Produkte
Products

Prüfbericht - Nr.: *Test Report No.:*	**19660073 001**		**Seite 1 von 26** *Page 1 of 26*
Auftraggeber: *Client:*	**Triradius, llc** **10369 blue jay rd** **po box 2283, heath** **OH 43056 United States**		
Gegenstand der Prüfung: *Test item:*	**b-Link™ Light Stick**		
Bezeichnung: *Identification:*	**V1.0.1**	**Serien-Nr.:** *Serial No.*	**Engineering Sample**
Wareneingangs-Nr.: *Receipt No.:*	**1803014475**	**Eingangsdatum:** *Date of receipt:*	**20.12.2013**
Prüfort: *Testing location:*	**Refer Page 4 of 26 for test facilities**		
Prüfgrundlage: *Test specification:*	**FCC Part 15, Subpart C** **ANSI C63.4-2003**		
Prüfergebnis: *Test Result:*	**Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).** *The test items passed the test specification(s).*		
Prüflaboratorium: *Testing Laboratory:*	**TÜV Rheinland (India) Pvt. Ltd.** 82/A, 3rd Main, West Wing, Electronic City Phase 1 Hosur Road, Bangalore – 560 100. India		

geprüft / *tested by:*			**kontrolliert /** *reviewed by:*		
10.01.2014	Vinay N Test Engineer	Vinay.N	13.01.2014	Raghavendra Kulkarni Senior Manager	Kulkarni
Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*	**Datum** *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

Sonstiges /*Other Aspects:* **FCC ID : 2AB4BB-LINK-STICK**

Abkürzungen:				***Abbreviations:***			
P(ass)	=	***entspricht Prüfgrundlage***		***P(ass)***	=	***passed***	
F(ail)	=	***entspricht nicht Prüfgrundlage***		***F(ail)***	=	***failed***	
N/A	=	***nicht anwendbar***		***N/A***	=	***not applicable***	
N/T	=	***nicht getestet***		***N/T***	=	***not tested***	

Test Result Summary

Clause	Test Item	Result
FCC 15.209	Spurious Radiated Emissions	Pass
FCC 15.205	Restricted Bands of Operation	Pass
FCC 15.249	Operation within Bands 902-928MHz	Pass

Content

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List of Type and Measurement Instruments

TÜV Rheinland (India) Pvt. Ltd, Bangalore

Equipment	Manufacturer	Model	S/N	Calibration Due Date
EMI Test Receiver	Rohde &Schwarz	ESU 40	100288	04.10.2014
Hybrid Log Periodic antenna	ETS Lindgren	3142D	00081354	26.07.2014
Broadband Horn Antenna	Frankonia	HAX-18	HAX18-802	23.03.2014
Double-Ridged Waveguide Horn Antenna	ETS Lindgren	116794	00133356	01.09.2014
Emission Horn Antenna	ETS Lindgren	116706	00107323	24.08.2014
Active Loop Antenna	Frankonia	LAX-10	LAX-10-800	11.04.2014
Spectrum Analyser	Agilent Technologies	E4407B	US41192772	21.03.2014

Testing Facilities:

1) TUV Rheinland (India) Private Limited
No. 108, West Wing
Electronic city Phase I
Bangalore – 560100

General Product Information

Product Function and Intended Use

The b-link is used mainly as a RF receiver device in asset tracking system. The system consists b-link™ light stick, a RFID reader and associated software. Each B–Link light stick will be attached with the assets. When a particular asset needs to be fetched then the software will give a command to the reader which in turn communicates with b-link™. The b-link will help the users to identify the appropriate asset using business logic.

Ratings and System Details

Operating Frequency	902-928MHz
No. of channels	130
Channel Spacing	200kHz
Modulation	GFSK
Transmitted Power	-1.73dBm
Data Rate	100kbps
Antenna Type	Chip Antenna
Number of antenna	1
Antenna Gain	-1dBi
Supply Voltage	3V DC
Dimensions	215.8mm X 27.76mm X 25.33mm

Test Conditions:

Voltage: 3 V DC (Battery)

Environmental conditions:

Temperature: +23 º C **RH:** 62%

Test Set-up and Operation Mode

Principle of Configuration Selection

Transmission was enabled with highest possible duty cycle on low, mid and high channel.

Test Operation and Test Software

Test software was used to enable the transmission with highest possible duty cycle and channels in 900MHz band on the EUT for the tests in this report.

Special Accessories and Auxiliary Equipment

- None

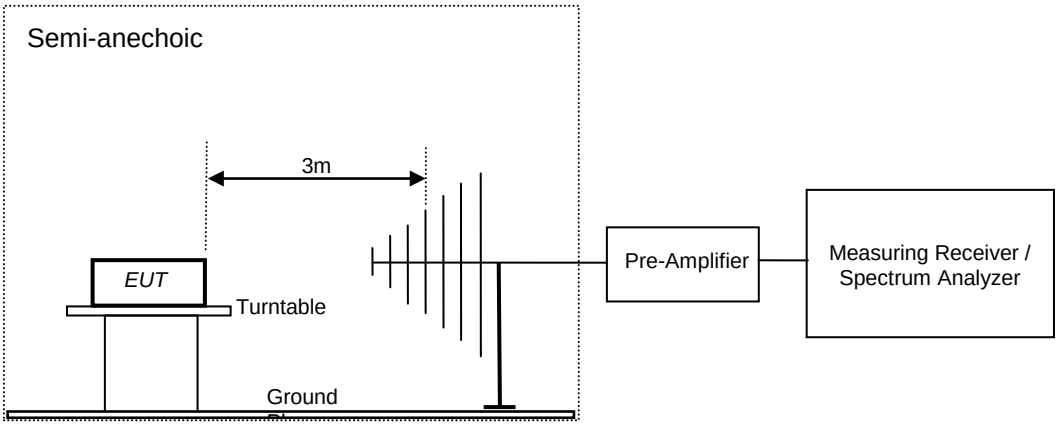
Countermeasures to achieve EMC Compliance

- None

Test Methodology

Radiated Emission Test

The radiated emission measurement was performed according to the procedures in ANSI C63.4-2003. The equipment under test (EUT) was placed at the middle of the 80 cm high turntable, and the EUT is 3 meters far from the measuring antenna. The turntable was rotated 360˚ for obtaining the maximum emission. The height of the measuring antennas was scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained. The measurement above 1000MHz was performed by horn antenna. The measurement below 30MHz was performed by loop antenna.
The EUT was rotated around the X-, Y-, and Z-Axis and the results from worst case axis are recorded.



Test Results

Spurious Radiated Emissions and Restricted Bands of Operation **Section 15.209 and 15.205, 15.249**

Result **Pass**

Test Specification	FCC Part 15 Section 15.209 &15.205&15.249
Test Method	ANSI C63.4-2003
Measurement Location	Semi Anechoic Chamber
Measuring Distance	3m
Detection	QP for frequency below 1GHz, Peak and Average for frequency above 1GHz
Requirement	As per the limits mentioned in the bellow table

Limit for Radiated Emission of Section 15.209:

Frequency (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Distance of Measurement (m)
0.009 – 0.490	2400/F(kHz)	48.50 – 13.80	300*
0.490 – 1.705	24000/F(kHz)	33.80 – 23.00	30*
1.705 -30	30	29.54	30*
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Remark: * the limit shows in the table above of frequency range 0.009 – 0.490, 0.490 – 1.705 MHz and 1.705-30MHz is at 300 meter, 30 meter and 30 meter range respectively, which corresponds to 88, 50 – 53.80, 53.80 – 43.00 and 49.5dBμV/m at 3m range by extrapolation calculation and the measurement of loop antenna.

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz Radiated emission limits in these three bands are based on measurements employing an average detector.

Test result:

Polarization	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
V	No Emissions Found			
H	798.05	44.62	46.00	-1.38

Channel	Polarization	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
Low	V	902.1	85.20	94.00	-8.80
		1804.2 (Pk)	40.74	74.00	-33.26
		1804.2 (Av)	35.20	54.00	-18.80
		2706.3 (Pk)	40.55	74.00	-33.45
		2706.3 (Av)	30.25	54.00	-23.75
	H	902.1	93.50	94.00	-0.50
		1804.2 (Pk)	44.28	74.00	-29.72
		1804.2 (Av)	40.70	54.00	-13.30
		2706.3 (Pk)	44.56	74.00	-29.44
		2706.3 (Av)	39.66	54.00	-14.34
Mid	V	915.1	83.29	94.00	-10.71
		1830.2 (Pk)	42.66	74.00	-31.34
		1830.2 (Av)	37.81	54.00	-16.19
		2745.3 (Pk)	39.85	74.00	-34.15
		2745.3 (Av)	29.34	54.00	-24.66
	H	915.1	91.73	94.00	-2.27
		1830.2 (Pk)	47.24	74.00	-26.76
		1830.2 (Av)	44.72	54.00	-9.28
		2745.3 (Pk)	43.94	74.00	-30.06
		2745.3 (Av)	38.47	54.00	-15.53
High	V	927.9	83.96	94.00	-10.04
		1855.8 (Pk)	45.02	74.00	-28.98
		1855.8 (Av)	41.92	54.00	-12.08
		2783.7 (Pk)	41.04	74.00	-32.96
		2783.7 (Av)	30.51	54.00	-23.49
	H	927.9	91.32	94.00	-2.68
		1855.8 (Pk)	50.61	74.00	-23.39
		1855.8 (Av)	49.28	54.00	-4.72
		2783.7 (Pk)	44.58	74.00	-29.42
		2783.7 (Av)	40.01	54.00	-13.99