27-Line SCSI Terminator With Reverse Disconnect

FEATURES

- Complies with SCSI, SCSI-2, SCSI-3 and FAST-20 (Ultra) Standards

- 2.5pF Channel Capacitance during Disconnect

- 100μA Supply Current in Disconnect Mode

- 4V To 7V Operation

- 110 Ohm 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.

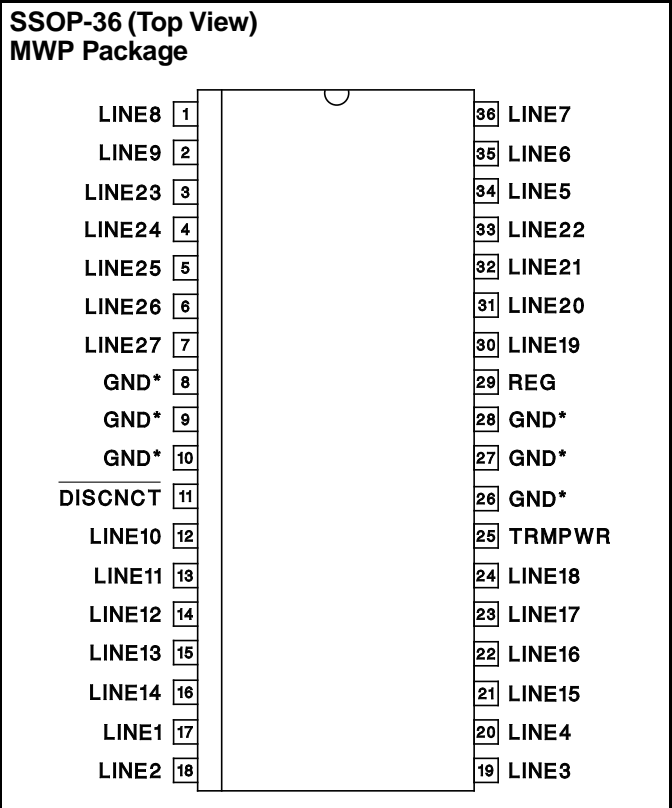Consult SSOP-36 Packaging Diagram for exact dimensions.

BLOCK DIAGRAM
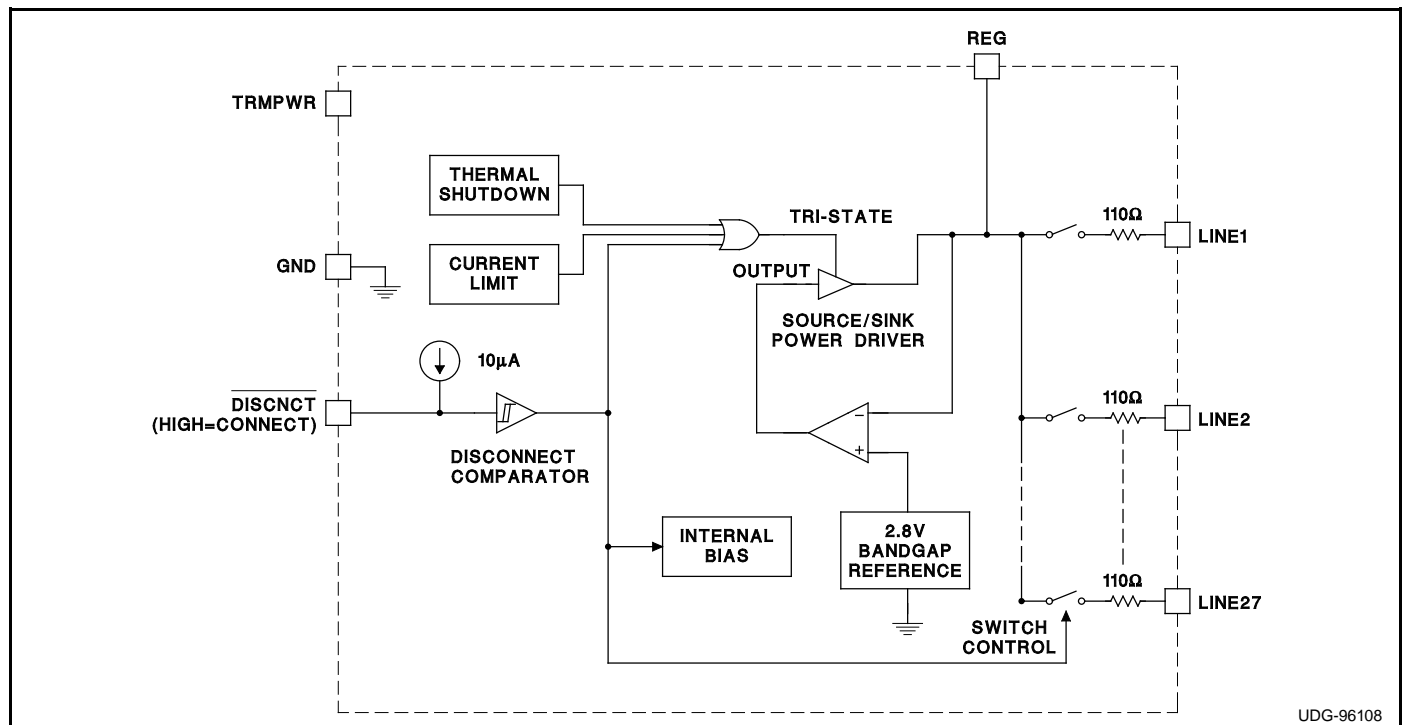
UDG-96108

ABSOLUTE MAXIMUM RATINGS

Termpwr 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

SSOP-36 (Top View)
MWP Package

Pin	Signal		Pin	Signal
1	LINE8		36	LINE7
2	LINE9		35	LINE6
3	LINE23		34	LINE5
4	LINE24		33	LINE22
5	LINE25		32	LINE21
6	LINE26		31	LINE20
7	LINE27		30	LINE19
8	GND*		29	REG
9	GND*		28	GND*
10	GND*		27	GND*
11	$\overline{\text{DISCNCT}}$		26	GND*
12	LINE10		25	TRMPWR
13	LINE11		24	LINE18
14	LINE12		23	LINE17
15	LINE13		22	LINE16
16	LINE14		21	LINE15
17	LINE1		20	LINE4
18	LINE2		19	LINE3

* 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					
Termpwr 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 (cont.) Unless otherwise stated, these specifications apply for T_A = 0°C to 70°C, TRMPWR = 4.75V, 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	$\overline{DISCNCT}$ = 0V		−20	−60	μA

Note 1: Measuring each termination line while other 26 are low (0.2V).
Note 2: Guaranteed 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 :

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

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 - 27: 110Ω termination channels.

REG: Output of the internal 2.7V regulator.

TRMPWR: Power for the IC.

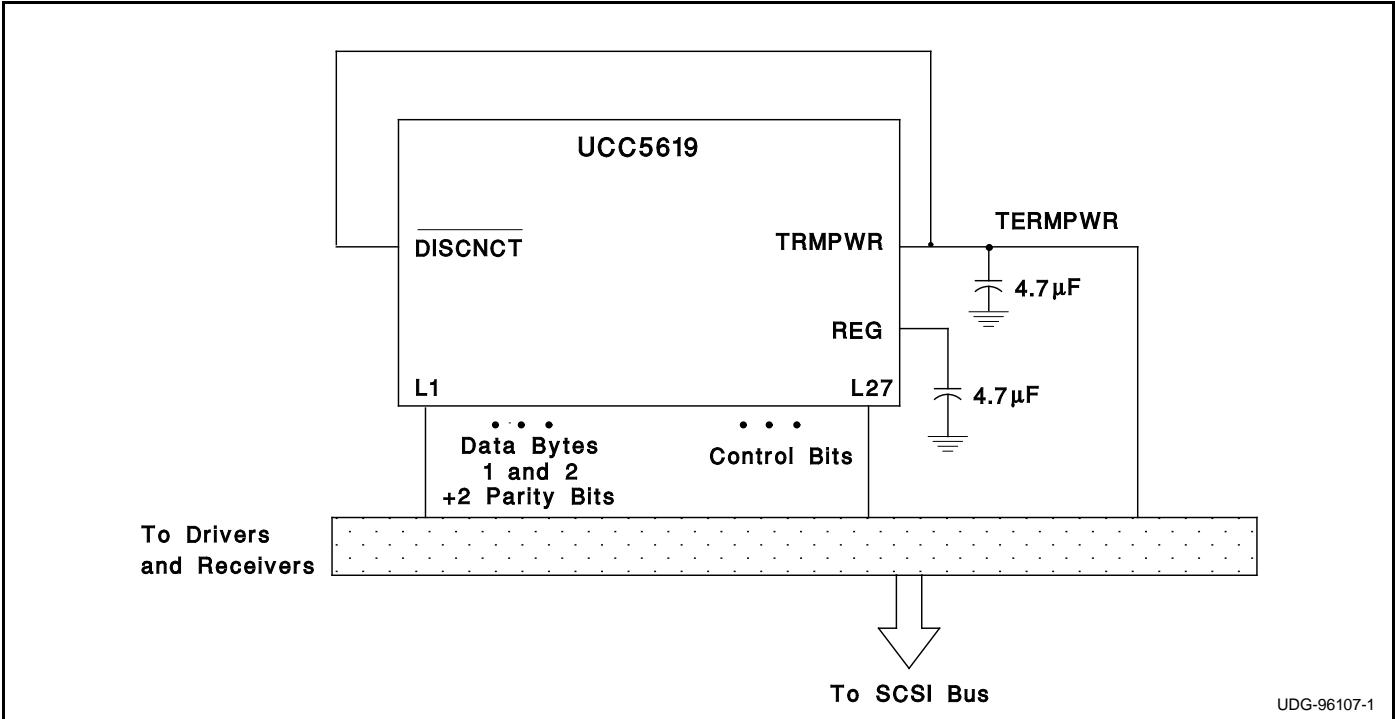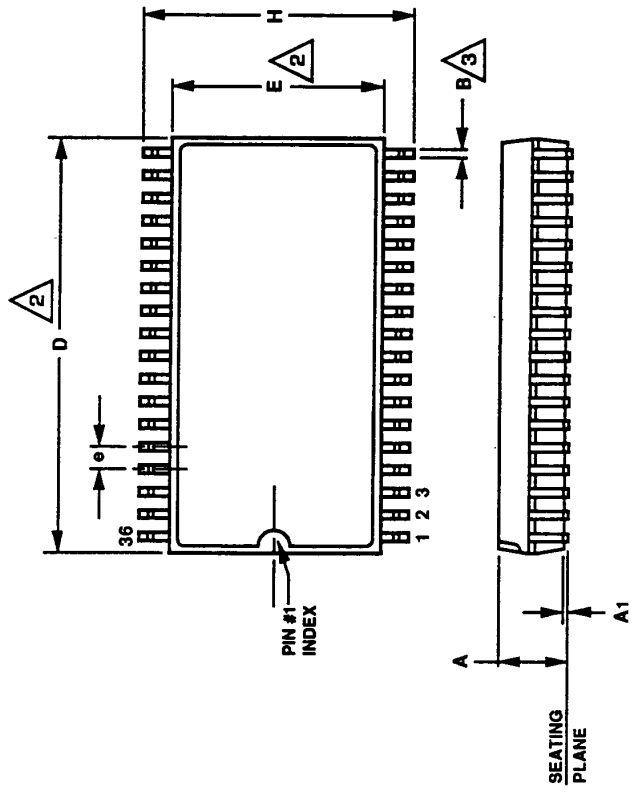**Figure 1. Typical Wide SCSI Bus Configuration Using the UCC5619**

VENDOR		

REV. NO.	REVISIONS	DATE	APP'D.
			01/15/96
—	INIT PER SCN #18179		

Dimensions Table

SYMBOL	DIMENSIONS					
	MIN		MAX			
	MM	INCHES	MM	INCHES		
A	2.35	.093	2.65	.104		
A1	0.10	.004	0.30	.012		
B	0.28	.011	0.39	.015		
C	0.15	.006	0.32	.0125		
D	15.20	.598	15.60	.614		
E	7.40	.291	7.60	.299		
e	0.80 MM .031 INCHES BSC					
H	10.00	.394	10.65	.419		
L	0.40	.016	1.27	.050		
θ	0°		8°			

DETAIL "A"

GAGE PLANE

0.356 (.014)

7°

L

θ

SEE DETAIL "A"

C

H

E

D

36

1 2 3

PIN #1 INDEX

A

A1

SEATING PLANE

B

NOTES:
1. CONTROLLING DIMENSION: MILLIMETERS. INCHES SHOWN FOR REFERENCE.

2. 'D' AND 'E' DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS. MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED 0.15mm PER SIDE.

3. THE BASIC LEAD SPACING IS 0.80mm BETWEEN CENTERLINES. EACH LEAD CENTERLINE SHALL BE LOCATED WITHIN 0.20mm OF ITS EXACT TRUE POSITION AT MAXIMUM MATERIAL CONDITION RELATIVE TO THE CENTER OF THE PACKAGE BODY.

4. LEADS SHALL BE COPLANAR WITHIN 0.10mm AT THE SEATING PLANE.

UNITRODE
INTEGRATED CIRCUIT CORP.
MERRIMACK, N.H.

DRAWN	RJV	DATE 1/96
APP'D		DATE

TOLERANCES (U.O.S.)
.XX ± .01
.XXX ± .005

FRACTIONS ± 1/64"

ANGLES ± 1/2°

SURFACE QUALITY ✓

TITLE

36 LEAD SSOP PACKAGE OUTLINE DRAWING

DWG NO.

MA 2154

SCALE

SHEET 1 OF 1