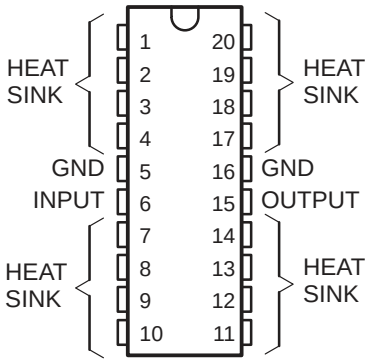
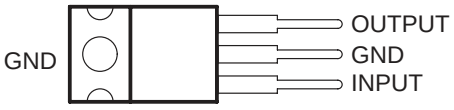
- **Fully Matches Parameters for SCSI Alternative 2 Active Termination**
- **Fixed 2.85-V Output**
- **±1.5% Maximum Output Tolerance at T_J = 25°C**
- **1-V Maximum Dropout Voltage**
- **500-mA Output Current**
- **±3% Absolute Output Variation**
- **Internal Overcurrent-Limiting Circuitry**
- **Internal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

PW PACKAGE
(TOP VIEW)

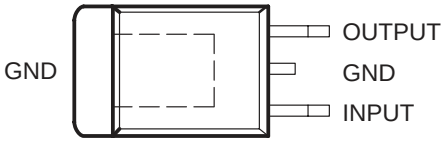


HEAT SINK – These pins have an internal resistive connection to ground and should be grounded or electrically isolated.

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 over the virtual junction temperature range of 0°C to 125°C.

AVAILABLE OPTIONS

T_J	PACKAGED DEVICES			CHIP FORM (Y)
	PLASTIC POWER (KC)	PLASTIC FLANGE MOUNT (KTP)	SURFACE MOUNT (PW)	
0°C to 125°C	TL2217-285KC	TL22I7-285KTP	TL22I7-285PWR	TL2217-285Y

The KTP and PW packages are only available taped and reeled. Add the suffix R to the device type (e.g., TL2217–285KTPR). Chip forms are tested at 25°C.

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
KTP package . . . . . 28°C/W
PW package . . . . . 83°C/W
Lead temperature 1,6 mm (1/16 inch) from case for 60 seconds . . . . . 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

		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	TL2217–285	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)

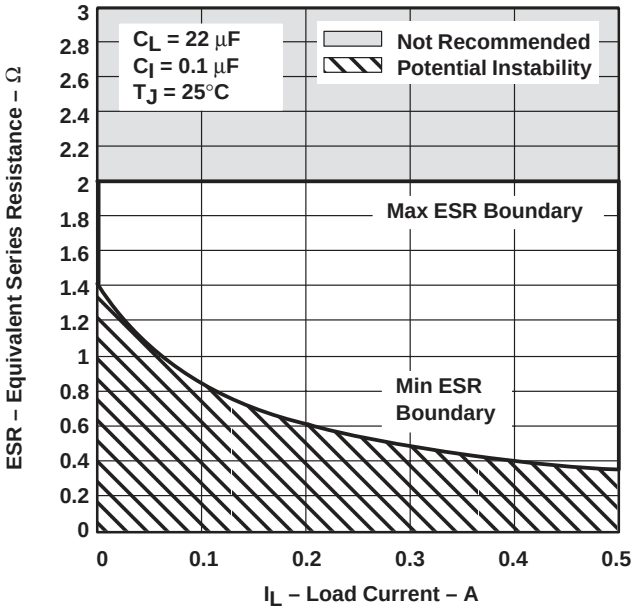
PARAMETER	TEST CONDITIONS†	TL2217-285Y			UNIT
		MIN	TYP	MAX	
Output voltage	I_O = 20 mA to 500 mA, V_I = 3.85 V to 5.5 V	2.81	2.85	2.89	V
Input voltage regulation	V_I = 3.85 V to 5.5 V		5	15	mV
Ripple rejection	f = 120 Hz, V_{ripple} = 1 V_{PP}		–62		dB
Output voltage regulation	I_O = 20 mA to 500 mA		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



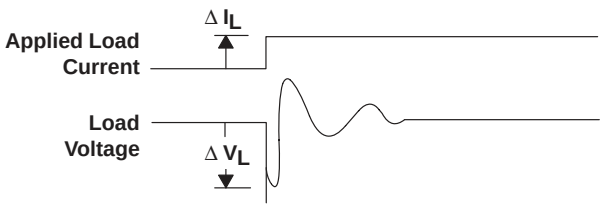


Figure 1

STABILITY
vs
ESR

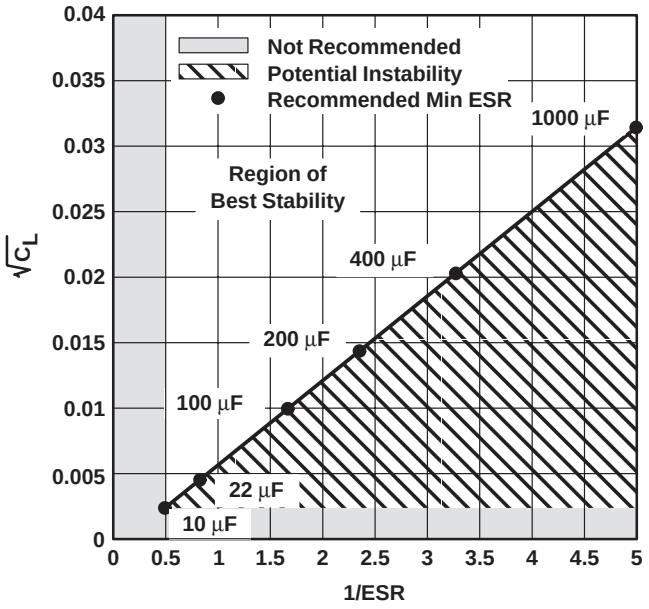


Figure 2

APPLICATION INFORMATION

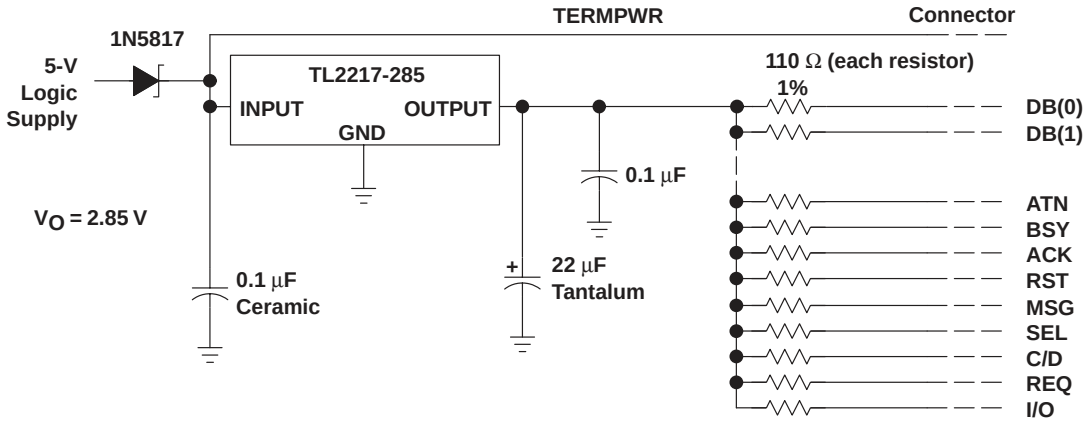


Figure 3. Typical Application Schematic

PACKAGING INFORMATION

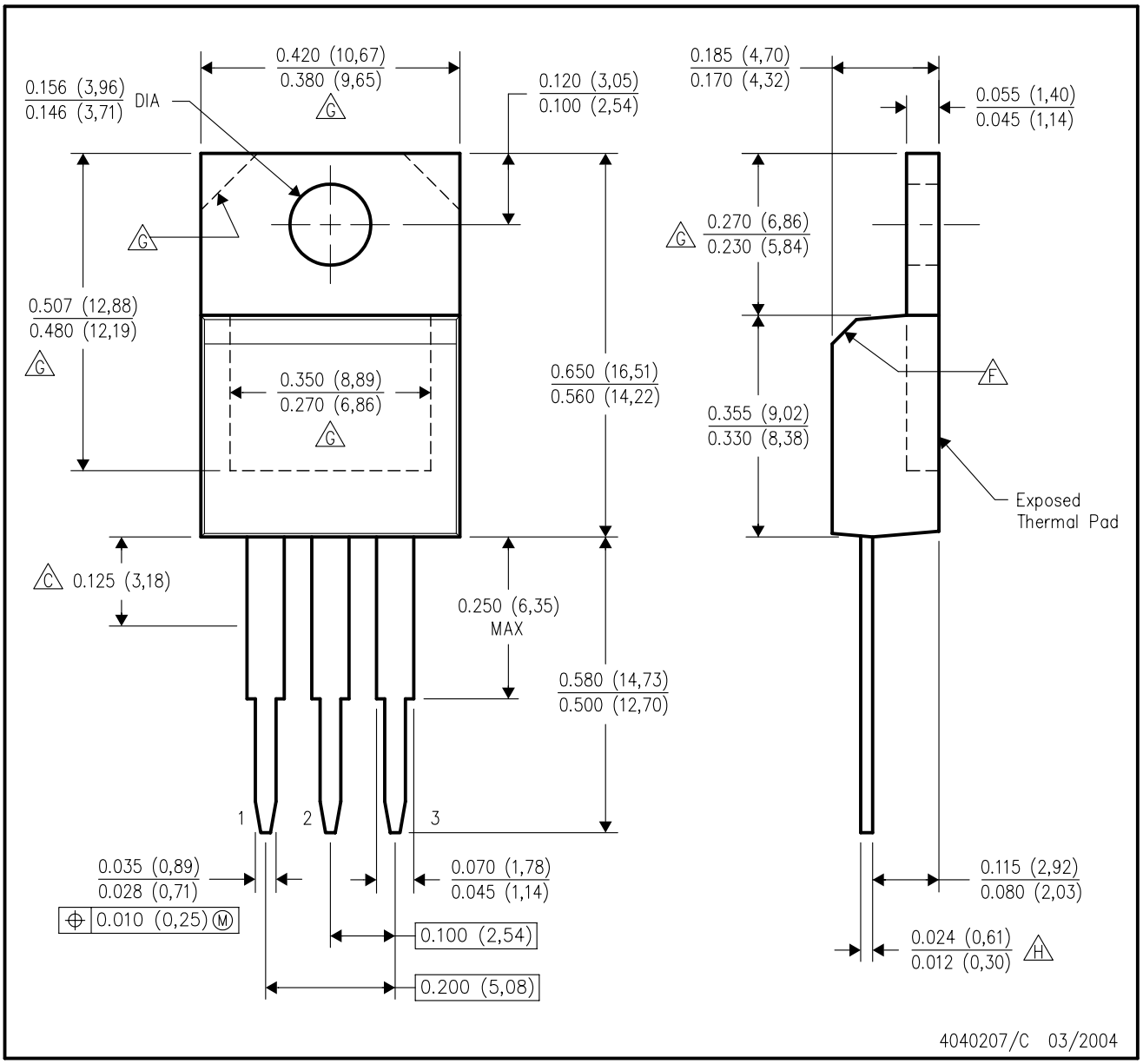
Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)
TL2217-285KC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI
TL2217-285PWR	OBSOLETE	TSSOP	PW	20		TBD	Call TI	Call TI

(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

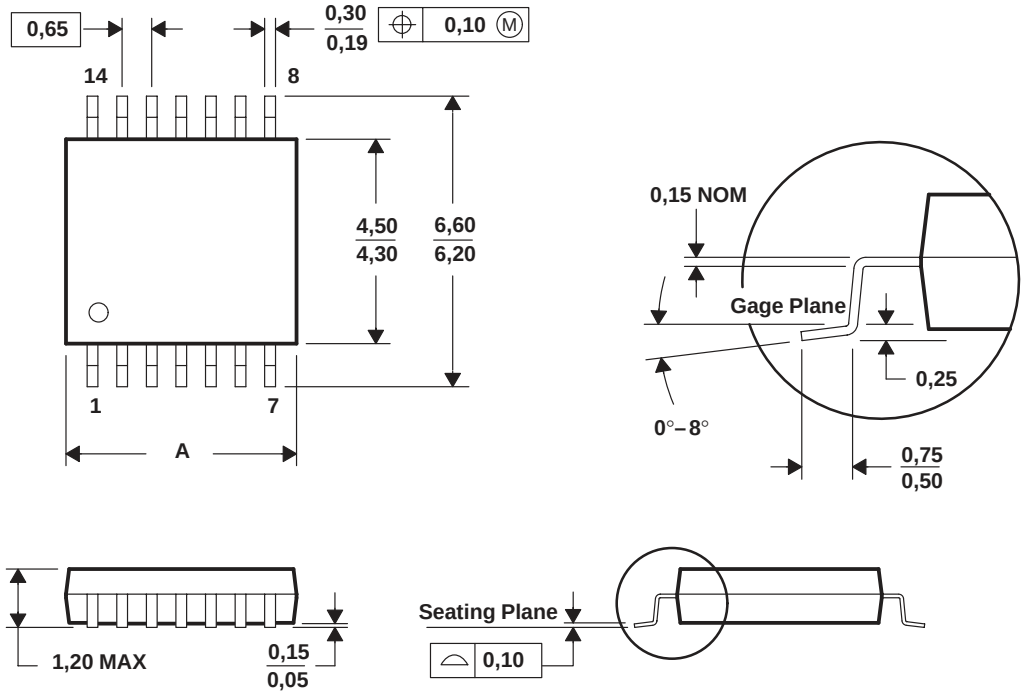
KC (R–PSFM–T3) PLASTIC FLANGE–MOUNT PACKAGE



NOTES:
- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. Lead dimensions are not controlled within this area.
- D. All lead dimensions apply before solder dip.
- E. The center lead is in electrical contact with the mounting tab.
- F. The chamfer is optional.
- G. Thermal pad contour optional within these dimensions.
- H. Falls within JEDEC TO–220 variation AB, except minimum lead thickness.

PW (R-PDSO-G)** **PLASTIC SMALL-OUTLINE PACKAGE**

14 PINS SHOWN



DIM \ PINS **	8	14	16	20	24	28
A MAX	3,10	5,10	5,10	6,60	7,90	9,80
A MIN	2,90	4,90	4,90	6,40	7,70	9,60

4040064/F 01/97

NOTES: A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion not to exceed 0,15.
D. Falls within JEDEC MO-153

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