**FEATURES**

- ESD Protection over ±10kV
  (±15kV IEC-1000-4-2 for LT1133A, LT1137A and LT1141A)
- Uses Small Capacitors: 0.1µF, 0.2µF
- 1µA Supply Current in SHUTDOWN
- 120kbaud Operation for \( R_L = 3k, C_L = 2500pF \)
- 250kbaud Operation for \( R_L = 3k, C_L = 1000pF \)
- CMOS Comparable Low Power
- Easy PC Layout: Flowthrough Architecture
- Rugged Bipolar Design: Absolutely No Latchup
- Outputs Assume a High Impedance State When Off or Powered Down
- Improved Protection: RS232 I/O Lines Can Be Forced to ±30V Without Damage
- Output Overvoltage Does Not Force Current Back into Supplies
- Available in SO and SSOP Packages

**DESCRIPTION**

The LT®1130A/LT1140A series of RS232 drivers/receivers features special bipolar construction techniques which protect the drivers and receivers beyond the fault conditions stipulated for RS232. Driver outputs and receiver inputs can be shorted to ±30V without damaging the device or the power supply generator. In addition, the RS232 I/O pins are resilient to multiple ±10kV ESD strikes. An advanced driver output stage operates up to 250kbaud while driving heavy capacitive loads. Supply current is typically 12mA, competitive with CMOS devices.

Several members of the series include flexible operating mode controls. The DRIVER DISABLE pin disables the drivers and the charge pump, the ON/OFF pin shuts down all circuitry. While shut down, the drivers and receivers assume high impedance output states.

**TYPICAL APPLICATION**

**Basic Operation**

- LT1130A 5-Driver/5-Receiver RS232 Transceiver
- LT1131A 5-Driver/4-Receiver RS232 Transceiver w/Shutdown
- LT1132A 5-Driver/3-Receiver RS232 Transceiver
- LT1133A 3-Driver/5-Receiver RS232 Transceiver
- LT1134A 4-Driver/4-Receiver RS232 Transceiver
- LT1135A 5-Driver/3-Receiver RS232 Transceiver w/o Charge Pump

**Output Waveforms**

- LT1136A 4-Driver/5-Receiver RS232 Transceiver w/Shutdown
- LT1137A 3-Driver/5-Receiver RS232 Transceiver w/Shutdown
- LT1138A 5-Driver/3-Receiver RS232 Transceiver w/Shutdown
- LT1139A 4-Driver/4-Receiver RS232 Transceiver w/Shutdown
- LT1140A 5-Driver/3-Receiver RS232 Transceiver w/o Charge Pump
- LT1141A 3-Driver/5-Receiver RS232 Transceiver w/o Charge Pump

*LT, LTC and LT are registered trademarks of Linear Technology Corporation.*
LT1130A/LT1140A Series

ABSOLUTE MAXIMUM RATINGS (Note 1)

Supply Voltage (VCC) ................................................  6V
V+ ........................................................................  13.2V
V– (Note 7) .......................................................  –13.2V

Input Voltage
Driver ........................................................... V– to V+
Receiver ...............................................  – 30V to 30V
On/Off Pin............................................. –0.3V to 12V
Driver Disable Pin ......................  –0.3V to VCC + 0.3V

Output Voltage
Driver .................................................... – 30V to 30V
Receiver .................................... – 0.3V to VCC + 0.3V

Short-Circuit Duration
V+ ...................................................................  30 sec
V– ...................................................................  30 sec
Driver Output ..............................................  Indefinite
Receiver Output ..........................................  Indefinite

Operating Temperature Range
LT113XAC/LT114XAC ............................  0° to 70° C
LT113XAI/LT114XAI ........................... – 40° to +85° C

Storage Temperature Range ................  – 65° C to 150° C
Lead Temperature (Soldering, 10 sec) .......... 300° C

PRODUCT SELECTION TABLE

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Power Supply Voltages*</th>
<th>Shutdown</th>
<th>Driver Disable</th>
<th>Drivers</th>
<th>Receivers</th>
<th>External Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT1130A</td>
<td>5</td>
<td>No</td>
<td>No</td>
<td>5</td>
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<td>LT1131A</td>
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<td>LT1133A**</td>
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<td>LT1135A</td>
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<td>LT1136A</td>
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<td>LT1137A**</td>
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<td>LT1138A</td>
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<td>LT1139A</td>
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<td>2 Capacitors</td>
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<td>LT1140A</td>
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<td>Yes</td>
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<tr>
<td>LT1141A**</td>
<td>5, 12, –12</td>
<td>Yes</td>
<td>Yes</td>
<td>3</td>
<td>5</td>
<td>None</td>
</tr>
</tbody>
</table>

*The LT1130A, LT1131A, LT1132A, LT1136A, LT1137A and LT1138A can operate with 5V and 12V supplies and two external capacitors.
**Meets ±15kV ESD air gap discharge and ±8kV contact methods per IEC-1000-4-2.

PACKAGE/ORDER INFORMATION

5-DRIVER/5-RECEIVER

ORDER PART NUMBER
LT1130ACN
LT1130ACSW

5-DRIVER/4-RECEIVER WITH SHUTDOWN

ORDER PART NUMBER
LT1131ACN
LT1131ACSW

Tjmax = 150°C, θjA = 56°C/W (NW)
Tjmax = 150°C, θjA = 88°C/W (SW)

Tjmax = 150°C, θjA = 56°C/W (NW)
Tjmax = 150°C, θjA = 88°C/W (SW)
# LT1130A/LT1140A Series

## PACKAGE/OPTION INFORMATION

### 5-DRIVER/3-RECEIVER

<table>
<thead>
<tr>
<th>TOP VIEW</th>
<th>ORDER PART NUMBER</th>
<th>ORDER PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Top View Diagram" /></td>
<td>LT1132ACN</td>
<td>LT1132ACSW</td>
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<tr>
<td><img src="image2" alt="Top View Diagram" /></td>
<td>LT1132ACN</td>
<td>LT1132ACSW</td>
</tr>
<tr>
<td><img src="image3" alt="Top View Diagram" /></td>
<td>LT1132ACN</td>
<td>LT1132ACSW</td>
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<tr>
<td><img src="image4" alt="Top View Diagram" /></td>
<td>LT1132ACN</td>
<td>LT1132ACSW</td>
</tr>
<tr>
<td><img src="image5" alt="Top View Diagram" /></td>
<td>LT1132ACN</td>
<td>LT1132ACSW</td>
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<tr>
<td><img src="image6" alt="Top View Diagram" /></td>
<td>LT1132ACN</td>
<td>LT1132ACSW</td>
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</table>

\[T_{\text{MAX}} = 150^\circ C, \theta_{JA} = 58^\circ C/W (N)\]
\[T_{\text{MAX}} = 150^\circ C, \theta_{JA} = 80^\circ C/W (SW)\]

### 4-DRIVER/4-RECEIVER

<table>
<thead>
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<th>TOP VIEW</th>
<th>ORDER PART NUMBER</th>
<th>ORDER PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image7" alt="Top View Diagram" /></td>
<td>LT1134ACN</td>
<td>LT1134ACSW</td>
</tr>
<tr>
<td><img src="image8" alt="Top View Diagram" /></td>
<td>LT1134ACN</td>
<td>LT1134ACSW</td>
</tr>
<tr>
<td><img src="image9" alt="Top View Diagram" /></td>
<td>LT1134ACN</td>
<td>LT1134ACSW</td>
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<tr>
<td><img src="image10" alt="Top View Diagram" /></td>
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<td>LT1134ACSW</td>
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<tr>
<td><img src="image11" alt="Top View Diagram" /></td>
<td>LT1134ACN</td>
<td>LT1134ACSW</td>
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<tr>
<td><img src="image12" alt="Top View Diagram" /></td>
<td>LT1134ACN</td>
<td>LT1134ACSW</td>
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</tbody>
</table>

\[T_{\text{MAX}} = 150^\circ C, \theta_{JA} = 58^\circ C/W (N)\]
\[T_{\text{MAX}} = 150^\circ C, \theta_{JA} = 80^\circ C/W (SW)\]

### 4-DRIVER/5-RECEIVER WITH SHUTDOWN

<table>
<thead>
<tr>
<th>TOP VIEW</th>
<th>ORDER PART NUMBER</th>
<th>ORDER PART NUMBER</th>
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</thead>
<tbody>
<tr>
<td><img src="image13" alt="Top View Diagram" /></td>
<td>LT1136ACN</td>
<td>LT1136ACSW</td>
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<tr>
<td><img src="image14" alt="Top View Diagram" /></td>
<td>LT1136ACN</td>
<td>LT1136ACSW</td>
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<tr>
<td><img src="image15" alt="Top View Diagram" /></td>
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<tr>
<td><img src="image16" alt="Top View Diagram" /></td>
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<td>LT1136ACSW</td>
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<tr>
<td><img src="image17" alt="Top View Diagram" /></td>
<td>LT1136ACN</td>
<td>LT1136ACSW</td>
</tr>
<tr>
<td><img src="image18" alt="Top View Diagram" /></td>
<td>LT1136ACN</td>
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\[T_{\text{MAX}} = 150^\circ C, \theta_{JA} = 58^\circ C/W (NW)\]
\[T_{\text{MAX}} = 150^\circ C, \theta_{JA} = 68^\circ C/W (SW)\]

### 3-DRIVER/5-RECEIVER WITH SHUTDOWN

<table>
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<th>ORDER PART NUMBER</th>
<th>ORDER PART NUMBER</th>
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<tr>
<td><img src="image19" alt="Top View Diagram" /></td>
<td>LT1137ACN</td>
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<td><img src="image20" alt="Top View Diagram" /></td>
<td>LT1137ACN</td>
<td>LT1137ACSW</td>
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<tr>
<td><img src="image21" alt="Top View Diagram" /></td>
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<tr>
<td><img src="image24" alt="Top View Diagram" /></td>
<td>LT1137ACN</td>
<td>LT1137ACSW</td>
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</table>

\[T_{\text{MAX}} = 150^\circ C, \theta_{JA} = 90^\circ C/W (NW)\]
\[T_{\text{MAX}} = 150^\circ C, \theta_{JA} = 85^\circ C/W (SW)\]
LT1130A/LT1140A Series

**PACKAGE/ORDER INFORMATION**

### 5-DRIVER/3-RECEIVER WITH SHUTDOWN

- **TOP VIEW**
- **V+** Output 8.6 V
- **V-** Output –7.8 V
- **5V VCC Supply Current**
  - LT1130A, LT1131A, LT1132A, LT1133A, LT1134A, LT1136A, LT1138A: 1217 mA
  - LT1139A, LT1140A, LT1141A: 815 mA

### ORDER PART NUMBER

- LT1138ACG
- LT1138ACN
- LT1138ACSW
- LT1138AIG

### 4-DRIVER/4-RECEIVER WITH SHUTDOWN WITH 12V AND 5V SUPPLIES

- **TOP VIEW**
- **V+** Output 8.6 V
- **V-** Output –7.8 V
- **5V VCC Supply Current**
  - LT1139A, LT1140A, LT1141A: 1217 mA

### ORDER PART NUMBER

- LT1139ACN
- LT1139ACSW

### 5-DRIVER/3-RECEIVER WITHOUT CHARGE PUMP

- **TOP VIEW**
- **V+** Output 8.6 V
- **V-** Output –7.8 V
- **5V VCC Supply Current**
  - LT1140A: 1217 mA

### ORDER PART NUMBER

- LT1140ACN
- LT1140ACSW

### 3-DRIVER/5-RECEIVER WITHOUT CHARGE PUMP

- **TOP VIEW**
- **V+** Output 8.6 V
- **V-** Output –7.8 V
- **5V VCC Supply Current**
  - LT1141A: 1217 mA

### ORDER PART NUMBER

- LT1141ACN
- LT1141ACSW

Consult factory for Industrial and Military grade parts.

**ELECTRICAL CHARACTERISTICS** (Note 2)

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>CONDITIONS</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNITS</th>
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<tr>
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<tr>
<td><strong>V+ Output</strong></td>
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<td>8.6</td>
<td></td>
<td></td>
<td>V</td>
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<tr>
<td><strong>V- Output</strong></td>
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<td>–7.8</td>
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<td></td>
<td>V</td>
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<td><strong>5V VCC Supply Current</strong></td>
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<td>LT1130A, LT1131A, LT1132A,</td>
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<td>25</td>
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<td>mA</td>
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<tr>
<td>LT1138A</td>
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<tr>
<td><strong>5V VCC Supply Current</strong></td>
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<tr>
<td>LT1135A, LT1140A, LT1141A</td>
<td>(Note 3)</td>
<td>8</td>
<td>15</td>
<td></td>
<td>mA</td>
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<tr>
<td><strong>5V VCC Supply Current</strong></td>
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<tr>
<td>LT1137A</td>
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<td><strong>5V VCC Supply Current</strong></td>
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<td>(Note 3)</td>
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<td>15</td>
<td></td>
<td>mA</td>
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<tr>
<td><strong>12V V+ Supply Current</strong></td>
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<td>mA</td>
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<tr>
<td><strong>12V V+ Supply Current</strong></td>
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<td>10</td>
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<td>mA</td>
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## ELECTRICAL CHARACTERISTICS (Note 2)

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<thead>
<tr>
<th>PARAMETER</th>
<th>CONDITIONS</th>
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<th>TYP</th>
<th>MAX</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>Supply Current when OFF (VCC) Shutdown (Note 4) Driver Disable</td>
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<td>1</td>
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<td>µA</td>
<td>mA</td>
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<tr>
<td>Supply Rise Time Shutdown to Turn-On C1, C2, C+, C− = 1.0µF C+ , C− = 0.1µF, C1, C2 = 0.2µF</td>
<td></td>
<td>2.0</td>
<td>0.2</td>
<td>ms</td>
<td>ms</td>
</tr>
<tr>
<td>ON/OFF Pin Thresholds Input Low Level (Device Shut Down) Input High Level (Device Enabled)</td>
<td></td>
<td>2.4</td>
<td>1.4</td>
<td>V</td>
<td></td>
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<tr>
<td>ON/OFF Pin Current 0V ≤ VON/OFF ≤ 5V</td>
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<td>–15</td>
<td>80</td>
<td>µA</td>
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<tr>
<td>DRIVER DISABLE Pin Thresholds Input Low Level (Drivers Enabled) Input High Level (Drivers Disabled)</td>
<td></td>
<td>2.4</td>
<td>1.4</td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td>DRIVER DISABLE Pin Current 0V ≤ VDRIVER DISABLE ≤ 5V</td>
<td></td>
<td>–10</td>
<td>500</td>
<td>µA</td>
<td></td>
</tr>
<tr>
<td>Oscillator Frequency</td>
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<td></td>
<td>kHz</td>
<td></td>
</tr>
</tbody>
</table>

### Any Driver

| Output Voltage Swing | Load = 3k to GND Positive | Negative | | 5 | 7.3 | | |
| Logic Input Voltage Level | Input Low Level (VOUT = High) | Input High Level (VOUT = Low) | | 1.4 | 0.8 | V | V |
| Logic Input Current | 0.8V ≤ VIN ≤ 2V | | 5 | 20 | µA | |
| Output Short-Circuit Current | VOUT = 0V | | ±9 | ±17 | mA | |
| Output Leakage Current | Shutdown VOUT = ±30V (Note 4) | | 10 | 100 | µA | |
| Data Rate | R L = 3k, C L = 2500pF | | 120 | 250 | kbaud | kbaud |
| Slew Rate | R L = 3k, C L = 51pF | | 15 | 30 | V/µs | V/µs |
| R L = 3k, C L = 2500pF (Note 8) | | 6 | | |
| Propagation Delay | Output Transition tHL High to Low (Note 5) | Output Transition tLH Low to High | | 0.6 | 1.3 | µs | µs |

### Any Receiver

| Input Voltage Thresholds | Input Low Threshold (VOUT = High) | Input High Threshold (VOUT = Low) | | 0.8 | 1.3 | | V |
| Hysteresis | | | | 0.1 | 0.4 | 1 | V |
| Input Resistance | –10V < VIN < 10V | | | 3 | 5 | 7 | kΩ |
| Output Voltage | Output Low, IOUT = –1.6mA | Output High, IOUT = 160µA (VCC = 5V) | | 0.2 | 4.2 | V | |
| | Shutdown (Note 4) 0 ≤ VOUT ≤ VCC | | | 3.5 | | |
| Output Short-Circuit Current | Sinking Current, VOUT = VCC | Source Current, VOUT = 0V | | 1 | –10 | mA | mA |
| Propagation Delay | Output Transition tHL High to Low (Note 6) | Output Transition tLH Low to High | | 250 | 600 | ns | |

The ● denotes specifications which apply over the operating temperature range (0°C ≤ TA ≤ 70°C for commercial grade and –40°C ≤ TA ≤ 85°C for industrial grade).

**Note 1:** Absolute Maximum Ratings are those values beyond which the life of the device may be impaired.

**Note 2:** Testing done at VCC = 5V and VON/OFF = 3V.

**Note 3:** Supply current is measured with driver and receiver outputs unloaded and the driver inputs tied high.

**Note 4:** Supply current and driver leakage current measurements in shutdown are performed with VON/OFF = 0.1V. Supply current measurements using DRIVER DISABLE are performed with VDRIVER DISABLE = 3V. For LT1135, LT1139, LT1140 and LT1141 with 12V supplies, VOUT leakage is 200µA for VOUT forced to ±25V.

**Note 5:** For driver delay measurements, R L = 3k and C L = 51pF. Trigger points are set between the driver’s input logic threshold and the output transition to the zero crossing (tHL = 1.4V to 0V and tLH = 1.4V to 0V).

**Note 6:** For receiver delay measurements, C L = 51pF. Trigger points are set between the receiver’s input logic threshold and the output transition to standard TTL/CMOS logic threshold (tHL = 1.3V to 2.4V and tLH = 1.7V to 0.8V).

**Note 7:** For LT1133A/LT1137A, absolute maximum externally applied V– = –6.5V. Internal charge pump will drive this pin to a higher negative voltage.

**Note 8:** For LT1137A, 4V/µs minimum.
TYPICAL PERFORMANCE CHARACTERISTICS

Driver Output Voltage

Receiver Input Thresholds

Supply Current vs Data Rate

Supply Current in Shutdown

Supply Current in Driver Disable

Driver Disable Threshold

ON/OFF Thresholds

Supply Current

Driver Leakage in Shutdown

VCC = 5.5V
VCC = 5V
VCC = 4.5V
VCC = 5V

5 DRIVER
Rl = 3k
Cn = 2500pF

3 DRIVER
Rl = 3k
Cn = 2500pF

1 DRIVER

NO LOAD

VOUT = 30V
VOUT = –30V
**PIN FUNCTIONS**

**VCC**: 5V Input Supply Pin. Supply current drops to zero in the shutdown mode. This pin should be decoupled with a 0.1μF ceramic capacitor close to the package pin. Insufficient supply bypassing can result in low output drive levels and erratic charge pump operation.

**GND**: Ground Pin.

**ON/OFF**: Control the operation mode of the device and is TTL/CMOS compatible. A logic low puts the device in the shutdown mode which reduces input supply current to zero and places all of the drivers and receivers in high impedance state. A logic high fully enables the transceiver.

**DRIVER DISABLE**: This pin provides an alternate control for the charge pump and RS232 drivers. A logic high on this pin shuts down the charge pump and places all drivers in a high impedance state. Receivers remain active under these conditions. Floating the DRIVER DISABLE pin or driving it to a logic low level fully enables the transceiver. A logic low on the ON/OFF pin supersedes the state of the DRIVER DISABLE pin. Supply current drops to 4mA when in driver disable mode.

**V+**: Positive Supply Output (RS232 Drivers). \( V^+ \approx 2V_{CC} - 1.5V \). This pin requires an external charge storage capacitor \( C \geq 1.0\mu F \), tied to ground or \( V_{CC} \). Larger value capacitors may be used to reduce supply ripple. With multiple transceivers, the \( V^+ \) and \( V^- \) pins may be paralleled into common capacitors. For large numbers of transceivers, increasing the size of the shared common storage capacitors is recommended to reduce ripple.
**PIN FUNCTIONS**

**V–**: Negative Supply Output (RS232 Drivers). $V^- = -(2V_{CC} - 2.5V)$. This pin requires an external charge storage capacitor $C \geq 0.1\mu F$. $V^-$ is short-circuit proof for 30 seconds.

**C1+, C1–, C2+, C2–**: Commutating Capacitor Inputs. These pins require two external capacitors $C \geq 0.2\mu F$: one from C1+ to C1–, and another from C2+ to C2–. To maintain charge pump efficiency, the capacitor’s effective series resistance should be less than $2\Omega$. For $C \geq 1\mu F$, low ESR tantalum capacitors work well in this application, although small value ceramic capacitors may be used with a minimal reduction in charge pump compliance. In applications where larger positive voltages are available, such as 12V, C1 may be omitted and the positive voltage may be connected directly to the C1+ pin. In this mode of operation, the V+ pin should be decoupled with a $0.1\mu F$ ceramic capacitor.

**DRIVER IN**: RS232 Driver Input Pins. These inputs are TTL/CMOS compatible. Inputs should not be allowed to float. Tie unused inputs to $V_{CC}$.

**DRIVER OUT**: Driver Outputs at RS232 Voltage Levels. Driver output swing meets RS232 levels for loads up to 3k.

Slew rates are controlled for lightly loaded lines. Output current capability is sufficient for load conditions up to 2500pF. Outputs are in a high impedance state when in shutdown mode, $V_{CC} = 0V$, or when the DRIVER DISABLE pin is active. Outputs are fully short-circuit protected from $V^- + 30V$ to $V^+ - 30V$. Applying higher voltages will not damage the device if the overdrive is moderately current limited. Short circuits on one output can load the power supply generator and may disrupt the signal levels of the other outputs. The driver outputs are protected against ESD to ±10kV for human body model discharges.

**RX IN**: Receiver Inputs. These pins accept RS232 level signals (±30V) into a protected 5k terminating resistor. The receiver inputs are protected against ESD to ±10kV for human body model discharges. Each receiver provides 0.4V of hysteresis for noise immunity. Open receiver inputs assume a logic low state.

**RX OUT**: Receiver Outputs with TTL/CMOS Voltage Levels. Outputs are in a high impedance state when in shutdown mode to allow data line sharing. Outputs are fully short-circuit protected to ground or $V_{CC}$ with the power on, off, or in shutdown mode.

**ESD PROTECTION**

The RS232 line inputs of the LT1130A/LT1140A series of RS232 Driver/Receivers have on-chip protection from ESD transients up to ±10kV. The protection structures act to divert the static discharge safely to system ground. In order for the ESD protection to function effectively, the power supply and ground pins of the LT1130A/LT1140A must be connected to ground through low impedances. The power supply decoupling capacitors and charge pump storage capacitors provide this low impedance in normal application of the circuit. The only constraint is that low ESR capacitors must be used for bypassing and charge storage. ESD testing must be done with pins $V_{CC}$, $V^+$, $V^-$ and GND shorted to ground or connected with low ESR capacitors.

The ESD protection on the LT1133A, LT1137A and LT1141A meets ±15kV air gap discharge and ±8kV contact methods per IEC-1000-4-2.
TYPICAL APPLICATIONS

Operation Using 5V and 12V Power Supplies

Typical Mouse Driving Application
### GW Package
#### 28-Lead Plastic SSOP (Wide 0.300)
(LTC DWG # 05-08-1642)

- **Dimensions in inches (millimeters) unless otherwise noted.**
- **GW Package**
- 28-Lead Plastic SSOP (Wide 0.300)
- (LTC DWG # 05-08-1642)

### N Package
#### 20-Lead PDIP (Narrow 0.300)
(LTC DWG # 05-08-1510)

- **Dimensions in inches (millimeters) unless otherwise noted.**
- **N Package**
- 20-Lead PDIP (Narrow 0.300)
- (LTC DWG # 05-08-1510)

### N Package
#### 24-Lead PDIP (Narrow 0.300)
(LTC DWG # 05-08-1510)

- **Dimensions in inches (millimeters) unless otherwise noted.**
- **N Package**
- 24-Lead PDIP (Narrow 0.300)
- (LTC DWG # 05-08-1510)

*DIMENSIONS DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.006" (0.152mm) PER SIDE.*

*DIMENSIONS DO NOT INCLUDE INTERLEAD FLASH. INTERLEAD FLASH SHALL NOT EXCEED 0.010" (0.254mm) PER SIDE.*
LT1130A/LT1140A Series

PACKAGE DESCRIPTION

Dimensions in inches (millimeters) unless otherwise noted.

NW Package
28-Lead PDIP (Wide 0.600)
(LTC DWG # 05-08-1520)

NO. PACKAGE
28-Lead PDIP (Wide 0.600)
(LTC DWG # 05-08-1520)

SW Package
20-Lead Plastic Small Outline (Wide 0.300)
(LTC DWG # 05-08-1620)

SW Package
24-Lead Plastic Small Outline (Wide 0.300)
(LTC DWG # 05-08-1620)

* THESE DIMENSIONS DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.
MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED 0.010 INCH (0.254MM)

NOTE 1
1. PIN 1 IDENT, NOTCH ON TOP AND CAVITIES ON THE BOTTOM OF PACKAGES ARE THE MANUFACTURING OPTIONS.
The PART MAY BE SUPPLIED WITH OR WITHOUT ANY OF THE OPTIONS
** DIMENSION DOES NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.006" (0.152mm) PER SIDE
** DIMENSION DOES NOT INCLUDE INTERLEAD FLASH. INTERLEAD FLASH SHALL NOT EXCEED 0.010" (0.254mm) PER SIDE

Information furnished by Linear Technology Corporation is believed to be accurate and reliable.
However, no responsibility is assumed for its use. Linear Technology Corporation makes no representa-
tion that the interconnection of its circuits as described herein will not infringe on existing patent rights.
**LT1130A/LT1140A Series**

**PACKAGE DESCRIPTION**
Dimensions in inches (millimeters) unless otherwise noted.

**SW Package**
28-Lead Plastic Small Outline (Wide 0.300)
(LTC DWG # 05-08-1620)

**TYPICAL APPLICATION**
Sharing Power Supply Generator with a Second Transceiver

**RELATED PARTS**

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