

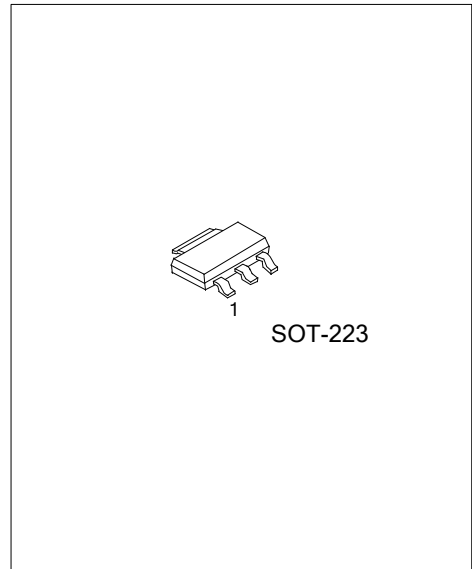


**LD2127/A**

Preliminary

**LINEAR INTEGRATED CIRCUIT**

**LOW DROPT FIXED AND ADJUSTABLE POSITIVE VOLTAGE REGULATORS**



■ DESCRIPTION

The UTC **LD2127/A** is a low dropout, 3-terminal positive voltage regulator designed to provide output current up to 800mA/1A, There are adjustable versions ( $V_{REF}=1.0V$ ) and various fixed versions.

■ FEATURES

- \* Low dropout voltage
- \* Suitable for SCSI-2 active termination if  $V_{OUT}$  set to 2.85V
- \* Output current up to 0.8A for 2127 and 1.0A for 2127A
- \* Built-in current limit and over temperature protection
- \* Ultra low Adjustment Current (7 $\mu$ A typ.)
- \* Ultra low minimum Load (0.3mA typ.)
- \* Stable with low ESR ceramic output capacitor (MLCC)

■ ORDERING INFORMATION

Ordering Number		Package	② Pin Assignment	Packing
Lead Free	Halogen Free			
LD2127①L-xx-AA3-②-R	LD2127①G-xx-AA3-②-R	SOT-223	A: AOI B: OAI C: AIO D: IAO	Tape Reel

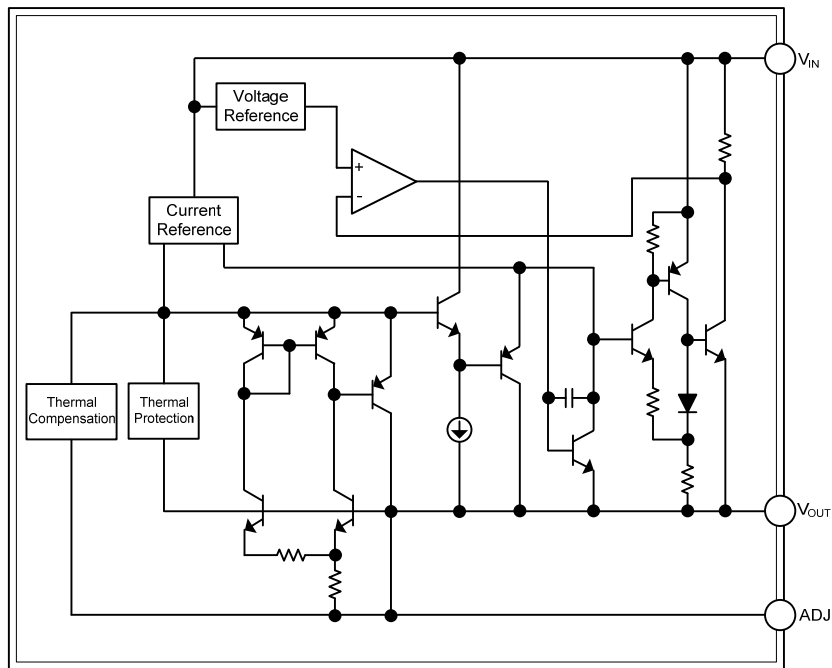
Note: Pin Assignment: I:  $V_{IN}$  O:  $V_{OUT}$  A: ADJ

<p>LD2127①L-xx-AA3-②-R</p>	<ul style="list-style-type: none"> <li>(1) R: Tape Reel</li> <li>(2) refer to Pin Assignment</li> <li>(3) AA3: SOT-223</li> <li>(4) xx: refer to Marking Information</li> <li>(5) L: Lead Free, G: Halogen Free</li> <li>(6) Blank: 800mA, A: 1A</li> </ul>
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MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-223	AD :ADJ	<p>Current Code ← [LD2127] → L: Lead Free            Voltage Code ← [XX] → G: Halogen Free            Pin Code            Date Code</p>

BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T<sub>A</sub>=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
DC Input Voltage	V <sub>IN</sub>	18	V
Power Dissipation	P <sub>D</sub>	Internally limited	W
Junction Temperature	T <sub>J</sub>	+150	°C
Storage temperature	T <sub>STG</sub>	-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.

■ RECOMMENDED OPERATING RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V <sub>IN</sub>	15	V
Operating Junction Temperature	T <sub>J</sub>	0 ~ +125	°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ <sub>JA</sub>	165	°C/W
Junction to Case	θ <sub>JC</sub>	15	°C/W

■ ELECTRICAL CHARACTERISTICS

(T<sub>A</sub>=25°C, refer to the test circuits, T<sub>J</sub>=0 ~ 125°C, C<sub>O</sub>=10μF unless otherwise specified)

For LD2127/A-ADJ

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Reference Voltage	V <sub>REF</sub>	V <sub>IN</sub> -V <sub>OUT</sub> =2V, I <sub>OUT</sub> =10mA, T <sub>J</sub> =25°C	0.98	1.0	1.02	V
Reference Voltage	V <sub>REF</sub>	V <sub>IN</sub> -V <sub>OUT</sub> =1.4~10V LD2127A : I <sub>OUT</sub> =10~1000mA	0.98	1.0	1.02	V
Line Regulation	ΔV <sub>OUT</sub>	V <sub>IN</sub> -V <sub>OUT</sub> =1.5 ~ 13.75V, I <sub>OUT</sub> =10mA		0.5		%
Load Regulation	ΔV <sub>OUT</sub>	V <sub>IN</sub> -V <sub>OUT</sub> =3V LD2127 : I <sub>OUT</sub> =10~800mA LD2127A : I <sub>OUT</sub> =10~1000mA		2.0		%
Temperature stability	ΔV <sub>OUT</sub>			0.50		%
Long Term Stability	ΔV <sub>OUT</sub>	1000 hrs, T <sub>J</sub> =125°C		0.3		%
Operating Input Voltage	V <sub>IN</sub>				15	V
Adjustment Pin Current	I <sub>ADJ</sub>	V <sub>IN</sub> ≤15V		7	10	μA
Adjustment Pin Current Change	ΔI <sub>ADJ</sub>	V <sub>IN</sub> -V <sub>OUT</sub> =1.4~10V, LD2127A : I <sub>OUT</sub> =10 ~ 1000mA		0.3	2	μA
Minimum Load Current	I <sub>O(MIN)</sub>	V <sub>IN</sub> =15V		0.3	1	mA
Current Limit	I <sub>LIMIT</sub>	V <sub>IN</sub> -V <sub>OUT</sub> =5V, T <sub>J</sub> =25°C	LD2127	800		mA
			LD2127A	1000		
Output Noise (%V <sub>O</sub> )	e <sub>N</sub>	B=10Hz ~ 10KHz, T <sub>J</sub> =25°C		0.003		%
Supply Voltage Rejection	SVR	I <sub>OUT</sub> =40mA, f=120Hz, T <sub>J</sub> =25°C, V <sub>IN</sub> -V <sub>OUT</sub> =3V, V <sub>RIPPLE</sub> =1V <sub>PP</sub>	75			dB
Dropout Voltage	V <sub>D</sub>	I <sub>OUT</sub> =100mA		1.05	1.15	V
		I <sub>OUT</sub> =500mA		1.15	1.25	
		I <sub>OUT</sub> =800mA		1.18	1.28	
		I <sub>OUT</sub> =1A		1.22	1.35	
Thermal Regulation		T <sub>A</sub> =25°C, 30ms Pulse		0.01	0.10	%/W
Thermal Shutdown	OTP			150		°C

■ APPLICATION NOTE of LD2127/A ADJUSTABLE

The **LD2127/A** adjustable has a reference voltage of between the OUT and ADJ pins.  $I_{ADJ}$  is  $7\mu\text{A}$  typ. ( $10\mu\text{A}$  max.) and  $\Delta I_{ADJ}$  is  $0.3\mu\text{A}$  typ. ( $2\mu\text{A}$  max.).

$R_1$  is normally fixed to  $1.2\text{k}\Omega$ .

From figure 1 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  $\text{k}\Omega$ , 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 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  $10\mu\text{F}$  electrolytic capacitor placed in parallel to the  $R_2$  resistor (See Fig. 2)

The UTC **LD2127/A** also supports MLCC. See Fig.3 for adjustable output.

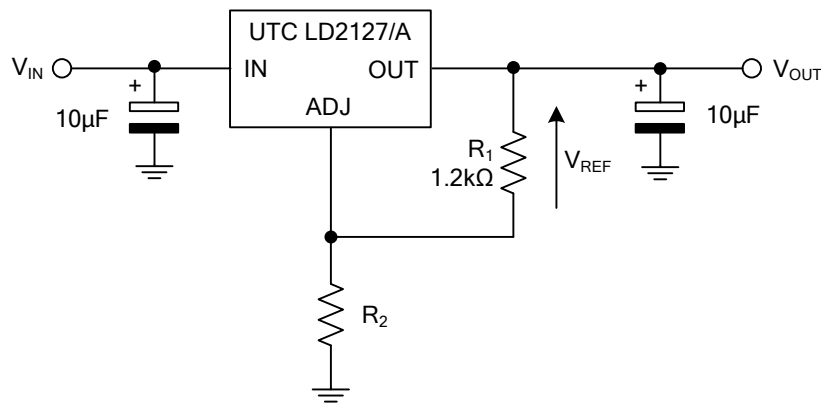


Fig.1 Adjustable Output Voltage Application Circuit

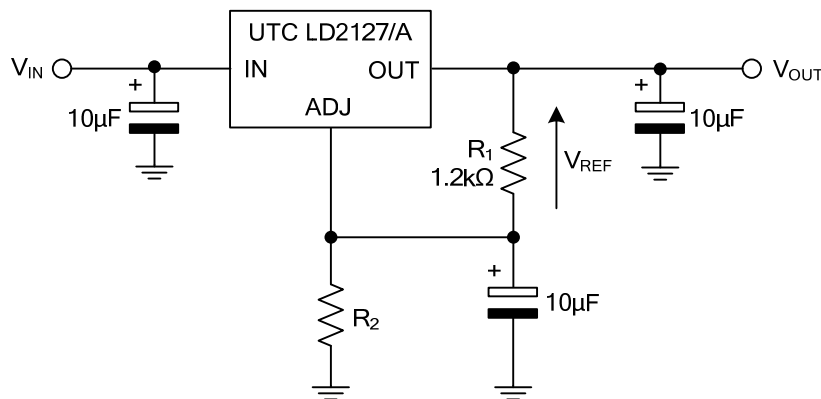


Fig.2 Adjustable Output Voltage Application with improved Ripple Rejection.

■ APPLICATION NOTE of LD2127/A ADJUSTABLE(Cont.)

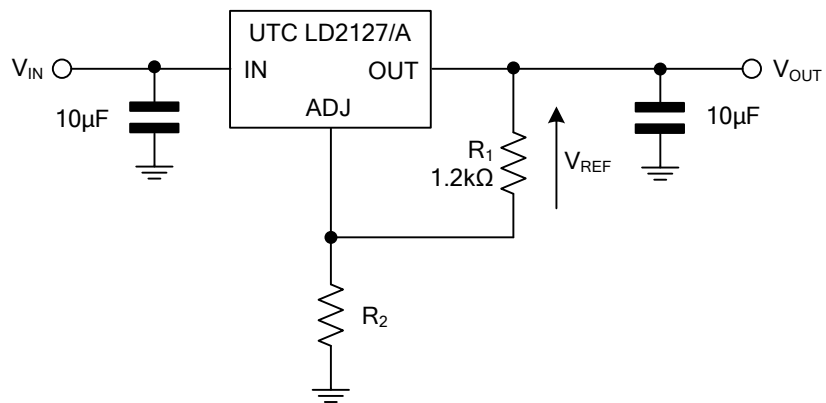
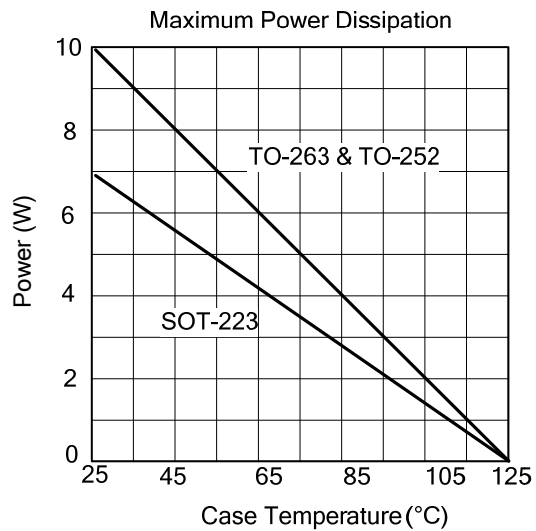


Fig.3 Adjustable Output Voltage Application Circuit for MLCC

## ■ TYPICAL CHARACTERISTICS



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