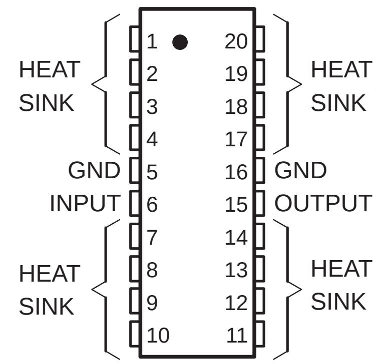
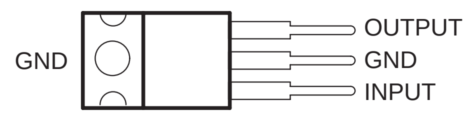
- **Fixed 3.3-V Output**
- **±1% Maximum Output Voltage Tolerance at T_J = 25°C**
- **500-mV Maximum Dropout Voltage at 500 mA**
- **500-mA Dropout Current**
- **±2% Absolute Output Voltage Variation**
- **Internal Overcurrent Limiting**
- **Internal Thermal-Overload Protection**
- **Internal Overvoltage Protection**
- **Package Options Include Plastic Flange Mounted (KTP), Power (KC), and Thin Shrink Small-Outline (PW) Packages**

PW PACKAGE
(TOP VIEW)



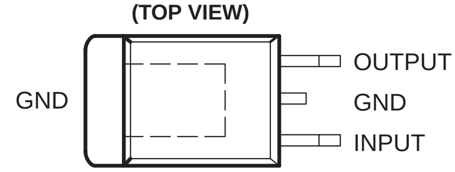
HEAT SINK – These terminals have an internal resistive connection to ground and should be grounded or electrically isolated.

KC PACKAGE
(TOP VIEW)



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

KTP PACKAGE
(TOP VIEW)



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

description

The TLV2217-33 is a low-dropout 3.3-V fixed-voltage regulator. The regulator is capable of sourcing 500 mA of current with an input-output differential of 0.5 V, or less. The TLV2217-33 provides internal overcurrent limiting, thermal-overload protection, and overvoltage protection.

The 0.5-V dropout for the TLV2217-33 makes it ideal for battery applications in 3.3-V logic systems. For example, battery input voltage to the regulator can drop as low as 3.8 V, and the TLV2217-33 can continue to regulate the system. For higher voltage systems, the TLV2217-33 can be operated with a continuous input voltage of 12 V.

The TLV2217-33 regulators are characterized for virtual junction temperature operation from 0°C to 125°C .

AVAILABLE OPTIONS

T_J	PACKAGED DEVICES			CHIP FORM (Y)
	PLASTIC POWER (KC)	SURFACE MOUNT (PW)	PLASTIC FLANGE MOUNT (KTP)	
0°C to 125°C	TLV2217-33KC	TLV2217-33PW	TLV2217-33KTP	TLV2217-33Y

The KTP and PW packages are available taped and reeled only. Add R suffix to device type (e.g., TLV2212-33PWR). Chip forms are tested at 25°C.

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

Continuous input voltage, VI . . . . 16 V
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
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 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.

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	3.8	12	V
Output current, I_O	0	500	mA
Operating virtual junction temperature range, T_J	0	125	°C

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

PARAMETER	TEST CONDITIONS‡		TLV2217-33 MIN	TYP	MAX	UNIT
Output voltage	I_O = 20 mA to 500 mA, V_I = 3.8 V to 5.5 V	T_J = 25°C	3.267	3.30	3.333	V
		T_J = 0°C to 125°C	3.234		3.366	
Input voltage regulation	V_I = 3.8 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 = 250 mA				400	mV
	I_O = 500 mA				500	
Bias current	I_O = 0			2	5	mA
	I_O = 500 mA			19	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 at V_I = 4.5 V, I_O = 500 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS†		TLV2217-33Y			UNIT
			MIN	TYP	MAX	
Output voltage	I_O = 20 mA to 500 mA,	V_I = 3.8 V to 5.5 V	3.267	3.30	3.333	V
Input voltage regulation	V_I = 3.8 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 = 250 mA				400	mV
	I_O = 500 mA				500	
Bias current	I_O = 0			2	5	mA
	I_O = 500 mA			19	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 TLV2217-33 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 1 and 2 can be used to establish the capacitance value and ESR range for best regulator performance.

ESR OF OUTPUT CAPACITOR
vs
LOAD CURRENT

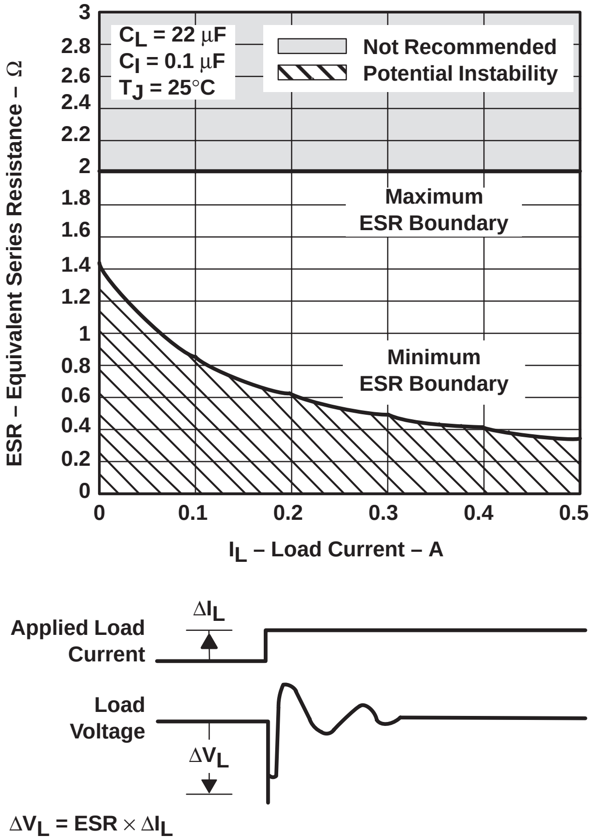


Figure 1

STABILITY
vs
ESR

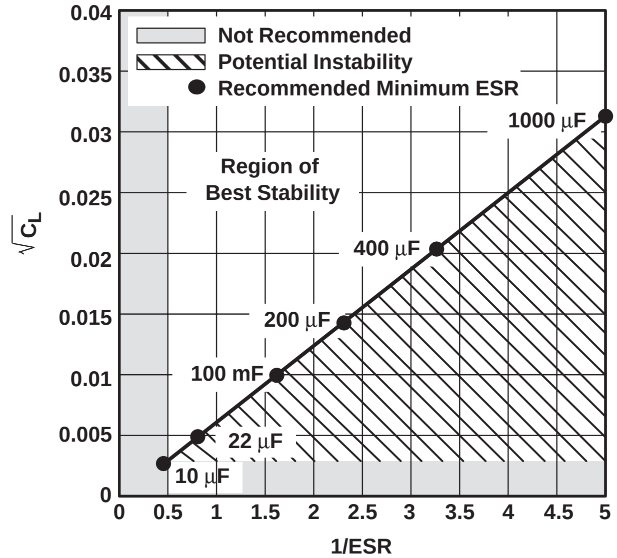


Figure 2

APPLICATION INFORMATION

application schematic

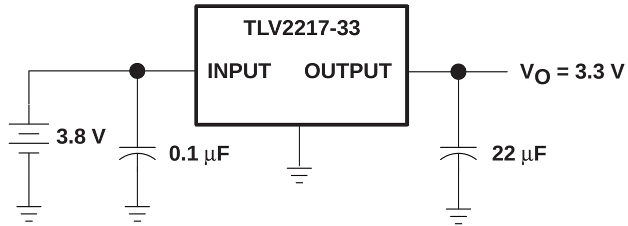


Figure 3

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