



## M29150

Preliminary

LINEAR INTEGRATED CIRCUIT

### 1.5A, VERY LOW DROP VOLTAGE REGULATORS

#### DESCRIPTION

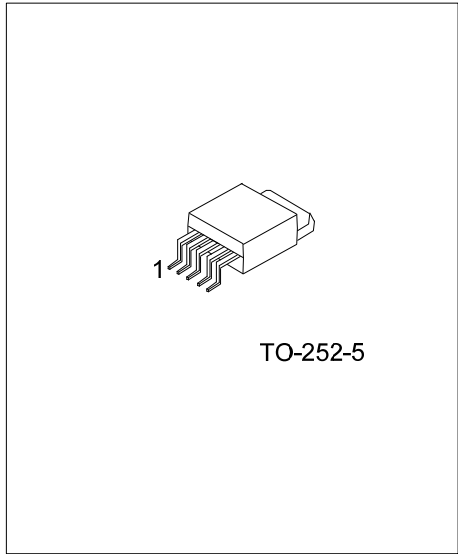
As the UTC linear intergrated LDO, the M29150 shows a high current, high accuracy, low-dropout voltage. The features are: 400mV dropout voltage, very low ground current. Cause the series have been designed for high current loads, so they are also used in lower current, extremely low dropout-critical systems (in which their tiny dropout voltage and ground current values are important attributes).

#### FEATURES

- \* Very low dropout voltage : typ. 0.4@I<sub>OUT</sub>=1.5A
- \* Output current guaranteed 1.5A
- \* Fixed and adjustable output voltage
- \* Thermal limit and Internal current
- \* Logic controlled electronic shutdown available

#### ORDERING INFORMATION

Ordering Number			Package	Packing
Normal	Lead Free	Halogen Free		
M29150-TN5-R	M29150L-TN5-R	M29150G-TN5-R	TO-252-5	Tape Reel
M29150-TN5-T	M29150L-TN5-T	M29150G-TN5-T	TO-252-5	Tube



Lead-free: M29150L  
Halogen-free: M29150G

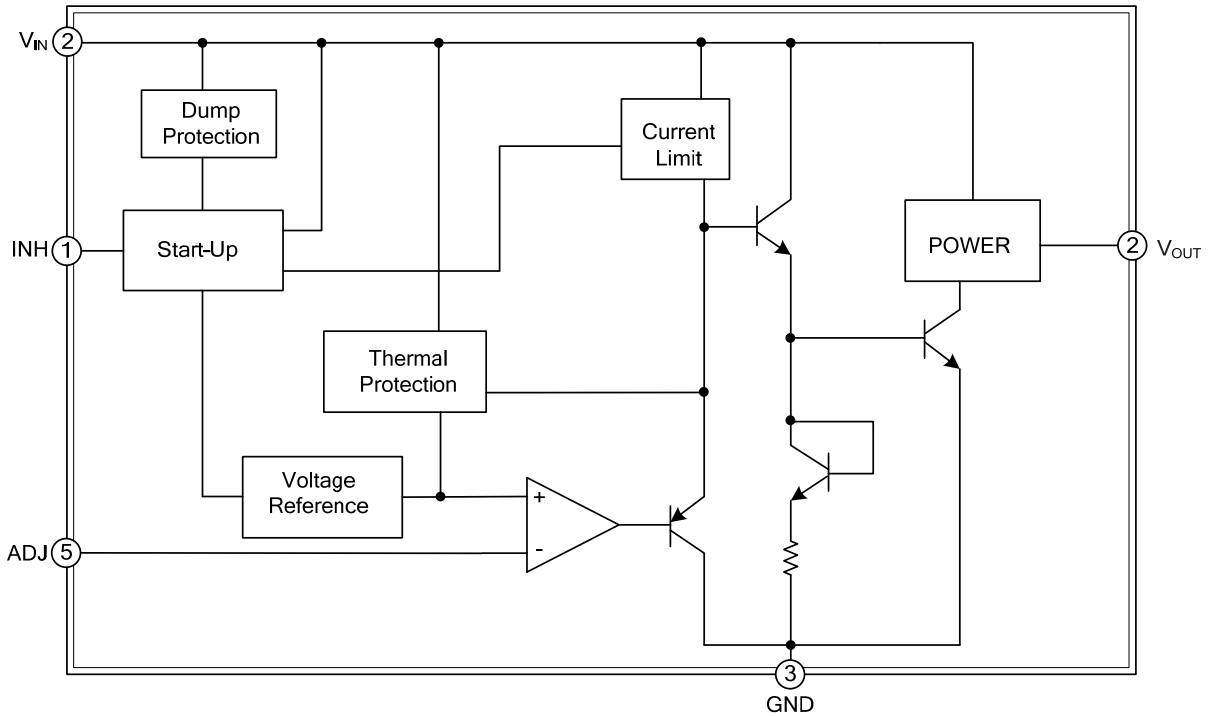
<p>M29150L-TN5-R</p> <p>(1)Packing Type (2)Package Type (3)Lead Plating</p>	<p>(1) R: Tape Reel, T: Tube (2) TN5: TO-252-5 (3) G: Halogen Free, L: Lead Free, Blank: Pb/Sn</p>
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## ■ PIN DESCRIPTIONS

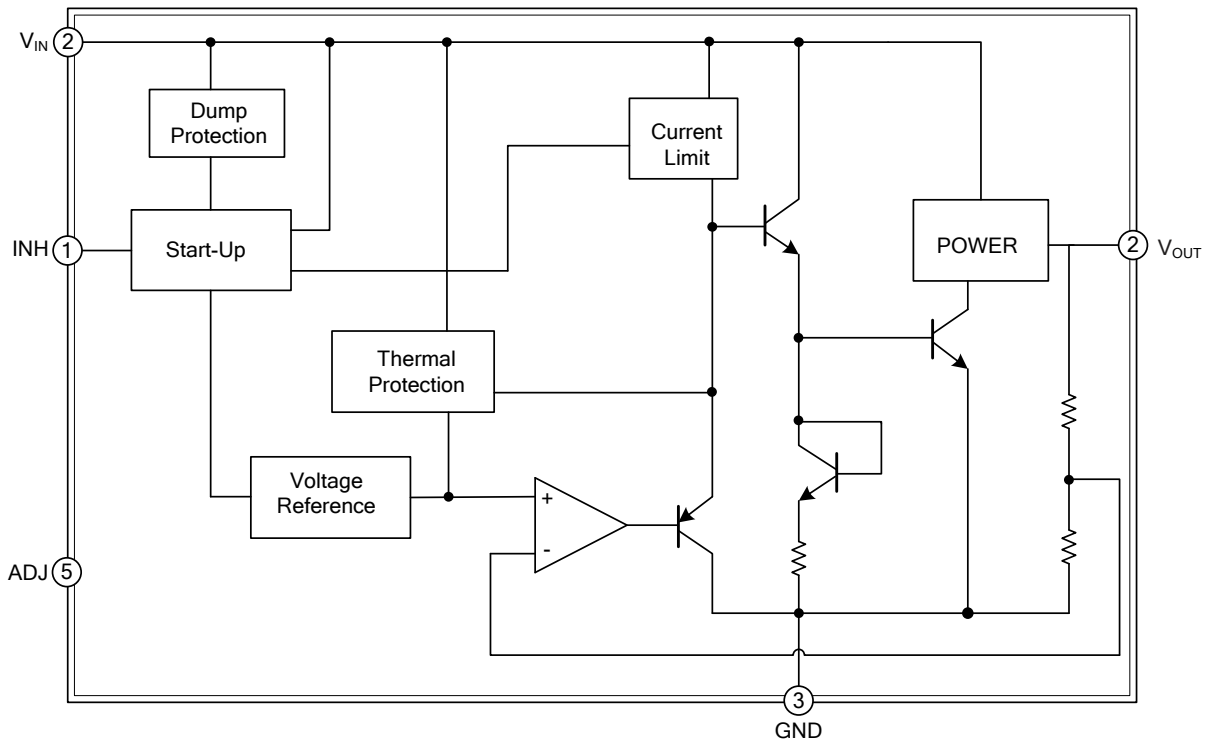
PIN NO.	PIN NAME	PIN FUNCTION
1	INH	Inhibit Function Input
2	V <sub>IN</sub>	Input voltage
3	GND	GND
4	V <sub>OUT</sub>	Output Voltage
5	ADJ	Adjustable Version Input /Not connected for fixed version

■ BLOCK DIAGRAM

Adjustable Version



Fixed Version



### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNITS
DC Input Voltage	$V_{IN}$	30(Note 2)	V
DC Output Voltage	$V_{OUT}$	-0.3 ~ +20	V
Inhibit Input Voltage	$V_{INH}$	-0.3 ~ +20	V
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 ~ +125	°C
Storage Temperature	$T_{STG}$	-55 ~ +150	°C

Note: 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. Here when this value above 14V, the device is automatically in shut-down.

### ■ THERMAL DATA

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

### ■ ELECTRICAL CHARACTERISTICS

( $I_{OUT}=10\text{mA}$ ,  $T_J=25^\circ\text{C}$ ,  $V_{INH}=2\text{V}$  (Note 2),  $C_I=330\text{nF}$ ,  $C_O=10\mu\text{F}$ , unless otherwise specified)

**$V_{OUT}=5.0\text{V}$**  ( $V_{IN}=7.0\text{V}$ )

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

■ ELECTRICAL CHARACTERISTICS(Cont.)

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	$\Delta V_{OUT}$	$V_{IN}=2.5\sim 13V$ , $I_{OUT}=10mA$		0.06	0.5	%
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	
		$V_{IN}=13V$ , $V_{INH}=GND$ , $T_J=-40\sim 125^{\circ}C$		0.13	0.18	
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 4), $T_J=-40\sim 125^{\circ}C$		0.8	V
	High	$V_{IH}$	ON MODE (Note 4), $T_J=-40\sim 125^{\circ}C$		2	V
Control Input Current	$I_{INH}$	$T_J=-40\sim 125^{\circ}C$ , $V_{INH}=13V$		5	10	$\mu A$
Output Noise Voltage	eN	$B_P=10Hz\sim 100KHz$ , $I_{OUT}=100mA$		50		$\mu V_{RMS}$
Thermal Shutdown	$T_{SHDN}$			150		$^{\circ}C$

Note: 1. Guaranteed by design.

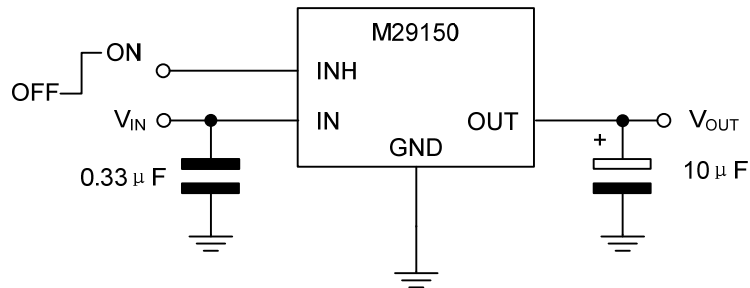
2. Only for version with Inhibit function.

3. Dropout voltage is defined as the input-to-output differential when the output voltage drops to 99% of its nominal value with  $V_{OUT} + 1V$  applied to  $V_{IN}$ .

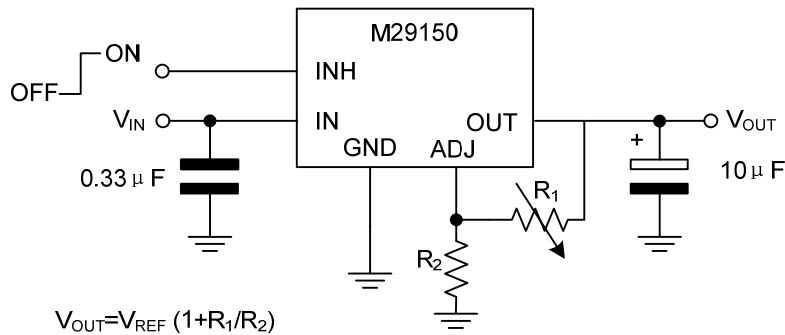
4. Reference voltage is measured between output and GND pin, with ADJ PIN tied to  $V_{OUT}$

■ TYPICAL APPLICATION CIRCUIT

For Fixed Version



For Adjustable Version



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