

DESCRIPTION

The LX5107 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 LX5107 requires a meager 30 μ A of supply current while offering only 3.0pF of output capacitance. To enter this low-power mode, the disconnect pin should be driven low 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 LX5107 consumes only 600 μ A 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 LX5107 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. In addition, the LX5107 sinks up to 50mA of current making it compatible with today's fast active negation drivers.

The LX5107 is a superior, pin-for-pin replacement for a variety of industry products such as the DS2107S and DS21S07A.

KEY FEATURES

- 3.0pF OUTPUT CAPACITANCE DURING DISCONNECT
- 30 μ A SUPPLY CURRENT IN DISCONNECT MODE
- 600 μ A SUPPLY CURRENT DURING NORMAL OPERATION
- 50mA SINK CURRENT FOR ACTIVE NEGATION
- LOGIC COMMAND DISCONNECTS ALL TERMINATION LINES
- CURRENT LIMIT AND THERMAL PROTECTION
- COMPATIBLE WITH SCSI 1, 2 AND 3 STANDARDS
- MEETS SCSI HOT PLUGGING CAPABILITY
- CONSULT FACTORY FOR APPLICATION TEST REPORT: 5107TR

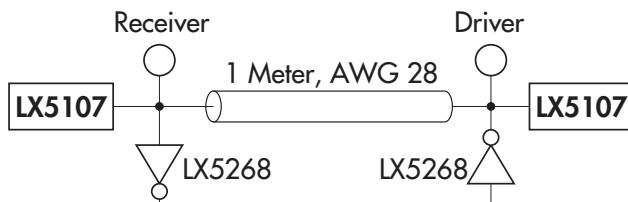
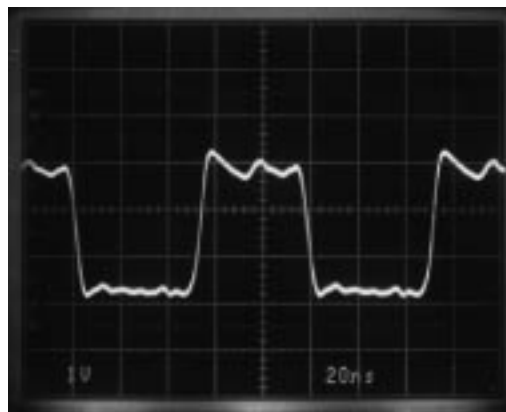
IMPORTANT: For the most current data, consult Linfinity's web site: <http://www.linfinit.com>.

PRODUCT HIGHLIGHT

RECEIVING WAVEFORM - 10MHZ



DRIVING WAVEFORM - 10MHZ



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

PACKAGE ORDER INFORMATION

T_J (°C)	DW Plastic SOWB 16-pin	PWP Plastic TSSOP 20-pin, Power
0 to 70	LX5107CDW	LX5107CPWP

Note: All surface-mount packages are available in Tape & Reel. Append the letter "T" to part number. (i.e. LX5107CDWT)

ABSOLUTE MAXIMUM RATINGS (Note 1)

TermPwr Voltage	+7V
Signal Line Voltage	0V to +7V
Regulator Output Current	0.5A
Operating Junction Temperature	
Plastic (DW, PW 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.

THERMAL DATA

DW PACKAGE:

THERMAL RESISTANCE-JUNCTION TO AMBIENT, θ_{JA}	95°C/W
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PWP PACKAGE:

THERMAL RESISTANCE-JUNCTION TO AMBIENT, θ_{JA}	83°C/W
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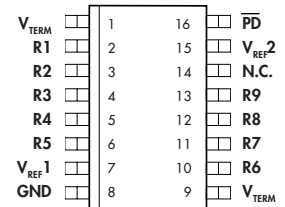
Junction Temperature Calculation: $T_J = T_A + (P_D \times \theta_{JA})$.

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

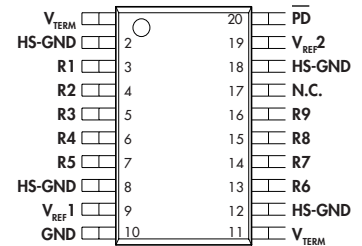
POWER UP / POWER DOWN FUNCTION TABLE

Disconnect	Outputs	Quiescent Current
L	HI Z	30 μ A
H	Enabled	600 μ A
Open	Enabled	600 μ A

PACKAGE PIN OUTS



DW PACKAGE
(Top View)



PWP PACKAGE
(Top View)

9-LINE LOW CAPACITANCE, μ POWER SCSI 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 V_{REF}		2.2			μ F
Operating Virtual Junction Temperature Range					
LX5107C		0		70	$^{\circ}$ 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 = Open. Low duty cycle pulse testing techniques are used which maintains junction and case temperatures equal to the ambient temperature.)

Parameter	Symbol	Test Conditions	LX5107			Units
			Min.	Typ.	Max.	
Supply Current Section						
TermPwr Supply Current		All term lines = Open		0.6	2.0	mA
		All term lines = 0.5V		194	210	mA
Power Down Mode		Disconnect = Low		30	70	μ A
Output Section (Terminator Lines)						
Terminator Impedance		$I_{TERM} = -5\text{mA to } -15\text{mA}, T_A = 25^{\circ}\text{C}$		110		Ω
		$I_{TERM} = -5\text{mA to } -15\text{mA}$	100	110	120	Ω
Terminator Output High Voltage			2.6	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 = Low, $V_{OUT} = 0\text{V to } 4.0\text{V}, T_A = +25^{\circ}\text{C}$		10	250	nA
Output Capacitance		Disconnect = Low		3.0		pF
Sink Current		$V_{OUT} = 4\text{V}$	30	50		mA
Regulator Section						
Regulator Output Voltage	V_{REF}			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		$V_{REG} = 0\text{V}$		-425	-600	mA
Thermal Shutdown				150		$^{\circ}$ C
Disconnect Section						
Disconnect Threshold			0.8	1.4	2.0	V
Input Current		Disconnect = 0V			65	μ A

FIGURE INDEX

Application Circuits

FIGURE #

1. LX5107 BLOCK DIAGRAM
2. 8-BIT SCSI SYSTEM APPLICATION

GRAPH / CURVE INDEX

Characteristic Curves

FIGURE #

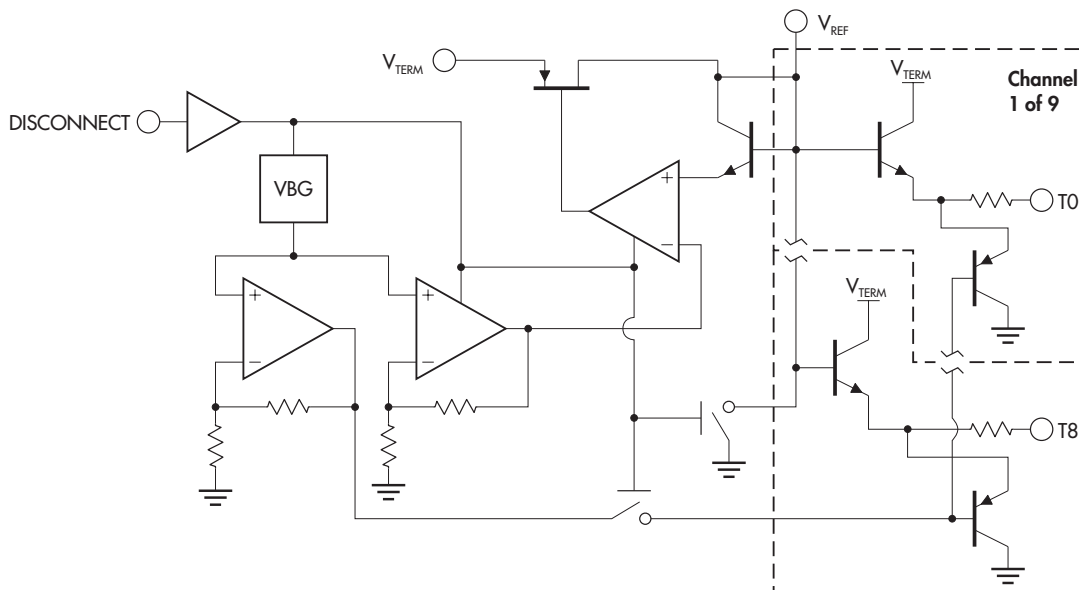
3. OUTPUT CURRENT vs. JUNCTION TEMPERATURE
4. OUTPUT VOLTAGE vs. JUNCTION TEMPERATURE
5. OUTPUT CURRENT vs. TERMPWR
6. OUTPUT CURRENT vs. OUTPUT VOLTAGE
7. OUTPUT VOLTAGE vs. TERMPWR
8. TERMPWR SUPPLY CURRENT vs. TEMPERATURE
9. OUTPUT LEAKAGE vs. OUTPUT VOLTAGE
10. OUTPUT CURRENT vs. OUTPUT LINE (OUTPUT MATCHING)
11. OUTPUT VOLTAGE vs. TIME (HOTSWAP GRAPH)

9-LINE LOW CAPACITANCE, μ POWER SCSI TERMINATOR

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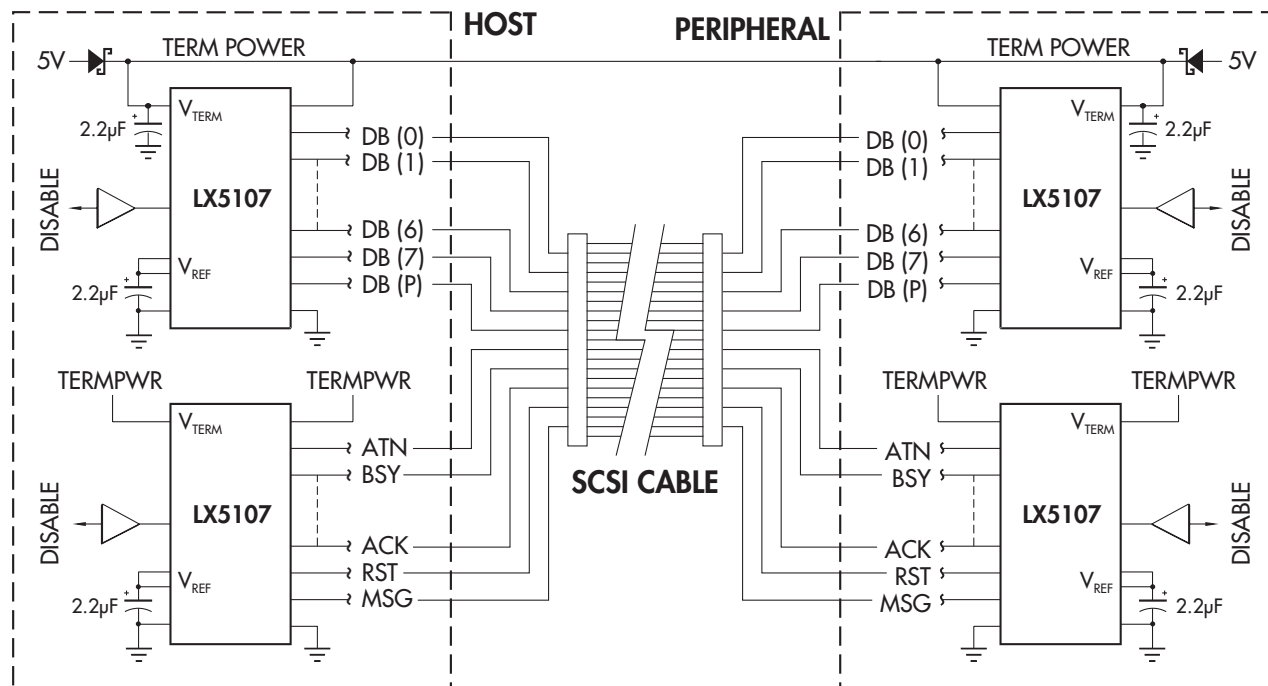
BLOCK DIAGRAM

FIGURE 1 — LX5107 BLOCK DIAGRAM



APPLICATION SCHEMATIC

FIGURE 2 — 8-BIT SCSI SYSTEM APPLICATION



Note: Add third LX5107 for 16-bit SCSI

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