



LR7XXYY

Advance

CMOS IC

LOW NOISE DUAL 300mA LDO

■ DESCRIPTION

The UTC **LR7XXYY** series are highly accurate, Dual, low noise, CMOS LDO voltage regulators. Performance features of the series includes low output noise, high ripple rejection ratio, low dropout and very fast turn-on times.

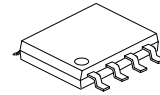
The UTC **LR7XXYY** includes a reference voltage source, error amplifiers, driver transistors, current limiters and phase compensators internally. The **LR7XXYY** current limiters' foldback circuit also operates as a short protect for the output current limiter.

The UTC **LR7XXYY** series is also fully compatible with low ESR ceramic capacitors, reducing cost and improving output stability.

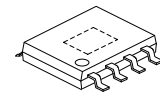
This high level of output stability is maintained even during frequent load fluctuations, due to the excellent transient response performance and high PSRR achieved across a broad range of frequencies. The EN function allows the output of each regulator to be turned off independently, resulting in greatly reduced power consumption. The output voltage of these ICs is internally fixed with high accuracy (1%).

■ FEATURES

- * Supply Current Typ. 25 μ A (each channel)
- * Standby Current Typ. 0.1 μ A (each channel)
- * Dropout Voltage Typ. 0.21V ($I_{OUT}=300mA$, $V_{OUT}=2.8V$)
Typ. 0.24V ($I_{OUT}=300mA$, $V_{OUT}=2.5V$)
- * Ripple Rejection Typ. 80dB ($f=1kHz$)
- * Temperature-Drift Coefficient of Output Voltage Typ. $\pm 30ppm/^{\circ}C$
- * Line Regulation Typ. 0.02%/V
- * Output Voltage Accuracy $\pm 1.0\%$
- * Input Voltage Range 2.5V~5.25V
- * Output Voltage Range 1.5V ~3.3V (0.1V steps)
(For details, please refer to MARK INFORMATION.)
- * Built-in Fold Back Protection Circuit Typ. 50mA
- * Built-in Auto Discharge Function B Version



SOP-8

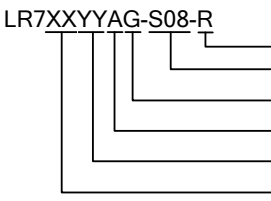


HSOP-8

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
LR7XXYYAL-S08-R	LR7XXYYAG-S08-R	SOP-8	Tape Reel
LR7XXYYAL-SH2-R	LR7XXYYAG-SH2-R	HSOP-8	Tape Reel

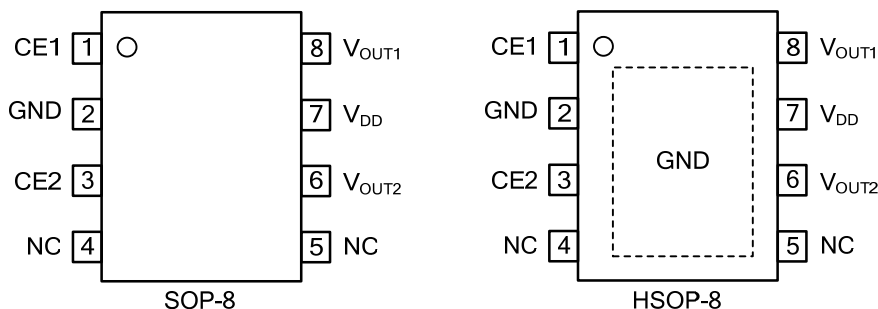
Note: XXYY: Output Voltage, refer to Marking Information.

<p>LR7XXYYAG-S08-R</p>  <p>(1) Packing Type (2) Package Type (3) Green Package (4) Discharge Function (5) Voltage Code at V_{OUT2} (6) Voltage Code at V_{OUT1}</p>		<p>(1) R: Tape Reel (2) S08: SOP-8, SH2: HSOP-8 (3) G: Halogen Free and Lead Free (4) A: without auto-discharge function at off state (5) YY: refer to Marking Information (6) XX: refer to Marking Information</p>
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MARKING INFORMATION

PACKAGE	VOLTAGE CODE		MARKING
	XX	YY	
SOP-8	18: 1.8V	25: 2.5V	
	18: 1.8V	33: 3.3V	

PIN CONFIGURATION



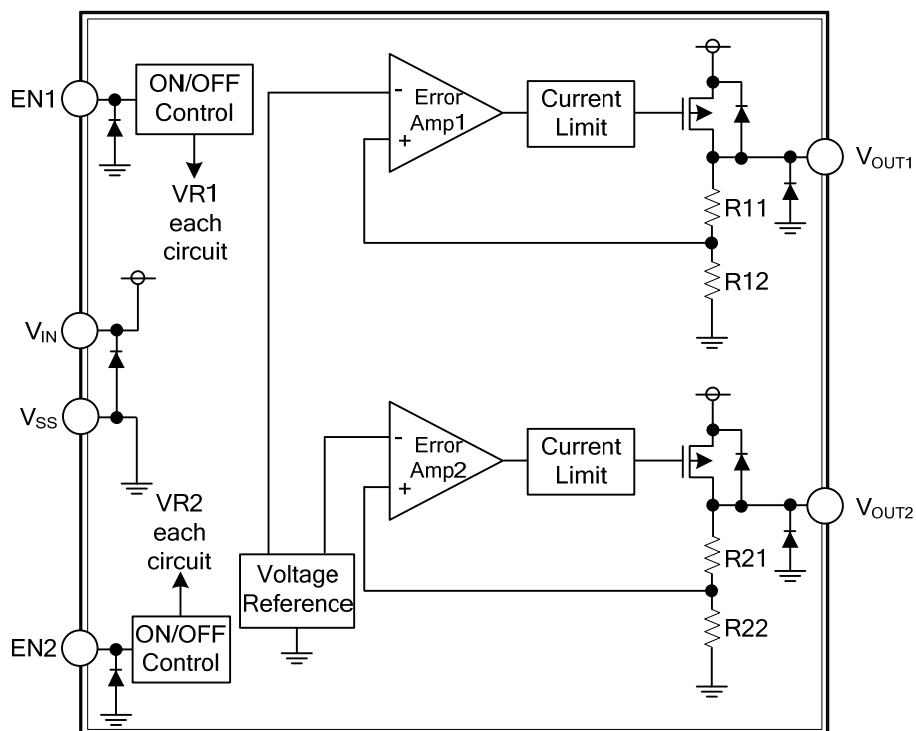
PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	CE1	Chip Enable Pin 1
2	GND	Ground Pin
3	CE2	Chip Enable Pin 2
4	NC	No Connection
5	NC	No Connection
6	V _{OUT2}	Output Pin 2
7	V _{DD}	Input Pin
8	V _{OUT1}	Output Pin 1

Notes: 1. Tab is GND level. (They are connected to the reverse side of this IC.)

2. The tab is better to be connected to the GND, but leaving it open is also acceptable.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	6.0	V
Input Voltage (CE Pin)	V_{CE}	6.0	V
Output Voltage	V_{OUT}	-0.3 ~ $V_{IN}+0.3$	V
Output Current 1	I_{OUT1}	400	mA
Output Current 2	I_{OUT2}	400	mA
Power Dissipation	P_D	880	mW
Operating Temperature Range	T_{OPR}	-40 ~ +85	°C
Storage Temperature Range	T_{STG}	-55 ~ +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

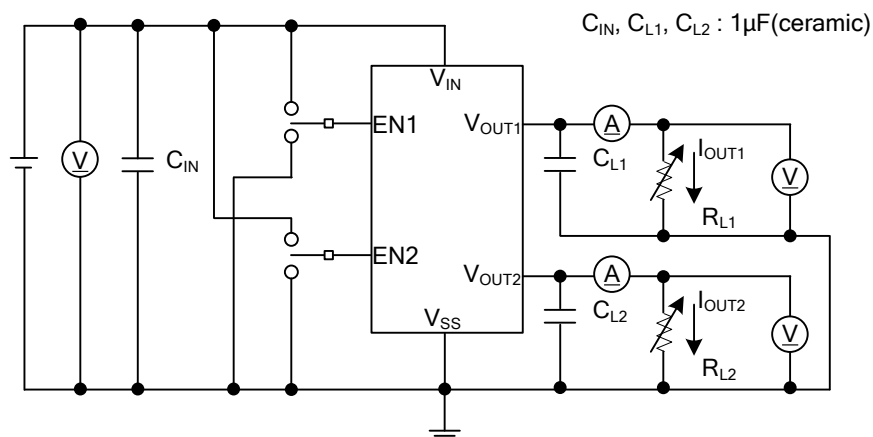
($T_{OPT}=25^{\circ}\text{C}$, $V_{IN}=\text{Set } V_{OUT}+1\text{V}$ for higher output of the regulator pair, $I_{OUT}=1\text{mA}$, $C_{IN}=C_{OUT}=1\mu\text{F}$, unless otherwise noted)

VR1/VR

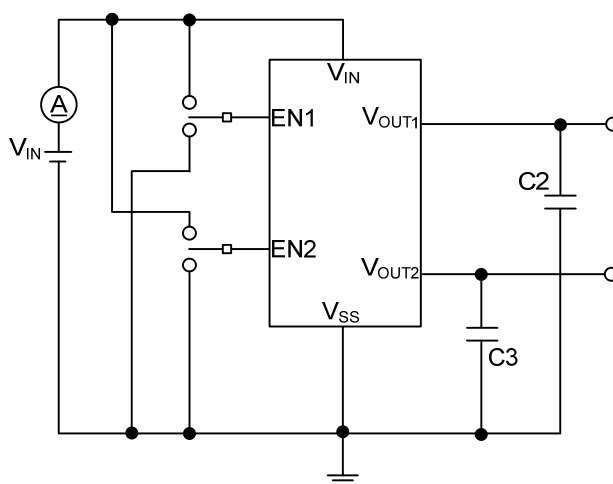
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN}=\text{Set } V_{OUT}+1\text{V}$, $I_{OUT}=1\text{mA}$, $V_{OUT}>2.0\text{V}$	$\times 0.99$		$\times 1.01$	V
		$V_{OUT} \leq 2.0\text{V}$	-20		+20	mV
Output Current	I_{OUT}		300			mA
Load Regulation	$\Delta V_{OUT}/\Delta I_{OUT}$	$1\text{mA} \leq I_{OUT} \leq 200\text{mA}$		20	40	mV
Dropout Voltage	V_{DIF}	$I_{OUT}=300\text{mA}$	$1.5\text{V} \leq \text{Set } V_{OUT} < 1.7\text{V}$	0.40	1.00	V
			$1.7\text{V} \leq \text{Set } V_{OUT} < 2.0\text{V}$	0.34	0.80	
			$2.0\text{V} \leq \text{Set } V_{OUT} < 2.5\text{V}$	0.29	0.50	
			$2.5\text{V} \leq \text{Set } V_{OUT} < 2.8\text{V}$	0.24	0.38	
			$2.8\text{V} \leq \text{Set } V_{OUT} \leq 3.3\text{V}$	0.21	0.34	
Supply Current	I_{SS}	$I_{OUT}=0\text{V}$		25	33	μA
Standby Current	$I_{standby}$	$V_{CE}=0\text{V}$		0.1	3.0	μA
Line Regulation	$\Delta V_{OUT}/\Delta V_{IN}$	Set $V_{OUT}+0.5\text{V} \leq V_{IN} \leq 5.0\text{V}$ (In case that $V_{OUT} \leq 2.0\text{V}$, $2.5\text{V} \leq V_{IN} \leq 5.0$)		0.02	0.10	%/V
Ripple Rejection	RR	$f=1\text{kHz}$, Ripple 0.2Vp-p, $V_{IN}=\text{Set } V_{OUT}+1\text{V}$, $I_{OUT}=30\text{mA}$ (In case that $V_{OUT} \leq 2.0\text{V}$, $V_{IN}=3\text{V}$)		80		dB
Input Voltage (Note 1)	V_{IN}		2.5		5.25	V
Output Voltage Temperature Coefficient	$\Delta V_{OUT}/\Delta T_{OPT}$	$-40^{\circ}\text{C} \leq T_{OPT} \leq 85^{\circ}\text{C}$		± 30		ppm/°C
Short Current Limit	I_{SC}	$V_{OUT}=0\text{V}$		50		mA
CE Pull-Down Current	I_{PD}		0.05	0.3	0.6	μA
CE Input Voltage "H"	V_{CEH}		1.5		6.0	V
CE Input Voltage "L"	V_{CEL}				0.3	V
Output Noise	en	$\text{BW}=10\text{Hz} \sim 100\text{kHz}$		30		μVrms
Low Output Nch Tr. ON Resistance (B version)	R_{LOW}	$V_{IN}=4.0$, $V_{CE}=0\text{V}$		30		Ω

Note: The maximum Input Voltage of the ELECTRICAL CHARACTERISTICS is 5.25V. In case of exceeding this specification, the IC must be operated on condition that the Input Voltage is up to 5.5V and the total operating time is within 500hrs.

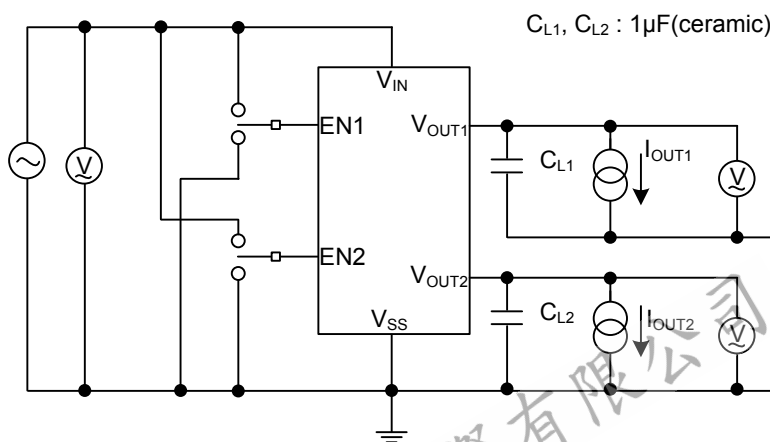
■ TEST CIRCUIT



Standard Test Circuit

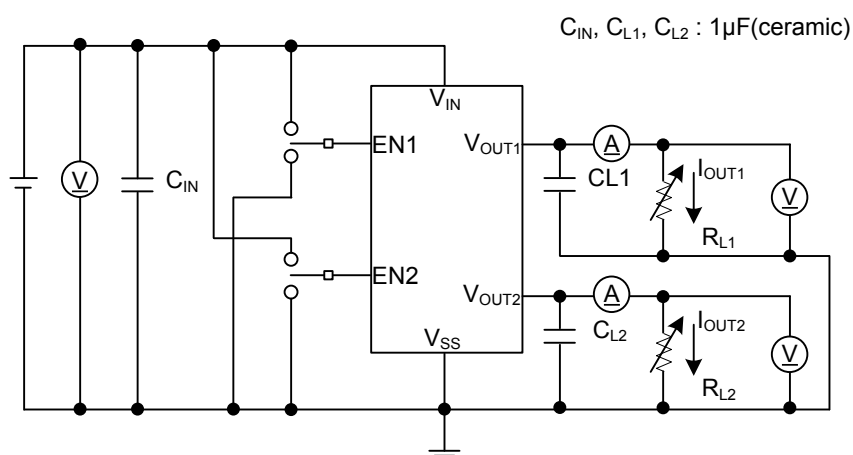


Supply Current Test Circuit



Test Circuit for Ripple Rejection

■ TYPICAL APPLICATION CIRCUIT(Cont.)



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