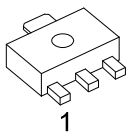
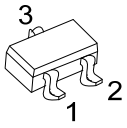
36-V INPUT VOLTAGE 300MA , ULTRA LOW IQ VOLTAGE REGULATOR



SOT-89



SOT-23-3
(JEDEC TO-236)

■ DESCRIPTION

The UTC **UR73XX** Series are a low dropout regulator with wide input voltage range, high output voltage accuracy, ultra low quiescent current and low dropout. This regulator is based on a CMOS process, and it's input voltage could high enough more than 36V, thus they are very suitable for high voltage application.

■ FEATURES

* High output voltage accuracy: ±2%
* Ultra low quiescent current: 1.2μA (Typ.)
* Low temperature-drift coefficient of V_{OUT}: ±50ppm/°C (Typ.)
* Wide Input voltage range: 2.5~ 36V

■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment				Packing
Lead Free	Halogen Free						
UR73XXL-AB3-x-R	UR73XXG-AB3-x-R	SOT-89	Pin Code	1	2	3	Tape Reel
			A	G	O	I	
			B	O	G	I	
			C	G	I	O	
			D	I	G	O	
UR73XXG-AE2-x-R	UR73XXG-AE2-x-R	SOT-23-3	Pin Code	1	2	3	Tape Reel
			1	G	I	O	
			2	O	I	G	
			3	G	O	I	
			4	I	O	G	

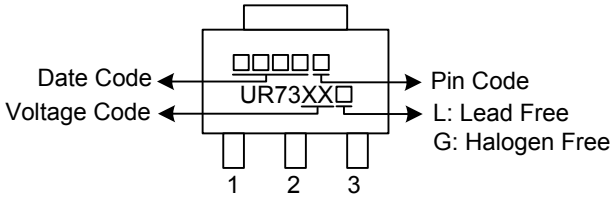
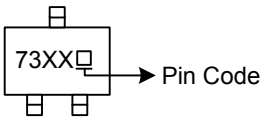
Note: Pin assignment: O: V_{OUT} G: Ground I: V_{IN}

UR73XXG-AB3-x-R

(1)Packing Type
(2)Pin Assignment
(2)Package Type
(4)Green Package
(5)Output Voltage Code

(1) R: Tape Reel
(2) refer to Pin Assignment
(3) AB3: SOT-89, AE2: SOT-23-3
(4) G: Halogen Free and Lead Free, L: Lead Free
(5) XX: Refer to Marking Information

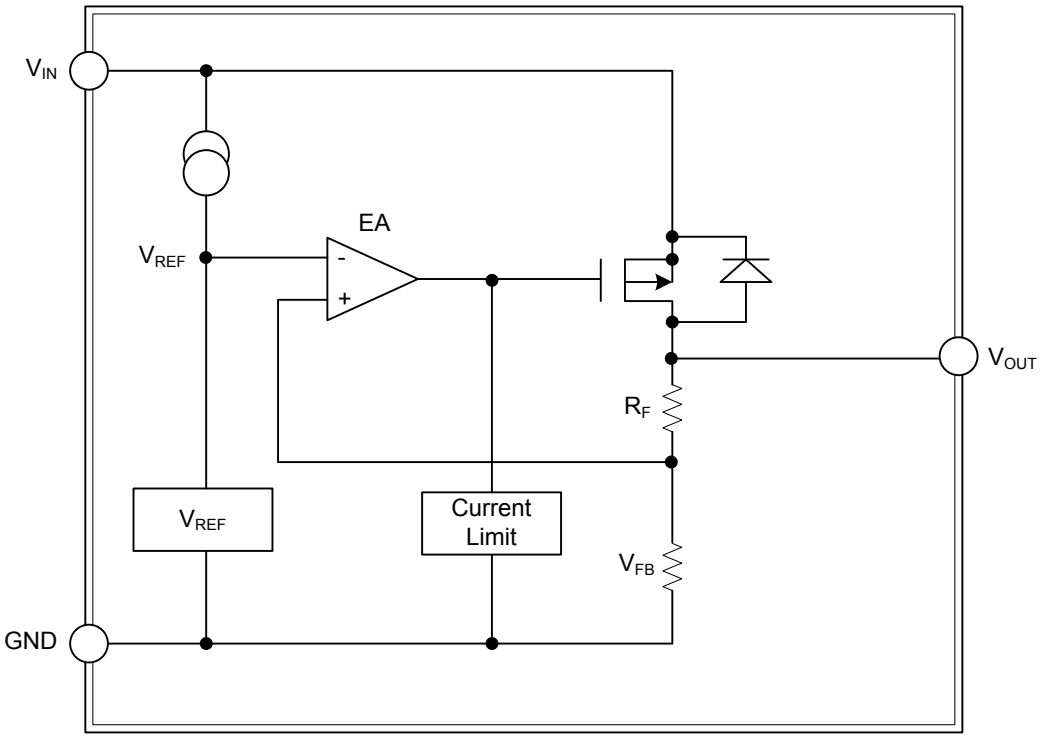
■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-89	15:1.5V 18:1.8V 21:2.1V 23:2.3V 25:2.5V 27:2.7V 30:3.0V 33:3.3V 36:3.6V 40:4.0V 44:4.4V 50:5.0V	
SOT-23-3		

■ PIN DESCRIPTION

PIN NAME	DESCRIPTION
V_{OUT}	Regulated output voltage
GND	Ground
V_{IN}	Input voltage

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT
Input Voltage		V_{IN}	36	V
Power Dissipation	SOT-89	P_D	500	mW
	SOT-23-3		300	mW
Operating Temperature Range		T_{OPR}	-40 ~ +85	°C
Storage Temperature Range		T_{STG}	-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_A=25°C, unless otherwise specified)

UTC **UR7315**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA	1.47	1.5	1.53	V
Output Current (Note 1)	I_{OUT}	V_{IN}=V_{OUT}+2V	100	200		mA
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=1mA		45	100	mV
Line Regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	V_{OUT}+2V≤V_{IN}≤36V, I_{OUT}=1mA		0.05	0.2	%/V
Load Regulation	ΔV_{OUT2}	V_{IN}=V_{OUT}+2V, 1.0mA≤I_{OUT}≤50mA		30	80	mV
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT1}}{T_A \bullet V_{OUT}}$	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA , -40°C≤T_A≤85°C		±50	±100	Ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		1.2	3.0	uA

UTC **UR7318**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA	1.764	1.8	1.836	V
Output Current (Note 1)	I_{OUT}	V_{IN}=V_{OUT}+2V	100	200		mA
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=1mA		45	100	mV
Line Regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	V_{OUT}+2V≤V_{IN}≤36V, I_{OUT}=1mA		0.05	0.2	%/V
Load Regulation	ΔV_{OUT2}	V_{IN}=V_{OUT}+2V, 1.0mA≤I_{OUT}≤50mA		30	80	mV
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT1}}{T_A \bullet V_{OUT}}$	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA , -40°C≤T_A≤85°C		±50	±100	Ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		1.2	3.0	uA

UTC **UR7321**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA	2.058	2.1	2.142	V
Output Current (Note 1)	I_{OUT}	V_{IN}=V_{OUT}+2V	100	200		mA
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=1mA		40	100	mV
Line Regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	V_{OUT}+2V≤V_{IN}≤36V, I_{OUT}=1mA		0.05	0.2	%/V
Load Regulation	ΔV_{OUT2}	V_{IN}=V_{OUT}+2V, 1.0mA≤I_{OUT}≤50mA		30	80	mV
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT1}}{T_A \bullet V_{OUT}}$	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA , -40°C≤T_A≤85°C		±50	±100	Ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		1.2	3.0	uA

■ ELECTRICAL CHARACTERISTICS (Cont.)

UTC **UR7323**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA	2.254	2.3	2.346	V
Output Current (Note 1)	I_{OUT}	V_{IN}=V_{OUT}+2V	100	200		mA
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=1mA		40	100	mV
Line Regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	V_{OUT}+2V≤V_{IN}≤36V, I_{OUT}=1mA		0.05	0.2	%/V
Load Regulation	ΔV_{OUT2}	V_{IN}=V_{OUT}+2V, 1.0mA≤I_{OUT}≤50mA		30	80	mV
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT1}}{T_A \bullet V_{OUT}}$	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA , -40°C≤T_A≤85°C		±50	±100	Ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		1.2	3.0	uA

UTC **UR7325**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA	2.45	2.5	2.55	V
Output Current (Note 1)	I_{OUT}	V_{IN}=V_{OUT}+2V	100	200		mA
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=1mA		40	100	mV
Line Regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	V_{OUT}+2V≤V_{IN}≤36V, I_{OUT}=1mA		0.05	0.2	%/V
Load Regulation	ΔV_{OUT2}	V_{IN}=V_{OUT}+2V, 1.0mA≤I_{OUT}≤50mA		30	80	mV
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT1}}{T_A \bullet V_{OUT}}$	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA , -40°C≤T_A≤85°C		±50	±100	Ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		1.2	3.0	uA

UTC **UR7327**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA	2.646	2.7	2.754	V
Output Current (Note 1)	I_{OUT}	V_{IN}=V_{OUT}+2V	100	200		mA
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=1mA		40	100	mV
Line Regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	V_{OUT}+2V≤V_{IN}≤36V, I_{OUT}=1mA		0.05	0.2	%/V
Load Regulation	ΔV_{OUT2}	V_{IN}=V_{OUT}+2V, 1.0mA≤I_{OUT}≤50mA		30	80	mV
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT1}}{T_A \bullet V_{OUT}}$	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA , -40°C≤T_A≤85°C		±50	±100	Ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		1.2	3.0	uA

UTC **UR7330**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA	2.94	3.0	3.06	V
Output Current (Note 1)	I_{OUT}	V_{IN}=V_{OUT}+2V	100	200		mA
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=1mA		40	100	mV
Line Regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	V_{OUT}+2V≤V_{IN}≤36V, I_{OUT}=1mA		0.05	0.2	%/V
Load Regulation	ΔV_{OUT2}	V_{IN}=V_{OUT}+2V, 1.0mA≤I_{OUT}≤50mA		30	80	mV
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT1}}{T_A \bullet V_{OUT}}$	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA , -40°C≤T_A≤85°C		±50	±100	Ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		1.2	3.0	uA

■ ELECTRICAL CHARACTERISTICS (Cont.)

UTC **UR7333**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA	3.234	3.3	3.366	V
Output Current (Note 1)	I_{OUT}	V_{IN}=V_{OUT}+2V	200	300		mA
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=1mA		30	80	mV
Line Regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	V_{OUT}+2V≤V_{IN}≤36V, I_{OUT}=1mA		0.05	0.2	%/V
Load Regulation	ΔV_{OUT2}	V_{IN}=V_{OUT}+2V, 1.0mA≤I_{OUT}≤50mA		30	80	mV
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT1}}{T_A \bullet V_{OUT}}$	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA , -40°C≤T_A≤85°C		±50	±100	Ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		1.2	3.0	uA

UTC **UR7336**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA	3.528	3.6	3.672	V
Output Current (Note 1)	I_{OUT}	V_{IN}=V_{OUT}+2V	200	300		mA
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=1mA		30	65	mV
Line Regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	V_{OUT}+2V≤V_{IN}≤36V, I_{OUT}=1mA		0.05	0.2	%/V
Load Regulation	ΔV_{OUT2}	V_{IN}=V_{OUT}+2V, 1.0mA≤I_{OUT}≤50mA		30	80	mV
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT1}}{T_A \bullet V_{OUT}}$	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA , -40°C≤T_A≤85°C		±50	±100	Ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		1.2	3.0	uA

UTC **UR7340**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA	3.92	4.0	4.08	V
Output Current (Note 1)	I_{OUT}	V_{IN}=V_{OUT}+2V	200	300		mA
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=1mA		30	65	mV
Line Regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	V_{OUT}+2V≤V_{IN}≤36V, I_{OUT}=1mA		0.05	0.2	%/V
Load Regulation	ΔV_{OUT2}	V_{IN}=V_{OUT}+2V, 1.0mA≤I_{OUT}≤50mA		30	80	mV
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT1}}{T_A \bullet V_{OUT}}$	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA , -40°C≤T_A≤85°C		±50	±100	Ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		1.2	3.0	uA

UTC **UR7344**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA	4.312	4.4	4.488	V
Output Current (Note 1)	I_{OUT}	V_{IN}=V_{OUT}+2V	200	300		mA
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=1mA		30	65	mV
Line Regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	V_{OUT}+2V≤V_{IN}≤36V, I_{OUT}=1mA		0.05	0.2	%/V
Load Regulation	ΔV_{OUT2}	V_{IN}=V_{OUT}+2V, 1.0mA≤I_{OUT}≤50mA		30	80	mV
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT1}}{T_A \bullet V_{OUT}}$	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA , -40°C≤T_A≤85°C		±50	±100	Ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		1.2	3.0	uA

■ ELECTRICAL CHARACTERISTICS (Cont.)

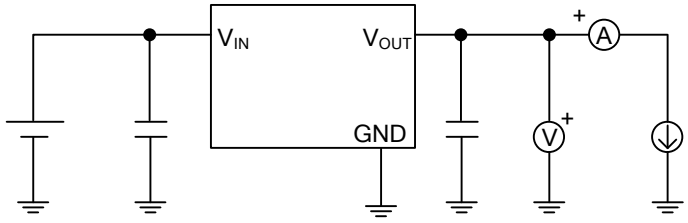
UTC **UR7350**

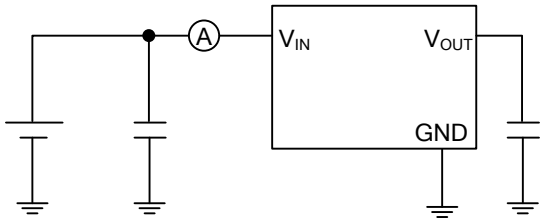
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA	4.9	5.0	5.1	V
Output Current (Note 1)	I_{OUT}	V_{IN}=V_{OUT}+2V	200	300		mA
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=1mA		30	65	mV
Line Regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	V_{OUT}+2V≤V_{IN}≤36V, I_{OUT}=1mA		0.05	0.2	%/V
Load Regulation	ΔV_{OUT2}	V_{IN}=V_{OUT}+2V, 1.0mA≤I_{OUT}≤50mA		30	80	mV
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT1}}{T_A \bullet V_{OUT}}$	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA , -40°C≤T_A≤85°C		±50	±100	Ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		1.2	3.0	uA

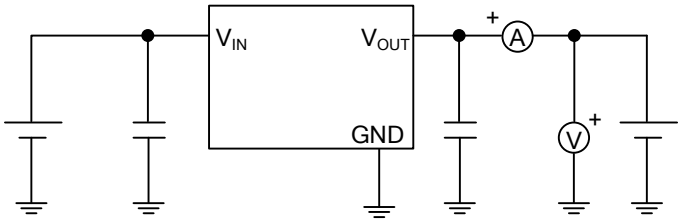
Notes: 1. Increase the output current slowly, record the current when V_{OUT} decrease 98% of V_{OUT}.

2. V_{drop}=V_{IN1}-(V_{OUT}×0.98), V_{OUT}: V_{IN}=V_{OUT}+2V, I_{OUT}=1mA

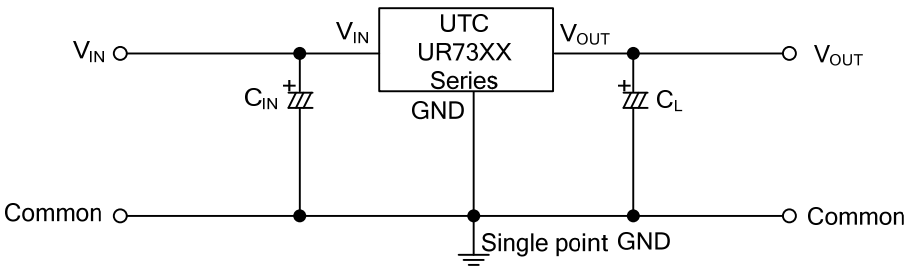
■ TEST CIRCUIT







■ TYPICAL APPLICATION CIRCUIT



C_{IN}>1.0μF
C_L>2.2μF (tantalum capacitor)