

Complete RS232 PC Serial Ports: 3 Drivers, 5 Receivers

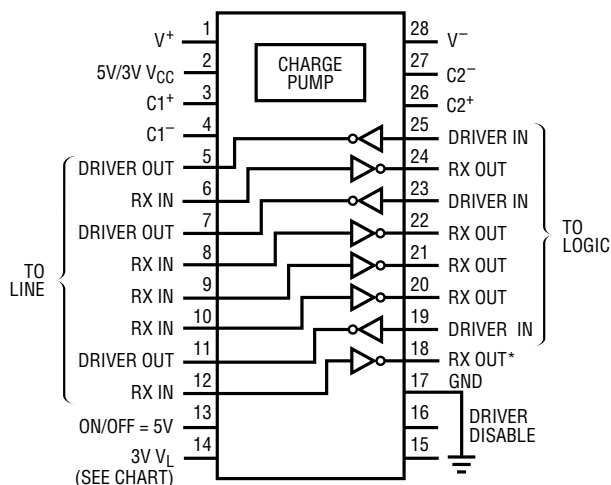
- $\pm 15\text{kV}$ ESD Protection (LT1137A)
- $\pm 10\text{kV}$ ESD Protection (All Others)
- 3V Logic Compatible
- Receiver Keep-Alive in Shutdown
- SO, SSOP Packages
- Ultralow Power (LTC1337: 1.5mW)
- Flowthrough Architecture
- $0.1\mu\text{F}$ Capacitors
- Low Power Shutdown
- 120kBd Operation
- Capable of Mouse Driving
- 3.3V or 5V Powered

LOGIC	SUPPLY VOLTAGE	ADD'L SUPPLY	TYP POWER (mW)	I _Q SHDN (μA)	# Rx ALIVE IN SD	Dx DIS-ABLE	ESD (kV)	CAPS	OUTPUT LEVEL	DEVICE
3V	3V		1.5	1	0		10	$4 \times 0.1\mu\text{F}$	RS562	LTC1327
3V	3V		1.5	0.2 10	0 5		10	$5 \times 0.1\mu\text{F}$	RS232	LTC1348
3V	3V		1.5	35	2		10	$4 \times 0.1\mu\text{F}$	RS562	LTC1350
3V	3V	+12V	1.5	70	1		10	$1 \times 10\mu\text{F}$ $1 \times 1.0\mu\text{F}$	RS232	LT1332
3V	5V	3V	30	60	1	X	10	$1 \times 1.0\mu\text{F}$ $5 \times 0.1\mu\text{F}$	RS232	LT1330
3V	3V		42	60	1	X	10	$6 \times 0.1\mu\text{F}$	RS562*	LT1331
3V	5V	3V	34	60	1	X	10	$6 \times 0.1\mu\text{F}$	RS232	
3V	5V	3V	60	1	0	X	10	$6 \times 0.1\mu\text{F}$	RS232	LT1342
5V	5V		1.5	1	0		10	$4 \times 0.1\mu\text{F}$	RS232	LTC1337
5V	5V		1.5	35	2		10	$4 \times 0.1\mu\text{F}$	RS232	LTC1349
5V	5V		1.5	80	5		10	$4 \times 0.1\mu\text{F}$	RS232	LTC1347
5V	5V		30	60	1	X	10	$1 \times 1.0\mu\text{F}$ $5 \times 0.1\mu\text{F}$	RS232	LT1237
5V	5V		60	1	0	X	15	$6 \times 0.1\mu\text{F}$	RS232	LT1137A
5V	5V		60	60	1	X	10	$6 \times 0.1\mu\text{F}$	RS232	LT1341

Note: Devices requiring $6 \times 0.1\mu\text{F}$ capacitors can use $2 \times 0.2\mu\text{F}$ and $2 \times 0.1\mu\text{F}$ capacitors.

*562-compatible

Typical Pin Configuration†



* REMAINS ALIVE IN SHUTDOWN
DEPENDENT ON PART TYPE

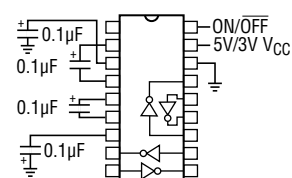
† EXCEPT LT1332 AND LTC1348

IC11

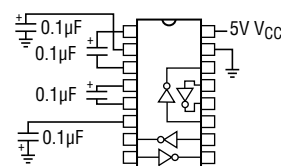
Single Supply RS232 2 Driver/2 Receiver Circuits

- Rugged Bipolar Construction
- $\pm 10\text{kV}$ ESD Protection
- $0.1\mu\text{F}$ Charge Pump Capacitors
- Immune to Latch-Up
- Low Power Shutdown
- Three-State Outputs When Shut Down

SUPPLY VOLTAGE	TYP POWER (mW)	I _Q SHDN (μA)	# Rx ALIVE IN SD	ESD (kV)	OUTPUT LEVEL	PACKAGE	DEVICE
3V	0.66	0.2	0	10	RS562	N18, SW18	LTC1385
3V	0.66			10	RS562	N16, SW16	LTC1386
5V	1.1	0.2	0	10	RS232	N18, SW18	LTC1382
5V	1.1			10	RS232	N16, S16	LTC1383
5V	1.1	35	2	10	RS232	N18, SW18	LTC1384
5V	40			10	RS232	S16	LT1381
5V	40	1.0	0	10	RS232	N18, SW18	LT1280A
5V	40			10	RS232	N16, SW16	LT1281A
5V	45	1.0	0	10	RS232	N18, SW18	LT1180A
5V	45			10	RS232	N16, SW16	LT1181A



18-Pin Configuration



16-Pin Configuration

More RS232 Driver/Receiver Combinations Inside!

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Rev H 0197

Other RS232 Driver/Receiver Combinations

DRIVERS	RECEIVERS	SUPPLIES REQUIRED	SHUTDOWN/RS232 and TTL THREE-STATE OUTPUTS	FAULT TOLERANT to $\pm 25V$	REQ'D CHARGE PUMP CAP SIZE	COMMENTS	PART NUMBER
4	0	$\pm 12V$	Yes	Yes	N/A	Low Power 1488 Upgrade	LT1030
4	0	$\pm 12V$	Yes	Yes	N/A	Low Power 1488 Upgrade Also Supports RS423	LT1032
3	3	5V, $\pm 12V$	Yes	Yes	N/A	One Receiver Active in Shutdown	LT1039
3	3	5V, $\pm 12V$	No	Yes	N/A	Rugged MC145406 Replacement	LT1039-16
5	5	5V	No	Yes	0.1 μF	Synchronous Communications, $\pm 10kV$ ESD	LT1130A
5	4	5V	Yes	Yes	0.1 μF	Synchronous Modem/DCE Interface, $\pm 10kV$ ESD	LT1131A
5	3	5V	No	Yes	0.1 μF	Modem/DCE Interface, $\pm 10kV$ ESD	LT1132A
3	5	5V	No	Yes	0.1 μF	PC/DTE Interface, $\pm 10kV$ ESD	LT1133A
4	4	5V	No	Yes	0.1 μF	5V Only 1488/1489 Replacement, $\pm 10kV$ ESD	LT1134A
5	3	5V, $\pm 12V$	No	Yes	N/A	Modem/DCE Interface, $\pm 10kV$ ESD	LT1135A
4	5	5V	Yes	Yes	0.1 μF	Synchronous PC/DTE Interface, $\pm 10kV$ ESD	LT1136A
5	3	5V	Yes	Yes	0.1 μF	Modem/DCE Interface, $\pm 10kV$ ESD	LT1138A
4	4	5V, 12V	Yes	Yes	0.1 μF	1488/1489 Replacement, $\pm 10kV$ ESD	LT1139A
5	3	5V, $\pm 12V$	Yes	Yes	N/A	Modem/DCE Interface, $\pm 10kV$ ESD	LT1140A
3	5	5V, $\pm 12V$	Yes	Yes	N/A	PC/DTE Interface, $\pm 10kV$ ESD	LT1141A
5	3	5V	Yes	Yes	0.1 μF	Ultralow Power, 1 Receiver Keep-Alive in SHDN, $\pm 10kV$ ESD	LTC1338

Complete AppleTalk®/LocalTalk® Transceivers



- Low Power
- Micropower Shutdown (Except LT1318)
- Micropower Receiver Keep Alive (LTC1323)
- Thermal/Short-Circuit Protection
- Small Charge Pump Capacitors
- Drivers High Impedance in Shutdown/Power Off States

SINGLE-ENDED		DIFFERENTIAL		SUPPLY VOLTAGE	COMMENTS	PKG	DEVICE
Tx	Rx	Tx	Rx				
2	1	1	1	5V	LocalTalk DCE Mode Select Rec.	SW24	LTC1318
2	2	1	0				
1	2	1	1	$\pm 5V$	LocalTalk* DTE	SW18	LTC1320
		1	1	5V	LocalTalk*	SW16	LTC1323-16
1	2	1	1	5V	LocalTalk* DTE	SW24, G28	LTC1323
		1	1	5V	LocalTalk	N16, SW16	LTC1324

*LocalTalk meets RS422 and each differential output also operates in single-ended mode.

Multistandard Interface Solutions

- 120kBd in EIA/TIA562 or RS232
- 10MBd in RS485/RS422
- Power-Up/Down Glitch-Free Outputs
- Driver Maintains High Impedance in Three-State, Shutdown or With Power Off
- Thermal Shutdown Protection
- Protection: I/O Lines Can Withstand $\pm 25V$
- Withstands Repeated $\pm 10kV$ ESD Pulses

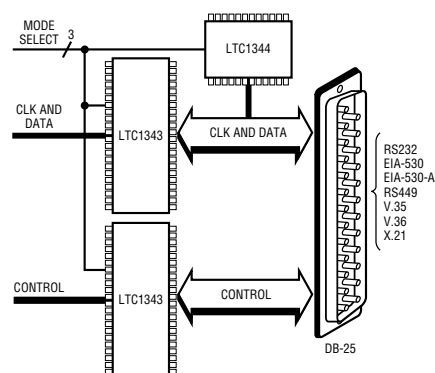
SINGLE-ENDED			DIFFERENTIAL			MODE	SUPPLY VOLTAGE	COMMENTS	PKG	DEVICE
STD	Tx	Rx	STD	Tx	Rx					
562	2	1	422	1	1	Mode = 0	5V	LocalTalk DCE, Configurable Rec.	SW24	LTC1318
562	2	2	422	1	0	Mode = 1				
562	2	2				SEL = 0	$\pm 5V$	User Configurable Includes Loopback Mode	NW24 SW24	LTC1321
232	2	2				SEL = 0	5V, $\pm 6.5V$			
			422/485	2	2	SEL = 1	± 5			
562	4	4				SEL = 0	± 5	User Configurable Includes Loopback Mode	NW24 SW24	LTC1322
232	4	4				SEL = 0	5, ± 6.5			
			422/485	2	2	SEL = 1	± 5			
232	4	4				SEL = 0	5	User Configurable Includes Loopback Mode	NW28 SW28	LTC1334
			422/485	2	2	SEL = 1				
562	4	4				SEL = 0	± 5	User Configurable Common Output Enable, Loopback	NW24 SW24	LTC1335
			422/485	2	2	SEL = 1				
232	2	2				SEL = 0	5	User Configurable		LTC1387
			422/485	1	1	SEL = 1				

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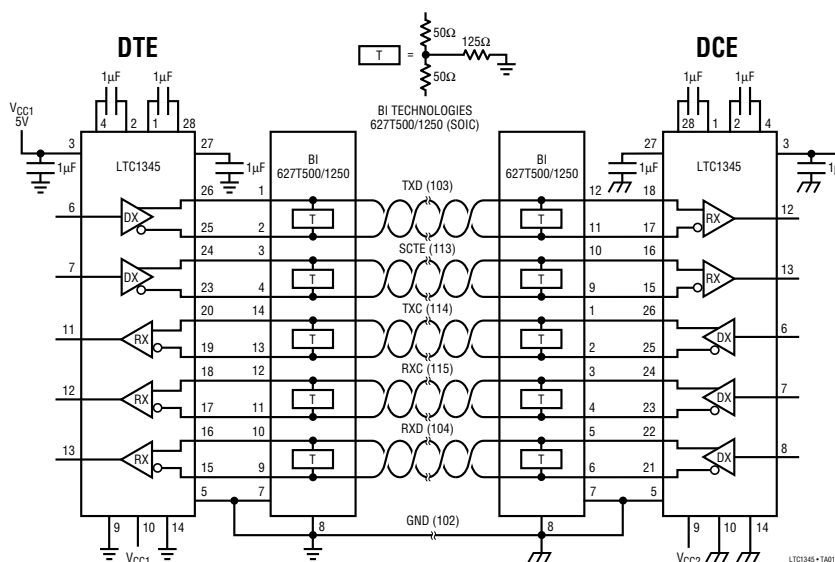
Multiprotocol Transceivers for Networking Equipment

CONFIGURABLE	LTC1343				LTC1344
Number of Drivers	3	4	4	3	
Number of Receivers	3	4	4	3	
Standards Supported	V.35 RS232 RS423 RS485				V.35, RS232, RS422
Protocols Supported	RS232, RS530, RS530A, RS449, V.35, V.36, X.21				
Supply Voltage	5V				5V
Features	Two Chips from a Complete Multiprotocol Port				Multiprotocol Termination
Packages	44-Lead SSOP28-Lead SSOP				
Data Sheet	NEW				NEW

Single 5V, Complete Multiprotocol Serial Port




V.35 Interface

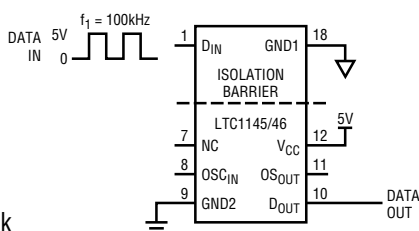


- Single Chip Provides All V.35 Differential Clock and Data Signals
- Operates From Single 5V Supply (LTC1345)
- Shutdown Mode Reduces I_{CC} to 1μA Typ
- Software Selectable DTE or DCE Configuration
- ±10kV ESD Protection
- 10MBd Transmission Rate
- Transmitter Maintains High Impedance When Disabled, Shut Down or with Power Off
- Meets CCITT V.35 Specification
- Transmitters are Short-Circuit Protected
- Available in Surface Mount SW Packages
- ±5V Powered (LTC1346A)



Low Power Digital Isolators

- UL Recognized  (LTC1145A, LTC1146A) File E151738 to UL1577
- Low Input Current
LTC1145: 700μA, LTC1146: 70μA
- Maximum Input Frequency
LTC1145: 200kHz, LTC1146: 20kHz
- TTL Level Output
- Noise Filter Prevents Glitches at the Output
- Output Can Be Synchronized to an External Clock

Digital Isolation Interface Data Rate Up to 200kHz



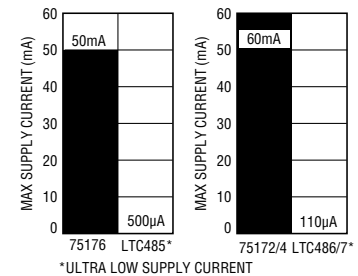
- Low Power Optoisolator Replacement
- Isolated Serial Data Interfaces
- Isolated Power MOSFET Drivers

ISOLATION VOLTAGE	INPUT CURRENT	MAX INPUT FREQUENCY	GLITCH-FREE OUTPUT FILTER	EXT CLOCK SYNCH	UL RECOGNIZED	PART NUMBER
2500	700μA	200kHz	Yes	Yes		LTC1145A
2500	70μA	20kHz	Yes	Yes		LTC1146A
500	700μA	200kHz	Yes	Yes		LTC1145
500	70μA	20kHz	Yes	Yes		LTC1146

RS485 Family Features

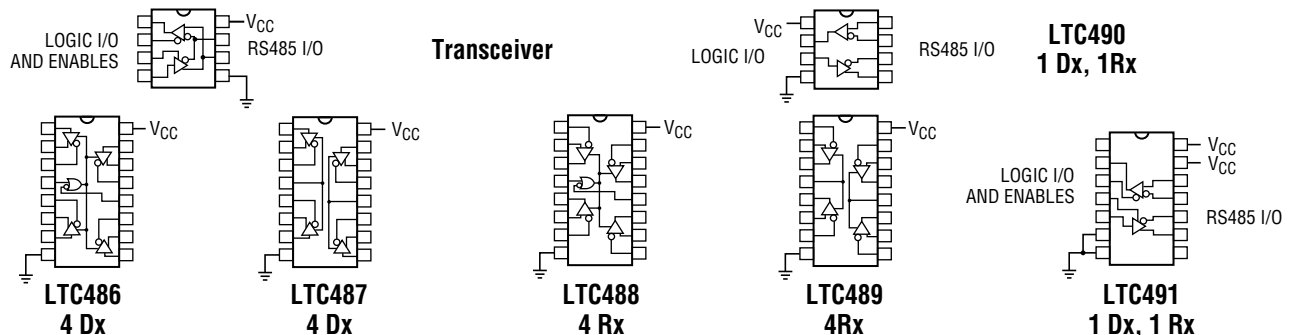
- Ultralow Power
- 3V Supply (LTC1480)
- Designed for RS485 and RS422 Applications
- Three-State RS485 Outputs When Shut Down
- Power-Up/Down Glitch-Free Outputs
- Power-Saving Shutdown Mode (LTC1481, LTC1483, LTC1487)
- Low EMI (LTC1483, LTC1487)
- 10MB Operation (LTC486/489, LTC1485)
- Industry Standard Pinouts
- SO Available

The LTC RS485 Advantage: Low Power



RS485/RS422 Interface

CONFIGURATION	V _{CC}	MAX DATA RATE	MAX I _{CC}	MAX I _{CC} (SD)	INDUSTRY STANDARD PINOUT	COMMENTS	PART NUMBER
Transceiver	5V	2.5M	500µA		75176		LTC485
Quad Driver	5V	10M	150µA		75172	26LS31 (RS422)	LTC486
Quad Driver	5V	10M	150µA		75174	3487 (RS422)	LTC487
Quad Receiver	5V	10M	10mA		75173	26LS32 (RS422), 10kV	LTC488
Quad Receiver	5V	10M	10mA		75175	3486 (RS422), 10kV	LTC489
Dr./Rec.	5V	2.5M	500µA		75179	10kV ESD	LTC490
Dr./Rec.	5V	2.5M	500µA		75ALS180	10kV ESD	LTC491
Transceiver	3V	2.5M	500µA	1µA	75176	10kV ESD	LTC1480
Transceiver	5V	2.5M	500µA	10µA	75176	Shutdown, 10kV ESD	LTC1481
Transceiver	5V	150k	500µA	10µA	75176	Low EMI, SD, 10kV ESD	LTC1483
Transceiver	5V	10M	3.5mA		75176	High Speed, 4kV ESD	LTC1485
Transceiver	5V	250k	200µA	10µA	75176	High Input Impedance, Low EMI, SD, 10kV ESD	LTC1487



Interface Standards

SPECIFICATION	RS232	RS423	RS422	RS485	RS562
Mode of Operation	Single-Ended	Single-Ended	Differential	Differential	Single-Ended
Number of Drivers and Receivers Allowed on One Line	1 Driver, 1 Receiver	1 Driver, 10 Receivers	1 Driver, 10 Receivers	32 Drivers, 32 Receivers	1 Driver, 1 Receiver
Maximum Cable Length	50 feet*	4000 feet	4000 feet	4000 feet	50 feet*
Maximum Data Rate	20kbps	100kbps	10Mbps	10Mbps	64kb/s
Maximum Voltage Applied to Driver Output	±25V	±6V	-0.25V to 6V	-7V to 12V	±25V
Driver Output Signal	Loaded	±5V	±3.6V	±2V	±1.5V
	Unloaded	±15V	±6V	±5V	±3.7V
Driver Load	3kΩ to 7kΩ	450Ω (Min)	100Ω	54Ω	3kΩ to 7kΩ
Maximum Driver Output Current (High Impedance State)	Power ON	—	—	—	60mA
	Power OFF	V _{MAX} /300Ω	±100µA	±100µA	V _{MAX} /300Ω
Output Slew Rate	30V/µs (Max)	Controls Provided	—	—	30V/µs (Max)
Receiver Input Voltage Range	±15V	±12V	±7V	-7V to 12V	±25V
Receiver Input Sensitivity	±3V	±200mV	±200mV	±200mV	±3V
Receiver Input Resistance	3k to 7k	4k (Min)	4k (Min)	12k (Min)	3k to 7k

*or 2500pF cable capacitance, as per EIA 232E