



IP1117/IP1117-18/IP1117-25/IP1117-33/IP1117-50

LDO Regulator with Adjustable and Fixed 1.8V, 2.5V,3.3V,5.0V

DESCRIPTION

The IP1117 is a series of low dropout voltage regulators which can provide up to 1.0A of output current. The IP1117 is available in four fixed voltages, 1.8V,2.5V,3.3V and 5.0V. In addition, it is also available in adjustable version. On chip precision trimming adjusts the reference/output voltage to within ±2%. Current limit is also trimmed to ensure specified output current and controlled short-circuit current. The IP1117 series is available in SOT-223 power packages.



FEATURES

- Adjustable and Fixed of 1.8V, 2.5V, 3.3V,5.0V
- Space saving SMD types of SOT-223
- 1.0A Output Current capability
- 1.1V drop-out voltage
- Foldback current limiting
- Thermal protection
- Over current protection

APPLICATIONS

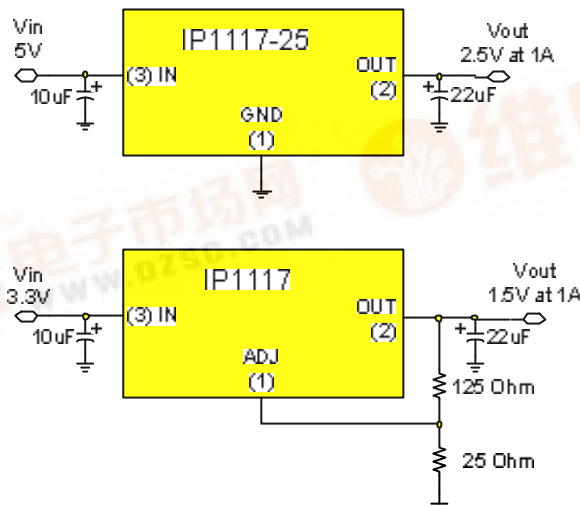
- Post Regulator for Switching DC/DC Converter
- CD Media
- Battery Charger
- Battery Powered Equipments

ORDERING INFORMATION

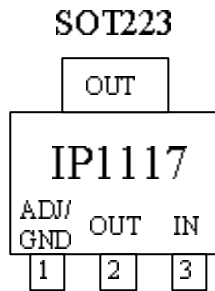
Device	Package	Operating Temp
IP1117/ IP1117L	SOT-223	-35°C ~ +125°C
IP1117-18/ IP1117L-18	SOT-223	
IP1117-25/ IP1117L-25	SOT-223	
IP1117-33/ IP1117L-33	SOT-223	
IP1117-50/ IP1117L-50	SOT-223	

L means Lead-free

TYPICAL APPLICATION CIRCUITS



PIN CONNECTIONS



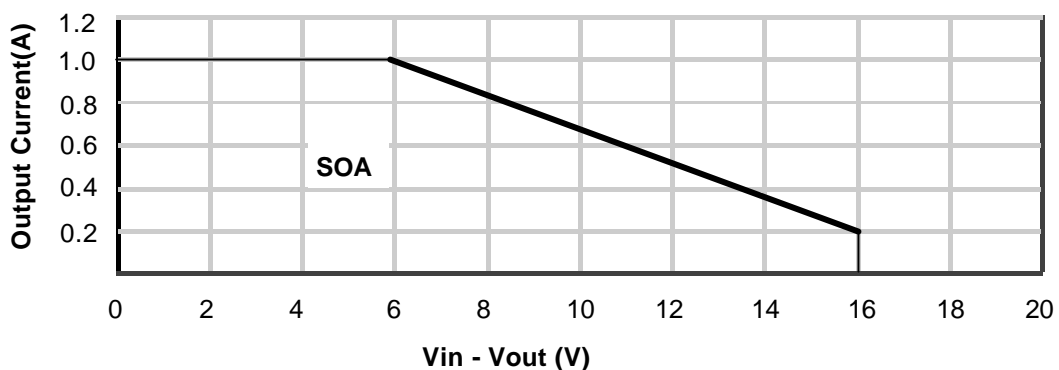
PIN DESCRIPTIONS

NO	SYMBOL	I/O	DESCRIPTION
1	ADJ/GND	-	Adjustable or Power Ground
2	OUT	O	Output
3	IN	I	Input

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Units
Input Voltage	Vinmax	18	V
Junction Temperature	Tj	-35 ~ +125	°C
Storage Temperature	Tstg	-55 ~ +150	°C

Absolute Maximum Safe Operating Area



Electrical Characteristics

($V_{in} = 5V$, $C_o = 10\mu F$, $T_a = 25^\circ C$, unless otherwise specified.)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Reference Voltage	Vref	IP1117 Only $1.5V < (V_{in} - V_{out}) < 7V$, $I_o = 10mA$	1.225	1.250	1.275	V
Output Voltage	Vout	IP1117-18 $10mA < I_{out} < 1A$, $3.3V < V_{in} < 10V$	1.764	1.800	1.836	V
		IP1117-25 $10mA < I_{out} < 1A$, $4.0V < V_{in} < 10V$	2.45	2.50	2.55	V
		IP1117-33 $10mA < I_{out} < 1A$, $4.75V < V_{in} < 10V$	3.234	3.300	3.366	V
		IP1117-50 $10mA < I_{out} < 1A$, $6.5V < V_{in} < 12V$	4.9	5.0	5.1	V
Line Regulation	dVout1	IP1117 $I_{out} = 10mA$, $1.5V < V_{in} - V_{out} < 12V$	-	0.035	0.2	%
		IP1117-18 $I_{out} = 10mA$, $3.3V < V_{in} < 15V$	-	1	4	mV
		IP1117-25 $I_{out} = 10mA$, $4.0V < V_{in} < 15V$	-	1	5	mV
		IP1117-33 $I_{out} = 10mA$, $4.75V < V_{in} < 15V$	-	1	7	mV
		IP1117-50 $I_{out} = 10mA$, $6.5V < V_{in} < 15V$	-	1	10	mV

ELECTRICAL CHARACTERISTICS

(Vin= 5V, Co=10uF, Ta = 25°C, unless otherwise specified.)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Load Regulation	dVout2	IP1117 Vin - Vout = 2.0V, 10mA < Iout < 1A	-	0.05	0.5	%
		IP1117-18 Vin = 3.8V, 10mA < Iout < 1A	-	1	9	mV
		IP1117-25 Vin = 4.5V, 10mA < Iout < 1A	-	1	12	mV
		IP1117-33 Vin = 5.3V, 10mA < Iout < 1A	-	1	16	mV
		IP1117-50 Vin = 7.0V, 10mA < Iout < 1A	-	1	25	mV
Dropout voltage	Vdrop	Iout = 100mA	-	1.0	1.15	V
		Iout = 1A	-	1.1	1.25	V
Quiescent current	Iq	Vin < 12V	-	5	10	mA
Ripple Rejection	RR	f = 120Hz, Cout = 22uF Tantalum, (Vin-Vout) = 3V, Vripple=1.0Vpp	60	72	-	dB
Current Limit	Ilimit	Vin - Vout = 2V	1	1.5	-	A
Adjust Pin Current	Iadj			-35	-100	uA
Adjust Pin Current Change	Ichg	10mA < Iout < 1A 1.5V < Vin - Vout < 12V		0.2	5	uA
Minimum Load Current	Imin	Only IP1117	10	-	-	mA
Long Term Stability	Stable	Ta=125°C, 1000hrs		0.03	1.0	%



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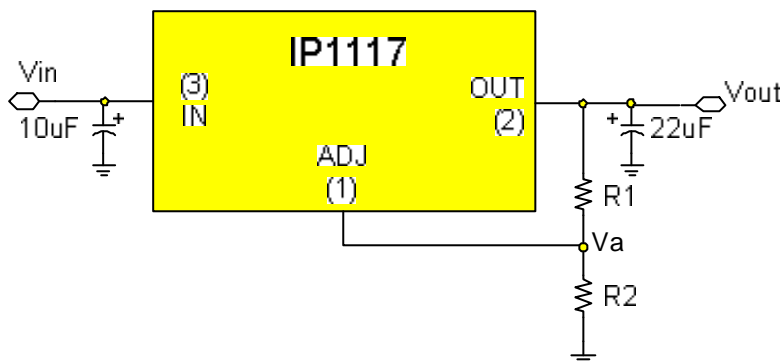
ELECTRICAL CHARACTERISTICS

($V_{in} = 5V$, $C_o = 10\mu F$, $T_a = 25^{\circ}C$, unless otherwise specified.)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
RMS Output Noise	Vn	10Hz < f < 10kHz	-	0.003	-	%
Thermal Shutdown	Tsd	Junction Temperature	-	150	-	$^{\circ}C$
Thermal Shutdown Hysteresis	Thys		-	10	-	$^{\circ}C$

APPLICATION SUMMARY

- Calculation of adjustable output voltage

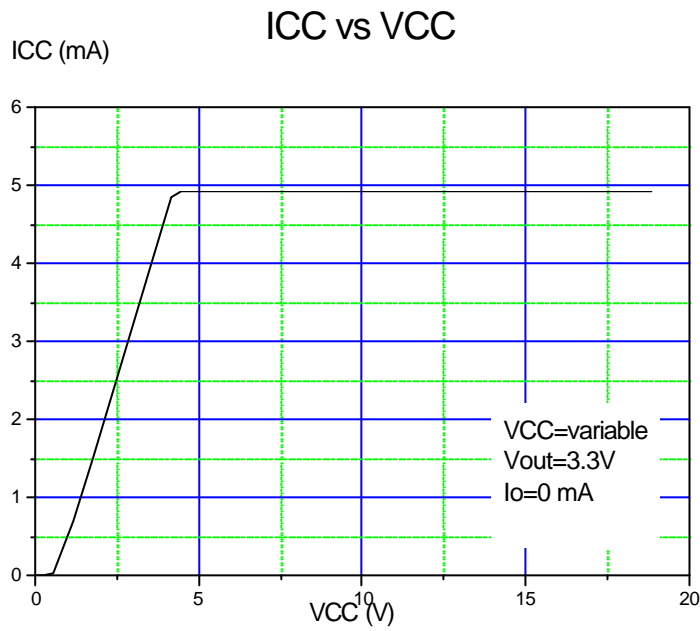


$$V_{out} = \left(1 + \frac{R_2}{R_1}\right) \times V_{ref} \quad (V_{ref} = 1.25V)$$

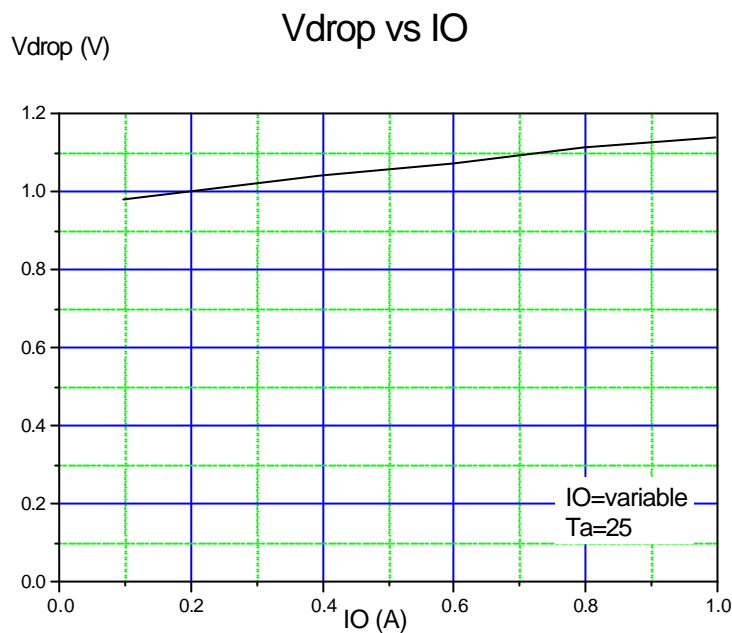
Example) R1=125 ohm, R2=25 ohm

$$V_{out} = \left(1 + \frac{25}{125}\right) \times 1.25 = 1.5$$

ELECTRICAL CHARACTERISTICS CURVES



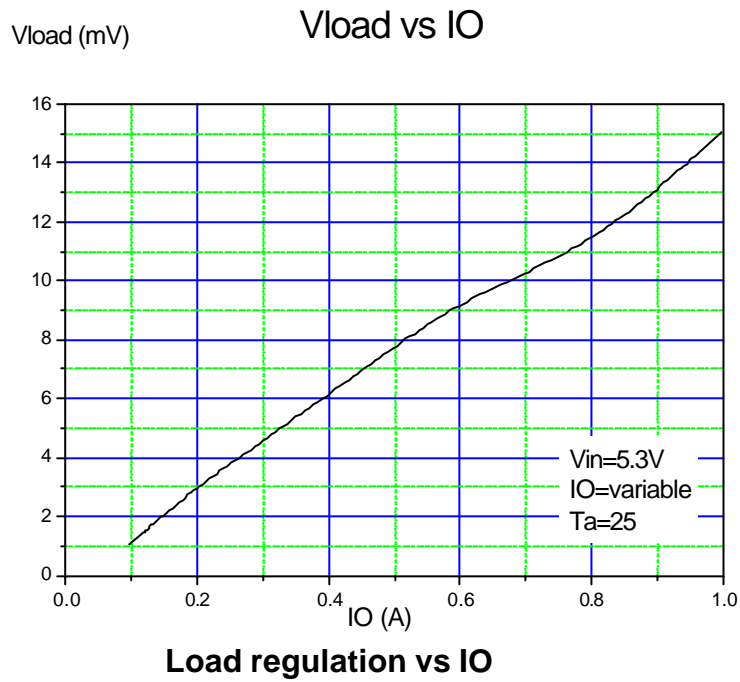
Quiescent current vs Vcc



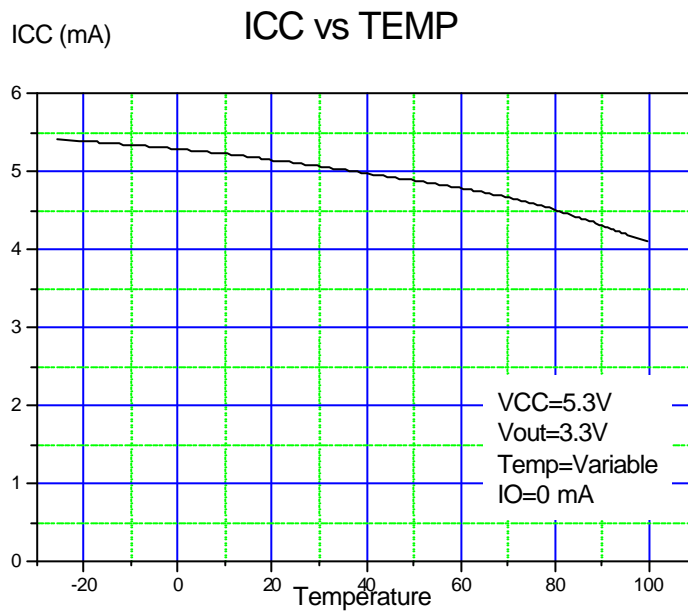
Drop out voltage vs IO



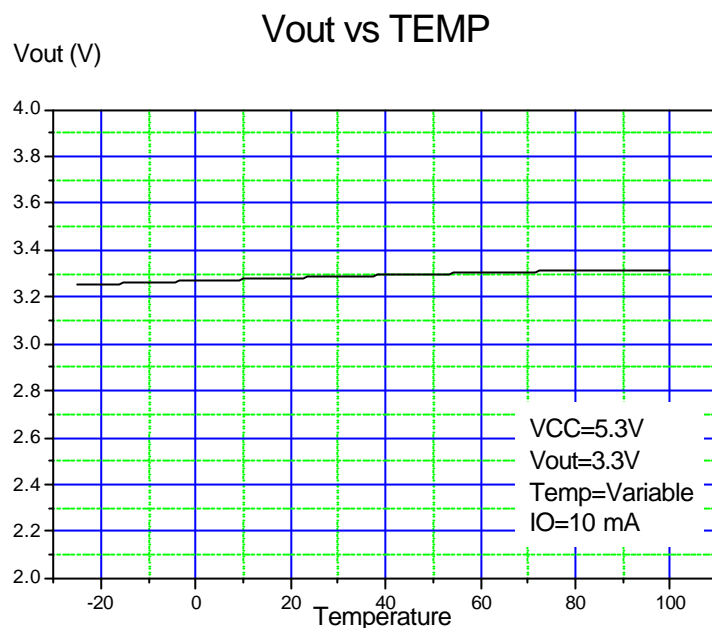
ELECTRICAL CHARACTERISTICS CURVES (Continued)



ELECTRICAL CHARACTERISTICS CURVES (Continued)

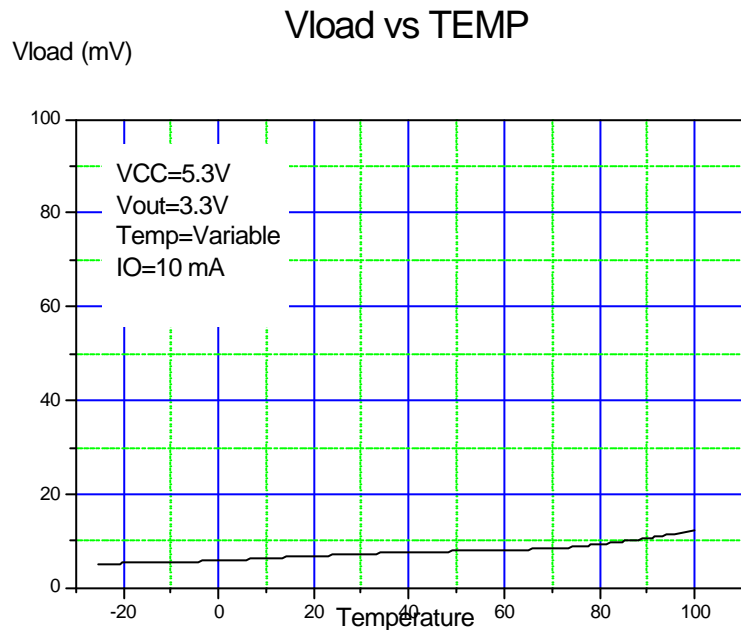


Quiescent current vs Temperature

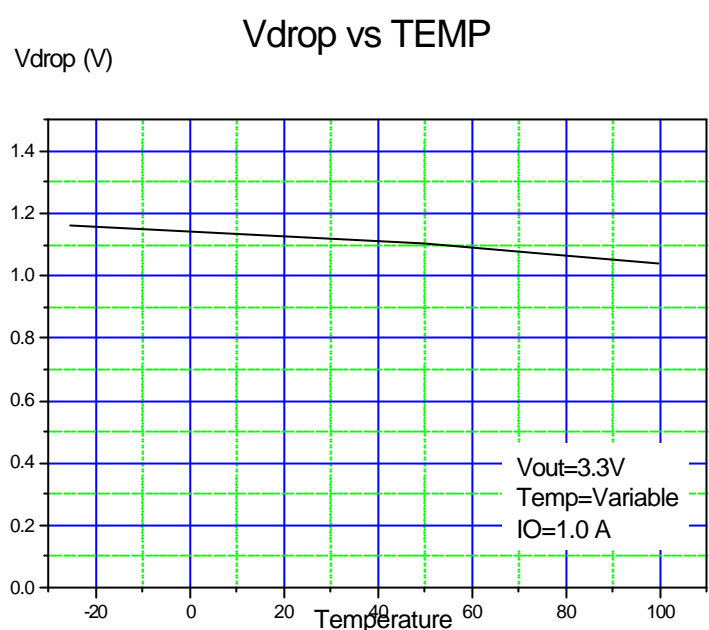


Output voltage vs Temperature

ELECTRICAL CHARACTERISTICS CURVES (Continued)



Load regulation vs Temperature



Drop out voltage vs Temperature

PACKAGE DIMENSION

SOT-223

