LINFINITY

MICROELECTRONICS

THE INFINITE POWER OF INNOVATION

LX5212

9-LINE LOW CAPACITANCE, µPOWER SCSI TERMINATOR

PRODUCTION DATA SHEET

DESCRIPTION

The LX5212 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 LX5212 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 yield subsequent reliable, error-free communications.

During normal operation, the LX5212 consumes only 600µA 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 LX5212 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 LX5212 sinks up to 30mA of current, making it compatible with today's fast active negation drivers.

The LX5212 is a superior, pin-for-pin replacement for a variety of industry products, such as the UC5614.

IMPORTANT: For the most current data, consult LinFinity's web site: **http://www.linfinity.com**.

KEY FEATURES

- 2.5pF OUTPUT CAPACITANCE DURING DISCONNECT
- 500nA SUPPLY CURRENT IN DISCONNECT MODE
- 600µA SUPPLY CURRENT DURING NORMAL OPERATION
- 30mA 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: **5212TR**
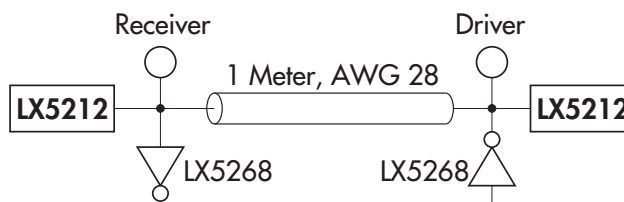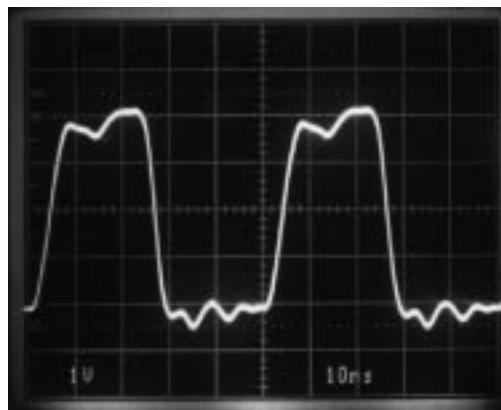- **EVALUATION BOARD AVAILABLE**

PRODUCT HIGHLIGHT

RECEIVING WAVEFORM - 20MHz

DRIVING WAVEFORM - 20MHz

Receiver — 1 Meter, AWG 28 — Driver

LX5212 — LX5268   LX5268 — LX5212
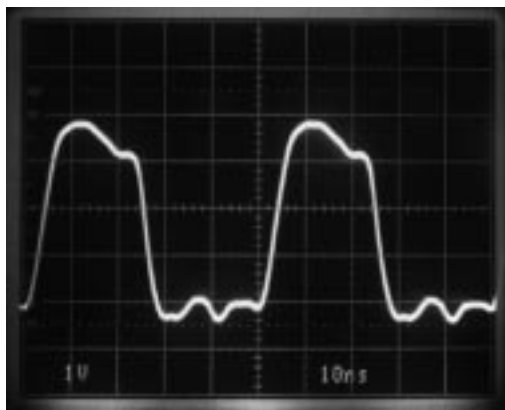
NOTE: For An In-Depth Discussion On Applying SCSI, Request Linfinity Application Note: "Understanding The Single-Ended SCSI Bus"

PACKAGE ORDER INFORMATION

T_A (°C)	N Plastic DIP 16-pin	PWP Plastic TSSOP 24-pin, Power	DP Plastic SOIC 16-pin, Power
0 to 70	LX5212CN	LX5212CPWP	LX5212CDP

Note: All surface-mount packages are available in Tape & Reel. Append the letter "T" to part number. (i.e. LX5212CDPT)

LX5212

ABSOLUTE MAXIMUM RATINGS   (Note 1)

TermPwr Voltage .... +7V
Signal Line Voltage .... 0V to +7V
Regulator Output Current 0.4A
Operating Junction Temperature
   Plastic (N, PWP, 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.

THERMAL DATA

N PACKAGE:

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

PWP PACKAGE:

THERMAL RESISTANCE-JUNCTION TO LEADS, θ_{JL}	27°C/W
THERMAL RESISTANCE-JUNCTION TO AMBIENT, θ_{JA}	100°C/W

DP PACKAGE:

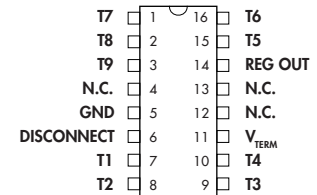| THERMAL RESISTANCE-JUNCTION TO LEADS, θ_{JL}	20°C/W
THERMAL RESISTANCE-JUNCTION TO AMBIENT, θ_{JA}	50°C/W

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
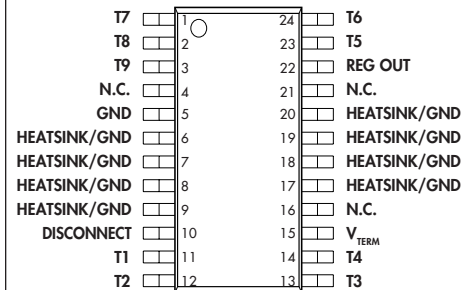system. All of the above assume no ambient airflow.

POWER UP / POWER DOWN FUNCTION TABLE

Disconnect	Outputs	Quiescent Current
L	Enabled	600µA
H	HI Z	0.5µA
Open	HI Z	0.5µA

PACKAGE PIN OUTS

T7	1	16	T6
T8	2	15	T5
T9	3	14	REG OUT
N.C.	4	13	N.C.
GND	5	12	N.C.
DISCONNECT	6	11	V_{TERM}
T1	7	10	T4
T2	8	9	T3

N PACKAGE
(Top View)

T7	1	24	T6
T8	2	23	T5
T9	3	22	REG OUT
N.C.	4	21	N.C.
GND	5	20	HEATSINK/GND
HEATSINK/GND	6	19	HEATSINK/GND
HEATSINK/GND	7	18	HEATSINK/GND
HEATSINK/GND	8	17	HEATSINK/GND
HEATSINK/GND	9	16	N.C.
DISCONNECT	10	15	V_{TERM}
T1	11	14	T4
T2	12	13	T3

PWP PACKAGE
(Top View)

T7	1	16	T6
T8	2	15	T5
T9	3	14	REG OUT
HEATSINK/GND	4	13	HEATSINK/GND
GND	5	12	HEATSINK/GND
DISCONNECT	6	11	V_{TERM}
T1	7	10	T4
T2	8	9	T3

DP PACKAGE
(Top View)

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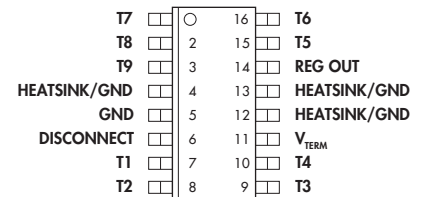
RECOMMENDED OPERATING CONDITIONS   (Note 2)

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 Capacitor on REGOUT		2.2			µF
Operating Virtual Junction Temperature Range					
LX5212C		0		125	°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 ≤ T_A ≤ 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	LX5212			Units
			Min.	Typ.	Max.	
Supply Current Section						
TermPwr Supply Current	I_{TERM}	All term lines = Open		0.6	1.2	mA
		All term lines = 0.5V		194	210	mA
Power Down Mode	I_{TERM}	Disconnect = Open		0.5	1	µA
Output Section (Terminator Lines)						
Terminator Impedance	Z_{OUT}	I_{OUT} = -5mA to -15mA, T_A = 25°C	104	110	116	Ω
		I_{OUT} = -5mA to -15mA	100	110	120	Ω
Terminator Output High Voltage	V_{OUT}		2.7	2.9		V
Max. Output Current	I_{OUT}	V_{OUT} = 0.5V, T_A = 25°C	-20.3	-21.8	-23	mA
		V_{OUT} = 0.5V	-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	-18.0	-21.8	-23	mA
Output Leakage		Disconnect = Open, V_{OUT} = 0.5V to 4V, T_A = 25°C		10	100	nA
		Disconnect = Open, V_{TERM} = Open, V_{OUT} = 0.5V to 4V, T_A = 25°C		10	100	nA
Output Capacitance	C_{OUT}	Disconnect = Open, Note 3, DP Package		1.8	2.5	pF
Sink Current		V_{OUT} = 4V	20	30		mA
Regulator Section						
Regulator Output Voltage	V_{REG}			3.6		V
Line Regulation		V_{TERM} = 4V to 6V		10	20	mV
Load Regulation		I_{REG} = 0 to -50mA		20	50	mV
Drop Out Voltage	V_{DO}	I_{REG} = -50mA		0.7	1.0	V
Short Circuit Current	I_{SC}	V_{REG} = 0V		-200	-350	mA
Thermal Shutdown				150		°C
Disconnect Section						
Disconnect Threshold			0.8		2.0	V
Input Current		Disconnect = 0V			40	µA

Note 3. This parameter, while guaranteed by design, is not 100% production tested.

9-LINE LOW CAPACITANCE, µPOWER SCSI TERMINATOR

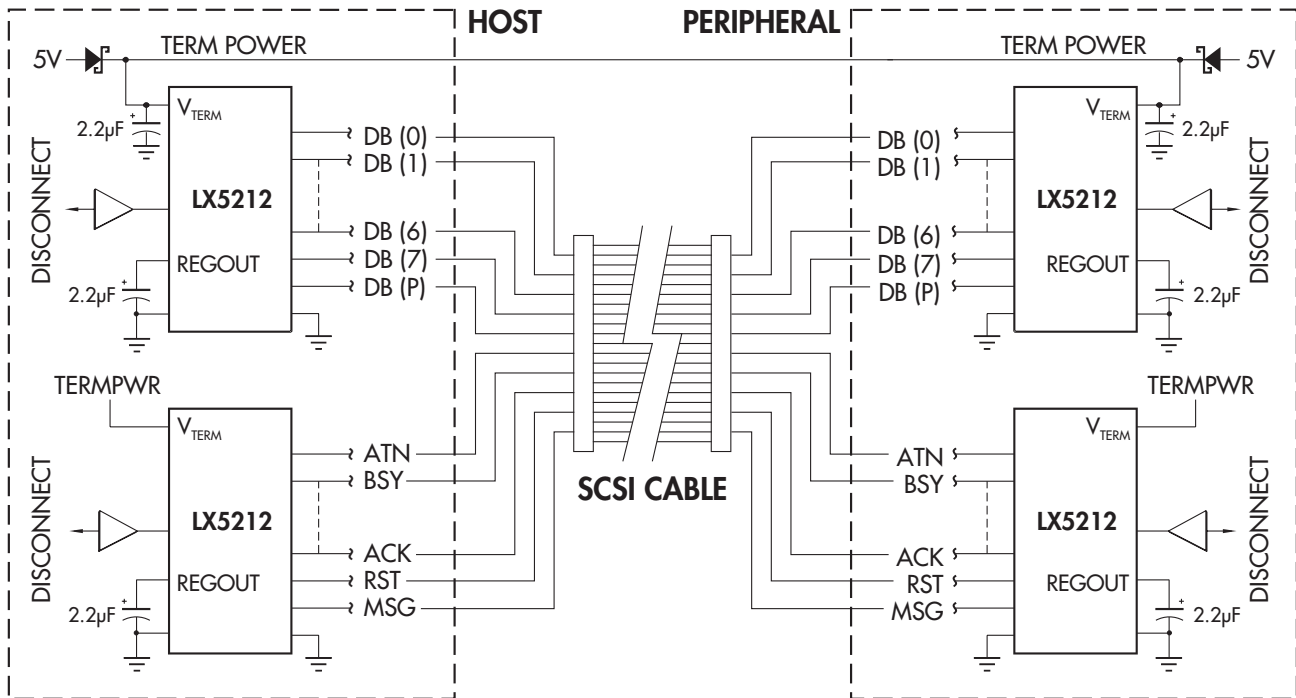P R O D U C T I O N   D A T A   S H E E T

BLOCK DIAGRAM

FIGURE 1 — LX5212 BLOCK DIAGRAM
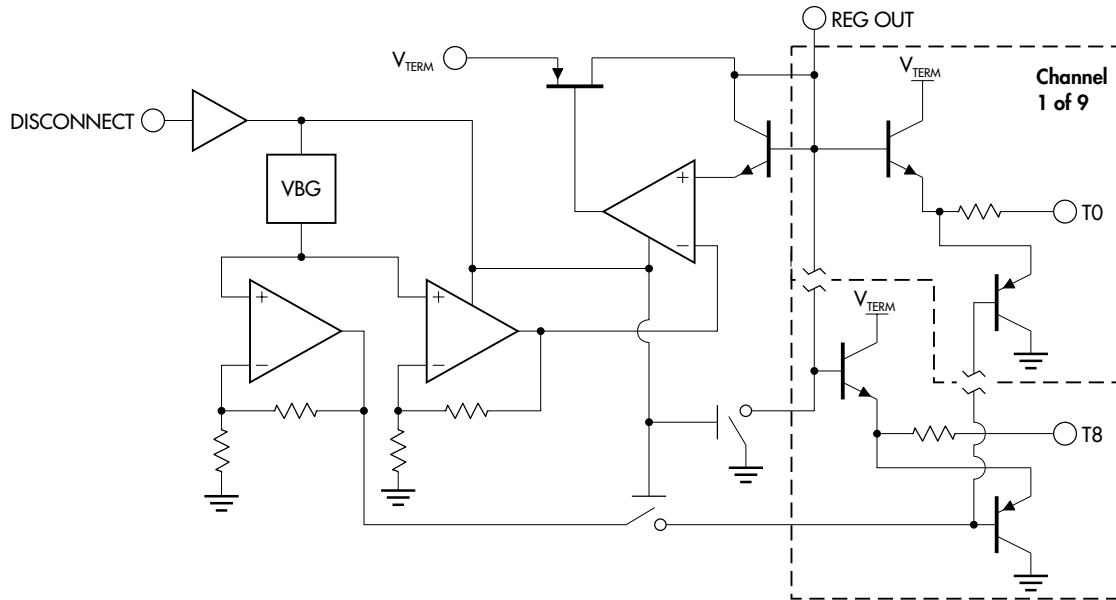
APPLICATION SCHEMATIC

FIGURE 2 — 8-BIT SCSI SYSTEM APPLICATION

Note: Add third LX5212 for 16-bit SCSI

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