

October 2004

6-Channel / 8-Channel Discrete-to-Digital Interface Sensing Open / Ground Signals

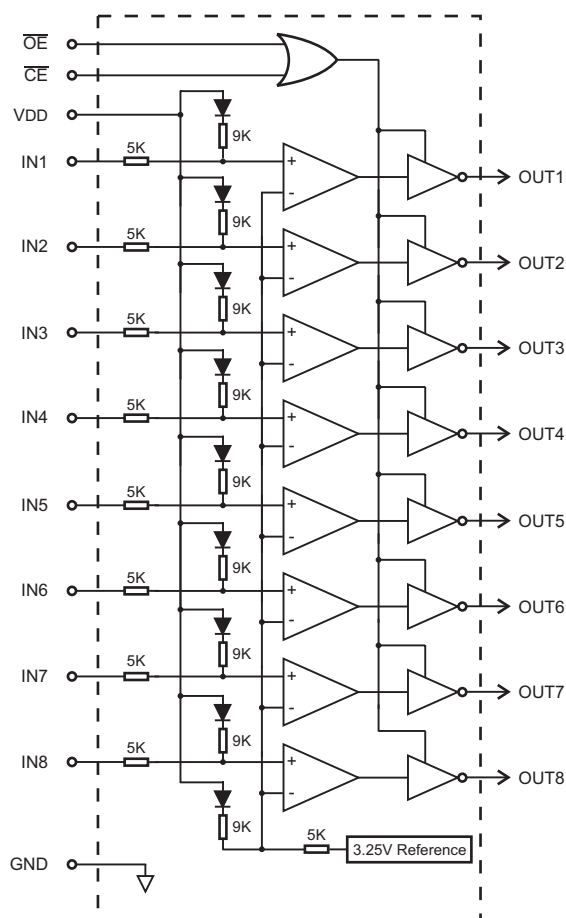
DESCRIPTION

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 DE1026.

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.

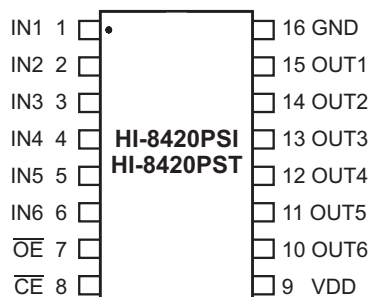
BLOCK DIAGRAM



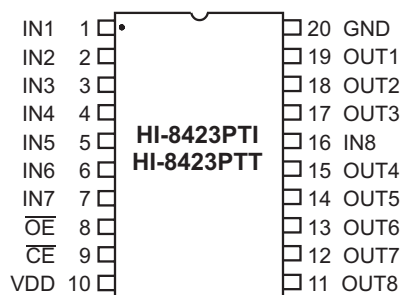
FEATURES

- 6 or 8 independent Open / Ground sensing channels
- 5.0V single supply operation
- Low power CMOS technology
- Lightning protected inputs to DO-160D level 3
- HI-8420 is a drop in replacement for DE1026

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	-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).

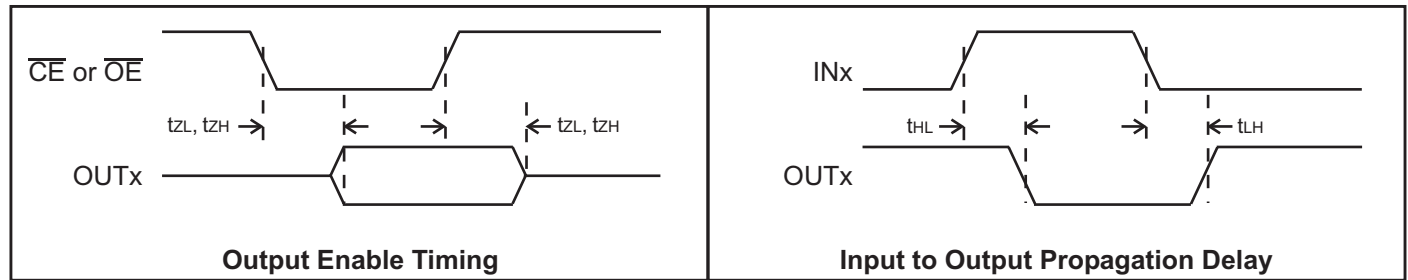
PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNITS
DISCRETE INPUTS						
Ground state input voltage	V _{SG}	Input voltage to give high output			3.0	V
Open state input voltage	V _{SO}	Input voltage to give low output	3.5			V
Ground state input resistor	R _{IG}	Resistor from input to ground to give high output	0		100	Ω
Open state input resistor	R _{IO}	Resistor from input to ground to give low output	100			KΩ
Input source current	I _{IO}	Current sourced into 100Ω to ground	-100	-330		μA
Reverse leakage current	I _{IR}	V _{IN} = 35 V, V _{DD} = 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
LOGIC INPUTS ($\overline{CE}$, $\overline{OE}$)						
Input Voltage	Input voltage HI	V_{IH}	2.0			V
	Input voltage LO	V_{IL}			0.8	V
Input current	Input sink	I_{IH}			1.0	μA
	Input source	I_{IL}	-1.0			μA
OUTPUTS						
Logic output voltage	High	V_{OH}	$I_{OH} = -5 \text{ mA}$	2.4		V
	Low	V_{OL}	$I_{OL} = 5 \text{ mA}$		0.4	V
Logic output voltage (CMOS)	High	V_{OH}	$I_{OH} = -100 \text{ }\mu A$	$V_{DD} - 0.2$		V
	Low	V_{OL}	$I_{OL} = 100 \text{ }\mu A$		0.2	V
Tri-state output current		I_{OZ}	$V_{OUT} = 0 \text{ V or } V_{DD}$		±10	μA
SUPPLY CURRENT						
VDD current	I_{DD}	$V_{IN} = V_{DD}$ (all inputs)		5	10	mA
SWITCHING CHARACTERISTICS						
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
HI-8423PTI	20 PIN PLASTIC TSSOP	-40°C TO +85°C	I	NO	SOLDER
HI-8423PTT	20 PIN PLASTIC TSSOP	-55°C TO +125°C	T	NO	SOLDER

LIGHTNING PROTECTION

The Open / Ground inputs will survive DO-160D level 3, waveforms 3 and 4 without external components. In order to guarantee survival to waveform 5A an external series resistor of at least 3.3KΩ is recommended.

INPUT SWITCHING THRESHOLD

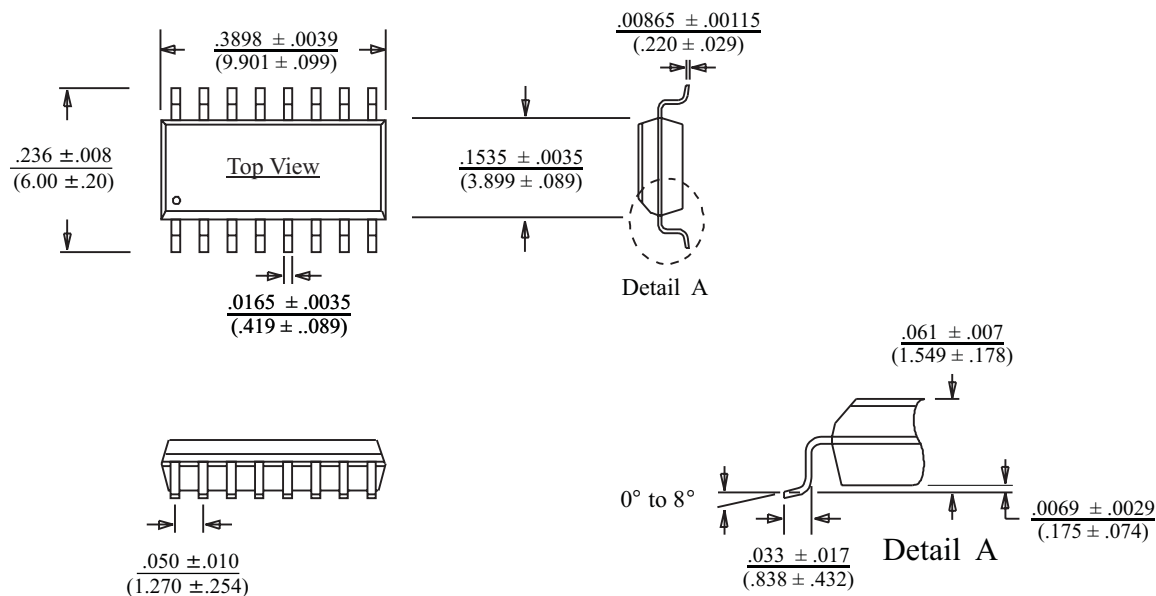
The input switching threshold of the Open / Ground inputs will decrease with increasing series resistance according to the function

$$V_T = 3.25 - 0.1R$$

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

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

Package Type: 16HN



20-PIN PLASTIC TSSOP

Package Type: 20HS

