



UR77XX

Preliminary

CMOS IC

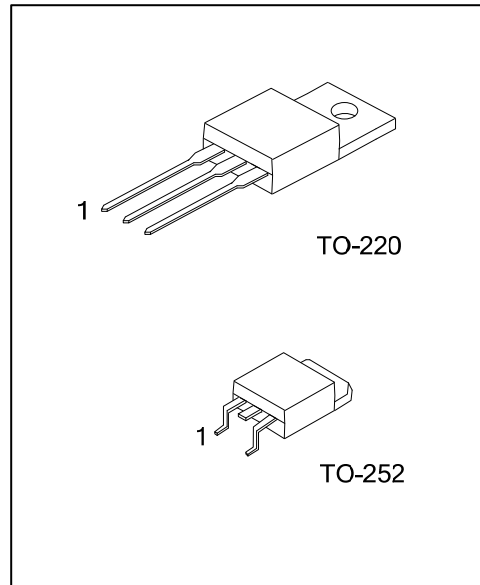
36V INPUT VOLTAGE 1A ULTRA LOW IQ VOLTAGE REGULATOR

DESCRIPTION

The UTC **UR77XX** 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 its input voltage could high enough more than 36V, thus they are very suitable for high voltage application.

FEATURES

- * High output voltage accuracy: $\pm 2\%$
- * Ultra low quiescent current: 1.0uA (Typ.)
- * Low temperature-drift coefficient of V_{OUT} : $\pm 100\text{ppm}/^\circ\text{C}$ (Typ.)
- * Wide Input voltage range: 2.5~36V



ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UR77XXL-TA3-T	UR77XXG-TF3-T	TO-220	Tube
UR77XXL-TN3-R	UR77XXG-TN3-R	TO-252	Tape Reel

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

<p>UR77XXG-TA3-T</p> <p>(1) Packing Type (2) Package Type (4) Green Package (5) Output Voltage Code</p>	<p>(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TN3: TO-252 (4) G: Halogen Free and Lead Free, L: Lead Free (5) XX: Refer to Marking Information</p>
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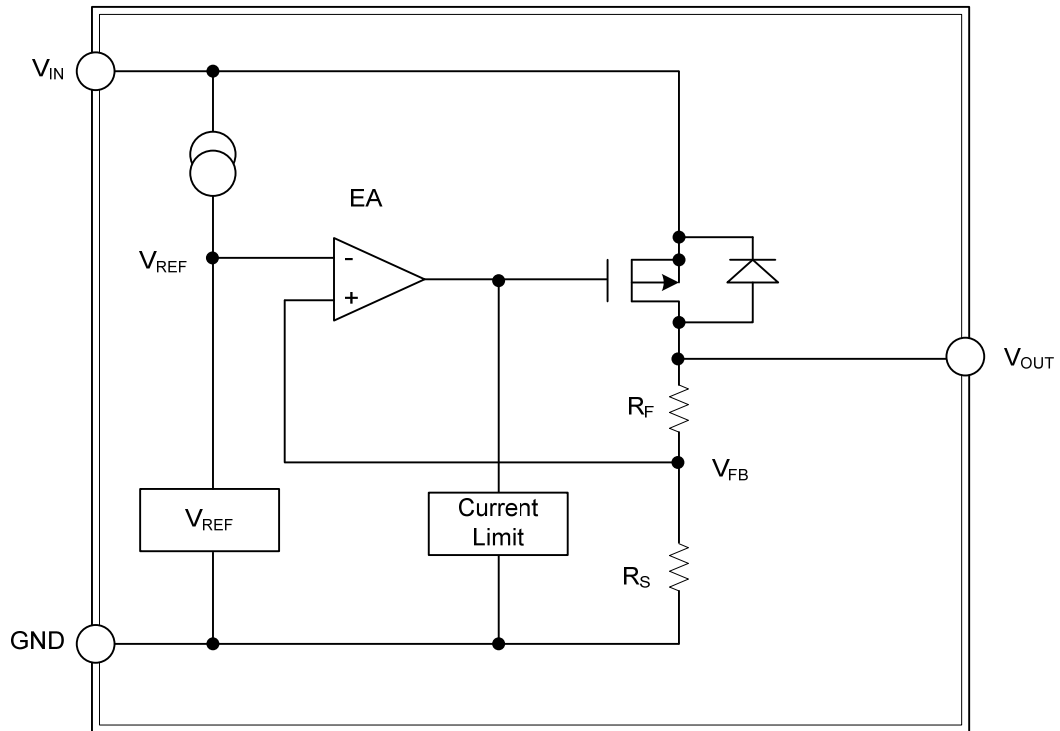
MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
TO-220 TO-252	33:3.3V 36:3.6V 40:4.0V 44:4.4V 50:5.0V	<p>UTC UR77XX</p> <p>Voltage Code ← UR77XX → Lot Code ← XXXX → Date Code ← YYMM →</p> <p>1 2 3</p> <p>L: Lead Free G: Halogen Free</p>

PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	V_{IN}	Input voltage
2	GND	Ground
3	V_{OUT}	Regulated output voltage

BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	36	V
Output Voltage	V_{OUT}	12	V
Power Dissipation	TO-220	1530	mW
	TO-252	890	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 ($T_A=25^\circ\text{C}$, unless otherwise specified)

UTC UR7733

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+2V, I_{OUT}=10\text{mA}$	3.234	3.3	3.366	V
Output Current (Note 1)	I_{OUT}	$V_{IN}=V_{OUT}+2V$	1			A
Dropout Voltage (Note 2)	V_{DROP}	$I_{OUT}=100\text{mA}$		160	200	mV
Line Regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \cdot V_{OUT}}$	$V_{OUT}+2V \leq V_{IN} \leq 36V, I_{OUT}=1\text{mA}$		0.05	0.2	%/V
Load Regulation	ΔV_{OUT2}	$V_{IN}=V_{OUT}+2V, 1.0\text{mA} \leq I_{OUT} \leq 100\text{mA}$		30	80	mV
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT1}}{T_A \cdot V_{OUT}}$	$V_{IN}=V_{OUT}+2V, I_{OUT}=10\text{mA}, -40^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$		±100		ppm/°C
Supply Current	I_{SS1}	$V_{IN}=V_{OUT}+2V$		1.0	5.0	uA

UTC UR7750

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+2V, I_{OUT}=10\text{mA}$	4.9	5.0	5.1	V
Output Current (Note 1)	I_{OUT}	$V_{IN}=V_{OUT}+2V$	1			A
Dropout Voltage (Note 2)	V_{DROP}	$I_{OUT}=100\text{mA}$		170	200	mV
Line Regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \cdot V_{OUT}}$	$V_{OUT}+2V \leq V_{IN} \leq 36V, I_{OUT}=1\text{mA}$		0.05	0.2	%/V
Load Regulation	ΔV_{OUT2}	$V_{IN}=V_{OUT}+2V, 1.0\text{mA} \leq I_{OUT} \leq 100\text{mA}$		30	80	mV
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT1}}{T_A \cdot V_{OUT}}$	$V_{IN}=V_{OUT}+2V, I_{OUT}=10\text{mA}, -40^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$		±100		ppm/°C
Supply Current	I_{SS1}	$V_{IN}=V_{OUT}+2V$		1.0	5.0	uA

UTC UR7790

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+2V, I_{OUT}=10\text{mA}$	8.82	9.0	9.18	V
Output Current (Note 1)	I_{OUT}	$V_{IN}=V_{OUT}+2V$	1			A
Dropout Voltage (Note 2)	V_{DROP}	$I_{OUT}=200\text{mA}$		200	240	mV
Line Regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \cdot V_{OUT}}$	$V_{OUT}+2V \leq V_{IN} \leq 36V, I_{OUT}=1\text{mA}$		0.05	0.2	%/V
Load Regulation	ΔV_{OUT2}	$V_{IN}=V_{OUT}+2V, 1.0\text{mA} \leq I_{OUT} \leq 100\text{mA}$		30	80	mV
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT1}}{T_A \cdot V_{OUT}}$	$V_{IN}=V_{OUT}+2V, I_{OUT}=10\text{mA}, -40^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$		±100		ppm/°C
Supply Current	I_{SS1}	$V_{IN}=V_{OUT}+2V$		2.0	8.0	uA

■ ELECTRICAL CHARACTERISTICS (Cont.)

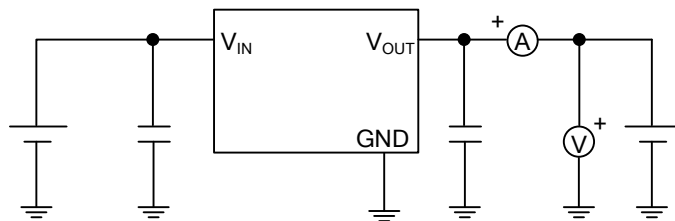
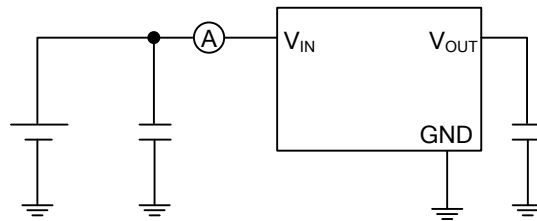
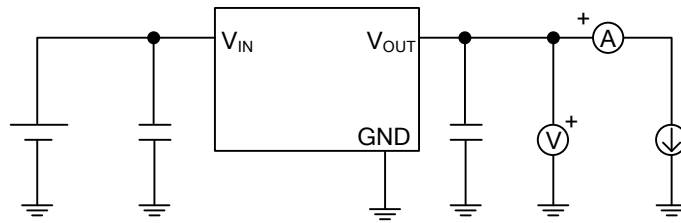
UTC UR7712

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+2V, I_{OUT}=10mA$	11.76	12.0	12.24	V
Output Current (Note 1)	I_{OUT}	$V_{IN}=V_{OUT}+2V$	1			A
Dropout Voltage (Note 2)	V_{DROP}	$I_{OUT}=200mA$		200	240	mV
Line Regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \cdot V_{OUT}}$	$V_{OUT}+2V \leq V_{IN} \leq 36V, I_{OUT}=1mA$		0.05	0.2	%/V
Load Regulation	ΔV_{OUT2}	$V_{IN}=V_{OUT}+2V, 1.0mA \leq I_{OUT} \leq 100mA$		30	80	mV
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT1}}{T_A \cdot V_{OUT}}$	$V_{IN}=V_{OUT}+2V, I_{OUT}=10mA, -40^\circ C \leq T_A \leq 85^\circ C$		± 100		ppm/ $^\circ C$
Supply Current	I_{SS1}	$V_{IN}=V_{OUT}+2V$		2.0	8.0	μA

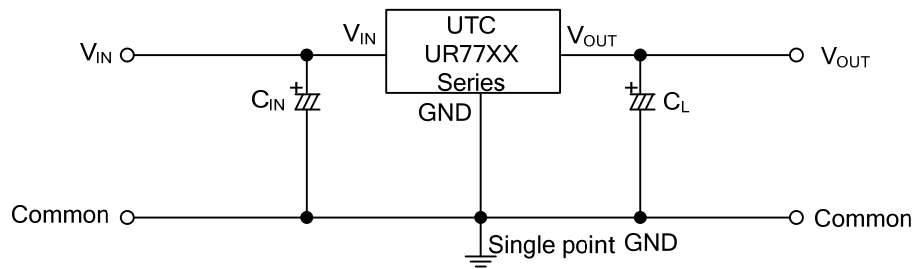
Notes: 1. Increase the output current slowly, record the current when V_{OUT} decrease 98% of V_{OUT} .

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

■ TEST CIRCUIT



■ TYPICAL APPLICATION CIRCUIT



$$C_{IN} > 1.0 \mu\text{F}$$

$$C_L > 2.2 \mu\text{F (tantalum capacitor)}$$

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