

Date: 2016-01-21 Page 1 of 34

No.: DM122293

**Applicant:** Pulse Play LTD

Hacharuv 8, Risphon, Israel

Manufacturer: Global Brands Manufacture Limited

EMS Business Unit, Block F, Yuen Yuen Industrial Estate, Huang Jiang Town, Dong Guan City, Guang Dong Province,

China

**Description of Sample(s):** Submitted sample(s) said to be

Product: Pulse Play
Brand Name: Pulse-play
Model Number: G1AR16
FCC ID: 2AG9X-2425

Date Sample(s) Received: 2016-01-14

**Date Tested:** 2016-01-14 to 2016-01-20

**Investigation Requested:** Perform ElectroMagnetic Interference measurement in

accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2015 and ANSI C63.10:2013 for FCC Certification.

**Conclusion(s):** The submitted product <u>COMPLIED</u> with the requirements of

Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this

Test Report.

Remark(s): ---



ElectroMagnetic Compatibility Department
For and on behalf of
STC (Dongguan) Company Limited



	2016-01-21 DM122293	Page 2 of 34
CONT	TENT:	
	Cover	Page 1 of 34
	Content	Page 2 of 34
<u>1.0</u>	General Details	
1.1	Test Laboratory	Page 3 of 34
1.2	Equipment Under Test [EUT]	Page 3 of 34
	Description of EUT operation	
1.0		D 4-624
1.3	Date of Order	Page 4 of 34
1.4	Submitted Sample(s)	Page 4 of 34
	- · · · · · · · · · · · · · · · · · · ·	D 4 C24
1.5	Test Duration	Page 4 of 34
1.6	Country of Origin	Page 4 of 34
<u>2.0</u>	Technical Details	
2.1	Investigations Requested	Page 5 of 34
2.2	Test Standards and Results Summary	Page 5 of 34
<u>3.0</u>	Test Results	
3.1	Emission	Page 6-30 of 34
	Appendix A	
	List of Measurement Equipment	Page 31 of 34
	Appendix B	
	Ancillary Equipment	Page 31 of 34
	Appendix C	
	Photographs of EUT	Page 32-34 of 34



Date: 2016-01-21 Page 3 of 34

No.: DM122293

## 1.0 General Details

### 1.1 Test Laboratory

STC (Dongguan) Company Limited

**EMC Laboratory** 

68 Fumin Nan Road, Dalang, Dongguan, Guangdong, China

Telephone: (86 769) 81119888 Fax: (86 769) 81116222

# 1.2 Equipment Under Test [EUT] Description of Sample(s)

Product: Pulse Play

Manufacturer: Global Brands Manufacture Limited

EMS Business Unit, Block F, Yuen Yuen Industrial Estate, Huang Jiang Town, Dong Guan City, Guang Dong Province,

China

Brand Name: Pulse-play Model Number: G1AR16

Rating: 5.0Vd.c. (Powered by USB port) / Li-ion rechargeable battery

x1 = 3.7Vd.c

#### 1.2.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Pulse Play. The transmission signal is digital modulated with channel frequency range 2402-2480MHz. The R.F. signal was modulated by IC; the type of modulation used was frequency hopping spread spectrum Modulation.

#### 1.3 Date of Order

2015-08-26

## 1.4 Submitted Sample(s):

1 Sample

#### 1.5 Test Duration

2015-09-01 to 2015-11-25

## 1.6 Country of Origin

China

#### STC (Dongguan) Company Limited



Date: 2016-01-21 Page 4 of 34 No.: DM122293

## 2.0 Technical Details

## 2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2015 Regulations and ANSI C63.10:2013for FCC Certification.

According FCC KDB 558074 DTS Measurement Guidance, Duty cycle  $\geq$  98%. The device was realized by test software.

## 2.2 Test Standards and Results Summary Tables

	EMISSION Results Summary											
Test Condition	Test Requirement	Class /	Т	est Resu	ılt							
			Severity	Pass	Fail	N/A						
Output Power of Fundamental Emissions	FCC 47CFR 15.247(b)(3)	ANSI C63.10:2013	N/A									
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.10:2013	N/A									
Conducted Emissions	FCC 47CFR 15.207	ANSI C63.10:2013	N/A									
Power Spectral Density	FCC 47CFR 15.247(e)	ANSI C63.10: 2013	N/A									
6dB Bandwidth	FCC 47CFR 15.247(a)(2)	ANSI C63.10: 2013	N/A									
Band Edge Emissions	FCC 47CFR 15.247(d)	ANSI C63.10: 2013	N/A									
RF Exposure	FCC 47CFR 15.247(i)	N/A	N/A	$\boxtimes$								

Note: N/A - Not Applicable



Date: 2016-01-21 Page 5 of 34

No.: DM122293

## 3.0 Test Results

#### 3.1 Emission

## 3.1.1 Maximum Peak Output Power

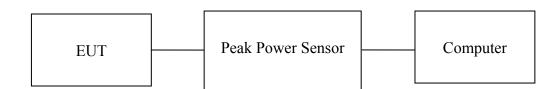
Test Requirement: FCC 47CFR 15.247(b)(3)

Test Method: N/A
Test Date: 2016-01-18
Mode of Operation: Tx mode

#### **Test Method:**

The RF output of the EUT was connected to the peak power sensor, and the level measured by the peak power sensor will be displayed on the computer. All the attenuation or cable loss will be added to the measured maximum output power. The results are recorded in W.

## **Test Setup:**



Note: a temporary antenna connector was soldered to the RF output.



Date: 2016-01-21 Page 6 of 34

No.: DM122293

## Limits for Peak Output Power of Fundamental & Harmonics Emissions [FCC 47CFR 15.247]:

For Digital Transmission systems in 2400-2483.5 MHz Band: 1 Watt (30dBm)

Results of Tx Mode GFSK (2402MHz to 2480MHz): Pass (Tx Unit)  Maximum conducted output power									
Channel	Frequency(MHz)	Output Power(Watt)							
Low	2402	0.000507							
Middle	2440	0.000411							
High	2480	0.000429							

Calculated measurement uncertainty : 30MHz to 1GHz 1.7dB

1GHz to 26GHz 1.7dB



Date: 2016-01-21 Page 7 of 34

No.: DM122293

#### 3.1.2 Radiated Emissions

Test Requirement: FCC 47CFR 15.209 Test Method: ANSI C63.10:2013

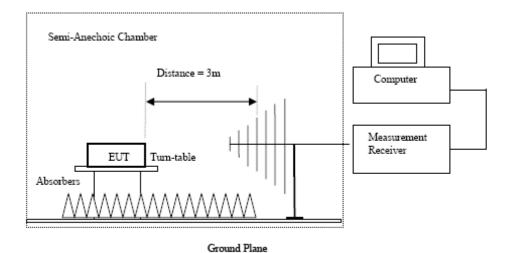
Test Date: 2016-01-18 Mode of Operation: Tx mode

#### **Test Method:**

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber\*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber\*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

\* Semi-anechoic chamber located on the G/F of "STC (Dongguan) Company Limited" with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 629686.

#### **Test Setup:**



- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
- Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz hom antennas are used,
   9kHz to 30MHz loop antennas are used.



Date: 2016-01-21 Page 8 of 34

No.: DM122293

## Limits for Radiated Emissions [FCC 47 CFR 15.247 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

## Result of Tx mode (2402.0 MHz) (GFSK) (9kHz - 30MHz): Pass

	Field Strength of Spurious Emissions									
	Average Value									
Frequency	Measured	Correction	Field	Field	Limit	E-Field				
	Level	Factor	Strength	Strength		Polarity				
MHz	dΒμV	dB/m	$dB\mu V/m$	dBμV/m	$dB\mu V/m$					
	Emissions detected are more than 20 dB below the FCC Limits									

Result of Tx mode (2402.0 MHz) (GFSK) (1GHz-26GHz): Pass

Result of 1x mode (2402.0 MHz) (GFSK) (1GHz-20GHz): Fass											
	Field Strength of Spurious Emissions										
	Peak Value										
Frequency	Measured	Correction	Field	Limit	Margin	E-Field					
	Level @3m	Factor	Strength	@3m		Polarity					
MHz	dΒμV	dB/m	$dB\mu V/m$	$dB\mu V/m$	dBμV/m						
4804.0	17.4	41.5	58.9	74.0	15.1	Vertical					
4804.0	15.4	42.4	57.8	74.0	16.2	Horizontal					
7206.0	10.9	45.1	56.0	74.0	18.0	Vertical					
7206.0	9.7	46.2	55.9	74.0	18.1	Horizontal					
9612.0	7.7	48	55.7	74.0	18.3	Vertical					
9612.0	6.5	48.8	55.3	74.0	18.7	Horizontal					
12010.0	4.7	51.5	56.2	74.0	17.8	Vertical					
12010.0	3.5	52.4	55.9	74.0	18.1	Horizontal					



Date: 2016-01-21 Page 9 of 34

No.: DM122293

## Result of Tx mode (2402.0 MHz) (GFSK) (1GHz-26GHz): Pass

	Field Strength of Spurious Emissions										
	Average Value										
Frequency	Measured	Correction	Field	Limit	Margin	E-Field					
	Level@3m	Factor	Strength	@3m		Polarity					
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dBuV/m						
4804.0	4.0	41.5	45.5	54.0	8.5	Vertical					
4804.0	1.8	42.4	44.2	54.0	9.8	Horizontal					
7206.0	-2.0	45.1	43.1	54.0	10.9	Vertical					
7206.0	-4.0	46.2	42.2	54.0	11.8	Horizontal					
9612.0	-8.0	48.0	40.0	54.0	14.0	Vertical					
9612.0	-8.5	48.8	40.3	54.0	13.7	Horizontal					
12010.0	-9.6	51.5	41.9	54.0	12.1	Vertical					
12010.0	-11.3	52.4	41.1	54.0	12.9	Horizontal					

## Result of Tx mode (2440.0 MHz) (GFSK) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions										
	Average Value									
Frequency	Measured	Correction	Field	Field	Limit	E-Field				
	Level	Factor	Strength	Strength		Polarity				
MHz	dΒμV	dB/m	$dB\mu V/m$	$dB\mu V/m$	dBμV/m					
	Emissions	detected are 1	nore than 20	dB below the	FCC Limits					

## Result of Tx mode (2440.0 MHz) (GFSK) (1GHz-26GHz): Pass

Field Strength of Spurious Emissions											
	Peak Value										
Frequency	Measured	Correction	Field	Limit	Margin	E-Field					
	Level @3m	Factor	Strength	@3m		Polarity					
MHz	$dB\mu V$	dB/m	dBμV/m	$dB\mu V/m$	dBμV/m						
4880.0	17.4	41.6	59.0	74.0	15.0	Vertical					
4880.0	16.1	42.5	58.6	74.0	15.4	Horizontal					
7320.0	10.8	45.2	56.0	74.0	18.0	Vertical					
7320.0	9.8	46.3	56.1	74.0	17.9	Horizontal					
9760.0	7.7	48.1	55.8	74.0	18.2	Vertical					
9760.0	6.7	48.9	55.6	74.0	18.4	Horizontal					
12200.0	4.3	51.6	55.9	74.0	18.1	Vertical					
12200.0	3.6	52.5	56.1	74.0	17.9	Horizontal					



Date: 2016-01-21 Page 10 of 34

No.: DM122293

## Result of Tx mode (2440.0 MHz) (GFSK) (1GHz-26GHz): Pass

	Field Strength of Spurious Emissions Average Value										
Frequency											
1	Level @3m	Factor	Strength	@3m	8	Polarity					
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dBuV/m						
4880.0	4.5	41.6	46.1	54.0	7.9	Vertical					
4880.0	2.9	42.5	45.4	54.0	8.6	Horizontal					
7320.0	-2.0	45.2	43.2	54.0	10.8	Vertical					
7320.0	-2.8	46.3	43.5	54.0	10.5	Horizontal					
9760.0	-6.2	48.1	41.9	54.0	12.1	Vertical					
9760.0	-8.1	48.9	40.8	54.0	13.2	Horizontal					
12200.0	-11.6	51.6	40.0	54.0	14.0	Vertical					
12200.0	-10.8	52.5	41.7	54.0	12.3	Horizontal					

## Result of Tx mode (2480.0 MHz) (GFSK) (9kHz - 30MHz): Pass

	Field Strength of Spurious Emissions									
	Average Value									
Frequency	Measured	Correction	Field	Field	Limit	E-Field				
	Level	Factor	Strength	Strength		Polarity				
MHz	dΒμV	dB/m	$dB\mu V/m$	$dB\mu V/m$	dBμV/m					
	Emissions	detected are 1	nore than 20	dB below the	FCC Limits	•				

## Result of Tx mode (2480.0 MHz) (GFSK) (1GHz-26GHz): Pass

	Field Strength of Spurious Emissions									
Peak Value										
Frequency	Measured	Correction	Field	Limit	Margin	E-Field				
	Level @3m	Factor	Strength	@3m		Polarity				
MHz	dΒμV	dB/m	dBμV/m	dBμV/m	dBμV/m					
4960.0	17.9	41.4	59.3	74.0	14.7	Vertical				
4960.0	15.4	42.7	58.1	74.0	15.9	Horizontal				
7440.0	9.7	45.6	55.3	74.0	18.7	Vertical				
7440.0	9.3	46.5	55.8	74.0	18.2	Horizontal				
9920.0	7.0	48.6	55.6	74.0	18.4	Vertical				
9920.0	5.7	49.7	55.4	74.0	18.6	Horizontal				
12400.0	4.6	51.4	56.0	74.0	18.0	Vertical				
12400.0	3.5	52.7	56.2	74.0	17.8	Horizontal				



Date: 2016-01-21 Page 11 of 34

No.: DM122293

## Result of Tx mode (2480.0 MHz) (GFSK) (1GHz-26GHz): Pass

	Field Strength of Spurious Emissions Average Value					
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
1	Level @3m	Factor	Strength	@3m	8	Polarity
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dBuV/m	
4960.0	5.0	41.4	46.4	54.0	7.6	Vertical
4960.0	2.5	42.7	45.2	54.0	8.8	Horizontal
7440.0	-4.2	45.6	41.4	54.0	12.6	Vertical
7440.0	-4.2	46.5	42.3	54.0	11.7	Horizontal
9920.0	-8.4	48.6	40.2	54.0	13.8	Vertical
9920.0	-9.4	49.7	40.3	54.0	13.7	Horizontal
12400.0	-10.2	51.7	41.5	54.0	12.5	Vertical
12400.0	-10.8	52.7	41.9	54.0	12.1	Horizontal

#### Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

\* Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement (9kHz-30MHz): 2.0dB uncertainty (30MHz -1GHz): 4.9dB

(1GHz -6GHz): 4.02dB (6GHz -26.5GHz): 4.03dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.



Date: 2016-01-21 Page 12 of 34

No.: DM122293

Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

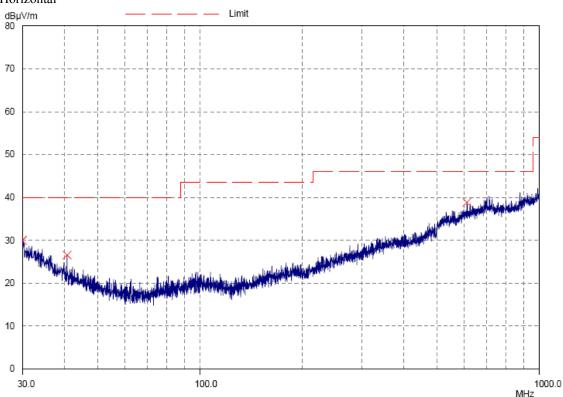
OF Class Dj.
Quasi-Peak Limits
$[\mu V/m]$
2400/F (kHz)
24000/F (kHz)
30
100
150
200
500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

#### Result of Tx mode (30MHz - 1GHz): Pass

Please refer to the following table for result details







Date: 2016-01-21 Page 13 of 34

No.: DM122293

Result of Tx mode (30MHz - 1GHz): Pass

	<u> </u>	Radiated	Emissions		
		Quasi	i-Peak		
Emission	E-Field	Level	Limit	Level	Limit
Frequency	Polarity	@3m	@3m	@3m	@3m
MHz		dBμV/m	dBμV/m	$\mu V/m$	$\mu V/m$
30.0	Horizontal	30.0	40.0	31.6	100
40.6	Horizontal	26.5	40.0	21.1	100
612.8	Horizontal	38.9	46.0	88.1	200



Date: 2016-01-21 Page 14 of 34

No.: DM122293

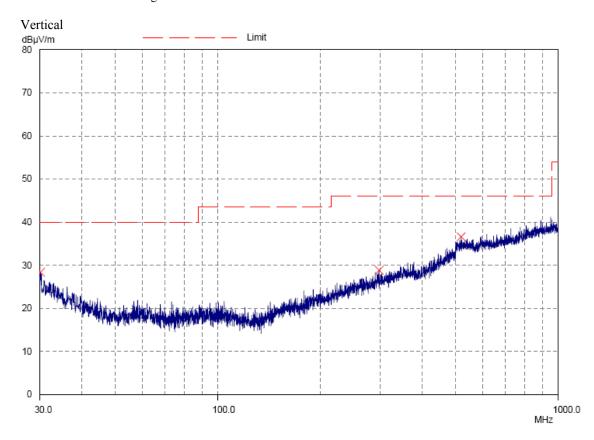
Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Elimits for Radiated Elimssions [Fee 47 er R 13.207 elass b].		
Frequency Range	Quasi-Peak Limits	
[MHz]	$[\mu V/m]$	
0.009-0.490	2400/F (kHz)	
0.490-1.705	24000/F (kHz)	
1.705-30	30	
30-88	100	
88-216	150	
216-960	200	
Above960	500	

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

## Result of Tx mode (30MHz - 1GHz): Pass

Please refer to the following table for result details





Date: 2016-01-21 Page 15 of 34

No.: DM122293

## Result of Tx mode (30MHz - 1GHz): Pass

Radiated Emissions					
		Quasi	i-Peak		
Emission	E-Field	Level	Limit	Level	Limit
Frequency	Polarity	@3m	@3m	@3m	@3m
MHz		$dB\mu V/m$	$dB\mu V/m$	$\mu V/m$	$\mu V/m$
30.2	Vertical	28.4	40.0	26.3	100
298.4	Vertical	28.9	46.0	27.9	200
519.5	Vertical	36.6	46.0	67.6	200

#### Remarks:

Calculated measurement uncertainty (30MHz - 1GHz): 4.9dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.



Date: 2016-01-21 Page 16 of 34

No.: DM122293

## 3.1.3 AC Mains Conducted Emissions (0.15MHz to 30MHz)

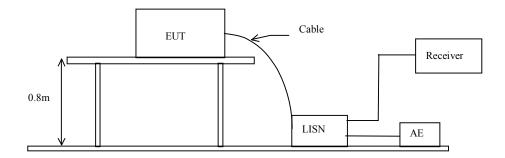
Test Requirement: FCC 47CFR 15.207 Test Method: ANSI C63.10:2013

Test Date: 2016-01-15
Mode of Operation: Tx mode
Test Voltage: 120Va.c. 60Hz

#### **Test Method:**

The test was performed in accordance with ANSI ANSI C63.10:2013, with the following: an initial measurement was performed in peak and average detection mode on the live line, any emissions recorded within 30dB of the relevant limit line were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

#### **Test Setup:**





Date: 2016-01-21 Page 17 of 34

No.: DM122293

## Limit for Conducted Emissions (FCC 47 CFR 15.207):

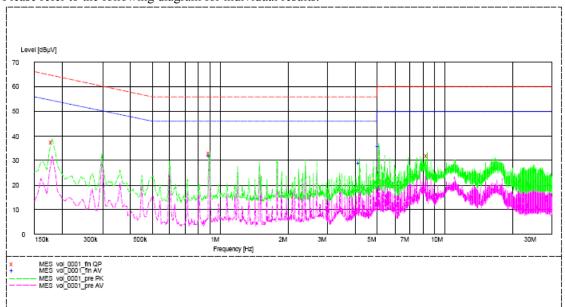
Frequency Range	Quasi-Peak Limits	Average
[MHz]	[dBµV]	[dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

<sup>\*</sup> Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram.

#### Result of Tx mode (L): PASS

Please refer to the following diagram for individual results.



		Quasi-peak		Ave	rage
Conductor	Frequency	Level	Limit	Level	Limit
Live or Neutral	MHz	dΒμV	dΒμV	dΒμV	dΒμV
Live	0.180	37.3	65.0	_*_	_*_
Live	0.900	33.0	56.0	_*_	_*_
Live	8.395	32.2	60.0	_*_	_*_
Live	0.900	_*_	_*_	32.0	46.0
Live	4.195	_*_	_*_	28.8	46.0
Live	5.095	_*_	_*_	35.9	50.0



Date: 2016-01-21 Page 18 of 34

No.: DM122293

## Limit for Conducted Emissions (FCC 47 CFR 15.207):

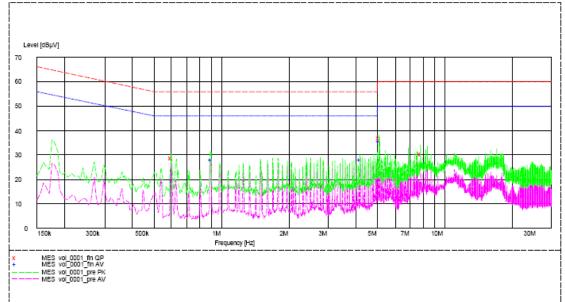
Frequency Range	Quasi-Peak Limits	Average
[MHz]	[dBµV]	[dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

<sup>\*</sup> Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram.

#### Result of Tx mode (N): PASS

Please refer to the following diagram for individual results.



		Quasi-peak		Average	
Conductor	Frequency	Level	Limit	Level	Limit
Live or Neutral	MHz	dΒμV	dΒμV	$dB\mu V$	dΒμV
Neutral	0.600	28.5	56.0	_*_	_*_
Neutral	5.095	36.8	60.0	_*_	_*_
Neutral	7.790	30.5	60.0	_*_	_*_
Neutral	0.900	_*_	_*_	28.3	46.0
Neutral	4.195	_*_	_*_	28.4	46.0
Neutral	5.095	_*_	_*_	35.6	50.0

#### Remarks:

Calculated measurement uncertainty (0.15MHz - 30MHz): 3.25dB

#### STC (Dongguan) Company Limited

<sup>-\*-</sup> Emission(s) that is far below the corresponding limit line.



Date: 2016-01-21 Page 19 of 34

No.: DM122293

## 3.1.4 Power Spectral Density

Test Requirement: FCC 47CFR 15.247(e)
Test Method: ANSI C63.10:2013

Test Date: 2016-01-14 Mode of Operation: Tx mode

#### **Test Method:**

The RF output of the EUT was connected to the spectrum analyzer. Set the fundamental frequency as the center frequency of the spectral analyzer. Use RBW=3kHz, VBW=10KHz, Set the span to 1.5 times the DTS channel bandwidth. Detector = peak, Sweep time = auto couple, Trace mode = max hold. Measure the Power Spectral Density (PSD) and record the results in dBm.

## **Test Setup:**

As Test Setup of clause 3.1.1 in this test report.

#### **Test Limit:**

The maximum power spectral density (PSD) shall not exceeded 8dBm in any 3kHz band.

# Results of Tx Mode GFSK (Tx:2402MHz to 2480MHz) : Pass (Tx Unit) Maximum power spectral density

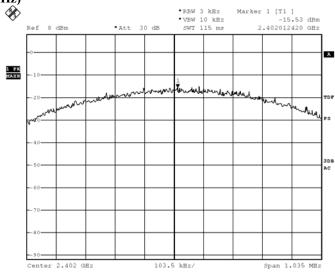
Transmitter Frequency	Maximum Power spectral density	Maximum Power spectral density
(MHz)	level / 3kHz band	/ 3kHz band limit
	(dBm)	
2402.0	-15.53	8dBm
2440.0	-15.26	8dBm
2480.0	-16.55	8dBm



Date: 2016-01-21 Page 20 of 34 No.: DM122293

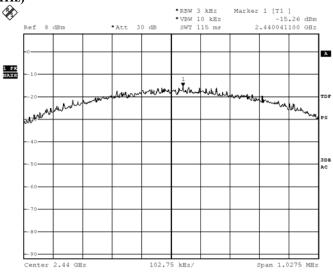
Tx mode GFSK (Tx: 2402MHz to 2480MHz)

CH 0 (2402.0 MHz)



BMP Date: 14.JAN.2016 15:30:50

## CH 19 (2440.0 MHz)



BMP

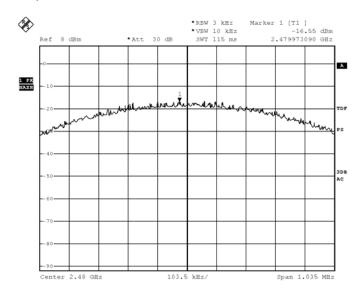
Date: 14.JAN.2016 15:27:41

#### STC (Dongguan) Company Limited



Date: 2016-01-21 Page 21 of 34 No.: DM122293

CH 39 (2480.0 MHz)



BMP

Date: 14.JAN.2016 15:29:17



Date: 2016-01-21 Page 22 of 34

No.: DM122293

## 3.1.5 6dB Spectrum Bandwidth Measurement

Test Requirement: FCC 47CFR 15.247(a)(2)
Test Method: ANSI C63.10:2013

Test Date: 2016-01-14 Mode of Operation: Tx mode

#### **Test Method:**

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

### **Test Setup:**

As Test Setup of clause 3.1.1 in this test report.



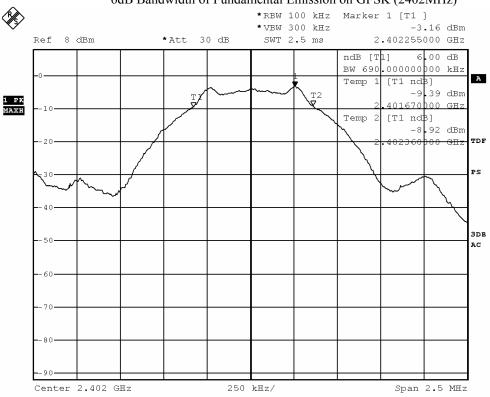
Date: 2016-01-21 Page 23 of 34

No.: DM122293

## **Limits for 6dB Spectrum Bandwidth Measurement:**

Center Frequency	6dB Bandwidth	FCC Limits
[MHz]	[KHz]	[kHz]
2402.0	690.0	> 500

## 6dB Bandwidth of Fundamental Emission on GFSK (2402MHz)



ВМР

Date: 14.JAN.2016 15:24:54



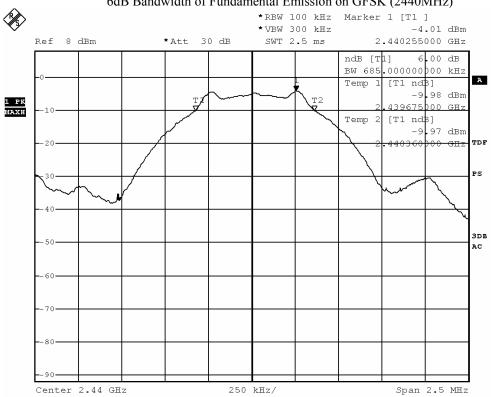
Date: 2016-01-21 Page 24 of 34

No.: DM122293

## **Limits for 6dB Spectrum Bandwidth Measurement:**

Frequency Range	6dB Bandwidth	FCC Limits
[MHz]	[KHz]	[kHz]
2440.0	685.0	> 500

## 6dB Bandwidth of Fundamental Emission on GFSK (2440MHz)



BMP

Date: 14.JAN.2016 15:26:17



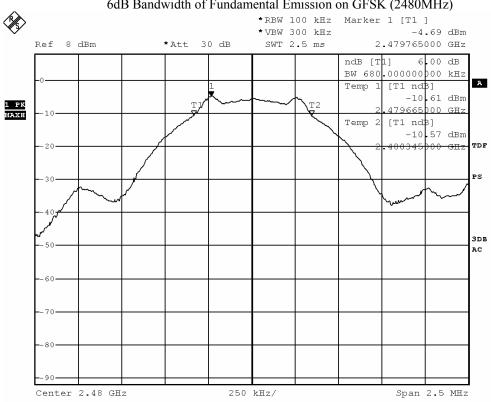
Date: 2016-01-21 Page 25 of 34

No.: DM122293

## **Limits for 6dB Spectrum Bandwidth Measurement:**

Frequency Range	6dB Bandwidth	FCC Limits
[MHz]	[KHz]	[kHz]
2480.0	680.0	> 500

## 6dB Bandwidth of Fundamental Emission on GFSK (2480MHz)



BMP

Date: 14.JAN.2016 15:23:03



Date: 2016-01-21 Page 26 of 34

No.: DM122293

## 3.1.6 Band Edges Measurement

Test Requirement: FCC 47CFR 15.247
Test Method: ANSI C63.10:2013

Test Date: 2016-01-14 Mode of Operation: Tx mode

#### **Test Method:**

The band edge is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. The RBW are set to 100kHz and VBW are set to 300kHz for this measurement.

## **Test Setup:**

As Test Setup of clause 3.1.2 in this test report.



Date: 2016-01-21 Page 27 of 34

No.: DM122293

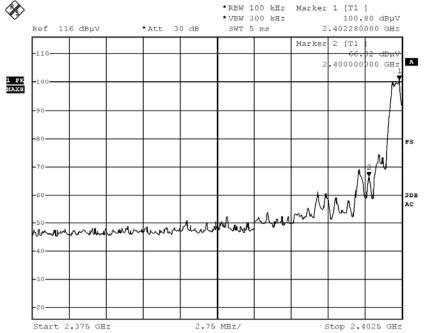
## **Band-edge Compliance of RF Conducted Emissions Measurement:**

#### Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

Frequency Range	Radiated Emission Attenuated below the
	Fundamental
[MHz]	[dB]
2400 – Lowest Fundamental (2402)	34.48

### Band-edge Compliance of RF Emissions - Lowest (GFSK)



BMP

Date: 14.JAN.2016 15:32:13



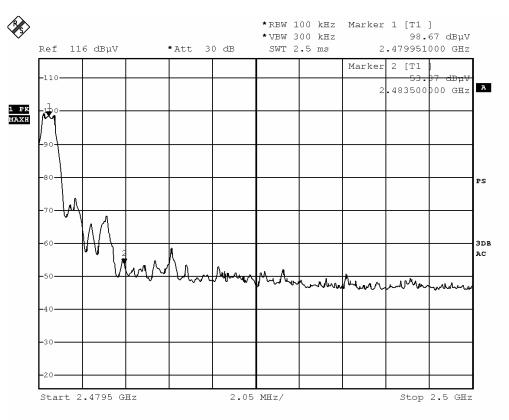
Date: 2016-01-21 Page 28 of 34

No.: DM122293

## **Band-edge Compliance of RF Conducted Emissions Measurement:**

Frequency Range	Radiated Emission Attenuated below the
	Fundamental
[MHz]	[dB]
2483.5 - Highest Fundamental (2480)	45.3

## Band-edge Compliance of RF Emissions – Highest (GFSK)



BMP

Date: 14.JAN.2016 15:34:23



Date: 2016-01-21 Page 29 of 34

No.: DM122293

## **Band-edge Compliance of RF Radiated Emissions Measurement:**

#### Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 5.205(c)).

Result: Band-edge Compliance of RF Radiated Emissions (Lowest)-GFSK

- 1	Acoust. Dana cage compliance of Rt Radiated Emissions (Lowest) of Six							
I	Field Strength of Band-edge Compliance							
l	Peak Value							
I	Frequency	Measured	Correction	Field	Limit	Margin	E-Field	
		Level @3m	Factor	Strength	@3m		Polarity	
l	MHz	dΒμV	dB/m	$dB\mu V/m$	$dB\mu V/m$	$dB\mu V/m$		
	2389.4	15.0	36.8	51.8	74.0	22.2	Vertical	
I	2390.0	12.2	36.8	49.0	74.0	25.0	Vertical	

Field Strength of Band-edge Compliance						
	Average Value					
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dΒμV	dB/m	$dB\mu V/m$	dBμV/m	$dB\mu V/m$	
2389.4	1.4	36.8	38.2	54.0	15.8	Vertical
2390.0	0.8	36.8	37.6	54.0	16.4	Vertical

Result: Band-edge Compliance of RF Radiated Emissions (Highest) -GFSK

Todato: Dana dago compliante of the removed Emissions (riightest) of 512						
Field Strength of Band-edge Compliance						
	Peak Value					
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dΒμV	dB/m	dBμV/m	$dB\mu V/m$	$dB\mu V/m$	
2485.8	20.9	36.4	57.3	74.0	16.7	Horizontal
2483.5	16.7	36.4	53.1	74.0	20.9	Horizontal

Field Strength of Band-edge Compliance						
		A	verage Valu	e		
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dΒμV	dB/m	$dB\mu V/m$	$dB\mu V/m$	$dB\mu V/m$	
2485.8	5.9	36.4	42.3	54.0	11.7	Horizontal
2483.5	3.8	36.4	40.2	54.0	13.8	Horizontal



Date: 2016-01-21 Page 30 of 34

No.: DM122293

#### 3.1.7 RF Exposure

Test Requirement: FCC 47CFR 15.247(i)

Test Date: 2016-01-21 Mode of Operation: Tx mode

#### **Requirements:**

In 15.247(i), an equipment shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the limits in §§ 1.1310 and 2.1093 of this chapter.

Applications to the Commission for construction permits, licenses to transmit or renewals thereof, equipment authorizations or modifications in existing facilities must contain a statement confirming compliance with the limits unless the facility, operation, or transmitter is categorically excluded, as discussed below. Technical information showing the basis for this statement must be submitted to the Commission upon request.

According to KDB447498 D01 General RF Exposure Guidance v06, unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition.

#### **Test Results:**

For 100 MHz to 6 GHz and test separation distances  $\leq$  50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]  $\cdot [\sqrt{f_{(GHz)}}] \le 3.0$  for 1-g SAR, and  $\le 7.5$  for 10-g extremity SAR,where f<sub>(GHz)</sub> is the RF channel transmit frequency in GHz Power and distance are rounded to the nearest mW and mm before calculation The result is rounded to one decimal place for comparison

The values 3.0 and 7.5 are referred to as *numeric thresholds* in step b) below

The test exclusions are applicable only when the minimum test separation distance is  $\leq$  50 mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $\leq$  5 mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.

#### **RF Exposure Evaluation**

 $[(0.507 \text{ mW}) / (5 \text{ mm})] \times [\sqrt{(2.402)}] \le 3.0.$ 

Therefore the SAR evaluation can be exempted.



Date: 2016-01-21 Page 31 of 34

No.: DM122293

## Appendix A

## **List of Measurement Equipment**

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EMD004	LISN	ROHDE & SCHWARZ	ESH3-Z5	100102	2015.3.24	2016.03.24
EMD022	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCS30	100314	2015.3.24	2016.03.24
EMD035	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCI	100441	2015.3.24	2016.03.24
EMD036	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB 26	100388	2015.3.24	2016.03.24
EMD041	TWO-LINE V- NETWORK	ROHDE & SCHWARZ	ENV216	100261	2015.3.24	2016.03.24
EMD061	BICONILOG ANTENNA	ETS.LINDGREN	3142C	00060439	2014.11.29	2016.11.29
EMD062	DOUBLE-RIDGED WAVEGUIDE (1GHZ – 18GHZ)	ETS.LINDGREN	3117	00075933	2014.11.15	2016.11.15
EMD084	MULTI-DVICE CONTROLLER	ETS.LINDGREN	2090	00060107	N/A	N/A
EMD088	VIDEO CONTOL UNIT	ETS.LINDGREN	Y21953A	2601073	N/A	N/A
EMD093	MONITOR	VIEWSONIC	VA9036	Q8X064201876	N/A	N/A
EMD102	INTELLIGENT FREQUENCY	AINUO LNSTRUMENT CO., LTD	AN97005SS	79707454	N/A	N/A
EMD103	INTELLIGENT FREQUENCY	AINUO LNSTRUMENT CO., LTD	AN97005SS	79707455	N/A	N/A
EMD105	FACT-3 EMC CHAMBER	ETS.LINDGREN	FACT-3	3803	N/A	N/A
EMD106	SHIELDING ROOM #1	ETS.LINDGREN	RFD-100	3802	N/A	N/A
EMD111	POWER METER	ROHDE & SCHWARZ	NRVD	102051	2015.3.24	2016.03.24
	100V INSERTION UNIT	ROHDE & SCHWARZ	URV5-Z4	100464	2015.3.24	2016.03.24
EMD113	PRE-AMPLIFIER	ROHDE & SCHWARZ	N/A	1129588	2015.3.24	2016.03.24
EMD124	LOOP ANTENNA	ETS-LINDGREN	6502	00104905	2014.04.28	2016.04.28
EMD131	STANDARD GAIN HORN ANTENNA (18GHZ – 26.5GHZ)	CHENGDU AINFO LNC.	JXTxLB-42- 15-C-KF	J2021100721001	2015.04.09	2017.04.09
RE01	RF CABLE	N/A	N/A	N/A	2015-9-28	2016.09.27
RE02	RF CABLE	N/A	N/A	N/A	2015-9-28	2016.09.27

#### Remarks:-

CM Corrective Maintenance

N/A Not Applicable TBD To Be Determined

## Appendix B

## **Ancillary Equipment**

Ī	ITEM NO.	DESCRIPTION	MODEL NO.	FCC ID	REMARK
	1	DELL COMPUTER	DMC	N/A	N/A

## STC (Dongguan) Company Limited



Date: 2016-01-21 Page 32 of 34

No.: DM122293

Appendix C

## Photographs of EUT

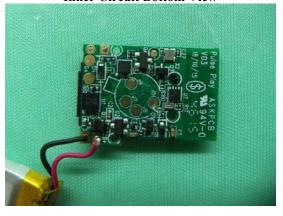
Front View of the product



Inside View of the product



**Inner Circuit Bottom View** 



Rear View of the product



**Inner Circuit Top View** 

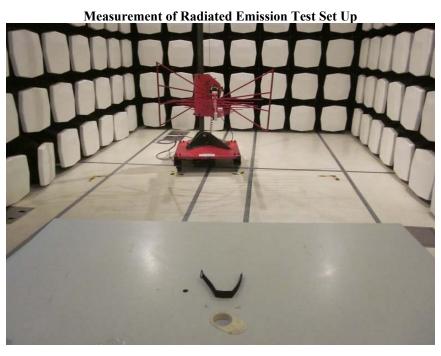




Date: 2016-01-21 Page 33 of 34 No.: DM122293

Photographs of EUT





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Date: 2016-01-21 Page 34 of 34 No.: DM122293

Photographs of EUT



Measurement of Conducted Emission Test Set Up



\*\*\*\*\* End of Test Report \*\*\*\*\*

## STC (Dongguan) Company Limited

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