

1A LOW DROPOUT LINEAR REGULATOR

Description

The YJ1117 series of positive adjustable and fixed regulators are designed to provide 1A with high efficiency. All internal circuitry is designed to operate down to 1.4V input to output differential. Its circuit includes a trimmed bandgap reference to assure output voltage accuracy to be within $\pm 1\%$. Current limit the typical value of 1.5A allow to minimize the stress on both the regulator and the power source circuitry under overload conditions.

The YJ1117 is available in 1.2V, 1.5V, 1.8V, 2.5V, 2.85V, 3.0V, 3.3V, 3.5V, 5.0V fixed output voltage versions and ADJ output voltage version. The fixed versions integrate the adjust resistors. It is also available in an adjustable version which can set the output voltage with two external resistors.

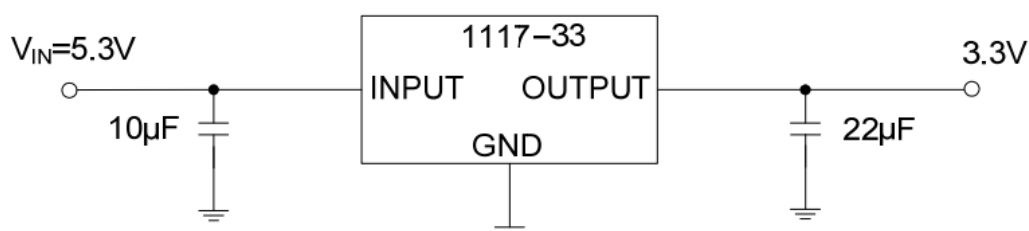
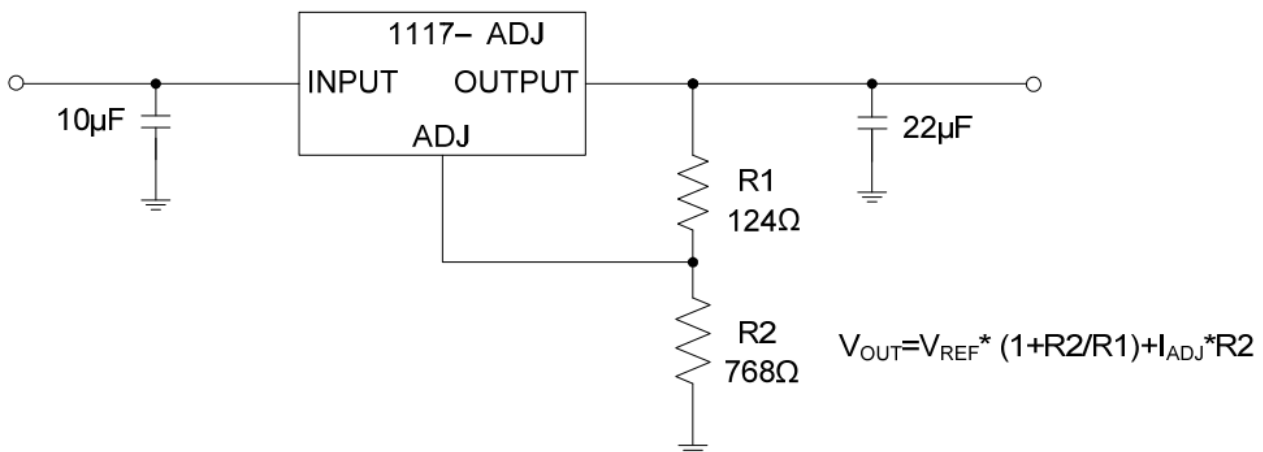
Features

- Adjustable or Fixed output.
- Output Current of 1A.
- Low Dropout, 1.3V typical at 1A Output Current.
- 0.04% Line Regulation.
- 0.2% Load Regulation.
- 100% Thermal Limit Burn-In.
- Fast Transient Response.

Applications

- PC Motherboard
- LCD Monitor
- Graphic Card
- Printer and Other Peripheral Equipment
- USB Device

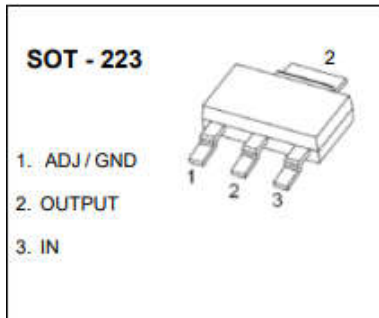
■ Typical Application



■ Package and Ordering Information

Model	Part Number	Package Description	Temperature Range	Ordering Number	Marking Information	Packing Option
YJ1117	YJ1117-ADJ	SOT-223	-40°C ~ 85°C	YJ1117-ADJLK3Y	1117-ADJ YWWXXX	Tape & Reel 2500
	YJ1117-12	SOT-223	-40°C ~ 85°C	YJ1117-12LK3Y	1117-12 YWWXXX	Tape & Reel 2500
	YJ1117-15	SOT-223	-40°C ~ 85°C	YJ1117-15LK3Y	1117-15 YWWXXX	Tape & Reel 2500
	YJ1117-18	SOT-223	-40°C ~ 85°C	YJ1117-18LK3Y	1117-18 YWWXXX	Tape & Reel 2500
	YJ1117-25	SOT-223	-40°C ~ 85°C	YJ1117-25LK3Y	1117-25 YWWXXX	Tape & Reel 2500
	YJ1117-28	SOT-223	-40°C ~ 85°C	YJ1117-28LK3Y	1117-28 YWWXXX	Tape & Reel 2500
	YJ1117-30	SOT-223	-40°C ~ 85°C	YJ1117-30LK3Y	1117-30 YWWXXX	Tape & Reel 2500
	YJ1117-33	SOT-223	-40°C ~ 85°C	YJ1117-33LK3Y	1117-33 YWWXXX	Tape & Reel 2500
	YJ1117-35	SOT-223	-40°C ~ 85°C	YJ1117-35LK3Y	1117-35 YWWXXX	Tape & Reel 2500
	YJ1117-50	SOT-223	-40°C ~ 85°C	YJ1117-50LK3Y	1117-50 YWWXXX	Tape & Reel 2500

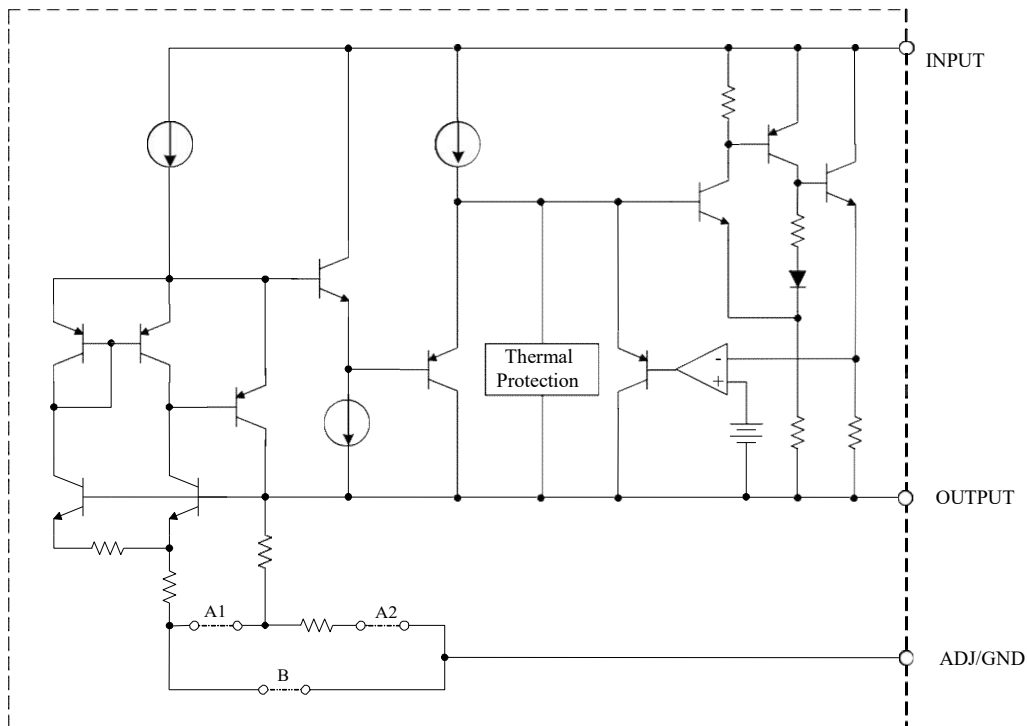
■ Pin Configuration and Top Mark



1117-XX : Part No.
XX: Output Voltage
YWW: Date Code
XXX: Tracking No.

XX	Output Voltage (V)	XX	Output Voltage (V)
ADJ	ADJ	28	2.85
12	1.2	30	3.0
15	1.5	33	3.3
18	1.8	35	3.5
25	2.5	50	5.0

■ Functional Block Diagram



■ Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Ratings	Unit
DC Input Voltage	V_{IN}	20	V
Operating Ambient Temperature	T_A	-40 to +85	$^\circ\text{C}$
Operating Junction Temperature	T_J	-40 to +125	$^\circ\text{C}$
Storage Temperature	T_{STG}	-65 to +150	$^\circ\text{C}$
Lead Temperature (Soldering, 10sec)	T_{LEAD}	260	$^\circ\text{C}$
Thermal Resistance from Junction to Ambient	SOT-223 θ_{JA}	70	$^\circ\text{C/W}$
Minimum ESD Rating (HBM)	V_{ESD}	2000	V

Notes:

1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.
2. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
3. This condition is only determined from design. It can't be 100% tested in mass production.

■ Recommended Operating Ratings

Parameter	Symbol	Ratings	Unit
Input Voltage	V_{IN}	15	V
Operating Junction Temperature	T_J	-40 to +125	$^\circ\text{C}$



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■ Electrical Characteristics ($V_{IN} \leq 10V$, $T_A = 25^\circ C$ unless otherwise noted)

For YJ1117-ADJ

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Reference Voltage	V_{REF}	$I_{OUT} = 10mA, V_{IN} = 3.23V$	1.231	1.250	1.269	V
		$1.5V \leq V_{IN} - V_{OUT} \leq 10V$	1.225	1.250	1.275	V
Line Regulation	LNR	$I_{OUT} = 10mA, 1.5V \leq V_{IN} - V_{OUT} \leq 10V$	-	0.04	0.2	%
Load Regulation	LDR	$10mA \leq I_{OUT} \leq 1A, V_{IN} = V_{OUT} + 1.5V$	-	0.2	0.4	%
Dropout Voltage	V_{DROP}	$I_{OUT} = 1A$	-	-	1.4	V
Quiescent Current	I_Q	$I_{OUT} = 0$	-	-	10	mA
Ripple Rejection	PSRR	$f = 120Hz, C_{OUT} = 22\mu F$ $(V_{IN} - V_{OUT}) = 3V, I_{OUT} = 300mA$	60	75	-	dB
RMS Output Noise (% of V_{OUT})	-	$10Hz \leq f \leq 10KHz$	-	0.003	-	%
Temperature Stability	-	-	-	0.5	-	%

For YJ1117-12

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V_{OUT}	$I_{OUT} = 10mA, V_{IN} = 3.2V$	1.176	1.200	1.224	V
		$1.5V \leq V_{IN} - V_{OUT} \leq 10V$	1.176	1.200	1.224	V
Line Regulation	LNR	$I_{OUT} = 10mA, 1.5V \leq V_{IN} - V_{OUT} \leq 10V$	-	0.04	0.2	%
Load Regulation	LDR	$10mA \leq I_{OUT} \leq 1A, V_{IN} = V_{OUT} + 1.5V$	-	0.2	0.4	%
Dropout Voltage	V_{DROP}	$I_{OUT} = 1A$	-	-	1.4	V
Quiescent Current	I_Q	$I_{OUT} = 0$	-	-	10	mA
Ripple Rejection	PSRR	$f = 120Hz, C_{OUT} = 22\mu F$ $(V_{IN} - V_{OUT}) = 3V, I_{OUT} = 300mA$	60	75	-	dB
RMS Output Noise (% of V_{OUT})	-	$10Hz \leq f \leq 10KHz$	-	0.003	-	%
Temperature Stability	-	-	-	0.5	-	%

For YJ1117-15

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V_{OUT}	$I_{OUT} = 10mA, V_{IN} = 3.5V$	1.477	1.500	1.522	V
		$1.5V \leq V_{IN} - V_{OUT} \leq 10V$	1.470	1.500	1.530	V
Line Regulation	LNR	$I_{OUT} = 10mA, 1.5V \leq V_{IN} - V_{OUT} \leq 10V$	-	0.04	0.2	%
Load Regulation	LDR	$10mA \leq I_{OUT} \leq 1A, V_{IN} = V_{OUT} + 1.5V$	-	0.2	0.4	%
Dropout Voltage	V_{DROP}	$I_{OUT} = 1A$	-	-	1.4	V
Quiescent Current	I_Q	$I_{OUT} = 0$	-	-	10	mA
Ripple Rejection	PSRR	$f = 120Hz, C_{OUT} = 22\mu F$ $(V_{IN} - V_{OUT}) = 3V, I_{OUT} = 300mA$	60	75	-	dB
RMS Output Noise (% of V_{OUT})	-	$10Hz \leq f \leq 10KHz$	-	0.003	-	%
Temperature Stability	-	-	-	0.5	-	%

For YJ1117-18

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V_{OUT}	$I_{OUT} = 10mA, V_{IN} = 3.8V$	1.773	1.800	1.827	V
		$1.5V \leq V_{IN} - V_{OUT} \leq 10V$	1.764	1.800	1.836	V
Line Regulation	LNR	$I_{OUT} = 10mA, 1.5V \leq V_{IN} - V_{OUT} \leq 10V$	-	0.04	0.2	%
Load Regulation	LDR	$10mA \leq I_{OUT} \leq 1A, V_{IN} = V_{OUT} + 1.5V$	-	0.2	0.4	%
Dropout Voltage	V_{DROP}	$I_{OUT} = 1A$	-	-	1.4	V
Quiescent Current	I_Q	$I_{OUT} = 0$	-	-	10	mA
Ripple Rejection	PSRR	$f = 120Hz, C_{OUT} = 22\mu F$ $(V_{IN} - V_{OUT}) = 3V, I_{OUT} = 300mA$	60	75	-	dB
RMS Output Noise (% of V_{OUT})	-	$10Hz \leq f \leq 10KHz$	-	0.003	-	%
Temperature Stability	-	-	-	0.5	-	%



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For YJ1117-25

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V _{OUT}	I _{OUT} = 10mA, V _{IN} = 4.5V	2.463	2.500	2.538	V
		1.5V ≤ V _{IN} - V _{OUT} ≤ 10V	2.450	2.500	2.550	V
Line Regulation	LNR	I _{OUT} = 10mA, 1.5V ≤ V _{IN} - V _{OUT} ≤ 10V	-	0.04	0.2	%
Load Regulation	LDR	10mA ≤ I _{OUT} ≤ 1A, V _{IN} = V _{OUT} + 1.5V	-	0.2	0.4	%
Dropout Voltage	V _{DROP}	I _{OUT} = 1A	-	-	1.4	V
Quiescent Current	I _Q	I _{OUT} = 0	-	-	10	mA
Ripple Rejection	PSRR	f = 120Hz, C _{OUT} = 22μF (V _{IN} - V _{OUT}) = 3V, I _{OUT} = 300mA	60	75	-	dB
RMS Output Noise (% of V _{OUT})	-	10Hz ≤ f ≤ 10KHz	-	0.003	-	%
Temperature Stability	-	-	-	0.5	-	%

For YJ1117-28

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V _{OUT}	I _{OUT} = 10mA, V _{IN} = 4.85V	2.807	2.850	2.893	V
		1.5V ≤ V _{IN} - V _{OUT} ≤ 10V	2.793	2.850	2.907	V
Line Regulation	LNR	I _{OUT} = 10mA, 1.5V ≤ V _{IN} - V _{OUT} ≤ 10V	-	0.04	0.2	%
Load Regulation	LDR	10mA ≤ I _{OUT} ≤ 1A, V _{IN} = V _{OUT} + 1.5V	-	0.2	0.4	%
Dropout Voltage	V _{DROP}	I _{OUT} = 1A	-	-	1.4	V
Quiescent Current	I _Q	I _{OUT} = 0	-	-	10	mA
Ripple Rejection	PSRR	f = 120Hz, C _{OUT} = 22μF (V _{IN} - V _{OUT}) = 3V, I _{OUT} = 300mA	60	75	-	dB
RMS Output Noise (% of V _{OUT})	-	10Hz ≤ f ≤ 10KHz	-	0.003	-	%
Temperature Stability	-	-	-	0.5	-	%

For YJ1117-30

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V _{OUT}	I _{OUT} = 10mA, V _{IN} = 5.0V	2.955	3.000	3.045	V
		1.5V ≤ V _{IN} - V _{OUT} ≤ 10V	2.940	3.000	3.060	V
Line Regulation	LNR	I _{OUT} = 10mA, 1.5V ≤ V _{IN} - V _{OUT} ≤ 10V	-	0.04	0.2	%
Load Regulation	LDR	10mA ≤ I _{OUT} ≤ 1A, V _{IN} = V _{OUT} + 1.5V	-	0.2	0.4	%
Dropout Voltage	V _{DROP}	I _{OUT} = 1A	-	-	1.4	V
Quiescent Current	I _Q	I _{OUT} = 0	-	-	10	mA
Ripple Rejection	PSRR	f = 120Hz, C _{OUT} = 22μF (V _{IN} - V _{OUT}) = 3V, I _{OUT} = 300mA	60	75	-	dB
RMS Output Noise (% of V _{OUT})	-	10Hz ≤ f ≤ 10KHz	-	0.003	-	%
Temperature Stability	-	-	-	0.5	-	%

For YJ1117-33

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V _{OUT}	I _{OUT} = 10mA, V _{IN} = 5.3V	3.251	3.300	3.350	V
		1.5V ≤ V _{IN} - V _{OUT} ≤ 10V	3.234	3.300	3.366	V
Line Regulation	LNR	I _{OUT} = 10mA, 1.5V ≤ V _{IN} - V _{OUT} ≤ 10V	-	0.04	0.2	%
Load Regulation	LDR	10mA ≤ I _{OUT} ≤ 1A, V _{IN} = V _{OUT} + 1.5V	-	0.2	0.4	%
Dropout Voltage	V _{DROP}	I _{OUT} = 1A	-	-	1.4	V
Quiescent Current	I _Q	I _{OUT} = 0	-	-	10	mA
Ripple Rejection	PSRR	f = 120Hz, C _{OUT} = 22μF (V _{IN} - V _{OUT}) = 3V, I _{OUT} = 300mA	60	75	-	dB
RMS Output Noise (% of V _{OUT})	-	10Hz ≤ f ≤ 10KHz	-	0.003	-	%
Temperature Stability	-	-	-	0.5	-	%



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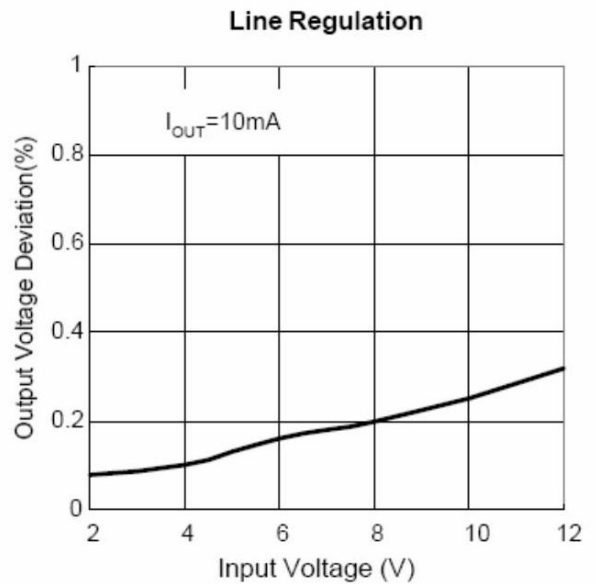
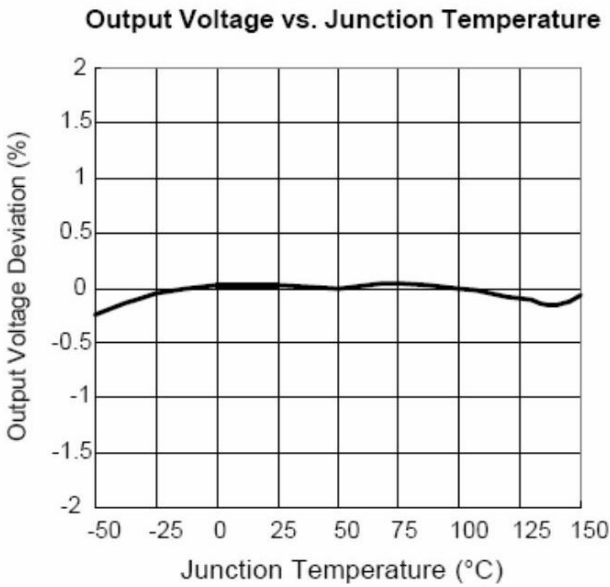
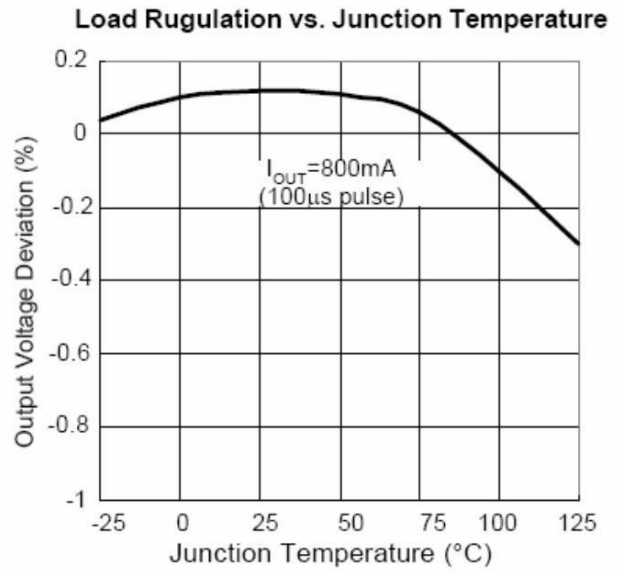
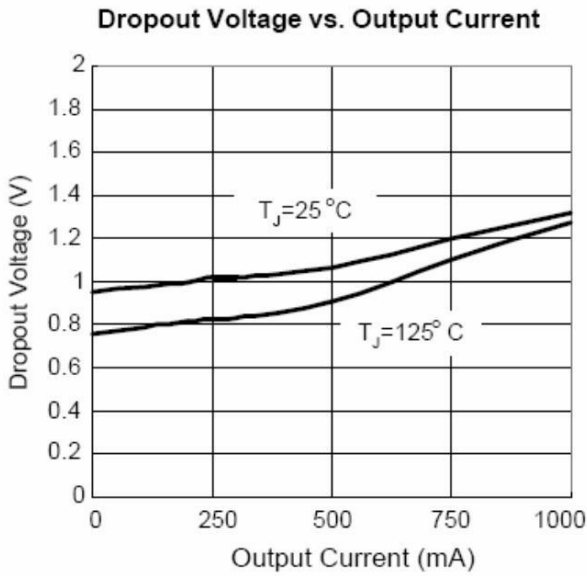
For YJ1117-35

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V_{OUT}	$I_{OUT} = 10mA, V_{IN} = 5.5V$	3.448	3.500	3.553	V
		$1.5V \leq V_{IN} - V_{OUT} \leq 10V$	3.430	3.500	3.570	V
Line Regulation	LNR	$I_{OUT} = 10mA, 1.5V \leq V_{IN} - V_{OUT} \leq 10V$	-	0.04	0.2	%
Load Regulation	LDR	$10mA \leq I_{OUT} \leq 1A, V_{IN} = V_{OUT} + 1.5V$	-	0.2	0.4	%
Dropout Voltage	V_{DROP}	$I_{OUT} = 1A$	-	-	1.4	V
Quiescent Current	I_Q	$I_{OUT} = 0$	-	-	10	mA
Ripple Rejection	PSRR	$f = 120Hz, C_{OUT} = 22\mu F$ $(V_{IN} - V_{OUT}) = 3V, I_{OUT} = 300mA$	60	75	-	dB
RMS Output Noise (% of V_{OUT})	-	$10Hz \leq f \leq 10KHz$	-	0.003	-	%
Temperature Stability	-	-	-	0.5	-	%

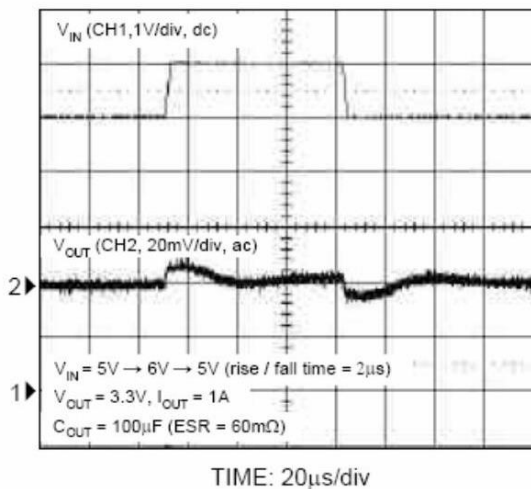
For YJ1117-50

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V_{OUT}	$I_{OUT} = 10mA, V_{IN} = 7V$	4.925	5.000	5.075	V
		$1.5V \leq V_{IN} - V_{OUT} \leq 10V$	4.900	5.000	5.100	V
Line Regulation	LNR	$I_{OUT} = 10mA, 1.5V \leq V_{IN} - V_{OUT} \leq 10V$	-	0.04	0.2	%
Load Regulation	LDR	$10mA \leq I_{OUT} \leq 1A, V_{IN} = V_{OUT} + 1.5V$	-	0.2	0.4	%
Dropout Voltage	V_{DROP}	$I_{OUT} = 1A$	-	-	1.4	V
Quiescent Current	I_Q	$I_{OUT} = 0$	-	-	10	mA
Ripple Rejection	PSRR	$f = 120Hz, C_{OUT} = 22\mu F$ $(V_{IN} - V_{OUT}) = 3V, I_{OUT} = 300mA$	60	75	-	dB
RMS Output Noise (% of V_{OUT})	-	$10Hz \leq f \leq 10KHz$	-	0.003	-	%
Temperature Stability	-	-	-	0.5	-	%

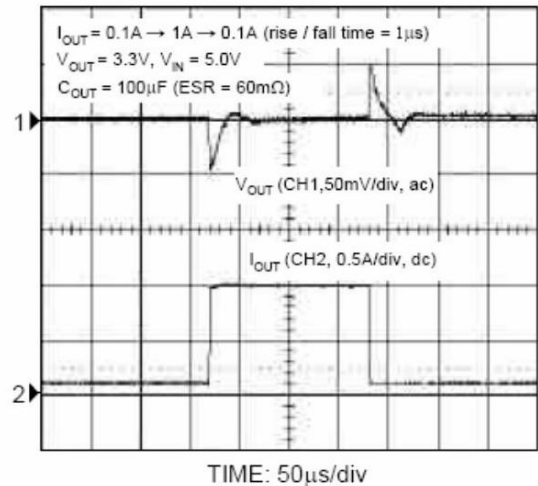
■ Typical Characteristics



Line Transient Response



Load Transient Response

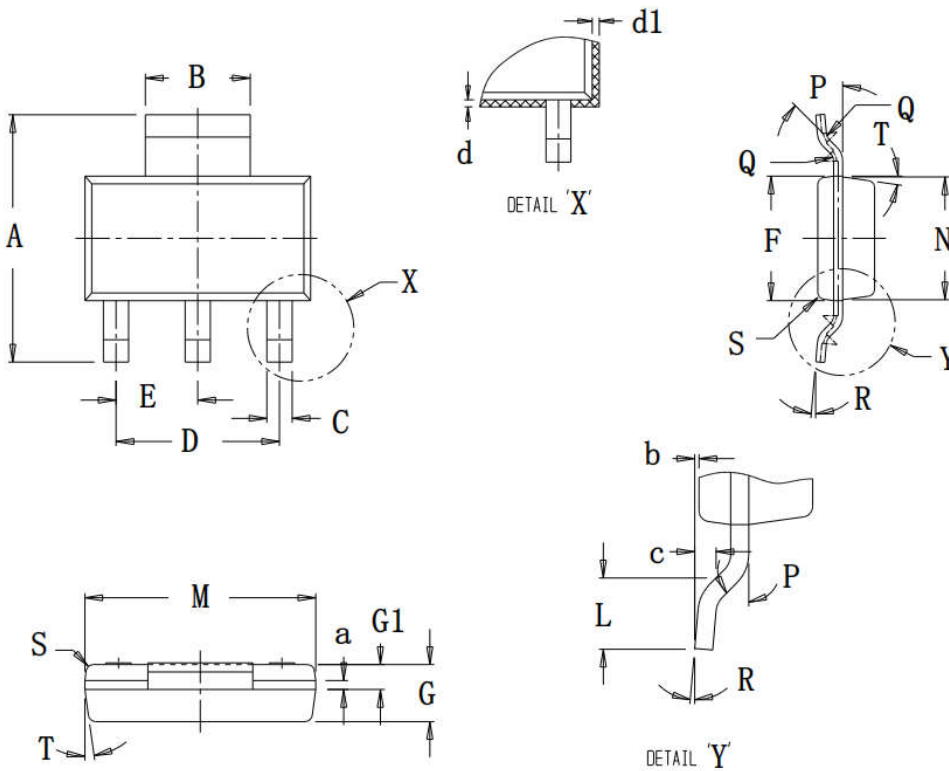




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■ Package Outline Drawing

SOT-223



COMMON DIMENSIONS UNITS: MEASURE=MILLIMETER			
SYMBOL	MIN	NOM	MAX
A	6.85	6.95	7.05
B	2.90	2.95	3.00
C	0.66	0.71	0.76
D	—	4.60	—
E	2.25	2.30	2.35
F	3.45	3.50	3.55
G	1.55	1.60	1.65
G1	0.675	0.700	0.725
L	0.90	1.00	1.10
M	6.45	6.50	6.55
N	3.40	3.45	3.50
P	—	45°REF	—
Q	—	R 0.3	—
R	0°	5°	10°
S	R 0.15	R 0.20	R 0.25
T	6°	8°	10°
a	—	0.254	—
b	0.02	0.06	0.10
c	—	0.30	—
d	0	—	0.10
d1	0	—	0.12



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