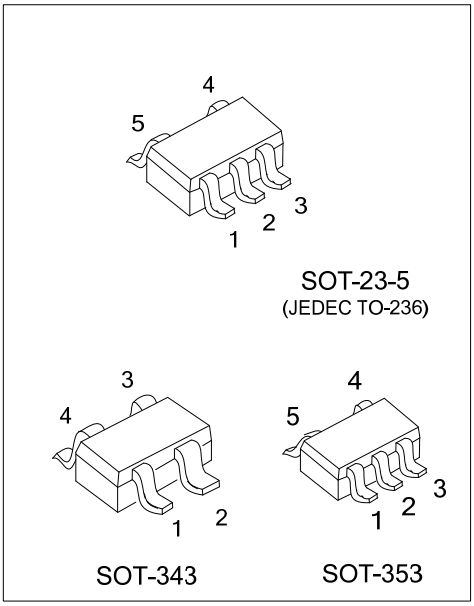
LR9101

CMOS IC

LOW NOISE 300mA LDO REGULATOR



■ DESCRIPTION

The UTC **LR9101** is a typical LDO (linear regulator) with the features of high output voltage accuracy, low supply current, low ON-resistance, and high ripple rejection.

During operation of the UTC **LR9101**, the dropout voltage is very low and the response of line transient and load transient are very well.

Internally, there're many functions of UTC **LR9101** which can be seen in the block figure. There are a voltage reference unit, an error amplifier, resistor-net for voltage setting, a current limit circuit, and a chip enable circuit in each UTC **LR9101**.

The UTC **LR9101** can be used as an ideal of the power supply for hand-held communication equipment, such as: power source for portable communication equipment, power source for electrical appliances, for example, cameras, VCRs and camcorders and power source for battery-powered equipment.

■ FEATURES

* Supply Current: 50μA (Typ.)
* Standby Mode: 0.1μA (Typ.)
* Ripple Rejection: 70dB (Typ.) @f=1kHz,V_{OUT}=2.5V
* Well Line Regulation: 0.02%/ V (Typ.)
* C_{IN}=C_{OUT}=1μF or more (Ceramic capacitors) are recommended to be used with this IC

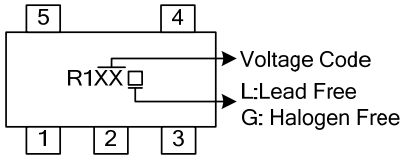
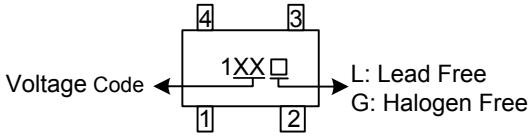
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
LR9101L-xx-AE5-R	LR9101G-xx-AE5-R	SOT-23-5	Tape Reel
LR9101L-xx-AL4-R	LR9101G-xx-AL4-R	SOT-343	Tape Reel
LR9101L-xx-AL5-R	LR9101G-xx-AL5-R	SOT-353	Tape Reel

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

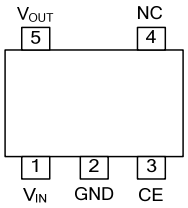
LR9101L-xx-AE5-R (1)Packing Type (2)Package Type (3)Output Voltage Code (4)Halogen Free	(1) R: Tape Reel (2) AE5: SOT-23-5, AL4: SOT-343, AL5: SOT-353 (3) xx: refer to Marking Information (4) L: Lead Free, G: Halogen Free

■ MARKING INFORMATION

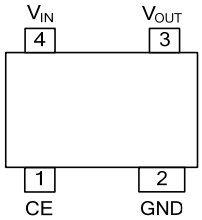
PACKAGE	VOLTAGE CODE	MARKING
SOT-23-5 SOT-353	10: 1.0V 12: 1.2V 18: 1.8V 27: 2.7V 25: 2.5V 28: 2.8V 33: 3.3V	
SOT-343		

■ PIN CONFIGURATION

SOT-23-5/SOT-353



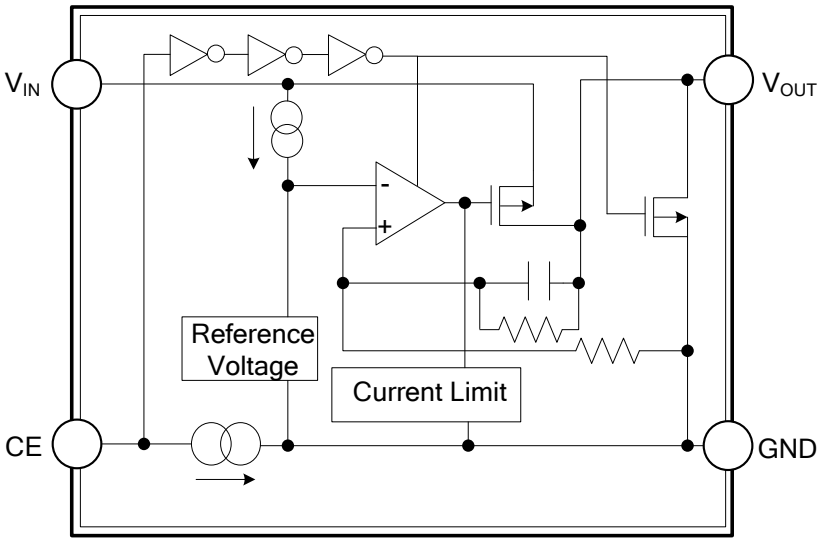
SOT-343



■ PIN DESCRIPTION

PIN NO.		PIN NAME	DESCRIPTION
SOT-23-5 SOT-353	SOT-343		
1	4	V_{IN}	Input Pin
2	2	GND	Ground Pin
3	1	CE	Chip Enable Pin. Active when this Pin is high.
4	-	NC	No Connection
5	3	V_{OUT}	Output Pin

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT
Input Voltage		V_{IN}	6	V
Input Voltage (CE Pin)		V_{CE}	6	V
Output Voltage		V_{OUT}	-0.3~ V_{IN}+0.3	V
Output Current		I_{OUT}	400	mA
Power Dissipation	SOT-23-5	P_D	300	mW
	SOT-343		250	mW
	SOT-353		260	mW
Junction Temperature		T_J	+125	°C
Operating Temperature		T_{OPR}	-40~+85	°C
Storage Temperature		T_{STG}	-55~+125	°C

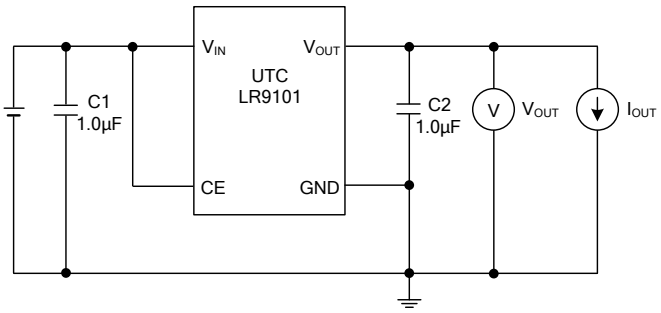
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ ELECTRICAL CHARACTERISTICS

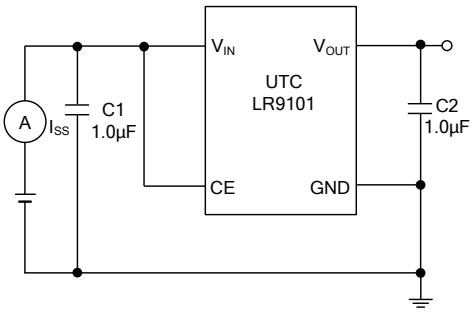
(T_A=25°C, V_{IN}=Set V_{OUT}+1V, I_{OUT}=1mA, C_I =C_O=1μF, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	V_{IN} = Set V_{OUT}+1V,	V_{OUT} > 2.0V	×0.99		×1.01	V
				V_{OUT} ≤ 2.0V		±20		mV
Input Voltage		V_{IN}					6	V
Load Regulation		ΔV_{OUT}	1mA≤I_{OUT}≤150mA			20	40	mV
Output Current		I_{OUT}			300			mA
Supply Current		I_{SS}	I_{OUT}=0A			50		μA
Supply Current (Standby)		I_{ST-BY}	V_{CE}=0V			0.1	2	μA
Short Current Limit		I_{LIMIT}	V_{OUT}=0V			200		mA
CE Pull-down Current		I_{PD}				0.3		μA
CE Input Voltage	High	V_{CEH}			1.5			V
	Low	V_{CEL}				1.1		V
Output Noise		eN	B_W=10Hz to 100kHz, I_{OUT} =30mA			30		μVrms
Ripple Rejection		RR	f=1kHz, Ripple 0.2V_{RMS} V_{IN}=Set V_{OUT}+1V, I_{OUT}=30mA (In case that V_{OUT}=2.0V, V_{IN}=3V)			70		dB
Dropout Voltage		V_D	I_{OUT}=150mA	1.0V≤V_{OUT}<1.2V		0.60		V
				1.2V≤V_{OUT}<1.5V		0.40		
				1.5V≤V_{OUT}<1.7V		0.24		
				1.7V≤V_{OUT}<2.0V		0.21		
				2.0V≤V_{OUT}<2.5V		0.19		
				2.5V≤V_{OUT}<2.8V		0.17		
				2.8V≤V_{OUT}≤5.0V		0.15		
Line Regulation		$\frac{\Delta V_{OUT}}{\Delta V_{IN}}$	1.2V≤V_{OUT}≤4.0V, V_{SET}+0.5V≤V_{IN}≤5V			0.02	0.10	%/V

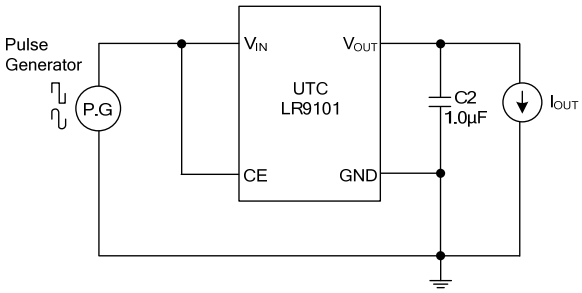
■ TEST CIRCUIT



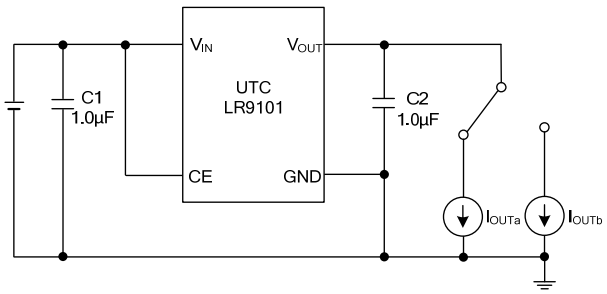
Basic Test Circuit



Test Circuit for Supply Current



Test Circuit for Ripple Rejection



Test Circuit for Load Transient Response

■ TYPICAL APPLICATION CIRCUIT