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APPROVAL SHEET

No: _____

Date: 2002/01/22



Customer: _____

Customer Part No: _____

Parts Name: RF Mouse-FSK (912MHZ)

Part No.: MSBC0003

Spec. No.: TSBC-003

Note: _____



Signature For Return

APP'D	CHK'D	DSG'D

**SPECIFICATION FOR
RF Mouse-FSK (912MHZ)**

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1. Table of date-revision

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**SPECIFICATION FOR
RF Keyboard-FSK (912MHZ)**

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: To assure continued compliance, (example-use only shielded interface cables when connecting to computer or peripheral devices) any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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**SPECIFICATION FOR
RF Mouse-FSK (912MHZ)**

2. Description:

The Topseed RF Mouse is a FSK (Frequency Shift Key) Transmitter for the frequency band 902-928 MHz. The RF 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 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 400 dots-per-inch (DPI) opto-mechanical encoder gives reliable control and accuracy.

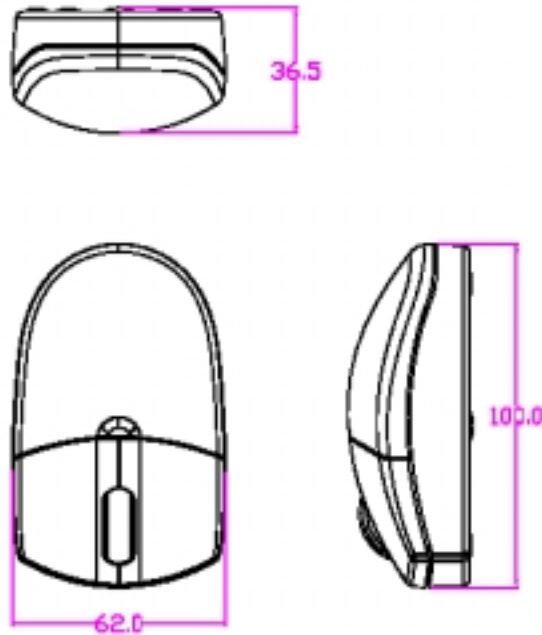
For the Receiver Modular use with USB 1.1 compliant can be easily actuated without affecting the position of the mouse.

The Radio Frequency designed in this Version of RF Mouse is FSK 912MHz and can be use in a range to 3 Meter from the Receiver at any directions. The Mouse can operate for 3 months with two AAA Alkaline batteries.

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**SPECIFICATION FOR
RF Mouse-FSK (912MHZ)**

3. Physical Description and Specification:



3.1 Dimensions

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

Length	100mm
Width	62.5mm
Height	36.5mm

3.2 Weight

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

Weight of the RF Mouse not to exceed 150 grams (with batteries).

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4. RF Mouse Specification

The RF Mouse consists of three major parts; a baseband controller, 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: 3 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 8.5 mA and 30 uA on sleep mode.
- 4-6 Mouse resolution: 400 DPI
- 4-7 Scrolling by mechanical encoder (24 detents every circle)
- 4-8 Support Power down Mode and high efficiency power amplifier.
- 4-9 Receiver Fully Compliant Low Speed (1.5Mbps) USB 1.1 Interface
- 4-10 Suspend/resume operation and device remote wakeup

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4.RF Mouse Specification

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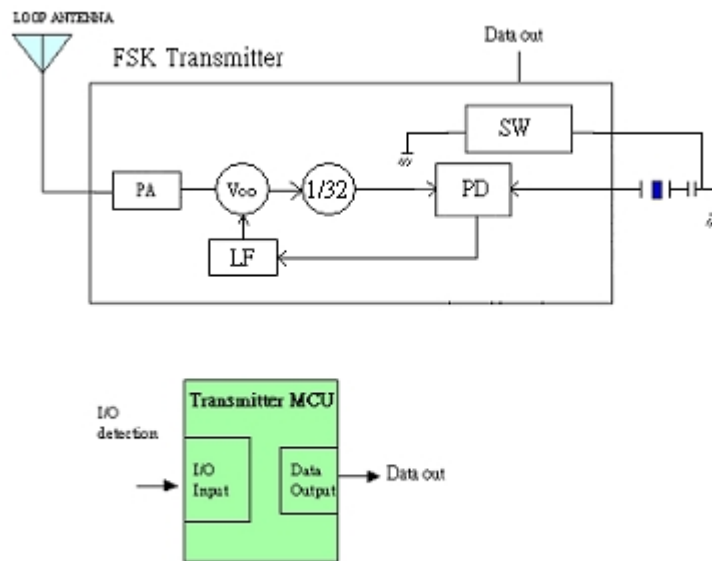
Frequency Range	912 MHz
Modulation	FSK
Channel No.	1
Channel I.D	6 bits → 64
Operation Voltage	3V
Battery	AAA*2 Alkaline batteries.
Batter Life	3 months
TX Power	< 0dBm (1mW)
Transmission rate	6K bps
TX FM frequency deviation	60-120 KHz
Frequency tolerance	+/- 20ppm
Hardware Resolution	400dpi
Button	3
Tracking Speed	200 mm/s
Transmission Distance	3 Meter

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5. Electrical Block Diagram

FSK (912MHZ) Transmitter

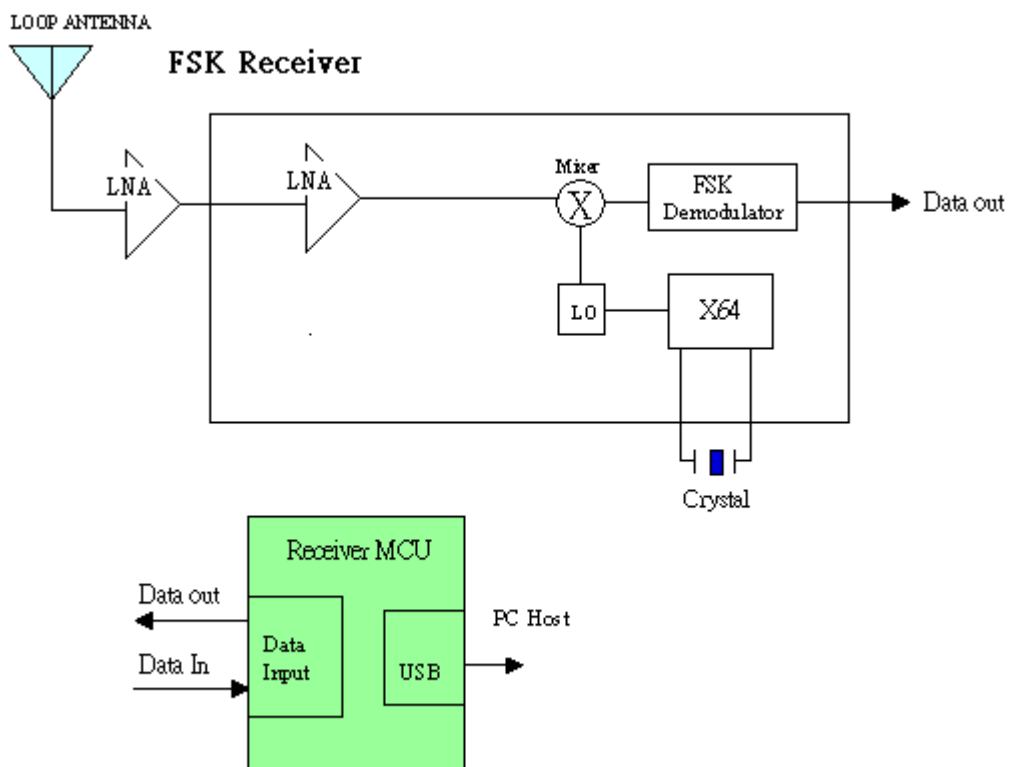


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5. Electrical Block Diagram

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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**SPECIFICATION FOR
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6. Electrical Characteristics:

6.1 GENERAL SPECIFICATION

6.1.1 OPERATING CONDITIONS

Temperature : 0 ~ 40°C
Relative humidity : 10 ~ 85% RH (non-condensing)

6.1.2 STORAGE CONDITIONS

Temperature : -10 ~60°C
Relative humidity : 5 ~ 90% RH (non-condensing)

TEST AND MEASUREMENT CONDITIONS

6.2 Operational Range

Parameter	Min	Max	Unit
Supply Voltage	2.3	3.6	V
Frequency (US)	912MHz+/-50KHz		MHZ
Ambient temperature	-10	60	°C

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		30	60	uA
	Stand by mode				mA
	Transmit Mode		8.5	10	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 Tracking life Test	(1) Load 100gf vertical load (2)Speed 250±50 mm/sec (3) Travel 200 km
8.2 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
8.3 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
8.4 Drop test	(1)Height 700±20mm (2) Test surface concrete (3) Direction free (4) Test times 3 times
8.5 ESD test	(1) Air Discharge: over 8KV (2) Contact Discharge: over 4KV
8.6 Scrolling life Test	(1) Load 50gf tangent load (2)Speed 200±20mm/sec (3) Travel 10Km

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9. Environmental Tests

ITEM	SPECIFICATION
9.1 Heat load test	Measure initial value at standard testing conditions. Leave samples in $60 \pm 2 \text{ }^\circ\text{C}$ 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 $40 \pm 5 \text{ }^\circ\text{C}$ for 24 ± 2 hours, and in standard testing conditions for 2 hours, then take measurements. Leave samples in $40 \pm 5 \text{ }^\circ\text{C}$, 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 $-15 \pm 2 \text{ }^\circ\text{C}$ 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	<p>Measure initial value at standard testing conditions.</p> <p>1. Conditions</p> <p style="text-align: center;">1 CYCLE (MIN)</p> <p>2. Test cycle: 10 cycles</p>

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

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