27-Line SCSI Terminator With Reverse Disconnect

FEATURES

- Complies with SCSI, SCSI-2, SCSI-3, SPI and FAST-20 (Ultra) Standards
- 2.5pF Channel Capacitance during Disconnect
- 100µA Supply Current in Disconnect Mode
- 4V To 7V Operation
- 110Ω Termination
- Completely Meets SCSI Hot Plugging
- –900mA Sourcing Current for Termination
- +500mA Sinking Current for Active Negation
- Logic Command Disconnects all Termination Lines
- Trimmed Impedance to 5%
- Current Limit and Thermal Shutdown Protection

DESCRIPTION

UCC5619 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 UCC5619 is ideal for high performance 5V SCSI systems. During disconnect the supply current is typically only 100µA, which makes the IC attractive for lower powered systems.

The UCC5619 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 UCC5619 to source full termination current and sink active negation current when all termination lines are actively negated.

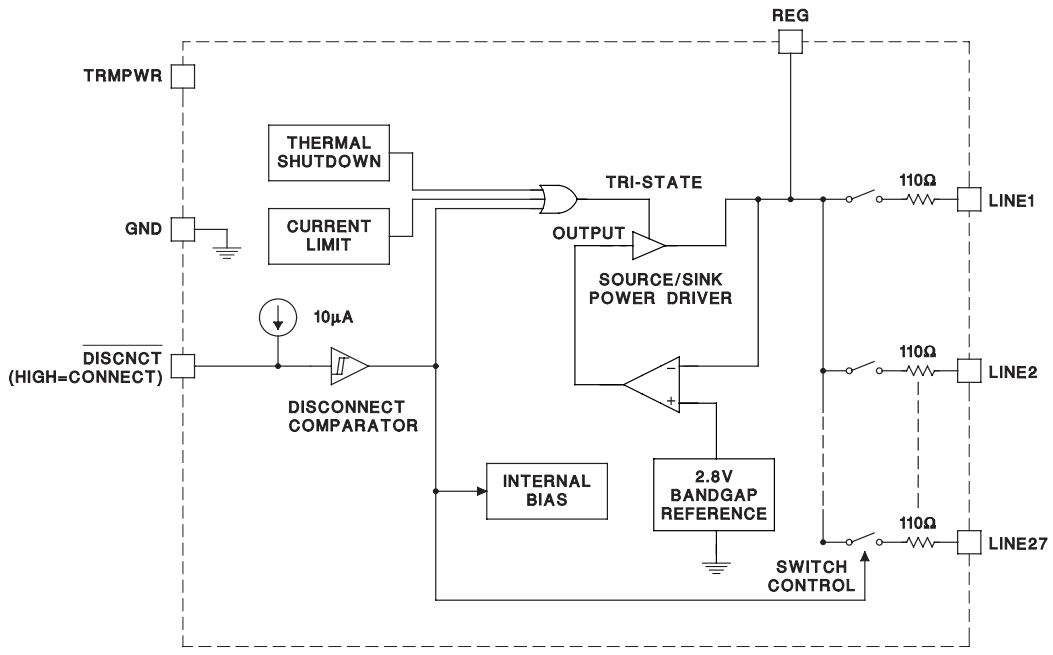
The UCC5619, as with all Unitrode terminators, is completely hot pluggable and appears as high impedance at the teminating channels with V_{TRMPWR} = 0V or open.

Internal circuit trimming is utilized, first to trim the 110Ω 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 SCSI operation.

Other features include thermal shutdown and current limit. This device is offered in low thermal resistance versions of the industry standard 36 pin wide body QSSOP (MWP).

Consult SSOP-36 (MWP QSSOP-36) Packaging Diagram for exact dimensions.

BLOCK DIAGRAM



Circuit Design Patented

UDG-96108

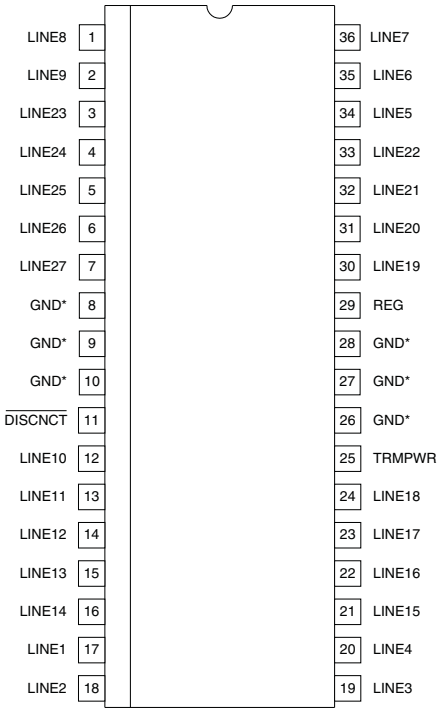
ABSOLUTE MAXIMUM RATINGS

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

QSSOP-36 (Top View)
MWP Package



** MWP package pins 8 - 10 and 26 - 28 serve as heatsink/ ground.*

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

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Supply Current Section					
TRMPWR Supply Current	All Termination Lines = Open		1	2	mA
	All Termination Lines = 0.2V		630	650	mA
Power Down Mode	$\overline{\text{DISCNCT}}$ = 0V		100	200	µA
Output Section (Termination Lines)					
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_{LINE} = 0.2V, T_J = 25°C	–22.1	–23.3	–24	mA
	V_{LINE} = 0.2V	–20.7	–23.3	–24	mA
	V_{LINE} = 0.2V, TRMPWR = 4V, T_J = 25°C (Note 1)	–21	–23	–24	mA
	V_{LINE} = 0.2V, TRMPWR = 4V (Note 1)	–20	–23	–24	mA
	V_{LINE} = 0.5V			22.4	mA
Output Leakage	$\overline{\text{DISCNCT}}$ = 0V, TRMPWR = 0V to 5.25V		10	400	nA
Output Capacitance	$\overline{\text{DISCNCT}}$ = 0V (Note 2)		2.5	4	pF

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

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Regulator Section					
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_{REG} = 0V	–650	–900	–1300	mA
Sinking Current Capability	V_{REG} = 3.5V	300	500	900	mA
Thermal Shutdown			170		°C
Thermal Shutdown Hysteresis			10		°C
Disconnect Section					
Disconnect Threshold		0.8	1.5	2.0	V
Input Current	$\overline{\text{DISCNCT}}$ = 0V		–20	–60	µA

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_{OUT} with V_{OUT} = 0.2V and V_{OUT} with no load, then calculate: $Z = \frac{V_{OUT}\ N.L. - 0.2V}{I_{OUT}\ at\ 0.2V}$

PIN DESCRIPTIONS

DISCNCT: Taking this pin low causes all channels to become high impedance, and the chip to go into low-power mode; a high state or leaving it open allows the channels to provide normal termination.

GND: Ground reference for the IC.

LINE1 - LINE27: 110Ω termination channels.

REG: Output of the internal 2.7V regulator; bypass with a 4.7µF capacitor to GND.

TRMPWR: Power for the IC; bypass with a 4.7µF capacitor to GND.

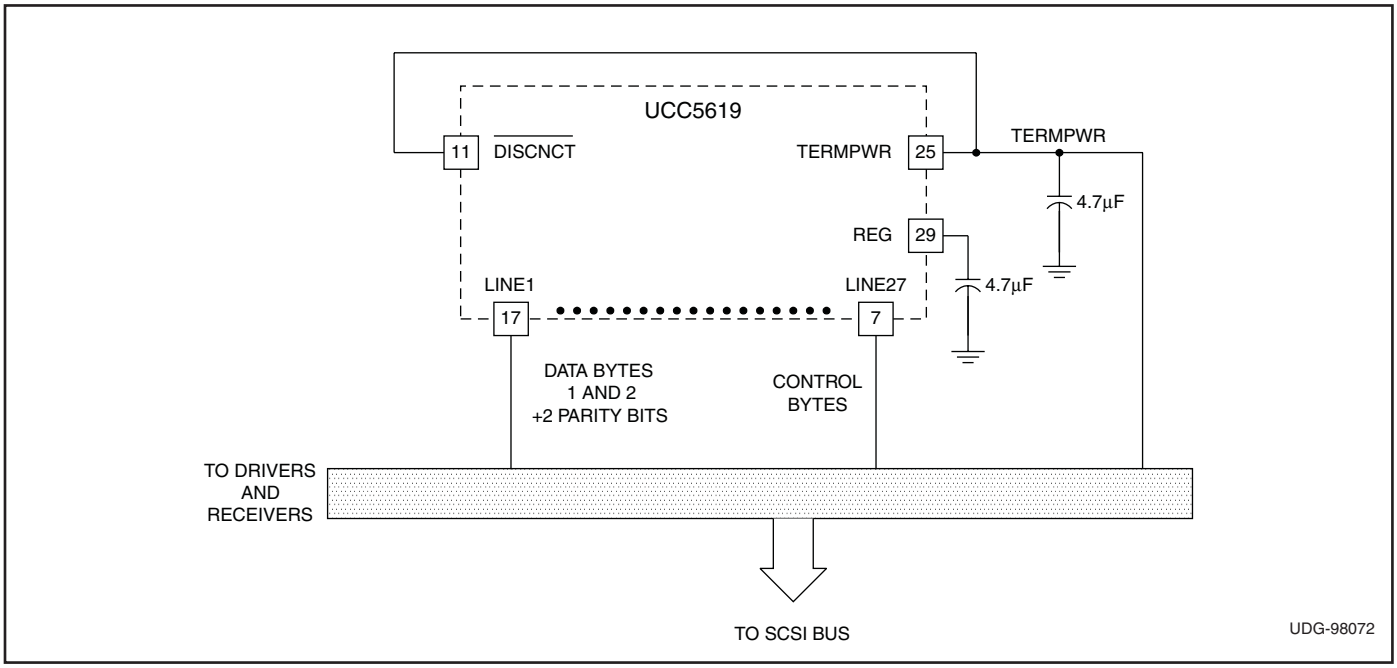


Figure 1. Typical wide SCSI bus configuration using the UCC5619

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)
UCC5619MWP	ACTIVE	SSOP	DCE	36	25	None	CU SNPB	Level-1-220C-UNLIM
UCC5619MWPTR	ACTIVE	SSOP	DCE	36	1000	None	CU SNPB	Level-1-220C-UNLIM

(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 - May not be currently available - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
None: Not yet available Lead (Pb-Free).
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" and in addition, uses package materials that do not contain halogens, including bromine (Br) or antimony (Sb) above 0.1% of total product weight.

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

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