

## 27 - Line SCSI Terminator With Split Reverse Disconnect

### FEATURES

- Complies with SCSI, SCSI-2, SCSI-3, SPI and FAST-20 (Ultra) Standards
- 2.5pF Channel Capacitance During Disconnect
- 100 $\mu$ A Supply Current in Disconnect Mode
- 4V To 7V Operation
- 110 $\Omega$  Termination
- Completely Meets SCSI Hot Plugging
- -900mA Sourcing Current for Termination
- +500mA Sinking Current for Active Negation
- Logic Command Disconnects all Termination Lines
- Split Reverse Controls Lines 1 to 9 and 10 to 27 Separately
- Trimmed Impedance to 5%
- Current Limit and Thermal Shutdown Protection

### DESCRIPTION

UCC5621 provides 27 lines of active termination for a SCSI (Small Computer Systems Interface) parallel bus. The SCSI standard recommends active termination at both ends of the cable.

The UCC5621 is ideal for high performance 5V SCSI systems. During disconnect the supply current is typically only 100 $\mu$ A, which makes the IC attractive for lower powered systems.

The UCC5621 features a split reverse disconnect allowing the user to control termination lines 10 to 27 with disconnect one, DISCNCT1, and control termination lines 1 to 9 with disconnect two, DISCNCT2.

The UCC5621 is designed with a low channel capacitance of 2.5pF, which eliminates effects on signal integrity from disconnected terminators at interim points on the bus.

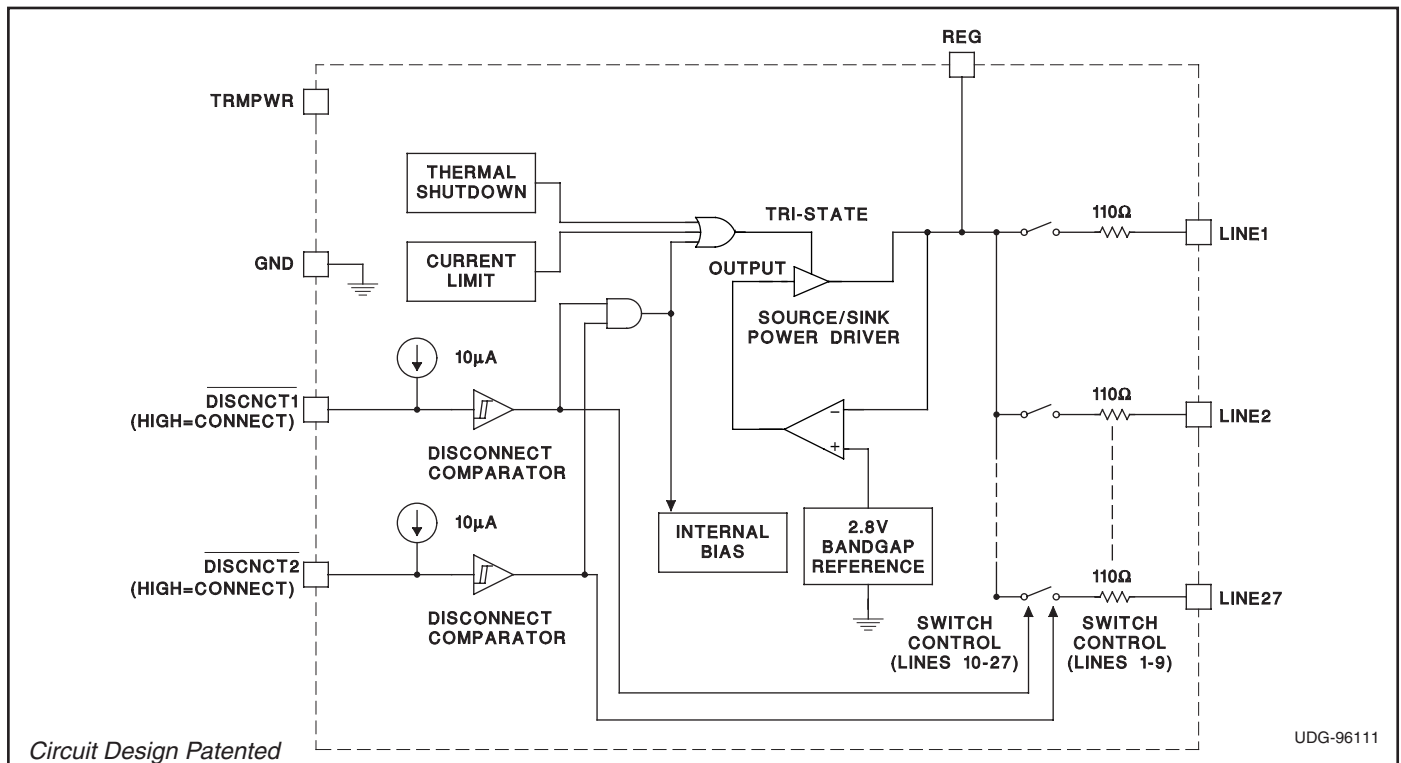
The power amplifier output stage allows the UCC5621 to source full termination current and sink active negation current when all termination lines are actively negated.

The UCC5621, as with all Unitrode terminators, is completely hot pluggable and appears as high impedance at the terminating channels with VTRMPWR = 0V or open.

Internal circuit trimming is utilized, first to trim the 110 $\Omega$  impedance, and then most importantly, to trim the output current as close to the maximum SCSI-3 specification as possible, which maximizes noise margin in FAST-20 SCSI operation.

(continued)

### BLOCK DIAGRAM



**DESCRIPTION (cont.)**

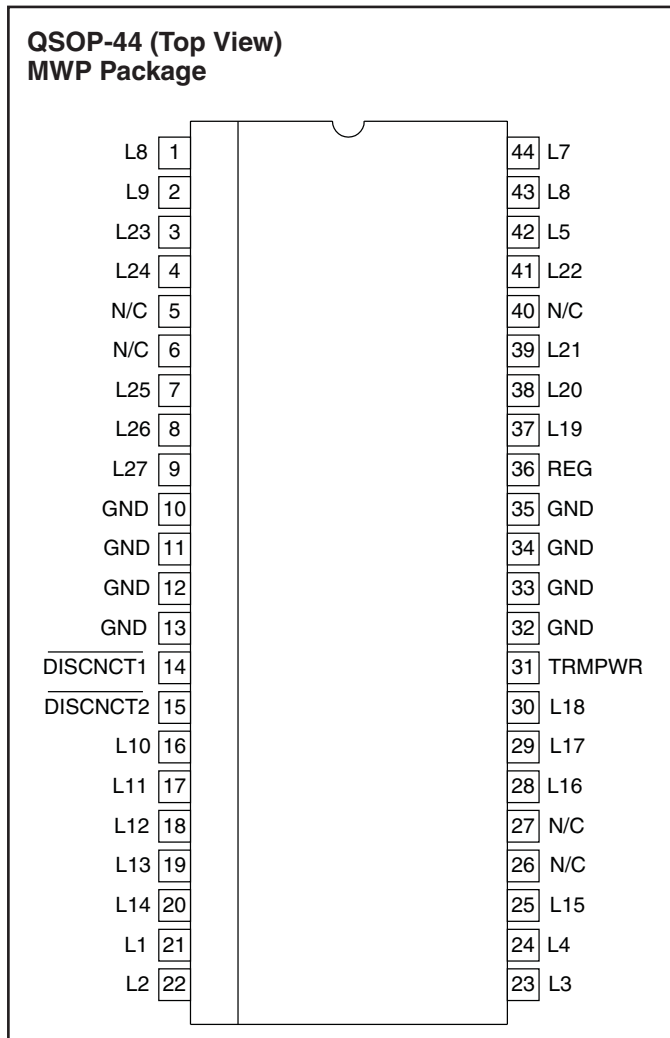
Other features include thermal shutdown and current limit. This device is offered in low thermal resistance versions of the industry standard 44 pin wide body QSOP (MWP). Consult QSOP-44 Packaging Diagrams for exact dimensions.

**ABSOLUTE MAXIMUM RATINGS**

TRMPWR Voltage . . . . . +7V  
 Signal Line Voltage . . . . . 0V to +7V  
 Regulator Output Current . . . . . 1.5A  
 Storage Temperature . . . . . -65°C to +150°C  
 Junction Temperature . . . . . -55°C to +150°C  
 Lead Temperature (Soldering, 10 Sec.) . . . . . +300°C

*Currents are positive into, negative out of the specified terminal. Consult Packaging Section of Databook for thermal limitations and considerations of packages.*

**CONNECTION DIAGRAM**



**ELECTRICAL CHARACTERISTICS** Unless otherwise stated, these specifications apply for T<sub>A</sub> = 0°C to 70°C, TRMPWR = 4.75V, DISCNCT1 = DISCNCT2 = 4.75V, T<sub>A</sub> = T<sub>J</sub>.

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
<b>Supply Current Section</b>					
TRMPWR Supply Current	All Termination Lines = Open		1	2	mA
	All Termination Lines = 0.2V		630	650	mA
Power Down Mode	DISCNCT1 = DISCNCT2 = 0V		100	200	µA
<b>Output Section (Termination Lines)</b>					
Termination Impedance	(Note 3)	104.5	110	115.5	Ω
Output High Voltage	(Note 1)	2.6	2.8	3.0	V
Max Output Current	V <sub>LINE</sub> = 0.2V, T <sub>J</sub> = 25°C	-22.1	-23.3	-24	mA
	V <sub>LINE</sub> = 0.2V	-20.7	-23.3	-24	mA
	V <sub>LINE</sub> = 0.2V, TRMPWR = 4V, T <sub>J</sub> = 25°C (Note 1)	-21	-23	-24	mA
	V <sub>LINE</sub> = 0.2V, TRMPWR = 4V (Note 1)	-20	-23	-24	mA
	V <sub>LINE</sub> = 0.5V			-22.4	mA
Output Leakage	DISCNCT1 = DISCNCT2 = 0V, TRMPWR = 0V to 5.25V		10	400	nA
Output Capacitance	DISCNCT1 = DISCNCT2 = 0V (Note 2)		2.5	4	pF

**ELECTRICAL CHARACTERISTICS** Unless otherwise stated, these specifications apply for  $T_A = 0^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ ,  $\text{TRMPWR} = 4.75\text{V}$ ,  $\text{DISCNCT1} = \text{DISCNCT2} = 4.75\text{V}$ ,  $T_A = T_J$ .

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
<b>Regulator Section</b>					
Regulator Output Voltage		2.6	2.8	3.0	V
Drop Out Voltage	All Termination Lines = 0.2V		0.4	0.8	V
Short Circuit Current	$V_{\text{REG}} = 0\text{V}$	-650	-900	-1300	mA
Sinking Current Capability	$V_{\text{REG}} = 3.5\text{V}$	300	500	900	mA
Thermal Shutdown			170		$^{\circ}\text{C}$
Thermal Shutdown Hysteresis			10		$^{\circ}\text{C}$
<b>Disconnect Section</b>					
Disconnect Threshold $\overline{\text{DISCNCT1}}$	Controls Lines 10 to 27	0.8	1.5	2.0	V
Input Current $\overline{\text{DISCNCT1}}$	$\overline{\text{DISCNCT1}} = 0\text{V}$		-10	-30	$\mu\text{A}$
Disconnect Threshold $\overline{\text{DISCNCT2}}$	Controls Lines 1 to 9	0.8	1.5	2	V
Input Current $\overline{\text{DISCNCT2}}$	$\overline{\text{DISCNCT2}} = 0\text{V}$		-10	-30	$\mu\text{A}$

Note 1: Measuring each termination line while other 26 are low (0.2V).

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

Note 3: Tested by measuring  $I_{\text{OUT}}$  with  $V_{\text{OUT}} = 0.2\text{V}$  and  $V_{\text{OUT}}$  with no load, then calculate:

$$Z = \frac{V_{\text{OUT N.L.}} - 0.2\text{V}}{I_{\text{OUT at } 0.2\text{V}}}$$

**PIN DESCRIPTIONS**

**DISCNCT1:** Disconnect one controls termination lines L10 – L27. Taking this pin low causes termination lines L10 – L27 to become high impedance, taking this pin high or leaving it open allows the channels to provide normal termination.

**GND:** Ground reference for the IC.

**L1 - L27:** 110Ω termination channels.

**REG:** Output of the internal 2.7V regulator.

**TRMPWR:** Power for the IC.

**DISCNCT2 :** Disconnect two controls termination lines L1 – L9. Taking this pin low causes termination lines L1 – L9 to become high impedance. Taking this pin high or leaving it open allows the channels to provide normal termination. Taking both disconnect pins low will put the chip in to sleep mode where it will be in low-power mode.

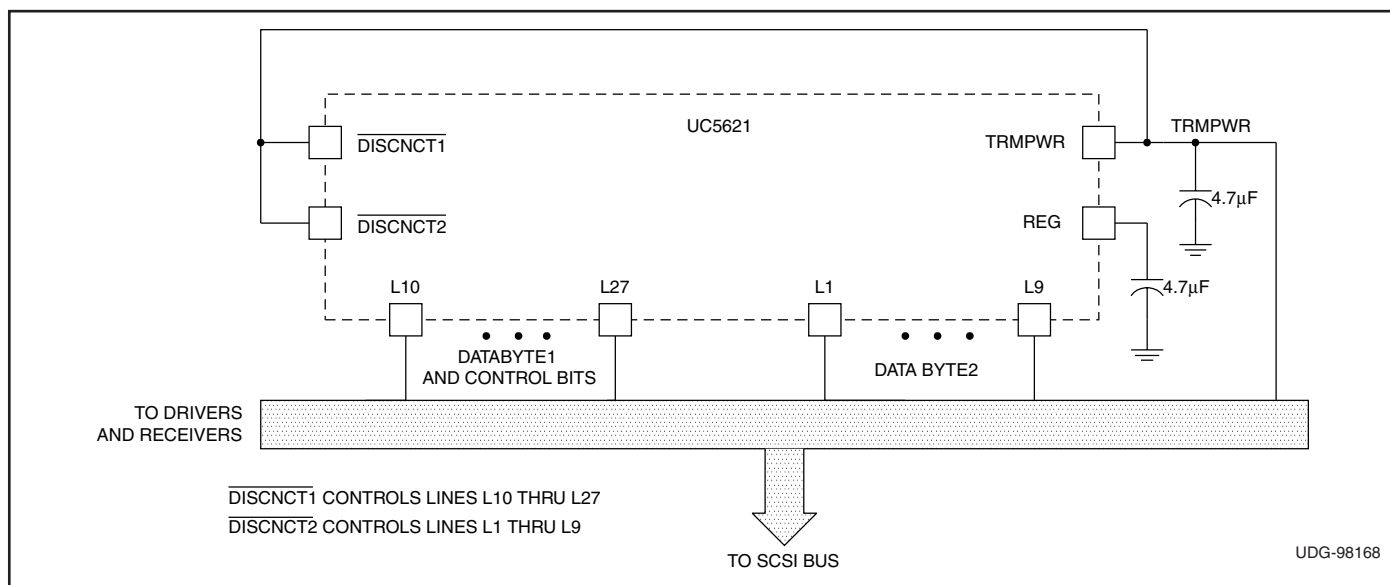


Figure 1. Typical Wide SCSI Bus Configuration Using the UCC5621

## 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.

### Mailing Address:

Texas Instruments  
Post Office Box 655303  
Dallas, Texas 75265