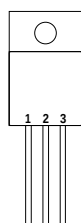


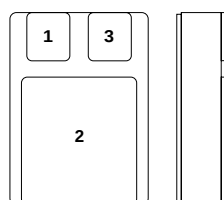
Pin 1 – ADJ.
Pin 2 – V_{IN}
Pin 3 – V_{OUT}
Case – V_{IN}

G Package – (TO-257AA)



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

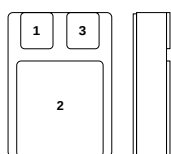
**IG Package – (TO-257AA)
(Isolated)**



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

SMD1 (TO276AB)

CERAMIC SURFACE MOUNT



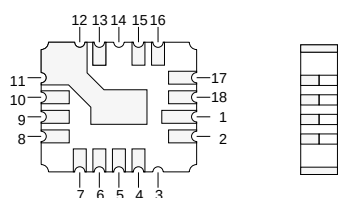
Pin 1 – ADJ.
Pin 2 – V_{OUT}
Pin 3 – V_{IN}

SMD05 (TO-276AA)

CERAMIC SURFACE MOUNT

FEATURES

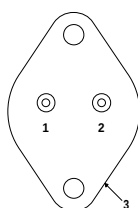
- **OUTPUT VOLTAGE RANGE OF:**
1.25 TO 40V FOR STANDARD VERSION
1.25 TO 50V FOR –HV VERSION
- **1% OUTPUT VOLTAGE TOLERANCE**
- **0.3% LOAD REGULATION**
- **0.01% / V LINE REGULATION**
- **COMPLETE SERIES OF PROTECTIONS:**
 - **CURRENT LIMITING**
 - **THERMAL SHUTDOWN**
 - **SOA CONTROL**



Pins 4,5 – ADJ.
Pins 6,7,8,9,10,11,12,13 – V_{OUT}
Pins 15,16,17,18,1,2 – V_{IN}

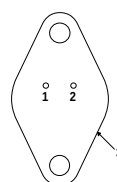
LCC4

CERAMIC SURFACE MOUNT



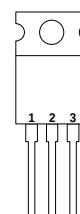
Pin 1 – ADJ.
Pin 2 – V_{OUT}
Case – V_{IN}

K Package – TO-3 (TO-204AA)



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

**R Package – TO-66
(TO-213AA)**



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

T Package – TO-220

ABSOLUTE MAXIMUM RATINGS ($T_{case} = 25^{\circ}C$ unless otherwise stated)

V_{I-O}	Input - Output Differential Voltage	– Standard – HV Series	40V 50V
I_O	Output Current		Internally limited
P_D	Power Dissipation		Internally limited
T_j	Operating Junction Temperature Range		See Order Information Table
T_{stg}	Storage Temperature		-65 to 150°C

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Document Number 2831

Issue 2

Parameter	Test Conditions	IP137A , IP137AHV LM137A , LM137AHV			IP137 , IP137HV LM137 , LM137HV			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} $P \leq P_{MAX}$ $T_J = -55$ to $150^\circ C$	-1.220	-1.25	-1.280	-1.200	-1.250	-1.300	V
$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$ Line Regulation 1	$V_{IN} - V_{OUT} = 3V$ to V_{MAX} $T_J = -55$ to $150^\circ C$		0.005	0.010		0.010	0.020	%V
			0.010	0.030		0.020	0.050	
$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$ Load Regulation 1	$I_{OUT} = 10mA$ to I_{MAX}	$V_{OUT} \leq 5V$		5	25	15	25	mV
		$V_{OUT} \geq 5V$		0.1	0.5	0.3	0.5	%
	$I_{OUT} = 10mA$ to I_{MAX} $T_J = -55$ to $150^\circ C$	$V_{OUT} \leq 5V$		10	50	20	50	mV
		$V_{OUT} \geq 5V$		0.2	1	0.3	1	%
Thermal Regulation	$t_p = 10ms$ $T_A = 25^\circ C$		0.002	0.020		0.002	0.02	%/W
Ripple Rejection	$V_{OUT} = -10V$ $f = 120Hz$	$C_{ADJ} = 0$		60	66	60		dB
		$C_{ADJ} = 10\mu F$ $T_J = -55$ to $150^\circ C$		70	80	66	77	dB
I_{ADJ} Adjust Pin Current	$T_J = -55$ to $150^\circ C$		65	100		65	100	μA
ΔI_{ADJ} Adjust Pin Current Change	$T_J = -55$ to $150^\circ C$	$I_{OUT} = 10mA$ 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 $150^\circ C$	$V_{IN} - V_{OUT} \leq 40V$		2.5	5	2.5	5	mA
		$V_{IN} - V_{OUT} \leq 10V$		1.2	3	1.2	3	
I_{CL} Current Limit	$T_J = -55$ to $150^\circ C$	$V_{IN} - V_{OUT} \leq 15V$		1.5	2.2	3.2	3.2	A
		$V_{IN} - V_{OUT} = 40V$		0.24	0.4	1	0.24	
		$V_{IN} - V_{OUT} = 50V$ (HV SERIES)		0.2	0.4	0.8	0.2	
$\frac{\Delta V_{OUT}}{\Delta T_{TEMP}}$ Temperature Stability	$T_J = -55$ to $150^\circ C$		0.6	1.5		0.6		%
$\frac{\Delta V_{OUT}}{\Delta TIME}$ Long Term Stability	$T_A = +125^\circ C$ $t = 1000$ Hrs		0.3	1		0.3	1	%
e_n RMS Output Noise (% of V_{OUT})	$f = 10$ Hz to 10 kHz $T_A = 25^\circ C$		0.003			0.003		%
$R_{\theta JC}$ Thermal Resistance Junction to Case	K Package		2.3	3		2.3	3	$^\circ C/W$
	R Package		5	7		5	7	
	G Package		3	5		3	5	
	LCC4 Package			13			13	

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 SMD packages, and $1/8$ " below the base of the package on the output pin of the TO-257 package.

2) Test Conditions unless otherwise stated: $V_{IN} - V_{OUT} = 5V$, $I_{OUT} = 0.5A$, $P_{MAX} = 20W$, $I_{MAX} = 1.5A$, $V_{MAX} = 40V$ for standard series, $50V$ for HV series.

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Document Number 2831

Issue 2

Parameter		Test Conditions		IP337A IP337AHV			IP337, IP337HV LM337 , LM337HV			Units
				Min.	Typ.	Max.	Min.	Typ.	Max.	
V _{REF}	Reference Voltage	I _{OUT} = 10mA		-1.238	-1.25	-1.262	-1.213	-1.25	-1.287	V
		I _{OUT} = 10mA to I _{MAX} V _{IN} – V _{OUT} = 3V to V _{MAX} P ≤ P _{MAX} T _J = 0 to 125°C		-1.220	-1.25	-1.280	-1.200	-1.250	-1.300	V
$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$	Line Regulation 1	V _{IN} – V _{OUT} = 3V to V _{MAX}		0.005		0.010	0.010		0.040	%V
		T _J = 0 to 125°C		0.010		0.030	0.020		0.070	
$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$	Load Regulation 1	I _{OUT} = 10mA to I _{MAX}	V _{OUT} ≤ 5V	5		25	15		50	mV
			V _{OUT} ≥ 5V	0.1		0.5	0.3		1	%
		I _{OUT} = 10mA to I _{MAX} T _J = 0 to 125°C	V _{OUT} ≤ 5V	10		50	20		70	mV
			V _{OUT} ≥ 5V	0.2		1	0.3		1.5	%
Thermal Regulation		t _p = 10ms T _A = 25°C		0.002		0.020	0.003		0.04	%/W
Ripple Rejection		V _{OUT} = 10V f = 120Hz	C _{ADJ} = 0	60	66		60			dB
			C _{ADJ} = 10μF T _J = 0 to 125°C	70	80		66		77	dB
I _{ADJ}	Adjust Pin Current	T _J = 0 to 125°C		65		100	65		100	μA
ΔI _{ADJ}	Adjust Pin Current Change	T _J = 0 to 125°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 = 0 to 125°C	V _{IN} – V _{OUT} ≤ 40V	2.5		5	2.5		10	mA
			V _{IN} – V _{OUT} ≤ 10V	1.2		3	1		6	
I _{CL}	Current Limit	T _J = 0 to 125°C	V _{IN} – V _{OUT} ≤ 15V	1.5	2.2	3.5	1.5	2.2	3.5	A
			V _{IN} – V _{OUT} = 40V	0.24	0.4	1	0.15	0.4		
			V _{IN} – V _{OUT} = 50V (HV SERIES)	0.2	0.4	0.8	0.1	0.4	0.8	
$\frac{\Delta V_{OUT}}{\Delta TEMP}$	Temperature Stability	T _J = 0 to 125°C		0.6		1.5	0.6			%
$\frac{\Delta V_{OUT}}{\Delta TIME}$	Long Term Stability	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 _{θJC}	Thermal Resistance	K Package		2.3		3	2.3		3	°C/W
	Junction to Case	T Package		4		5	4			
		LCC4 Package		13			13			

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 $\frac{1}{8}$ " 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 SMD packages, and $\frac{1}{8}$ " below the base of the package on the output pin of the TO-257 package.

2) Test Conditions unless otherwise stated:

$$V_{IN} - V_{OUT} = 5V, I_{OUT} = 0.5A, P_{MAX} = 20W, I_{MAX} = 1.5A$$

$$V_{MAX} = 40V \text{ for standard series, } 50V \text{ for HV series.}$$

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Issue 2

