

9-Line Low Capacitance SCSI Active Terminator

FEATURES

- Complies with SCSI, SCSI-2 Standards
- 9pF Channel Capacitance during Disconnect
- 100 μ A Supply Current in Disconnect Mode
- Meets SCSI Hot Plugging Capability
- -300mA Sourcing Current for Termination
- +40mA Sinking Current for Active Negation
- Logic Command Disconnects all Termination Lines
- Trimmed Termination Current to 7%
- Trimmed Impedance to 7%
- Current Limit and Thermal Shutdown Protection

DESCRIPTION

The UC5604 provides 9 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 segment.

The UC5604 provides a disconnect feature which, when opened or driven high, will disconnect all terminating resistors and disable the regulator, greatly reducing standby power. The output channels remain high impedance even without TermPwr applied.

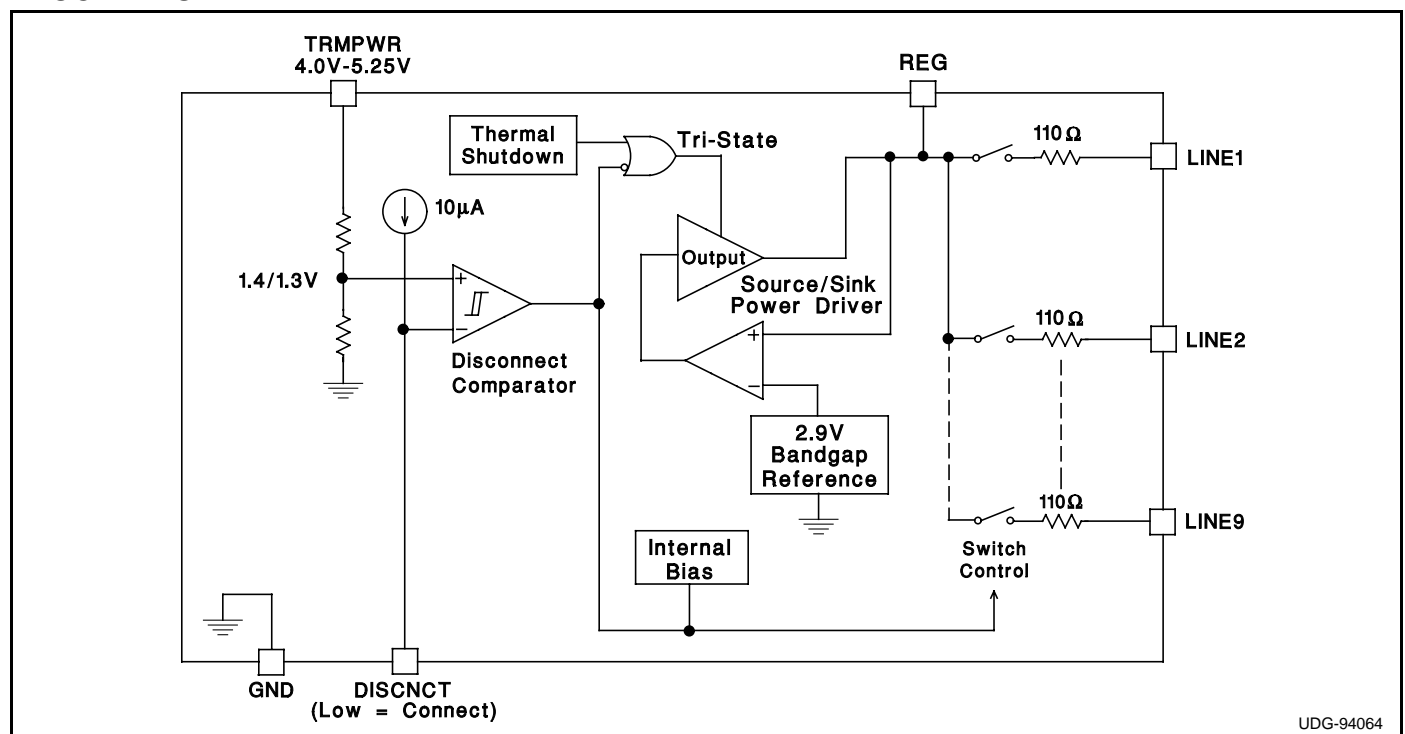
The UC5604 is pin-for-pin compatible with its predecessor, the UC5603 - 9 line Active Terminator. The only functional difference between the UC5604 and UC5603 is the absence of the negative clamps. Parametrically, the UC5604 has a 7% tolerance on impedance and current compared to a 3% tolerance on the UC5603 and the sink current is reduced from 300mA to 40mA. Custom power packages are utilized to allow normal operation at full power conditions (1.2 watts).

Internal circuit trimming is utilized, first to trim the impedance to a 7% tolerance, and then most importantly, to trim the output current to a 7% tolerance, as close to the max SCSI spec 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 16 pin narrow body SOIC, 16 pin ZIP (zig-zag in line package) and 24 pin TSSOP.

BLOCK DIAGRAM



Circuit Design Patented

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.

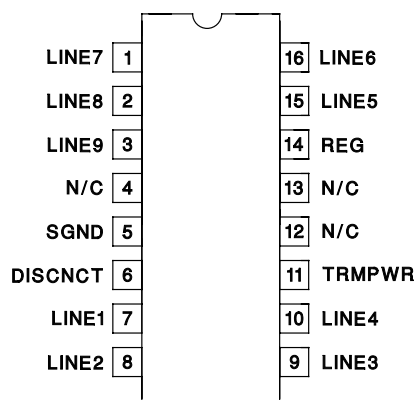
Consult Packaging Section of Unitrode Integrated Circuits databook for thermal limitations and considerations of packages.

RECOMMENDED OPERATING CONDITIONS

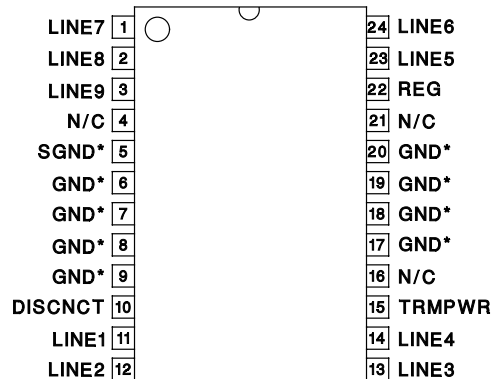
Tempwr Voltage	3.8V to 5.25V
Signal Line Voltage	0V to +5V
Disconnect Input Voltage	0V to Tempwr

CONNECTION DIAGRAMS

DIL-16 (Top View)
N or J Package

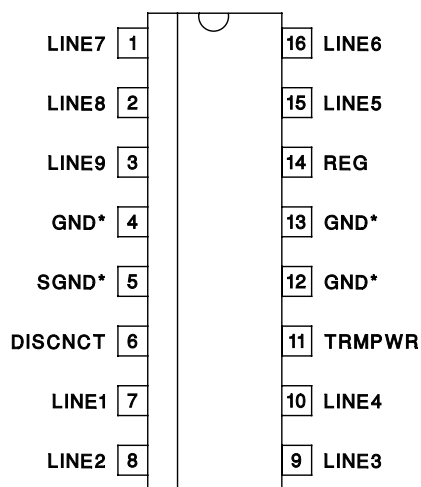


TSSOP-24 (Top View)
PWP Package



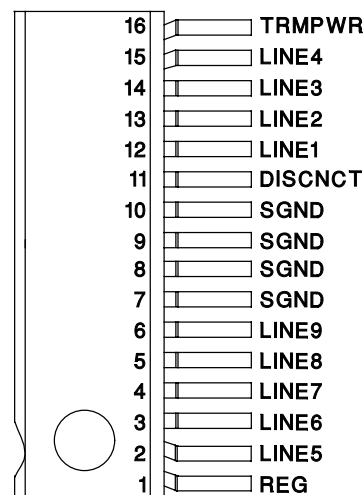
* PWP package pin 5 serves as signal ground; pins 6, 7, 8, 9, 17, 18, 19, and 20 serve as heatsink/ground.

SOIC-16 (Top View)
DP Package



* DP package pin 5 serves as signal ground; pins 4, 12, 13 serve as heatsink/ground.

ZIP-16 (Top View)
Z 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							
Tempwr Supply Current	All termination lines = Open				14	20	mA
	All termination lines = 0.5V				200	220	mA
Power Down Mode	DISCNCT = Open				100	150	μA
Output Section (Terminator Lines)							
Terminator Impedance	ΔLINE = -5mA to -15mA			97	110	129	Ohms
Output High Voltage	TRMPWR = 4V (Note 1)		0°C < TJ < 70°C	2.55		3.2	V
			TJ = 25°C	2.6	2.9	3.1	V
Max Output Current	VLINE = 0.5V		TJ = 25°C	-19.5	-21.9	-22.4	mA
			0°C < TJ < 70°C	-18.5	-21.9	-22.4	mA
Max Output Current	VLINE = 0.5V, TRMPWR = 4V (Note 1)		TJ = 25°C	-18.0	-21.9	-22.4	mA
			0°C < TJ < 70°C	-17.0	-21.9	-22.4	mA
Output Clamp Level	ILINE = -30mA			-0.2	-0.05	0.1	V
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)				9	12	pF
Regulator Section							
Regulator Output Voltage				2.5	2.9	3.2	V
Regulator Output Voltage	All Termination Lines = 5V			2.55	2.9	3.1	V
Line Regulation	TRMPWR = 4V to 6V				10	20	mV
Load Regulation	IREG = +100mA to -100mA				20	50	mV
Drop Out Voltage	All Termination Lines = 0.5V				1.0	1.2	V
Short Circuit Current	VREG = 0V			-200	-400	-600	mA
Sinking Current Capability	VREG = 3.5V			20	40		mA
Thermal Shutdown					170		°C
Thermal Shutdown Hysteresis					10		°C
Disconnect Section							
Disconnect Threshold				1.1	1.4	1.7	V
Threshold Hysteresis					100		mV
Input Current	DISCNCT = 0V				150	200	uA

Note 1: Measuring each termination line while other 8 are low (0.5V).

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

APPLICATION INFORMATION

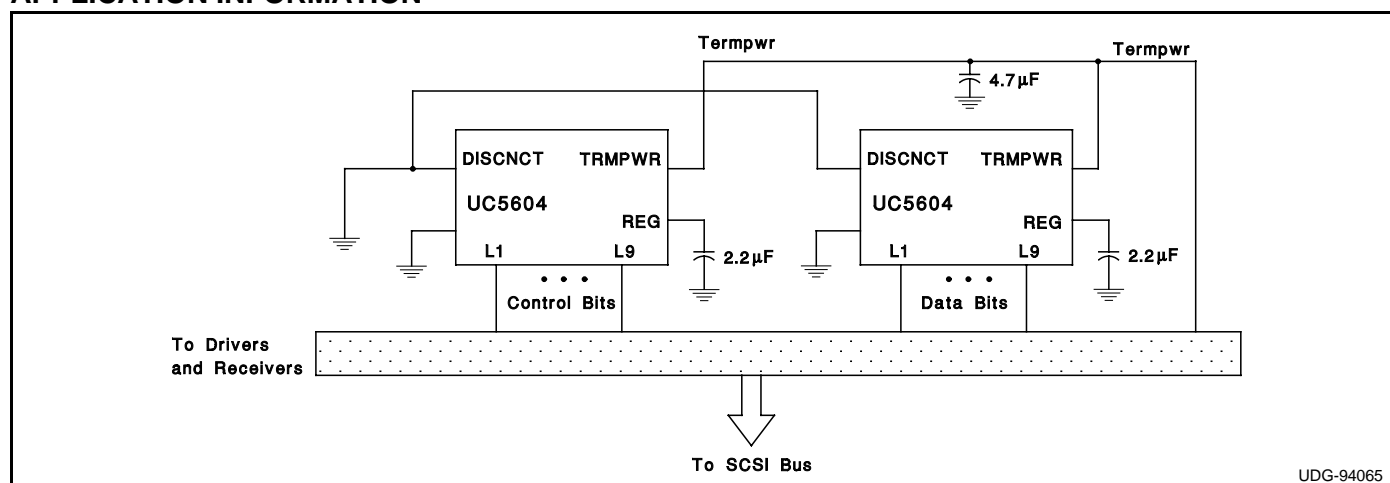


Figure 1: Typical SCSI Bus Configurations Utilizing 2 UC5604 Devices

APPLICATION INFORMATION (cont.)

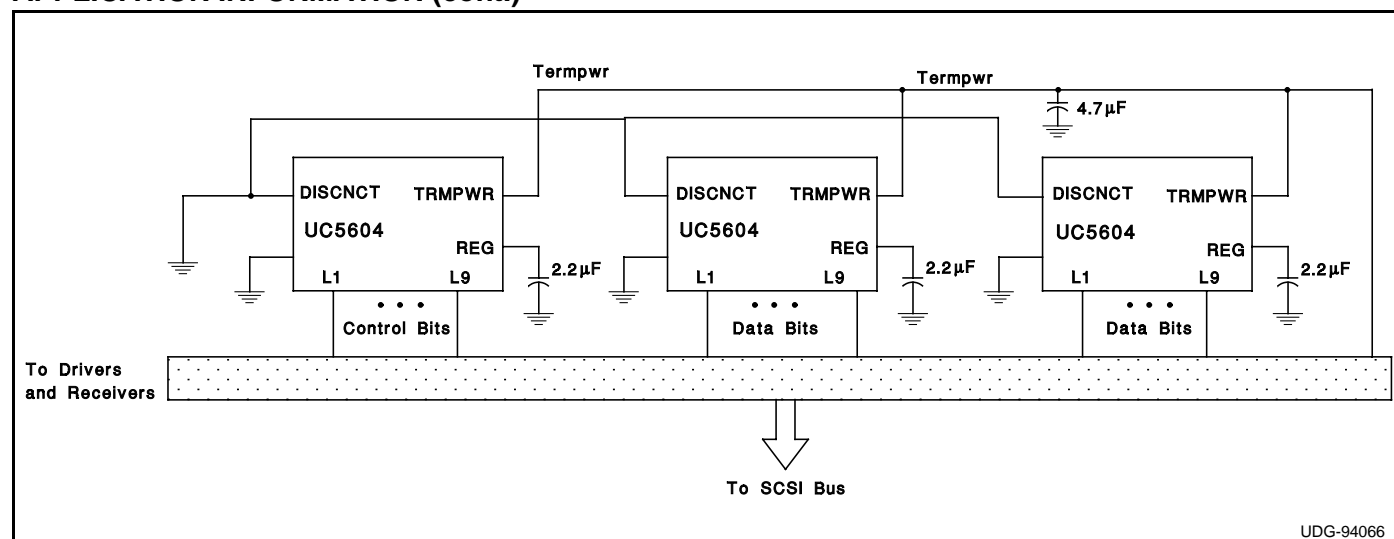


Figure 2: Typical Wide SCSI Bus Configurations Utilizing 3 UC5604 Devices.

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