

ATTESTATION

of conformity

with European Directives

For the following

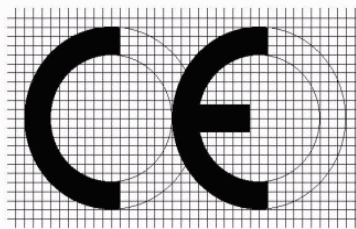
Product : Self-Ballasted LED Lamps
Model Name : GTW-050C
Variant Model Name : GTW-040C, GTW-030C

Applicant : APEX INTEC CO.,LTD.
Address : 619-9, Indonggasan-ro, Gasan-myeon, Chilgok-gun,
Gyeongsangbuk-do, Republic of Korea

Manufactured at : APEX INTEC CO.,LTD.
Address : 619-9, Indonggasan-ro, Gasan-myeon, Chilgok-gun,
Gyeongsangbuk-do, Republic of Korea

The submitted sample of the above equipment has been tested for CE marking according to following European Directive and standards:

- Electromagnetic Compatibility Directive 2014/30/EU



The referred test report(s) show that the product complies with standard(s) recognized as giving presumption of compliance with the essential requirements in the specified European Directive. This verification does not imply assessment of the production of the product. The CE marking may be affixed if all relevant and effective European Directives with CE are applicable.

The standards relevant for the evaluation of EMC requirements are as follows:

Test Standards : EN 55015:2013 /A1:2015
EN 61547:2009
EN 61000-3-2:2014
EN 61000-3-3:2013

Date of issue: 2019-08-27



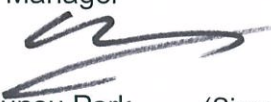
APEX INTEC CO.,LTD.

619-9, Indonggasan-ro, Gasan-myeon,
Chilgok-gun, Gyeongsangbuk-do,
Republic of Korea

(Name and signature of authorized person)



TEST REPORT

KCTL Inc. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-31-285-0894 FAX: 82-505-299-8311 www.kctl.co.kr	Report No.: KR19-SEC0297 Page (1) of (61)	
<p>1. Client</p> <ul style="list-style-type: none"> ◦ Name : APEX INTEC CO.,LTD. ◦ Address : 619-9, Indonggasan-ro, Gasan-myeon, Chilgok-gun, Gyeongsangbuk-do, Republic of Korea ◦ Date of Receipt : 2019-04-23 <p>2. Use of Report : -</p> <p>3. Name of Product and Model : Self-Ballasted LED Lamps / GTW-050C</p> <p>4. Manufacturer and Country of Origin : APEX INTEC CO.,LTD. / Korea</p> <p>5. Date of Test : 2019-04-25 to 2019-05-02</p> <p>6. Test method used : EN 55015:2013 /A1:2015 EN 61547:2009 EN 61000-3-2:2014 EN 61000-3-3:2013</p> <p>7. Test Results : Refer to the test result in the test report</p>		
Affirmation	Tested by  Name : Gueseok Lee (Signature)	Technical Manager  Name : Gunsu Park (Signature)
2019-08-27		
<h2>KCTL Inc.</h2>		
<p>As a test result of the sample which was submitted from the client, this report does not guarantee the whole product quality. This test report should not be used and copied without a written agreement by KCTL Inc.</p>		

REPORT REVISION HISTORY

Date	Revision	Page No
2019-08-27	Originally issued	-

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Contents

1. Applicant information	4
2. Laboratory information.....	5
3. Test system configuration.....	6
3.1 Operation environment.....	6
3.2 Measurement Uncertainty	7
3.3 Measurement Program.....	8
4. Description of EUT	9
4.1 General information.....	9
4.2 Product description.....	10
4.3 Auxiliary equipments	10
4.4 Test configuration	11
4.5 Operating conditions	11
5. Summary of test results	12
5.1 Summary of EMI emission test results.....	12
5.2 Summary of immunity test results	12
5.3 Performance criteria	13
6. Test results	14
6.1 Disturbance Voltages	14
6.2 Radiated Electromagnetic disturbance	18
6.3 Radiated Emission	23
6.4 Harmonics	27
6.5 Flicker.....	32
6.6 Electrostatic Discharge.....	35
6.7 Radio Frequency Electromagnetic Fields	41
6.8 Electrical Fast Transient/BURST.....	45
6.9 Surge.....	48
6.10 Conducted Immunity	51
6.11 Magnetic field immunity.....	55
6.12 Dips and Interruptions	57
7. EUT photographs	59

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Page (4) of (61)

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1. Applicant information

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Report No.:
KR19-SEC0297

Page (5) of (61)

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2. Laboratory information

Address

KCTL Inc. (Suwon Lab.)

65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea

Telephone Number: 82 31 285 0894

Facsimile Number: 82 505 299 8311

FCC Site Designation No: KR0040

VCCI Registration No. : R-20080, G-20078, C-20059, T-20056

Industry Canada Registration No. : 8035A

KOLAS NO.: KT231

SITE MAP



3. Test system configuration

3.1 Operation environment

	Temperature	Humidity	Pressure
Chamber 10 m(RE)	21.6 °C	28.0 % R.H.	-
Shielded room(CE)	22.3 °C	28.1 % R.H.	-
Shielded room(ESD)	22.8 °C	33.7 % R.H.	101.0 kPa

Test site

These testing items were performed following locations;

Test item	Test site
Disturbance Voltages	Shielded Room
Radiated Electromagnetic disturbance	Shielded Room
Radiated Emission	10 m Chamber
Harmonics current	EMI Test area
Voltage fluctuations and flickers	EMI Test area
Electrostatic discharge	Shielded Room
Radiated RF immunity	3F Anechoic chamber (3 m)
Electrical Fast Transient/BURST	Shielded Room
Surge	Shielded Room
Conducted RF immunity	Shielded Room
Magnetic field immunity	Shielded Room
Voltage dip/interruption	Shielded Room

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Report No.:
KR19-SEC0297

Page (7) of (61)



3.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC.

The factors contributing to uncertainties are test receiver, cable loss, antenna factor calibration, Antenna directivity, antenna factor variation with height, antenna phase center variation, antenna frequency interpolation, measurement distance variation, site imperfection, mismatch, and system repeatability. Based on CISPR 16-4-2, the measurement uncertainty level with a 95 % confidence level was applied.

Conducted Emission measurement (Confidence level about 95 %, $k = 2$)			
Shielded Room (CE#1)	9 kHz ~ 150 kHz:	3.66 dB	
	150 kHz ~ 30 MHz:	3.26 dB	
Shielded Room (CE#2)	9 kHz ~ 150 kHz:	3.48 dB	
	150 kHz ~ 30 MHz:	3.06 dB	
Radiated Emission measurement (Confidence level about 95 %, $k = 2$)			
10 m Chamber (4F)	30 MHz ~ 300 MHz	3 m:	5.32 dB
		10 m:	5.32 dB
	300 MHz ~ 1 000 MHz	3 m:	5.46 dB
		10 m:	5.34 dB
	1 GHz ~ 6 GHz	3 m:	6.32 dB
	10 m Chamber (2F)	30 MHz ~ 300 MHz	3 m:
10 m:			4.96 dB
300 MHz ~ 1 000 MHz		3 m:	5.14 dB
		10 m:	5.00 dB
1 GHz ~ 6 GHz		3 m:	6.34 dB
Radio Frequency Electromagnetic Fields (Confidence level about 95 %, $k = 2$)			
0.86 dB			
Disturbance Power Electromagnetic Fields (Confidence level about 95 %, $k = 2$)			
2.82 dB			

3.3 Measurement Program

These test items were performed by software programs;

Test item	Measurement Program		Used
Conducted Emission	EP5CE_V 5.4.0(TOYO)		☒
Radiated Electromagnetic disturbance	EMC32_V 9.01.0 (ROHDE & SCHWARZ)		☒
Radiated Emission	2F	EP5RE_V 4.6.0(TOYO)	☒
	4F	EP5RE_V 5.11.10(TOYO)	
Harmonics current, Voltage fluctuations and flickers	CTS 4_V 4.6.2 (AMETEK)		☒
Radiated RF immunity	3F	EMC32_V 9.01.0 (ROHDE & SCHWARZ)	☒
	6F	EMC32_V 8.53.0 (ROHDE & SCHWARZ)	
Electrical Fast Transient/BURST, Surge, Magnetic field immunity, Voltage dip/interruption	6F(#1)	ISMIEC_V 4.08(EM TEST)	☒
	6F(#2)	ISMIEC_V 4.07(EM TEST)	
	3F(#3)	IEC_V 5.2.9(EM TEST)	
Conducted RF immunity	6F(#1)	EMC32_V 9.25.00 (ROHDE & SCHWARZ)	☒
	3F(#2)	ICD_V 5.3.4(EM TEST)	

4. Description of EUT

4.1 General information

Electrical Characteristics

NO	ITEMS	CONDITIOS	UNIT	SPECIFICATION		
				MIN	TYP	MAX
1	Power Consumption	System	W	45	50	55
2	Input Voltage		Vac		230	
3	Input Current		A	-	0.23	-
4	Frequency		Hz	-	50/60	
5	Power Factor		%	0.90	0.97	-
6	Working Temperature		°C	-20	-	40
7	Ingress Protection Rating		IP	-	65	-
8	Life time (@55°C)	Incl. Driver	Hour	50,000	-	-
9	Certificate			KS, HIGH EFFICIENCY EQUIPMENT		
10	Warranty			3 Years		

Optical Characteristics

NO	ITEMS	CONDITIOS	UNIT	SPECIFICATION		
				MIN	TYP	MAX
1	Total Luminous Flux		lm	-	6000	-
2	Efficacy		Lm/W	-	120	-
3	CCT		K	5310	5665	6020
4	CRI		Ra	80	-	-

Dimensional Characteristics

NO	ITEMS	SPECIFICATION	REMARKS
1	Net Weight (Incl. Driver)	0.89 Kg	
2	Dimension	266(L) X Ø 95(W)	

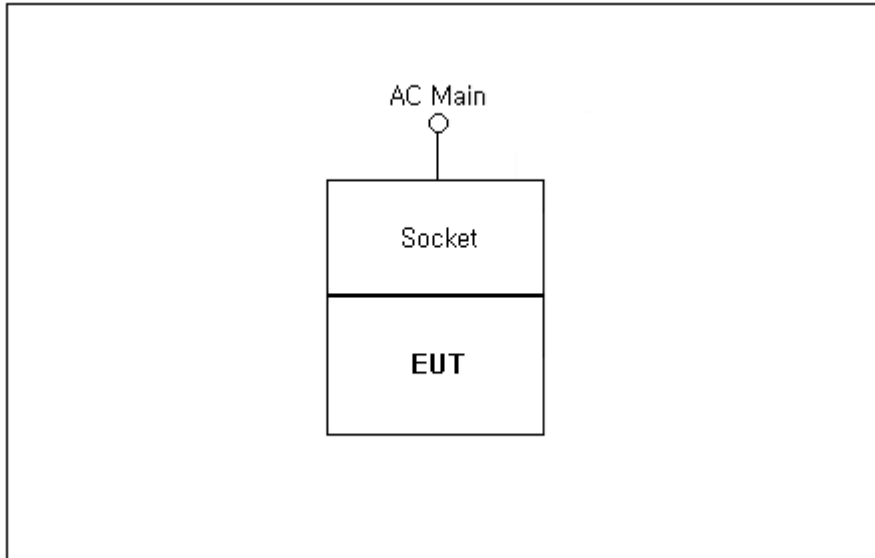
4.2 Product description

Type of product	Self-Ballasted LED Lamps
Model name (Basic)	GTW-050C
Model name (Variant)	GTW-040C, GTW-030C
Difference	Power consumption difference GTW-050C: 50 W GTW-040C: 40 W GTW-030C: 30 W
Serial no	-
Testing voltage	230 V, 50 Hz
Input rating	230 V, 50/60 Hz
Internal clock frequency	-
Note	-

4.3 Auxiliary equipments

Type	Model / Part #	S/N	Manufacturer
Socket	-	-	-

4.4 Test configuration



	Start		End		Cable	
	Name	I/O port	Name	I/O port	Length (m)	Spec.
1	EUT	Power	Socket	-	Direct	-

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
Test #1	Check the LED lighting monitoring test with Light meter.

5. Summary of test results

5.1 Summary of EMI emission test results

Applied	Test items	Test method	Result
<input checked="" type="checkbox"/>	Disturbance Voltages	EN 55015:2013 /A1:2015	Pass
<input checked="" type="checkbox"/>	Radiated Electromagnetic disturbance	EN 55015:2013 /A1:2015	Pass
<input checked="" type="checkbox"/>	Radiated Emission	EN 55015:2013 /A1:2015	Pass
<input checked="" type="checkbox"/>	Harmonics current	EN 61000-3-2:2014	Pass
<input checked="" type="checkbox"/>	Voltage fluctuations and flickers	EN 61000-3-3:2013	Pass

5.2 Summary of immunity test results

Applied	Test items	Test method	Result
EN 61547:2009			
<input checked="" type="checkbox"/>	Electrostatic discharge	EN 61000-4-2:2009	Pass
<input checked="" type="checkbox"/>	Radiated RF immunity	EN 61000-4-3:2006 /A2:2010	Pass
<input checked="" type="checkbox"/>	Electrical Fast Transient/BURST	EN 61000-4-4:2012	Pass
<input checked="" type="checkbox"/>	Surge	EN 61000-4-5:2014	Pass
<input checked="" type="checkbox"/>	Conducted RF immunity	EN 61000-4-6:2014	Pass
<input checked="" type="checkbox"/>	Magnetic field immunity	EN 61000-4-8:2010	Pass
<input checked="" type="checkbox"/>	Voltage dip/interruption	EN 61000-4-11:2004	Pass

5.3 Performance criteria

Performance criterion A:

During the test no change of the luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended.
(The luminous intensity shall be deemed to be unchanged if the measured intensities do not deviate by more than 15 %.)

Performance criterion B:

During the test the luminous may change the any value.
After the test the luminous intensity shall be restored to its initial value within 1 min. Regulating controls needs 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.

Performance criterion C:

During and after the test change of the luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30min, all functions shall return to normal if necessary by temporary interruption of the mains supply and/or operating the regulating control. Additional requirement for lighting equipment incorporating a starting device: After the test the lighting equipment is switch off. After half an hour it is switched on again. The lighting equipment shall start and operate as intended.

6. Test results

6.1 Disturbance Voltages

Test specification	EN 55015:2013 /A1:2015		
Testing voltage	230 V, 50 Hz		
Test facility	Shielded room (CE#2)		
Date	2019-04-25		
Temperature (°C)	22.3 °C	Humidity (% R.H.)	28.1 % R.H.
Remarks	Pass		

6.1.1 Limits of disturbance voltages measurement

Mains terminals

Frequency	Limits dB(μ V) ^a	
	Quasi-peak	Average
9 kHz ~ 50 kHz	110	-
50 kHz ~ 150 kHz	90 ~ 80 ^b	-
150 kHz ~ 0.5 MHz	66 ~ 56 ^b	56 ~ 46 ^b
0.5 MHz ~ 5 MHz	56 ^c	46 ^c
5 MHz ~ 30 MHz	60	50

^a At the transition frequency, the lower limit applies.

^b The limit decreases linearly with the logarithm of the frequency in the ranges
50 kHz - 150 kHz and 150 kHz - 0.5 MHz

^c For electrode less lamps and luminaries, the limit in the frequency range of
2.51 MHz - 3.0 MHz is 73 dB(μ V) quasi-peak and 63 dB(μ V) average

Load terminals

Frequency [MHz]	Limits dB(μ V) ^a	
	Quasi-peak	Average
0.15 ~ 0.5	80	70
0.5 ~ 30	74	64

^a At the transition frequency, the lower limit applies.

Control terminals

Frequency [MHz]	Limits dB(μV)	
	Quasi-peak	Average
0.15 ~ 0.50	84 ~ 74	74 ~ 64
0.5 ~ 30	74	64

Note #1 The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz

Note #2 The voltage disturbance limits are derived for use with an impedance stabilization network (ISN) which Presents a common mode(asymmetric mode) impedance of 15 Ω to the control terminal

6.1.2 Measurement procedure

The measurements were performed in a shielded room. EUT was setup as shown in photograph and placed on a non-metallic table height of 0.8 m above the reference ground plane. The rear of table was located 0.4 m to the vertical conducted plane. EUT was power through the LISN, which was bonded to the ground plane. The LISN power was filtered. Each EUT power lead, except ground (safety) lead was individually connected through a LISN to input power source. EUT signal cables that hung closer than 0.4 m to the Horizontal metal ground 0.3 m ~ 0.4 m long. The power cord was bundles in the center. All peripheral equipment was powered from a sub LISN. The LISN and ISN were positioned 0.8 m from the EUT. Peak and Average detection were used in preliminary testing and Quasi-peak and Average detections were used at final measurement.

6.1.3 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
EMI TEST RECEIVER	ESCI	100710	R&S	2019.08.23	<input checked="" type="checkbox"/>
TWO-LINE V-NETWORK	ENV216	101584	R&S	2020.04.05	<input checked="" type="checkbox"/>
TWO-LINE V-NETWORK	NNLK8121	8121-472	SCHWARZBECK	2019.08.24	<input type="checkbox"/>

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Report No.:
KR19-SEC0297

Page (16) of (61)

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6.1.4 Photographs of test setup

Mains terminals



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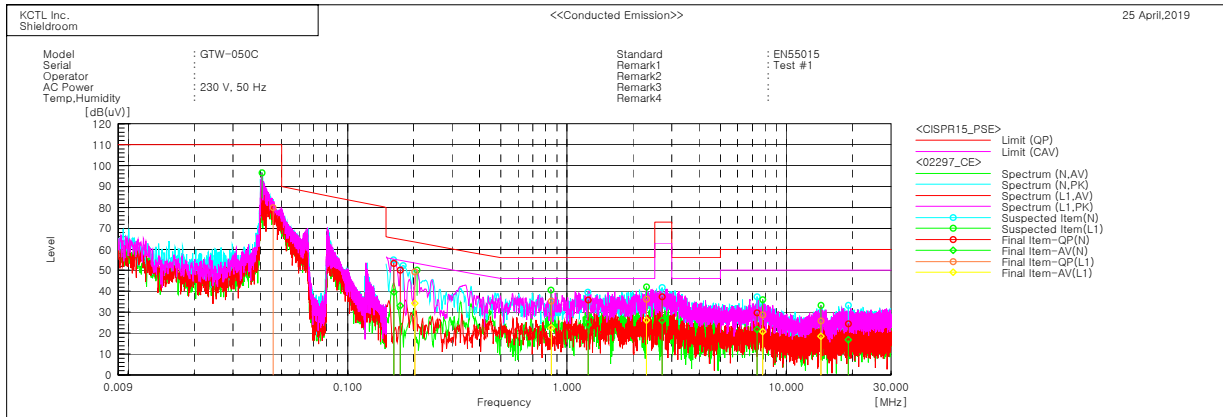
Report No.:
KR19-SEC0297

Page (17) of (61)



6.1.5 Disturbance Voltages measurement result

Main terminals



Final Result

--- N Phase ---										
No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c. f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.16248	43.6	29.7	9.8	53.4	39.5	65.3	55.3	11.9	15.8
2	0.1742	40.2	23.2	9.9	50.1	33.1	64.8	54.8	14.7	21.7
3	1.25266	26.3	14.4	9.6	35.9	24.0	56.0	46.0	20.1	22.0
4	2.71873	27.8	16.3	9.6	37.4	25.9	73.0	63.0	35.6	37.1
5	7.36485	19.9	12.0	9.7	29.6	21.7	60.0	50.0	30.4	28.3
6	19.17837	14.4	6.8	10.0	24.4	16.8	60.0	50.0	35.6	33.2

--- L1 Phase ---										
No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c. f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.04571	70.5		9.5	80.0		110.0	0.0	30.0	
2	0.20245	39.5	24.5	9.8	49.3	34.3	63.5	53.5	14.2	19.2
3	0.84882	25.6	12.9	9.7	35.3	22.6	56.0	46.0	20.7	23.4
4	2.30241	26.5	16.4	9.7	36.2	26.1	56.0	46.0	19.8	19.9
5	7.80975	18.9	11.0	9.8	28.7	20.8	60.0	50.0	31.3	29.2
6	14.38202	15.8	8.5	10.0	25.8	18.5	60.0	50.0	34.2	31.5

6.2 Radiated Electromagnetic disturbance

Test specification	EN 55015:2013 /A1:2015		
Testing voltage	230 V, 50 Hz		
Test facility	Shielded room(2F)		
Date	2019-04-25		
Temperature (°C)	22.3 °C	Humidity (% R.H.)	27.6 % R.H.
Remarks	Pass		

6.2.1 Limits of radiated electromagnetic disturbance measurement

Frequency	Limits for loop diameter dB(μ A) ^a		
	2 m	3 m	4 m
9 kHz ~ 70 kHz	88	81	75
70 kHz ~ 150 kHz	88 ~ 58 ^b	81 ~ 51 ^b	75 ~ 45 ^b
150 kHz ~ 3.0 MHz	58 ~ 22 ^b	51 ~ 15 ^b	49 ~ 9 ^b
3.0 MHz ~ 30 MHz	22	15 ~ 16 ^c	9 ~ 12 ^c

^a At the transition frequency, the lower limit applies.

^b Decreasing linearly with the logarithm of the frequency. For electrode less lamps and luminaries, the limit in the frequency range of 2.2 MHz ~ 3.0 MHz is 58 dB(μ A) for 2 m, 51 dB(μ A) for 3 m, and 45 dB(μ A) for 4 m loop diameter.

^c Increasing linearly with the logarithm of the frequency.

Margin(dB) = Limit(dB(μ A)) - QuasiPeak(dB(μ A))

Note

Although the kind and length of the cable that described in section 5.3.3.3 have to be stated to apply "b", but we didn't go through above procedure because our customer asked us to do not fill them in.

6.2.2 Used equipments

Equipment	Model	Serial No.	Makers	Next Cal. Date	Used
EMI TEST RECEIVER	ESCI	100710	R&S	2019.08.23	<input checked="" type="checkbox"/>
TRIPLE Loop	HXYZ 9170-218	HFCD9171-218	SCHWARZBECK	-	<input checked="" type="checkbox"/>

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Report No.:
KR19-SEC0297
Page (19) of (61)

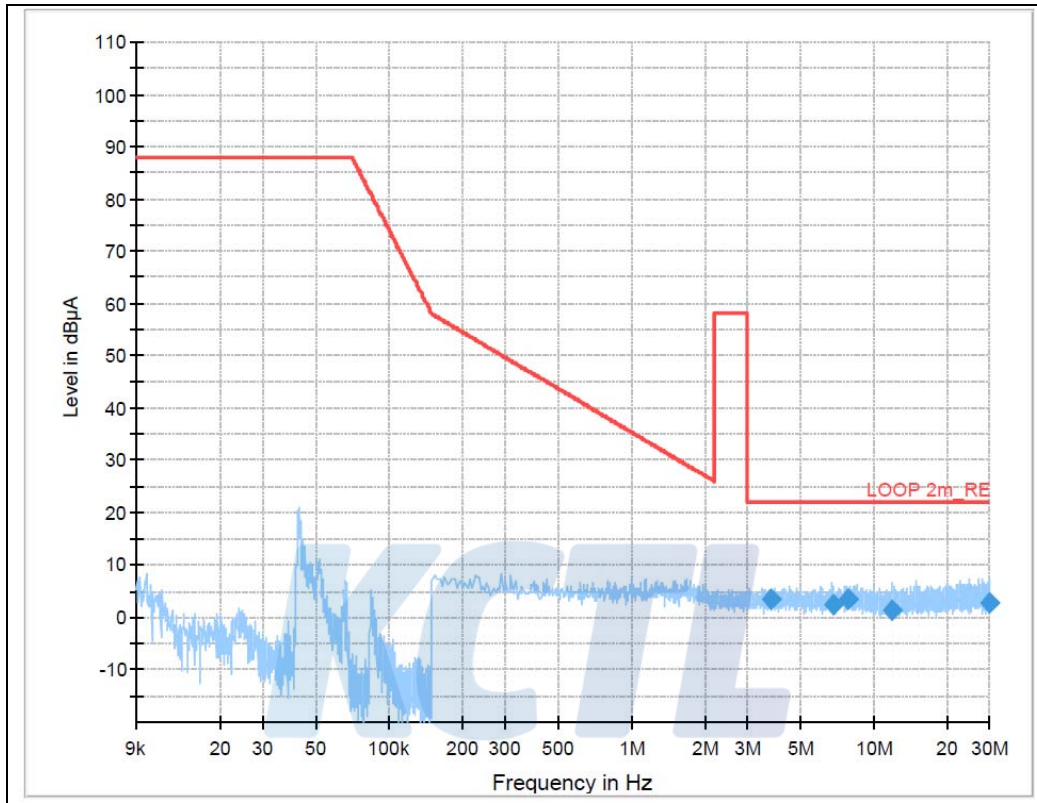


6.2.3 Photographs of test setup



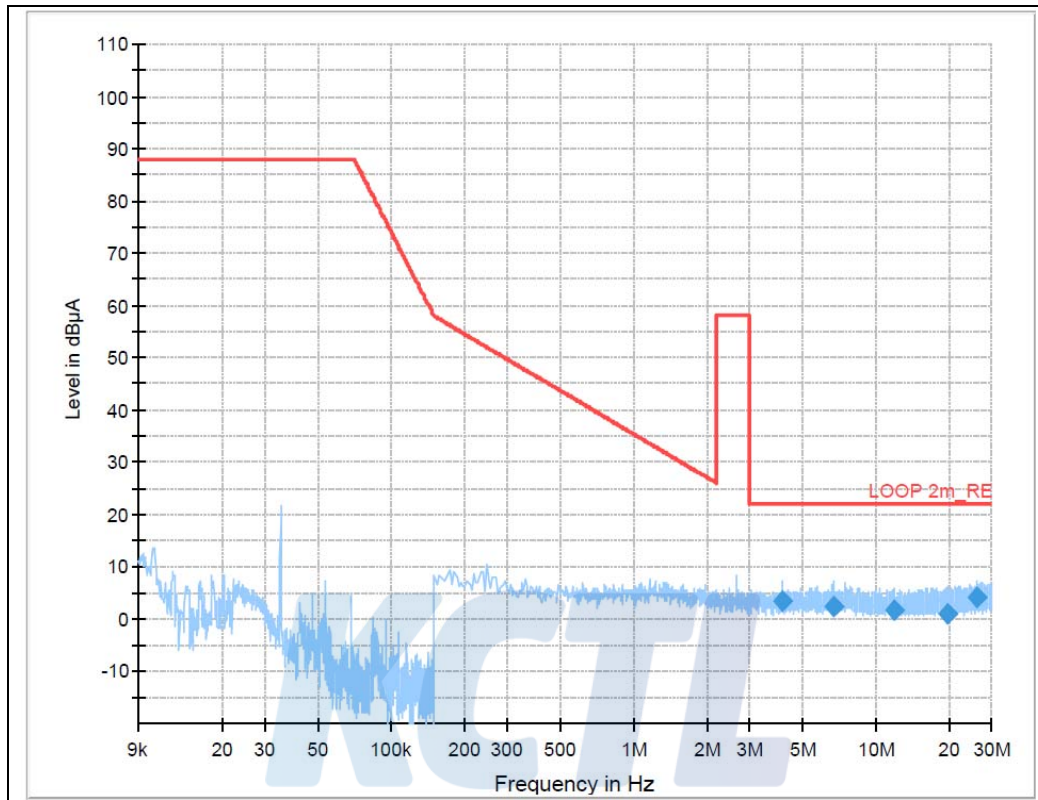
6.2.4 Radiated Electromagnetic disturbance result

X (2 m)



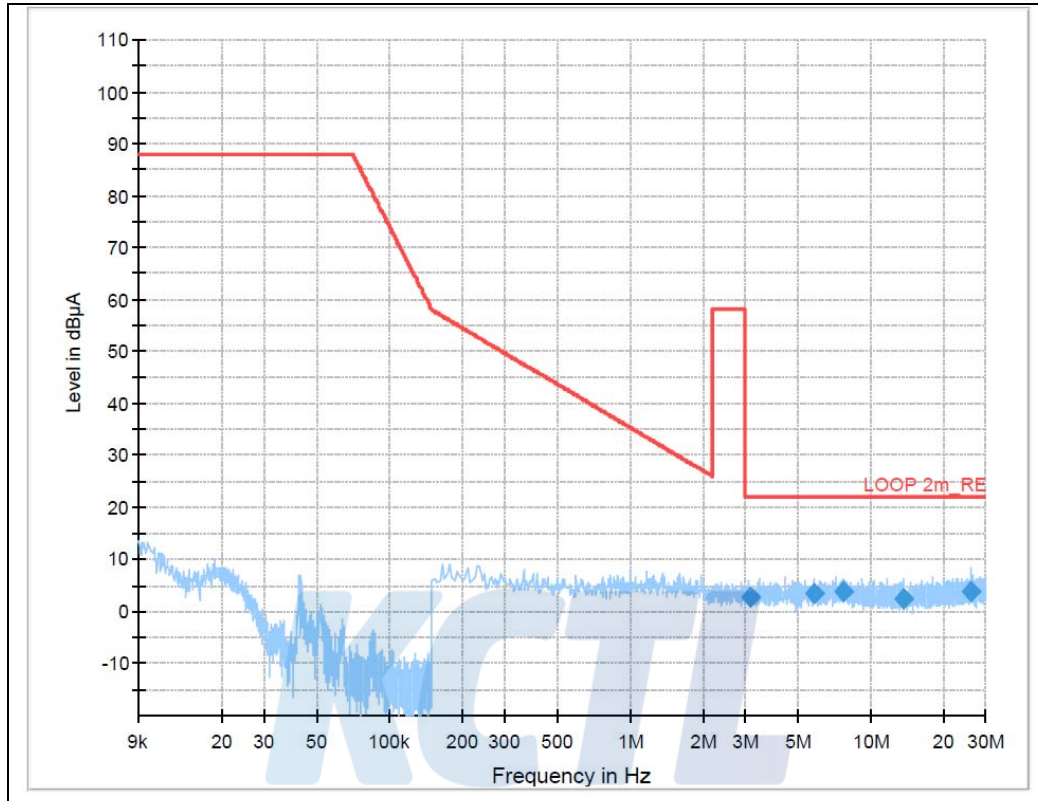
Frequency (MHz)	Corr. (dB)	QuasiPeak (dB(µA))	Limit (dB(µA))	Margin (dB)
3.7940	0.05	3.62	22.00	18.38
6.8260	0.03	2.35	22.00	19.65
7.8860	0.04	3.63	22.00	18.37
11.9100	0.10	1.51	22.00	20.49
29.7940	0.15	2.66	22.00	19.34

Y (2 m)



Frequency (MHz)	Corr. (dB)	QuasiPeak (dB(µA))	Limit (dB(µA))	Margin (dB)
4.1300	0.04	3.37	22.00	18.63
6.6580	0.03	2.31	22.00	19.69
11.8180	0.10	1.85	22.00	20.15
19.7460	0.16	1.05	22.00	20.95
25.9180	0.15	4.26	22.00	17.74

Z (2 m)



Frequency (MHz)	Corr. (dB)	QuasiPeak (dB(µA))	Limit (dB(µA))	Margin (dB)
3.1420	0.04	2.68	22.00	19.32
5.8220	0.02	3.62	22.00	18.38
7.7420	0.04	3.66	22.00	18.34
13.7100	0.14	2.44	22.00	19.56
26.2020	0.15	3.68	22.00	18.32

6.3 Radiated Emission

Test specification	EN 55015:2013 /A1:2015		
Testing voltage	230 V, 50 Hz		
Test facility	10 m Chamber (2F)		
Test distance	10 m		
Date	2019-04-25		
Temperature (°C)	21.6 °C	Humidity (% R.H.)	28.0 % R.H.
Remarks	Pass		

6.3.1 Limits of radiated emission measurement

Frequency [MHz]	Quasi-peak limits (dB(μ V/m))
30 ~ 230	30
230 ~ 300	37

At the transition frequency, the lower limit applies.

6.3.2 Measurement procedure

The test was done at a 10 m chamber with a quasi-peak detector. EUT was placed on a non-metallic table height of 0.8 m above the reference ground plane. Cables were folded back and forth forming a bundle 0.3 m to 0.4 m long and were hanged at a 0.4 m height to the ground plane.

Cables connected to EUT were fixed to cause maximum emission.

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.

The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

6.3.3 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
EMI TEST RECEIVER	ESC17	100732	R&S	2019.08.23	☒
Bilog Antenna	VULB9168	583	SCHWARZBECK	2020.04.13	☒
AMPLIFIER	310N	284608	SONOMA	2019.08.23	☒
COAXIAL FIXED ATTENUATOR	8491B-003	2708A18758	AGILENT	-	☒
Antenna Mast	MA4000-EP	303	Innco Systems	-	☒
Turn Table	DT2000	79	Innco Systems	-	☒

6.3.4 Sample calculation

The field strength is calculated adding the antenna Factor, cable loss and, Antenna pad adding, subtracting the amplifier gain from the measured reading.

The sample calculation is as follow:

$$\text{Result} = \text{M.R} + \text{C.F}(\text{A.F} + \text{C.L} + 6 \text{ dB Att} - \text{A.G})$$

M.R = Meter Reading

C.F = Correction Factor

A.F = Antenna Factor

C.L = Cable Loss

A.G = Amplifier Gain

6 dB Att = 6 dB Attenuator

If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 6 dB, A.G 35 dB

The result is

$$30 + 12 + 5 + 6 - 35 = 18 \text{ dB}(\mu\text{V/m})$$

Bilog Antenna and ATTENUATOR (6 dB) were calibrated together.

AV = CAV : Abbreviation of CISPR Average

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Report No.:
KR19-SEC0297

Page (25) of (61)

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6.3.5 Photographs of test setup

30 MHz ~ 300 MHz



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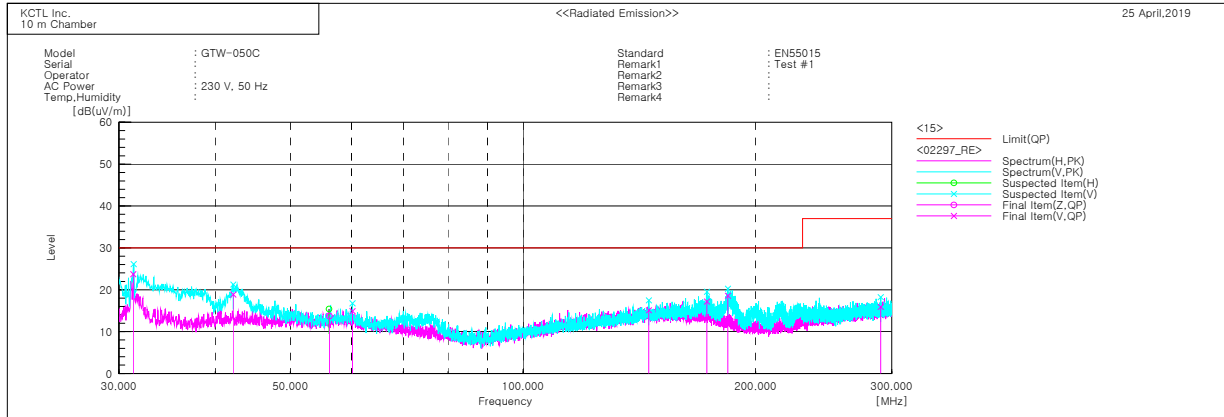
Report No.:
KR19-SEC0297

Page (26) of (61)



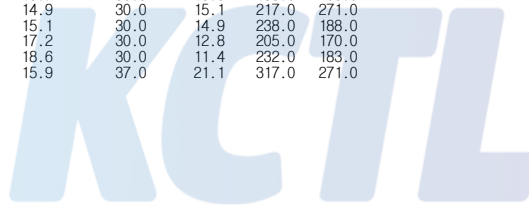
6.3.6 Radiated emission measurement result

30 MHz ~ 300 MHz



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	31.321	V	37.2	-13.5	23.7	30.0	6.3	134.0	203.0
2	42.184	V	30.9	-12.0	18.9	30.0	11.1	201.0	130.0
3	56.164	H	25.5	-11.8	13.7	30.0	16.3	138.0	203.0
4	60.173	V	26.9	-12.0	14.9	30.0	15.1	217.0	271.0
5	145.526	V	24.9	-9.8	15.1	30.0	14.9	238.0	188.0
6	173.016	V	27.5	-10.3	17.2	30.0	12.8	205.0	170.0
7	184.103	V	30.1	-11.5	18.6	30.0	11.4	232.0	183.0
8	290.314	V	24.2	-8.3	15.9	37.0	21.1	317.0	271.0



6.4 Harmonics

Test specification	EN 61000-3-2:2014				
Testing voltage	230 V, 50 Hz				
Test facility	EMI Test area(6F)				
Date	2019-04-25				
Temperature(°C)	22.3 °C	Humidity (% R.H.)	28.6 % R.H.	Pressure (kPa)	101.2 kPa
Remarks	Pass				

6.4.1 Measurement procedure

The equipment is supplied in series with shunt(s) R_m or current transformer(s) from a source having the same nominal voltage and frequency as the rated supply voltage and frequency of the equipment. Measurements shall be made under normal load, or conditions for adequate heat discharge, and under normal operating conditions. User's operation controls or automatic programmers shall be set to produce the maximum harmonic component, for each successive harmonic component in turn. For the purpose of harmonic current limitation, equipment is classified as follows :

Class A : Equipment not specified in one of the three other Classes shall be considered as Class A equipment.

- Balanced three-phase equipment;
- Household appliances, excluding equipment identified as Class D;
- Tools, excluding portable tools;
- Dimmers for incandescent lamps;
- Audio equipment.

Class B : Portable tools; Arc welding equipment which is not professional equipment.

Class C : Lighting equipment.

Class D : Equipment having a specified power according to 6.2.2 less than or equal to 600 w, of the following types:

- Personal computers and personal computer monitors;
- Television receivers.
- Refrigerators and freezers having one or more variable-speed drives to control compressor motor(s).

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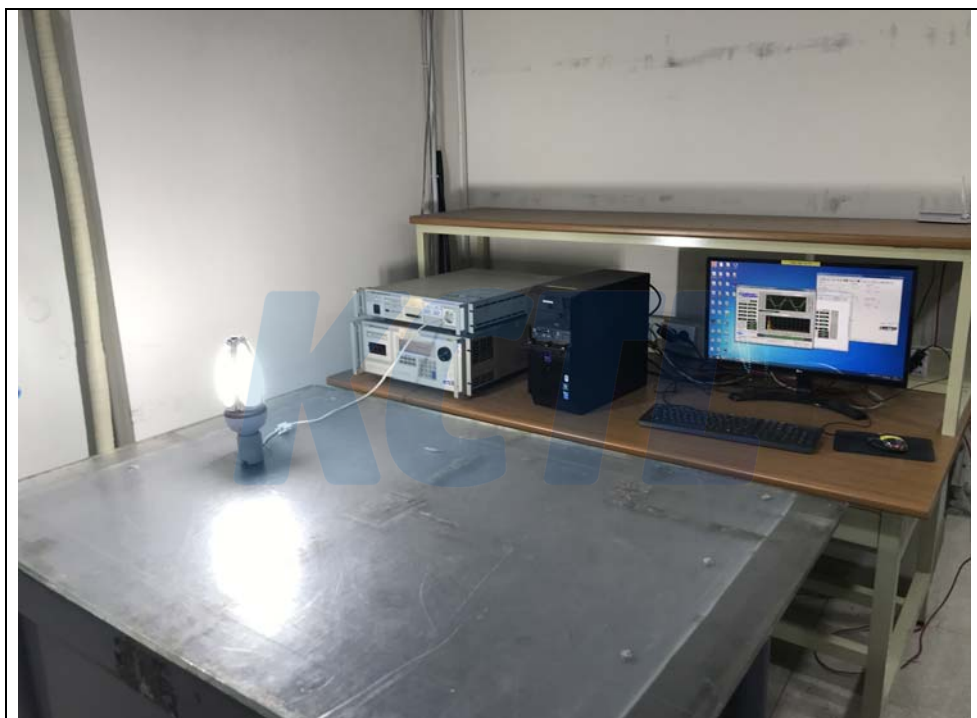
Page (28) of (61)

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6.4.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
Hamonic / Flicker Meter (AC POWER SOURCE)	5001IX	54894	C.I.	2020.03.22	<input checked="" type="checkbox"/>
Hamonic / Flicker Meter (Analyzer)	PACS-1	72072	C.I.	2020.03.22	<input checked="" type="checkbox"/>

6.4.3 Photographs of test setup



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Report No.:
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Page (29) of (61)



6.4.4 Measurement result

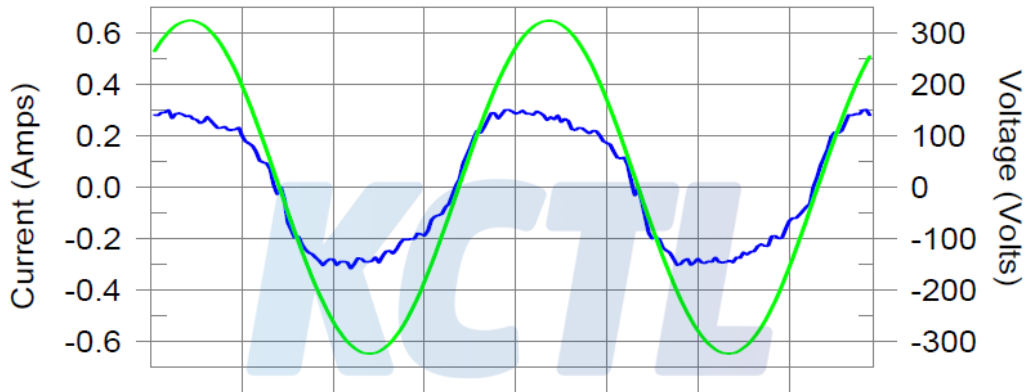
Harmonics – Class-C per Ed. Ed. 5.0 (2018)(Run time)

EUT: GTW-050C
Test category: Class-C per Ed. 5.0 (2018) (European limits)
Test date: 25/04/2019
Test duration (min): 10
Comment: Comment
Customer: APEX INTEC CO.,LTD.

Tested by: KCTL Inc.
Test Margin: 100
Start time: 09:13:03
End time: 09:23:15
Data file name: H-000047.cts_data

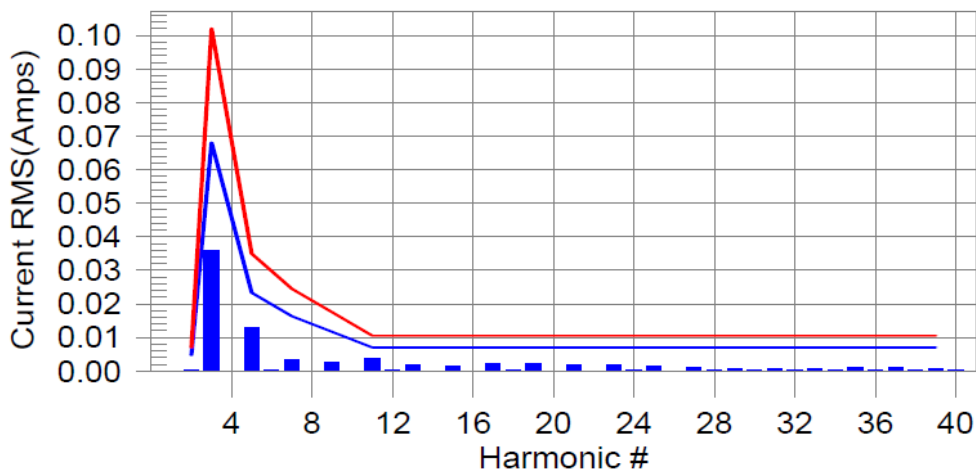
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class C limit line

European Limits



Test result: Pass Worst harmonics H5-38.1% of 150% limit, H5-55.2% of 100% limit

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Report No.:
KR19-SEC0297

Page (30) of (61)



Current Test Result Summary (Run time)

EUT: GTW-050C Tested by: KCTL Inc.
Test category: Class-C per Ed. 5.0 (2018) (European limits) Test Margin: 100
Test date: 25/04/2019 Start time: 09:13:03 End time: 09:23:15
Test duration (min): 10 Data file name: H-000047.cts_data
Comment: Comment
Customer: APEX INTEC CO.,LTD.

Test Result: Pass Source qualification: Normal
THC(A): 0.039 I-THD(%): 17.1 POHC(A): 0.004 POHC Limit(A): 0.022

Highest parameter values during test:

V _{RMS} (Volts): 229.38	Frequency(Hz): 50.00
I _{Peak} (Amps): 0.342	I _{RMS} (Amps): 0.232
I _{Fund} (Amps): 0.228	Crest Factor: 1.490
Power (Watts): 51.7	Power Factor: 0.973

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.000	0.005	N/A	0.000	0.007	N/A	Pass
3	0.036	0.068	53.0	0.036	0.102	35.5	Pass
4	0.000	0.000	N/A	0.000	0.000	N/A	Pass
5	0.013	0.023	55.2	0.013	0.035	38.1	Pass
6	0.000	0.000	N/A	0.000	0.000	N/A	Pass
7	0.003	0.016	N/A	0.004	0.024	N/A	Pass
8	0.000	0.000	N/A	0.000	0.000	N/A	Pass
9	0.003	0.012	N/A	0.003	0.017	N/A	Pass
10	0.000	0.000	N/A	0.000	0.000	N/A	Pass
11	0.004	0.007	N/A	0.004	0.010	N/A	Pass
12	0.000	0.000	N/A	0.000	0.000	N/A	Pass
13	0.002	0.007	N/A	0.002	0.010	N/A	Pass
14	0.000	0.000	N/A	0.000	0.000	N/A	Pass
15	0.001	0.007	N/A	0.001	0.010	N/A	Pass
16	0.000	0.000	N/A	0.000	0.000	N/A	Pass
17	0.002	0.007	N/A	0.002	0.010	N/A	Pass
18	0.000	0.000	N/A	0.000	0.000	N/A	Pass
19	0.002	0.007	N/A	0.002	0.010	N/A	Pass
20	0.000	0.000	N/A	0.000	0.000	N/A	Pass
21	0.002	0.007	N/A	0.002	0.010	N/A	Pass
22	0.000	0.000	N/A	0.000	0.000	N/A	Pass
23	0.002	0.007	N/A	0.002	0.010	N/A	Pass
24	0.000	0.000	N/A	0.000	0.000	N/A	Pass
25	0.001	0.007	N/A	0.002	0.010	N/A	Pass
26	0.000	0.000	N/A	0.000	0.000	N/A	Pass
27	0.001	0.007	N/A	0.001	0.010	N/A	Pass
28	0.000	0.000	N/A	0.000	0.000	N/A	Pass
29	0.001	0.007	N/A	0.001	0.010	N/A	Pass
30	0.000	0.000	N/A	0.000	0.000	N/A	Pass
31	0.001	0.007	N/A	0.001	0.010	N/A	Pass
32	0.000	0.000	N/A	0.000	0.000	N/A	Pass
33	0.001	0.007	N/A	0.001	0.010	N/A	Pass
34	0.000	0.000	N/A	0.000	0.000	N/A	Pass
35	0.001	0.007	N/A	0.001	0.010	N/A	Pass
36	0.000	0.000	N/A	0.000	0.000	N/A	Pass
37	0.001	0.007	N/A	0.001	0.010	N/A	Pass
38	0.000	0.000	N/A	0.000	0.000	N/A	Pass
39	0.001	0.007	N/A	0.001	0.010	N/A	Pass
40	0.000	0.000	N/A	0.000	0.000	N/A	Pass

Note: Rated I(f) & PF limits were applied for this test. The rated I(f)(RMS) is 0.233 Amps & the rated PF is 0.974.

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KR19-SEC0297

Page (31) of (61)



Voltage Source Verification Data (Run time)

EUT: GTW-050C
Test category: Class-C per Ed. 5.0 (2018) (European limits)
Test date: 25/04/2019
Test duration (min): 10
Comment: Comment
Customer: APEX INTEC CO.,LTD.

Tested by: KCTL Inc.
Test Margin: 100
Start time: 09:13:03
End time: 09:23:15
Data file name: H-000047.cts_data

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	229.38	Frequency(Hz):	50.00
I_Peak (Amps):	0.342	I_RMS (Amps):	0.232
I_Fund (Amps):	0.228	Crest Factor:	1.490
Power (Watts):	51.7	Power Factor:	0.973

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.109	0.459	23.80	OK
3	0.490	2.064	23.75	OK
4	0.026	0.459	5.69	OK
5	0.023	0.918	2.51	OK
6	0.026	0.459	5.66	OK
7	0.025	0.688	3.65	OK
8	0.013	0.459	2.88	OK
9	0.015	0.459	3.22	OK
10	0.017	0.459	3.66	OK
11	0.029	0.229	12.62	OK
12	0.016	0.229	6.80	OK
13	0.023	0.229	10.11	OK
14	0.015	0.229	6.39	OK
15	0.009	0.229	3.89	OK
16	0.012	0.229	5.09	OK
17	0.010	0.229	4.28	OK
18	0.014	0.229	6.17	OK
19	0.013	0.229	5.53	OK
20	0.006	0.229	2.80	OK
21	0.009	0.229	3.72	OK
22	0.006	0.229	2.56	OK
23	0.007	0.229	2.87	OK
24	0.008	0.229	3.65	OK
25	0.009	0.229	3.77	OK
26	0.010	0.229	4.42	OK
27	0.007	0.229	3.16	OK
28	0.012	0.229	5.03	OK
29	0.008	0.229	3.44	OK
30	0.010	0.229	4.20	OK
31	0.007	0.229	3.18	OK
32	0.010	0.229	4.43	OK
33	0.011	0.229	4.96	OK
34	0.005	0.229	2.02	OK
35	0.009	0.229	3.97	OK
36	0.005	0.229	2.20	OK
37	0.009	0.229	3.77	OK
38	0.011	0.229	4.65	OK
39	0.015	0.229	6.38	OK
40	0.007	0.229	2.84	OK

6.5 Flicker

Test specification	EN 61000-3-3:2013				
Testing voltage	230 V, 50 Hz				
Test facility	EMI Test area(6F)				
Date	2019-04-25				
Temperature(°C)	23.4 °C	Humidity (% R.H.)	48.1 % R.H.	Pressure (kPa)	99.9 kPa
Remarks	Pass				

6.5.1 Measurement procedure

EUT was connected to the power analyzer system.

Measurement was performed to obtain the desired flicker parameters.

The measuring time depends on which parameters are to be measured.

$$P_{ft} = 2 \text{ h}$$

$$P_{st} = 10 \text{ min}$$

Controls and automatic programs shall be set to produce the most unfavorable sequence of voltage changes, using only those combinations of controls and programs are mentioned by the manufacturer in the instruction manual.

6.5.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
Hamonic / Flicker Meter (AC POWER SOURCE)	5001IX	54894	C.I.	2020.03.22	<input checked="" type="checkbox"/>
Hamonic / Flicker Meter (Analyzer)	PACS-1	72072	C.I.	2020.03.22	<input checked="" type="checkbox"/>

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Report No.:
KR19-SEC0297
Page (33) of (61)



6.5.3 Photographs of test setup



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KR19-SEC0297

Page (34) of (61)

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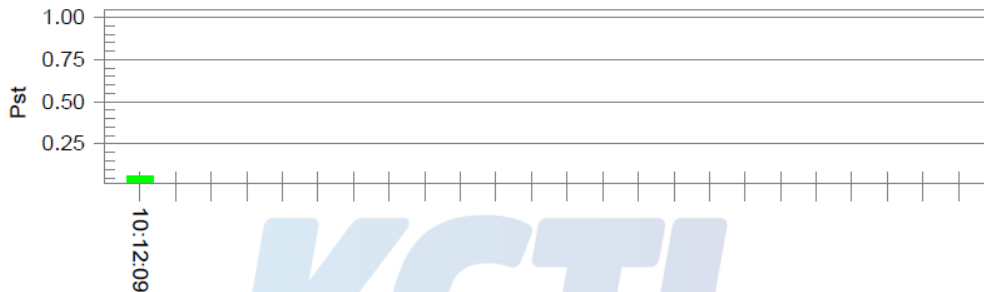
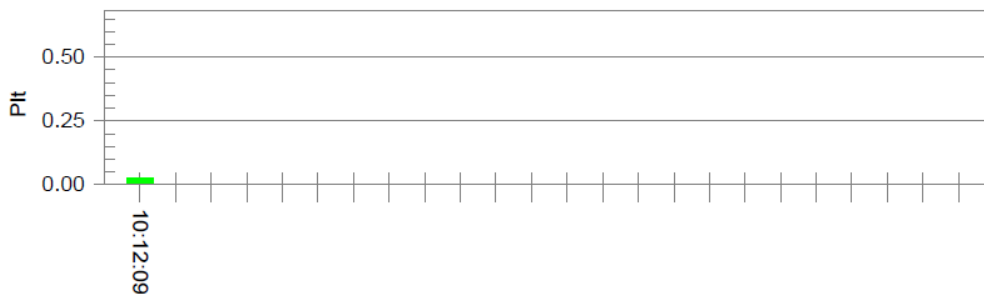
6.5.4 Measurement result

Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)


EUT: GHO-1000M1-B Tested by: KCTL Inc
 Test category: All parameters (European limits) Test Margin: 100
 Test date: 01/08/2019 Start time: 10:01:48 End time: 10:12:15
 Test duration (min): 10 Data file name: F-000049.cts_data
 Comment: Comment
 Customer: APEX INEC CO.,LTD.

Test Result: Pass

Status: Test Completed

Pst_i and limit lineEuropean LimitsPlt and limit line**Parameter values recorded during the test:**

Vrms at the end of test (Volt):	229.33		
T-max (mS):	0	Test limit (mS):	500.0 Pass
Highest dc (%):	0.00	Test limit (%):	3.30 Pass
Highest dmax (%):	0.00	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000 Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.650 Pass

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6.6 Electrostatic Discharge

Test specification	EN 61000-4-2:2009, Criteria : B				
Test level	<input checked="" type="checkbox"/> Contact: ± 4 kV <input checked="" type="checkbox"/> Air: ± 2 kV, ± 4 kV, ± 8 kV <input checked="" type="checkbox"/> HCP: ± 4 kV <input checked="" type="checkbox"/> VCP: ± 4 kV				
Discharge impedance	330 Ω / 150 pF				
Number of discharge (Each polarity)	<input checked="" type="checkbox"/> Contact: 10 <input checked="" type="checkbox"/> Air: 10 <input checked="" type="checkbox"/> HCP / VCP: 10				
Interval between discharges	1 s				
Testing voltage	230 V, 50 Hz				
Test facility	Shielded room (6F)				
Date	2019-04-26				
Temperature($^{\circ}$ C)	22.8 $^{\circ}$ C	Humidity (% R.H.)	33.7 % R.H.	Pressure (kPa)	101.0 kPa
Remarks	Pass - A: There was no change of operation status during above testing.				

6.6.1 Measurement procedure

A ground reference plane was located on the floor, and connected to earth via a low Impedance connection. The return cable of the ESD generator was connected to the reference plane. In case of floor standing equipment, EUT was placed on the reference plane on 0.1 m of insulating Support. In case of table top equipment, EUT was placed on a wooden table 0.8 m above the reference grounded floor. A horizontal coupling plane (HCP) was placed on the table, and Connected to the reference plane via a 470 k Ω resistor located in each end (0.5 mm insulating support between EUT and HCP). In both cases a vertical coupling plane(VCP) OF 0.5 X 0.5 m was located 0.1 m from the EUT's sides. The VCP was connected to the reference plane in the same matter as the HCP.

6.6.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
ESD TESTER	NSG 437	182	TESEQ	2020.04.10	<input checked="" type="checkbox"/>
HCP	-	-	-	-	<input checked="" type="checkbox"/>
VCP	-	-	-	-	<input checked="" type="checkbox"/>
LIGHT METER	TES 1335	090501870	TES	2019.08.28	<input checked="" type="checkbox"/>



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Report No.:
KR19-SEC0297
Page (37) of (61)



6.6.3 Photographs of test setup



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Page (38) of (61)



6.6.4 Measurement result

Electrostatic Discharge (Test Point)

Air discharge



Contact discharge



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Report No.:
KR19-SEC0297
Page (39) of (61)



HCP/VCP discharge

Location(EUT)	Applied level (±)	Result
HCP (All 4 sides)	± 4 kV	A
VCP (All 4 sides)	± 4 kV	A

Contact discharge

Location(EUT)	Applied level (±)	Result
Front	± 4 kV	A
Rear	± 4 kV	A
Left	± 4 kV	A
Right	± 4 kV	A

Air discharge

Location(EUT)	Applied level (±)	Result
Front	± 2 kV, ± 4 kV, ± 8 kV	A
Rear	± 2 kV, ± 4 kV, ± 8 kV	A
Left	± 2 kV, ± 4 kV, ± 8 kV	A
Right	± 2 kV, ± 4 kV, ± 8 kV	A

Lux Meter

Before	After
78.5 klux	78.4 klux

6.7 Radio Frequency Electromagnetic Fields

Test specification	EN 61000-4-3:2006 /A2:2010, Criteria : A				
Tested frequency	80 MHz ~ 1 GHz				
Test level & Modulation	3 V/m, 80 % Amplitude Modulation (1 kHz)				
Frequency Step	1 % step				
Dwell time	1 s				
Distance	3 m from EUT to tip of antenna				
Testing Voltage	230 V, 50 Hz				
Test facility	3F Anechoic chamber (3 m)				
Date	2019-05-02				
Temperature(°C)	22.8 °C	Humidity (% R.H.)	29.3 % R.H.	Pressure (kPa)	101.2 kPa
Remarks	Pass - A: There was no change of operation status during above testing.				

6.7.1 Measurement procedure

The test was performed at 3 m full anechoic chamber.

For floor standing equipment, the EUT was standing on the floor.

For tabletop equipment, the EUT was located on a wooden table 0.8 m above the floor.

The EUT was tested all sides, horizontal and vertical polarization.

6.7.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
POWER SENSOR	PH2000	303224	AR	2019.08.24	☒
POWER SENSOR	PH2000	311217	AR	2019.08.24	☒
POWER METER	PM2002	25002	AR	2019.08.24	☒
DIRECTIONAL COUPLER	DC6180A	0348926	AR	2019.08.24	☒
Signal generator	E4421B	GB40052295	AGILENT	2019.08.23	☒
BROADBAND AMPLIFIER	BBA 100	100996-1	R&S	-	☒
Bilog Antenna	VULB9163	552	SCHWARZBECK	-	☒
Antenna Mast	MA4640-XP-ET	-	Innco Systems	-	☒
LIGHT METER	TES 1335	090501870	TES	2019.08.28	☒



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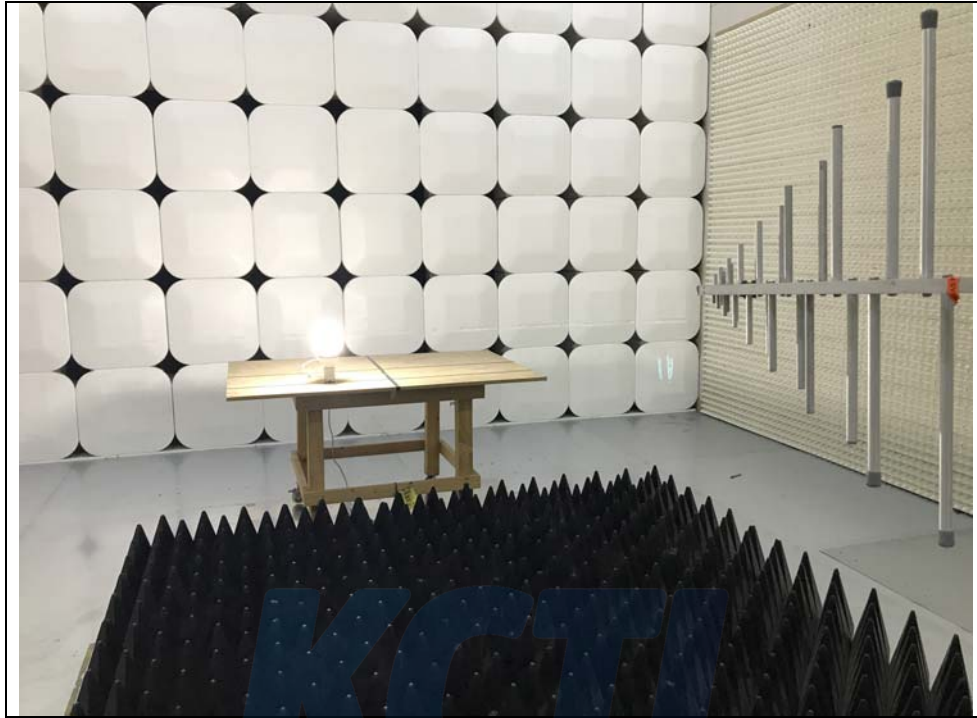
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KR19-SEC0297

Page (43) of (61)

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6.7.3 Photographs of test setup



6.7.4 Measurement result

Location(EUT)	Antenna polarization	Result
Front side	Horizontal	A
	Vertical	A
Rear side	Horizontal	A
	Vertical	A
Left side	Horizontal	A
	Vertical	A
Right side	Horizontal	A
	Vertical	A

Lux Meter

Location(EUT)	Antenna polarization	Before	After
Front side	Horizontal	78.3 klux	78.1 klux
	Vertical	78.6 klux	78.5 klux
Rear side	Horizontal	78.2 klux	78.2 klux
	Vertical	78.4 klux	78.4 klux
Left side	Horizontal	78.3 klux	78.3 klux
	Vertical	78.5 klux	78.4 klux
Right side	Horizontal	78.4 klux	78.3 klux
	Vertical	78.7 klux	78.5 klux

6.8 Electrical Fast Transient/BURST

Test specification	EN 61000-4-4:2012, Criteria : B				
Coupling	<input checked="" type="checkbox"/> AC main <input type="checkbox"/> DC Line <input type="checkbox"/> Control: Clamp <input type="checkbox"/> Telecommunication: Clamp				
Test level	<input checked="" type="checkbox"/> AC main: ± 1 kV Peak <input type="checkbox"/> DC Line: ± 0.5 kV Peak <input type="checkbox"/> Control: ± 0.5 kV Peak <input type="checkbox"/> Telecommunication: ± 0.5 kV Peak				
Repetition frequency	5 kHz, Tr/Th = 5 / 50 ns				
Coupling time (Minimum)	120 s				
Testing Voltage	230 V, 50 Hz				
Test facility	Shielded room (3F)				
Date	2019-04-26				
Temperature(°C)	22.3 °C	Humidity (% R.H.)	28.5 % R.H.	Pressure (kPa)	101.0 kPa
Remarks	Pass - A: There was no change of operation status during above testing.				

6.8.1 Measurement procedure

A ground reference plane was located on the floor.
 EFT generator was connected to reference ground plane via low impedance connection.
 For floor standing equipment, EUT was placed on a 0.1 m wooden table.
 For tabletop equipment, EUT was placed on a 0.1 m above the ground reference plane.
 Test generator and coupling/decoupling network was placed on, and bounded to, the ground reference plane. When using the coupling clamp, the minimum distance between the coupling plates and all other conductive surfaces, except the ground reference plane beneath the coupling clamp, Shall be 0.5 m.

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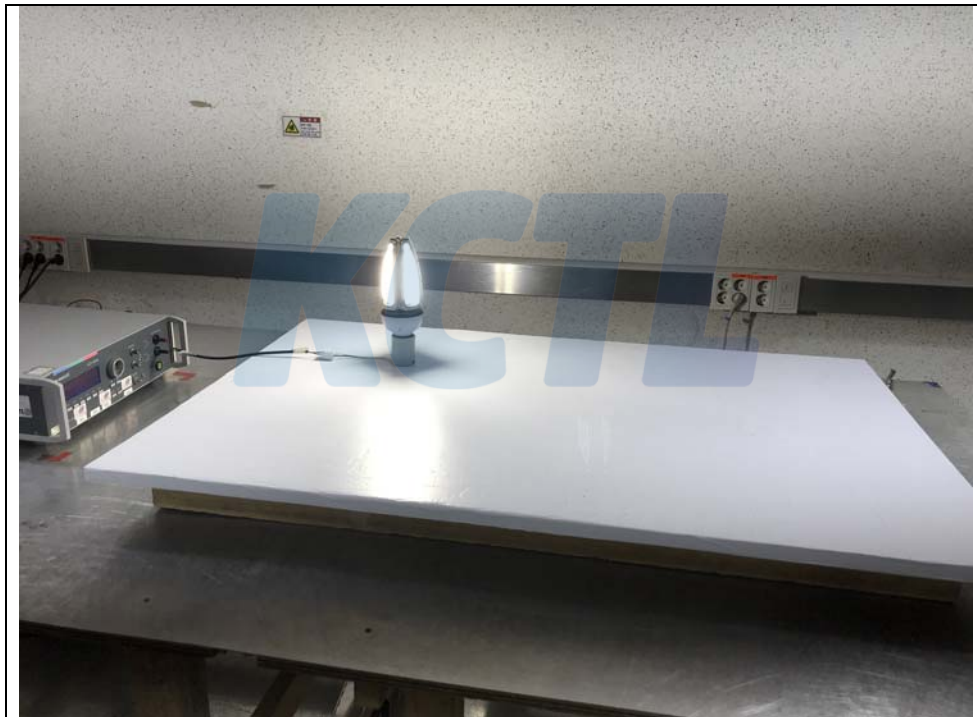
Page (46) of (61)

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6.8.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
ULTRA COMPACT SIMULATOR	UCS500N	V1238113636	EM TEST	2019.08.24	<input checked="" type="checkbox"/>
Capacitive Coupling clamp	HFK	P1411132494	EM TEST	2020.04.04	<input type="checkbox"/>
LIGHT METER	TES 1335	090501870	TES	2019.08.28	<input checked="" type="checkbox"/>

6.8.3 Photographs of test setup



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Report No.:
KR19-SEC0297

Page (47) of (61)

KCTL**6.8.4 Measurement result**

AC main

Coupling point	(+)	(-)	Result
L	+ 1 kV	- 1 kV	A
N	+ 1 kV	- 1 kV	A
PE	+ 1 kV	- 1 kV	A
L-N	+ 1 kV	- 1 kV	A
L-PE	+ 1 kV	- 1 kV	A
N-PE	+ 1 kV	- 1 kV	A
L-N-PE	+ 1 kV	- 1 kV	A

DC Line

Coupling point	(+)	(-)	Result
-	-	-	-

Telecommunication

Coupling point	(+)	(-)	Result
-	-	-	-

Lux Meter

Before	After
76.5 klux	78.6 klux

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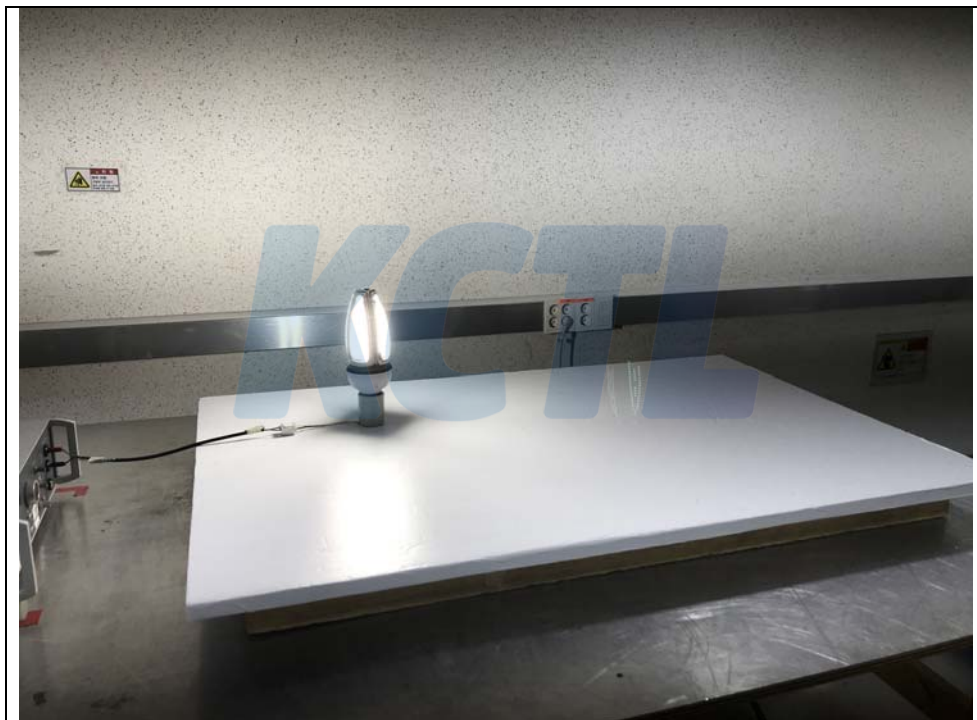
Page (49) of (61)

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6.9.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
ULTRA COMPACT SIMULATOR	UCS500N	V1238113636	EM TEST	2019.08.24	<input checked="" type="checkbox"/>
COUPLING & DECOUPLING NETWORK	CNV 508 N1	V1108108861	EM TEST	2019.08.23	<input type="checkbox"/>
LIGHT METER	TES 1335	090501870	TES	2019.08.28	<input checked="" type="checkbox"/>

6.9.3 Photographs of test setup



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Report No.:
KR19-SEC0297

Page (50) of (61)



6.9.4 Measurement result

AC main

Coupling point	(+)	(-)	Result
L-N	+ 1 kV	- 1 kV	A
L-PE	+ 2 kV	- 2 kV	A
N-PE	+ 2 kV	- 2 kV	A

Control

Coupling point	(+)	(-)	Result
-	-	-	-

Lux Meter

Before	After
78.3 klux	78.1 klux



6.10 Conducted Immunity

Test specification	EN 61000-4-6:2014, Criteria : A				
Tested frequency	0.15 MHz ~ 80 MHz				
Test level & Modulation	3 V, 80 % Amplitude Modulation (1 kHz)				
Frequency Step	1 % step				
Dwell time	1 s				
Coupling method	<input checked="" type="checkbox"/> AC main: CDN(M3) <input type="checkbox"/> DC Line: CDN(M2) <input type="checkbox"/> Telecommunication: Clamp				
Testing Voltage	230 V, 50 Hz				
Test facility	Shielded room (3F)				
Date	2019-04-26				
Temperature(°C)	22.5 °C	Humidity (% R.H.)	27.3 % R.H.	Pressure (kPa)	101.2 kPa
Remarks	Pass - A: There was no change of operation status during above testing.				

6.10.1 Measurement procedure

A ground reference plane was located on the floor.

The test was performed on a ground reference plane on a 0.1 m wooden table.

This test were performed using CDN for mains, clamp for signal and injection probe.

The frequency range was swept from 0.15 MHz to 80 MHz. This frequency range was Modulated with 1 kHz sine wave at 80 %.

The signal generators provided the modulated frequency at a 1 % step size.

The power and all network cable, I/O cables longer than 3 m length were tested.

6.10.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
POWER SENSOR	NRP-Z91	103183	R&S	2019.08.24	<input checked="" type="checkbox"/>
POWER SENSOR	NRP-Z91	103184	R&S	2019.08.24	<input checked="" type="checkbox"/>
C.D.N	CDN L-801 M2 / M3	2936	EM TEST	2019.08.23	<input checked="" type="checkbox"/>
C.D.N	CDN M2/M3N	0111-04	EM TEST	2019.08.23	<input type="checkbox"/>
SIGNAL GENERATOR	SMC100A	105221	R&S	2020.04.04	<input checked="" type="checkbox"/>
COAXIAL FIXED ATTENUATOR	73-6-34	MU918	MCE/ WEINSCHEL	2020.04.04	<input checked="" type="checkbox"/>
BROADBAND AMPLIFIER	BBA150	101937	R&S	2019.08.23	<input checked="" type="checkbox"/>
LIGHT METER	TES 1335	090501870	TES	2019.08.28	<input checked="" type="checkbox"/>

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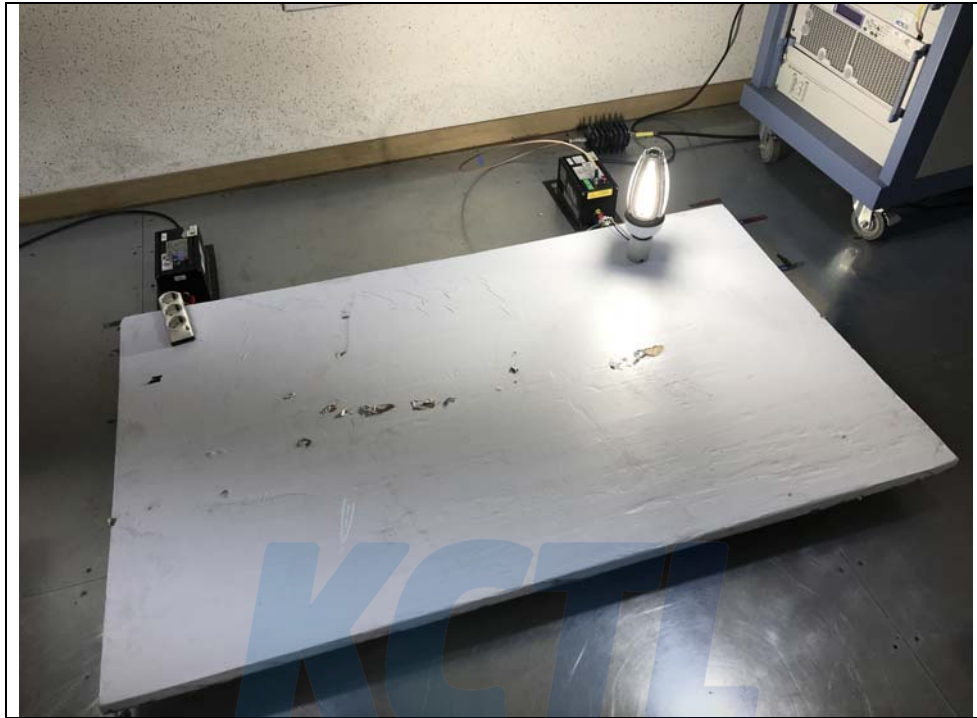
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Report No.:
KR19-SEC0297
Page (53) of (61)



6.10.3 Photographs of test setup



6.10.4 Measurement result

AC main

Coupling point	Coupling method	Result
Power	CDN(M3)	A

DC Line

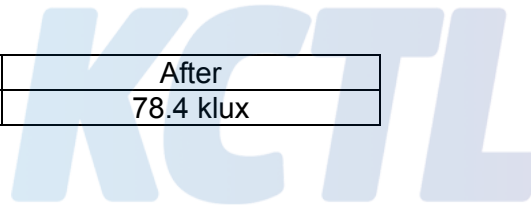
Coupling point	Coupling method	Result
-	-	-

Telecommunication

Coupling point	Coupling method	Result
-	-	-

Lux Meter

Before	After
78.6 klux	78.4 klux



6.11 Magnetic field immunity

Test specification	EN 61000-4-8:2010, Criteria : A				
Magnetic field strength	3 A/m (rms)				
Coupling time	60 s				
Frequency	50 Hz				
Testing Voltage	230 V, 50 Hz				
Test facility	Shielded room (6F)				
Polarization	X, Y, Z				
Date	2019-04-25				
Temperature (°C)	22.3 °C	Humidity (% R.H.)	27.6 % R.H.	Pressure (kPa)	101.2 kPa
Remarks	Pass - A: There was no change of operation status during above testing.				

6.11.1 Measurement procedure

The test was performed on a ground reference plane (GRP) on a 0.8 m wooden table. The EUT was isolated 10 cm isolating support. The ground plane was connected to floor reference ground plane via low impedance connection. The test generator was placed 3 m distance from the induction coil. The generator was connected reference ground plane. Preliminary verification of equipment performances was carried out prior to applying the test magnetic field. The field was applied to the EUT horizontal, vertical polarization.

6.11.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
ULTRA COMPACT SIMULATOR	UCS 500-M6BS1	V0545100858	EM TEST	2020.04.04	<input checked="" type="checkbox"/>
Coil Source (Magnetic Coil)	MS100N	P1304110811	EM TEST	-	<input checked="" type="checkbox"/>
Coil Source (Current transformer)	VIC2630	P1303109248	EM TEST	-	<input checked="" type="checkbox"/>
ELF FIELD MONITOR	ELF-66D	K316093	WALKER SCIENTIFIC	2019.04.25	<input checked="" type="checkbox"/>
LIGHT METER	TES 1335	090501870	TES	2019.08.28	<input checked="" type="checkbox"/>

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Report No.:
KR19-SEC0297

Page (56) of (61)

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6.11.3 Photographs of test setup



6.11.4 Measurement result

Positions	Polarity	Test level	Frequency	Result
Enclosure	X	3 A/m	50 Hz	A
	Y			A
	Z			A

Lux Meter

Positions	Polarity	Before	After
Enclosure	X	76.8 klux	76.8 klux
	Y	76.7 klux	76.7 klux
	Z	77.1 klux	76.6 klux

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6.12 Dips and Interruptions

Test specification	EN 61000-4-11:2004, Criteria: B or C				
Number of dips	3 T				
Duration	60 s				
Phase	Zero crossing (0 °, 180 °)				
Testing Voltage	230 V, 50 Hz				
Test facility	Shielded room (3F)				
Date	2019-04-26				
Temperature (°C)	22.3 °C	Humidity (% R.H.)	27.1 % R.H.	Pressure (kPa)	101.0 kPa
Remarks	Pass				

6.12.1 Measurement procedure

The dips/interruption test is only applicable to AC mains.
 The dips/interruptions were applied at zero crossing.

6.12.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
ULTRA COMPACT SIMULATOR	UCS500N	V1238113636	EM TEST	2019.08.24	<input checked="" type="checkbox"/>
LIGHT METER	TES 1335	090501870	TES	2019.08.28	<input checked="" type="checkbox"/>

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Report No.:
KR19-SEC0297

Page (58) of (61)

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6.12.3 Photographs of test setup



6.12.4 Measurement result

230 V, 50 Hz

Test Level (%UT)	Dip/Int. (%UT)	Duration /Period	Angle (°)	Count number	Result
70 %	30 %	10 Period	0	3T	A
0 %	100 %	0.5 Period	0 / 180	3T	A

Comment:

A: There was no change of operation status during above testing.

Lux Meter

Test Level	Dip/Int.	Before	After
70 %	30 %	78.0 klux	78.0 klux
0 %	100 %	78.4 klux	78.3 klux

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Report No.:
KR19-SEC0297

Page (59) of (61)

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7. EUT photographs

Front View



Rear View



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KR19-SEC0297

Page (60) of (61)

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Left View



Right View



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Report No.:
KR19-SEC0297
Page (61) of (61)

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Inside



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