

6980

Specification

ECM-W5504

Approval

Check

Person in charge

T. Higashiyama

00. 9. 22 Established

1. SCOPE

This specification applies to a computer input device, the wireless mouse which transmits the input data by weak radio waves. The signal out put of this mouse is transmitted by the original communication format. The hardware system is configured with the dedicated receiver. <WIF-0601C> and the system applies to outside Japan as a wireless system.

2. Rating Characteristic

2-1 Controller Specification

Controller	uPD75430
OSC. Frequency	4.00 MHz

2-2 Mouse output format

Baud rate	9600 bps
Start bit	1 bit
Data bit	8 bits
Parity bit	1 bit
Stop bit	1 bit

2-2-1 Data format

	start	D0	D1	D2	D3	D4	D5	D6	D7	parity	stop
1st	0	ID0	ID1	ID2	ID3	ID4	ID5	ID6	ID7	EVEN	1
2nd	0	SWR	SWL	SWM	ZU	ZD		DT	SEC	EVEN	1
3rd	0	X0	X1	X2	X3	X4	X5	X6	X7	EVEN	1
4th	0	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	EVEN	1
5th	0	S0	S1	S2	S3	S4	S5	S6	S7	EVEN	1

SWR : Right SW button (0=off,1=on)

SWL : Left SW button (0=off,1=on)

SWM : Z axis near side WS button (middle) SW button (0=off,1=on)

ZU : Z axis near side WS button(0=off,1=on)

ZD : Z axis opponent side SW button (0=off,1=on)

LB : Low battery bit (0=Low battery, 1=Good)

DT : Device type 0=Mouse 1=Keyboard

SEC : Security bit 0=Mouse data 1=Security data

X0 - X7 : X direction count value

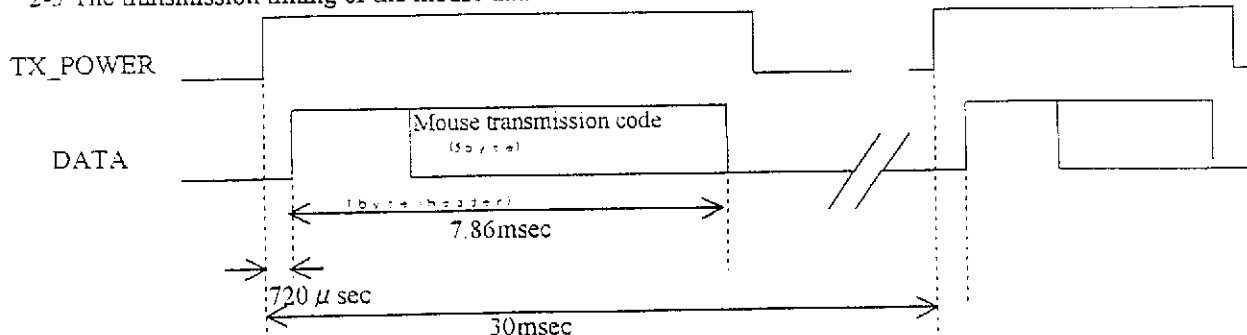
Y0 - Y7 : Y direction count value

S0 - S7 : check sum (Set up as the total of all the data is 0)

*1 The entire transmitting data packet is transmitted from Header. Header consists of Start Bit, Data 8bit (all "1"), Parity Bit and Stop Bit, and the header (1 byte) is added to transmission.

*2 For ID registration mode (Pushing down SWR,M,L at the same time) , 4 byte (ID code, Check sum etc) of other security format data is transmitted

2-3 The transmission timing of the mouse data



Rev	H	Write in the last page
	H	
	H	
	H	
	H	

S

64

0359

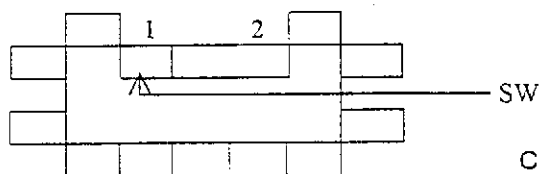


2-4 Transmission Specification

2-4-1	Transmission mode	Weak radio wave
2-4-2	Modulation scheme Frequency deviation	FSK (Frequency deviation modulation) 2.5~4.0 KHz
2-4-3	Electric field strength Transmission out put	Reference value MAX 54 dBuV/m * The field strength of the measurement method for domestic weak radio wave. Equipping MITSUMI original measurement jig 77.0 dBuV ~ 84.0 dBuV
2-4-4	Frequency for use	1ch 27.045MHz $\pm$ 2.5kHz (25°C) 2ch 27.145MHz $\pm$ 2.5kHz

Supplemental remarks for item 2-4-4, 2-4-5

	SLIDE SW
1CH 27.045MHz	1
2CH 27.145MHz	2



CH : 1=CH-1、2=CH-2

* Factory-shipped configuration : SLIDE SW : CH-1

2-5 Rating

2-5-1	Resolution X,Y	400 cpi (count/inch)
2-5-2	Z SW resolution	1 cpc (count/click)
2-5-3	Z SW resolution (automatic mode)	10 cps (count/sec)
2-5-4	Max speed	200 mm/sec
2-5-5	Operation voltage (Battery)	Alkaline AAA battery $\times$ 2 pcs (nominal voltage 3.0V)
2-5-6	Minimum operating voltage	Battery end 2.2V (when loaded)
2-5-7	Operating temperature	273.15K(0°C)~313.15K(40°C)
2-5-8	Storage temperature	253.15K(-20°C)~333.15K(60°C)
2-5-9	Operating humidity	Less than 80 % RH
2-5-10	Storage humidity	Less than 95 % RH

2-6 Automatic Scroll mode

Pushing Z SW(Scroll mode SW) to front and rear direction more than 0.7 seconds, scroll mode is shifted to automatic mode.

2-7 Required Battery

Alkaline AAA battery (Batteries are not included with Mouse)

2-8 ID registration for the receiver

In order to register ID code to the receiver (WIF-0601C), pressing down the Tact SW to light on the LED. And then, each of three mouse buttons L, R and Z (vertical direction) should be pressed at the same time while LED is lighting on (for 20 second). When the receiver complete ID registration, LED on the receiver is back into the previous status.



3 Electrical Characteristics

3-1 Standard Test Condition

The test shall be carried at temperature of $298.15\text{K} \pm (25 \pm 2^\circ\text{C})$, and the relative humidity of $65 \pm 5\%$ RH. The test can be carried in the temperature range 278.15K to 308.15K (5 to 35°C), and the 45 to 85% RH except crucial affection relative humidity range to the test results.

Power supply shall be set up as follows. (Set up voltage) $\pm 2\%$

The test shall be done on the flat and horizontal rigid desk.

3-2 Electrical characteristics

Number	Item	Specification			unit	Test condition
		Min.	Typ.	Max		
3-2-1	Current consumption		7	12	mA	Operating mode
			40	70	uA	Stand-by mode
3-2-2	Hysteresis (1)	X	- 678	+ 678	Count	Moving angle $Q = 45^\circ$ Moving range $D = 400\text{mm}$ Speed $= 100 \pm 5\text{mm/sec}$ The mouse is moved with the condition above and returned back into position along the same track. The count X and Y are measured then.
		Y	- 678	+ 678	Count	
3-2-3	Hysteresis (2)	X	- 15	$16 \times \frac{D}{\cos Q^\circ}$	%	Moving angle $Q = 45^\circ$ Moving range $D = 400\text{mm}$ Speed $= 100 \pm 5\text{mm/sec}$ The mouse is moved with the condition above and returned back into position along the same track. The count X and Y are measured then.
		Y	- 15	$16 \times \frac{D}{\sin Q^\circ}$	%	
3-2-4	Transmitting Frequency deviation	-2.5		+2.5	KHz	
3-2-5	Transmitting Frequency Shift range	2.5		5	KHz	
3-2-6	Transmitting out put	77.0	80.5	84.0	dBuV	Testing by the original jig

Hysteresis (1) typical count value

$$16 \times \frac{400\text{mm}}{\sin 45^\circ} = 4525 \text{ count}$$

(The range of the motion)

3-3 The definition of the operation mode of the mouse

3-3-1 Operation mode

The status of the performance of the mouse in normal motion.

3-3-2 Stand-by mode

When the motion of the mouse is suspended for one second, the mode is shifted to Stand-by mode. The status that sampling the motion of the mouse with using intermittent action by CR literal. This status is shifted to the operation mode by the motion of the mouse or SW.

4. Mechanical Characteristics

4-1 External dimension

Refer the drawing for appearance.

4-2 Weight

The weight of the mouse body shall be $100 \text{ g} \pm 20 \text{ g}$. (Including battery : $123 \text{ g} \pm 20 \text{ g}$)

4-3 Mechanical Characteristics

Number	Item	Specification			Unit	Test condition
		Min.	Tyo.	Max.		
4-3-1	Operating force			1.471 (150)	N (gf)	Unit moves any direction. (Load 100gf vertical force)
4-3-2	Operating force of select SW	0.392 (40)		0.980 (100)	N (gf)	
4-3-3	Operating force of scroll SW (1)	1.079 (110)		1.863 (190)	N (gf)	Vertical downward direction
4-3-4	Operating force of scroll SW (2)	0.490 (50)		1.177 (120)	N (gf)	Front and rear 45° angle toward horizontal surface

5. Reliability Test

5-1 Reliability performance

Number	Item	Specification			Unit	Test condition
		Min.	Typ.	Max.		
5-1-1	Hysteresis (1)	X	- 678		+ 678	Count
		Y	- 678		+ 678	Count
5-1-2	(2)	X	- 15	16 X D X $\cos Q^\circ$	+ 15	%
		Y	- 15	16 X D X $\sin Q^\circ$	+ 15	%
5-1-3	Transmitting Frequency deviation	-2.5		+2.5	KHz	
5-1-4	Transmitting Frequency shift range	2.5		5	KHz	
5-1-5	Transmitting output	77.0	80.5	84.0	dBuV	Testing by the original jig



Number	Item	Specification			Unit	Test condition
		Min.	Typ.	Max.		
5-1-6	Operation force			1.471 (150)	N (gf)	Unit moves any direction. Load (100gf) 0.980N vertical force
5-1-7	Operation force of selecting SW	0.392 (40)		0.980 (100)	N (gf)	
5-1-8	Operation force of scrolling SW (1)	1.079 (110)		1.863 (190)	N (gf)	Vertical downward direction
5-1-9	Operation force of scrolling SW (2)	0.490 (50)		1.177 (120)	N (gf)	Front and rear 45° angle toward horizontal surface

5-2 Reliability Test Performance item

5-2-1 Low temperature test

The unit is kept at the temperature of $253.15\text{K} \pm 2 (-20 \pm 2^\circ\text{C})$ for 96 ± 1 hours, and then left in ambient room temperature and relative humidity for 2 hours. Then, the testing result should meet the performance from 5-1-1 to 5-1-5.

5-2-2 Heat test (High temperature test)

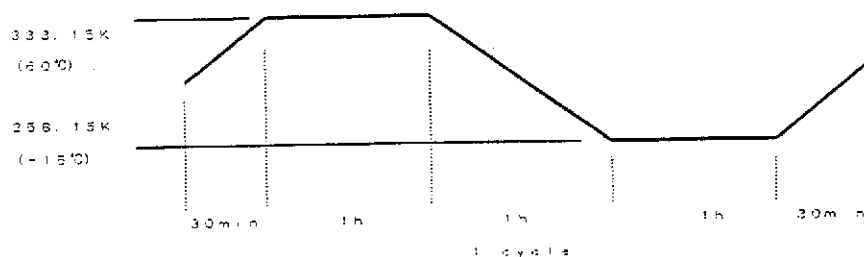
The unit is kept at the temperature of $333.15\text{K} \pm 2 (60 \pm 2^\circ\text{C})$ for 96 ± 1 hours, and then left in ambient room temperature and relative humidity for 2 hours. Then, the testing result should meet the performance from 5-1-1 to 5-1-5.

5-2-3 Humidity test

The unit is kept at the temperature of $313.15\text{K} \pm 2 (40 \pm 2^\circ\text{C})$, and the relative humidity of 90~95%RH for 96 ± 1 hours, and then left in ambient room temperature and relative humidity for 2 hours. Then, the testing result should meet the performance from 5-1-1 to 5-1-5.

5-2-4 Temperature cycle test

The unit is kept at the following temperature changing condition for 5 cycles and then left in ambient room temperature and relative humidity for 2 hours. Then, the testing result should meet the performance from 5-1-1 to 5-1-5.



5-2-5 Impact test (Drop test) $75 \pm 2\text{cm}$ 15mm

Drop the unit from $75 \pm 2\text{cm}$ height above a wood board 15mm thick placed on a concrete floor, 3 times in the same direction. Then the testing result should meet the performance from 5-1-1 to 5-1-6.

5-2-6 Life Test

5-2-6-1 Operation life test

The unit is moved 200km in any direction on the clean and level acrylic board at 250 ± 10 mm/sec speed while 0.980N(100gf) vertical load is applied, and then clean the ball. Then the testing result should meet the performance 5-1-1, 5-1-2 and 5-1-6.

5-2-6-2 L & R Select Switches life test

The L, R, switches are operated 2 million cycles by the operating force 0.980N (100gf). After this operation, the testing result should meet the performance 5-1-7.

(Switching speed : 2 cycles /sec)

5-2-6-3 Scroll Switch life test (Operation of a vertical direction)

The scroll switch is operated in a vertical direction 1 million cycles by the operating force 1.961N(200gf). After this operation, the testing result should meet the performance 5-1-8

(Switching speed : 2 cycles /sec)

5-2-6-4 Scroll Switch life test (Operation of a front and a rear direction)

The scroll switch is operated in a front and a rear direction 3 million cycle by the operating force 1.667N(170gf). After this operation, the testing result should meet the performance 5-1-9.

(Switching speed : 1 cycles /sec)

5-2-7 Electrostatic Destruction Test

The unit is discharged up to ± 14 KV at any point based on the following conditions. After that, the testing result should meet the performance 5-1-1 and 5-1-5.

Discharge resistor : 330 Ω

Discharge capacitor : 150pF

The number of discharges : 15 times/point

5-2-8 Vibration Test

The unit is vibrated based on the following conditions. After that, the testing result should meet the performance 5-1-1 and 5-1-9.

Vibration frequency : sin wave 10 ~ 55Hz (Sweep : 1oct/min)

Vibration amplitude : 1.5mm Direction : X,Y,Z

Vibration time : 2 hours/each direction

変更履歴書

Revision Record

改訂 番号 Rev. No.	発行 年月日 Date	変 更 内 容		担当 Person in Charge
		ページ Page	Content	
00	'00. 9. 22		新規制定 Original	小 林 T. Kobayashi

