

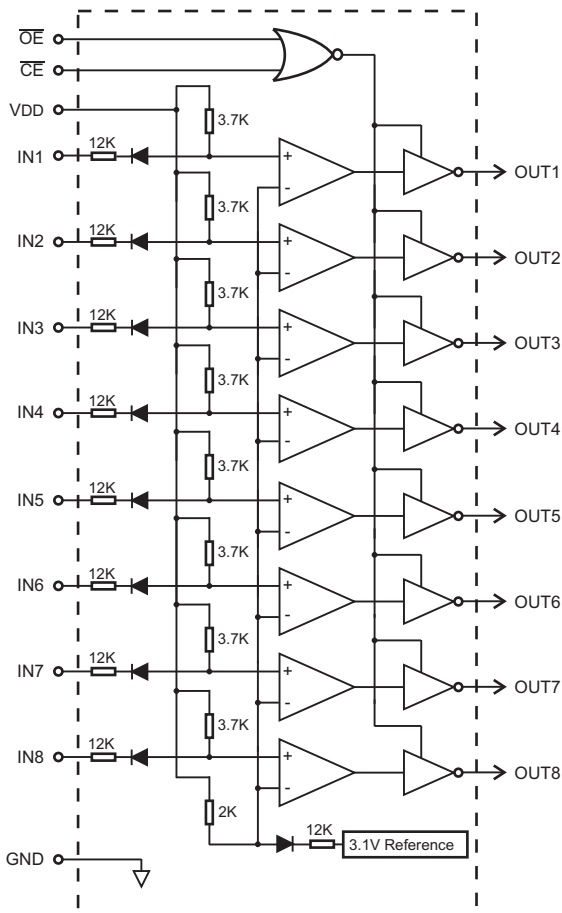
DESCRIPTION

The HI-84201 is a six channel discrete-to-digital interface device with inputs configured to sense Open / Ground 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-84201 is a drop-in replacement for the DEI1026A.

The HI-84231 is an equivalent device with eight Open / Ground sense channels.

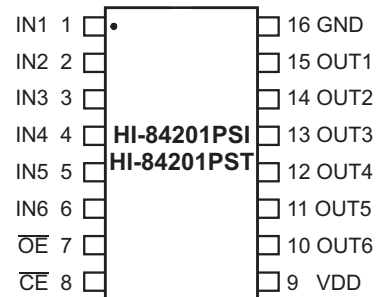
BLOCK DIAGRAM



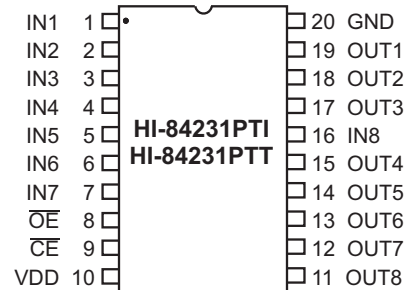
FEATURES

- 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-84201 is a drop in replacement for DEI1026A

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 |

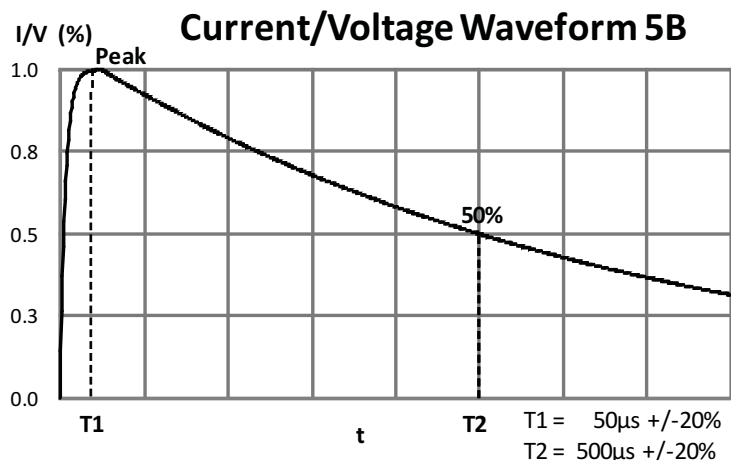
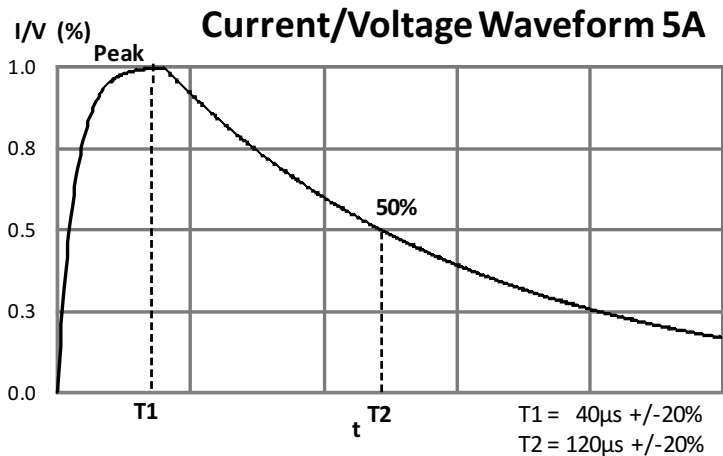
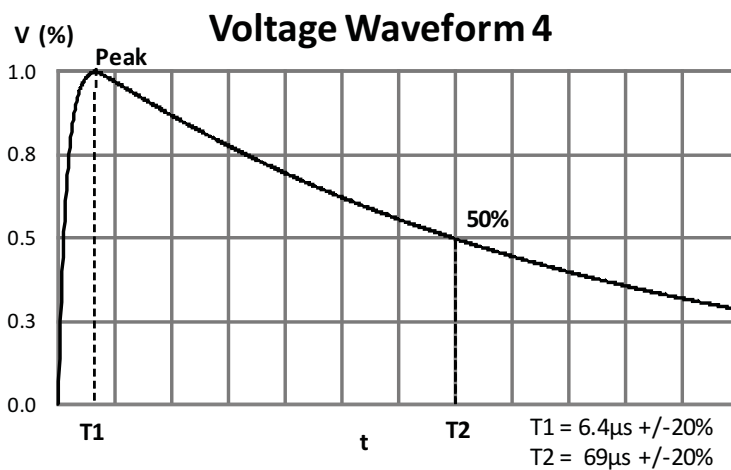
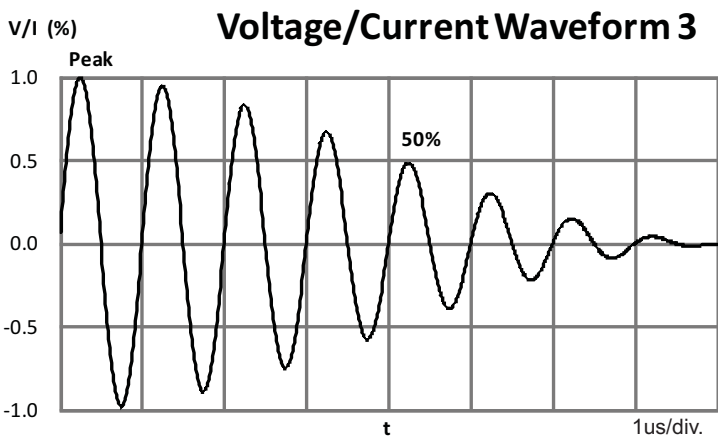
PIN DESCRIPTIONS

| PIN | | SYMBOL | FUNCTION | DESCRIPTION |
|------------|------------|-----------------|------------------|------------------------------------------------------------------------|
| (HI-84201) | (HI-84231) | | | |
| 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 | 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 | 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 |

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 |

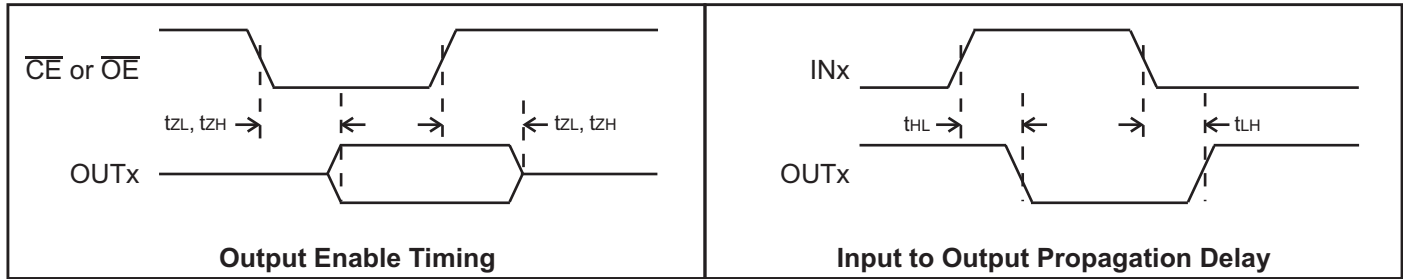
NOTE: Stresses above absolute maximum ratings or outside recommended operating conditions may cause permanent damage to the device. These are stress ratings only. Operation at the limits is not recommended.

ELECTRICAL CHARACTERISTICS

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

| PARAMETER | SYMBOL | CONDITION | MIN | TYP | MAX | UNITS |
|------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------|------|------------|------------|----------|
| DISCRETE INPUTS | | | | | | |
| Ground state input voltage | VSG | Input voltage to give high output Operating voltage and temp. VDD = 5 V, TA = 25C | | | 3.0 3.5 | V V |
| Open state input voltage | VSO | Input voltage to give low output | 4.0 | | | 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 | 220 | | | kΩ |
| Input source current | IIO | Current sourced into 100Ω to ground | -100 | -330 | | μA |
| Reverse leakage current | IIR | VIN = 35 V, VDD = 0 V | | | 100.0 | μA |
| LOGIC INPUTS (\overline{CE}, \overline{OE}) | | | | | | |
| Input Voltage | Input voltage HI Input voltage LO | V _{IH} V _{IL} | 2.0 | | 0.8 | V V |
| Input current | Input sink Input source | I _{IH} I _{IL} | | | 1.0 | μA μA |
| OUTPUTS | | | | | | |
| Logic output voltage | High Low | V _{OH} V _{OL} | | | 0.4 | V V |
| Logic output voltage (CMOS) | High Low | V _{OH} V _{OL} | | VDD - 0.05 | | V V |
| Tri-state output current | | I _{OZ} | | | ±10 | μA |
| SUPPLY CURRENT | | | | | | |
| VDD current | I _{DD} | VIN = VDD (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} | | | 25 | ns |
| Output disable time | | t _{LZ} , t _{HZ} | | | 25 | ns |

TIMING DIAGRAMS



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 |
|-------------|----------------------------------------|
| 84201PS | 16 PIN PLASTIC NARROW BODY SOIC (16HN) |
| 84231PT | 20 PIN PLASTIC TSSOP (20HT) |

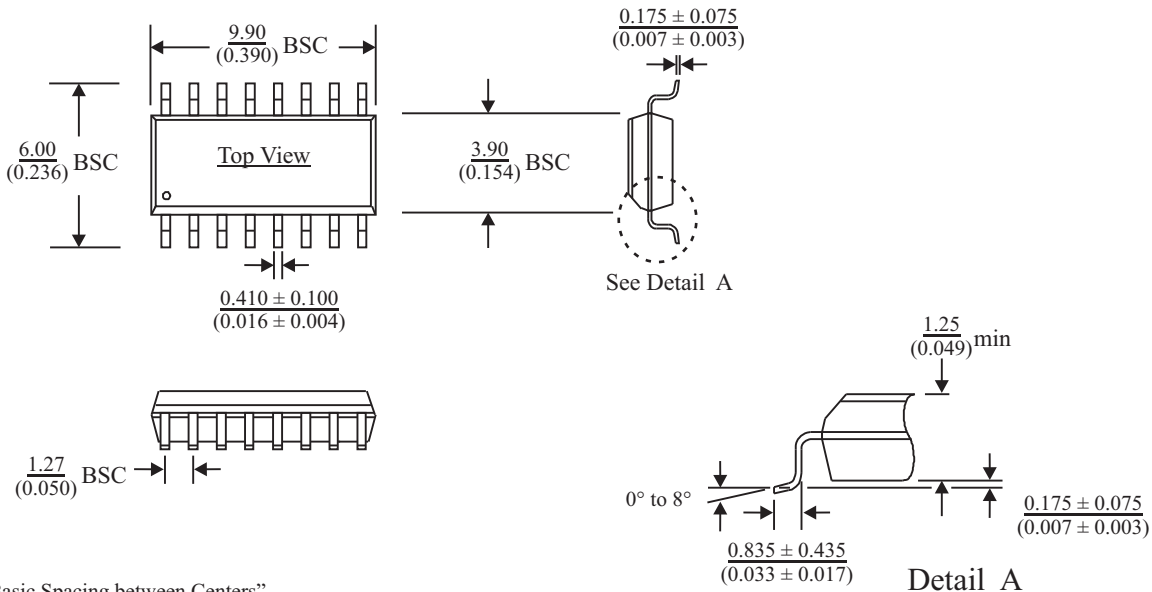
REVISION HISTORY

| P/N | Rev | Date | Description of Change |
|---------|-----|----------|-----------------------|
| DS84201 | New | 08/27/18 | Initial Release. |

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

millimeters (inches)

Package Type: 16HN

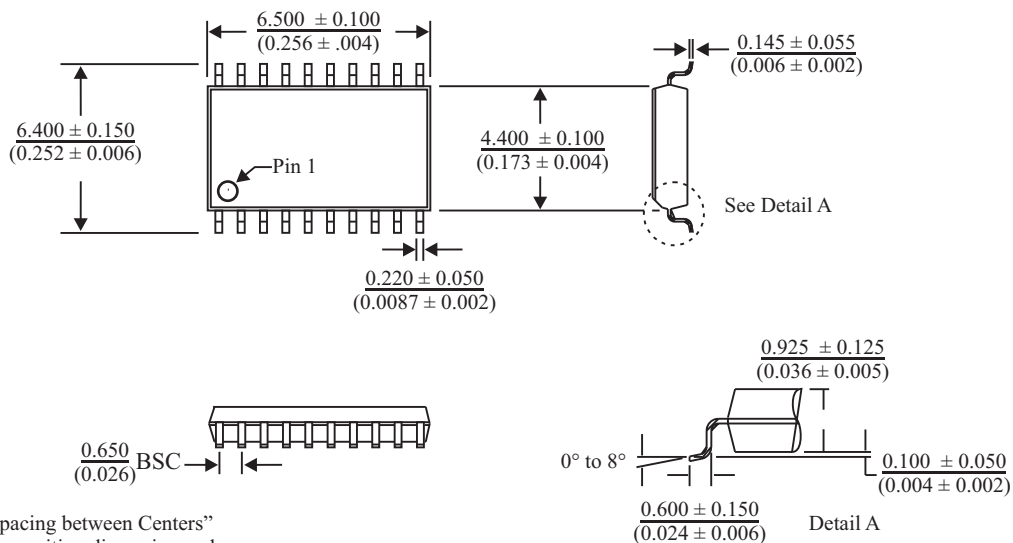


BSC = "Basic Spacing between Centers" is theoretical true position dimension and has no tolerance. (JEDEC Standard 95)

20-PIN PLASTIC TSSOP

millimeters(inches)

Package Type: 20HS



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