

DESCRIPTION

The LX5203 is a nine-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 LX5203 requires a meager 60µA of supply current, while offering only 6pF 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 yield subsequent reliable, error-free communications.

During normal operation, the LX5203 con-

sumes only 600µA of current. Linfinity's proprietary BiCMOS low dropout regulator architecture enables oscillation-free operation with minimal output capacitance. Linfinity recommends a minimum stabilization capacitor value of 2.2µF.

The LX5203 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 the LX5203 sinks up to 150mA of current making it compatible with today's fast active negation drivers.

The LX5203 is a superior, pin-for-pin replacement for a variety of industry products such as the UC5603 and UC5613.

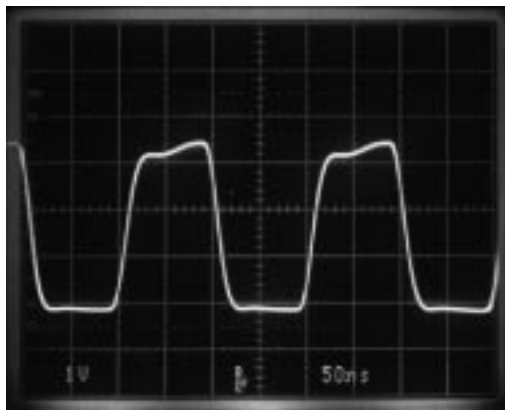
KEY FEATURES

- 6pF OUTPUT CAPACITANCE DURING DISCONNECT
- 60µA SUPPLY CURRENT IN DISCONNECT MODE
- 600µA SUPPLY CURRENT DURING NORMAL OPERATION
- 150mA SINK CURRENT FOR ACTIVE NEGATION
- LOGIC COMMAND DISCONNECTS ALL TERMINATION LINES
- CURRENT LIMIT AND THERMAL PROTECTION
- COMPATIBLE WITH SCSI 1, 2 AND 3 STANDARDS
- CONSULT FACTORY FOR APPLICATION TEST REPORT: **5203TR**

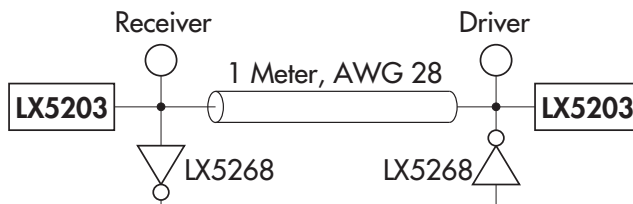
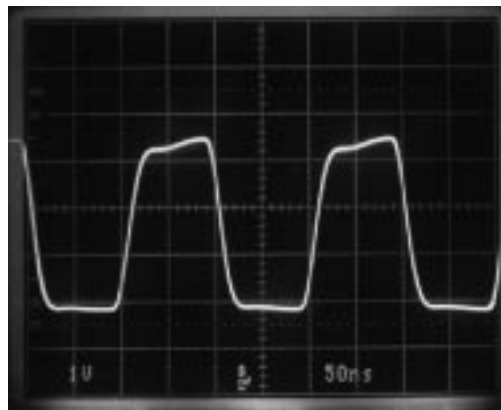
IMPORTANT: For the most current data, consult Linfinity's web site: <http://www.linfinity.com>.

PRODUCT HIGHLIGHT

RECEIVING WAVEFORM - 5MHZ



DRIVING WAVEFORM - 5MHZ



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

PACKAGE ORDER INFORMATION

| T _A (°C) | N | Plastic DIP 16-pin | DP | Plastic SOIC 16-pin, Power |
|---------------------|---|-----------------------|----|-------------------------------|
| 0 to 70 | | LX5203CN | | LX5203CDP |

Note: All surface-mount packages are available in Tape & Reel. Append the letter "T" to part number. (i.e. LX5203CDPT)

9-LINE SCSI ACTIVE TERMINATOR

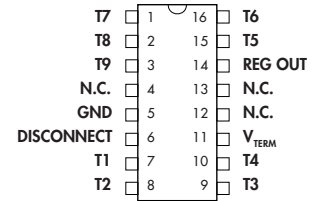
PRODUCTION DATA SHEET

ABSOLUTE MAXIMUM RATINGS (Note 1)

| | |
|--|----------------|
| TermPwr Voltage | +7V |
| Signal Line Voltage | 0V to +7V |
| Regulator Output Current | 0.4A |
| Operating Junction Temperature | |
| Plastic (N, DP Packages) | 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.

PACKAGE PIN OUTS



N PACKAGE
(Top View)

THERMAL DATA

N PACKAGE:

| | |
|---|---------------|
| THERMAL RESISTANCE-JUNCTION TO AMBIENT, θ_{JA} | 65°C/W |
|---|---------------|

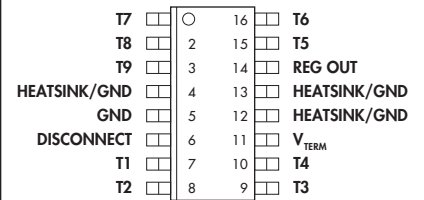
DP PACKAGE:

| | |
|---|---------------|
| THERMAL RESISTANCE-JUNCTION TO LEADS, θ_{JL} | 20°C/W |
|---|---------------|

| | |
|---|---------------|
| THERMAL RESISTANCE-JUNCTION TO AMBIENT, θ_{JA} | 45°C/W |
|---|---------------|

Junction Temperature Calculation: $T_j = T_a + (P_D \times \theta_{JA})$.

The θ_{JA} numbers are guidelines for the thermal performance of the device/pc-board system. All of the above assume no ambient airflow.



DP PACKAGE
(Top View)

POWER UP / POWER DOWN FUNCTION TABLE

| Disconnect | Outputs | Quiescent Current |
|------------|---------|-------------------|
| L | Enabled | 600µA |
| H | HI Z | 60µA |
| Open | HI Z | 60µA |

9-LINE SCSI ACTIVE TERMINATOR

PRODUCTION DATA SHEET

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 Capacitor on REGOUT | | 2.2 | | | μ F |
| Operating Virtual Junction Temperature Range | | | | | |
| LX5203C | | 0 | | 125 | $^{\circ}$ 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 $0^{\circ}\text{C} \leq T_A \leq 70^{\circ}\text{C}$. TermPwr = 4.75V, Disconnect = 0V. Low duty cycle pulse testing techniques are used which maintains junction and case temperatures equal to the ambient temperature.)

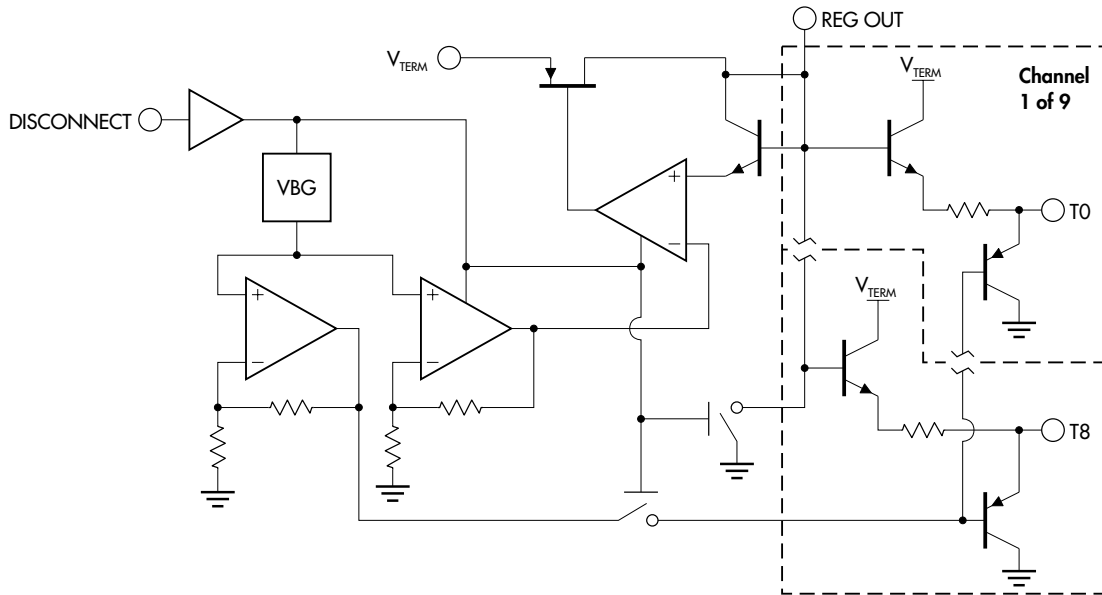
| Parameter | Symbol | Test Conditions | LX5203 | | | Units |
|--|--------|---|--------|-------|------|--------------|
| | | | Min. | Typ. | Max. | |
| Supply Current Section | | | | | | |
| TermPwr Supply Current | | All term lines = Open | | 0.6 | 1.2 | mA |
| | | All term lines = 0.5V | | 194 | 208 | mA |
| Power Down Mode | | Disconnect = Open | | 60 | 100 | μ A |
| Output Section (Terminator Lines) | | | | | | |
| Terminator Impedance | | $I_{TERM} = -5\text{mA to } -15\text{mA}, T_A = 25^{\circ}\text{C}$ | 104 | 110 | 116 | Ω |
| | | $I_{TERM} = -5\text{mA to } -15\text{mA}$ | 100 | 110 | 120 | Ω |
| Terminator Output High Voltage | | | 2.7 | 2.9 | | V |
| Max. Output Current | | $V_{OUT} = 0.5\text{V}, T_A = 25^{\circ}\text{C}$ | -20.3 | -21.8 | -23 | mA |
| | | $V_{OUT} = 0.5\text{V}, 0^{\circ}\text{C} \leq T_A \leq 70^{\circ}\text{C}$ | -19.0 | -21.8 | -23 | mA |
| | | $V_{OUT} = 0.5\text{V}, V_{TERM} = 4\text{V}, T_A = 25^{\circ}\text{C}$ | -19.5 | -21.8 | -23 | mA |
| | | $V_{OUT} = 0.5\text{V}, V_{TERM} = 4\text{V}, 0^{\circ}\text{C} \leq T_A \leq 70^{\circ}\text{C}$ | -18.0 | -21.8 | -23 | mA |
| Output Leakage | | Disconnect = Open, $V_{TERM} = 0\text{V to } 5.25\text{V}$ | | 10 | 400 | nA |
| Output Capacitance | | Disconnect = Open | | 6 | | pF |
| Sink Current | | $V_{OUT} = 4\text{V}$ | 20 | 30 | | mA |
| Regulator Section | | | | | | |
| Regulator Output Voltage | | | | 3.6 | | V |
| Line Regulation | | $V_{TERM} = 4\text{V to } 6\text{V}$ | | 10 | 20 | mV |
| Load Regulation | | $I_{REG} = 0\text{ to } -50\text{mA}$ | | 20 | 50 | mV |
| Drop Out Voltage | | $I_{REG} = -50\text{mA}$ | | 0.7 | 1.0 | V |
| Short Circuit Current | | $V_{REG} = 0\text{V}$ | | -200 | -350 | mA |
| Thermal Shutdown | | | | 150 | | $^{\circ}$ C |
| Disconnect Section | | | | | | |
| Disconnect Threshold | | | 0.8 | | 2.0 | V |
| Input Current | | Disconnect = 0V | | | 40 | μ A |

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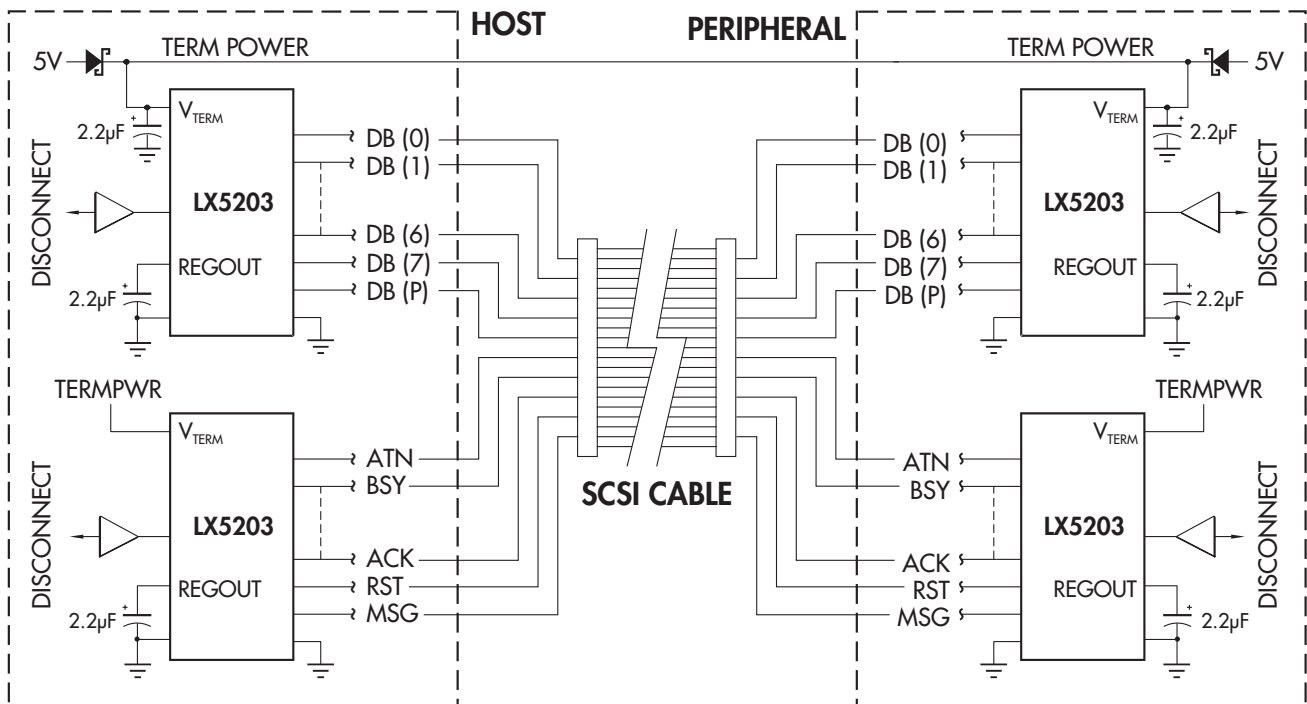
BLOCK DIAGRAM

FIGURE 1 — LX5203 BLOCK DIAGRAM



APPLICATION SCHEMATIC

FIGURE 2 — 8-BIT SCSI SYSTEM APPLICATION



Note: Add third LX5203 for 16-bit SCSI

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