

Test Report No.:
FCC2022-0020-H

Test Report

EUT	:	ActivPanel 9 WiFi and Bluetooth Module
MODEL	:	AP9-WIFIBT-AB-02
BRAND NAME	:	Promethean
APPLICANT	:	Promethean Limited
Classification Of Test	:	N/A

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Client	Name : Promethean Limited		
	Address : Promethean House,Lower Philips Rd,whitebirk Industrial Estate,Blackburn,Bb1 5th United Kingdom		
Manufacturer	Name : Promethean Limited		
	Address : Promethean House,Lower Philips Rd,whitebirk Industrial Estate,Blackburn,Bb1 5th United Kingdom		
Equipment Under Test	Name :ActivPanel 9 WiFi and Bluetooth Module		
	Model/Type: AP9-WIFIBT-AB-02		
	Trade mark :Promethean		
	SerialNO.:N/A		
	Sampe NO.:3-1		
Date of Receipt.	2022.03.25	Date of Testing	2022.03.25~2022.04.23
Test Specification		Test Result	
FCC Part 2 (Section 2.1091) IC RSS-102 Issue 5 KDB 447498 D01 IEEE C95.1, IEEE C95.3		PASS	
Evaluation of Test Result	The equipment under test was found to comply with the requirements of the standards applied.		
	Issue Date: 2022.04.23		
Tested by: 	Reviewed by: 	Approved by: 	
Xu ZhenFei Name Signature	Liu YongHai Name Signature	Chen HuaWen Name Signature	
Other Aspects: NONE.			
Abbreviations:OK, Pass= passed Fail = failed N/A= not applicable EUT= equipment, sample(s) under tested			

This test report relates only to the EUT, and shall not be reproduced except in full, without written approval of CVC.



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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FCC2022-0020-H	Original release	2022.04.23



1. GERTIFICATION

FCC ID	QAM023
IC ID	5459A-023
PRODUCT	ActivPanel 9 WiFi and Bluetooth Module
BRAND	Promethean
MODEL	AP9-WIFIBT-AB-02
ADDITIONAL MODEL	N/A
STANDARDS	FCC Part 2 (Section 2.1091)
	IC RSS-102 Issue 5
	KDB 447498 D01
	IEEE C95.1
	IEEE C95.3



2. RF EXPOSURE LIMIT

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (FCC)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (A/m)	POWER DENSITY (mW/cm ²)	AVERAGE TIME (minutes)
LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE				
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

MPE calculation Formula(FCC)

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

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



LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (IC)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (A/m)	POWER DENSITY (W/m ²)	AVERAGE TIME (minutes)
LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE				
48-300	22.06	0.05852	1.291	6
300-6000	$3.142 \cdot F^{0.3417}$	$0.008335 \cdot F^{0.3417}$	$0.02619 \cdot F^{0.6834}$	6

F = Frequency in MHz

MPE calculation Formula(IC)

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

P_d = power density in W/m²

P_{out} = output power to antenna in W

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in m

3. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.



4. ANTENNA GAIN

The antennas provided to the EUT, please refer to the following table:

Frequency (MHz)	Chain 0 Peak Gain (dBi)	Chain 1 Peak Gain (dBi)	Antenna Type
2412-2462	2.9	2.9	External Antenna
5180-5240	5.3	5.3	External Antenna
5260-5320	4.4	4.4	External Antenna
5500-5700	3.0	3.0	External Antenna
5745-5825	3.2	3.2	External Antenna

Frequency (MHz)	Chain 2 Peak Gain (dBi)	Antenna Type
2402-2480	2.9	External Antenna

NOTE: Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, CVC is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.



5. CALCULATION RESULT OF MAXIMUM CONDUCTED AV POWER

The measured conducted Average Power

Mode	Averaged Power (dBm)
BT	5.53
2.4G WIFI	15.00
U-NII-1	15.04
U-NII-2A	15.97
U-NII-2C	15.56
U-NII-3	13.91

The tuned conducted Average Power (declared by client)

Mode	Frequency (MHz)	Target Power (dBm)	Tolerance (dBm)	Lower Tolerance (dBm)	Upper Tolerance (dBm)
BT	2402-2480	5	± 1	4	6
2.4G WIFI	2412-2462	14	± 1	13	15
U-NII-1	5180-5240	15	± 1	14	16
U-NII-2A	5260-5320	15	± 1	14	16
U-NII-2C	5500-5700	15	± 1	14	16
U-NII-3	5745-5825	14	± 1	13	15



MAXIMUM PERMISSIBLE EXPOSURE (FCC)

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2402-2480	6	2.9	20	0.0015	1
2412-2462	15	2.9	20	0.0123	1
5180-5240	16	5.3	20	0.0270	1
5260-5320	16	4.4	20	0.0220	1
5500-5700	16	3.0	20	0.016	1
5745-5825	15	3.2	20	0.013	1

Note: This device can operate simultaneously in BT, 2.4G WIFI and 5G WIFI.

CALCULATION FOR SIMULTANEOUS TRANSMISSION

2.4GHz and 5GHz can transmit simultaneously, the formula of calculated the exposure is:

$$(CEF1/LEF1)^2 + (CEF2/LEF2)^2 + \dots < 1$$

CEF= Calculation E-Field Strength

LEF= Limit of E-Field Strength

$$= 0.0015/1 + 0.0123/1 + 0.0270/1 = 0.0408 < 1, \text{ which is less than the "1" limit.}$$

MAXIMUM PERMISSIBLE EXPOSURE (IC)

FREQUENCY BAND (MHz)	Max power (dBm)	Antenna gain (dBi)	DISTANCE (m)	POWER DENSITY (W/m ²)	LIMIT (W/m ²)
2402-2480	6	2.9	0.2	0.0154	5.37
2412-2462	15	2.9	0.2	0.1227	5.37
5180-5240	16	5.3	0.2	0.2684	9.05
5260-5320	16	4.4	0.2	0.2181	9.12
5500-5700	16	3.0	0.2	0.1580	9.43
5745-5825	15	3.2	0.2	0.1314	9.71

Note: This device can operate simultaneously in BT, 2.4G WIFI and 5G WIFI.

CALCULATION FOR SIMULTANEOUS TRANSMISSION

2.4GHz and 5GHz can transmit simultaneously, the formula of calculated the exposure is:

$$(CEF1/LEF1)^2 + (CEF2/LEF2)^2 + \dots < 1$$

CEF= Calculation E-Field Strength

LEF= Limit of E-Field Strength

$$= 0.0154/5.37 + 0.1227/5.37 + 0.2684/9.05 = 0.0553 < 1, \text{ which is less than the "1" limit.}$$



Important

- (1) The test report is valid with the official seal of the laboratory and the signatures of Test engineer, Author and Reviewer simultaneously.
- (2) The test report is invalid if altered.
- (3) Any photocopies or part photocopies in the test report are forbidden without the written permission from the laboratory.
- (4) Objections to the test report must be submitted to the laboratory within 15 days.
- (5) Generally, commission test is responsible for the tested samples only.

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