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MAXIMUM PERMISSIBLE EXPOSURE ASSESSMENT REPORT

On Model Name: IP Camera

Model Numbers: GXV3615WPI_HD

Brand Name: Grandstream

FCC ID : YZZGXV3615WPI-HD

IC:11964A-GXV3615

Prepared for Grandstream Networks,Inc.

Test Report #: SHE-1404-11142-FCC-MPE

Tested by: Daomen — Galanz
Daomen/ Engineer — Company Name

Reviewed by: — ECMG
Jawen Yin/Senior Engineer — Company Name

QC Manager: Swall Zhang — ECMG
Swall Zhang/ QC Manager — Company Name

Test Report Released by: Swall Zhang — May 9th, 2014
Swall Zhang — Date

Test Location

Tests performed in a Certified ANSI Semi-Anechoic Chamber and Shielded Room.

Test Site Location	*: Galanz* *25 South Ronggui Rd., Shunde, Foshan,Guangdong, China*
Tel	*: (86)-757-23612785*
Fax	*: (86)-757-23612537*

Test Facility

The test facility was recognized, certified, or accredited by the following organizations:

- *CNAL – LAB Code: L2244*

Galanz EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements)for the Competence of Testing Laboratories.

- *FCC – Registration No.: 580210*

Galanz EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC was maintained in our files.

- *IC – Registration No.: 8801A*

The Laboratory is registered to perform emission tests with Industry Canada (IC), and the registration number is 8801A.

List of Test and Measurement Instruments

No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated Untill	Calibration Interval
01	Shielding Room	ETS	N/A	N/A	2014-10-25	1 year
02	Spectrum Analyzer(9KHz-30GHz)	R&S	FSP30	100755	2014-10-25	1 year
03	EMI Receiver	SCHAFFNER	SMR4503	11725	2014-10-25	1 year
04	LISN	ETS	4825/2	1161	2014-10-25	1 year
05	Coaxial Cable	ATC-Lab	N/A	N/A	2014-10-25	1 year
06	Double-ridged Wave guide horn	ETS	3115	6587	2014-10-25	1 year
07	Double-ridged Wave guide horn	ETS	3160	00052486	2014-10-25	1 year
08	Microwave system amplifier (0.5G-26.5G)	Agilent	83017A	MY39500438	2014-10-25	1 year
09	Band-pass Filter	Micro-Tronic	BRM50702	S/N-030	2014-10-25	1 year
10	Biconilog Antenna	ETS	3142C	00042672	2014-10-25	1 year
11	Semi-anechoic Chamber	ETS	N/A	N/A	2015-10-25	2 years
12	LISN	R&S	ESZH-Z2	N/A	2014-10-25	1 year

Note: All testing were performed using internationally recognized standards.All test instruments were calibrated.

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Opinions and Interpretations

This test report relates to the abovementioned equipment under test (EUT). Without the permission of ECMG Electronic Technical Testing Corp (Shenzh en) Test Lab this test report is not permitted to be duplicated in extract s.This test report does not entitle to carry any test mark on this or similar products.The manufacturer has sole responsibility of continued compliance of the device.

Statement of Measurement Uncertainty

The data and results referenced in the document are true and accura te.The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities that can account for a nominal measurement error. Furthermore, component and process variability of devices similar to that tested may resultin additional deviation.

Administrative Data

Test Sample	*: IP Camera*
Model Name	*: GXV3615WPI_HD*
Model Tested	*: GXV3615WPI_HD*
Receipt Date	*: April 15th, 2014*
Date Tested	*: April 15th to 17th, 2014*
Applicant	*: Grandstream Networks, Inc.*
Address	*5F, Bldg #1, No.2 Kefa Rd., Science & Technology Park, Shenzhen, China*
Telephone	*: (86)-755-26014600*
Fax	*: (86)-755-26014601*
Manufacturer	*: Grandstream Networks, Inc.*
Address	*5F, Bldg #1, No.2 Kefa Rd., Science & Technology Park, Shenzhen, China*
Telephone	*: (86)-755-26014600*
Fax	*: (86)-755-26014601*
Factory	*: Grandstream Networks, Inc.*
Address	*5F, Bldg #1, No.2 Kefa Rd., Science & Technology Park, Shenzhen, China*
Telephone	*: (86)-755-26014600*
Fax	*: (86)-755-26014601*

EUT Description

Grandstream Networks, Inc. Tested model GXV3615WPI_HD (referred to as the EUT in this report) is an IP Camera.The EUT is an IP Camera with IEEE 80211.b/g/n Radio functionalityes. Technical specifications of the EUT are as beLows:

<table>
<tr><th colspan="2">Parameters</th><th>Ranges</th></tr>
<tr><td rowspan="2">Basic parameters</td><td>Rated voltage</td><td>DC +12V</td></tr>
<tr><td>Rated Current</td><td>0.5A</td></tr>
<tr><td>FCC Classification</td><td colspan="2">Digital Transmission System(DTS)</td></tr>
<tr><td>Industry Cannada</td><td colspan="2">Category I Equipment/Spread Spectrum/Digital Device (2400-2483.5 MHz)</td></tr>
<tr><td rowspan="7">Specifications of IEEE 802.11b/g/n</td><td>Operating band</td><td>2.400 GHz ~ 2.4835GHz (2.4 GHz ISM Band)</td></tr>
<tr><td>WLAN standard</td><td>IEEE 802.11b/g/n, Wi-Fi compliant</td></tr>
<tr><td>Modulation</td><td>802.11b: DBPSK,DQPSK,CCK (DSSS) ;
802.11g/n: BPSK,QPSK,16-QAM,64-QAM (OFDM).</td></tr>
<tr><td>Number of Channels:</td><td>1to 13 channels</td></tr>
<tr><td>Data Transfer Rates</td><td>11n: up to 150Mbps;
11g: 54/48/36/24/18/12/9/6Mbps (Dynamic) ;
11b: 11/5.5/2/1Mbps (Dynamic)</td></tr>
<tr><td>RF Output Power</td><td>11b: 17dBm±2dB;
11g(6,9,12,18M): 17dBm±2dB;
11g(24,36M): 15dBm±2dB;
11g(48,54M): 13dBm±2dB;
11n(MCS 0,1,2,3): 17dBm±2dB;
11n(MCS 4,5): 15dBm±2dB;
11n(MCS 6,7): 13dBm±2dB</td></tr>
<tr><td>Working Frequency of Each Channel</td><td>
<table>
<tr><th>Channel No.</th><th>Frequency (MHz)</th><th>Channel No.</th><th>Frequency (MHz)</th></tr>
<tr><td>001</td><td>2412</td><td>007</td><td>2442</td></tr>
<tr><td>002</td><td>2417</td><td>008</td><td>2447</td></tr>
<tr><td>003</td><td>2422</td><td>009</td><td>2452</td></tr>
<tr><td>004</td><td>2427</td><td>010</td><td>2457</td></tr>
<tr><td>005</td><td>2432</td><td>011</td><td>2462</td></tr>
<tr><td>006</td><td>2437</td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td rowspan="2">Antenna spec.</td><td>Antenna Type</td><td>EMB Antenna Coaxial,1T1R</td></tr>
<tr><td>Frequency range</td><td>2.4GHz to 2.5GHz</td></tr>
</table>

Continue on to next page…

Parameter			Ranges
Antenna spec.		Polarization	Linear
		VSWR	< = 2.0
		Gain	2.0 dBi
		Impedance	50 ohm (Nominal)
		Connector Type	U.FL-R-SMT
I/O Ports		LAN & PC Port	10/100 Switch LAN port for connecting to Ethernet&PC. The indicator will be steady for connection and flashing for network activity.. It supports PoE.
		Power Jack	12V DC power jack; UL Certified
Universal power supply	Power Adapter #1	Input	100-240VAC 50/60Hz
		Output	12VDC, 0.5A
		Model	WCF1200050A1BA
		Brand name	Mass Power
	Power Adapter #2	Input	100-240VAC 50/60Hz 0.2A
		Output	12VDC, 0.5A
		Model	UE06L8-120050SPAU
		Brand name	UE

Note:

1. The EUT includes two power adapters which have been tested and only the worst-case power adapter #1 recorded in this report.
2. For more detailed information's or features please refer to user's manual of EUT.

ATTACHMENT 1 – RF EXPOSURE COMPLIANCE REQUIREMENT

Applicable Standard:

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

FCC Exposure Limits for General Population/Uncontrolled Exposure

a) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	*Electric Field Strength (E) (V/m)*	*Magnetic Field Strength (H) (A/m)*	*Power Density (S) (mW/cm2)*	*Averaging Times |E|2 , |H|2 or S (minutes)*
0.3-3.0	*614*	*1.63*	*(100)**	*6*
3.0-30	*1842/f*	*4.89/f*	*(900/f)**	*6*
30-300	*61.4*	*0.163*	*1.0*	*6*
300-1500			*F/300*	*6*
1500-100000			*5*	*6*

(b) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	*Electric Field Strength (E) (V/m)*	*Magnetic Field Strength (H) (A/m)*	*Power Density (S) (mW/cm2)*	*Averaging Times |E|2 , |H|2 or S (minutes)*
0.3-1.34	*614*	*1.63*	*(100)**	*30*
1.34-30	*824/f*	*2.19/f*	*(180/f)**	*30*
30-300	*27.5*	*0.073*	*0.2*	*30*
300-1500			*F/1500*	*30*
1500-100000			*1.0*	*30*

*Note: f=frequency in MHz; *Plane-wave equivalent power density*

RSS-102 Exposure Limits:

4.2 RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m2)	Averaging Time (minutes)
0.003-1	280	2.19	-	6
1-10	280/f	2.19/f	-	6
10-30	28	2.19/f	-	6
30-300	28	0.073	2*	6
300-1500	1.585 f 0.5	0.0042 f 0.5	f/150	6
1500-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/f 1.2
150000-300000	0.158 f 0.5	4.21 x 10-4 f 0.5	6.67 x 10-5 f	616000/f 1.2

Note: f is frequency in MHz.
** Power density limit is applicable at frequencies greater than 100 MHz.*

4.4 RF Field Strength Limits for Controlled Use Devices (Controlled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m2)	Averaging Time (minutes)
0.003-1	600	4.9	-	6
1-10	600/f	4.9/f	-	6
10-30	60	4.9/f	-	6
30-300	60	0.163	10*	6
300-1500	3.54 f 0.5	0.0094 f 0.5	f/30	6
1500-15000	137	0.364	50	6
15000-150000	137	0.364	50	616000/f 1.2
150000-300000	0.354 f 0.5	9.4 x 10-4 f 0.5	3.33 x 10-4 f	616000/f 1.2

Note: f is frequency in MHz.
**Power density limit is applicable at frequencies greater than 100 MHz.*

MPE Calculation Method:

*E (V/m) = (30*P*G) $^{0.5}$/d Power Density: S (mW/m2) = E^2/377*

E = Electric Field (V/m)
P = Peak RF output Power (W)
G = EUT Antenna numeric gain (numeric)
d = Separation distance between radiator and human body (m)

The formula can be changed to
*S = (30*P*G) / (377*d^2)*

From the peak EUT RF output power, the minimum mobile separation distance d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained.

Note :
*The maximal conducted peak output power is **18.99dBm (0.079Watt)** in the lowest channel(2412MHz).*

The best case gain of the antenna is 2.0dBi.
2.0dB logarithmic terms convert to numeric result is nearly 1.58.

The worst-case test result:
FCC Exposure Limits:

Channel (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (W)	Power Density (S) (mW/cm2)	Limit of Power Density (S) (mW/cm2)	Test Result
2412	1.58	18.99	0.079	**0.248**	1.0	Compliant

The unit does meet the requirement.

RSS-102 Exposure Limit:

Channel (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (W)	Power Density (S) (W/m2)	Limit of Power Density (S) (mW/cm2)	Test Result
2412	1.58	18.99	0.079	**2.480**	10.0	Compliant

The unit does meet the requirement.

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