



## LR1121B

CMOS IC

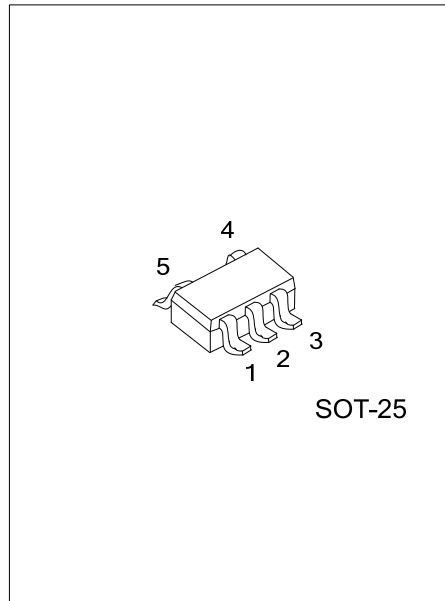
### HIGH RIPPLE-REJECTION LDO REGULATOR

#### DESCRIPTION

The UTC **LR1121B** is CMOS-based voltage regulator ICs with high output voltage accuracy, extremely low current, low ON-resistance, and high Ripple Rejection.

An ON/OFF circuit enables the output to be turned off, ensuring a long battery life. a built-in low on-resistance transistor provides a low dropout voltage and large output current, and a built-in overcurrent protector prevents the load current from exceeding the current capacitance of the output transistor.

The line transient response and load transient of the UTC **LR1121B** is excellent.



#### FEATURES

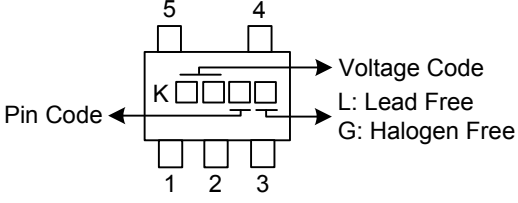
- \* Ultra-Low Supply Current :  
During Operation: 30µA TYP.  
During Standby: 0.1µA Typ.
- \* Output Voltage: 2.1V ~ 5.5V, Selectable in 0.1 V Steps.
- \* High Output Voltage Accuracy: ±2.0%
- \* Low Dropout Voltage: 180 mV Typ. (2.8 V Output Product, I<sub>OUT</sub> = 100 mA)
- \* High Ripple Rejection: 70 dB TYP. (@ 1.0 kHz)
- \* High Peak Current Capability: 150 mA Output is Possible (@ V<sub>IN</sub> ≥ V<sub>OUT(S)</sub> + 1.0 V)

#### ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
LR1121BL-xx-AF5-A-R	LR1121BG-xx-AF5-A-R	SOT-25	Tape Reel
LR1121BL-xx-AF5-B-R	LR1121BG-xx-AF5-B-R	SOT-25	Tape Reel

<p>LR1121BG-xx-AF5-A-R</p> <p>(1)Packing Type (2)Pin Code (3)Package Type (4)Output Voltage Code (5)Green Package</p>	<p>(1) R: Tape Reel (2) refer to Pin Description (3) AF5: SOT-25 (4) xx: refer to Marking Information (5) G: Halogen Free and Lead Free, L: Lead Free</p>
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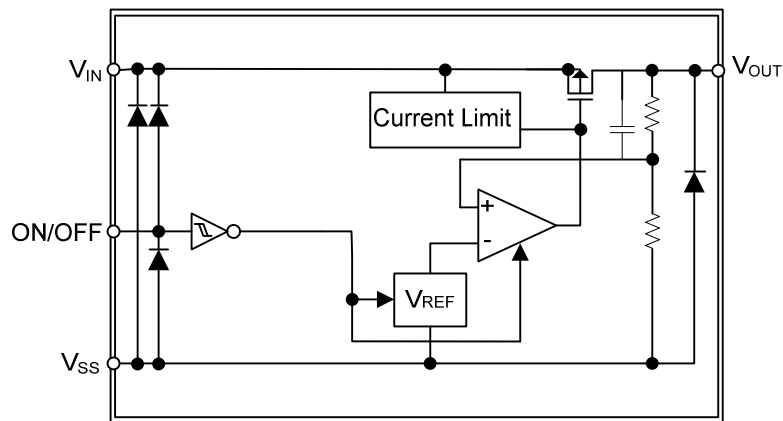
## MARKING INFORMATION

PACKAGE	VOLTAGE CODE				MARKING
SOT-25	21:2.1V	30:3.0V	40:4.0V	50:5.0V	
	22:2.2V	31:3.1V	41:4.1V	51:5.1V	
	23:2.3V	32:3.2V	42:4.2V	52:5.2V	
	24:2.4V	33:3.3V	43:4.3V	53:5.3V	
	25:2.5V	34:3.4V	44:4.4V	54:5.4V	
	26:2.6V	35:3.5V	45:4.5V	55:5.5V	
	27:2.7V	36:3.6V	46:4.6V		
	28:2.8V	37:3.7V	47:4.7V		
	2J:2.85V	38:3.8V	48:4.8V		
	29:2.9V	39:3.9V	49:4.9V		

## PIN DESCRIPTION

PIN NO.		SYMBOL	DESCRIPTION
A	B		
5	1	$V_{OUT}$	Output pin
2	2	$V_{SS}$	GND pin
1	3	$V_{IN}$	Input pin
3	4	ON/OFF	Chip enable pin
4	5	NC*	No connection (The NC pin is electrically open or connected to $V_{IN}$ or $V_{SS}$ .)

## BLOCK DIAGRAM



### ■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V <sub>IN</sub>	7	V
	V <sub>ON/OFF</sub>	0.3 ~ V <sub>IN</sub> +0.3	V
Output Voltage	V <sub>OUT</sub>	-0.3 ~ V <sub>IN</sub> +0.3	V
Power Dissipation	P <sub>D</sub>	280	mW
Junction Temperature	T <sub>J</sub>	125	°C
Operating Temperature	T <sub>OPR</sub>	-40 ~ +85	°C
Storage Temperature	T <sub>STG</sub>	-40 ~ +125	°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.

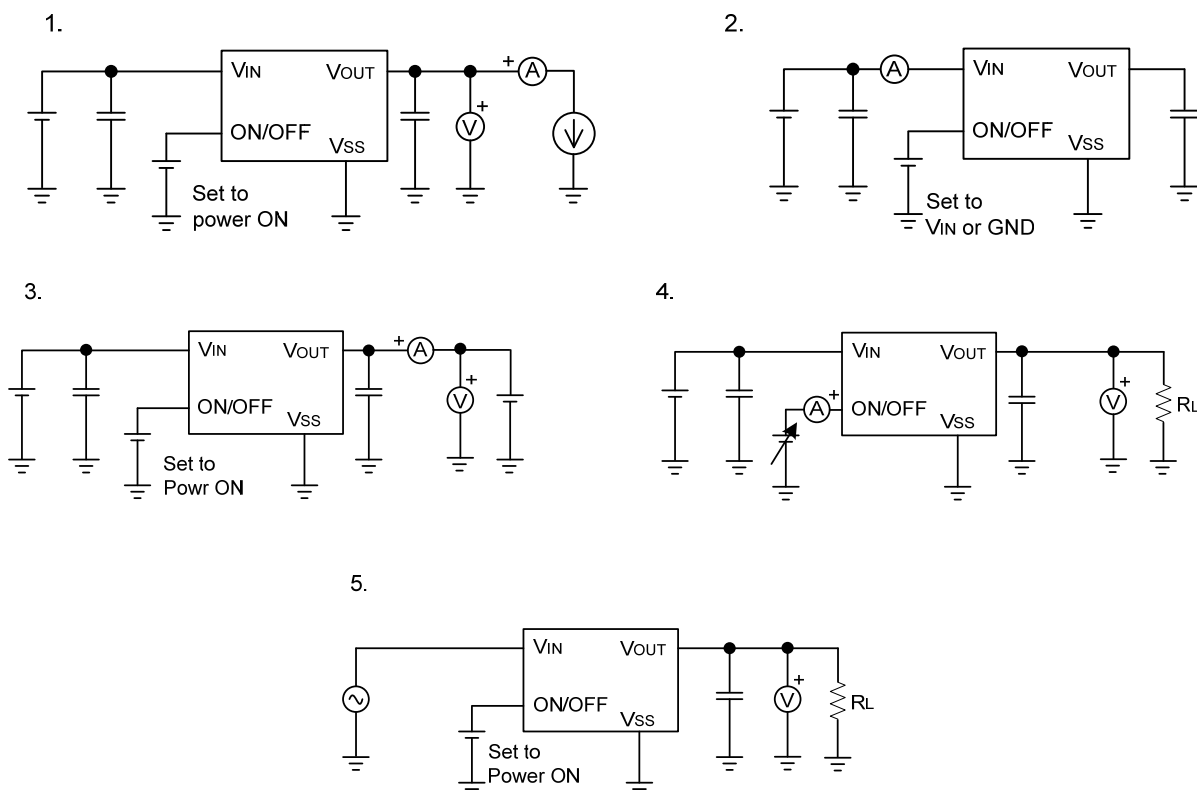
### ■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CIRCUIT	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V <sub>OUT</sub>	1	V <sub>IN</sub> =V <sub>OUT</sub> +1.0V, I <sub>OUT</sub> =30mA	V <sub>OUT</sub> ×0.98		V <sub>OUT</sub> ×1.02	V
Output Current	I <sub>OUT</sub>	3	V <sub>IN</sub> ≥ V <sub>OUT</sub> +1.0V	200			mA
Input Voltage	V <sub>IN</sub>			2.0		7	V
Line Regulation	$\frac{\Delta V_{OUT(LINE)}}{\Delta V_{IN} \times V_{OUT}}$	1	V <sub>OUT</sub> +0.5V ≤ V <sub>IN</sub> ≤ 7V I <sub>OUT</sub> =30mA		0.04	0.2	%/V
Load Regulation	ΔV <sub>OUT(LOAD)</sub>	1	V <sub>IN</sub> =V <sub>OUT</sub> +1.0V 1.0mA ≤ I <sub>OUT</sub> ≤ 80mA		15	40	mV
Supply Current	I <sub>SS1</sub>	2	V <sub>IN</sub> =V <sub>OUT</sub> +1.0V, ON/OFF pin=ON, no load		30	65	μA
Supply Current During standby	I <sub>SS2</sub>	2	V <sub>IN</sub> =V <sub>OUT</sub> +1.0V, ON/OFF pin=OFF, no load		0.1	1.0	
Short Circuit Current	I <sub>SHORT</sub>	3	V <sub>IN</sub> =V <sub>OUT</sub> +1.0V, ON/OFF pin=ON, V <sub>OUT</sub> =0V		230		mA
Shutdown Pin Input Voltage	High	V <sub>SH</sub>	4	V <sub>IN</sub> =V <sub>OUT</sub> +1.0V, R <sub>L</sub> =10KΩ	1.6		V <sub>IN</sub>
	Low	V <sub>SL</sub>	4	V <sub>IN</sub> =V <sub>OUT</sub> +1.0V, R <sub>L</sub> =10KΩ	0		0.3
Shutdown Pin Input Current	High	I <sub>SH</sub>	4	V <sub>IN</sub> =7V, V <sub>ON/OFF</sub> =V <sub>IN</sub>	-0.1		0.1
	Low	I <sub>SL</sub>	4	V <sub>IN</sub> =7V, V <sub>ON/OFF</sub> =V <sub>SS</sub>	-0.1		0.1
Ripple Rejection	RR	5	V <sub>IN</sub> =V <sub>OUT</sub> +1.0V, f=1.0kHz Ripple 0.5Vp-p		70		dB

### ■ ELECTRICAL CHARACTERISTICS OF DROPOUT VOLTAGE (T<sub>A</sub>=25°C)

Output Voltage, V <sub>OUT</sub> (V)	V <sub>D</sub> (Dropout Voltage)				
	Condition	MIN	TYP	MAX	UNIT
2.1V ≤ V <sub>OUT(S)</sub> ≤ 2.4V	I <sub>OUT</sub> =100mA		0.22	0.70	V
2.5V ≤ V <sub>OUT(S)</sub> ≤ 2.7V			0.20	0.35	V
2.8V ≤ V <sub>OUT(S)</sub> ≤ 3.3V			0.18	0.30	V
3.4V ≤ V <sub>OUT(S)</sub> ≤ 5.5V			0.15	0.26	V

## ■ TEST CIRCUIT



### Note:

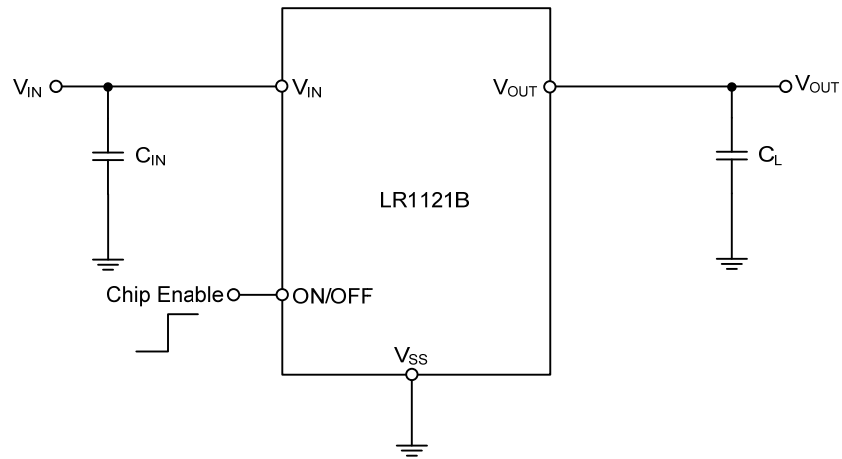
Input capacitor ( $C_{IN}$ ): 1.0  $\mu$ F or more

Output capacitor ( $C_L$ ): 2.2 $\mu$ F or more (tantalum capacitor)

## ■ SELECTION OF OUTPUT CAPACITOR ( $C_L$ )

In this IC, phase compensation and the output capacitor is made for securing stable operation even if the load current is varied. Therefore, always place a capacitor ( $C_L$ ) of 2.2  $\mu$ F or more between  $V_{OUT}$  and  $V_{SS}$  pins. Using a capacitor whose ESR is outside the optimum range (approximately 0.5 ~ 5 $\Omega$ ), whether larger or smaller, may cause an unstable output, resulting in oscillation. For this reason, a tantalum electrolytic capacitor is recommended.

## ■ TYPICAL APPLICATION CIRCUIT

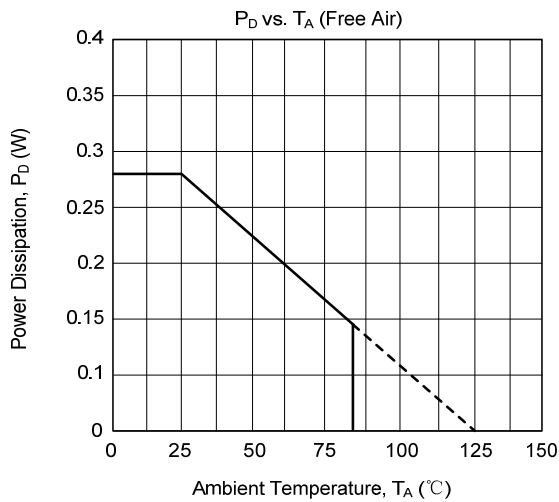
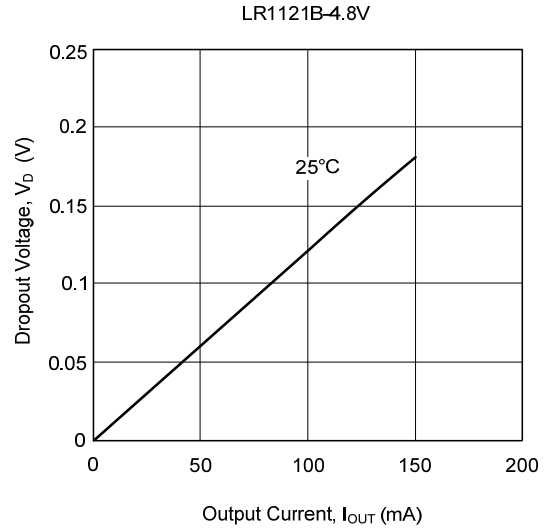
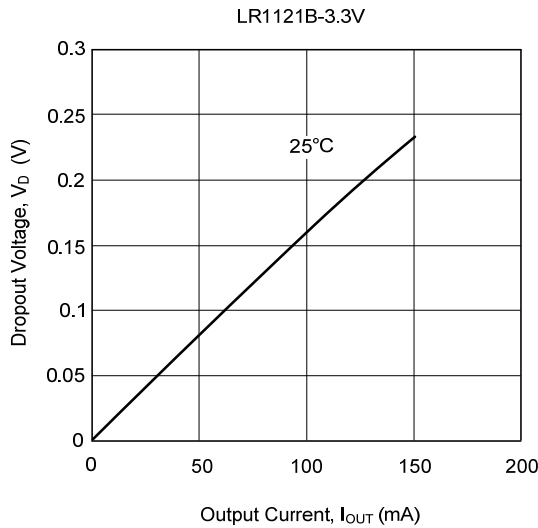


## Note:

Input capacitor ( $C_{IN}$ ): 1.0  $\mu$ F or moreOutput capacitor ( $C_L$ ): 2.2 $\mu$ F or more (tantalum capacitor)

■ TYPICAL CHARACTERISTICS

Dropout voltage vs. Output current



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