RF TEST REPORT



Report No.: 18020175-FCC-R1

Supersede Report No.: N/A			
Applicant	Great American Merchandise & Events (GAME)		
Product Name	Pool & Spa Thermometer with Indoor Display		
Main Model	15900-4PK-E-01		
Serial Model	N/A		
Test Standard	FCC Part 15.231	: 2017, ANSI C63.10: 2013	
Test Date	February 6 to Fel	bruary 7, 2018	
Issue Date	February 9, 2018		
Test Result	Pass Fail		
Equipment complied with the specification			
Equipment did not comply with the specification			
Louise Tu Deon Dai			
Louise Tu Test Engineer		Deon Dai Engineer Reviewer	
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only			

Issued by: SIEMIC (Nanjing-China) Laboratories 2-1 Longcang Avenue Yuhua Economic and

2-1 Longcang Avenue Yuhua Economic and Technology Development Park, Nanjing, China Tel:+86(25)86730138 Fax:+86(25)86730127 Email: China@siemic.com.cn



Test Report No.	18020175-FCC-R1
Page	2 of 38

Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC , RF/Wireless , Telecom
Canada	EMC, RF/Wireless, Telecom
Taiwan	EMC, RF, Telecom , Safety
Hong Kong	RF/Wireless ,Telecom
Australia	EMC, RF, Telecom , Safety
Korea	EMI, EMS, RF, Telecom, Safety
Japan	EMI, RF/Wireless, Telecom
Singapore	EMC , RF , Telecom
Europe	EMC, RF, Telecom , Safety



Test Report No.	18020175-FCC-R1
Page	3 of 38

This page has been left blank intentionally.



 Test Report No.
 18020175-FCC-R1

 Page
 4 of 38

<u>CONTENTS</u>

1.	REPORT REVISION HISTORY	5
2.	CUSTOMER INFORMATION	5
3.	TEST SITE INFORMATION	5
4.	EQUIPMENT UNDER TEST (EUT) INFORMATION	6
5.	TEST SUMMARY	7
6.	MEASUREMENTS, EXAMINATION AND DERIVED RESULTS	8
6.1 A	NTENNA REQUIREMENT	8
6.2 A	C CONDUCTED EMISSIONS VOLTAGE	9
6.3 2	0DB OCCUPIED BANDWIDTH1	1
6.4 R	ADIATED FUNDAMENTAL AND SPURIOUS EMISSION1	3
6.5 D	EACTIVATION	!1
ANN	EX A. TEST INSTRUMENT	:3
ANN	EX B. EUT AND TEST SETUP PHOTOGRAPHS2	:4
ANN	EX C. TEST SETUP AND SUPPORTING EQUIPMENT	5
ANN	EX D. USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PARTLIST	67
ANN	EX E. DECLARATION OF SIMILARITY	8



Test Report No.	18020175-FCC-R1
Page	5 of 38

1. <u>Report Revision History</u>

Report No.	Report Version	Description	Issue Date
18020175-FCC-R1	NONE	Original	February 9, 2018

2. Customer information

Applicant Name	Great American Merchandise & Events (GAME)
Applicant Add	16444 N 91st Street, Scottsdale, AZ 85260,USA
Manufacturer Name	Great American Merchandise & Events (GAME)
Manufacturer Add	16444 N 91st Street, Scottsdale, AZ 85260,USA

3. <u>Test site information</u>

Lab performing tests	SIEMIC (Nanjing-China) Laboratories
Lab Add	2-1 Longcang Avenue Yuhua Economic and Technology Development Park, Nanjing, China
FCC Test Site No.	694825
IC Test Site No.	4842B-1
Test Software	EZ_EMC



Test Report No.	18020175-FCC-R1
Page	6 of 38

4. Equipment Under Test (EUT) Information

Description of EUT:	Pool & Spa Thermometer with Indoor Display
Main Model:	15900-4PK-E-01
Serial Model:	N/A
Date EUT received:	February 6, 2018
Test Date(s):	February 6 to February 7, 2018
Antenna Gain:	0 dBi
Type of Modulation:	ASK
RF Operating Frequency (ies):	Tx:434.04 MHz
Number of Channels:	1 CH
Port:	N/A
Input Power:	2.7-3.3V
Trade Name :	N/A
FCC ID:	2AKBO-15900-1



Test Report No.	18020175-FCC-R1
Page	7 of 38

5. Test Summary

The product was tested in accordance with the following specifications. All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207	Conducted Emissions Voltage	N/A
§15.231(b)	Fundamental & Radiated Spurious Emission	Compliance
§15.231(c)	20dB Bandwidth	Compliance
§15.231(a)(1)	Deactivation	Compliance

Note: Preliminary radiated emission testing has been performed on X, Y, Z axis, only worst case test result is presented in this test report.

"N/A" means the EUT is powered by the battery.

Measurement Uncertainty

Emissions					
Test Item	Description	Uncertainty			
Conducted Emissions & Radiated Spurious Emissions	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	1.634dB / 3.952dB			



6. <u>Measurements, Examination And Derived Results</u>

6.1 Antenna Requirement

Applicable Standard

Requirement(s): 47 CFR §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna requirement must meet at least one of the following:

- a) Antenna must be permanently attached to the device.
- b) Antenna must use a unique type of connector to attach to the device.
- c) Device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.

The antenna is permanently attached to the device which meets the requirement.

Result: Compliance.



 Test Report No.
 18020175-FCC-R1

 Page
 9 of 38

6.2 AC Conducted Emissions Voltage

Temperature	
Relative Humidity	
Atmospheric Pressure	
Test date :	
Tested By :	

Conducted Emission Limit

Frequency ranges	Lin	nit (dBµV)
(MHz)	QP	Average
0.15 ~ 0.5	66 – 56	56 – 46
0.5 ~ 5	56	46
5 ~ 30	60	50

Spec	Item	Requirement	Applicable				
47CFR§15.20 7	a)	 For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any a) frequency or frequencies, within the band 150 kHz to 30 MHz, shall □ not exceed the limits in the following table, as measured using a 50 [mu]H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequency ranges. 					
Test Setup		Vertical Ground Reference Plane EUT UT Boom Horizontal Ground Reference Plane Note: 1.Support units were connected to second LISN. 2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.					
Procedure	-	The EUT and supporting equipment were set up in accordance with the r of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as Annex B. The power supply for the EUT was fed through a 50W/50mH EUT LISN, filtered mains. The RF OUT of the EUT LISN was connected to the EMI test receiver via coaxial cable. All other supporting equipment were powered separately from another m	equirements shown in connected to a a low-loss ain supply.				
Remark	"N/A" m	neans the EUT is powered by the battery.					
Result	N/A	Fail					

	E MIC Veritas Group Company		Test Report No. Page	18020175-FCC-R1 10 of 38
Test Data	N/A	🗖 Fail		
Test Plot	✓ N/A	🗖 Fail		

Data	sample								
No.	Frequency	Reading	Detector	Lisn/Isn	Ps_Lmt	Cab_L	Result	Limit	Margin
	(MHz)	(dBµV)		(dB}	(dB)	(dB)	(dBµV)	(dBµV)	(dB)

Frequency (MHz) = Emission frequency in MHz

Reading $(dB\mu V)$ = Receiver Reading Value

Detector=Quasi Peak Detector or Average Detector

Lisn/ISN= Insertion loss of LISN

Ps_Lmt= Insertion loss of transient limiter (The transient limiter included 10dB attenuation)

Cab_L= cable loss

Result (dBµV) = Reading Value + Corrected Value

Limit (dB μ V) = Limit stated in standard

Calculation Formula:

Margin (dB) = Result (dB μ V) – limit (dB μ V)



Test Report No.	18020175-FCC-R1
Page	11 of 38

6.3 20dB Occupied Bandwidth

Temperature	18°C
Relative Humidity	50%
Atmospheric Pressure	1018mbar
Test date :	February 7, 2018
Tested By :	Louise Tu

Requirement(s):							
Spec	Item	Requirement	Applicable				
§15.231(c)	a) b)	 a) The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. b) For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. 					
Test Setup		Spectrum Analyzer EUT					
Test Procedure	20dB E - - - - - M a th	mission bandwidth measurement procedure Set RBW = 100 kHz. Set the video bandwidth (VBW) ≥3*RBW. Detector = Peak. Trace mode = max hold. Sweep = auto couple. Allow the trace to stabilize. leasure the maximum width of the emission that is constrained by the ssociated with the two outermost amplitude points (upper and lower that are attenuated by 20 dB relative to the maximum level measured undamental emission.	e frequencies frequencies) in the				
Remark							
Result	✓ Pase	s Fail					
Test Data Yes Test Plot Yes		N/A N/A					



Test Report No.	18020175-FCC-R1
Page	12 of 38

20dB Bandwidth measurement result

Туре	Freq (MHz)	СН	Measured 20dB Bandwidth (kHz)	Limit (kHz)	Result
20dB BW	434.04	1 CH	474	1085.1	Pass

Test Plots

20dB Bandwidth measurement result

x dB -20.00 dB	AC	SENSE:INT Center Freq: 434.040000 M Trig: Free Run Ava	ALIGNAUTO Hz IHold:>10/10	11:24:12 AM Feb 07, 2018 Radio Std: None	Meas Setup
	#IFGain:Low	#Atten: 10 dB	1	Radio Device: BTS	Avg/Hold Num
					10 On Off
10 dB/div Ref -20.0	00 dBm				
Log					
-30.0					AvgMode
-40.0		~~~			Exp Repeat
-50.0	~~~~				
-60.0					
-70.0					
-80.0					
-90.0					0.00
-100					OBWPower
-110					99.00 %
Center 434 MHz				Span 1 MHz	
#Res BW 100 kHz		#VBW 300 kHz		Sweep 1 ms	
				15	
Occupied Band	width	Total Power	-28.6	aBm	
	632.54 k⊦	lz			x dB
Tropomit Frog Fr	or 44 400 k		00	00.1/	-20.00 dB
mansmit Freq En	-14.109 K	DBW Powe		00 %	
x dB Bandwidth	474.0 k	Hz xdB	-20.0	0 dB	
					More
					1 of 2
MSG			STATUS		



Test Report No.	18020175-FCC-R1
Page	13 of 38

6.4 Radiated Fundamental and Spurious Emission

Temperature	18°C
Relative Humidity	50%
Atmospheric Pressure	1018mbar
Test date :	February 6 to February 7, 2018
Tested By :	Louise Tu

Requirement(s):

Spec	Item	Requirement	Requirement Applicable								
		Intentional radiators ma paragraph (a) of this se including operation pro- intentional radiator com this section, except the replaced by the followin	ay operate at a periodic rate of ection and may be employed hibited in paragraph (a) of th iplies with the provisions of p field strength table in paragr ng: Field strength of	exceeding that specified in for any type of operation, is section, provided the paragraphs (b) through (d) of raph (b) of this section is Field strength of							
§15.231(b)	a)	frequency (MHz)	fundamental (microvolts/meter)	spurious emissions (microvolts/meter)							
o ()	,	40.66-40.70	1000	100							
		70-130	500	50							
		130-174	500 to 1500	50 to 150							
		260.470	1500 1500 to 50001	150 to 5001							
		Δονο 170	5000	500							
		7,0070 470	0000								
	A: <1G	iHz									
Test Setup		EUT& Support Units 80cm	A 3m Turn Table Ground Plane Test Receiver	nt. Tower Variable							
	B: >1GH	Iz									

SIF		Fest Report No.	18020175-FCC-R1
A Bureau Veritas	Group Company	Page	14 of 38
	EUT& Support Units	3m Turn T Gro Tes	Ant. Tower Variable
Procedure	 The EUT was switched of The test was carried out Maximization of the emis polarization, and adjustir a. Vertical or horit rotation of the I b. The EUT was f c. Finally, the ant A Quasi-peak measurem Steps 2 and 3 were reperence 	on and allowed to at the selected fr isions, was carrie ig the antenna he zontal polarisation EUT) was chosen hen rotated to the enna height was hent was then ma ated for the next	warm up to its normal operating condition. equency points obtained from the EUT characterisation. ed out by rotating the EUT, changing the antenna eight in the following manner: n (whichever gave the higher emission level over a full n. e direction that gave the maximum emission. adjusted to the height that gave the maximum emission. adjusted to the height that gave the maximum emission. adjusted for that frequency point. frequency point, until all selected frequency points were
Result	Pass Fail		
Test Data Test Plot	Yes N/A Yes (See below)		



Test Report No.	18020175-FCC-R1
Page	15 of 38

Data Sample

No.	Frequency	Reading	Detector	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
	(MHz)	(dBµV/m)		(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(cm)	(°)

Frequency (MHz) = Emission frequency in MHz

Reading $(dB\mu V/m)$ = Receiver Reading Value

Detector= Peak Detector or Quasi Peak Detector

Ant_F=Antenna Factor

PA_G=Pre-Amplifier Gain

Cab_L=Cable Loss

Result (dBµV/m) = Read ing Value + Corrected Value

Limit (dB μ V/m) = Limit stated in standard

Height (cm) = Height of Receiver antenna

Degree = Turn table degree

Calculation Formula:

 $\overline{\text{Margin (dB)} = \text{Result (dB}\mu\text{V/m)} - \text{limit (dB}\mu\text{V/m)}}$



 Test Report No.
 18020175-FCC-R1

 Page
 16 of 38



Vertical Polarity Plot @3m

Field strength of fundamental Result

Frequency (MHz)	Reading (dBµV/m)	Factors (dB)	Azimuth	Polarity	Height (m)	correct (dBµV/m)	Limit (dBµV)	Margin (dB)	Comm ents
434.04	84.76	-29.35	21.00	V	2.00	55.41	92.87	-37.46	Pk
434.04	-	-	-	V	-	44.15	72.87	-28.72	Ave

Field strength of spurious emissions Result

Frequency (MHz)	Reading (dBµV/m)	Factors (dB)	Azimuth	Polarity	Height (m)	correct (dBµV/m)	Limit (dBµV)	Margin (dB)	Comm ents
868.08	46.25	-18.39	124.00	V	1.00	27.86	72.87	-45.01	Pk
868.08	-	-	-	V	-	16.6	52.87	-36.27	Ave



 Test Report No.
 18020175-FCC-R1

 Page
 17 of 38



Horizontal Polarity Plot @3m

Field strength of fundamental Result

Frequency (MHz)	Reading (dBµV/m)	Factors (dB)	Azimuth	Polarity	Height (m)	correct (dBµV/m)	Limit (dBµV)	Margin (dB)	Comm ents
434.04	84.79	-29.35	164.00	Н	3.00	55.44	92.87	-37.43	Pk
434.04	-	-	-	Н	-	44.18	72.87	-28.69	Ave

Field strength of spurious emissions Result

Frequency (MHz)	Reading (dBµV/m)	Factors (dB)	Azimuth	Polarity	Height (m)	correct (dBµV/m)	Limit (dBµV)	Margin (dB)	Comm ents
868.08	48.53	-18.39	244.00	Н	2.00	30.14	72.87	-42.73	Pk
868.08	-	-	-	Н	-	18.88	52.87	-33.99	Ave



Test Report No.	18020175-FCC-R1
Page	18 of 38

Spurious Emissions (< 1GHz) Measurement Result

	Vertical Polarity Plot @3m										
No.	Frequency	Reading	Detector	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
	(MHz)	(dBµV/m)		(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(cm)	(°)
1	30.1054	46.05	peak	21.54	45.69	0.87	22.77	40.00	-17.23	200	148
2	126.7723	47.74	peak	16.20	47.06	1.83	18.71	43.50	-24.79	100	234
3	205.6751	50.39	peak	14.86	47.48	2.28	20.05	43.50	-23.45	200	231
5	724.2611	49.33	peak	22.34	45.63	4.32	30.36	46.00	-15.64	100	62
6	868.0800	46.25	peak	22.99	46.14	4.76	27.86	46.00	-18.14	100	124
7	962.1623	47.57	peak	23.64	46.29	4.98	29.90	54.00	-24.10	100	357

Horizontal Polarity Plot @3m

No.	Frequency	Reading	Detector	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
	(MHz)	(dBµV/m)		(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(cm)	(°)
1	116.9495	47.58	peak	15.73	46.46	1.75	18.60	43.50	-24.90	200	143
2	396.2415	57.10	peak	16.03	48.90	3.21	27.44	46.00	-18.56	300	269
4	724.2611	48.71	peak	22.55	45.63	4.32	29.95	46.00	-16.05	300	293
5	869.1302	48.53	peak	22.79	46.12	4.76	29.96	46.00	-16.04	200	244
6	979.1804	47.18	peak	24.60	46.62	5.02	30.18	54.00	-23.82	200	74

Notes:

- 1. Duty cycle is 27.35%, 20log (duty cycle) = -11.26dB correction was used to determine the average level from the peak reading. Average = peak reading + 20log (duty cycle), Final Average= peak reading -11.26dB
- 2. All the data measurement of peak values.
- 3. FCC Limit for Average Measurement=16.67* (434.04-260)+1500=4401.2468µV/m=72.87dBµV/m
- 4. Average pulsed signal over one complete pulse train or 100 ms time frame if pulse train exceeds 100 ms
- 5. Maximum average in 100 ms
- 6. Calculate duty cycle for pulse train or 100 ms
- 7. Duty cycle = (t1 + t2 + t3 + ...tn)/T where tn = pulse width, T = pulse train length or 100 ms



 Test Report No.
 18020175-FCC-R1

 Page
 19 of 38

Spurious Emissions (> 1GHz) Measurement Result

Frequency GHz	Reading (dBµV/m)	Direction Degree	Height Meter	Polar H/V	Factors (dB)	correct (dBµV/m)	FCC15.231 Limit (dBµV/m)	Margin	Comments
1.302	66.84	126.00	1.00	V	-19.10	47.74	74	-26.26	Peak
1.302	-	-	-	V	-	36.48	54	-17.52	Ave
1.736	61.15	134.00	1.00	V	-17.22	43.93	72.87	-28.94	Peak
1.736	-	-	-	V	-	32.67	52.87	-20.2	Ave
2169	65.94	6.00	1.00	V	-16.81	49.13	72.87	-23.74	Peak
2169	-	-	-	V	-	37.87	52.87	-15	Ave
2.603	59.96	214.00	2.00	V	-16.96	43	72.87	-29.87	Peak
2.603	-	-	-	V	-	31.74	52.87	-21.13	Ave
3.037	59.93	249.00	1.00	V	-16.77	43.16	72.87	-29.71	Peak
3.037	-	-	-	V	-	31.9	52.87	-20.97	Ave
3.471	58.02	19.00	2.00	V	-16.37	41.65	72.87	-31.22	Peak
3.471	-	-	-	V	-	30.39	52.87	-22.48	Ave
3.905	56.77	299.00	1.00	V	-15.97	40.8	72.87	-32.07	Peak
3.905	-	-	-	V	-	29.54	52.87	-23.33	Ave
4.338	57.34	267.00	2.00	V	-14.26	43.08	74	-30.92	Peak
4.338	-	-	-	V	-	31.82	54	-22.18	Ave
1.302	68.53	5.00	1.00	Н	-19.10	49.43	74	-24.57	Peak
1.302	-	-	-	Н	-	38.17	54	-15.83	Ave
1.736	62.37	128.00	1.00	Н	-17.22	45.15	72.87	-27.72	Peak
1.736	-	-	-	Н	-	33.89	52.87	-18.98	Ave
2169	65.87	293.00	1.00	Н	-16.81	49.06	72.87	-23.81	Peak
2169	-	-	-	Н	-	37.8	52.87	-15.07	Ave
2.603	63.61	337.00	2.00	Н	-16.96	46.65	72.87	-26.22	Peak
2.603		-	-	Н	-	35.39	52.87	-17.48	Ave
3.037	58.58	144.00	1.00	Н	-16.77	41.81	72.87	-31.06	Peak
3.037	-	-	-	Н	-	30.55	52.87	-22.32	Ave
3.471	58.21	359.00	2.00	Н	-16.37	41.84	72.87	-31.03	Peak
3.471	-	-	-	Н	-	30.58	52.87	-22.29	Ave
3.905	56.35	257.00	1.00	Н	-15.97	40.38	72.87	-32.49	Peak
3.905	-	-	-	Н	-	29.12	52.87	-23.75	Ave
4.338	57.29	198.00	1.00	Н	-14.26	43.03	74	-30.97	Peak
4.338	-	-	-	Н	-	31.77	54	-22.23	Ave

Note: Duty cycle is 27.35%, 20log (duty cycle) = -11.26dB correction was used to determine the average level from the peak reading. Average = peak reading + 20log (duty cycle), final Average= peak reading -11.26dB

Note: Narrow Pulse: 0.22ms 2/NP = 2/0.22ms =9.09 kHz RBW > 2/NP (9.09 kHz) Therefore PDCF is not needed.



Test Report No.	18020175-FCC-R1
Page	20 of 38

Duty Cycle Measurement Result





 Test Report No.
 18020175-FCC-R1

 Page
 21 of 38

6.5 Deactivation

Temperature		18°C
Relative Humidity		50%
Atmospheric Pressure		1018mbar
Test date :		March 05, 2018
Tested By :		Louise Tu
Requirement(s):	1	
Spec	Item	Requirement Applicable
§15.231 e)		In addition, devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.
Test Setup		Spectrum Analyzer EUT
Test Procedure	<u>measure</u> - - - - - - -	ement procedureSet analyzer center frequency to channel center frequency.Set the span to 0Hz.Set the VBW \geq 3 ' RBW.Detector = peak.Sweep time = auto couple.Trace mode = max hold.Allow trace to fully stabilize.
Remark		
Result	Pass	s Fail
Test Data	5	✓ N/A
Test Plot	s (See belo	ow) N/A



 Test Report No.
 18020175-FCC-R1

 Page
 22 of 38

Test Plots Deactivation Measurement Result

Duration time=0.675s < 1s

Silent time=59.1s > 10s

Silent time=59.1s > 30*0.675s=20.25s

Agilent Spect	RE 50.0 AC		SE	NSEINT		ALIGN ALITO	01:35:23.6	M Mar 05, 2018	
Marker 1	Δ 675.000 ms	PNO: Mide	→→ Trig: Fre	e Run	Avg Type	: Log-Pwr	TR4 T	CE 123456 /PE W	Marker
		IFGain:Low	Atten: 10	0 dB			Dilland C		Select Marker
0 dB/div	Ref 0.00 dBm					4	UNIVI C	-4.34 dB	1
- ^{og}									
10.0									Norma
-20.0									Delt
30.0		———X	2	1∆2					Deit
40.0									
10.0									Fixed
50.0									
60.0									
									O
70.0				L					
80.0 <mark>p.lk.14.04.</mark>	antre whith the grant of the same	mounter		Mr. hours	man and the	Ange-Nelstone	ol molyiphism	newletene-lhaves	Properties
.90 0									
									Mor
Center 43	34.040000 MHz							Span 0 Hz	1 of
Res BW 1	100 kHz	#VE	3W 300 kHz	2		Sweep	5.000 s	(1001 pts)	
ASG .						and the second se			
						STATUS			
Agilent Spect	rum Analyzer - Swept SA RF 50 Ω AC		SE	NSE:INT		ALIGNAUTO	01:41:15	M Mar 05, 2018	
gilent Specti XI	<mark>rum Analyzer - Swept SA</mark> RF 50Ω AC	PNO: Wide	SE →→→ Trig: Fre	INSE:INT	Avg Type	ALIGN AUTO	01:41:15 F TRA T	M Mar 05, 2018 CE 1 2 3 4 5 6 PPE WWWWWWW	Trace/Detector
gilent Spectr	rum Analyzer - Swept SA RF 50 Ω AC	PNO: Wide IFGain:Low	SE → Trig: Fre Atten: 10	ense:INT e Run 0 dB	Ауд Туре	ALIGNAUTO 2: Log-Pwr	01:41:15 F TRA T 0 M k r 1	M Mar 05, 2018 CE 123456 WWWWWW ET P NNNNN	Trace/Detector Select Trace
<mark>gilent Spectrangen (</mark>	rum Analyzer - Swept SA RF 50 Q AC Ref 0.00 dBm	PNO: Wide IFGain:Low	→ Trig: Fre Atten: 10	e Run 0 dB	Avg Type	ALIGNAUTO	01:41:15 TRA TY I ΔMkr1	M Mar 05, 2018 CE 11 2 3 4 5 6 PPE WWWWWWW ET P NNNN 59.10 s -0.61 dB	Trace/Detector Select Trace 1
gilent Spectr a 0 dB/div .og	rum Analyzer - Swept SA RF 50 Ω AC Ref 0.00 dBm	PNO: Wide IFGain:Low	Trig: Fre Atten: 10	INSE:INT e Run 0 dB	Avg Type	ALIGNAUTO :: Log-Pwr	01:41:15 F TRA TY I	MMar 05, 2018 ce 1 2 3 4 5 6 Pre PNNNNN 59.10 s -0.61 dB	Trace/Detector Select Trace 1
o dB/div	rum Analyzer - Swept SA RF 50 Ω AC Ref 0.00 dBm	PNO: Wide IFGain:Low	SE Trig: Fre Atten: 10	INSE:INT I e Run D dB	Ауд Туре	ALIGNAUTO :: Log-Pwr	01:41:15 TRA TRA TRA TY	MMar05, 2018 CE 12 3 4 5 6 PE WARNANN N 59.10 S -0.61 dB	Trace/Detector Select Trace 1 Clear Writ
o dB/div	rum Analyzer - Swept SA RF 50 Ω AC Ref 0.00 dBm	PNO: Wide IFGain:Low	→ Trig: Fre Atten: 11	e Run 0 dB	Avg Type	ALIGNAUTO :: Log-Pwr	01:41:15 TR# T AMkr1	MMar05, 2018 CE 12 3 4 5 6 PPE WWWWWW ET PNNNNN 59.10 S -0.61 dB	Trace/Detector Select Trace 1 Clear Writ
gjlent Spectr d 0 dB/div 0 g 20.0	rum Analyzer - Swept SA RF 50 Ω AC Ref 0.00 dBm	PNO: Wide IFGain:Low	→ Trig: Fre Atten: 11	nse:INT e Run 0 dB	Ауд Туре	ALIGNAUTO : Log-Pwr	01:41:15 TRA T AMK r1	MMar 05, 2018 CE 12 3 4 5 6 PPE WINNIN 59.10 S -0.61 dB	Trace/Detector Select Trace 1 Clear Writ
gilent Spectr 0 0 0 0 0 0 0 0 0 0 0 0 0	rum Analyzer - Swept SA RF 50 Ω AC Ref 0.00 dBm	PNO: Wide IFGain:Low	Atten: 11	e Run 0 dB	Ауд Туре	status alignauto : Log-Pwr	01:41:15 TRA TRA DMkr1	MMar 05, 2018 CCE 112 3 4 5 6 PNNNNN 59.10 s -0.61 dB	Trace/Detector Select Trace 1 Clear Writ Trace Averag
gllent Spect d 0 dB/div 0 g 10.0 20.0 30.0 40.0	rum Analyzer - Swept SA RF 50 Ω AC Ref 0.00 dBm	PNO: Wide IFGain:Low	→→- Trig: Fre Atten: 10	e Run 0 dB	Avg Type	status alignauto : Log-Pwr	01:41:15 TRA TRA AMKr1	MMar 05, 2018 CC 012 3 4 5 6 P WWWWWW ST P NNNNN 59.10 S -0.61 dB	Trace/Detector Select Trace 1 Clear Writ Trace Averag
10 dB/div 20 0 30 0 40 0	rum Analyzer - Swept SA RF 50 Ω AC Ref 0.00 dBm	PNO: Wide IFGain:Low	Atten: 1	e Run 0 dB	Avg Type	ALIGNAUTO 2: Log-Pwr		MMar 05, 2018 CC 12 23 4 5 6 PPE WINNINN 59.10 s -0.61 dB	Trace/Detector Select Trace 1 Clear Writ Trace Averag Max Hol
10 dB/div - 0 g - 0 g	rum Analyzer - Swept SA RF 50 Ω AC Ref 0.00 dBm	PNO: Wide IFGain:Low	Atten: 10	e Run 0 dB	Avg Type	ALIGNAUTO : Log-Pwr	01:41:15	MMar 05, 2018 cc 12 3 4 5 6 P NNN N 59.10 s -0.61 dB	Trace/Detector Select Trace 1 Clear Writ Trace Averag Max Hol
10 dB/div - og - 10 0 - 0 0 - 0 -	rum Analyzer - Swept SA RF 50 Ω AC Ref 0.00 dBm	PNO: Wide IFGain:Low	Trig: Fre Atten: 10	e Run 0 dB	Avg Type	ALIGNAUTO : Log-Pwr	01:41:15 TRA TRA AMKr1	MMar 05, 2018 CC 012 3 4 5 6 P NNNNN 59.10 S -0.61 dB	Trace/Detector Select Trace 1 Clear Writ Trace Averag Max Hol Min Hol
glent Spect glent Spect 10 dB/div 20 0 20 0 20 0 30 0 40 0 50 0 50 0 	RF 50 Ω AC Ref 0.00 dBm	PNO: Wide IFGain:Low	Atten: 1	e Run 0 dB	Avg Type	ALIGNAUTO E Log-Pwr		M Mar 05, 2019 CC 11 2 3 4 5 6 F WINN NN N 59.10 S -0.61 dB	Trace/Detector Select Trace 1 Clear Writ Trace Averag Max Hol Min Hol
glient Spect d 10 dB/div o g 20.0 30.0 40.0 50.0 50.0 70.0 	RF SU Ω AC Ref 0.00 dBm Image: Amount of the state of t	PNO: Wide IFGain:Low	→ Trig: Fre Atten: 10	e Run 0 dB	Avg Type	ALIGNAUTO : Log-Pwr		M Mar 05, 2018 CC 12 3 4 5 6 P NNNNN 59.10 s -0.61 dB	Trace/Detector Select Trace 1 Clear Writ Trace Averag Max Hol Min Hol
0 dB/div 0 gB/div	rum Analyzer - Swept SA RF 50 Ω AC Ref 0.00 dBm 	PNO: Wide IFGain:Low	SE Atten: 10	e Run 0 dB	Avg Type	ALIGNAUTO : Log-Pwr		MMar 05, 2018 CC 12 3 4 5 6 P NNNNN 59.10 S -0.61 dB	Trace/Detector Select Trace 1 Clear Writ Trace Averag Max Hol Min Hol View Blank Trace On
I0 dB/div 00 dB/div	RF SU Ω AC Ref 0.00 dBm Ref 0.00 dBm Ref 0.00 dBm	PNO: Wide IFGain:Low	SE Atten: 11	NSE.INT	Avg Type	ALIGNAUTO L L Og - Pwr		MMar 05, 2019 CC 12 3 4 5 6 PR WINN NN N 59.10 S -0.61 dB	Trace/Detector Select Trace 1 Clear Writ Trace Averag Max Hol Min Hol View Blank Trace On
glent Spect glent	RF SU Ω AC Ref SU Ω AC Ref O.OO dBm Image: Accord and the second and te	PNO: Wide IFGain:Low	→ Trig: Fre Atten: 11	e Run 0 dB		ALIGNAUTO : Log-Pwr		M Mar 05, 2018 CC 12 3 4 5 6 P NNN N 59.10 s -0.61 dB	Trace/Detector Select Trace 1 Clear Writ Trace Averag Max Hol Min Hol View Blank Trace On
0 dB/div 0 dB/div 0 glient Spect 0 glient Spec	Ref 50 Ω AC Ref 0.00 dBm 0.00 dBm Image: Contract of the second secon	PNO: Wide IFGain:Low	SE Atten: 11	e Run 0 dB	Avg Type	ALIGNAUTO : Log-Pwr		22 Span 0 Hz	Trace/Detector Select Trace 1 Clear Writ Trace Averag Max Hol Min Hol View Blank Trace On Or
0 dB/div 0 glent Spect 10 glent Spect 11 glent Spect 12 glent Spect 13 glent Spect	Ref SU Ω AC Ref SU Ω AC Ref SU Ω AC	PNO: Wide IFGain:Low	SE Atten: 11 Atten:	e Run 0 dB		ALIGNAUTO : Log-Pwr 	01:41:15 TRA TRA TRA TRA TRA TRA TRA TRA TRA TRA	MMar 05, 2018 CC 012 3 4 5 6 PR WANNER 59.10 S -0.61 dB 	Trace/Detector Select Trace 1 Clear Writ Trace Averag Max Hol Min Hol View Blank Trace On 1 of



 Test Report No.
 18020175-FCC-R1

 Page
 23 of 38

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted Emissions	5		1	L	
R&S EMI Test Receiver	ESPI3	101216	05/03/2017	05/02/2018	
V-LISN	ESH3-Z5	838979/005	05/15/2017	05/14/2018	
SIEMIC EZ_EMC software Conducted Emissions	Ver.ICP-03A1	N/A	N/A	N/A	
RF conducted test					
Agilent Technologies Spectrum Analyzer	N9010A	MY47191130	05/03/2017	05/02/2018	\boxtimes
Radiated Emissions					
Agilent Technologies Spectrum Analyzer	N9010A	MY47191130	05/03/2017	05/02/2018	\boxtimes
R&S EMI Receiver	ESPI3	101216	05/03/2017	05/02/2018	\boxtimes
Antenna (30MHz~6GHz)	JB6	A121411	10/31/2017	10/30/2018	\boxtimes
EMCO Horn Antenna (1 ~18GHz)	3115	N/A	11/15/2017	11/14/2018	\boxtimes
Hp Agilent Pre-Amplifier	8447F	1937A01160	10/31/2017	10/30/2018	\boxtimes
Pre-Amplifier	8449B	3008A02224	10/30/2017	10/29/2018	\boxtimes
SIEMIC EZ_EMC software Radiated Emissions	Ver.ICP-03A1	N/A	N/A	N/A	\boxtimes



Test Report No. 18020175-FCC-R1 Page

24 of 38

Annex B. EUT And Test Setup Photographs

Photograph: EUT External Photos Annex B.i.



Top View1 of EUT



Bottom View2 of EUT



Test Report No.	18020175-FCC-R1
Page	25 of 38



View3 of EUT



View4 of EUT



Test Report No.	18020175-FCC-R1
Page	26 of 38



View5 of EUT



View6 of EUT



Test Report No.	18020175-FCC-R1
Page	27 of 38

Annex B.ii. Photograph EUT Internal Photos



Uncover - Front View



EUT Screen1 – Front View



Test Report No.	18020175-FCC-R1
Page	28 of 38



EUT Screen1 – Rear View



EUT Screen2 – Front View



Test Report No.	18020175-FCC-R1
Page	29 of 38



EUT Screen2 – Rear View



EUT PCB1 – Front View



Test Report No.	18020175-FCC-R1
Page	30 of 38



EUT PCB1 – Rear View



EUT PCB2 – Front View



Test Report No.	18020175-FCC-R1
Page	31 of 38



EUT PCB2 – Rear View



EUT PCB3 – Front View



Test Report No.	18020175-FCC-R1
Page	32 of 38



EUT PCB3 – Rear View



 Test Report No.
 18020175-FCC-R1

 Page
 33 of 38

Annex B.iii. Photograph: Test Setup Photo







Test Report No.

Page

18020175-FCC-R1

34 of 38



 Test Report No.
 18020175-FCC-R1

 Page
 35 of 38

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Radiated Emissions





 Test Report No.
 18020175-FCC-R1

 Page
 36 of 38

Annex C. ii. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Manufacturer	Equipment Description	Model	Calibration Due Date
N/A	N/A	N/A	N/A



Test Report No.	18020175-FCC-R1
Page	37 of 38

Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see attachment



Test Report No.	18020175-FCC-R1
Page	38 of 38

Annex E. DECLARATION OF SIMILARITY

N/A