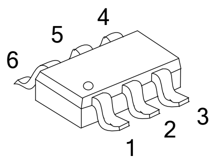
LR3XXYYB

CMOS IC

150mA 2CH LDO REGULATOR



SOT-26

■ DESCRIPTION

The UTC **LR3XXYYB** are CMOS voltage regulator ICs that have high output voltage accuracy, low dropout, low supply current, and high ripple rejection. Every voltage regulator IC of UTC **LR3XXYYB** series consists of an error amplifier, a voltage reference unit, a current limit circuit, resistors for setting output voltage, and a chip enable circuit.

Due to built-in transistor with low ON resistance and a chip enable function these ICs perform with low dropout voltage prolongs the battery life of each system. The load transient response and line transient response of the UTC **LR3XXYYB** Series are excellent, so these ICs are suitable for hand-held communication equipment power supply.

■ FEATURES

* Low supply current: Typ. 60μA
* Standby mode: Typ. 0.1μA
* Low dropout voltage
* High ripple rejection
* Low temperature-drift coefficient of output voltage
* Excellent line regulation
* High output voltage accuracy
* Output voltage stepwise setting with a step of 0.1V in the range of 1.5V ~ 3.3V is possible
* Built-in fold-back protection circuit Typ. 40mA (current at short mode)
* Ceramic capacitor is recommended. (1.0μF or more)

■ ORDERING INFORMATION

Ordering Number	Package	Packing
LR3XXYYBG-AG6-R	SOT-26	Tape Reel

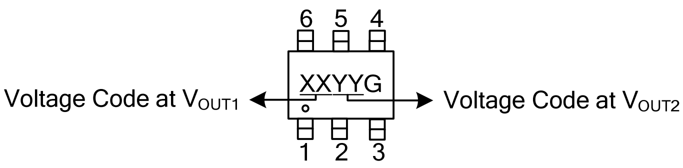
Note: XXYY: Output Voltage, refer to Marking Information.

LR3XXYYBG-AG6-R

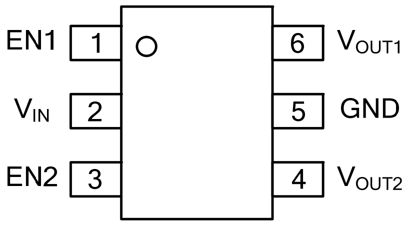
(1) Packing Type	(1) R: Tape Reel
(2) Package Type	(2) AG6: SOT-26
(3) Green Package	(3) G: Halogen Free and Lead Free
(4) Voltage Code at V_{OUT2}	(4) YY: refer to Marking Information
(5) Voltage Code at V_{OUT1}	(5) XX: refer to Marking Information

■ MARKING INFORMATIONS

PACKAGE	VOLTAGE CODE		MARKING
	XX	YY	
SOT-26	12:1.2V	18:1.8V	
	12:1.2V	28:2.8V	
	15:1.5V	30:3.0V	
	15:1.5V	28:2.8V	
	15:1.5V	33:3.3V	
	18:1.8V	12:1.2V	
	18:1.8V	25:2.5V	
	18:1.8V	28:2.8V	
	18:1.8V	30:3.0V	
	18:1.8V	33:3.3V	
	28:2.8V	12:1.2V	
	28:2.8V	15:1.5V	
	28:2.8V	18:1.8V	
	28:2.8V	33:3.3V	
	29:2.9V	19:1.9V	
	33:3.3V	15:1.5V	
	33:3.3V	18:1.8V	
	33:3.3V	28:2.8V	
	33:3.3V	33:3.3V	



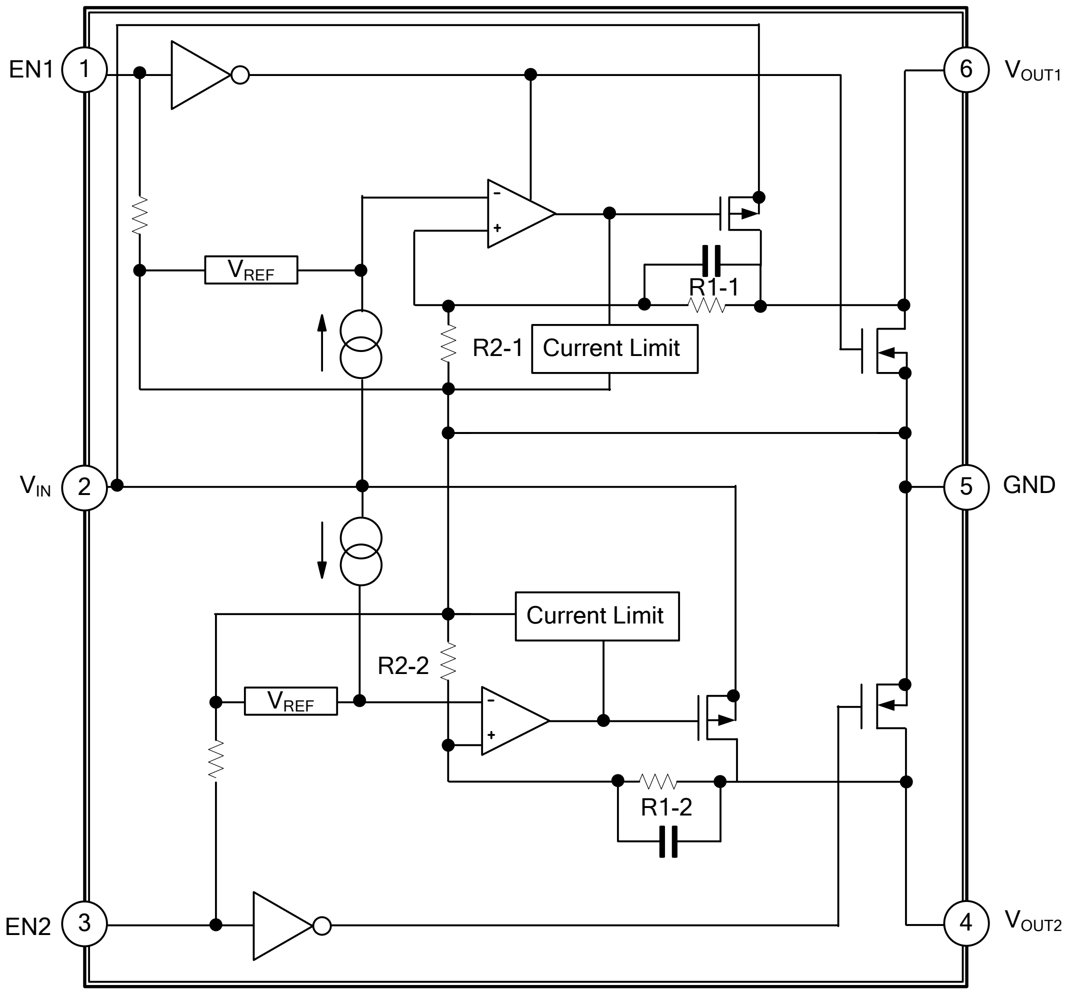
■ PIN CONFIGURATIONS



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	EN1	Channel 1's output enable control Pin
2	V_{IN}	Voltage Input pin
3	EN2	Channel 2's output enable control Pin
4	V_{OUT2}	Channel 2's voltage output
5	GND	Ground
6	V_{OUT1}	Channel 1's voltage output

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	6.5	V
Input Voltage (EN)	V_{EN}	6.5	V
Output Voltage	V_{OUT}	-0.3 ~ V_{IN} + 0.3	V
Output Current	I_{OUT1+} I_{OUT2}	700	mA
Power Dissipation	P_D	420	mW
Operating Temperature	T_{OPR}	-40 ~ +85	°C
Storage Temperature	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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ_{JA}	250	°C/W

■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=Set V_{OUT}+1V, 1mA≤I_{OUT}≤30mA	V_{OUT} ×0.98		V_{OUT} ×1.02	V
Output Current	I_{OUT}	$V_{IN}-V_{OUT}$=1.0V	150			mA
Load Regulation	ΔV_{LOAD}	V_{IN}=Set V_{OUT}+1V, 1mA≤I_{OUT}≤150mA		15	40	mV
Line Regulation	ΔV_{LINE}	Set V_{OUT}+0.5V≤V_{IN}≤6.0V, I_{OUT}=30mA		0.02	0.10	%/V
Dropout Voltage	V_D	Refer to the Electrical Characteristics by Output Voltage				
Supply Current	I_{SS}	V_{IN}=Set V_{OUT}+1V (Both LDOs)		90	120	μA
Supply Current (Standby)	$I_{STN\text{-}BY}$	V_{IN}=Set V_{OUT}+1V V_{CE}=GND		0.1	1.0	μA
Power Supply Ripple Rejection	PSRR	Ripple 0.5Vp−p, V_{IN}=Set V_{OUT}+1V I_{OUT}=30mA (In case that V_{OUT}≤1.7V, V_{IN}=Set V_{OUT}+1.2V)		75 (Note1) 65 (Note2)		dB
Input Voltage	V_{IN}		2.0		6.0	V
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_{OPR}}$	I_{OUT}=30mA, -40°C≤T_{OPR}≤85°C		±100		ppm /°C
Short Current Limit	$I_{SC(LIMIT)}$	V_{OUT}=0V		40		mA
Pull-Down Resistance for EN Pin	R_{PD}		0.7	2.0	8.0	MΩ
EN Input Voltage “H”	V_{CEH}		1.5			V
EN Input Voltage “L”	V_{CEL}				0.3	V
Output Noise	eN	BW=10Hz ~100kHz		30		μVrms
Low Output Nch Tr. ON Resistance (of B version)	R_{LOW}	V_{CE}=0V		60		Ω

Notes: 1. f=1kHz, 70dB as to V_{OUT}≥2.5V Output type
2. f=10kHz, 60dB as to V_{OUT}≥2.5V Output type

■ ELECTRICAL CHARACTERISTICS BY OUTPUT VOLTAGE

Output Voltage V_{OUT} (V)	Dropout Voltage, V_D (V)		
	CONDITION	TYP	MAX
V_{OUT}=1.2	I_{OUT}=150mA	0.40	0.75
V_{OUT}=1.5		0.38	0.70
V_{OUT}=1.6		0.35	0.65
V_{OUT}=1.7		0.33	0.60
1.8≤V_{OUT}≤2.0		0.32	0.55
2.1≤V_{OUT} ≤2.7		0.28	0.50
2.8≤V_{OUT}≤3.3		0.22	0.35

■ TEST CIRCUITS

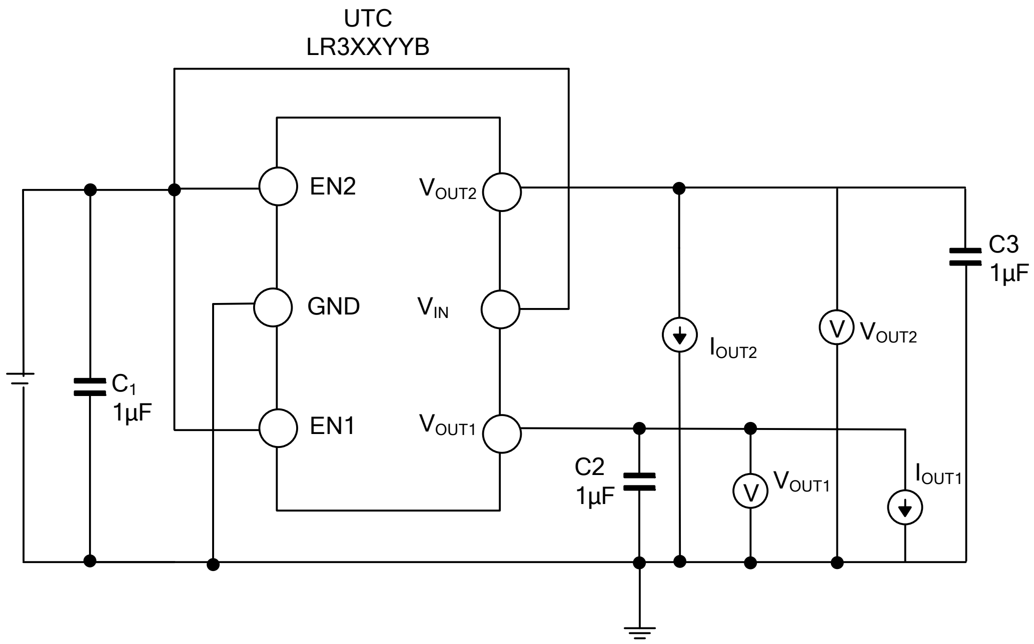


Fig.1 Standard Test Circuit

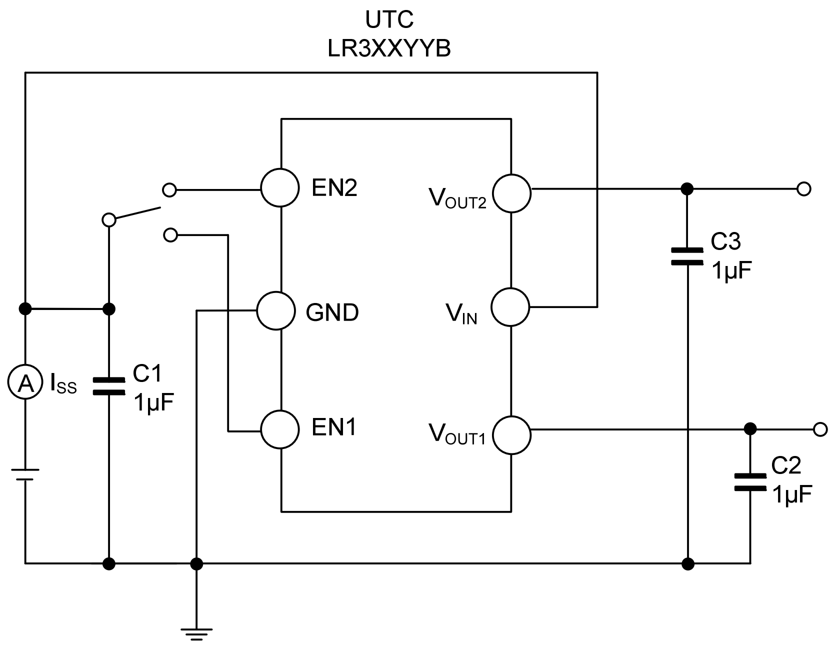


Fig.2 Supply Current Test Circuit

■ TEST CIRCUITS(Cont.)

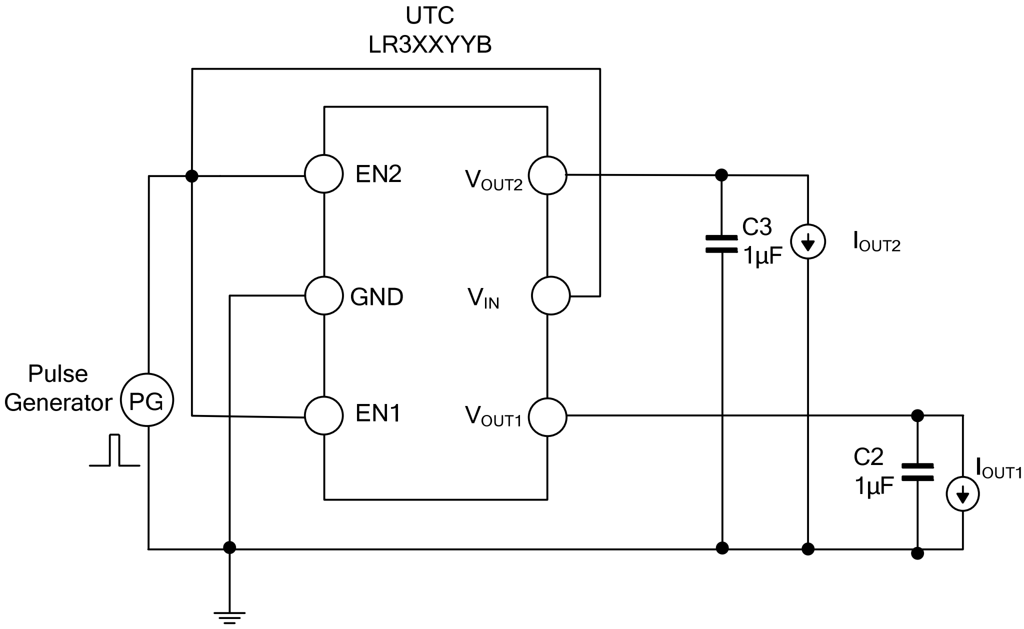


Fig.3 Ripple Rejection, Line Transient Response Test Circuit

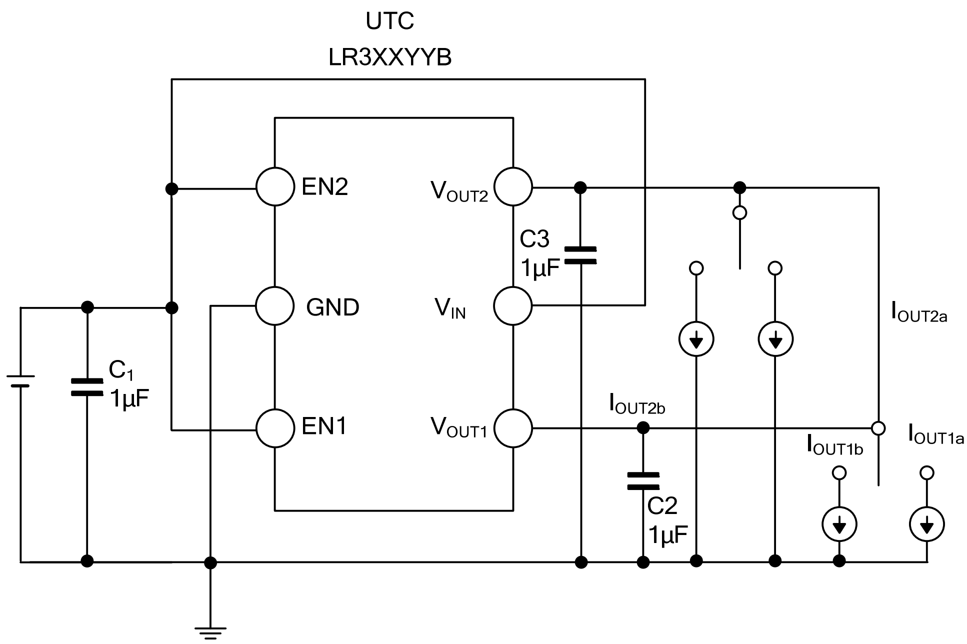
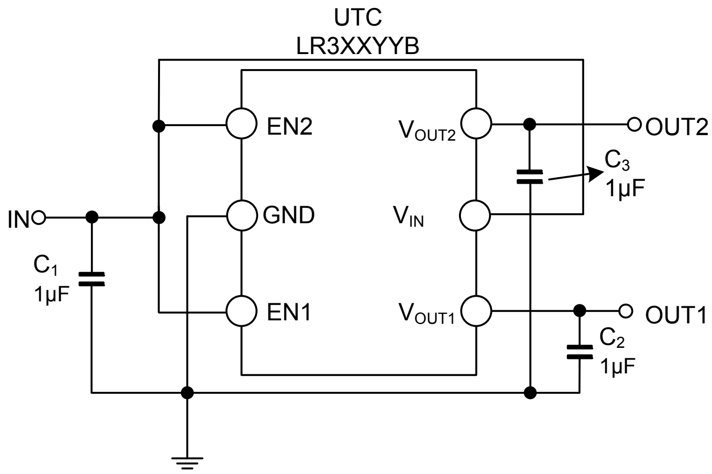


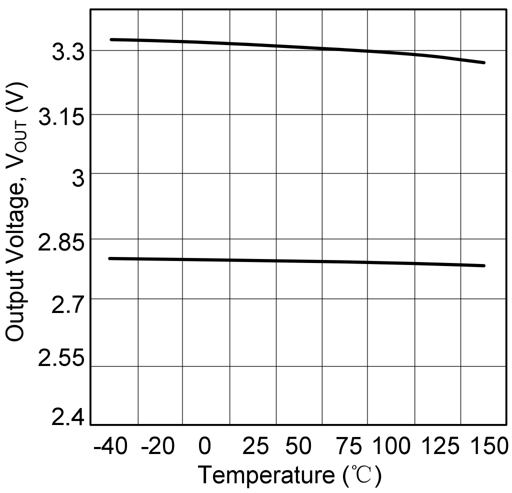
Fig.4 Load Transient Response Test Circuit

■ TYPICAL APPLICATION CIRCUIT

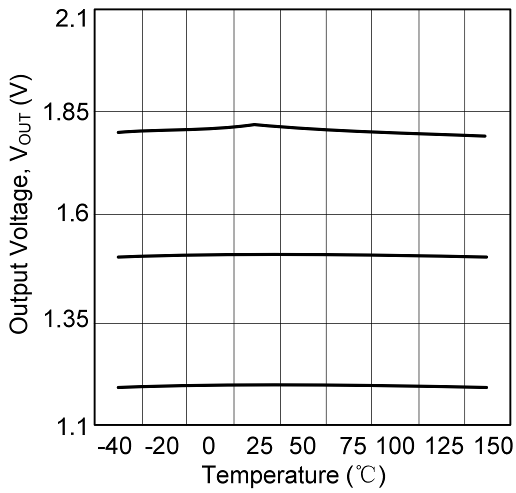


■ TYPICAL CHARACTERISTICS

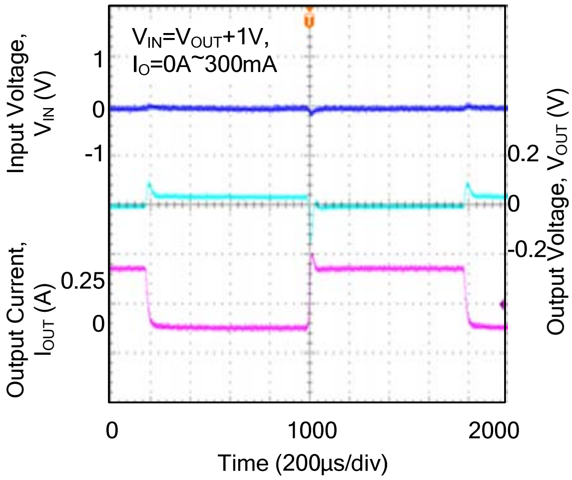
Output Voltage vs. Temperature



Output Voltage vs. Temperature



Load Transient Response (V_{OUT}=3.3V)



Load Transient Response (V_{OUT}=2.8V)