TEST REPORT

Order Number	**: GETEC-C1-19-211**
Test Report Number	**: GETEC-E2-19-026**
Type of Equipment	**: Remote Controller**
Model Name	**: B905**
Applicant	**: OHSUNG ELECTRONICS CO., LTD.**
Applicant Address	**: # 181 Gongdan-dong, Gumi-si, Gyeongbuk, Republic of Korea.**
Serial Number	**: Prototype**
Date of Incoming	**: May 09, 2019**
Date of Issue	**: May 20,2019s**

SUMMARY

This device has been verified to comply with the requirement of following regulation.

-. EN 55032 (2015)
-. EN 55035(2017)
-. EN 55024 (2010)

This test report only contains the result of a specific sample supplied by applicant for the testing.
It is not a generally valid assessment of the features of the respective products of the mass-production.

This test report consists of 26 pages.

This test report should not be used to claim quality endorsement by KOLAS.
The test results in this report are traceable to the national or intentional standard.

Tested by: 정순훈

Soon - Hoon Jeong / Senior Engineer
GUMI UNIVERSITY EMC CENTER

Approved by:

Hyoung-Seop, Kim / Technical Manager
GUMI UNIVERSITY EMC CENTER

CONTENTS

1. Client Information

1.1 Applicant

-. Company : OHSUNG ELECTRONICS CO., LTD.
-. Address : # 181 Gongdan-dong, Gumi-si, Gyeongbuk, Republic of Korea.
-. Name of contact : Mr. Dae-Young, Bae / Senior Engineer
-. Telephone Number : +82-54-468-7130
-. Fax Number : +82-54-461-8368

1.2 Manufacturer

-. Company : OHSUNG ELECTRONICS CO., LTD.
-. Address : # 181 Gongdan-dong, Gumi-si, Gyeongbuk, Republic of Korea.
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1.3 Test laboratory

-. Company : GUMI UNIVERSITY EMC CENTER
-. Address : 37 Yaeun-ro, Gumi-si, Gyeongsangbuk-do, 730-711, Republic of Korea
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2. Descriptions of EUT (Equipment under Test)

2.1 Identification of EUT

- IR distance can change, depending on receiver's performances.
- IR distance can be affected by environment.
- Maximum distance : 12 meters with the RCU pointed to the STB at 0° angle.
- Directional limits : Horizontaly +/-30° at 7 meters - Vertically +/-30° at 7 meters.
- Battery : 2 x LR03 - Size AAA
- Operating Voltage: DC 3.0V (-20%, +10%)
- Operating Current : under 50mA
- Leakage Current : under 10㎂

2.2 Support equipment

2.2.1 Defined as equipment needed for correct operation of the EUT, but not considered as part of the testing and evaluation of the EUT:

Description	Manufacturer	Model Name	S/N
IR remote control tester	-	-	-

2.2.2 System configuration

Description	Manufacturer	Model Name	S/N
-	-	-	-

2.3 Used Cable(s)

The EUT was tested with following cables:

Cable Name	Condition	Description
-	-	-

2.4 Operating condition during the test

▪ Test Voltage / Frequency: DC 3V

A. Normal Operating Mode(Continuous IR transmitting)

2.5 Performance Criteria

2.5.1 Function(s) monitored during & after Immunity test

: Check the state of the EUT IR Continuous Operating.

2.5.2 Performance Criteria

■ Performance Criterion A

-. The performance of the EUT shall remain within specified operating tolerances.(EN 55024)

-. The equipment shall continue to operate as intended without operator intervention.
No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended.
The performance level may be replaced by a permissible loss of performance.
If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation,
and by what the user may reasonably expect from the equipment if used as intended. (EN 55035)

■ Performance Criterion B

-. Out-of-tolerance performance is permitted while the EUT is subjected to the applied interference. However, this is only allowed provided that.
1) The performance returns to normal when the interference is removed
2) There is no change of operating state or loss of stored data. (EN 55024)

-. During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.

After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended. (EN 55035)

■ Performance Criterion C

-. The EUT may experience a temporary loss of function and operator intervention is permitted. However, the EUT can be recovered to normal operation by reset. (EN 55024)

-. Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.
A reboot or re-start operation is allowed.
Information stored in non-volatile memory, or protected by a battery backup,
shall not be lost.(EN 55035)

2.6 Alternative type(s)/model(s)

: None

3. Test summary

3.1 Test regulation

EN 55032 (2015): Electromagnetic compatibility of multimedia equipment - Emission requirements

EN 55024 (2010): Information technology equipment - Immunity characteristics - Limits and methods of measurement

EN 55035(2017): Electromagnetic compatibility of multimedia equipment - Immunity requirements

Referring to the following basic standard:
EN 61000-4-2 (2009) : Electronic discharge immunity test
EN 61000-4-3 (2006) + A2(2010) : Radiated radio-frequency electromagnetic immunity test
EN 61000-4-4 (2012) : Electrical fast transient / burst immunity test
EN 61000-4-5 (2014): Surge immunity test
EN 61000-4-6 (2014): Immunity to conducted disturbances, induced by radio-frequency fields
EN 61000-4-8 (2010): Power frequency magnetic field immunity test
EN 61000-4-11 (2004): Voltage dips, short interruptions and voltage variations immunity test

3.2 Test results

STANDARDS		Result	Note
EN 55032	Conducted disturbance	N/A	1)
	Radiated disturbance	Pass	-
EN 55024 EN 55035	Electrostatic discharge immunity (EN 61000-4-2)	Pass	-
	Radiated RF electromagnetic fields immunity (EN 61000-4-3)	Pass	-
	Electrical fast transient / Burst immunity (EN 61000-4-4)	N/A	1)
	Surge immunity (EN 61000-4-5)	N/A	1)
	Conducted disturbances immunity (EN 61000-4-6)	N/A	1)
	Power frequency magnetic field immunity (EN 61000-4-8)	N/A	2)
	Voltage dips, interruptions, variations immunity (EN 61000-4-11)	N/A	1)
EN 61000-3-2	Current Harmonics	N/A	1)
EN 61000-3-3	Voltage fluctuations	N/A	1)

-. Note 1) The test was not applied. Because The EUT was supplied power from the battery
2) The test was not applied, Because, The EUT is not susceptible to magnetic field.

3.3 Additions, deviations, exclusions from standards

-. None

3.4 List of Test and Measurement instruments

Test Equipment	Model	Manufacturer	Serial No.	Cal. Date	Cal. Until
GUMI UNIVERSITY EMC CENTER EMC Laboratory					
Conducted disturbance					☐
EMI Test Receiver	ESCI	Rohde & Schwarz	100237	2019-04-13	2020-04-13
LISN	ENV216	Rohde & Schwarz	100172	2019-04-09	2020-04-09
LISN	ENV216	Rohde & Schwarz	100173	2019-04-09	2020-04-09
Impedance Network	ISN T8	TESEQ. GmbH	24568	2019-04-18	2020-04-17
Impedance Network	ENY81-CA6	Rohde & Schwarz	101573	2019-04-18	2020-04-17
capacitive voltage probe	CVP9222	Schwarzbeck	9222-040	2019-04-11	2020-04-10
current probe	EZ-17	Rohde & Schwarz	100849	2019-04-12	2020-04-11
CDN	S1-50	EM Test	0004047C	2019-04-12	2020-04-11
Impedance Network	ST08	TESEQ	42870	2019-04-12	2020-04-11
Radiated disturbance					☒
EMI Test Receiver	ESR7	Rohde & Schwarz	101382	2019-04-10	2020-04-10
EMI Test Receiver	ESIB40	Rohde & Schwarz	100266	2019-04-12	2020-04-12
Broadband Test Antenna	VULB9160	Schwarzbeck	3099	2017-09-29	2019-09-29
Broadband Test Antenna	VULB9160	Schwarzbeck	3313	2017-09-29	2019-09-29
Horn Antenna	BBHA9120D	Schwarzbeck	207	2018-09-14	2019-09-14
Horn Antenna	BBHA9120D	Schwarzbeck	597	2019-04-22	2020-04-21
Position Controller	MCU066	MATURO GmbH	1390306	N/A	N/A
Turntable	TT2.5SI	MATURO GmbH	1390307	N/A	N/A
Antenna Mast	AM 4.0	MATURO GmbH	1390308	N/A	N/A
Position Controller	CO3000	Innco system GmbH	CO3000/779/33050314/L	N/A	N/A
Turntable	DT3000	Innco system GmbH	1280314	N/A	N/A
Antenna Mast	MA4000-EP	Innco system GmbH	4420314	N/A	N/A
Antenna Mast	MA4640-XP-ET	HD CmbH	MA4640/558	N/A	N/A
Preamplifier	AFS 44 00101800-25-10P-44	MITEQ	1258943	2019-04-10	2020-04-10
Preamplifier	AFS 44 00101800-25-10P-44	MITEQ	1258942	2019-04-10	2020-04-10
Low Noise Amplifier	TK-PA06S	TESTEK	170038-L	2019-04-10	2020-04-09
Amplifier	310N	187164	Sonoma Instrument	2019-04-10	2020-04-10

Test Equipment	Model	Manufacturer	Serial No.	Cal. Date	Cal. Until
Antenna Terminal Disturbance Voltage					☐
EMI Test Receiver	ESCI	Rohde & Schwarz	100237	2019-04-13	2020-04-13
Matching pad(50-70 Ω)	11852B	Hewlett Packard	03313	2019-04-12	2020-04-12
Directional Bridge	86205A	Agilent	MY31400063	2019-04-12	2020-04-12
Harmonics & Flicker					☐
Precision Power Analyzer	PPA5511	N4L	162-05554	2019-02-18	2020-02-18
AC Power Source	360AMX	PACIFIC	0438	2019-04-12	2020-04-12
Impedance Network	IEC555	VOLTECH	5016	2019-04-17	2020-04-17
Electrostatic Discharge(ESD)					☒
ESD Generator	ESD30N	EM test	P1251107614	2018-09-18	2019-09-18
ESD Gun	PESD 3000	HAEFELY	H012055	2019-04-15	2020-04-15
Radiated Susceptibility					☒
Signal Generator	SMT03	Rohde & Schwarz	839227/020	2019-04-09	2020-04-09
Signal Generator	SMR20	Rohde & Schwarz	846834/017	2019-04-09	2020-04-09
Dual Channel Power Meter	NRVD	Rohde & Schwarz	837794/048	2019-04-09	2020-04-09
Broadband Antenna	STLP9129	Schwarzbeck	9129001	N/A	N.A
Power sensor	URV5-Z2	Rohde & Schwarz	837630/012	2019-04-09	2020-04-09
Power sensor	URV5-Z2	Rohde & Schwarz	835640/020	2019-04-09	2020-04-09
Dual Direction Coupler	DC6180	Amplifier Research	300338	2019-04-12	2020-04-12
Dual Direction Coupler	DC7144	Amplifier Research	307795	2019-04-12	2020-04-12
Power Amplifier	AR-250W	Amplifier Research	300679	2019-04-12	2020-04-12
Power Amplifier	60S1G3	Amplifier Research	308059	2019-04-12	2020-04-12
Field Monitor	FM 5004	Amplifier Research	300344	N/A	N.A
RF-System Panel	TS-RSP	Rohde & Schwarz	100072	N/A	N.A
Power Switch Unit	PSU	Rohde & Schwarz	N/A	N/A	N.A
High Power Amplifier	TK-PA06/10W	TESTEK	160007-P	2019-04-11	2020-04-11
High Power Directional Tap	ZGDC35-93HP+	Mini-Circuits	375	2019-04-10	2020-04-10
Average Power sensor	NRP-Z91	Rohde & Schwarz	103381	2019-04-10	2020-04-10
Sound Acoustic Tester	TST-1000	TESTEK	150041	2018-09-27	2019-09-27
Audio Analyzer	UPL	Rohde & Schwarz	100998	2019-04-12	2020-04-11

Test Equipment	Model	Manufacturer	Serial No.	Cal. Date	Cal. Until
Electrical Fast Transient(EFT)					☐
Ultra Compact Simulator	UCS500M6	EM Test AG	0500-10	2019-04-09	2020-04-08
Capacitive coupling clamp	HFK	EM Test AG	None.	2019-04-12	2020-04-11
Ultra compact simulator	UCS500 N7	EM TEST	P1506148841	2019-04-11	2020-04-10
High spped CDN	CNI 508N2	EM TEST	P1611177319	2019-04-12	2020-04-11
CDN	CNI 503B7	P1536163488	EM TEST	2019-04-11	2020-04-10
Surge					☐
Ultra Compact Simulator	UCS500M6	EM Test AG	0500-10	2019-04-09	2020-04-08
Tel. Surge Generator	TSS500	EM Test AG	0200-05	2019-04-12	2020-04-11
Ultra compact simulator	UCS500 N7	EM TEST	P1506148841	2019-04-11	2020-04-10
High spped CDN	CNI 508N2	EM TEST	P1611177319	2019-04-12	2020-04-11
CDN	CNI 503B7	P1536163488	EM TEST	2019-04-11	2020-04-10
Voltage Dips and Interruptions					☐
Ultra compact simulator	UCS500M6	EM TEST AG	0500-10	2019-04-09	2020-04-08
Motorized VARIAC	MV2632	EM TEST AG	N/A	N/A	N/A
Ultra compact simulator	UCS500 N7	EM TEST	P1506148841	2019-04-11	2020-04-10
High spped CDN	CNI 508N2	EM TEST	P1611177319	2019-04-12	2020-04-11
CDN	CNI 503B7	P1536163488	EM TEST	2019-04-11	2020-04-10
Conducted Susceptibility (150kHz-230MHz)/(150kHz-80MHz)					☐
RF GENERATOR	NSG 4070B-80	TESEQ	46703	2018-04-18	2019-04-18
ATTENUATOR	ATN 6075	TESEQ	46299	2019-04-12	2020-04-12
EM Clamp	F-2031-23mm	FCC	328	2018-05-11	2019-05-11
Sound Acoustic Tester	TST-1000	TESTEK	150041	2019-04-16	2020-04-16
Audio Analyzer	UPL	Rohde & Schwarz	100998	2018-09-27	2019-09-27
CDN	CDN-M332	TESEQ	45359	2019-04-12	2020-04-12
CDN	CDN-M332	TESEQ	46531	2019-04-09	2020-04-09
CDN	CDN-M232	TESEQ	47098	2019-04-09	2020-04-09
CDN	CDN-M232	TESEQ	47099	2019-04-09	2020-04-09
Audio analyzer	UPL	Rohde & Schwarz	100998	2019-04-12	2020-04-11

Test Equipment	Model	Manufacturer	Serial No.	Cal. Date	Cal. Until
TS9980 AV EMS Test System					☐
Signal generator	SML03	Rohde & Schwarz	101894	2019/4/12	2020/4/11
Signal generator	SML03	Rohde & Schwarz	101895	2019/4/12	2020/4/11
Single power meter	NRVS	Rohde & Schwarz	101008	2019/4/12	2020/4/11
Power sensor	URV5-Z4	Rohde & Schwarz	100062	2019/4/12	2020/4/11
Audio analyzer	UPL	Rohde & Schwarz	100998	2019/4/12	2020/4/11
Relay switching panel	TS-RSP	Rohde & Schwarz	100139	N/A	N/A
Power amplifier	BSA1515-25	BONN Elektronik	045622-05	2019/4/11	2020/4/10
Controller	CO 1000	Inn-co GmbH	CO1000/267/10921005/L	N/A	N/A
Slide bar	KM 5300	Inn-co GmbH	KM5300/052/10921005/L	N/A	N/A
Absorbing clamp	MDS-21	Rohde & Schwarz	825134/021	2019/4/19	2020/4/18
EMI test receiver	ESCS30	Rohde & Schwarz	839809/003	2019/4/12	2020/4/11
MPEG generator	DVG	Rohde & Schwarz	100397	N/A	N/A
TV transmitter(Digital)	SFQ	Rohde & Schwarz	100563	2019/4/13	2020/4/12
TV transmitter(Analog)	SFM	Rohde & Schwarz	100153	2019/4/12	2020/4/11
TV transmitter(Analog & Digital)	SFE	Rohde & Schwarz	100153	2019/4/12	2020/4/11
TV Generator	SGSF	Rohde & Schwarz	100047	2019/4/12	2020/4/11
TV Generator	SGPF	Rohde & Schwarz	100125	2019/4/12	2020/4/11
TV Generator	SGMF	Rohde & Schwarz	100034	2019/4/12	2020/4/11

※All test equipment used is calibrated on a regular basis.

☐: ***Not Used***
☒: ***Used***

4. EUT Modifications

-. None

5. Conducted disturbance

5.1 Operating environment

Temperature : - ℃
Relative humidity : - % R.H.

5.2 Test set-up

The conducted disturbance measurements were performed in the shielded room.
The EUT was placed on wooden table, 0.8 m heights above the floor, 0.4 m from the reference ground plane (GRP) wall and 0.8 m from AMN & ISN.
AMN is bonded on horizontal reference ground plane.
The ground plane, which was electrically bonded to the shield room, ground system and all power lines entering the shield room, was filtered.

5.3 Measurement uncertainty

The measurement uncertainty was calculated in accordance with ISO "Guide to the expression of uncertainty in measurement."
The measurement uncertainty was given with a confidence of 95 %.

Test items	Uncertainty	Remark
Conducted emission (9 kHz ~ 150 kHz)	3.84 dB	Confidence level of approximately 95 % (k = 2)
Conducted emission (150 kHz ~ 30 MHz)	3.31 dB	Confidence level of approximately 95 % (k = 2)

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.
The listed uncertainties are the worst case uncertainty for the entire range of measurement. please note that the uncertainty values are provided for informational purposes only are not used in determining the PASS/FAIL results

5.4Test data for mains terminal disturbance voltage

5.41 Mains terminal
-. Test Date : -
-. Resolution bandwidth : 9 kHz
-. Frequency range : 0.15 MHz ~ 30 MHz
-. Line : Live line(L1), Neutral line(N)
-. Note :

6. Radiated disturbance

6.1 Operating Environment

Temperature	:	22.8 ℃
Relative Humidity	:	37.4 % R.H.

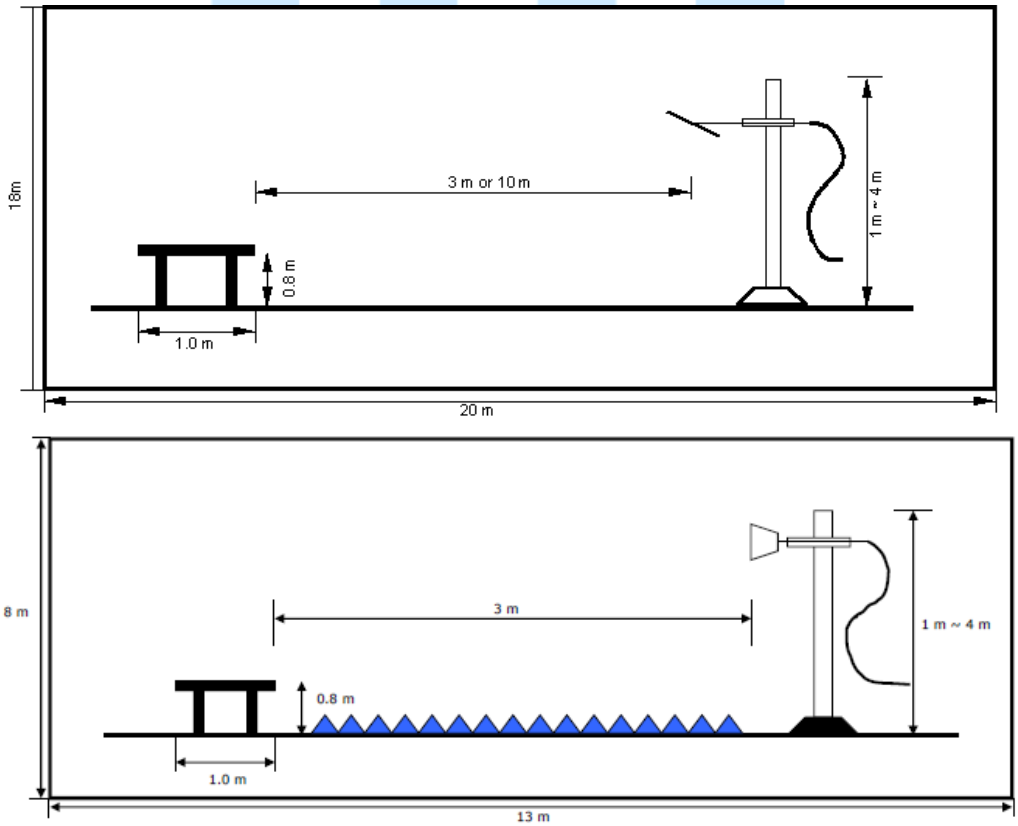
6.2 Test set-up

Exploratory Radiated measurements were conducted at the 3m semi anechoic chamber in order to identify the highest emission by operating the EUT in a range of typical modes of operation, cable positions, system configuration and arrangement.

Based on exploratory measurements, the final measurements were conducted at the worst test conditions.
Final measurements of below 1 GHz were made at 3 m Chamber or Open area test site that complies with CISPR 16.
Above 1GHz final measurements were conducted at the 3 m Chamber only.

For measurements above 1 GHz, the bottom side of 3 m chamber was installed with absorbers in order to meet SVSWR Limit.
Exploratory measurements were scanned using Peak mode of EMI Test receiver and final measurements were measured with Quasi-Peak mode (Below 1GHz) and Peak & Average mode (Above 1 GHz).

The measurements were performed by rotating the EUT 360° and adjusting the receive antenna height from 1.0 m to 4.0 m. All frequencies were investigated in both horizontal and vertical antenna polarity.



6.3 Measurement uncertainty

The measurement uncertainty was calculated in accordance with ISO "Guide to the expression of uncertainty in measurement."

The measurement uncertainty was given with a confidence of 95 %.

Test Items(3 m Anechoic Chamber)	Uncertainty	Remark
Radiated emission (30 MHz ~ 300 MHz, 3 m, Vertical)	5.14 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (30 MHz ~ 300 MHz, 3 m, Horizontal)	5.10 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Vertical)	6.05 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Horizontal)	5.19 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (1 000 MHz ~ 6 000 MHz, 3 m)	5.77 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (1 000 MHz ~ 18 000 MHz, 3 m)	5.77 dB	Confidence level of approximately 95 % (k = 2)
Test Items(10 m Anechoic Chamber)	Uncertainty	Remark
Radiated emission (30 MHz ~ 300 MHz, 10 m, Vertical)	4.74 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (30 MHz ~ 300 MHz, 10 m, Horizontal)	4.71 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (300 MHz ~ 1 000 MHz,10 m, Vertical)	4.81 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Horizontal)	4.79 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (1 000 MHz ~ 6 000 MHz, 3 m)	5.83 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (1 000 MHz ~ 18 000 MHz, 3 m)	5.77 dB	Confidence level of approximately 95 % (k = 2)

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

The listed uncertainties are the worst case uncertainty for the entire range of measurement. please note that the uncertainty values are provided for informational purposes only are not used in determining the PASS/FAIL results

6.4 Test data for Radiated disturbance

-. Test Date : May 13, 2019
-. Resolution Bandwidth : 120 kHz
-. Frequency Range : 30 MHz ~ 1 000 MHz
-. Measurement Distance : 10 m
-. Note : none

Measurements refer to the attached Appendix B

7. Current Harmonics

7.1 Operating environment

Temperature : - ℃
Relative humidity : - % R.H.

7.2 Test data for current harmonics

-. Test date: -
-. Test rating: -
-. Note: -

8. Voltage fluctuations

8.1 Operating environment

Temperature : -℃
Relative humidity : - % R.H.

8.2 Test data for voltage fluctuation

-. Test date: -
-. Test rating: -
-. Note: -

9. Electrostatic discharge immunity

9.1 Operating environment

Parameters required prior to the test		Parameters recorded during the test
Temperature	(15 ~ 35) °C	22.9 °C
Relative Humidity	(30 ~ 60) % R.H.	36.4 % R.H.
Air pressure	(86 ~ 106) kPa	100.8 kPa

9.2 Test set-up

The EUT was placed on a non-metallic support 0.8 m above a ground reference plane (GRP).
The EUT was put into operation according to the specified operating mode.
The VCP (vertical coupling plane) were connected to the GRP with cables contain two 470 kΩ resistors.
Ungrounded equipment, or ungrounded part(s) of equipment, cannot discharge itself similarly to class I mains-supplied equipment. If the charge is not removed before the next ESD pulse is applied, it is possible that the EUT or part(s) of the EUT be stressed up to twice the intended test voltage. Therefore, double-insulated equipment could be charged at an unrealistically high charge, by accumulating several ESD discharges on the capacitance of the class II insulation, and then discharge at the breakdown voltage of the insulation with a much higher energy. In the case of class II & III equipment, to avoid of unrealistically high charge, it is possible to ionize “using ionizer” before each discharge.

9.3 Test data for Electrostatic discharge immunity

Test date: May 13. 2019

Required Performance Criteria : B
Discharge voltage Contact : ± 4 kV
Discharge voltage Air : ± 2 kV, ± 4 kV, ± 8 kV
Number of discharges : ≥10 discharges at each point the air discharge
≥25 discharges at each point the contact discharge
Test Points of discharge point ■ Each location on the surface touchable by hand.
■ HCP/VCP: 0.1 m from the four sides of the EUT.
* See following photo of discharge point.
(Blue line is contact discharge and red line is air discharge.
Test mode : A

Contact Discharge
Air Discharge

■ Test point

Test point	Voltage (kV)	Coupling	Result(Criteria)
HCP	± 4	Contact Discharge	Pass(A)
VCP	± 4	Contact Discharge	Pass(A)
#1. Body	± 2, ± 4, ± 8	Air Discharge	Pass(A)
#2. Function Key	± 2, ± 4, ± 8	Air Discharge	Pass(A)

Comment: None

10. Radiated RF-electromagnetic field immunity

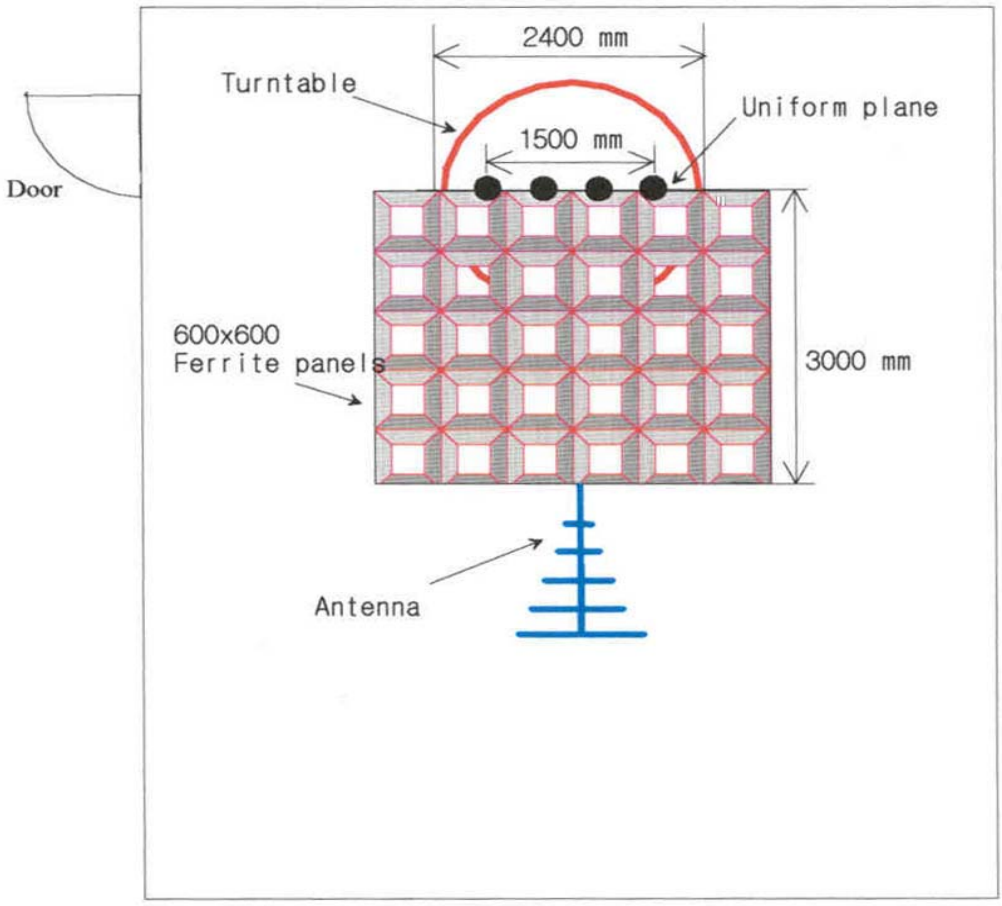
10.1 Operating environment

Parameters required prior to the test		Parameters recorded during the test
Temperature	(15 ~ 35) °C	23.0 °C
Relative Humidity	(10 ~ 75) % R.H.	36.1 % R.H.
Air pressure	(86 ~ 106) kPa	100.4 kPa

10.2 Test set-up

The EUT was placed on a non-metallic support 0.8 m above a ground reference plane (GRP) and was put into operation according to the specified operating mode.

Ferrite tiles were placed on the GRP between the EUT and the transmission antenna to reduce the reflections from GRP as below drawing.



10.3 Test data for RF-Electromagnetic field immunity

Test date: May 13. 2019

Required Performance Criteria : A
Distance of antenna – EUT : 3 m
Spot Frequency : 1.8 GHz, 2.6GHz, 3.5GHz, 5.0 GHz
Modulation : AM: 80 %, 1 kHz
Dwell time : 3 s
Frequency Step : 1 %
Test mode : A

Frequency Range (MHz)	Exposed side	Polarity (H/V)	Field Strength (V/m)	Result(Criteria)
80 ~ 1 000, Sport Frequency.	Front	H	3	Pass(A)
80 ~ 1 000, Sport Frequency.	Rear	H	3	Pass(A)
80 ~ 1 000, Sport Frequency.	Left	H	3	Pass(A)
80 ~ 1 000, Sport Frequency.	Right	H	3	Pass(A)
80 ~ 1 000, Sport Frequency.	Front	V	3	Pass(A)
80 ~ 1 000, Sport Frequency.	Rear	V	3	Pass(A)
80 ~ 1 000, Sport Frequency.	Left	V	3	Pass(A)
80 ~ 1 000, Sport Frequency.	Right	V	3	Pass(A)

Comment: None.

11. Electrical fast transient / burst immunity

11.1 Operating Environment

Parameters required prior to the test		Parameters recorded during the test
Temperature	(15 ~ 35) °C	- °C
Relative Humidity	(10 ~ 75) % R.H.	- % R.H.
Air pressure	(86 106) kPa	- kPa

11.2 Test Set-up

The EUT was placed on an insulating support of 0.8 m heights above a ground reference plane (GRP).
The ground reference was placed in a wooden table 0.8 m above the reference plane.
The EUT was put into operation according to the specified operating mode.

11.3 Test data for EFT/Burst immunity

Test date: -

Required Performance Criteria : B
Port
☐ AC Power Port (Type: 0.50 m unshielded)
☐ DC Power Port (Type:)
☐ Signal/Data/Telecom Port (Type: -)

Burst Characteristic **Tr** 5 ns **Th** 50 ns **Fburst** 5 kHz **Trep** 300 ms
Test mode : -

Test port	Test level (kV)	Coupling	Coupling time (s)	Result(Criteria)
-	-	-	-	-

Comment: None.

12. Surge immunity

12.1 Operating Environment

Parameters required prior to the test		Parameters recorded during the test
Temperature	(15 ~ 35) °C	- °C
Relative Humidity	(10 ~ 75) % R.H.	- % R.H.
Air pressure	(86 ~ 106) kPa	- kPa

12.2 Test Set-up

The EUT was placed on an insulating support of 0.8 m heights above a ground reference plane (GRP).
The ground reference was placed in a wooden table 0.8 m above the reference plane.
The EUT was put into operation according to the specified operating mode.

12.3 Test data for surge immunity

Test date: -

Required Performance Criteria : B
Port ☐ AC Power Port (Type: 0.50 m unshielded)
☐ DC Power Port (Type:)
☐Signal/Data/Telecom Port (Type:)
Source Impedance ☐ 2 Ω + 18 μF: Differential Mode ☐ 12 Ω + 9 μF: Common Mode
☐ 42 Ω + 0.1 μF: Common Mode
Number of surges : 5 surges/polarity
Repetition rate : 2 s ~ 6 s
Test mode : -

Test port	Mode (Diff. / Comm.)	Test level (kV)	Phase (°)	Result(Criteria)
-	-	-	-	-

Comment: None.

13. Conducted RF-electromagnetic field immunity

13.1 Operating Environment

Parameters required prior to the test		Parameters recorded during the test
Temperature	(15 ~ 35) °C	- °C
Relative Humidity	(10 ~ 75) % R.H.	- % R.H.
Air pressure	(86 ~ 106) kPa	- kPa

13.2 Test Set-up

The EUT was placed on an insulating support of 0.8 m heights above a ground reference plane (GRP).
All relevant cables shall be provided with appropriate CDN and/or injection clamp at a distance between 0.1 m and 0.3 m from EUT on the GRP.
The EUT was put into operation according to the specified operating mode.

13.3 Test data for conducted RF-electromagnetic field immunity

Test date: -

Required Performance Criteria : A
Port
☐ AC Power Port (Type: 0.50 m unshielded)
☐ DC Power Port (Type:)
☐ Signal/Data/Telecom Port (Type: -)
Modulation : AM: 80 %, 1 kHz
Dwell time : 3 s
Frequency Step : 1 %
Test mode : -

Frequency Range (MHz)	Test port	Coupling device	Field Strength (V)	Result(Criteria)
-	-	-	-	-

Comment: None.

14. Voltage dips, short interruptions and voltage variations immunity

14.1 Operating environment

Parameters required prior to the test		Parameters recorded during the test
Temperature	(15 ~ 35) °C	-°C
Relative Humidity	(10 ~ 75) % R.H.	- % R.H.
Air pressure	(86 ~ 106) kPa	- kPa

14.2 Test set-up

The EUT was connected to the test generator with the shortest power supply cable as specified by the EUT manufacturer. The EUT was put into operation according to the specified operating mode.

14.3 Test data for voltage dips, short interruptions and voltage variations immunity

Test date: -

Test Power rate :
Test Level,

ΔUT	Duration(ms)	Required Performance Criteria
> 95 %	0.5 p (10)	B
> 95 %	1 p (20)	B
30 %	25 p (500)	C
> 95 %	250 p (5000)	C

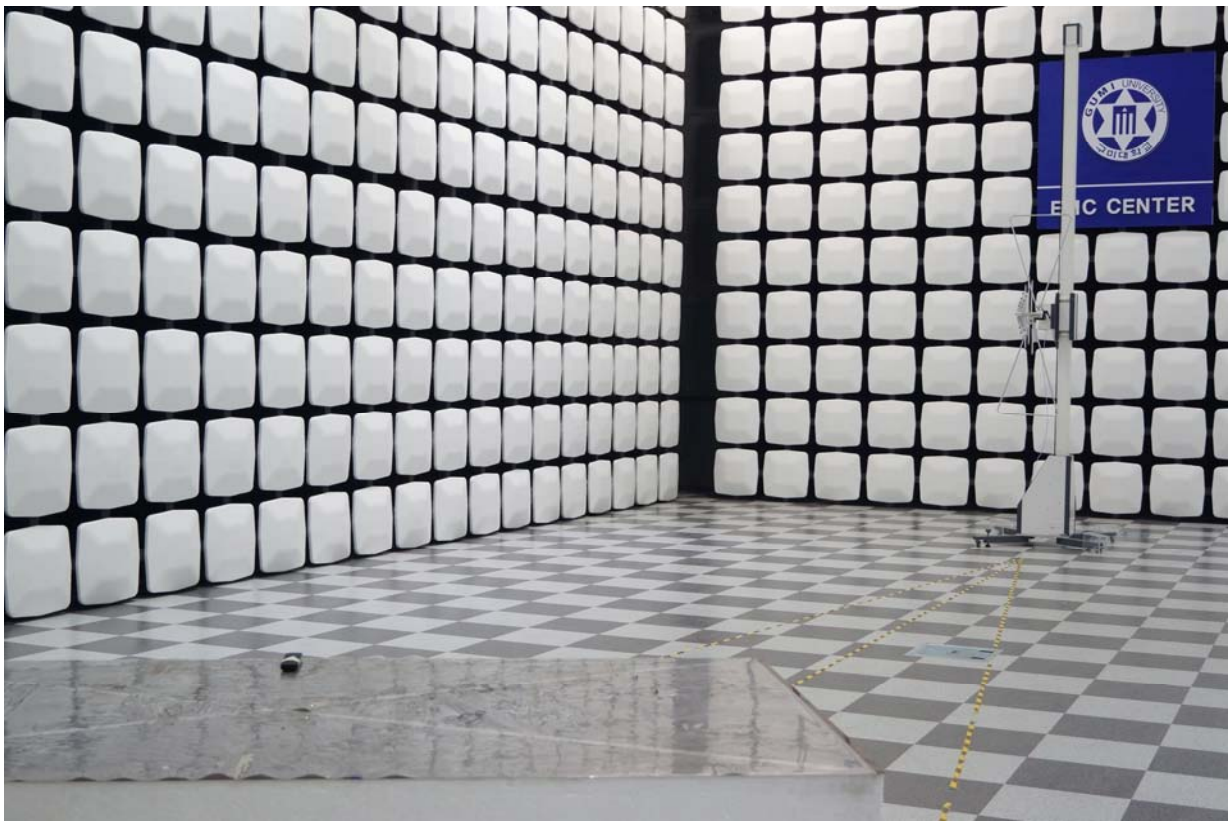
Number of Reductions : 3 times of each level
Reduction Intervals : 10 s
Test mode : A

Test Item	Voltage Reductions (% UT)	Duration (ms)	Result(Criteria) AC 100 V
Dips	>95	10	-
Dips	>95	20	-
Dips	30	500	-
Interruptions	>95	5000	-

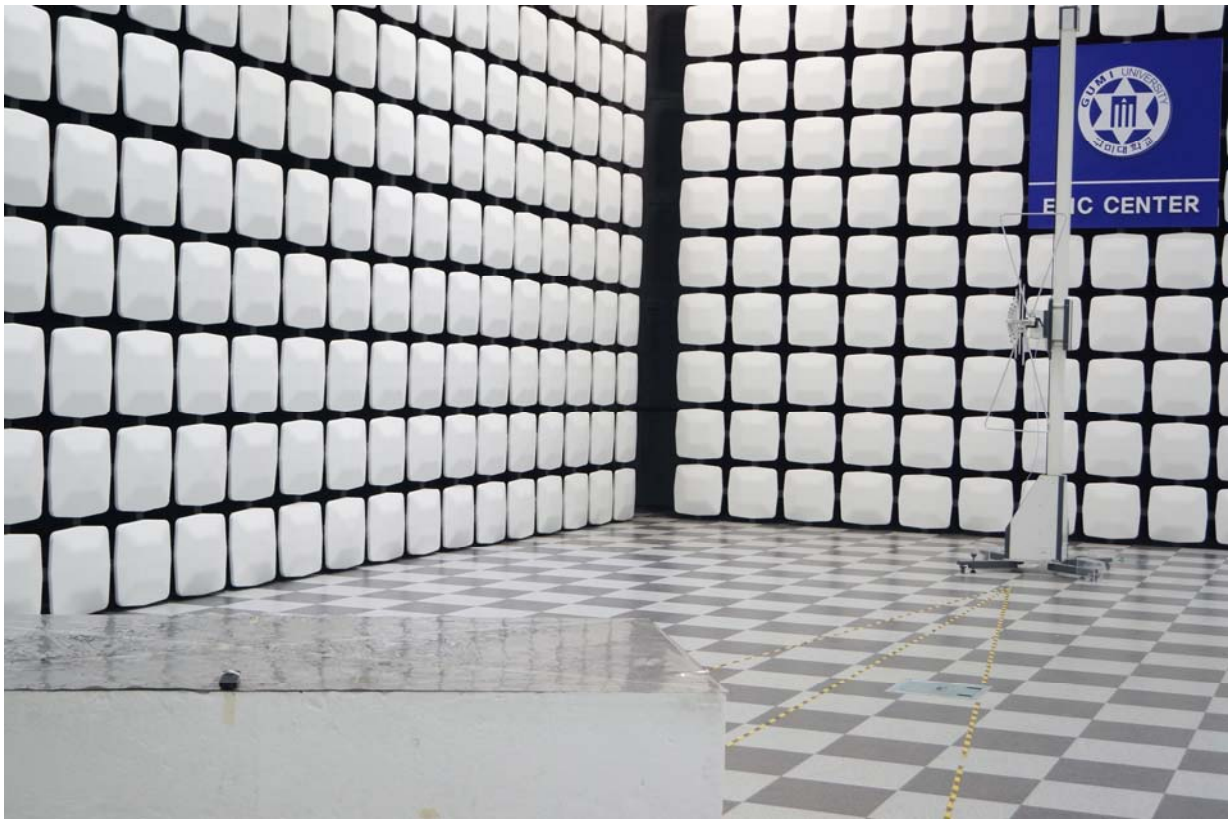
Comment: None **-The END-**

APPENDIX A
: TEST SET UP PHOTOGRAPHS

■ Radiated Test Picture (Front): Below 1 GHz



■ Radiated Test Picture (Rear): Below 1 GHz



■ Electrostatic discharge immunity

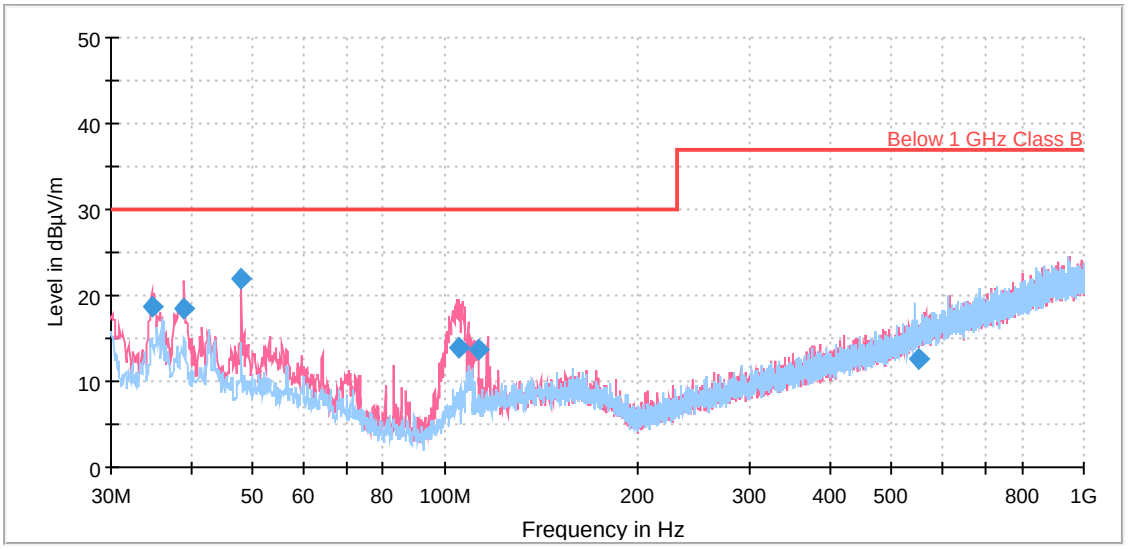
■ Radiated RF-electromagnetic field immunity

APPENDIX B

: RADIATED EMISSION TEST DATA

EUT Information

Report Number:	GETEC-E2-19-026
EUT Name(Model Name):	Remote Controller(B905)
Rating:	DC 3 V
Operating Mode:	IR Transmitting Mode
Condition (Temp./Humi.)	22.8 'C / 37.4 % R.H / 100.8 kPa.
Comment	



Preview Result 1V-PK+
Below 1 GHz Class B
Preview Result 1H-PK+
Final_Result QPK

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)
34.752	18.62	30.00	11.38	1000.0	120.000	400.0	V	103.0	-29
38.953	18.43	30.00	11.57	1000.0	120.000	106.0	V	-25.0	-29
48.007	21.86	30.00	8.14	1000.0	120.000	100.0	V	181.0	-30
105.067	13.82	30.00	16.18	1000.0	120.000	181.0	V	30.0	-33
112.568	13.77	30.00	16.23	1000.0	120.000	125.0	V	3.0	-32
550.915	12.58	37.00	24.42	1000.0	120.000	375.0	H	307.0	-21