

# Low Voltage Differential (LVD) SCSI 9 Line Terminator

## FEATURES

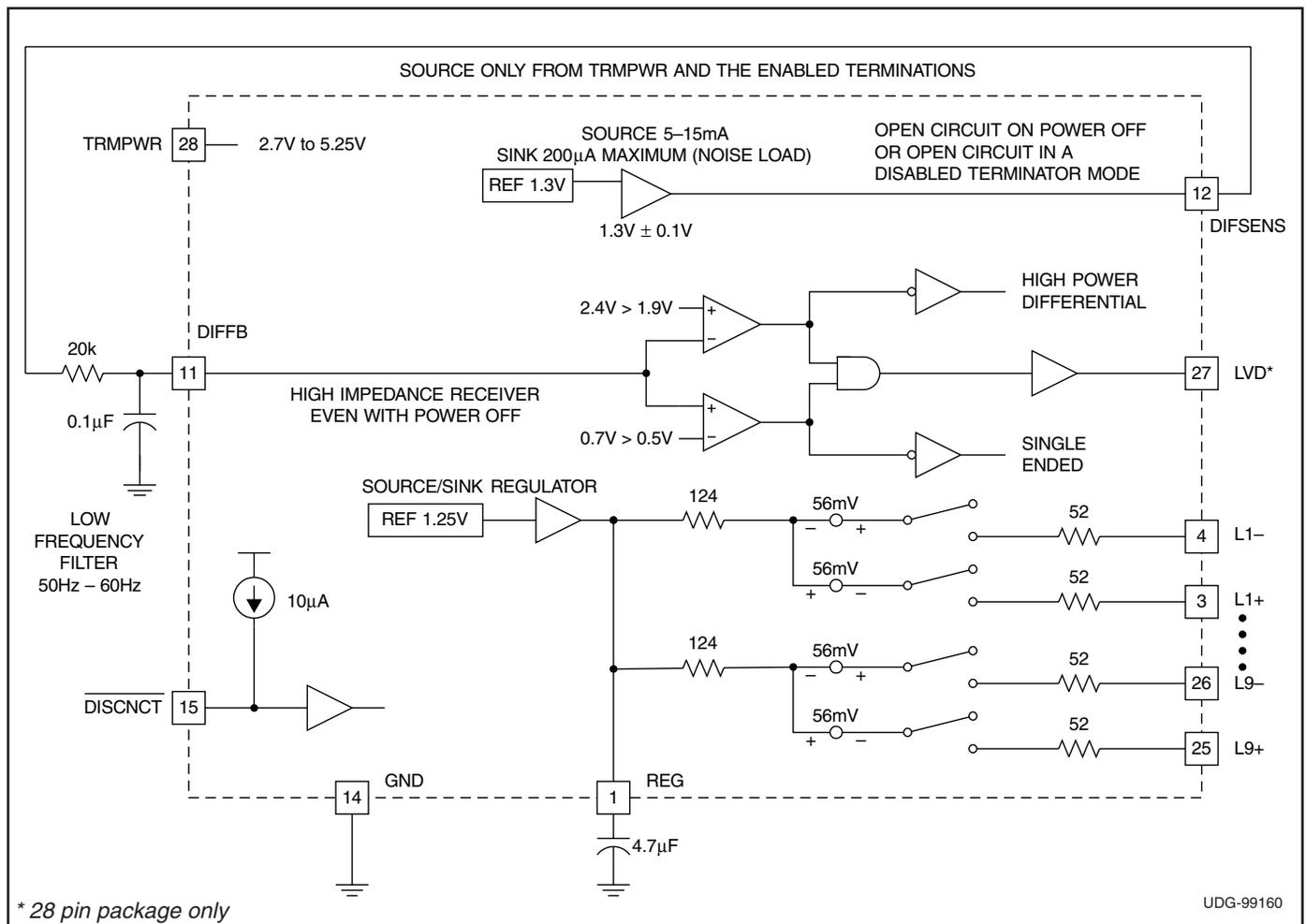
- First LVD only Active Terminator
- Meets SCSI SPI-2 Ultra2 (Fast-40) and Ultra3 / Ultra160 (Fast-80) Standards
- 2.7V to 5.25V Operation
- Differential Failsafe Bias
- Reversed Disconnect Polarity

## DESCRIPTION

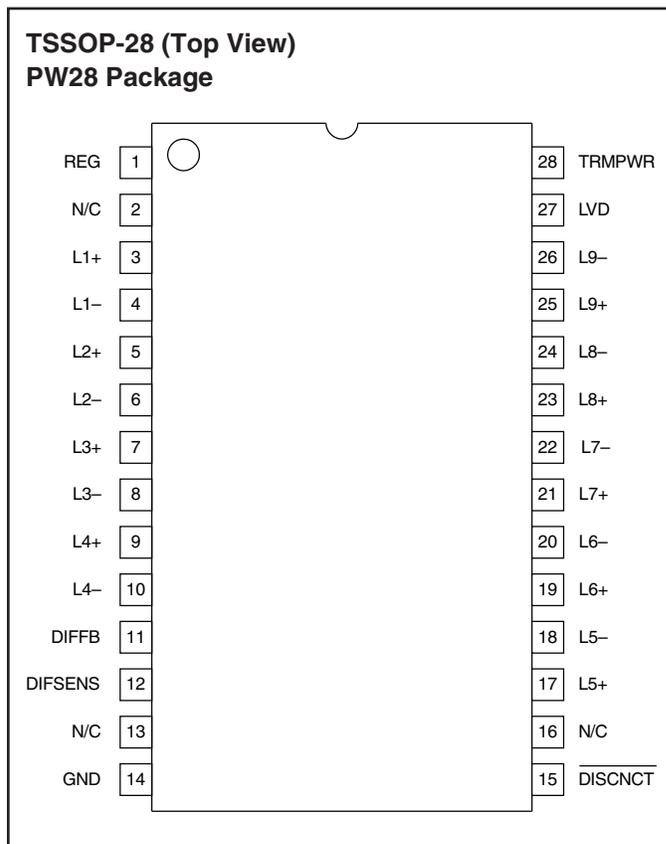
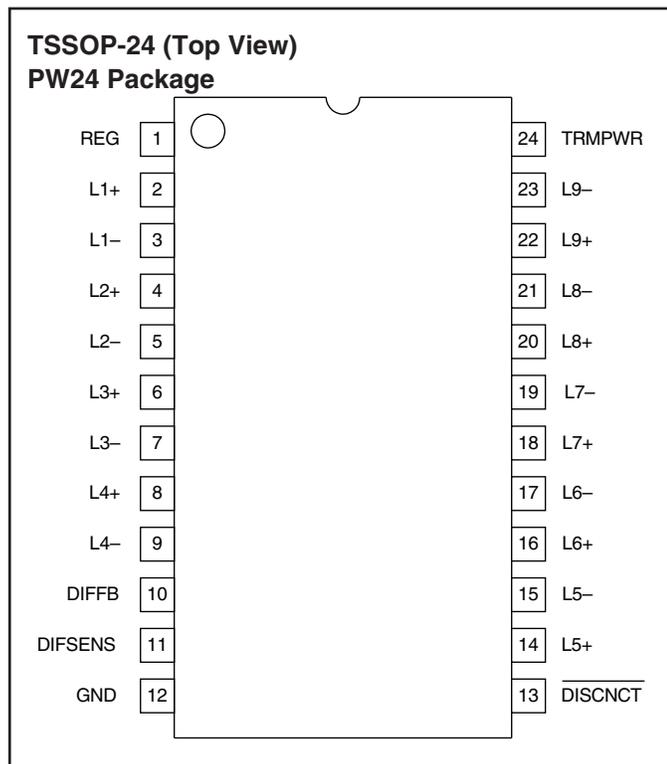
The UCC5641 is an active terminator for Low Voltage Differential (LVD) SCSI networks. This LVD only design allows the user to reach peak bus performance while reducing system cost. The device is designed as an active Y-terminator to improve the frequency response of the LVD Bus. Designed with a 1.5pF channel capacitance, the UCC5641 allows for minimal bus loading for a maximum number of peripherals. With the UCC5641, the designer will be able to comply with the Fast-40 SPI-2 and Fast-80 SPI-3 specifications. The UCC5641 also provides a much-needed system migration path for ever improving SCSI system standards. This device is available in the 24 pin TSSOP and 28 pin TSSOP for ease of layout use.

The UCC5641 is not designed for use in single ended or high voltage differential systems.

## BLOCK DIAGRAM



**CONNECTION DIAGRAMS**



**ABSOLUTE MAXIMUM RATINGS**

TRMPWR Voltage . . . . . +6V  
 Signal Line Voltage . . . . . 0V to 3.6V  
 Package Dissipation . . . . . 1W  
 Storage Temperature . . . . . -65°C to +150°C  
 Junction Temperature . . . . . -55°C to +150°C  
 Lead Temperature (Soldering, 10 sec.) . . . . . +300°C

*Currents are positive into negative out of the specified terminal. consult Packaging Section of Databook for thermal limitations and considerations of package.*

**RECOMMENDED OPERATING CONDITIONS**

TRMPWR Voltage . . . . . 2.7V to 5.25V

**ELECTRICAL CHARACTERISTICS:** Unless otherwise stated, specifications apply for  $T_A = 0^\circ\text{C}$  to  $70^\circ\text{C}$ , TRMPWR = 3.3V.  $T_A = T_J$ .

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
<b>TRMPWR Supply Current Section</b>					
TRMPWR Supply Current	No Load			25	mA
	Disabled Terminator			400	$\mu\text{A}$
TRMPWR Voltage		2.7		5.25	V

**ELECTRICAL CHARACTERISTICS:** Unless otherwise stated, specifications apply for  $T_A = 0^\circ\text{C}$  to  $70^\circ\text{C}$ ,  $\text{TRMPWR} = 3.3\text{V}$ .  $T_A = T_J$ .

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
<b>Regulator Section</b>					
1.25V Regulator	DIFSENS connected to DIFFB	1.15	1.25	1.35	V
1.25V Regulator Source Current	DIFSENS connected to DIFFB		-100	-80	mA
1.25V Regulator Sink Current	DIFSENS connected to DIFFB	80	100		mA
1.3V Regulator	DIFFB connected to GND	1.2	1.3	1.4	V
1.3V Regulator Source Current	DIFSENS to GND	-15		-5	mA
1.3V Sink Current	DIFSENS to 3.3V	50		200	$\mu\text{A}$
<b>Differential Termination Section</b>					
Differential Impedance	-2.5mA to 4.5mA	100	105	110	$\Omega$
Common Mode Impedance	L+ connected to L-	110	150	165	$\Omega$
Differential Bias Voltage	No load, L+ or L-	100		125	mV
Common Mode Bias		1.15	1.25	1.35	V
Output Leakage, Disconnect	DISCNCT, TRMPWR = 0 to 5.25V, $V_{\text{LINE}} = 0.2$ to 5.25V		10	400	nA
Output Capacitance	Single ended measurement to ground (Note 1)			3	pF
<b>Low Voltage Differential (LVD) Status Bit Section</b>					
I <sub>SOURCE</sub>	$V_{\text{LOAD}} = 2.4\text{V}$		-6	-4	mA
I <sub>SINK</sub>	$V_{\text{LOAD}} = 0.4\text{V}$	2	5		mA
<b>Disconnect &amp; Differential Sense Input Section</b>					
DISCNCT Threshold		0.8		2	V
Input Current	At 0V and 3.3V	-30	-10		$\mu\text{A}$
Differential Sense SE to LVD Threshold		0.5		0.7	V
Differential Sense LVD to HPD Threshold		1.9		2.4	V

Note 1: Guaranteed by design. Not 100% tested in production.

## PIN DESCRIPTION

**DIFFB:** Differential sense filter pin should be connected to a 0.1 $\mu\text{F}$  capacitor and 20k $\Omega$  resistor to Diff Sense.

**DIFSENS:** The SCSI bus differential sense line to detect what type of devices are connected to the SCSI Bus.

**DISCNCT:** Disconnect pin shuts down the terminator when it is not at the end of the bus.

**GND:** Ground.

**Ln -:** Negative line in differential applications for the SCSI Bus.

**Ln +:** Positive line for differential applications for the SCSI Bus.

**LVD:** (28 pin package only) Indicates that the bus is in LVD mode.

**REG:** Regulator bypass; must be connected to a 4.7 $\mu\text{F}$  capacitor to ground.

**TRMPWR:**  $V_{\text{IN}}$  2.7V to 5.25V supply.

APPLICATION INFORMATION

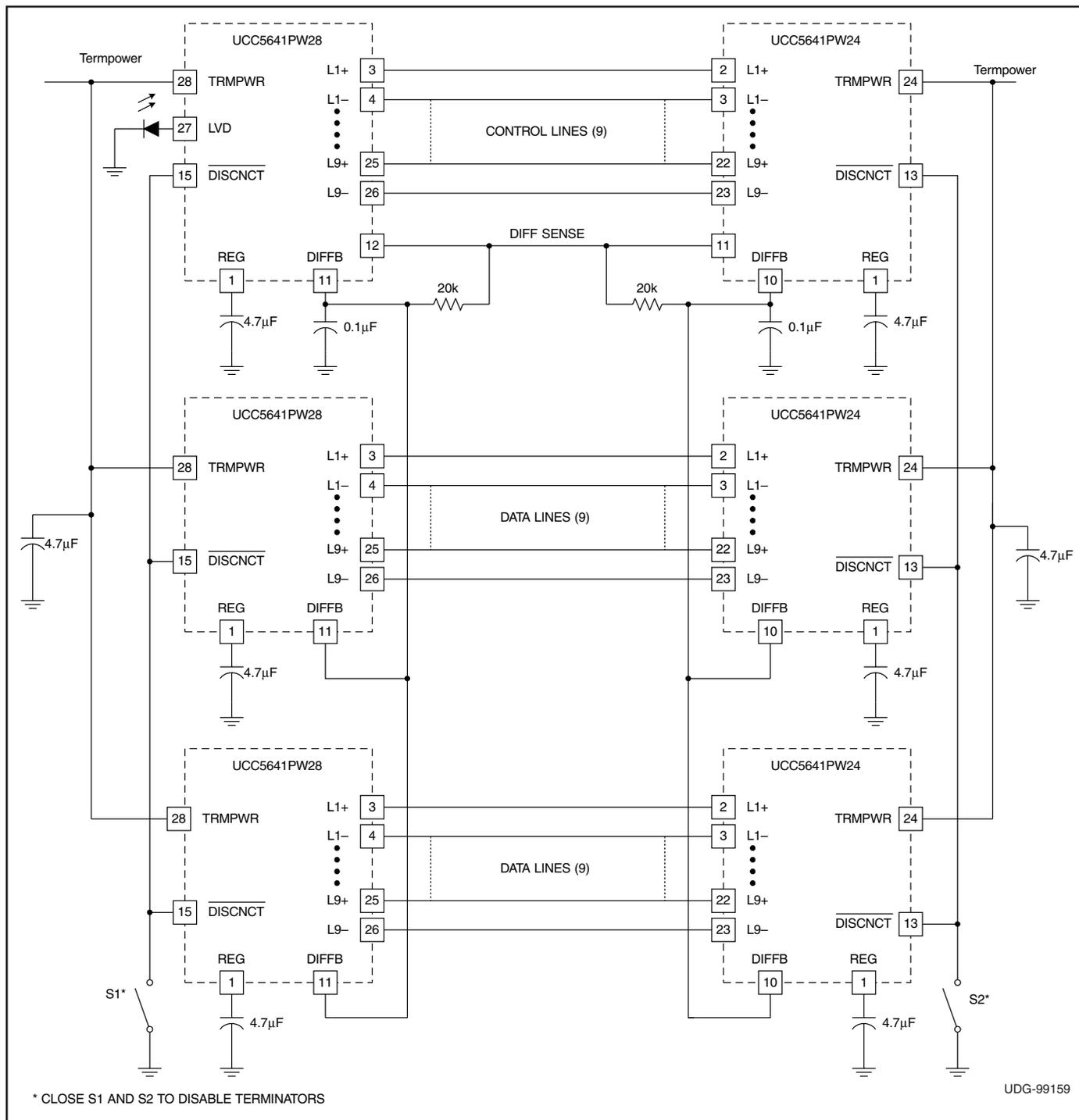


Figure 1. Application diagram.

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