- **2.5-V, 2.85-V, 3.3-V, 5-V, and Adjustable Output Voltage Options**
- **3-A Output Current Capability**
- **Operates Down to 1-V Dropout**
- **Specified Dropout Voltage at Multiple Current Levels With a 1.3-V (Max) Dropout at 3 A**
- **0.2 % Line Regulation Maximum**
- **0.4 % Load Regulation Maximum**
- **Current Limiting and Thermal Protection**

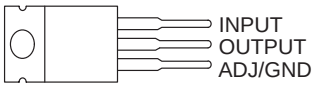
description

The TL3317-series devices are positive low-dropout regulators, designed to provide an output current in excess of 3 A. These devices are available in 2.5-V, 2.85-V, 3.3-V, 5-V, and adjustable output voltage options. All internal circuitry is designed to operate down to 1-V dropout voltage. The dropout voltage is specified at a maximum of 1.3 V at 3 A, decreasing with lower load currents. And, unlike pnp-type regulators, where up to 10% of the output current is wasted as quiescent current, the quiescent current of the TL3317 flows into the load, increasing the overall efficiency of the device.

The TL3317 requires a minimum of 10 μF output capacitance for stability. Output capacitors of this size, or larger, normally are included in most regulator designs. The TL3317 series of high-current adjustable and fixed-voltage LDO regulators is intended for designs requiring a low-cost solution for the regulation of low-voltage power supplies in DVD-ROM drives, soundcards, motherboards, consumer electronics, and communications electronics. Typical applications include high-efficiency linear regulators, battery chargers, post regulation for switching power supplies, constant-current regulators, and microprocessor supplies.

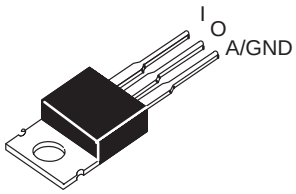
The TL3317C-series devices are characterized for operation over the virtual junction temperature range of 0°C to 125°C.

KC PACKAGE
(TOP VIEW)

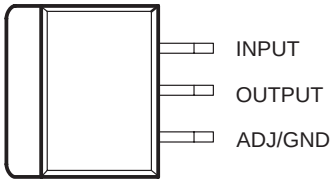


The OUTPUT terminal is in electrical contact with the mounting base.

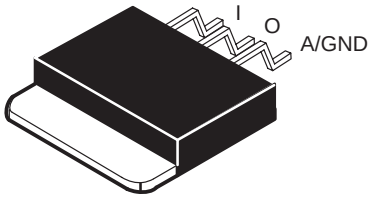
TO-220AB



KTE PACKAGE
(TOP VIEW)



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



PRODUCT PREVIEW

AVAILABLE OPTIONS

T_J	V_O TYP (V)	PACKAGED DEVICES	
		HEAT-SINK MOUNTED (KC)	PLASTIC FLANGE-MOUNTED (KTE)
0°C to 125°C	2.5 V	TL3317-25CKC	TL3317-25CKTER
	2.85 V	TL3317-285CKC	TL3317-285CKTER
	3.3 V	TL3317-33CKC	TL3317-33CKTER
	5 V	TL3317-50CKC	TL3317-50CKTER
	ADJ	TL3317CKC	TL3317CKTER

The KTE package is only available taped and reeled.

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Continuous input voltage . . . . . 20 V
Package thermal impedance, θ_{JA} (see Notes 1 and 2): KC package . . . . . 22°C/W
KTE package . . . . . 23°C/W
Lead temperature 1,6 mm (1/16 inch) from case for 10 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 affect reliability.
2. The package thermal impedance is calculated in accordance with JESD 51.

recommended operating conditions

		MIN	MAX	UNIT
Input voltage, V_I	TL3317C		16	V
	TL3317-25C	4.1	16	
	TL3317-285C	4.45	16	
	TL3317-33C	4.9	16	
	TL3317-50C	6.6	16	
Output current, I_{OUT}			3	A
Operating virtual junction temperature range, T_J		0	125	°C

PRODUCT PREVIEW

electrical characteristics, T_J = 0°C to 125°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS†		MIN	TYP	MAX	UNIT
Output voltage, V_{OUT}	$V_{IN} - V_{OUT}$ = 3 V, I_{OUT} = 10 mA, T_J = 25°C	TL3317	1.238	1.25	1.262	V
	V_{IN} = 5 V, I_{OUT} = 10 mA, T_J = 25°C	TL3317-25	2.475	2.5	2.525	
	V_{IN} = 4.5 V to 10 V, I_{OUT} = 0 to 3 A		2.45	2.5	2.55	
	V_{IN} = 5 V, I_{OUT} = 10 mA, T_J = 25°C	TL3317-285	2.822	2.85	2.879	
	V_{IN} = 4.5 V to 10 V, I_{OUT} = 0 to 3 A		2.793	2.85	2.907	
	V_{IN} = 5 V, I_{OUT} = 10 mA, T_J = 25°C	TL3317-33	3.267	3.3	3.333	
	V_{IN} = 4.9 V to 15 V, I_{OUT} = 0 to 3 A		3.234	3.3	3.366	
	V_{IN} = 8 V, I_{OUT} = 10 mA, T_J = 25°C	TL3317-50	4.95	5	5.05	
	V_{IN} = 6.6 V to 16 V, I_{OUT} = 0 to 3 A		4.9	5	5.1	
Line regulation	I_{OUT} = 10 mA, $V_{IN} - V_{OUT}$ = 1.5 V to 15 V	TL3317		0.035%	0.2%	
	I_{OUT} = 0 mA, V_{IN} = 4.5 V to 10 V	TL3317-25		1	6	mV
		TL3317-285		1	6	
	I_{OUT} = 0 mA, V_{IN} = 4.9 V to 15 V	TL3317-33		1	6	
	I_{OUT} = 0 mA, V_{IN} = 6.6 V to 16 V	TL3317-50		1	10	
Load regulation	I_{OUT} = 10 mA to 3 A, $V_{IN} - V_{OUT}$ = 3 V	TL3317		0.2%	0.4%	
	I_{OUT} = 0 to 3 A, V_{IN} = 5 V	TL3317-25		3	10	mV
		TL3317-285		4	15	
		TL3317-33		7	20	
	I_{OUT} = 0 to 3 A, V_{IN} = 8 V	TL3317-50		10	35	
Dropout voltage	I_{OUT} = 100 mA			1	1.1	V
	I_{OUT} = 1 A			1.2	1.3	
	I_{OUT} = 3 A			1.3	1.5	
Current limit	$V_{IN} - V_{OUT}$ = 5 V,	T_J = 125°C	3.2	5.5		A
Minimum load current	$V_{IN} - V_{OUT}$ = 15 V	TL3317		5	10	mA
Quiescent current	$V_{IN} \le$ 15 V (fixed-voltage devices)			5	10	mA
Thermal regulation	30 ms pulse,	T_J = 25°C		0.004	0.02	%/W
Ripple rejection	$V_{IN} - V_{OUT}$ = 3 V, f = 120 Hz, T_J = 25°C	TL3317	60	75		dB
		TL3317-25	60	74		
		TL3317-285	60	73		
		TL3317-33	60	72		
		TL3317-50	60	68		
Output noise voltage (% of V_{OUT})	f = 10 Hz to 100 kHz			0.003%		
Temperature stability				0.5%		
Long-term stability	1000 hours,	T_A = 125°C		0.3%	1%	

† All characteristics are measured with a 0.1-μF capacitor across the input and a 10-μF capacitor, with an ESR of less than 1 Ω, across the output. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible.

PRODUCT PREVIEW

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