

TEST REPORT

FCC Part 15 : Subpart B – UNINTENTIONAL RADIATORS

FCC ID : 2AXGBCOXIC

Report Number :	EFC-2020-000006
Date of issue :	Apr.09.2021
Total number of pages :	16
Tested by (name + signature)	Seong Seungseop 성 승 섭
Approved by (name + signature) :	Lee Sang Yong 이 상 용
Testing Laboratory :	Korea Testing & Research institute (KTR)
Address :	98, Gyoyukwon-ro, Gwacheon-si, Gyeonggi-do, 13810, Korea
Applicant` s name :	CoX Space Co., Ltd
Address :	858ho, Business Support Hub, 815, Daewangpangyo-ro, Sujeong-gu, Seongnam-si, Gyeonggi-do, Republic of Korea
Manufacturer` s name :	CoX Space Co., Ltd
Address :	858ho, Business Support Hub, 815, Daewangpangyo-ro, Sujeong-gu, Seongnam-si, Gyeonggi-do, Republic of Korea
Test specification :	
Standard :	FCC Part 15 : Subpart B – UNINTENTIONAL RADIATORS
Test procedure :	KTR-QM-01
Non-standard test method:	N/A
Test Report Form No :	KTR-QI-Y10053-F19(00)
Test Reoprt Form(s) Originator :	Korea Testing & Research institute
Master TRF:	Dated 2012-06
General remarks :	<ol style="list-style-type: none"> 1. The test results of this test report are only limited in to the samples and sample names provided by the client and do not guarantee the quality of all products of the client. You can check website (www.ktr.or.kr) or QR code to verify the authenticity of the certificate. 2. This test report shall be used only within the purpose of its defined usage and shall not be used for public relation, advertisement and lawsuit. 3. This test report is only valid when printed on KTR original report paper with hologram and when re-issued by KTR. The copy and the electronic file of the test report are only for reference. 4. This test report is a revised version which replaces the existing report, due to the addition of FCC ID
Test item description	
Manufacturer :	CoX Space Co., Ltd
Model/Type reference :	COXiC / SNOWL Charger Cradle
Ratings :	DC 3.7 V(Battery)



Summary of testing	
Tests performed (name of test and test clause): FCC Part 15 : Subpart B – UNINTENTIONAL RADIATORS – 15.107 Limits of disturbance voltages in the frequency range 150 kHz to 30 MHz – 15.109 Limits of radiated disturbance in the frequency range 30 MHz to 1 000 MHz	Testing location: 98, Gyoyukwon-ro, Gwacheon-si, Gyeonggi-do, 13810, Korea
Summary of compliance with National Differences: N/A	
Copy of marking plate: N/A	
Possible test case verdicts	
– test case does not apply to the test object:	N/A
– test object does meet the requirement :	P (Pass)
– test object does not meet the requirement :	F (Fail)
Testing	
Date of receipt of test item.....:	2020. 06. 29.
Date (s) of performance of tests.....:	2020. 08. 25. ~ 2020. 08. 26.
Complementary items.....:	–

FCC Part 15 : Subpart B – UNINTENTIONAL RADIATORS

Item	Description	
1.1...	General Description	4
1.1.1	Laboratory information	4
1.1.2	Equipment Description	4
1.1.3	Additional information about the EUT	4
1.1.4	Equipment Used During Test	5
1.1.5	Power Interface	5
1.1.6	Information of Manufacture	5
1.2...	EUT Operation Modes	5
1.3...	EUT Configuration Modes	5
1.4...	Input/Output Ports	6
1.5...	EUT Internal Clock Frequencies or Oscillator Frequencies	6
1.6...	Result Summary	6
1.7...	Measurement Uncertainty	6
1.8...	Test Conditions and Results - Limits of disturbance voltage in the frequency range:150 kHz to 30 MHz	7
1.9...	Test Conditions and Results - Limits of radiated disturbance in the frequency range : 30 MHz to 1 000 MHz	13

1.1 General Description

1.1.1 Laboratory information

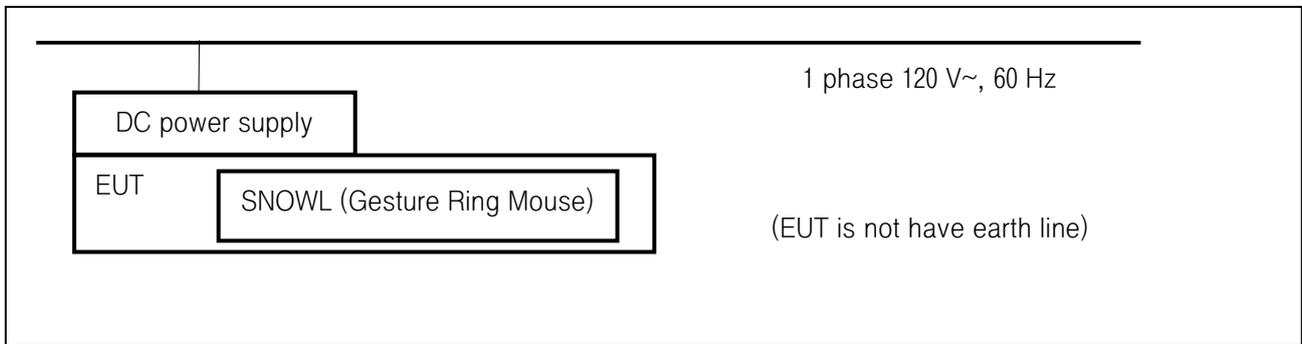
The 10 m semi-anechoic chamber and/or EMC facilities are used for these testing.
 These facilities were accredited by KOLAS, KC, KCC of Korea, FCC of USA and VCCI of Japan

Address
 KOREA TESTING & RESEARCH INSTITUTE.
 98, Gyoyukwon-ro, Gwacheon-si, Gyeonggi-do, 13810, Korea
 Korea Telephone No. : + 82-2-2092-4088
 Facsimile No. : + 82-2-2635-6103

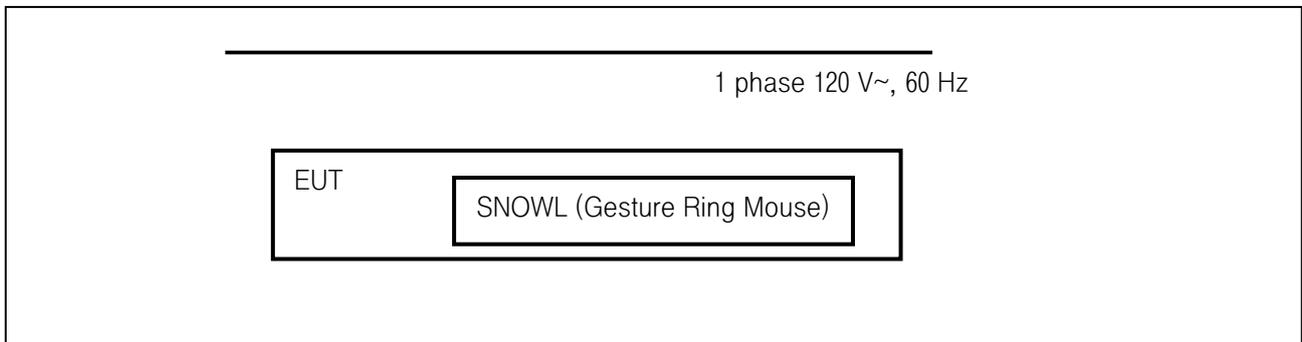
Registered No.
 KOLAS : 011
 KC : J
 KCC & FCC : KCC & FCC : KR0030(Designation), FCC : 503434(Registration)
 VCCI Reg. No. : C-2363, R-2183

1.1.2 Equipment Description

[#1 Charge+Discharge]



[#2 Discharge]



1.1.3 Additional information about the EUT

Basic model	Variable Model name base	Variable	Range of variable	Comments
-	-	-	-	-

1.1.4 Equipment Used During Test

Use*	Product Type	Manufacturer	Model	Comments
EUT	SNOWL Charger Cradle	CoX Space Co., Ltd	COXiC	-
ACC	DC power supply	Flextronics Power Systems (Dongguan)	A1205	Output : 5 Vd.c.
	SNOWL (Gesture Ring Mouse)	CoX Space Co., Ltd	COXiC	-

* Use = EUT – Equipment Under Test, ACC – Accessory (Not Subjected to Test), or SIM – Simulator (Not Subjected to Test)

1.1.5 Power Interface

Mode #	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
1	120	-	-	AC - 60	1	Powered from DC power supply (EUT : 5 Vd.c. Charge)
2	-	-	-	-	-	No external power (discharge state)

1.1.6 Information of Manufacture

Information	
1	Manufacture & Address CoX Space Co., Ltd 858ho, Business Support Hub, 815, Daewangpangyo-ro, Sujeong-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

1.2 EUT Operation Modes

Mode #	Description
1	Discharge + Charge
2	Discharge

1.3 EUT Configuration Modes

Mode #	Description
1	Discharge + Charge
2	Discharge

1.4 Input/Output Ports

Port #	Name	Type	Cable Max. > 3 m	Cable Shielded	Connected to
1	DC IN	LINE	1.0	No	DC power supply
2	DC OUT	LINE	0.0	No	SNOWL (Gesture Ring Mouse)

1.5 EUT Internal Clock Frequencies or Oscillator Frequencies

Frequency (MHz)	Description
-	N/A

1.6 Result Summary

FCC Part 15		
Clause	Requirement – Test	Result
15.107	Limits of disturbance voltages in the frequency range 150 kHz to 30 MHz	PASS
15.109	Limits of radiated disturbance in the frequency range 30 MHz to 1 000 MHz	PASS

1.7 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2017

All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty
Conducted Emissions(150 kHz ~ 30 MHz)	± 2.30 dB
Radiated Spurious Emissions(Below 1 GHz)	± 4.10 dB

1.8 Test Conditions and Results – Limits of disturbance voltage in the frequency range:150 kHz to 30 MHz

1.7	TEST: Limits of terminal disturbance voltages in the frequency range 150 kHz to 30 MHz				Verdict
Method	Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. All power was connected to the system through Line Impedance Stabilization Networks (LISN). Conducted voltage measurements on mains lines were made at the output of the LISN. Conducted voltage on load terminals and additional terminals were made by using a 1 500 Ω probe.				P
Parameters recorded during the test		Laboratory Ambient Temperature		(20.4 \pm 1.0) $^{\circ}$ C	
		Relative Humidity		(44.5 \pm 1.0) %	
		Air pressure		(100.0 \pm 1.0) kPa	
Date of Test		2020. 08. 25.			
Fully configured sample scanned over the following frequency range		150 kHz to 30 MHz			
Except for Class A digital devices					
Limits – At mains terminals					
Frequency (MHz)	Limit (dB(μ V))				
	Quasi-Peak	Result	Average	Result	
0.15 to 0.5	56 ~ 66	PASS	46 ~ 56	PASS	
0.5 to 5	56	PASS	46	PASS	
5 to 30	60	PASS	50	PASS	
Supplementary information: None					
Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Test Receiver	R & S	ESCI	101138	2020. 11. 10.	2021. 11. 10.
LISN	R & S	ENV216	101365	2021. 02. 25.	2022. 02. 25.
Extension Cable	TESTEK	Extension Cable	-	2021. 02. 25.	2022. 02. 25.

Test set-up



EUT Operation mode : MODE #1 Discharge + Charge

Test results : PASS

Frequency [MHz]	Correction Factor [dB]		LISN Line	QuasiPeak [dB(μV)]	Limit [dB(μV)]	Margin [dB]
	LISN	Cable Loss				
0.166	9.60	0.01	L	28.81	65.16	<<
0.274	9.62	0.01	L	25.08	61.00	<<
0.374	9.63	0.01	L	26.52	58.41	<<
0.406	9.63	0.01	L	19.59	57.73	<<
0.574	9.64	0.01	L	14.08	56.00	<<
1.106	9.65	0.01	L	11.93	56.00	<<
Frequency [MHz]	Correction Factor [dB]		LISN Line	CAverage [dB(μV)]	Limit [dB(μV)]	Margin [dB]
	LISN	Cable Loss				
0.366	9.63	0.01	L	18.23	48.59	<<
0.430	9.63	0.01	L	6.70	47.25	<<
0.594	9.64	0.01	L	6.82	46.00	<<
1.090	9.65	0.01	L	5.44	46.00	<<
1.122	9.65	0.01	L	6.49	46.00	<<
1.702	9.66	0.01	L	4.47	46.00	<<

* QuasiPeak(dBμV) and CAverage(dBμV) are the values that contains the values of Correction Factor(dB).

"<" means a margin of more than 20 dB.

Frequency [MHz]	Correction Factor [dB]		LISN Line	QuasiPeak [dB(μV)]	Limit [dB(μV)]	Margin [dB]
	LISN	Cable Loss				
0.154	9.60	0.01	N	27.80	65.78	<<
0.274	9.62	0.01	N	24.83	61.00	<<
0.382	9.63	0.01	N	24.01	58.24	<<
0.530	9.64	0.01	N	14.79	56.00	<<
0.570	9.64	0.01	N	12.23	56.00	<<
4.756	9.74	0.03	N	9.41	56.00	<<
Frequency [MHz]	Correction Factor [dB]		LISN Line	CAverage [dB(μV)]	Limit [dB(μV)]	Margin [dB]
	LISN	Cable Loss				
0.290	9.62	0.01	N	7.58	50.52	<<
0.370	9.63	0.01	N	13.10	48.50	<<
0.558	9.64	0.01	N	5.46	46.00	<<
0.578	9.64	0.01	N	4.67	46.00	<<
1.082	9.65	0.01	N	4.35	46.00	<<
1.130	9.65	0.01	N	2.71	46.00	<<

* QuasiPeak(dBμV) and CAverage(dBμV) are the values that contains the values of Correction Factor(dB).

"<" means a margin of more than 20 dB.

Test Graph

R&S ES-SCAN Test Report

KTR

Continuous Disturbance Voltage

EMI Measurement Test Report

EUT	COXiC
Order Number	EFC-2020-00006
Test Laboratory	KTR
Factor	ENV216
Polarization	LIVE
Test Voltage	120 V ~, 60 Hz
Test Spec	FCC PART 15B

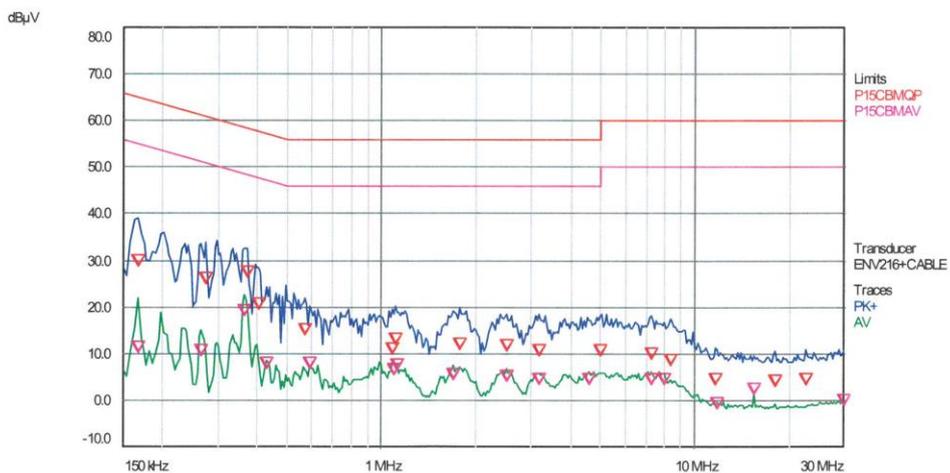
Scan Settings (2 Ranges)

Frequencies			Receiver Settings			
Start	Stop	Step	Res BW	M-Time	Atten	Preamp
150 kHz	3 MHz	4 kHz	9 kHz (6dB)	10 ms	Auto	On
3 MHz	30 MHz	4 kHz	9 kHz (6dB)	10 ms	Auto	On

Final Measurement

Detectors:	QP, CA	Meas Time:	1 s
Peaks:	16	Acc. Margin:	100 dB

Pre-measurement Graph



R&S ES-SCAN Test Report

KTR

Continuous Disturbance Voltage

EMI Measurement Test Report

EUT	COXiC
Order Number	EFC-2020-00006
Test Laboratory	KTR
Factor	ENV216
Polarization	NEUTRAL
Test Voltage	120 V ~, 60 Hz
Test Spec	FCC PART 15B

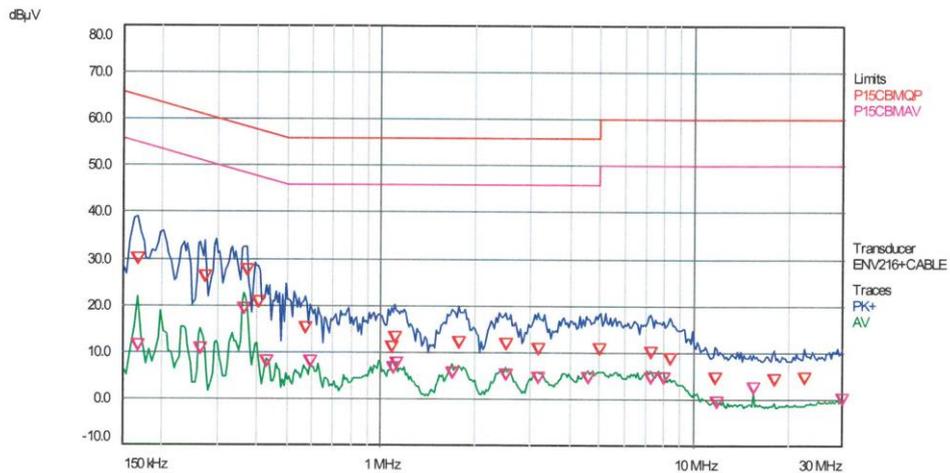
Scan Settings (2 Ranges)

Frequencies			Receiver Settings			
Start	Stop	Step	Res BW	M-Time	Atten	Preamp
150 kHz	3 MHz	4 kHz	9 kHz (6dB)	10 ms	Auto	On
3 MHz	30 MHz	4 kHz	9 kHz (6dB)	10 ms	Auto	On

Final Measurement

Detectors:	QP, CA	Meas Time:	1 s
Peaks:	16	Acc. Margin:	100 dB

Pre-measurement Graph



2020년 8월 25일 화요일 오후 8:02:25

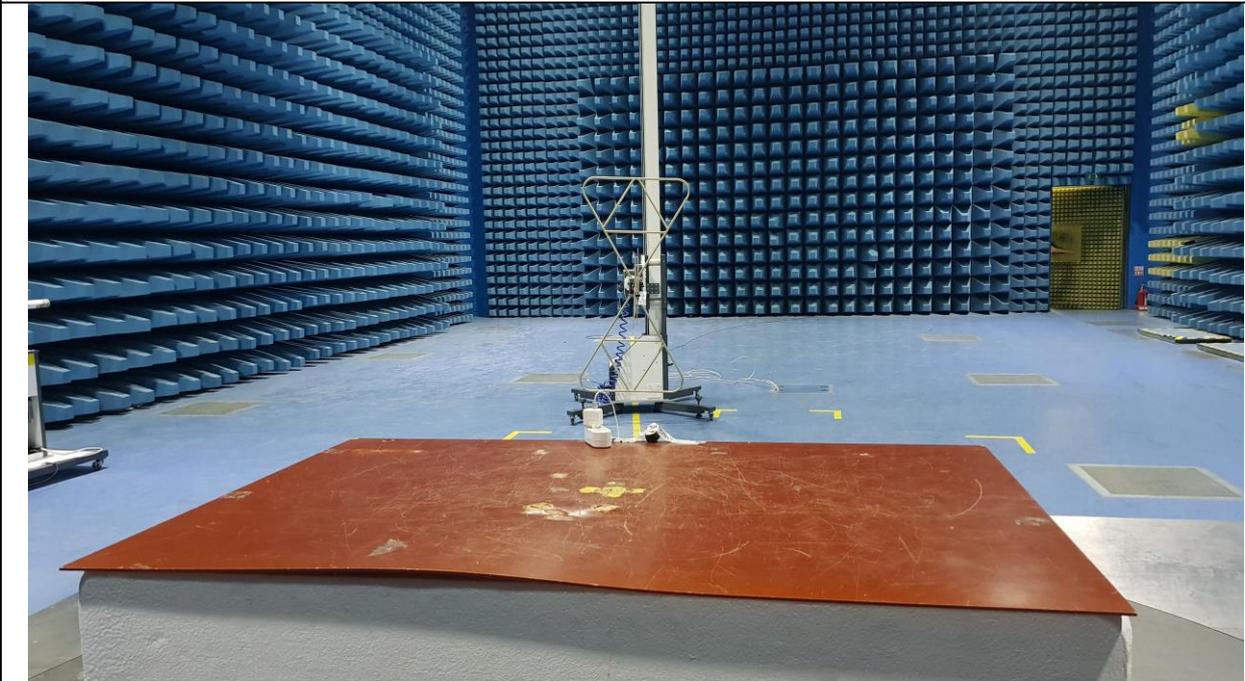
1 of 2

1.9 Test Conditions and Results – Limits of radiated disturbance in the frequency range : 30 MHz to 1 000 MHz

1.8	TEST: Limits of radiated disturbance in the frequency range		Verdict
Method	Measurements were made on a 3 meters open area test site that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3 meters with the receive antenna located at 1 to 4-meters height in both horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.		P
Parameters recorded during the test	Laboratory Ambient Temperature	(22.4 ± 1.0) °C	
	Relative Humidity	(46.1 ± 1.0) %	
	Air pressure	(99.9 ± 1.0) kPa	
Fully configured sample scanned over the following frequency range	30 MHz to 1 000 MHz	3 meters measurement distance	
Date of Test	2020. 08. 26.		
Limits – Enclosure			
Frequency (MHz)	Limit		
	Field strength ($\mu\text{V}/\text{m}$)	Field strength ($\text{dB}\mu\text{V}/\text{m}$)	Results
30 to 88	100	40.00	PASS
88 to 216	150	43.52	PASS
216 to 960	200	46.02	PASS
Above 960	500	53.97	PASS
Supplementary information:			
Unit conversion => $20 * \text{LOG}(\text{Field strength}(\mu\text{V}/\text{m})) = \text{Field strength}(\text{dB}\mu\text{V}/\text{m})$			

Test Equipment Used						
Description	Manufacturer	Model	Identifier	Cal. Date	Next Cal. Due	Test Software
Test Receiver	R & S	ESR3	102635	2020.09.10	2021.09.10	EMC32 (ver. 10.35.10)
Bi-Log Ant	TDK	HLP-3003C	130962	2020.12.07	2021.12.07	-
Antenna Mast	innco	CO3000	-	-	-	-
Turn Table	HD	-	-	-	-	-

Test set-up MODE #1



Test set-up MODE #2



EUT Operation mode : MODE #1 Discharge + Charge, MODE #2 Discharge
Reference the test result.

Test results : PASS

Test Graph – MODE #1

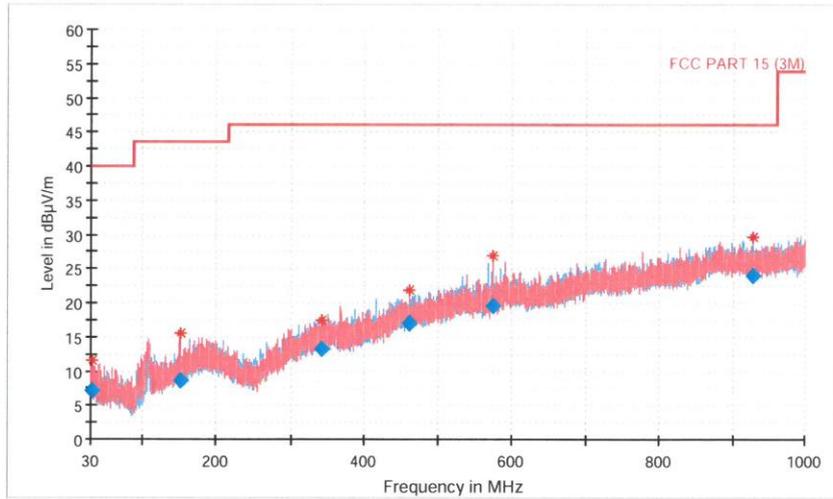
EMI Auto Test(3)

1 / 1

EMI RE Auto Test Report

Common Information

EUT:	COXiC
Order No:	EFC-2020-000006
Test Description:	FCC Part 15
Operating Conditions:	Charge+Discharge
Operator Name:	KTR



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
32.14000000	7.17	40.00	32.83	1000.0	120.000	400.0	H	63.0	11.9
150.77350000	8.65	43.52	34.87	1000.0	120.000	100.0	V	6.0	13.6
341.60050000	13.32	46.02	32.70	1000.0	120.000	400.0	V	10.0	18.7
462.02100000	16.95	46.02	29.07	1000.0	120.000	125.0	V	341.0	21.5
575.57650000	19.50	46.02	26.52	1000.0	120.000	125.0	V	7.0	23.2
927.01250000	24.08	46.02	21.94	1000.0	120.000	108.0	H	188.0	28.1

8/26/2020

Test Graph - MODE #2

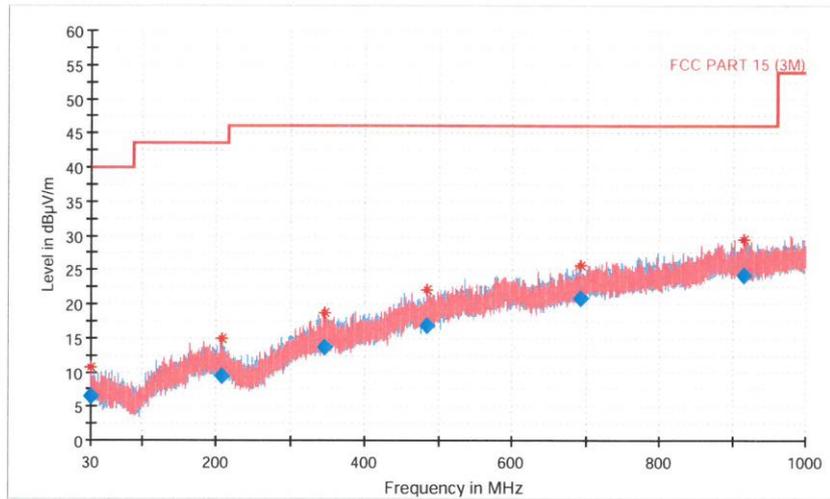
EMI Auto Test(3)

1 / 1

EMI RE Auto Test Report

Common Information

EUT:	COXiC
Order No:	EFC-2020-000006
Test Description:	FCC Part 15
Operating Conditions:	Discharge
Operator Name:	KTR



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.44000000	6.63	40.00	33.37	1000.0	120.000	122.0	H	58.0	12.1
206.76450000	9.40	43.52	34.12	1000.0	120.000	394.0	V	25.0	14.8
344.80000000	13.63	46.02	32.39	1000.0	120.000	125.0	V	33.0	18.9
484.20850000	16.77	46.02	29.25	1000.0	120.000	100.0	V	206.0	21.5
691.76450000	20.89	46.02	25.13	1000.0	120.000	125.0	H	232.0	25.0
915.87450000	24.24	46.02	21.78	1000.0	120.000	125.0	V	209.0	28.2

8/26/2020