

NCC

電磁波曝露量之評估報告

產品名稱 : ACCESS POINT
型號 : APINP303
廠牌 :  
申請者 : 慧與科技股份有限公司
申請者地址 : 臺北市南港區經貿二路 66 號 10 樓之 1
測試標準 : LP0002 (107 年版)
參考法規 : ANSI C63.10-2013
測試結果 : 符合
測試日期 : 2017.10.16 ~ 2017.11.18
發行日期 : 2018.11.04

測試工程師 : 

(柯文凱)

報告審核人 : 

(陳柏均)

報告簽屬人 : 

(柯承志)



修訂紀錄

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1. 產品資訊

1.1. 待測物裝置資料

產品名稱	ACCESS POINT
商標	 
產品型號	APINP303
天線樣式	Refer to the table "Antenna List"
天線規格	Refer to the table "Antenna List"
待測物額定電壓	POE input or AC adapter input
調變模式	DSSS for IEEE 802.11 b, OFDM for IEEE 802.11a/g/n/ac
藍牙規格	v4.2 single mode
ZigBee 規格	802.15.4
軟體版本	v1.02
工作溫度	0 ~ 40 °C
工作環境	Indoor Use
配件	
電源供應器	Part No.: SDI30-12-U-P209-C1 Model No.: SDI30-12-U Input Power: 100 - 240V ~ 50/60Hz, 1.0A Output Power: 12VDC/2.5A

Note: The applicant provide one POE adapter (Manufacturer: MICROSEMI) for approval testing, it is not for sale.

1.2. 天線樣式

Antenna Type	Frequency Band (GHz)	TX Paths	Max Peak Gain (dBi)	Beam-Forming Directional Gain (dBi)	CDD Directional Gain (dBi)	
					For Power	For PSD
Wi-Fi Internal Antenna						
PCB	2.4	2	2.1	3.01	2.1	5.11
	5	2	5.9	3.01	5.9	8.91
Bluetooth Internal Antenna						
PCB	2.4	1	4.5	--		

Note:

- The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

For CDD transmissions, directional gain is calculated as follows, $N_{ANT} = 2$, $N_{SS} = 1$.

If all antennas have the same gain, G_{ANT} , Directional gain = $G_{ANT} + \text{Array Gain}$, where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,
Array Gain = $10 \log (N_{ANT} / N_{SS})$ dB = 3.01;
- For power measurements on IEEE 802.11 devices,
Array Gain = 0 dB for $N_{ANT} \leq 4$;

The EUT also supports Beam Forming mode, and the Beam Forming support 802.11n/ac, not include 802.11a/b/g.

2. 電磁波曝露量評估

2.1. 限制值

根據低功率射頻電機技術規範(105 年 8 月 23 日) 第 5.20 章節，電磁波曝露量之評估：本規範有規定需進行電磁波曝露量之評估者，應符合以下之要求：

職業性/可控制之電磁波曝露量

頻率範圍 (MHz)	電場強度 (V/m)	磁場強度 (A/m)	功率密度 (mW/cm ²)	平均時間 (minutes)
0.3-3.0	614	1.63	*100	6
3-30	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	-----	-----	5.0	6

註 1：標記*表平面波等效功率密度。

註 2：f 表測試頻率，單位：(MHz)。

一般人/不可控制之電磁波曝露量

頻率範圍 (MHz)	電場強度 (V/m)	磁場強度 (A/m)	功率密度 (mW/cm ²)	平均時間 (minutes)
0.3-3.0	614	1.63	*100	30
3-30	1842/f	4.89/f	*180/f ²	30
30-300	27.5	0.073	1.0	30
300-1,500	-----	-----	f/1500	30
1,500-100,000	-----	-----	1.0	30

註 1：標記*表平面波等效功率密度。

註 2：f 表測試頻率，單位：(MHz)。

P_{d} is the limit of MPE (1 mW/cm²)

If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2.2. 電磁波曝露量評估之計算結果

Product	ACCESS POINT
Test Item	電磁波曝露量評估

Test Mode	Frequency Band (MHz)	Max Conducted Power (dBm)	Antenna Gain (dBi)	Maximum EIRP (dBm)
BLE	2402 ~ 2480	8.03	4.50	12.53
ZigBee	2405 ~ 2480	7.44	4.50	11.94
802.11b/g/n	2412 ~ 2462	21.98	5.11	27.09
802.11a/n/ac	5180 ~ 5240	21.58	8.91	30.62
	5470 ~ 5725	21.59		
	5745 ~ 5825	21.71		

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)
BLE	2402 ~ 2480	12.53	0.0036	1
ZigBee	2405 ~ 2480	11.94	0.0031	
802.11b/g/n	2412 ~ 2462	27.09	0.1018	1
802.11a/n/ac	5180 ~ 5240	30.62	0.2295	1
	5470 ~ 5725			
	5745 ~ 5825			

CONCULISON:

Both of the WLAN 2.4GHz Band, WLAN 5GHz Band and BLE Band can transmit simultaneously.

The max Power Density at R (20 cm) = $0.0036\text{mW/cm}^2 + 0.0031\text{mW/cm}^2 + 0.1018\text{mW/cm}^2 + 0.2295\text{mW/cm}^2 = 0.338\text{mW/cm}^2 < 1\text{mW/cm}^2$.

Therefore, the Min Safety Distance is 20cm.

End