CE-EMC TEST REPORT

Test Report No. : EM/2016/B0043

Applicant : MechaTronix Kaohsiung Co., Ltd
Address : NO.818, Dashun 2nd Rd., Sanmin Dist., Kaohsiung City 80787, Taiwan
Manufacturer : MechaTronix Kaohsiung Co., Ltd
Address : NO.818, Dashun 2nd Rd., Sanmin Dist., Kaohsiung City 80787, Taiwan

Equipment Under Test (EUT) :

Name : CoolBay®
Brand Name : MechaTronix
Model No.: CoolBay® Tera Wide-01
Added Model(s) : CoolBay® Tera Medium-01, CoolBay® Tera Narrow-01, CoolBay® Giga Wide-01, CoolBay® Giga Medium-01, CoolBay® Giga Narrow-01

Standards:

EN 55015 : 2013+A1:2015	EN 61000-3-2 : 2014
EN 61000-3-3 : 2013	
EN 61547 : 2009	IEC 61000-4-2 : 2008
IEC 61000-4-3 : 2006+A1:2007+A2:2010	IEC 61000-4-4 : 2012
IEC 61000-4-5 : 2014	IEC 61000-4-6 : 2013
IEC 61000-4-8 : 2009	IEC 61000-4-11 : 2004

In the configuration tested, the EUT complied with the standards specified above.

Date of Receipt : Nov. 23, 2016
Date of Test : Nov. 23 ~ Dec. 09, 2016
Date of Issue: Dec. 14, 2016

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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Tested By:	Kobe Wu	***Date***	Dec. 14, 2016
	Kobe Wu (Engineer)		
Approved By	Victor Wen	***Date***	Dec. 14, 2016
	Victor Wen (Assistant Manager)		

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Version

Version No.	Description	Date
00	Original report	Dec. 14, 2016

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1. General Description

1.1 General Description of EUT

Name of EUT	:	CoolBay®
Brand Name	:	MechaTronix
Model No.	:	CoolBay® Tera Wide-01
Added Model(s)	:	CoolBay® Tera Medium-01, CoolBay® Tera Narrow-01, CoolBay® Giga Wide-01, CoolBay® Giga Medium-01, CoolBay® Giga Narrow-01
Variant Description	:	Please see as below.

	power	Color temperature	lens	reflector	W
CoolBay® Giga Narrow-01	HBG-160-60A	4000k	60	45	160
CoolBay® Giga Medium-01			90	90	
CoolBay® Giga Wide-01			120	120	
CoolBay® Tera Narrow-01	HBG-240-60A		60	45	240
CoolBay® Tera Medium-01			90	90	
CoolBay® Tera Wide-01			120	120	

1.2 Details of EUT

Power Supply	:	AC 230V/50Hz
Modes/Function	:	Mode 1 Operation

1.3 Description of Support Units

PRODUCT	MANUFACTURER	MODEL NO.	SERIAL NO.
N/A	N/A	N/A	N/A

1.4 Operation Procedure

1. The sample connect to an AC power for 30 minutes.
2. Test.

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1.5 The worst case of the EUT

EUT will be carried out in the worst case as followings:
Worst Case :
CE_Worst_Case: Mode 1 Operation
RE_Worst_Case: Mode 1 Operation

1.6 Modification List

No modification by SGS Taiwan Electronics & Communication Laboratory.

1.7 Configuration of Tested System

Stand alone EUT, put it on test table only.

1.8 Cable List

Cable Type	Core	Length	Category	Shielding/Non-shielding
Power Cable	N/A	0.3m	Class I equipment	Non-shielding

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1.9 Summary of Results

Highest Emission					
Standard	Test Type	Result	Phase/Pol.	Frequency(MHz)	Margin(dB)
EN 55015: 2013+A1:2015	Conducted Emission	PASS	Line	0.9940	-10.56 (QP)
			Neutral	0.9940	-10.58 (QP)
	Radiated Emission	PASS	Ver.	138.6400	-4.54 (QP)
		PASS	Y.LOOP	0.8190	-14.00 (QP)
EN 61000-3-2:2014	Harmonic current emissions	PASS	Meet the requirements		
EN 61000-3-3:2013	Voltage changes, voltage fluctuations & flicker	PASS	Meet the requirements		

Immunity (EN 61547 : 2009)				
Standard	**Test Type**	**Result**	**Performance Criteria**	**Test Judgment**
IEC 61000-4-2:2008	ESD test	PASS	Criterion B	Meets the requirements of Performance Criterion A
IEC 61000-4-3: 2006+A1:2007+A2:2010	RS test	PASS	Criterion A	Meets the requirements of Performance Criterion A
IEC 61000-4-4:2012	EFT test	PASS	Criterion B	Meets the requirements of Performance Criterion A
IEC 61000-4-5:2014	Surge test	PASS	Criterion B	Meets the requirements of Performance Criterion B
IEC 61000-4-6:2013	CS test	PASS	Criterion A	Meets the requirements of Performance Criterion A
IEC 61000-4-8:2009	PMF	PASS	Criterion A	Meets the requirements of Performance Criterion A
IEC 61000-4-11:2004	Dip test	PASS	Criterion C/B	Meets the requirements of Performance Criterion B/A

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2. EMISSION

EN 55015 : 2013+A1:2015

2.1 Test Results

EN 55015	Result
Conducted Emission	**PASS**
Radiated Emission	**PASS**
CISPR 32 Radiated Emission	**PASS**

2.2 Frequency Range

Conducted Emission : 9 kHz – 30 MHz
Radiated Emission : 9 kHz – 30 MHz
Radiated Emission : 30MHz – 300MHz

2.3 Methods and Procedures

Standard	Edition	Description
EN 55015	2013+A1:2015	Limits and methods of measurement of radio interference characteristics of electrical lighting and similar equipment.
CISPR 32	2015	Electromagnetic compatibility of multimedia equipment – Emission requirements.

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2.4 Test of Conducted Emission

2.4.1 Test Instruments

SGS Conducted_Emission WuKu Conducted Room_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESCI 3	100335	2015/12/22	2016/12/21
Coaxial Cables	N/A	WK CE Cable	N/A	2016/11/26	2017/11/25
LISN	SCHWARZBECK	NSLK 8127	8127-649	2016/5/11	2017/5/10
Test S/W	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803 Measurement Uncertainty of Conducted Emission Expanded uncertainty (K=2) of conducted emission is 2.28 dB.					

2.4.2 EUT Operating Condition

Environment :

Temperature	Humidity
20 °C	58 %RH

Test setup : Please refer to photo of CE testing set-up

2.4.3 Measurement Level Calculation

Factor = LISN insertion loss + Cable loss

Measurement Level = Reading Level + Factor

Over (Margin) = Measurement Level – Limit

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2.4.4 Measurement Data

Model No.: CoolBay® Tera Wide-01
Mode_1_L

Site Conduction Room	Phase: L1	Temperature: 20 ℃
Limit: EN55015(QP)-2009	Power: AC 230V/50Hz	Humidity: 58 %
Mode: Mode_1		
Note: (preheat 30Min.)		

Conducted Emission

File :B0043 Data :#7 Date: 2016/11/28 Time: 上午 11:22:06

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.3500	45.60	0.11	45.71	58.96	-13.25	QP	
2	*	0.6020	42.80	0.13	42.93	56.00	-13.07	QP	
3		0.8420	41.70	0.13	41.83	56.00	-14.17	QP	
4		1.0260	40.90	0.14	41.04	56.00	-14.96	QP	
5		1.4380	38.40	0.15	38.55	56.00	-17.45	QP	
6		23.0660	37.10	0.47	37.57	60.00	-22.43	QP	

*:Maximum data x:Over limit !:over margin

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Mode_1_N

Site Conduction Room
Limit: EN55015(QP)-2009
Mode: Mode_1
Note: (preheat 30Min.)

Phase: N
Power: AC 230V/50Hz

Temperature: 20 ℃
Humidity: 58 %

Conducted Emission

File :B0043 Data :#8 Date: 2016/11/28 Time: 上午 11:30:23

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.3500	45.10	0.10	45.20	58.96	-13.76	QP	
2	*	0.6020	44.00	0.11	44.11	56.00	-11.89	QP	
3		0.6020	33.60	0.11	33.71	46.00	-12.29	AVG	
4		0.8420	42.90	0.11	43.01	56.00	-12.99	QP	
5		0.9620	39.40	0.12	39.52	56.00	-16.48	QP	
6		1.4420	37.80	0.13	37.93	56.00	-18.07	QP	
7		23.5700	37.70	0.46	38.16	60.00	-21.84	QP	

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Added Model(s) : CoolBay® Giga Wide-01
Mode_1_L

Site Conduction Room	Phase: L1	Temperature: 20 ℃
Limit: EN55015(QP)-2009	Power: AC 230V/50Hz	Humidity: 58 %
Mode: Mode_1		
Note: S2,(preheat 30Min.)		

Conducted Emission

File :B0043 Data :#5 Date: 2016/11/28 Time: 上午 10:29:50

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	51.50	0.10	51.60	66.00	-14.40	QP	
2		0.2620	44.00	0.11	44.11	61.37	-17.26	QP	
3		0.4380	41.60	0.12	41.72	57.10	-15.38	QP	
4	*	0.9940	45.30	0.14	45.44	56.00	-10.56	QP	
5		0.9940	33.80	0.14	33.94	46.00	-12.06	AVG	
6		1.0700	43.10	0.14	43.24	56.00	-12.76	QP	
7		13.7420	34.10	0.41	34.51	60.00	-25.49	QP	

*:Maximum data x:Over limit !:over margin

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Mode_1_N

Site Conduction Room
Limit: EN55015(QP)-2009
Mode: Mode_1
Note: S2,(preheat 30Min.)

Phase: N
Power: AC 230V/50Hz

Temperature: 20 ℃
Humidity: 58 %

Conducted Emission

File :B0043 Data :#6 Date: 2016/11/28 Time: 上午 10:46:34

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	51.10	0.07	51.17	66.00	-14.83	QP	
2		0.2620	41.00	0.09	41.09	61.37	-20.28	QP	
3		0.4420	39.80	0.10	39.90	57.02	-17.12	QP	
4		0.6220	37.20	0.11	37.31	56.00	-18.69	QP	
5	*	0.9940	45.30	0.12	45.42	56.00	-10.58	QP	
6		0.9940	33.50	0.12	33.62	46.00	-12.38	AVG	
7		14.8020	35.80	0.41	36.21	60.00	-23.79	QP	

*:Maximum data x:Over limit !:over margin

File :B0043\Data :#6 *Page: 1*

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2.5 Test of Radiated Emission

2.5.1 Test Instruments

SGS Loop (Lamps) WuKu_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESCI 3	100335	2015/12/22	2016/12/21
Coaxial Cables	N/A	LK CE Cable	N/A	2016/3/11	2017/3/10
Triple Loop Antenna	Schwarzbeck	HXYZ 9170	9170/109	2015/12/14	2016/12/13
Test S/W	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803 Measurement Uncertainty of Radiated Emission Expanded uncertainty of radiated emission is 2.3 dB. (9KHz ~ 30MHz)					

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SGS Radiated_Below_1GHz HWAYA 10m_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESCI 3	101342	2016/3/5	2017/3/4
EMI Test Receiver	R&S	ESCI 3	101343	2015/12/25	2016/12/24
Broadband Antenna	SCHWAZBECK	VULB9168	9168-628	2016/9/22	2017/9/21
Broadband Antenna	SCHWAZBECK	VULB9168	9168-629	2016/9/22	2017/9/21
Pre Amplifier	EMC Instruments Corp.	EMC330	980178	2016/3/31	2017/3/30
Pre Amplifier	EMC Instruments Corp.	EMC330	980179	2016/3/31	2017/3/30
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150917	2016/9/18	2017/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150919	2016/9/18	2017/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150820	2016/9/18	2017/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150918	2016/9/18	2017/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150821	2016/9/18	2017/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150822	2016/9/18	2017/9/17
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Turn Table	MF	N/A	N/A	N.C.R.	N.C.R.
Site NSA	Chance Most	10M Chamber	10M SAC	2015/12/31	2016/12/30
Test S/W	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.

SGS Taiwan LTD. Electronics & Communication Laboratory
No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
Measurement Uncertainty of Radiated Emission
Expanded uncertainty of radiated emission is 4.16 dB. (30MHz ~ 1000MHz)

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2.5.2 EUT Operating Condition

Environment :

Temperature	Humidity
21 °C	68 %RH

Test setup : Please refer to photo of RE testing set-up

2.5.3 Measurement Level Calculation

Correction Factor = Antenna Factor + Cable loss- Amplifier Gain

Measurement Level = Reading Level + Correction Factor

(Loop) Correct Factor = Cable loss

Over (Margin) = Measurement Level – Limit

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2.5.4 Measurement Data

Model No.: CoolBay® Tera Wide-01
Mode_1_X

Site Loop Room	Polarization: X	Temperature: 21 ℃
Limit: EN55015 LOOP	Power: AC 230V/50Hz	Humidity: 68 %
Mode: Mode 1	Distance:	
Note: (preheat 30Min.)		

Radiated Emission

File :B0043 Data :#2 Date: 2016/12/5 Time: 上午 09:53:37

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment
1		6.0330	4.40	0.22	4.62	22.00	-17.38	QP	
2		8.0920	5.10	0.26	5.36	22.00	-16.64	QP	
3		12.8890	4.50	0.30	4.80	22.00	-17.20	QP	
4		15.4570	4.40	0.30	4.70	22.00	-17.30	QP	
5		21.5860	4.70	0.32	5.02	22.00	-16.98	QP	
6	*	28.5400	5.20	0.39	5.59	22.00	-16.41	QP	

*:Maximum data x:Over limit !:over margin

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Mode_1_Y

Site Loop Room	Polarization: Y	Temperature: 21 ℃
Limit: EN55015 LOOP	Power: AC 230V/50Hz	Humidity: 68 %
Mode: Mode 1	Distance:	
Note: (preheat 30Min.)		

Radiated Emission

File :B0043 Data :#4 Date: 2016/12/5 Time: 上午 10:00:04

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment
1	*	0.8170	22.10	0.10	22.20	37.63	-15.43	QP	
2		1.3500	15.80	0.10	15.90	31.60	-15.70	QP	
3		4.3970	4.40	0.18	4.58	22.00	-17.42	QP	
4		7.9250	4.60	0.26	4.86	22.00	-17.14	QP	
5		14.8900	4.40	0.30	4.70	22.00	-17.30	QP	
6		28.6720	5.10	0.39	5.49	22.00	-16.51	QP	

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Mode_1_Z

Site Loop Room
Limit: EN55015 LOOP
Mode: Mode 1
Note: (preheat 30Min.)

Polarization: Z
Power: AC 230V/50Hz
Distance:

Temperature: 21 ℃
Humidity: 68 %

Radiated Emission

File :B0043 Data :#6 Date: 2016/12/5 Time: 上午 10:06:00

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment
1		3.3930	4.60	0.15	4.75	22.00	-17.25	QP	
2		4.4510	4.40	0.18	4.58	22.00	-17.42	QP	
3		7.7370	4.70	0.25	4.95	22.00	-17.05	QP	
4		9.3750	4.60	0.29	4.89	22.00	-17.11	QP	
5		19.4480	4.70	0.30	5.00	22.00	-17.00	QP	
6	*	26.3210	4.90	0.36	5.26	22.00	-16.74	QP	

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Added Model(s) : CoolBay® Giga Wide-01
Mode_1_X

Site Loop Room	Polarization: X	Temperature: 21 ℃
Limit: EN55015 LOOP	Power: AC 230V/50Hz	Humidity: 68 %
Mode: Mode 1	Distance:	
Note: S2(preheat 30Min.)		

Radiated Emission

File :B0043 Data :#8 Date: 2016/12/5 Time: 上午 10:13:18

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment
1		3.3270	4.80	0.14	4.94	22.00	-17.06	QP	
2		6.0510	4.30	0.22	4.52	22.00	-17.48	QP	
3		10.4490	4.50	0.30	4.80	22.00	-17.20	QP	
4		15.2220	4.60	0.30	4.90	22.00	-17.10	QP	
5		19.5110	4.60	0.30	4.90	22.00	-17.10	QP	
6	*	28.9780	5.10	0.39	5.49	22.00	-16.51	QP	

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Mode_1_Y

Site Loop Room
Limit: EN55015 LOOP
Mode: Mode 1
Note: S2(preheat 30Min.)

Polarization: Y
Power: AC 230V/50Hz
Distance:

Temperature: 21 ℃
Humidity: 68 %

Radiated Emission

File :B0043 Data :#10 Date: 2016/12/5 Time: 上午 10:19:54

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment
1	*	0.8190	23.50	0.10	23.60	37.60	-14.00	QP	
2		1.2210	13.40	0.10	13.50	32.80	-19.30	QP	
3		3.8790	4.50	0.16	4.66	22.00	-17.34	QP	
4		8.1940	5.00	0.26	5.26	22.00	-16.74	QP	
5		21.0620	4.60	0.31	4.91	22.00	-17.09	QP	
6		27.0770	4.80	0.37	5.17	22.00	-16.83	QP	

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Mode_1_Z

Site Loop Room	Polarization: Z	Temperature: 21 ℃
Limit: EN55015 LOOP	Power: AC 230V/50Hz	Humidity: 68 %
Mode: Mode 1	Distance:	
Note: S2(preheat 30Min.)		

Radiated Emission

File :B0043 Data :#12 Date: 2016/12/5 Time: 上午 10:26:20

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment
1		5.1680	4.30	0.20	4.50	22.00	-17.50	QP	
2		7.0620	4.40	0.24	4.64	22.00	-17.36	QP	
3		9.9390	4.60	0.30	4.90	22.00	-17.10	QP	
4		16.6460	4.50	0.30	4.80	22.00	-17.20	QP	
5		19.7550	4.50	0.30	4.80	22.00	-17.20	QP	
6	*	27.9580	5.10	0.38	5.48	22.00	-16.52	QP	

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Model No.: CoolBay® Tera Wide-01
Mode_1_H

Site SGS 10m Chamber
Limit: EN55015 10M Radiation
Mode: Mode_1
Note:

Polarization: *Horizontal*
Power: AC 230V/50Hz
Distance: 10m

Temperature: 23 ℃
Humidity: 71 %

Radiated Emission

File :EM-2016-B0043 Data :#12 Date: 2016/12/1 Time: 下午 04:18:50

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		51.3400	24.78	-11.61	13.17	30.00	-16.83	QP	
2		109.5400	25.31	-15.05	10.26	30.00	-19.74	QP	
3	*	138.6400	31.51	-12.29	19.22	30.00	-10.78	QP	
4		152.2200	30.15	-11.70	18.45	30.00	-11.55	QP	
5		243.4000	24.46	-13.07	11.39	37.00	-25.61	QP	
6		262.8000	26.40	-12.37	14.03	37.00	-22.97	QP	

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Mode_1_V

Site SGS 10m Chamber
Limit: EN55015 10M Radiation
Mode: Mode_1
Note:

Polarization: *Vertical*
Power: AC 230V/50Hz
Distance: 10m

Temperature: 23 ℃
Humidity: 71 %

Radiated Emission

File :EM-2016-B0043 Data :#11 Date: 2016/12/1 Time: 下午 04:18:49

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		30.0000	30.92	-12.80	18.12	30.00	-11.88	QP	
2		80.4400	31.70	-16.07	15.63	30.00	-14.37	QP	
3	*	138.6400	37.35	-11.89	25.46	30.00	-4.54	QP	
4		153.1900	32.39	-11.31	21.08	30.00	-8.92	QP	
5		231.7600	33.07	-14.05	19.02	37.00	-17.98	QP	
6		250.1900	26.61	-12.50	14.11	37.00	-22.89	QP	

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Added Model(s) : CoolBay® Giga Wide-01
Mode_1_H

Site SGS 10m Chamber	Polarization: *Horizontal*	Temperature: 23 ℃
Limit: EN55015 10M Radiation	Power: AC 230V/50Hz	Humidity: 71 %
Mode: S2_Mode_1	Distance: 10m	
Note:		

Radiated Emission

File :EM-2016-B0043 Data :#16 Date: 2016/12/1 Time: 下午 04:29:39

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		58.1300	25.48	-12.15	13.33	30.00	-16.67	QP	
2		135.7300	24.61	-12.53	12.08	30.00	-17.92	QP	
3		150.2800	26.75	-11.74	15.01	30.00	-14.99	QP	
4	*	162.8900	26.84	-11.68	15.16	30.00	-14.84	QP	
5		241.4600	26.18	-13.14	13.04	37.00	-23.96	QP	
6		308.3900	25.03	-10.70	14.33	37.00	-22.67	QP	

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File :EM-2016-B0043\Data :#16 *Page: 1*

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Mode_1_V

Site SGS 10m Chamber
Limit: EN55015 10M Radiation
Mode: S2_Mode_1
Note:

Polarization: Vertical
Power: AC 230V/50Hz
Distance: 10m

Temperature: 23 ℃
Humidity: 71 %

Radiated Emission

File :EM-2016-B0043 Data :#15 Date: 2016/12/1 Time: 下午 04:29:37

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		42.6100	25.31	-11.29	14.02	30.00	-15.98	QP	
2		54.2500	25.39	-11.36	14.03	30.00	-15.97	QP	
3	*	85.2900	31.99	-16.90	15.09	30.00	-14.91	QP	
4		128.9400	26.88	-12.71	14.17	30.00	-15.83	QP	
5		151.2500	26.37	-11.34	15.03	30.00	-14.97	QP	
6		191.9900	28.24	-14.12	14.12	30.00	-15.88	QP	

*:Maximum data x:Over limit !:over margin

File :EM-2016-B0043\Data :#15 *Page: 1*

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3. Harmonics

EN 61000-3-2 : 2014

3.1 Test Results

EN 61000-3-2 : 2014	**PASS**

3.2 Methods and Procedures

Standard	Edition	Description
EN 61000-3-2	2014	Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)

3.3 Test Instruments

SGS Harmonic EN61000-3-2 WuKu_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
HARMONICS SYSTEM	EMC Partner	HARMONICS-1000	151	2016/11/25	2017/11/24
Power Supply	EMC Partner	PS3	103497	2016/11/25	2017/11/24
Test Software	EMC PARTNER	HARMONICS-1000	Ver. 4.22	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803					

3.4 EUT Operating Condition

Environment :

Temperature	Humidity
20 °C	58 %RH

Test setup : Please refer to photo of HARMONIC testing set-up

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3.5 Measurement Data

Model No.: CoolBay® Tera Wide-01

Mode_1

Harmonic Emission - IEC 61000-3-2 , EN 61000-3-2 , (EN60555-2) 2016/11/29 上午 10:1

Urms =	230.1	V	P =	234.8	W	THC =	0.136	A	Range: 2 A
Irms =	1.046	A	pf =	0.976		H1max =	1.054	A	V-nom: 230 V
									TestTime: 10 min (100%)

Test completed, Result: PASSED

HAR-1000 EMC-Partner

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Urms =	230.1V	Freq =	49.922	Range:	2 A		
Irms =	1.046A	Ipk =	1.647A	cf =	1.575		
P =	234.8W	S =	240.7VA	pf =	0.976		
THDi =	13.1 %	THDu =	0.10 %	Class C			
Test - Time :	10min (100 %)						
Limit Reference:	H1(max)= 1.0538A	pf(max)= 1.004					
Test completed, Result: PASSED							
Order	Freq.	Iavg	Iavg%L	Imax	Imax%L	Limit	Status
	[Hz]	[A]	[%]	[A]	[%]	[A]	
1	50	1.0423		1.0582			
2	100	0.0000	0.0000	0.0040	19.113	0.0211	
3	150	0.1274	40.153	0.1284	40.461	0.3174	
4	200	0.0000		0.0018			
5	250	0.0274	25.971	0.0283	26.874	0.1054	
6	300	0.0000		0.0016			
7	350	0.0171	23.153	0.0178	24.160	0.0738	
8	400	0.0000		0.0016			
9	450	0.0171	32.501	0.0179	34.055	0.0527	
10	500	0.0000		0.0016			
11	550	0.0165	52.313	0.0173	54.828	0.0316	
12	600	0.0000		0.0016			
13	650	0.0132	41.882	0.0144	45.562	0.0316	
14	700	0.0000		0.0018			
15	750	0.0118	37.225	0.0128	40.542	0.0316	
16	800	0.0000		0.0017			
17	850	0.0079	24.989	0.0092	28.959	0.0316	
18	900	0.0000		0.0017			
19	950	0.0067	21.127	0.0077	24.325	0.0316	
20	1000	0.0000		0.0017			
21	1050	0.0000	0.0000	0.0060	18.920	0.0316	
22	1100	0.0000		0.0016			
23	1150	0.0000	0.0000	0.0044	13.900	0.0316	
24	1200	0.0000		0.0017			
25	1250	0.0000	0.0000	0.0040	12.742	0.0316	
26	1300	0.0000		0.0017			
27	1350	0.0023	7.3211	0.0077	24.325	0.0316	
28	1400	0.0000		0.0018			
29	1450	0.0000	0.0000	0.0061	19.306	0.0316	

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30	1500	0.0000		0.0016		
31	1550	0.0000	0.0000	0.0057	18.147	0.0316
32	1600	0.0000		0.0017		
33	1650	0.0000	0.0000	0.0060	18.920	0.0316
34	1700	0.0000		0.0018		
35	1750	0.0000	0.0000	0.0056	17.761	0.0316
36	1800	0.0000		0.0020		
37	1850	0.0000	0.0000	0.0046	14.672	0.0316
38	1900	0.0000		0.0020		
39	1950	0.0000	0.0000	0.0038	11.970	0.0316
40	2000	0.0000		0.0022		

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No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803/新北市五股區新北產業園區五工路 134 號
t (886-2) 2299-3279 f (886-2) 2298-0488 www.tw.sgs.com
Member of SGS Group

Added Model(s) : CoolBay® Giga Wide-01

Mode_1

Harmonic Emission - IEC 61000-3-2 , EN 61000-3-2 , (EN60555-2) 2016/11/29 上午 10:4

Urms =	229.9	V	P =	152.2	W	THC =	0.068	A	Range: 2 A
Irms =	0.680	A	pf =	0.974		H1max =	0.687	A	V-nom: 230 V
									TestTime: 10 min (100%)

Test completed, Result: PASSED

HAR-1000 EMC-Partner

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Urms =	229.9V	Freq =	49.922	Range:	2 A		
Irms =	0.680A	Ipk =	1.008A	cf =	1.483		
P =	152.2W	S =	156.3VA	pf =	0.974		
THDi =	10.2 %	THDu =	0.10 %	Class C			
Test - Time :	10min (100 %)						
Limit Reference:	H1(max)= 0.6874A	pf(max)= 1.004					
Test completed, Result: PASSED							
Order	Freq.	Iavg	Iavg%L	Imax	Imax%L	Limit	Status
	[Hz]	[A]	[%]	[A]	[%]	[A]	
1	50	0.6778		0.6874			
2	100	0.0000	0.0000	0.0028	20.422	0.0137	
3	150	0.0517	24.994	0.0519	25.059	0.2070	
4	200	0.0000		0.0004			
5	250	0.0312	45.422	0.0314	45.639	0.0687	
6	300	0.0000		0.0002			
7	350	0.0211	43.883	0.0212	44.142	0.0481	
8	400	0.0000		0.0002			
9	450	0.0154	44.907	0.0155	45.106	0.0344	
10	500	0.0000		0.0002			
11	550	0.0116	56.180	0.0117	56.826	0.0206	
12	600	0.0000		0.0002			
13	650	0.0085	41.315	0.0088	42.620	0.0206	
14	700	0.0000		0.0002			
15	750	0.0056	27.312	0.0059	28.413	0.0206	
16	800	0.0000		0.0001			
17	850	0.0000	0.0000	0.0035	17.166	0.0206	
18	900	0.0000		0.0001			
19	950	0.0000	0.0000	0.0024	11.839	0.0206	
20	1000	0.0000		0.0001			
21	1050	0.0000	0.0000	0.0024	11.839	0.0206	
22	1100	0.0000		0.0001			
23	1150	0.0000	0.0000	0.0028	13.615	0.0206	
24	1200	0.0000		0.0001			
25	1250	0.0000	0.0000	0.0031	14.798	0.0206	
26	1300	0.0000		0.0001			
27	1350	0.0000	0.0000	0.0031	14.798	0.0206	
28	1400	0.0000		0.0001			
29	1450	0.0000	0.0000	0.0028	13.615	0.0206	

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30	1500	0.0000		0.0001		
31	1550	0.0000	0.0000	0.0026	12.431	0.0206
32	1600	0.0000		0.0001		
33	1650	0.0000	0.0000	0.0021	10.063	0.0206
34	1700	0.0000		0.0001		
35	1750	0.0000	0.0000	0.0017	8.2871	0.0206
36	1800	0.0000		0.0001		
37	1850	0.0000	0.0000	0.0015	7.1033	0.0206
38	1900	0.0000		0.0002		
39	1950	0.0000	0.0000	0.0016	7.6952	0.0206
40	2000	0.0000		0.0002		

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4. Flicker

EN 61000-3-3 : 2013

4.1 Test Results

EN 61000-3-3 : 2013	**PASS**

4.2 Methods and Procedures

Standard	Edition	Description
EN 61000-3-3	2013	Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection

4.3 Test Instruments

SGS Flicker EN61000-3-3 WuKu_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
HARMONICS SYSTEM	EMC Partner	HAR1000-1P	HAR1000-1P 115V-0240	2016/11/25	2017/11/24
Power Supply	EMC Partner	PS3	103497	2016/11/25	2017/11/24
Test Software	EMC PARTNER	HARMONICS-1000	Ver. 4.22	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803					

4.4 EUT Operating Condition

Environment :

Temperature	Humidity
20 °C	58 %RH

Test setup : Please refer to photo of FLICKER testing set-up

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4.5 Measurement Data

Model No.: CoolBay® Tera Wide-01

Mode_1

Actual Flicker (Fli): 0.00

Short-term Flicker (Pst): 0.07
Limit (Pst): 1.00

Long-term Flicker (Plt): 0.07
Limit (Plt): 0.65

Maximum Relative Volt. Change (dmax): 0.00%
Limit (dmax): 4.00%

Relative Steady-state Voltage Change (dc): 0.01%
Limit (dc): 3.00%

Tmax 3.00% (dt): 0.00ms
Limit (dt>Lim): 500ms

Flicker Emission - IEC 61000-3-3 , EN 61000-3-3

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Urms =	229.5	V	P =	231.4	W
Irms =	1.034	A	pf =	0.975	

Range: 2 A
V-nom: 230 V
TestTime: 10 min (100%)

Test completed, Result: PASSED

HAR-1000 EMC-Partner

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Added Model(s) : CoolBay® Giga Wide-01

Mode_1

Actual Flicker (Fli): 0.00

Short-term Flicker (Pst): 0.07
Limit (Pst): 1.00

Long-term Flicker (Plt): 0.07
Limit (Plt): 0.65

Maximum Relative Volt. Change (dmax): 0.00%
Limit (dmax): 4.00%

Relative Steady-state Voltage Change (dc): 0.00%
Limit (dc): 3.00%

Tmax 3.00% (dt): 0.00ms
Limit (dt>Lim): 500ms

Flicker Emission - IEC 61000-3-3 , EN 61000-3-3

2016/11/29 上午 11:0

Urms =	229.7	V	P =	150.7	W
Irms =	0.675	A	pf =	0.972	

Range: 2 A
V-nom: 230 V
TestTime: 10 min (100%)

Test completed, Result: PASSED

HAR-1000 EMC-Partner

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5. IMMUNITY

EN 61547 : 2009

5.1 Performance

Test Standard	Performance Criteria	Result
IEC 61000-4-2:2008	B	PASS
IEC 61000-4-3:2006+A1:2007+A2:2010	A	PASS
IEC 61000-4-4:2012	B	PASS
IEC 61000-4-5:2014	B	PASS
IEC 61000-4-6:2013	A	PASS
IEC 61000-4-8:2009	A	PASS
IEC 61000-4-11:2004	C/B	PASS

5.2 Performance Criteria Description

Criterion A – During the test no change of the luminous intensity shall be observed and the regulating control, in any, shall operate during the test as intended.

Criterion B – During the test the luminous intensity may change to any value. After the test the luminous intensity shall be restored to its initial value within 1 min.

Regulating controls need not function during the test, but after the test the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given.

Criterion C – During and after the test any change of the luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall return to normal if necessary by temporary interruption of the mains supply and/or operating the regulating control.

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5.3 Test of IEC 61000-4-2

5.3.1 Methods and Procedures

Standard	Edition	Description
IEC 61000-4-2	2008	Electrostatic Discharge (ESD)

5.3.2 Test Instruments

SGS ESD EN61000-4-2 WuKu No.1_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
ESD Simulator	NoiseKen	ESS-100L/TC-815R	ESS0635368	2016/8/6	2017/8/5
HCP	N/A	1.6 x 0.8 m	N/A	N.C.R.	N.C.R.
VCP	N/A	0.5 x 0.5 m	N/A	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803					

5.3.3 EUT Operating Condition

Environment :

Temperature	Humidity
21 °C	45 %RH

Test setup : Please refer to photo of ESD testing set-up

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5.3.4 Results of Electrostatic Discharge Test (ESD)

Model No.: CoolBay® Tera Wide-01
Added Model(s) : CoolBay® Giga Wide-01

Test Mode	: Test mode 1
Basic Standard	: IEC 61000-4-2
Discharge Impedance	: 330 ohm / 150 pF
Discharge Voltage	: Air Discharge : ±2, 4, 8 kV Contact Discharge : ±2, 4 kV HCP/VCP : ±2, 4 kV
Polarity	: Positive/Negative
Number of Discharge	: 25 times at each test point
Discharge Mode	: Single Discharge
Discharge Period	: 1 second

A. Observations :

Test points: 1. Surface of case. 2. Junction of case. 3. Screw.

Direct Application			Test Results	
Discharge Level (kV)	Polarity (+/-)	Test Point	Contact Discharge	Air Discharge
2,4,8	+/-	N/A	N/A	N/A
2,4	+/-	1~3	A	N/A

Remark: A : No degradation of performance or loss of function.
N/A : Not Applicable.

B. Observations :

Test points: 1. Front side. 2. Rear side. 3. Left side. 4. Right side.

Indirect Application			Test Results	
Discharge Level (kV)	Polarity (+/-)	Test Point	Horizontal Coupling	Vertical Coupling
2,4	+/-	1 - 4	A	A

Remark: A : No degradation of performance or loss of function.
N/A : Not Applicable.

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5.4 Test of IEC 61000-4-3

5.4.1 Methods and Procedures

Standard	Edition	Description
IEC 61000-4-3	2006+A1:2007 +A2:2010	Radio-Frequency Electromagnetic Field Susceptibility Test, RS

5.4.2 Test Instruments

SGS RS EN61000-4-3 WuKu_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
RS Test Site	Chance Most	8*4*4 Chamber	N/A	2016/4/12	2017/4/11
Signal Generator	Agilent	8648D	3847M00432	2016/6/21	2017/6/20
Function Generator	Agilent	33220A	MY44009642	2016/6/21	2017/6/20
Dual Directional Coupler	R&D MICROWAVES	C1-A47NFNF	30	N.C.R.	N.C.R.
Power Amplifier	OPHIR	5127FE	1050	N.C.R.	N.C.R.
Power Amplifier	Frankonia	FLG50B	1011	N.C.R.	N.C.R.
Power Amplifier	MILMEGA	AS0206-30	1029943	N.C.R.	N.C.R.
Relay Switching Unit	Frankonia	RSU-3203	113A3122	N.C.R.	N.C.R.
Remote RF Switch	AUDIX	R2s1216	2008040801	N.C.R.	N.C.R.
Turn Table	Chance Most	N/A	N/A	N.C.R.	N.C.R.
Antenna Tower	Chance Most	N/A	N/A	N.C.R.	N.C.R.
Controller	Chance Most	886	N/A	N.C.R.	N.C.R.
Log-Per Broad band	Schwarzbeck	VUSLP9111E	N/A	N.C.R.	N.C.R.
Field Probe	WG	EMR-30	M-0006	2016/10/14	2017/10/13
Test Software	Audix	i2	Ver. 4.110805a	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803					

5.4.3 EUT Operating Condition

Environment :

Temperature	Humidity
21 °C	45 %RH

Test setup : Please refer to photo of RS testing set-up

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5.4.4 Results of Radiated Radio Frequency Electromagnetic (RS)

Model No.: CoolBay® Tera Wide-01

Added Model(s) : CoolBay® Giga Wide-01

Test Mode : Test mode 1
Basic Standard : IEC 61000-4-3
Frequency range : 80 MHz - 1000 MHz
Field strength : 3 V/m
Modulation : 80% AM (1kHz)
Frequency step : 1 % of fundamental
Polarity of Antenna : Horizontal and Vertical
Dwell Time : 3 seconds
Test distance : 3 m

No.	Frequency (MHz)	Antenna Orientation	Observation	EUT Orientation
1	80 - 1000	Vertical/Horizontal	A	0 degree
2	80 - 1000	Vertical/Horizontal	A	90 degree
3	80 - 1000	Vertical/Horizontal	A	180 degree
4	80 - 1000	Vertical/Horizontal	A	270 degree

Remark: A : No degradation of performance or loss of function.
N/A : Not Applicable.

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5.5 Test of IEC 61000-4-4

5.5.1 Methods and Procedures

Standard	Edition	Description
IEC 61000-4-4	2012	Electrical fast transient/burst requirements

5.5.2 Test Instruments

SGS EFT EN61000-4-4 WuKu_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMS Multi-Tester	EMC Partner	TRANSIENT 2000	648	2016/3/16	2017/3/15
EFT Clamp	EMC Partner	CN-EFT1000	469	2016/3/16	2017/3/15
SGS Taiwan LTD. Electronics & Communication Laboratory No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803					

5.5.3 EUT Operating Condition

Environment :

Temperature	Humidity
24 °C	55 %RH

Test setup : Please refer to photo of EFT testing set-up

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5.5.4 Results of Electrical Fast Transient (EFT)

Model No.: CoolBay® Tera Wide-01

Added Model(s) : CoolBay® Giga Wide-01

Test Mode : Test mode 1
Basic Standard : IEC 61000-4-4
Test Voltage : AC Input/Output :+/– 1 kV
Test Voltage : DC Input/Output, signal and control lines :+/– 0.5 kV
Polarity : Positive/Negative :+/– 2 min
Impulse Frequency : 5 kHz
Tr/Tn : 5/50ns
Burst : 15ms/300ms

Observation :

Test Point	Polarity	Test Level (kV)	Results
L	+/-	1	A
N	+/-	1	A
L+N	+/-	1	A
L+N+PE	+/-	1	A
DC Input	+/-	0.5	N/A
Signal/Comm.	+/-	0.5	N/A

Remark: A : No degradation of performance or loss of function.
N/A : Not Applicable.

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5.6 Test of IEC 61000-4-5

5.6.1 Methods and Procedures

Standard	Edition	Description
IEC 61000-4-5	2014	Surge immunity test

5.6.2 Test Instruments

SGS Surge EN61000-4-5 WuKu_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMS Multi-Tester	EMC Partner	TRANSIENT 2000	648	2016/3/16	2017/3/15
Universal Surge CDN	EMC Partner	CDN-UTP4	15	2016/3/16	2017/3/15
SGS Taiwan LTD. Electronics & Communication Laboratory No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803					

5.6.3 EUT Operating Condition

Environment :

Temperature	Humidity
24 °C	55 %RH

Test setup : Please refer to photo of SURGE testing set-up

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5.6.4 Results of Surge Test

Model No.: CoolBay® Tera Wide-01

Added Model(s) : CoolBay® Giga Wide-01

Test Mode : Test mode 1

Wave shape data: 1.2/50 μs

No. of Tests : 5 positive and 5 negative pulses
(should be applied at the peak value and zero crossing points for total 20 pulses of the a.c. voltage wave.)

Observation Description

AC input line:

Test Point	Phase Angle (degree)	Polarity (+/-)	Test Level (kV)	Observation
L – N	0, 90, 180, 270	+/-	1	A
L – PE	0, 90, 180, 270	+/-	2	B
N – PE	0, 90, 180, 270	+/-	2	B

DC input:

Test Point	Phase Angle (degree)	Polarity (+/-)	Test Level (kV)	Observation
DC input	N/A	+/-	0.5	N/A

Signal line:

Test Point	Phase Angle (degree)	Polarity (+/-)	Test Level (kV)	Observation
Signal I/O	N/A	+/-	1	N/A

Remark: A : No degradation of performance or loss of function.

B : During test, the EUT's function degradation. After test, it recovery by itself.

N/A : Not Applicable.

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5.7 Test of IEC 61000-4-6

5.7.1 Methods and Procedures

Standard	Edition	Description
IEC 61000-4-6	2013	Immunity to conducted disturbances, induced by radio-frequency fields.

5.7.2 Test Instruments

SGS CS EN61000-4-6 WuKu_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Signal Generator	R&S	SMY01	844146/016	2015/12/17	2016/12/16
Function Generator	Agilent	33220A	MY44009642	2016/6/21	2017/6/20
Dual Directional Coupler	ar	DC3001A	424831	N.C.R.	N.C.R.
RF Power Amplifier	Kalmus	116FC-CE	2366773	N.C.R.	N.C.R.
6dB Power Attenuator	N/A	352-255-006	9731	N.C.R.	N.C.R.
Coaxial Cables	N/A	No. 15-17, 21-23	N/A	N.C.R.	N.C.R.
CDN	TESEQ	CDN M016	37386	2016/12/01	2017/11/30
CDN	Frankonia	CDN M2+M3	A2210179	N.C.R.	N.C.R.
Bulk Current Injection Probe	FCC	FCC-120-9A	8527	N.C.R.	N.C.R.
EM Injection Clamp	FCC	F-203I-23MM	479	2015/11/27	2016/11/26
Test Software	Audix	i2	Ver. 4.110805a	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803					

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5.7.3 EUT Operating Condition

Environment :

Temperature	Humidity
22 °C	51 %RH

Test setup : Please refer to photo of CS testing set-up

5.7.4 Results of Immunity to Conducted Disturbances (CS)

Model No.: CoolBay® Tera Wide-01

Added Model(s) : CoolBay® Giga Wide-01

Test Mode : Test mode 1

Basic Standard : IEC 61000-4-6

Frequency range : 0.15 MHz - 80 MHz

Field strength : 3 Vrms

Modulation : 80% AM, 1 kHz Sinewave

Frequency step : 1 % of fundamental

Dwell Time : 3 seconds

Coupling Method : CDN 3 Lines

Cable Description	Frequency (MHz)	Observation
AC input	0.15 – 80	A
DC input	0.15 – 80	N/A
Signal/Comm.	0.15 – 80	N/A

Remark: A : No degradation of performance or loss of function.
N/A : Not Applicable.

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5.8 Test of IEC 61000-4-8

5.8.1 Methods and Procedures

Standard	Edition	Description
IEC 61000-4-8	2009	Power Frequency Magnetic Field Immunity Test

5.8.2 Test Instruments

SGS PFMF EN61000-4-8 WuKu_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
AC clamp meter	DER EE	DE-3103	K0011708	2015/12/15	2016/12/14
PMF Antenna	EMC Partner	MF-1000	MF-1000-2 -07	N.C.R.	N.C.R.
TRANSFORMER	TAI YEESH SING	ETL-0128	N/A	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803					

5.8.3 EUT Operating Condition

Environment :

Temperature	Humidity
23 °C	49 %RH

Test setup : Please refer to photo of PMF testing set-up

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5.8.4 Result of Immunity to power Frequency Magnetic

Model No.: CoolBay® Tera Wide-01
Added Model(s) : CoolBay® Giga Wide-01

Test Mode : Test mode 1
Basic Standard : IEC 61000-4-8 : 2009
Power Frequency: 50Hz, 60Hz
Magnetic Field : 3 A/m(r.m.s)
Coil Orientation : X, Y, Z Axis
Observation : A

Remark: A : No degradation of performance or loss of function.
N/A : Not Applicable.

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5.9 Test of IEC 61000-4-11

5.9.1 Methods and Procedures

Standard	Edition	Description
IEC 61000-4-11	2004	Voltage dips, short interruptions and voltage variations immunity tests

5.9.2 Test Instruments

SGS DIP EN61000-4-11 WuKu_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMS Multi-Tester	EMC Partner	TRANSIENT 2000	648	2016/3/16	2017/3/15
SGS Taiwan LTD. Electronics & Communication Laboratory No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803					

5.9.3 EUT Operating Condition

Environment :

Temperature	Humidity
24 °C	55 %RH

Test setup : Please refer to photo of DIP testing set-up

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5.9.4 Results of Voltage Dips Immunity Test

Model No.: CoolBay® Tera Wide-01

Added Model(s) : CoolBay® Giga Wide-01

Test Mode : Test mode 1

Voltage : 70%, 0 % Ut

Phase Angle : 0,180 degree

Total events : 3 dropouts

Event interval : 10 seconds

Environmental phenomena	Test Voltage Level	Number of periods	Observation
Voltage dips	70%	10	B
Voltage Interruptions	0%	0.5	A

Remark: A : No degradation of performance or loss of function.

B : During test, the EUT's function degradation. After test, it recovery by itself.

N/A : Not Applicable.

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APPENDIX - Constructional Details

Photography of General Testing Set-up 54-71
Photographs of Product 72-78

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Photography of General Testing Set-up

CE Testing Set-up

Model No.: CoolBay® Tera Wide-01

Mode_1_-

Mode_1_+

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Added Model(s) : CoolBay® Giga Wide-01

Mode_1_-

Mode_1_+

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Loop Testing Set-up

Model No.: CoolBay® Tera Wide-01

Mode_1

Added Model(s) : CoolBay® Giga Wide-01

Mode_1

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RE Testing Set-up

Model No.: CoolBay® Tera Wide-01

Mode_1_-

Mode_1_+

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Added Model(s) : CoolBay® Giga Wide-01

Mode_1_-

Mode_1_+

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HARMONIC Testing Set-up

Model No.: CoolBay® Tera Wide-01

Mode_1

Added Model(s) : CoolBay® Giga Wide-01

Mode_1

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FLICEKR Testing Set-up

Model No.: CoolBay® Tera Wide-01

Mode_1

Added Model(s) : CoolBay® Giga Wide-01

Mode_1

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ESD Testing Set-up

Model No.: CoolBay® Tera Wide-01

Mode_1

Added Model(s) : CoolBay® Giga Wide-01

Mode_1

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ESD Test point
Air
Cont.

Model No.: CoolBay® Tera Wide-01

01

02

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Added Model(s) : CoolBay® Giga Wide-01

01

02

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RS Testing Set-up

Model No.: CoolBay® Tera Wide-01

Mode_1

Added Model(s) : CoolBay® Giga Wide-01

Mode_1

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EFT Testing Set-up

Model No.: CoolBay® Tera Wide-01

Mode_1

Added Model(s) : CoolBay® Giga Wide-01

Mode_1

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Surge Testing Set-up

Model No.: CoolBay® Tera Wide-01

Mode_1

Added Model(s) : CoolBay® Giga Wide-01

Mode_1

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CS Testing Set-up

Model No.: CoolBay® Tera Wide-01

Mode_1

Added Model(s) : CoolBay® Giga Wide-01

Mode_1

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PMF Testing Set-up

Model No.: CoolBay® Tera Wide-01

Mode_1

Added Model(s) : CoolBay® Giga Wide-01

Mode_1

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DIP Testing Set-up

Model No.: CoolBay® Tera Wide-01

Mode_1

Added Model(s) : CoolBay® Giga Wide-01

Mode_1

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Photographs of Product

Exterior

Model No.: CoolBay® Tera Wide-01

O01

O02

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Added Model(s) : CoolBay® Giga Wide-01

O01

O02

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Interior

Model No.: CoolBay® Tera Wide-01

I01

I02

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I05

Added Model(s) : CoolBay® Giga Wide-01

I01

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I04

I05

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