

Test Report No.50176073 001

Appendix D: Radiated and Mains Spurious Emission Data

(File: 50176073 001AppendixD)

Contents

Spurious Emissions, TX Mode, 1-10G.....	2
Spurious Emissions, TX Mode, 30M-1G	11
Spurious Emissions, TX Mode, 9K-30M	17
Spurious Emissions, Main	19

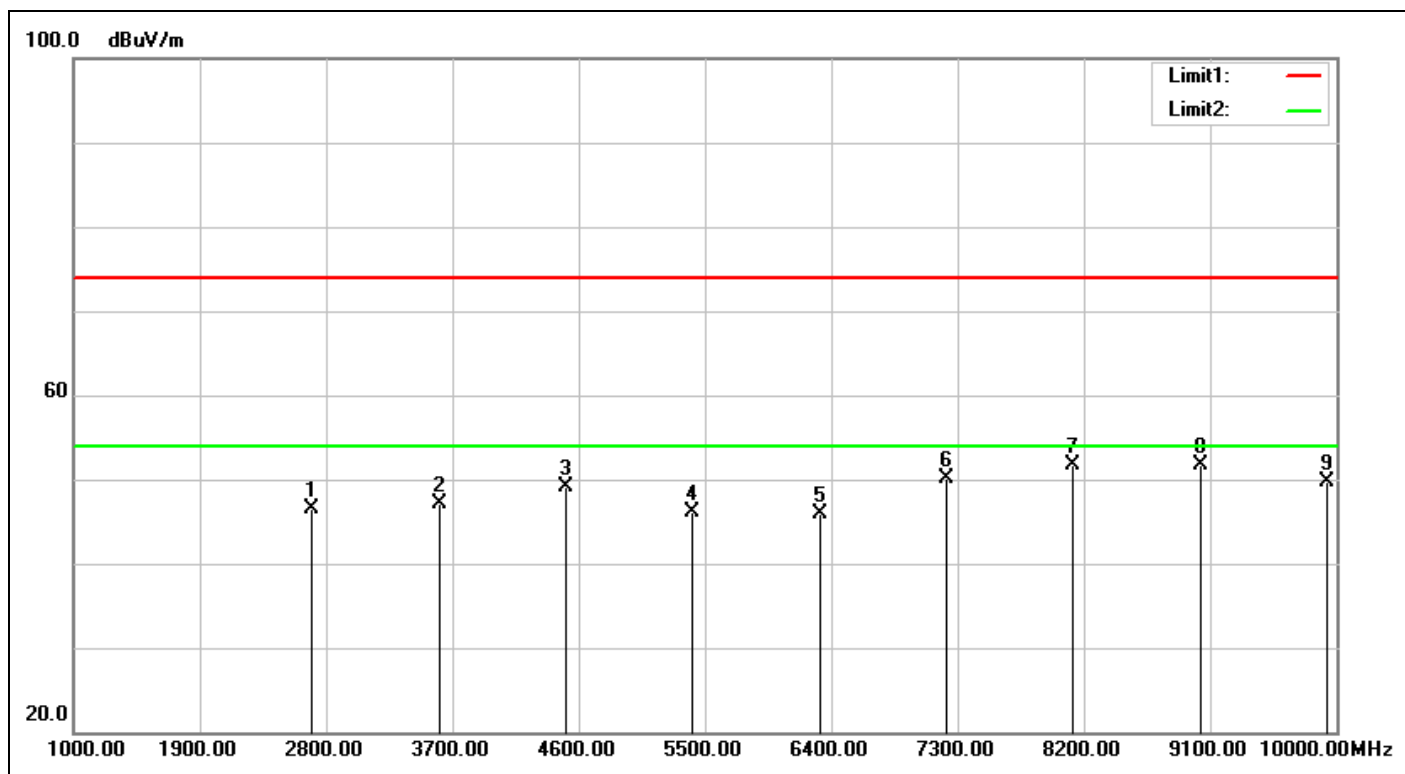
Spurious Emissions, TX Mode, 1-10G



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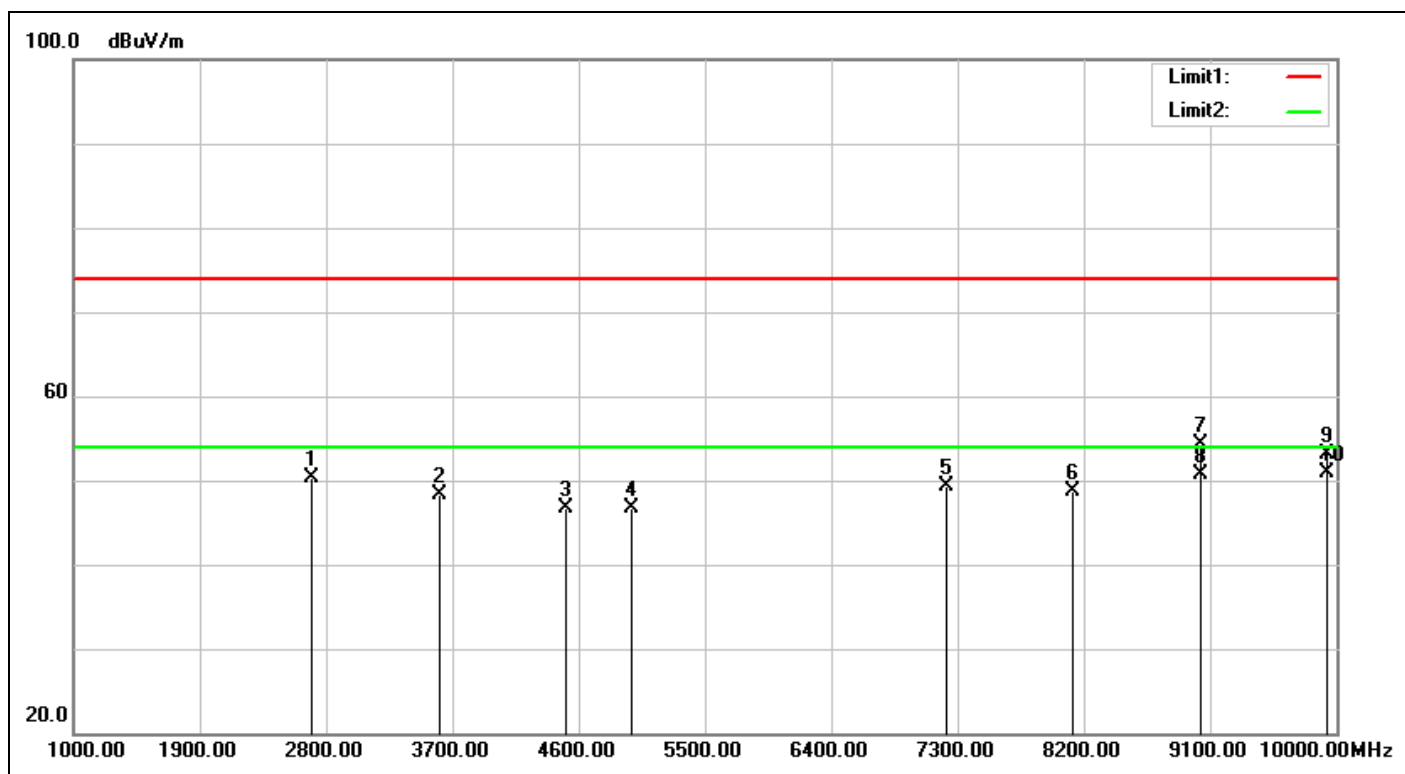
11F., No.758, Sec.4 Bade Road. Songshan Dist, Taipei City 105

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



Service No.:	114080238	Test Distance:	3m
Test Standard:	FCC Above 1G PEAK	Ant. Polarization:	Horizontal
Test item:	Radiation Emission	Test Time:	2018/9/3 16:17:29
Applicant:	GloabalSat	Test Rating:	DC 5V
Product:	Sigfox Tracker	Temp.(°C)/Hum.(%)	21(°C)/57%
Model No.:	ST-100U	Test Engineer:	Kevin Kuo
Test Mode:	902.1375M-TX		
Remark:			

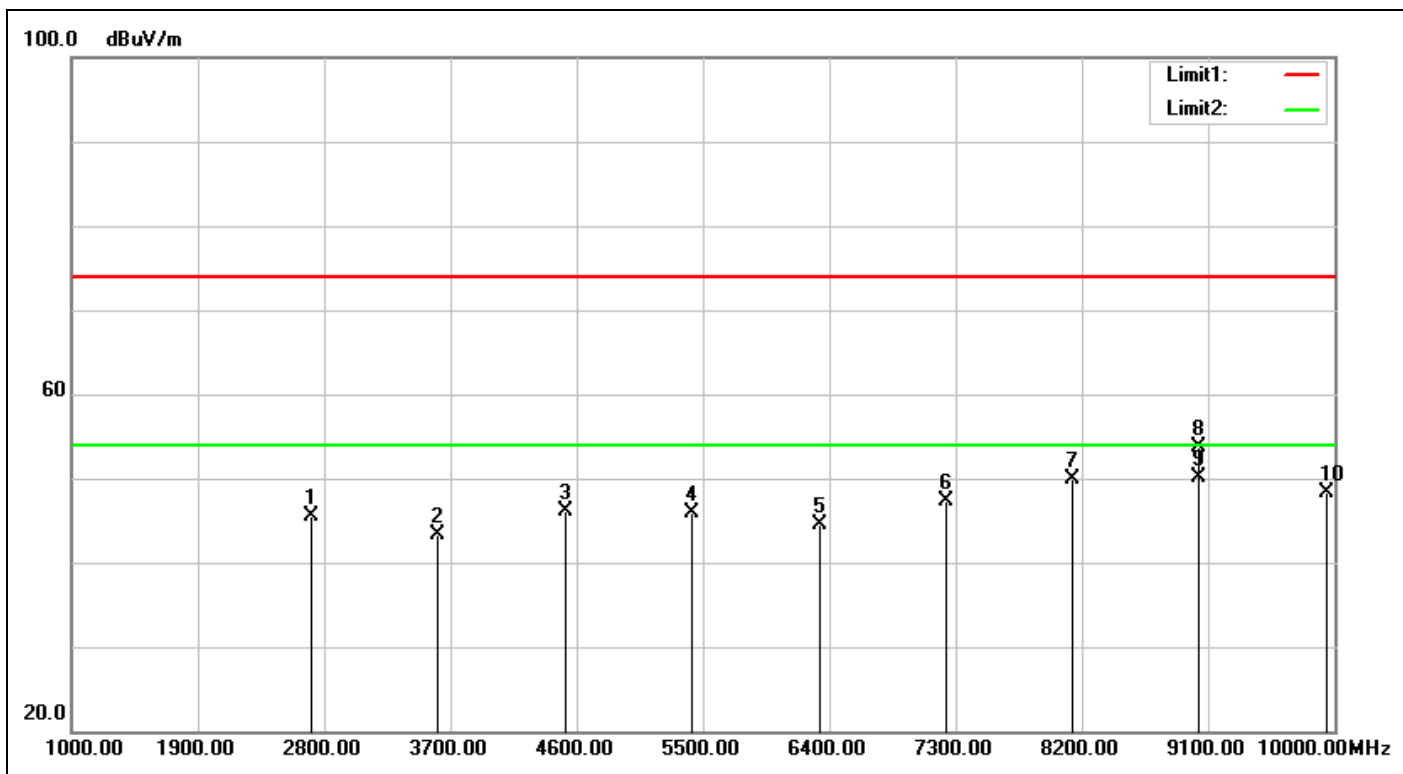
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	2701.000	-11.88	58.37	46.49	74.00	-27.51	peak	100	120	
2	3610.000	-11.42	58.58	47.16	74.00	-26.84	peak	100	76	
3	4510.000	-9.40	58.60	49.20	74.00	-24.80	peak	100	312	
4	5410.000	-7.27	53.43	46.16	74.00	-27.84	peak	100	62	
5	6319.000	-2.85	48.78	45.93	74.00	-28.07	peak	100	140	
6	7219.000	-2.72	52.78	50.06	74.00	-23.94	peak	100	220	
7	8119.000	-2.50	54.13	51.63	74.00	-22.37	peak	100	104	
8	9028.000	-2.30	53.97	51.67	74.00	-22.33	peak	100	240	
9	9928.000	-3.52	53.29	49.77	74.00	-24.23	peak	100	104	



Service No.:	114080238	Test Distance:	3m
Test Standard:	FCC Above 1G PEAK	Ant. Polarization:	Vertical
Test item:	Radiation Emission	Test Time:	2018/9/3 16:18:31
Applicant:	GloabalSat	Test Rating:	DC 5V
Product:	Sigfox Tracker	Temp.(°C)/Hum.(%)	21(°C)/57%
Model No.:	ST-100U	Test Engineer:	Kevin Kuo
Test Mode:	902.1375M-TX		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	2706.000	-11.87	62.19	50.32	74.00	-23.68	peak	100	160	
2	3608.000	-11.42	59.74	48.32	74.00	-25.68	peak	100	66	
3	4510.000	-9.40	56.06	46.66	74.00	-27.34	peak	100	257	
4	4978.000	-8.92	55.57	46.65	74.00	-27.35	peak	100	71	
5	7219.000	-2.72	52.01	49.29	74.00	-24.71	peak	100	276	
6	8119.000	-2.50	51.11	48.61	74.00	-25.39	peak	100	63	
7	9028.000	-2.30	56.60	54.30	74.00	-19.70	peak	100	88	
8	9028.000	-2.30	52.98	50.68	54.00	-3.32	AVG	100	88	

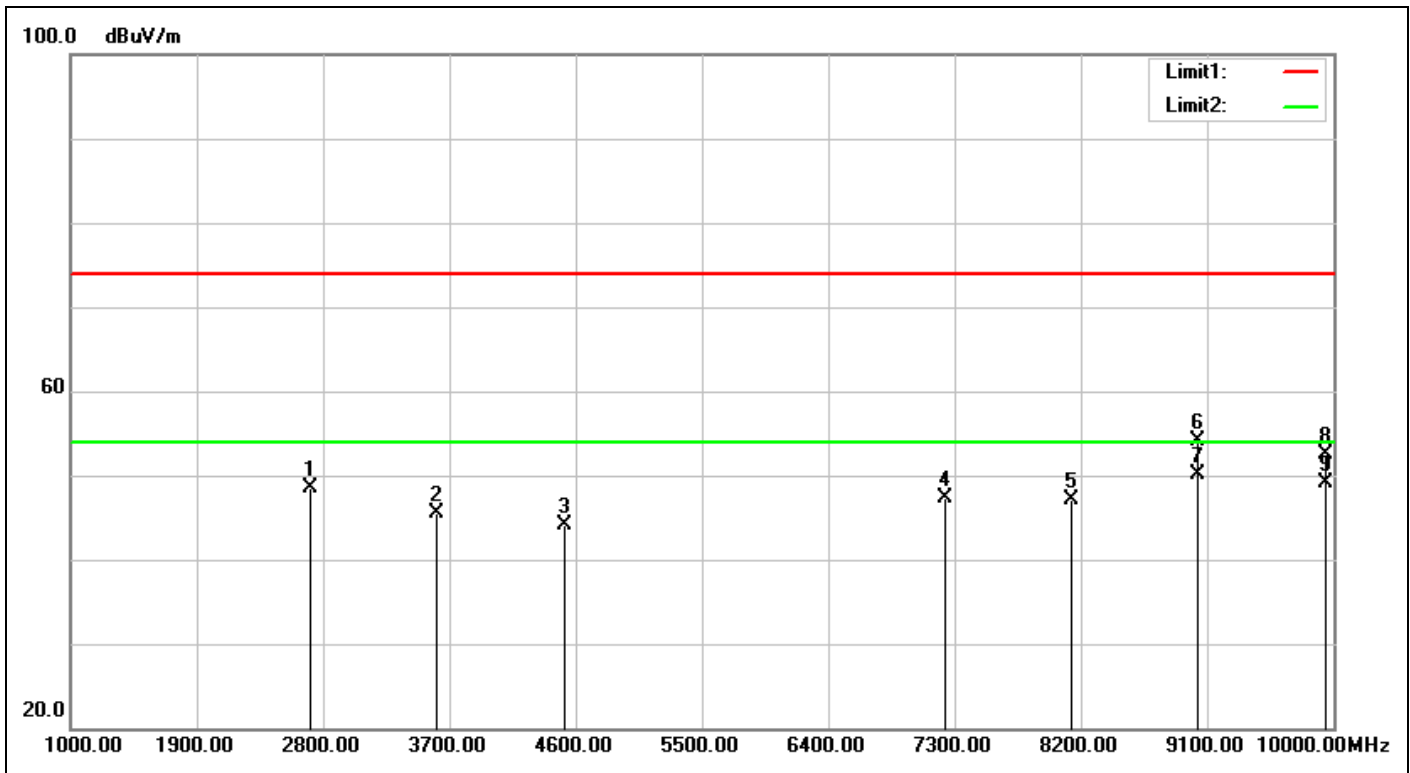
9	9928.000	-3.52	56.62	53.10	74.00	-20.90	peak	100	96	
10	9928.000	-3.52	54.35	50.83	54.00	-3.17	AVG	100	96	



Service No.:	114080238	Test Distance:	3m
Test Standard:	FCC Above 1G PEAK	Ant. Polarization:	Horizontal
Test item:	Radiation Emission	Test Time:	2018/9/3 16:33:35
Applicant:	GloabalSat	Test Rating:	DC 5V
Product:	Sigfox Tracker	Temp.(°C)/Hum.(%):	21(°C)/57%
Model No.:	ST-100U	Test Engineer:	Kevin Kuo
Test Mode:	903.4125M-TX		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	2710.000	-11.87	57.46	45.59	74.00	-28.41	peak	100	122	
2	3610.000	-11.42	54.63	43.21	74.00	-30.79	peak	100	67	
3	4519.000	-9.39	55.54	46.15	74.00	-27.85	peak	100	202	
4	5419.000	-7.23	53.22	45.99	74.00	-28.01	peak	100	133	
5	6328.000	-2.82	47.26	44.44	74.00	-29.56	peak	100	180	
6	7228.000	-2.70	50.02	47.32	74.00	-26.68	peak	100	14	
7	8137.000	-2.47	52.46	49.99	74.00	-24.01	peak	100	213	
8	9037.000	-2.31	56.03	53.72	74.00	-20.28	peak	100	235	

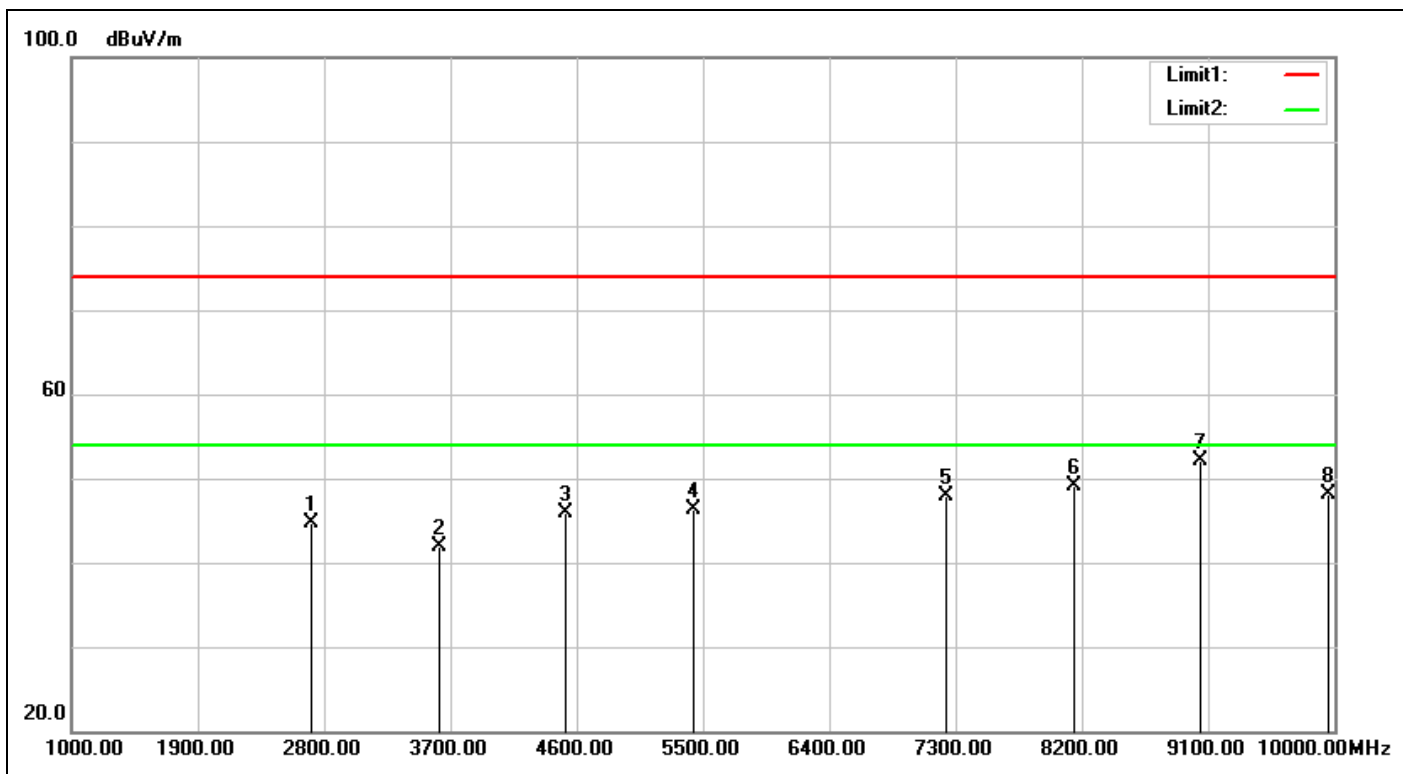
9	9037.000	-2.31	52.37	50.06	54.00	-3.94	AVG	100	235	
10	9946.000	-3.57	51.79	48.22	74.00	-25.78	peak	100	324	



Service No.:	114080238	Test Distance:	3m
Test Standard:	FCC Above 1G PEAK	Ant. Polarization:	Vertical
Test item:	Radiation Emission	Test Time:	2018/9/3 16:34:38
Applicant:	GloabalSat	Test Rating:	DC 5V
Product:	Sigfox Tracker	Temp.(°C)/Hum.(%)	21(°C)/57%
Model No.:	ST-100U	Test Engineer:	Kevin Kuo
Test Mode:	903.4125M-TX		
Remark:			

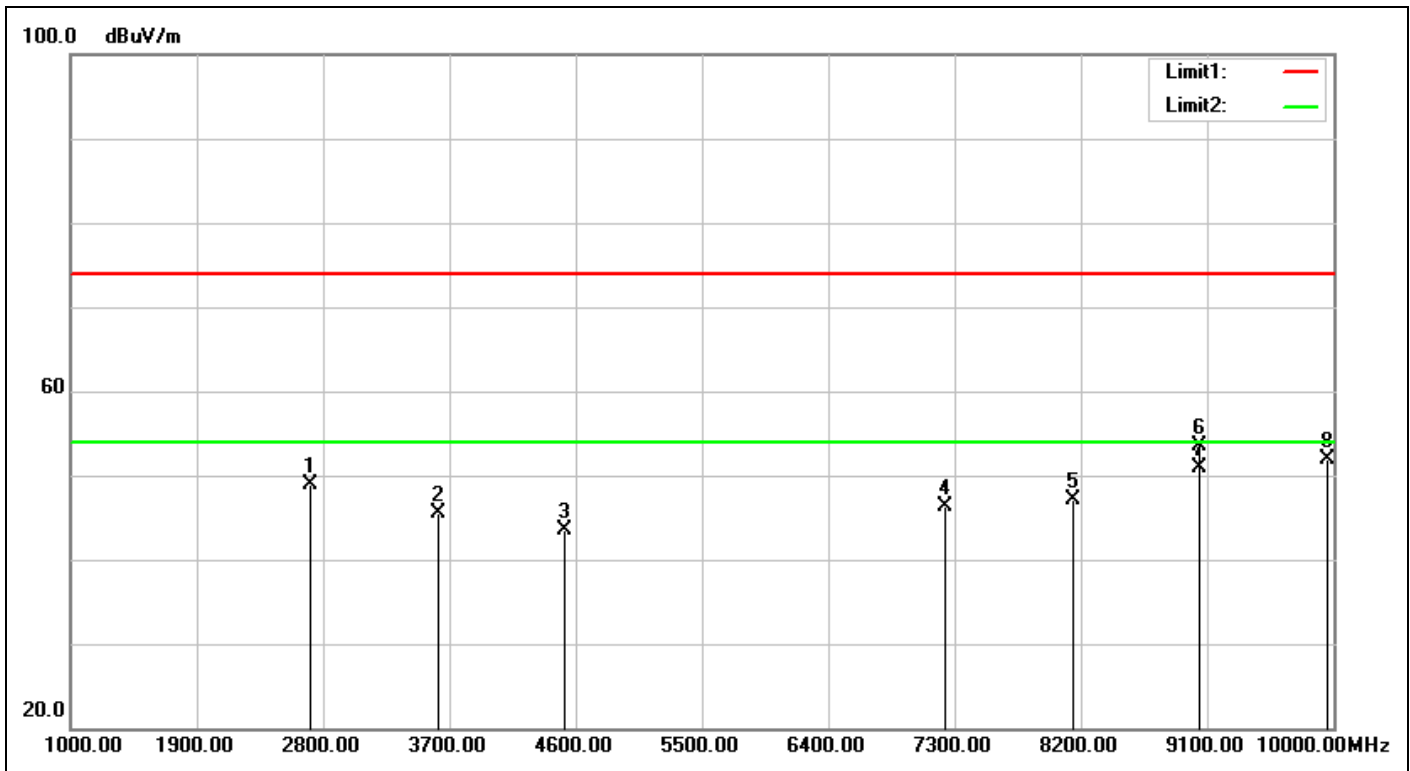
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	2710.000	-11.87	60.36	48.49	74.00	-25.51	peak	100	155	
2	3610.000	-11.42	57.00	45.58	74.00	-28.42	peak	100	92	
3	4519.000	-9.39	53.46	44.07	74.00	-29.93	peak	100	211	
4	7228.000	-2.70	49.91	47.21	74.00	-26.79	peak	100	266	
5	8137.000	-2.47	49.52	47.05	74.00	-26.95	peak	100	111	
6	9037.000	-2.31	56.36	54.05	74.00	-19.95	peak	100	86	
7	9037.000	-2.31	52.34	50.03	54.00	-3.97	AVG	100	86	
8	9946.000	-3.57	56.16	52.59	74.00	-21.41	peak	100	92	

9	9946.000	-3.57	52.58	49.01	54.00	-4.99	AVG	100	92	
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Service No.:	114080238	Test Distance:	3m
Test Standard:	FCC Above 1G PEAK	Ant. Polarization:	Horizontal
Test item:	Radiation Emission	Test Time:	2018/9/3 16:43:56
Applicant:	GloabalSat	Test Rating:	DC 5V
Product:	Sigfox Tracker	Temp.(°C)/Hum.(%):	21(°C)/57%
Model No.:	ST-100U	Test Engineer:	Kevin Kuo
Test Mode:	904.6625M-TX		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	2710.000	-11.87	56.57	44.70	74.00	-29.30	peak	100	122	
2	3619.000	-11.40	53.34	41.94	74.00	-32.06	peak	100	221	
3	4523.000	-9.39	55.25	45.86	74.00	-28.14	peak	100	229	
4	5428.000	-7.20	53.42	46.22	74.00	-27.78	peak	100	122	
5	7237.000	-2.68	50.62	47.94	74.00	-26.06	peak	100	218	
6	8146.000	-2.47	51.65	49.18	74.00	-24.82	peak	100	210	
7	9046.000	-2.31	54.40	52.09	74.00	-21.91	peak	100	232	
8	9955.000	-3.58	51.77	48.19	74.00	-25.81	peak	100	332	



Service No.:	114080238	Test Distance:	3m
Test Standard:	FCC Above 1G PEAK	Ant. Polarization:	Vertical
Test item:	Radiation Emission	Test Time:	2018/9/3 16:44:59
Applicant:	GloabalSat	Test Rating:	DC 5V
Product:	Sigfox Tracker	Temp.(°C)/Hum.(%):	21(°C)/57%
Model No.:	ST-100U	Test Engineer:	Kevin Kuo
Test Mode:	904.6625M-TX		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	2710.000	-11.87	60.68	48.81	74.00	-25.19	peak	100	172	
2	3619.000	-11.40	56.92	45.52	74.00	-28.48	peak	100	75	
3	4519.000	-9.39	52.95	43.56	74.00	-30.44	peak	100	175	
4	7237.000	-2.68	48.92	46.24	74.00	-27.76	peak	100	266	
5	8146.000	-2.47	49.57	47.10	74.00	-26.90	peak	100	61	
6	9046.000	-2.31	55.89	53.58	74.00	-20.42	peak	100	83	
7	9046.000	-2.31	53.27	50.96	54.00	-3.04	AVG	100	83	
8	9955.000	-3.58	55.49	51.91	74.00	-22.09	peak	100	86	

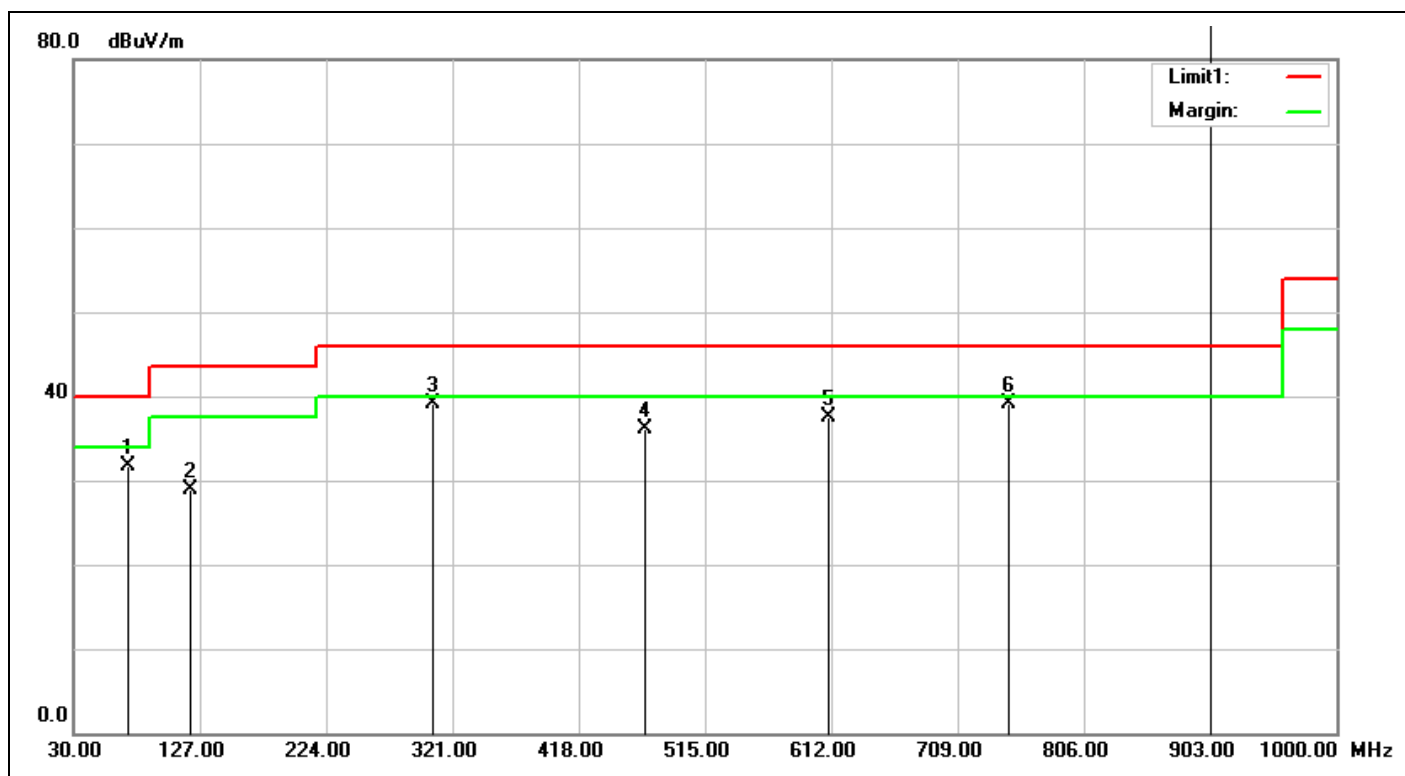
Spurious Emissions, TX Mode, 30M-1G



TUV Rheinland Taiwan Ltd.

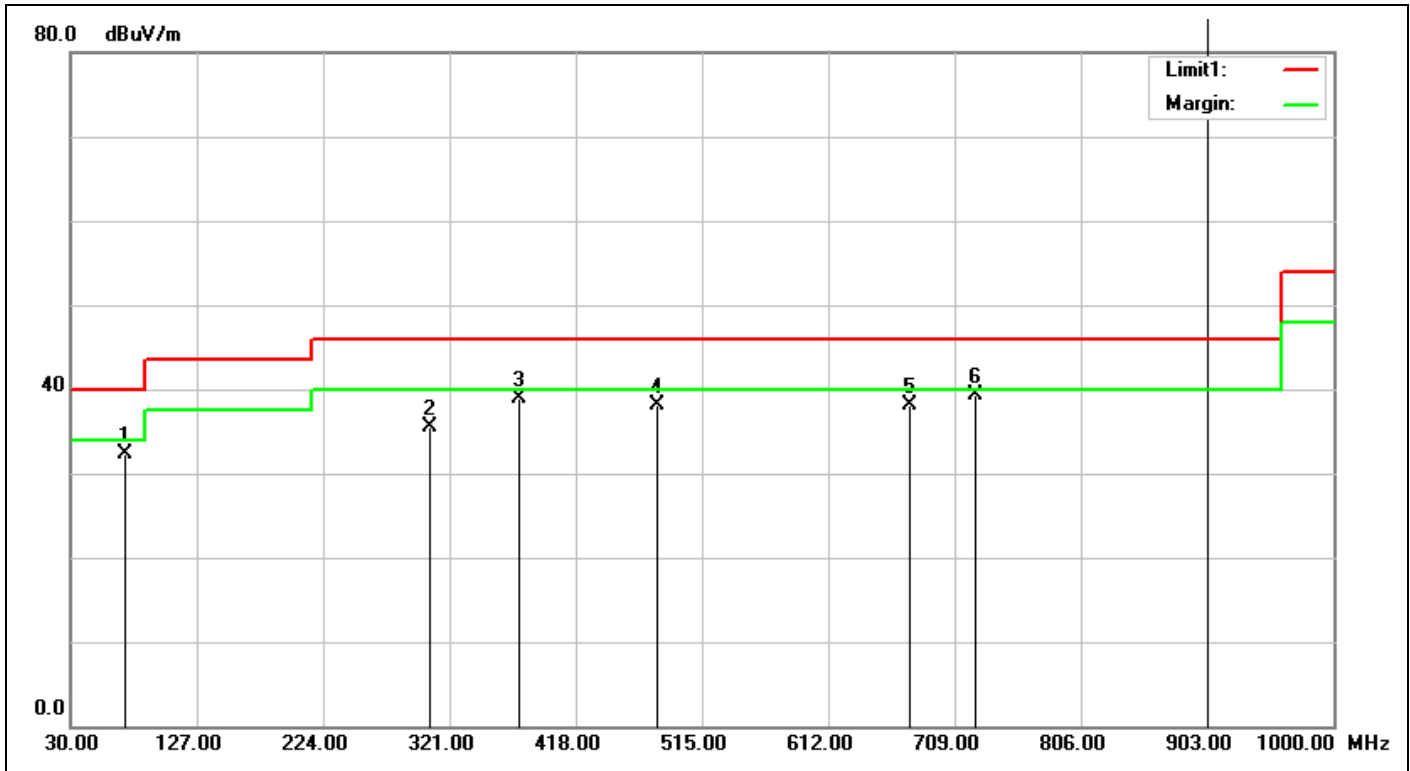
11F., No.758, Sec.4 Bade Road. Songshan Dist, Taipei City 105

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



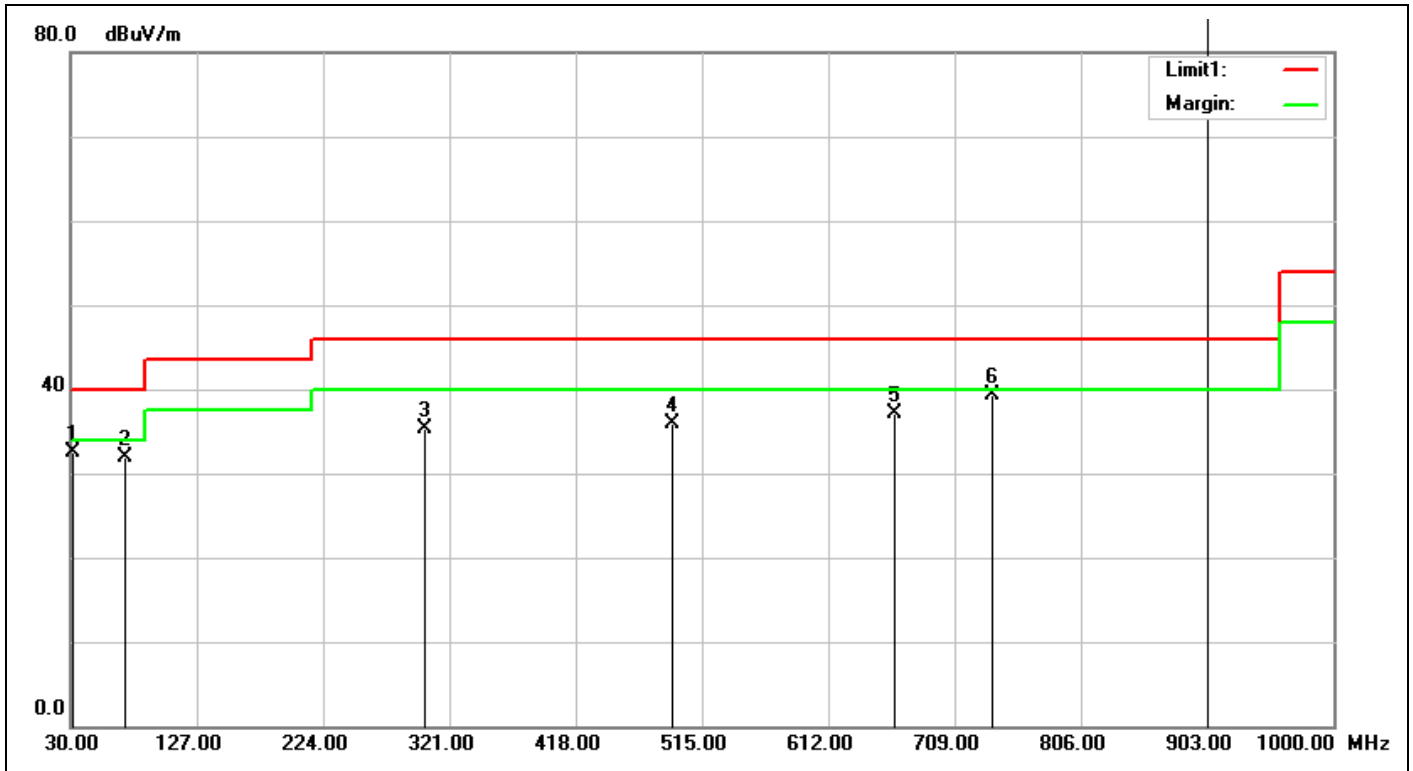
Service No.:	114080238	Test Distance:	3m
Test Standard:	FCC Class B 3M Radiation	Ant. Polarization:	Horizontal
Test item:	Radiation Emission	Test Time:	2018/9/4 20:27:13
Applicant:	GloabalSat	Test Rating:	DC 5V
Product:	Sigfox Tracker	Temp.(°C)/Hum.(%)	24(°C)/48%
Model No.:	ST-100U	Test Engineer:	Kevin Kuo
Test Mode:	902.1375M-TX		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	71.7100	-14.36	46.15	31.79	40.00	-8.21	QP	100	132	
2	119.2400	-9.00	37.87	28.87	43.50	-14.63	QP	100	115	
3	305.4800	-5.98	44.99	39.01	46.00	-6.99	QP	100	36	
4	468.4400	-2.96	39.06	36.10	46.00	-9.90	QP	100	59	
5	610.0600	-0.78	38.35	37.57	46.00	-8.43	QP	100	191	
6	748.7700	1.46	37.56	39.02	46.00	-6.98	QP	100	244	
7	903.0000	3.92	102.71	106.63	46.00	60.63	peak	100	20	TX



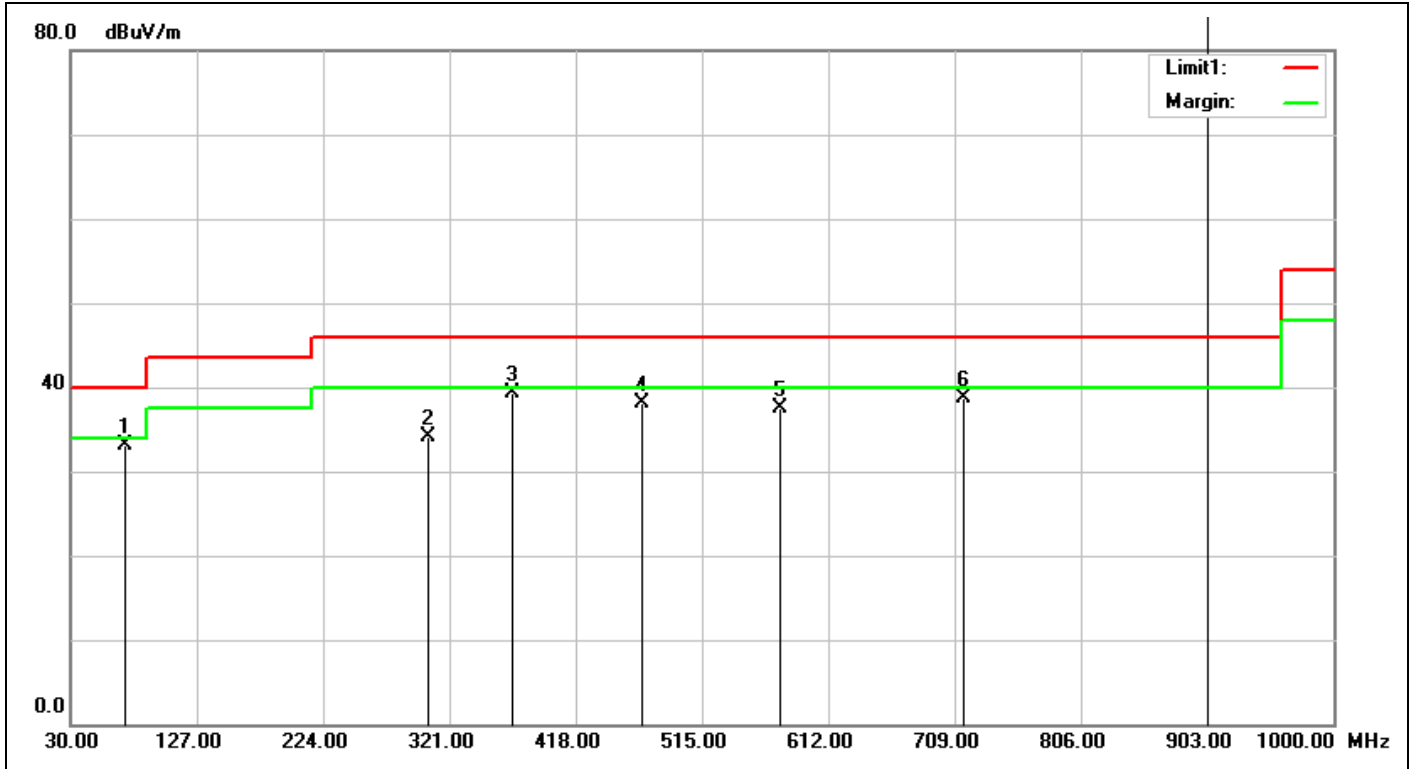
Service No.:	114080238	Test Distance:	3m
Test Standard:	FCC Class B 3M Radiation	Ant. Polarization:	Vertical
Test item:	Radiation Emission	Test Time:	2018/9/4 20:23:16
Applicant:	GloabalSat	Test Rating:	DC 5V
Product:	Sigfox Tracker	Temp.(°C)/Hum.(%):	24(°C)/48%
Model No.:	ST-100U	Test Engineer:	Kevin Kuo
Test Mode:	902.1375M-TX		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	71.7100	-14.36	46.58	32.22	40.00	-7.78	QP	100	107	
2	306.4500	-5.95	41.47	35.52	46.00	-10.48	QP	100	336	
3	374.3500	-4.27	43.11	38.84	46.00	-7.16	QP	100	334	
4	480.0799	-2.71	40.91	38.20	46.00	-7.80	QP	100	101	
5	675.0500	0.02	38.18	38.20	46.00	-7.80	QP	100	36	
6	725.4900	1.00	38.33	39.33	46.00	-6.67	QP	100	255	
7	903.0000	3.92	107.56	111.48	46.00	65.48	peak	100	145	TX



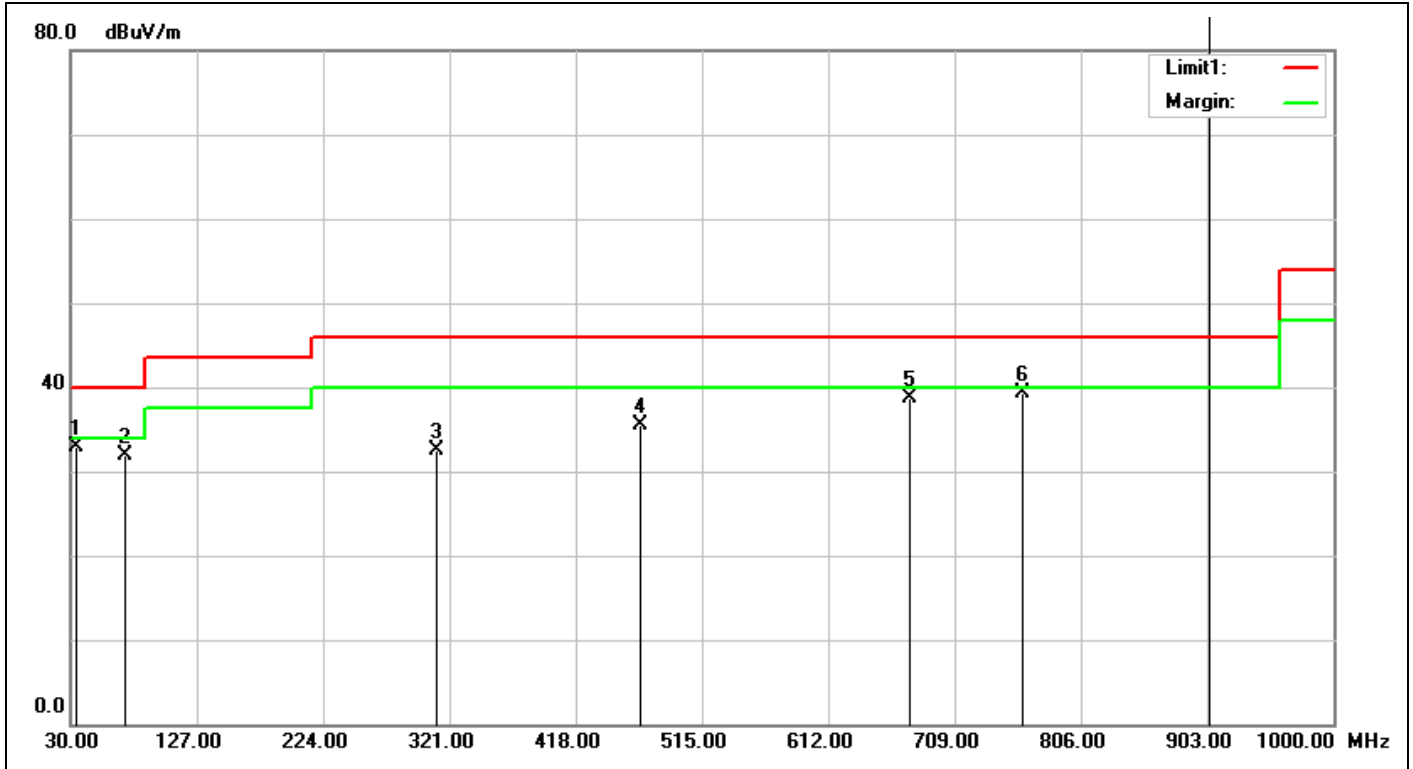
Service No.:	114080238	Test Distance:	3m
Test Standard:	FCC Class B 3M Radiation	Ant. Polarization:	Horizontal
Test item:	Radiation Emission	Test Time:	2018/9/4 20:34:40
Applicant:	GloabalSat	Test Rating:	DC 5V
Product:	Sigfox Tracker	Temp.(°C)/Hum.(%):	24(°C)/48%
Model No.:	ST-100U	Test Engineer:	Kevin Kuo
Test Mode:	903.4125M-TX		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	31.9400	-2.55	34.99	32.44	40.00	-7.56	QP	100	64	
2	71.7100	-14.36	46.18	31.82	40.00	-8.18	QP	100	103	
3	302.5700	-6.06	41.40	35.34	46.00	-10.66	QP	100	27	
4	491.7200	-2.47	38.38	35.91	46.00	-10.09	QP	100	128	
5	663.4099	-0.20	37.27	37.07	46.00	-8.93	QP	100	233	
6	738.1000	1.25	38.09	39.34	46.00	-6.66	QP	100	158	
7	903.9700	3.95	101.78	105.73	46.00	59.73	peak	100	265	TX



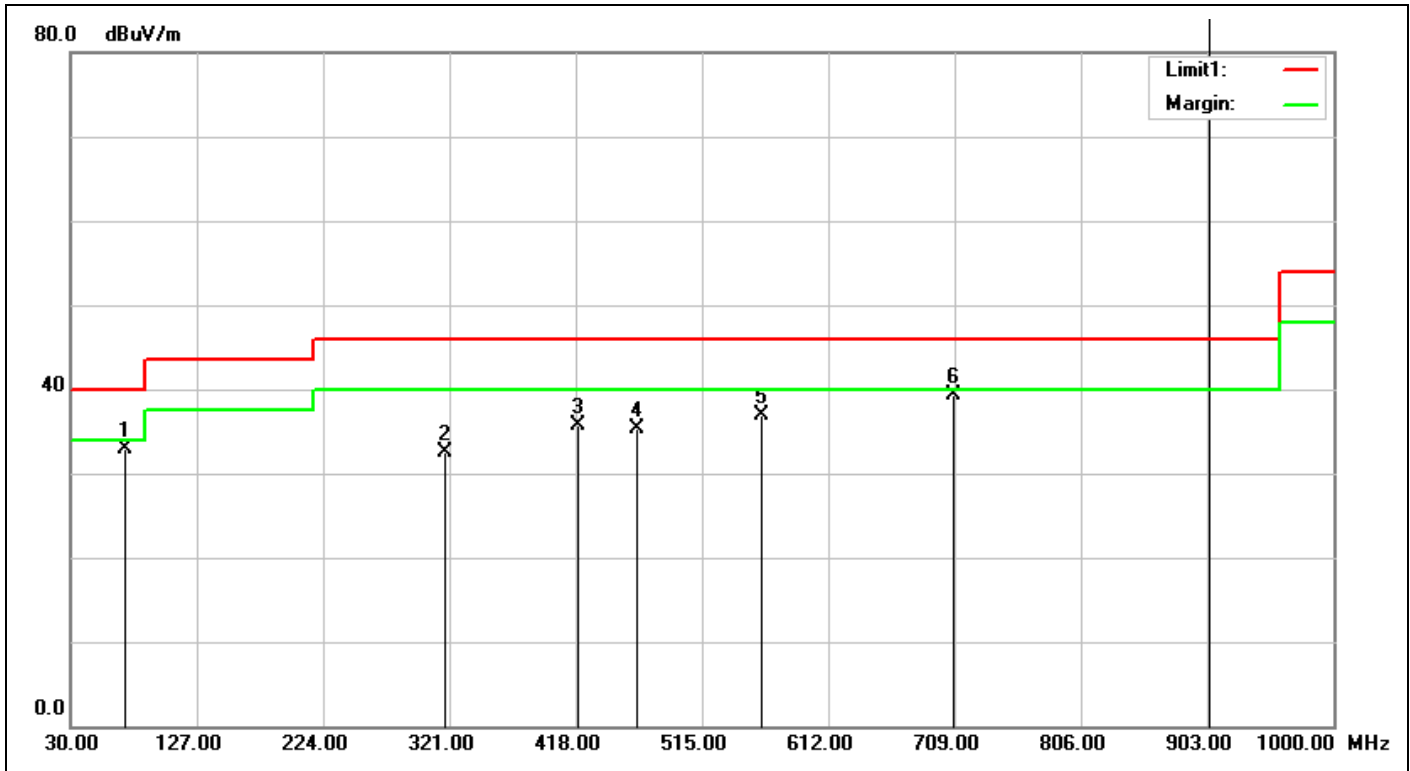
Service No.:	114080238	Test Distance:	3m
Test Standard:	FCC Class B 3M Radiation	Ant. Polarization:	Vertical
Test item:	Radiation Emission	Test Time:	2018/9/4 20:32:39
Applicant:	GloabalSat	Test Rating:	DC 5V
Product:	Sigfox Tracker	Temp.(°C)/Hum.(%):	24(°C)/48%
Model No.:	ST-100U	Test Engineer:	Kevin Kuo
Test Mode:	903.4125M-TX		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	71.7100	-14.36	47.52	33.16	40.00	-6.84	QP	100	113	
2	304.5100	-6.01	40.04	34.03	46.00	-11.97	QP	100	205	
3	369.5000	-4.36	43.71	39.35	46.00	-6.65	QP	100	151	
4	468.4400	-2.96	41.15	38.19	46.00	-7.81	QP	100	322	
5	575.1400	-1.28	38.76	37.48	46.00	-8.52	QP	100	69	
6	715.7900	0.80	37.91	38.71	46.00	-7.29	QP	100	308	
7	903.9700	3.95	106.63	110.58	46.00	64.58	peak	100	199	TX



Service No.:	114080238	Test Distance:	3m
Test Standard:	FCC Class B 3M Radiation	Ant. Polarization:	Horizontal
Test item:	Radiation Emission	Test Time:	2018/9/4 20:39:38
Applicant:	GloabalSat	Test Rating:	DC 5V
Product:	Sigfox Tracker	Temp.(°C)/Hum.(%):	24(°C)/48%
Model No.:	ST-100U	Test Engineer:	Kevin Kuo
Test Mode:	904.6625M-TX		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	33.8800	-3.70	36.62	32.92	40.00	-7.08	QP	100	54	
2	71.7100	-14.36	46.20	31.84	40.00	-8.16	QP	100	177	
3	311.3000	-5.81	38.22	32.41	46.00	-13.59	QP	100	299	
4	467.4700	-2.97	38.47	35.50	46.00	-10.50	QP	100	36	
5	675.0500	0.02	38.65	38.67	46.00	-7.33	QP	100	201	
6	761.3800	1.66	37.62	39.28	46.00	-6.72	QP	100	113	
7	904.9400	3.98	102.02	106.00	46.00	60.00	peak	100	254	TX



Service No.:	114080238	Test Distance:	3m
Test Standard:	FCC Class B 3M Radiation	Ant. Polarization:	Vertical
Test item:	Radiation Emission	Test Time:	2018/9/4 20:37:44
Applicant:	GloabalSat	Test Rating:	DC 5V
Product:	Sigfox Tracker	Temp.(°C)/Hum.(%):	24(°C)/48%
Model No.:	ST-100U	Test Engineer:	Kevin Kuo
Test Mode:	904.6625M-TX		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	71.7100	-14.36	47.18	32.82	40.00	-7.18	QP	100	313	
2	317.1200	-5.65	38.17	32.52	46.00	-13.48	QP	100	261	
3	419.9400	-3.59	39.22	35.63	46.00	-10.37	QP	100	57	
4	465.5300	-3.01	38.41	35.40	46.00	-10.60	QP	100	156	
5	560.5900	-1.51	38.49	36.98	46.00	-9.02	QP	100	29	
6	708.0300	0.65	38.63	39.28	46.00	-6.72	QP	100	25	
7	904.9400	3.98	106.63	110.61	46.00	64.61	peak	100	12	TX

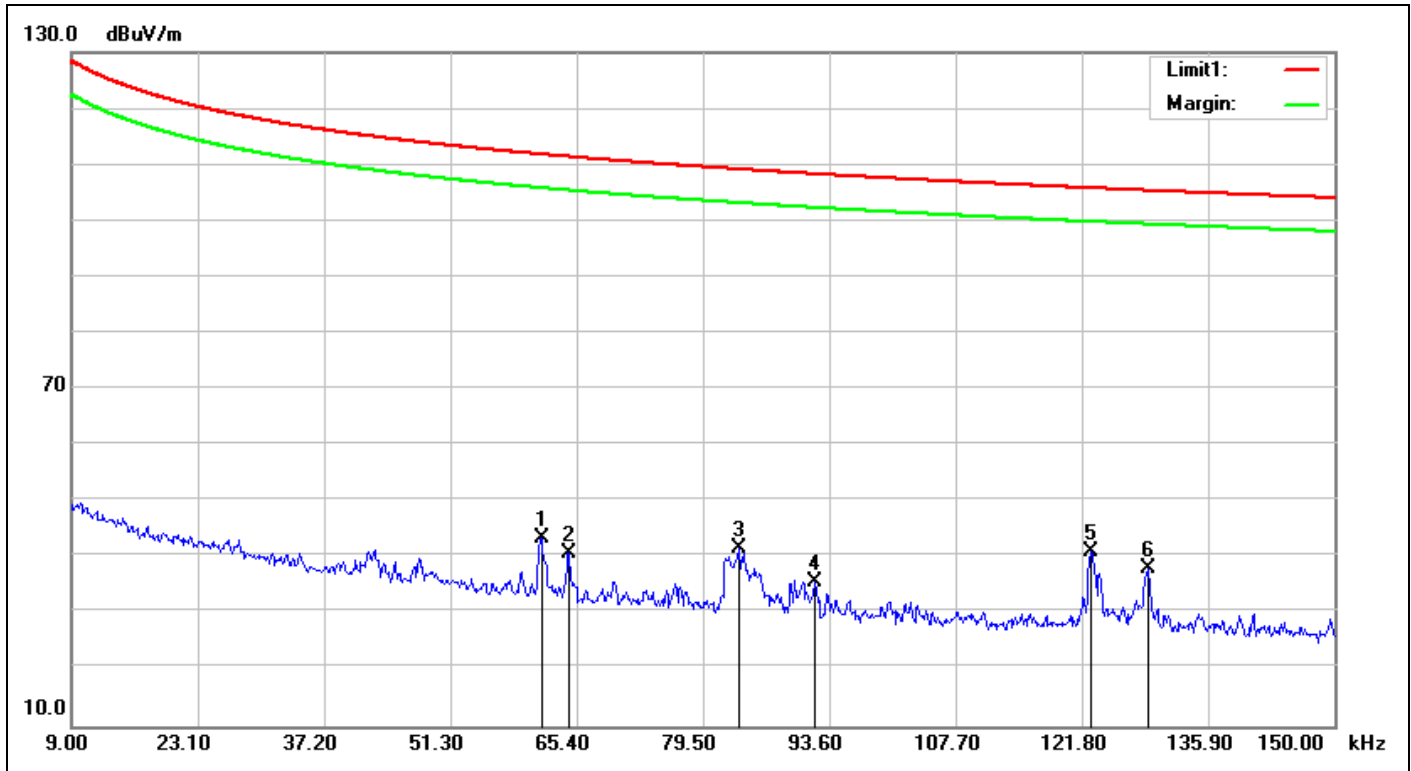
Spurious Emissions, TX Mode, 9K-30M



TUV Rheinland Taiwan Ltd.

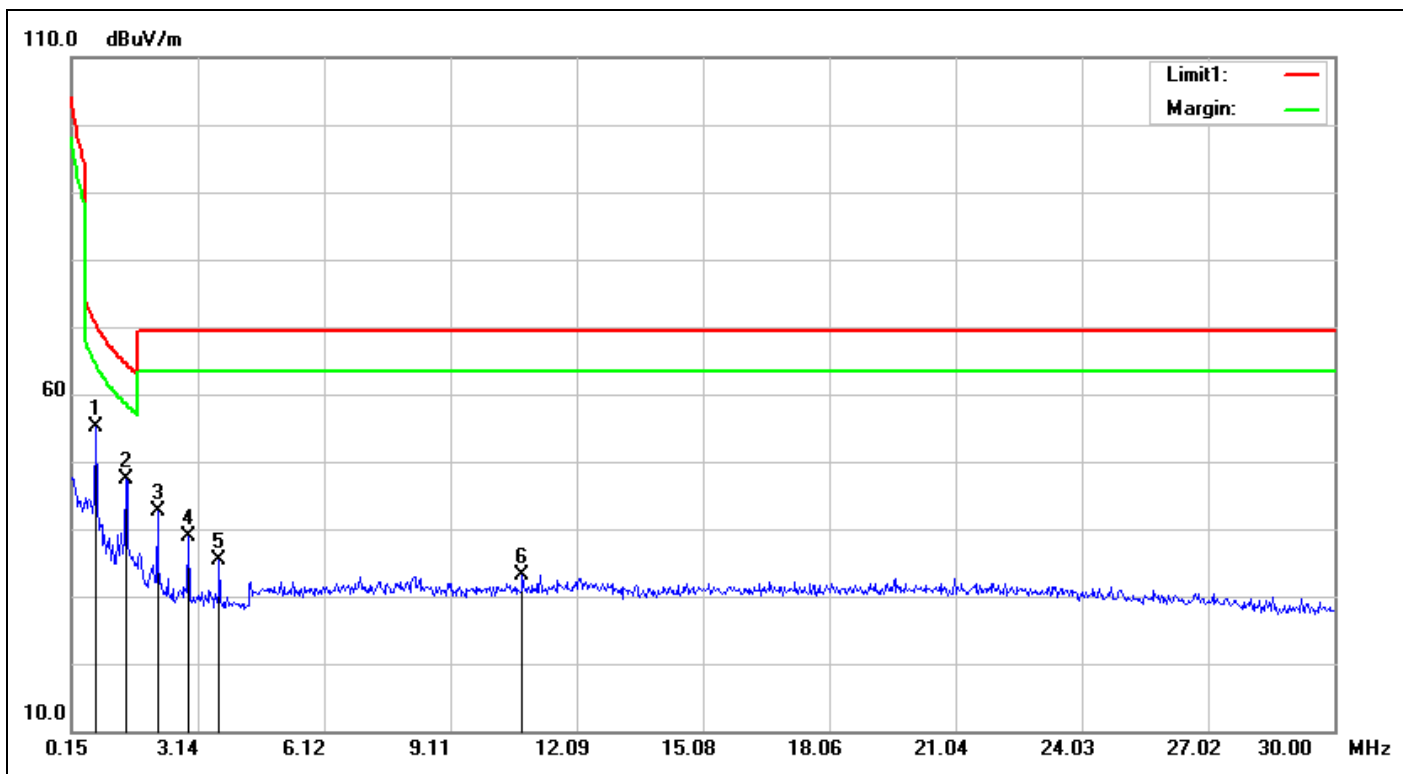
11F., No.758, Sec.4 Bade Road. Songshan Dist, Taipei City 105

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



Service No.:	114080238	Test Distance:	3m
Test Standard:	FCC15.209_9k-1G_3m	Ant. Polarization:	
Test item:	Radiation Emission	Test Time:	2018/8/27 09:50:42
Applicant:	GloabalSat	Test Rating:	DC 5V
Product:	Sigfox Tracker	Temp.(°C)/Hum.(%):	25.4(°C)/56%
Model No.:	ST-100U	Test Engineer:	Amy Hsu
Test Mode:	903.4125M-TX		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	0.0614	18.78	24.72	43.50	111.83	-68.33	QP	100	284	
2	0.0645	18.75	22.02	40.77	111.40	-70.63	QP	100	284	
3	0.0834	18.52	23.20	41.72	109.17	-67.45	QP	100	271	
4	0.0920	18.42	17.25	35.67	108.32	-72.65	QP	100	277	
5	0.1227	18.34	22.73	41.07	105.82	-64.75	QP	100	261	
6	0.1292	18.34	19.62	37.96	105.37	-67.41	QP	100	261	



Service No.:	114080238	Test Distance:	3m
Test Standard:	FCC15.209_9k-1G_3m	Ant. Polarization:	
Test item:	Radiation Emission	Test Time:	2018/8/27 09:53:48
Applicant:	GloabalSat	Test Rating:	DC 5V
Product:	Sigfox Tracker	Temp.(°C)/Hum.(%):	25.4(°C)/56%
Model No.:	ST-100U	Test Engineer:	Amy Hsu
Test Mode:	903.4125M-TX		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	0.7171	18.66	36.54	55.20	70.50	-15.30	QP	100	259	
2	1.4335	18.65	28.63	47.28	64.50	-17.22	QP	100	259	
3	2.1798	18.59	24.07	42.66	69.50	-26.84	QP	100	255	
4	2.9260	18.53	20.32	38.85	69.50	-30.65	QP	100	259	
5	3.6424	18.83	16.55	35.38	69.50	-34.12	QP	100	259	
6	10.8064	20.54	12.53	33.07	69.50	-36.43	QP	100	248	

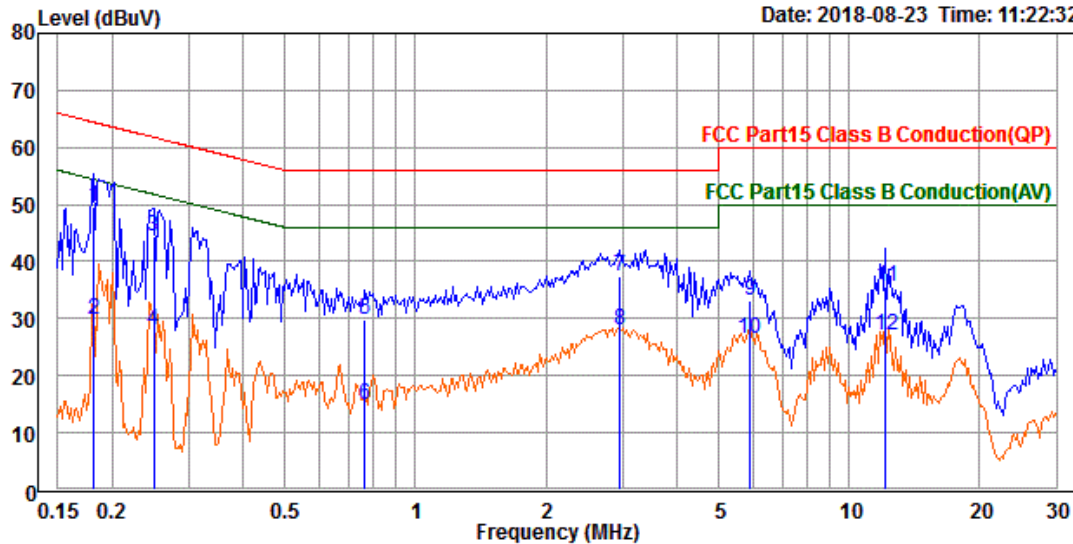
Spurious Emissions, Main



TUV Rheinland Taiwan Ltd.
11F., No.758, Sec.4 Bade Road. Songshan Dist, Taipei City 105
Tel:+886-2172-7000 Fax:+886-2528-0018

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Date: 2018-08-23 Time: 11:22:32



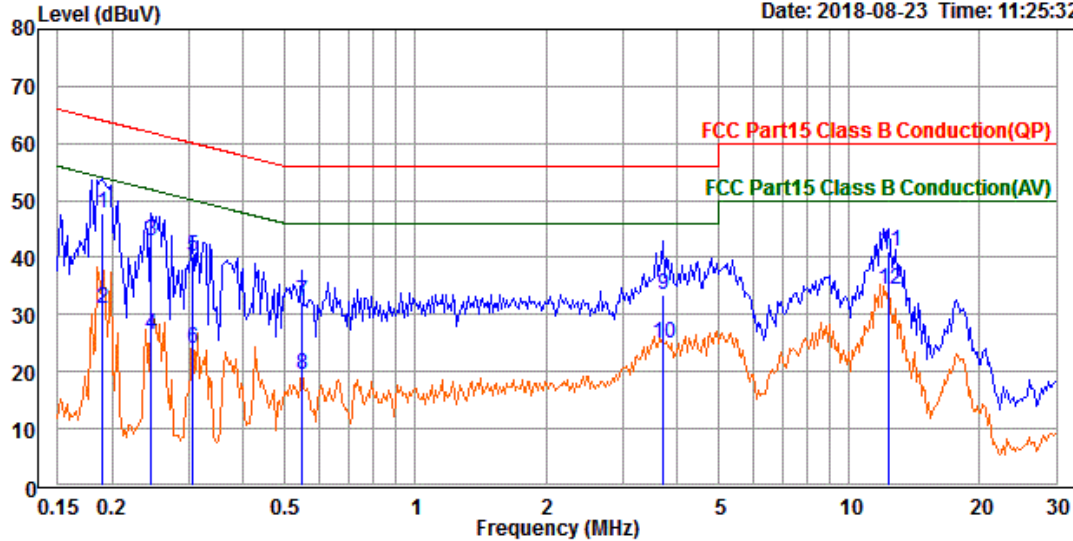
Trace: 1

Site : Conduction room
Condition : FCC Part15 Class B Conduction(QP) line1
Test Engineer: Amy Hsu
Applicant : Gloabalsat
Product : Sigfox Tracker
Model No. : ST-100U
Test Rating : 120Vac/60Hz
Tmp/Hum : 21 °C / 47 %
Memo :

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.181	39.94	9.68	49.62	64.43	-14.81	QP
2	0.181	20.01	9.68	29.69	54.43	-24.74	Average
3	0.249	34.82	9.68	44.50	61.79	-17.29	QP
4	0.249	18.42	9.68	28.10	51.79	-23.69	Average
5	0.766	20.05	9.70	29.75	56.00	-26.25	QP
6	0.766	5.12	9.70	14.82	46.00	-31.18	Average
7	2.960	27.67	9.74	37.41	56.00	-18.59	QP
8	2.960	18.28	9.74	28.02	46.00	-17.98	Average
9	5.876	23.34	9.78	33.12	60.00	-26.88	QP
10	5.876	16.73	9.78	26.51	50.00	-23.49	Average
11	12.141	25.85	9.84	35.69	60.00	-24.31	QP
12	12.141	17.12	9.84	26.96	50.00	-23.04	Average

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Date: 2018-08-23 Time: 11:25:32



Trace: 1

Site : Conduction room
Condition : FCC Part15 Class B Conduction(QP) neutral
Test Engineer: Amy Hsu
Applicant : Gloabalsat
Product : Sigfox Tracker
Model No. : ST-100U
Test Rating : 120Vac/60Hz
Tmp/Hum : 21 °C / 47 %
Memo :

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.190	37.97	9.68	47.65	64.02	-16.37	QP
2	0.190	21.24	9.68	30.92	54.02	-23.10	Average
3	0.247	33.17	9.68	42.85	61.87	-19.02	QP
4	0.247	16.87	9.68	26.55	51.87	-25.32	Average
5	0.307	30.35	9.67	40.02	60.06	-20.04	QP
6	0.307	14.37	9.67	24.04	50.06	-26.02	Average
7	0.546	22.66	9.68	32.34	56.00	-23.66	QP
8	0.546	9.74	9.68	19.42	46.00	-26.58	Average
9	3.720	23.67	9.74	33.41	56.00	-22.59	QP
10	3.720	15.14	9.74	24.88	46.00	-21.12	Average
11	12.385	31.26	9.86	41.12	60.00	-18.88	QP
12	12.385	24.44	9.86	34.30	50.00	-15.70	Average