

# 1. RF Exposure Requirements

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## 1.1 General Information

### Client Information

Applicant: Feit Electric Company  
Address of applicant: 4901 Gregg Road Pico Rivera, Ca 90660

Manufacturer: National State Industries Limited  
Address of manufacturer: XinXing Group, WuLian Village, FengGang Town, DONGGUAN CITY, Guangdong Province 523695

### General Description of EUT:

Product Name: 13 INCH SMART COACH LANTERN  
Trade Name: Feit  
Model No.: LAN13/RGBW  
ULAN13BZ/600/WIFIBLE/82765LED/RGBCCT-FS-BZ,  
LAN13/RGBW/RP,  
Adding Model(s): ULAN13BZ/600/WIFIBLE/82765LED/RGBCCT-FS-BZ-RP,  
LAN13/RGBW/YY,  
ULAN13BZ/600/WIFIBLE/82765LED/RGBCCT-FS-XXX-YY  
Rated Voltage: AC 120V/ 60Hz  
Battery Capacity: /  
FCC ID: SYW-LAN13RGBW  
Equipment Type: Fixed device

### Technical Characteristics of EUT:

#### Wi-Fi

Support Standards: 802.11b, 802.11g, 802.11n  
2412-2462MHz for 802.11b/g/n(HT20)  
Frequency Range: 2422-2452MHz for 802.11n(HT40)  
RF Output Power: 17.34dBm (Conducted)  
Type of Modulation: CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM  
Quantity of Channels: 11 for 802.11b/g/n(HT20); 7 for 802.11n(HT40)  
Channel Separation: 5MHz  
Type of Antenna: PCB Antenna  
Antenna Gain: 1.27dBi

## 1.2 RF Exposure Exemption

According to §1.1307(b)(3) and 447498 D04 Interim General RF Exposure Guidance v01, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

**Option A:** FCC Rule Part 1.1307 (b)(3)(i)(A): The available maximum time-averaged power is no more than 1mW, regardless of separation distance.

**Option B:** FCC Rule Part 1.1307 (b)(3)(i)(B): The available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold  $P_{th}$  (mW) described in the following formula.  $P_{th}$  is given by:

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

$d$  = the separation distance (cm);

**Option C:** FCC Rule Part 1.1307 (b)(3)(i)(C): The minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. R must be at least  $\lambda/2\pi$ , where  $\lambda$  is the free-space operating wavelength in meters.

Single RF Sources Subject to Routine Environmental Evaluation	
RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1,920 R^2$
1.34-30	$3,450 R^2/f^2$
30-300	$3.83 R^2$
300-1,500	$0.0128 R^2 f$
1,500-100,000	$19.2 R^2$

**For Multiple RF sources:** FCC Rule Part 1.1307(b)(3)(ii):

- (A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required).
- (B) In the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

### 1.3 Calculated Result

Radio Access Technology	Min. Frequency	Max. Output Power	Max. Tune-Up Output Power	Antenna Gain	Duty Cycle	Tune-Up EIRP
	(MHz)	(dBm)	(dBm)	(dBi)	(%)	(dBm)
Wi-Fi	2412	17.34	18.0	1.27	100	19.27

Frequency (MHz)	Option	Min. Distance	Tune-Up ERP		Exposure Limit	Ratio	Result
		(cm)	(dBm)	(mW)	(mW)		Pass/Fail
2412	C	20.00	17.12	51.52	768.00	0.07	Pass

Note: 1.  $ERP = EIRP - 2.15dB$ ;  $EIRP = Output Power + Antenna gain$

2. Option A, B and C refers as clause 1.2.

3. For option B,  $P_{th}(mW)$  convert to  $Exposure Limit(mW)$ ; For option C,  $ERP(W)$  convert to  $Exposure Limit(mW)$ .

4.  $Ratio = Tune-Up ERP(mW) / Exposure Limit (mW)$

#### Mode for Simultaneous Multi-band Transmission:

Radio Access Technology	Ratio 1	Ratio 2	Simultaneous Ratio	Limit	Result
					Pass/Fail
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Result: Pass