Radio Frequency Exposure Report

On Behalf of

SJ Incorporated

FCC ID:	**SNL-16005400**
Product Description:	**Gyro Receiver Graupner/SJ HoTT**
Model No.:	**GR-12+3xG**
Supplementary Model:	**N/A**
Prepared for:	**SJ Incorporated** 8th F,202 Dong,Chunui Techno-Park2,202,Chuni-Dong,Wonmi-Gu,Bucheon-Shi,Kyungki-Do,South Korea
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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Applicant:	**SJ Incorporated**
Address of Applicant:	8th F,202 Dong,Chunui Techno-Park2,202,Chuni-Dong,Wonmi-Gu,Bucheon-Shi,Kyungki-Do,South Korea
Manufacturer 1:	**SJ Technology(Shenzhen)Co.,Ltd**
Address of manufacturer:	F6, 1 Bldg, A Area, Yintianxifa Industrial Area, Xixiang Town, Baoan District Shenzhen, Guangdong Province, China
Manufacturer 2:	**SJ Incorporated**
Address of Manufacturer:	8th F,202 Dong,Chunui Techno-Park2,202,Chuni-Dong,Wonmi-Gu,Bucheon-Shi,Kyungki-Do,South Korea

General Description of E.U.T

Items	**Description**
EUT Description:	Gyro Receiver Graupner/SJ HoTT
Model No.:	GR-12+3xG
Trade Name:	GRAUPNER/SJ HoTT
Supplementary Model:	N/A
Frequency Band:	2404.056 MHz ~ 2474.025 MHz
Number of Channels:	70
Type of Modulation:	FHSS
Antenna Gain:	1.5dBi
Antenna Type:	Integral Antenna
Rated Voltage:	Input: DC 3.6V~8.4V
Adapter description:	Model: N/A Input: N/A Output: N/A

Remark: ** The test data gathered are from the production sample provided by the manufacturer.*

1.2 Objective

The objective of the following report is used to demonstrate that EUT operated in a manner that ensures the public is not exposed to radio frequency energy levels in excess of the relative provisions of FCC 47CFR Part 1.1307

1.3 General Description of Test

Items	Description
EUT Frequency band	☒ FHSS: 2.400GHz ~ 2.483GHz ☐ WLAN: 2.400GHz ~ 2.483GHz ☐ WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☐ WLAN: 5.745GHz ~ 5825GHz ☐Others: _____
Device category	☐Portable (<20cm separation) ☒Mobile (>20cm separation) ☐Others _____
Exposure classification	☐Occupational/Controlled exposure (S = 5mW/cm2) ☒General Population/Uncontrolled exposure (S=1mW/cm^2) ☐Others: _____
Antenna diversity	☒Single antenna ☐Multiple antennas: ☐Tx diversity ☐Rx diversity ☐Tx/Rx diversity
Max. output power	18.63dBm (0.0729W)
Antenna gain (Max)	1.5dBi (Numeric gain:1.41)
Evaluation applied	☒MPE Evaluation ☐SAR Evaluation
Note: *1. The maximum output power is 18.63dBm (0.0729W) at 2474.025MHz (with 1.41 numeric antenna gain.)* *2. For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20 cm, even if the calculations indicate that the MPE distance would be lesser.*	

1.4 Human Exposure Assessment Results

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where E = *Field Strength in Volts / meter*
P = *Power in Watts*
G = *Numeric antenna gain*
d = *Distance in meters*
S = *Power Density in milliwatts / square centimeter*

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and
*d (cm) =100 * d (m)*

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \qquad \textit{Equation 1}$$

Where d = *distance in cm*
P = *Power in mW*
G = *Numeric antenna gain*
S = *Power Density in* mW/cm^2

EUT parameter (data from the separate report)	
Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$	Where G: numerical gain of transmitting antenna; TP: Transmitted power in watt; d: distance from the transmitting antenna in meter
Max average output power in Watt (TP)	18.63dBm (0.0729W)
Antenna gain (G)	1.5 dBi (Numeric gain: 1.41
Exposure classification	S=1mW/cm^2
Minimum distance in meter (d) (from transmitting structure to the human body)	20cm (0.2m)
Yields $S = \frac{30xPxG}{3770d^2}$, P=0.0729W, G=1.41, d=0.2 S=0.0204mW/cm^2 Or $d = \sqrt{\frac{30xPxG}{3770S}}$, S=1, P=0.0729W, G=1.41 d=0.0285m	
Conclusion: S=0.0204mW/cm^2 is significant lower than the General Population Exposure Power Density Limit 1mW/cm^2 or except the distance when human body proximity to the antenna is less than 2.85cm then will reach the General Population Exposure Power Density Limit (For mobile or fixed location transmitters, the maximum power density is 1.0 mW / cm^2 even if the calculation indicates that the power density would be larger.)	