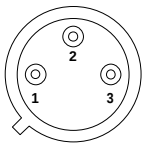
IP137MAHVH **IP137MAH**
IP137MHVH **IP137MH**
LM137HVH **LM137H**

0.5 AMP NEGATIVE ADJUSTABLE VOLTAGE REGULATOR



Pin 1 – ADJ.
Pin 2 – V_{OUT}
Pin 3 – V_{IN}

H Package – TO–39

FEATURES

- **–1.2V TO 47V OUTPUT VOLTAGE RANGE**
- **0.5A OUTPUT CURRENT**
- **1% OUTPUT VOLTAGE TOLERANCE**
- **0.5% / A LOAD REGULATION**
- **0.01% / V LINE REGULATION**
- **0.02% / W THERMAL REGULATION**
- **INTERNAL PROTECTION**

Internal current and power limiting coupled with true thermal limiting prevents device damage due to overloads or shorts, even if the regulator is not fastened to a heat sink.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C unless otherwise stated)

$V_{I–O}$	Input - Output Differential Voltage	– Standard	40V
		– HV Series	50V
I_O	Output Current		Internally limited
P_D	Power Dissipation		Internally limited
T_J	Operating Junction Temperature Range		–55 to +150°C
T_{STG}	Storage Temperature		–65 to 150°C
T_J	Lead temperature		300°C

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	Parameter	Test Conditions		IP137MAHV IP137MA			IP137MHV , IP137M LM137HV , LM137			Units
				Min.	Typ.	Max.	Min.	Typ.	Max.	
V_{REF}	Reference Voltage	I_{OUT} = 10mA		-1.238	-1.25	-1.262	-1.225	-1.25	-1.275	V
		I_{OUT} = 10mA to I_{MAX} $V_{IN} - V_{OUT}$ = 3V to V_{MAX} $P \le P_{MAX}$	T_J = -55 to 150°C	-1.220	-1.25	-1.280	-1.200	-1.25	-1.300	V
$\frac{\Delta V_{OUT}}{\Delta V_{IN}}$	Line Regulation [1]	$V_{IN} - V_{OUT}$ = 3V to V_{MAX}			0.005	0.010		0.010	0.020	%/V
			T_J = -55 to 150°C		0.010	0.030		0.020	0.050	
$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$	Load Regulation [1]	I_{OUT} = 10mA to I_{MAX}	$V_{OUT} \le 5V$		5	25		15	25	mV
			$V_{OUT} \ge 5V$		0.1	0.5		0.3	0.5	%
		I_{OUT} = 10mA to I_{MAX} T_J = -55 to 150°C	$V_{OUT} \le 5V$		10	50		20	50	mV
			$V_{OUT} \ge 5V$		0.2	1		0.3	1	%
	Thermal Regulation	t_p = 10ms	T_A = 25°C		0.002	0.020		0.002	0.02	%/W
	Ripple Rejection	V_{OUT} = -10V f = 120Hz	C_{ADJ} = 0	60	66			60		dB
			C_{ADJ} = 10µF T_J = -55 to 150°C	70	80		66	77		dB
I_{ADJ}	Adjust Pin Current	T_J = -55 to 150°C			65	100		65	100	µA
ΔI_{ADJ}	Adjust Pin Current Change	T_J = -55 to +150°C	I_{OUT} = 10mA to I_{MAX}		0.2	2		0.5	5	µA
			$V_{IN} - V_{OUT}$ = 3V to 40V		1.0	5		2	5	
			$V_{IN} - V_{OUT}$ = 3V to 50V **(HV SERIES)**		2.0	6		3	6	
I_{MIN}	Minimum Load Current	T_J = -55 to 150°C	$V_{IN} - V_{OUT} \le 40V$		2.5	5		2.5	5	mA
			$V_{IN} - V_{OUT} \le 10V$		1.2	3		1.2	3	
I_{CL}	Current Limit	T_J = -55 to 150°C	$V_{IN} - V_{OUT} \le 15V$	0.50	0.80	1.5	0.50	0.80	1.5	A
			$V_{IN} - V_{OUT}$ = 40V	0.15	0.17		0.15	0.17		
			$V_{IN} - V_{OUT}$ = 50V **(HV SERIES)**	0.10	0.17	0.5	0.10	0.17	0.5	
$\frac{\Delta V_{OUT}}{\Delta TEMP}$	Temperature Stability	T_J = -55 to 150°C			0.6	1.5		0.6		%
$\frac{\Delta V_{OUT}}{\Delta TIME}$	Long Term Stability	T_A = +125°C t = 1000 Hrs			0.3	1		0.3	1	%
e_n	RMS Output Noise (% of V_{OUT})	f = 10 Hz to 10 kHz T_A = 25°C			0.003			0.003		%
$R_{\theta JC}$	Thermal Resistance Junction to Case	H Package			12	15		12	15	°C/W

1) Regulation is measured at constant junction temperature, using pulse testing at a low duty cycle. Changes in output voltage due to heating effects are covered under thermal regulation specifications. Load regulation is measured at a point $^1/_8$" from the bottom of the package for the TO–3 and TO–66 packages, at the junction of the wide and narrow portion of the output lead for the SMD1package, and $^1/_8$" below the base of the package on the output pin of the TO–257 package.

2) Test Conditions unless otherwise stated: $V_{IN} - V_{OUT}$ = 5V , I_{OUT} = 0.1A , P_{MAX} = 2W , I_{MAX} = 0.5A
V_{MAX} = 40V for standard series , 50V for HV series.

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