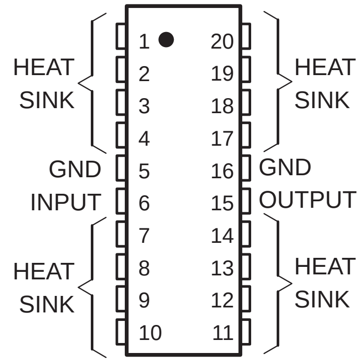
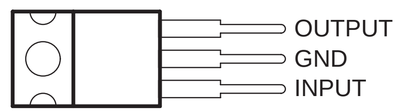
- **Fully Matches Parameters for SCSI Alternative 2 Active Termination**
- **Fixed 2.85-V Output**
- **±1% Maximum Output Tolerance at T_J = 25°C**
- **0.7-V Maximum Dropout Voltage**
- **620-mA Output Current**
- **±2% Absolute Output Variation**
- **Internal Overcurrent-Limiting Circuitry**
- **Internal Thermal-Overload Protection**
- **Internal Overvoltage Protection**

PW PACKAGE
(TOP VIEW)



HEAT SINK – These terminals have an internal resistive connection to ground and should be grounded or electrically isolated.

KC PACKAGE
(TOP VIEW)



The GND terminal is in electrical contact with the mounting base.

description

The TL-SCSI285 is a low-dropout (0.7-V) fixed-voltage regulator specifically designed for small computer systems interface (SCSI) alternative 2 active signal termination. The TL-SCSI285 0.7-V maximum dropout ensures compatibility with existing SCSI systems, while providing a wide TERMPWR voltage range. At the same time, the ±1% initial tolerance on its 2.85-V output voltage ensures a tighter line-driver current tolerance, thereby increasing the system noise margin.

The fixed 2.85-V output voltage of the TL-SCSI285 supports the SCSI alternative 2 termination standard, while reducing system power consumption. The 0.7-V maximum dropout voltage brings increased TERMPWR isolation, making the device ideal for battery-powered systems. The TL-SCSI285, with internal current limiting, overvoltage protection, ESD protection, and thermal protection, offers designers enhanced system protection and reliability.

When configured as a SCSI active terminator, the TL-SCSI285 low-dropout regulator eliminates the 220-Ω and the 330-Ω resistors required for each transmission line with a passive termination scheme, reducing significantly the continuous system power drain. When placed in series with 110-Ω resistors, the device matches the impedance level of the transmission cable and eliminates reflections.

The TL-SCSI285 is characterized for operation over the virtual junction temperature range of 0°C to 125°C.

AVAILABLE OPTIONS

T_J	PACKAGED DEVICES		CHIP FORM (Y)
	PLASTIC POWER (KC)	SURFACE MOUNT (PW)	
0°C to 125°C	TL-SCSI285KC	TL-SCSI285PWR	TL-SCSI285Y

The PW package is only available taped and reeled. Chip forms are tested at 25°C.

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absolute maximum ratings over operating virtual junction temperature range (unless otherwise noted)†

Continuous input voltage, V_I . . . . . 7.5 V
Operating virtual junction temperature range, T_J . . . . . –55°C to 150°C
Package thermal impedance, θ_{JA} (see Notes 1 and 2): KC package . . . . . 22°C/W
PW package . . . . . 83°C/W
Lead temperature 1,6 mm (1/16 inch) from case for 60 seconds: KC or PW package . . . . . 260°C
Storage temperature range, T_{stg} . . . . . –65°C to 150°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.

NOTES: 1. Maximum power dissipation is a function of T_J(max), θ_{JA}, and T_A. The maximum allowable power dissipation at any allowable ambient temperature is $P_D = (T_J(max) – T_A)/\theta_{JA}$. Operating at the absolute maximum T_J of 150°C can impact reliability. Due to variations in individual device electrical characteristics and thermal resistance, the built-in thermal overload protection may be activated at power levels slightly above or below the rated dissipation.
2. The package thermal impedance is calculated in accordance with JESD 51, except for through-hole packages, which use a trace length of zero.

recommended operating conditions

		TL-SCSI285		UNIT
		MIN	MAX	
Input voltage, V_I	T_J = 25°C			V
Input voltage, V_I	T_J = 0°C to 125°C	3.55	5.5	V
Output current, I_O	KC package	0	620	mA
	PW package	0	500	
Operating virtual junction temperature range, T_J		0	125	°C

electrical characteristics, V_I = 4.5 V, I_O = 500 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS‡	TL-SCSI285KC			UNIT
		MIN	TYP	MAX	
Output voltage	I_O = 20 mA to 500 mA, V_I = 3.55 V to 5.5 V, T_J = 25°C	2.82	2.85	2.88	V
	I_O = 500 mA to 620 mA, V_I = 3.65 V to 5.5 V, T_J = 0 to 125°C	2.79		2.91	
Input regulation	V_I = 3.55 V to 5.5 V		5	15	mV
Ripple rejection	f = 120 Hz, V_{ripple} = 1 $V_{O(PP)}$		–62		dB
Output regulation	I_O = 20 mA to 620 mA		5	30	mV
	I_O = 20 mA to 500 mA		5	30	
Output noise voltage	f = 10 Hz to 100 kHz		500		µV
Dropout voltage	I_O = 500 mA			0.7	V
	I_O = 620 mA			0.8	
Bias current	I_O = 0		2	5	mA
	I_O = 27 mA, equivalent 1 line asserted		3	6	
	I_O = 500 mA, equivalent 18 lines asserted (8-bit)		26	49	
	I_O = 620 mA		37	62	

‡ Pulse-testing techniques are used to maintain the virtual junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.1-µF capacitor across the input and a 22.0-µF tantalum capacitor with equivalent series resistance of 1.5 Ω on the output.

electrical characteristics, V_I = 4.5 V, I_O = 500 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS†		TL-SCSI285PW			UNIT
			MIN	TYP	MAX	
Output voltage	I_O = 20 mA to 500 mA, V_I = 3.55 V to 5.5 V	T_J = 25°C	2.82	2.85	2.88	V
		T_J = 0 to 125°C	2.79		2.91	
Input regulation	V_I = 3.55 V to 5.5 V			5	15	mV
Ripple rejection	f = 120 Hz, V_{ripple} = 1 $V_{O(PP)}$			–62		dB
Output regulation	I_O = 20 mA to 500 mA			5	30	mV
Output noise voltage	f = 10 Hz to 100 kHz			500		µV
Dropout voltage	I_O = 500 mA				0.7	V
Bias current	I_O = 0			2	5	mA
	I_O = 27 mA, equivalent 1 line asserted			3	6	
	I_O = 500 mA, equivalent 18 lines asserted (8-bit)			26	49	

† Pulse-testing techniques are used to maintain the virtual junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.1-µF capacitor across the input and a 22.0-µF tantalum capacitor with equivalent series resistance of 1.5 Ω on the output.

electrical characteristics, V_I = 4.5 V, I_O = 500 mA, T_J = 25°C

PARAMETER	TEST CONDITIONS†	TL-SCSI285Y			UNIT
		MIN	TYP	MAX	
Output voltage	I_O = 20 mA to 500 mA, V_I = 3.55 V to 5.5 V		2.85		V
Input regulation	V_I = 3.55 V to 5.5 V		5		mV
Ripple rejection	f = 120 Hz, V_{ripple} = 1 $V_{O(PP)}$		–62		dB
Output regulation	I_O = 20 mA to 620 mA		5		mV
	I_O = 20 mA to 500 mA		5		
Output noise voltage	f = 10 Hz to 100 kHz		500		µV
Bias current	I_O = 0		2		mA
	I_O = 27 mA, equivalent 1 line asserted		3		
	I_O = 500 mA, equivalent 18 lines asserted (8-bit)		26		
	I_O = 620 mA		37		

† Pulse-testing techniques are used to maintain the virtual junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.1-µF capacitor across the input and a 22.0-µF tantalum capacitor with equivalent series resistance of 1.5 Ω on the output.

APPLICATION INFORMATION

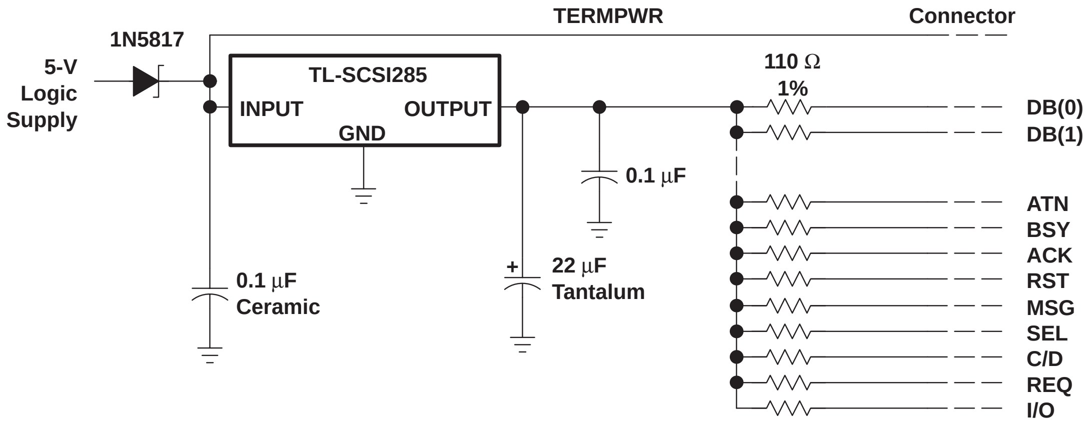
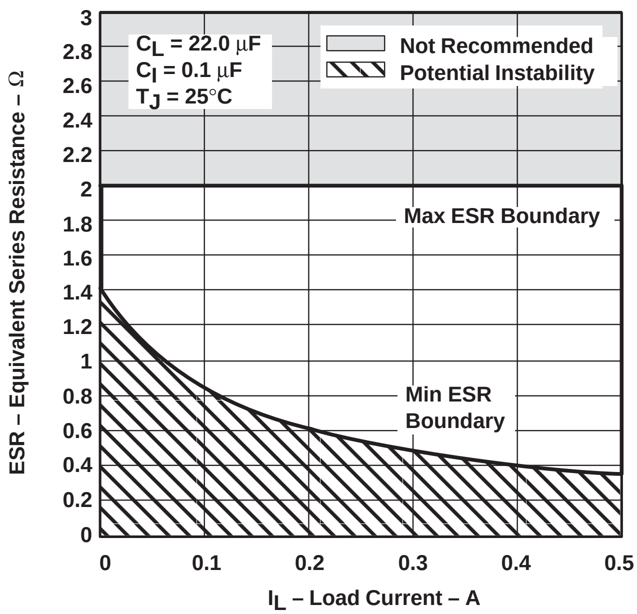


Figure 1. Typical Application Schematic

COMPENSATION CAPACITOR SELECTION INFORMATION

The TL-SCSI285 is a low-dropout regulator. This means that the capacitance loading is important to the performance of the regulator because it is a vital part of the control loop. The capacitor value and the equivalent series resistance (ESR) both affect the control loop and must be defined for the load range and the temperature range. Figures 2 and 3 can be used to establish the capacitance value and ESR range for best regulator performance.

ESR OF OUTPUT CAPACITOR
vs
LOAD CURRENT



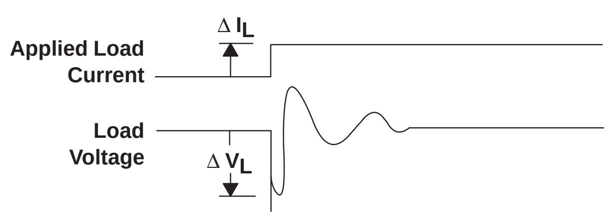


Figure 2

STABILITY
vs
ESR

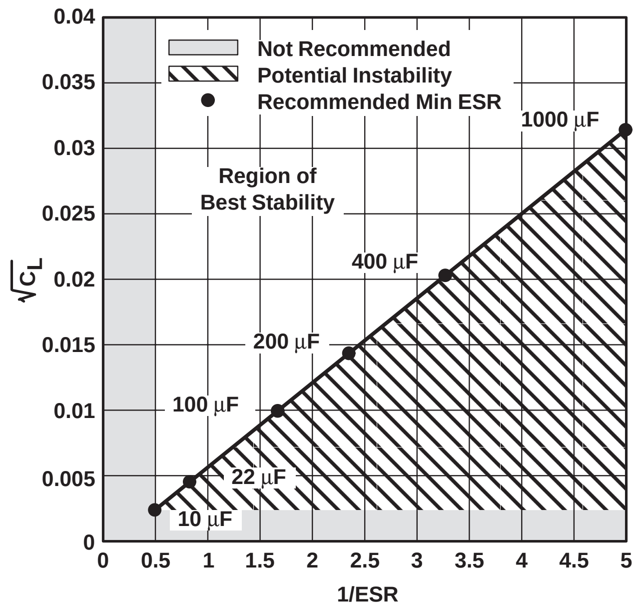


Figure 3

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