



LR2128

Preliminary

LINEAR INTEGRATED CIRCUIT

300mA SELECTABLE FIXED/ADJUSTABLE LOW DROPOUT LINEAR REGULATOR

DESCRIPTION

As a low dropout linear regulator, the UTC **LR2128** only needs low input voltage (2.7~6V) and can deliver current to 300mA for setting the output voltage.

The UTC **LR2128** is an ideal for being used in such battery-powered equipments notebook, personal computer and cellular phone. Its typical dropout voltage is 230mV at loading current 300mA.

For setting the output voltage, the UTC **LR2128** has two output voltage operation modes: fixed mode senses the output voltage on V_{OUT} , ADJ mode needs two resistors as a voltage divider.

To protect itself against current over-loads and over temperature, the UTC **LR2128** has current limit and thermal shutdown functions.

FEATURES

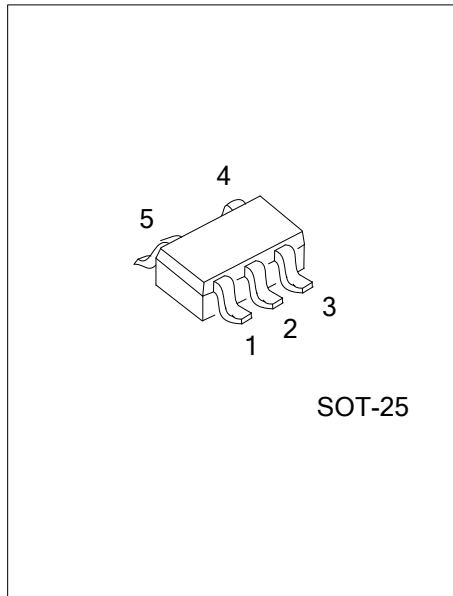
- * Operating Voltage: 2.7~6V
- * Low Voltage Dropout
- * Output Current Guaranteed 300mA
- * For Setting Output Voltage Two Modes
 - Fixed mode :Fixed Output Voltage 1~5V
 - ADJ mode: Adjustable Output Voltage 0.8~5.5V
- * Internal Current Limit Protection
- * With Soft-Start
- * Internal thermal Protection
- * Work stably with Low ESR Ceramics Capacitor

ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
LR2128AL-xx-AF5-R	LR2128AG-xx-AF5-R	SOT-25	Tape Reel
LR2128BL-xx-AF5-R	LR2128BG-xx-AF5-R	SOT-25	Tape Reel

Note: xx: Output Voltage, Refer to Marking Information.

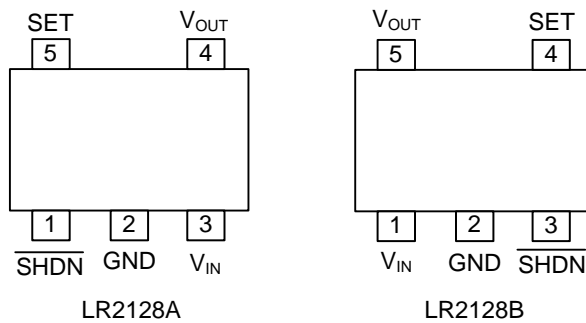
<p>LR2128AG-xx-AF5-R</p> <p>(1)Packing Type (2)Package Type (3)Output Voltage Code (4)Green Package (5)Pin Configuration</p>	<p>(1) R: Tape Reel (2) AF5: SOT-25 (3) xx: refer to Marking Information (4) G: Halogen Free and Lead Free, L: Lead Free (5) refer to PIN CONFIGURATION</p>
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MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING	
		LR2128A	LR2128B
SOT-25	25: 2.5V AD: ADJ		

PIN CONFIGURATION

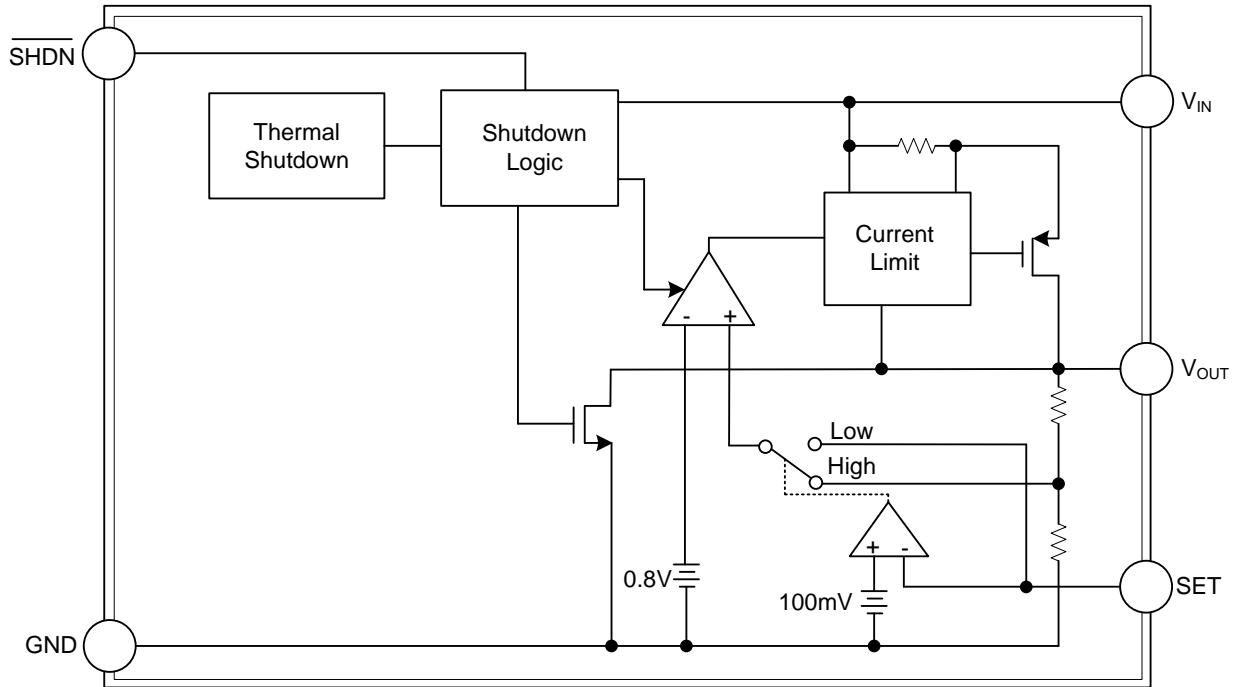


PIN DESCRIPTION

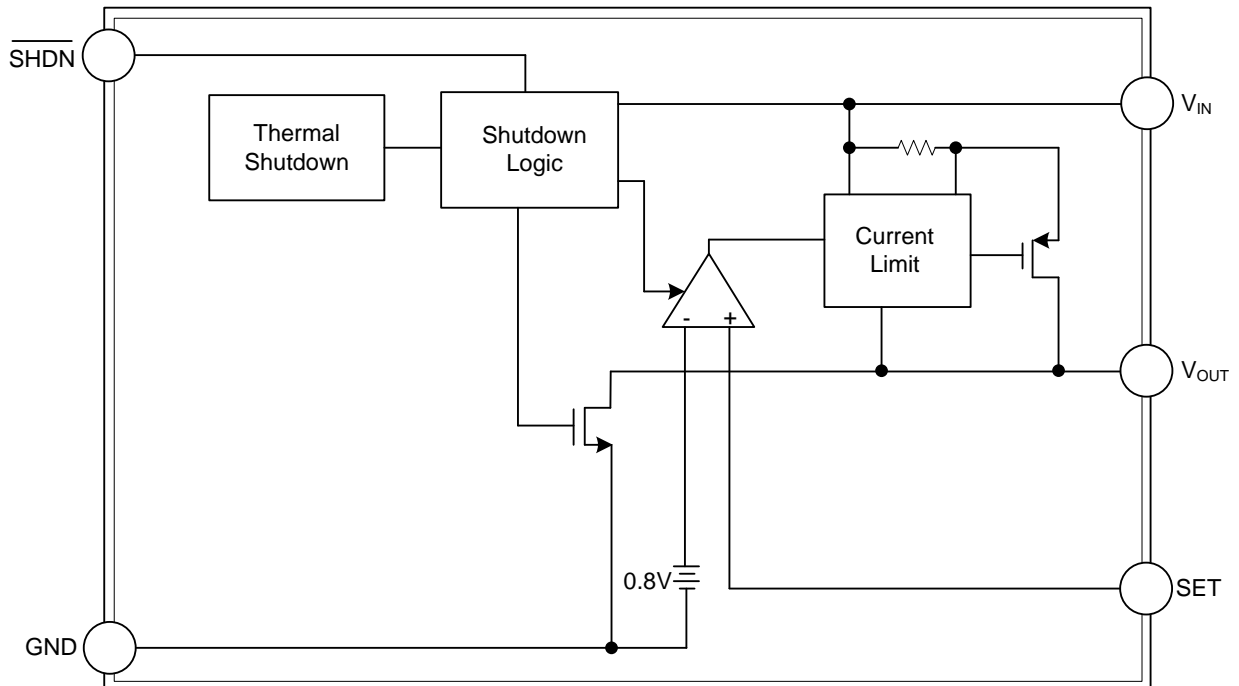
PIN NO		PIN NAME	DESCRIPTION
LR2128A	LR2128B		
1	3	SHDN	Control pin for shutdown Logic High: enable Logic Low: shutdown
2	2	GND	Ground
3	1	V _{IN}	Voltage supply
4	5	V _{OUT}	Output pin
5	4	SET	When this pin is connected to ground, turns to fixed output voltage operation for LR2128-XX. When this pin is connected to an external resistor divider, turns to adjustable output voltage mode operation for LR2128-AD.

■ BLOCK DIAGRAM

For LR2128-XX



For LR2128-AD



■ **ABSOLUTE MAXIMUM RATING** ($T_A=25^{\circ}\text{C}$, Unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
V_{IN} Supply Voltage (V_{IN} to GND)	V_{IN}	-0.3 ~ +6.5	V
$\overline{\text{SHDN}}$ Input Voltage ($\overline{\text{SHDN}}$ to GND)	$V_{\overline{\text{SHDN}}}$	-0.3 ~ +6.5	V
Power Dissipation	P_D	380	mW
Junction Temperature	T_J	-40 ~ +125	$^{\circ}\text{C}$
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 CONDITIONS**

PARAMETER	SYMBOL	RATINGS	UNIT
V_{IN} Supply Voltage	V_{IN}	2.7 ~ 6	V
Output Voltage	V_{OUT}	0.8 ~ 5.5	V
V_{OUT} Output Current	I_{OUT}	0 ~ 300	mA
Input Capacitor	C_{IN}	0.22 ~ 100	μF
Output Capacitor	C_{OUT}	1.5 ~ 33	μF
Junction Temperature	T_{OPR}	-40 ~ +85	$^{\circ}\text{C}$

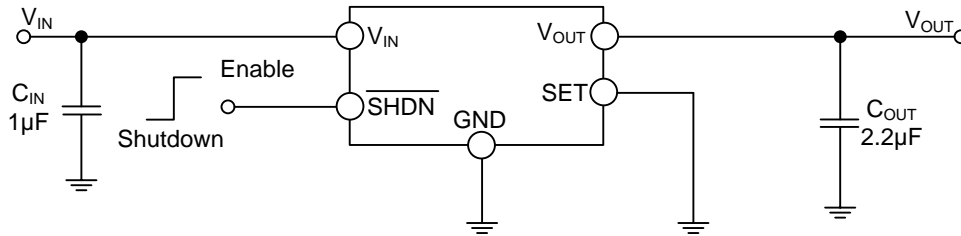
■ **ELECTRICAL CHARACTERISTICS**

($V_{IN}=V_{OUT}+1\text{V}$ (min $V_{IN}=2.8\text{V}$), $I_{OUT}=0\sim 300\text{mA}$, $C_{IN}=1\mu\text{F}$, $C_{OUT}=2.2\mu\text{F}$, $T_A=25^{\circ}\text{C}$, unless otherwise specified)

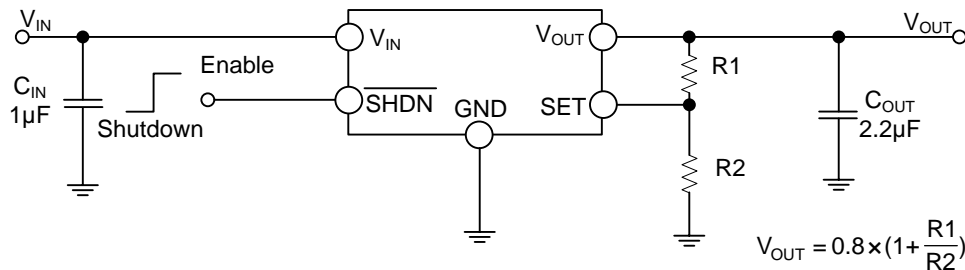
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}		0.8		5.5	V
Input Voltage	V_{IN}		2.7		6	V
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	$\Delta V_{OUT}\%/\Delta V_{IN}$, $I_{OUT}=10\text{mA}$	-0.07		+0.07	%/V
Load Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}}$	$\Delta V_{OUT}\%/V_{OUT}$	-0.4		+0.4	%
Output Voltage Accuracy		Fixed output voltage, $I_{OUT}=10\text{mA}$	-2		+2	%
Reference Voltage	V_{REF}	Measured on SET, $V_{IN}=2.8\text{V}$, $I_{OUT}=10\text{mA}$	0.784	0.8	0.816	V
Quiescent Current	I_Q	$I_{OUT}=10\text{mA}\sim 300\text{mA}$		90	200	μA
Dropout Voltage	V_D	$V_{OUT}=2.5\text{V}$, $I_{OUT}=300\text{mA}$		230	360	mV
		$V_{OUT}=3.3\text{V}$, $I_{OUT}=300\text{mA}$		170	300	mV
Power Supply Ripple Rejection Ratio	PSRR	$f=10\text{kHz}$, $I_{OUT}=300\text{mA}$		45		dB
Output Voltage Noise	eN	$f=80\text{Hz}\sim 100\text{kHz}$, $I_{OUT}=300\text{mA}$		160		μV_{RMS}
Current Limit	I_{LIMIT}		300			mA
Shutdown Threshold	V_{IH}		1.6			V
	V_{IL}				0.4	V
Shutdown Supply Current	I_{OFF}	$\overline{\text{SHDN}}=\text{Low}$, $V_{IN}=6\text{V}$		0.1	1	μA
V_{OUT} Discharge MOSFET $R_{DS(ON)}$		$\overline{\text{SHDN}}=\text{Low}$		60		Ω
Thermal Shutdown Temperature	T_{SHDN}	$I_{OUT}=10\text{mA}$		150		$^{\circ}\text{C}$
Thermal Shutdown Hysteresis	DT_{SHDN}	$I_{OUT}=10\text{mA}$		20		$^{\circ}\text{C}$
SET Input Threshold for Fixed/Adjustable Output Voltage Mode		LR2128-XX		80		mV
SET Input Bias Current			-100		100	nA
Soft-Start Interval	T_{SS}			60		μs

■ TYPICAL APPLICATION CIRCUIT

For Fixed Output Voltage Mode (For LR2128-XX)



For Adjustable Output Voltage Mode (For LR2128-AD)



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