

Features

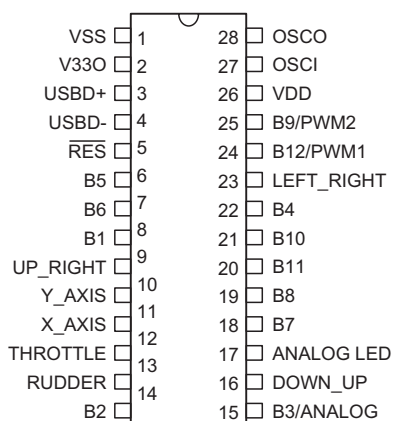
- USB 2.0 low speed compliance/USB HID 1.1 compliance
- Operation voltage: 4.2V~5.5V
- Operation frequency: 6MHz
- 12 function buttons
- Mode switch: digital mode or analog mode can be changed by switch
- Interface: USB+vibration
- One LED indicator (indicate for digital and analog mode switch)
- An 8-way D-pad
- 2 sticks (X-axis Y-axis Throttle Rudder)
- Compatible operation system:
Windows 98SE/2000/XP/XP SP1/XP SP2/2000 SERVER/2003 SERVER
- Vibration function (Driver optional install, if has install driver must have installed DirectX7.0 or later version too)
- 28-pin SOP package

General Description

HT82J927A is designed as USB+ Vibration interface gamepad controller. The HT82J927A can easily be used via the game controller input function on Windows 98SE/2000/XP/XP SP1/XP SP2/2000 SERVER/2003

SERVER operation systems. It has 12 function buttons, vibration function, one LED indicator, 2 sticks, an 8-way D-pad.

Pin Assignment



HT82J927A
-28 SOP-A

Pin Description

Pin Name	I/O	Description
B1~B2, B3/ANALOG, B4~B8, B9/PWM2, B10~B11, B12/PWM1	I/O	For 12 function buttons (B9/PWM2, B12/PWM1 pin-shared with PWM1, PWM2 and Vibration function).
X_AXIS Y_AXIS THROTTLE RUDDER	I/O	For 2 sticks (X-axis, Y-axis, Throttle, Rudder)
UP_RIGHT LEFT_RIGHT DOWN_UP	I/O	For an 8-way D-pad (Hat switch :UP, DOWN, LEFT, RIGHT)
ANALOG LED	O	For LED indicator
VSS	—	Negative power supply, ground
RES	I	Schmitt trigger reset input, active low.
VDD	—	Positive power supply
V33O	O	3.3V regulator output
USBD+	I/O	USB CLK I/O line
USBD-	I/O	USB DATA I/O line
OSCI OSCO	I O	OSCI, OSCO are connected to a 6MHz crystal/resonator (determined by software instructions) for the internal system clock.

Absolute Maximum Ratings

Supply Voltage $V_{SS}-0.3V$ to $V_{SS}+6.0V$ Storage Temperature $-50^{\circ}C$ to $125^{\circ}C$
Input Voltage $V_{SS}-0.3V$ to $V_{DD}+0.3V$ Operating Temperature $0^{\circ}C$ to $70^{\circ}C$

Note: These are stress ratings only. Stresses exceeding the range specified under "Absolute Maximum Ratings" may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

D.C. Characteristics

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{DD}	Conditions				
V _{DD}	Operating Voltage	—	—	4.2	—	5.5	V
I _{DD}	Operating Current (6MHz Crystal)	5V	No load, f _{sys} =6MHz	—	7	9	mA
I _{STB}	Standby Current	5V	No load, system HALT	—	300	500	μA
V _{IL1}	Input Low Voltage for I/O Ports	5V	—	0	—	0.8	V
V _{IH1}	Input High Voltage for I/O Ports	5V	—	2	—	5	V
V _{IL2}	Input Low Voltage ($\overline{\text{RES}}$)	5V	—	0	—	0.4V _{DD}	V
V _{IH2}	Input High Voltage ($\overline{\text{RES}}$)	5V	—	0.9V _{DD}	—	V _{DD}	V
I _{OL}	Output Sink Current for Other Ports B1~B2, B3/ANALOG, B4~B8, B9/PWM2, B10~B11, B12/PWM1, X-AXIS, Y-AXIS, THROTTLE and RUDDER	5V	V _{OL} =0.4V	2	4	—	mA
I _{OH}	Output Port Source Current	5V	V _{OH} =3.4V	-2.5	-4	—	mA
V _{LVR}	Low Voltage Reset	5V	—	2.4	2.7	3	V

Note: Reset pins voltage level is CMOS level

IO pins voltage level is TTL level

A.C. Characteristics

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{DD}	Conditions				
f _{sys}	System Clock (Crystal OSC)	5V	—	—	6	—	MHz
f _{RCSYS}	RC Clock with 8-bit Prescaler Register	5V	—	0	32	—	kHz
t _{WDT}	Watchdog Time-out Period (System Clock)	—	Without WDT prescaler	1024	—	—	t _{RCSYS}
t _{RF}	USBD+, USBD- Rising & Falling Time	—	—	75	—	300	ns
t _{SST}	System Start-up Timer Period	—	Wake-up from HALT	—	1024	—	t _{sys}
t _{OSC}	Crystal Setup	—	—	—	5	10	ms
f _{PWM}	PWM Cycle Period Decide by Driver	—	6MHz	—	810	—	Hz

Note: Power-on period=t_{WDT}+t_{SST}+t_{OSC}

WDT Time-out in normal mode=1/f_{RCSYS}×256×WDTS+t_{WDT}

WDT Time-out in HALT mode=1/f_{RCSYS}×256×WDTS+t_{SST}+t_{OSC}
Functional Description
Device to PC Command

Byte1: Throttle value

Byte3: X-Axis value

Byte5: 00H

Byte7: Button 5~Button 12 value

Byte2: Rudder value

Byte4: Y-Axis value

Byte6: Hat switch and Button1~Button4 value

PC to Device Command

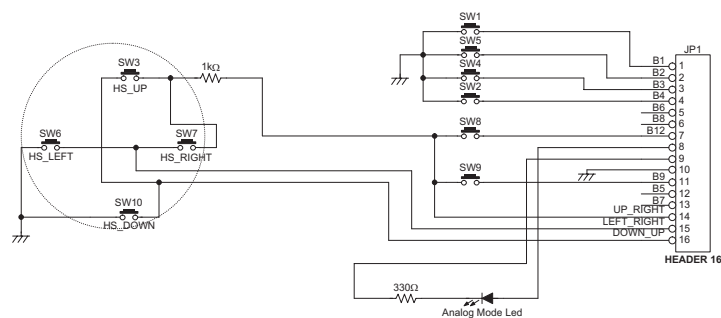
Byte1: Vibration function enable or disable

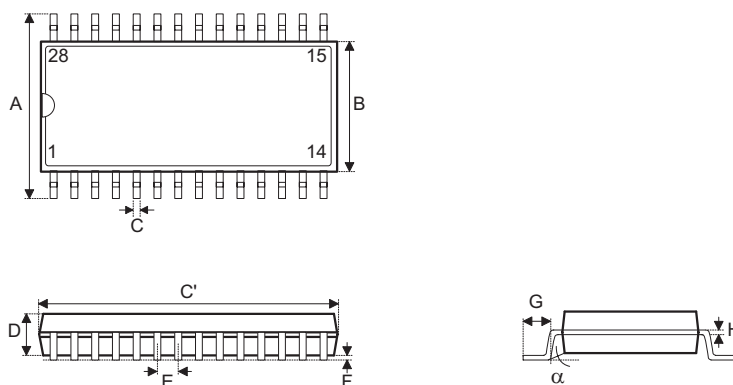
Byte3: Left Vibration function intensity

Byte5: Right Vibration function intensity

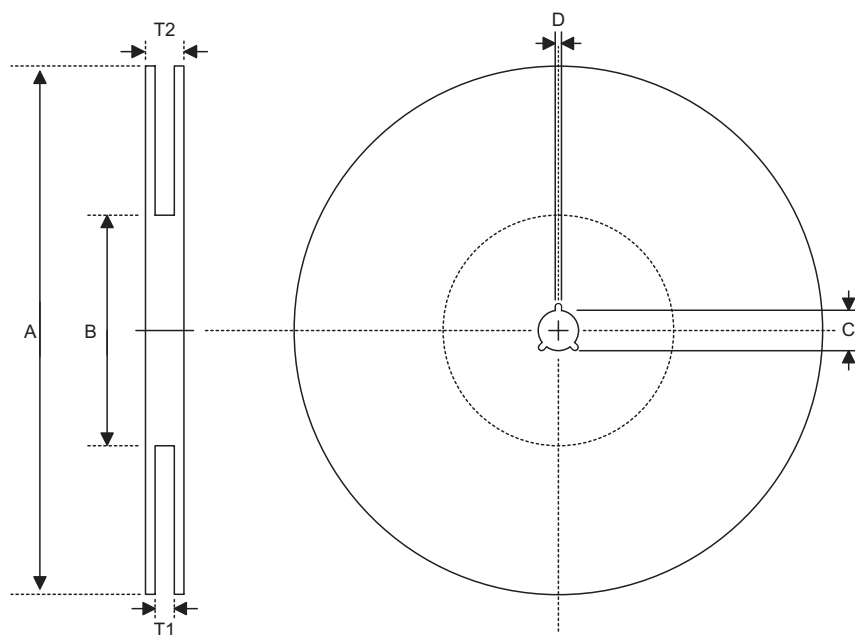
Wake-up: None

Top Circuit



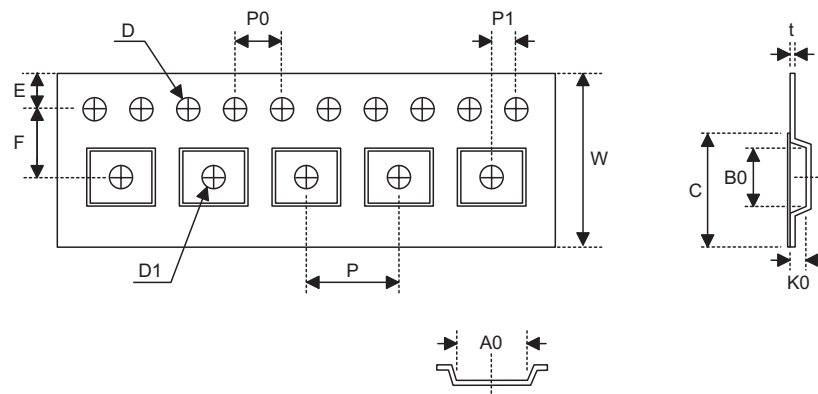
Package Information
28-pin SOP (300mil) Outline Dimensions


Symbol	Dimensions in mil		
	Min.	Nom.	Max.
A	394	—	419
B	290	—	300
C	14	—	20
C'	697	—	713
D	92	—	104
E	—	50	—
F	4	—	—
G	32	—	38
H	4	—	12
α	0°	—	10°

Product Tape and Reel Specifications
Reel Dimensions


SOP 28W (300mil)

Symbol	Description	Dimensions in mm
A	Reel Outer Diameter	330±1.0
B	Reel Inner Diameter	62±1.5
C	Spindle Hole Diameter	13.0+0.5 -0.2
D	Key Slit Width	2.0±0.5
T1	Space Between Flange	24.8+0.3 -0.2
T2	Reel Thickness	30.2±0.2

Carrier Tape Dimensions


SOP 28W (300mil)

Symbol	Description	Dimensions in mm
W	Carrier Tape Width	24.0±0.3
P	Cavity Pitch	12.0±0.1
E	Perforation Position	1.75±0.1
F	Cavity to Perforation (Width Direction)	11.5±0.1
D	Perforation Diameter	1.5±0.1
D1	Cavity Hole Diameter	1.5±0.25
P0	Perforation Pitch	4.0±0.1
P1	Cavity to Perforation (Length Direction)	2.0±0.1
A0	Cavity Length	10.85±0.1
B0	Cavity Width	18.34±0.1
K0	Cavity Depth	2.97±0.1
t	Carrier Tape Thickness	0.35±0.01
C	Cover Tape Width	21.3

Holtek Semiconductor Inc. (Headquarters)

No.3, Creation Rd. II, Science Park, Hsinchu, Taiwan
Tel: 886-3-563-1999
Fax: 886-3-563-1189
<http://www.holtek.com.tw>

Holtek Semiconductor Inc. (Taipei Sales Office)

4F-2, No. 3-2, YuanQu St., Nankang Software Park, Taipei 115, Taiwan
Tel: 886-2-2655-7070
Fax: 886-2-2655-7373
Fax: 886-2-2655-7383 (International sales hotline)

Holtek Semiconductor Inc. (Shanghai Sales Office)

7th Floor, Building 2, No.889, Yi Shan Rd., Shanghai, China 200233
Tel: 021-6485-5560
Fax: 021-6485-0313
<http://www.holtek.com.cn>

Holtek Semiconductor Inc. (Shenzhen Sales Office)

43F, SEG Plaza, Shen Nan Zhong Road, Shenzhen, China 518031
Tel: 0755-8346-5589
Fax: 0755-8346-5590
ISDN: 0755-8346-5591

Holtek Semiconductor Inc. (Beijing Sales Office)

Suite 1721, Jinyu Tower, A129 West Xuan Wu Men Street, Xicheng District, Beijing, China 100031
Tel: 010-6641-0030, 6641-7751, 6641-7752
Fax: 010-6641-0125

Holmate Semiconductor, Inc. (North America Sales Office)

46712 Fremont Blvd., Fremont, CA 94538
Tel: 510-252-9880
Fax: 510-252-9885
<http://www.holmate.com>

Copyright © 2005 by HOLTEK SEMICONDUCTOR INC.

The information appearing in this Data Sheet is believed to be accurate at the time of publication. However, Holtek assumes no responsibility arising from the use of the specifications described. The applications mentioned herein are used solely for the purpose of illustration and Holtek makes no warranty or representation that such applications will be suitable without further modification, nor recommends the use of its products for application that may present a risk to human life due to malfunction or otherwise. Holtek's products are not authorized for use as critical components in life support devices or systems. Holtek reserves the right to alter its products without prior notification. For the most up-to-date information, please visit our web site at <http://www.holtek.com.tw>.