



RF Exposure Evaluation Declaration

FCC ID : 2ALJ3AP35X
Applicant : HAN Networks Co., Ltd.
Application Type : Certification
Product : HAN Access Point
Model No. : AP351
Brand Name : HANNETWORKS, HAN NETWORKS
FCC Classification : Digital Transmission System (DTS)
Unlicensed National Information Infrastructure (NII)
Test Procedure(s) : KDB 447498 D01v06
Received Date : March 17, 2021

Tested By : *Fran Chen*
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(Paddy Chen)

Approved By : *Chenz Ker*
(Chenz Ker)



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

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Revision History

Report No.	Version	Description	Issue Date	Note
2107TW0105-U5	1.0	Original Report	2021-08-01	Valid

Note: This is a copy report based on MRT original report (report No.: 2105TW0102-U5). It only changed the information of the applicant and the product. The hardware and software of the product are the same.

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1. General Information

1.1. Applicant

HAN Networks Co., Ltd.

101-A16, 1st Floor, Building 3, No.9 compound, Yongfeng Road, Haidian District, Beijing, P.R. China

1.2. Manufacturer

HAN Networks Co., Ltd.

101-A16, 1st Floor, Building 3, No.9 compound, Yongfeng Road, Haidian District, Beijing, P.R. China

1.3. Testing Facility

☐	Test Site - MRT Suzhou Laboratory		
	Laboratory Location (Suzhou - Wuzhong)		
	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China		
	Laboratory Location (Suzhou - SIP)		
	4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China		
	Laboratory Accreditations		
A2LA: 3628.01		CNAS: L10551	
FCC: CN1166		ISED: CN0001	
VCCI: R-20025, G-20034, C-20020, T-20020			
☐	Test Site - MRT Shenzhen Laboratory		
	Laboratory Location (Shenzhen)		
	1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China		
	Laboratory Accreditations		
	A2LA: 3628.02		CNAS: L10551
	FCC: CN1284		ISED: CN0105
☒	Test Site - MRT Taiwan Laboratory		
	Laboratory Location (Taiwan)		
	No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)		
	Laboratory Accreditations		
	TAF: L3261-190725		
FCC: 291082, TW3261		ISED: TW3261	

2. PRODUCT INFORMATION

2.1. Feature of Equipment under Test

Product Name	HAN Access Point
Model No.	AP351
Brand Name	HANNETWORKS, HAN NETWORKS
Operating Temperature	0 ~ 45 °C
Wi-Fi Specification	802.11a/b/g/n/ac/ax
Accessories	
AC/DC Adapter	Model: ADP-50GR B Input: 100-240V ~ 50/60Hz, 1.3A Output: 48.0V, 1.042A, 50.1W MAX
PoE Injector	Model: POE60U-1BT-X Input: 100-240V ~ 1.5A, 50/60Hz Output: 56.0V, 0.535A, (Pin 3,6+ to pin 1,2 Return); 56V dc, 0.535A(pin 4,5+ to Pin 7,8 Return)

Note:

1. The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.
2. The AC/DC adapter and PoE Injector are not sold with product.

2.2. Description of Available Antennas

Antenna Type	Frequency Band (MHz)	T _x Paths	Max Antenna Gain (dBi)	Directional Gain (dBi)		Beamforming Directional Gain (dBi)
				For Power	For PSD	
PIFA Antenna	2400 ~ 2483.5	4	3.9	3.9	9.92	9.92
Dipole Antenna	5150 ~ 5350	4	3.8	3.8	9.82	9.82
PIFA & Dipole Antenna	5470 ~ 5850	8	3.9	BW $\geq$ 40M, 3.9 BW=20M, 6.9	12.93	12.93
Scanning						
Dipole Antenna	2400 ~ 2483.5	1	3.5	3.5	3.5	--
Dipole Antenna	5150 ~ 5250 & 5725 ~5850	1	3.9	3.9	3.9	--
Bluetooth						
Dipole Antenna	2400 ~ 2483.5	1	3.5	3.5	3.5	--
Remark: 1. The EUT supports Cyclic Delay Diversity (CDD) mode and beamforming mode. 2. All antenna information (Antenna type and Peak Gain) is provided by the manufacturer. 3. High gain antenna power setting will be reduced according to difference value of antenna gain declared by applicant.						

3. RF Exposure Evaluation

3.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	f/1500	6
1500-100,000	--	--	1	30

f= Frequency in MHz

Calculation Formula: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

r = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1mW/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.

3.2. Test Result of RF Exposure Evaluation

Product	HAN Access Point
Test Item	RF Exposure Evaluation

Antenna Gain: Refer to clause 2.2.

Test Mode	Frequency Band (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Maximum EIRP (dBm)
802.11b/g/n/ax	2412 ~ 2462	23.85	3.9	27.75
802.11a/n/ac/ax	5180~ 5350	26.18	3.8	29.98
802.11a/n/ac/ax	5470~ 5850	26.91	3.9	30.81
802.11 b/g Scan antenna	2412 ~ 2462	18.05	3.5	21.55
802.11a Scan antenna	5180~ 5240 5745~5825	19.06	3.9	22.96
BLE	2400~2483.5	18.04	3.5	21.54

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Safety Distance (cm)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)
802.11b/g/n/ax	2412 ~ 2462	27.75	20	0.11850	1
802.11a/n/ac/ax	5180 ~ 5825	29.98	20	0.19803	1
802.11a/n/ac/ax	5470~ 5850	30.81	20	0.23973	1
802.11 b/g Scan antenna	2412 ~ 2462	21.55	20	0.02843	1
802.11a Scan antenna	5180~ 5240 5745~5825	22.96	20	0.03933	1
BLE	2400~2483.5	21.54	20	0.02836	1

CONCLUSION:

The 2.4G & 5G can't work simultaneously with Scan Wi-Fi.

The max Power Density at R (20 cm) = $0.11850\text{mW/cm}^2 + 0.19803\text{mW/cm}^2 + 0.23973\text{mW/cm}^2 + 0.02836\text{mW/cm}^2 = 0.58462\text{mW/cm}^2 < 1\text{mW/cm}^2$.

So, the safety distance is 20cm for device installed without any other radio equipment.

The End