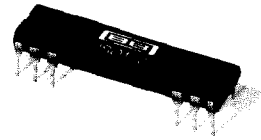
BURR-BROWN®



ISO150

www.burr-brown.com/databook/ISO150.html

Dual, Isolated, Bi-Directional DIGITAL COUPLER

FEATURES

- REPLACES HIGH-PERFORMANCE OPTOCOUPLERS
- DATA RATE: 80M Baud, typ
- LOW POWER CONSUMPTION: 25mW Per Channel, max
- TWO CHANNELS, EACH BI-DIRECTIONAL, PROGRAMMABLE BY USER
- PARTIAL DISCHARGE TESTED: 2400Vrms
- CREEPAGE DISTANCE OF 16.5mm (DIP)
- LOW COST PER CHANNEL
- PLASTIC DIP AND SOIC PACKAGES

APPLICATIONS

- DIGITAL ISOLATION FOR A/D, D/A CONVERSION
- ISOLATED UART INTERFACE
- MULTIPLEXED DATA TRANSMISSION
- ISOLATED PARALLEL TO SERIAL INTERFACE
- TEST EQUIPMENT
- MICROPROCESSOR SYSTEM INTERFACE
- ISOLATED LINE RECEIVER
- GROUND LOOP ELIMINATION

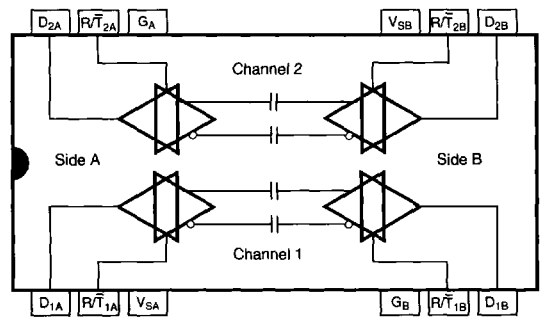
DESCRIPTION

The ISO150 is a two-channel, galvanically isolated data coupler capable of data rates of 80MBaud, typical. Each channel can be individually programmed to transmit data in either direction.

Data is transmitted across the isolation barrier by coupling complementary pulses through high voltage 0.4pF capacitors. Receiver circuitry restores the pulses to standard logic levels. Differential signal transmission rejects isolation-mode voltage transients up to 1.6kV/µs.

ISO150 avoids the problems commonly associated with optocouplers. Optically isolated couplers require high current pulses and allowance must be made for LED aging. The ISO150's Bi-CMOS circuitry operates at 25mW per channel.

ISO150 is available in a 24-pin DIP package and in a 28-lead SOIC. Both are specified for operation from –40°C to 85°C.



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Internet: http://www.burr-brown.com/ • FAXLine: (800) 548-6133 (US/Canada Only) • Cable: BBRCORP • Telex: 066-6491 • FAX: (520) 889-1510 • Immediate Product Info: (800) 548-6132

SPECIFICATIONS

At T_A = +25°C and V_S = +5V, unless otherwise noted.

PARAMETER	CONDITION	ISO150AP, AU MIN	ISO150AP, AU TYP	ISO150AP, AU MAX	UNITS
ISOLATION PARAMETERS					
Rated Voltage, Continuous	60Hz	1500			Vrms
Partial Discharge, 100% Test[1]	1s, 5pC	2400			Vrms
Creepage Distance (External)					
DIP—"P" Package			16		mm
SOIC—"U" Package			7.2		mm
Internal Isolation Distance			0.10		mm
Isolation Voltage Transient Immunity[2]			1.6		kV/µs
Barrier Impedance			$>10^{14}$ II 7		Ω II pF
Leakage Current	240Vrms, 60Hz		0.6		µArms
DC PARAMETERS					
Logic Output Voltage, High, V_{OH}	I_{OH} = 6mA	V_S–1		V_S	V
Low, V_{OL}	I_{OL} = 6mA	0		0.4	V
Logic Output Short-Circuit Current	Source or Sink		30		mA
Logic Input Voltage, High[3]		2		V_S	V
Low[3]		0		0.8	V
Logic Input Capacitance			5		pF
Logic Input Current			<1		nA
Power Supply Voltage Range[3]		3	5	5.5	V
Power Supply Current[4]					
Transmit Mode	DC		0.001	100	µA
	50MBaud		14		mA
Receive Mode	DC		7.2	10	mA
	50MBaud		16		mA
AC PARAMETERS					
Data Rate, Maximum[5]	C_L = 50pF	50	80		MBaud
Data Rate, Minimum		DC			
Propagation Time[6]	C_L = 50pF		27	40	ns
Propagation Delay Skew[7]	C_L = 50pF		0.5	2	ns
Pulse Width Distortion[8]	C_L = 50pF		1.5	6	ns
Output Rise/Fall Time, 10% to 90%	C_L = 50pF		9	14	ns
Mode Switching Time					
Receive-to-Transmit			13		ns
Transmit-to-Receive			75		ns
TEMPERATURE RANGE					
Operating Range		–40		85	°C
Storage		–40		125	°C
Thermal Resistance, θ_{JA}			75		°C/W

NOTES: (1) All devices receive a 1s test. Failure criterion is ≥5 pulses of ≥5pC. (2) The voltage rate-of-change across the isolation barrier that can be sustained without data errors. (3) Logic inputs are HCT-type and thresholds are a function of power supply voltage with approximately 0.4V hystersis—see text. (4) Supply current measured with both transceivers set for the indicated mode. Supply current varies with data rate—see typical curves. (5) Calculated from the maximum Pulse Width Distortion (PWD), where Data Rate = 0.3/PWD. (6) Propagation time measured from V_{IN} = 1.5V to V_O = 2.5V. (7) The difference in propagation time of channel A and channel B in any combination of transmission directions. (8) The difference between propagation time of a rising edge and a falling edge.

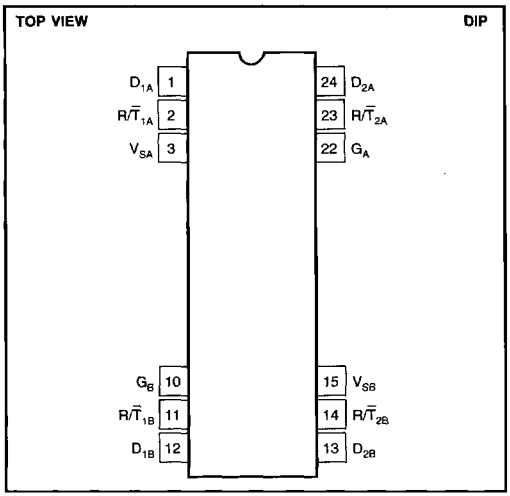
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ABSOLUTE MAXIMUM RATINGS

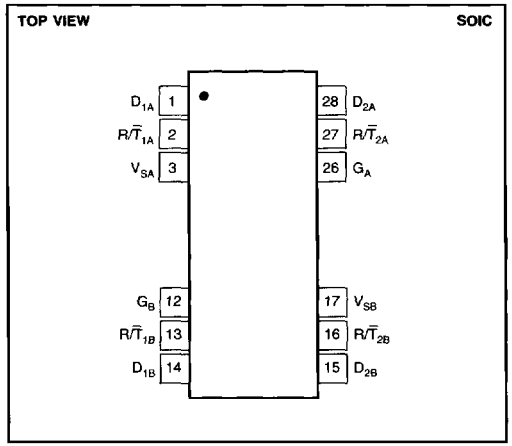
Storage Temperature	–40°C to +125°C
Supply Voltages, V_S	–0.5 to 6V
Transmitter Input Voltage, V_I	–0.5 to V_S + 0.5V
Receiver Output Voltage, V_O	–0.5 to V_S + 0.5V
$R/\overline{T}_X$ Inputs	–0.5 to V_S + 0.5V
Isolation Voltage dV/dt, V_{ISO}	500kV/µs
D_X Short to Ground	Continuous
Junction Temperature, T_J	175°C
Lead Temperature (soldering, 10s)	260°C
1.6mm below seating plane (DIP package)	300°C

PIN CONFIGURATION

TOP VIEW — DIP



TOP VIEW — SOIC



PACKAGE INFORMATION

PRODUCT	PACKAGE	PACKAGE DRAWING NUMBER[1]
ISO150AP	24-Pin Single-Wide DIP	243-1
ISO150AU	28-Lead SOIC	217-2

NOTE: (1) For detailed drawing and dimension table, please see end of data sheet, or Appendix C of Burr-Brown IC Data Book.

PIN DESCRIPTIONS

NAME	FUNCTION
D_{1A}	*Data in or data out for transceiver 1A.* $\overline{R}/T_{1A}$ *held* low makes D_{1A} an input pin.
$R/\overline{T}_{1A}$	Receive/Transmit switch controlling transceiver 1A.
V_{SA}	+5V supply pin for side A which powers transceivers 1A and 2A.
G_B	Ground pin for transceivers 1B and 2B.
$R/\overline{T}_{1B}$	Receive/Transmit switch controlling transceiver 1B.
D_{1B}	*Data in or data out for transceiver 1B.* $\overline{R}/T_{1B}$ *held* low makes D_{1B} an input pin.
D_{2B}	*Data in or data out for transceiver 2B.* $\overline{R}/T_{2B}$ *held* low makes D_{2B} an input pin.
$R/\overline{T}_{2B}$	Receive/Transmit switch controlling D_{2B}.
V_{SB}	+5V supply pin for side B which powers transceivers 1B and 2B.
G_A	Ground pin for transceivers 1A and 2A.
$R/\overline{T}_{2A}$	Receive/Transmit switch controlling transceiver 2A.
D_{2A}	*Data in or data out for transceiver 2A.* $\overline{R}/T_{2A}$ *held* low makes D_{2A} in input pin.

ELECTROSTATIC DISCHARGE SENSITIVITY

This integrated circuit can be damaged by ESD. Burr-Brown recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.