UNITRODE

9-Line Low Capacitance SCSI Active Terminator

FEATURES

- Reverse Disconnect
- Complies with SCSI, SCSI-2 and SPI-2 Standards
- 5pF Channel Capacitance during Disconnect
- Hot Plugging Capability
- –400mA Sourcing Current for Termination
- +100mA Sinking Current for Active Negation
- 1V Dropout Voltage Regulator
- 100µA Supply Current in Disconnect Mode
- Trimmed Termination Current to 5%
- Trimmed Impedance to 5%
- Low Thermal Resistance Surface Mount Packages

DESCRIPTION

The UC5605 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.

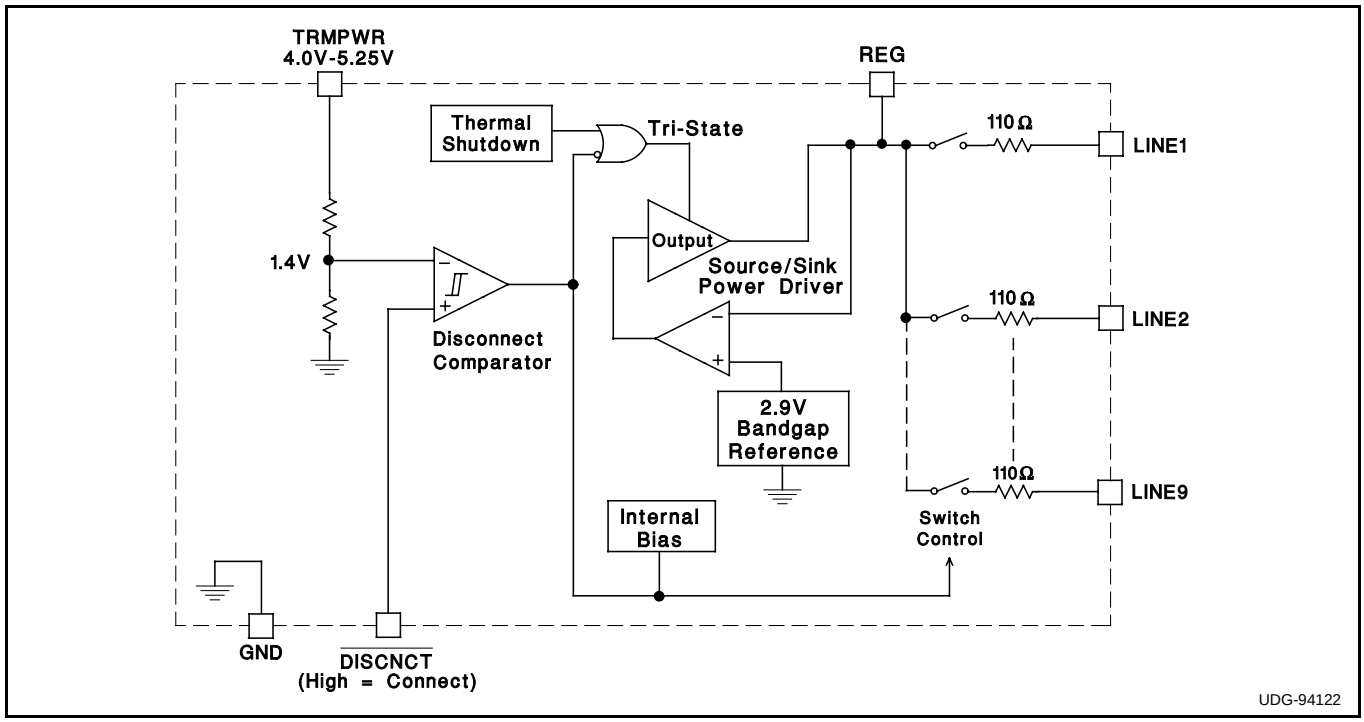
The only functional differences between the UC5603 and UC5605 is the absence of the negative clamps on the output lines and the disconnect input must be at a logic-low for the terminating resistors to be disconnected. Parametrically, the UC5605 has a 5% tolerance on impedance and current compared to a 3% tolerance on the UC5603. Custom power packages are utilized to allow normal operation at full power (2 Watts).

The UC5605 provides a disconnect feature which, when driven low, disconnects all terminating resistors, disables the regulator and greatly reduces standby power consumption. The output channels remain high impedance even without Termpwr applied. A low channel capacitance of 5pF allows interim points of the bus to have little to no effect on the signal integrity.

Internal circuit trimming is utilized, first to trim the impedance to a 5% tolerance, and then most importantly, to trim the output current to a 5% tolerance, as close to the maximum SCSI specification as possible. This maximizes the 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

Termpwr Voltage . . . . . +7V
Signal Line Voltage . . . . . 0V to +7V
Regulator Output Current 0.6A
Storage Temperature . . . . . –65°C to +150°C
Operating Temperature . . . . . –55°C to +150°C
Lead Temperature (Soldering, 10 Sec.) . . . . . +300°C

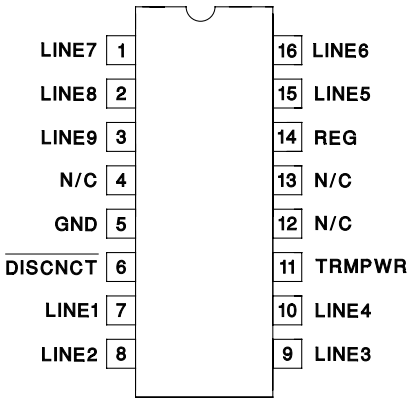
Unless otherwise specified all voltages are with respect to Ground. Currents are positive into, negative out of the specified terminal.
Consult Packaging Section of Unitrode Integrated Circuits databook for thermal limitations and considerations of packages.

RECOMMENDED OPERATING CONDITIONS

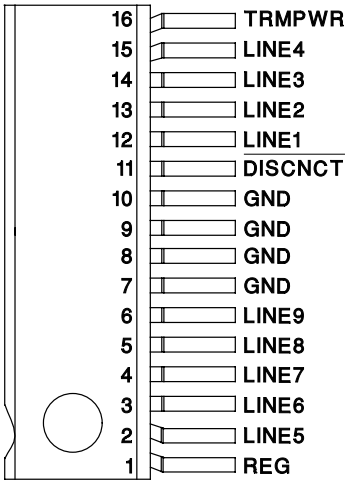
Termpwr Voltage . . . . . 3.8V to 5.25V
Signal Line Voltage . . . . . 0V to +5V
Disconnect Input Voltage . . . . . 0V to Termpwr

CONNECTION DIAGRAMS

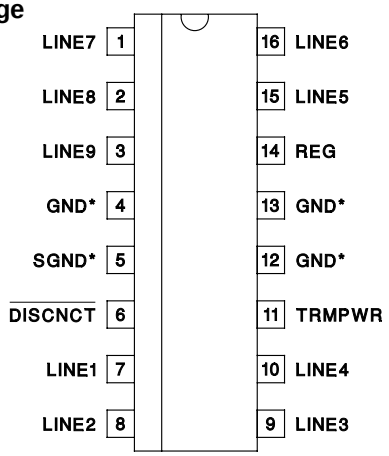
DIL-16 (Top View)
N or J Package



ZIP-16 (Top View)
Z Package

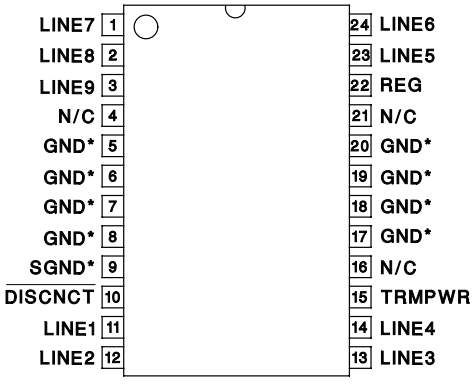


SOIC-16 (Top View)
DP Package



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

TSSOP-24 (Top View)
PWP Package



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

Note: Drawings are not to scale.

ELECTRICAL CHARACTERISTICS Unless otherwise stated, these specifications apply for T_A = 0°C to 70°C. TRMPWR = 4.75V, $\overline{\text{DISCNCT}}$ = 2.4V, $T_A = T_J$.

PARAMETER	TEST CONDITIONS			MIN	TYP	MAX	UNITS
Supply Current Section							
Termpwr Supply Current	All termination lines = Open				17	23	mA
	All termination lines = 0.5V				200	225	mA
Power Down Mode	$\overline{\text{DISCNCT}}$ = 0V				100	150	µA
Output Section (Termination Lines)							
Terminator Impedance	ΔI_{LINE} = -5mA to -15mA			104.5	110	115.5	Ohms
Output High Voltage	TRMPWR = 4V			2.65	2.9	3.1	V
Max Output Current	V_{LINE} = 0.5V		T_J = 25°C	-20.3	-21.5	-22.4	mA
			0°C < T_J < 70°C	-19.8	-21.5	-22.4	mA
Max Output Current	V_{LINE} = 0.5V, TRMPWR = 4V (Note 1)		T_J = 25°C	-19.5	-21.5	-22.4	mA
			0°C < T_J < 70°C	-19.0	-21.5	-22.4	mA
	V_{LINE} = 0.2V, TRMPWR = 4.0V to 5.25V		0°C < T_J < 70°C	–21.6	–24.0	–25.4	mA
Output Leakage	$\overline{\text{DISCNCT}}$ = 0V TRMPWR = 0V to 5.25V	REG = 0V	V_{LINE} = 0 to 4V		10	400	nA
			V_{LINE} = 5.25V			100	µA
		REG = Open	V_{LINE} = 0V to 5.25V		10	400	nA
Output Capacitance	$\overline{\text{DISCNCT}}$ = 0V (Note 2) (DP Package)				5	6	pF
Regulator Section							
Regulator Output Voltage				2.7	2.9	3.1	V
	All Termination Lines = 4V			2.7	2.9	3.1	V
Line Regulation	TRMPWR = 4V to 6V				10	20	mV
Drop Out Voltage	All Termination Lines = 0.5V				1.0	1.2	V
Short Circuit Current	REG = 0V			-200	-400	-600	mA
Sinking Current Capability	REG = 3.5V			75	100	400	mA
Thermal Shutdown					170		°C
Thermal Shutdown Hysteresis					10		°C
Disconnect Section							
Disconnect Threshold				1.1	1.4	1.7	V

Note 1: Measuring each termination line while other 8 are low.
Note 2: Guaranteed by design. Not 100% tested in production.

APPLICATION INFORMATION

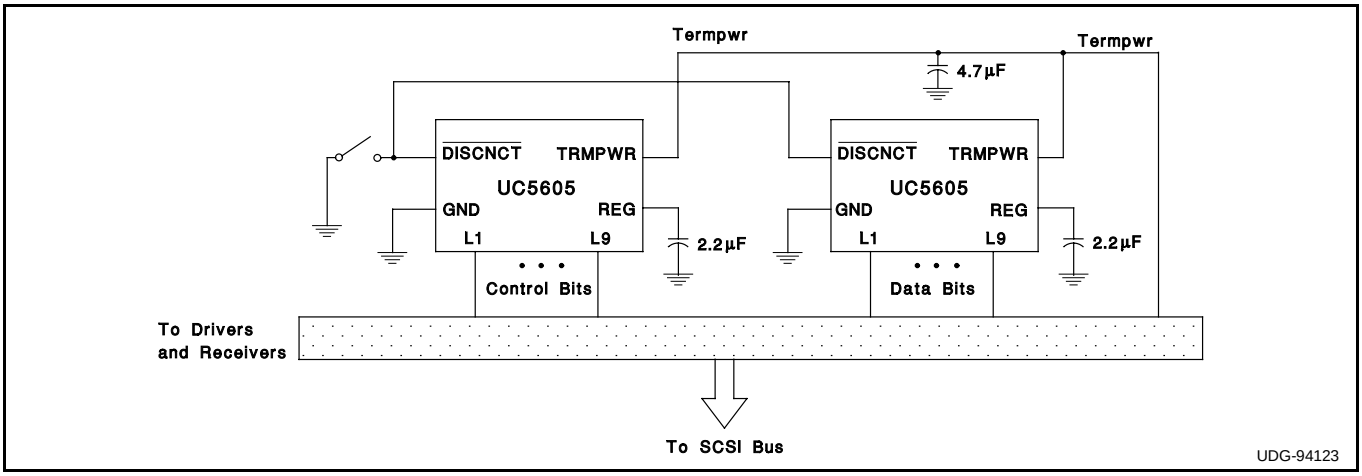


Figure 1: Typical SCSI Bus Configurations Utilizing 2 UC5605 Devices

APPLICATION INFORMATION (cont.)

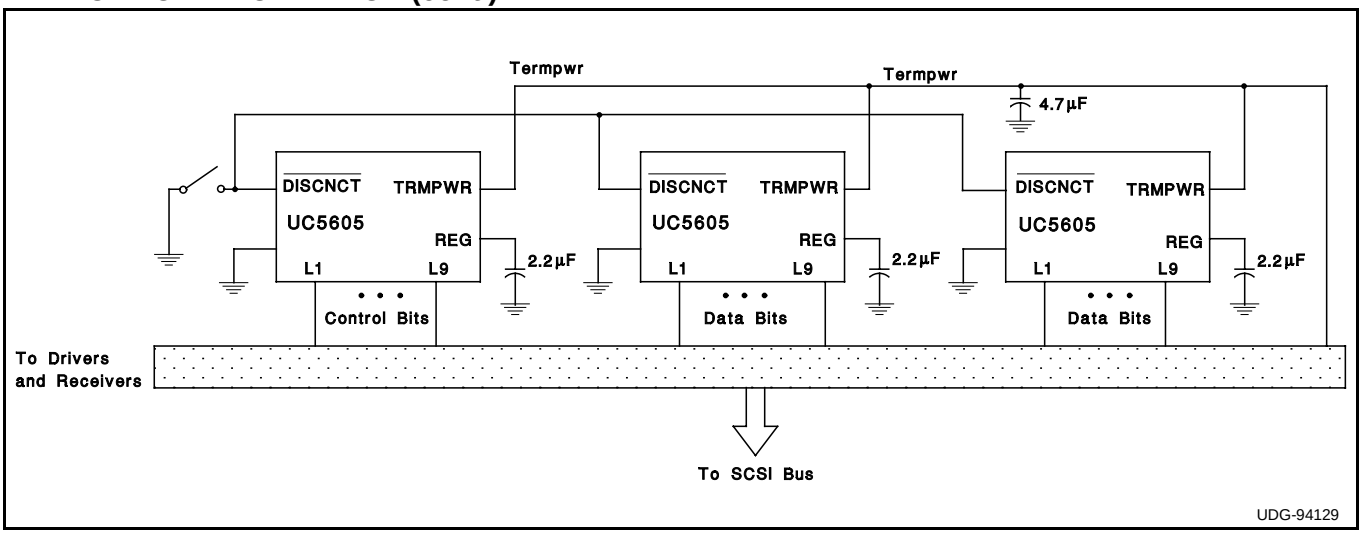


Figure 2: Typical Wide SCSI Bus Configurations Utilizing 3 UC5605 Devices.

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