27-Line SCSI Terminator

FEATURES

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

- 2.5pF Channel Capacitance during Disconnect

- 100mA 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

UCC5620 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 UCC5620 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 UCC5620 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 UCC5620 to source full termination current and sink active negation current when all termination lines are actively negated.

The UCC5620, 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 QSOP (MWP).

Consult QSOP-36 packaging diagram for exact dimensions.

BLOCK DIAGRAM

Circuit Design Patented

UDG-96109

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 termi-
nal. Consult Packaging Section of Databook for thermal limita-
tions and considerations of packages.*

CONNECTION DIAGRAM
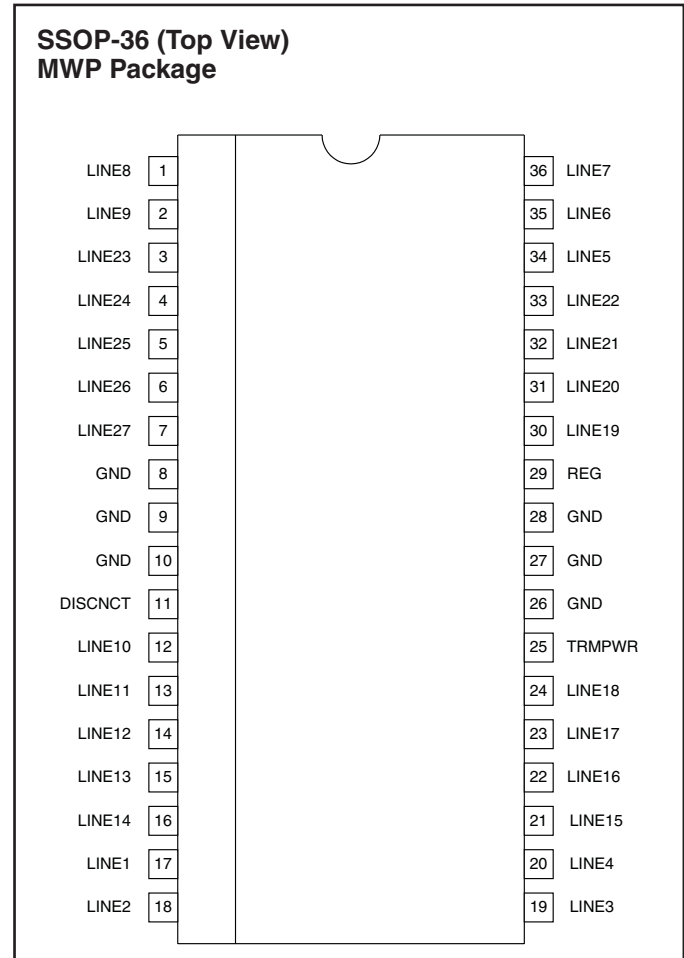
SSOP-36 (Top View)
MWP Package

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	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

ELECTRICAL CHARACTERISTICS

Unless otherwise stated, these specifications apply for T_A = 0°C to 70°C, TRMPWR = 4.75V, DISCNCT = 0V, $T_A = T_J$.

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	DISCNCT = TRMPWR		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	DISCNCT = 2.4V, TRMPWR = 0V to 5.25V		10	400	nA
Output Capacitance	DISCNCT = 2.4V (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, DISCNCT = 0V, $T_A = T_J$.

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	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: $Z = \dfrac{(V_{OUT}\ N.L. - 0.2V)}{I_{OUT}\ at\ 0.2V}$

PIN DESCRIPTIONS

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

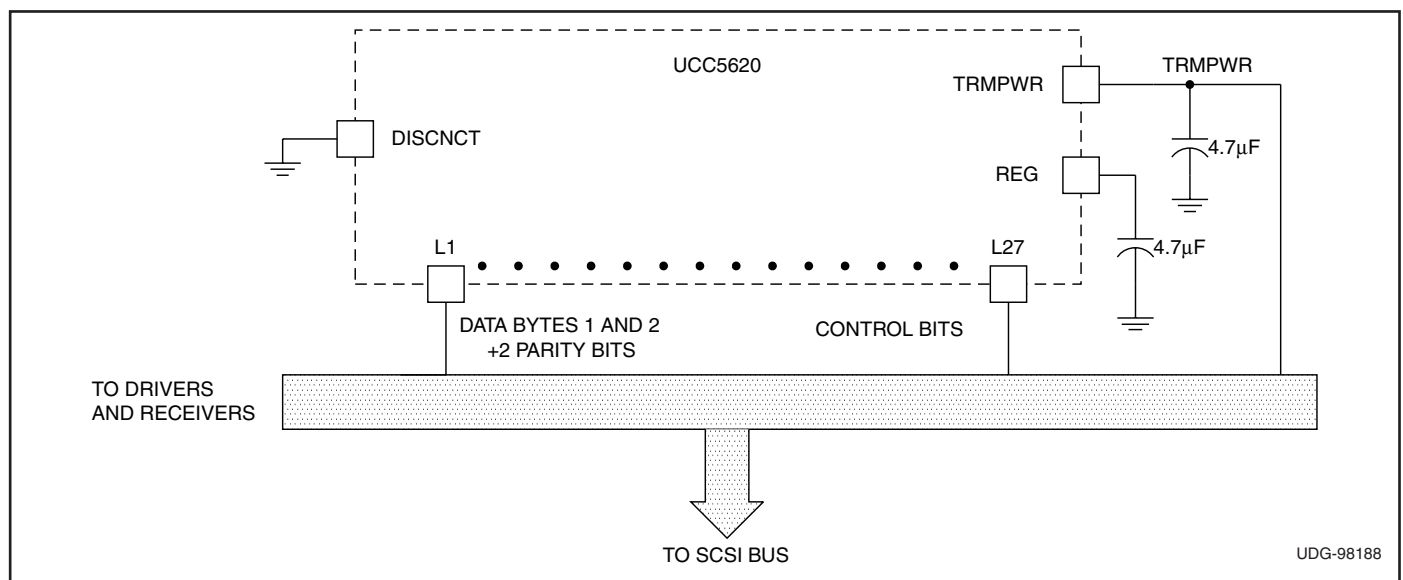**TRMPWR:** Power for the IC.

APPLICATION INFORMATION

Figure 1. Typical Wide SCSI Bus Configuration Using the UCC5620

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