32-Channel Serial to Parallel Converter with P-Channel Open Drain Outputs

Features

- Processed with HVCMOS® Technology
- Output voltages to -220V
- Source current minimum 60mA
- ► Shift register speed 8.0MHz
- Polarity and blanking inputs
- CMOS compatible inputs
- Forward and reverse shifting options
- Can be used with the HV5622 to provide 220V push-pull operation
- 44-lead PLCC surface mount package

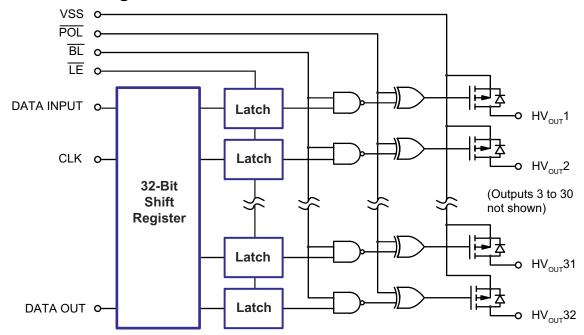
General Description

The HV4622 is a low-voltage serial to high-voltage parallel converter with P-Channel open drain outputs. This device has been designed for use a driver for AC-electroluminescent displays. It can also be used in any application requiring multiple output high-voltage current source capabilities, such as driving inkjet and electrostatic print heads, plasma panels, or vacuum fluorescent displays.

This device consists of a 32-bit shift register, 32 data latches, and control logic to perform polarity and blanking functions. Data is shifted through the shift register on the logic high-to-low transition of the clock. The HV4622 shifts in the clockwise direction (when viewed from the top of the package). A data output buffer is provided for cascading devices. This output reflects the current status of the last bit of the shift register. The data in the shift register is latched when the latch enable pin is brought to logic high, and then returned to ground. If the latch enable pin is held high, the latch becomes transparent and the shift register data is directly reflected in the outputs.

For applications requiring active pull down as well as pull up, the HV4622 can be paired with the HV5622.

Functional Block Diagram



Ordering Information

	Package Options
Device	44-Lead PLCC .653x.653in body .180in height (max) .050in pitch
HV4622	HV4622PJ-G



Absolute Maximum Ratings

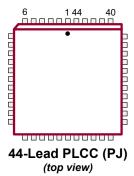
Parameter	Value
Supply voltage, V _{DD}	+0.5V to -16V
Output voltage, V _{PP}	+0.5V to -240V
Logic input levels	+0.5V to V _{DD} -0.3V
Ground current ¹	1.5A
Continuous total power dissipation ²	1200mW
Operating temperature range	-40°C to +85°C
Storage temperature range	-65°C to +150°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied. Continuous operation of the device at the absolute rating level may affect device reliability. All voltages are referenced to $V_{\rm SS}$:

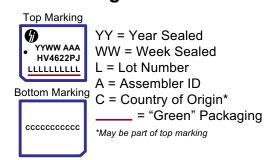
Notes:

- 1. Duty cycle limited by the total power dissipated in the package.
- 2. For operation above 25°C ambiant derate linearly to maximum operating temperature at 20mW/°C.

Pin Configuration



Product Marking



Package may or may not include the following marks: Si or **44-Lead PLCC (PJ)**

Recommended Operating Conditions

Sym	Parameter	Min	Max	Units
V _{DD}	Logic supply voltage	-10.8	-13.2	V
V_{pp}	Output voltage	+0.3	-220	V
V _{IH}	High-level input voltage (Logic "1")	V _{DD} +2.0V	$V_{_{\mathrm{DD}}}$	V
V _{IL}	Low-level input voltage (Logic "0")	0	-2.0	V
f _{CLK}	Clock frequency	-	8.0	MHz
T _A	Operating free-air temperature	-40	+85	°C

Note

All voltages are referenced to V_{ss}.

⁻G indicates package is RoHS compliant ('Green')

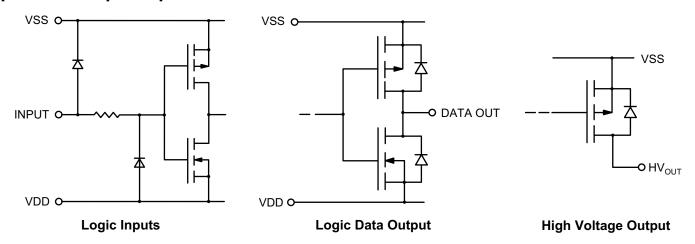
DC Electrical Characteristics (Over recommended operating conditions unless otherwise noted)

Sym	Parameter		Min	Max	Units	Conditions
I _{DD}	V _{DD} supply current		-	-15	mA	$f_{CLK} = 8.0MHz, F_{DATA} = 4.0MHz$
I _{DDQ}	Quiescent V _{DD} supply	current	-	-100	μA	$V_{IN} = V_{SS}$ or V_{DD}
I _{O(OFF)}	Off state output curre	nt	-	-100	μA	All SWS parallel
I _{IH}	High-level logic input	-	-1.0	μA	$V_{IH} = V_{DD}$	
I _{IL}	Low-level logic input	-	+1.0	μA	V _{IL} = V _{SS}	
V _{OH}	High level output	V _{DD} +1.0V	-	V	I _{DOUT} = -100μA	
\/	Low lovel output	HV _{OUT}	-	-30	V	I _{HVOUT} = -60mA
V _{OL}	Low level output	D _{OUT}	-	-1.0	V	I _{DOUT} = -100μA
V _{oc}	HV _{OUT} clamp voltage	-	+1.5	V	I _{OL} = +60mA	

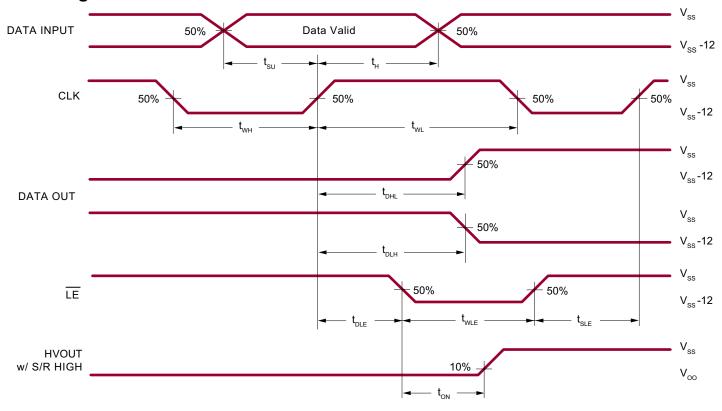
AC Electrical Characteristics (V_{DD} = -12V, T_c = 25°C)

Sym	Parameter	Min	Max	Units	Conditions
f _{CLK}	Clock frequency	-	8.0	MHz	
t_{WH}, t_{WL}	Clock width high or low	62	-	ns	
t _{su}	Data set-up time before clock rises	50	-	ns	
t _H	Data hold time after clock rises	20	-	ns	
t _{on}	Turn on time, HV_{OUT} from enable	-	400	ns	$R_L = 10K\Omega$ to V_{OO} max
t _{DHL}	Delay time clock to data high to low	-	100	ns	C _L = 15pF
t _{DLH}	Delay time clock to data low to high	-	100	ns	C _L = 15pF
t _{DLE}	Delay time clock to LE high to low	50	-	ns	
t _{wle}	LE pulse width	50	-	ns	
t _{SLE}	LE set-up time before clock rises	50	-	ns	

Input and Output Equivalent Circuits



Switching Waveforms



Function Table

			Inputs			Outputs					
Function		21.16			POL	Shift Reg		HV Outputs		Data Out	
	Data	CLK	LE	BL		1	232	1	232	*	
All on	Х	Х	Х	L	L	*	**	Н	НН	*	
All off	Х	Х	X	L	Н	*	**	L	LL	*	
Invert mode	Х	Х	L	Н	L	*	**	*	**	*	
Load S/R	H or L	1	L	Н	Н	H or L	**	*	**	*	
Load latabas	Х	H or L	1	Н	Н	*	**	*	**	*	
Load latches	Х	H or L	1	Н	L	*	**	*	**	*	
Transparent latch mode	L	1	Н	Н	Н	L	**	L	**	*	
	Н	\	Н	Н	Н	Н	* *	Н	* *	*	

Notes:

H = high level = -12V, L = low level = 0V, X = irrelevant, \downarrow = high-to-low transition, \uparrow = low-to-high transition.

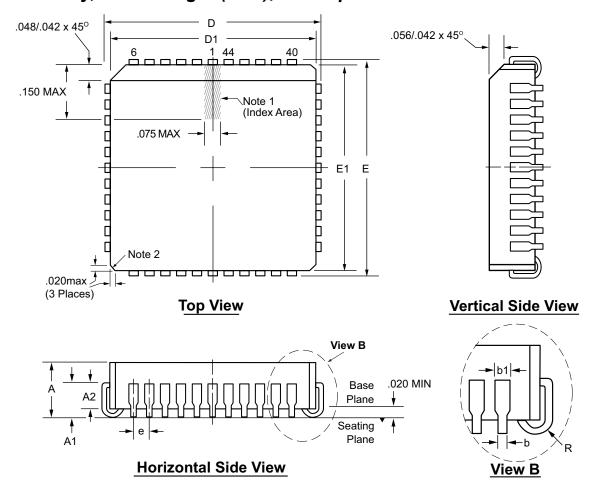
^{* =} dependent on previous stage's state before the last CLK high-to-low transition or last LE high.

Pin Description

Pin #	Function	Description							
1	HV _{out} 16								
2	HV _{out} 15								
3	HV _{out} 14								
4	HV _{out} 13								
5	HV _{out} 12								
6	HV _{out} 11								
7	HV _{out} 10								
8	HV _{OUT} 9	IP-II - III - II - II							
9	HV _{OUT} 8	High voltage outputs.							
10	HV _{OUT} 7								
11	HV _{OUT} 6								
12	HV _{OUT} 5								
13	HV _{OUT} 4								
14	HV _{OUT} 3								
15	HV _{OUT} 2								
16	HV _{out} 1								
17	N/C	No connect.							
18	Data Out	Data output pin.							
19	N/C								
20	N/C	No connect.							
21	N/C								
22	POL	Inverts the polarity of the HV _{OUT} pins							
23	CLOCK	Clock pin, shift registers shifts data on rising edge of input clock.							
24	VSS	Reference voltage, usually ground.							
25	VDD	Logic supply voltage.							
26	ĪĒ	Logic enable pin, data is shifted from shift register to latches on logic input low.							
27	Data In	Data input pin.							
28	BL	Blanking pin, logic input low sets all HV _{OUT} pins low.							
29	HV _{оит} 32								
30	HV _{оит} 31								
31	HV _{OUT} 30								
32	HV _{OUT} 29								
33	HV _{OUT} 28								
34	HV _{OUT} 27								
35	HV _{OUT} 26								
36	HV _{OUT} 25	High voltage outputs.							
37	HV _{OUT} 24								
37	HV _{OUT} 23								
39	HV _{OUT} 22								
40	HV _{OUT} 21								
41	HV _{OUT} 20								
42	HV _{OUT} 19								
43	HV _{OUT} 18								
44	HV _{OUT} 17								

44-Lead PLCC Package Outline (PJ)

.653x.653in body, .180in height (max), .050in pitch



Notes:

- A Pin 1 identifier must be located in the index area indicated. The Pin 1 identifier can be: a molded mark/identifier; an embedded metal marker; or a printed indicator.
- 2. Actual shape of this feature may vary.

Symb	ol	Α	A 1	A2	b	b1	D	D1	E	E1	е	R
Dimension (inches)	MIN	.165	.090	.062	.013	.026	.685	.650	.685	.650		.025
	NOM	.172	.105	-	-	-	.690	.653	.690	.653	.050 BSC	.035
	MAX	.180	.120	.083	.021	.036 [†]	.695	.656	.695	.656		.045

JEDEC Registration MS-018, Variation AC, Issue A, June, 1993.

† This dimension differs from the JEDEC drawing.

Drawings not to scale.

Supertex Doc. #: DSPD-44PLCCPJ, Version F031111.

(The package drawing(s) in this data sheet may not reflect the most current specifications. For the latest package outline information go to http://www.supertex.com/packaging.html.)

Supertex inc. does not recommend the use of its products in life support applications, and will not knowingly sell them for use in such applications unless it receives an adequate "product liability indemnification insurance agreement." **Supertex inc.** does not assume responsibility for use of devices described, and limits its liability to the replacement of the devices determined defective due to workmanship. No responsibility is assumed for possible omissions and inaccuracies. Circuitry and specifications are subject to change without notice. For the latest product specifications refer to the **Supertex inc.** (website: http://www.supertex.com)

©2011 **Supertex inc.** All rights reserved. Unauthorized use or reproduction is prohibited

