



## LD1117/A

## LINEAR INTEGRATED CIRCUIT

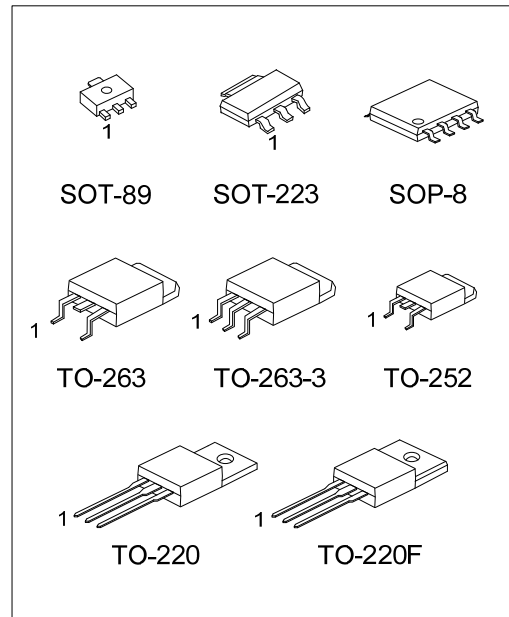
### LOW DROP FIXED AND ADJUSTABLE POSITIVE VOLTAGE REGULATORS

#### DESCRIPTION

The UTC **LD1117/A** is a low dropout, 3-terminal positive voltage regulator designed to provide output current up to 800mA/1A, There are adjustable version ( $V_{REF}=1.25V$ ) 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 1117 and 1.0A for 1117A
- \* Built-in current limit and over temperature protection
- \* Available in  $\pm 1%$ (at 25°C) and 2% in all temperature range
- \* Low current consumption
- \* Support MLCC



Lead-free: LD1117L-xx / LD1117AL-xx  
 Halogen-free: LD1117G-xx / LD1117AG-xx

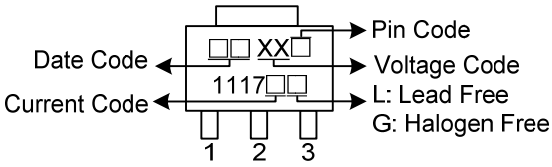
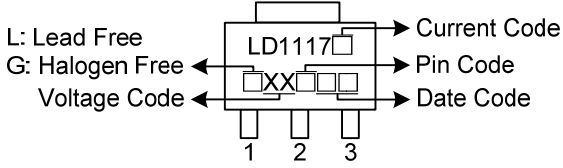
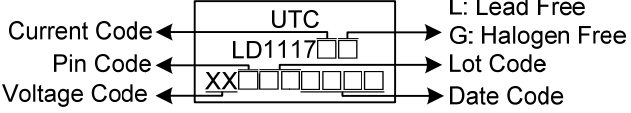
#### ORDERING INFORMATION

Ordering Number			Package	② Pin Assignment	Packing
Normal	Lead Free	Halogen Free			
LD1117①-xx-AA3-②-③	LD1117①L-xx-AA3-②-③	LD1117①G-xx-AA3-②-③	SOT-223	A: GOI B: OGI C: GIO D: IGO	R: Tape Reel T: Tube
LD1117①-xx-AB3-②-③	LD1117①L-xx-AB3-②-③	LD1117①G-xx-AB3-②-③	SOT-89		
LD1117①-xx-TA3-②-③	LD1117①L-xx-TA3-②-③	LD1117①G-xx-TA3-②-③	TO-220		
LD1117①-xx-TF3-②-③	LD1117①L-xx-TF3-②-③	LD1117①G-xx-TF3-②-③	TO-220F		
LD1117①-xx-TN3-②-③	LD1117①L-xx-TN3-②-③	LD1117①G-xx-TN3-②-③	TO-252		
LD1117①-xx-TQ2-②-③	LD1117①L-xx-TQ2-②-③	LD1117①G-xx-TQ2-②-③	TO-263		
LD1117①-xx-TQ3-②-③	LD1117①L-xx-TQ3-②-③	LD1117①G-xx-TQ3-②-③	TO-263-3		
LD1117①-xx-S08-②-③	LD1117①L-xx-S08-②-③	LD1117①G-xx-S08-②-③	SOP-8		

Note: Pin Assignment: I:V<sub>IN</sub> O:V<sub>OUT</sub> G:GND/ADJ

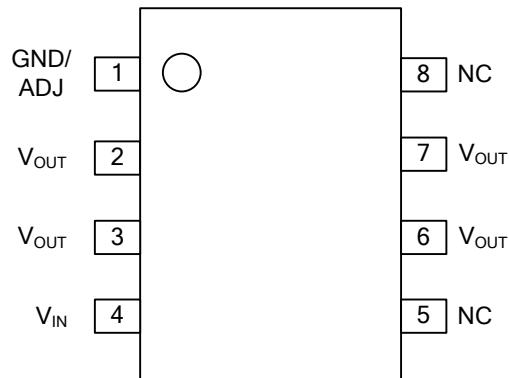
<p>LD1117①L-xx-AA3-②-③</p> <p>(1)Packing Type (2)Pin Assignment (3)Package Type (4)Output Voltage Code (5)Lead Plating (6)Current Code</p>	<p>(1) R: Tape Reel, T: Tube (2) refer to Pin Assignment (3) AA3: SOT-223, AB3: SOT-89, TA3:TO-220, TF3: TO-220F, TN3: TO-252, TQ2: TO-263, TQ3: TO-263-3, S08: SOT-8 (4) xx: refer to Marking Information (5) G: Halogen Free, L: Lead Free, Blank: Pb/Sn (6) Blank: 800mA, A: 1A</p>
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### MARKING INFORMATION

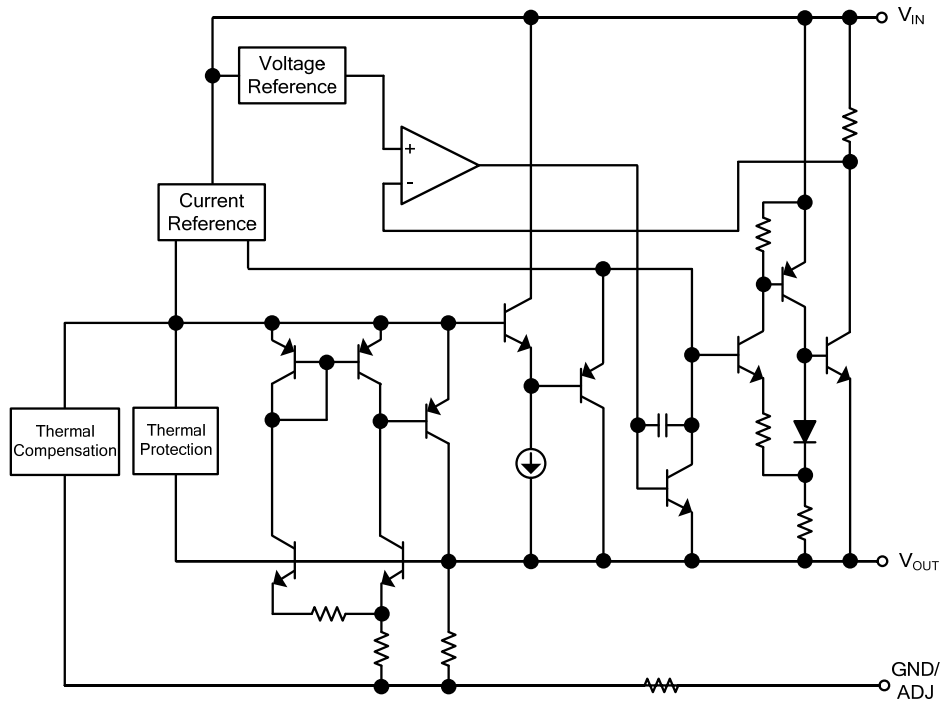
PACKAGE	VOLTAGE CODE	MARKING
SOT-89		
SOT-223	12 :1.2V 15 :1.5V 18 :1.8V 25 :2.5V 2J :2.85V 30 :3.0V 33 :3.3V 36 :3.6V 50 :5.0V AD :ADJ	
TO-220 TO-220F TO-252 TO-263 TO-263-3		

Note: Current code: Blank: 0.8A A: 1A

### PIN CONFIGURATION of SOP-8



## ■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS ( $T_a=25^{\circ}\text{C}$ )

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

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	$V_{IN}$	15	V
Operating Junction Temperature Range	$T_J$	0 ~ +125	$^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223	$\theta_{JA}$	165	$^{\circ}\text{C/W}$
	SOT-89		180	$^{\circ}\text{C/W}$
	SOP-8		150	$^{\circ}\text{C/W}$
	TO-252		112	$^{\circ}\text{C/W}$
	TO-220		54	$^{\circ}\text{C/W}$
	TO-263		64	$^{\circ}\text{C/W}$
Junction to Case	SOT-223	$\theta_{JC}$	15	$^{\circ}\text{C/W}$
	SOT-89		50	$^{\circ}\text{C/W}$
	SOP-8		20	$^{\circ}\text{C/W}$
	TO-252		12	$^{\circ}\text{C/W}$
	TO-220		4	$^{\circ}\text{C/W}$
	TO-263		4	$^{\circ}\text{C/W}$

### ■ ELECTRICAL CHARACTERISTICS

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

#### For LD1117/A-1.2

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	$V_{OUT}$	$V_{IN}=3.2\text{V}$ , $I_{OUT}=10\text{mA}$ , $T_J=25^\circ\text{C}$	1.176	1.200	1.224	V
Output Voltage	$V_{OUT}$	$V_{IN}=2.7$ to $8\text{V}$ LD1117 : $I_{OUT}=10\sim 800\text{mA}$ LD1117A : $I_{OUT}=10\sim 1000\text{mA}$	1.176	1.200	1.224	V
Line Regulation	$\Delta V_{OUT}$	$V_{IN}=2.7$ to $8\text{V}$ , $I_{OUT}=10\text{mA}$		1	6	mV
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=2.7\text{V}$ LD1117 : $I_{OUT}=10\sim 800\text{mA}$ LD1117A : $I_{OUT}=10\sim 1000\text{mA}$		1	10	mV
Temperature stability	$\Delta V_{OUT}$			0.5		%
Long Term Stability	$\Delta V_{OUT}$	1000 hrs, $T_J=125^\circ\text{C}$		0.3		%
Operating Input Voltage	$V_{IN}$	$I_{OUT}=100\text{mA}$			15	V
Quiescent Current	$I_Q$	$V_{IN}\leq 10\text{V}$		5	10	mA
Current Limit	$I_{LIMIT}$	$V_{IN}=6.2\text{V}$ , $T_J=25^\circ\text{C}$	LD1117	800		mA
			LD1117A	1000		
Minimum Load Current	$I_{O(MIN)}$	$V_{IN}=15\text{V}$		2	5	mA
Output Noise Voltage	eN	$B=10\text{Hz}$ to $10\text{KHz}$ , $T_J=25^\circ\text{C}$		100		$\mu\text{V}$
Supply Voltage Rejection	SVR	$I_{OUT}=40\text{mA}$ , $f=120\text{Hz}$ , $T_J=25^\circ\text{C}$ , $V_{IN}=4.2\text{V}$ , $V_{RIPPLE}=1\text{Vpp}$	60	75		dB
Dropout Voltage	$V_D$	$I_{OUT}=100\text{mA}$		1.00	1.10	V
		$I_{OUT}=500\text{mA}$		1.15	1.25	
		$I_{OUT}=800\text{mA}$		1.20	1.30	
		$I_{OUT}=1\text{A}$		1.20	1.30	
Thermal Regulation		$T_a=25^\circ\text{C}$ , 30ms Pulse		0.01	0.10	%/W

#### For LD1117/A-1.5

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	$V_{OUT}$	$V_{IN}=3.5\text{V}$ , $I_{OUT}=10\text{mA}$ , $T_J=25^\circ\text{C}$	1.470	1.500	1.530	V
Output Voltage	$V_{OUT}$	$V_{IN}=3$ to $8\text{V}$ LD1117 : $I_{OUT}=0\sim 800\text{mA}$ LD1117A : $I_{OUT}=0\sim 1000\text{mA}$	1.470	1.500	1.530	V
Line Regulation	$\Delta V_{OUT}$	$V_{IN}=3$ to $8\text{V}$ , $I_{OUT}=0\text{mA}$		1	6	mV
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=3\text{V}$ LD1117 : $I_{OUT}=0\sim 800\text{mA}$ LD1117A : $I_{OUT}=0\sim 1000\text{mA}$		1	10	mV
Temperature stability	$\Delta V_{OUT}$			0.5		%
Long Term Stability	$\Delta V_{OUT}$	1000 hrs, $T_J=125^\circ\text{C}$		0.3		%
Operating Input Voltage	$V_{IN}$	$I_{OUT}=100\text{mA}$			15	V
Quiescent Current	$I_Q$	$V_{IN}\leq 10\text{V}$		5	10	mA
Current Limit	$I_{LIMIT}$	$V_{IN}=6.5\text{V}$ , $T_J=25^\circ\text{C}$	LD1117	800		mA
			LD1117A	1000		
Output Noise Voltage	eN	$B=10\text{Hz}$ to $10\text{KHz}$ , $T_J=25^\circ\text{C}$		100		$\mu\text{V}$
Supply Voltage Rejection	SVR	$I_{OUT}=40\text{mA}$ , $f=120\text{Hz}$ , $T_J=25^\circ\text{C}$ , $V_{IN}=4.5\text{V}$ , $V_{RIPPLE}=1\text{Vpp}$	60	75		dB
Dropout Voltage	$V_D$	$I_{OUT}=100\text{mA}$		1.00	1.10	V
		$I_{OUT}=500\text{mA}$		1.15	1.25	
		$I_{OUT}=800\text{mA}$		1.20	1.30	
		$I_{OUT}=1\text{A}$		1.20	1.30	
Thermal Regulation		$T_a=25^\circ\text{C}$ , 30ms Pulse		0.01	0.10	%/W

■ ELECTRICAL CHARACTERISTICS(Cont.)

For LD1117/A-1.8

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
Output Voltage	$V_{OUT}$	$V_{IN}=3.8V, I_{OUT}=10mA, T_J=25^{\circ}C$	1.764	1.800	1.836	V	
Output Voltage	$V_{OUT}$	$V_{IN}=3.3$ to 8V LD1117 : $I_{OUT}=0\sim 800mA$ LD1117A : $I_{OUT}=0\sim 1000mA$	1.764	1.800	1.836	V	
Line Regulation	$\Delta V_{OUT}$	$V_{IN}=3.3$ to 8V, $I_{OUT}=0mA$		1	6	mV	
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=3.3V$ LD1117 : $I_{OUT}=0\sim 800mA$ LD1117A : $I_{OUT}=0\sim 1000mA$		1	10	mV	
Temperature stability	$\Delta V_{OUT}$			0.5		%	
Long Term Stability	$\Delta V_{OUT}$	1000 hrs, $T_J=125^{\circ}C$		0.3		%	
Operating Input Voltage	$V_{IN}$	$I_{OUT}=100mA$			15	V	
Quiescent Current	$I_Q$	$V_{IN}\leq 10V$		5	10	mA	
Current Limit	$I_{LIMIT}$	$V_{IN}=6.8V, T_J=25^{\circ}C$	LD1117	800		mA	
			LD1117A	1000			
Output Noise Voltage	eN	B=10Hz to 10KHz, $T_J=25^{\circ}C$		100		$\mu V$	
Supply Voltage Rejection	SVR	$I_{OUT}=40mA, f=120Hz, T_J=25^{\circ}C,$ $V_{IN}=5.5V, V_{RIPPLE}=1V_{pp}$	60	75		dB	
Dropout Voltage	$V_D$	$I_{OUT}=100mA$		1.00	1.10	V	
			$I_{OUT}=500mA$		1.15		1.25
			$I_{OUT}=800mA$		1.20		1.30
			$I_{OUT}=1A$		1.20		1.30
Thermal Regulation		$T_a=25^{\circ}C, 30ms$ Pulse		0.01	0.10	%/W	

For LD1117/A-2.5

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
Output Voltage	$V_{OUT}$	$V_{IN}=4.5V, I_{OUT}=10mA, T_J=25^{\circ}C$	2.450	2.500	2.550	V	
Output Voltage	$V_{OUT}$	$V_{IN}=3.9$ to 10V LD1117 : $I_{OUT}=0\sim 800mA$ LD1117A : $I_{OUT}=0\sim 1000mA$	2.450	2.500	2.550	V	
Line Regulation	$\Delta V_{OUT}$	$V_{IN}=3.9$ to 10V, $I_{OUT}=0mA$		1	6	mV	
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=3.9V$ LD1117 : $I_{OUT}=0\sim 800mA$ LD1117A : $I_{OUT}=0\sim 1000mA$		1	10	mV	
Temperature stability	$\Delta V_{OUT}$			0.5		%	
Long Term Stability	$\Delta V_{OUT}$	1000 hrs, $T_J=125^{\circ}C$		0.3		%	
Operating Input Voltage	$V_{IN}$	$I_{OUT}=100mA$			15	V	
Quiescent Current	$I_Q$	$V_{IN}\leq 10V$		5	10	mA	
Current Limit	$I_{LIMIT}$	$V_{IN}=7.5V, T_J=25^{\circ}C$	LD1117	800		mA	
			LD1117A	1000			
Output Noise Voltage	eN	B=10Hz to 10KHz, $T_J=25^{\circ}C$		100		$\mu V$	
Supply Voltage Rejection	SVR	$I_{OUT}=40mA, f=120Hz, T_J=25^{\circ}C,$ $V_{IN}=5.5V, V_{RIPPLE}=1V_{pp}$	60	75		dB	
Dropout Voltage	$V_D$	$I_{OUT}=100mA$		1.00	1.10	V	
			$I_{OUT}=500mA$		1.15		1.25
			$I_{OUT}=800mA$		1.20		1.30
			$I_{OUT}=1A$		1.20		1.30
Thermal Regulation		$T_a=25^{\circ}C, 30ms$ Pulse		0.01	0.10	%/W	

■ ELECTRICAL CHARACTERISTICS(Cont.)

For LD1117/A-2.85

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Output Voltage	$V_{OUT}$	$V_{IN}=4.85V, I_{OUT}=10mA, T_J=25^{\circ}C$	2.793	2.850	2.907	V	
Output Voltage	$V_{OUT}$	$V_{IN}=4.25$ to 10V LD1117 : $I_{OUT}=0\sim 800mA$ LD1117A : $I_{OUT}=0\sim 1000mA$	2.793	2.850	2.907	V	
Line Regulation	$\Delta V_{OUT}$	$V_{IN}=4.25$ to 10V, $I_{OUT}=0mA$		1	6	mV	
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=4.25V$ LD1117 : $I_{OUT}=0\sim 800mA$ LD1117A : $I_{OUT}=0\sim 1000mA$		1	10	mV	
Temperature stability	$\Delta V_{OUT}$			0.5		%	
Long Term Stability	$\Delta V_{OUT}$	1000 hrs, $T_J=125^{\circ}C$		0.3		%	
Operating Input Voltage	$V_{IN}$	$I_{OUT}=100mA$			15	V	
Quiescent Current	$I_Q$	$V_{IN}\leq 10V$		5	10	mA	
Current Limit	$I_{LIMIT}$	$V_{IN}=7.85V, T_J=25^{\circ}C$	LD1117	800		mA	
			LD1117A	1000			
Output Noise Voltage	eN	B=10Hz to 10KHz, $T_J=25^{\circ}C$		100		$\mu V$	
Supply Voltage Rejection	SVR	$I_{OUT}=40mA, f=120Hz, T_J=25^{\circ}C,$ $V_{IN}=5.85V, V_{RIPPLE}=1V_{pp}$	60	75		dB	
Dropout Voltage	$V_D$		$I_{OUT}=100mA$		1.00	1.10	V
			$I_{OUT}=500mA$		1.15	1.25	
			$I_{OUT}=800mA$		1.20	1.30	
			$I_{OUT}=1A$		1.20	1.30	
Thermal Regulation		$T_a=25^{\circ}C, 30ms$ Pulse		0.01	0.10	%/W	

For LD1117/A-3.0

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
Output Voltage	$V_{OUT}$	$V_{IN}=5V, I_{OUT}=10mA, T_J=25^{\circ}C$	2.940	3.000	3.060	V	
Output Voltage	$V_{OUT}$	$V_{IN}=4.5$ to 10V LD1117 : $I_{OUT}=0\sim 800mA$ LD1117A : $I_{OUT}=0\sim 1000mA$	2.940	3.000	3.060	V	
Line Regulation	$\Delta V_{OUT}$	$V_{IN}=4.5$ to 12V, $I_{OUT}=0mA$		1	6	mV	
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=4.5V$ LD1117 : $I_{OUT}=0\sim 800mA$ LD1117A : $I_{OUT}=0\sim 1000mA$		1	10	mV	
Temperature stability	$\Delta V_{OUT}$			0.5		%	
Long Term Stability	$\Delta V_{OUT}$	1000 hrs, $T_J=125^{\circ}C$		0.3		%	
Operating Input Voltage	$V_{IN}$	$I_{OUT}=100mA$			15	V	
Quiescent Current	$I_Q$	$V_{IN}\leq 15V$		5	10	mA	
Current Limit	$I_{LIMIT}$	$V_{IN}=8V, T_J=25^{\circ}C$	LD1117	800		mA	
			LD1117A	1000			
Output Noise Voltage	eN	B=10Hz to 10KHz, $T_J=25^{\circ}C$		100		$\mu V$	
Supply Voltage Rejection	SVR	$I_{OUT}=40mA, f=120Hz, T_J=25^{\circ}C,$ $V_{IN}=6V, V_{RIPPLE}=1V_{pp}$	60	75		dB	
Dropout Voltage	$V_D$		$I_{OUT}=100mA$		1.00	1.10	V
			$I_{OUT}=500mA$		1.15	1.25	
			$I_{OUT}=800mA$		1.20	1.30	
			$I_{OUT}=1A$		1.20	1.30	
Thermal Regulation		$T_a=25^{\circ}C, 30ms$ Pulse		0.01	0.10	%/W	

■ ELECTRICAL CHARACTERISTICS(Cont.)

For LD1117/A-3.3

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	$V_{OUT}$	$V_{IN}=5.3V, I_{OUT}=10mA, T_J=25^{\circ}C$	3.234	3.300	3.366	V
Output Voltage	$V_{OUT}$	$V_{IN}=4.75$ to 10V LD1117 : $I_{OUT}=0\sim 800mA$ LD1117A : $I_{OUT}=0\sim 1000mA$	3.234	3.300	3.366	V
Line Regulation	$\Delta V_{OUT}$	$V_{IN}=4.75$ to 15V, $I_{OUT}=0mA$		1	6	mV
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=4.75V$ LD1117 : $I_{OUT}=0\sim 800mA$ LD1117A : $I_{OUT}=0\sim 1000mA$		1	10	mV
Temperature stability	$\Delta V_{OUT}$			0.5		%
Long Term Stability	$\Delta V_{OUT}$	1000 hrs, $T_J=125^{\circ}C$		0.3		%
Operating Input Voltage	$V_{IN}$	$I_{OUT}=100mA$			15	V
Quiescent Current	$I_Q$	$V_{IN}\leq 15V$		5	10	mA
Current Limit	$I_{LIMIT}$	$V_{IN}=8.3V, T_J=25^{\circ}C$	LD1117	800		mA
			LD1117A	1000		
Output Noise Voltage	eN	B=10Hz to 10KHz, $T_J=25^{\circ}C$		100		$\mu V$
Supply Voltage Rejection	SVR	$I_{OUT}=40mA, f=120Hz, T_J=25^{\circ}C,$ $V_{IN}=6.3V, V_{RIPPLE}=1V_{pp}$	60	75		dB
Dropout Voltage	$V_D$	$I_{OUT}=100mA$		1.00	1.10	V
		$I_{OUT}=500mA$		1.15	1.25	
		$I_{OUT}=800mA$		1.20	1.30	
		$I_{OUT}=1A$		1.20	1.30	
Thermal Regulation		$T_A=25^{\circ}C, 30ms$ Pulse		0.01	0.10	%/W

For LD1117/A-3.6

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	$V_{OUT}$	$V_{IN}=5.6V, I_{OUT}=10mA, T_J=25^{\circ}C$	3.528	3.600	3.672	V
Output Voltage	$V_{OUT}$	$V_{IN}=5$ to 10V LD1117 : $I_{OUT}=0\sim 800mA$ LD1117A : $I_{OUT}=0\sim 1000mA$	3.528	3.600	3.672	V
Line Regulation	$\Delta V_{OUT}$	$V_{IN}=5$ to 15V, $I_{OUT}=0mA$		1	6	mV
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=5V$ LD1117 : $I_{OUT}=0\sim 800mA$ LD1117A : $I_{OUT}=0\sim 1000mA$		1	10	mV
Temperature stability	$\Delta V_{OUT}$			0.5		%
Long Term Stability	$\Delta V_{OUT}$	1000 hrs, $T_J=125^{\circ}C$		0.3		%
Operating Input Voltage	$V_{IN}$	$I_{OUT}=100mA$			15	V
Quiescent Current	$I_Q$	$V_{IN}\leq 15V$		5	10	mA
Current Limit	$I_{LIMIT}$	$V_{IN}=8.6V, T_J=25^{\circ}C$	LD1117	800		mA
			LD1117A	1000		
Output Noise Voltage	eN	B=10Hz to 10KHz, $T_J=25^{\circ}C$		100		$\mu V$
Supply Voltage Rejection	SVR	$I_{OUT}=40mA, f=120Hz, T_J=25^{\circ}C,$ $V_{IN}=6.6V, V_{RIPPLE}=1V_{pp}$	60	75		dB
Dropout Voltage	$V_D$	$I_{OUT}=100mA$		1.00	1.10	V
		$I_{OUT}=500mA$		1.15	1.25	
		$I_{OUT}=800mA$		1.20	1.30	
		$I_{OUT}=1A$		1.20	1.30	
Thermal Regulation		$T_A=25^{\circ}C, 30ms$ Pulse		0.01	0.10	%/W



■ ELECTRICAL CHARACTERISTICS(Cont.)

For LD1117/A-5.0

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
Output Voltage	$V_{OUT}$	$V_{IN}=7V, I_{OUT}=10mA, T_J=25^{\circ}C$	4.900	5.000	5.100	V	
Output Voltage	$V_{OUT}$	$V_{IN}=6.5$ to 15V LD1117 : $I_{OUT}=0\sim 800mA$ LD1117A : $I_{OUT}=0\sim 1.0A$	4.900	5.000	5.100	V	
Line Regulation	$\Delta V_{OUT}$	$V_{IN}=6.5$ to 15V, $I_{OUT}=0mA$		1	10	mV	
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=6.5V$ LD1117 : $I_{OUT}=0\sim 800mA$ LD1117A : $I_{OUT}=0\sim 1000mA$		1	15	mV	
Temperature stability	$\Delta V_{OUT}$			0.5		%	
Long Term Stability	$\Delta V_{OUT}$	1000 hrs, $T_J=125^{\circ}C$		0.3		%	
Operating Input Voltage	$V_{IN}$	$I_{OUT}=100mA$			15	V	
Quiescent Current	$I_Q$	$V_{IN}\leq 15V$		5	10	mA	
Current Limit	$I_{LIMIT}$	$V_{IN}=10V, T_J=25^{\circ}C$	LD1117	800		mA	
			LD1117A	1000			
Output Noise Voltage	$e_N$	$B=10Hz$ to 10KHz, $T_J=25^{\circ}C$		100		$\mu V$	
Supply Voltage Rejection	SVR	$I_{OUT}=40mA, f=120Hz, T_J=25^{\circ}C,$ $V_{IN}=8V, V_{RIPPLE}=1V_{pp}$	60	75		dB	
Dropout Voltage	$V_D$	$I_{OUT}=100mA$		1.00	1.10	V	
			$I_{OUT}=500mA$		1.15		1.25
			$I_{OUT}=800mA$		1.20		1.30
			$I_{OUT}=1A$		1.20		1.30
Thermal Regulation		$T_A=25^{\circ}C, 30ms$ Pulse		0.01	0.10	%/W	

For LD1117/A-ADJ

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
Reference Voltage	$V_{REF}$	$V_{IN}-V_{OUT}=2V, I_{OUT}=10mA, T_J=25^{\circ}C$	1.225	1.25	1.275	V	
Reference Voltage	$V_{REF}$	$V_{IN}-V_{OUT}=1.4$ to 10V LD1117 : $I_{OUT}=10\sim 800mA$ LD1117A : $I_{OUT}=10\sim 1000mA$	1.225	1.25	1.275	V	
Line Regulation	$\Delta V_{OUT}$	$V_{IN}-V_{OUT}=1.5$ to 13.75V, $I_{OUT}=10mA$		0.035	0.2	%	
Load Regulation	$\Delta V_{OUT}$	$V_{IN}-V_{OUT}=3V$ LD1117 : $I_{OUT}=10\sim 800mA$ LD1117A : $I_{OUT}=10\sim 1000mA$		0.1	0.4	%	
Temperature stability	$\Delta V_{OUT}$			0.50		%	
Long Term Stability	$\Delta V_{OUT}$	1000 hrs, $T_J=125^{\circ}C$		0.3		%	
Operating Input Voltage	$V_{IN}$				15	V	
Adjustment Pin Current	$I_{ADJ}$	$V_{IN}\leq 15V$		60	120	$\mu A$	
Adjustment Pin Current Change	$\Delta I_{ADJ}$	$V_{IN}-V_{OUT}=1.4$ to 10V, LD1117 : $I_{OUT}=10\sim 800mA$ LD1117A : $I_{OUT}=10\sim 1000mA$		1	5	$\mu A$	
Minimum Load Current	$I_{O(MIN)}$	$V_{IN}=15V$		2	5	mA	
Current Limit	$I_{LIMIT}$	$V_{IN}-V_{OUT}=5V, T_J=25^{\circ}C$	LD1117	800		mA	
			LD1117A	1000			
Output Noise (%Vo)	$e_N$	$B=10Hz$ to 10KHz, $T_J=25^{\circ}C$		0.003		%	
Supply Voltage Rejection	SVR	$I_{OUT}=40mA, f=120Hz, T_J=25^{\circ}C,$ $V_{IN}-V_{OUT}=3V, V_{RIPPLE}=1V_{pp}$	60	75		dB	
Dropout Voltage	$V_D$	$I_{OUT}=100mA$		1.00	1.10	V	
			$I_{OUT}=500mA$		1.15		1.25
			$I_{OUT}=800mA$		1.20		1.30
			$I_{OUT}=1A$		1.20		1.30
Thermal Regulation		$T_A=25^{\circ}C, 30ms$ Pulse		0.01	0.10	%/W	

## TYPICAL APPLICATIONS

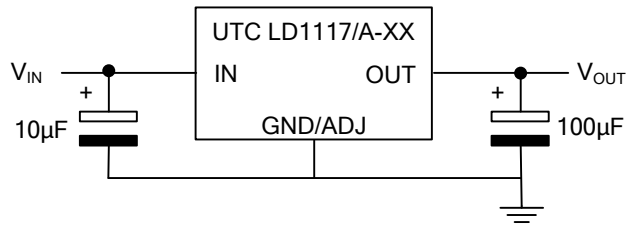


Fig.1 Tynca Application Circuit

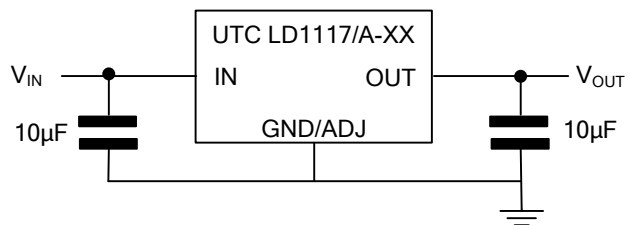


Fig.2 Tynca Application Circuit (FOR MLCC)

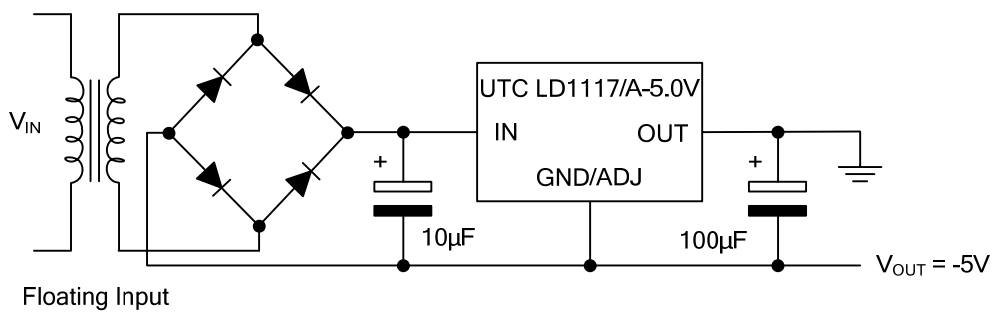


Fig.3 Negative Supply

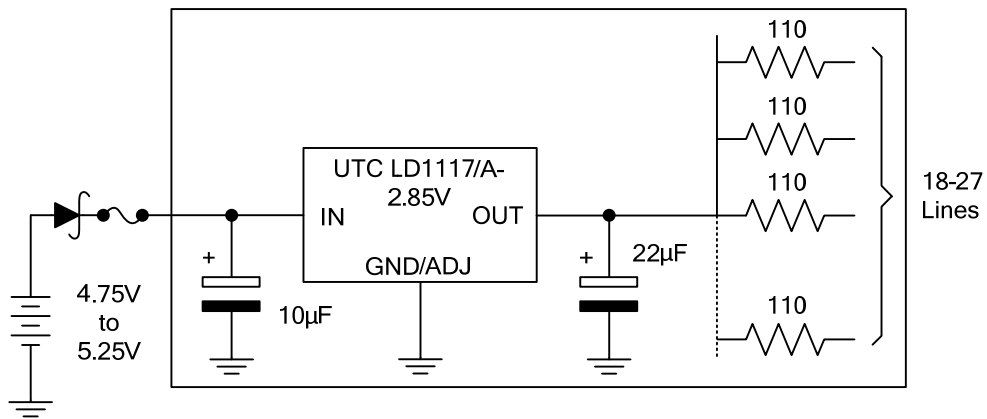


Fig.4 Active Terminator for SCSI-2 BUS

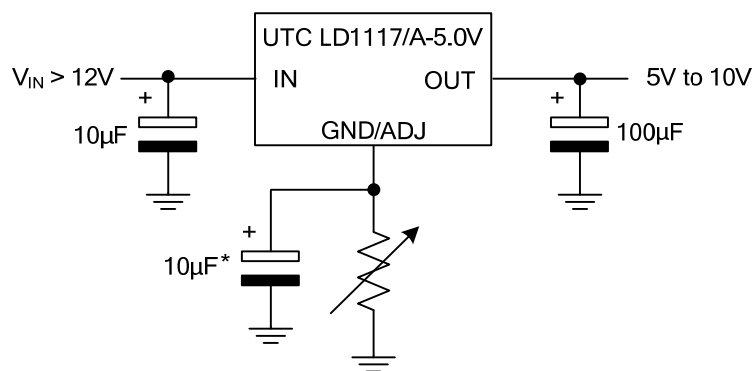


Fig.5 Circuit for Increasing Output Voltage

■ APPLICATION NOTE of LD1117/A ADJUSTABLE

The LD1117/A adjustable has a reference voltage of between the OUT and ADJ/GND pins.  $I_{ADJ}$  is 60µA typ. (120µA max.) and  $\Delta I_{ADJ}$  is 1µA typ. (5µA max.).

$R_1$  is normally fixed to 120Ω.

From figure 4 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)

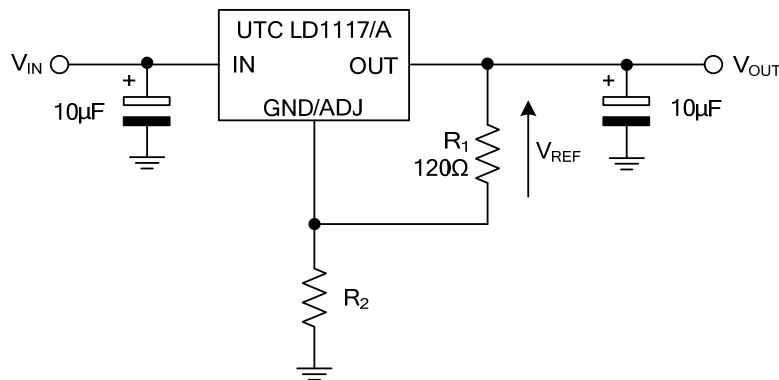


Fig.6 Adjustable Output Voltage Application Circuit

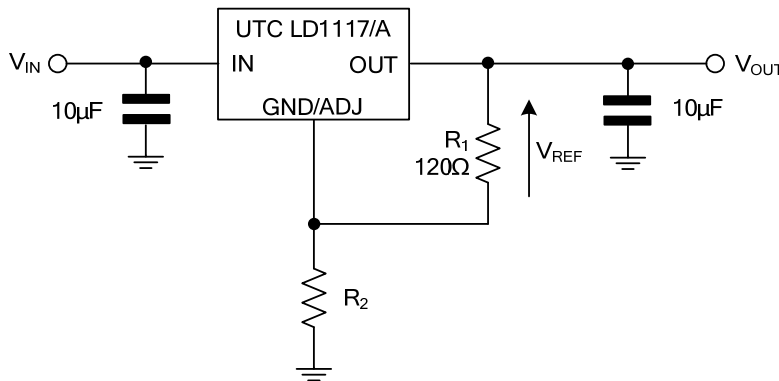


Fig.7 Adjustable Output Voltage Application Circuit (FOR MLCC)

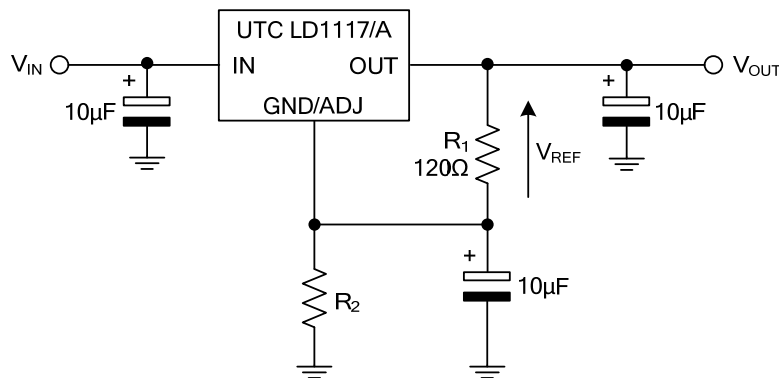
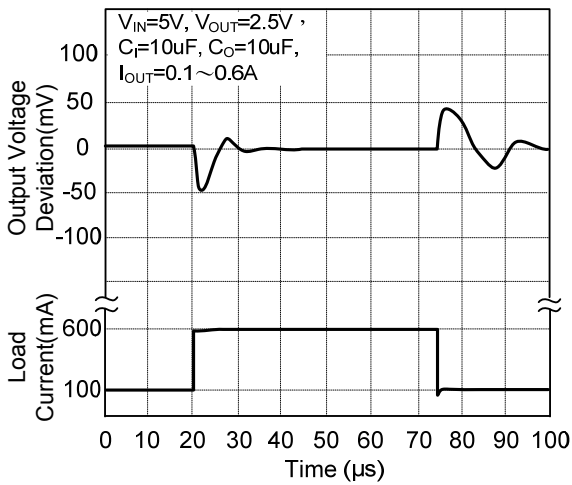


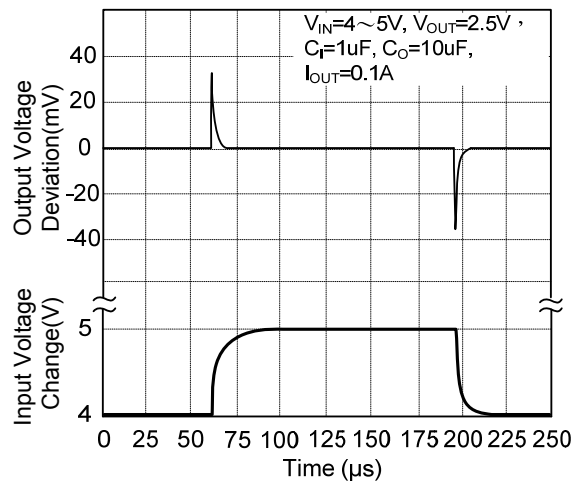
Fig.8 Adjustable Output Voltage Application with improved Ripple Rejection.

## TYPICAL CHARACTERISTICS

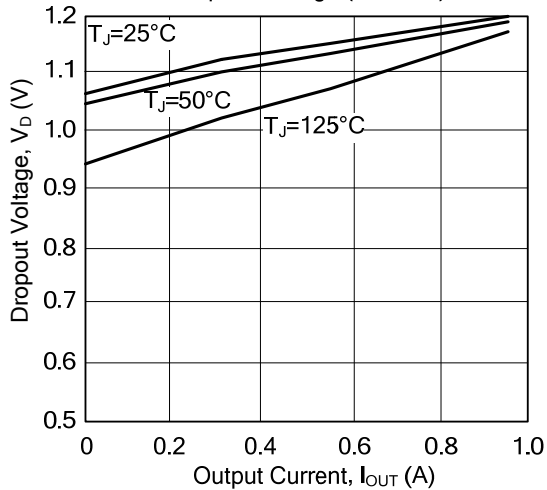
### Load Transient Response



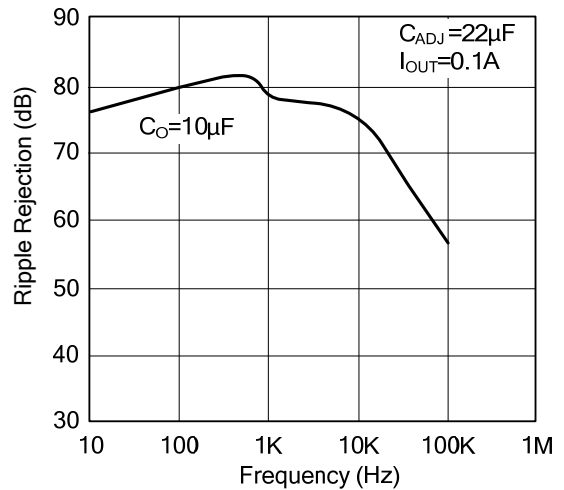
### Line Transient Response



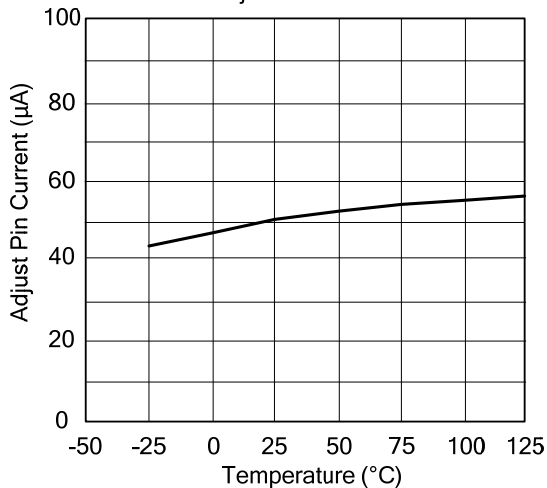
### Dropout Voltage ( $V_{IN}-V_{OUT}$ )



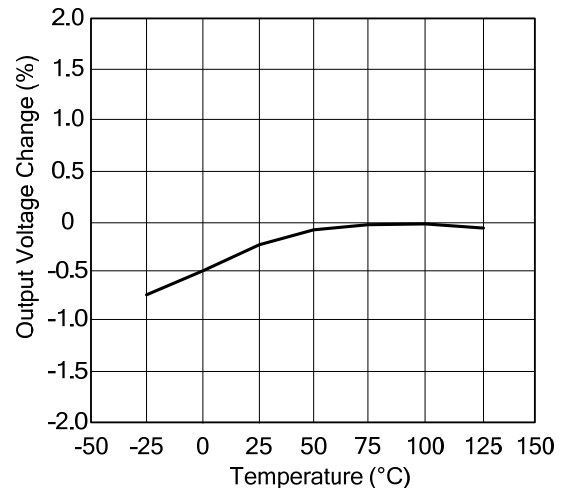
### Ripple Rejection



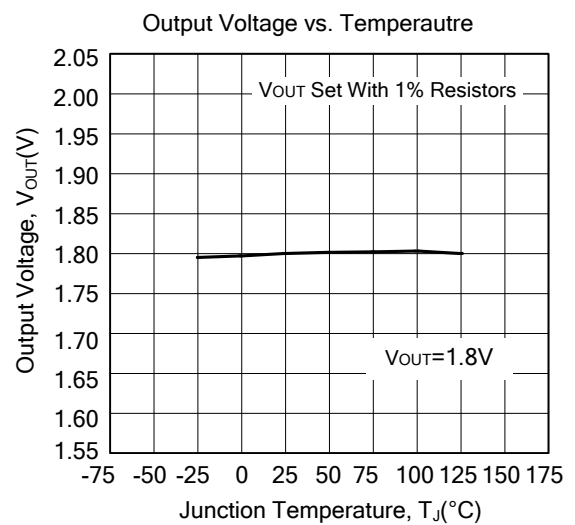
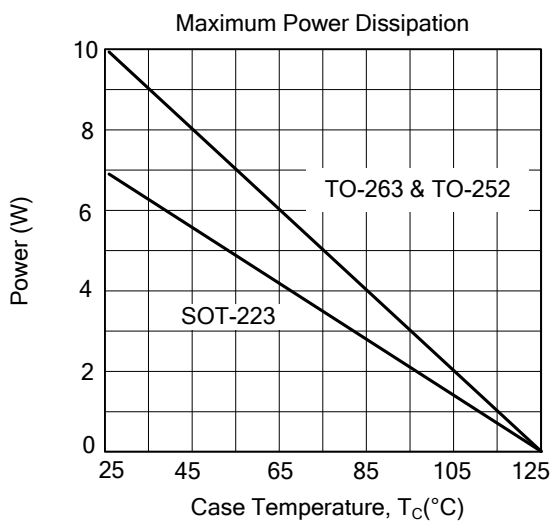
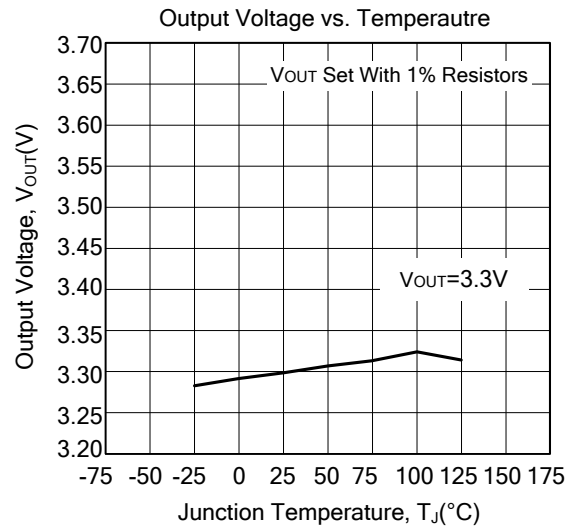
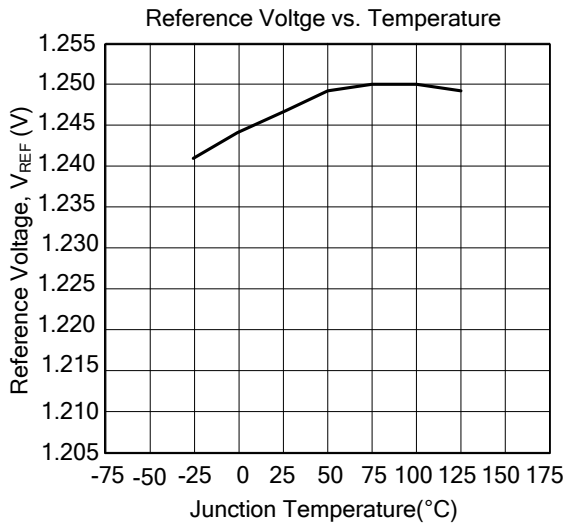
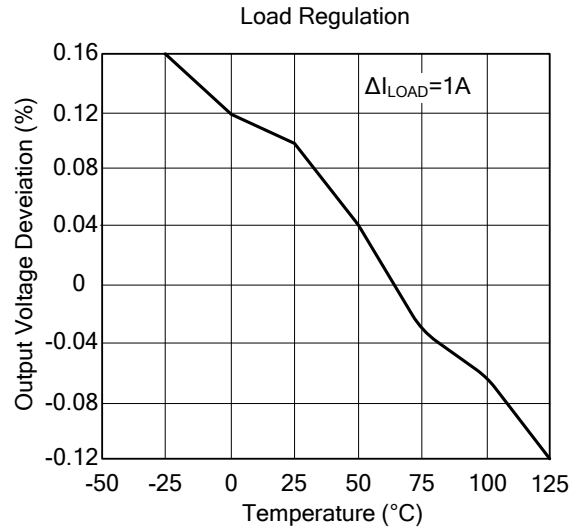
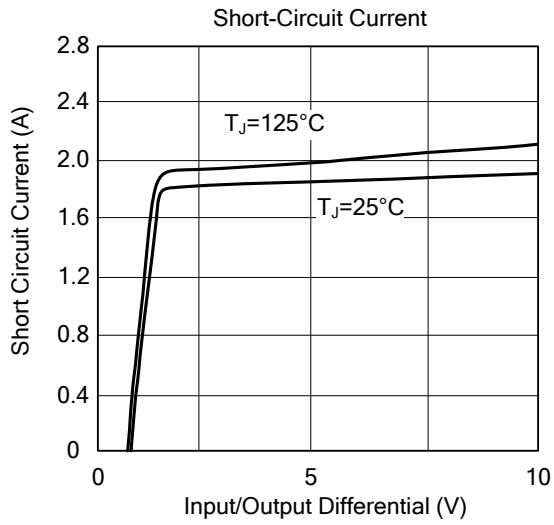
### Adjust Pin Current



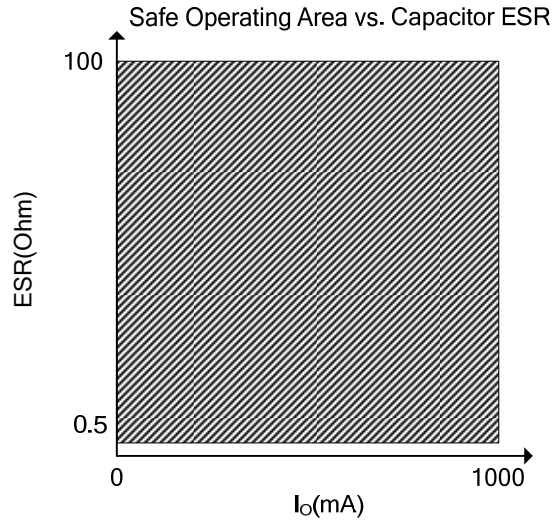
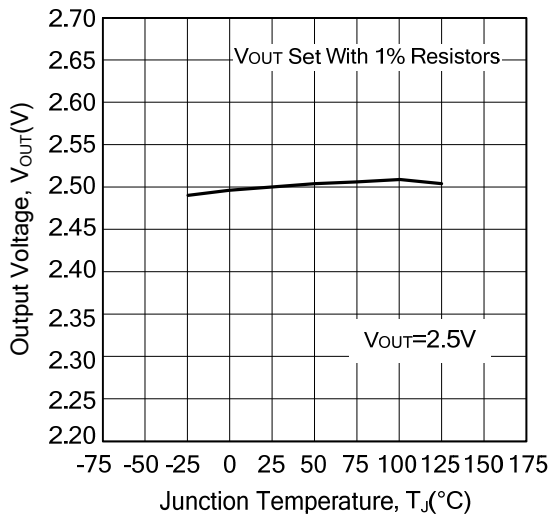
### Temperature Stability



## TYPICAL CHARACTERISTICS(Cont.)



■ TYPICAL CHARACTERISTICS(Cont.)



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