

1.5A, Three Terminal Adjustable Negative Voltage Regulators

FEATURES

- Output voltage adjustable from -1.2 to -37V
- Guaranteed 1.5A output current
- Line regulation typically 0.01%/V
- Load regulation typically 0.3%
- Excellent thermal regulation, 0.002%/W
- 77 dB ripple rejection
- Excellent rejection of thermal transients
- 50 ppm/°C temperature coefficient
- Temperature-independent current limit
- Internal thermal overload protection
- Standard 3-lead transistor packages (TO-3, TO-220, TO-257, and isolated TO-257)

DESCRIPTION

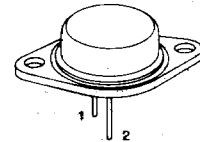
The UC137/UC237/UC337 are adjustable 3-terminal negative voltage regulators capable of supplying in excess of -1.5A over an output voltage range of -1.2V to -37V. These regulators are exceptionally easy to apply, requiring only 2 external resistors to set the output voltage and 1 output capacitor for frequency compensation. The circuit design has been optimized for excellent regulation and low thermal transients. Further, the UC137 series features internal current limiting, thermal shutdown and safe-area compensation, making them virtually blowout-proof against overloads.

The UC137/UC237/UC337 serve a wide variety of applications including local on-card regulation, programmable-output voltage regulation or precision current regulation. The UC137/UC237/UC337 are ideal complements to the UC117/UC217/UC317 adjustable positive regulators. These devices are available in TO-3, TO-220, TO-257, and isolated TO-257 packages. The UC137 is rated for operation from -55°C to +150°C, the UC237 from -25°C to +150°C and the UC337 from 0°C to +125°C.

ABSOLUTE MAXIMUM RATINGS

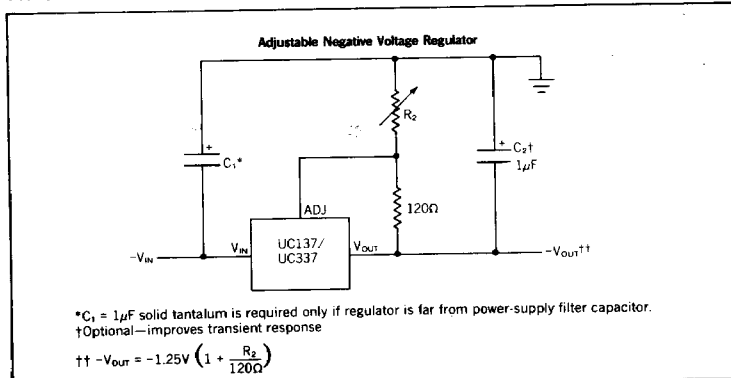
Power Dissipation	Internally limited
Input—Output Voltage Differential	40V
Operating Junction Temperature Range	
UC137	-55°C to +150°C
UC237	-25°C to +150°C
UC337	0°C to +125°C
Storage Temperature	-65°C to +150°C
Lead Temperature (Soldering, 10 seconds)	300°C

K(TO-3)



- Pin 1. Adjust
Pin 2. Input
Case: Output

TYPICAL APPLICATION



G, IG (TO-257)



- Non-isolated
Pin 1. Adjust
Pin 2. Input
Pin 3. Output
Pin 4. Output
- Isolated
Pin 1. Adjust
Pin 2. Input
Pin 3. Output
Pin 4. No Connection

Note: When ordering, add suffix "K" (for TO-3 package), "T" (for TO-220 package), "G" (for non-isolated TO-257) and "IG" (for isolated TO-257) to the Part Number.

ELECTRICAL CHARACTERISTICS (Note 1) $T_A = T_J$

PARAMETER	TEST CONDITIONS	UC137/UC237			UC337			UNITS
		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
Line Regulation	$T_A = 25^\circ\text{C}$, $3\text{V} \leq V_{\text{IN}} - V_{\text{OUT}} \leq 40\text{V}$ (Note 2)		0.01	0.02		0.01	0.04	%/V
Load Regulation	$T_A = 25^\circ\text{C}$, $10\text{mA} \leq I_{\text{OUT}} \leq I_{\text{MAX}}$ $ V_{\text{OUT}} \leq 5\text{V}$, (Note 2, 3) $ V_{\text{OUT}} \geq 5\text{V}$, (Note 2, 3)		15 0.3	25 0.5		15 0.3	50 1.0	mV %
Thermal Regulation	$T_A = 25^\circ\text{C}$, 10ms Pulse		0.002	0.02		0.003	0.04	%/W
Adjustment Pin Current			65	100		65	100	μA
Adjustment Pin Current Change	$10\text{mA} \leq I_L \leq I_{\text{MAX}}$ $2.5\text{V} \leq V_{\text{IN}} - V_{\text{OUT}} \leq 40\text{V}$, $T_A = 25^\circ\text{C}$		2	5		2	5	μA
Reference Voltage	$T_A = 25^\circ\text{C}$ $3 \leq V_{\text{IN}} - V_{\text{OUT}} \leq 40\text{V}$ $10\text{mA} \leq I_{\text{OUT}} \leq I_{\text{MAX}}$, $P \leq P_{\text{MAX}}$	-1.225 -1.200	-1.250 -1.250	-1.275 -1.300	-1.213 -1.200	-1.250 -1.250	-1.287 -1.300	V V
Line Regulation	$3\text{V} \leq V_{\text{IN}} - V_{\text{OUT}} \leq 40\text{V}$, (Note 2)		0.02	0.05		0.02	0.07	%/V
Load Regulation	$10\text{mA} \leq I_{\text{OUT}} \leq I_{\text{MAX}}$, (Note 2, 3) $ V_{\text{OUT}} \leq 5\text{V}$ $ V_{\text{OUT}} \geq 5\text{V}$		20 0.3	50 1		20 0.3	70 1.5	mV %
Temperature Stability	$T_{\text{MIN}} \leq T_J \leq T_{\text{MAX}}$		0.6			0.6		%
Minimum Load Current	$ V_{\text{IN}} - V_{\text{OUT}} \leq 40\text{V}$ $ V_{\text{IN}} - V_{\text{OUT}} \leq 10\text{V}$		2.5 1.2	5 3		2.5 1.5	10 6	mA mA
Current Limit	$ V_{\text{IN}} - V_{\text{OUT}} \leq 15\text{V}$ K, G, IG Packages T Package $ V_{\text{IN}} - V_{\text{OUT}} = 40\text{V}$ K, G, IG Packages T Package	1.5 1.5	2.2 2.2		1.5 1.5	2.2 2.2		A A A A
RMS Output Noise	$T_A = 25^\circ\text{C}$, $10\text{Hz} \leq f \leq 10\text{kHz}$		0.003			0.003		%
Ripple Rejection Ratio	$V_{\text{OUT}} = -10\text{V}$, $f = 120\text{Hz}$ $C_{\text{ADJ}} = 10\mu\text{F}$	66	60 77		66	60 77		dB dB
Long Term Stability	$T_A = 125^\circ\text{C}$, 1000 Hours		0.3	1		0.3	1	%
Thermal Resistance, Junction to Case	K Package T Package G Package IG Package		2.3 2.5 3.0	3 3.5 4.2		2.3 4 2.5 3.0	3 5 3.5 4.2	$^\circ\text{C}/\text{W}$ $^\circ\text{C}/\text{W}$ $^\circ\text{C}/\text{W}$ $^\circ\text{C}/\text{W}$

Notes: 1. Unless otherwise noted, the above specifications apply over the following conditions:

UC137: $-55^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$

UC237: $-25^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$

UC337: $0^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$

$|V_{\text{IN}} - V_{\text{OUT}}| = 5\text{V}$, $I_o = 0.5\text{A}$, $I_{\text{MAX}} = 1.5\text{A}$

2. All regulation specifications are measured at constant junction temperatures using low duty-cycle pulse testing.

3. Measurement taken at 0.180 inches from case for G and IG Packages.

TYPICAL PERFORMANCE CHARACTERISTICS

