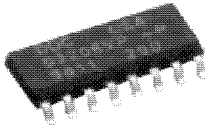


SIX-CHANNEL DISCRETE-TO-DIGITAL INTERFACE



FEATURES

- **16-Pin Narrow-Body SOIC**
- **Lightning Protection to 600V/24A per DO-160C**
- **TTL-Compatible Outputs**
- **High Reliability**
- **Tri-state Outputs**
- **Low Cost**

DESCRIPTION

The DD-03206VP is a six-channel discrete-to-digital interface device with lightning-protected inputs to handle Open/Gnd signals. The outputs may be enabled and are TTL-compatible. The inputs (pins 1-6) of this small, 16-pin narrow body SOIC (Small Outline Integrated Circuit) are lightning protected to 600V/24A level 3 of DO160C.

APPLICATIONS

With its high reliability, low cost and lightning protection the DD-03206VP serves a variety of interface requirements for aerospace applications, including flight critical, essential and nonessential functions.

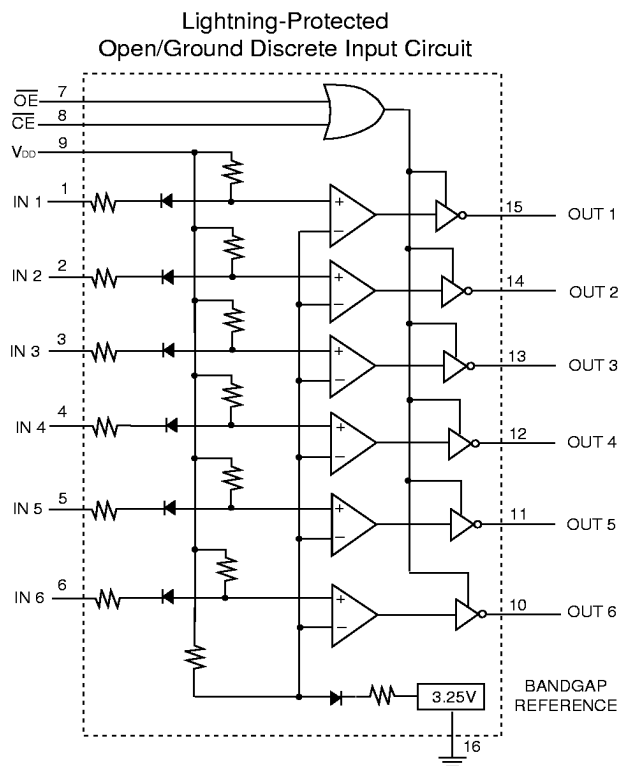


FIGURE 1. DD-03206 CONCEPT ILLUSTRATION

TABLE 1. DD-03206 ABSOLUTE MAXIMUM RATINGS			
PARAMETER	UNITS	MINIMUM	MAXIMUM
Supply Voltage	V	-0.3	7.0
Discrete Input Voltage	V	-5	35
Digital Input Voltage (\overline{CE} and \overline{OE})	V	V _{ss} - 0.3	V _{dd} + 0.3
Lightning Protection (Pins 1-6; DO160C, Waveforms 3, 4* and 5*, level 3)	V	-300*, -600	+300*, +600
ESD Protection (Human Body Model)	kV	2	
Storage Temperature	°C	-55	125
Operating Free Air Temperature	°C	-55	85
Lead Soldering Temperature, 10 sec max	°C		280
Body Soldering Temperature, 10 sec max	°C		210
Power Dissipation	mW		250

* Waveforms 4 and 5 only

TABLE 2. DD-03206 RECOMMENDED OPERATING CONDITIONS					
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage	V _{dd}	4.5	5.0	5.5	V
Operating Free Air Temperature	T _a	-55		85	°C
Logic Output Source Current	I _{oh}	-5.0		5.0	mA
Logic Output Sink Current	I _{ol}				mA

TABLE 3. DD-03206 TRUTH TABLE			
\overline{CE} (CHIP ENABLE)	\overline{OE} (OUTPUT ENABLE)	DISCRETE INPUT	OUTPUT
0	0	Open	0
0	0	Ground	1
1	X	X	High Z
X	1	X	High Z

TABLE 4. DD-03206 CHARACTERISTICS
 (Ta = -55° C TO +85° C, Vdd = 4.5 TO 5.5 V, UNLESS OTHERWISE NOTED)

PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNITS
Power Supply and Thermal Data						
Supply Current	I _{dd}	V _{in} = V _{dd} (all inputs)			12.0	mA
Thermal Resistance	θ _{ja}	V _{dd} = 5.5 V			120	°C/W
Discrete Input Characteristics						
Ground State Input Voltage	V _{sg}	Voltage from input terminal to ground for logic high output.	-5.0		3.0	V
Open State Input Voltage	V _{so}	Voltage from input terminal to ground for logic low output.	3.5		+35	V
Logic Input Characteristics						
CE, OE Input Logic 1 Level	V _{ih}		2.0			V
CE, OE Input Logic 0 Level	V _{il}				0.8	V
DC Output Characteristics						
Output Logic 1 Level	V _{oh}	I _{oh} = -5 mA	2.4			V
Output Logic 0 Level	V _{ol}	I _{ol} = 5 mA			0.4	V
Off-State Output Current	I _{oz}	OE/ = V _{dd} V _{dd} = 5.5 V	-10		+10	μA
Switching Characteristics						
I/O Propagation Delay (FIG.3)	t _{HL} , t _{LH}	R _L = 1 kΩ to V _{dd} , C _L = 30 pF			150	ns
Delay from CE or OE input (with output low) to Output High-Z (FIG 2)	t _{LZ}				50	ns
Delay from CE or OE input (with output High-Z) to Output Low (FIG 2)	t _{ZL}				50	ns
Delay from CE or OE input (with output high) to Output High-Z (FIG 2)	t _{HZ}				50	ns
Delay from CE or OE input (with output High-Z) to Output High (FIG 2)	t _{ZH}				50	ns
Discrete Input Characteristics						
Ground State Input Resistor	R _{ig}	Resistor from Input to Ground to guarantee Logic High Output			100	Ω
Open State Input Resistor	R _{io}	Resistor from Input to Ground to guarantee Logic Low Output	100k			Ω
Input Source Current	I _{io}	V _{in} = 0 V, Maximum Ground State Input Resistance = 100 Ω	-400		-100	μA
Reverse Leakage Current*	I _{ir}	V _{in} = 35 V, V _{dd} = 0 V			100	μA

* V_{in} must not be exceeded when V_{dd} is not present.

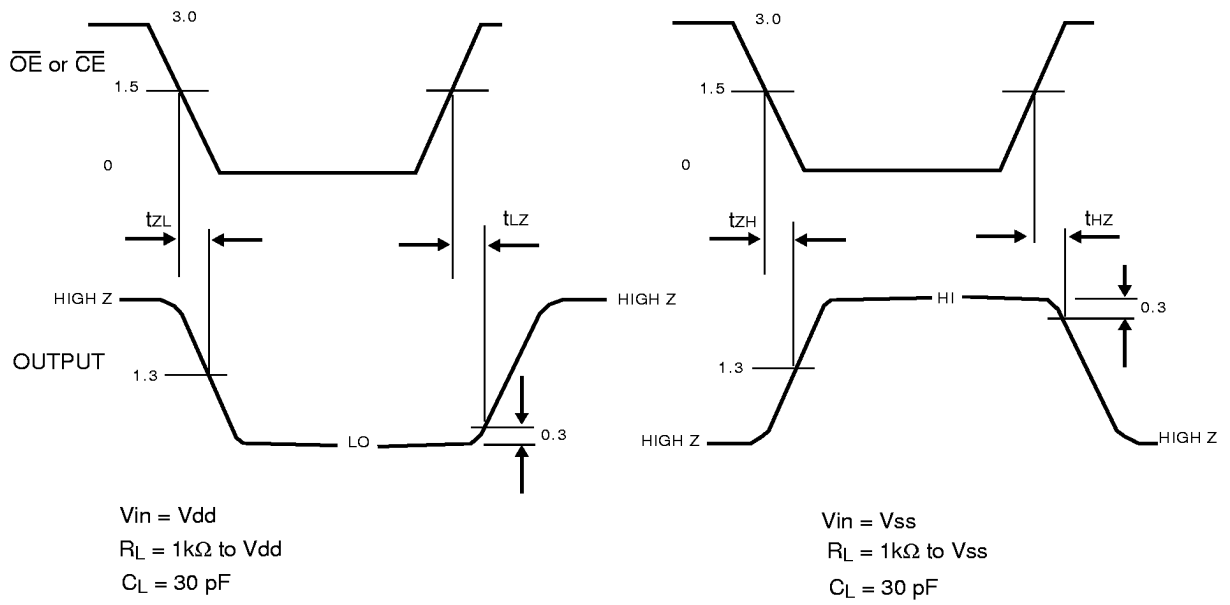


FIGURE 2. ENABLE-TO-OUTPUT PROPAGATION DELAY

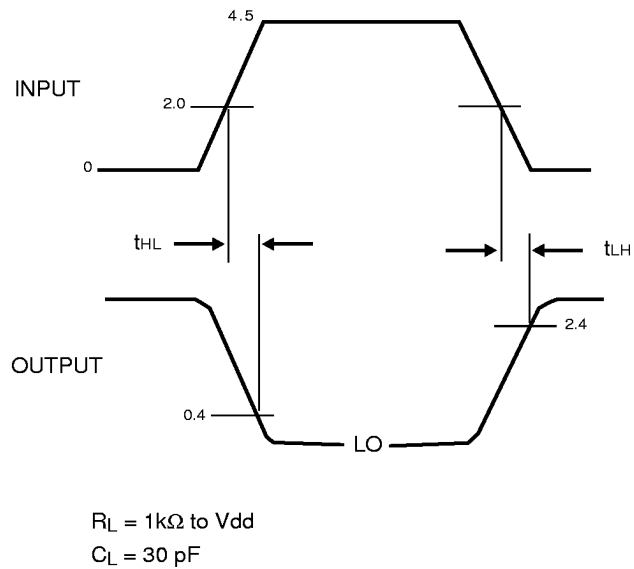


FIGURE 3. INPUT-TO-OUTPUT PROPAGATION DELAY

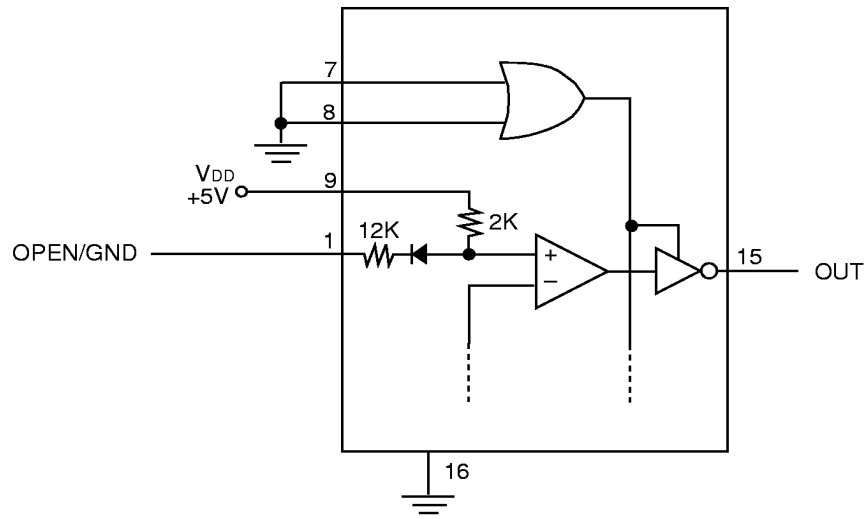


FIGURE 4. SAMPLE CIRCUITRY FOR OPEN GROUND INPUT

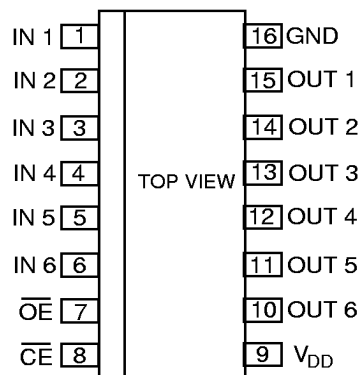
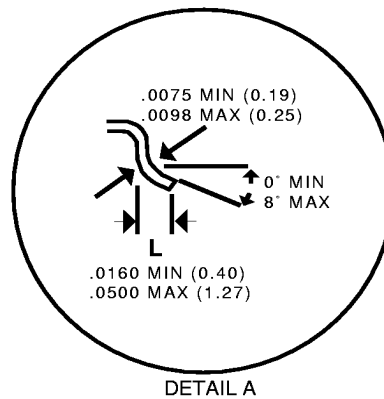
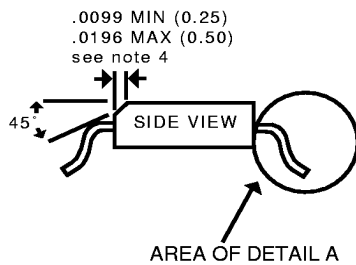
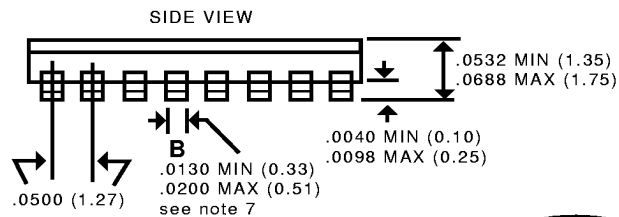
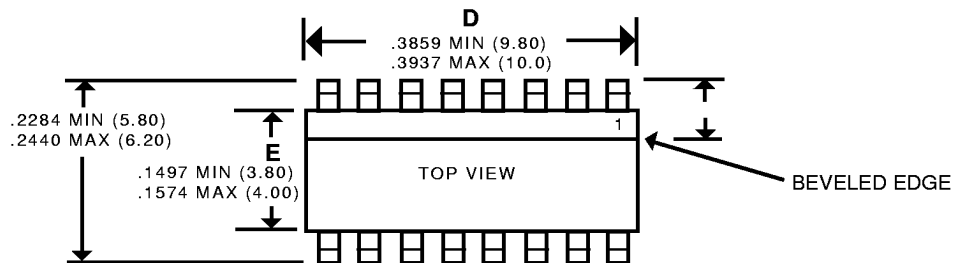


FIGURE 5. DD-03206 PIN OUTS



NOTES:

1. This part conforms to JEDEC MS-012AC for Standard Small Outline (SO) Molded 16-Lead .150 (3.75) Body Width Package.
2. Dimensions: Inch (mm).
3. "D" and "E" do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .006 (0.15).
4. The chamfer on the body is optional.
5. "L" is the length of terminal for soldering to a substrate.
6. Terminal numbers are shown for reference only.
7. The lead width "B", as measured .014 (0.36) or greater above the seating plane, shall not exceed a maximum value of 0.024 (0.61).
8. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.

FIGURE 6. DD-03206 MECHANICAL OUTLINE

WHAT IS A DISCRETE?

Advisory Circular (FAA), Airworthiness Approval of Traffic Alert and Collision Avoidance Systems (TCAS II) and Mode S Transponders, AC20-131, defines a discrete as "a separate, complete and distinct signal." In many instances these signals are binary, on or off, 28 V-based signals; they are typically Open/Gnd, 28 V/Open, or 28 V/Gnd with very low bandwidth (DC to 200 Hz).

Today's systems address the interface with circuits tailored for each interface comprised of R-C input filters, divider networks,

diode isolation and comparators. Multichannel interface to a processor requires additional logic and latches. The resulting circuit consumes considerable PC-board real estate (up to one sq. in. per channel).

The DD-03206VP is ideal for designs that require small size and low cost. With built-in lightning protection this 16-pin narrow body SOIC will provide solutions for your next Open/Gnd discrete-to-digital interface design.

ORDERING INFORMATION

DD-03206VP-900

