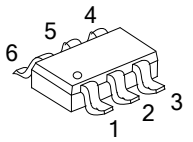
300mA SMALL DUAL LDO REGULATOR



SOT-23-6
(JDEDE TO-236)

■ DESCRIPTION

The UTC **LR9XXYY** Series are a low dropout regulator with high output voltage accuracy, low quiescent current, low dropout, and high ripple rejection. This regulator is based on a CMOS process. Each of these regulator ICs contains dual LDO regulator, both of them includes a voltage reference, an error amplifier, resistors for setting Output Voltage, a current limit circuit, and a chip enable circuit.

The UTC **LR9XXYY** Series exhibit ultra excellent line transient response and load transient response, thus they are very suitable for the power supply for hand-held communication equipment.

■ FEATURES

* Supply Current: TYP. 50μA×2 (VR1&VR2)
* Standby Current: TYP. 0.1μA×2 (VR1&VR2)
* Input Voltage Range: 1.4V~5.25V
* Output Voltage Range: 0.8V~3.7V (0.1V steps)
  (For details, please refer to MARK SPECIFICATION TABLE)
* Output Voltage Accuracy: ±1.0% (V_{SET}>2.0V, T_{OPT}=25°C)
* Temperature-Drift Coefficient of Output Voltage: TYP. ±80ppm/°C
* Dropout Voltage: TYP. 0.25V (I_{OUT}=300mA, V_{SET}=2.5V)
* Ripple Rejection: TYP. 75dB (f=1kHz)
* Line Regulation: TYP. 0.02%/V
* Built-in Fold Back Protection Circuit: TYP. 60mA
  (Current at short mode)
* Ceramic capacitors are recommended to be used with this IC:
  1.0μF or more

■ RDERING INFORMATION

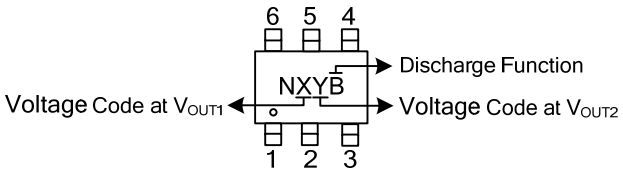
Ordering Number	Package	Packing
LR9XXYYBG-AE6-R	SOT-23-6	Tape Reel

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

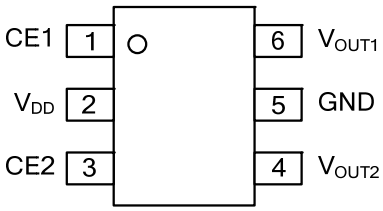
LR9XXYYBG-AE6-R

(1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) AE6: SOT-23-6
(3)Green Package	(3) G: Halogen Free and Lead Free
(4)Discharge Function	(4) B: without auto-discharge function at off state
(5)Voltage Code at V_{OUT2}	(5) YY: refer to Marking Information
(6)Voltage Code at V_{OUT1}	(6) XX: refer to Marking Information

■ MARKING INFORMATIONS

PACKAGE	VOLTAGE CODE				MARKING
	CODE	X	CODE	Y	
SOT-23-6	1	1.2V	1	1.2V	
	2	1.5V	2	1.5V	
	3	1.8V	3	1.8V	
	4	2.0V	4	2.0V	
	5	2.5V	5	2.5V	
	6	2.8V	6	2.8V	
	7	3.0V	7	3.0V	
	8	3.3V	8	3.3V	
	9	3.6V	9	3.6V	

■ PIN CONFIGURATION

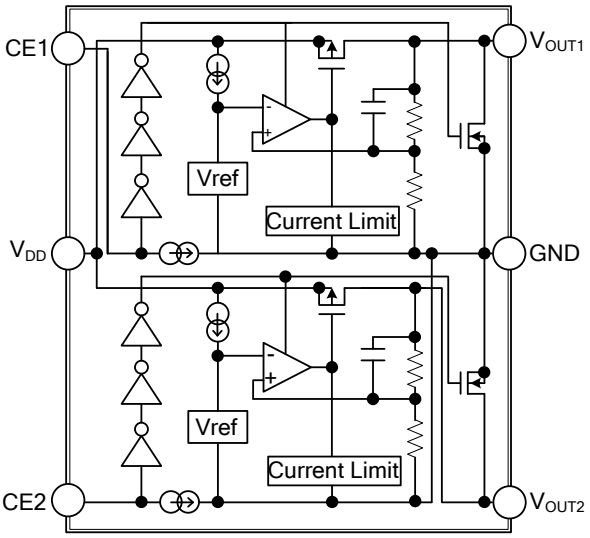


■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	CE1	Chip Enable Pin 1 (“H” Active)
2	V_{DD}	Input Pin
3	CE2	Chip Enable Pin 2 (“H” Active)
4	V_{OUT2}	Output Pin 2
5	GND	Ground Pin
6	V_{OUT1}	Output Pin 1

■ BLOCK DIAGRAM

UTC LR9XXYYB
(With Auto Discharge)



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	6.0	V
Input Voltage (CE Pin)	V_{CE}	-0.3~6.0	V
Output Voltage	V_{OUT1}, V_{OUT2}	-0.3~V_{IN} +0.3	V
Output Current	I_{OUT1}, I_{OUT2}	400	mA
Power Dissipation	P_D	420	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

(V_{IN}=Set V_{OUT}+1.0V for V_{OUT} options greater than 1.5V, V_{IN}=2.5V for V_{OUT}≤1.5V, I_{OUT}=1mA, C_{IN}=C_{OUT}=0.22μF unless otherwise noted. Values surrounded by **boldface** indicate the values under all temperature range, or -40°C≤T_A≤85°C) (T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	T_{OPT}=25°C	V_{SET}>2.0V	x 0.99		x 1.01	V
			V_{SET}≤2.0V	-20		+20	mV
		-40°C≤T_{OPT}≤85°C	V_{SET}>2.0V	**x 0.97**		**x 1.03**	V
			V_{SET}≤2.0V	**-60**		**+60**	mV
Output Current	I_{OUT}			**300**			mA
Load Regulation	$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$	1mA≤I_{OUT}≤300mA			15	**40**	mV
Dropout Voltage	V_{DIF}	I_{OUT}=300mA	V_{OUT}=0.8V		0.56	**0.72**	V
			V_{OUT}=0.9V		0.51	**0.65**	
			1.0V≤V_{OUT}<1.2V		0.46	**0.59**	
			1.2V≤V_{OUT}<1.4V		0.39	**0.50**	
			1.4V≤V_{OUT}<1.7V		0.35	**0.44**	
			1.7V≤V_{OUT}<2.1V		0.30	**0.39**	
			2.1V≤V_{OUT}<2.5V		0.26	**0.34**	
			2.5V≤V_{OUT}<3.0V		0.25	**0.30**	
			V_{OUT}=0.8V		0.22	**0.29**	
Supply Current	I_{SS}	I_{OUT}=0mA			50	**75**	μA
Supply Current (Standby)	$I_{STANDBY}$	V_{CE}=0V			0.1	1.0	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN}}$	V_{SET}+0.5V≤V_{IN}≤5.25V (V_{IN}≥1.4V)			0.02	**0.10**	%/V
Ripple Rejection	RR	f=1kHz, Ripple 0.2Vp-p V_{IN}=V_{SET}+1V, I_{OUT}=30mA (In case that V_{SET}≤2.0V, V_{IN}=3V)			75		dB
Input Voltage (Note 1)	V_{IN}			**1.40**		**5.25**	V
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_{OPT}}$	-40°C≤T_{OPT}≤85°C			±80		ppm
Short Current Limit	I_{SC}	V_{OUT}=0V			60		mA
CE Pull-down Current	I_{PD}				0.3	**0.6**	μA
CE Input Voltage “H”	V_{CEH}			**1.0**			V
CE Input Voltage “L”	V_{CEL}					**0.4**	V
Output Noise	en	BW=10Hz~100kHz			75		μVrms
Low Output Nch Tr. ON Resistance (of B version)	R_{LOW}	V_{IN}=4.0V, V_{CE}=0V			50		Ω

Notes: 1. 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.

2. All of unit are tested and specified under load conditions such that T_J≈T_{OPT}=25°C except for Output Noise, Ripple Rejection, Output Voltage Temperature Coefficient and Thermal Shutdown.

■ TYPICAL APPLICATION CIRCUIT