

Maximum Permissible Exposure Report

For

Shenzhen Qiyue Optronics Company Limited

Flat3, Tower 3, Excellence Meilin Center Plaza, Zhongkang Road 128, Shangmeilin, Futian District, Shenzhen, China

FCC ID: XOMRWBXXX50XXX

FCC Rule(s):	<u>FCC 47CFR Part 1.1310</u>
Product Description:	<u>50" UHD LED TV</u>
Tested Model:	<u>D50RWB714-U-A-I RNSMU5036</u> <u>XXXXXXXXXXXX50XXXXXXXXXXXX</u> <u>(Where "X"can be any alphanumeric of a-z, A-Z or 0-9 or blank & "-".)</u>
Report No.:	<u>STR18057001E-2</u>
Sample Receipt Date:	<u>May 14, 2018</u>
Tested Date:	<u>May 14~ 23, 2018</u>
Issued Date:	<u>May 23, 2018</u>
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM Test Technology Co., Ltd.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information	
Applicant:	Shenzhen Qiyue Optronics Company Limited
Address of applicant:	Flat3,Tower 3, Excellence Meilin Center Plaza, Zhongkang Road 128, Shangmeilin, Futian District, Shenzhen, China
Manufacturer:	SHENZHEN QIYUE OPTRONICS COMPANY LIMITED BRANCH
Address of manufacturer:	SEIYU INDUSTRIAL PARK, DA SAN VILLAGE, DA SHUI KENG, GUANLAN TOWN, LONGHUA NEW DISTRICT, SHENZHEN, P.R.C

General Description of EUT	
Product Name:	50" UHD LED TV
Trade Name:	RCA/SYLVANIA/PROSCAN/TECHNICOLOR
Model No.:	D50RWB714-U-A-I RNSMU5036 XXXXXXXXXXXX50XXXXXXXXXXXX (Where "X"can be any alphanumeric of a-z, A-Z or 0-9 or blank &"-".)
Adding Model(s):	/
Rated Voltage:	Input: AC 100-240V
Power Adapter Model:	/
<i>Note: The test data is gathered from a production sample provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Frequency Range:	IEEE 802.11b/ g / nHT20: 2412MHz~2462MHz IEEE802.11nHT40: 2422MHz~2452MHz
RF Output Power:	Max output power in total is 15.50dBm (Conducted)
Modulation:	IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK,BPSK)
Quantity of Channels:	11 for 802.11b/g/n(HT20); 7 for 802.11n(HT40)
Type of Antenna:	Wi-Fi Antenna
Antenna Gain:	Antenna 1: 3 dBi Antenna 2: 3 dBi

1.2 Test Standards

The objective of the following report is used to demonstrate that EUT operated in a manner that ensures the public is not exposed to radio frequency energy levels in excess of the relative provisions of FCC 47CFR Part 1.1310

1.3 General Description of Test

Items	Description
EUT Frequency band	<input type="checkbox"/> FHSS: 2.400GHz ~ 2.483GHz <input checked="" type="checkbox"/> WLAN: 2.400GHz ~ 2.483GHz <input type="checkbox"/> WLAN: 5.150GHz ~ 5.250GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5825GHz <input type="checkbox"/> Others: _____
Device category	<input type="checkbox"/> Portable (<20cm separation) <input type="checkbox"/> Mobile (>20cm separation) <input checked="" type="checkbox"/> Others <u>Fixed location (>20cm separation)</u>
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure ($S = 5\text{mW/cm}^2$) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure $(S=1\text{mW/cm}^2)$ <input type="checkbox"/> Others: _____
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas: <input checked="" type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Max. output power	Max output power in total is 15.50dBm (35.5mW)
Antenna gain (Max)	3.0dBi (Numeric gain:2.00)
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation

Note:

1. *2.4GHz: The maximum output is 15.50dBm at IEEE 802.11n HT20 mode 2412MHz (with 2.00 numeric antenna gain.)*
2. *For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20 cm, even if the calculations indicate that the MPE distance would be lesser.*

1.4 Human Exposure Assessment Results

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3–3.0	614	1.63	* 100	6
3.0–30	1842/f	4.89/f	* 900/f ²	6
30–300	61.4	0.163	1.0	6
300–1,500 .....	.....	.....	f/300	6
1,500–100,000 .....	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	* 100	30
1.34–30	824/f	2.19/f	* 180/f ²	30
30–300	27.5	0.073	0.2	30
300–1,500 .....	.....	.....	f/1500	30
1,500–100,000 .....	.....	.....	1.0	30

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

Calculation

$$\text{Given } E = \frac{\sqrt{30 \times P \times G}}{d} \quad \& \quad S = \frac{E^2}{3770}$$

Where E = Field Strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power Density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

$$P (\text{mW}) = P (\text{W}) / 1000 \text{ and}$$

$$d (\text{cm}) = 100 * d (\text{m})$$

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where d = distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power Density in mW/cm²

EUT parameter (data from the separate report)	
Given	Where G: numerical gain of transmitting antenna; TP: Transmitted power in watt; d: distance from the transmitting antenna in meter
Max average output power in Watt (TP)	Max output power in total is 15.50dBm (35.5mW=0.0355W)
Antenna gain (G)	3.0dBi (Numeric gain: 2.00)
Exposure classification	$S=1\text{mW/cm}^2$
Minimum distance in meter (d) (from transmitting structure to the human body)	20cm (0.2m)
Yields	$S = \frac{30 \times P \times G}{3770 d^2}, \quad P=35.5\text{mW}=0.0355\text{W}, G=2.00, d=0.2\text{m}=20\text{cm}$ $S=0.014\text{mW/cm}^2$
Conclusion:	$S=0.014\text{mW/cm}^2$ is significant lower than the FCC 47CFR Part 1.1310 Limit 1mW/cm^2 . (For mobile or fixed location transmitters, the maximum power density is 1.0 mW / cm^2 even if the calculation indicates that the power density would be larger.)