RF Exposure Evaluation Declaration

FCC ID:	TK4WPJ558
APPLICANT:	Compex Systems Pte Ltd
Application Type:	Certification
Product:	WIRELESS ACCESS POINT
Model No.:	WPJ558HV, WPJ558LV, WPJ558LV-A, WPJ557LV-A, WPJ557HV-A, MMJ558LV, MMJ558LV-A MMJ558HV, MMJ558HV-A, MMN558LV, MMN558LV-A, MMN558HV, MMN558HV-A, MMS558LV, MMS558LV-A, MMS558HV, MMS558HV-A, MMZ558LV, MMZ558LV-A, MMZ558HV, MMZ558HV-A
Trademark:	COMPEX
FCC Classification:	Digital Transmission System (DTS)
Test Date:	November 01 ~ 24, 2016

Reviewed By Manager : Robin Wu
(Robin Wu)

Approved By CEO : Marlin Chen
(Marlin Chen)

Revision History

Report No.	Version	Description	Issue Date	Note
1611RSU00205	Rev. 01	Initial report	11-27-2016	Valid

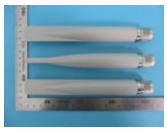
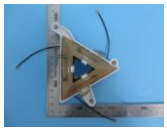
1. PRODUCT INFORMATION

1.1. Equipment Description

Product Name	WIRELESS ACCESS POINT
Model No.	WPJ558HV, WPJ558LV, WPJ558LV-A, WPJ557LV-A, WPJ557HV-A, MMJ558LV, MMJ558LV-A MMJ558HV, MMJ558HV-A, MMN558LV, MMN558LV-A, MMN558HV, MMN558HV-A, MMS558LV, MMS558LV-A, MMS558HV, MMS558HV-A, MMZ558LV, MMZ558LV-A, MMZ558HV, MMZ558HV-A
Frequency Range	802.11b/g/n-HT20: 2412 ~ 2462MHz 802.11n-HT40: 2422 ~ 2452MHz
Type of Modulation	802.11b: DSSS 802.11g/n: OFDM

Note: Difference between all models is for different marketing requirement.

1.2. Description of Available Antennas

Antenna	Antenna Type	Max Peak Gain (dBi)	CDD Directional Gain (dBi)		
			For Power	For 2Tx PSD	For 3Tx PSD
	Panel Antenna	4.5	4.5	7.51	9.27
	Panel Antenna	4.0	4.0	7.01	8.77
	Dipole Antenna	2.0	2.0	5.01	6.77

Note:

1. The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.
   For CDD transmissions, directional gain is calculated as follows, N_{ANT} = 3, N_{SS} = 1.
   1) If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + 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 = 4.77;
   - For power measurements on IEEE 802.11 devices,
     Array Gain = 0 dB for N_{ANT} ≤ 4;
2. The Cyclic Delay Diversity (CDD) mode only support 802.11n 2TX and 3TX, not include 802.11b/g.
3. For 802.11b/g mode only support 1TX and 1RX, 802.11n mode only support 2TX and 2RX, 3TX and 3RX.

2. RF Exposure Evaluation

2.1. 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: $Pd = (Pout*G)/(4*pi*r^2)$

Where
Pd = power density in mW/cm^2
Pout = output power to antenna in mW
G = gain of antenna in linear scale
Pi = 3.1416
r = distance between observation point and center of the radiator in cm

Pd is the limit of MPE, $1mW/cm^2$. 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. Test Result of RF Exposure Evaluation

Product	WIRELESS ACCESS POINT
Test Item	RF Exposure Evaluation

Antenna Gain: Refer to Clause 1.2 of antenna description.

Test Mode	Frequency Band (MHz)	Maximum Output Power (dBm)	Power Density at R = 20 cm (mW/cm^2)	Limit (mW/cm^2)
802.11b/g/n	2412 ~ 2462	24.48	0.1573	1

CONCULISON:

Therefore, the Max Power Density at R (20 cm) = 0.1573mW/cm^2 < 1mW/cm^2.
So the EUT complies with the requirement.

The End