Produkte
Products

Prüfbericht - Nr.: *Test Report No.:*	**19660060 001**		**Seite 1 von 10** *Page 1 of 10*
Auftraggeber: *Client:*	**The Kroger Co.** **11450 Grooms Rd.** **Blue Ash, OH 45242** **United States**		
Gegenstand der Prüfung: *Test item:*	**G2Z Camera With Access Point**		
Bezeichnung: *Identification:*	**G2Z-CAP**	**Serien-Nr.:** *Serial No.*	**Engineering Sample**
Wareneingangs-Nr.: *Receipt No.:*	**1803022504**	**Eingangsdatum:** *Date of receipt:*	**13.01.2014**
Prüfort: *Testing location:*	**Refer Page 4 of 13 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:*

04.02.2014	Vinay N Engineer	Vinay.N
Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

kontrolliert / *reviewed by:*

07.02.2014	Raghavendra Kulkarni Senior Manager	Rkulkarni
Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

Sonstiges / *Other Aspects:* **FCC ID : PBR-SZG2WCR1**
Contains FCC ID:PBR-SZMDLBR1 & PBR-SZMDLNR1

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

Note:

The Product Contains FCC approved modules and hence the module related tests are excluded.

This Product is originally certified with FCC ID: PBR-SZG2WCR1. With respect to the changes made to the product, Class 2 permissive change is been applied. Please refer the C2PC letter for the changes made.

Content

List of Type and Measurement Instruments

TÜV Rheinland (India) Pvt. Ltd, Bangalore

List of Test and Measurement Instruments

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

G2Z-CAP is PoE (Power over Ethernet) IP camera, with Pan/Tilt movement and on board ZigBee modules used for wireless communication with other ZigBee devices. G2Z-CAP is ceiling mount device for surveillance and monitoring through network. It captures video from CMOS sensor at different angle (Pan Movement 350º and Tilt Movement 90 º) & streams it via Ethernet. The G2Z Camera has built-in web server and, also supports time synchronization with NTP (network time protocol) server, Ability to view and save snapshots, advanced video analytics for people counting, occupancy check etc. Also works as access point for data communication and location tracking system.

Ratings and System Details

Operating Frequency	2400MHz – 2483.5MHz
No. of channels	15
Channel Spacing	5MHz
Modulation	DSSS
Transmitted Power	11 dBm max
Data Rate	250 kbps
Antenna Type	PCB inverted F antenna
Number of antenna	4
Antenna Gain	3.27dBi Max
Supply Voltage	48VDC - Power over Ethernet
Dimensions	180mm x 172 mm x 172 mm
Environmental	Temp: +5 ºC to +40 ºC Humidity: 20-80% RH

Test Conditions:

Voltage: 48 V DC

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 changing data rates and channels in 2.4 GHz band on the EUT for the tests in this report.

Special Accessories and Auxiliary Equipment

- None

Countermeasures to achieve EMC Compliance

A ferrite bead was used on the POE cable (accessory) closer to the DUT during testing. Refer appendix 1 for test setup photos.
Ferrite no. 28A2025-0A (make: Laird Technologies) with impedance of 130Ω, 320Ω and 510Ω at 25 MHz, 100 MHz and 300 MHz respectively.

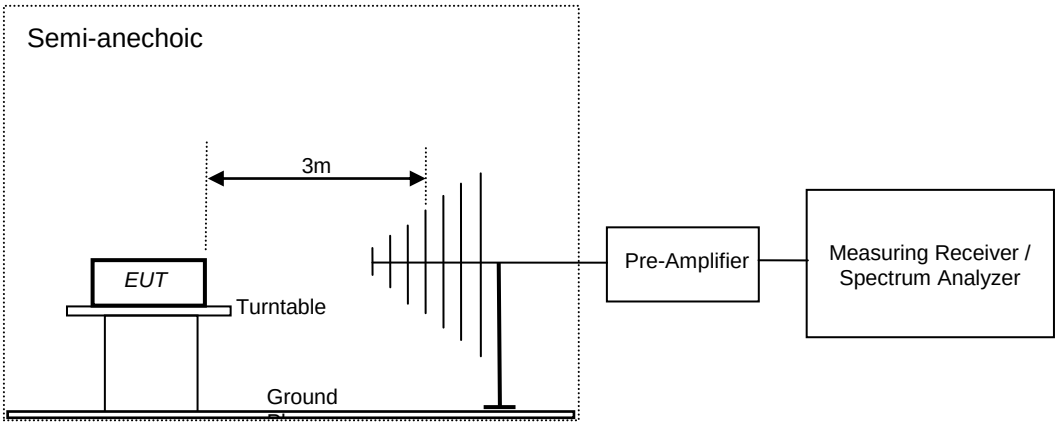
Table of carrier frequencies

Frequency Band	Channel No.	Frequency (MHz)
2400-2483.5 MHz	11	2405
	12	2410
	13	2415
	14	2420
	15	2425
	16	2430
	17	2435
	18	2440
	19	2445
	20	2450
	21	2455
	22	2460
	23	2465
	24	2470
	25	2480

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

Maximum transmitted output power

The product contains 4 Zigbee modules. Below are the maximum transmitted output power levels of individual modules.

Module 1→5.22mW
Module 2→1.30mW
Module 3→1.30mW
Module 4→5.22mW

The total In-Band power is
(5.22+1.3+1.3+5.22) mW = 13.03mW = 11dBm which is less than the compliance limit 24dBm (6dB down from 30dBm as the modules are correlated)

Power Spectral Density

The product contains 4 Zigbee modules. Below are the maximum power spectral density levels of individual modules.

Module 1→0.41mW
Module 2→0.11mW
Module 3→0.11mW
Module 4→0.41mW

The total In-Band power is
(0.41+0.11+0.11+0.41) mW = 1.04mW = 0dBm which is less than the compliance limit 2 dBm (6dB down from 6dBm as the modules are correlated)

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

Result **Pass**

Test Specification	FCC Part 15 Section 15.209 &15.205
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 Results

Frequency below 1 GHz

Antenna Polarization	Spurious Emission (MHz)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
V	54.01	33.99	40	-06.01
	324.00	41.60	46	-04.40
	432.02	42.57	46	-03.43
H	324.00	39.00	46	-06.99
	432.02	35.86	46	-10.14

Test result:

Fundamental Frequency (MHz)	Antenna Polarization	Spurious Emission (MHz)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Test Configuration 1: All four modules operating at Low channel					
2405	**V**	2405.4 (Pk)	93.17	*	-
		2405.2 (Av)	85.44	*	-
		2388.5 (Pk)	43.20	74	-19.17
		2390 (Av)	27.35	54	-31.44
		4809.9 (Pk)	51.26	74	-22.74
		4810 (Av)	39.83	54	-14.17
	H	2404.5 (Pk)	103.51	*	-
		2405.2 (Av)	94.60	*	-
		2370.7 (Pk)	46.81	74	-27.19
		2390 (Av)	28.94	54	-25.06
		4811 (Pk)	52.53	74	-21.47
		4809.8 (Av)	42.466	54	-11.53
Test Configuration 2: All four modules operating at High Channel					
High Channel 2480	**V**	2479.5 (Pk)	93.78	*	-
		2480.1 (Av)	85.22	*	-
		2483.5 (Pk)	48.60	74	-25.4
		2483.5 (Av)	37.60	54	-16.40
		4959.9 (Pk)	51.50	74	-22.50
		4959.8 (Av)	39.89	54	-14.11
	H	2480.5 (Pk)	105.01	*	-
		2480 (Av)	95.15	*	-
		2483.5 (Pk)	58.28	74	-15.72
		2483.5 (Av)	46.85	54	-7.15
		4959 (Pk)	55.01	74	-18.99
		4959.8 (Av)	42.66	54	-11.34

* - --> Fundamental Frequency
Pk--> Peak Detector
Av--> Average Detector
Module1 & Module4 →Modules with amplifier, FCC ID: PBR-SZMDLBR1
Module2 & Module3 →Modules without amplifier, FCC ID: PBR-SZMDLNR1