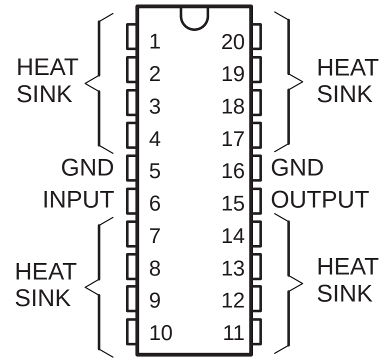
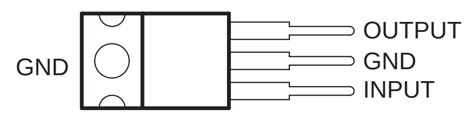
- **Fully Matches Parameters for Alternative 2 SCSI Active Termination**
- **Fixed 2.85-V Output**
- **±1.5% Maximum Output Tolerance at T_J = 25°C**
- **1-V Maximum Dropout Voltage**
- **500-mA Output Current**
- **±3% Absolute Output Variation**
- **Internal Overcurrent Limiting**
- **Internal Thermal-Overload Protection**
- **Internal Overvoltage Protection**

PW PACKAGE
(TOP VIEW)

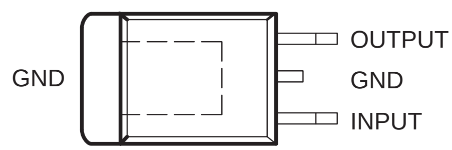


HEAT SINK – These pins have an internal resistive connection to ground and should be grounded or electrically isolated.

KC PACKAGE†
(TOP VIEW)



KTP PACKAGE†
(TOP VIEW)



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

description

The TL2217-285 is a low-dropout (1 V) fixed-voltage regulator specifically designed for small computer systems interface (SCSI) alternative 2 active signal termination. The TL2217-285 1-V maximum dropout ensures compatibility with existing SCSI systems, while providing a wide TERMPWR voltage range. At the same time, the ±1.5% initial tolerance on its 2.85-V output voltage ensures a tighter line-driver current tolerance, thereby increasing system noise margin.

The fixed 2.85-V output voltage of TL2217-285 supports the SCSI alternative 2 termination standard, while reducing system power consumption. The 1-V maximum dropout voltage brings increased TERMPWR isolation, making the device ideal for battery-powered systems. The TL2217-285, 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 TL2217-285 low-dropout regulator eliminates the 220-Ω and 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 TL2217-285 is characterized for operation from 0°C to 125°C virtual junction temperature.

AVAILABLE OPTIONS

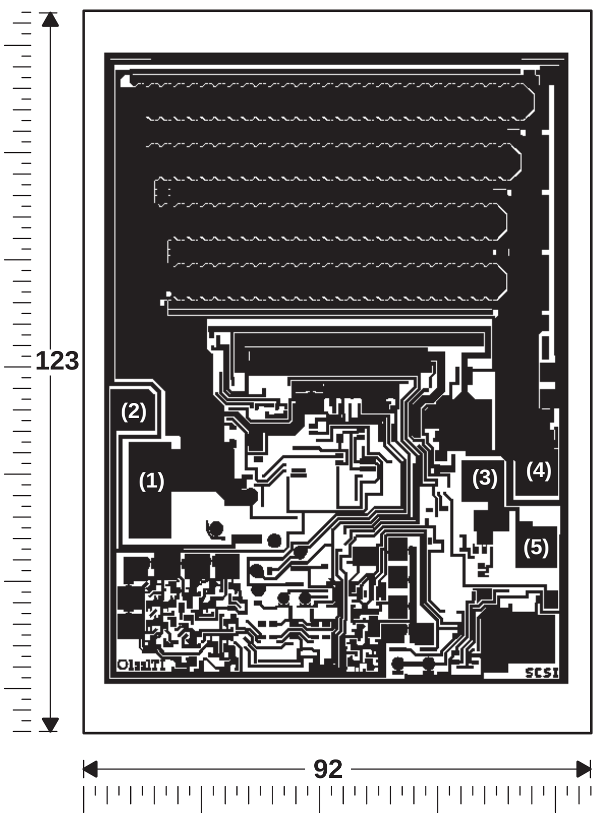
T_A	PACKAGE			CHIP FORM (Y)
	PLASTIC POWER (KC)	PLASTIC FLANGE MOUNT (KTP)†	SURFACE MOUNT (PW)†	
0°C to 125°C	TL2217-285KC	TL22I7-285KTP	TL22I7-285PWLE	TL2217-285Y

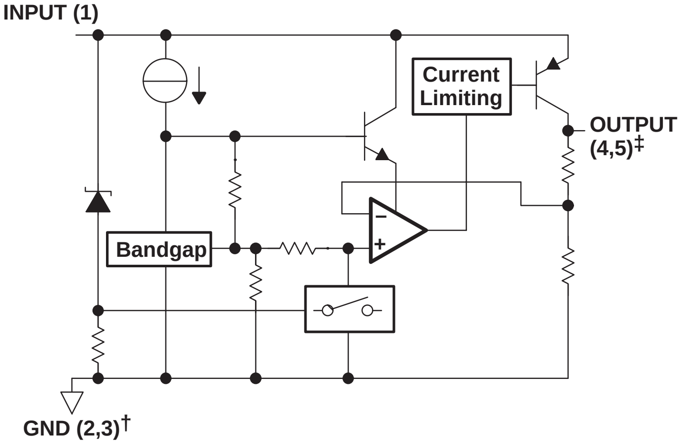
† The KTP and PW packages are only available left-end taped and reeled.

TL2217-285Y chip information

These chips, properly assembled, have characteristics similar to the TL2217-285. Thermal compression or ultrasonic bonding can be used on the doped-aluminum bonding pads. The chips can be mounted with conductive epoxy or a gold-silicon preform.

BONDING-PAD ASSIGNMENTS





CHIP THICKNESS:
11 MILS TYPICAL

BONDING PADS:
7 X 7 MILS MINIMUM

T_J(max) = 150°C

TOLERANCES ARE ±10%.

ALL DIMENSIONS ARE IN MILS.

† Must connect pads 2 and 3 together
‡ Must connect pads 4 and 5 together

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

Continuous input voltage, V_I . . . . 7.5 V
Continuous total power dissipation (see Note 1) . . . . See Dissipation Rating Table
Operating virtual junction temperature range, T_J . . . . –55°C to 150°C
Storage temperature range, T_{stg} . . . . –65°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 60 seconds . . . . 260°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.

NOTE 1: Refer to Figures 1 and 2 to avoid exceeding the design maximum virtual junction temperature; these ratings should not be exceeded. Due to variation 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.

DISSIPATION RATING TABLE

PACKAGE	POWER RATING AT	$T_A \leq 25°C$ POWER RATING	DERATING FACTOR ABOVE $T_A = 25°C$	$T_A = 70°C$ POWER RATING	$T_A = 85°C$ POWER RATING	$T_A = 125°C$ POWER RATING
KC	T_A	2000 mW	16.0 mW/°C	1280 mW	1040 mW	400 mW
	T_C†	20000 mW	182.0 mW/°C	14540 mW	11810 mW	4530 mW
KTP	T_A	1800 mW	14.5 mW/°C	1147 mW	943 mW	363 mW
	T_C†	18000 mW	163.6 mW/°C	13091 mW	10636 mW	4091 mW
PW	T_A	950 mW	7.6 mW/°C	608 mW	494 mW	190 mW
	T_C	3600 mW	29.4 mW/°C	2353 mW	1912 mW	735 mW

† Derate above 40°C

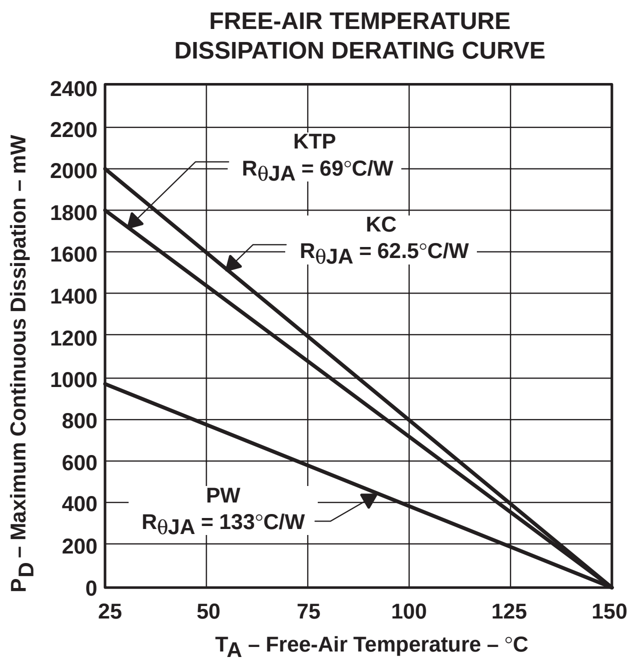


Figure 1

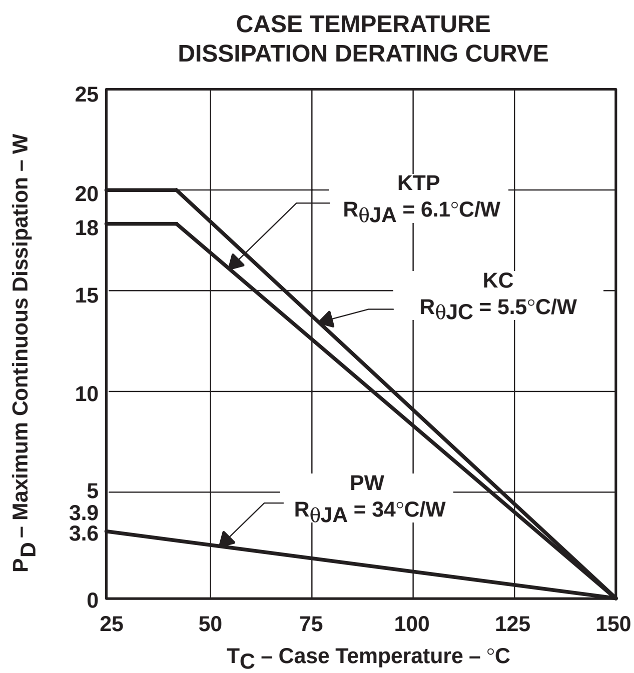


Figure 2

recommended operating conditions

	MIN	MAX	UNIT
Input voltage, V_I	3.85	5.5	V
Output current, I_O	0	500	mA
Operating virtual junction temperature range, T_J	0	125	°C

electrical characteristics over recommended operating conditions, $V_I = 4.5$ V, $I_O = 500$ mA, $T_J = 25°C$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS†		TL2217-285			UNIT
			MIN	TYP	MAX	
Output voltage	I_O = 20 mA to 500 mA, V_I = 3.85 V to 5.5 V	T_J = 25°C	2.81	2.85	2.89	V
		T_J = 0°C to 125°C	2.765		2.935	
Input voltage regulation	V_I = 3.85 V to 5.5 V			5	15	mV
Ripple rejection	f = 120Hz, V_{ripple} = 1 V_{PP}			–62		dB
Output voltage regulation	I_O = 20 mA to 500 mA			5	30	mV
Output noise voltage	f = 10 Hz to 100 kHz			500		µV
Dropout voltage					1	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-µF tantalum capacitor with equivalent series resistance of 1.5 Ω on the output.

electrical characteristics over recommended operating conditions, $V_I = 4.5$ V, $I_O = 500$ mA, $T_J = 25°C$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	TL2217-285Y			UNIT
		MIN	TYP	MAX	
Output voltage	I_O = 20 mA to 500 mA, V_I = 3.85 V to 5.5 V	2.81	2.85	2.89	V
Input voltage regulation	V_I = 3.85 V to 5.5 V		5	15	mV
Ripple rejection	f = 120 Hz, V_{ripple} = 1 V_{PP}		–62		dB
Output voltage 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			1	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-µF tantalum capacitor with equivalent series resistance of 1.5 Ω on the output.

COMPENSATION CAPACITOR SELECTION INFORMATION

The TL2217-285 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. Figure 3 and Figure 4 can be used to establish the capacitance value and ESR range for best regulator performance.

ESR (OUTPUT CAPACITOR)
vs
LOAD CURRENT

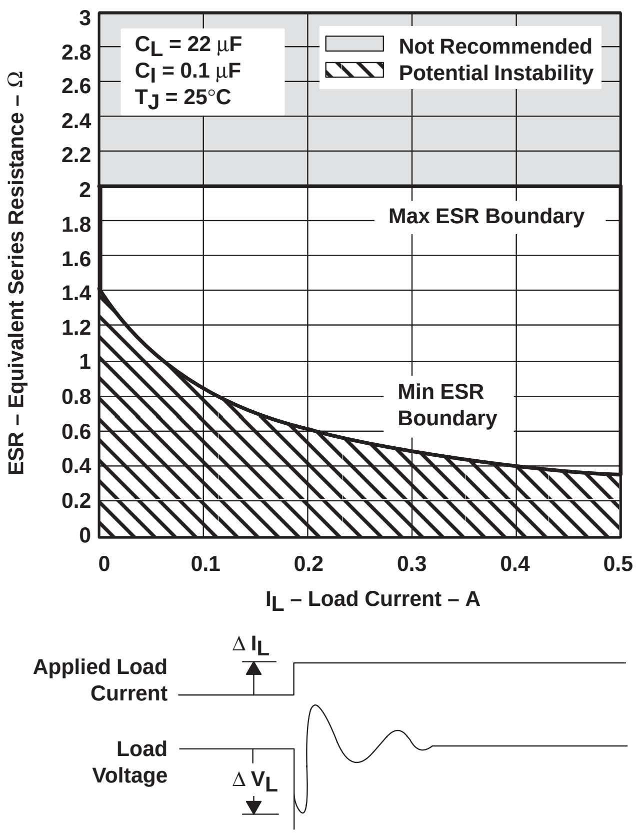


Figure 3

STABILITY
vs
ESR

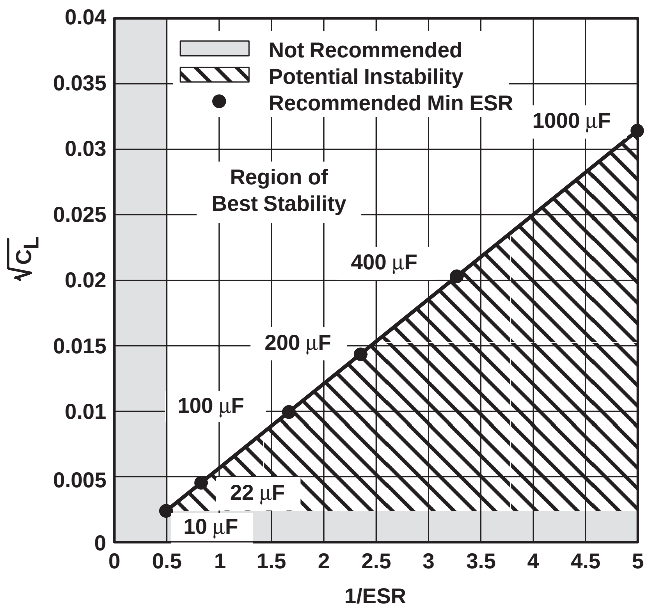


Figure 4

APPLICATION INFORMATION

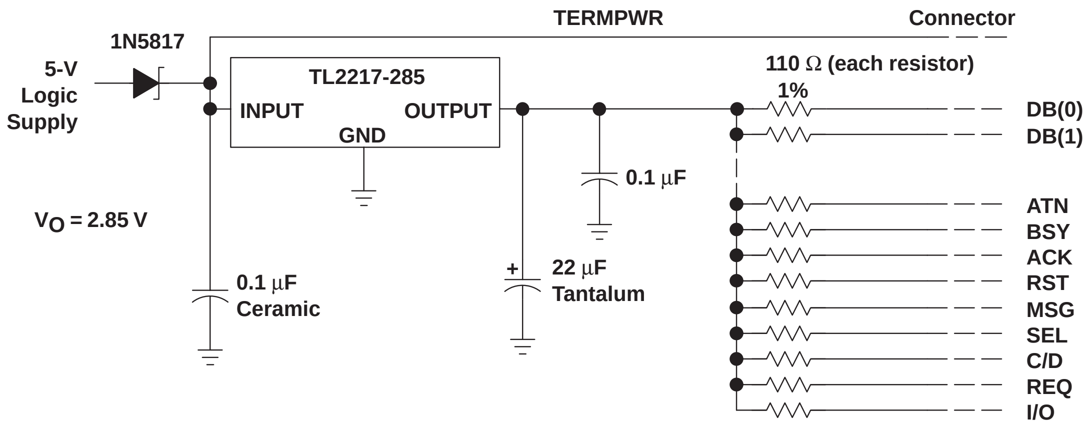


Figure 5. Typical Application Schematic