# Plug and Play, 18-Line SCSI Active Terminator

## FEATURES

- Complies with SCSI and SCSI-2 Standards
- 8pF Channel Capacitance during Disconnect
- SCSI Plug and Play, Dual Low Disconnect, Logic Low Command Disconnects All Termination Lines
- Meets SCSI Hot Plugging Capability
- –650mA Sourcing Current for Termination
- +200mA Sinking Current for Active Negation
- 200µA Supply Current in Disconnect Mode
- Trimmed Termination Current to 7%
- Trimmed Impedance to 7%
- Provides Active Termination for 18 Lines
- Current Limit and Thermal Shutdown Protection
- Low Thermal Resistance Surface Mount Packages

## DESCRIPTION

The UC5607 provides 18 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 UC5607 provides a low disconnect feature which will disconnect all terminating resistors, and will disable the regulator, greatly reducing standby power. The output channels remain high impedance even without Termpwr applied.

The UC5607 terminator is specially designed with two disconnect pins for full SCSI Plug and Play (PnP) applications.

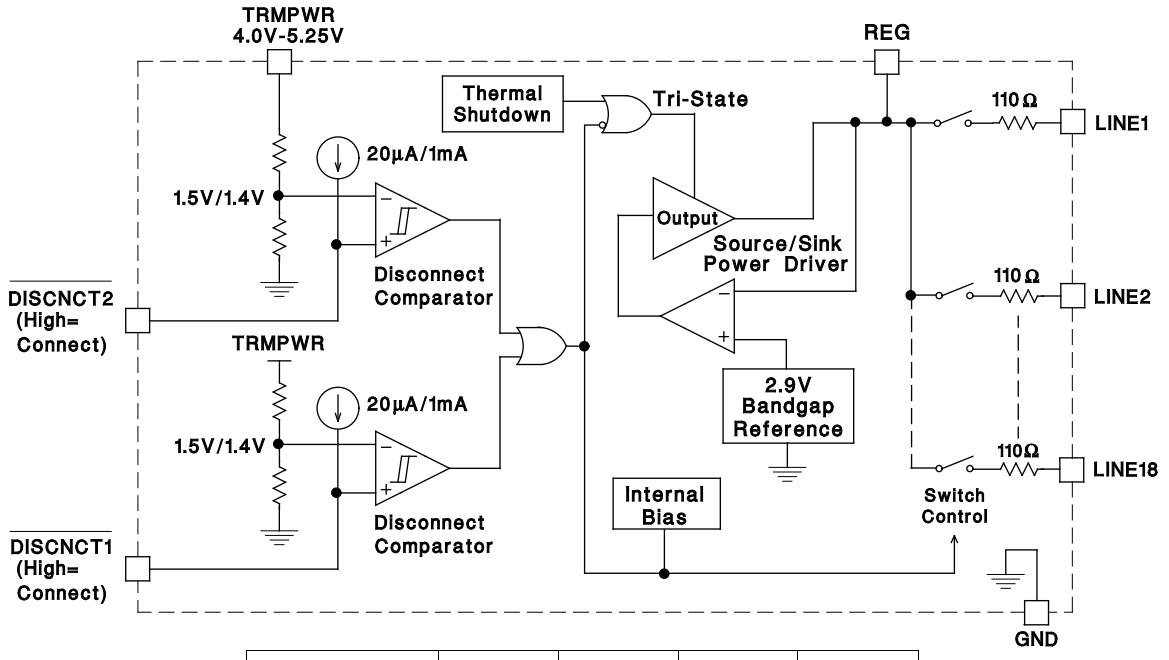
Custom power packages are utilized to allow normal operation at full power conditions (2 Watts).

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 28 pin wide body SOIC, and 28 pin PLCC, as well as 24 pin DIP.

## BLOCK DIAGRAM




| | Connect | Connect | Connect | Disc |
|---|---|---|---|---|
| $\overline{\text{DISCNCT1}}$ | **1** | 0 | **1** | 0 |
| $\overline{\text{DISCNCT2}}$ | 0 | **1** | **1** | 0 |

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**Circuit Design Patented**

## ABSOLUTE MAXIMUM RATINGS

Termpwr Voltage . . . . . +7V
Signal Line Voltage . . . . . 0V to +7V
Regulator Output Current . . . . . 1A
Storage Temperature . . . . . –65°C to +150°C
Operating Temperature . . . . . –55°C to +150°C
Lead Temperature (Soldering, 10 Sec.) . . . . . +300°C

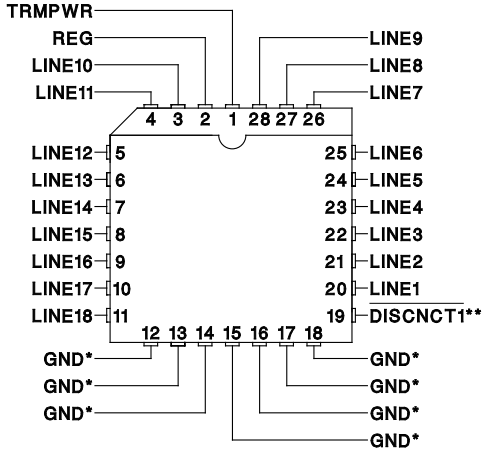
*Unless otherwise specified all voltages are with respect to Ground. Currents are positive into, negative out of the specified terminal.*
*Consult Packaging Section of Unitrode Integrated Circuits databook for thermal limitations and considerations of packages.*

## RECOMMENDED OPERATING CONDITIONS

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

## CONNECTION DIAGRAMS

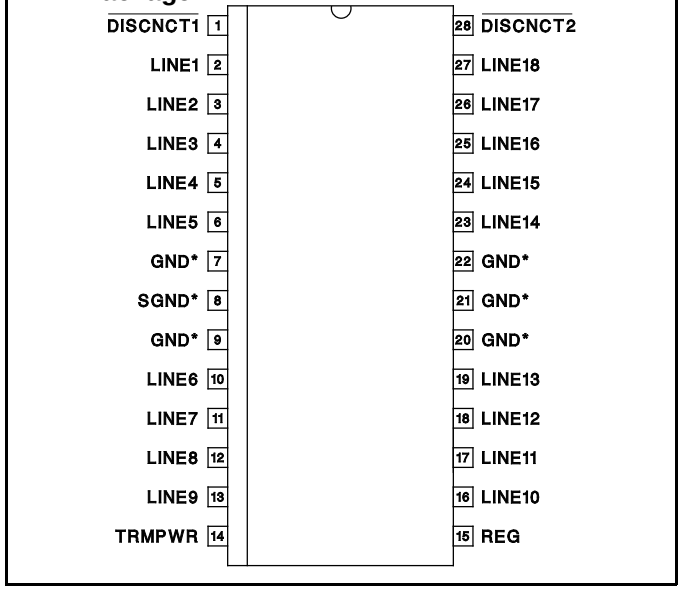
**PLCC-28 (Top View)**
**QP Package**




* *QP package pins 12 - 18 serve as both heatsink and signal ground.*

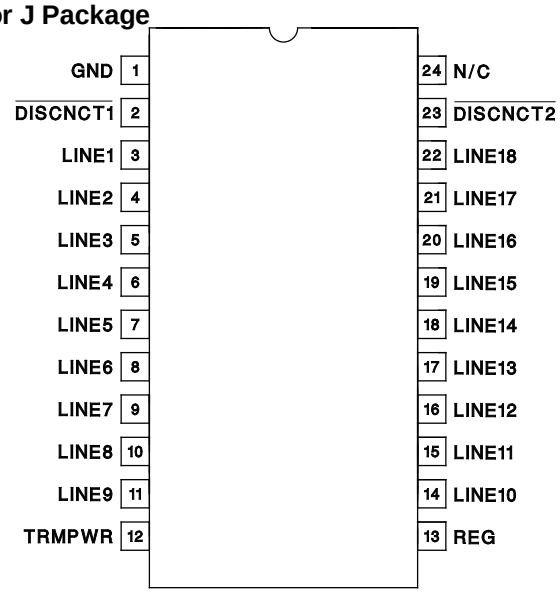
** $\overline{DISCNCT2}$ *is internally tied to ground.*

**SOIC-28 (Top View)**
**DWP Package**




** DWP package pin 8 serves as signal ground; pins 7, 8, 9, 20, 21, 22 serve as heatsink/ground.*

**DIL-24 (Top View)**
**N or J Package**




*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, $\overline{DISCNCT1}$ = $\overline{DISCNCT2}$ = 2.2V. $T_A$ = $T_J$.

| PARAMETER | TEST CONDITIONS | | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|
| **Supply Current Section** | | | | | | |
| Termpwr Supply Current | All termination lines = Open | | | 30 | 45 | mA |
| | All termination lines = 0.5V | | | 420 | 470 | mA |
| Power Down Mode | $\overline{DISCNCT1}$ = $\overline{DISCNCT2}$ = 0V | | | 200 | 350 | µA |
| **Output Section (Terminator Lines)** | | | | | | |
| Terminator Impedance | $\Delta I_{LINE}$ = -5mA to -15mA | $T_J$ = 25°C | 102 | 110 | 118 | Ohms |
| | | 0°C < $T_J$ < 70°C | 97 | 110 | 129 | Ohms |
| Output High Voltage | $V_{TRMPWR}$ = 4V (Note 1) | $T_J$ = 25°C | 2.6 | 2.9 | 3.1 | V |
| | | 0°C < $T_J$ < 70°C | 2.55 | 2.9 | 3.2 | V |

**ELECTRICAL CHARACTERISTICS (cont.)** Unless otherwise stated, these specifications apply for $T_A$ = 0°C to 70°C. TRMPWR = 4.75V, DISCNCT1 = DISCNCT2 = 2.2V. $T_A$ = $T_J$.

| PARAMETER | TEST CONDITIONS | | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|
| **Output Section (Terminator Lines) cont.** | | | | | | |
| Max Output Current | $V_{LINE}$ = 0.5V | $T_J$ = 25°C | -19.5 | -21.9 | -22.4 | mA |
| | | 0°C < $T_J$ < 70°C | -18.5 | -21.9 | -22.4 | mA |
| Max Output Current | $V_{LINE}$ = 0.5V, TRMPWR = 4V (Note 1) | $T_J$ = 25°C | -18.0 | -21.9 | -22.4 | mA |
| | | 0°C < $T_J$ < 70°C | -17.0 | -21.9 | -22.4 | mA |
| Output Leakage | $\overline{\text{DISCNCT1}}$ = $\overline{\text{DISCNCT2}}$ = 0V, TRMPWR = 0V to 5.25V | | | 10 | 400 | nA |
| Output Capacitance | $\overline{\text{DISCNCT1}}$ = $\overline{\text{DISCNCT2}}$ = 0V (Note 2) | | | 8 | 10 | pF |
| **Regulator Section** | | | | | | |
| Regulator Output Voltage | All Termination Lines = 5V | $T_J$ = 25°C | 2.7 | 2.9 | 3.1 | V |
| | | 0°C < $T_J$ < 70°C | 2.55 | 2.9 | 3.2 | 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 | REG = 0V | | -450 | -650 | -850 | mA |
| Sinking Current Capability | REG = 3.5V | | 100 | 200 | 500 | mA |
| Thermal Shutdown | | | | 170 | | °C |
| Thermal Shutdown Hysteresis | | | | 10 | | °C |
| **Disconnect Section** | | | | | | |
| Disconnect Threshold | | | 0.8 | 1.4 | 2.0 | V |
| Threshold Hysteresis | | | | 100 | | mV |
| Input Current | $\overline{\text{DISCNCT1}}$ = $\overline{\text{DISCNCT2}}$ = 0V | | | -20 | -50 | µA |
| | $\overline{\text{DISCNCT1}}$ = $\overline{\text{DISCNCT2}}$ = 2.4V | | | -1 | | mA |

*Note 1: Measuring each termination line while other 17 are low (0.5V).*
*Note 2: Guaranteed by design. Not 100% tested in production.*

## APPLICATION INFORMATION

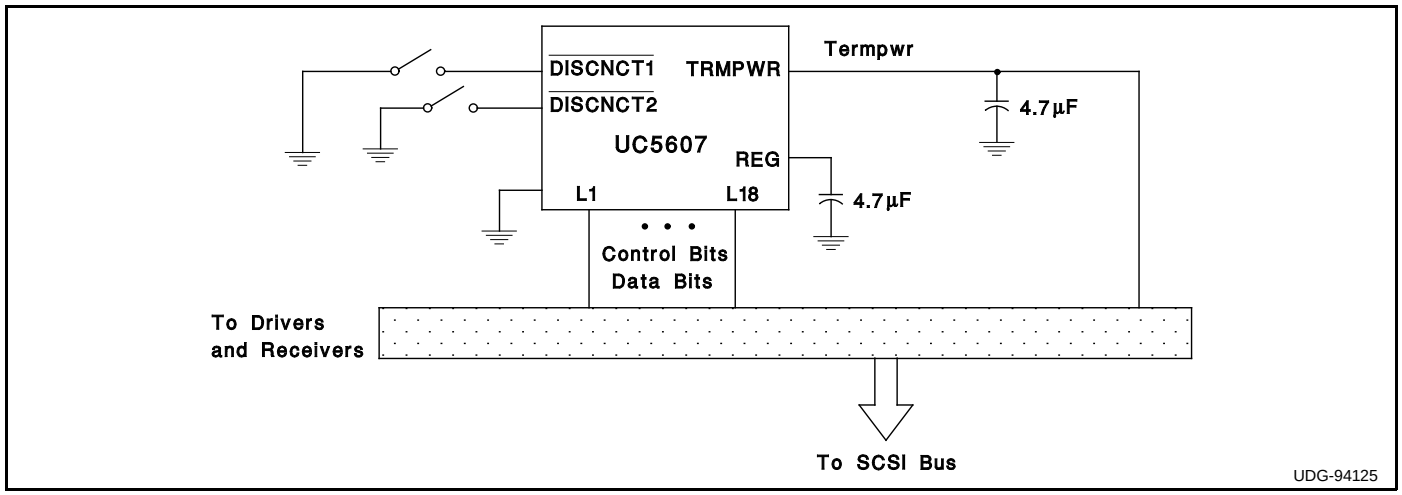



**Figure 1: Typical SCSI Bus Configuration Utilizing UC5607 Device**

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