UNITRODE

18-Line Low Capacitance SCSI Active Terminator

FEATURES

- Reverse Disconnect
- Complies with SCSI, SCSI-2 and SPI-2 Standards
- 6pF Channel Capacitance during Disconnect
- 100µA Supply Current in Disconnect Mode
- Meets SCSI Hot Plugging Capability
- –650mA Sourcing Current for Termination
- +200mA Sinking Current for Active Negation
- Provides Active Termination for 18 Lines
- Logic Command Disconnects all Termination Lines
- Trimmed Termination Current to 5%
- Trimmed Impedance to 5%
- Current Limit and Thermal Shutdown Protection

DESCRIPTION

The UC5609 provides 18 lines of active termination for a SCSI (Small Computer Systems Interface) parallel bus. The SCSI standard recommends active termination at both ends of the bus cable.

The UC5609 is pin-for-pin compatible with its predecessors, the UC5601, UC5602 and UC5608 - 18 Line Active Terminators, except for the reverse disconnect sense. Parametrically the UC5609 has a 5% tolerance on impedance and current compared to a 3% tolerance on the UC5601 and the sink current is increased from 20 to 200mA. The low side clamps have been removed. Custom power packages are utilized to allow normal operation at full power conditions (2 Watts).

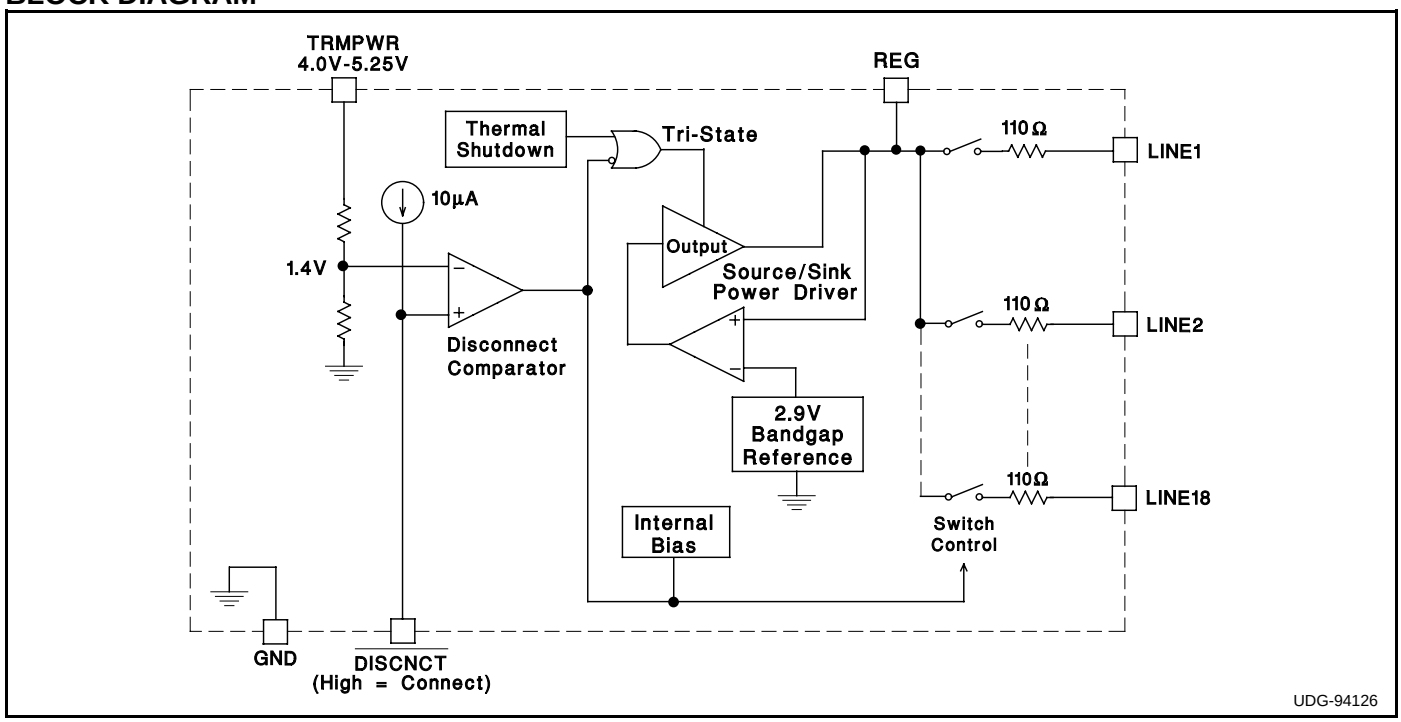
When in disconnect mode the terminator will disconnect all terminating resistors and disable the regulator, greatly reducing standby power. The output channels remain high impedance even without Termpwr applied.

Internal circuit trimming is utilized to trim the impedance to a 5% tolerance and, most importantly, to trim the output current to a 5% tolerance, as close to the max SCSI spec as possible, which maximizes noise margin in fast SCSI operation.

Other features include 4.0 to 5.25V Termpwr, thermal shutdown and current limit.

This device is offered in low thermal resistance versions of the industry standard 28 pin wide body SOIC, 28 pin wide body TSSOP, and 28 pin PLCC, as well as 24 pin DIP.

BLOCK DIAGRAM



Circuit Design Patented

ABSOLUTE MAXIMUM RATINGS

Termpwr Voltage . . . . . +7V
Signal Line Voltage . . . . . 0V to +7V
Regulator Output Current 1A
Storage Temperature . . . . . –65°C to +150°C
Operating Temperature . . . . . –55°C to +150°C
Lead Temperature (Soldering, 10 Sec.) . . . . . +300°C

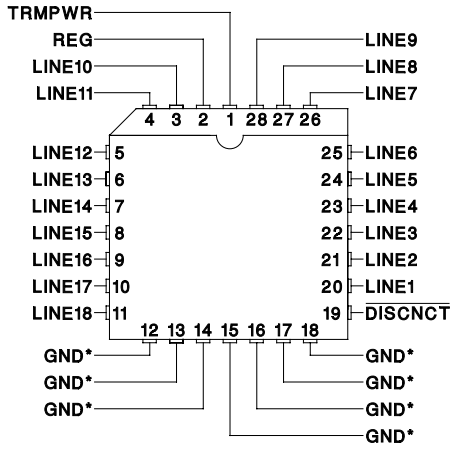
Unless otherwise specified all voltages are with respect to Ground. Currents are positive into, negative out of the specified terminal.
Consult Packaging Section of Unitrode Integrated Circuits databook for thermal limitations and considerations of packages.

RECOMMENDED OPERATING CONDITIONS

Termpwr Voltage . . . . . 3.8V to 5.25V
Signal Line Voltage . . . . . 0V to +5V
Disconnect Input Voltage . . . . . 0V to Termpwr

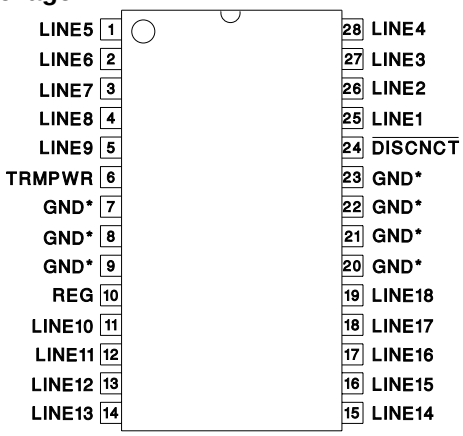
CONNECTION DIAGRAMS

PLCC-28 (Top View)
QP Package



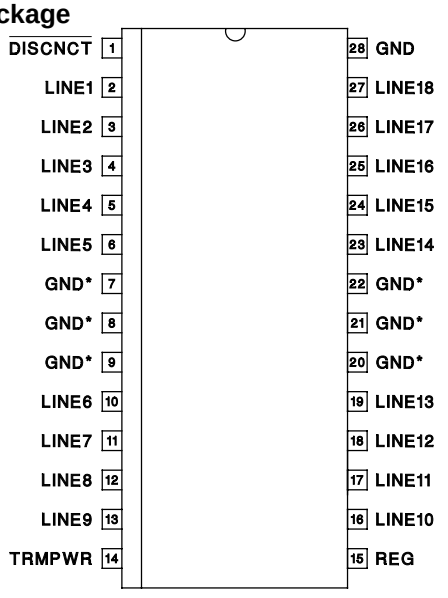
** QP package pins 12 - 18 serve as both heatsink and signal ground.*

TSSOP-28 (Top View)
PWP Package



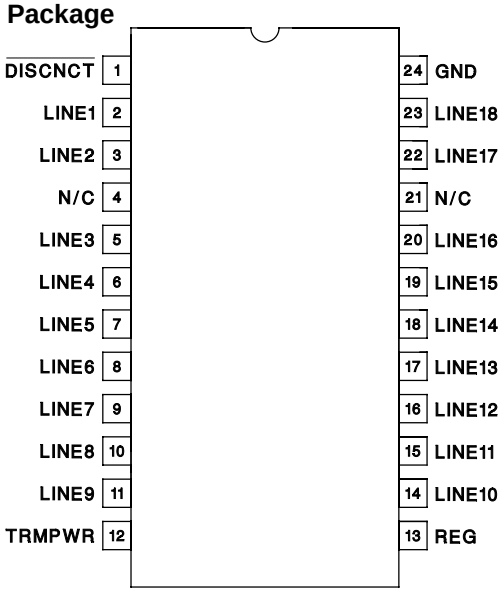
** PWP package pin 23 serves as signal ground; pins 7, 8, 9, 20, 21 and 22 serve as heatsink/ground.*

SOIC-28 (Top View)
DWP Package



** DWP package pin 28 serves as signal ground; pins 7, 8, 9, 20, 21, 22 serve as heatsink/ground.*

DIL-24 (Top View)
N or J Package



Note: Drawings are not to scale.

ELECTRICAL CHARACTERISTICS Unless otherwise stated, these specifications apply for T_A = 0°C to 70°C. TRMPWR = 4.75V, $\overline{\text{DISCNCT}}$ = 2.4V. $T_A = T_J$.

PARAMETER	TEST CONDITIONS			MIN	TYP	MAX	UNITS
Supply Current Section							
Termpwr Supply Current	All termination lines = Open				17	25	mA
	All termination lines = 0.5V				400	430	mA
Power Down Mode	DISCNCT = GND				100	150	µA
Output Section (Terminator Lines)							
Terminator Impedance	ΔI_{LINE} = -5mA to -15mA			104.5	110	115.5	Ω
Output High Voltage	V_{TRMPWR} = 4V (Note 1)			2.65	2.9	3.0	V
Max Output Current	V_{LINE} = 0.5V		T_J = 25°C	-20.3	-21.5	-22.4	mA
			0°C < T_J < 70°C	-19.8	-21.5	-22.4	mA
Max Output Current	V_{LINE} = 0.5V, TRMPWR = 4V (Note 1)		T_J = 25°C	-19.5	-21.5	-22.4	mA
			0°C < T_J < 70°C	-19.0	-21.5	-22.4	mA
	V_{LINE} = 0.2V, TRMPWR = 4V to 5.25V		0°C < T_J < 70°C	-21.6	-24.0	-25.4	mA
Output Leakage	$\overline{\text{DISCNCT}}$ = GND	TRMPWR = 0V to 5.25V REG = 0V	V_{LINE} = 0 to 4V		10	400	nA
			V_{LINE} = 5.25V			100	µA
		TRMPWR = 0V to 5.25V, REG = Open V_{LINE} = 0V to 5.25V			10	400	nA
Output Capacitance	$\overline{\text{DISCNCT}}$ = GND (Note 2)				6	7	pF
Regulator Section							
Regulator Output Voltage				2.8	2.9	3	V
Regulator Output Voltage	All Termination Lines = 4V			2.8	2.9	3	V
Line Regulation	TRMPWR = 4V to 6V				10	20	mV
Drop Out Voltage	All Termination Lines = 0.5V				1.0	1.2	V
Short Circuit Current	V_{REG} = 0V			-450	-650	-950	mA
Sinking Current Capability	V_{REG} = 3.5V			100	200	500	mA
Thermal Shutdown					170		°C
Thermal Shutdown Hysteresis					10		°C
Disconnect Section							
Disconnect Threshold				1.1	1.4	1.7	V

Note 1: Measuring each termination line while other 17 are low (0.5V).
Note 2: Guaranteed by design. Not 100% tested in production.

APPLICATION INFORMATION

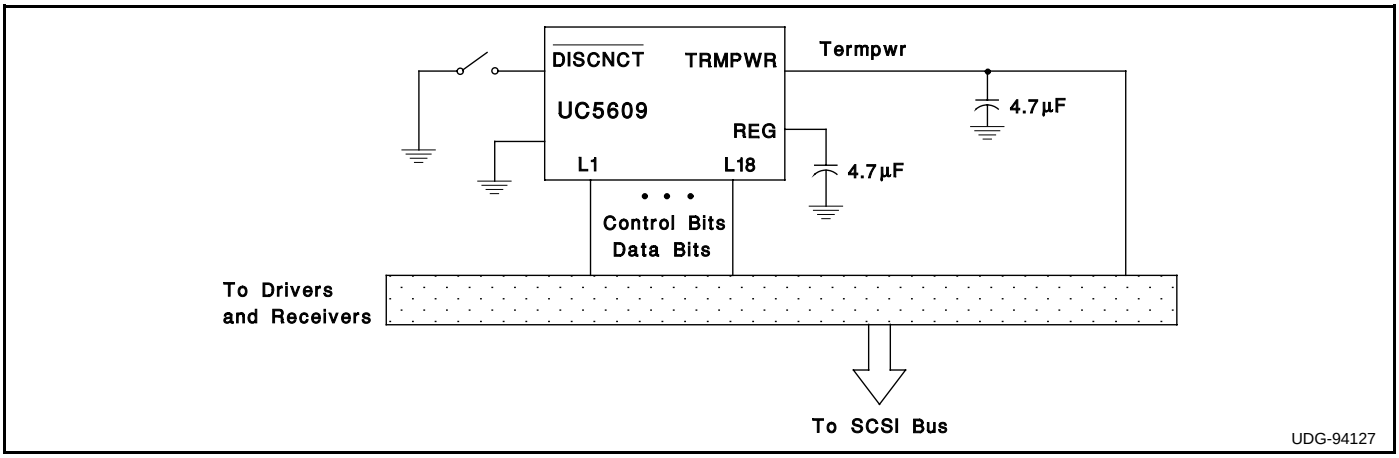


Figure 1: Typical SCSI Bus Configuration

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