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# APPROVAL SHEET

No: \_\_\_\_\_

Date: 2002/08/01

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Customer: \_\_\_\_\_

Customer Part No: \_\_\_\_\_

Parts Name: RF Optical Mouse

Part No.: MSBG0002-902

Spec. No.: TSBG-901

Note: \_\_\_\_\_  
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**SPECIFICATION FOR  
RF Optical Mouse**

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FCC GUIDELINES

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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**2. Description:**

The RF Optical Mouse is a FSK (Frequency Shift Key) Transmitter for the frequency band 902-928 MHz. The RF Optical Mouse offers a full-integrated PLL synthesizer and a high efficiency power amplifier to drive a loop antenna; A special circuit design and an unique power amplifier design are used to save current consumption and to save battery live.

This RF Optical Mouse is a three button designed with **3D** scrolling design, scroll wheel, lets you scroll up and down as desired, when browsing the Internet or scrolling through any Windows documents With 800 dots-per-inch (DPI) gives reliable control and accuracy.

For the Receiver Modular use with USB 1.1 compliant can be easily actuated without affecting the position of the mouse.

The Radio Frequency designed in this Version of RF Mouse is FSK 912MHz and can be use in a range to 5-7 Meter from the Receiver at any directions. The Mouse can operate for 2 months with two AAA Alkaline batteries.

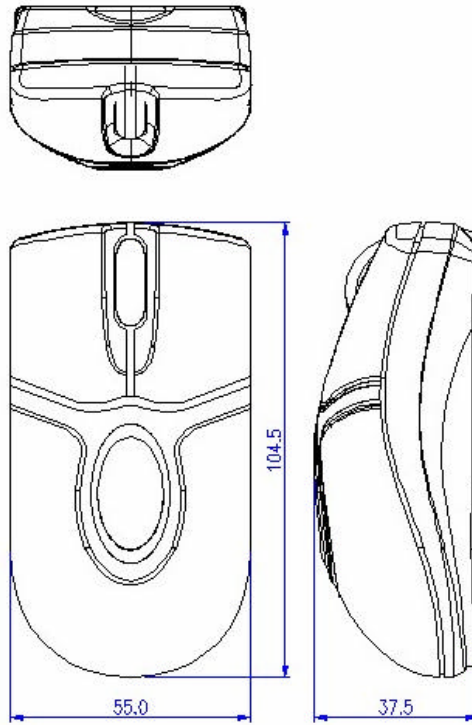


Note that the Channel button (Red button) on the receiver should flash any time the Cordless device is moved or a button is pressed. Then, it will remember your product ID and Channel ID

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**3. Physical Description and Specification:**



**3.1 Dimensions**

The approximate dimensions of the mouse' s transmitter is as follows:

Length	104.5 mm
Width	55 mm
Height	37.5 mm

**3.2 Weight**

The approximate dimensions of the mouse' s transmitter is as follows:  
Weight of the RF Mouse not to exceed 65 grams (without batteries).

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**4.RF Optical Mouse Specification**

**4-1 Main Feature**

The RF Optical Mouse consists of three major parts; a baseband controller-The New HP ADNS-2030 Chip offers extra high 800 Dpi resolution, a radio that suitable for America available 902–928 MHz frees ISM band applications, and a low power uC-controlled, includes RF antenna supporting circuitry, together with basic RF software level.

- 4- 1 Range in meters: 5-7 Meter from the Receiver
- 4- 2 Frequency Range: 912MHz+/-50KHz (64 channels ID for Mouse)
- 4- 3 Data transmitting by transistor module
- 4- 4 Operational voltage: 3.0 V
- 4-5 Low power consumption: on normal operation 25 mA and 150 uA on sleep mode.
- 4-6 Mouse resolution: 800 DPI
- 4-7 Support Power down Mode and high efficiency power amplifier.
- 4-8 Receiver Fully Compliant Low Speed (1.5Mbps) USB 1.1 Interface
- 4-9 Suspend/resume operation and device remote wakeup

**4-2 System Requement**

**Windows-based PC**

To use RF Optical Mouse with the scroll wheel and all customizable buttons, you need:

- 4-2-1 One of the following: Microsoft Windows 98, Windows Me, Windows 2000, or Windows XP Home Edition or Professional operating systems
- 4-2-2 An available Universal Serial Bus (USB) port on your PC

**Macintosh-based PC**

To use RF Optical Mouse with the scroll wheel and all customizable buttons, you need:

- 4-2-3 Mac OS 8.6 , 9.x or 10.1.2-10.1.3
- 4-2-4 An available Universal Serial Bus (USB) port

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## 4.RF Optical Mouse Specification

### 4-3 RF Optical Mouse Characteristics

#### **Wireless Freedom**

Free yourself from desktop clutter and extra cables. The 64 Channel ID common radio frequency reduces interference and allows you to place the receiver out of sight.

#### **USB Connector**

Plugs into the rectangular Universal Serial Bus (USB) port on either a Windows- or Macintosh-based computer

#### **PC- or Macintosh-Compatible**

The rectangular Universal Serial Bus (USB) plug connects to a Windows or Macintosh-based computer (Supported on Mac OS 8.6 or 9.X)

#### **Power Saving Features**

Power saving technology conserves battery life. when you remove your hand , it will enter save mode and puts the mouse into "sleep" mode. And Simply awaken with a move of the mouse .

#### **Ergonomic Design**

Ergonomic Designed , provides support in a natural,comfortable position .

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4.RF Optical Mouse Specification

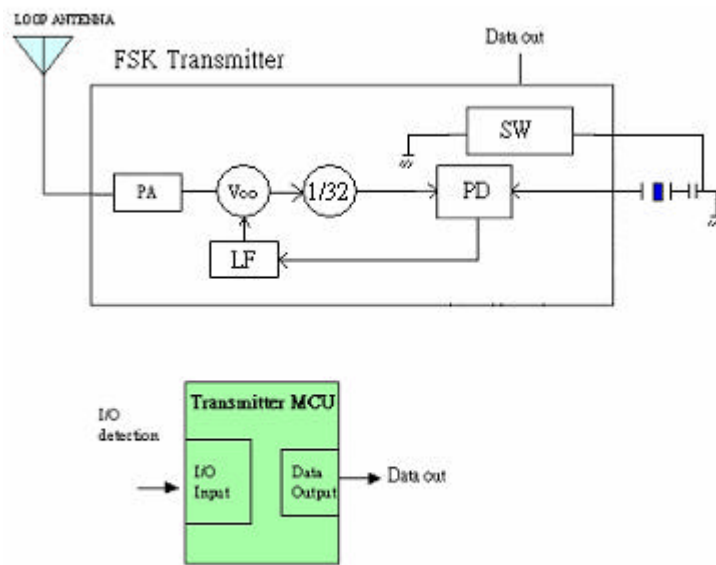
4-4 RF Characteristics

Frequency Range	912 MHz
Modulation	FSK
Channel No.	1
Channel I.D	6 bits 64
Operation Voltage	3V
Battery	AAA*2 Alkaline batteries.
Batter Life	2 months
TX Power	< 0dBm (1mW)
Transmission rate	6K bps
TX FM frequency deviation	60-120 KHz
Frequency tolerance	+/- 20ppm
Hardware Resolution	800dpi
Button	3
Transmission Distance	5-7 Meter

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5. Electrical Block Diagram

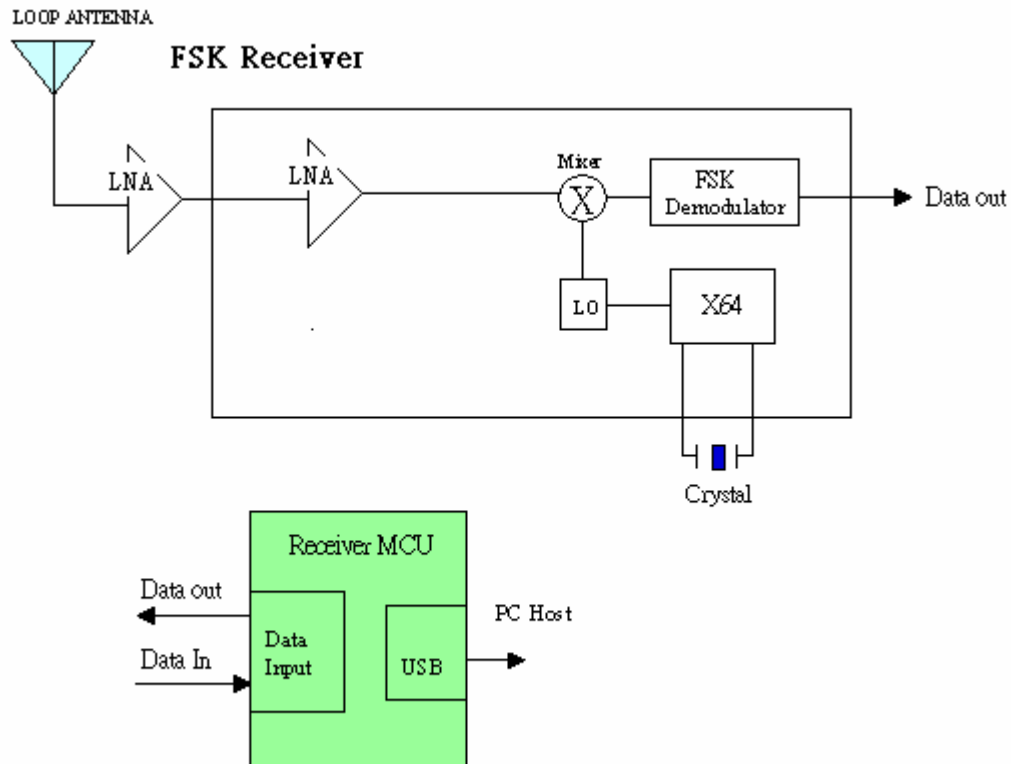
5-1 FSK (912MHZ) Transmitter



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5-2 FSK (912MHZ) Receiver



USB 1.1 compliant The module is a USB high-speed class device (12 Mbps) and has the full functionality of a USB slave

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**6. Electrical Characteristics:**

**6.1 GENERAL SPECIFICATION**

6.1.1 Operation temperature range : -10 ~ + 55

6.1.2 Storage temperature range : - 25 ~ + 65

6.1.3 Relative humidity range : 10 %~ 95 % RH

**6.2 Operational Range**

Parameter	Min	Max	Unit
<b>Supply Voltage</b>	<b>3.0</b>	<b>3.6</b>	<b>V</b>
<b>Frequency (US)</b>	<b>912MHz+/-50KHz</b>		<b>MHZ</b>
<b>Ambient temperature</b>	<b>-10</b>	<b>60</b>	

**6.3 Electrostatic Discharge (ESD) Sensitivity**

**Direct discharge:**

Test Voltage: Not less than 8 KV for Air discharge

Not less than 4 KV for Contact discharge

**Indirect discharge:**

Test Voltage: Not less than 4 KV for HCP

Not less than 4 KV for VCP

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**6.4 AC/DC Characteristics**

Supply Voltage: VS= 3.0 V

Parameter		Min	Typ	Max	Unit
Current Consumption	Sleep mode		140	180	uA
	Stand by mode		1.6	2	mA
	Transmit Mode		25	35	mA
Data rate			6K		bps
Sensitivity			-102		dbm
Transmitter settling time			2.2		ms
Power amplifier output		-4	0	2	dbm
Output power (Transmit mode)			1		mW

**7.Mechanical Specification**

ITEM	SPECIFICATION
7.1 Mouse Operating force	Max. 150gf in any direction.
7.2 Button operating force	(1) Left and right button Max. 150gf (2) Scroll button Max. 300gf
7.3 Button stroke	0.1 ~ 2.5mm
7.4 Operation speed	Max. 200 mm/sec
7.5 Scrolling operation force	Max. 50gf in tangent direction.

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**8.Endurance**

ITEM	SPECIFICATION
8.1 Left and right button life test	(1) Switching frequency 1~2cycles/sec (2) Switch Actuation force: 50-100 gram force (3) Minimum Actuation per Switch 500,000 actuation
8.2 Wheel scroll button life test	(1) Switching frequency 1~2cycles/sec (2) Switch Actuation force: 50-100 gram force (3) Minimum Actuation per Switch 500,000 actuation s
8.3 Drop test	(1)Height 700 ±20mm (2) Test surface concrete (3) Direction free (4) Test times 3 times
8.3 ESD test	(1) Air Discharge: over 8KV (2) Contact Discharge: over 4KV
8.4 Scrolling life Test	(1) Load 50gf tangent load (2)Speed 200 ±20mm/sec (3) Travel 10Km

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**9. Environmental Tests**

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9.1 Heat load test	Measure initial value at standard testing conditions. Leave samples in 60 ± 0.5 °C for 96 ± 5 hours, and in standard testing conditions for 2 hours, then take measurements within 1 hour.
9.2 Humidity load test	Leave samples in 40 ± 0.5 °C for 24 ± 2 hours, and in standard testing conditions for 2 hours, then take measurements. Leave samples in 40 ± 0.5 °C, 90~95%RH, for 96 ± 5 hours, and in standard testing conditions for 2 hours, then take measurements within 1 hour.
9.3 Cold test	Measure initial value at standard testing conditions. Leave samples in -15 ± 0.5 °C for 96 ± 5 hours, and in Standard testing conditions for 2 hours, then take Measurements within 1 hour.
9.4 Vibration test	Vibration test fixture is used to vibrate the tuner with a total amplitude 1mm and frequency ranging from 10 to 55Hz, once per minute onsecutively, for 40 minutes in each of three directions. X. Y and Z
9.5 HEAT CYCLE TEST	Measure initial value at standard testing conditions. 1. Conditions <div style="text-align: center; margin-top: 10px;"> </div>

**NOTE:** When using RF products, keep away from hi-frog electric products.

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