

Six-Channel Discrete-to-Digital Interface  
Sensing Open / Ground Signals

**DESCRIPTION**

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

The device is a drop-in replacement for the DE11026. 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.

The HI-8420 is offered in a small footprint 16-pin plastic package. Please contact the Holt sales department for other packaging options.

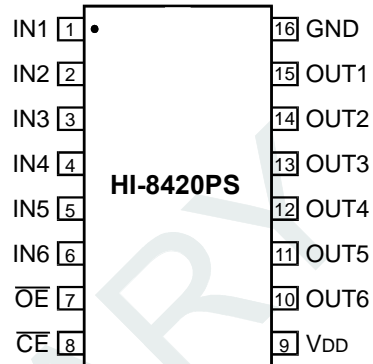
**FEATURES**

- Six independent Open / Ground sensing channels
- 5.0V single supply operation
- Low power CMOS technology
- Military processing options available
- Drop in replacement for DE11026

**FUNCTION TABLE**

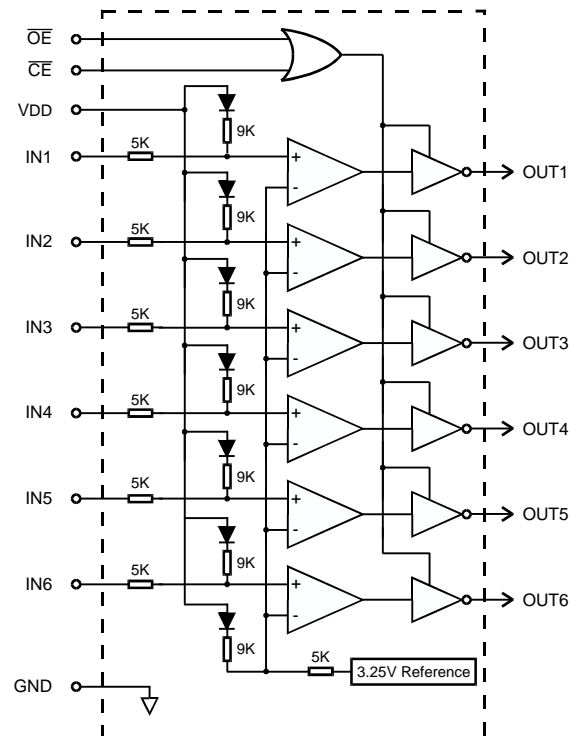
Discrete Input	$\overline{CE}$	$\overline{OE}$	Output
Open	0	0	0
Ground	0	0	1
X	1	X	High Z
X	X	1	High Z

**PIN CONFIGURATION**



16-Pin Plastic SOIC package  
(Narrow Body)

**BLOCK DIAGRAM**



## PIN DESCRIPTIONS

PIN	SYMBOL	FUNCTION	DESCRIPTION
1	IN1	Discrete Input	Open / Ground sensing input, channel 1
2	IN2	Discrete Input	Open / Ground sensing input, channel 2
3	IN3	Discrete Input	Open / Ground sensing input, channel 3
4	IN4	Discrete Input	Open / Ground sensing input, channel 4
5	IN5	Discrete Input	Open / Ground sensing input, channel 5
6	IN6	Discrete Input	Open / Ground sensing input, channel 6
7	$\overline{OE}$	Digital input	Output Enable. OUT1-OUT6 are high-impedance if $\overline{OE}$ is high
8	$\overline{CE}$	Digital input	Chip Enable. OUT1-OUT6 are high-impedance if $\overline{CE}$ is high
9	VDD	Power	Positive supply voltage 5.0 V
10	OUT6	Tri-state output	Logic output, channel 6
11	OUT5	Tri-state output	Logic output, channel 5
12	OUT4	Tri-state output	Logic output, channel 4
13	OUT3	Tri-state output	Logic output, channel 3
14	OUT2	Tri-state output	Logic output, channel 2
15	OUT1	Tri-state output	Logic output, channel 1
16	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	-5 V to +35 V
Power dissipation at 25°C	350 mW
Solder temperature	275°C for 10 sec
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).

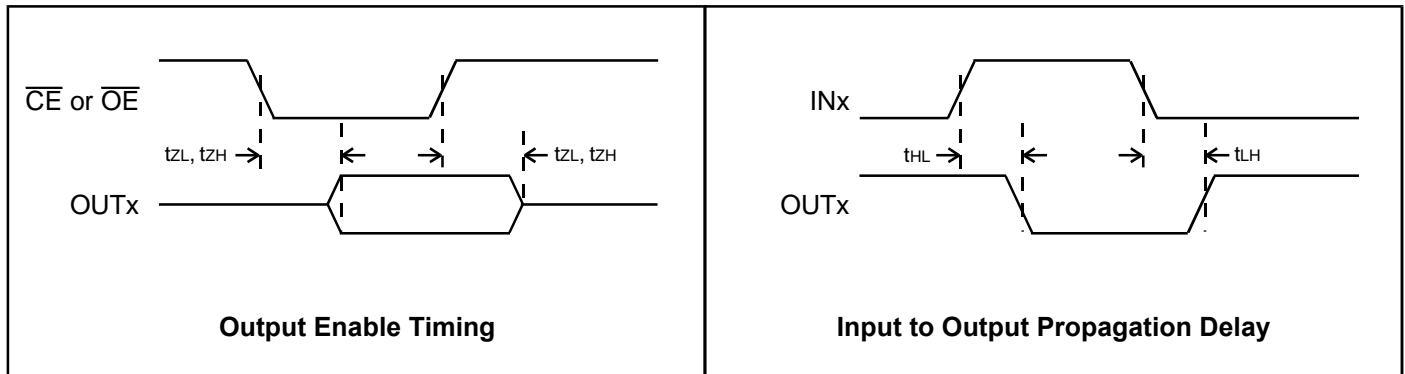
PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNITS
DISCRETE INPUTS						
Ground state input voltage	V <sub>SG</sub>	Input voltage to give high output			3.0	V
Open state input voltage	V <sub>SO</sub>	Input voltage to give low output	3.5			V
Ground state input resistor	R <sub>IG</sub>	Resistor from input to ground to give high output	0		100	Ω
Open state input resistor	R <sub>IO</sub>	Resistor from input to ground to give low output	100			KΩ
Input source current	I <sub>IO</sub>	Current sourced into 100Ω to ground	-100	-330		μA
Reverse leakage current	I <sub>IR</sub>	V <sub>IN</sub> = 35 V, V <sub>DD</sub> = 0 V			5.0	mA

## ELECTRICAL CHARACTERISTICS (Cont.)

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

PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNITS	
<b>LOGIC INPUTS (<math>\overline{CE}</math>, <math>\overline{OE}</math>)</b>							
Input Voltage	Input voltage HI	$V_{IH}$	2.0			V	
	Input voltage LO	$V_{IL}$			0.8	V	
Input current	Input sink	$I_{IH}$	$V_{IH} = V_{DD}$		1.0	$\mu A$	
	Input source	$I_{IL}$	$V_{IL} = 0 V$	-1.0		$\mu A$	
<b>OUTPUTS</b>							
Logic output voltage	High	$V_{OH}$	$I_{OH} = -5 mA$	2.4		V	
	Low	$V_{OL}$	$I_{OL} = 5 mA$		0.4	V	
Logic output voltage (CMOS)	High	$V_{OH}$	$I_{OH} = -100 \mu A$	$V_{DD} - 0.2$		V	
	Low	$V_{OL}$	$I_{OL} = 100 \mu A$		0.2	V	
Tri-state output current		$I_{OZ}$	$V_{OUT} = 0 V \text{ or } V_{DD}$		±10	$\mu A$	
<b>SUPPLY CURRENT</b>							
VDD current		$I_{DD}$	$V_{IN} = V_{DD}$ (all inputs)		5	10	mA
<b>SWITCHING CHARACTERISTICS</b>							
Propagation delay	IN to OUT	$t_{LH}, t_{HL}$			150	ns	
Output enable time		$t_{ZL}, t_{ZH}$	From $\overline{CE}$ or $\overline{OE}$		25	ns	
Output disable time		$t_{LZ}, t_{HZ}$	From $\overline{CE}$ or $\overline{OE}$		25	ns	

## TIMING DIAGRAMS



## ORDERING INFORMATION

PART NUMBER	PACKAGE DESCRIPTION	TEMPERATURE RANGE	PROCESS FLOW	BURN IN	LEAD FINISH
HI-8420PSI	16 PIN PLASTIC SOIC (NARROW BODY)	-40°C TO +85°C	I	NO	SOLDER
HI-8420PST	16 PIN PLASTIC SOIC (NARROW BODY)	-55°C TO +125°C	T	NO	SOLDER

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

Package Type: 16HN

