



REG5601

18-LINE SCSI ACTIVE TERMINATOR

FEATURES

- COMPLIES WITH SCSI-2 SPECIFICATIONS
- INTERNAL 2.9V REGULATOR
- ON-CHIP TERMINATION RESISTORS
- DISCONNECT ALL TERMINATION RESISTORS WITH A SINGLE LOGIC COMMAND
- POWER-DOWN MODE: 150 μ A max
- LINE CAPACITANCE: 10pF typ
- CURRENT LIMIT AND THERMAL SHUT-DOWN PROTECTION
- 28-Lead SOIC and SSOP PACKAGES

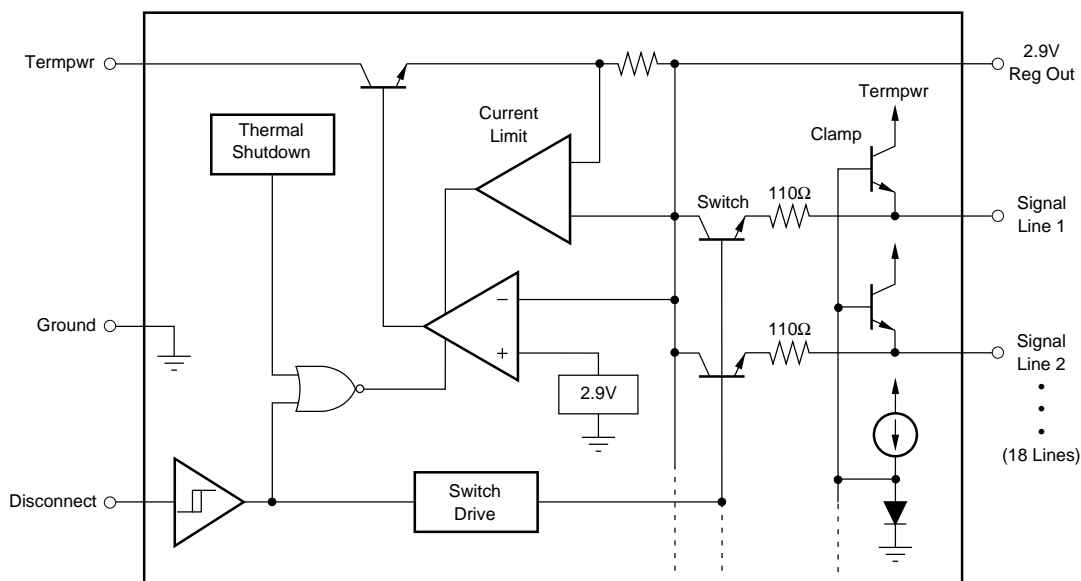
DESCRIPTION

The REG5601 is an 18-line active terminator for SCSI-2 (Small Computer Systems Interface) circuitry. On-chip resistors and 2.9V regulator provide the prescribed 110 Ω termination for low power dissipation and high speed data transmission.

All line connections can be disconnected from the bus with a single logic control line to reduce standby power consumption. Output lines remain high impedance without power applied. Each line is individually clamped at ground to dissipate negative-going glitches.

The 2.9V regulator is current-limited and thermally protected. Regulated output is available for external circuitry.

The REG5601 is available in 28-lead SOIC and fine-pitch SSOP packages and is specified for operation over the 0 $^{\circ}$ C to 70 $^{\circ}$ C temperature range.



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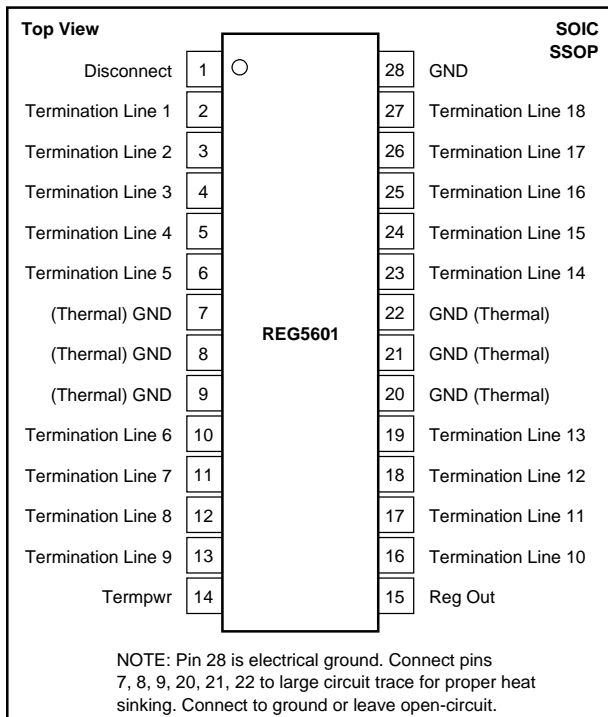
SPECIFICATIONS

T_A = 0°C to +70°C, Tempwr = 4.75V, and Disconnect = 0V unless otherwise specified.

| PARAMETERS | CONDITIONS | REG5601U | | | REG5601E | | | UNIT | |
|------------------------------------|--|----------|-------|------|----------|-------|-------|------|----|
| | | MIN | TYP | MAX | MIN | TYP | MAX | | |
| POWER SUPPLY | | | | | | | | | |
| Tempwr Supply Voltage | All Termination Lines = Open All V _{TERM} = 0.5V Disconnect = Open (High) | 4.0 | | 5.25 | 4.0 | | 5.25 | V | |
| Tempwr Supply Current | | | 14 | 25 | | 14 | 25 | mA | |
| Power-Down Mode | | | | 385 | 430 | | 385 | 430 | mA |
| | | | 100 | 150 | | 100 | 150 | µA | |
| TERMINATION LINES | | | | | | | | | |
| Termination Impedance | $\Delta I_{TERM} = 5mA$ to 15mA Tempwr = 4V ⁽¹⁾ V _{TERM} = 0.5V Tempwr = 4V, V _{TERM} = 0.5V ⁽¹⁾ I _{TERM} = -30mA Disconnect = Open (High), Tempwr = 0V to 5.25V Disconnect = Open (High) | 107 | 110 | 115 | 107 | 110 | 115.5 | Ω | |
| Output High Voltage | | 2.65 | 2.8 | | 2.65 | 2.8 | | V | |
| Maximum Output Current | | 20.5 | 21.7 | 22.4 | 19.8 | 21.7 | 22.4 | mA | |
| | | 19.4 | 21 | 22.4 | 19 | 21 | 22.4 | mA | |
| Output Clamp Level | | -0.2 | -0.05 | 0.1 | -0.2 | -0.05 | 0.1 | V | |
| Output Leakage | | | 20 | 400 | | 20 | 400 | nA | |
| Output Capacitance | | | 10 | | | 10 | | pF | |
| REGULATOR | | | | | | | | | |
| Regulator Output Voltage | Tempwr = 4V to 6V I _{REG} = 0 to 400mA All V _{TERM} = 0.5V, $\Delta V_{REG} = 100mV$ V _{REG} = 0V V _{REG} = 3.5V | 2.8 | 2.9 | 3.0 | 2.8 | 2.9 | 3.0 | V | |
| Line Regulation | | | 6 | 20 | | 6 | 20 | mV | |
| Load Regulation | | | 20 | 50 | | 20 | 50 | mV | |
| Drop-Out Voltage | | | 1.0 | 1.2 | | 1.0 | 1.2 | V | |
| Short-Circuit Current | | | 450 | 1350 | 1650 | 450 | 1350 | 1650 | mA |
| Current Sink | | | 8 | 11 | | 8 | 11 | mA | |
| Thermal Shutdown | | | | 170 | | | 170 | °C | |
| DISCONNECT LOGIC INPUT | | | | | | | | | |
| Disconnect Threshold | Disconnect = 0V | 0.8 | 1.6 | 2.0 | 0.8 | 1.6 | 2.0 | V | |
| Threshold Hysteresis | | | 200 | | | 200 | | mV | |
| Input Current (Internal Pull-Up) | | | 6 | 15 | | 6 | 15 | µA | |
| TEMPERATURE RANGE | | | | | | | | | |
| Operating | | 0 | | 70 | 0 | | 70 | °C | |
| Storage | | -40 | | 150 | -40 | | 150 | °C | |
| θ _{JL} (junction to lead) | | | 20 | | | 20 | | °C/W | |

NOTE: (1) Measurement of each termination line while the other 17 lines are held low (0.5V).

CONNECTION DIAGRAM



ABSOLUTE MAXIMUM RATINGS

| | |
|--------------------------------|-----------------|
| Tempwr Voltage | +7V |
| Signal Line Voltage | 0V to +7V |
| Regulator Output Current | 1.65A |
| Power Dissipation | 2.5W |
| Operating Junction Temperature | -40°C to +150°C |
| Storage Temperature | -40°C to +150°C |

PACKAGE/ORDERING INFORMATION

| MODEL | PACKAGE | PACKAGE DRAWING NUMBER ⁽¹⁾ |
|----------|----------------------|---------------------------------------|
| REG5601U | Plastic 28-Lead SOIC | 217 |
| REG5601E | Plastic 28-Lead SSOP | 324 |

NOTE: (1) For detailed drawing and dimension table, please see end of data sheet, or Appendix D of Burr-Brown IC Data Book.



This integrated circuit can be damaged by ESD. Burr-Brown recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

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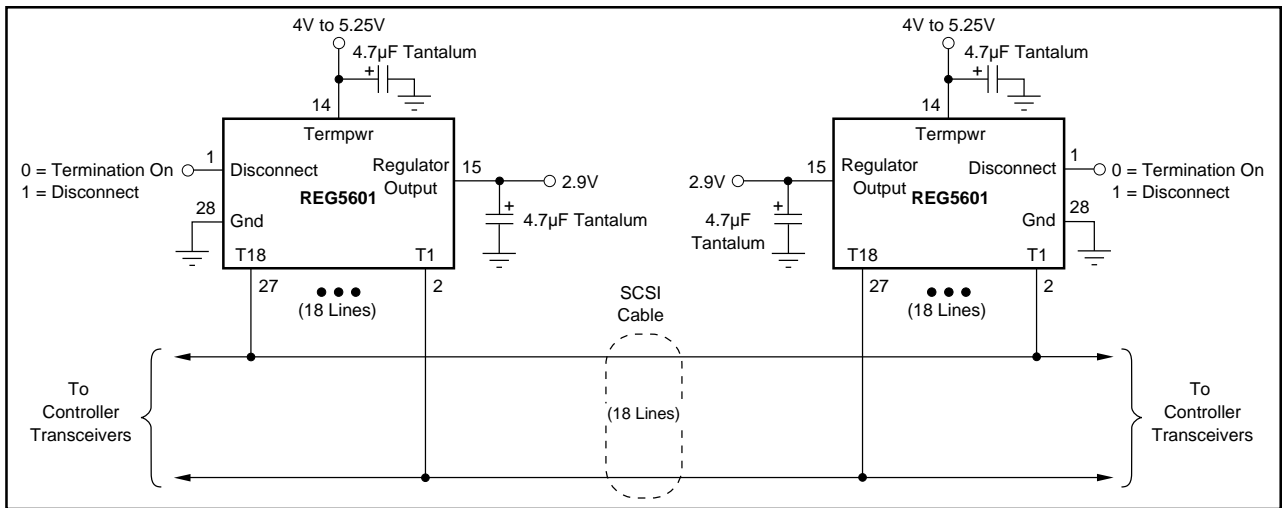


FIGURE 1. Standard SCSI Termination Application.

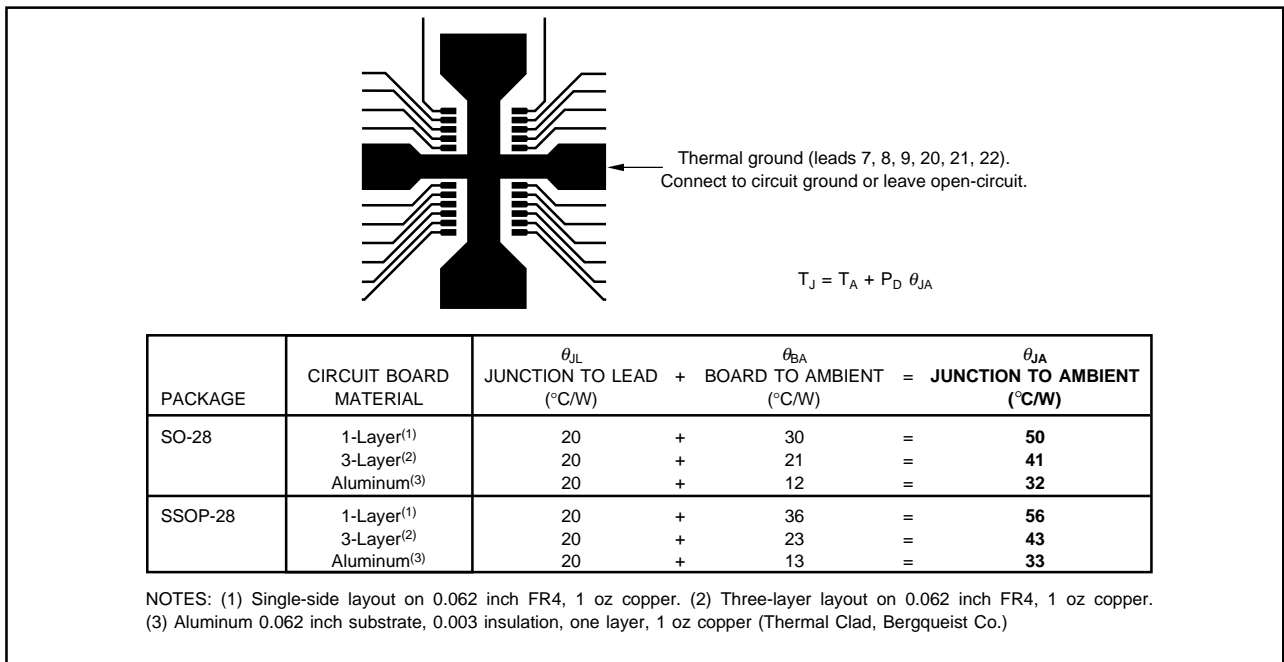


FIGURE 2. Circuit Board Layout.

The REG5601 has current limit and thermal shutdown that protect it from damage during output short-circuit or overload. The current limit is approximately 1350mA and thermal shutdown activates at a junction temperature of approximately 175°C. For good reliability, the junction temperature should not exceed 125°C. Any tendency to activate the thermal shutdown during normal operation is an indication of inadequate heat sinking and/or excessive power dissipation. Heat is dissipated primarily by conduction through the leads to circuit board traces. It is important to connect the six thermal ground leads (7, 8, 9, 20, 21, 22) to a large circuit trace—see Figure 2. Measured values of thermal resistance for various circuit board materials are shown. These are approximate values. Variations in circuit board pattern, mounting techniques, air flow, proximity to other circuit boards and heat sources will affect thermal performance.

A simple experiment will determine whether the actual circuit board layout is adequate (i.e., θ_{BA} is low enough) so that the maximum recommended junction temperature of the REG5601 will not be exceeded. The procedure uses the internal thermal shutdown feature of the REG5601 (at $T_J \approx 175^\circ\text{C}$) to determine when the junction is approximately 50°C above the maximum recommended junction temperature ($T_J = 125^\circ\text{C}$). Operate the circuit with normal or other desired test electrical conditions. Increase the ambient temperature and determine the value at which thermal limit occurs (by sensing a sudden drop in V_{REG} output). At this point T_J is approximately 175°C. If this occurs at an ambient temperature of more than 50°C above the system ambient temperature design goal, the T_J will not exceed 125°C under the same electrical conditions when the ambient temperature is at the system design goal value.

PACKAGE DRAWINGS

