HI-84210, HI-84240

6-Channel / 8-Channel Discrete-to-Digital 28V / Open Sensors with Integrated Lightning Protection

August 2018

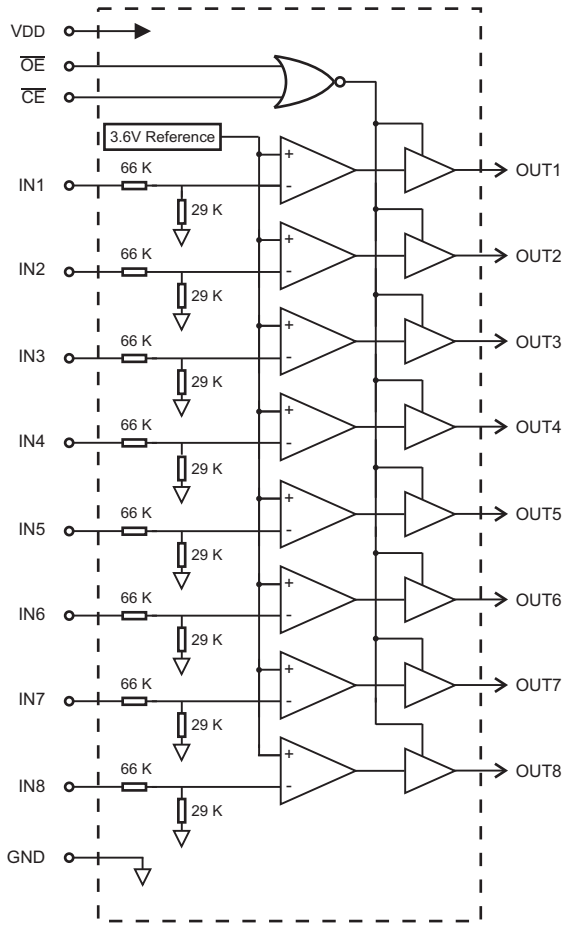
DESCRIPTION

The HI-84210 is a six channel discrete-to-digital interface device with inputs configured to sense 28V / Open discrete signals. All sense inputs are internally lightning protected to RTCA/DO160G, Section 22 Level 3 Pin Injection Test Waveform Set A (3 & 4), Set B (3 & 5A) and Set Z (3 & 5B) without using external components. The device outputs are CMOS / TTL compatible and may be disabled (tri-state) using the $\overline{CE}$ and $\overline{OE}$ pins.

The HI-84210 is a drop-in replacement for the DEI1054.

The HI-84240 is an equivalent device with eight 28V / Open sense channels.

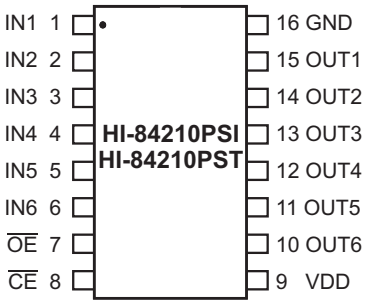
BLOCK DIAGRAM



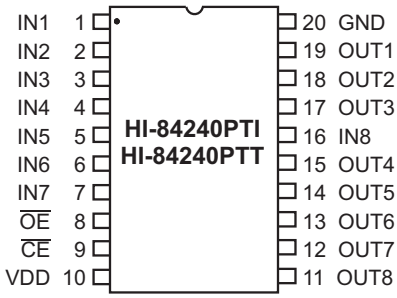
FEATURES

- 6 or 8 independent Open / Ground sensing channels
- Sense inputs internally lightning protected to RTCA/DO160G, Section 22 Level 3 Pin Injection Test Waveform Set A (3 & 4), Set B (3 & 5A) and Set Z (3 & 5B) without using external components
- 5.0V single supply operation
- Low power CMOS technology
- Industrial and Extended temperature ranges
- HI-84210 is a drop in replacement for DEI1054

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	1
28 Volts	0	0	0
X	1	X	High Z
X	X	1	High Z

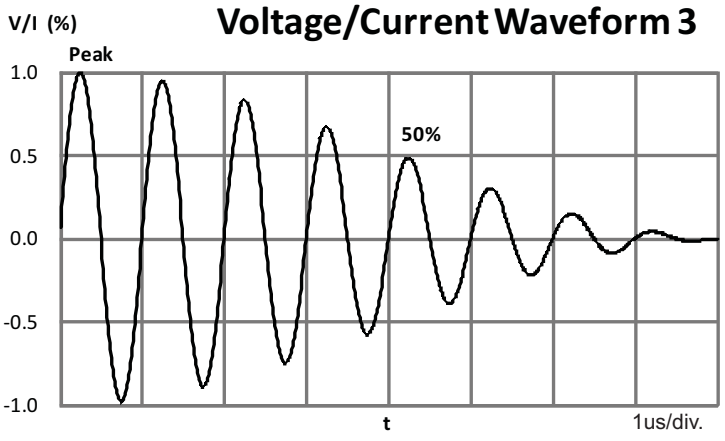
PIN DESCRIPTIONS

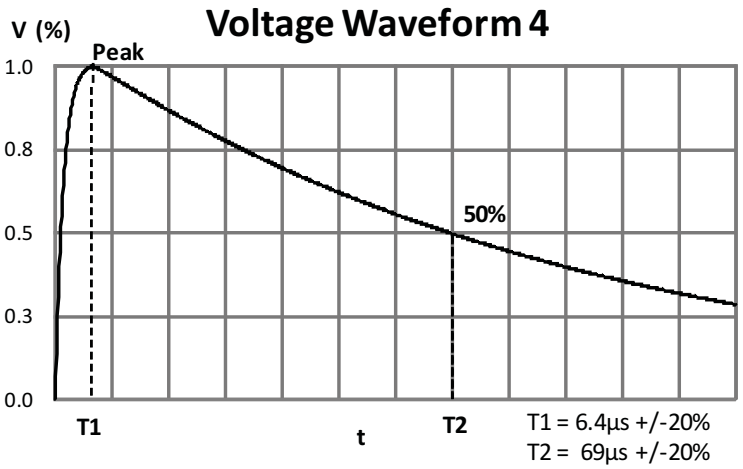
PIN		SYMBOL	FUNCTION	DESCRIPTION
(HI-84210)	(HI-84240)			
1	1	IN1	Discrete Input	28 Volt / Open sensing input, channel 1
2	2	IN2	Discrete Input	28 Volt / Open sensing input, channel 2
3	3	IN3	Discrete Input	28 Volt / Open sensing input, channel 3
4	4	IN4	Discrete Input	28 Volt / Open sensing input, channel 4
5	5	IN5	Discrete Input	28 Volt / Open sensing input, channel 5
6	6	IN6	Discrete Input	28 Volt / Open sensing input, channel 6
-	7	IN7	Discrete Input	28 Volt / Open 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	V_{DD}	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	28 Volt / Open 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

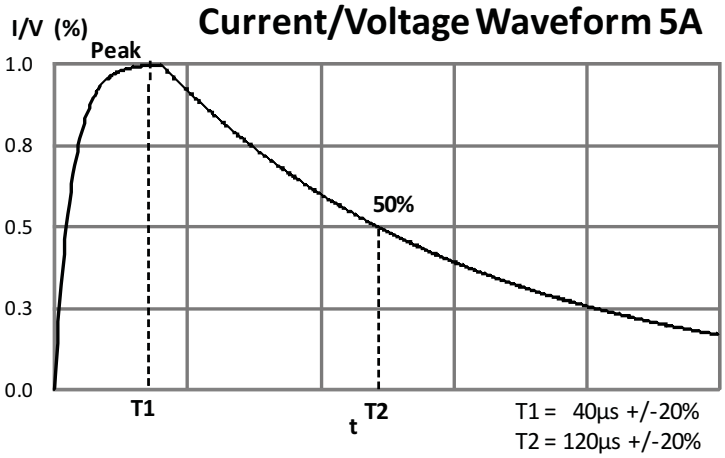
LIGHTNING PROTECTION

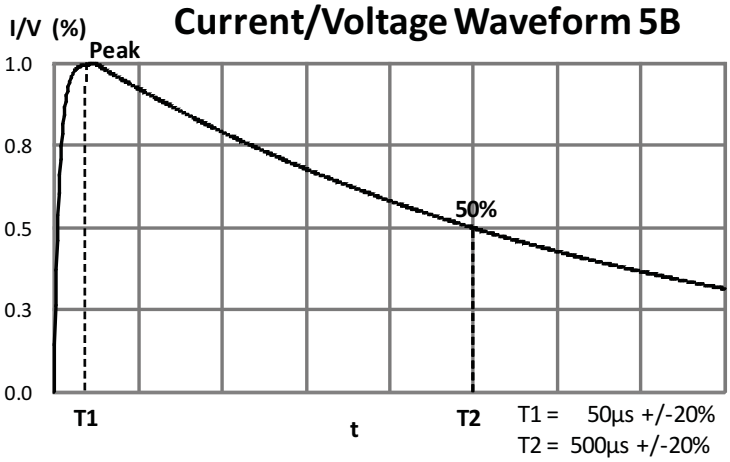
All discrete inputs are protected to RTCA/DO-160G, Section 22, Categories A3 and B3, Waveforms 3, 4, 5A, 5B with no external components. See table and waveforms below.

Level	Waveforms			
	3/3	4/4	5A/5A	5B/5B
	Voc (V) / Isc (A)	Voc (V) / Isc (A)	Voc (V) / Isc (A)	Voc (V) / Isc (A)
3	600/24	300/60	300/300	300/300









ABSOLUTE MAXIMUM RATINGS

Supply voltage (VDD)	-0.3 V to +7 V
Logic input voltage range	-0.3 V to (VDD + 0.3) 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

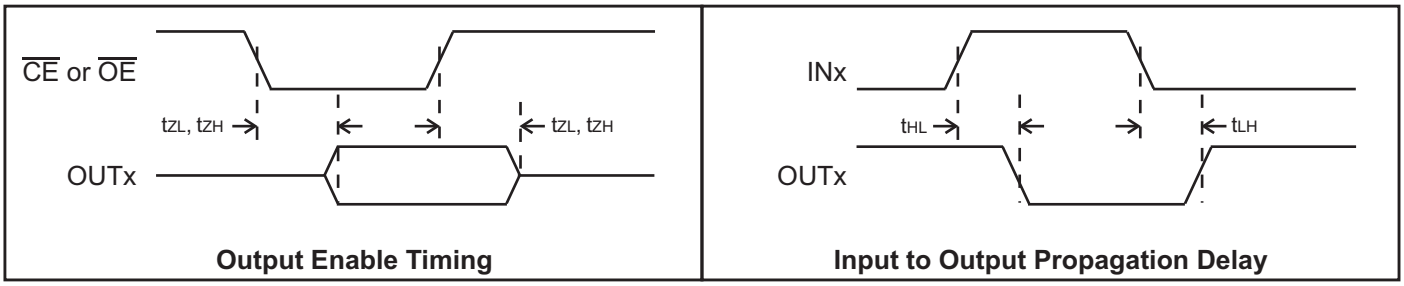
NOTE: Stresses above absolute maximum ratings or outside recommended operating conditions may cause permanent damage to the device. These are stress ratings only. Operation at the limits is not recommended.

ELECTRICAL CHARACTERISTICS

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

PARAMETER		SYMBOL	CONDITION	MIN	TYP	MAX	UNITS
DISCRETE INPUTS							
Open state input voltage		V_{SO}	Input voltage to give high output	-5		10	V
28 V state input voltage		V_{S28}	Input voltage to give low output	14			V
Open state input current		I_{SO}	Maximum input current to give high output			84	µA
28 V state input current		I_{S28}	Minimum input current to give low output	197			µA
Input resistance		R_{IN}	0 V < V_{IN} < 16 V	71		119	KΩ
Input current at 28 V		I_{IN28}	V_{IN} = 28 V			394	µA
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}	V_{IH} = V_{DD}			1.0	µA
	Input source	I_{IL}	V_{IL} = 0 V	-1.0			µA
OUTPUTS							
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 uA	V_{DD} - 0.05			V
	Low	V_{OL}	IOL = 100 uA			V_{SS} + 0.05	V
Tri-state output current		I_{OZ}	V_{OUT} = 0 V or V_{DD} V_{DD} = 5.5V			±10	µA
SUPPLY CURRENT							
V_{DD} current		I_{DD}	V_{IN} = 0 V (all inputs)		5	10	mA
SWITCHING CHARACTERISTICS							
Propagation delay	IN to OUT	t_{LH}, t_{HL}				500	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

HI - 842xxx x x

	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
84210PS	16 PIN PLASTIC NARROW BODY SOIC (16HN)
84240PT	20 PIN PLASTIC TSSOP (20HT)

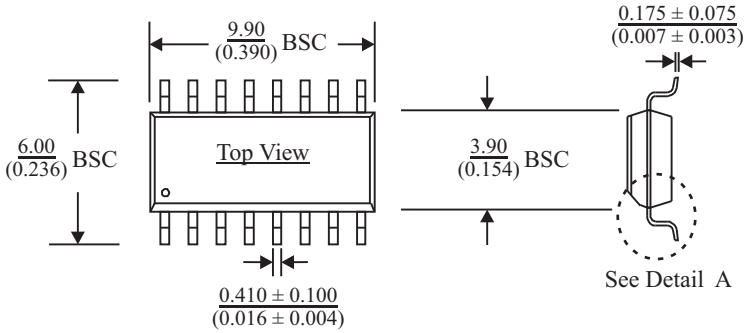
REVISION HISTORY

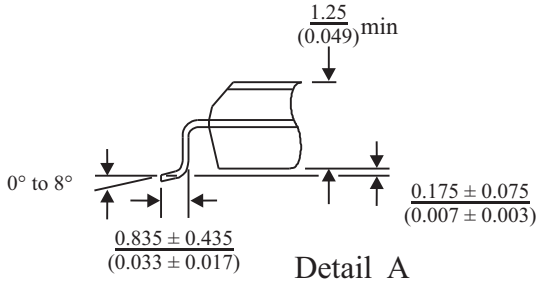
P/N	Rev	Date	Description of Change
DS84210	New	08/27/18	Initial Release.

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

millimeters (inches)

Package Type: 16HN



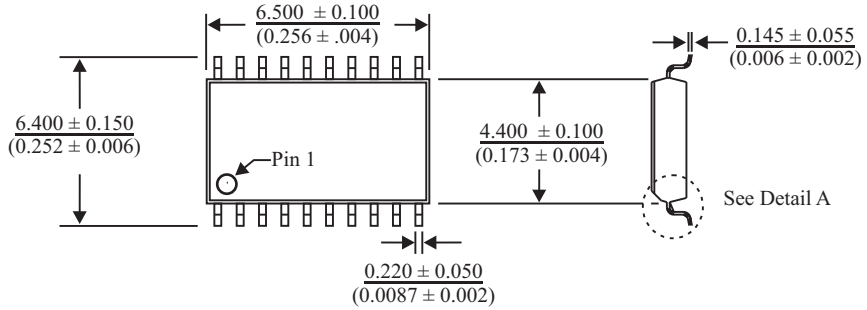


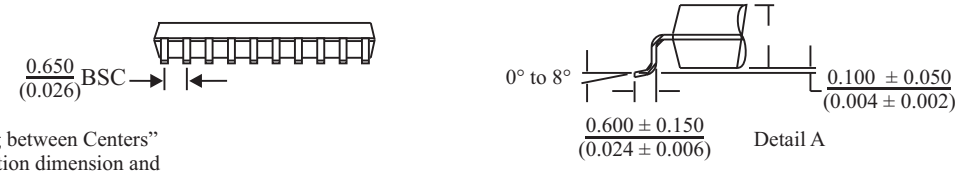
BSC = "Basic Spacing between Centers" is theoretical true position dimension and has no tolerance. (JEDEC Standard 95)

20-PIN PLASTIC TSSOP

millimeters(inches)

Package Type: 20HS





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