

18-Line Low Capacitance SCSI Active Terminator

FEATURES

- 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 UC5608 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 UC5608 is pin-for-pin compatible with its predecessors, the UC5601 and UC5602 - 18 Line Active Terminator. Parametrically the UC5608 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).

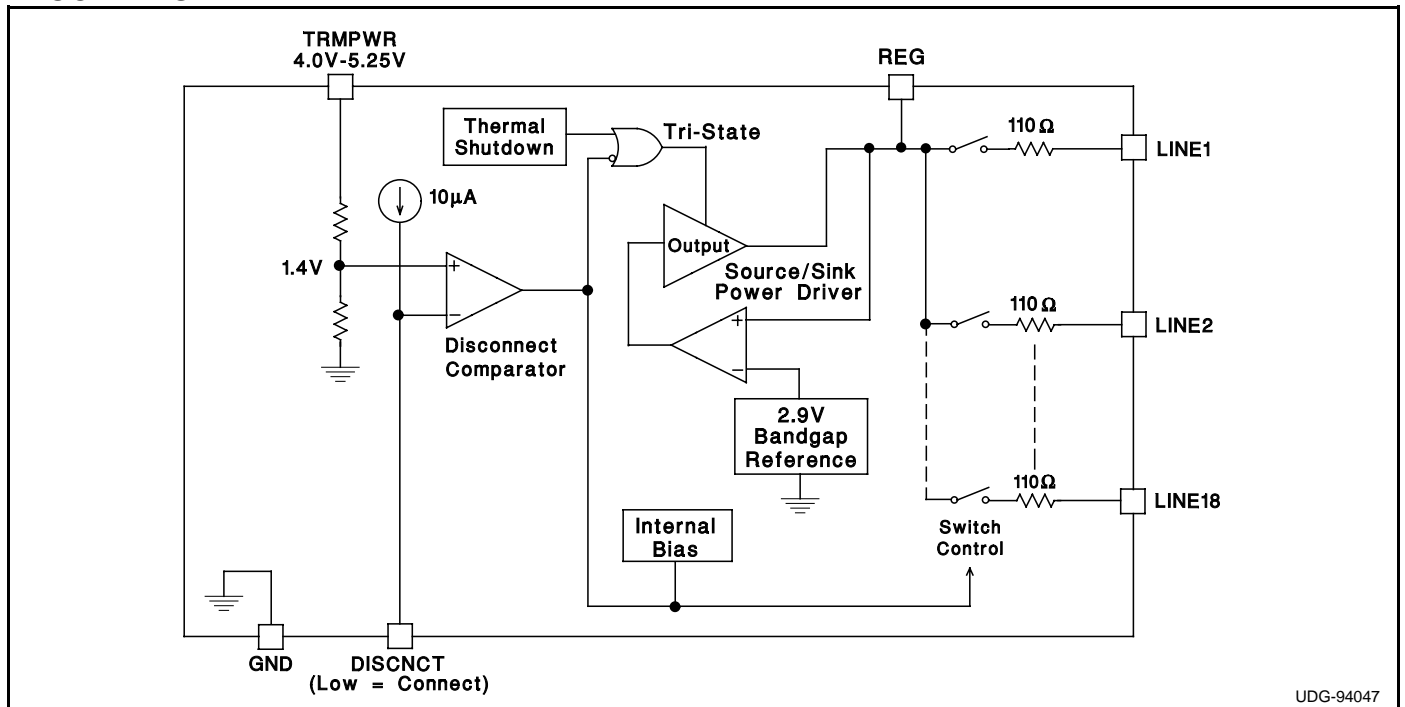
When in disconnect mode the terminator will disconnect all terminating resistors and disable the regulator, greatly reducing standby power. The output channels remain high impedance even without Tempwr applied.

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 Tempwr, 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



UDG-94047

Circuit Design Patented

ABSOLUTE MAXIMUM RATINGS

Tempwr 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

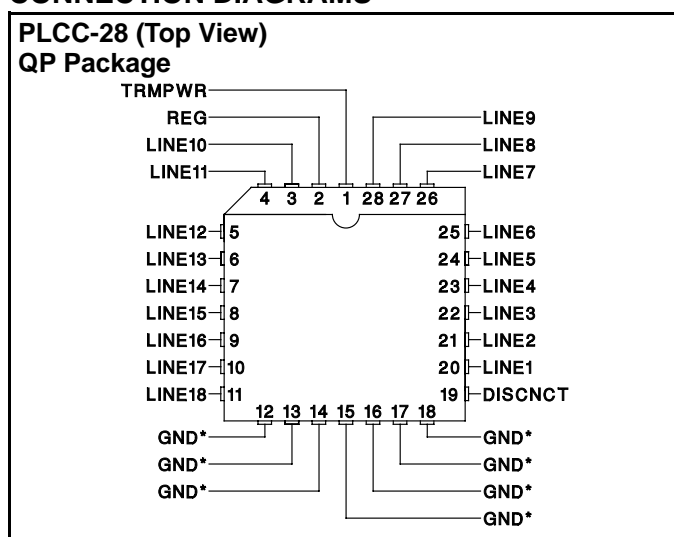
Unless otherwise specified all voltages are with respect to Ground. Currents are positive into, negative out of the specified terminal.

Consult Packaging Section of Unitrode Integrated Circuits databook for thermal limitations and considerations of packages.

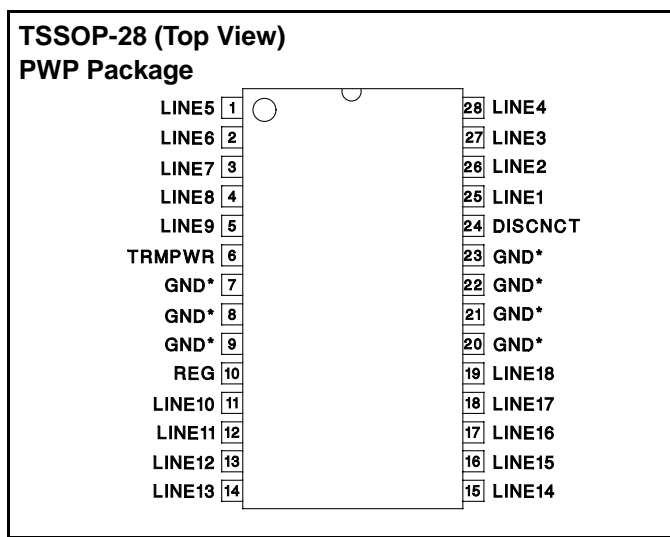
RECOMMENDED OPERATING CONDITIONS

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

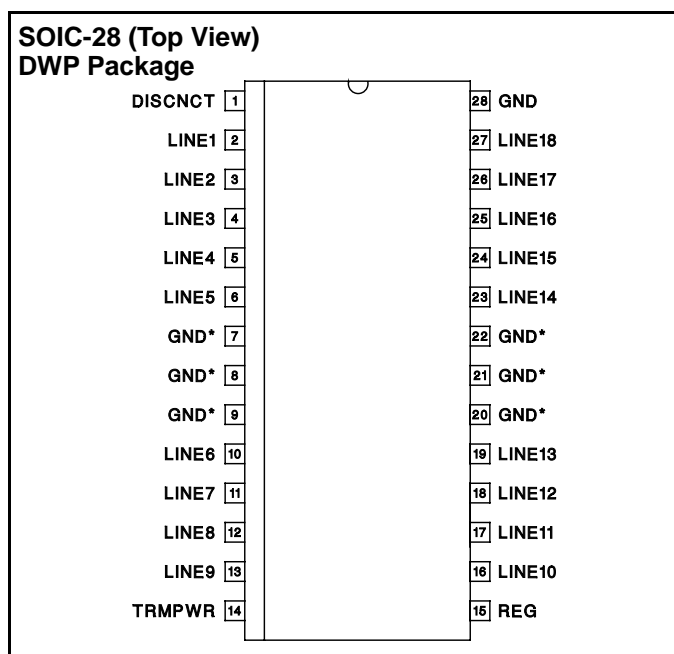
CONNECTION DIAGRAMS



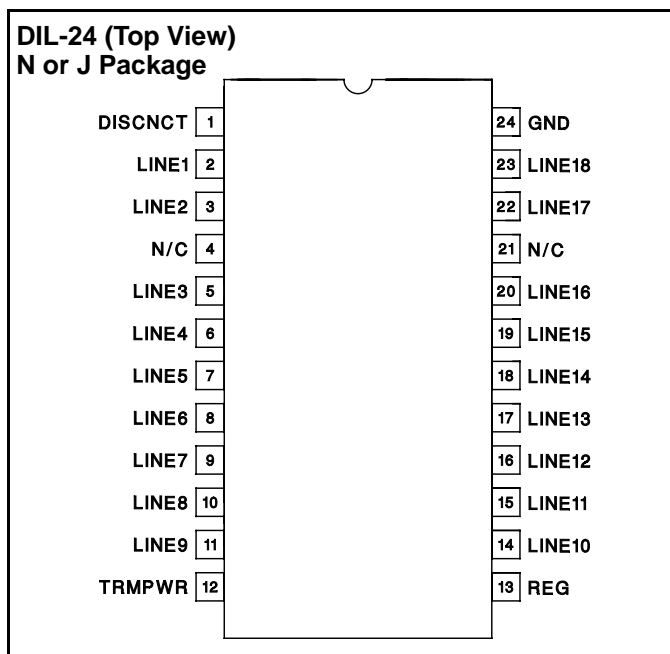
* QP package pins 12 - 18 serve as both heatsink and signal ground.



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



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



Note: Drawings are not to scale.

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

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS		
Supply Current Section							
Tempwr Supply Current	All termination lines = Open		17	25	mA		
	All termination lines = 0.5V		400	430	mA		
Power Down Mode	DISCNCT = Open		100	150	μA		
Output Section (Terminator Lines)							
Terminator Impedance	$\Delta\text{LINE} = -5\text{mA}$ to -15mA	104.5	110	115.5	Ohms		
Output High Voltage	$V_{\text{TRMPWR}} = 4\text{V}$ (Note 1)	2.65	2.9	3.0	V		
Max Output Current	$V_{\text{LINE}} = 0.5\text{V}$	$T_J = 25^\circ\text{C}$	-20.3	-21.5	-22.4	mA	
		$0^\circ\text{C} < T_J < 70^\circ\text{C}$	-19.8	-21.5	-22.4	mA	
Max Output Current	$V_{\text{LINE}} = 0.5\text{V}$, TRMPWR = 4V (Note 1)	$T_J = 25^\circ\text{C}$	-19.5	-21.5	-22.4	mA	
		$0^\circ\text{C} < T_J < 70^\circ\text{C}$	-19.0	-21.5	-22.4	mA	
	$V_{\text{LINE}} = 0.2\text{V}$, TRMPWR = 4V to 5.25V	$0^\circ\text{C} < T_J < 70^\circ\text{C}$	-21.6	-24.0	-25.4	mA	
Output Leakage	DISCNCT = 4V	TRMPWR = 0V to 5.25V REG = 0V	$V_{\text{LINE}} = 0$ to 4V		10	400	nA
			$V_{\text{LINE}} = 5.25\text{V}$			100	μA
		TRMPWR = 0V to 5.25V, REG = Open $V_{\text{LINE}} = 0\text{V}$ to 5.25V		10	400	nA	
Output Capacitance	DISCNCT = Open (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	$V_{\text{REG}} = 0\text{V}$	-450	-650	-950	mA		
Sinking Current Capability	$V_{\text{REG}} = 3.5\text{V}$	100	200	500	mA		
Thermal Shutdown			170		$^\circ\text{C}$		
Thermal Shutdown Hysteresis			10		$^\circ\text{C}$		
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

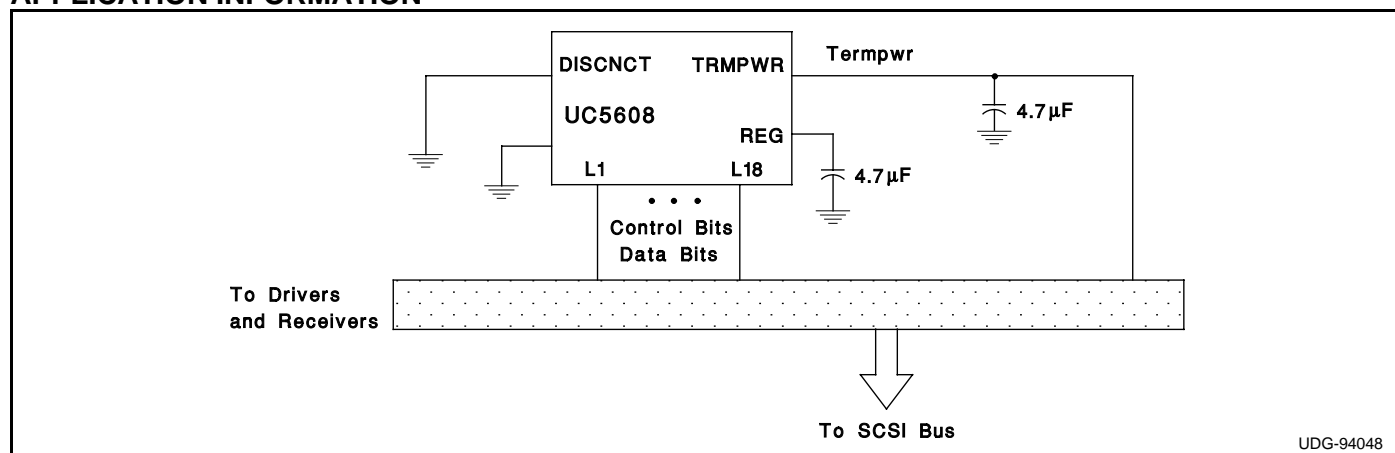


Figure 1: Typical SCSI Bus Configuration

PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
UC5608DWP	OBSOLETE	SOIC	DW	28		TBD	Call TI	Call TI
UC5608DWP/81168	OBSOLETE	SOIC	DW	28		TBD	Call TI	Call TI
UC5608DWPTR	OBSOLETE	SOIC	DW	28		TBD	Call TI	Call TI
UC5608DWPTR/81168	OBSOLETE	SOIC	DW	28		TBD	Call TI	Call TI
UC5608N	OBSOLETE	PDIP	N	24		TBD	Call TI	Call TI
UC5608QP	OBSOLETE	PLCC	FN	28		TBD	Call TI	Call TI
UC5608QPTR	OBSOLETE	PLCC	FN	28		TBD	Call TI	Call TI

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

Important Information and Disclaimer:The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products		Applications	
Amplifiers	amplifier.ti.com	Audio	www.ti.com/audio
Data Converters	dataconverter.ti.com	Automotive	www.ti.com/automotive
DSP	dsp.ti.com	Broadband	www.ti.com/broadband
Interface	interface.ti.com	Digital Control	www.ti.com/digitalcontrol
Logic	logic.ti.com	Military	www.ti.com/military
Power Mgmt	power.ti.com	Optical Networking	www.ti.com/opticalnetwork
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
		Telephony	www.ti.com/telephony
		Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments
Post Office Box 655303 Dallas, Texas 75265