

# UTC UR133/A LINEAR INTEGRATED CIRCUIT

## 300/500mA LOW DROPOUT LINEAR VOLTAGE REGULATOR

### DESCRIPTION

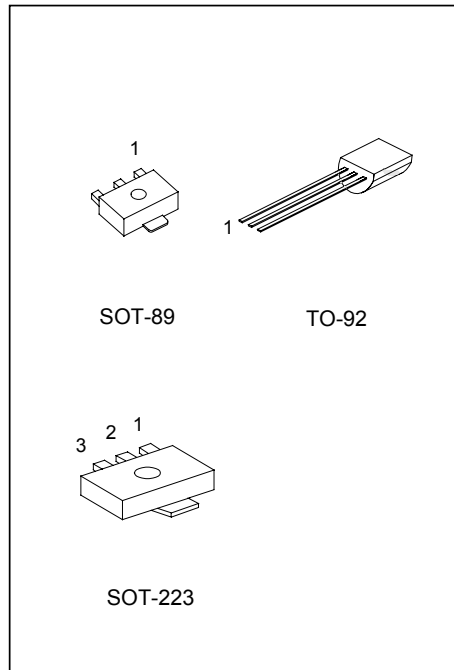
The UTC UR133/A is a 300/500mA fixed output voltage low dropout linear regulator. Wide range of available output voltage fits most of applications. Built-in output current-limiting most thermal-limiting provide maximal protection against any fault conditions.

### FEATURES

- \*Guaranteed 300/500mA output current
- \*Input voltage range up to 12V
- \*Extremely tight load regulation
- \*Fast transient response
- \*Current-limiting and Thermal-limiting
- \*Three-terminal adjustable or fixed 1.5V, 1.8V, 2.2V, 2.5V, 2.7V, 2.8V, 2.9V, 3.0V, 3.3V, 3.5V, 3.7V, 4.7V, 5.0V

### APPLICATIONS

- \*Voltage regulator for LAN Card, CD-ROM, and DVD
- \*Wireless communication systems



### PIN DESCRIPTION

NAME	FUNCTION
VOUT	Output
GND	Ground/Adjustable
VIN	Positive Power Input

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## MARKING INFORMATION

PACKAGE	VOLTAGE CODE	PIN CODE	PIN 1	PIN 2	PIN 3	MARKING
SOT-89	15:1.5V	A	GND	OUT	IN	
	18:1.8V	B	OUT	GND	IN	
	22:2.2V	C	GND	IN	OUT	
	25:2.5V	D	IN	GND	OUT	
	27:2.7V					
28:2.8V						
TO-92	29:2.9V	A	GND	OUT	IN	
	30:3.0V	B	OUT	GND	IN	
	33:3.3V	C	GND	IN	OUT	
	35:3.5V	D	IN	GND	OUT	
	37:3.7V					
47:4.7V						
SOT-223	50:5.0V	A	GND	OUT	IN	
	AD: ADJUSTABLE	B	OUT	GND	IN	
		C	GND	IN	OUT	
		D	IN	GND	OUT	

## ABSOLUTE MAXIMUM RATINGS

PARAMETER	MIN.	TYP.	MAX.	UNIT
Input Voltage $V_{in}$	-0.3		12	V
Operating Junction Temperature Range	-40		125	°C
Storage Temperature Range	-65		150	°C
Power Dissipation				W
SOT-89		0.50		
Thermal Resistance, $R_{\theta JC}=100^{\circ}\text{C/W}$				
Thermal Resistance, $R_{\theta JA}=300^{\circ}\text{C/W}$				
TO-92		0.60		
Thermal Resistance, $R_{\theta JA}=160^{\circ}\text{C/W}$				
SOT-223		0.80		
Thermal Resistance, $R_{\theta JC}=15^{\circ}\text{C/W}$				
Thermal Resistance $R_{\theta JA}=60^{\circ}\text{C/W}$ (est)				

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UTC UR133/A 1.5V, 1.8V, 2.2V, 2.5V, 2.7V, 2.8V, 2.9V, 3.0V

ELECTRICAL CHARACTERISTICS (Ta=25°C, CIN=1μF, COUT=10μF, unless otherwise specified)

PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNITS
Output Voltage UR133/A	$I_L=1\text{mA}$ , $V_{IN-VOUT}=1.4\text{V}$	1.47	1.50	1.53	V
		1.77	1.80	1.83	
		2.16	2.20	2.24	
		2.45	2.50	2.55	
		2.65	2.70	2.75	
		2.74	2.80	2.86	
		2.84	2.90	2.96	
		2.94	3.00	3.06	
Output Voltage Temperature Coefficient			50	150	PPM/°C
Line Regulation	$I_L=1\text{mA}$ , $V_{IN-Vout}=2\text{V}\sim V_{in}=9\text{V}$			0.5	%VOUT
Load Regulation (note 2) UR133 UR133A	$I_L=1\text{mA}\sim 300\text{mA}$ , $V_{IN-Vout}=2\text{V}$		10	30	mV
		$I_L=1\text{mA}\sim 500\text{mA}$ , $V_{IN-Vout}=2\text{V}$		10	
Current Limit (note 3) UR133 UR133A	$V_{IN-Vout}=2\text{V}$ , $V_{OUT}=0\text{V}$		350		mA
			550		
Dropout Voltage (note 4,5)				1.5	V
Standby current	$I_L=0$ , $V_{IN}=9\text{V}$				mA
				3.0	

UTC UR133/A ADJ 3.3V, 3.5V, 3.7V, 4.7V, 5.0V

ELECTRICAL CHARACTERISTICS (Ta=25°C, CIN=1μF, COUT=10μF, unless otherwise specified)

PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNITS
Adjustable (R1=120Ω, R2=200Ω, Vout=3.3V)					
Reference Voltage	$V_{in-Vo}=2\text{V}$ , $I_L=1\text{mA}$	1.238	1.250	1.262	V
Output Voltage UR133/A	$I_L=1\text{mA}$ , $V_{IN-VOUT}=1.4\text{V}$	3.23	3.30	3.37	V
		3.43	3.50	3.57	
		3.63	3.70	3.77	
		4.61	4.70	4.79	
		4.90	5.00	5.10	
Output Voltage Temperature Coefficient			50	150	PPM/°C
Line Regulation	$I_L=1\text{mA}$ , $V_{IN-Vout}=2\text{V}\sim V_{in}=12\text{V}$			0.5	%VOUT
Load Regulation (note 2) UR133 UR133A	$I_L=1\text{mA}\sim 300\text{mA}$ , $V_{IN-Vout}=2\text{V}$		10	30	mV
		$I_L=1\text{mA}\sim 500\text{mA}$ , $V_{IN-Vout}=2\text{V}$		10	
Current Limit (note 3) UR133 UR133A	$V_{IN-Vout}=2\text{V}$ , $V_{OUT}=0\text{V}$		350		mA
			550		
Dropout Voltage (note 4,5)				1.3	V
Standby current	$I_L=0$ , $V_{IN}=12\text{V}$				mA
				5.0	

Note 1: Guaranteed by design.

Note 2: Regulation is measured at constant junction temperature, using pulsed ON time.

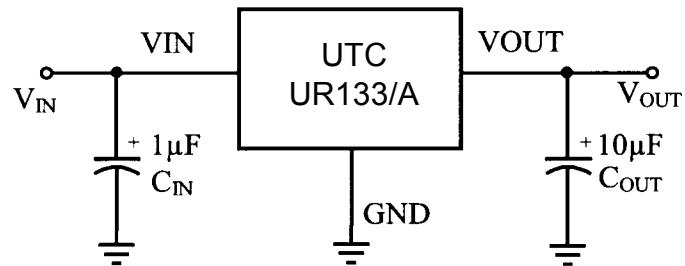
Note 3: Current Limit is measured at constant junction temperature, using pulsed ON time.

Note 4: Dropout is measured at constant junction temperature, using pulsed ON time, and the criterion is VOUT inside target value±2%.

Note 5: Dropout test is skipped at the condition of  $V_{IN}<3\text{V}$ .

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## TYPICAL APPLICATION CIRCUIT

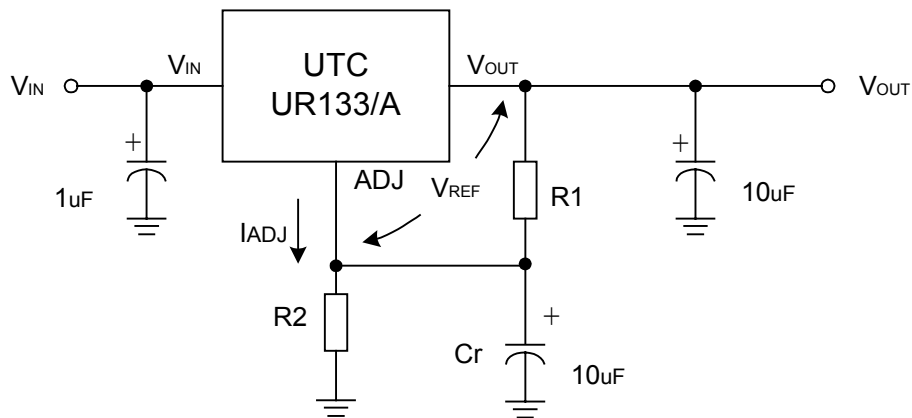


## APPLICATION INFORMATION

A 10µF (or larger) capacitor is recommended between VOUT and GND for stability. The part may oscillate without the capacitor. Any type of capacitor can be used, but not Aluminum electrolytics when operating below -25°C. The capacitance may be increased without limit.

A 1µF capacitor (or larger) should be placed between VIN to GND.

## UR133/A ADJUSTABLE

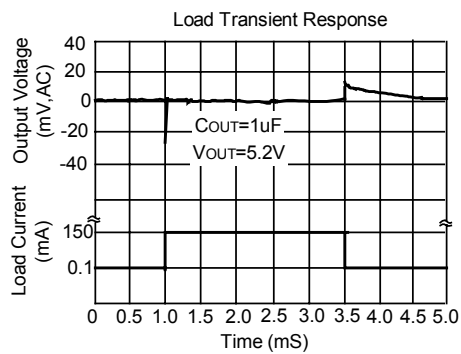
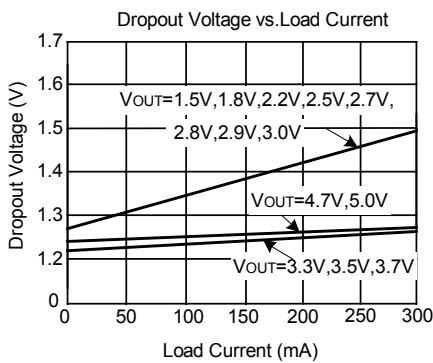
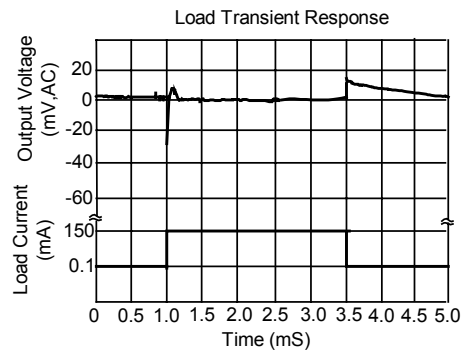
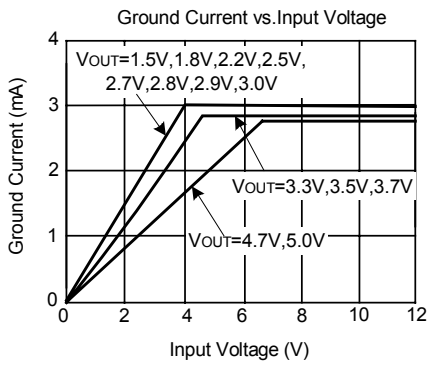
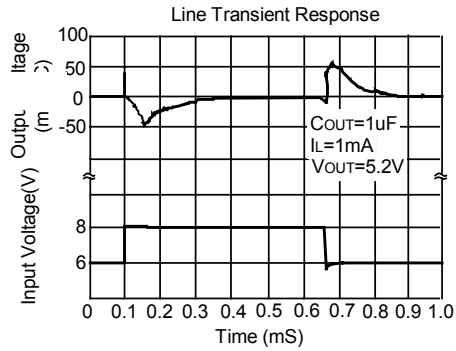
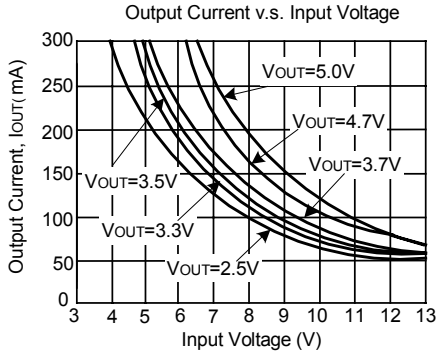


Cr:10uF to improve ripple rejection

$$V_{OUT} = V_{REF}(1 + R_2/R_1) + I_{ADJ} * R_2$$

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## UR133



# UTCUR133/A LINEAR INTEGRATED CIRCUIT

UR133A

