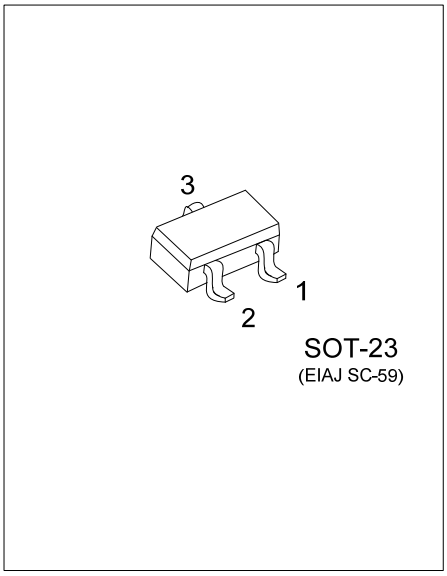
LD3117 *LINEAR INTEGRATED CIRCUIT*

500mA LOW DROPOUT LINEAR VOLTAGE REGULATORS



■ DESCRIPTION

The UTC **LD3117** are 500mA fixed output voltage low dropout linear regulators. Wide range of available output voltage fits most of applications. Built-in output current-limiting most thermal-limiting provide maximal protection against any fault conditions.

■ FEATURES

*Guaranteed 500mA output current
*Input voltage range up to 20V
*Extremely tight load regulation
*Fast transient response
*Current-limiting and Thermal-limiting
*Three-terminal adjustable or fixed 1.5V, 1.8V, 2.2V, 2.5V, 2.7V, 2.8V, 2.9V,3.0V, 3.3V, 3.5V, 3.6V, 3.7V, 4.7V, 5.0V

■ ORDERING INFORMATION

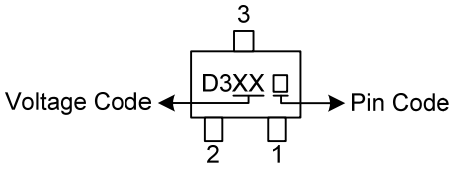
Ordering Number		Package	① Pin Assignment	Packing
Lead Free	Halogen Free			
LD3117L-xx-AE3-①-R	LD3117G-xx-AE3-①-R	SOT-23	A: GOI B: OGI C: GIO D: IGO	R: Tape Reel

Note: 1. Pin assignment: I: V_{IN} (Positive Power Input) O: V_{OUT} (Output) G: GND (Ground/Adjustable)
2. xx: Output Voltage, refer to Marking Information.

LD3117G-xx-AE3-①-R

(1)Packing Type	(1) R: Tape Reel
(2)Pin Assignment	(2) refer to Pin Assignment
(3)Package Type	(3) AE3: SOT-23
(4)Output Voltage Code	(4) xx: refer to Marking Information
(5)Green Package	(5) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	PIN CODE	PIN 1	PIN 2	PIN 3	MARKING
SOT-23	15:1.5V 18:1.8V 22:2.2V 25:2.5V	A	G	O	I	
	27:2.7V 28:2.8V 29:2.9V 30:3.0V	B	O	G	I	
	33:3.3V 35:3.5V 36:3.6V	C	G	I	O	
	37:3.7V 47:4.7V 50:5.0V AD:ADJ	D	I	G	O	

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage V_{IN}	V_{IN}	-0.3 ~ +20	V
Power Dissipation	P_D	295	mW
Operating Temperature	T_{OPR}	-40 ~ +85	°C
Storage Temperature	T_{STG}	-65 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	335	°C/W

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, C_{IN}=1μF, C_{OUT}=10μF, unless otherwise specified)

For LD3117-1.5V, 1.8V, 2.2V, 2.5V, 2.7V, 2.8V, 2.9V, 3.0V

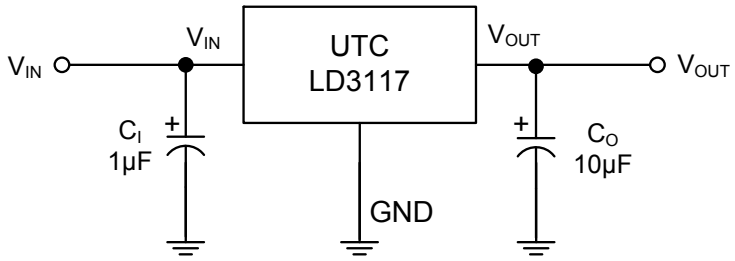
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	I_L=2mA, V_{IN}-V_{OUT}=1.4V	1.47	1.50	1.53	V
			1.77	1.80	1.83	V
			2.16	2.20	2.24	V
			2.45	2.50	2.55	V
			2.65	2.70	2.75	V
			2.74	2.80	2.86	V
			2.84	2.90	2.96	V
			2.94	3.00	3.06	V
Dropout Voltage (Note 4,5)	V_D	I_L=500mA			1.5	V
Line Regulation	ΔV_{OUT}	I_L=2mA, V_{IN}-V_{OUT}=2V ~ V_{IN}=9V			0.5	%V_{OUT}
Load Regulation (Note 2)	ΔV_{OUT}	I_L=2mA ~ 500mA, V_{IN}-V_{OUT} =2V		10	50	mV
Current Limit (Note 3)	I_{LIMIT}	V_{IN}-V_{OUT}=2V, V_{OUT}=0V		550		mA
Standby Current	I_{ST-BY}	I_L=0, V_{IN}=9V			5.0	mA

For LD3117-ADJ 3.3V, 3.5V, 3.6V, 3.7V, 4.7V, 5.0V

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
ADJUSTABLE (R1=120Ω, R2=200Ω, V_{OUT}=3.3V)							
Reference Voltage		V_{REF}	V_{IN}-V_{OUT}=2V, I_L=2mA	1.238	1.250	1.262	V
Output Voltage-LD3117		V_{OUT}	I_L=2mA, V_{IN}-V_{OUT}=1.4V	3.23	3.30	3.37	V
				3.43	3.50	3.57	V
				3.53	3.60	3.67	V
				3.63	3.70	3.77	V
				4.61	4.70	4.79	V
				4.90	5.00	5.10	V
Dropout Voltage (Notes 4, 5)	LD3117	V_D	I_L=500mA			1.3	V
	LD3117-ADJ	V_D	I_L=500mA			1.5	V
Line Regulation		ΔV_{OUT}	I_L=2mA, V_{IN}-V_{OUT}=2V ~ V_{IN}=12V			0.5	%V_{OUT}
Load Regulation (Note 2)		ΔV_{OUT}	I_L=2mA ~ 500mA, V_{IN}-V_{OUT} =2V		10	50	mV
Current Limit (Note 3)		I_{LIMIT}	V_{IN}-V_{OUT}=2V, V_{OUT}=0V		550		mA
Standby current		I_{ST-BY}	I_L=0, V_{IN}=12V			5.0	mA
Adjust Pin Current		I_{ADJ}	V_{IN}=12V			200	μA
Adjust Pin Current Change		ΔI_{ADJ}	V_{IN}=2.75V~12V, I_L=1mA~500mA			5	μA

Notes: 1. Guaranteed by design.
2. Regulation is measured at constant junction temperature, using pulsed ON time.
3. Current Limit is measured at constant junction temperature, using pulsed ON time.
4. Dropout is measured at constant junction temperature, using pulsed ON time, and the criterion is V_{OUT} inside target value±2%.
5: Dropout test is skipped at the condition of V_{IN}<3V.

■ TYPICAL APPLICATION CIRCUIT

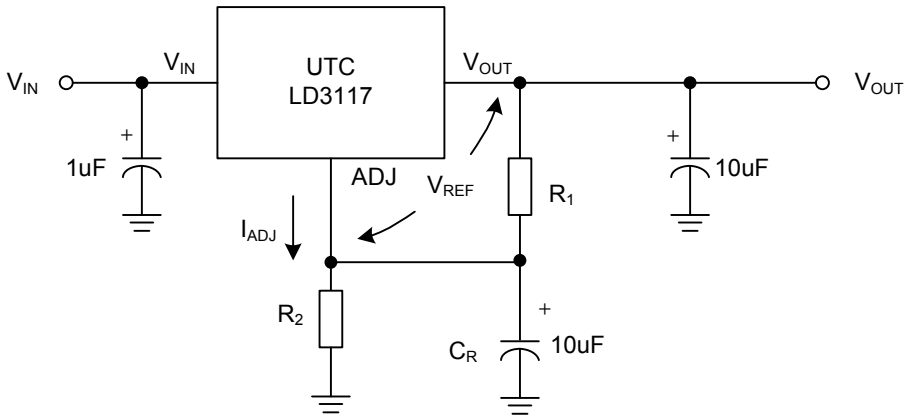


■ APPLICATION INFORMATION

A 10μF (or larger) capacitor is recommended between V_{OUT} and GND for stability. The part may oscillate without the capacitor. Any type of capacitor can be used, but not Aluminum electrolytics when operating below -25°C. The capacitance may be increased without limit.

A 1μF capacitor (or larger) should be placed between V_{IN} to GND.

LD3117 ADJUSTABLE



C_R:10uF to improve ripple rejection

$V_{OUT}=V_{REF}(1+R_2/R_1)+I_{ADJ}*R_2$