

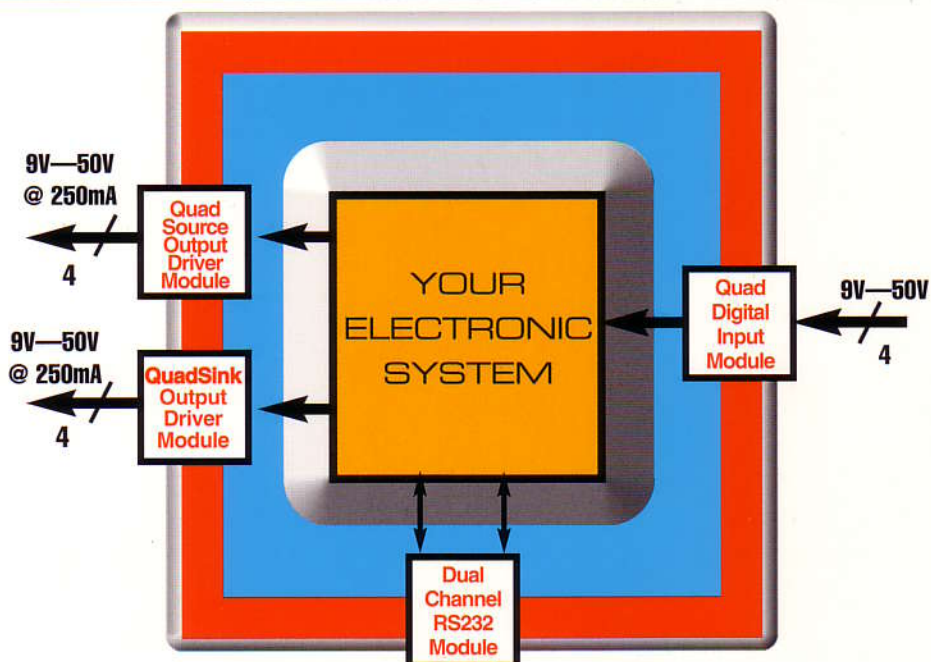
# LPS



LASER PHOTO-TOOLING SERVICES  
I N C O R P O R A T E D



**ISOLATION PRODUCTS CATALOG**



**LPS, Inc.** is pleased to offer a complete line of isolation modules for use in communications, high voltage output drive (sink and source) and high voltage input reading. These modules provide cost effective methods for marrying low voltage controls to high voltage loads. They are designed to operate for long reliable service in demanding industrial environments. Isolation for the I/O modules is 2500VRMS for one minute while the RS232DI module is 1520VRMS for one minute. This makes them ideal for applications with high transient voltages and different ground potentials. The modules are contained in a hard epoxy 40 pin DIP package for excellent environmental protection and can operate from -40C to +85C.

Serial communications among electronic systems often require isolation to insure that ground differences between the systems do not result in system damage or erroneous data transmission. For problems associated with RS-232 communications, LPS has developed the RS232DI (pin for pin compatible with the MAX252 manufactured by MAXIM). The RS232DI is a complete, electrically isolated, dual RS-232 Transceiver that includes isolation for the communications lines and the single +5V power supply. It can be used for microprocessor (TTL) to PC communications with no additional parts or configured for PC to PC communications with the addition of one transceiver chip.

The high voltage output driver modules (SNKQI/SRCQI) deliver a photo-isolated noise free output from a microprocessor or logic level system to external loads such as valves, solenoids, relay coils, etc. The SNKQI and SRCQI are designed to be pin for pin compatible to allow the user to configure system outputs to either sink or source current. The high voltage input module (DIGINQI) provides a photo-isolated, noise free interface from a high voltage load or sensor to a microprocessor or logic level system. Both output driver modules and the input reader module have four independently controlled channels that operate from 9 to 50 VDC and a complete microprocessor interface. The output driver modules sink or source up to 250mA per channel and include a reset function that guarantees all outputs will be disabled during power-up.

# RS232DI



COMPLETE, +5V, ISOLATED, DUAL RS-232 TRANSCEIVER



## FEATURES

- No External Components Required
- Dual Isolated Tx/Rx Interface
- Power Supply Shut-Down
- Separate Enable
- Single +5V Supply
- Operation from -40°C to +85°C
- UL and CSA Approval Pending

## APPLICATIONS

- High Transient Environments
- High Ground Potential Differences
- High Noise Environments

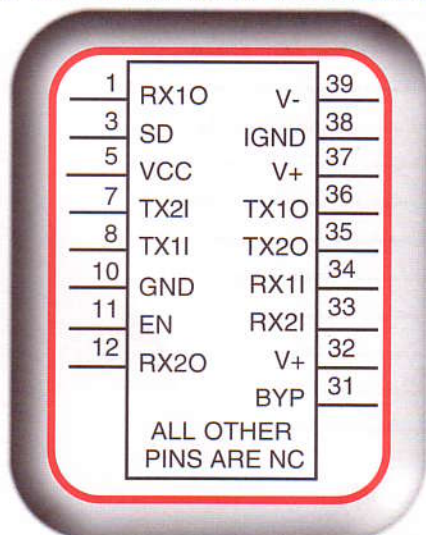
## GENERAL DESCRIPTION

The RS232DI is a complete, electrically isolated, dual RS-232 Transceiver that requires no external components. The device includes isolation for both the communications lines as well as the single +5V power supply.

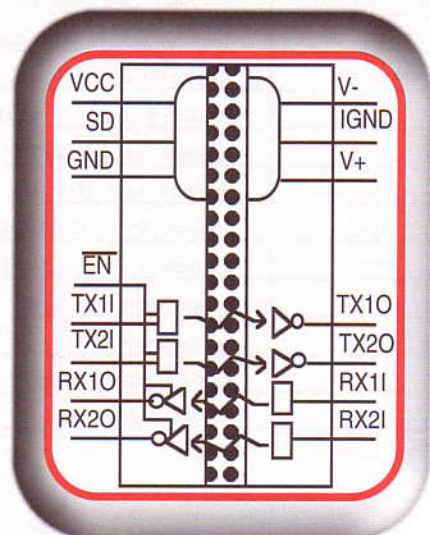
Isolation for the device is 1520VRMS for one minute, which makes it ideal for applications with high transient voltages and different ground potentials.

The RS232DI comes in an encapsulated 40 pin DIP package.

## PIN ARRANGEMENT



## INTERNAL OPERATION



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## ELECTRICAL OPERATING CHARACTERISTICS

(VCC = +5V  $\pm$ 10%, TA = -40°C TO +85°C)

PARAMETER	CONDITION	MIN	TYP	MAX	UNIT
RS-232 Output Voltage Swing	TX10, TX20 - RL = 3K	$\pm$ 5	$\pm$ 9		V
RS-232 Output Leakage Current	V+ = V- = 0V or SD = Vcc TX10, TX20 = +/-15V		$\pm$ .05	$\pm$ 10	$\mu$ A
RS-232 Input Voltage Range	RX11, RX21	-30		+30	V
RS-232 Input High Threshold	RX11, RX21		1.8	2.4	V
RS-232 Input Low Threshold	RX11, RX21	.8	1.3		V
RS-232 Input Hysteresis	RX11, RX21	.2	.5	1	V
RS-232 Input Resistance	RX11, RX21 @ 25°C	3	5	7	Kohm
RS-232 Output Slew Rate	RL = 3K, CL = 2.5nF, +3V to -3V	6	12	30	V/ $\mu$ s
RS-232 Output Resistance	V+ = V- = 0V or SD = Vcc	300			ohm
RS-232 Output Short Circuit Current	TX10, TX20	$\pm$ 7	$\pm$ 22		mA
Propagation Delay	RS-232 to TTL		1.4	1.6	$\mu$ s
Propagation Delay	TTL to RS-232		3	5	$\mu$ s
TTL Input Logic Threshold Low	TX11, TX21			.9	V
TTL Input Logic Threshold High	TX11, TX21	3.15			V
TTL Output Logic Threshold Low	RX10, RX20			.26	V
TTL Output Logic Threshold High	RX10, RX20	3.98			V
Transmission Data Rate		200K			Bits/sec.
Isolation Voltage	1500VRMS For 1 Minute		2500VRMS For 1 Second		

## PIN DESCRIPTIONS

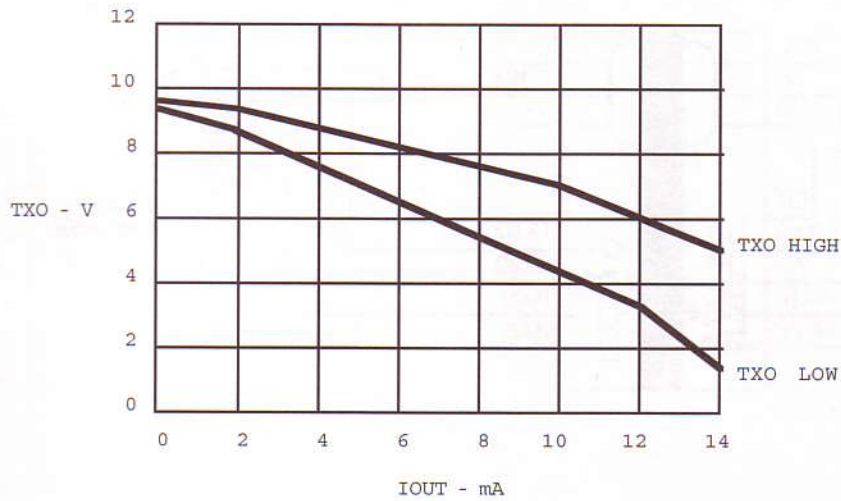
PIN #	PIN NAME	FUNCTION
1	RX10	Receiver #1 Output - TTL/CMOS Logic Compatible
3	SD	Active High Signal that Disables Low and High Side Power
5	VCC	+5V Power Supply
7	TX21	Transmitter #2 Input - TTL/CMOS Logic Compatible
8	TX11	Transmitter #1 Input - TTL/CMOS Logic Compatible
10	GND	+5V Power Supply Reference
11	EN	Active High Signal that Sends RX10, RX20, TX11 and TX21 into a High Impedance State
12	RX20	Receiver #2 Output - TTL/CMOS Logic Compatible
31	BYP	Isolated +5V Output (For Internal Use Only)
33	RX21	Receiver #2 Input - EIA RS-232 Compatible
34	RX11	Receiver #1 Input - EIA RS-232 Compatible
35	TX20	Transmitter #2 Output - EIA RS-232 Compatible
36	TX10	Transmitter #1 Output - EIA RS-232 Compatible
32, 37	V+	Isolated Positive Power Supply
38	IGND	Isolated Ground
39	V-	Isolated Negative Power Supply
Others	NC	No Connection Required

**COMPLETE, +5V, ISOLATED,  
DUAL RS-232 TRANSCEIVER**



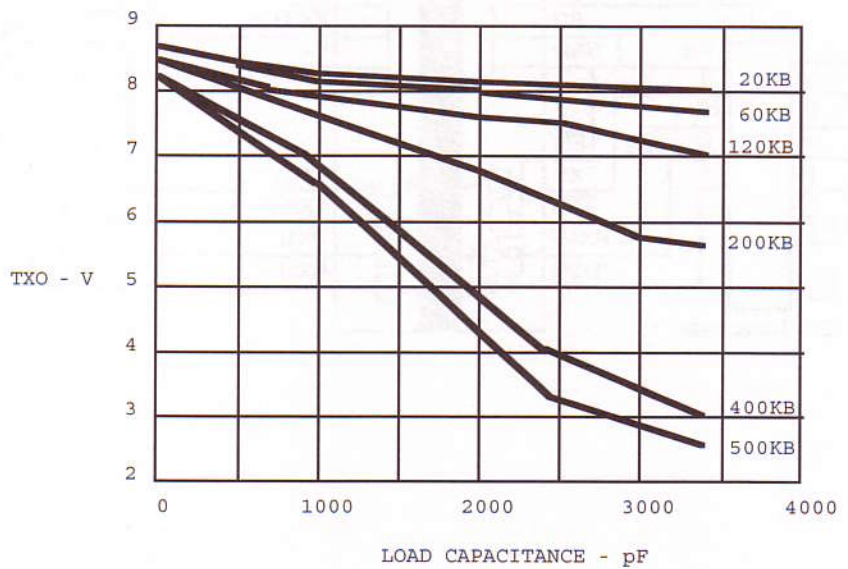
**TRANSMITTER OUTPUT  
VOLTAGE VS. CURRENT**

**VCC=+5V, TA=+25°C**



**TRANSMITTER  
BAUD RATE VS. LOAD CAPACITANCE**

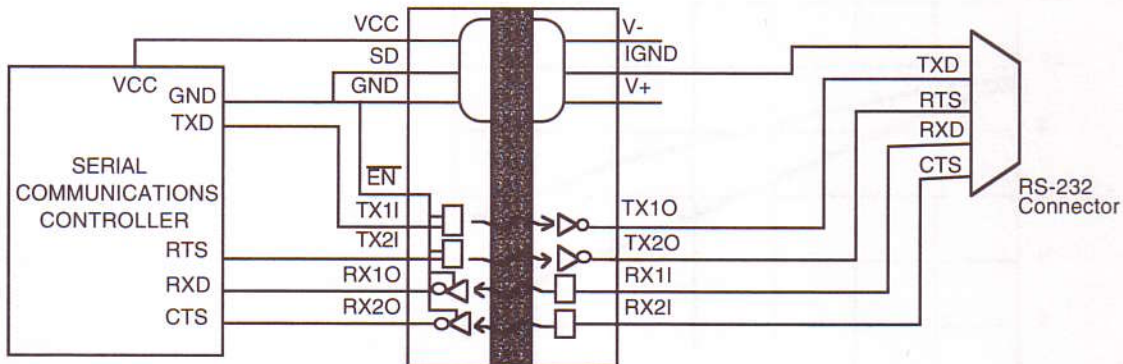
**VCC=+5V, TA=+25°C, RL=3K**



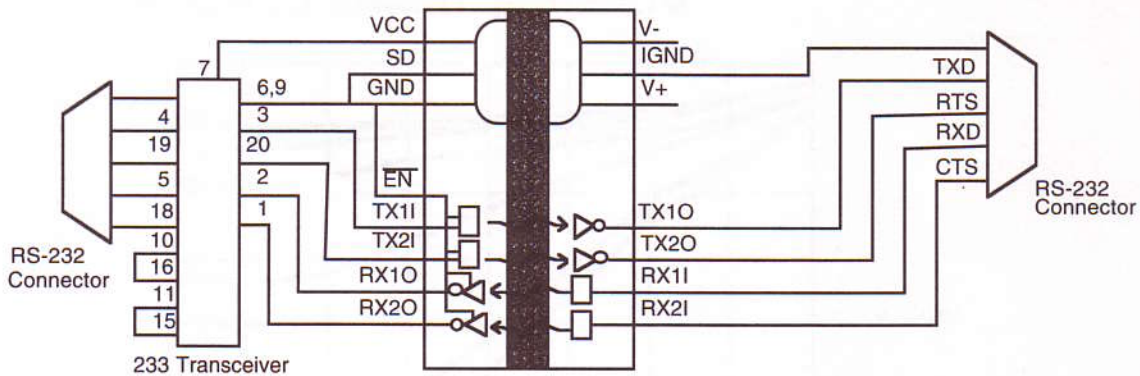
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## APPLICATION INFORMATION

### RS-232 TO TTL CONVERTER FOR INTERFACE WITH A SERIAL COMMUNICATIONS CONTROLLER



### RS-232 ISOLATION ADAPTER

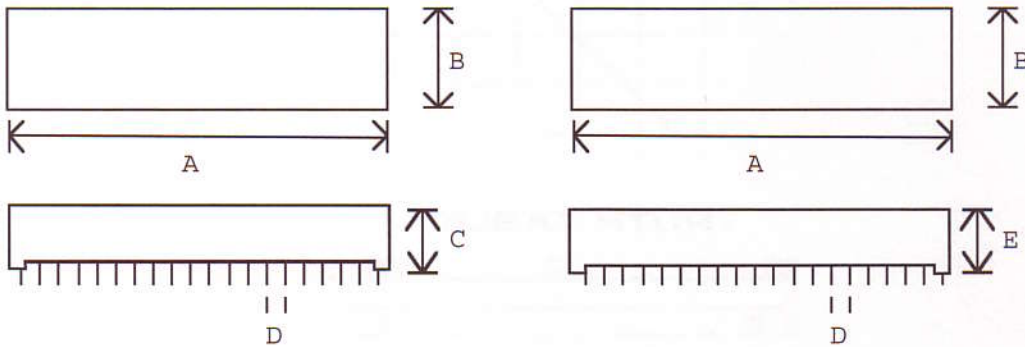


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## MANUFACTURING INFORMATION

**RS232DI**

**SNKQI, SRCQI AND DIGINQI**



DIMENSION	INCHES	MM
A	2.085	52.95
B	.780	19.81
C	.490	12.44
D	.100	2.54
E	.430	10.92
F	0.160	4.064
G	0.430	10.922
H	.110	2.794

Lead Diameter .018 Inches

## APPLICATION NOTES

### SOCKET FOR USE IN INTERCHANGING SNKQI AND SRCQI

