UNITRODE

Low Voltage Differential (LVD/SE) SCSI 9 Line Terminator

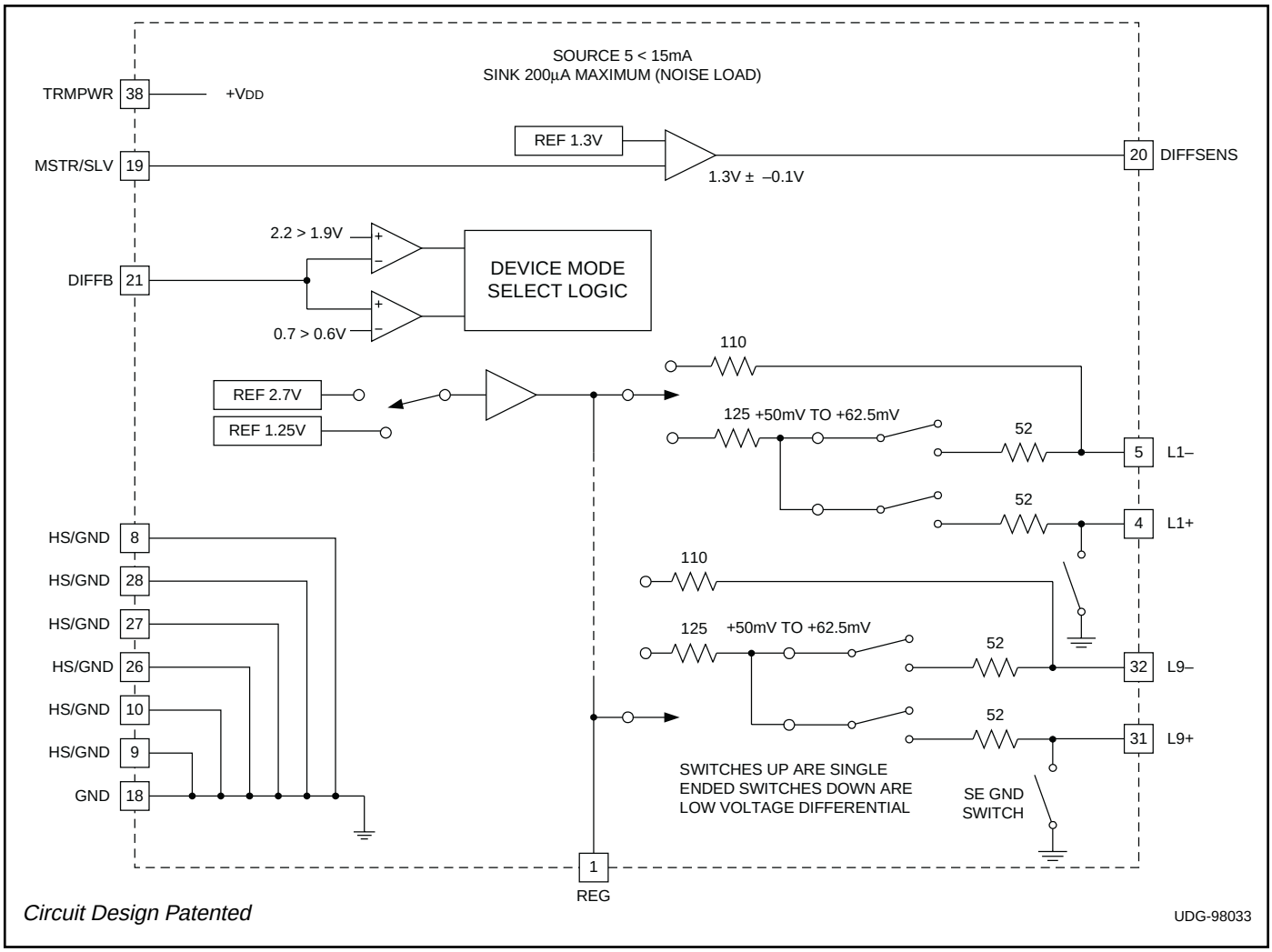
FEATURES

- Auto Selection Multi-Mode Single Ended or Low Voltage Differential Termination
- 3.0V to 5.25V Operation
- Differential Failsafe Bias
- Thermal Packaging for Low Junction Temperature and Better MTBF
- Master/Slave Inputs
- Supports Active Negation
- 3pF Channel Capacitance

DESCRIPTION

The UCC5510 Multi-Mode Low Voltage Differential and Single Ended Terminator is specially designed for automatic termination of Single-Ended or Low Voltage Differential SCSI Bus. The Multi-Mode operation of this device allows for a transition system design for the next generation SCSI Parallel Interface (SPI-2). Compliant with SPI-2, with SPI and Fast-20 the UCC5510 incorporates all the functions necessary to properly terminate the SCSI Bus and has internal thermal shut down and short circuit limiting.

BLOCK DIAGRAM



Circuit Design Patented

UDG-98033

ABSOLUTE MAXIMUM RATINGS

TRMPWR Voltage 6V
Signal Line Voltage . . . . . 0V to TRMPWR
Package Power Dissipation 2W
Storage Temperature . . . . . –65°C to +150°C
Junction Temperature . . . . . –55°C to +150°C
Lead Temperature (Soldering, 10sec.) . . . . . +300°C

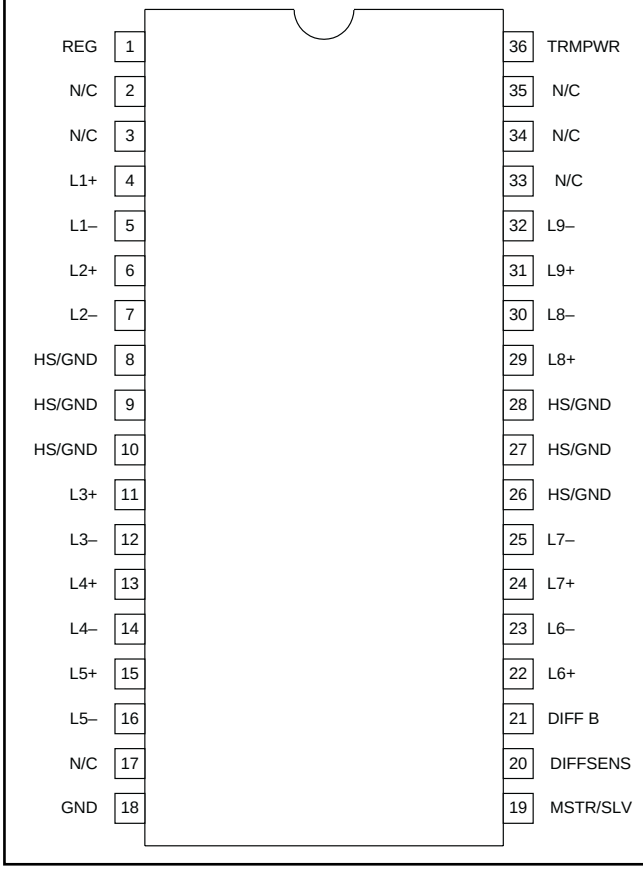
RECOMMENDED OPERATING CONDITIONS

TRMPWR Voltage . . . . . 3.0V TO 5.25V

All voltages are with respect to pin 1. Currents are positive into, negative out of the specified terminal. Consult Packaging Section of the Databook for thermal limitations and considerations of packages.

CONNECTION DIAGRAM

SSOP-36 (Top View)
MWP Package



ELECTRICAL CHARACTERISTICS: Unless otherwise specified, T_A = 0°C to 70°C, TRMPWR = 3.3V.

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
TRMPWR Supply Current Section					
TRMPWR Supply Current				20	mA
	Disable Terminator, in DISCNCT mode.			35	µA
Regulator Section					
1.25V Regulator	LVD Mode	1.15	1.25	1.35	V
1.25V Regulator Source Current	LVD Mode, Differential Sense Floating	–80	–100		mA
1.25V Regulator Sink Current	LVD Mode, Differential Sense Floating	80	100		mA
1.3V Regulator	DIFFSENS	1.2	1.3	1.4	V
1.3V Regulator Source Current	DIFFSENS	–5		–15	mA
1.3V Regulator Sink Current	DIFFSENS	50		200	µA
2.7V Regulator	Single Ended Mode	2.5	2.7	3	V
2.7V Regulator Source Current	Single Ended Mode	–200	–400	–800	mA
2.7V Regulator Sink Current	Single Ended Mode	100	200	400	mA
2.7V Regulator Dropout Voltage	V_{TRMPWR} – (V_{REG} – 3.0 Min)			200	mV

ELECTRICAL CHARACTERISTICS: Unless otherwise specified, T_A = 0°C to 70°C, TRMPWR = 3.3V.

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Differential Termination Section					
Differential Impedance		100	105	110	Ω
Common Mode Impedance		110	125	165	Ω
Differential Bias Voltage	Drivers Tri-stated	100		125	mV
Common Mode Bias			1.25		V
Output Capacitance	Single Ended Measurement to Ground (Note 1)			3	pF
Single Ended Termination Section					
Impedance		102.3	110	117.7	Ω
Termination Current	Signal Level 0.2V	–21	–23	–24	mA
	Signal Level 0.5V			–22.4	mA
Output Leakage	Disabled, TRMPWR = 0V to 5.25V			400	nA
Output Capacitance	Single Ended Measurement to Ground (Note 1)			3	pF
Single Ended GND SW Impedance				60	Ω
Differential Sense (DIFF B) Input Sections					
DIFFB Single Ended Threshold		0.6		0.7	V
DIFFB Sense LVD Threshold		1.9		2.2	V
DIFFB Input Current	V_{DIFFB} = 0V and 3.3V	–10		10	µA
Master/Slave (MSTR/SLV) Input Section					
MSTR/SLV Threshold		0.8		2	V
MSTR/SLV Input Current		–30		30	µA

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

PIN DESCRIPTIONS

DIFFB: DIFF SENSE filter pin should be connected to a 0.1µF capacitor to GND and 20k resistor to SCSI/Bus DIFF SENSE Line.

DIFFSENS: The SCSI bus DIFF SENSE line is driven to 1.3V to detect what type of devices are connected to the SCSI bus.

HS/GND: Heat Sink GND. Connect to large area PC board traces to increase power dissipation capability.

GND: Power Supply Return.

L1– thru L9–: Signal line/active line for single ended or negative line in differential applications for the SCSI bus.

L1+ thru L9+: Ground line for single ended or positive line for differential applications for the SCSI bus.

MSTR/SLV: Mode select for the non-controlling terminator. MSTR enables the 1.3V regulator, when the terminator is enabled. ***Note:*** *This function will be removed on further generations of the multimode terminators.*

REG: Regulator bypass, must be connected to a 4.7µF capacitor.

TRMPWR: V_{IN} 3.0V to 5.25V supply.

APPLICATION INFORMATION

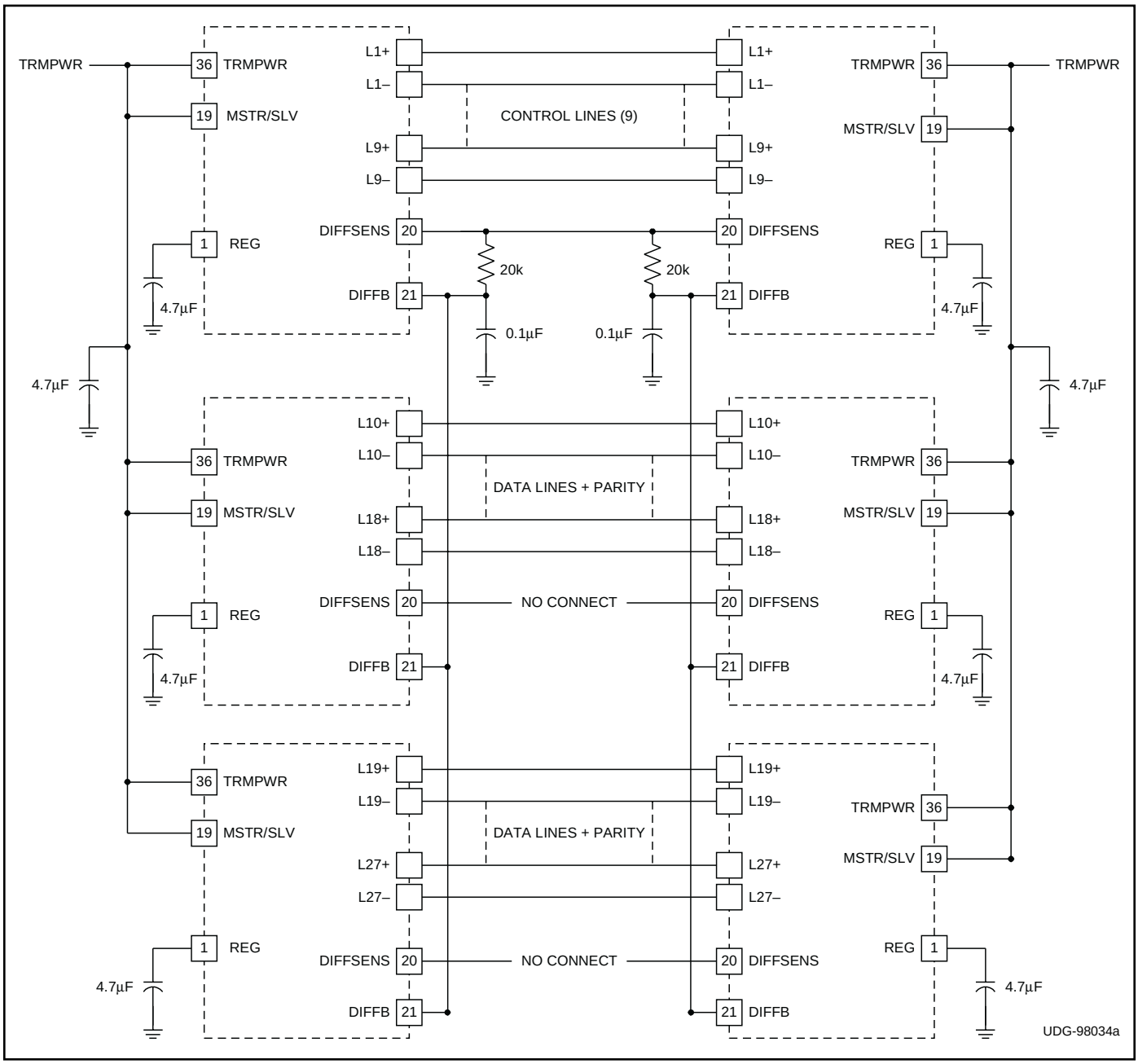


Figure 1. Application Drawing

The master is selected by placing TRMPWR on MSTR/SLV and enabling the 1.3V regulator. The master is the only terminator connected directly to the DIFFSENS bus line. All the other terminators receive a mode signal by connecting the DIFFB pins together.

The balancing capacitor is very important during high speed operation. The typical capacitor balance between the positive (+) and negative (–) signals is 0.1pF, except in the MWP package where between L8 and L9 the balance is 0.23pF and 0.4pF respecitvely The negative (–) signal line has a higher capacitance than the positive (+) signal line. The FQP package has typically 0.2pF less capacitance than the MWP package, where the typical balance is 0.1pF except for L8 and L3, where the balance is 0.4pF.

Note: The master/slave function will not be included in future Unitrode terminators.

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UCC5510, 9-LINE MULTIMODE TERMINATOR FOR PLUGS AND CONNECTORS

Device Status: Active

Parameter Name	UCC5510
Number of Lines	9
Driver Types Supported	LVD, SE
TERMPWR Voltage (max) (V)	5.25
TERMPWR Voltage (min) (V)	3.0
Integrated SPI-3 Mode Switching Filter/Delay	No
Process	Bi-CMOS
Active Negation Support	Yes
Channel Capacitance (pF)	3
Resistor Tolerance (ppm)	500
Typical Sink Current (mA)	100
Current Tolerance (%)	4
Single-Ended Termination Impedance (ohms)	110
Single-Ended Tolerance (%)	7
LVD Termination Impedance (ohms)	105
LVD Tolerance (%)	5
Commonmode Impedance (ohms)	125
Integrated TERMPWR Regulation	No

Description

Unitrode Products from Texas Instruments

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- 3pF Channel Capacitance

To view the following documents, Acrobat Reader 3.x is required.
To download a document to your hard drive, right-click on the link and choose 'Save'.

Datasheets

Full datasheet in Acrobat PDF: slus332a.pdf (47 KB)
Full datasheet in Zipped PostScript: slus332a.psz (35 KB)

Pricing/Samples/Availability

Orderable Device	Package	Pins	Temp (ºC)	Status	Price/unit USD (100-999)	Pack Qty	Availability / Samples
UCC5510MWP	DGK	36	0 TO 70	ACTIVE	3.43	1	Check stock or order
UCC5510MWP-TR	UTR	36	0 TO 70	OBSOLETE			
UCC5510MWPTR	DGK	36	0 TO 70	ACTIVE	3.07	1	Check stock or order

Application Reports

- COMPARING BUS SOLUTIONS (SLLA067 - Updated: 03/06/2000)
- ELECTROSTATIC DISCHARGE APPLICATION NOTE (SSYA008 - Updated: 05/05/1999)
- JITTER ANALYSIS (SLLA075 - Updated: 03/31/2000)
- THERMAL CHARACTERISTICS OF LINEAR AND LOGIC PACKAGES USING JEDEC PCB DESIGNS (SZZA017A - Updated: 09/10/1999)

Table Data Updated on: 8/15/2000

Texas Instruments