

9-Line Low Capacitance SCSI Active Terminator

FEATURES

- Complies with SCSI, SCSI-2 Standards
- 9pF Channel Capacitance during Disconnect
- 100µA 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 *Tempwr* applied.

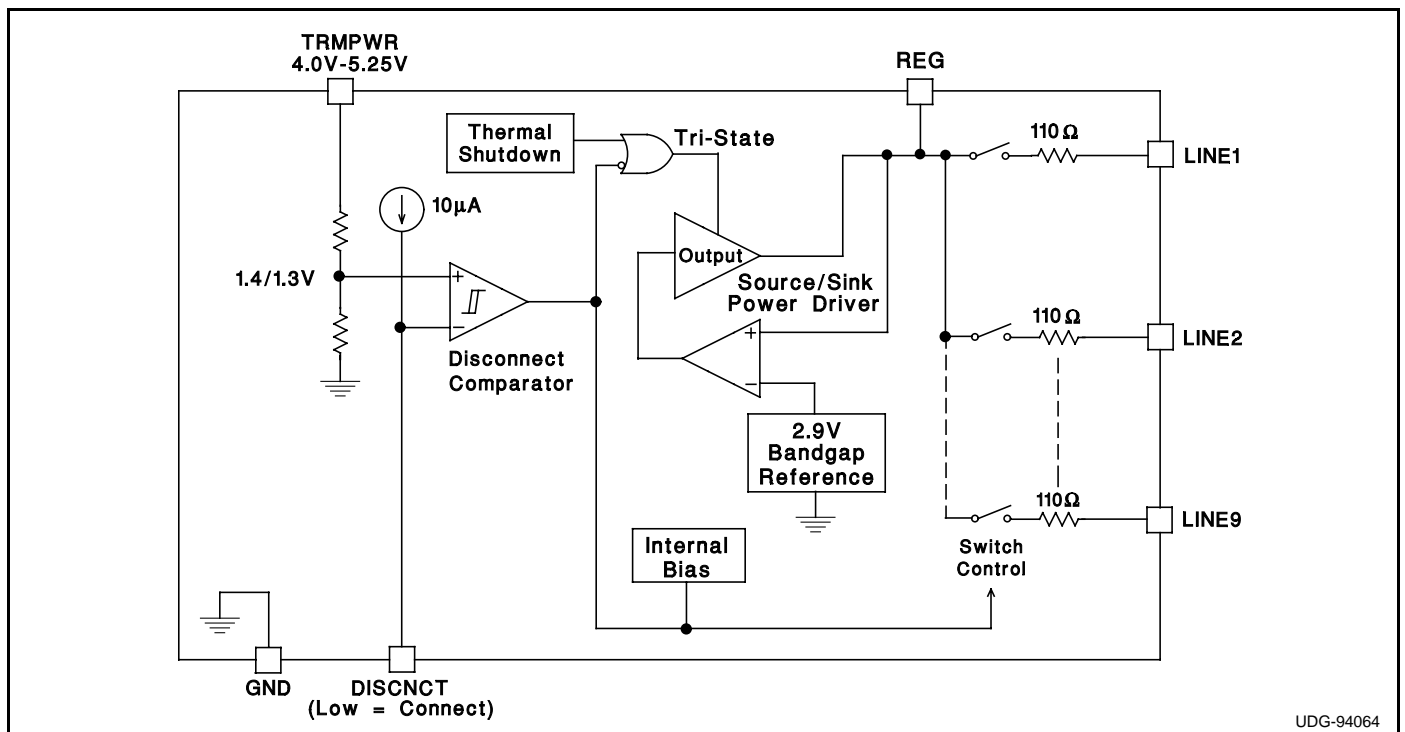
The UC5604 is pin-for-pin compatible with its predecessor, the UC5603 - 9 line Active Terminator. The only functional difference between the UC5604 and UC5603 is the absence of the negative clamps. Parametrically, the UC5604 has a 7% tolerance on impedance and current compared to a 3% tolerance on the 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.

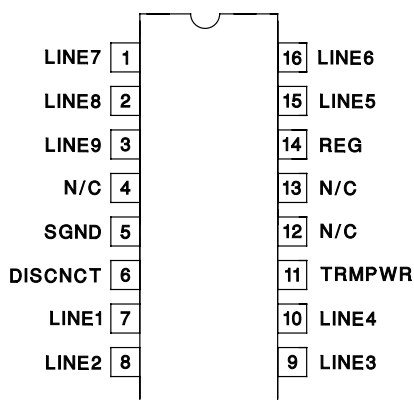
Consult Packaging Section of Unitrode Integrated Circuits databook for thermal limitations and considerations of packages.

RECOMMENDED OPERATING CONDITIONS

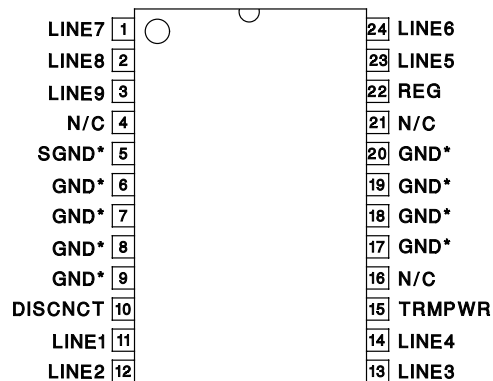
Tempwr Voltage	3.8V to 5.25V
Signal Line Voltage	0V to +5V
Disconnect Input Voltage	0V to Tempwr

CONNECTION DIAGRAMS

DIL-16 (Top View)
N or J Package

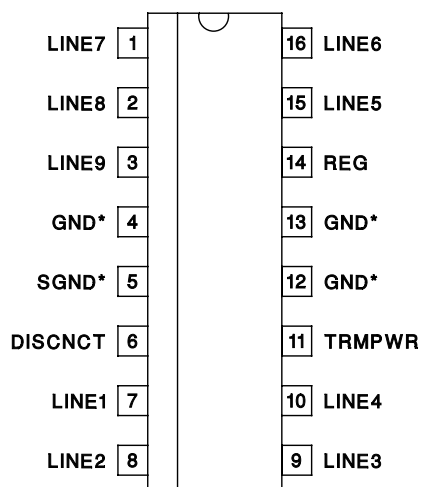


TSSOP-24 (Top View)
PWP Package



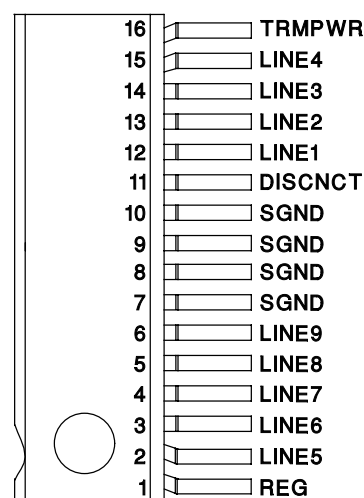
* PWP package pin 5 serves as signal ground; pins 6, 7, 8, 9, 17, 18, 19, and 20 serve as heatsink/ground.

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 TA = 0°C to 70°C.
 TRMPWR = 4.75V, DISCNCT = 0V. TA = TJ.

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 REG = 0V	VLINE = 0 to 4V		10	400	nA
			VLINE = 5.25V			100	μA
		TRMPWR = 0V to 5.25V, REG = Open VLINE = 0V to 5.25V			10	400	nA
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	I _{REG} = +100mA to -100mA		20	50	mV		
Drop Out Voltage	All Termination Lines = 0.5V		1.0	1.2	V		
Short Circuit Current	V _{REG} = 0V	-200	-400	-600	mA		
Sinking Current Capability	V _{REG} = 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	μA		

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

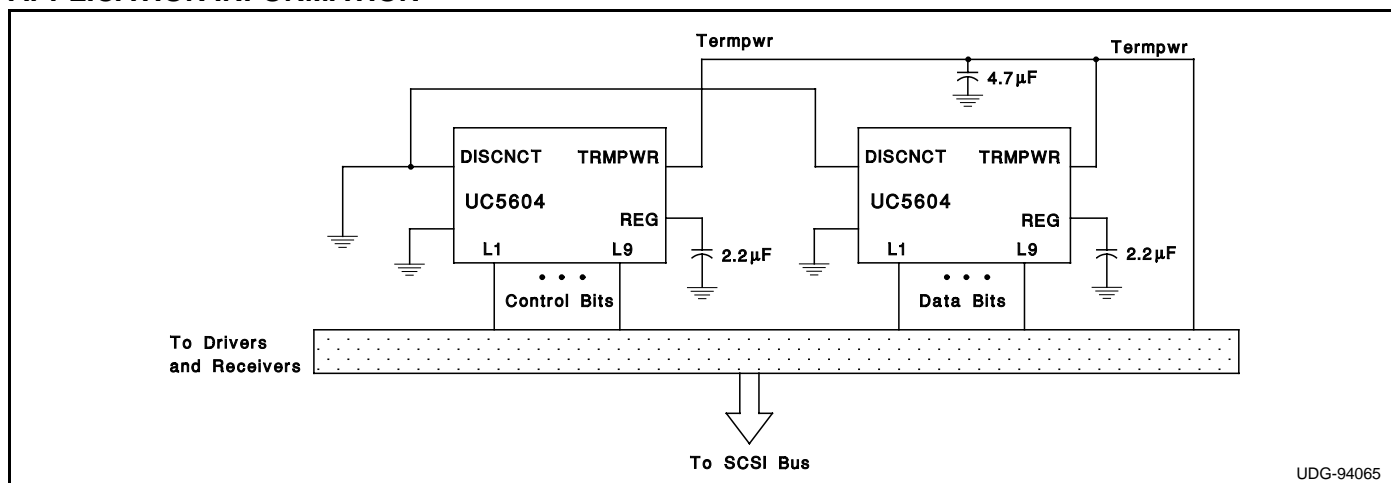


Figure 1: Typical SCSI Bus Configurations Utilizing 2 UC5604 Devices

APPLICATION INFORMATION (cont.)

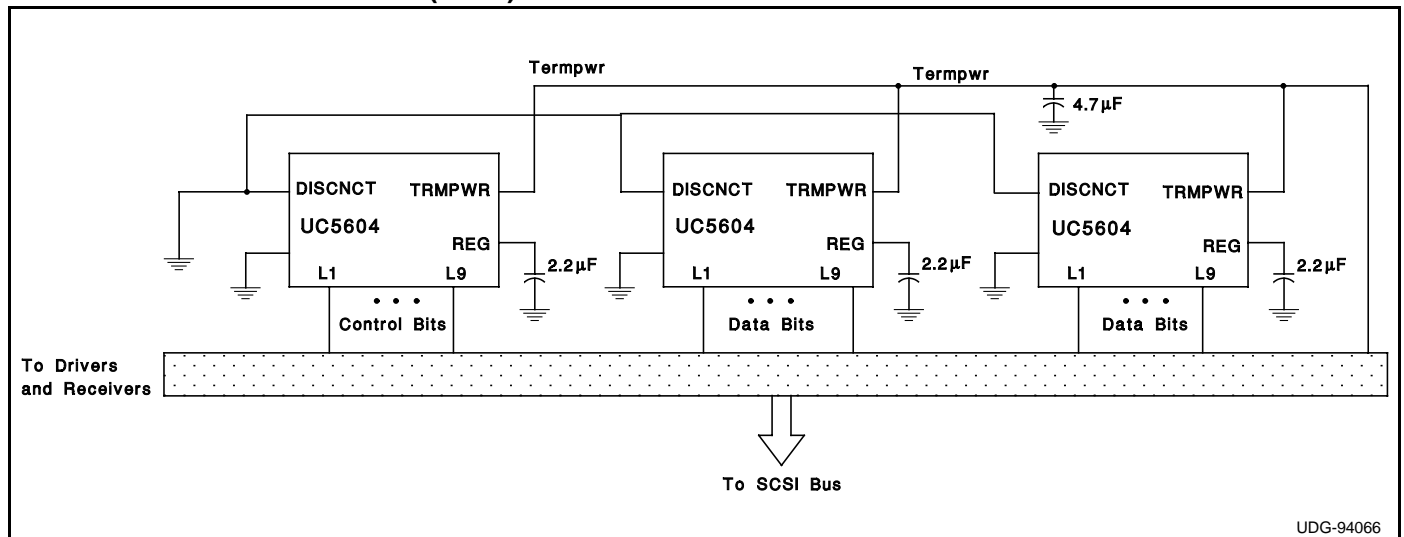


Figure 2: Typical Wide SCSI Bus Configurations Utilizing 3 UC5604 Devices.

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