

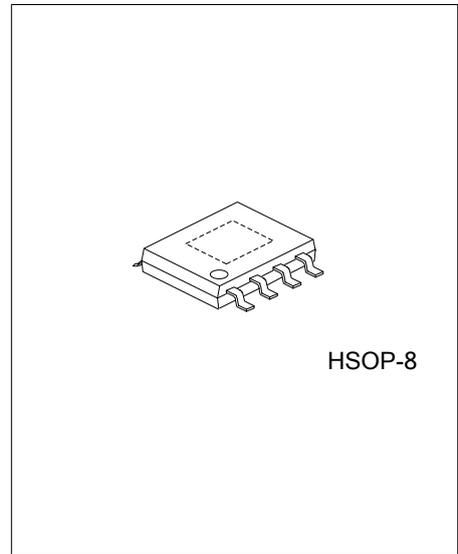


LD1119A

Advance

LINEAR INTEGRATED CIRCUIT

LOW DROP FIXED AND ADJUSTABLE POSITIVE VOLTAGE REGULATORS



DESCRIPTION

The UTC LD1119A is a low dropout, 3-terminal positive voltage regulator designed to provide output current up to 1A, There are adjustable version (VREF=1.25V) and various fixed versions.

FEATURES

- * Low dropout voltage
* Output current up to 1.0A
* Built-in current limit and over temperature protection
* Low current consumption
* Support MLCC

ORDERING INFORMATION

Table with columns: Ordering Number (Lead Free, Halogen Free), Package, Pin Assignment (1-8), Packing (Tape Reel)

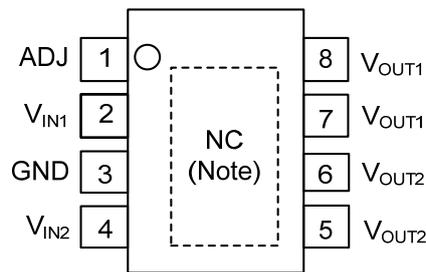
Notes: 1. Pin Assignment: A: ADJ G: GND I: VIN O: VOUT
2. xx: Output Voltage, Refer to Marking Information.

Table explaining LD1119AG-xx-SH2-R marking: (1) Packing Type, (2) Package Type, (3) Output Voltage Code, (4) Green Package

MARKING INFORMATIONS

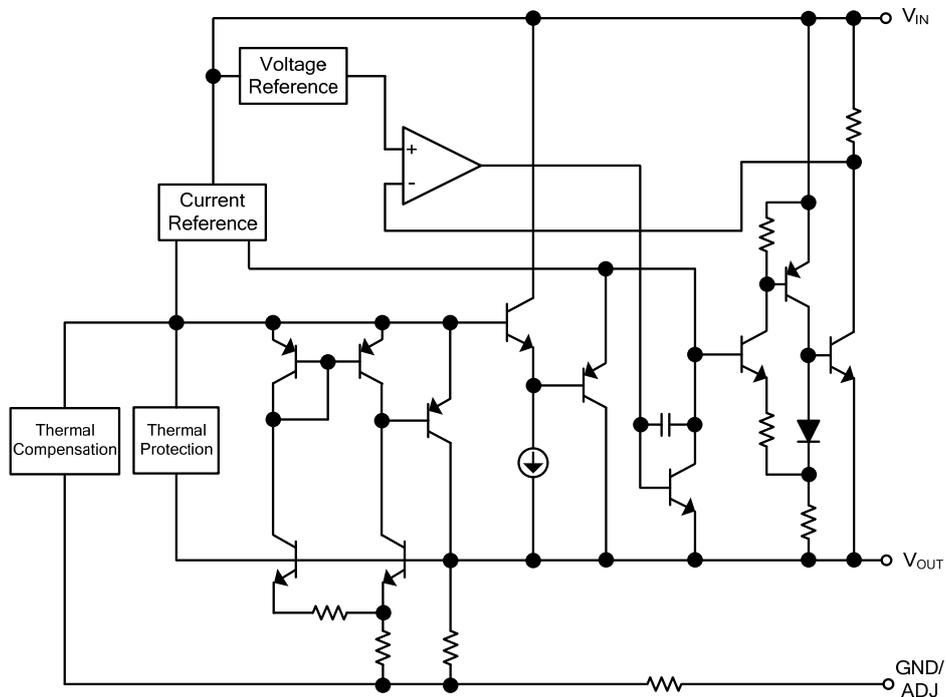
PACKAGE	VOLTAGE CODE		MARKING
	V _{OUT1}	V _{OUT2}	
HSOP-8	AD: ADJ	33: 3.3V	<p> Voltage Code at V_{OUT2} ← Voltage Code at V_{OUT1} ← </p> <p> UTC □□□□ → Date Code L: Lead Free G: Halogen Free Lot Code </p>

PIN CONFIGURATION



Note: No connect.

BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
DC Input Voltage	V_{IN}	18	V
Power Dissipation	P_D	Internally limited	
Junction Temperature	T_J	+150	$^\circ\text{C}$
Operating Temperature (Note 2)	T_{OPR}	-40 ~ +125	$^\circ\text{C}$
Storage temperature	T_{STG}	-65 ~ +150	$^\circ\text{C}$

Notes: 1. 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.

2. 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}	12	V

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	150	$^\circ\text{C}/\text{W}$

■ ELECTRICAL CHARACTERISTICS

($T_A=25^\circ\text{C}$, refer to the test circuits, $T_J=0 \sim 125^\circ\text{C}$, $C_O=10\mu\text{F}$ unless otherwise specified)

For LD1119A-3.3

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	$V_{IN}=5.3\text{V}$, $I_{OUT}=10\text{mA}$, $T_J=25^\circ\text{C}$	3.234	3.300	3.366	V
Output Voltage	V_{OUT}	$V_{IN}=4.75$ to 10V , $I_{OUT}=0\sim 1000\text{mA}$	3.234	3.300	3.366	V
Line Regulation	ΔV_{OUT}	$V_{IN}=4.75$ to 12V , $I_{OUT}=0\text{mA}$		1	8	mV
Load Regulation	ΔV_{OUT}	$V_{IN}=4.75\text{V}$, $I_{OUT}=0\sim 800\text{mA}$		1	10	mV
Operating Input Voltage	V_{IN}	$I_{OUT}=100\text{mA}$			12	V
Quiescent Current	I_Q	$V_{IN}\leq 12\text{V}$		5	10	mA
Current Limit	I_{LIMIT}	$V_{IN}=8.3\text{V}$, $T_J=25^\circ\text{C}$	1000			mA
Output Noise Voltage	e_N	$B=10\text{Hz}$ to 10KHz , $T_J=25^\circ\text{C}$		100		μV
Supply Voltage Rejection	SVR	$I_{OUT}=40\text{mA}$, $f=120\text{Hz}$, $T_J=25^\circ\text{C}$, $V_{IN}=6.3\text{V}$, $V_{RIPPLE}=1V_{PP}$		70		dB
Dropout Voltage	V_D	$I_{OUT}=800\text{mA}$		1.2	1.4	V

For LD1119A-ADJ

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Reference Voltage	V_{REF}	$V_{IN}-V_{OUT}=2\text{V}$, $I_{OUT}=10\text{mA}$, $T_J=25^\circ\text{C}$	1.225	1.25	1.275	V
Reference Voltage	V_{REF}	$V_{IN}-V_{OUT}=1.4$ to 10V , $I_{OUT}=10\sim 1000\text{mA}$	1.225	1.25	1.275	V
Line Regulation	ΔV_{OUT}	$V_{IN}-V_{OUT}=1.5$ to 12V , $I_{OUT}=10\text{mA}$		0.1	0.5	%
Load Regulation	ΔV_{OUT}	$V_{IN}-V_{OUT}=3\text{V}$, $I_{OUT}=10\sim 800\text{mA}$		0.1	0.4	%
Operating Input Voltage	V_{IN}				12	V
Adjustment Pin Current	I_{ADJ}	$V_{IN}\leq 12\text{V}$		100	150	μA
Adjustment Pin Current Change	ΔI_{ADJ}	$V_{IN}-V_{OUT}=1.4$ to 10V $I_{OUT}=10 \sim 1000\text{mA}$		1	5	μA
Minimum Load Current	$I_{O(MIN)}$	$V_{IN}=12\text{V}$		2	5	mA
Current Limit	I_{LIMIT}	$V_{IN}-V_{OUT}=5\text{V}$, $T_J=25^\circ\text{C}$	1000			mA
Supply Voltage Rejection	SVR	$I_{OUT}=40\text{mA}$, $f=120\text{Hz}$, $T_J=25^\circ\text{C}$, $V_{IN}-V_{OUT}=3\text{V}$, $V_{RIPPLE}=1V_{PP}$		70		dB
Dropout Voltage	V_D	$I_{OUT}=800\text{mA}$		1.2	1.4	V

■ APPLICATION NOTE of LD1119A ADJUSTABLE

The LD1119A adjustable has a reference voltage of between the OUT and ADJ/GND pins. I_{ADJ} is 60µA typ. (120µA max.) and ΔI_{ADJ} is 1µA typ. (5µA max.).

R_1 is normally fixed to 120Ω.

From figure 6 we obtain:

$$V_{OUT} = V_{REF} + R_2(I_{ADJ} + I_{R1}) = V_{REF} + R_2(I_{ADJ} + V_{REF}/R_1) = V_{REF}(1 + R_2/R_1) + R_2 \times I_{ADJ}$$

Usually R_2 value is in the range of few KΩ, so the $R_2 \times I_{ADJ}$ product could be neglected; then the above expression becomes: $V_{OUT} = V_{REF}(1 + R_2/R_1)$

For better load regulation, realize a good Kelvin connection of R_1 and R_2 is important. Particularly R_1 connection must be realized very close to OUT and ADJ/GND pin, while R_2 ground connection must be placed as near as possible to the negative Load pin. Ripple rejection can be improved by introducing a 10µF electrolytic capacitor placed in parallel to the R_2 resistor (See Fig. 8)

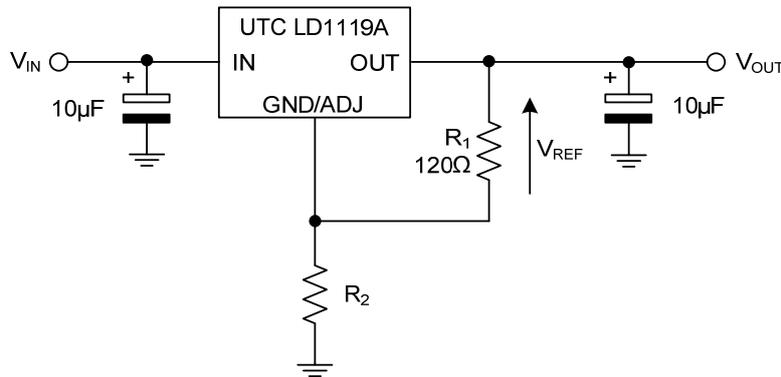


Fig.6 Adjustable Output Voltage Application Circuit

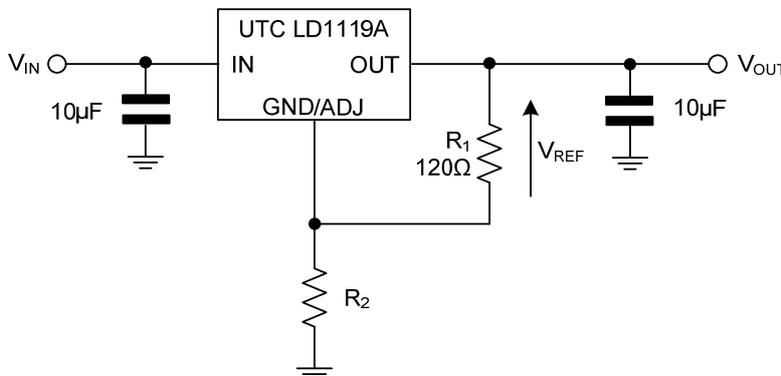


Fig.7 Adjustable Output Voltage Application Circuit (FOR MLCC)

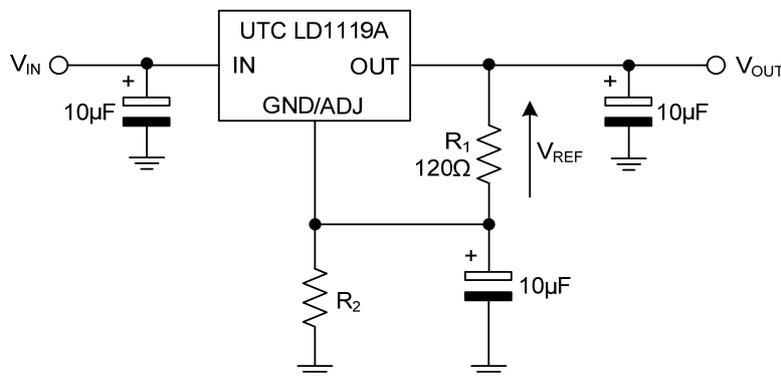


Fig.8 Adjustable Output Voltage Application with improved Ripple Rejection.

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