# LINFINITY
## MICROELECTRONICS

**THE INFINITE POWER OF INNOVATION**

## LX5207

### 18-LINE LOW CAPACITANCE, µPOWER SCSI TERMINATOR

### PRODUCTION DATA SHEET

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## DESCRIPTION

The LX5207 is an eighteen line active terminator for the SCSI parallel bus. This SCSI standard recommends active termination at both ends of the SCSI bus.

During disconnect mode, the LX5207 requires a meager 500nA of supply current while offering only 2.5pF of output capacitance. To enter this low power mode, the disconnect pin can be left open (floating) or driven high thereby disconnecting the terminating resistors and placing the internal low dropout regulator into low power mode. In disconnect mode each termination line presents a high impedance to the SCSI bus with the overall effect being to preserve high signal integrity and subsequent reliable, error free communications.

During normal operation, the LX5207 consumes only 800µA of current which is the lowest enabled supply current of any terminator available on the market today. Linfinity's proprietary BiCMOS low dropout regulator architecture enables this unique and very efficient operating characteristic.

The LX5207 also offers a precisely trimmed channel output current specified to a 5% tolerance. The maximum value of the output current is trimmed as closely as possible to the SCSI standard maximum specification to give the highest possible noise margin for fast SCSI operation. And finally, the LX5207 sinks up to 100mA of current making it compatible with today's fast active negation drivers.
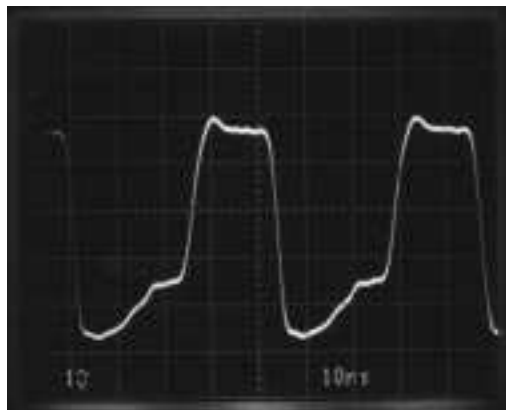
The LX5207 is a superior, pin-for-pin replacement for a variety of industry products such as the UC5601, UC5602, UC5608, and UC5609.
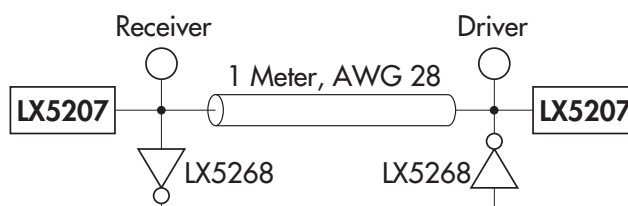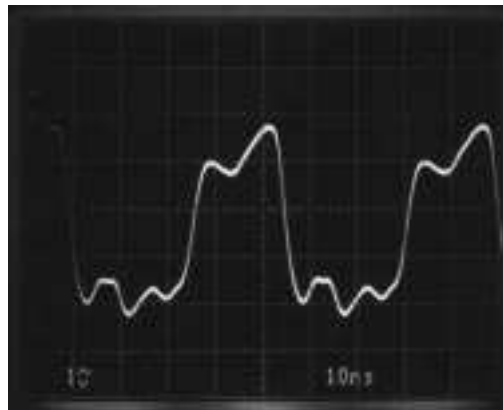
## KEY FEATURES

- 2.5pF OUTPUT CAPACITANCE DURING DISCONNECT

- 500nA SUPPLY CURRENT IN DISCONNECT MODE

- 800µA SUPPLY CURRENT DURING NORMAL OPERATION

- 100mA SINK CURRENT FOR ACTIVE NEGATION

- LOGIC COMMAND DISCONNECTS ALL TERMINATION LINES

- CURRENT LIMIT AND THERMAL PROTECTION

- COMPATIBLE WITH SCSI 1, 2, 3, AND FAST-20 STANDARDS

- HOT SWAP COMPATIBLE

- CONSULT FACTORY FOR APPLICATION TEST REPORT: **5207TR**

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## PRODUCT HIGHLIGHT

### RECEIVING WAVEFORM - 20MHZ



### DRIVING WAVEFORM - 20MHZ





Receiver    Driver

LX5207    1 Meter, AWG 28    LX5207

LX5268    LX5268

——— NOTE: ———
For An In-Depth Discussion On Applying SCSI, Request Linfinity Application Note: "Understanding The Single-Ended SCSI Bus"

## PACKAGE ORDER INFO

| T$_A$ (°C) | DWP Plastic SOWB 28-pin, Power |
|---|---|
| **0 to 70** | **LX5207CDWP** |

Note: All surface-mount packages are available in Tape & Reel. Append the letter "T" to part number. (i.e. LX5207CDWPT)

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### FOR FURTHER INFORMATION CALL (714) 898-8121

# LX5207

## ABSOLUTE MAXIMUM RATINGS   (Note 1)

TermPwr Voltage ...................................................................................................+7V
Signal Line Voltage .................................................................................... 0V to +7V
Regulator Output Current ................................................................................... 1.2A
Operating Junction Temperature
   Plastic (DWP Package).................................................................................. 150°C
Storage Temperature Range .............................................................. -65°C to 150°C
Lead Temperature (Soldering, 10 seconds) ................................................... 300°C

Note 1.   Exceeding these ratings could cause damage to the device. All voltages are with
             respect to Ground.  Currents are positive into, negative out of the specified
             terminal.

## THERMAL DATA

**DWP PACKAGE:**

| | |
|---|---|
| THERMAL RESISTANCE-JUNCTION TO LEADS, $\theta_{JL}$ | 18°C/W |
| THERMAL RESISTANCE-JUNCTION TO AMBIENT, $\theta_{JA}$ | 40°C/W |

Junction Temperature Calculation:  $T_J = T_A + (P_D \times \theta_{JA})$.
The $\theta_{JA}$ numbers are guidelines for the thermal performance of the device/pc-board
system.  All of the above assume no ambient airflow.

## PACKAGE PIN OUTS

| | | |
|---|---|---|
| DISCONNECT | 1 | 28 | GND |
| T1 | 2 | 27 | T18 |
| T2 | 3 | 26 | T17 |
| T3 | 4 | 25 | T16 |
| T4 | 5 | 24 | T15 |
| T5 | 6 | 23 | T14 |
| HEAT SINK | 7 | 22 | HEAT SINK |
| HEAT SINK | 8 | 21 | HEAT SINK |
| HEAT SINK | 9 | 20 | HEAT SINK |
| T6 | 10 | 19 | T13 |
| T7 | 11 | 18 | T12 |
| T8 | 12 | 17 | T11 |
| T9 | 13 | 16 | T10 |
| $V_{TERM}$ | 14 | 15 | REG OUT |

**DWP PACKAGE**
(Top View)

### POWER UP / POWER DOWN FUNCTION TABLE

| Disconnect | Outputs | Quiescent Current |
|:---:|:---:|:---:|
| L | Enabled | 800µA |
| H | HI Z | 0.5µA |
| Open | HI Z | 0.5µA |

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## RECOMMENDED OPERATING CONDITIONS  (Note 2)

| Parameter | Symbol | Recommended Operating Conditions | | | Units |
|-----------|--------|------|------|------|-------|
| | | Min. | Typ. | Max. | |
| Termpwr Voltage | $V_{TERM}$ | 4 | | 5.25 | V |
| Signal Line Voltage | | 0 | | 5 | V |
| Disconnect Input Voltage | | 0 | | $V_{TERM}$ | V |
| Output Capacitance on REGOUT | | 4.7 | | | µF |
| Operating Virtual Junction Temperature Range | | | | | |
|    LX5207C | | 0 | | 70 | °C |

Note 2.  Range over which the device is functional.

## ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, these specifications apply over the operating ambient temperature range of $0°C \leq T_A \leq 70°C$.  Termpwr = 4.75V, Disconnect = 0V.  Low duty cycle pulse testing techniques are used which maintains junction and case temperatures equal to the ambient temperature.)

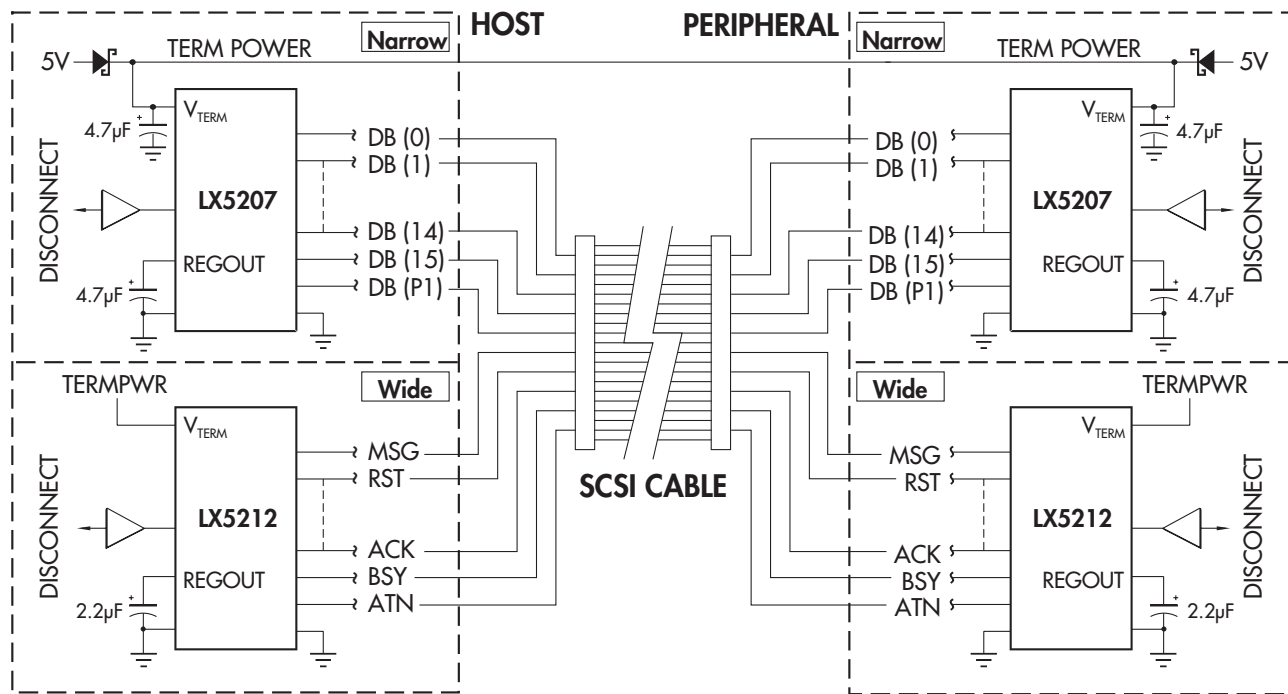| Parameter | Symbol | Test Conditions | LX5207 | | | Units |
|-----------|--------|-----------------|--------|--------|--------|-------|
| | | | Min. | Typ. | Max. | |
| **Supply Current Section** | | | | | | |
| Termpwr Supply Current | | All term lines = Open | | 0.8 | 2.0 | mA |
| | | All term lines = 0.5V | | 390 | 415 | mA |
| Power Down Mode | | Disconnect = Open | | 0.5 | 1 | µA |
| **Output Section (Terminator Lines)** | | | | | | |
| Terminator Impedance | | $I_{TERM}$ = -5mA to -15mA | 100 | 110 | 120 | Ω |
| Terminator Output High Voltage | | | 2.7 | 2.9 | | V |
| Max. Output Current | | $V_{OUT}$ = 0.5V, $T_A$ = 25°C | -20.3 | -21.8 | -23 | mA |
| | | $V_{OUT}$ = 0.5V, $0°C \leq T_A \leq 70°C$ | -19.0 | -21.8 | -23 | mA |
| | | $V_{OUT}$ = 0.5V, $V_{TERM}$ = 4V, $T_A$ = 25°C | -19.5 | -21.8 | -23 | mA |
| | | $V_{OUT}$ = 0.5V, $V_{TERM}$ = 4V, $0°C \leq T_A \leq 70°C$ | -18.0 | -21.8 | -23 | mA |
| Output Leakage | | Disconnect = Open, $V_{TERM}$ = 0V to 5.25V | | 10 | 400 | nA |
| Output Capacitance | | Disconnect = Open | | 2.5 | | pF |
| Sink Current | | $V_{OUT}$ = 4V | 58 | 70 | | mA |
| **Regulator Section** | | | | | | |
| Regulator Output Voltage | | | | 3.6 | | V |
| Line Regulation | | $V_{TERM}$ = 4V to 6V | | 10 | 20 | mV |
| Load Regulation | | $I_{REG}$ = 0 to -100mA | | 20 | 50 | mV |
| Drop Out Voltage | | $I_{REG}$ = -100mA | | 0.45 | 1.0 | V |
| Short Circuit Current | | $V_{REG}$ = 0V | | -800 | -1100 | mA |
| Thermal Shutdown | | | | 150 | | °C |
| **Disconnect Section** | | | | | | |
| Disconnect Threshold | | | 0.8 | | 2.0 | V |
| Input Current | | Disconnect = 0V | | | 40 | µA |

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# LX5207

## BLOCK DIAGRAM

**FIGURE 1** — LX5207 BLOCK DIAGRAM
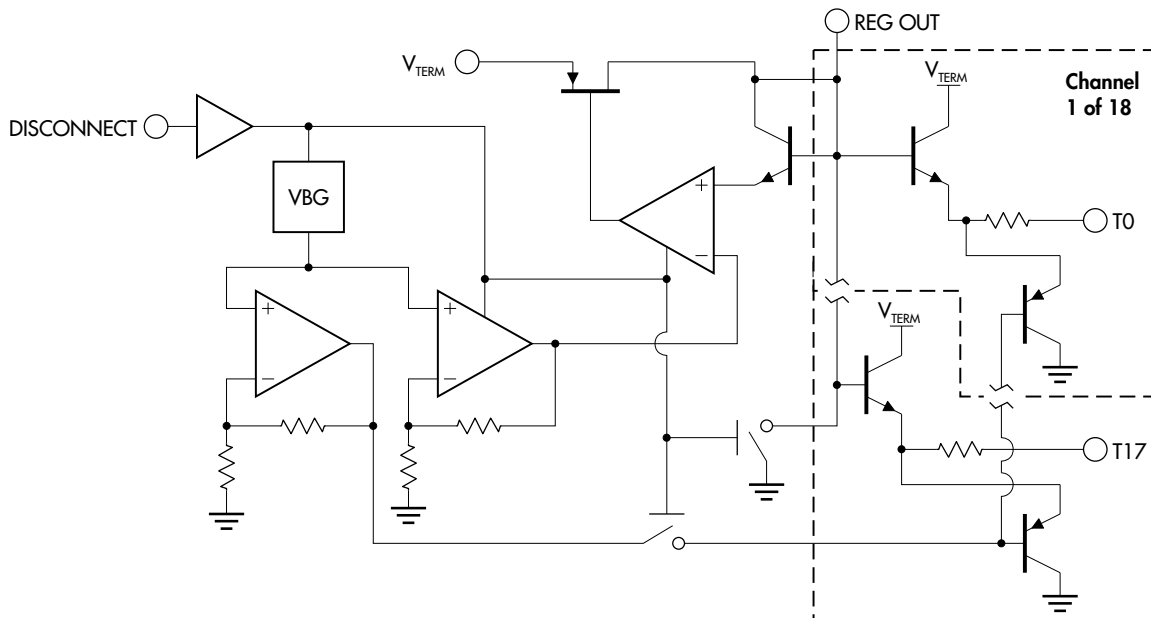


## APPLICATION SCHEMATIC

**FIGURE 2** — 8/16-BIT SCSI SYSTEM APPLICATION

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