



## UT7500

Preliminary

CMOS IC

### HIGH DRIVER REGULATOR

#### DESCRIPTION

The UTC **UT7500** series is a low voltage regulator implemented by CMOS technology which is composed of a three-terminal high current. The input voltage for it is allowed as high as 24V and the output voltage are fixed at 3.0V、3.3V and 5.0V. Besides, it delivers 100mA output current. Other outstanding features of UTC **UT7500** include low voltage drop and low quiescent current.

When being used with external components, UTC **UT7500** can obtain variable voltages and currents.

UTC **UT7500** series is very suitable for applications, such as battery-powered equipment, communication equipment and audio/video equipment.

#### FEATURES

- \* Very Low Power Consumption
- \* Very Low Voltage Drop
- \* Very Low Temperature Coefficient
- \* Up to 24V Input Voltage
- \* 100mA @ $P_D \leq 250mW$  Output Current
- \* Tolerance  $\pm 3\%$
- \* Halogen Free

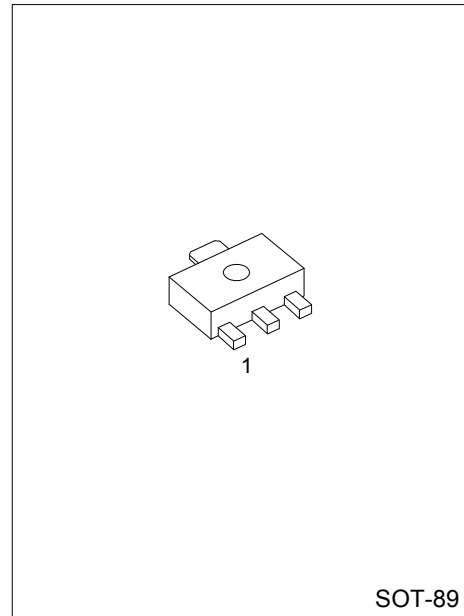
#### ORDERING INFORMATION

Ordering Number	Package	Pin Assignment			Packing
		1	2	3	
UT7500G-xx-AB3-C-R	SOT-89	G	I	O	Tape Reel

Note: Pin Assignment: I:V<sub>IN</sub> O:V<sub>OUT</sub> G:GND

xx: Output Voltage, refer to Marking Information.

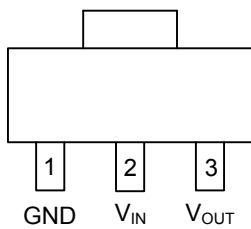
<p>UT7500G-xx-AB3-C-R</p>	<p>(1) Packing Type</p> <p>(2) Pin Code</p> <p>(3) Package Type</p> <p>(4) Output Voltage Code</p> <p>(5) Halogen Free</p>	<p>(1) R: Tape Reel</p> <p>(2) Refer to Pin Assignment</p> <p>(3) AB3: SOT-89</p> <p>(4) xx: Refer to Marking Information</p> <p>(5) G: Halogen Free</p>
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MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-89	30 :3.0V 33 :3.3V 50 :5.0V	

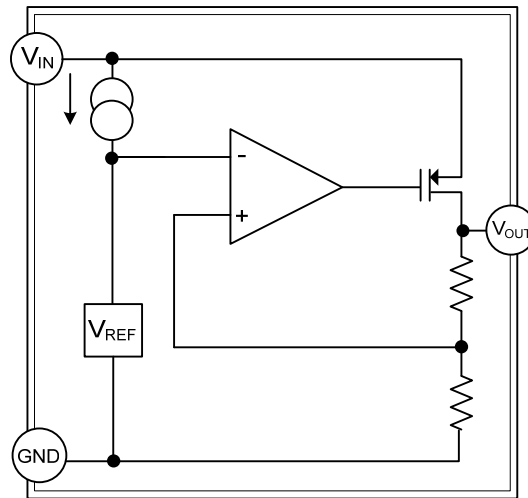
PIN CONFIGURATION



PIN DESCRIPTION

PIN NO	PIN NAME	I/O	DESCRIPTION
1	GND	G	Ground
2	V <sub>IN</sub>	I	Input pin of voltage supply.
3	V <sub>OUT</sub>	O	Output pin of regulator.

■ BLOCK DAIGRAM



■ ABSOLUTE MAXIMUM RATING ( $T_a=25^\circ\text{C}$ )

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{IN}$	-0.3 ~ +26	V
Power Consumption	$P_C$	250	mW
Junction Temperature	$T_J$	+125	$^\circ\text{C}$
Operating Temperature	$T_{ORP}$	0 ~ +70	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-50 ~ +125	$^\circ\text{C}$

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)

**FOR UT7500-30**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage Tolerance	$V_{OUT}$	$V_{IN}=5.0\text{V}$ , $I_{OUT}=10\text{mA}$	2.85	3.0	3.15	V
Input Voltage	$V_{IN}$				24	V
Output Current	$I_{OUT}$	$V_{IN}=5.0\text{V}$	60	100		mA
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=5.0\text{V}$ , $1\text{mA} \leq I_{OUT} \leq 50\text{mA}$		60	150	mV
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	$4\text{V} \leq V_{IN} \leq 12\text{V}$ , $I_{OUT}=1\text{mA}$		0.2		%/V
Voltage Drop	$V_D$	$I_{OUT}=1\text{mA}$		100		mV
Current Consumption	$I_{SS}$	$V_{IN}=5.0\text{V}$ , No load		10	20	$\mu\text{A}$
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A}$	$V_{IN}=5.0\text{V}$ , $I_{OUT}=10\text{mA}$ $0^\circ\text{C} < T_a < 70^\circ\text{C}$		$\pm 0.45$		$\text{mV}/^\circ\text{C}$

**FOR UT7500-33**

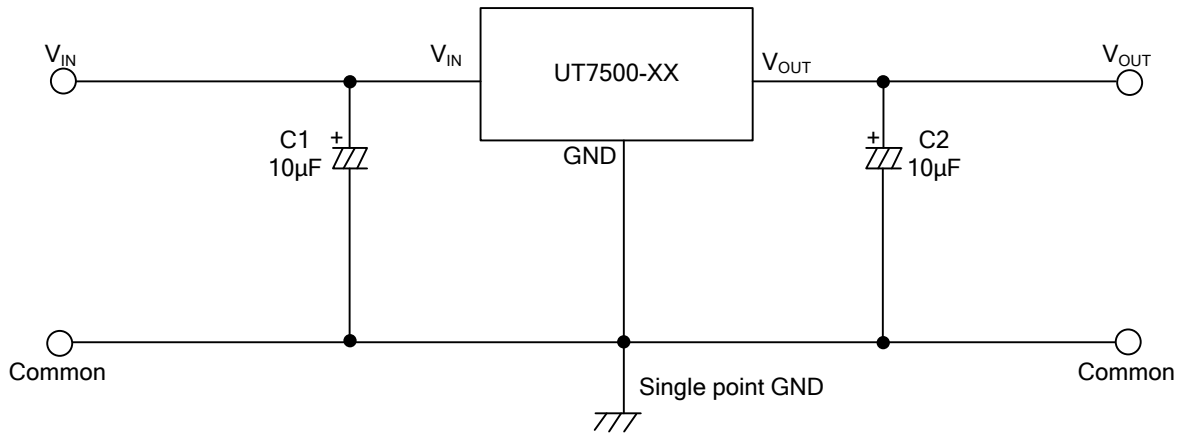
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage Tolerance	$V_{OUT}$	$V_{IN}=5.5\text{V}$ , $I_{OUT}=10\text{mA}$	3.14	3.3	3.47	V
Input Voltage	$V_{IN}$				24	V
Output Current	$I_{OUT}$	$V_{IN}=5.5\text{V}$	60	100		mA
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=5.5\text{V}$ , $1\text{mA} \leq I_{OUT} \leq 50\text{mA}$		60	150	mV
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	$4.5\text{V} \leq V_{IN} \leq 12\text{V}$ , $I_{OUT}=1\text{mA}$		0.2		%/V
Voltage Drop	$V_D$	$I_{OUT}=1\text{mA}$		100		mV
Current Consumption	$I_{SS}$	$V_{IN}=5.5\text{V}$ , No load		10	20	$\mu\text{A}$
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A}$	$V_{IN}=5.5\text{V}$ , $I_{OUT}=10\text{mA}$ $0^\circ\text{C} < T_a < 70^\circ\text{C}$		$\pm 0.5$		$\text{mV}/^\circ\text{C}$

**FOR UT7500-50**

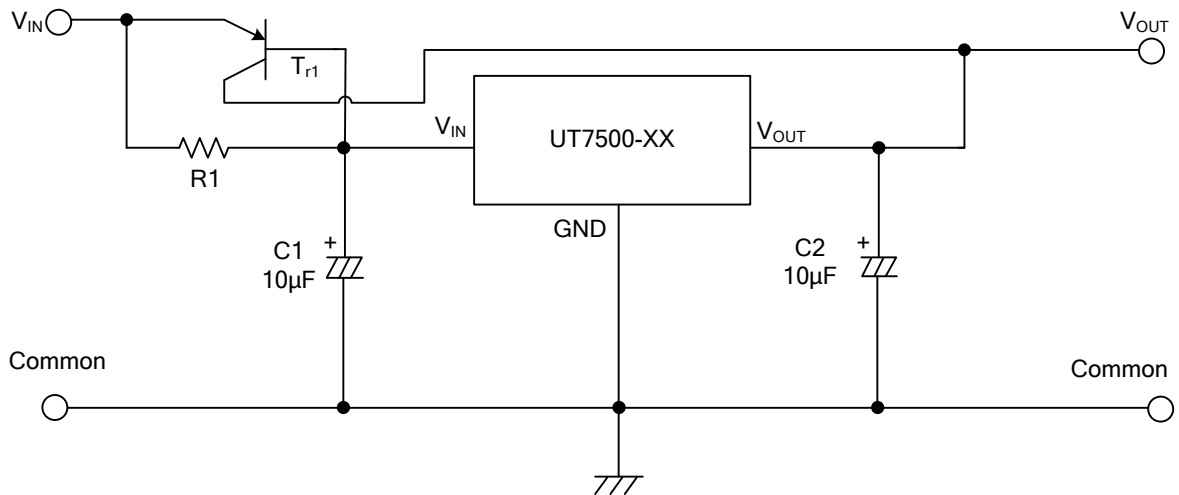
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage Tolerance	$V_{OUT}$	$V_{IN}=7.0\text{V}$ , $I_{OUT}=10\text{mA}$	4.75	5.0	5.25	V
Input Voltage	$V_{IN}$				24	V
Output Current	$I_{OUT}$	$V_{IN}=7.0\text{V}$	100	150		mA
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=7.0\text{V}$ , $1\text{mA} \leq I_{OUT} \leq 70\text{mA}$		60	150	mV
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	$6\text{V} \leq V_{IN} \leq 15\text{V}$ , $I_{OUT}=1\text{mA}$		0.2		%/V
Voltage Drop	$V_D$	$I_{OUT}=1\text{mA}$		100		mV
Current Consumption	$I_{SS}$	$V_{IN}=7.0\text{V}$ , No load		10	20	$\mu\text{A}$
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A}$	$V_{IN}=7.0\text{V}$ , $I_{OUT}=10\text{mA}$ $0^\circ\text{C} < T_a < 70^\circ\text{C}$		$\pm 0.75$		$\text{mV}/^\circ\text{C}$

■ TYPICAL APPLICATION CIRCUITS

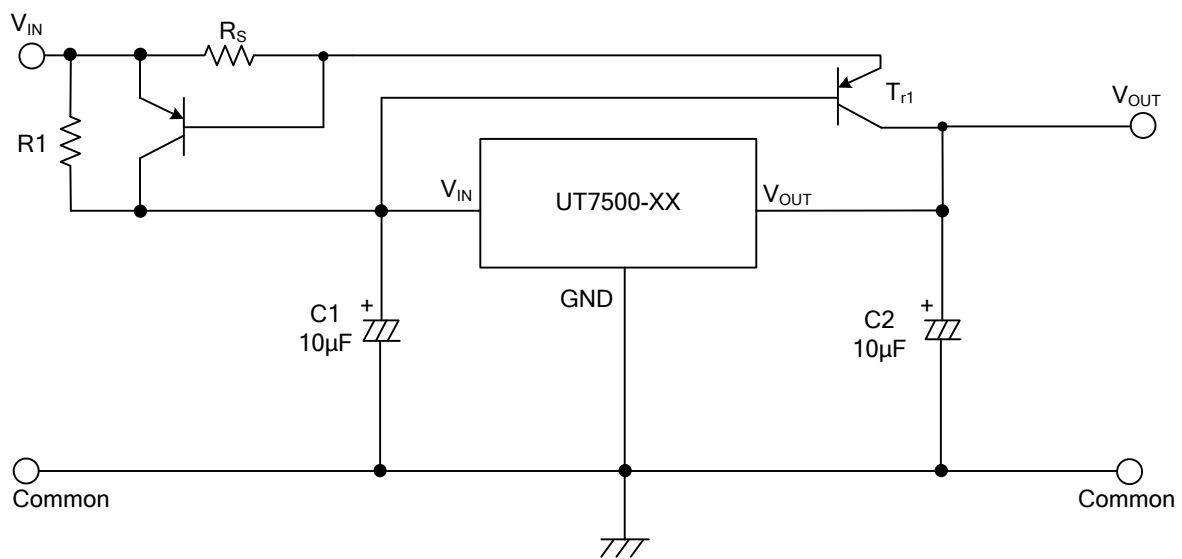
Basic Circuit



High Output Current Positive Voltage Regulator

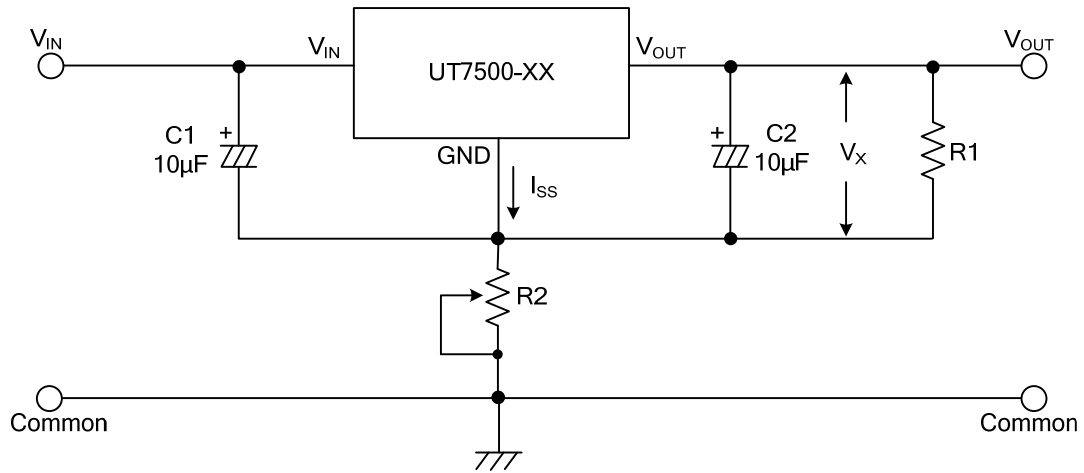


Short-Circuit Protection for  $T_{r1}$



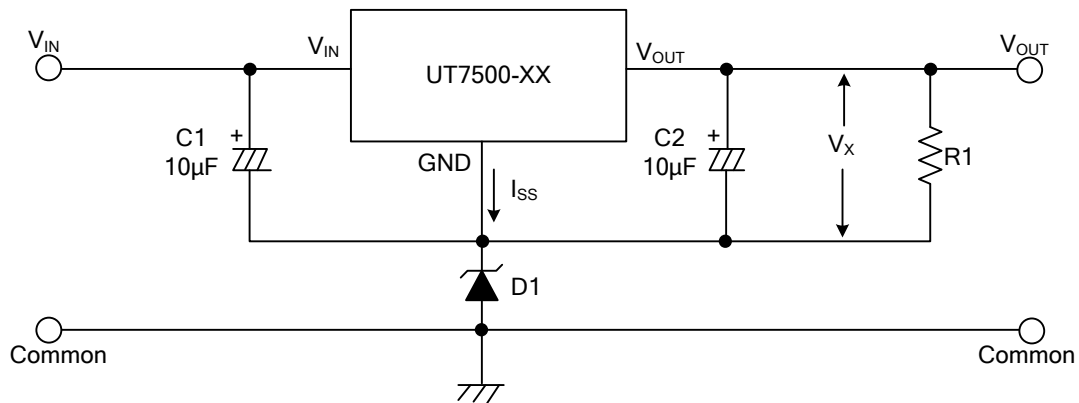
■ TYPICAL APPLICATION CIRCUITS(Cont.)

**Circuit for Increasing Output Voltage**



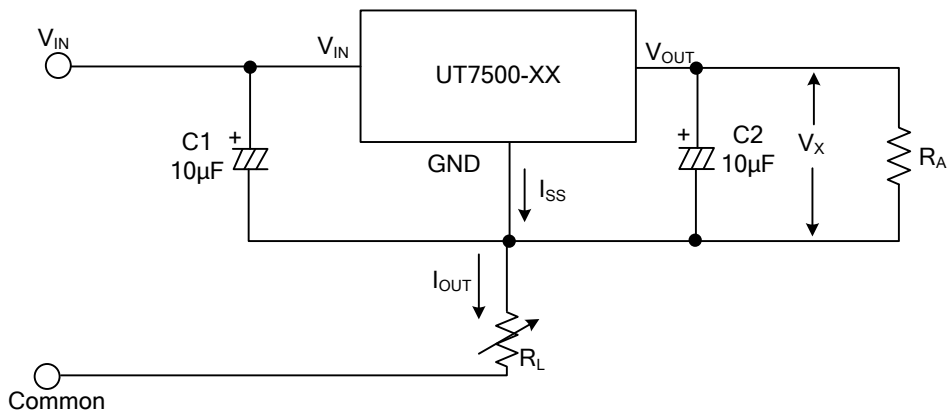
$$V_{OUT} = V_X (1 + R2/R1) + I_{SS}R2$$

**Circuit for Increasing Output Voltage**



$$V_{OUT} = V_X + V_{D1}$$

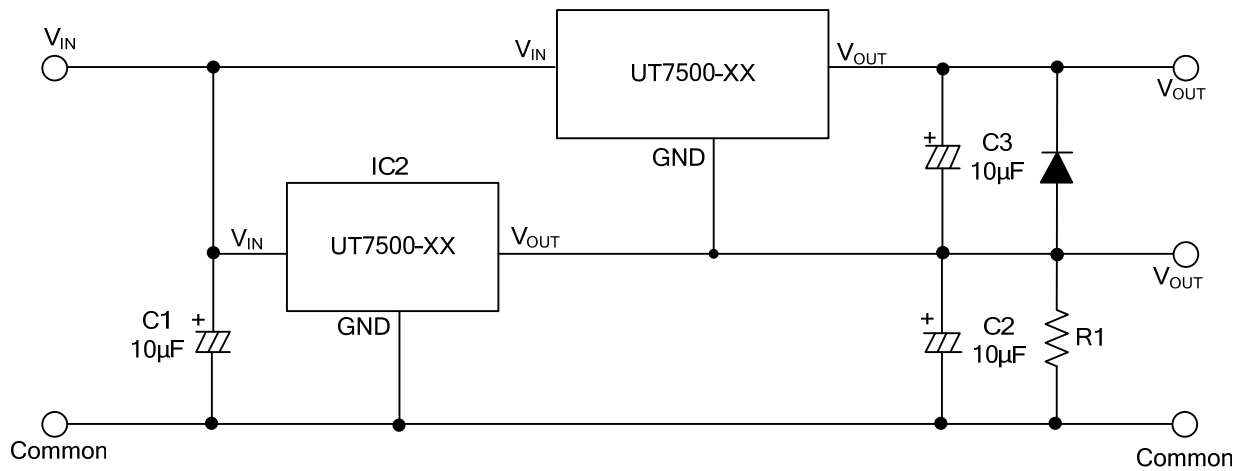
**Constant Current Regulator**



$$I_{OUT} = \frac{V_X}{R_A} + I_{SS}$$

### ■ TYPICAL APPLICATION CIRCUITS(Cont.)

#### Dual Supply



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