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# APPROVAL SHEET

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

Date: 2002/1/22



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

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

Parts Name: RF Flex Pointer -FSK (912MHZ)

Part No.: RCAM0004-1

Model No.: TSAM-004

Note: W M/M  
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Signature For Return

APP'D	CHK'D	DSG'D

**SPECIFICATION FOR  
RF Flex Pointer-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.

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**SPECIFICATION FOR  
RF Flex Pointer-FSK (912MHZ)**

**2. Description:**

The TopSeed RF Flex Pointer is a FSK (Frequency Shift Key) Transmitter for the frequency band 902-928 MHz. The Flex Pointer 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 life.

This RF Flex Pointer is a best companion of Microsoft Power Point with Laser pointer designed, scroll wheel, FSR Moues Sensor, lets you scroll up and down as desired, when browsing the Internet move Mouse cursor or scrolling through any Windows documents gives reliable control and accuracy. Flex Pointer RF's radio frequency wireless technology solves all of your presentation input needs.

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

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

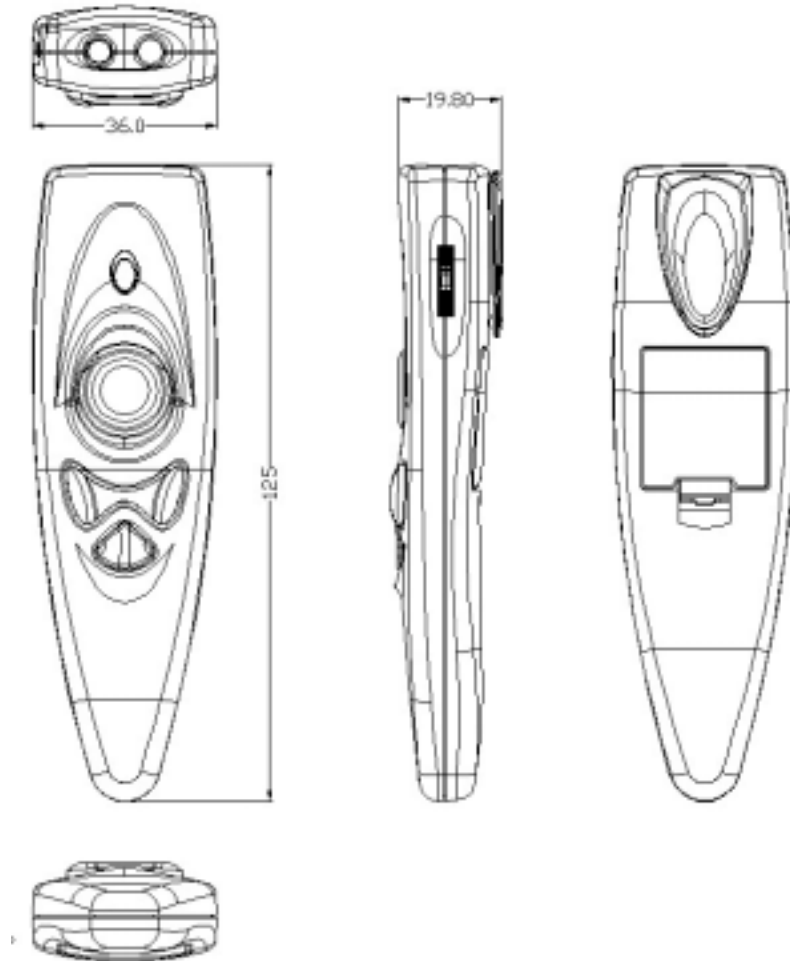


The Radio Frequency designed in this Version of RF Flex Pointer is FSK 912MHz and can be use in a range of up to 10 Meter from the Receiver at any directions. The Flex Pointer can operate for 10-12 months with **CR2450 DC 3V Lithium batteries**

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**3. Physical Description and Specification:**



**3.1 Dimensions**

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

Length	125mm
Width	36 mm
Height	19.8 mm

**3.2 Weight**

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

Weight of the RF Flex Pointer not to exceed 55 grams (with batteries).

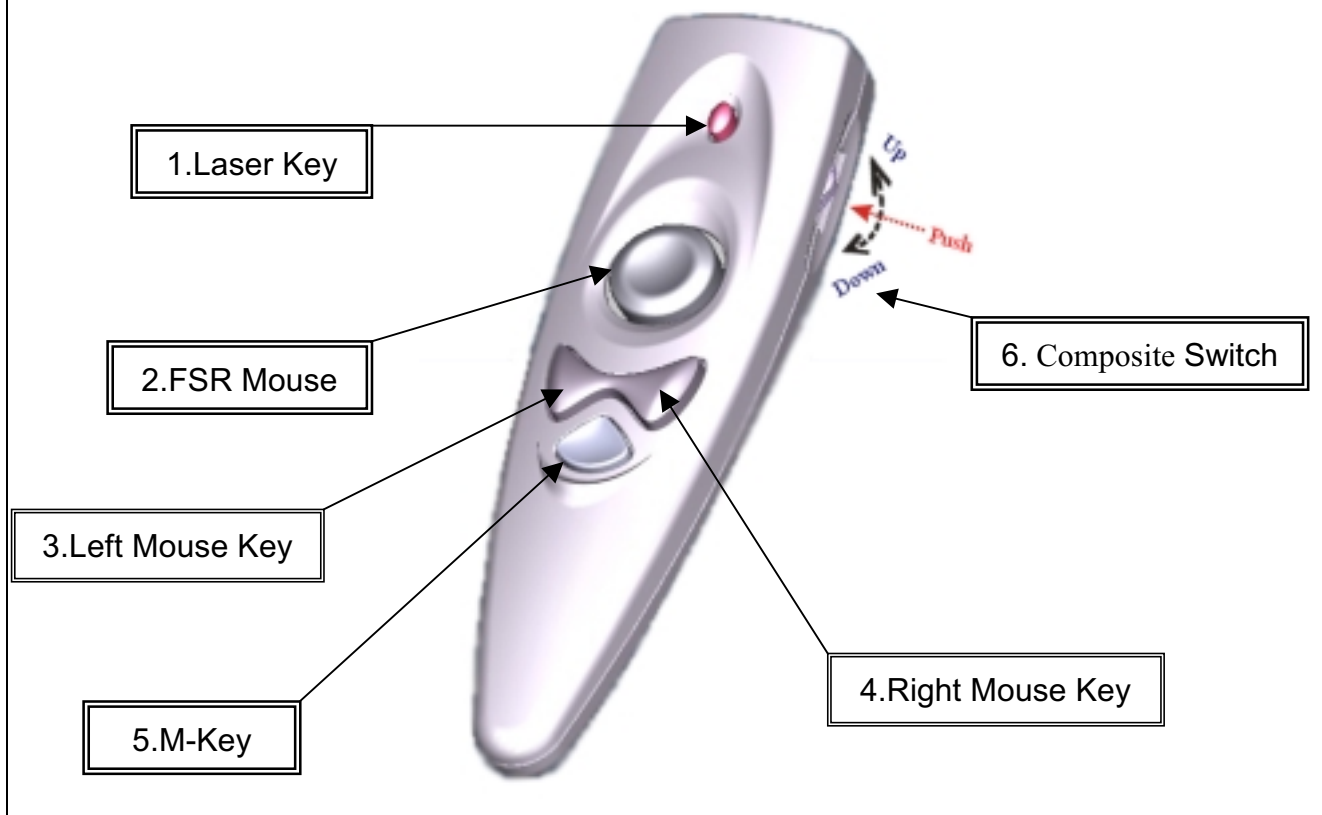
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4.RF Flex Pointer Specification

4-10 Key Definition



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4.RF Flex Pointer Specification

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	Mode-1	Mode-2 (Multimedia)
1.Laser key	Laser Pointer ON/Off	Windows Media Player On
2.FSR Mouse	Control Mouse cursor	Up: The Last Song Down: The Next Song
3.Left Mouse Key	Left Mouse Key	Play/Pause
4.Right Mouse Key	Right Mouse Key	Stop
5.M-Key	Green LED Off	Green LED On
6.Composite Switch	Up: Line Up Down: Line Down Push: Drag	Up: Volume Up Down: Volume Down Push: Mute

**Notice:**

1) In Mode-1, M-Key with 2 special function.

Function 1: **M-Key+ Laser Key** (Laser Pointer Enable/Disable Button)

**M-Key and Laser Key** are pushed simultaneously more than **2 seconds (Red LED flashed)**, the laser pointer is enable/disable to use.

Function 2: **M-Key+ Composite switch Push Key** (ID Change)

**M-Key and Composite switch Push Key** are pushed simultaneously more than **5 seconds (Green LED flashed)**, the ID is changed.

2) For safety consideration, in the laser pointer is enable to use situation, the M-key **red LED** flashed 1 time per 2 seconds. Besides, after you stop using laser pointer about **30 minutes**, the laser pointer function will be disable.

3) Power : DC-3V CR2450 Battery 1pcs

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4.RF Flex Pointer Specification

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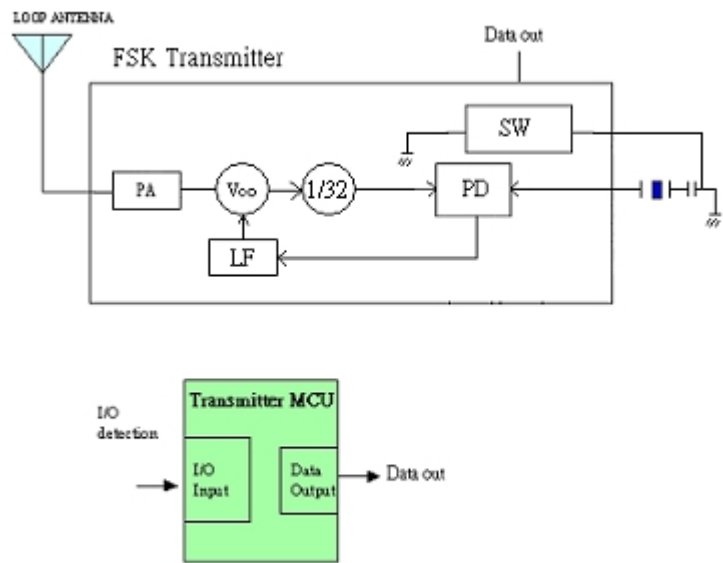
Frequency Range	912 MHz
Modulation	FSK
Channel No.	1
Channel I.D	6 bits → 64
Operation Voltage	3V
Battery	CR2450 DC 3V Lithium batteries.
Batter Life	6 months
TX Power	< 0dBm (1mW)
Transmission rate	6K bps
TX FM frequency deviation	+/- 60 KHz
Frequency tolerance	+/- 20ppm
Button	7
FSR Mouse	<b>Microsoft serial, PS/2 two-button mouse standard.</b>
Transmission Distance	7-10 Meter

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## 5. Electrical Block Diagram

### FSK (912MHZ) Transmitter

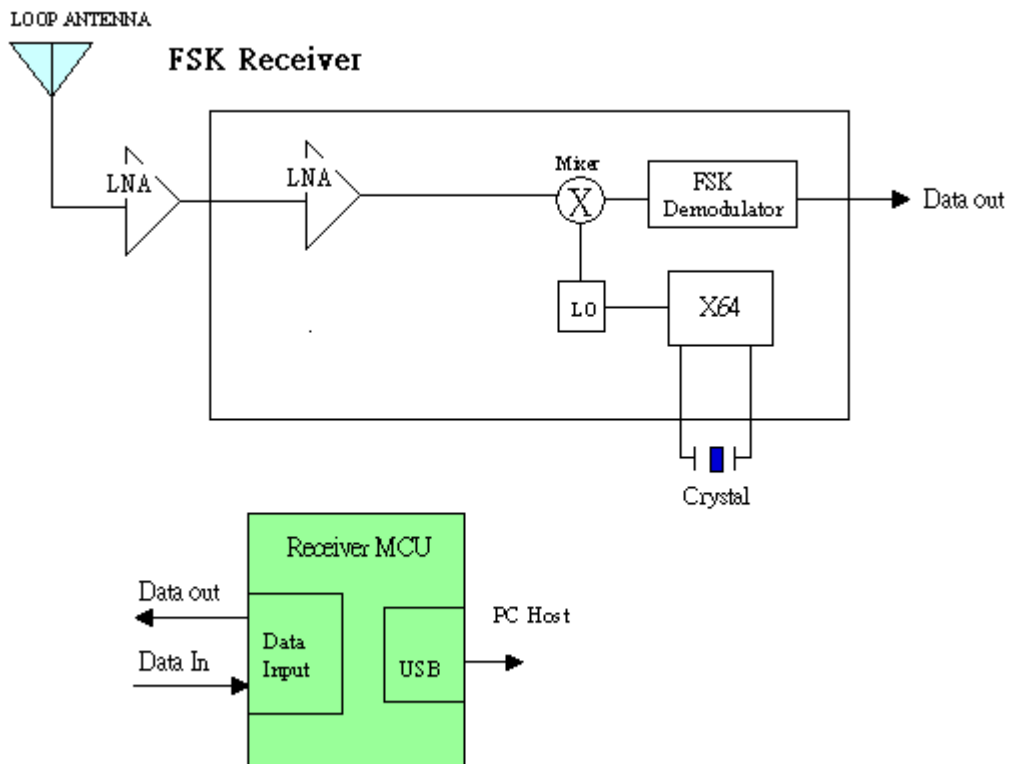


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**5. Electrical Block Diagram**

**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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**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
<b>Supply Voltage</b>	<b>2.4</b>	<b>3.3</b>	<b>V</b>
<b>Frequency (US)</b>	<b>902</b>	<b>928</b>	<b>MHZ</b>
<b>Ambient temperature</b>	<b>-10</b>	<b>60</b>	°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		10		uA
	Transmit Mode		6	7	mA
	Laser operation		25		mA
Data rate			3K		bps
Sensitivity			-100		dbm
Transmitter settling time			2.2		ms
Power amplifier output		-4	-2	0	dbm
Output power (Transmit mode)			1		mW

**6.5 Specifications for typical FSR Mouse**

**6.5.1 Hardware Interfaces:** RS232C serial, PS/2 mouse port standard.

**6.5.2 Output Data Formats:** Microsoft serial, PS/2 two-button mouse standard.

**6.5.3 System Compatibility:** DOS, Windows, and OS/2 via serial and PS/2 ports. PS/2 compatible with any PS/2 mouse port.

**6.5.4 Directional Control:** Continuous 360 ° Control.

**6.5.5 Lifetime:** Dependent on integration method  
( Sensor lifetime>10 million cycles)

**6.5.6 Primary Materials:** FSR sensor may be made up of one or more of the following materials: Polyester, polysulfone, polyether imide, acrylic, and/or silver impregnated acrylic.

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**8.Endurance**

ITEM	SPECIFICATION
8.1 Operating Life (With battery)	(1) 100000 cycle operations at a rate of 15~30 cycle/minute (2) Load: 180gf
8.2 Operating Life (W/O battery)	(3) 300000 cycle operations at a rate of 150~200 cycle/minute (4) Load: 180gf
8.3 Drop test	(1)Height 600±20mm (2) Test surface concrete (3) Direction free (4) Test times 3 times
8.4 ESD test	(1) Air Discharge: over 8KV (2) Contact Discharge: over 4KV
8.5 Scrolling life Test	(1) Load 50gf tangent load (2)Speed 15~20 mm/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. <b>Leave samples in 60 ± 2 ° C for 96 ± 5 hours, and in standard testing conditions for 2 hours, then take measurements within 1 hour.</b>
9.2 Humidity load test	Leave samples in 40±5 ° C for 24±2 hours, and in standard testing conditions for 2 hours, then take measurements. <b>Leave samples in 40 ± 5 ° C, 90~95%RH, for 96± 5 hours, and in standard testing conditions for 2 hours, then take measurements within 1 hour.</b>
9.3 Cold test	Measure initial value at standard testing conditions. <b>Leave samples in -15± 2 ° C for 96 ± 5 hours, and in Standard testing conditions for 2 hours, then take Measurements within 1 hour.</b>
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><b>1. Conditions</b></p> <p style="text-align: center;">1 CYCLE (MIN)</p> <p><b>2. Test cycle: 10 cycles</b></p>

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

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