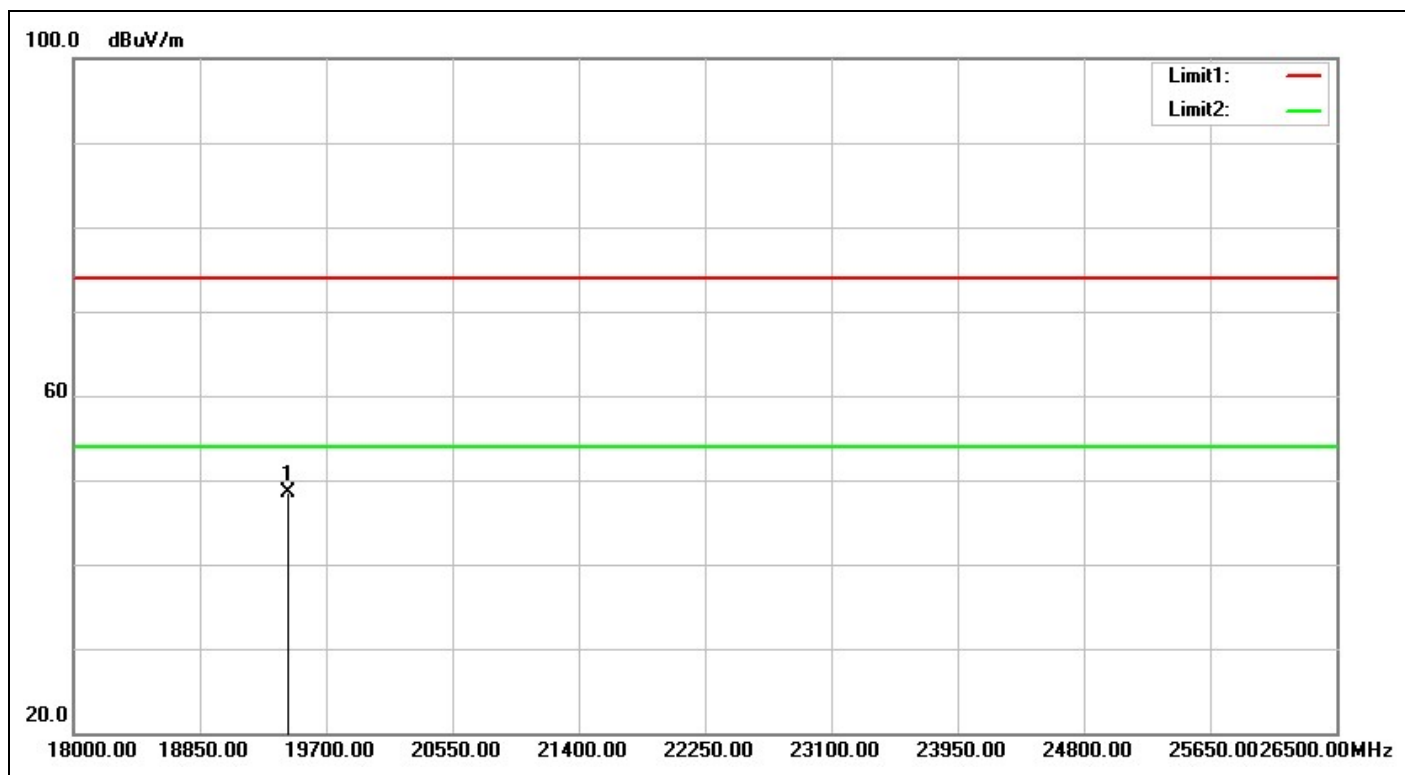
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Test Standard:	FCC Above 1G PEAK	Ant. Polarization:	Vertical
Test item:	Radiation Emission	Test Time:	2018/6/12 22:23:12
Applicant:	AMPAK	Test Rating:	DC 5V
Product:	BLE SiP	Temp.(°C)/Hum.(%)	21(°C)/55%
Model No.:	WSDT-752B_SC	Test Engineer:	Kevin.Kuo
Test Mode:	TX-2440		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	19836.000	30.97	18.43	49.40	74.00	-24.60	peak	100	195	



Service No.:	114078507	Test Distance:	3m
Test Standard:	FCC Above 1G PEAK	Ant. Polarization:	Horizontal
Test item:	Radiation Emission	Test Time:	2018/6/12 22:24:46
Applicant:	AMPAK	Test Rating:	DC 5V
Product:	BLE SiP	Temp.(°C)/Hum.(%):	21(°C)/55%
Model No.:	WSDT-752B_SC	Test Engineer:	Kevin.Kuo
Test Mode:	TX-2480		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	22717.500	32.71	17.73	50.44	74.00	-23.56	peak	100	315	



Service No.:	114078507	Test Distance:	3m
Test Standard:	FCC Above 1G PEAK	Ant. Polarization:	Vertical
Test item:	Radiation Emission	Test Time:	2018/6/12 22:25:48
Applicant:	AMPAK	Test Rating:	DC 5V
Product:	BLE SiP	Temp.(°C)/Hum.(%)	21(°C)/55%
Model No.:	WSDT-752B_SC	Test Engineer:	Kevin.Kuo
Test Mode:	TX-2480		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	19445.000	30.43	18.07	48.50	74.00	-25.50	peak	100	61	

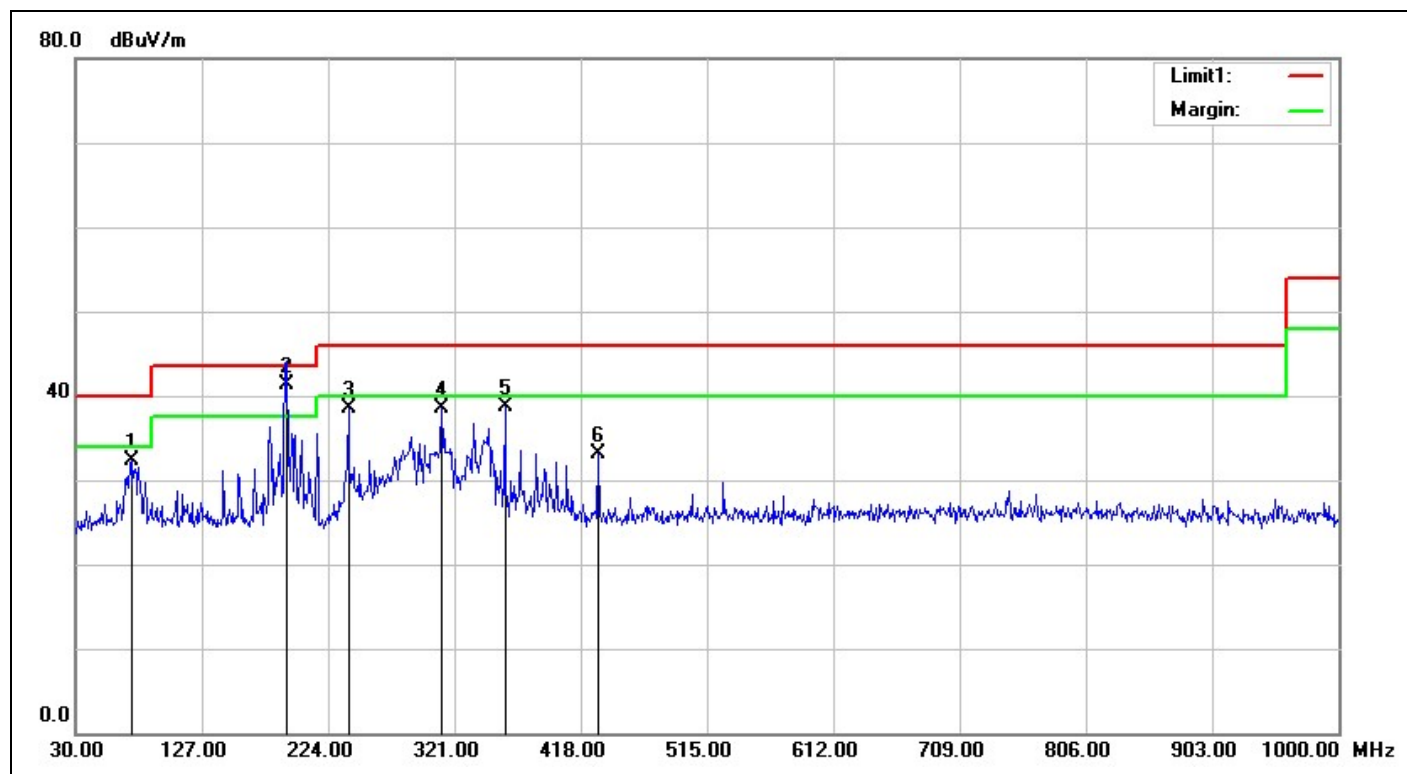
Spurious Emissions, TX Mode, 30M-1G



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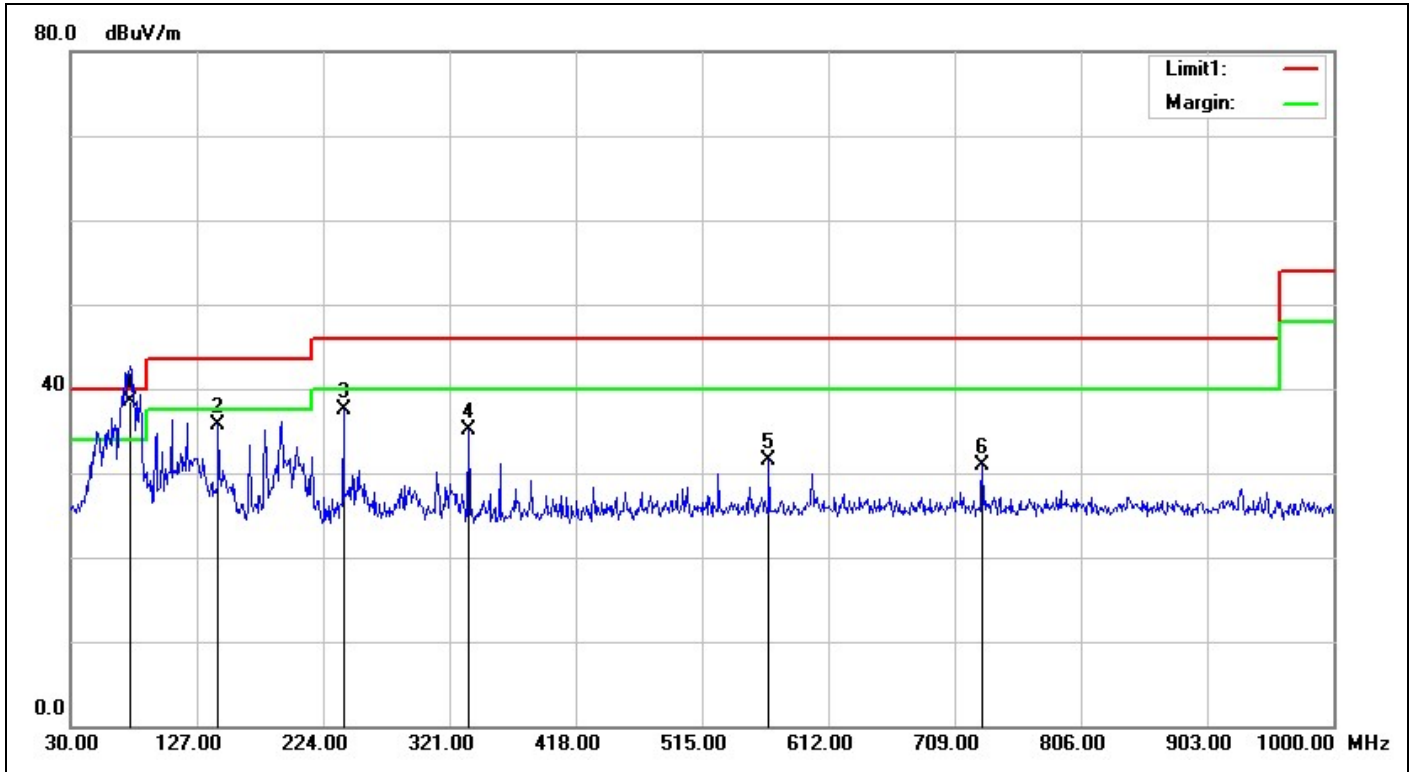
Tel:+886-2172-7000 fax:+886-2528-0018



Service No.:	114078507	Test Distance:	3m
Test Standard:	FCC Class B 3M Radiation	Ant. Polarization:	Horizontal
Test item:	Radiation Emission	Test Time:	2018/6/12 22:50:52
Applicant:	AMPAK	Test Rating:	DC 5V
Product:	BLE SiP	Temp.(°C)/Hum.(%)	21(°C)/55%
Model No.:	WSDT-752B_SC	Test Engineer:	Kevin.Kuo
Test Mode:	TX-2440		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	73.6500	13.53	18.71	32.24	40.00	-7.76	QP	100	231	
2	191.9900	16.39	24.91	41.30	43.50	-2.20	QP	100	218	
3	239.5200	18.85	19.70	38.55	46.00	-7.45	QP	100	194	
4	311.3000	21.40	17.13	38.53	46.00	-7.47	QP	100	210	
5	359.8000	22.91	15.81	38.72	46.00	-7.28	QP	100	194	
6	431.5799	24.53	8.59	33.12	46.00	-12.88	QP	100	58	

Spurious Emissions, Mains, 150kHz - 30MHz



Service No.:	114078507	Test Distance:	3m
Test Standard:	FCC Class B 3M Radiation	Ant. Polarization:	Vertical
Test item:	Radiation Emission	Test Time:	2018/6/12 22:51:56
Applicant:	AMPAK	Test Rating:	DC 5V
Product:	BLE SiP	Temp.(°C)/Hum.(%):	21(°C)/55%
Model No.:	WSDT-752B_SC	Test Engineer:	Kevin.Kuo
Test Mode:	TX-2440		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	75.5899	13.73	24.77	38.50	40.00	-1.50	QP	100	160	
2	143.4900	18.87	16.81	35.68	43.50	-7.82	QP	100	269	
3	239.5200	18.85	18.58	37.43	46.00	-8.57	QP	100	0	
4	335.5500	22.19	12.93	35.12	46.00	-10.88	QP	100	133	
5	566.4099	27.03	4.43	31.46	46.00	-14.54	QP	100	131	
6	730.3400	29.38	1.53	30.91	46.00	-15.09	QP	100	160	

Spurious Emissions, Mains, 150kHz - 30MHz

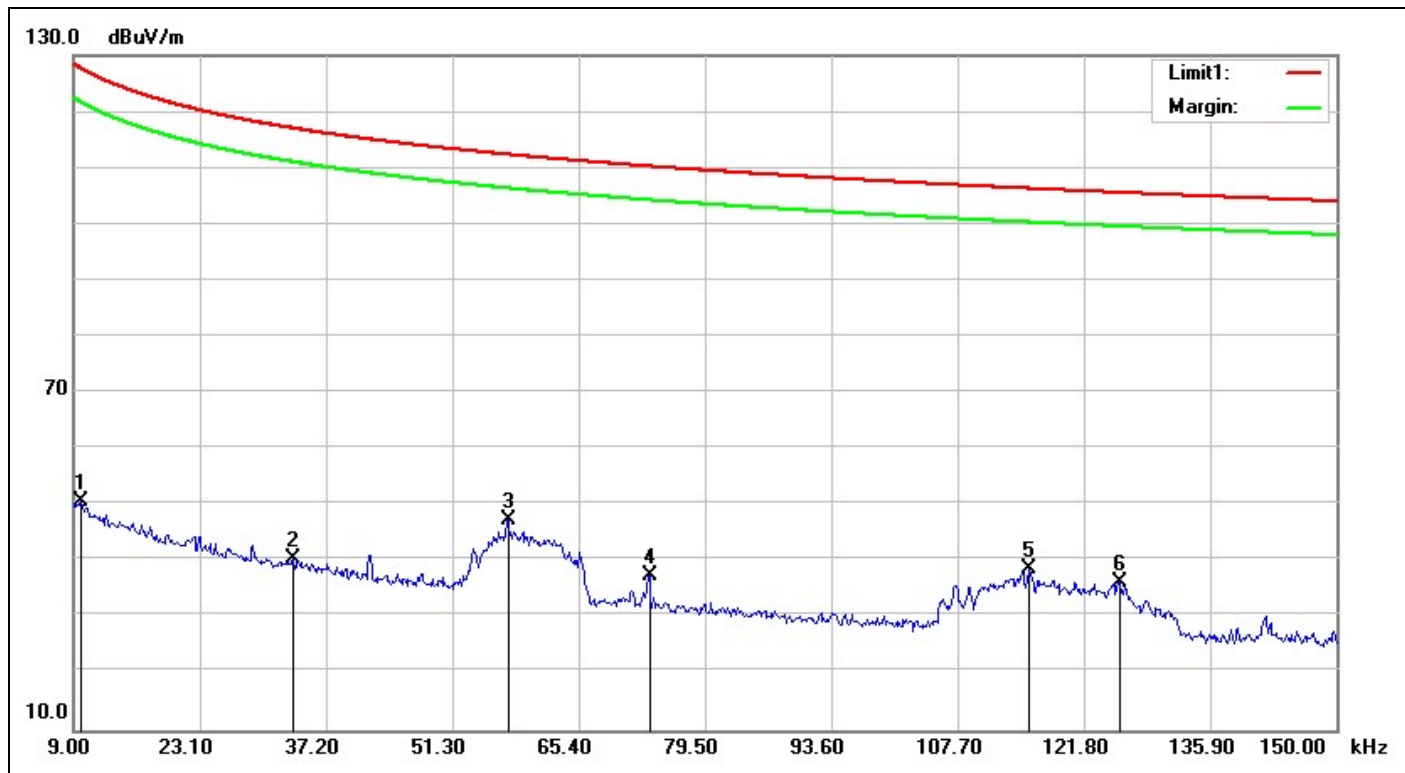
Spurious Emissions, TX Mode, 9K-30M



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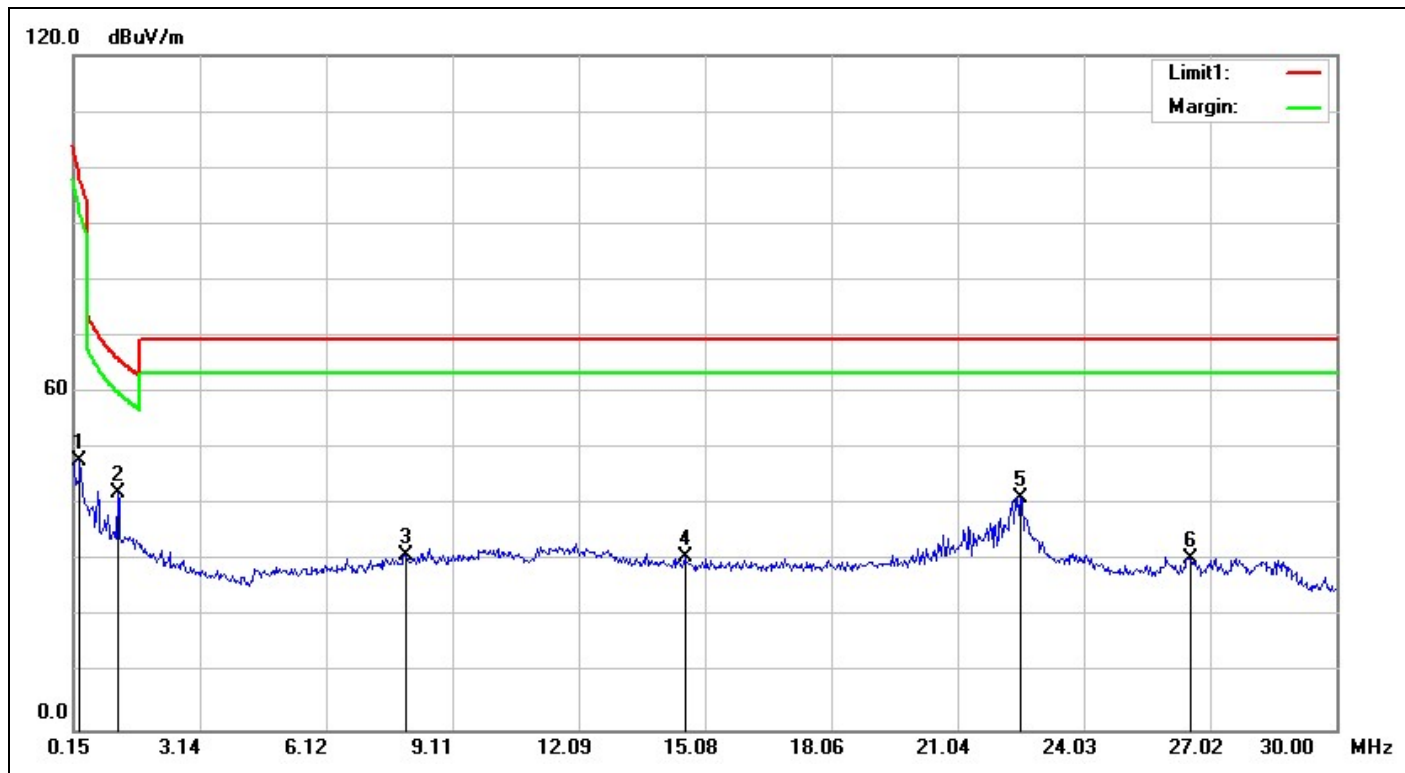
Tel:+886-2172-7000 fax:+886-2528-0018



Service No.:	114078507	Test Distance:	3m
Test Standard:	FCC15.209_9k-1G_3m	Ant. Polarization:	
Test item:	Radiation Emission	Test Time:	2018/6/26 21:56:34
Applicant:	AMPAK	Test Rating:	DC 5V
Product:	BLE SiP	Temp.(°C)/Hum.(%)	20(°C)/44%
Model No.:	WSDT-752B_SC	Test Engineer:	Kevin.Kuo
Test Mode:	TX-2440		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	0.0098	18.49	32.15	50.64	127.67	-77.03	QP	100	114	
2	0.0335	19.26	21.10	40.36	117.02	-76.66	QP	100	45	
3	0.0575	18.84	28.52	47.36	112.35	-64.99	QP	100	23	
4	0.0733	18.65	18.83	37.48	110.25	-72.77	QP	100	1	
5	0.1157	18.34	20.34	38.68	106.29	-67.61	QP	100	223	
6	0.1257	18.34	18.02	36.36	105.58	-69.22	QP	100	201	

Spurious Emissions, Mains, 150kHz - 30MHz



Service No.:	114078507	Test Distance:	3m
Test Standard:	FCC15.209_9k-1G_3m	Ant. Polarization:	
Test item:	Radiation Emission	Test Time:	2018/6/26 21:58:16
Applicant:	AMPAK	Test Rating:	DC 5V
Product:	BLE SiP	Temp.(°C)/Hum.(%):	20(°C)/44%
Model No.:	WSDT-752B_SC	Test Engineer:	Kevin.Kuo
Test Mode:	TX-2440		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	0.2993	18.44	29.38	47.82	98.07	-50.25	QP	100	20	
2	1.1947	18.66	23.39	42.05	66.08	-24.03	QP	100	114	
3	8.0006	20.04	10.97	31.01	69.50	-38.49	QP	100	23	
4	14.5974	20.96	9.75	30.71	69.50	-38.79	QP	100	11	
5	22.5375	21.68	19.51	41.19	69.50	-28.31	QP	100	355	
6	26.5673	21.83	8.73	30.56	69.50	-38.94	QP	100	287	

Spurious Emissions, Mains, 150kHz - 30MHz

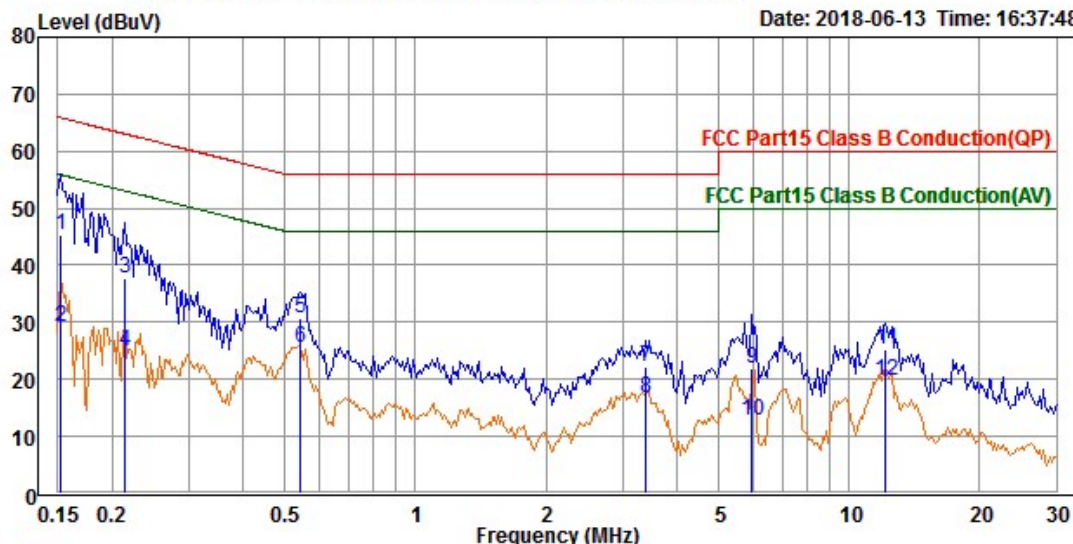
Spurious Emissions, Mains, 150kHz - 30MHz



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File: C:\EMC\Report\2018\AMPAK\114078507(AMPAK)_00005.EMI

Date: 2018-06-13 Time: 16:37:48



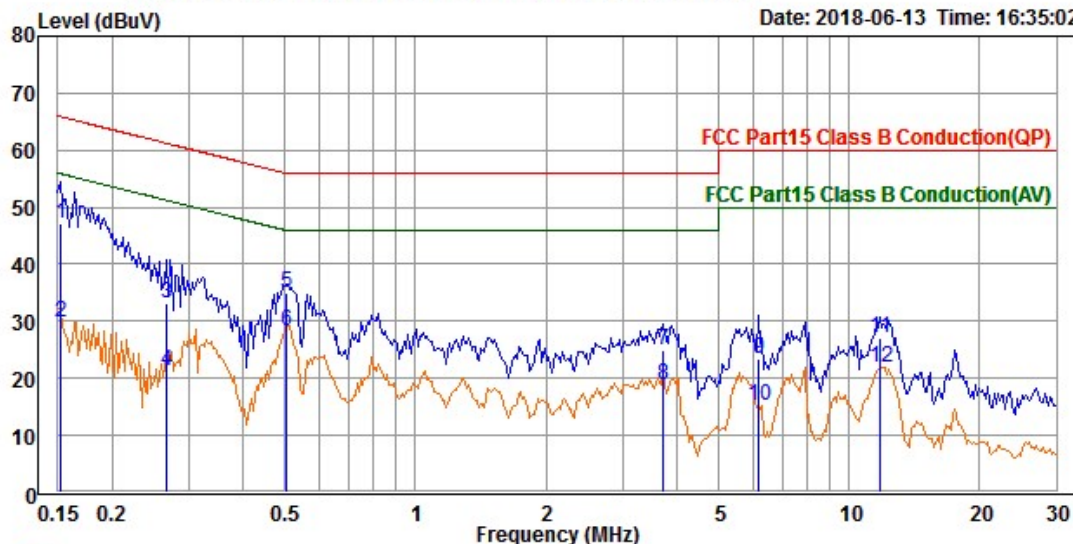
Trace: 1

Site : Conduction room
Condition : FCC Part15 Class B Conduction(QP) neutral
Test Engineer: Kevin Kuo
Applicant : AMPAK
Product : BLE SiP
Model No. : WSDT-752B_SC
Test Rating : 110Vac/60Hz
Tmp/Hum : 21.6°C / 44%
Memo : AC Mains

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.151	35.69	9.73	45.42	65.92	-20.50	QP
2	0.151	19.57	9.73	29.30	55.92	-26.62	Average
3	0.215	27.87	9.73	37.60	63.03	-25.43	QP
4	0.215	15.08	9.73	24.81	53.03	-28.22	Average
5	0.541	20.87	9.73	30.60	56.00	-25.40	QP
6	0.541	15.72	9.73	25.45	46.00	-20.55	Average
7	3.401	12.30	9.79	22.09	56.00	-33.91	QP
8	3.401	6.94	9.79	16.73	46.00	-29.27	Average
9	5.935	12.10	9.84	21.94	60.00	-38.06	QP
10	5.935	2.82	9.84	12.66	50.00	-37.34	Average
11	12.141	15.40	9.90	25.30	60.00	-34.70	QP
12	12.141	9.86	9.90	19.76	50.00	-30.24	Average

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Date: 2018-06-13 Time: 16:35:02



Trace: 1

Site : Conduction room
Condition : FCC Part15 Class B Conduction(QP) line1
Test Engineer: Kevin Kuo
Applicant : AMPAK
Product : BLE SiP
Model No. : WSDT-752B_SC
Test Rating : 110Vac/60Hz
Tmp/Hum : 21.6°C / 44%
Memo : AC Mains

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.151	37.57	9.67	47.24	65.92	-18.68	QP
2	0.151	20.17	9.67	29.84	55.92	-26.08	Average
3	0.267	23.48	9.67	33.15	61.21	-28.06	QP
4	0.267	11.48	9.67	21.15	51.21	-30.06	Average
5	0.504	25.20	9.68	34.88	56.00	-21.12	QP
6	0.504	18.66	9.68	28.34	46.00	-17.66	Average
7	3.720	15.08	9.73	24.81	56.00	-31.19	QP
8	3.720	9.17	9.73	18.90	46.00	-27.10	Average
9	6.176	13.74	9.77	23.51	60.00	-36.49	QP
10	6.176	5.57	9.77	15.34	50.00	-34.66	Average
11	11.785	17.19	9.81	27.00	60.00	-33.00	QP
12	11.785	12.12	9.81	21.93	50.00	-28.07	Average