



## UM5237

Preliminary

LINEAR INTEGRATED CIRCUIT

### 3-TERMINAL ADJUSTABLE REGULATOR

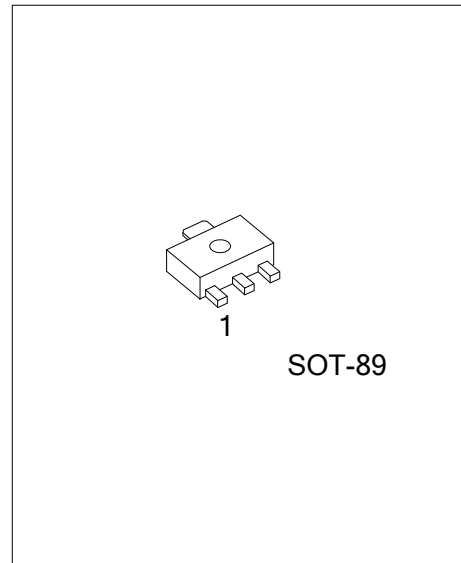
#### DESCRIPTION

The UTC **UM5237** is a 3-terminal adjustable regulator. It's used as a variable output voltage regulator.

The UTC **UM5237** has a less power dissipation and more exact loading voltage regulation .it's suitable for driver circuit, differential amplifier and reference voltage generator circuit, etc.

#### FEATURES

- \* Wide Input/Output voltage range
- \* Low Dropout Voltage
- \* Over current protect
- \* External circuit can adjust the output voltage



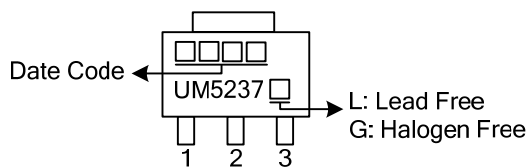
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UM5237L-AB3-R	UM5237G-AB3-R	SOT-89	O	G	I	Tape Reel

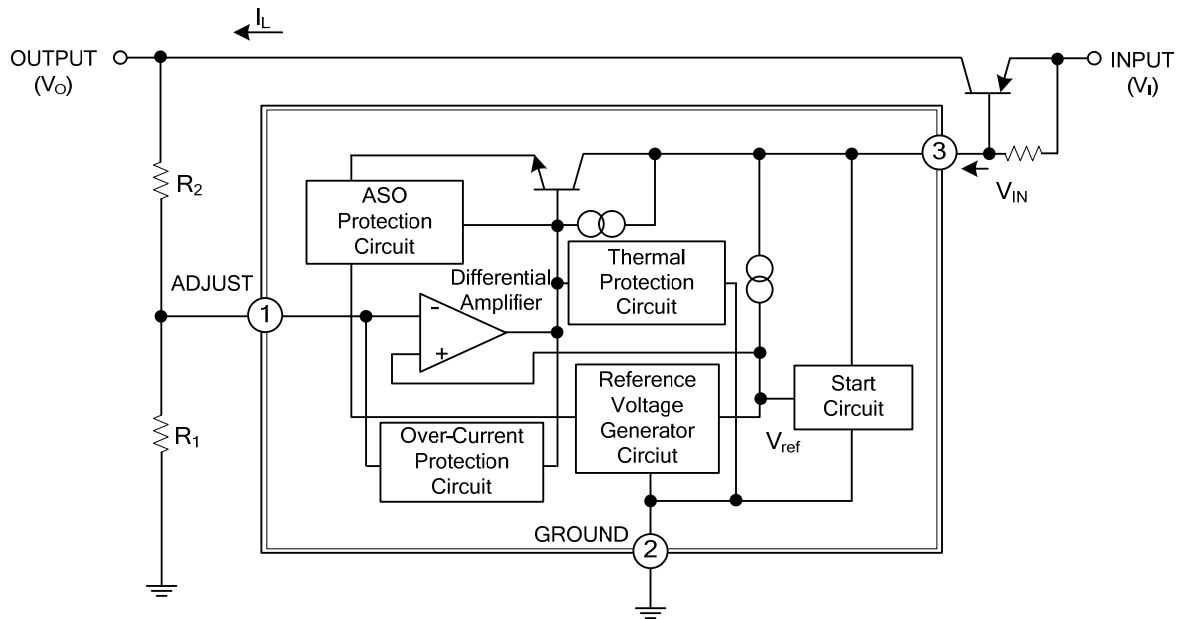
Note: Pin Assignment: O: OUTPUT G: GROUND I: INPUT

<p>UM5237G-AB3-R</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) R: Tape Reel (2) AB3: SOT-89 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING



■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING ( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	$V_{IN}$	30	V
Drive Current	$I_D$	30	mA
Input/Output Voltage Difference	$V_{IN}-V_{OUT}$	28	V
Internal Power Dissipation	$P_D$	500	mW
Operating Temperature	$T_{OPR}$	-20 ~ +75	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^{\circ}\text{C}$

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.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage Range	$V_{IN}$	3.5 ~ 30	V
Output Voltage Range	$V_{OUT}$	1.5 ~ 25	V

■ ELECTRICAL CHARACTERISTICS

(Test circuit (a) is used with  $T_A=25^{\circ}\text{C}$ ,  $V_I=15\text{V}$ ,  $V_O=12\text{V}$ ,  $I_L=200\text{mA}$ ,  $C_{REF}=1\mu\text{A}$ ,  $R_1=4.3\text{K}\Omega$ )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage	$V_{IN}$	Between Pin 1 and Pin 2	3.5		30	V
Output Voltage	$V_{OUT}$	$R_2 \approx 0.82 \sim 108\text{K}\Omega$	1.5		28	V
Minimum Input/Output Voltage Difference	$V_{IN}-V_{OUT}$			0.2		V
Reference Voltage	$V_{REF}$	Between Pin 2 and Pin 3	1.2	1.26	1.32	V
Input Voltage Regulation	$R_{eq-in}$	$V_I=15 \sim 20\text{V}$		0.02	0.1	%/V
Loading Voltage Regulation	$R_{eq-L}$	$I_L=10 \sim 200\text{mA}$		0.02	0.1	%
Bias Current	$I_B$	$I_L=0$ (disregarding the current in resistors $R_1, R_2$ )		1.7	3.0	mA
Output Voltage Thermal Coefficient	$TC_{VO}$	$T_A=0 \sim 75^{\circ}\text{C}$		0.02		%/ $^{\circ}\text{C}$
Ripple Rejection	RR	$f=120\text{Hz}$ measured with circuit (b)		68		dB
Output Noise Voltage	$V_{NO}$	$f=20\text{Hz} \sim 100\text{KHZ}$		25		$\mu\text{Vrms}$

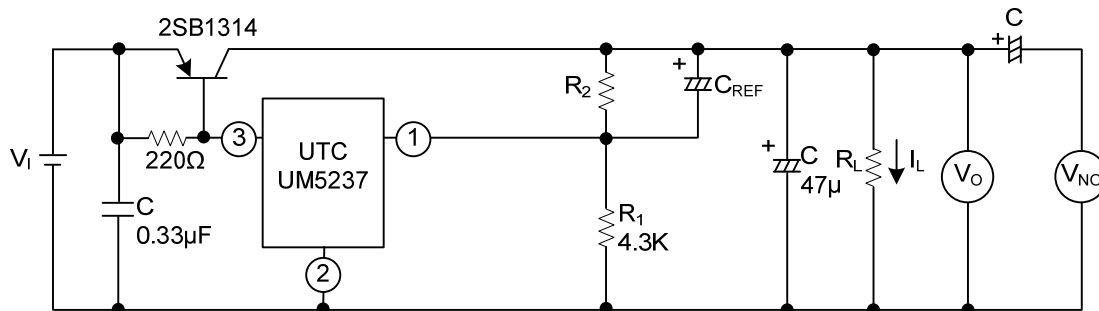
### ■ TEST CIRCUIT

#### (a) Standard test circuit

$$V_O = V_{REF} \left( 1 + \frac{R_2}{R_1} \right) \approx 1.26 \times \left( 1 + \frac{R_2}{4.3} \right) (V)$$

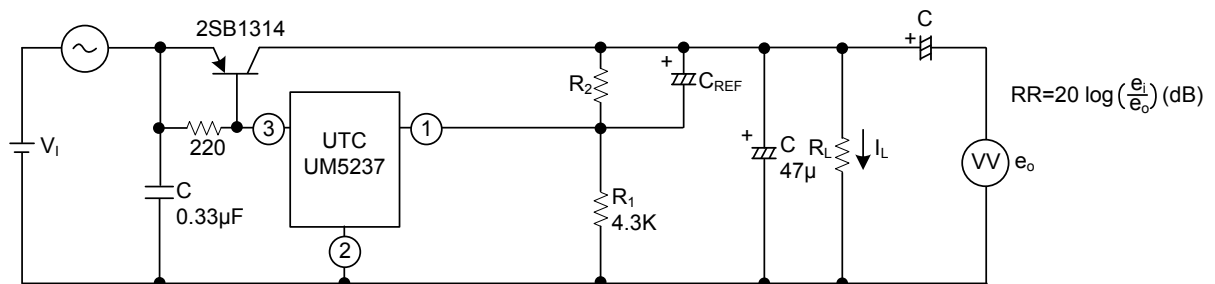
$$R_2 = R_1 \left( \frac{V_O}{V_{REF}} - 1 \right) \approx 4.3 \times \left( \frac{V_O}{1.26} - 1 \right) (K\Omega)$$

( $R_1 = 4.3K\Omega$ ,  $V_{REF} \approx 1.26V$ )



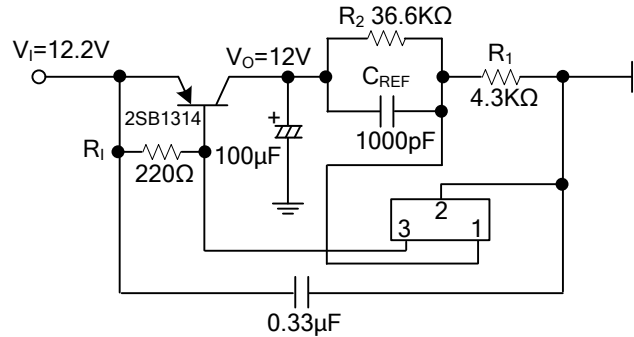
#### (b) Ripple rejection test circuit

$f = 120\text{Hz}$ ,  $e_i = 0.1\text{Vrms}$



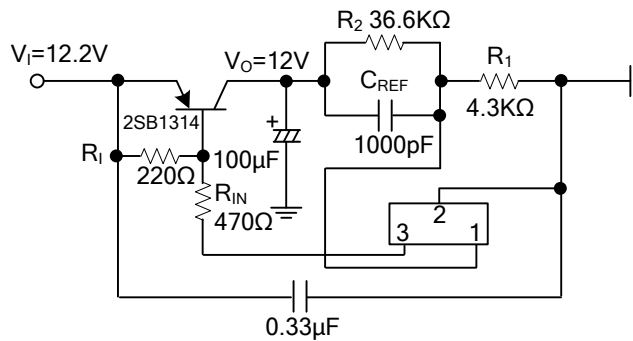
■ TYPICAL APPLICATION CIRCUIT

1. Standard Application Circuit

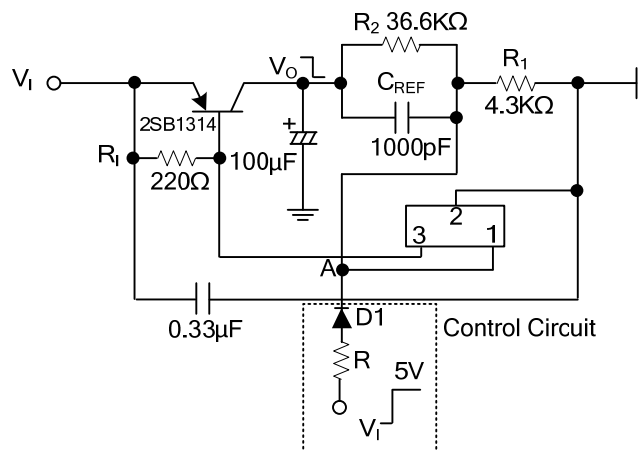


$$V_O = V_{REF} \times \left( 1 + \frac{R_2}{R_1} \right) V, \quad V_{REF} = 1.26V$$

2. Maximum Drive Current Controller Application Circuit



3. Output Voltage ON/OFF Controller



Set control circuit resistor R so that voltage of point A is more than 1.5V and less than 5V

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