



LR2125

LINEAR INTEGRATED CIRCUIT

300mA SELECTABLE FIXED/ADJUSTABLE LOW DROPOUT LINEAR REGULATOR

DESCRIPTION

As a low dropout linear regulator, the UTC **LR2125** only needs low input voltage (2.8~6V), and can deliver current to 300mA for setting the output voltage.

The UTC **LR2125** 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 **LR2125** 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 **LR2125** has current limit and thermal shutdown functions.

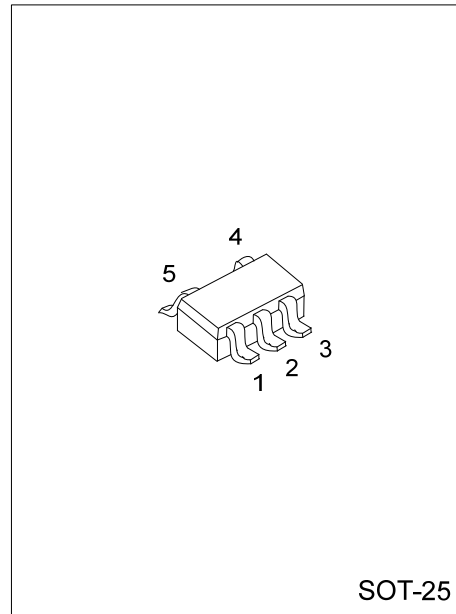
FEATURES

- * Operating Voltage: 2.8~6V
- * 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
- * Halogen Free

ORDERING INFORMATION

Ordering Number	Package	Packing
LR2125G-xx-AF5-R	SOT-25	Tape Reel

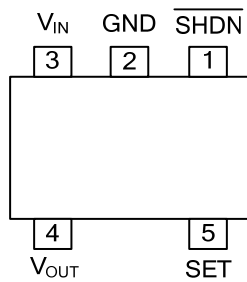
LR2125G-xx-AF5-R	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) AF5: SOT-25
	(3)Output Voltage Code	(3) xx: Refer to Marking Information
	(4)Halogen Free	(4) G: Halogen Free



MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-25	12 :1.2V 18 :1.8V 25 :2.5V AD :ADJ	

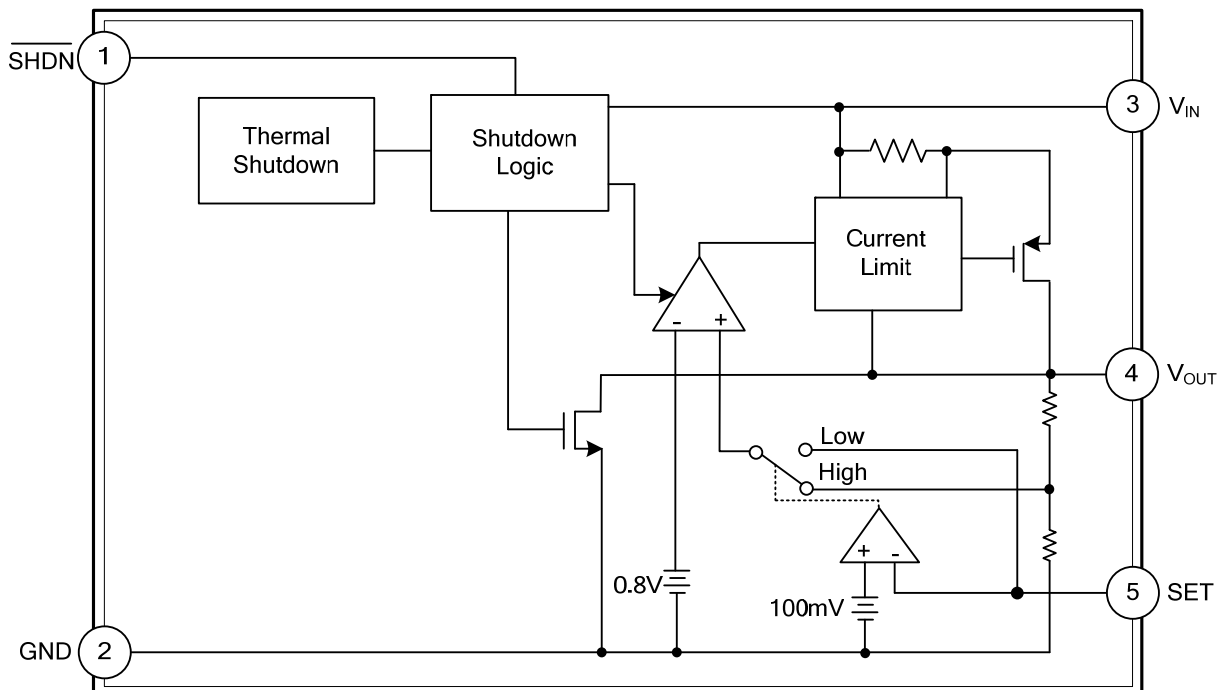
PIN CONFIGURATION



PIN DESCRIPTION

PIN NO	PIN NAME	DESCRIPTION
1	$\overline{\text{SHDN}}$	Control pin for shutdown Logic High: enable Logic Low: shutdown
2	GND	Ground
3	V_{IN}	Voltage supply
4	V_{OUT}	Output pin
5	SET	When this pin is connected to ground, turns to fixed output voltage operation. When this pin is connected to an external resistor divider, turns to adjustable output voltage mode operation.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

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	Internally Limited	W
Junction Temperature	T _J	-40 ~ +125	°C
Storage Temperature	T _{STG}	-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 CONDITIONS

PARAMETER	SYMBOL	RATINGS	UNIT
V _{IN} Supply Voltage	V _{IN}	2.8 ~ 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 ~ +125	°C

■ ELECTRICAL CHARACTERISTICS

(V_{IN} = V_{OUT}+1V (min V_{IN}=2.8V), I_{OUT}=0~300mA, C_{IN} = 1μF, C_{OUT} = 2.2μF, T_a = 25°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}		2.8		6	V
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	$\Delta V_{OUT}\%/\Delta V_{IN}$, I _{OUT} =10mA	-0.06		+0.06	%/V
Load Regulation	$\frac{\Delta V_{OUT}}{\Delta I_{OUT} \times V_{OUT}}$	$\Delta V_{OUT}\%/\Delta I_{OUT}$	-0.2		+0.2	%/A
Output Voltage Accuracy		Fixed output voltage, I _{OUT} =10mA	-2		+2	%
Reference Voltage	V _{REF}	Measured on SET, V _{IN} =2.8V, I _{OUT} =10mA	0.784	0.8	0.816	V
Quiescent Current	I _Q	I _{OUT} = 10mA ~ 300mA		135	160	μA
Dropout Voltage	V _D	V _{OUT} = 2.5V, I _{OUT} = 300mA		230	360	mV
		V _{OUT} = 3.3V, I _{OUT} = 300mA		170	300	mV
Power Supply Ripple Rejection Ratio	PSRR	f = 10kHz, I _{OUT} = 300mA		45		dB
Output Voltage Noise	eN	f = 80Hz ~ 100KHz, I _{OUT} = 300mA		160		μV _{RMS}
Current Limit	I _{LIMIT}		400	500	650	mA
Shutdown Threshold	V _{IH}		1.6			V
	V _{IL}				0.4	V
Shutdown Supply Current	I _{OFF}	$\overline{\text{SHDN}}$ = Low, V _{IN} = 6V		0.1	1	μA
V _{OUT} Discharge MOSFET R _{DS(ON)}		$\overline{\text{SHDN}}$ = Low		60		Ω
Thermal Shutdown Temperature	T _{SHDN}			160		°C
Thermal Shutdown Hysteresis	DT _{SHDN}			40		°C
SET Input Threshold for Fixed/Adjustable Output Voltage Mode				100		mV
SET Input Bias Current			-100		100	nA
Soft-Start Interval	T _{SS}			60		μs

■ APPLICATION INFORMATION

Input Capacitor

Value :

Larger than 1 μ F, at least a 1 μ F ceramic capacitor

Place :

Be placed near the VIN very closely

Purpose and Advantage Description :

To prevent the input rail from dropping, this capacitor can provide surge current as while as the circuit's stepping load transients.

Output Capacitor

Value :

Larger than 2.2 μ F

Place :

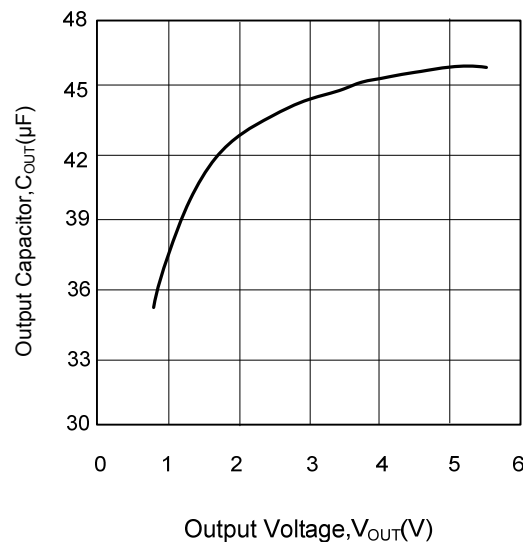
Be placed at the load and near the GND pin very closely.

Purpose and Advantage Description :

Mainly make sure the circuit's operating stability. And the large value capacitor also can reduce noise and improve transient response. Additionally, it can affect power on issue.

$$C_{OUT(max)} = 0.87 \times \left(0.55 - \frac{0.1155}{V_{OUT}}\right)$$

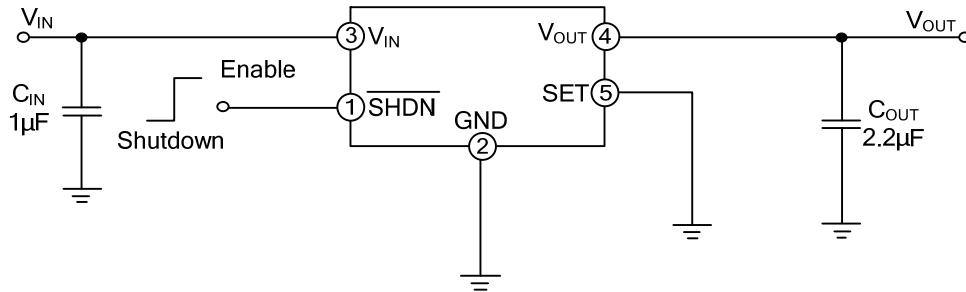
Maximum Output Capacitor's Value (μ F) and the Output Voltage (V)'s Value's Relationship



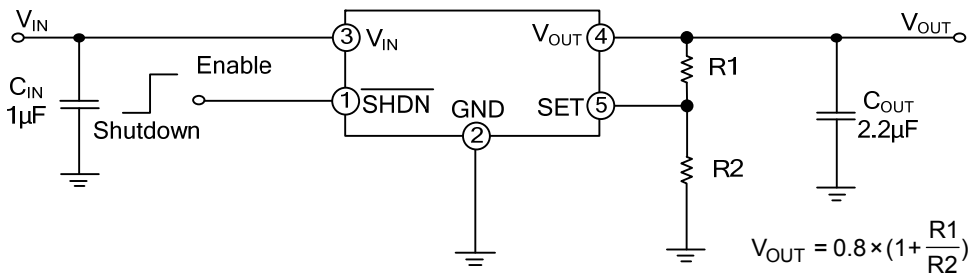
Maximum Output Capacitor's Changing Over V_{OUT} .

■ TYPICAL APPLICATION CIRCUITS

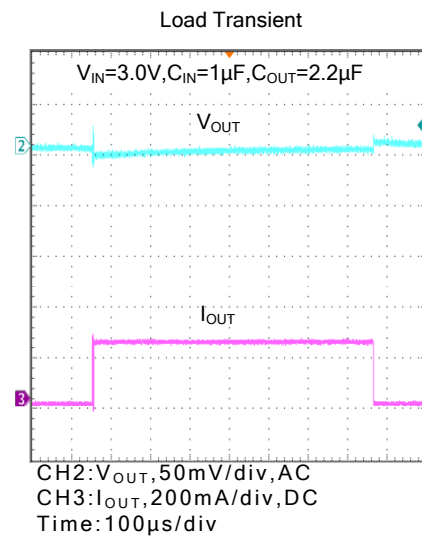
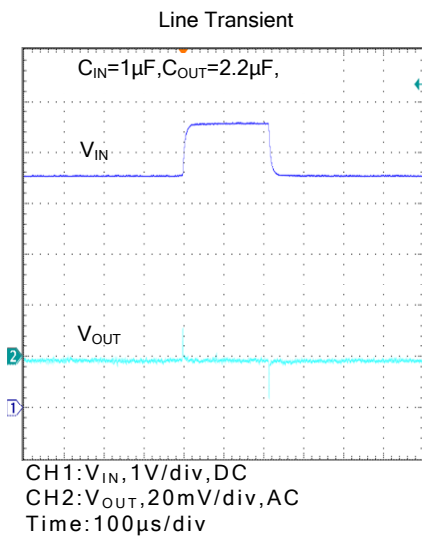
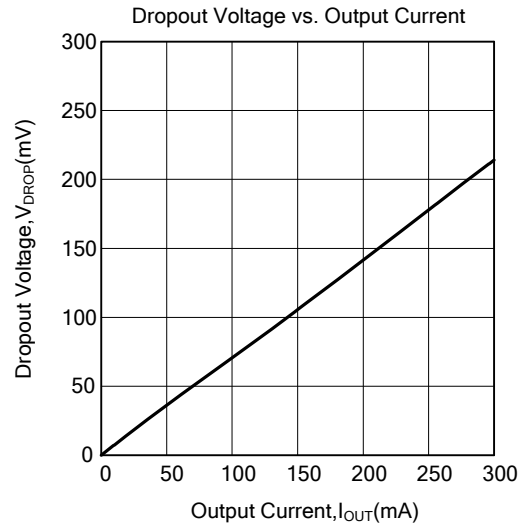
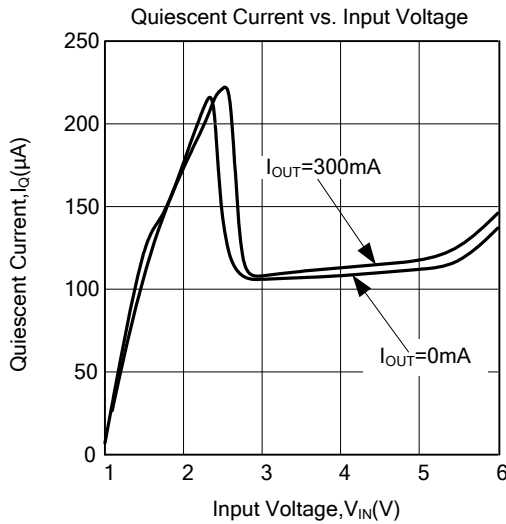
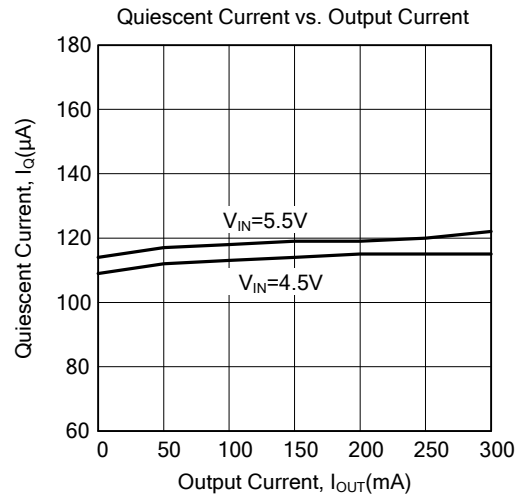
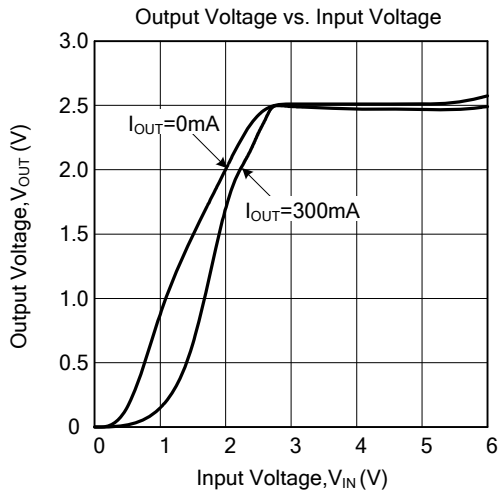
For Fixed Output Voltage Mode



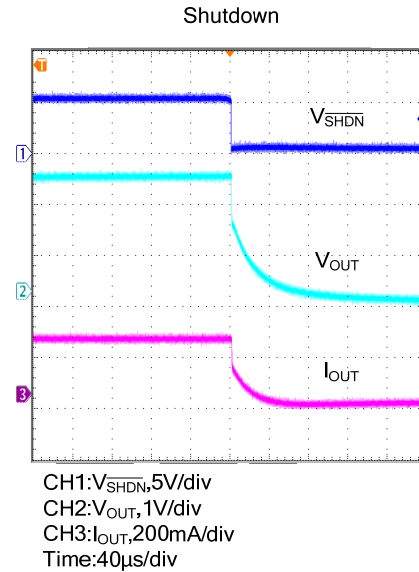
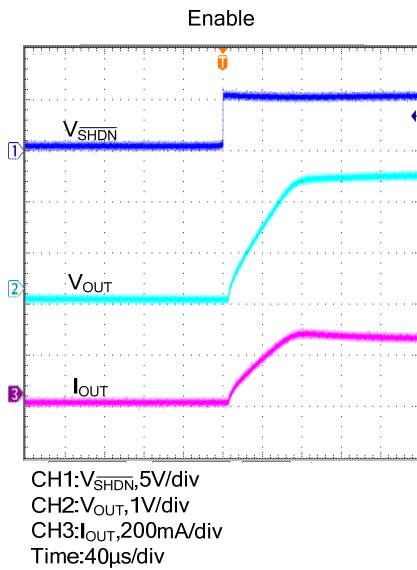
For Adjustable Output Voltage Mode



TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



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