



## M29150A/B

## LINEAR INTEGRATED CIRCUIT

### 1.5A, VERY LOW DROP VOLTAGE REGULATORS

#### DESCRIPTION

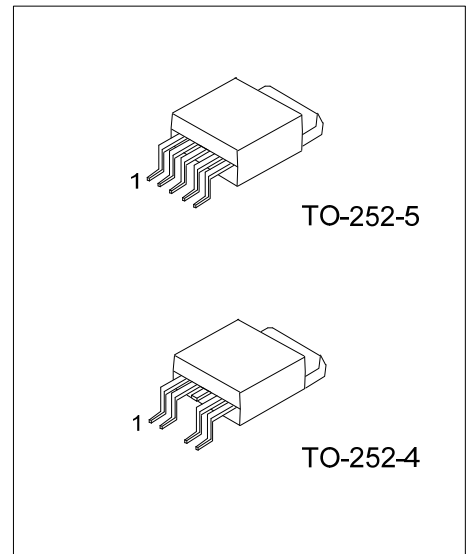
As the UTC linear integrated LDO, the UTC **M29150A/B** shows a high current, high accuracy, low-dropout voltage. The features are: 400mV dropout voltage, very low ground current. Cause the series have been designed for high current loads, so they are also used in lower current, extremely low dropout-critical systems (in which their tiny dropout voltage and ground current values are important attributes).

#### FEATURES

- \* Very low dropout voltage : typ. 0.4@ $I_{OUT}=1.5A$
- \* Output current guaranteed 1.5A
- \* Fixed and adjustable output voltage
- \* Thermal limit and Internal current
- \* Logic controlled electronic shutdown available
- \* Over voltage protection

#### ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
M29150AL-xx-TN4-R	M29150AG-xx-TN4-R	TO-252-4	Tape Reel
M29150BL-xx-TN4-R	M29150BG-xx-TN4-R	TO-252-4	Tape Reel
M29150AL-xx-TN5-R	M29150AG-xx-TN5-R	TO-252-5	Tape Reel
M29150BL-xx-TN5-R	M29150BG-xx-TN5-R	TO-252-5	Tape Reel

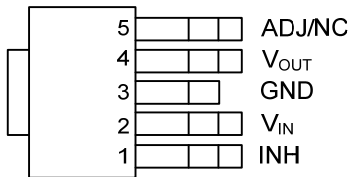


<p>M29150XL-xx-TN4-R</p>	<p>(1) R: Tape Reel</p> <p>(2) TN4: TO-252-4, TN5: TO-252-5</p> <p>(3) xx: Refer to Marking Information</p> <p>(4) G: Halogen Free, L: Lead Free</p> <p>(5) X: Refer to Marking Information</p>
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### MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
TO-252-4	50 :5.0V	<p>The diagram shows a 5-pin package with markings: UTC, M29150X, OVP Code, Voltage Code, L: Lead Free, G: Halogen Free, LOT Code, and Date Code. The pins are numbered 1 to 5 from left to right.</p>
TO-252-5	AD :ADJ	

### PIN CONFIGURATION

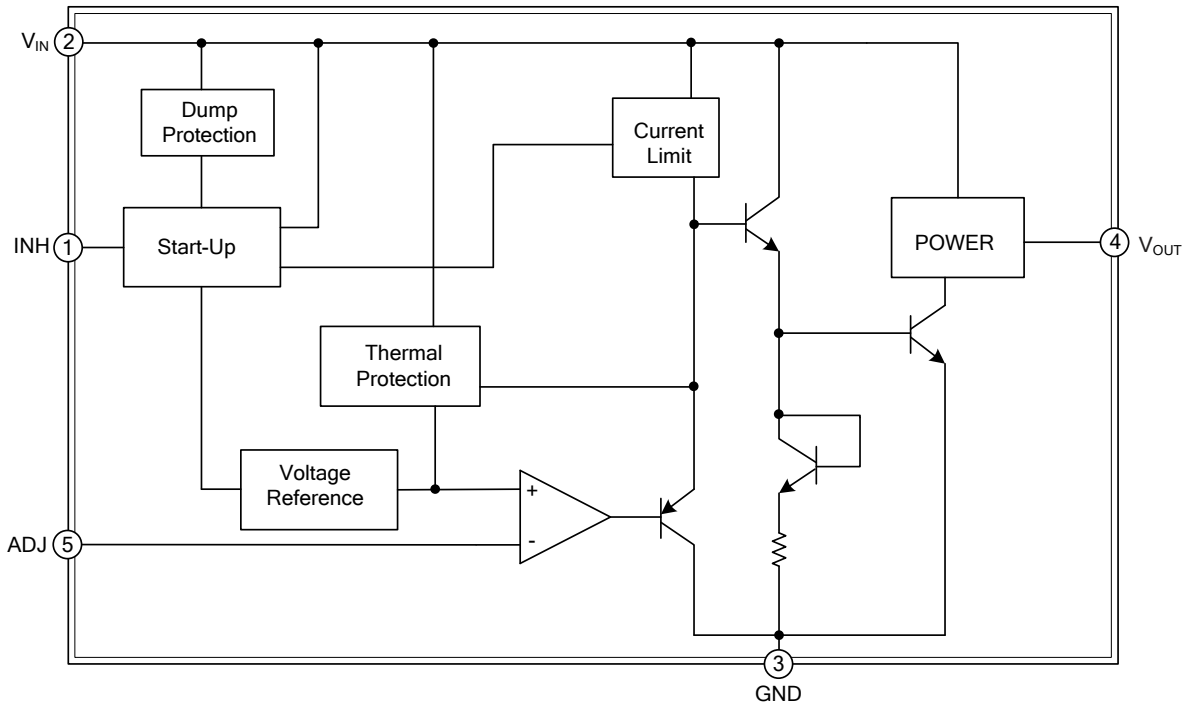


### PIN DESCRIPTIONS

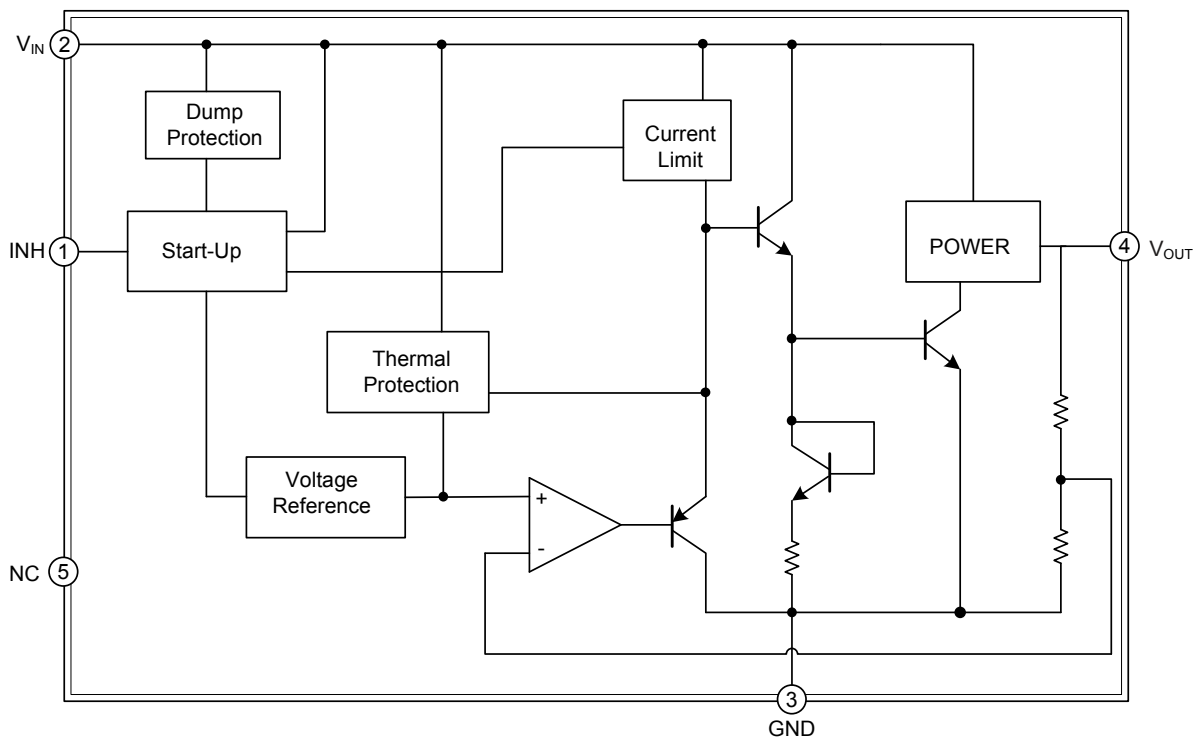
PIN NO.	PIN NAME	PIN FUNCTION
1	INH	Inhibit Function Input
2	V <sub>IN</sub>	Input voltage
3	GND	GND
4	V <sub>OUT</sub>	Output Voltage
5	ADJ/NC	Adjustable Version Input /Not connected for fixed version

■ BLOCK DIAGRAM

**Adjustable Version**



**Fixed Version**



### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNITS
DC Input Voltage	$V_{IN}$	30	V
DC Output Voltage	$V_{OUT}$	-0.3 ~ +20	V
Inhibit Input Voltage	$V_{INH}$	-0.3 ~ +20	V
Over Voltage Protection	M29150A	OVP	14
	M29150B		35
Output current	$I_{OUT}$	Internally Limited	mA
Power Dissipation	$P_D$	Internally Limited	mW
Junction Temperature	$T_J$	+150	°C
Operating Temperature	$T_{OPR}$	-40 ~ +85	°C
Storage Temperature	$T_{STG}$	-55 ~ +150	°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.

### ■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	100	°C/W
Junction to Case	$\theta_{JC}$	8	°C/W

### ■ ELECTRICAL CHARACTERISTICS

( $I_{OUT}=10mA$ ,  $T_J=25^\circ C$ ,  $V_{INH}=2V$  (Note 2),  $C_I=0.33\mu F$ ,  $C_O=10\mu F$ , unless otherwise specified)

#### M29150-5.0V ( $V_{IN}=7.0V$ )

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	$V_{OUT}$	$V_{IN}=6V\sim 10.5V$ , $I_{OUT}=10mA\sim 1.5A$ M29150A	4.9	5.0	5.1	V
		$V_{IN}=6V\sim 10.5V$ , $I_{OUT}=10mA\sim 1.5A$ $V_{IN}=30V$ , $I_{OUT}=10mA\sim 100mA$ M29150B	4.95	5.0	5.05	V
Load Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}}$	$I_{OUT}=10mA\sim 1.5A$		0.2	1.0	%
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}}$	$V_{IN}=6V\sim 13V$ M29150A		0.06	0.5	%
		$V_{IN}=6V\sim 30V$ M29150B				
Supply Voltage Rejection	SVR	$f=120Hz$ , $V_{IN}=7\pm 1V$ , $I_{OUT}=0.75A$ (Note 1)	49	64		dB
Dropout Voltage	$V_D$	$I_{OUT}=250mA$ , $T_J=-40\sim 125^\circ C$ (Note 3)		0.1		V
		$I_{OUT}=0.75A$ , $T_J=-40\sim 125^\circ C$ (Note 3)		0.2		V
		$I_{OUT}=1.5A$ , $T_J=-40\sim 125^\circ C$ (Note 3)		0.4	0.7	V
Quiescent Current	$I_Q$	$I_{OUT}=0.75A$ , $T_J=-40\sim 125^\circ C$		15	40	mA
		$I_{OUT}=1.5A$ , $T_J=-40\sim 125^\circ C$		30	80	mA
		$V_{IN}=13V$ , $V_{INH}=GND$ , $T_J=-40\sim 125^\circ C$ M29150A		0.13	0.18	mA
		$V_{IN}=30V$ , $V_{INH}=GND$ , $T_J=-40\sim 125^\circ C$ M29150B				
Short Circuit Current	$I_{SC}$	$V_{IN}-V_{OUT}=5.5V$		2.2		A
Control Input Logic Low	$V_{IL}$	OFF MODE (Note 2), $T_J=-40\sim 125^\circ C$			0.8	V
Control Input Logic High	$V_{IH}$	ON MODE (Note 2), $T_J=-40\sim 125^\circ C$	2			V
Control Input Current	$I_{INH}$	$V_{INH}=13V$ , $T_J=-40\sim 125^\circ C$		5	10	$\mu A$
Output Noise Voltage	$e_N$	$B_P=10Hz\sim 100KHz$ , $I_{OUT}=100mA$		200		$\mu V_{RMS}$
Thermal Shutdown	$T_{SHDN}$			150		°C

### ■ ELECTRICAL CHARACTERISTICS(Cont.)

#### M29150-ADJ ( $V_{IN}=3.23V$ )

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Minimum Operating Input Voltage	$V_{IN}$	$I_{OUT}=10mA\sim 1.5A$ , $T_J=-40\sim 125^{\circ}C$	2.5			V
Load Regulation	$\Delta V_{OUT}$	$I_{OUT}=10mA\sim 1.5A$		0.2	1.0	%
Line Regulation	$\Delta V_{OUT}$	$V_{IN}=2.5V\sim 13V$ , $I_{OUT}=10mA$	M29150A	0.06	0.5	%
		$V_{IN}=2.5V\sim 30V$ , $I_{OUT}=10mA$	M29150B			
Reference Voltage	$V_{REF}$	$I_{OUT}=10mA\sim 1.5A$ , $V_{IN}=2.5\sim 4.5V$ $T_J=-40\sim 125^{\circ}C$ (Note 4)	-1%	1.23	+1%	V
			-2%		+2%	
Supply Voltage Rejection	SVR	$f=120Hz$ , $V_{IN}=3.23\pm 1V$ , $I_{OUT}=0.75A$ (Note 1)	45	75		dB
Quiescent Current	$I_Q$	$I_{OUT}=0.75A$ , $T_J=-40\sim 125^{\circ}C$		15	40	mA
		$I_{OUT}=1.5A$ , $T_J=-40\sim 125^{\circ}C$		30	80	mA
		$V_{IN}=13V$ , $V_{INH}=GND$ , $T_J=-40\sim 125^{\circ}C$	M29150A	0.13	0.18	mA
		$V_{IN}=30V$ , $V_{INH}=GND$ , $T_J=-40\sim 125^{\circ}C$	M29150B			
Adjust Pin Current	$I_{ADJ}$	$T_J=-40\sim 125^{\circ}C$ (Note 1)			1	$\mu A$
Short Circuit Current	$I_{SC}$	$V_{IN}-V_{OUT}=5.5V$		2.2		A
Control Input Logic Low	$V_{IL}$	OFF MODE (Note 2), $T_J=-40\sim 125^{\circ}C$			0.8	V
Control Input Logic High	$V_{IH}$	ON MODE (Note 2), $T_J=-40\sim 125^{\circ}C$	2			V
Control Input Current	$I_{INH}$	$V_{INH}=13V$ , $T_J=-40\sim 125^{\circ}C$		5	10	$\mu A$
Output Noise Voltage	$e_N$	$B_P=10Hz\sim 100KHz$ , $I_{OUT}=100mA$		50		$\mu V_{RMS}$
Thermal Shutdown	$T_{SHDN}$			150		$^{\circ}C$

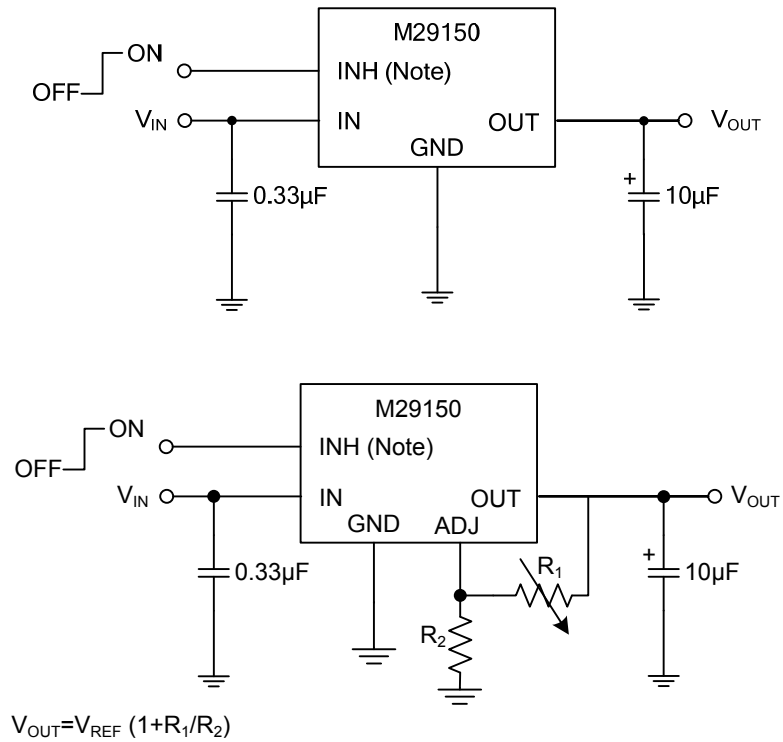
Note: 1. Guaranteed by design.

2. Only for version with Inhibit function.

3. Dropout voltage is defined as the input-to-output differential when the output voltage drops to 98% of its nominal value with  $V_{OUT} + 1V$  applied to  $V_{IN}$ .

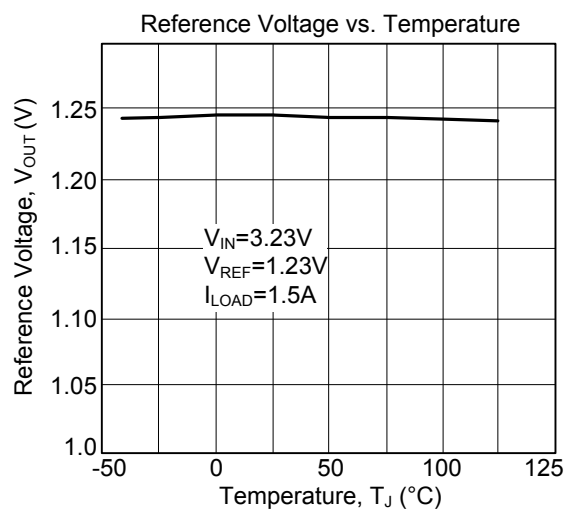
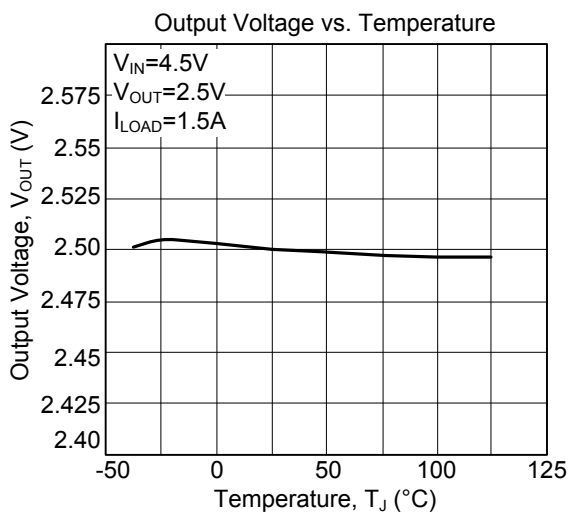
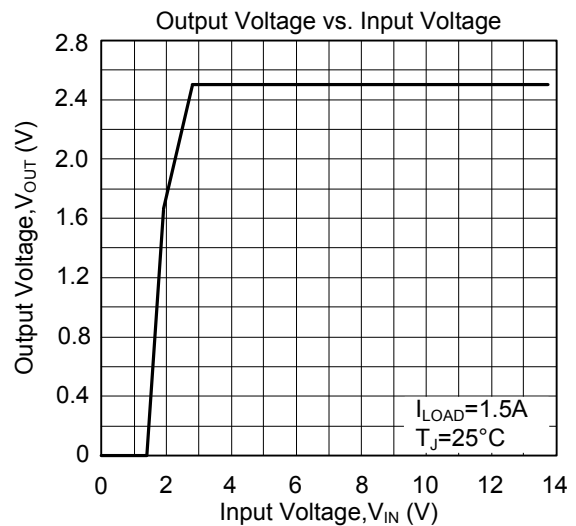
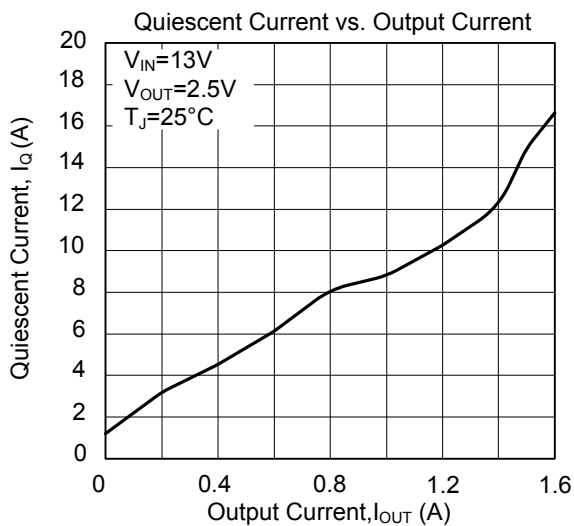
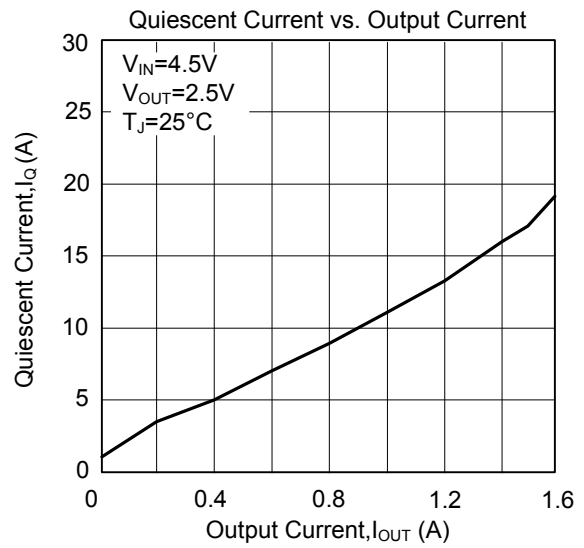
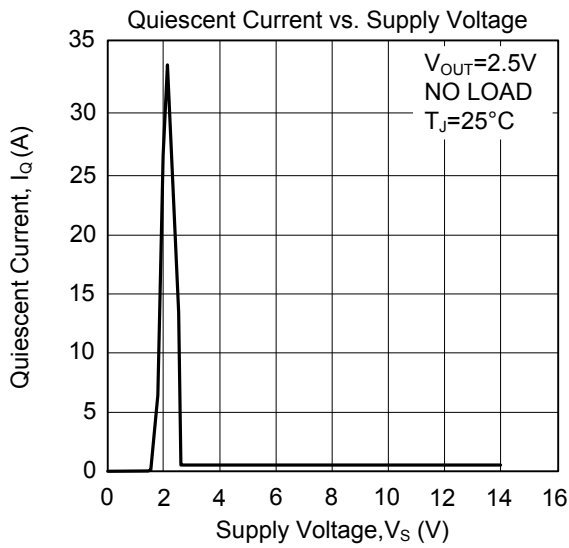
4. Reference voltage is measured between output and GND pin, with ADJ PIN tied to  $V_{OUT}$

## ■ TYPICAL APPLICATION CIRCUITS

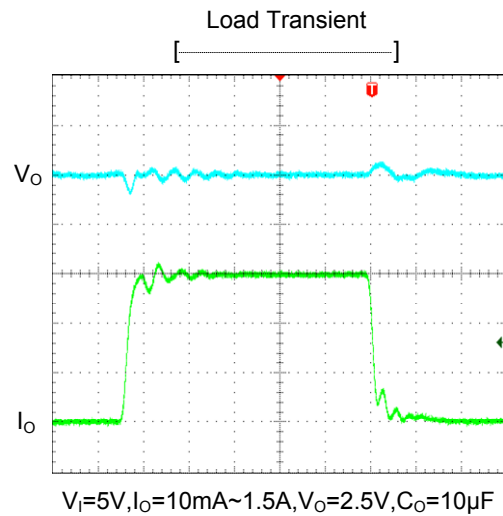
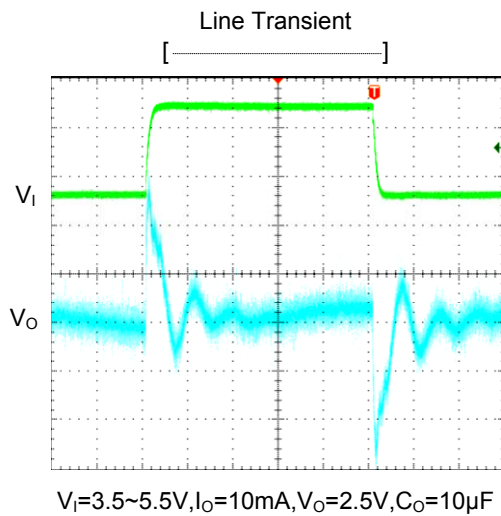
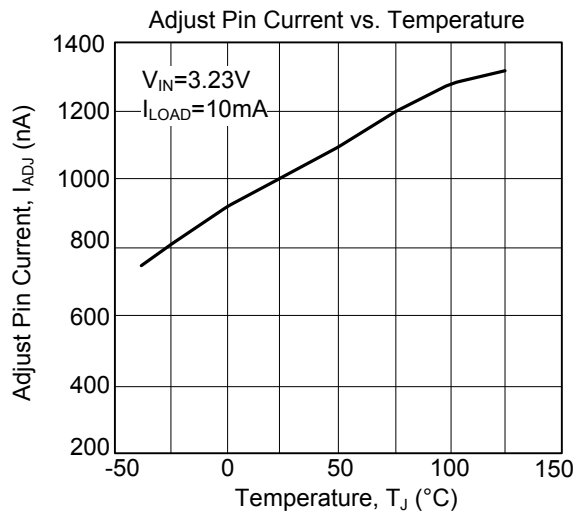
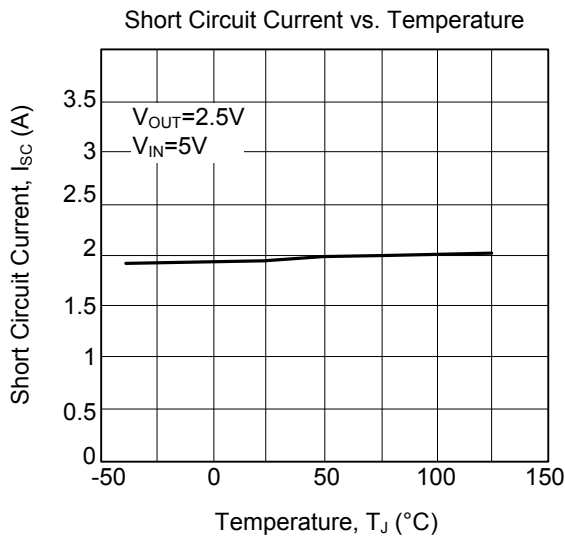
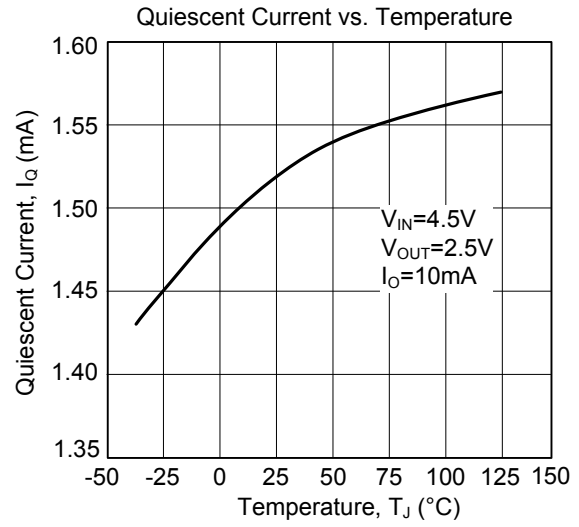
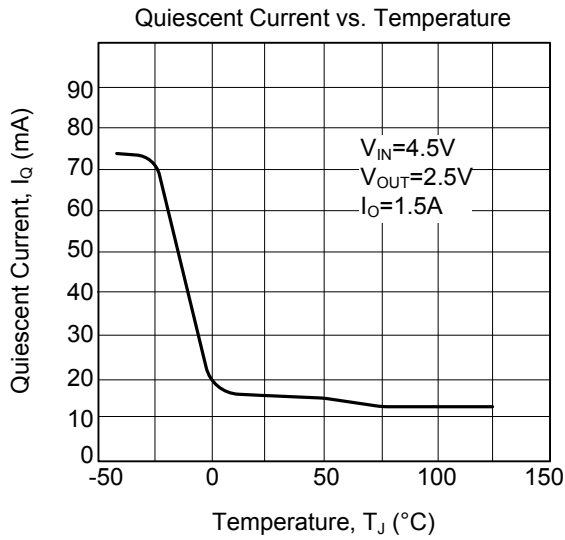


Note: Only for version with inhibit function.

## TYPICAL CHARACTERISTICS

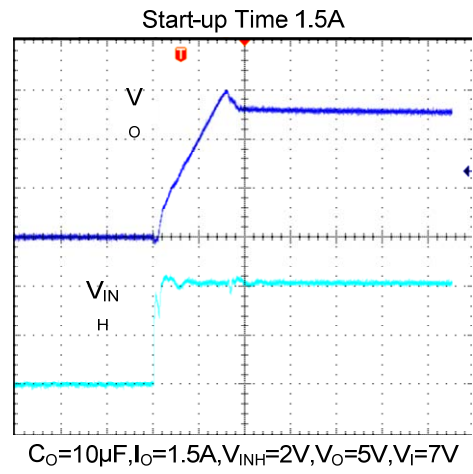
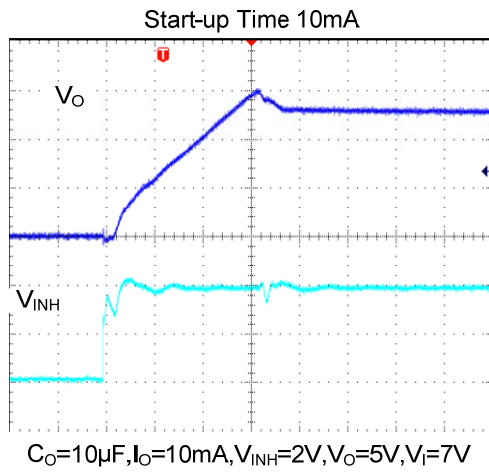


## ■ TYPICAL CHARACTERISTICS(Cont.)





■ TYPICAL CHARACTERISTICS(Cont.)



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