

Report No.: FR640901-03AL

FCC Test Report

IP Wireless Camera Equipment

Brand Name FLIR SECURE . LOREX SECURE

Model No. Fxx2xxx (x=0-9, A-Z) \rightarrow FXCx2xxx (x=0-9, A-Z)

FCC ID UCZFXC22

Standard 47 CFR FCC Part 15.247

2400 MHz - 2483.5 MHz Frequency

Point-to-multipoint; Point-to-point **Function**

Lorex Technology Inc Applicant

250 Royal Crest Court, Markham, Ontario, L3R

3S1, Canada

Manufacturer Chicony Electronics (Dong Guan) Co.,Ltd.

> San Zhong Guan Li Qu, Qingxi Town, Dongguan City Guangdong 523651 China

The product sample received on Apr. 14, 2016 and completely tested on May 09, 2017. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONALINC., the test report shall not be reproduced except in full.

Phoenix Chen

SPORTON INTERNATIONAL INC.





SPORTON INTERNATIONAL INC. : 1 of 22 Page No. TEL: 886-3-3273456 Report Version : Rev. 01 FAX: 886-3-3270973 Issued Date : Jun. 15, 2017



FCC Test Report

Table of Contents

1	GENERAL DESCRIPTION	5
1.1	Information	5
1.2	Testing Applied Standards	
1.3	Testing Location Information	
1.4	Measurement Uncertainty	6
2	TEST CONFIGURATION OF EUT	7
2.1	Test Condition	7
2.2	Test Channel Mode	7
2.3	The Worst Case Measurement Configuration	8
2.4	Accessories	8
2.5	Support Equipment	g
2.6	Test Setup Diagram	10
3	TRANSMITTER TEST RESULT	12
3.1	AC Power-line Conducted Emissions	12
3.2	DTS Bandwidth	13
3.3	Maximum Conducted Output Power	14
3.4	Power Spectral Density	
3.5	Emissions in Non-restricted Frequency Bands	
3.6	Emissions in Restricted Frequency Bands	18
4	TEST EQUIPMENT AND CALIBRATION DATA	22
APPE	ENDIX A. TEST RESULTS OF AC POWER-LINE CONDUCTED EMISSIONS	
APPE	ENDIX B. TEST RESULTS OF DTS BANDWIDTH	
APPE	ENDIX C. TEST RESULTS OF MAXIMUM CONDUCTED OUTPUT POWER	
APPE	ENDIX D. TEST RESULTS OF POWER SPECTRAL DENSITY	
APPE	ENDIX E. TEST RESULTS OF EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS	
APPE	ENDIX F. TEST RESULTS OF EMISSIONS IN RESTRICTED FREQUENCY BANDS	
APPE	ENDIX G. TEST PHOTOS	
PHO	TOGRAPHS OF EUT v01	

TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: UCZFXC22 Page No. : 2 of 22
Report Version : Rev. 01
Issued Date : Jun. 15, 2017

Summary of Test Result

Conformance Test Specifications								
Report Clause	Ref. Std. Clause	Description	Limit	Result				
1.1.2	15.203	Antenna Requirement	FCC 15.203	Complied				
3.1	15.207	AC Power-line Conducted Emissions	FCC 15.207	Complied				
3.2	15.247(a)	DTS Bandwidth	≥500kHz	Complied				
3.3	15.247(b)	Maximum Conducted Output Power	Power [dBm]:30	Complied				
3.4	15.247(e)	Power Spectral Density	PSD [dBm/3kHz]:8	Complied				
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	Non-Restricted Bands: >30 dBc	Complied				
3.6	15.247(d)	Emissions in Restricted Frequency Bands	Restricted Bands: FCC 15.209	Complied				

SPORTON INTERNATIONAL INC. TEL: 886-3-3273456

FAX: 886-3-3270973 FCC ID: UCZFXC22 Page No. : 3 of 22
Report Version : Rev. 01

Report No.: FR640901-03AL

Issued Date : Jun. 15, 2017

Revision History

Report No.	Version	Description	Issued Date
FR640901-03AL	Rev. 01	Initial issue of report	Jun. 15, 2017
+			

SPORTON INTERNATIONAL INC.

TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: UCZFXC22 Page No. : 4 of 22
Report Version : Rev. 01
Issued Date : Jun. 15, 2017

General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number
2400-2483.5	LE	2402-2480	0-39 [40]

Report No.: FR640901-03AL

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	BT-LE(1Mbps)	1	1TX

Note:

- Bluetooth LE uses a GFSK (1Mbps) modulation for DSSS. BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	-	FX_C	PIFA Antenna	fixed on board	0.61

1.1.3 EUT Information

	Operational Condition						
EU.	T Power T	уре	From AC Adapter / I	Host Sys	stem		
	Type of EUT						
\boxtimes	Stand-alone						
	Combined (EUT where the radio part is fully integrated within another device)						
	Combined Equipment - Brand Name / Model No.:						
	Plug-in radio (EUT intended for a variety of host systems)						
	Host System - Brand Name / Model No.:						
	Other:						

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
BT-LE(1Mbps)	0.626	2.034	391.25u	3k

SPORTON INTERNATIONAL INC. Page No. : 5 of 22 TEL: 886-3-3273456 Report Version : Rev. 01 FAX: 886-3-3270973 Issued Date : Jun. 15, 2017

1.1.5 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FR640901-02AL Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
1. Power was increased	All test items other than AC newer line
2. FW Version was changed	All test items other than AC power-line
3. Model name and brand name were added	conducted emissions were re-tested

Report No.: FR640901-03AL

1.2 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 15
- ANSI C63.10-2013
- KDB 558074 D01 v04

1.3 Testing Location Information

	Testing Location								
\boxtimes	HWA YA	ADD	:	No. 52, Huaya 1st Rd.,	No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)				
		TEL	:	886-3-327-3456	886-3-327-3456 FAX : 886-3-327-0973				
Test site Designation No. 553509 with FCC.									
	JHUBEI	ADD	:	No.8, Ln. 724, Bo'ai St	, Zhubei City, Hsinchu County, Taiwan (R.O.C.)				
	TEL: 886-3-656-9065 FAX: 886-3-656-9085								
	Test site Designation No. TW0006 with FCC.								

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Ryan Hong	23°C / 56%	17/May/2016
Radiated	03CH09-HY	Jeff	24.2°C / 58%	05/May/2017
RF Conducted	TH01-HY	Gary	21.5°C / 61%	09/May/2017

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	2.1 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	2.6 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	2.9 dB	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%

 SPORTON INTERNATIONAL INC.
 Page No.
 : 6 of 22

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Jun. 15, 2017



2 Test Configuration of EUT

2.1 Test Condition

Condition Item	Abbreviation/Remark	Remark
RF Conducted-DTS	Abbreviation	Remark
TnomVnom	Tnom	20°C
-	Vnom	110V

2.2 Test Channel Mode

Test Software	DoS

Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	default
2440MHz	default
2480MHz	default

SPORTON INTERNATIONAL INC.

TEL: 886-3-3273456

Reconstruction

FAX: 886-3-3270973 FCC ID: UCZFXC22 Page No. : 7 of 22
Report Version : Rev. 01
Issued Date : Jun. 15, 2017



2.3 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests			
Tests Item	Tests Item AC power-line conducted emissions		
Condition AC power-line conducted measurement for line and neutral			
Operating Mode CTX			
1 Adapter Mode			
2 USB Mode			
Mode 1 configuration was pretested to be the worst case for EMI and measured during the test.			

The Worst Case Mode for Following Conformance Tests		
Tests Item DTS Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in Non-restricted Frequency Bands		
Test Condition Conducted measurement at transmit chains		

The Worst Case Mode for Following Conformance Tests			
Tests Item	Emissions in Restricted Frequency Band	ls	
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.		
Operating Mode < 1GHz	CTX		
1	Adapter Mode		
2	USB Mode		
	Y Plane Z Plane		
Orthogonal Planes of EUT			
Worst Planes of EUT		V	

2.4 Accessories

Specification of Accessory					
Brand Name SPPS Model Name SC/10WA050200US					
AC Adapter 1	Power Rating	I/P:100 - 240 Vac, 0.5 A, O/P: 5 Vdc, 2 A			
Brand Name I.T.E		I.T.E	Model Name	YJC010W-0502000U	
AC Adapter 2	Power Rating	I/P:100 - 240 Vac, 0.5 A, O/P: 5 Vdc, 2 A			
USB Cable	Signal Line	2.7 meter, shielded cable, w/o ferrite core			

Note: Regarding to more detail and other information, please refer to user manual.

SPORTON INTERNATIONAL INC.

TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: UCZFXC22 Page No. : 8 of 22
Report Version : Rev. 01
Issued Date : Jun. 15, 2017

FCC Test Report No.: FR640901-03AL

2.5 Support Equipment

	Support Equipment- Conduction				
No.	No. Equipment Brand Name Model Name FCC ID				
1	Notebook	DELL	E5530	DoC	
2	AC adapter for NB	DELL	LA65NS2-01	DoC	

	Support Equipment – RF Conducted				
No.	No. Equipment Brand Name Model Name FCC ID				
1	Notebook	DELL	E5410	DoC	
2	Adapter for NB	DELL	HA65NM130	DoC	

	Support Equipment – Radiated Emission				
No.	No. Equipment Brand Name Model Name FCC ID				
1	Notebook	DELL	E6400	DoC	
2	Adapter for NB	DELL	LA65NS2-01	DoC	

 SPORTON INTERNATIONAL INC.
 Page No.
 : 9 of 22

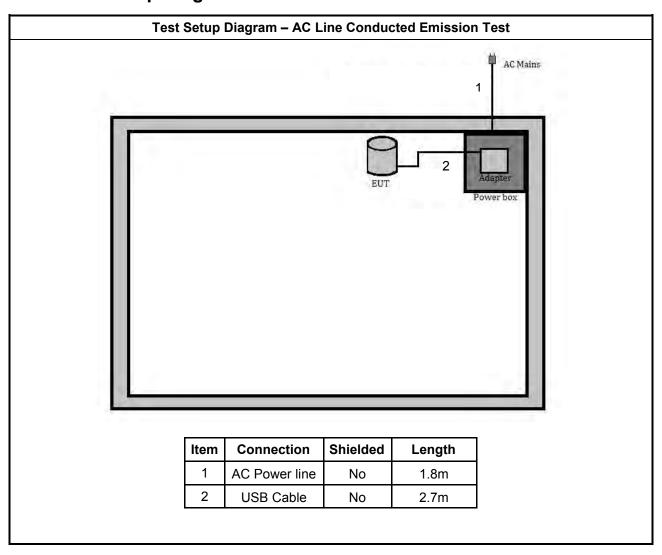
 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Jun. 15, 2017



Report No.: FR640901-03AL

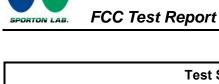
2.6 **Test Setup Diagram**



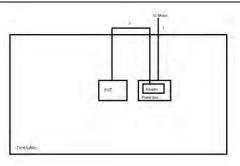
SPORTON INTERNATIONAL INC.

TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: UCZFXC22

Page No. : 10 of 22 Report Version : Rev. 01 Issued Date : Jun. 15, 2017

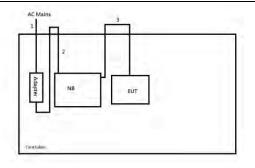


Test Setup Diagram - Radiated Test (Mode 1)



Item	Connection	Shielded	Length
1	AC Power line	No	1.8m
2	USB Cable	No	2.7m

Test Setup Diagram - Radiated Test (Mode 2)



Item	Connection	Shielded	Length
1	AC Power line	No	1.8m
2	DC Power line	No	1.8m
3	USB Cable	No	2.7m

TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: UCZFXC22

Page No. : 11 of 22 Report Version : Rev. 01

Issued Date : Jun. 15, 2017



3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

Frequency Emission (MHz)	Quasi-Peak	Average		
0.15-0.5	66 - 56 *	56 - 46 *		
0.5-5	56	46		
5-30	60	50		

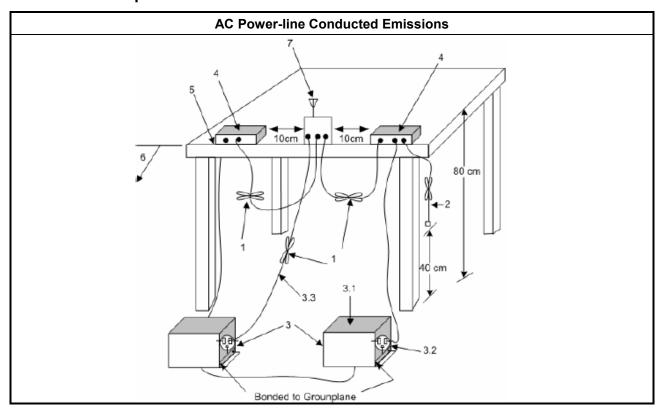
3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method
■ Refer as ANSI C63.10-2013, clause 6.2 foray power-line conducted emissions.

3.1.4 Test Setup



3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

SPORTON INTERNATIONAL INC.
TEL: 886-3-3273456

FAX: 886-3-3270973 FCC ID: UCZFXC22 Page No. : 12 of 22
Report Version : Rev. 01
Issued Date : Jun. 15, 2017

FCC Test Report No.: FR640901-03AL

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit				
Systems using digital modulation techniques:				
■ 6 dB bandwidth ≥ 500 kHz.				

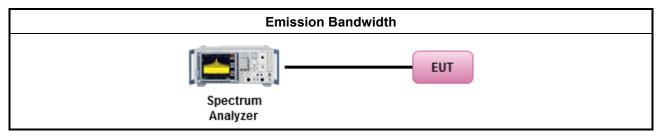
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

	Test Method				
•	For the emission bandwidth shall be measured using one of the options below:				
	Refer as KDB 558074, clause 8.1 Option 1 for 6 dB bandwidth measurement.				
	Refer as KDB 558074, clause 8.2 Option 2 for 6 dB bandwidth measurement.				
	Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.				

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

 SPORTON INTERNATIONAL INC.
 Page No.
 : 13 of 22

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Jun. 15, 2017

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

■ If $G_{TX} \le 6$ dBi, then $P_{Out} \le 30$ dBm (1 W)							
_	 Point-to-multipoint systems (P2M): If G_{TX} > 6 dBi, then P_{Out} = 30 - (G_{TX} - 6) dBm Point-to-point systems (P2P): If G_{TX} > 6 dBi, then P_{Out} = 30 - (G_{TX} - 6)/3 dBm Smart antenna system (SAS): 						
•							
•							
	- Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm						
	- Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm						
	- Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ dB dBm						
r.p.	Power Limit:						
24	2400-2483.5 MHz Band						
-	 Point-to-multipoint systems (P2M): P_{eirp} ≤ 36 dBm (4 W) 						
-	Point-to-point systems (P2P): P _{eirp} ≤ MAX(36, [P _{Out} + G _{TX}]) dBm						
•	Smart antenna system (SAS)						
	- Single beam: P _{eirp} ≤ MAX(36, P _{Out} + G _{TX}) dBm						
- Overlap beam: P _{eirp} ≤ MAX(36, P _{Out} + G _{TX}) dBm							
	- Aggregate power on all beams: P _{eirp} ≤ MAX(36, [P _{Out} + G _{TX} + 8]) dBm						

Report No.: FR640901-03AL

3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

 SPORTON INTERNATIONAL INC.
 Page No.
 : 14 of 22

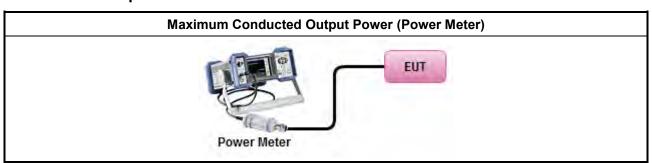
 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Jun. 15, 2017

3.3.3 Test Procedures

	Test Method
•	Maximum Peak Conducted Output Power
	Refer as KDB 558074, clause 9.1.1 Option 1 (RBW ≥ EBW method).
	Refer as KDB 558074, clause 9.1.2 Option 2 (integrated band power method)
	☐ Refer as KDB 558074, clause 9.1.3 Option 3 (peak power meter for VBW ≥ DTS BW)
•	Maximum Average Conducted Output Power
	Duty cycle ≥ 98%
	Refer as KDB 558074, clause 9.2.2.4 Method AVGSA-2 (spectral trace averaging).
	Duty cycle < 98%
	Refer as KDB 558074, clause 9.2.2.5 Method AVGSA-2 Alt. (slow sweep speed)
	RF power meter and average over on/off periods with duty factor or gated trigger
	Refer as KDB 558074, clause 9.2.3.1 Method AVGPM (using an RF average power meter).
•	For conducted measurement.
	■ If the EUT supports multiple transmit chains using options given below: Refer as KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	■ If multiple transmit chains, EIRP calculation could be following as methods: P _{total} = P ₁ + P ₂ + + P _n (calculated in linear unit [mW] and transfer to log unit [dBm]) EIRP _{total} = P _{total} + DG

3.3.4 Test Setup



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: UCZFXC22

SPORTON INTERNATIONAL INC.

Page No. : 15 of 22
Report Version : Rev. 01
Issued Date : Jun. 15, 2017

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

Power Spectral Density Limit Power Spectral Density (PSD)≤8 dBm/3kHz

Report No.: FR640901-03AL

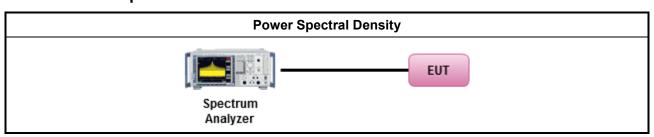
3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

	Test Method						
•	Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).						
	⊠ F	₹efe	er as KDB 558074, clause 10.2 Method PKPSD (RBW=3-100kHz; Detector=peak).				
•	For conducted measurement.						
	If The EUT supports multiple transmit chains using options given below:						
			Measure and sum the spectra across the outputs. Refer as KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.				

3.4.4 Test Setup



3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

 SPORTON INTERNATIONAL INC.
 Page No.
 : 16 of 22

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Jun. 15, 2017

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit			
RF output power procedure	Limit (dB)		
Peak output power procedure	20		
Average output power procedure	30		

Report No.: FR640901-03AL

- Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.
- Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

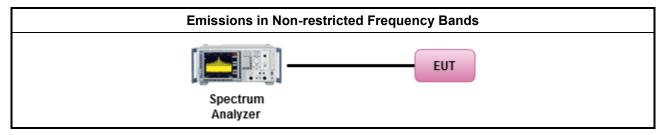
3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

	Test Method
•	Refer as KDB 558074, clause 11 for unwanted emissions into non-restricted bands.

3.5.4 Test Setup



3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

 SPORTON INTERNATIONAL INC.
 Page No.
 : 17 of 22

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Jun. 15, 2017



3.6 Emissions in Restricted Frequency Bands

3.6.1 Emissions in Restricted Frequency Bands Limit

Restricted Band Emissions Limit						
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)			
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300			
0.490~1.705	24000/F(kHz)	33.8 - 23	30			
1.705~30.0	30	29	30			
30~88	100	40	3			
88~216	150	43.5	3			
216~960	200	46	3			
Above 960	500	54	3			

Report No.: FR640901-03AL

: 18 of 22

: Rev. 01

: Jun. 15, 2017

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB / decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

SPORTON INTERNATIONAL INC. Page No.
TEL: 886-3-3273456 Report Version
FAX: 886-3-3270973 Issued Date

3.6.3 Test Procedures

Test Method

Report No.: FR640901-03AL

- The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
- Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
- For the transmitter unwanted emissions shall be measured using following options below:
 - Refer as KDB 558074, clause 12 for unwanted emissions into restricted bands.
 - Refer as KDB 558074, clause 12.2.5.3 (ANSI C63.10, clause 4.1.4.2.3), Reduced VBW≥1/T.
 - Refer as KDB 558074, clause 12.2.4 measurement procedure peak limit.
- For the transmitter band-edge emissions shall be measured using following options below:
 - Refer as KDB 558074 clause 13.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.
 - Refer as KDB 558074, clause 13.2 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.
 - Refer as KDB 558074, clause 13.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
- For conducted and cabinet radiation measurement, refer as KDB 558074, clause 12.2.2.
 - For conducted unwanted emissions into restricted bands (absolute emission limits).
 Devices with multiple transmit chains using options given below:
 - (1) Measure and sum the spectra across the outputs or
 - (2) Measure and add 10 log(N) dB
 - For KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.

 SPORTON INTERNATIONAL INC.
 Page No.
 : 19 of 22

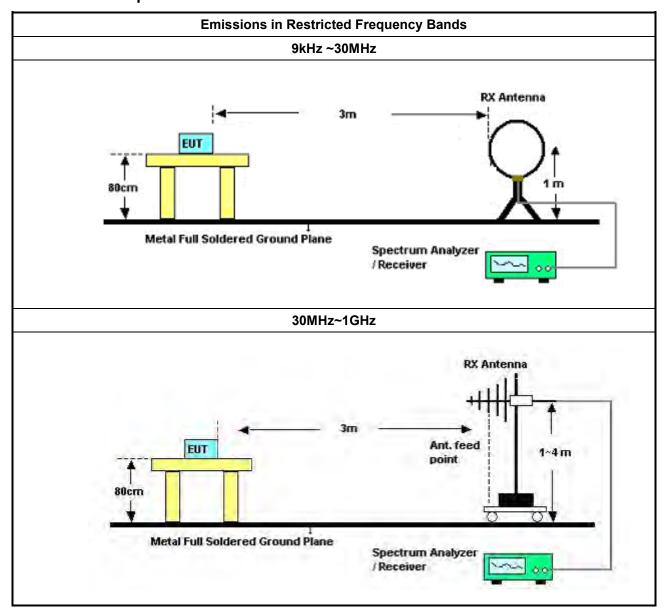
 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Jun. 15, 2017

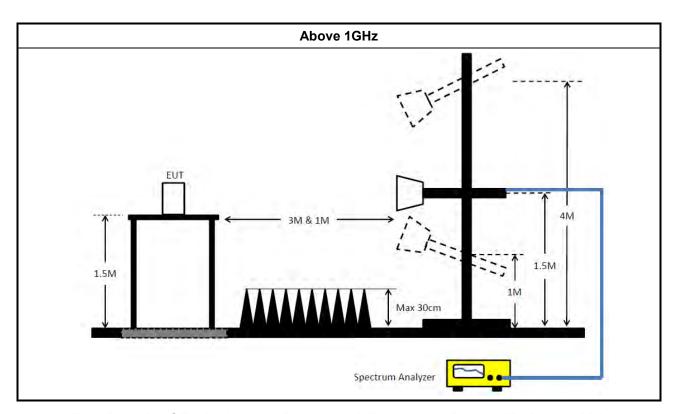


Drt Report No. : FR640901-03AL

3.6.4 Test Setup



TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: UCZFXC22 Page No. : 20 of 22
Report Version : Rev. 01
Issued Date : Jun. 15, 2017



3.6.5 Test Result of Emissions in Restricted Frequency Bands (Below 30MHz)

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported. All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

3.6.6 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

SPORTON INTERNATIONAL INC.

TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: UCZFXC22 Page No. : 21 of 22
Report Version : Rev. 01

Issued Date : Jun. 15, 2017



Test Equipment and Calibration Data 4

Instrument for AC Conduction

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMC Receiver	KETSIGHT	N9038A	MY54130031	20Hz~8.4GHz	14/Apr/2016	13/Apr/2017
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz~30MHz	26/Jan/2016	25/Jan/2017
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832020001	9kHz~30MHz	30/Oct/2015	29/Oct/2016
EMI Filter	LINDGREN	LRE-2030	2651	< 450Hz	NCR	NCR

NCR : Non-Calibration Require

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101013	9kHz~40GHz	30/Dec/2016	29/Dec/2017
Power Sensor	Anritsu	MA2411B	0917017	300MHz ~ 40GHz	10/Feb/2017	09/Feb/2018
Power Meter	Anritsu	ML2495A	0949003	300MHz ~ 40GHz	10/Feb/2017	09/Feb/2018
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	21/Jul/2016	20/Jul/2017
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_104	MY10710/4	30MHz~26.5GHz	02/Oct/2016	01/Oct/2017
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_104	MY10709/4	30MHz~26.5GHz	02/Oct/2016	01/Oct/2017
RF Cable-0.5m	HUBER+SUHNER	SUCOFLEX_104	MY10713/4	30MHz~26.5GHz	02/Oct/2016	01/Oct/2017
AC Power Source	G.W	APS-9102	EL920581	AC 0V ~ 300V	04/Jun/2016	03/Jun/2017

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz ~ 1GHz	25/Apr/2017	24/Apr/2018
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz ~ 18GHz	21/Jun/2016	20/Jun/2017
Amplifier	Agilent	8449B	3008A02364 1GHz ~ 26.5GHz		17/Nov/2016	16/Nov/2017
Amplifier	EMC	EMC9135	980209 9KHz~1GHz		05/Sep/2016	04/Sep/2017
Spectrum Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz ~ 44GHz	04/Jul/2016	03/Jul/2017
Bilog Antenna	TESEQ	CBL 6111D	35418	30MHz~1GHz	01/Oct/2016	30/Sep/2017
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170614	18GHz ~ 40GHz	06/Feb/2017	05/Feb/2018
Loop Antenna	R&S	HFH2-Z2	100330	9 kHz~30 MHz	10/Nov/2016	09/Nov/2017
RF Cable-high	Jye Bao	RG142	03CH09-HY	1GHz ~ 40GHz	23/Jul/2016	22/Jul/2017
Horn Antenna	AARONIA AG	POWERLOG 70180	05192	1G~18G	05/Jan/2017	04/Jan/2018

SPORTON INTERNATIONAL INC.

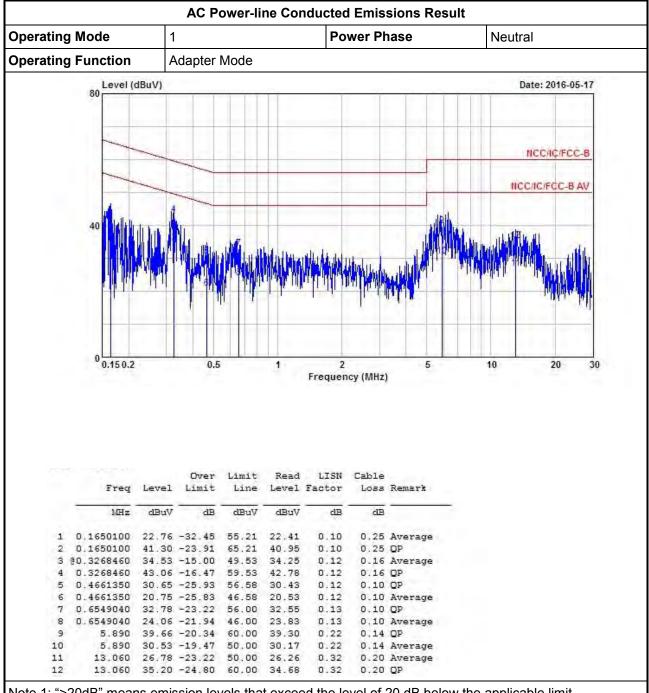
TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: UCZFXC22

Page No. : 22 of 22 Report Version : Rev. 01

Issued Date : Jun. 15, 2017



Appendix I. Test Result of AC Power-line Conducted Emissions



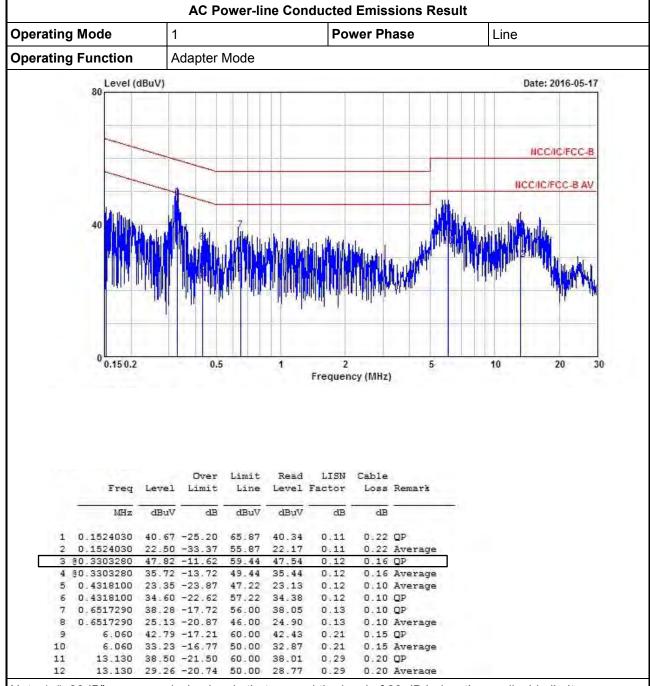
Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

SPORTON INTERNATIONAL INC.

TEL: 886-3-3273456 FAX: 886-3-3270973 Page No. : A1 of A2





Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

SPORTON INTERNATIONAL INC.

TEL: 886-3-3273456 FAX: 886-3-3270973 Page No.

: A2 of A2



EBW-DTS Result Appendix B

Summary

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
BT-LE(1Mbps)	-	-	-	-	-
2.4-2.4835GHz	712.5k	1.058M	1M06F1D	706.25k	1.054M

Max-N dB = Maximum 6dB down bandwidth; Max-OBW = Maximum 99% occupied bandwidth; Min-N dB = Minimum 6dB down bandwidth; Min-OBW = Minimum 99% occupied bandwidth;

Result

Mode	Result	Limit	Port 1-N dB	Port 1-OBW
		(Hz)	(Hz)	(Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	500k	711.25k	1.056M
2440MHz_TnomVnom	Pass	500k	712.5k	1.058M
2480MHz_TnomVnom	Pass	500k	706.25k	1.054M

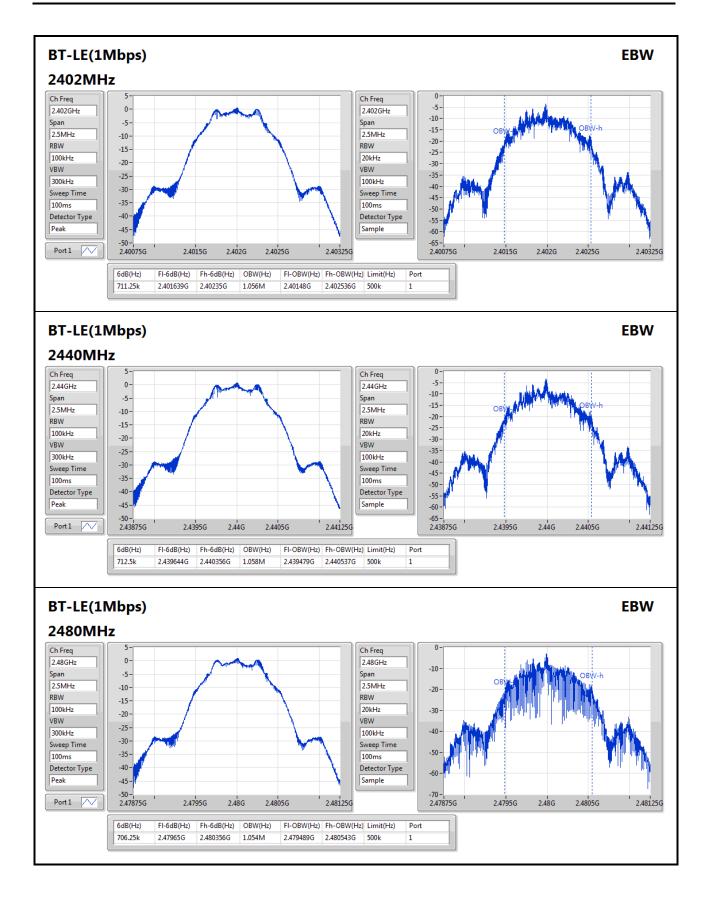
Port X-N dB = Port X 6dB down bandwidth; Port X-OBW = Port X 99% occupied bandwidth;

SPORTON INTERNATIONAL INC. Page No. : B1 of B2

640901-03

TEL: 886-3-327-3456 FAX: 886-3-327-0973





TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : B2 of B2



AV Power-DTS Result

Appendix C

640901-03

Summary

Mode	Power	Power
	(dBm)	(W)
BT-LE(1Mbps)	-	-
2.4-2.4835GHz	0.55	0.00114

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	0.61	0.19	30.00
2440MHz_TnomVnom	Pass	0.61	0.26	30.00
2480MHz_TnomVnom	Pass	0.61	0.55	30.00

SPORTON INTERNATIONAL INC. Page No. : C1 of C1

TEL: 886-3-327-3456 FAX: 886-3-327-0973



PSD Result Appendix D

Summary

Mode	PD
	(dBm/RBW)
BT-LE(1Mbps)	-
2.4-2.4835GHz	-13.66

RBW=3kHz.

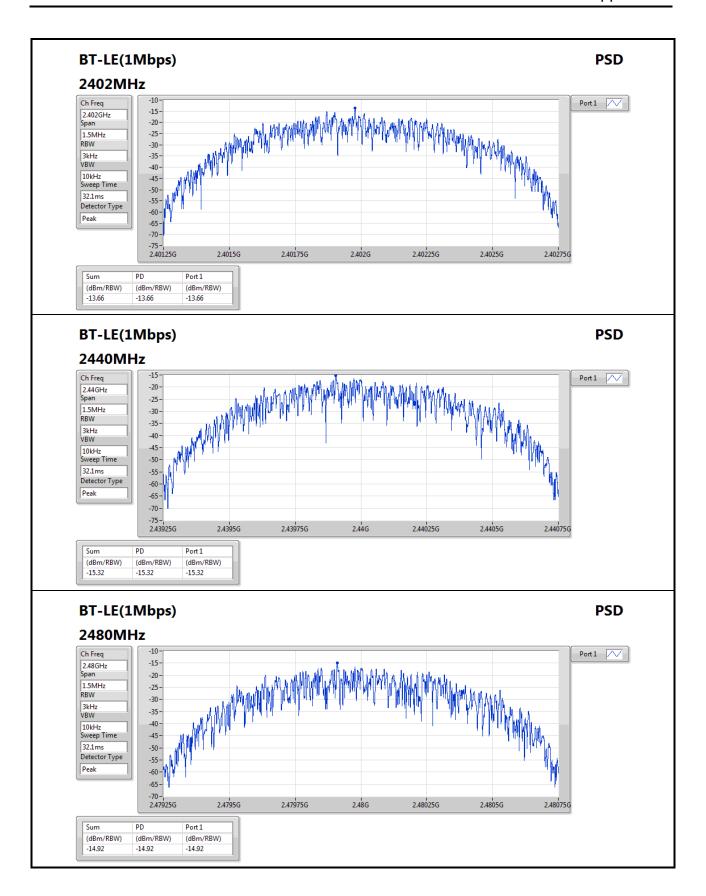
Result

Mode	Result	Gain	PD	PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	0.61	-13.66	8.00
2440MHz_TnomVnom	Pass	0.61	-15.32	8.00
2480MHz_TnomVnom	Pass	0.61	-14.92	8.00

RBW=3kHz.

SPORTON INTERNATIONAL INC. Page No. : D1 of D2

TEL: 886-3-327-3456 FAX: 886-3-327-0973 **PSD Result** Appendix D



SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : D2 of D2



CSE Non-restricted Band-DTS Result

Appendix E

Summary

Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
BT-LE(1Mbps)	-	-	-	-	-	-	-		-	-	-	-	-
2.4-2.4835GHz	Pass	2.439913G	-1.09	-30.64	804.336M	-58.00	2.399224G	-57.13	2.484232G	-55.58	6.822356G	-51.51	1

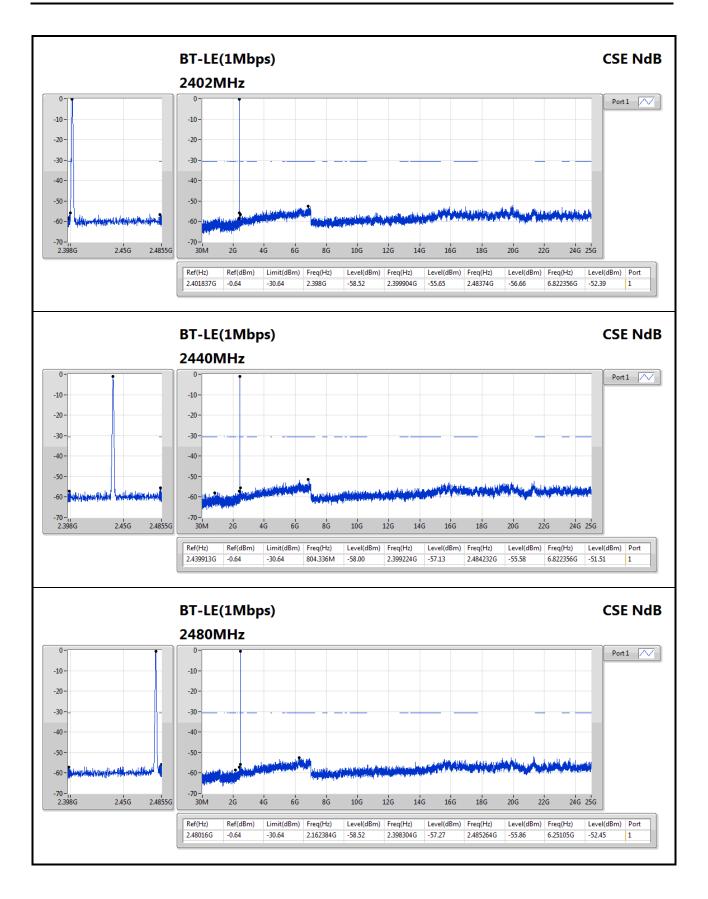
Result

rtoodit													
Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz_TnomVnom	Pass	2.401837G	-0.64	-30.64	2.398G	-58.52	2.399904G	-55.65	2.48374G	-56.66	6.822356G	-52.39	1
2440MHz_TnomVnom	Pass	2.439913G	-0.64	-30.64	804.336M	-58.00	2.399224G	-57.13	2.484232G	-55.58	6.822356G	-51.51	1
2480MHz_TnomVnom	Pass	2.48016G	-0.64	-30.64	2.162384G	-58.52	2.398304G	-57.27	2.485264G	-55.86	6.25105G	-52.45	1

SPORTON INTERNATIONAL INC. Page No. : E1 of E2

TEL: 886-3-327-3456 FAX: 886-3-327-0973





TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : E2 of E2



RSE TX below 1GHz Result

Appendix F.1

640901-03

Summary

Mode	Result	Туре	Freq	Level	Limit	Margin	Factor	Dist	Pol.	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)	(H/V)	(°)	(m)	
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2.4-2.4835GHz_Adapter	Pass	PK	299.66M	43.00	46.00	-3.00	-15.32	3	Н	360	1.00	-

SPORTON INTERNATIONAL INC. Page No. : F1 of F6

TEL: 886-3-327-3456 FAX: 886-3-327-0973



RSE TX below 1GHz Result

Appendix F.1

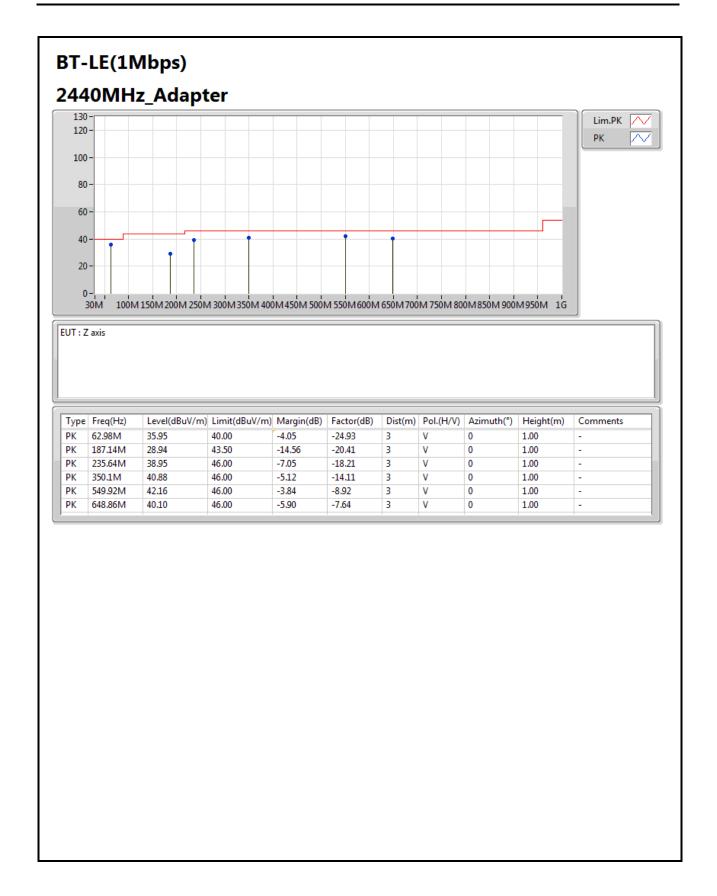
Result

Mode	Result	Туре	Freq	Level	Limit	Margin	Factor	Dist	Pol.	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)	(H/V)	(°)	(m)	
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2440MHz_Adapter	Pass	PK	150.28M	32.23	43.50	-11.27	-18.49	3	Н	360	1.00	-
2440MHz_Adapter	Pass	PK	200.72M	34.66	43.50	-8.84	-20.12	3	Н	360	1.00	-
2440MHz_Adapter	Pass	PK	299.66M	43.00	46.00	-3.00	-15.32	3	Н	360	1.00	-
2440MHz_Adapter	Pass	PK	549.92M	41.15	46.00	-4.85	-8.92	3	Н	360	1.00	-
2440MHz_Adapter	Pass	PK	771.08M	39.30	46.00	-6.70	-5.97	3	Н	360	1.00	-
2440MHz_Adapter	Pass	QP	350.1M	42.73	46.00	-3.27	-14.11	3	Н	228	1.01	-
2440MHz_Adapter	Pass	PK	62.98M	35.95	40.00	-4.05	-24.93	3	V	0	1.00	-
2440MHz_Adapter	Pass	PK	187.14M	28.94	43.50	-14.56	-20.41	3	٧	0	1.00	-
2440MHz_Adapter	Pass	PK	235.64M	38.95	46.00	-7.05	-18.21	3	V	0	1.00	-
2440MHz_Adapter	Pass	PK	350.1M	40.88	46.00	-5.12	-14.11	3	V	0	1.00	-
2440MHz_Adapter	Pass	PK	549.92M	42.16	46.00	-3.84	-8.92	3	V	0	1.00	-
2440MHz_Adapter	Pass	PK	648.86M	40.10	46.00	-5.90	-7.64	3	V	0	1.00	-
2440MHz_USB	Pass	PK	169.68M	35.58	43.50	-7.92	-19.72	3	Н	0	1.00	-
2440MHz_USB	Pass	PK	231.76M	39.28	46.00	-6.72	-18.61	3	Н	0	1.00	-
2440MHz_USB	Pass	PK	532.46M	41.96	46.00	-4.04	-9.88	3	Н	0	1.00	-
2440MHz_USB	Pass	PK	771.08M	40.18	46.00	-5.82	-5.97	3	Н	0	1.00	-
2440MHz_USB	Pass	QP	299.66M	42.23	46.00	-3.77	-15.32	3	Н	226	1.02	-
2440MHz_USB	Pass	QP	350.1M	42.88	46.00	-3.12	-14.11	3	Н	224	1.1	-
2440MHz_USB	Pass	PK	227.88M	37.85	46.00	-8.15	-19.01	3	V	360	1.00	-
2440MHz_USB	Pass	PK	237.58M	38.97	46.00	-7.03	-18.02	3	V	360	1.00	-
2440MHz_USB	Pass	PK	299.66M	36.69	46.00	-9.31	-15.32	3	٧	360	1.00	-
2440MHz_USB	Pass	PK	549.92M	42.34	46.00	-3.66	-8.92	3	٧	360	1.00	-
2440MHz_USB	Pass	PK	648.86M	40.85	46.00	-5.15	-7.64	3	٧	360	1.00	-
2440MHz_USB	Pass	PK	771.08M	40.47	46.00	-5.53	-5.97	3	V	360	1.00	-

SPORTON INTERNATIONAL INC. Page No. : F2 of F6

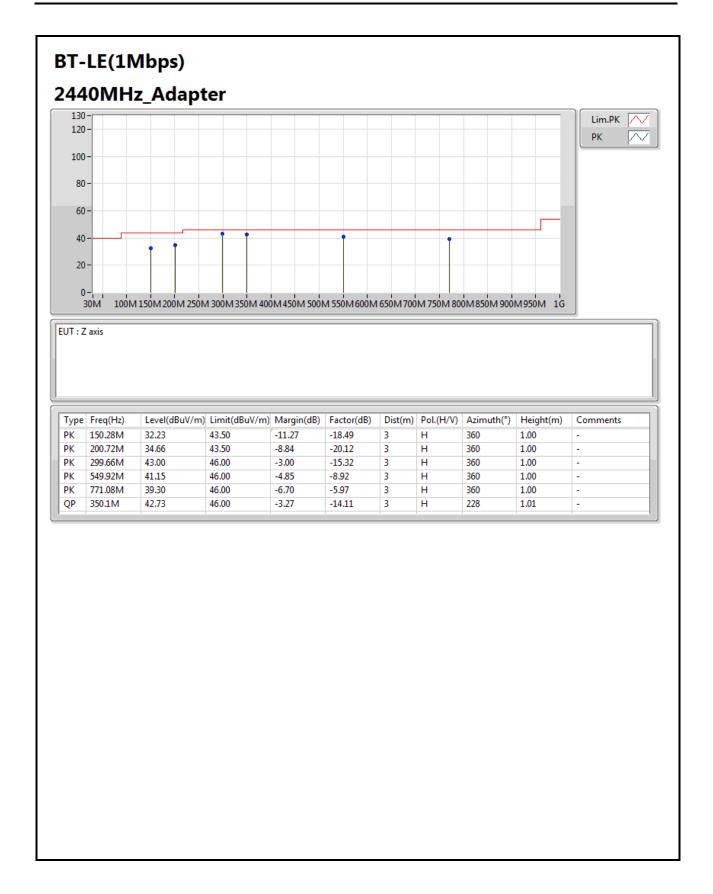
TEL: 886-3-327-3456 FAX: 886-3-327-0973





TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F3 of F6





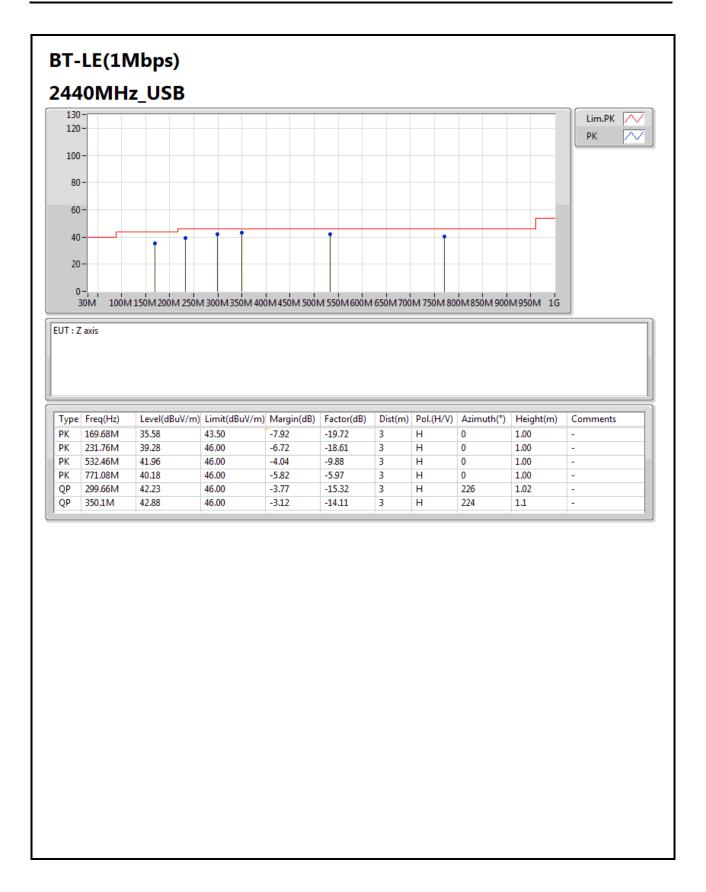
TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F4 of F6





TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F5 of F6





TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F6 of F6



RSE TX above 1GHz Result

Appendix F.2

Summary

Mode	Result	Туре	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2.4-2.4835GHz	Pass	AV	2.4906G	47.11	54.00	-6.89	31.55	3	V	220	2.74	-

SPORTON INTERNATIONAL INC. Page No. : F1 of F14

TEL: 886-3-327-3456 FAX: 886-3-327-0973



RSE TX above 1GHz Result

Appendix F.2

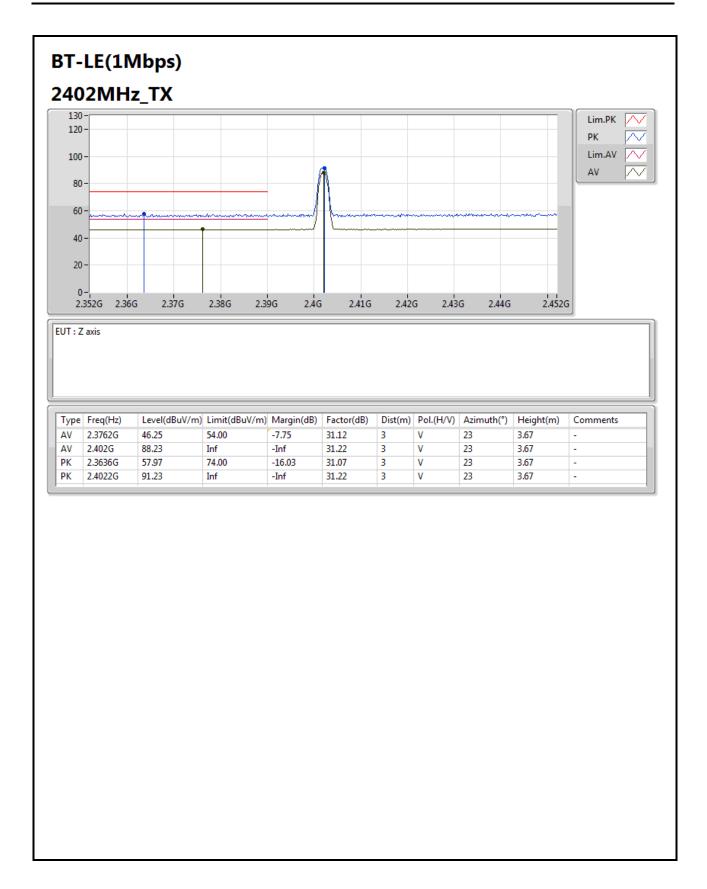
Result

Mode	Result	Туре	Freq (Hz)	Level	Limit	Margin	Factor	Dist	Pol.	Azimuth	Height	Comments
				(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)	(H/V)	(°)	(m)	
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3888G	46.28	54.00	-7.72	31.17	3	Н	45	1.05	-
2402MHz	Pass	AV	2.402G	89.00	Inf	-Inf	31.22	3	Н	45	1.05	-
2402MHz	Pass	PK	2.3554G	58.95	74.00	-15.05	31.04	3	Н	45	1.05	-
2402MHz	Pass	PK	2.4018G	92.05	Inf	-Inf	31.22	3	Н	45	1.05	-
2402MHz	Pass	AV	2.3762G	46.25	54.00	-7.75	31.12	3	٧	23	3.67	-
2402MHz	Pass	AV	2.402G	88.23	Inf	-Inf	31.22	3	٧	23	3.67	-
2402MHz	Pass	PK	2.3636G	57.97	74.00	-16.03	31.07	3	٧	23	3.67	-
2402MHz	Pass	PK	2.4022G	91.23	Inf	-Inf	31.22	3	٧	23	3.67	-
2402MHz	Pass	AV	4.804G	33.81	54.00	-20.19	3.80	3	Н	0	1.50	-
2402MHz	Pass	PK	4.804G	45.93	74.00	-28.07	3.80	3	Н	0	1.50	-
2402MHz	Pass	AV	4.804G	34.33	54.00	-19.67	3.80	3	V	360	1.50	-
2402MHz	Pass	PK	4.804G	45.77	74.00	-28.23	3.80	3	V	360	1.50	-
2440MHz	Pass	AV	2.3888G	46.28	54.00	-7.72	31.17	3	Н	31	1.50	-
2440MHz	Pass	AV	2.44G	89.00	Inf	-Inf	31.36	3	Н	31	1.50	-
2440MHz	Pass	AV	2.4936G	47.10	54.00	-6.90	31.57	3	Н	31	1.50	-
2440MHz	Pass	PK	2.3868G	58.08	74.00	-15.92	31.16	3	Н	31	1.50	-
2440MHz	Pass	PK	2.4404G	92.24	Inf	-Inf	31.36	3	Н	31	1.50	-
2440MHz	Pass	PK	2.4872G	59.51	74.00	-14.49	31.54	3	Н	31	1.50	-
2440MHz	Pass	AV	2.3824G	46.30	54.00	-7.70	31.14	3	V	48	2.45	-
2440MHz	Pass	AV	2.44G	85.77	Inf	-Inf	31.36	3	V	48	2.45	-
2440MHz	Pass	AV	2.4976G	47.07	54.00	-6.93	31.58	3	V	48	2.45	-
2440MHz	Pass	PK	2.3776G	57.91	74.00	-16.09	31.12	3	V	48	2.45	-
2440MHz	Pass	PK	2.4404G	88.97	Inf	-Inf	31.36	3	٧	48	2.45	-
2440MHz	Pass	PK	2.496G	58.01	74.00	-15.99	31.57	3	٧	48	2.45	-
2440MHz	Pass	AV	4.88G	33.70	54.00	-20.30	3.93	3	Н	0	1.50	-
2440MHz	Pass	PK	4.88G	45.43	74.00	-28.57	3.93	3	Н	0	1.50	-
2440MHz	Pass	AV	4.88G	33.71	54.00	-20.29	3.93	3	V	360	1.50	-
2440MHz	Pass	PK	4.88G	45.22	74.00	-28.78	3.93	3	٧	360	1.50	-
2480MHz	Pass	AV	2.48G	90.59	Inf	-Inf	31.51	3	Н	29	1.50	-
2480MHz	Pass	AV	2.4914G	47.08	54.00	-6.92	31.56	3	Н	29	1.50	-
2480MHz	Pass	PK	2.4798G	93.63	Inf	-Inf	31.51	3	Н	29	1.50	-
2480MHz	Pass	PK	2.4938G	57.80	74.00	-16.20	31.57	3	Н	29	1.50	-
2480MHz	Pass	AV	2.48G	87.72	Inf	-Inf	31.51	3	٧	220	2.74	-
2480MHz	Pass	AV	2.4906G	47.11	54.00	-6.89	31.55	3	٧	220	2.74	-
2480MHz	Pass	PK	2.4798G	90.80	Inf	-Inf	31.51	3	٧	220	2.74	-
2480MHz	Pass	PK	2.4874G	59.21	74.00	-14.79	31.54	3	V	220	2.74	-
2480MHz	Pass	AV	4.96G	34.00	54.00	-20.00	4.07	3	Н	0	1.50	-
2480MHz	Pass	PK	4.96G	47.32	74.00	-26.68	4.07	3	Н	0	1.50	-
2480MHz	Pass	AV	4.96G	33.98	54.00	-20.02	4.07	3	٧	360	1.50	-
2480MHz	Pass	PK	4.96G	46.16	74.00	-27.84	4.07	3	V	360	1.50	-

SPORTON INTERNATIONAL INC. Page No. : F2 of F14

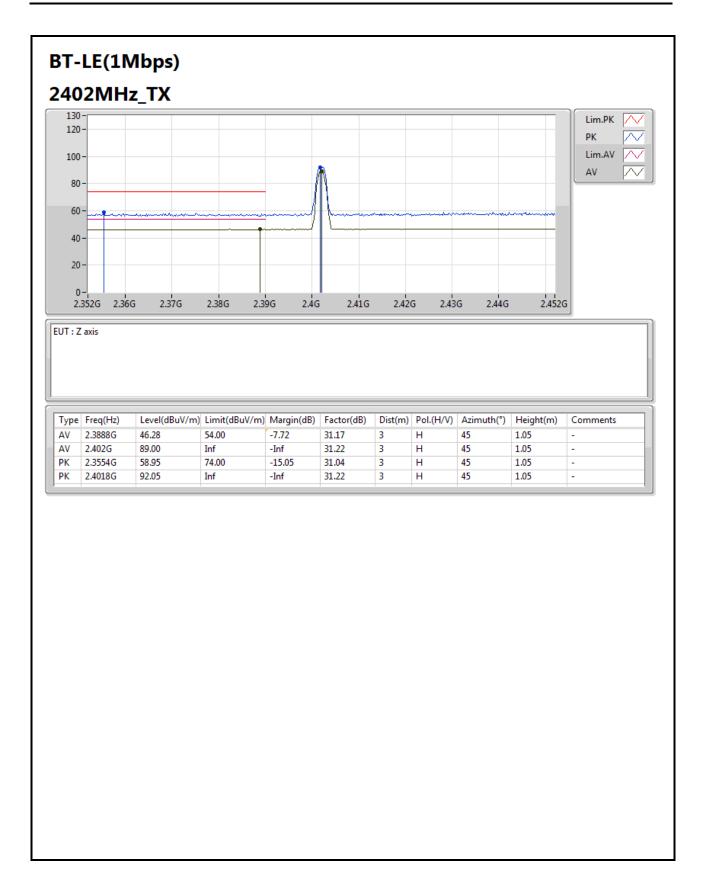
TEL: 886-3-327-3456 FAX: 886-3-327-0973





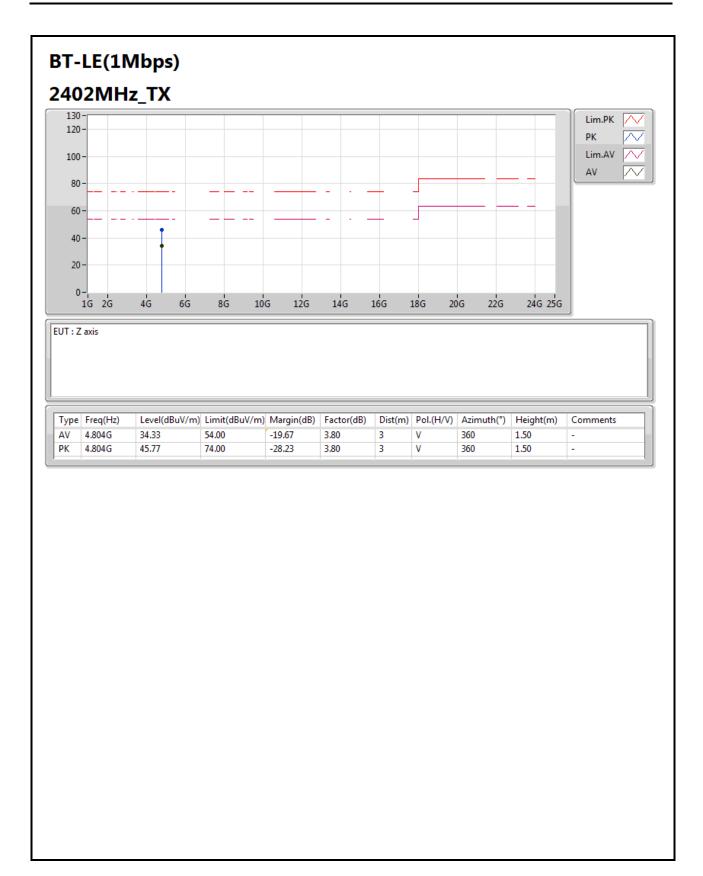
TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F3 of F14





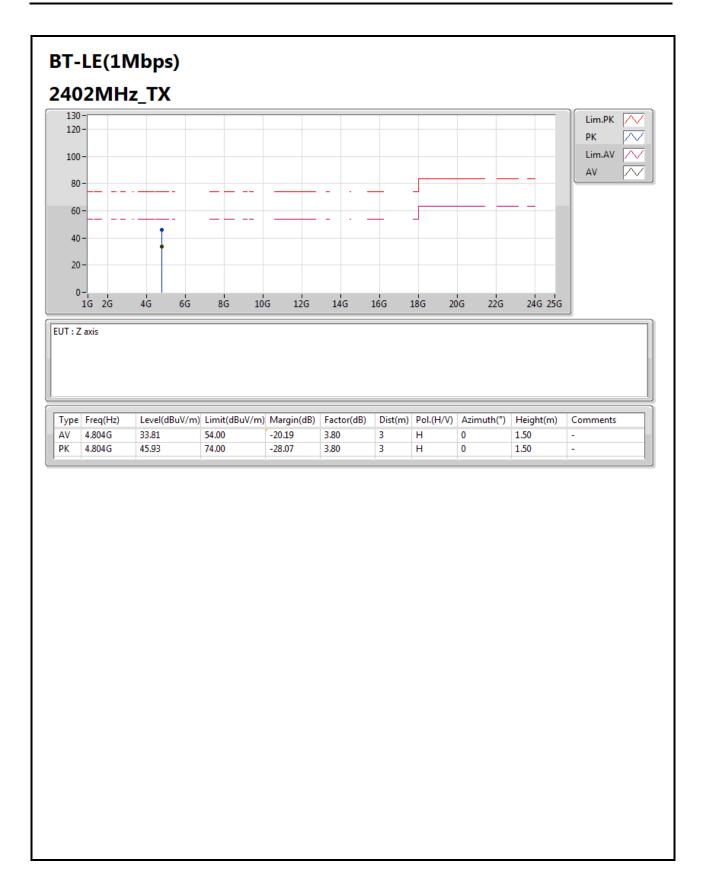
TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F4 of F14





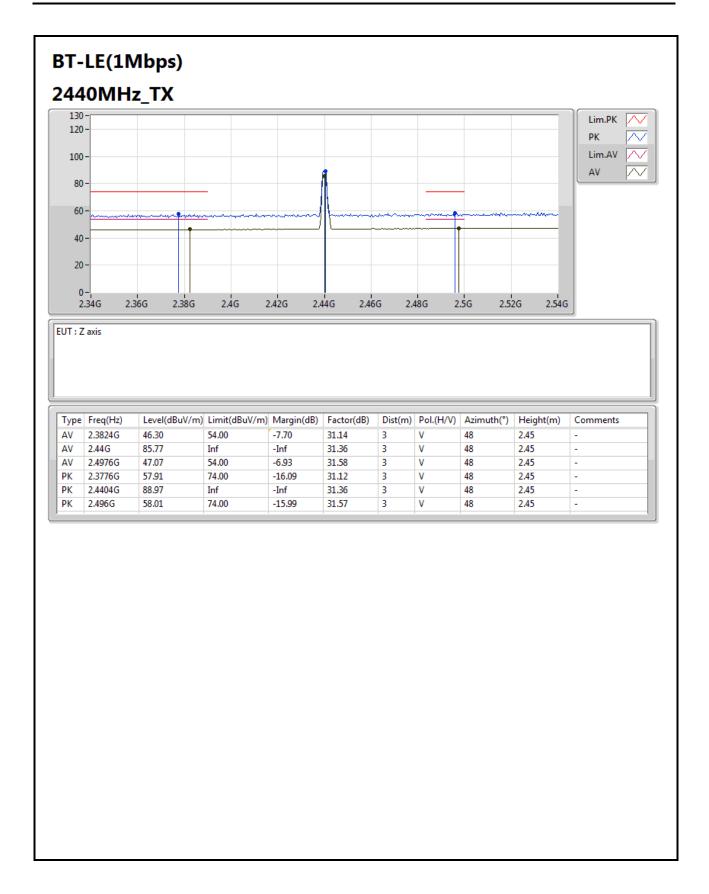
TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F5 of F14





TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F6 of F14



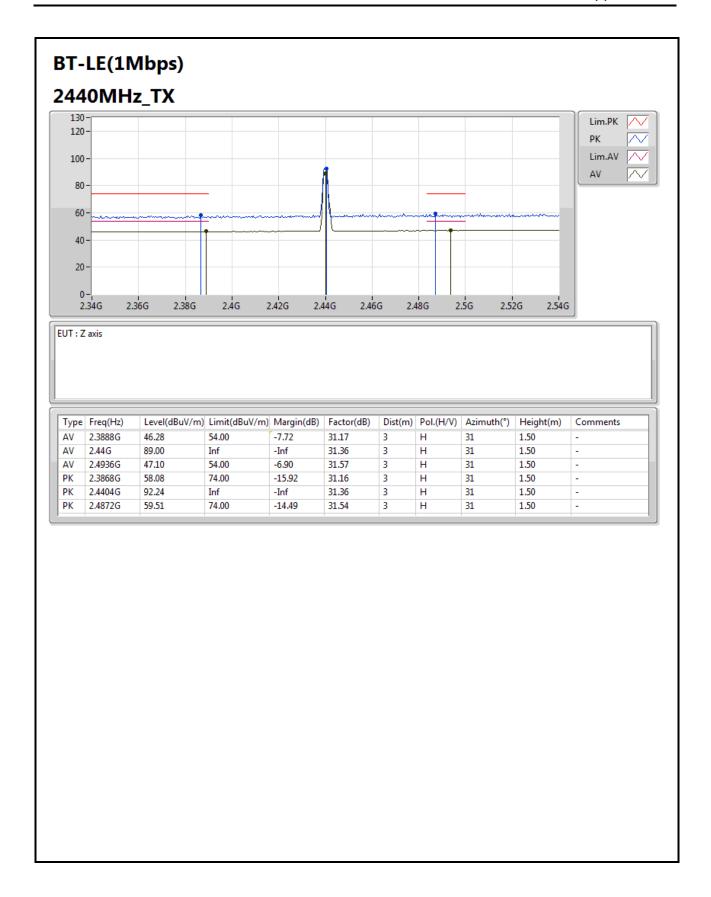


TEL: 886-3-327-3456

FAX: 886-3-327-0973 640901-03

Page No. : F7 of F14

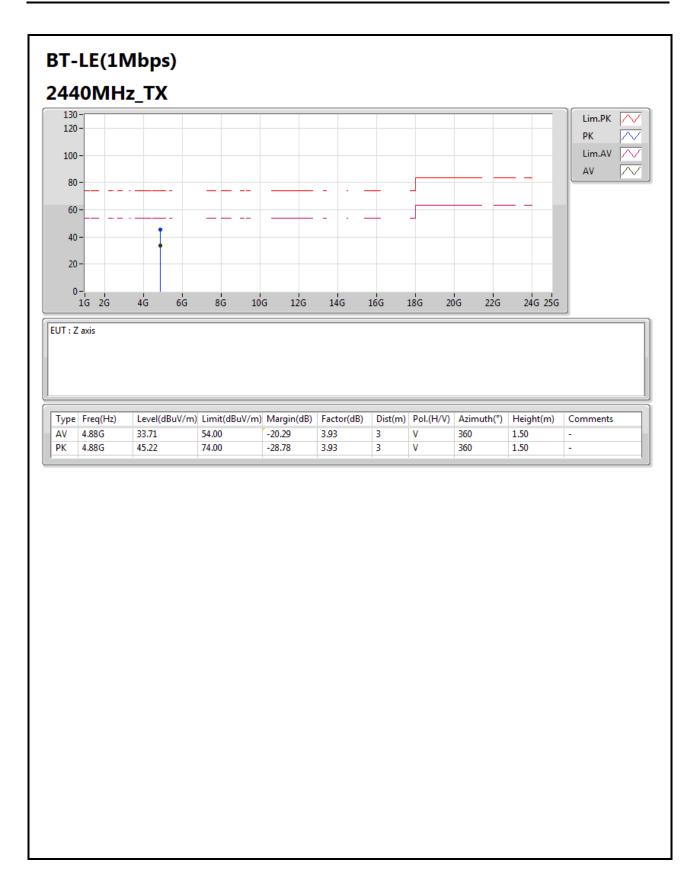




TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F8 of F14

Page No. : F9 of F14



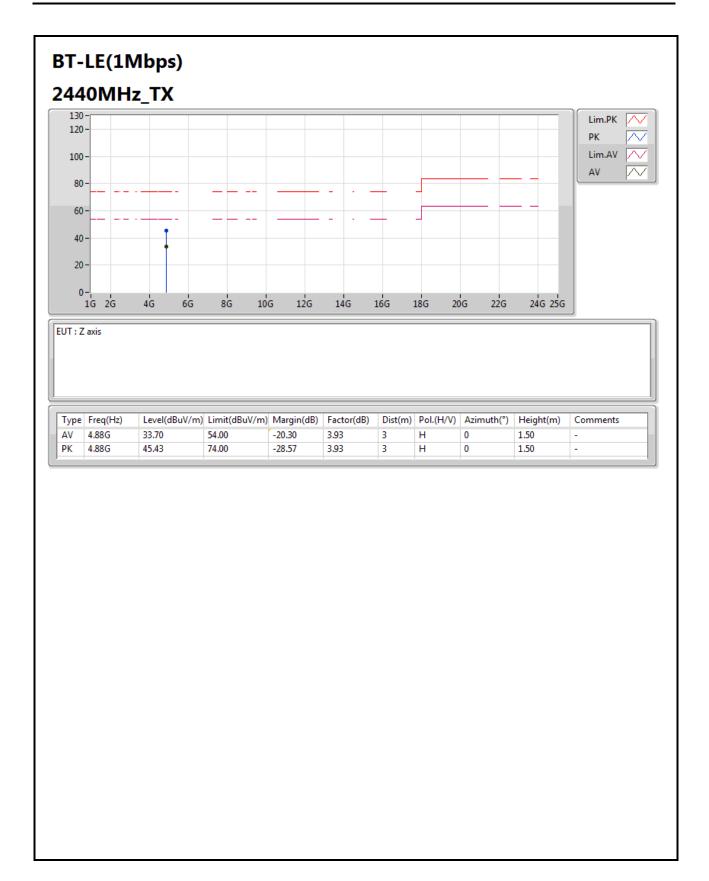


SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456

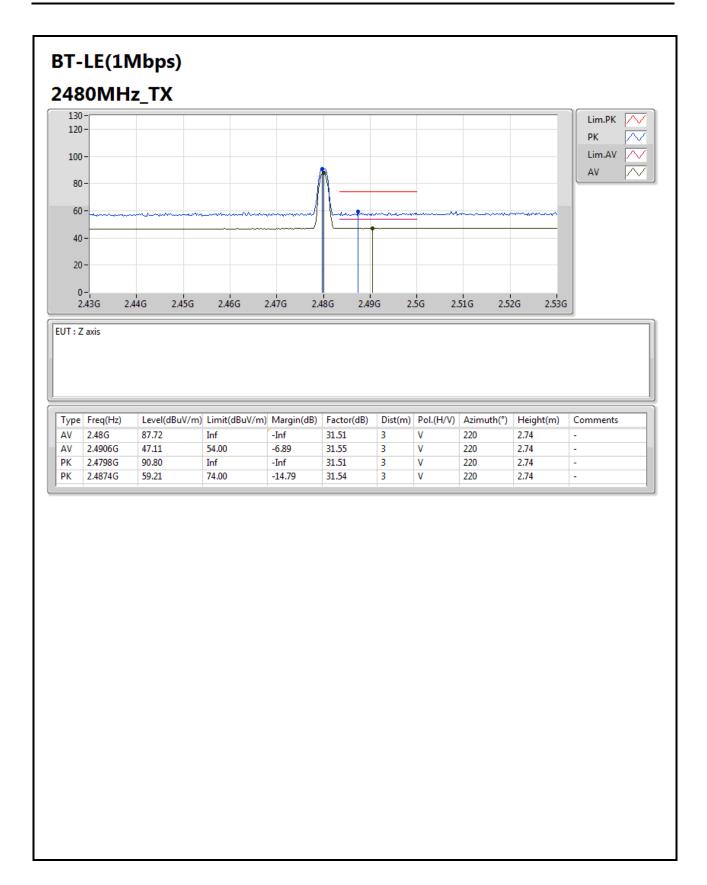
FAX: 886-3-327-0973 640901-03





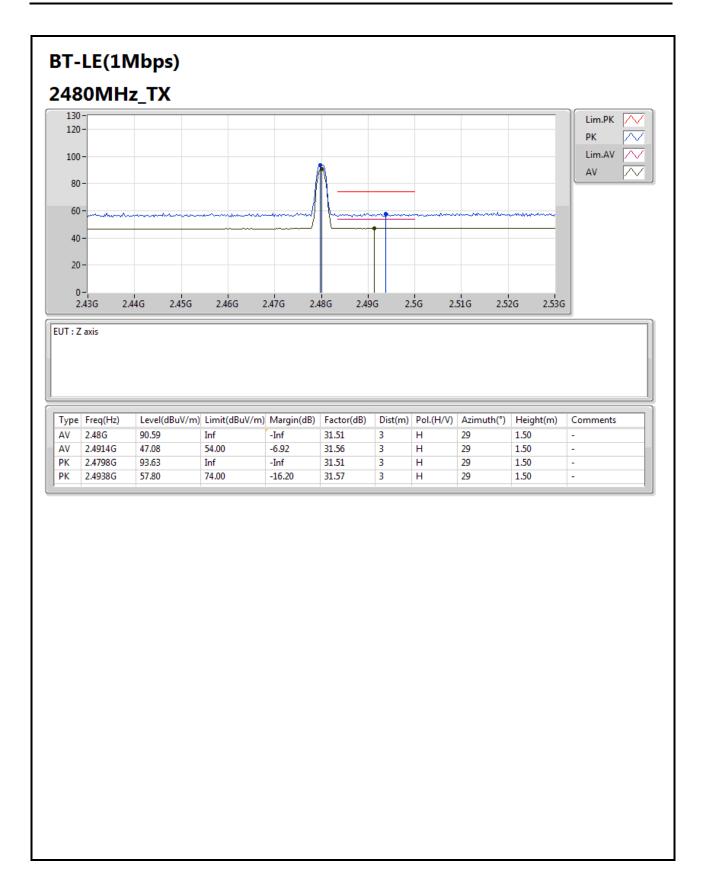
TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F10 of F14





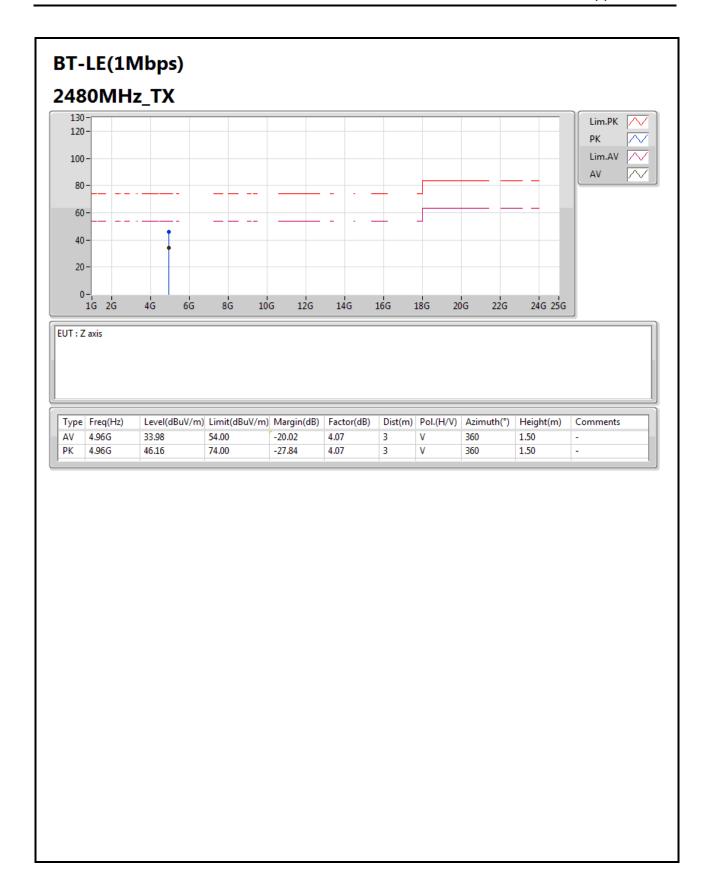
TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F11 of F14





TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F12 of F14 640901-03



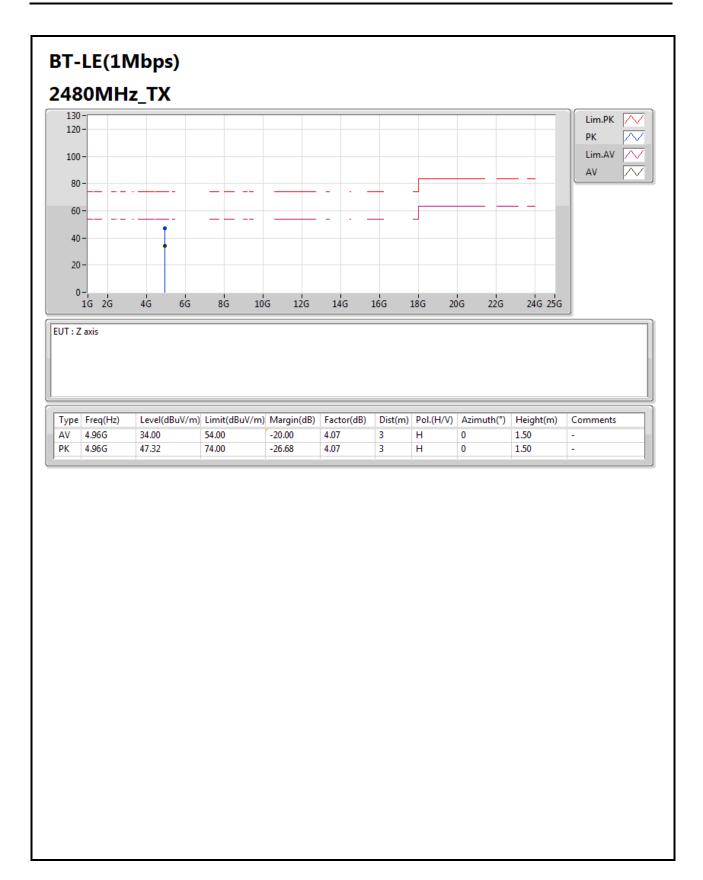


TEL: 886-3-327-3456 FAX: 886-3-327-0973

.....

Page No. : F13 of F14





TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F14 of F14