# SK317 LINEAR INTEGRATED CIRCUIT

DESCRIPTION

The SK317 is an adjustable 3-terminal positive voltage regulator, designed to supply 1A of output current with voltage adjustable from 1.3V ~ 37V.

FEATURES

*Output voltage adjustable from 1.3V ~ 37V
*Output current in excess of 1A
*Internal short circuit protection
*Internal over temperature protection
*Output transistor safe area compensation

BLOCK DIAGRAM
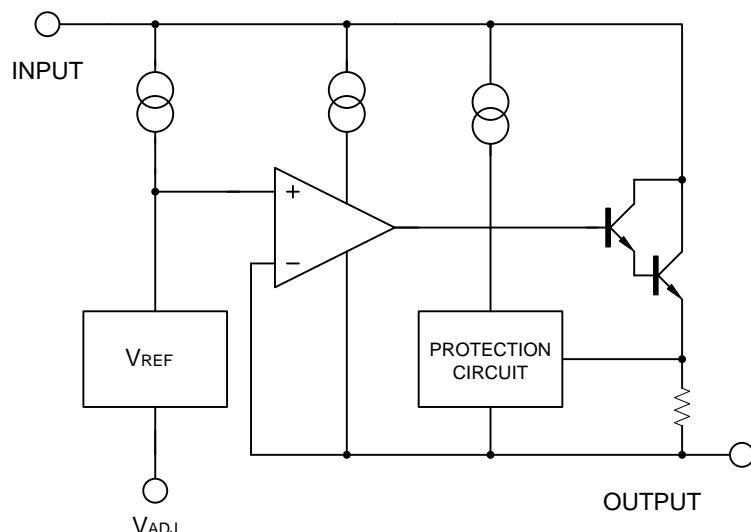
ORDERING INFORMATION

Ordering Number	Package	Marking	Quantity	Packing
SK317LR	SOT-223	LM317	2500	Tape Reel
SK317OR	TO-252	LM317	2500	Tape Reel
SK317TR	TO-220	LM317	1000	Tube

Pin Configuration

TO220 Top View

SOT223 (Top View)

4

Mark

1   2   3

TO252 (Top View)

2

Mark

1   3

1 2 3
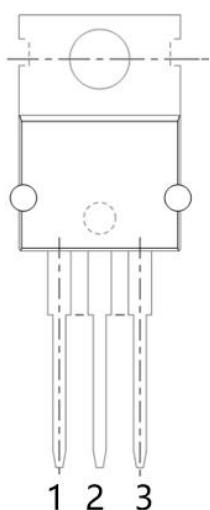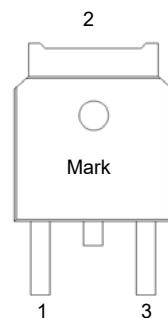
Table1: SK317TR series (TO220 PKG)

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

Table2: SK317LR 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

Table3: SK317OR series (TO252 PKG)

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

ABSOLUTE MAXIMUM RATINGS (TA=25°C , unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Input - Output Voltage Difference	V_{IN}-V_{OUT}	40	V
Power Dissipation	P_D	Internal limited	
Junction Temperature	T_J	+125	°C
Operating Temperature	T_{OPR}	-40 ~ +85	°C
Storage Temperature	T_{STG}	-40 ~ +150	°C

Note: Absolute maximum ratings are stress ratings only and functional device operation is not implied. The device could be damaged beyond Absolute maximum ratings.

THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction-to-Ambient	TO-252	θ_{JA}	112	°C/W
	TO-220		65	
	SOT-223		165	
Junction-to-Case	TO-252	θ_{JC}	12	°C/W
	TO-220		5	
	SOT-223		23	

ELECTRICAL CHARACTERISTICS

(V_{IN}-V_{OUT}=5V, I_{OUT}=10mA, T_A=25°C, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Line Regulation	$\Delta V_{OUT}/V_{OUT}$	3V≦V_{IN}-V_{OUT}≦40V			0.01	0.04	%/V
Load Regulation	ΔV_{OUT}	10mA≦I_{OUT}≦1A	V_{OUT}≦5V		5	25	mV
			V_{OUT}≧5V		0.1	0.5	%
Adjustable Pin Current	I_{ADJ}				50	100	μA
Adjustable Pin Current Change	ΔI_{ADJ}	3V≦V_{IN}-V_{OUT}≦40V, 10mA≦I_{OUT}≦1A, P_D≦20W			0.2	5	μA
Reference Voltage	V_{REF}	3V≦V_{IN}-V_{OUT}≦40V, 10mA≦I_{OUT}≦1A, P_D≦20W		1.20	1.25	1.30	V
Temperature Stability		T_{MIN}≦T_J≦T_{MAX}			0.7		%/V_{OUT}
Minimum Load Current for Regulation	$I_{L(MIN)}$	V_{IN}-V_{OUT}=40V			3.5	10	mA
Maximum Output Current	$I_{O(MAX)}$	V_{IN}-V_{OUT}=40V, P_D≦20W		0.2	0.3		A
RMS Noise vs. %of V_{OUT}	eN	10H_Z≦f≦10KH_Z			0.003		%/V_{OUT}
Ripple Rejection	RR	V_{OUT}=10V,f=120H_Z	C_{ADJ}=0		65		dB
			C_{ADJ}=10μF 66		80		

Note: C_{ADJ} is connected between Adjust pin and Ground.

APPLICATION CIRCUITS
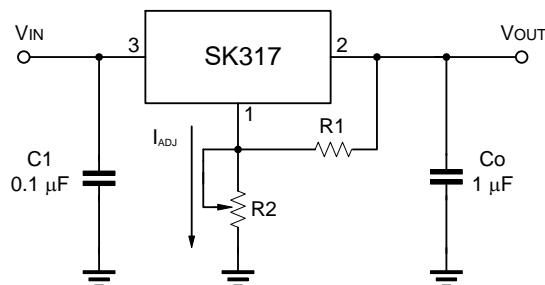
Fig.1 Programmable voltage regulator

$V_{OUT} = 1.25V*(1+R2/R1)+I_{ADJ}*R2$

C1 is required when regulator is located an appreciated distance from power supply. Co is needed to improve transient response.
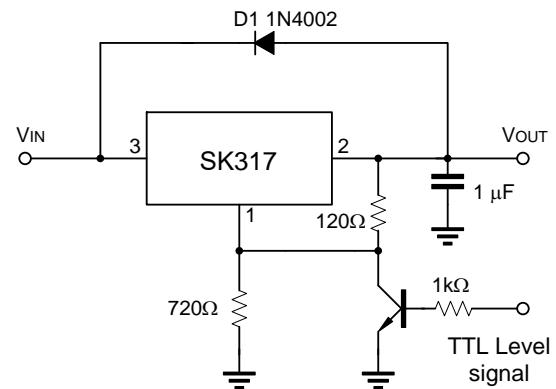

Fig.2 Regulator with On-off control
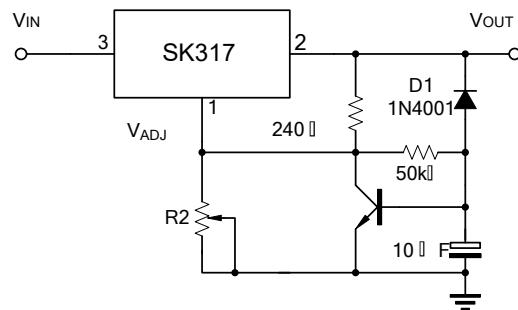
Fig.3 Soft Start Application
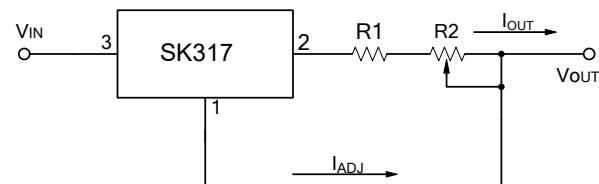
$$I_{O(MAX)} = \left(\frac{V_{REF}}{R1}\right)+I_{ADJ} = \frac{1.25V}{R1}$$

$$I_{O(MIN)} = \left(\frac{V_{REF}}{R1+R2}\right)+I_{ADJ} = \frac{1.25V}{R1+R2}$$

Fig.4 Constant Current Application

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TYPICAL CHARACTERISTICS

Load Regulation vs. temperature

Adjustment Current vs. Temperature

Current Limit

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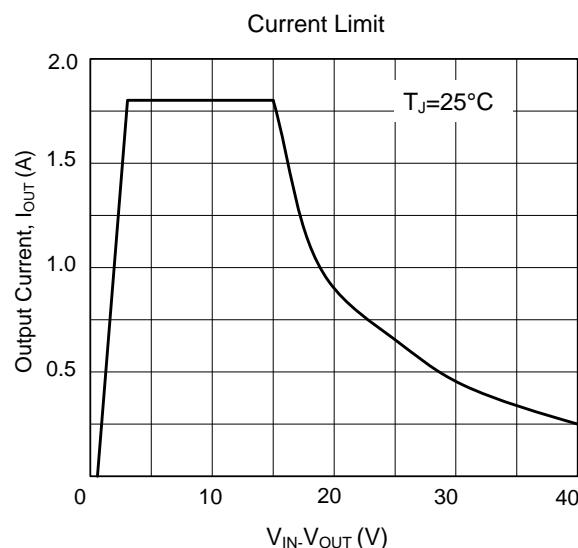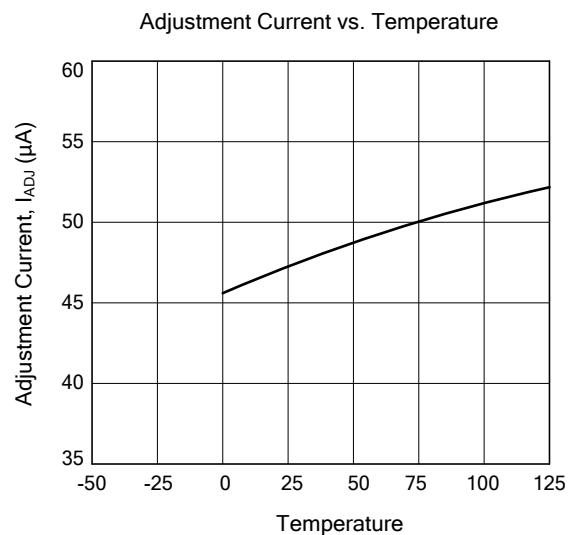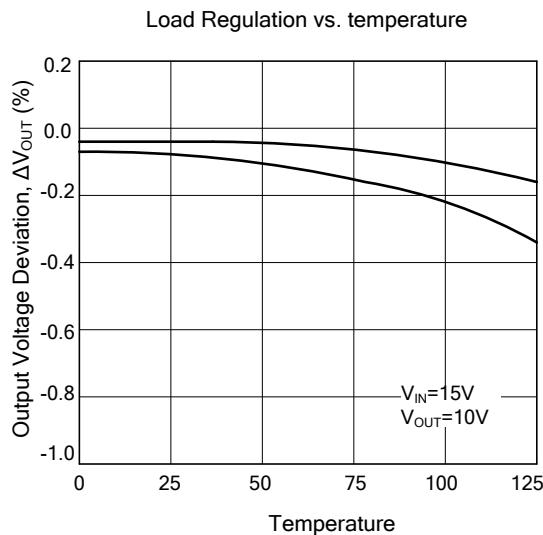
SOT-223
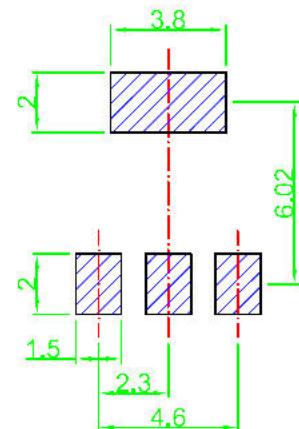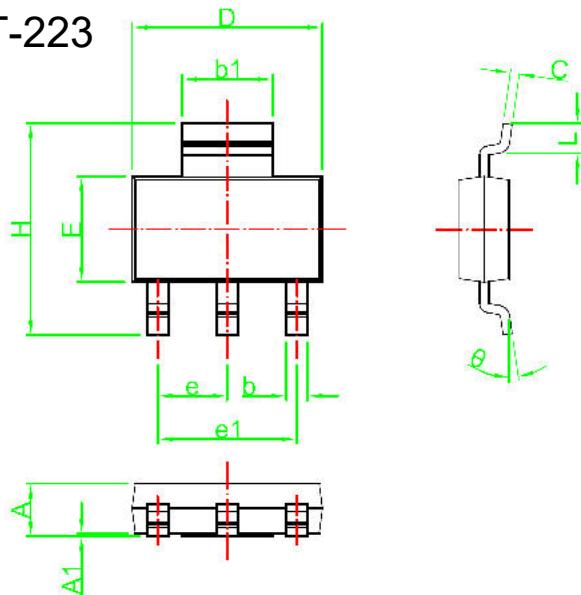
Recommended Land Pattern

Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.50	1.70	0.059	0.067
A1	---	0.10	---	0.004
b	0.60	0.82	0.024	0.032
b1	2.90	3.10	0.114	0.122
C	0.24	0.35	0.009	0.014
D	6.15	6.65	0.242	0.262
E	3.30	3.70	0.130	0.146
e	2.30 TYP		0.091 TYP	
e1	4.50	4.70	0.177	0.185
H	6.70	7.30	0.264	0.287
L	0.80	1.15	0.031	0.045
θ	0°	10°	0°	10°

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TO-252
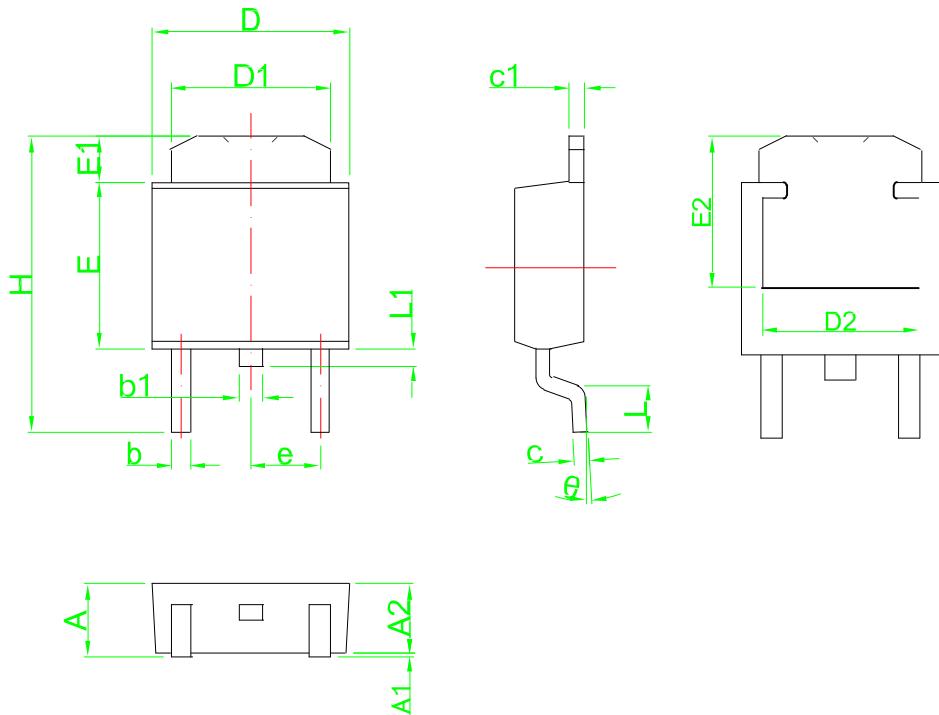
Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	2.25	2.65	0.089	0.104
A1	0.00	0.15	0.000	0.006
A2	2.20	2.40	0.087	0.094
b	0.50	0.70	0.020	0.028
b1	0.70	0.90	0.028	0.035
c	0.46	0.66	0.018	0.026
c1	0.46	0.66	0.018	0.026
D	6.30	6.70	0.248	0.264
D1	5.20	5.40	0.205	0.213
D2	5.10	5.40	0.201	0.213
E	5.30	5.70	0.209	0.224
E1	1.40	1.60	0.055	0.063
E2	4.90	5.40	0.193	0.213
H	9.40	9.90	0.370	0.390
e	2.30 TYP		0.09 TYP	
L	1.40	1.77	0.055	0.070
L1	0.50	0.70	0.020	0.028
θ	0°	8°	0°	8°

TO-220
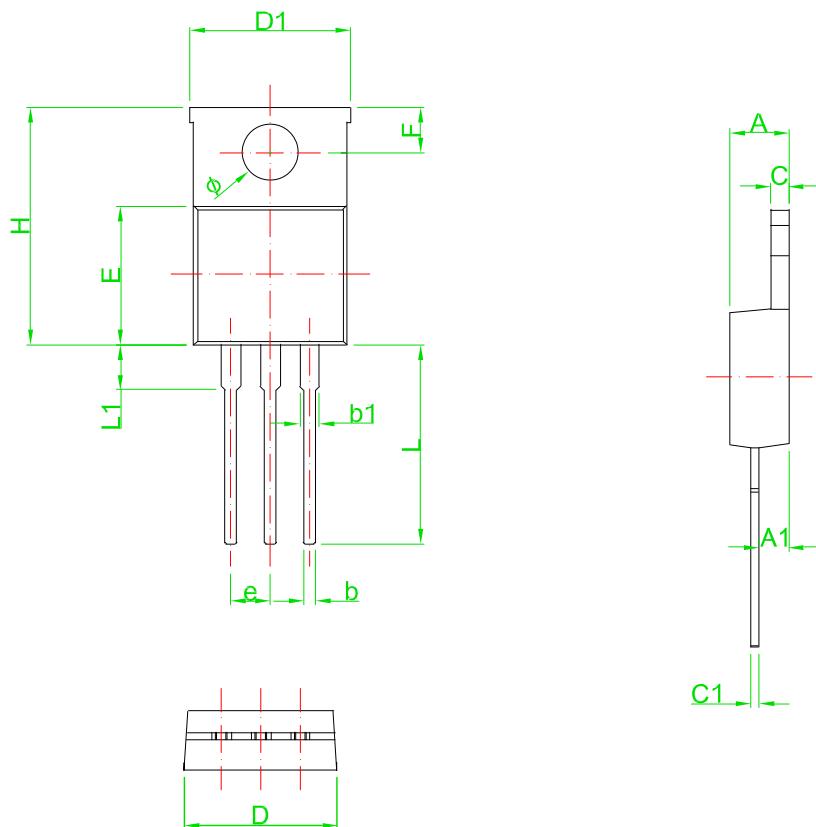
Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	4.00	4.80	0.157	0.189
A1	1.80	2.80	0.071	0.110
b	0.60	1.00	0.024	0.039
b1	1.14	1.78	0.045	0.070
C	1.00	1.40	0.039	0.055
C1	0.36	0.61	0.014	0.024
D	9.90	10.50	0.390	0.413
D1	10.00	10.60	0.394	0.417
E	8.38	9.20	0.330	0.362
e	2.54 TYP		0.100 TYP	
F	2.54	3.20	0.100	0.126
Ø	3.50	3.90	0.138	0.154
H	14.48	15.87	0.570	0.625
L	13.00	13.80	0.512	0.543
L1	---	4.10	---	0.161

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TO-252-2L PACKAGE OUTLINE DIMENSIONS
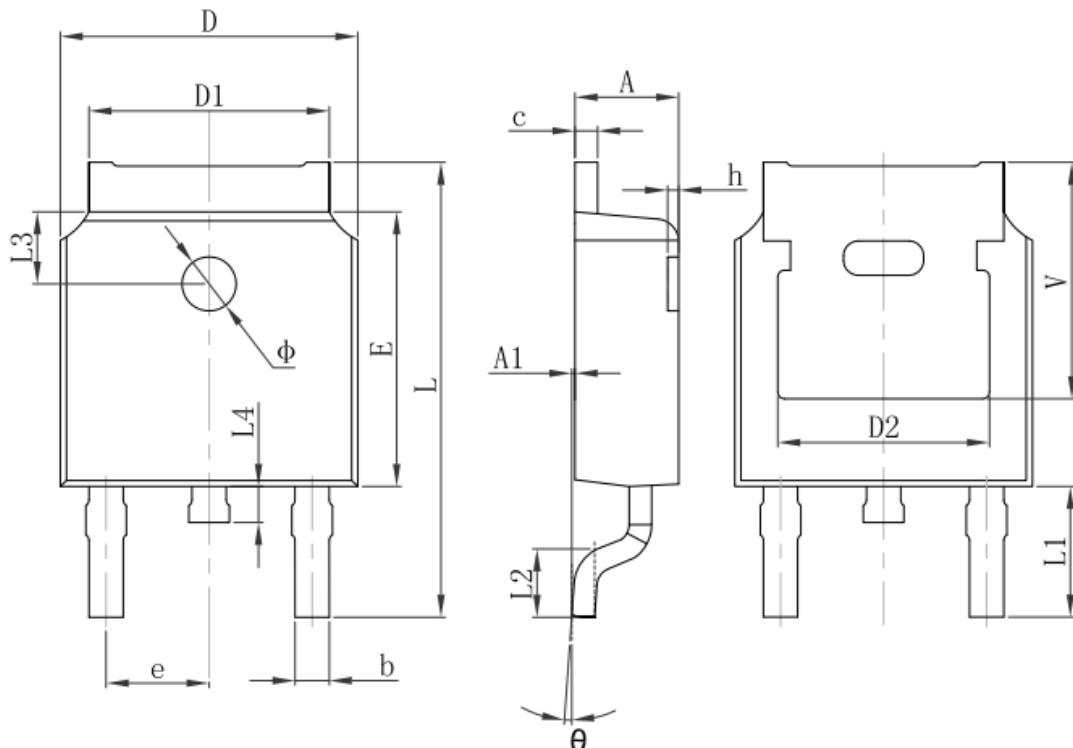
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	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.	