Unitrode Products from Texas Instruments

- SPI-2 and SPI-3 Compliant
- 2.85-V Regulated Output Voltage with 1.4% Tolerance
- Provides Current for up to 27 Lines of Active Termination for SCSI Buses
- −750-mA Sourcing Current for Termination
- 300-mA Sinking Current for Active Negation Drivers
- 0.9-V Dropout Voltage Regulator at 750 mA and 2.75 V Output
- 100-A Supply Current in Disconnect Mode
- Current Limit and Thermal Shutdown Protection
- Low Thermal Resistance Surface Mount Package

simplified block diagram
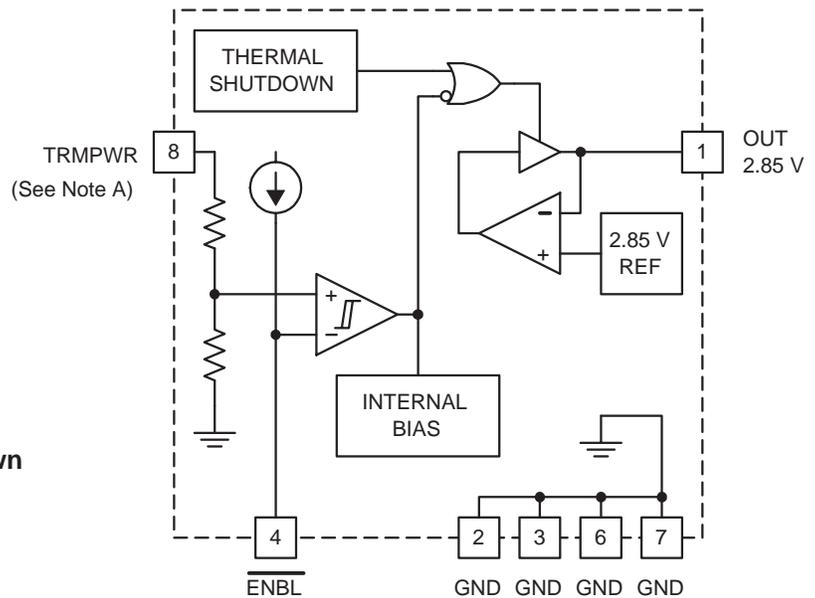
Note A: 4.0 V TO 6.0 V (4.75 V NOMIMAL)

description

The UC560 provides current for up to 27 lines of active termination for a SCSI (small computers systems interface) parallel bus. The SCSI standard requires active termination at both ends of the cable. The UC560 is based on the UC5603 and UC5613 SCSI active terminators. It uses the voltage regulator and internal logic circuits of those parts, but has no termination circuits. The UC560 provides greater source current-drive capability compared to the UC5603 and UC5613.

The UC560 sink current maintains regulation with all active-negation drivers negated. It provides a disconnect feature which disables the regulator to greatly reduce standby power. Internal circuit trimming is utilized for a 1.4% tolerance output voltage. Other features include thermal shutdown and current limit for short circuit conditions.

The UC560 is available in low-thermal-resistance version of the industry standard 8-pin power SOIC.

AVAILABLE OPTIONS

T$_A$	PACKAGED DEVICES SOIC (DP)[†]
0°C to 70°C	UC560DP

[†] The DP package is available taped and reeled. Add TR suffix to device type (e.g. UC560DPTR) to order quantities of 3000 devices per reel.

Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

TEXAS INSTRUMENTS

UC560
27−LINE SCSI SOURCE/SINK REGULATOR

DP PACKAGE
(TOP VIEW)

```
        ┌───┬─┐───┐
   OUT [│ 1 └─┘ 8 │] TERMPWR
HS/GND [│ 2     7 │] HS/GND
HS/GND [│ 3     6 │] HS/GND
  ENBL [│ 4     5 │] N/C
        └─────────┘
```
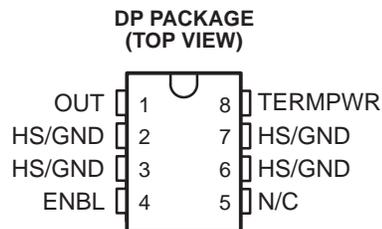
NOTE 1: For DP package, pins 2, 3, 6 and 7 are heat sinking pins. Pin 2 is the connect point for electrical ground.
NOTE 2: For all packages, N/C is no connection.

absolute maximum ratings over operating free-air temperature (unless otherwise noted)† ‡

Input voltage,
  TERMPWR . . . . 7 V
  $\overline{\text{ENBL}}$ . . . . −0.3 V to TERMPWR + 0.3 V
Regulator Output Current . . . . 1.4 A
Power Dissipation . . . . 2.5 W
Storage Temperature . . . . −65°C to 150°C
Junction Temperature . . . . −55°C to 150°C
Lead Temperature (Soldering, 10 seconds) . . . . 300°C

† Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and
  functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not
  implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

‡ Currents are positive into and negative out of the specified terminal. Consult Packaging Section of Interface Products Data Book *(TI Literature
  Number SLUD002)* for thermal limitations and considerations of packages.

recommended operating conditions

	MIN	MAX	UNIT
Input voltage, TERMPWR	4.0	6.0	V
Operating virtual junction temperature, T_J¶	0	70	°C

¶ It is not recommended that the device operate under conditions beyond those specified in this table for extended periods of time.

TEXAS INSTRUMENTS
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electrical characteristics over recommended operating free-air temperature range, T_A **= 0°C to 70°C, TERMPWR = 4.75 V,** $\overline{ENBL}$ **= 0 V,** C_{OUT} **= 4.7 μF,** $C_{TERMPWR}$ **= 4.7 μF,** T_A **=** T_J**, unless otherwise specified.**

PARAMETER	TEST CONDITIONS		MIN	TYP	MAX	UNITS
Supply Current Section						
TERMPWR supply current	No load			18	25	mA
	I_{OUT} = −700 mA			710	750	mA
Power down mode	$\overline{ENBL}$ = 2.0 V			100	140	μA
Regulator Section						
Regulator output voltage	25°C, No load		2.81	2.85	2.89	V
Load regulation	I_{OUT} = 300 mA to −750 mA	See Note 1		25	30	mV
Line regulation	TERMPWR = 4.0 V to 6.0 V See Note 1	No load,		10	20	mV
Dropout voltage	I_{OUT} = −750 mA	VOUT = 2.75 V		0.9	1.2	V
Short circuit current	V_{OUT} = 0.0 V			−1.3	−0.85	A
Sinking current	V_{OUT} = 3.5 V			500	600	mA
	$\overline{ENBL}$ = 2.0 V	VOUT = 3.0 V		1	2	mA
Thermal shutdown	See Note 2			170		°C
Thermal shutdown hysteresis	See Note 2			10		°C
Shutdown Section						
$\overline{ENBL}$ threshold			1.1	1.4	1.7	V
Threshold hysteresis				100		mV
$\overline{ENBL}$ output current			−15	−10		μA

NOTES: 1. Tested at a constant junction temperature by low duty cycle pulse testing.
2. Ensured by design. Not production tested.

pin descriptions

$\overline{ENBL}$**:** (Enable pin) The $\overline{ENBL}$ function is active low, and the pin sources 10 μA (typical) when at ground and TERMPWR is between 4 V and 6 V. The part goes into disable mode if $\overline{ENBL}$ is above 1.4 V (typical) , and returns to enable mode when $\overline{ENBL}$ drops below 1.3 V typical. The part also greatly reduces TERMPWR current when disabled (100 μA typical).

GND: Ground pin.

OUT: (2.85-V regulated output voltage pin) The part is internally current limited for both sinking and sourcing current to prevent damage. When the part is in disabled mode ($\overline{ENBL}$ 1.4 V typical), the output goes to 0 V with no external supply source on OUT. The IC current sinks if there is an external supply voltage applied to OUT when in disabled mode. For best perfomance, a 4.7-μF low-ESR capacitor is recommended.

TERMPWR: (Supply voltage pin) The pin should be decoupled with at least a 2.2-μF low-ESR output capacitor. For best perfomance, a 4.7-μF low-ESR capacitor is recommended. Lead lengths should be kept at a minimum.

UC560
27–LINE SCSI SOURCE/SINK REGULATOR

APPLICATION INFORMATION

TYPICAL SCSI BUS CONFIGURATION

(18 TERMINATION LINES)
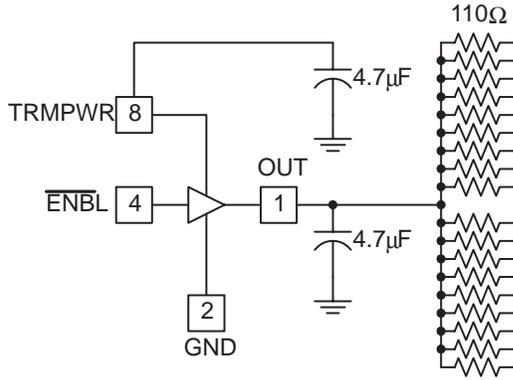
Figure 1   UDG–00075

TYPICAL WIDE SCSI BUS CONFIGURATION

(27 TERMINATION LINES)
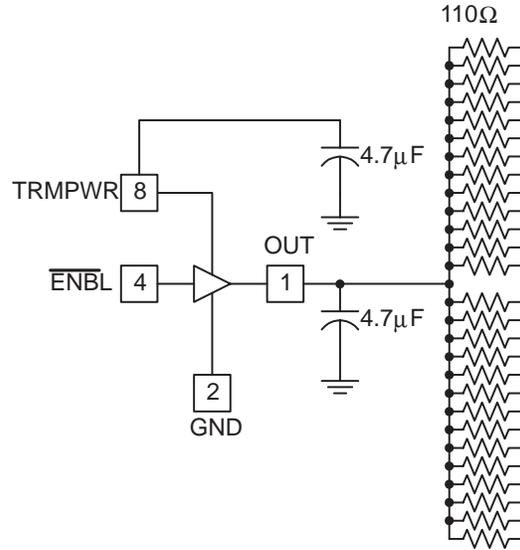
Figure 2   UDG–00076

TYPICAL CHARACTERISTICS

OUTPUT VOLTAGE
vs
TEMPERATURE
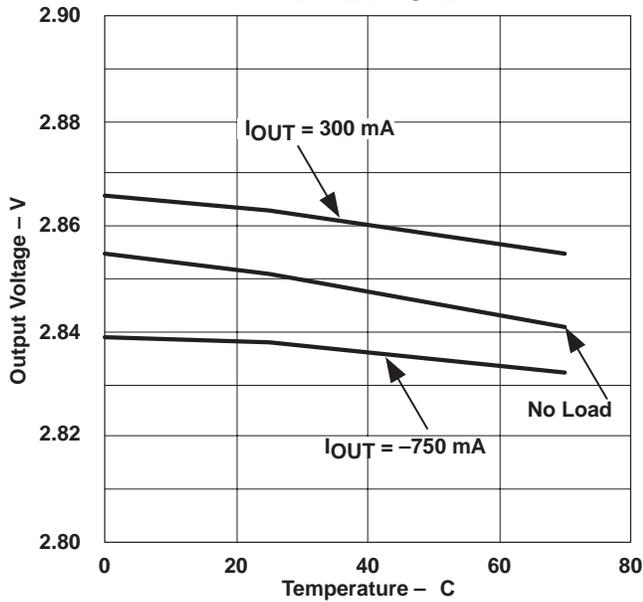
Figure 3

DROPOUT VOLTAGE
vs
TEMPERATURE

Figure 4

![TEXAS INSTRUMENTS]

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**LOAD REGULATION
vs
TEMPERATURE**

Figure 5

**LINE REGULATION
vs
TEMPERATURE**
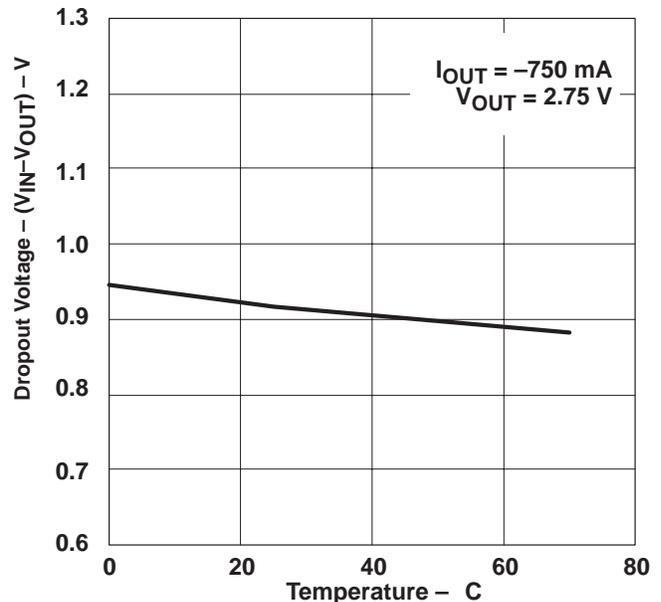
Figure 6
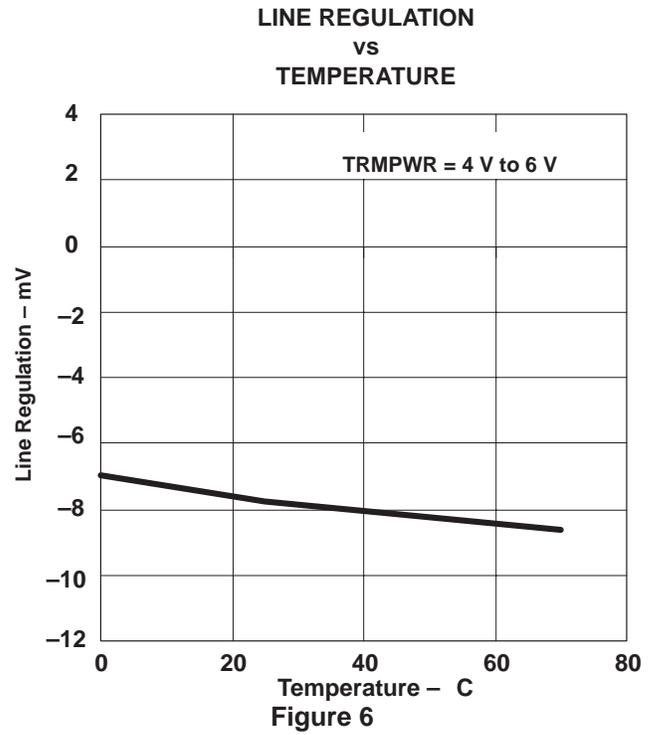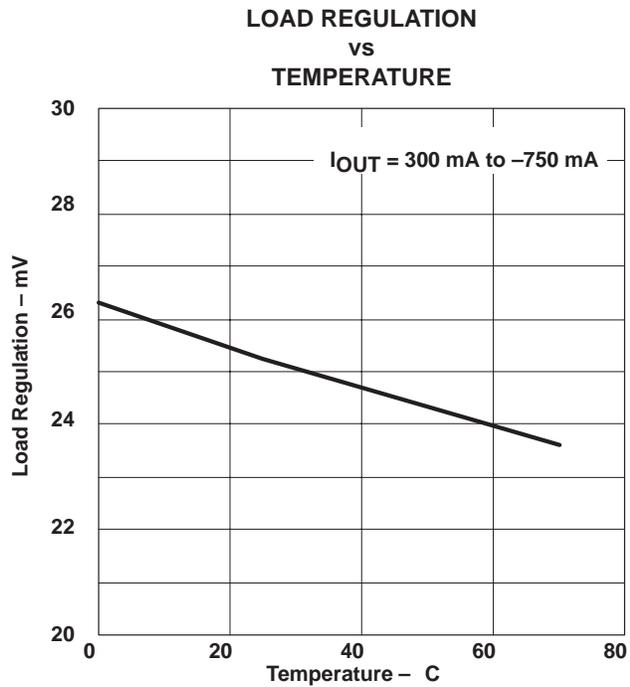
PACKAGING INFORMATION

Orderable Device	Status [1]	Package Type	Package Drawing	Pins	Package Qty	Eco Plan [2]	Lead/Ball Finish	MSL Peak Temp [3]
UC560DP	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI
UC560DPTR	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI
UC560TD	OBSOLETE	DDPAK/ TO-263	KTT	5		TBD	Call TI	Call TI

[1] The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

[2] Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

[3] MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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