

Radio Frequency Exposure Report

On Behalf of

Graupner GmbH & Co. KG.

FCC ID: ZKZ-MC-16

Product Description: Computer System Graupner/SJ HoTT

Model No.: MC-16

Supplementary Model: N/A

Prepared for: Graupner GmbH & Co. KG.

Henriettenstr. 94-96 D-73230 Kirchheim/Teck GERMANY

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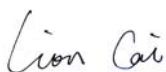
Fax: 86-755-86337028

Report No.: BCT12KR-2055E-2

Issue Date: December 9, 2012

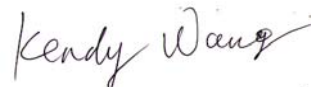
Test Date: November 9~December 9, 2012

Tested by:



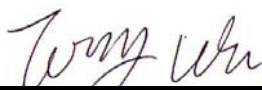
Lion Cai

Reviewed by:



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TABLE OF CONTENTS

1 - GENERAL INFORMATION	3
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
1.2 OBJECTIVE	3
1.3 GENERAL DESCRIPTION OF TEST	4
1.4 HUMAN EXPOSURE ASSESSMENT RESULTS	4

1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Applicant:	Graupner GmbH & Co. KG
Address of Applicant:	Henriettenstr. 94-96 D-73230 Kirchheim/Teck GERMANY
Manufacturer:	SJ TECHNOLOGY(SHENZHEN) CO.,LTD
Address of Manufacturer:	F6, 1 BLDG, A AREA, YINTIANXIFA INDUSTRIAL AREA, XIXIANG TOWN, BAOAN DISTRICT SHENZHEN, GUANGDONG PROVINCE, CHINA

General Description of E.U.T

Items	Description
EUT Description:	Computer System Graupner/SJ HoTT
Model No.:	MC-16
Trade Name:	HoTT
Supplementary Model:	N/A
Frequency Band:	2404.056 MHz ~ 2474.025 MHz
Channel Spacing:	1 MHz
Number of Channels:	70
Type of Modulation:	FHSS
Antenna Type:	Built-in Antenna
Rated Voltage:	Input: 4.2VDC 0.8A
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	<input checked="" type="checkbox"/> FHSS: 2.400GHz ~ 2.483GHz <input type="checkbox"/> WLAN: 2.400GHz ~ 2.483GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5825GHz <input type="checkbox"/> Others: _____
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others _____
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm ²) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm ²) <input type="checkbox"/> Others: _____
Antenna diversity	<input checked="" type="checkbox"/> Single antenna <input type="checkbox"/> Multiple antennas: <div style="margin-left: 100px;"> <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity </div>
Max. output power	19.89dBm (0.0975W)
Antenna gain (Max)	0 dBi (Numeric gain:1)
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation
Note: 1. The maximum output power is 19.65dBm (0.0923W) at 2404MHz (with 10 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:

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

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = 100 * d \text{ (m)}$$

Yields

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

Where d = distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power Density in mW / cm²

EUT parameter (data from the separate report)	
Given $E = \frac{\sqrt{30 \times P \times G}}{d} \quad \& \quad S = \frac{E^2}{3770}$	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)	19.89dBm (0.0975W)
Antenna gain (G)	0 dBi (Numeric gain: 1)
Minimum distance in meter (d) (from transmitting structure to the human body)	20cm (0.2m)
Yields $E = 24.42\text{V/m}$ $S = 0.1581\text{mW/cm}^2$	
Conclusion: $S = 0.1836\text{mW/cm}^2$ is significant lower than the 1mW/cm^2 (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.)	