HT82J927A
USB Gamepad

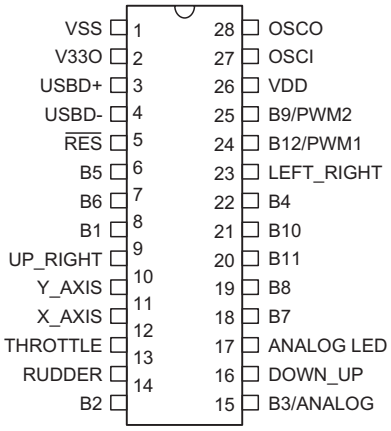
Features

- 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 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 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
$\overline{RES}$	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

Input Voltage ..... V_{SS}–0.3V to V_{DD}+0.3V

Storage Temperature ..... –50°C to 125°C

Operating Temperature ..... 0°C to 70°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 ($\overline{RES}$)	5V	—	0	—	$0.4V_{DD}$	V
V_{IH2}	Input High Voltage ($\overline{RES}$)	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
Byte2: Rudder value
Byte3: X-Axis value
Byte4: Y-Axis value
Byte5: 00H
Byte6: Hat switch and Button1~Button4 value
Byte7: Button 5~Button 12 value

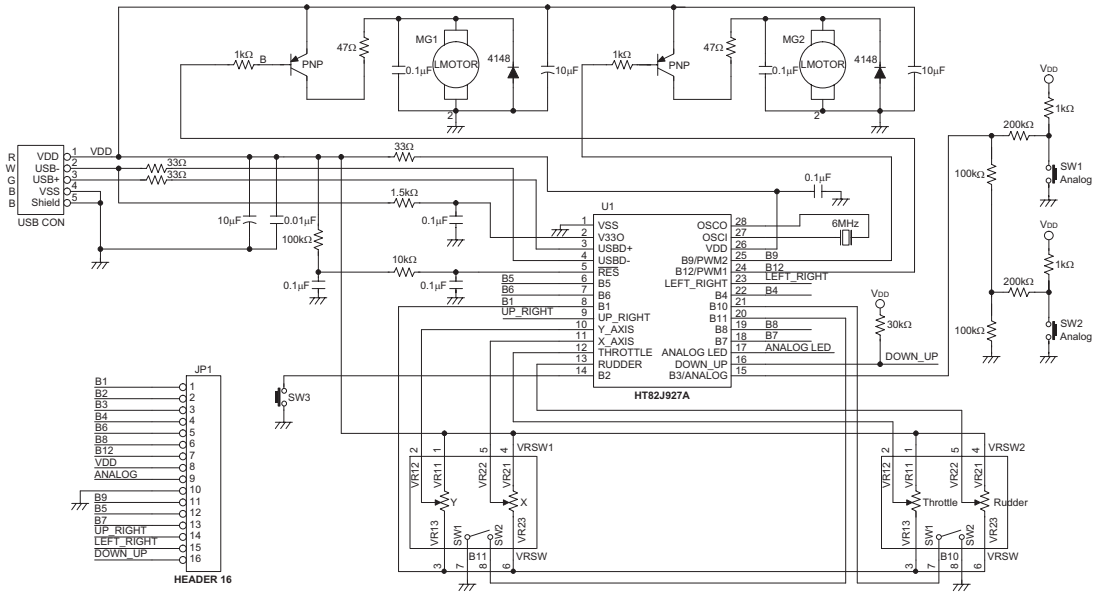
PC to Device Command

Byte1: Vibration function enable or disable
Byte3: Left Vibration function intensity
Byte5: Right Vibration function intensity

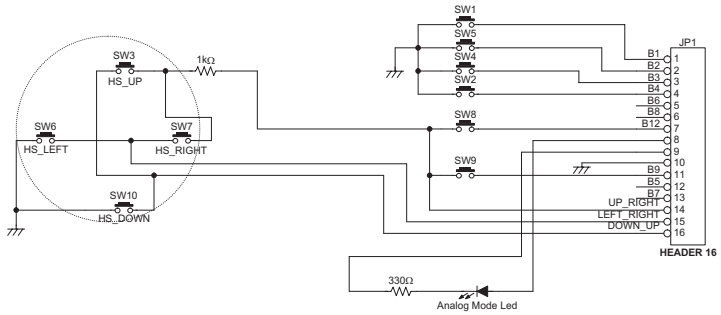
Wake-up: None

Application Circuits

Top Circuit

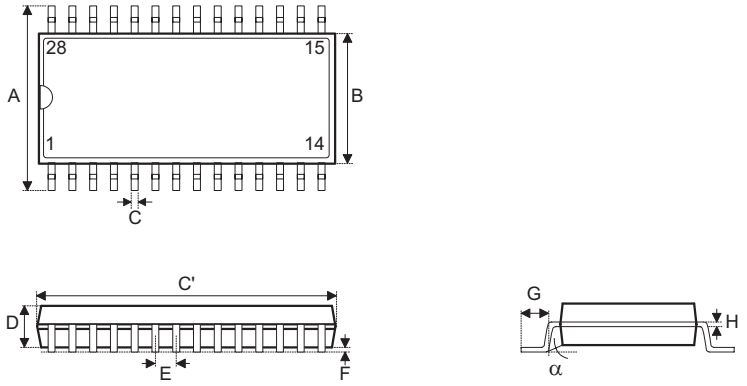


Button Circuit



Package Information

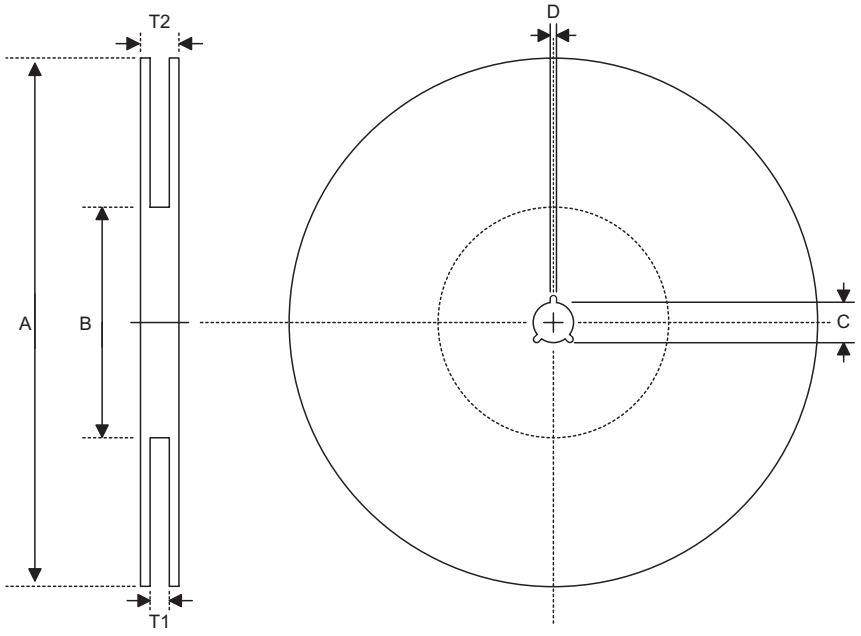
28-pin SOP (300mil) Outline Dimensions



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

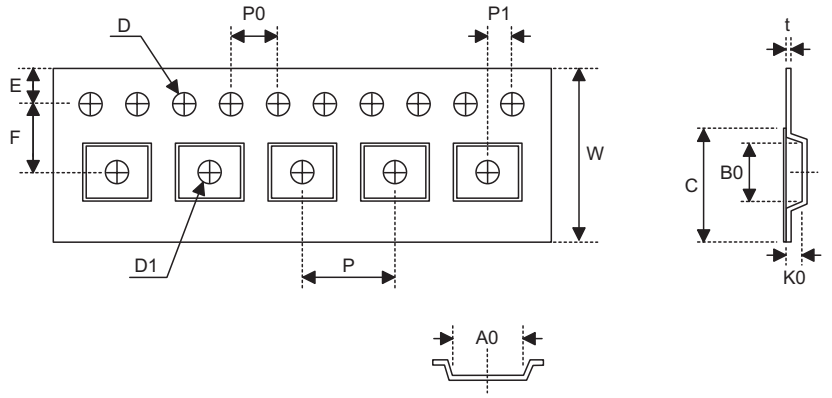
Reel Dimensions



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

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