

SCSI Active Terminator

FEATURES

- Complies with SCSI, SCSI-2 Standards
- 10pF Channel Capacitance During Disconnect
- Active Termination for 18 Lines
- Logic Command Disconnects all Termination Lines
- Low Supply Current in Disconnect Mode
- Trimmed Regulator for Accurate Termination Current
- Current Limit and Thermal Shutdown Protection
- 110 Ohm Termination
- Meets SCSI Hot Plugging

DESCRIPTION

The UC5602 is a pin compatible version of its predecessor, the UC5601, and is targeted for high volume applications which require active termination, but not the high performance of the UC5601. The major differences are relaxed output current and termination tolerances, and the absence of low side clamps.

The UC5602 provides 18 lines of active termination for a SCSI (Small Computer Systems Interface) parallel bus. The SCSI-2 standard recommends active termination at both ends of the cable segment, and SCSI-3 will make it a requirement.

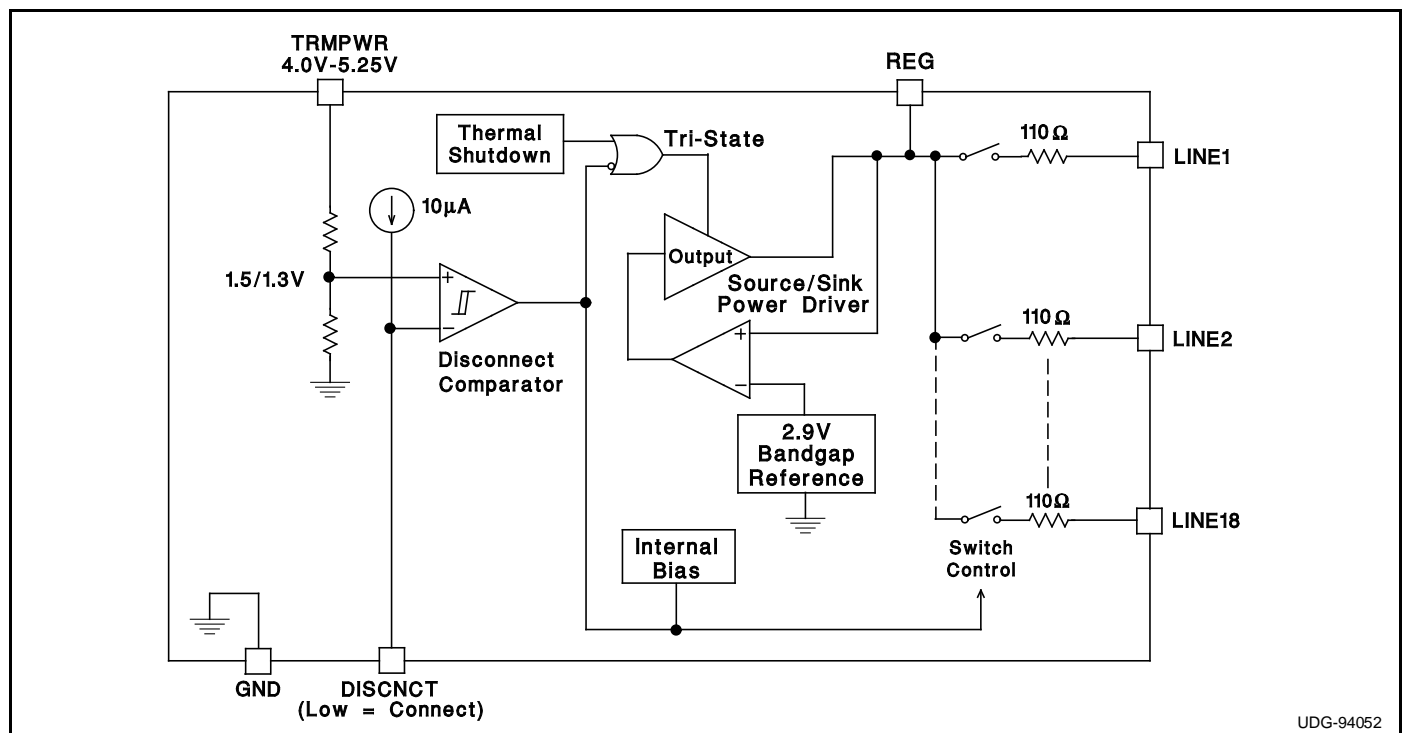
The UC5602 provides a disconnect feature which, when opened or driven high, will disconnect all terminating resistors, and disables the regulator; greatly reducing standby power. The output channels remain high impedance even without Tempwr applied.

Internal circuit trimming is utilized, first to trim the impedance to a 7% tolerance; and then most importantly, to trim the output current 7% tolerance, as close to the max SCSI as possible, which maximizes noise margin in fast SCSI operation.

Other features include thermal shutdown, current limit, and 40mA of active negation sink current capability.

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

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

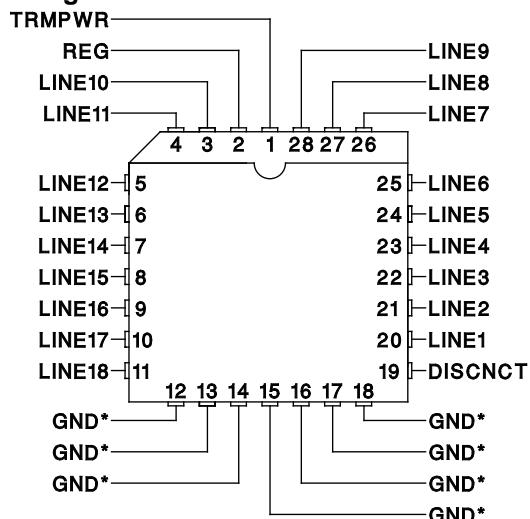
Tempwr Voltage +7V
 Signal Line Voltage 0V to +7V
 Regulator Output Current 0.5A
 Storage Temperature -65°C to +150°C
 Operating Temperature -55°C to +150°C
 Lead Temperature (Soldering, 10 Sec.) +300°C

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

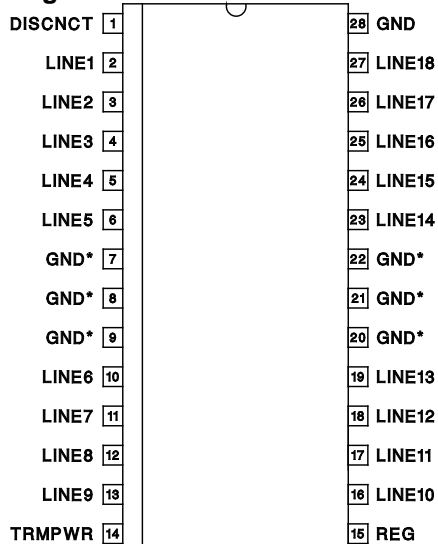
Consult Packaging Section of Unitrode Integrated Circuits data book for thermal limitations and considerations of packages.

RECOMMENDED OPERATING CONDITIONS

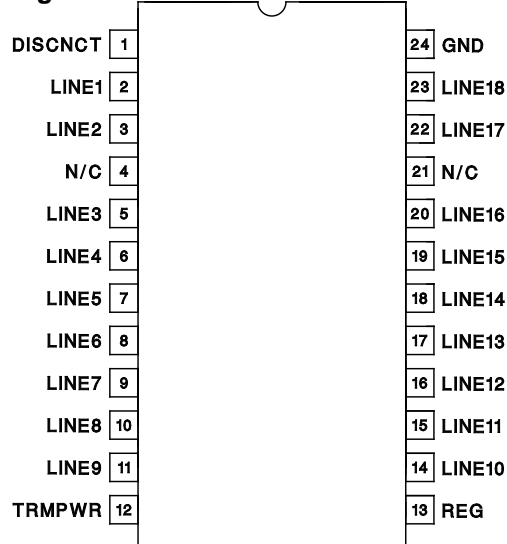
Tempwr Voltage 4.0V to 5.25V
 Signal Line Voltage 0V to +3V
 Disconnect Input Voltage 0V to Tempwr

CONNECTION DIAGRAMS**PLCC-28 (Top View)****QP Package**

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

Note: Drawings are not to scale.

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

PARAMETER	TEST CONDITIONS		MIN	TYP	MAX	UNITS	
Supply Current Section							
Termpwr Supply Current	All termination lines = Open			20	29	mA	
	All termination lines = 0.5V			400	435	mA	
Power Down Mode	DISCNCT = Open			100	150	μA	
Output Section (Termination Lines)							
Termination Impedance	ΔLINE = -5mA to -15mA		TJ = 25°C	102	110	118	Ω
			0°C < TJ < 70°C	97		129	Ω
Output High Voltage	VTRMPWR = 4V (Note 1)		TJ = 25°C	2.6	2.9	3.1	V
			0°C < TJ < 70°C	2.55		3.2	V
Max Output Current	VLINE = 0.5V		TJ = 25°C	-19.5	-21.4	-22.4	mA
			0°C < TJ < 70°C	-18.5		-22.4	mA
Max Output Current	VLINE = 0.5V, TRMPWR = 4V (Note 1)		TJ = 25°C	-18.0	-21.5	-22.4	mA
			0°C < TJ < 70°C	-17.0		-22.4	mA
Output Leakage	DISCNCT = 4V	TRMPWR = 0V to 5.25V	VLINE = 0 to 4V		10	400	nA
		REG = 0V	VLINE = 5.25V			100	μA
		TRMPWR = 0V to 5.25V, REG = Open			10	400	nA
		VLINE = 0V to 5.25V					
Output Capacitance	DISCNCT = Open (Note 2)			10	13	pF	
Regulator Section							
Regulator Output Voltage			TJ = 25°C	2.7	2.9	3.1	V
			0°C < TJ < 70°C	2.55		3.2	V
Line Regulation	TRMPWR = 4V to 6V			10	20	mV	
Load Regulation	IREG = 0 to -400mA			20	50	mV	
Drop Out Voltage	All Termination Lines = 0.5V			1.0	1.2	V	
Short Circuit Current	VREG = 0V		-450	-650	-850	mA	
Sinking Current Capability	VREG = 3.5V		20	40		mA	
Thermal Shutdown				170		°C	
Disconnect Section							
Disconnect Threshold			1.1	1.4	1.7	V	
Threshold Hysteresis				100		mV	
Input Current	DISCNCT = 0V			150	200	μA	

Note 1: Measuring each termination line while other 17 are low (0.5V).

Note 2: Guaranteed by design. Not 100% tested in production.

THERMAL DATA

DWP package: (see packaging section of UICC data book for more details on thermal performance)

Thermal Resistance Junction to Leads, θ_{jL} 18°C/W

Thermal Resistance Junction to Ambient, θ_{ja} $33^\circ\text{--}43^\circ\text{C/W}$

N package:

Thermal Resistance Junction to Leads, θ_{jL} 50°C/W

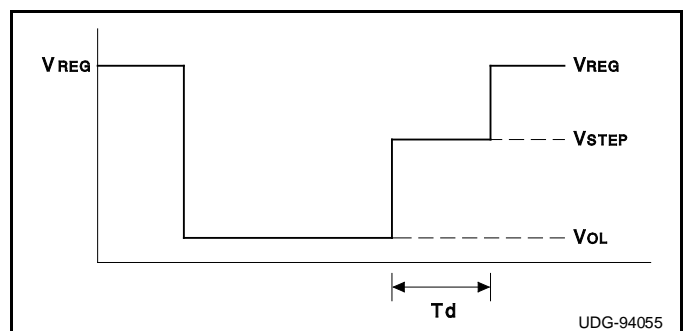
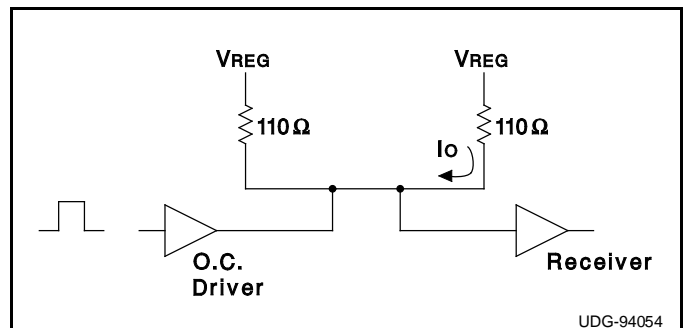
Thermal Resistance Junction to Ambient, θ_{ja} $95^\circ\text{--}105^\circ\text{C/W}$

QP package:

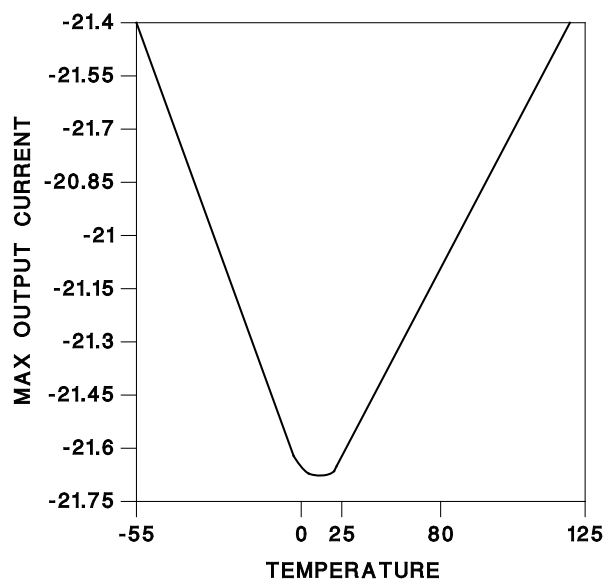
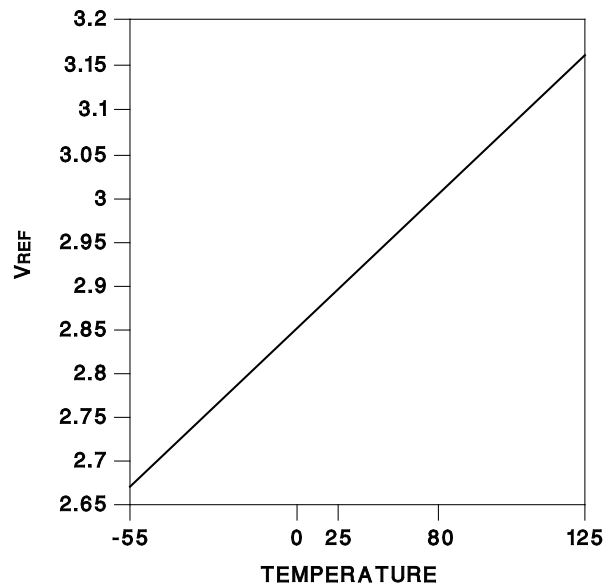
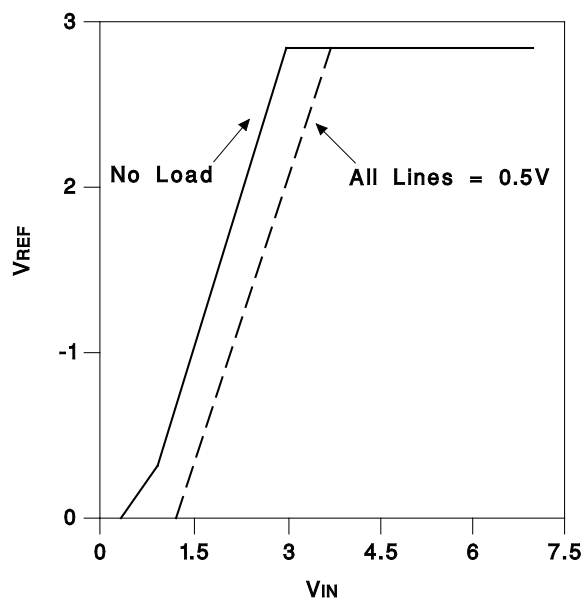
Thermal Resistance Junction to Leads, θ_{jL} 15°C/W

Thermal Resistance Junction to Ambient, θ_{ja} $30^\circ\text{--}40^\circ\text{C/W}$

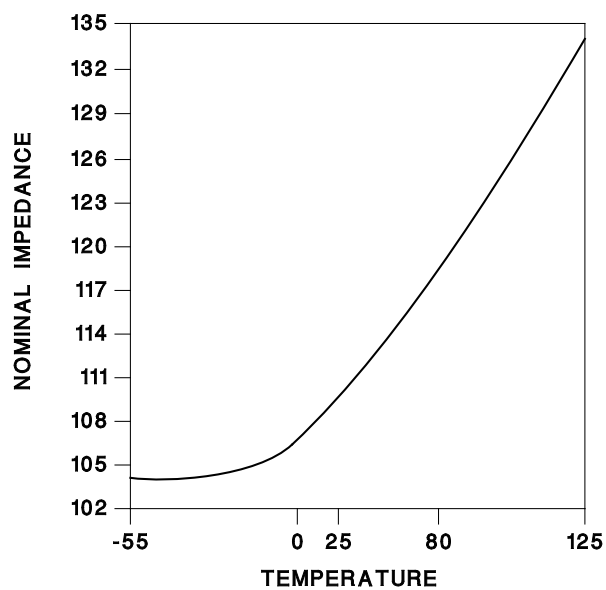
Note: The above numbers for θ_{jL} are maximums for the limiting thermal resistance of the package in a standard mounting configuration. The θ_{ja} numbers are meant to be guidelines for the thermal performance of the device/pc-board system. All of the above numbers assume no ambient airflow.



Max Output Current vs. Temperature

 V_{REF} vs. Temperature V_{REF} vs. V_{IN} 

Output Impedance vs. Temperature



IMPORTANT NOTICE

Texas Instruments and its subsidiaries (TI) reserve the right to make changes to their products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgement, including those pertaining to warranty, patent infringement, and limitation of liability.

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

CERTAIN APPLICATIONS USING SEMICONDUCTOR PRODUCTS MAY INVOLVE POTENTIAL RISKS OF DEATH, PERSONAL INJURY, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE ("CRITICAL APPLICATIONS"). TI SEMICONDUCTOR PRODUCTS ARE NOT DESIGNED, AUTHORIZED, OR WARRANTED TO BE SUITABLE FOR USE IN LIFE-SUPPORT DEVICES OR SYSTEMS OR OTHER CRITICAL APPLICATIONS. INCLUSION OF TI PRODUCTS IN SUCH APPLICATIONS IS UNDERSTOOD TO BE FULLY AT THE CUSTOMER'S RISK.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards must be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance or customer product design. TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such semiconductor products or services might be or are used. TI's publication of information regarding any third party's products or services does not constitute TI's approval, warranty or endorsement thereof.