UNITRODE

Low Voltage Differential (LVD) SCSI 9 Line Terminator

FEATURES

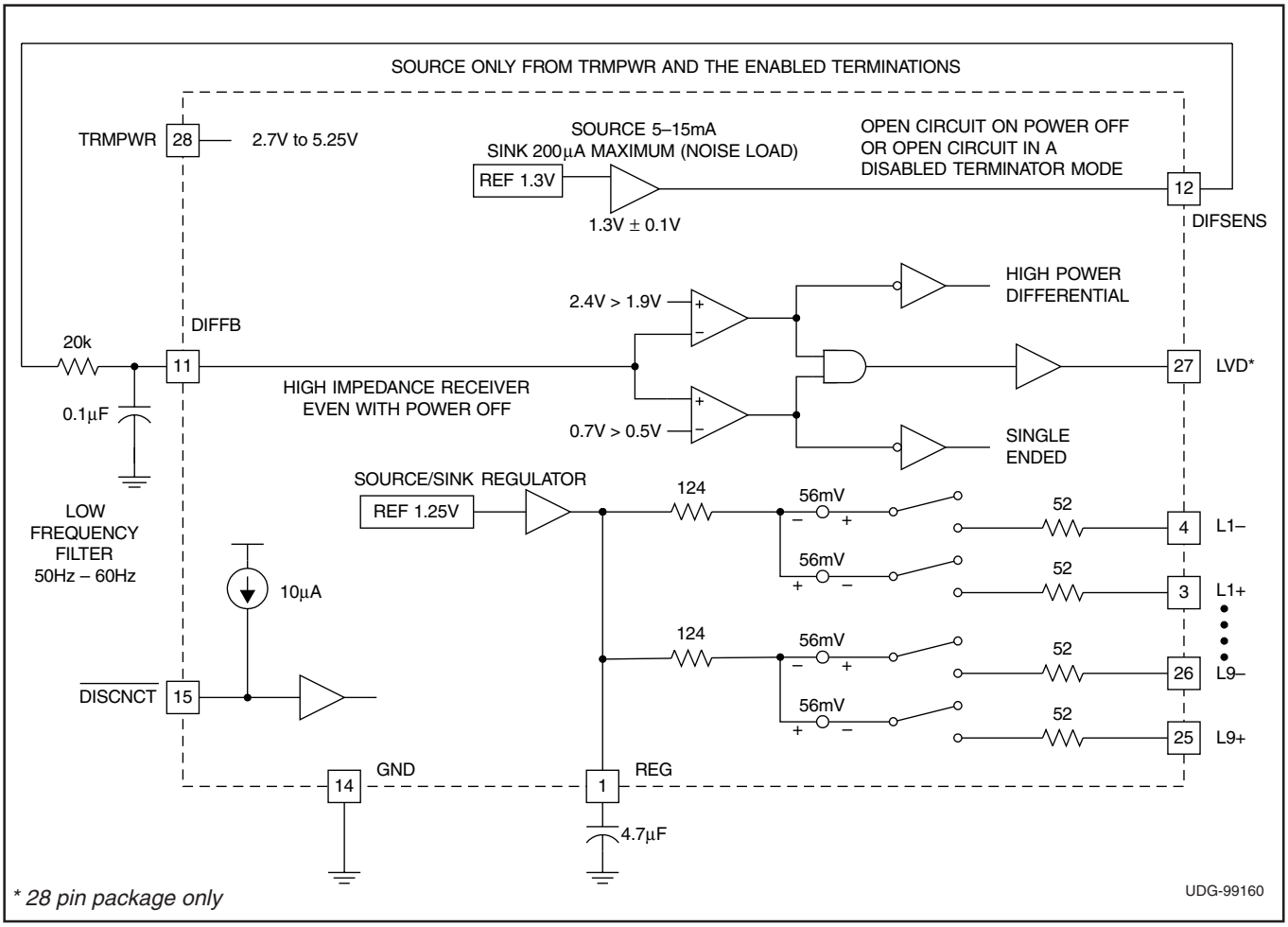
- First LVD only Active Terminator
- Meets SCSI SPI-2 Ultra2 (Fast-40) and Ultra3 / Ultra160 (Fast-80) Standards
- 2.7V to 5.25V Operation
- Differential Failsafe Bias
- Reversed Disconnect Polarity

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.

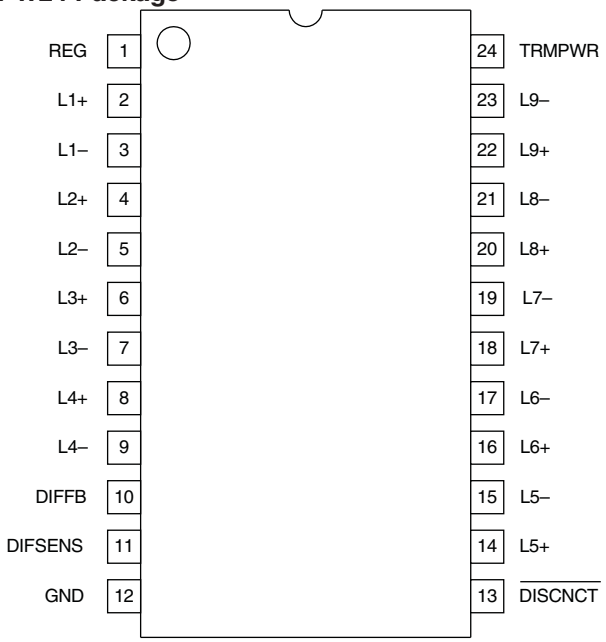
The UCC5641 is not designed for use in single ended or high voltage differential systems.

BLOCK DIAGRAM

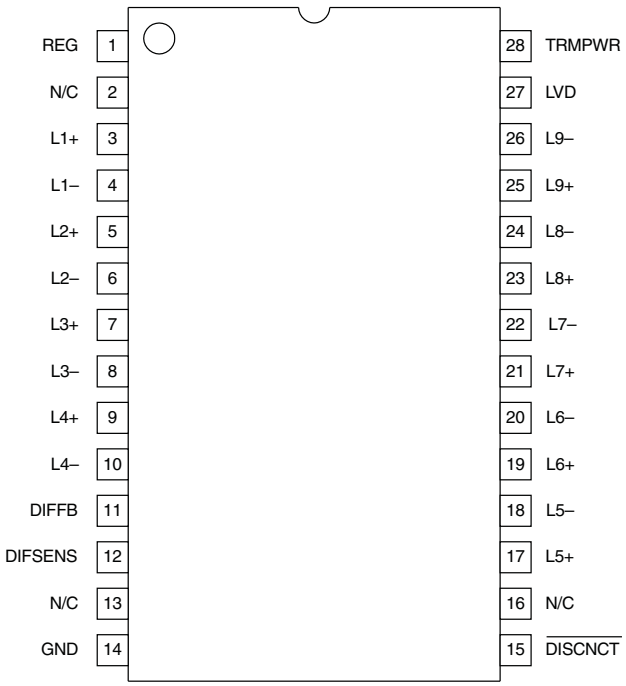


CONNECTION DIAGRAMS

TSSOP-24 (Top View)
PW24 Package



TSSOP-28 (Top View)
PW28 Package



ABSOLUTE MAXIMUM RATINGS

TERMPWR 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

TERMPWR Voltage . . . . . 2.7V to 5.25V

ELECTRICAL CHARACTERISTICS: Unless otherwise stated, specifications apply for T_A = 0°C to 70°C, TRMPWR = 3.3V. $T_A = T_J$.

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
TRMPWR Supply Current Section					
TRMPWR Supply Current	No Load			25	mA
	Disabled Terminator			400	µA
TRMPWR Voltage		2.7		5.25	V

ELECTRICAL CHARACTERISTICS: Unless otherwise stated, specifications apply for T_A = 0°C to 70°C, TRMPWR = 3.3V. $T_A = T_J$.

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Regulator Section					
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	µA
Differential Termination Section					
Differential Impedance	–2.5mA to 4.5mA	100	105	110	Ω
Common Mode Impedance	L+ connected to L–	110	150	165	Ω
Differential Bias Voltage	No load, L+ or L–	100		125	mV
Common Mode Bias		1.15	1.25	1.35	V
Output Leakage, Disconnect	$\overline{\text{DISCNCT}}$, TRMPWR = 0 to 5.25V, V_{LINE} = 0.2 to 5.25V		10	400	nA
Output Capacitance	Single ended measurement to ground (Note 1)			3	pF
Low Voltage Differential (LVD) Status Bit Section					
I_{SOURCE}	V_{LOAD} = 2.4V		–6	–4	mA
I_{SINK}	V_{LOAD} = 0.4V	2	5		mA
Disconnect & Differential Sense Input Section					
$\overline{\text{DISCNCT}}$ Threshold		0.8		2	V
Input Current	At 0V and 3.3V	–30	–10		µA
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 0.1µF capacitor and 20kΩ resistor to Diff Sense.

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

$\overline{\text{DISCNCT}}$: Disconnect pin shuts down the terminator when it is not at the end of the bus.

GND: Ground.

L*n* –: Negative line in differential applications for the SCSI Bus.

L*n* +: 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 4.7µF capacitor to ground.

TRMPWR: V_{IN} 2.7V to 5.25V supply.

APPLICATION INFORMATION

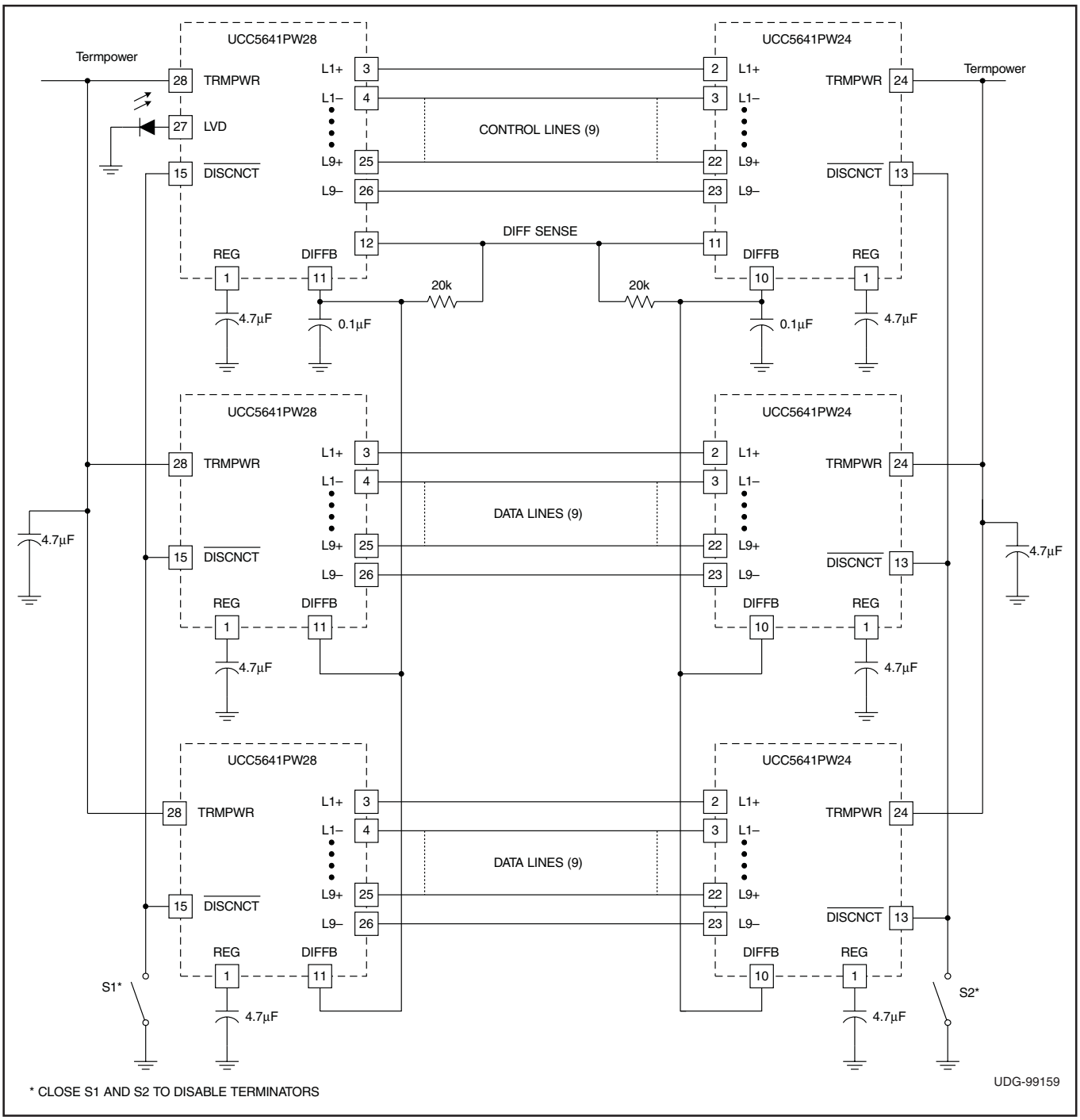


Figure 1. Application diagram.

UNITRODE CORPORATION
7 CONTINENTAL BLVD. • MERRIMACK, NH 03054
TEL. (603) 424-2410 • FAX (603) 424-3460