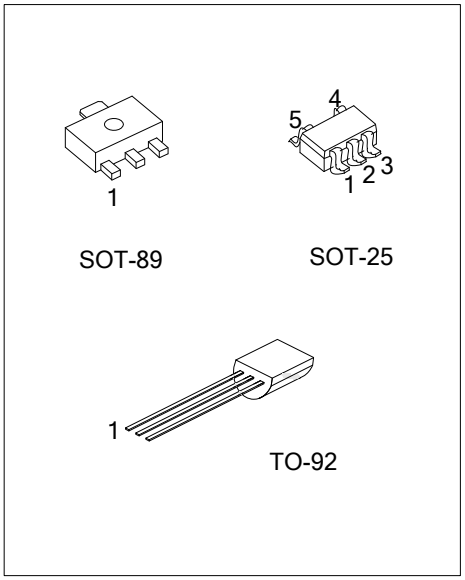
UT71XX

CMOS IC

THREE-TERMINAL LOW POWER VOLTAGE REGULATORS



■ DESCRIPTION

The UTC **UT71XX** series is a set of three- Terminal low power voltage regulators implemented in CMOS technology. They are available with several fixed output voltages ranging from 1.5V~7.0V. The advantage of CMOS technology is low voltage dropout and low quiescent current.

Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain variable voltages and currents.

■ FEATURES

* Accurate output voltage range (±2.4%)
* Low power consumption
* Low voltage dropout
* Low temperature coefficient
* Wide operating voltage (24V Max.)

■ ORDERING INFORMATION

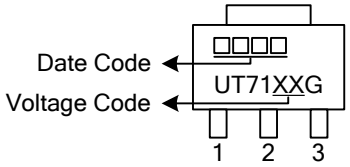
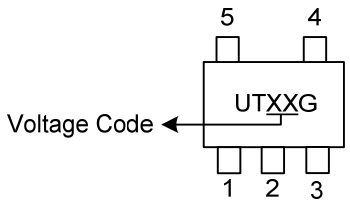
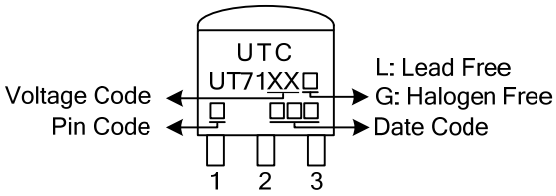
Ordering Number		Package	Pin Assignment					Packing
Lead free	Halogen Free		1	2	3	4	5	
-	UT71XXG-AB3-C-R	SOT-89	G	I	O	-	-	Tape Reel
-	UT71XXG-AF5-B-R	SOT-25	G	I	O	N	N	Tape Reel
UT71XXL-T92-B-B	UT71XXG-T92-B-B	TO-92	O	G	I	-	-	Tape Box
UT71XXL-T92-B-K	UT71XXG-T92-B-K	TO-92	O	G	I	-	-	Bulk
UT71XXL-T92-C-B	UT71XXG-T92-C-B	TO-92	G	I	O	-	-	Tape Box
UT71XXL-T92-C-K	UT71XXG-T92-C-K	TO-92	G	I	O	-	-	Bulk

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

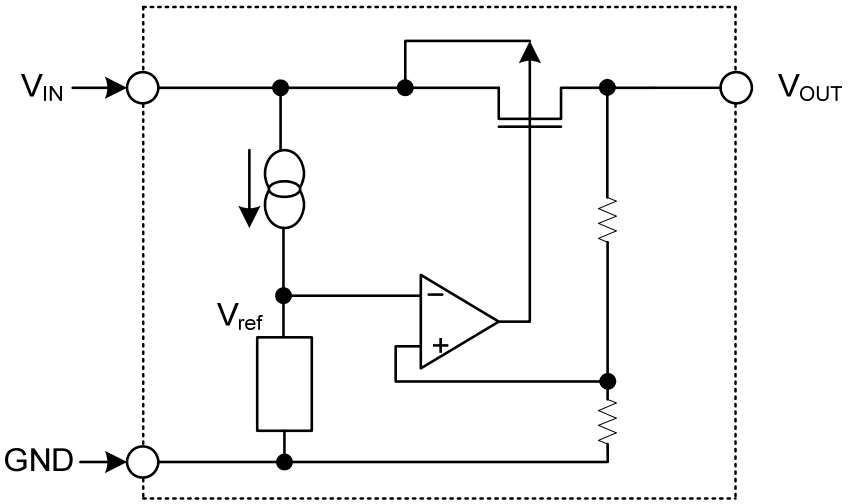
UT71xxG-AB3-C-R

(1)Packing Type	(1) B: Tape Box, K: Bulk, R: Tape Reel
(2)Pin Assignment	(2) refer to Pin Assignment
(3)Package Type	(3) AB3: SOT-89, AF5: SOT-25, T92: TO-92
(4)Green Package	(4) G: Halogen Free and Lead Free, L: Lead Free
(5)Output Voltage Code	(5) xx: refer to Marking Information

■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-89	15:1.5V 18:1.8V 20:2.0V 25:2.5V 27:2.7V 28:2.8V 30:3.0V 33:3.3V 36:3.6V 44:4.4V 45:4.5V 50:5.0V 70:7.0V	
SOT-25		
TO-92		

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V_{CC}	-0.3 ~ +28	V
Power Dissipation	SOT-89/TO-92	P_D	250	mW
	SOT-25		200	
Operating Temperature		T_{OPR}	-40 ~ +85	°C
Storage Temperature		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)

For UT7115

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=3.5V, I_{OUT}=10mA	1.464	1.5	1.536	V
Input Voltage	V_{IN}				24	V
Load Regulation	$\triangle V_{OUT}$	V_{IN}=3.5V,1mA≤I_{OUT}≤20mA		60	100	mV
Voltage Dropout	V_D	I_{OUT}=1mA		60		mV
Output Current	I_{OUT}	V_{IN}=3.5V	20	30		mA
Current Consumption	I_{SS}	V_{IN}=3.5V, No load		7	16	μA
Line Regulation	$\frac{\triangle V_{OUT}}{\triangle V_{IN} \times V_{OUT}}$	2.5V≤V_{IN}≤24V, I_{OUT}=0.5mA		0.2		%/V
Temperature Coefficient	$\frac{\triangle V_{OUT}}{\triangle T_A}$	V_{IN}=3.5V, I_{OUT}=10mA 0°C<T_A<70°C		±0.2		mV/°C

For UT7118

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=3.8V, I_{OUT}=10mA	1.757	1.8	1.843	V
Input Voltage	V_{IN}				24	V
Load Regulation	$\triangle V_{OUT}$	V_{IN}=3.8V,1mA≤I_{OUT}≤20mA		60	100	mV
Voltage Dropout	V_D	I_{OUT}=1mA		60		mV
Output Current	I_{OUT}	V_{IN}=3.8V	20	30		mA
Current Consumption	I_{SS}	V_{IN}=3.8V, No load		7	16	μA
Line Regulation	$\frac{\triangle V_{OUT}}{\triangle V_{IN} \times V_{OUT}}$	2.8V≤V_{IN}≤24V, I_{OUT}=0.5mA		0.2		%/V
Temperature Coefficient	$\frac{\triangle V_{OUT}}{\triangle T_A}$	V_{IN}=3.8V, I_{OUT}=10mA 0°C<T_A<70°C		±0.25		mV/°C

For UT7120

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=4V, I_{OUT}=10mA	1.952	2.0	2.048	V
Input Voltage	V_{IN}				24	V
Load Regulation	$\triangle V_{OUT}$	V_{IN}=4V, 1mA≤I_{OUT}≤20mA		60	100	mV
Voltage Dropout	V_D	I_{OUT}=1mA		60		mV
Output Current	I_{OUT}	V_{IN}=4V	20	30		mA
Current Consumption	I_{SS}	V_{IN}=4V, No load		7	16	μA
Line Regulation	$\frac{\triangle V_{OUT}}{\triangle V_{IN} \times V_{OUT}}$	3V≤V_{IN}≤24V, I_{OUT}=0.5mA		0.2		%/V
Temperature Coefficient	$\frac{\triangle V_{OUT}}{\triangle T_A}$	V_{IN}=4V, I_{OUT}=10mA 0°C<T_A<70°C		±0.3		mV/°C

■ ELECTRICAL CHARACTRISTICS(Cont.)

For UT7125

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=4.5V, I_{OUT}=10mA	2.440	2.5	2.560	V
Input Voltage	V_{IN}				24	V
Load Regulation	$\triangle V_{OUT}$	V_{IN}=4.5V,1mA≤I_{OUT}≤20mA		60	100	mV
Voltage Dropout	V_D	I_{OUT}=1mA		60		mV
Output Current	I_{OUT}	V_{IN}=4.5V	20	30		mA
Current Consumption	I_{SS}	V_{IN}=4.5V, No load		7	16	μA
Line Regulation	$\frac{\triangle V_{OUT}}{\triangle V_{IN} \times V_{OUT}}$	3.5V≤V_{IN}≤24V, I_{OUT}=0.5mA		0.2		%/V
Temperature Coefficient	$\frac{\triangle V_{OUT}}{\triangle T_A}$	V_{IN}=4.5V, I_{OUT}=10mA 0°C<T_A<70°C		±0.35		mV/°C

For UT7127

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=4.7V, I_{OUT}=10mA	2.635	2.7	2.765	V
Input Voltage	V_{IN}				24	V
Load Regulation	$\triangle V_{OUT}$	V_{IN}=4.7V,1mA≤I_{OUT}≤20mA		60	100	mV
Voltage Dropout	V_D	I_{OUT}=1mA		60		mV
Output Current	I_{OUT}	V_{IN}=4.7V	20	30		mA
Current Consumption	I_{SS}	V_{IN}=4.7V, No load		7	16	μA
Line Regulation	$\frac{\triangle V_{OUT}}{\triangle V_{IN} \times V_{OUT}}$	3.7V≤V_{IN}≤24V, I_{OUT}=0.5mA		0.2		%/V
Temperature Coefficient	$\frac{\triangle V_{OUT}}{\triangle T_A}$	V_{IN}=4.7V, I_{OUT}=10mA 0°C<T_A<70°C		±0.4		mV/°C

For UT7128

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=4.8V, I_{OUT}=10mA	2.732	2.8	2.867	V
Input Voltage	V_{IN}				24	V
Load Regulation	$\triangle V_{OUT}$	V_{IN}=4.8V,1mA≤I_{OUT}≤20mA		60	100	mV
Voltage Dropout	V_D	I_{OUT}=1mA		60		mV
Output Current	I_{OUT}	V_{IN}=4.8V	20	30	-	mA
Current Consumption	I_{SS}	V_{IN}=4.8V, No load		7	16	μA
Line Regulation	$\frac{\triangle V_{OUT}}{\triangle V_{IN} \times V_{OUT}}$	3.8V≤V_{IN}≤24V, I_{OUT}=1mA		0.2		%/V
Temperature Coefficient	$\frac{\triangle V_{OUT}}{\triangle T_A}$	V_{IN}=4.8V, I_{OUT}=10mA 0°C<T_A<70°C		±0.4		mV/°C

For UT7130

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=5V, I_{OUT}=10mA	2.928	3.0	3.072	V
Input Voltage	V_{IN}				24	V
Load Regulation	$\triangle V_{OUT}$	V_{IN}=5V, 1mA≤I_{OUT}≤20mA		60	100	mV
Voltage Dropout	V_D	I_{OUT}=1mA		60		mV
Output Current	I_{OUT}	V_{IN}=5V	20	30	-	mA
Current Consumption	I_{SS}	V_{IN}=5V, No load		7	16	μA
Line Regulation	$\frac{\triangle V_{OUT}}{\triangle V_{IN} \times V_{OUT}}$	4V≤V_{IN}≤24V, I_{OUT}=1mA		0.2		%/V
Temperature Coefficient	$\frac{\triangle V_{OUT}}{\triangle T_A}$	V_{IN}=5V, I_{OUT}=10mA 0°C<T_A<70°C		±0.45		mV/°C

■ ELECTRICAL CHARACTRISTICS(Cont.)

For UT7133

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=5.5V, I_{OUT}=10mA	3.220	3.3	3.379	V
Input Voltage	V_{IN}				24	V
Load Regulation	$\triangle V_{OUT}$	V_{IN}=5.5V, 1mA≤I_{OUT}≤30mA		60	100	mV
Voltage Dropout	V_D	I_{OUT}=1mA		60		mV
Output Current	I_{OUT}	V_{IN}=5.5V	20	30		mA
Current Consumption	I_{SS}	V_{IN}=5.5V, No load		7	16	μA
Line Regulation	$\frac{\triangle V_{OUT}}{\triangle V_{IN} \times V_{OUT}}$	4.5V≤V_{IN}≤24V, I_{OUT}=1mA		0.2		%/V
Temperature Coefficient	$\frac{\triangle V_{OUT}}{\triangle T_A}$	V_{IN}=5.5V, I_{OUT}=10mA 0°C<T_A<70°C		±0.5		mV/°C

For UT7136

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=5.6V, I_{OUT}=10mA	3.513	3.6	3.686	V
Input Voltage	V_{IN}				24	V
Load Regulation	$\triangle V_{OUT}$	V_{IN}=5.6V,1mA≤I_{OUT}≤30mA		60	100	mV
Voltage Dropout	V_D	I_{OUT}=1mA		60		mV
Output Current	I_{OUT}	V_{IN}=5.6V	20	30		mA
Current Consumption	I_{SS}	V_{IN}=5.6V, No load		7	16	μA
Line Regulation	$\frac{\triangle V_{OUT}}{\triangle V_{IN} \times V_{OUT}}$	4.6V≤V_{IN}≤24V, I_{OUT}=1mA		0.2		%/V
Temperature Coefficient	$\frac{\triangle V_{OUT}}{\triangle T_A}$	V_{IN}=5.6V, I_{OUT}=10mA 0°C<T_A<70°C		±0.6		mV/°C

For UT7144

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=6.4V, I_{OUT}=10mA	4.294	4.4	4.505	V
Input Voltage	V_{IN}				24	V
Load Regulation	$\triangle V_{OUT}$	V_{IN}=6.4V, 1mA≤I_{OUT}≤30mA		60	100	mV
Voltage Dropout	V_D	I_{OUT}=1mA		60		mV
Output Current	I_{OUT}	V_{IN}=6.4V	20	30		mA
Current Consumption	I_{SS}	V_{IN}=6.4V, No load		7	16	μA
Line Regulation	$\frac{\triangle V_{OUT}}{\triangle V_{IN} \times V_{OUT}}$	5.4V≤V_{IN}≤24V, I_{OUT}=1mA		0.2		%/V
Temperature Coefficient	$\frac{\triangle V_{OUT}}{\triangle T_A}$	V_{IN}=6.4V, I_{OUT}=10mA 0°C<T_A<70°C		±0.7		mV/℃

For UT7145

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=6.5V, I_{OUT}=10mA	4.392	4.5	4.608	V
Input Voltage	V_{IN}				24	V
Load Regulation	$\triangle V_{OUT}$	V_{IN}=6.5V, 1mA≤I_{OUT}≤30mA		60	100	mV
Voltage Dropout	V_D	I_{OUT}=1mA		60		mV
Output Current	I_{OUT}	V_{IN}=6.5V	20	30		mA
Current Consumption	I_{SS}	V_{IN}=6.5V, No load		7	16	μA
Line Regulation	$\frac{\triangle V_{OUT}}{\triangle V_{IN} \times V_{OUT}}$	5.5V≤V_{IN}≤24V, I_{OUT}=1mA		0.2		%/V
Temperature Coefficient	$\frac{\triangle V_{OUT}}{\triangle T_A}$	V_{IN}=6.5V, I_{OUT}=10mA 0°C<T_A<70°C		±0.7		mV/°C

■ ELECTRICAL CHARACTRISTICS(Cont.)

For UT7150

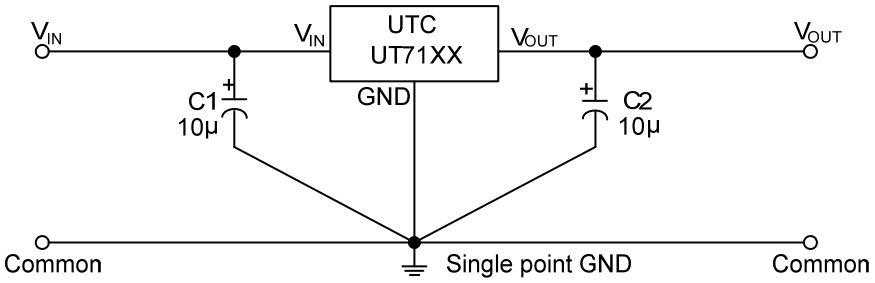
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=7V, I_{OUT}=10mA	4.88	5.0	5.12	V
Input Voltage	V_{IN}				24	V
Load Regulation	$\triangle V_{OUT}$	V_{IN}=7V, 1mA≤I_{OUT}≤30mA		60	100	mV
Voltage Dropout	V_D	I_{OUT}=1mA		60		mV
Output Current	I_{OUT}	V_{IN}=7V	20	30		mA
Current Consumption	I_{SS}	V_{IN}=7V, No load		7	16	μA
Line Regulation	$\frac{\triangle V_{OUT}}{\triangle V_{IN} \times V_{OUT}}$	6V≤V_{IN}≤24V, I_{OUT}=1mA		0.2		%/V
Temperature Coefficient	$\frac{\triangle V_{OUT}}{\triangle T_A}$	V_{IN}=7V, I_{OUT}=10mA 0°C<T_A<70°C		±0.75		mV/°C

For UT7170

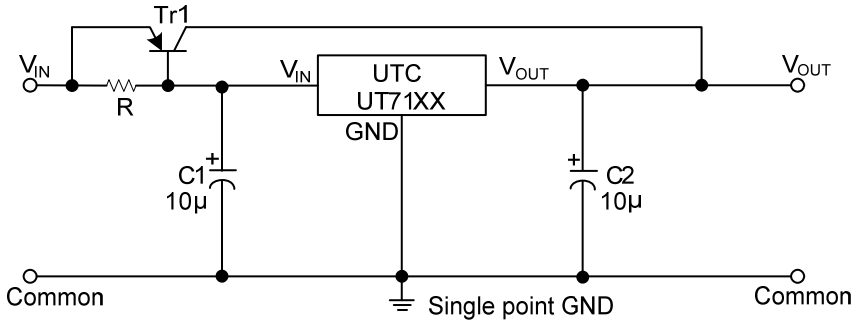
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=9V, I_{OUT}=10mA	6.832	7.0	7.168	V
Input Voltage	V_{IN}				24	V
Load Regulation	$\triangle V_{OUT}$	V_{IN}=9V, 1mA≤I_{OUT}≤30mA		60	100	mV
Voltage Dropout	V_D	I_{OUT}=1mA		60		mV
Output Current	I_{OUT}	V_{IN}=9V	20	30		mA
Current Consumption	I_{SS}	V_{IN}=9V, No load		7	16	μA
Line Regulation	$\frac{\triangle V_{OUT}}{\triangle V_{IN} \times V_{OUT}}$	8V≤V_{IN}≤24V, I_{OUT}=1mA		0.2		%/V
Temperature Coefficient	$\frac{\triangle V_{OUT}}{\triangle T_A}$	V_{IN}=9V, I_{OUT}=10mA 0°C<T_A<70°C		±1.05		mV/°C

■ TYPICAL APPLICATION CIRCUIT

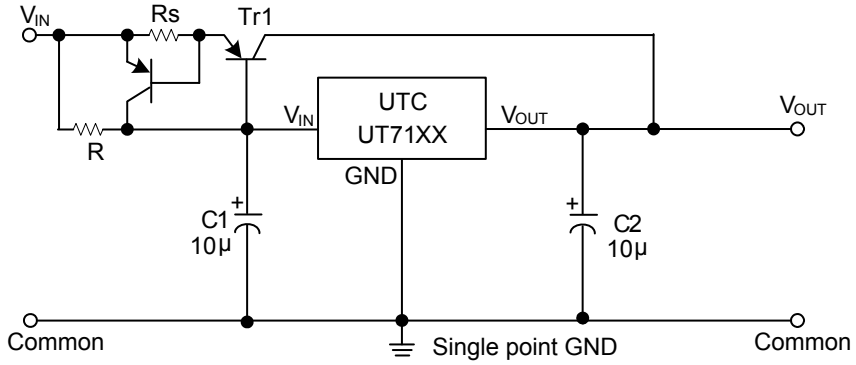
The basic circuits using the UTC **UT71XX** series



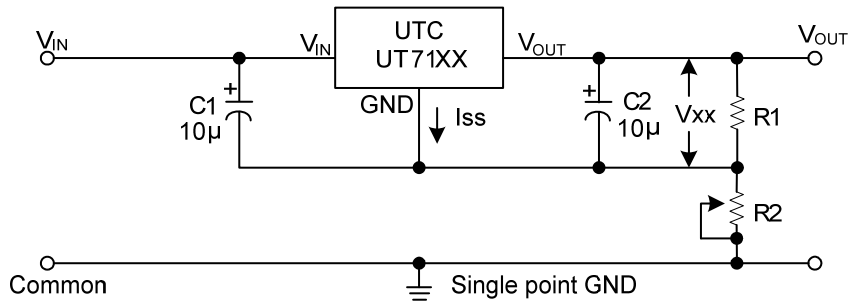
High output current positive voltage regulator



Short-circuit protection for Tr1



Circuit for increasing output voltage

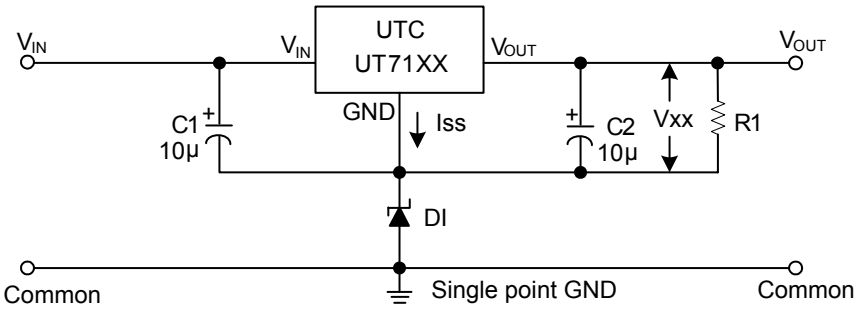


$$V_{OUT} = Vxx\left(1+\frac{R2}{R1}\right) + IssR2$$

$$\fallingdotseq Vxx\left(1+\frac{R2}{R1}\right)$$

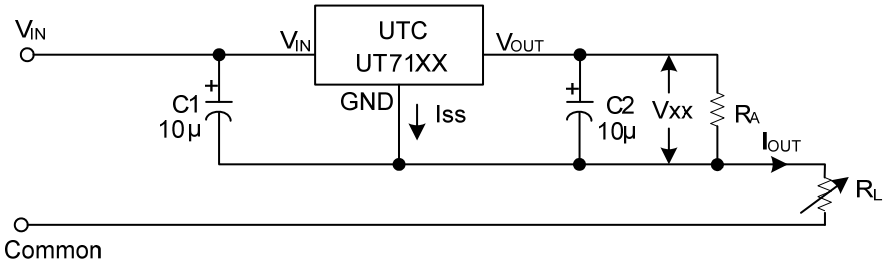
■ TYPICAL APPLICATION CIRCUIT(cont.)

Circuit for increasing output voltage



$$V_{OUT} = Vxx + V_{DI}$$

Constant current regulator



$$I_{OUT} = \frac{V_{xx}}{R_A} + Iss$$

Dual supply