LM317

DATASHEET

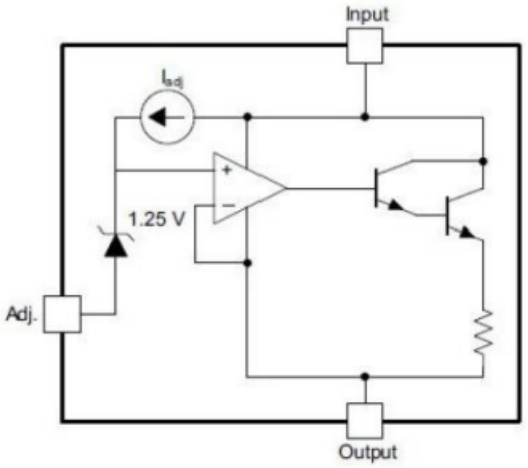
Specification Revision History:

Version	Date	Description
V1.0	2020/09	New
V1.1	2023/02	Modify Ordering Information
V1.2	2025/02	Modify Ordering Information
V1.3	2025/03	Add application precautions and overall typesetting.

Features

- Output current greater than 1.5A
- Range Output voltage range adjustable from 1.25V to 37V

Block Diagram

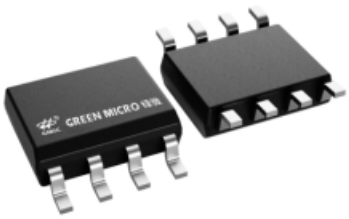


Applications

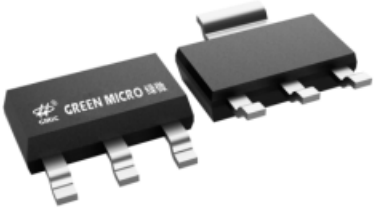
- Power Management for Computer Mother Board,Graphic Card
- LCD Monitor and LCD TV
- DVD Decode Board
- ADSL Modem
- Post Regulators for Switching Supplies

General Description

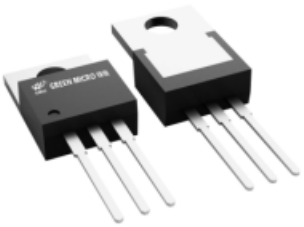
The 317 device is an adjustable three-terminal positive-voltage regulator capable of supplying more than 1.5A over an output-voltage range of 1.25V to 37V. 317 features a very low standby current 1.5mA.



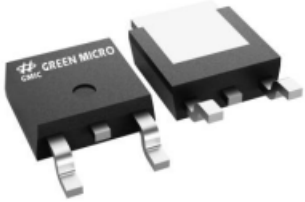
SOP-8



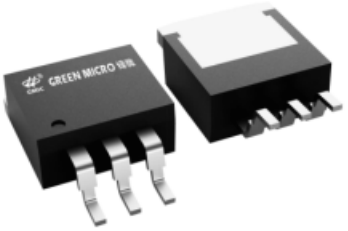
SOT-223



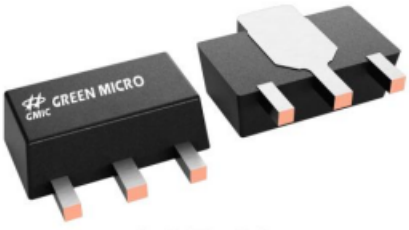
TO-220



TO-252



TO-263

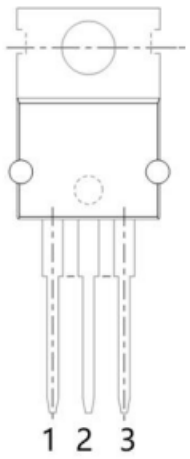


SOT-89

Product Model	Package Type	Marking	Packing	Packing Qty
LM317LDR162	SOP-8	LM317 162	REEL	2500PCS/REEL
LM317LIPK162	SOT-89-3	LM317 162	REEL	1000PCS/REEL
LM317L162	SOT-223-3	LM317 162	REEL	2500PCS/REEL
LM317HVT162	TO-220-3	LM317 162	TUBE	1000PCS/BOX
LM317MDTXT162	TO-252-2	LM317 162	REEL	2500PCS/REEL
LM317KTTRT162	TO-263-3	LM317 162	REEL	800PCS/REEL
LM317LBDR2G162	SOP-8	LM317 162	REEL	2500PCS/REEL
LM317MBSTT3G162	SOT-223-3	LM317 162	REEL	2500PCS/REEL
LM317TG162	TO-220-3	LM317 162	TUBE	1000PCS/BOX
LM317MABDTRKG162	TO-252-2	LM317 162	REEL	2500PCS/REEL
LM317D2TR4G162	TO-263-3	LM317 162	REEL	800PCS/REEL

Pin Configuration

TO220 Top View



SOT223 (Top View)

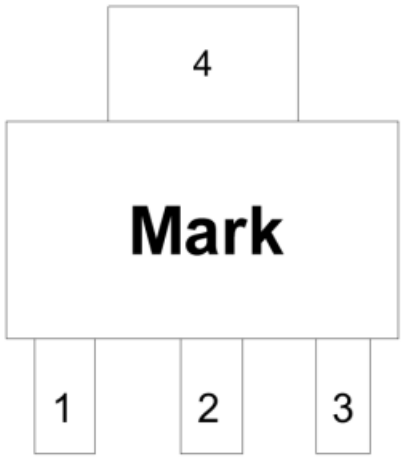


Table1:317 series(TO220 PKG)

PIN NO.	PIN NAME	FUNCTION
1	ADJ	ADJ pin
2	VOUT	Output voltage pin
3	VIN	Input voltage pin

Table2:317 series(SOT223 PKG)

PIN NO.	PIN NAME	FUNCTION
1	ADJ	ADJ pin
2	VOUT	Output voltage pin
3	VIN	Input voltage pin
4	VOUT	Output voltage pin

Absolute Maximum Ratings

Max Input Voltage ····· 40V

Max Operating Junction Temperature(Tj) ····· 150°C

Ambient Temperature(Ta)····· -20°C~85°C

Storage Temperature(Ts) ····· -40°C~150°C

Caution:Exceed these limits to damage to the device.Exposure to absolute maximum rating conditions may affect device reliability.

Thermal Information

Symbol	Parameter	TO220	UNIT
$R_{\theta(JA)}$	Junction-to-ambient thermal resistance	37.9	°C/W
$R_{\theta JC(top)}$	Junction-to-case (top)thermal resistance	51.1	°C/W
$R_{\theta JB}$	Junction-to-board thermal resistance	23.2	°C/W
Ψ_{JT}	Junction-to-top characterization parameter	13.0	°C/W
Ψ_{JB}	Junction-to-board characterization parameter	22.8	°C/W
$R_{\theta JC(bot)}$	Junction-to-case(bottom)thermal resistance	4.2	°C/W

Electrical Characteristics

TA=25°C,unless otherwise noted.

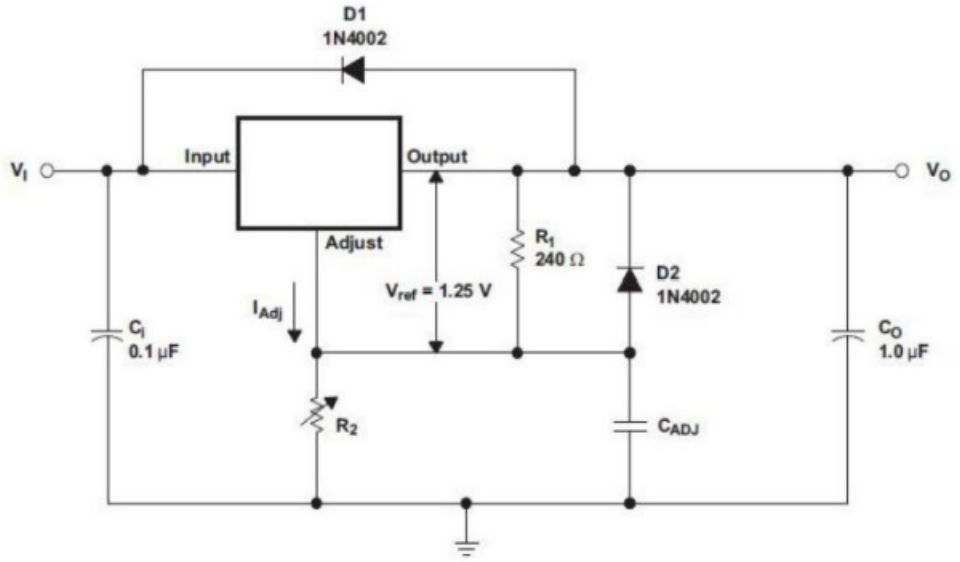
Parameter	Test Conditions		Min	Typ	Max	Unit
Line regulation	VI-VO=3V to 40V	Tj=25°C	-5	--	5	mV
Load regulation	I_o=10mA to 1500mA		-25	--	25	mV
Reference viltage	V_I-V_o=3V to 40V,P_D≤20W,I_o=10mA to 1.5A		1.2	1.25	1.3	V
Output-voltage Temperature stability	T_J=0°C to 125°C			0.7		%V_o
Maximum output current	V_I-V_o≤15V,Tj=25°C		1.5	2		A

Detailed Description

317 device is an adjustable three-terminal positive-voltage regulator capable of supplying up to 1.5A over an output-voltage range of 1.25V to 37V.It requires only two external resistors to set the output voltage.The device features a typical line regulation of 1mV and typical load regulation of7 mV.

The 317 device is versatile in its applications,including uses in programmable output regulation and local on-card regulation.Or,by connecting a fixed resistor between the ADJUST and OUTPUT terminals,the317 device can function as a precision current regulator.An optional output capacitor can be added to improve transient response.

Typical Application



Adjustable Voltage Regulator

1.R1 and R2 are required to set the output voltage.

2.C_{ADJ} is recommended to improve ripple rejection.It prenents amplification of the ripple as the output voltage is adjusted higher.

3.C_I is recommended,particularly if the regulator is not in clouse proximity to the power-supply filter capacitors.A 0.1uF or 1uF ceramic or tantalum capacitor provides sufficient bypassing for most applications,especially when adjustment and output capacitors are used.

4.C_O improves transient response,but is not needed for stability.

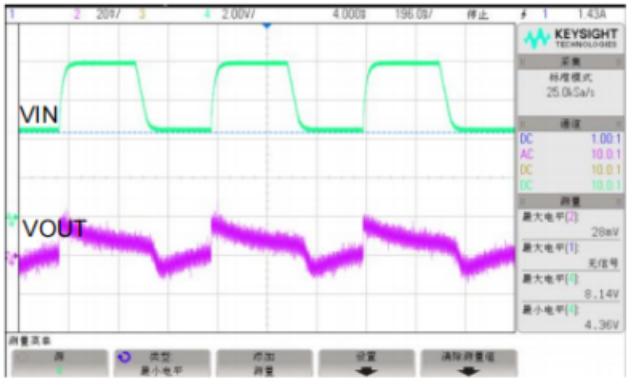
5.Protection diode D2 is recommended if C_{ADJ} is used.The diode provides a low-impedance discharge path to prevent the capacitor from discharging into the output of the regulator.

6.Protection diode D1 is recommended if C_O is used.The diode provides a low-impedance diacharge path to prevent the capactior from discharging into the output of the regulator.

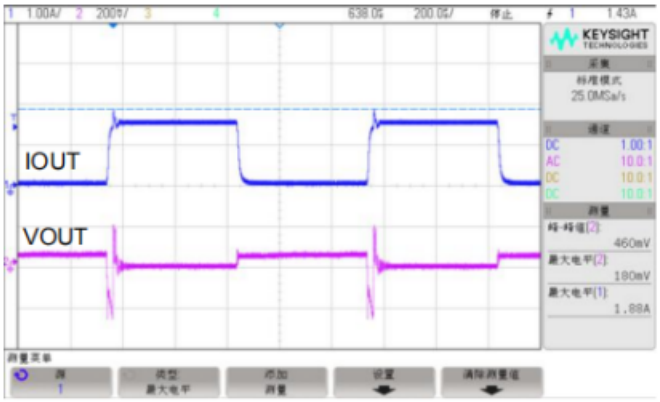
7.V_O is calculated as shown:$V_O=V_{REF}(1+R2/R1)+(I_{ADJ}XR2)$,$I_{ADJ}$ is typically 50uA and negligible in most applications.

Typical Performance Characteristics

Line Transient Response

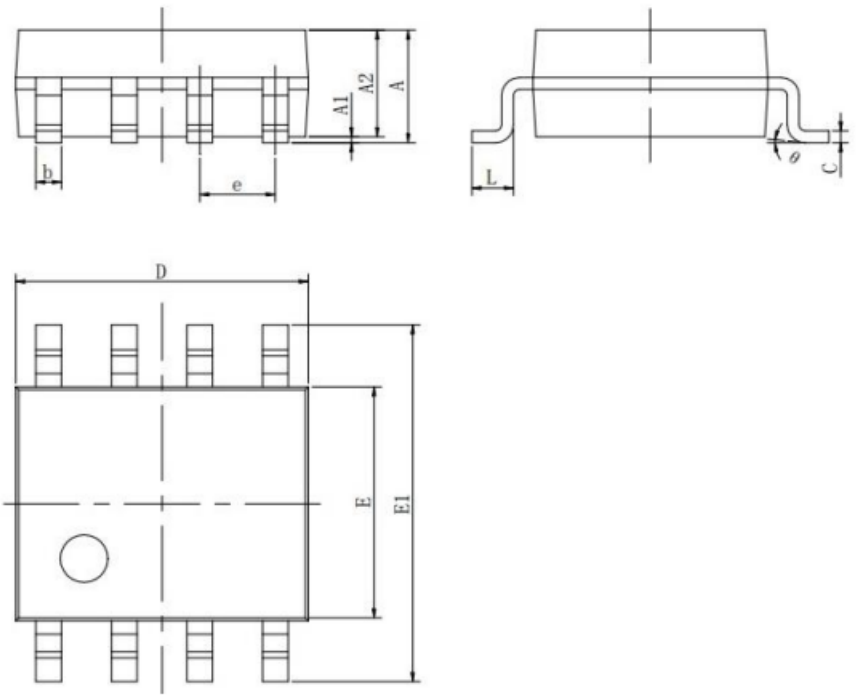


Load Transient Response



Package Information

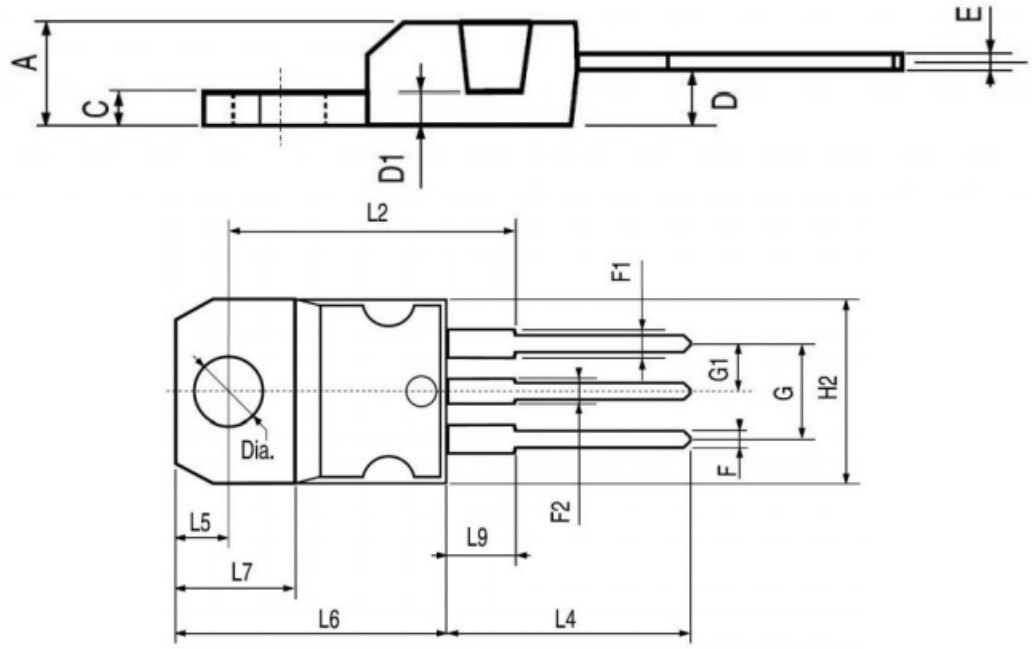
SOP-8 Unit : mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.800	0.053	0.071
A1	0.050	0.250	0.004	0.010
A2	1.250	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
C	0.170	0.250	0.006	0.010
D	4.780	5.000	0.185	0.197
E	3.800	4.000	0.150	0.157
E1	5.800	6.300	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

TO-220

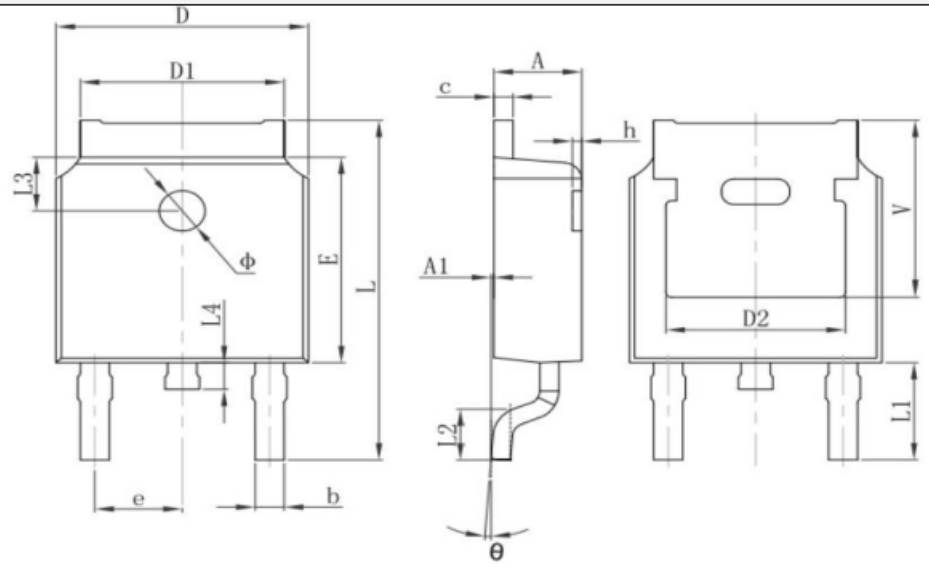
Unit : mm



Symbol	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106
H2	10.0		10.70	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.2		6.6	0.244		0.260
L9	3.5		3.93	0.137		0.154
DIA.	3.75		3.85	0.147		0.151

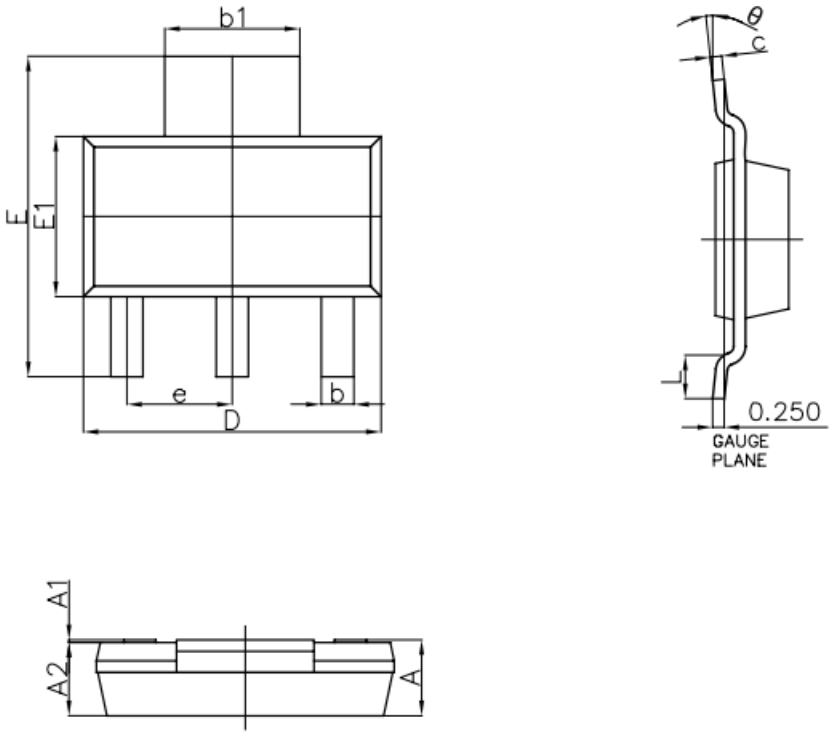
TO-252-2

Unit : mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
C	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	

SOT-223



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	——	1.800	——	0.071
A1	0.020	0.100	0.001	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.840	0.026	0.033
b1	2.900	3.100	0.114	0.122
c	0.230	0.350	0.009	0.014
D	6.300	6.700	0.248	0.264
E	6.700	7.300	0.264	0.287
E1	3.300	3.700	0.130	0.146
e	2.300(BSC)		0.091(BSC)	
L	0.750	——	0.030	——
θ	0°	10°	0°	10°

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