

December 2013

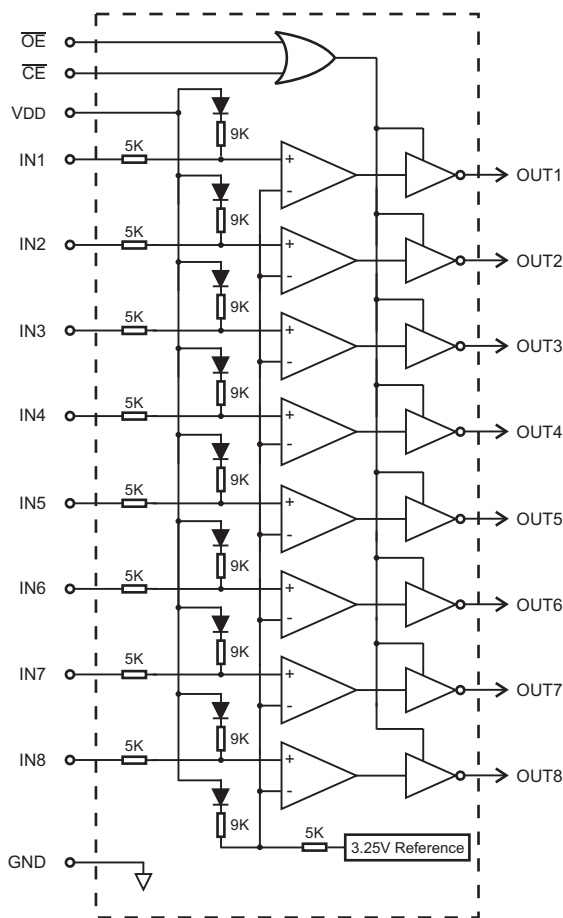
### DESCRIPTION

The HI-8420 is a six channel discrete-to-digital interface device. The HI-8423 has eight channels. Mixed-signal CMOS technology is used to provide superior low-power performance. The device inputs are configured to sense Ground / Open discrete signals. The device outputs are CMOS / TTL compatible and may be disabled (tri-state) using the  $\overline{CE}$  and  $\overline{OE}$  pins.

The HI-8420 is a drop-in replacement for the DEI1026.

For added functionality, the Holt HI-8422 offers eight channels of Open / Ground sensing and eight channels of 28V / Ground sensing in a single device.

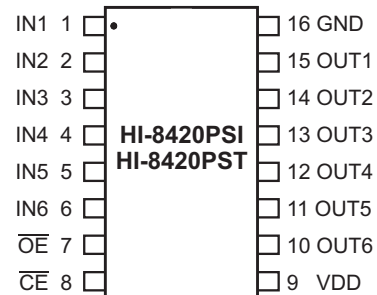
### BLOCK DIAGRAM



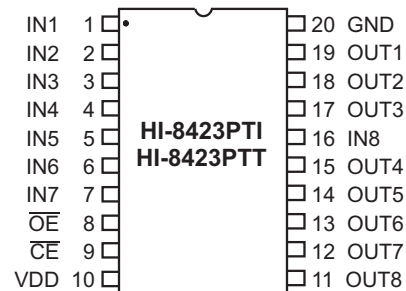
### FEATURES

- 6 or 8 independent Open / Ground sensing channels
- 5.0V single supply operation
- Low power CMOS technology
- Industrial and Extended temperature ranges
- HI-8420 is a drop in replacement for DEI1026

### PIN CONFIGURATIONS



**16-Pin Plastic SOIC package  
(Narrow Body)**



**20 Pin TSSOP package**

### FUNCTION TABLE

Discrete Input	$\overline{CE}$	$\overline{OE}$	Output
Open	0	0	0
Ground	0	0	1
X	1	X	High Z
X	X	1	High Z

**PIN DESCRIPTIONS**

PIN		SYMBOL	FUNCTION	DESCRIPTION
(HI-8420)	(HI-8423)			
1	1	IN1	Discrete Input	Open / Ground sensing input, channel 1
2	2	IN2	Discrete Input	Open / Ground sensing input, channel 2
3	3	IN3	Discrete Input	Open / Ground sensing input, channel 3
4	4	IN4	Discrete Input	Open / Ground sensing input, channel 4
5	5	IN5	Discrete Input	Open / Ground sensing input, channel 5
6	6	IN6	Discrete Input	Open / Ground sensing input, channel 6
-	7	IN7	Discrete Input	Open / Ground sensing input channel 7
7	8	$\overline{OE}$	Digital input	Output Enable. OUT1-OUT8 are high-impedance if $\overline{OE}$ is high
8	9	$\overline{CE}$	Digital input	Chip Enable. OUT1-OUT8 are high-impedance if $\overline{CE}$ is high
9	10	VDD	Power	Positive supply voltage 5.0 V
-	11	OUT8	Tri-state output	Logic output, channel 8
-	12	OUT7	Tri-state output	Logic output, channel 7
10	13	OUT6	Tri-state output	Logic output, channel 6
11	14	OUT5	Tri-state output	Logic output, channel 5
12	15	OUT4	Tri-state output	Logic output, channel 4
-	16	IN8	Discrete Input	Open / Ground sensing input, channel 8
13	17	OUT3	Tri-state output	Logic output, channel 3
14	18	OUT2	Tri-state output	Logic output, channel 2
15	19	OUT1	Tri-state output	Logic output, channel 1
16	20	GND	Power	Ground

## ABSOLUTE MAXIMUM RATINGS

Supply voltage (VDD)	-0.3 V to +7 V
Logic input voltage range	-0.3 V to +5.5 V
Discrete input voltage range	-80 V to + 80 V
Power dissipation at 25°C	350 mW
Solder temperature (reflow)	260°C
Storage temperature	-65°C to +150°C

## RECOMMENDED OPERATING CONDITIONS

Supply Voltage	
VDD .....	4.5 V to 5.5 V
Operating Temperature Range	
Industrial Screening .....	-40°C to +85°C
Hi-Temp Screening .....	-55°C to +125°C

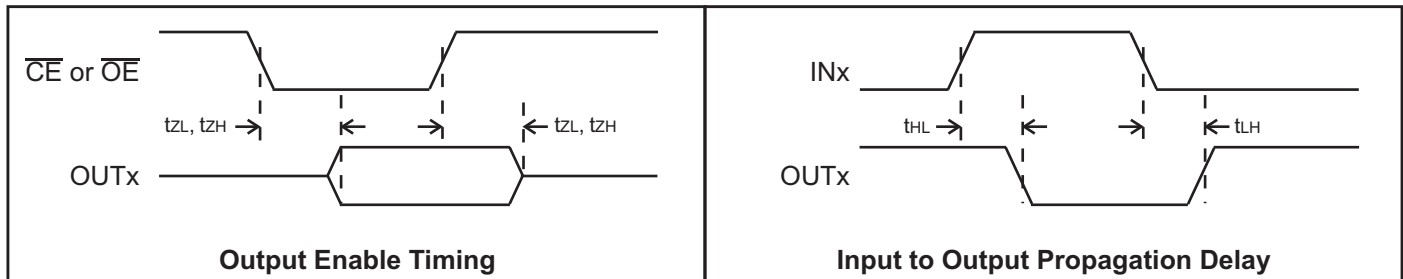
NOTE: Stresses above absolute maximum ratings or outside recommended operating conditions may cause permanent damage to the device. These are stress ratings only. Operation at the limits is not recommended.

## ELECTRICAL CHARACTERISTICS

VDD = 5.0V ± 10%, GND = 0V, TA = Operating Temperature Range (unless otherwise specified).

PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNITS
<b>DISCRETE INPUTS</b>						
Ground state input voltage	VSG	Input voltage to give high output			3.0	V
Open state input voltage	VSO	Input voltage to give low output	3.5			V
Ground state input resistor	RIG	Resistor from input to ground to give high output	0		100	Ω
Open state input resistor	RIO	Resistor from input to ground to give low output	100			KΩ
Input source current	IIO	Current sourced into 100Ω to ground	-100	-330		μA
Reverse leakage current	IIR	VIN = 35 V, VDD = 0 V			5.0	mA
<b>LOGIC INPUTS (<math>\overline{CE}</math>, <math>\overline{OE}</math>)</b>						
Input Voltage	Input voltage HI	V <sub>IH</sub>	2.0			V
	Input voltage LO	V <sub>IL</sub>			0.8	V
Input current	Input sink	I <sub>IH</sub>			1.0	μA
	Input source	I <sub>IL</sub>	-1.0			μA
<b>OUTPUTS</b>						
Logic output voltage	High	V <sub>OH</sub>	2.4			V
	Low	V <sub>OL</sub>			0.4	V
Logic output voltage (CMOS)	High	V <sub>OH</sub>	V <sub>DD</sub> - 0.2			V
	Low	V <sub>OL</sub>			0.2	V
Tri-state output current		I <sub>OZ</sub>			±10	μA
<b>SUPPLY CURRENT</b>						
VDD current		I <sub>DD</sub>		5	10	mA
<b>SWITCHING CHARACTERISTICS</b>						
Propagation delay	IN to OUT	t <sub>LH</sub> , t <sub>HL</sub>			150	ns
Output enable time		t <sub>ZL</sub> , t <sub>ZH</sub>			25	ns
Output disable time		t <sub>LZ</sub> , t <sub>HZ</sub>			25	ns

## TIMING DIAGRAMS



## INPUT SWITCHING THRESHOLD

The input switching threshold of the Open / Ground inputs will decrease with increasing series resistance according to the function

$$V_T = 3.25 - 0.1R$$

where  $V_T$  is the nominal input switching threshold, and  $R$  is the value of the external series resistor in Kohms.

## ORDERING INFORMATION

HI - 842xxx x x

PART NUMBER	LEAD FINISH
Blank	Tin / Lead (Sn / Pb) Solder
F	100% Matte Tin (Pb-free, RoHS compliant)

PART NUMBER	TEMPERATURE RANGE	FLOW	BURN IN
I	-40°C TO +85°C	I	NO
T	-55°C TO +125°C	T	NO

PART NUMBER	PACKAGE DESCRIPTION
8420PS	16 PIN PLASTIC NARROW BODY SOIC (16HN)
8423PT	20 PIN PLASTIC TSSOP (20HT)

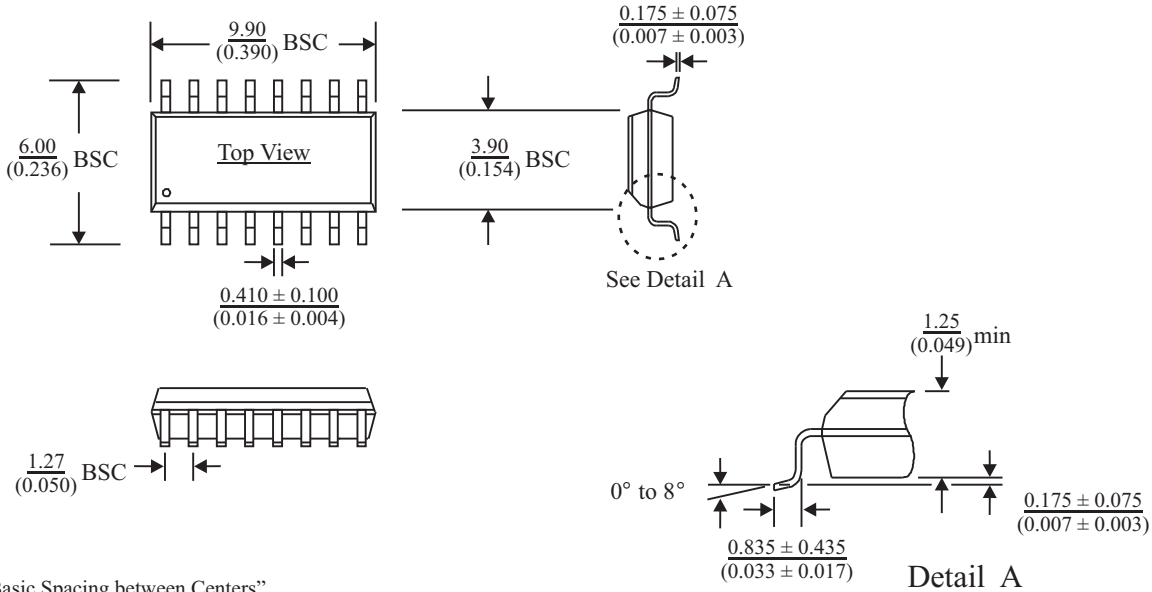
## REVISION HISTORY

P/N	Rev	Date	Description of Change
DS8420	E	08/04/10	Removed reference to lightning protected inputs throughout datasheet, increased discrete input voltage range and added reference to available temperature ranges.
	F	12/10/13	Update package information. Update solder reflow temperature in Absolute Maximum Ratings table.

**16-PIN PLASTIC SMALL OUTLINE (SOIC) - NB**  
(Narrow Body)

millimeters (inches)

Package Type: 16HN

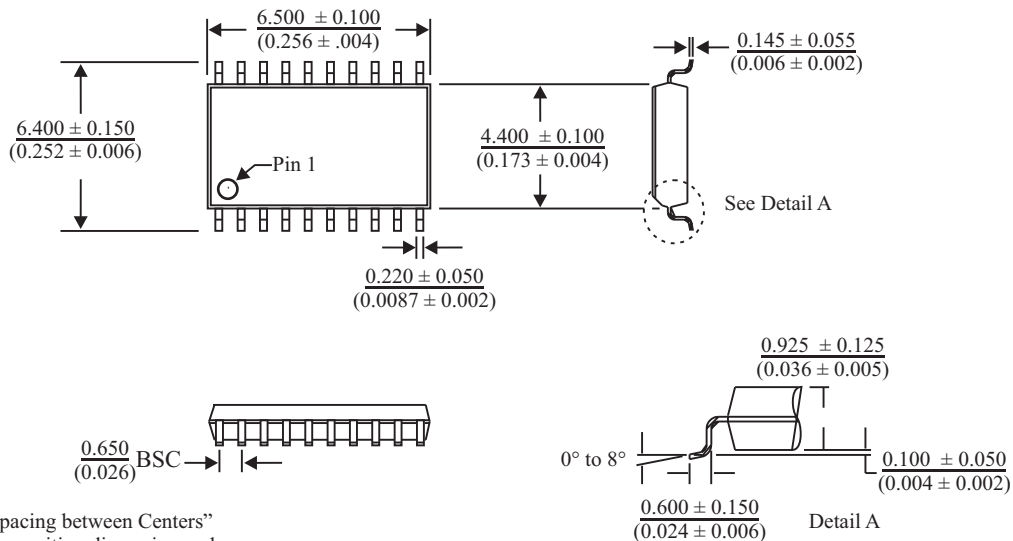


BSC = "Basic Spacing between Centers" is theoretical true position dimension and has no tolerance. (JEDEC Standard 95)

**20-PIN PLASTIC TSSOP**

millimeters(inches)

Package Type: 20HS



BSC = "Basic Spacing between Centers" is theoretical true position dimension and has no tolerance. (JEDEC Standard 95)