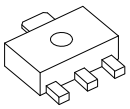
36V INPUT VOLTAGE 1A ULTRA LOW IQ VOLTAGE REGULATOR



SOT-89

■ DESCRIPTION

The UTC **UR87XXH** 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: 5.0uA (Typ.)
* Low temperature-drift coefficient of V_{OUT}: ±100ppm/°C (Typ.)
* Wide Input voltage range: 2.5 ~ 36V

■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UR87XXHL-AB3-B-R	UR87XXHG-AB3-B-R	SOT-89	O	G	I	Tape Reel
UR87XXHL-AB3-C-R	UR87XXHG-AB3-C-R	SOT-89	G	I	O	Tape Reel

Notes: 1. xx: output voltage.
2. Pin assignment: O: V_{OUT} G: Ground I: V_{IN}

UR87XXHG-AB3-B-R

(1)Packing Type	(1) R: Tape Reel
(2)Pin Assignment	(2) refer to Pin Assignment
(3)Package Type	(3) AB3: SOT-89
(4)Green Package	(4) G: Halogen Free and Lead Free, L: Lead Free
(5)Output Voltage Code	(5) XX: Refer to Marking Information

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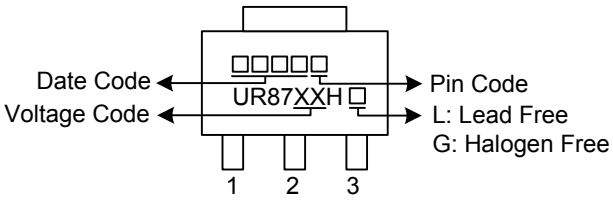
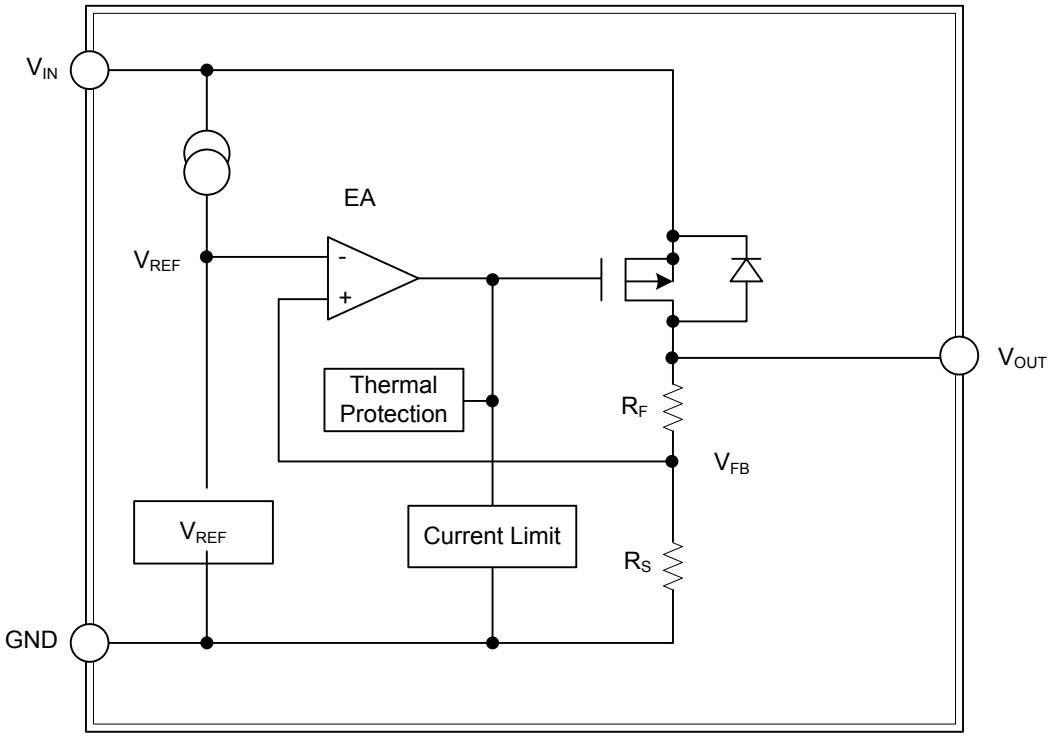
■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-89	30: 3.0V 33: 3.3V 36: 3.6V 40: 4.0V 45: 4.5V 50: 5.0V 12: 12V	

■ PIN DESCRIPTION

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

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	36	V
Power Dissipation	P_D	500	mW
Operating Temperature Range	T_{OPR}	-40 ~ +125	°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 **UR8730H**

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	1			A
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=100mA		160	200	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}≤1.0A		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		±100		ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		5	10	uA
Thermal Shutdown	TSD			160		°C

UTC UR8733H

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	1			A
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=100mA		160	200	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}≤1.0A		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		±100		ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		5	10	uA
Thermal Shutdown	TSD			160		°C

UTC UR8736H

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	1			A
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=100mA		160	200	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}≤1.0A		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		±100		ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		5	10	uA
Thermal Shutdown	TSD			160		°C

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

UTC UR8740H

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	1			A
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=100mA		160	200	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}≤1.0A		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		±100		ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		5	10	uA
Thermal Shutdown	TSD			160		°C

UTC UR8745H

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+2V, I_{OUT}=10mA	4.41	4.5	4.59	V
Output Current (Note 1)	I_{OUT}	V_{IN}=V_{OUT}+2V	1			A
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=100mA		160	200	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}≤1.0A		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		±100		ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		5	10	uA
Thermal Shutdown	TSD			160		°C

UTC **UR8750H**

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	1			A
Dropout Voltage (Note 2)	V_{DROP}	I_{OUT}=100mA		160	200	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}≤1.0A		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		±100		ppm/°C
Supply Current	I_{SS1}	V_{IN}=V_{OUT}+2V		5	10	uA
Thermal Shutdown	TSD			160		°C

■ ELECTRICAL CHARACTERISTICS

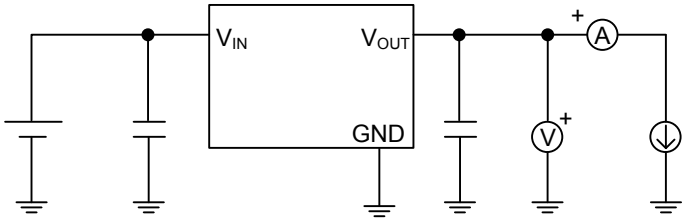
UTC **UR8712H**

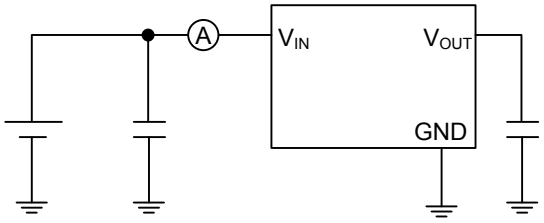
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+2V$, $I_{OUT}=10mA$	11.76	12	12.24	V
Output Current (Note 1)	I_{OUT}	$V_{IN}=V_{OUT}+2V$	1			A
Dropout Voltage (Note 2)	V_{DROP}	$I_{OUT}=100mA$		160	200	mV
Line Regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	$V_{OUT}+2V \le V_{IN} \le 36V$, $I_{OUT}=1mA$		0.05	0.2	%/V
Load Regulation	ΔV_{OUT2}	$V_{IN}=V_{OUT}+2V$, $1.0mA \le I_{OUT} \le 1.0A$		30	80	mV
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT1}}{T_A \bullet V_{OUT}}$	$V_{IN}=V_{OUT}+2V$, $I_{OUT}=10mA$, $-40°C \le T_A \le 85°C$		±100		ppm/°C
Supply Current	I_{SS1}	$V_{IN}=V_{OUT}+2V$		5	12	uA
Thermal Shutdown	TSD			160		°C

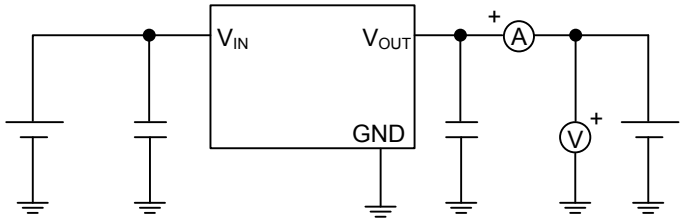
Notes: 1. Increase the output current slowly, record the current when V_{OUT} decrease 98% of V_{OUT}.

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

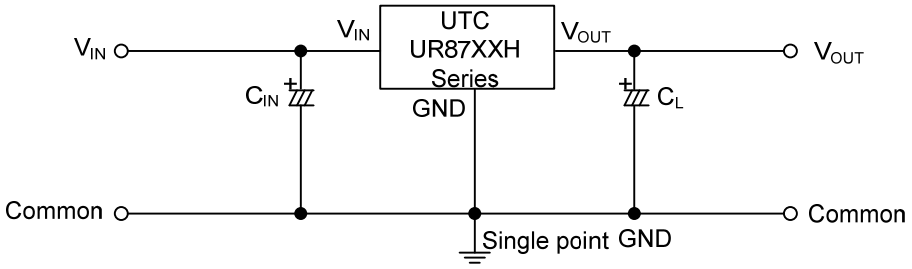
■ TEST CIRCUIT







■ TYPICAL APPLICATION CIRCUIT



C_{IN} > 1.0μF
C_L > 2.2μF

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