

High Current LED Driver

■ Features

- 500mA Maximum Output Current.
- 2% Output Current Setting Accuracy.
- External Resistor Allows Designer to set Current.
- Output current limiting
- Built-in thermal shutdown
- Packages: SOT89-3L

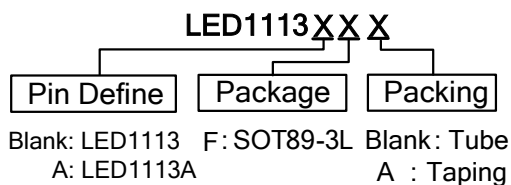
■ Applications

- High Power LED Driver

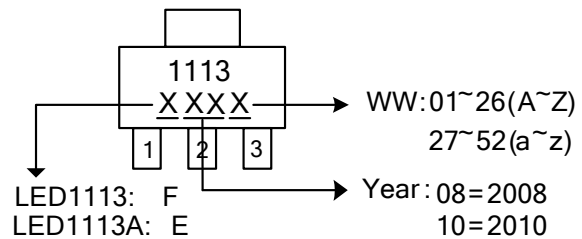
■ General Description

LED1113/A is a low dropout current regulator for high current LED Driver. The output current was decided by external resistor. Build-in thermal shutdown and current limit protection function.

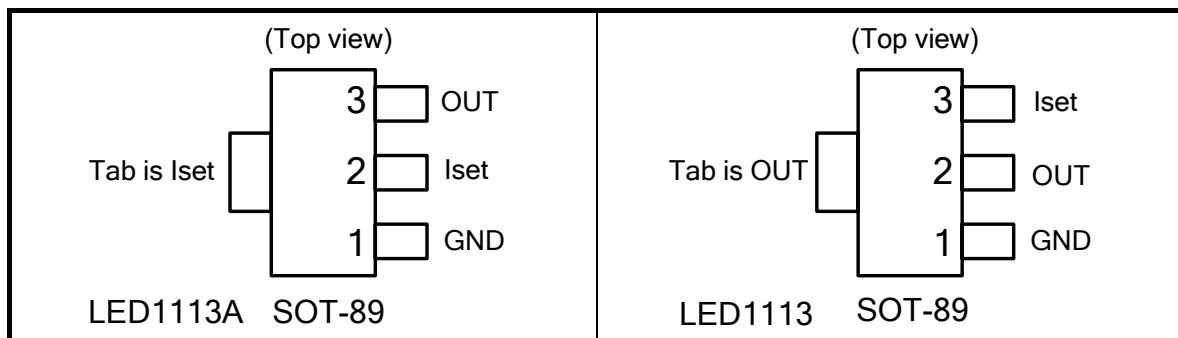
■ Ordering Information



■ Marking Information



■ Pin Descriptions



NAME	PIN #	FUNCTION
GND	1	Ground
Iset	2	Output current set input. Connect a resistor from I _{SET} to GND to set LED current.
OUT	3	Output pin. The LEDs are connected from these pins to VCC.

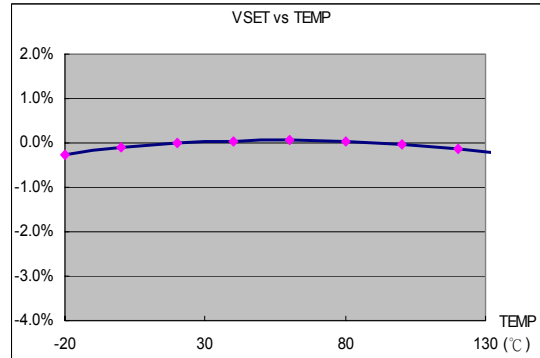
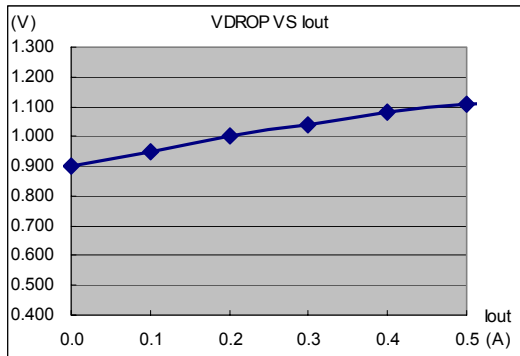
■ Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
V _{OUT}	Output Voltage	28	V
T _{OP}	Operating Junction Temperature Range	0 to +125	°C
T _J	Maximum junction Temperature	150	°C
P _D	Power Dissipation (PCB=FR4,2 inch sq.) T _A =25°C, T _J =125°C SOT89	1110	mW
T _{ST}	Storage Temperature	-65 to +150	°C

■ Electrical Characteristics (Under Operating Conditions, T_J=25°C)

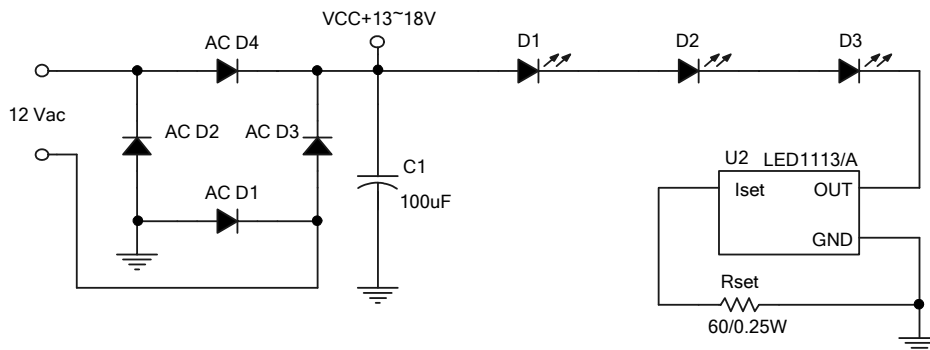
PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	I _{OUT} =5mA	2.45	-	26	V
Output Sink Current	V _{CC} -V _{LED} =V _{OUT} >2.5V, I _{OUT} =5mA	500			mA
V _{SET} Voltage	V _{CC} -V _{LED} =V _{OUT} >2.5V, I _{OUT} =5mA	1.225	1.250	1.275	V
Dropout Voltage (V _{OUT} -V _{SET})	I _{OUT} = 500mA, ΔV _{SET} =2%V _{SET}	-	1.1	1.2	V
Output Current (Note 1,2)	1W LED R _{SET} =3.6Ω / 0.5W	340	347	354	mA
	0.5W LED R _{SET} =7.2Ω	170	174	177	mA
	20mA LED R _{SET} =60Ω	20.4	20.8	21.3	mA
Current Limit	V _{OUT} > 5V	0.8	-	-	A
θ _{JA} Thermal Resistance Junction-to-Ambient	SOT89	-	300	-	°C/W
θ _{JC} Thermal Resistance Junction-to-Case	SOT89 (PCB=FR4,2 inch sq.)	-	90	-	°C/W

Typical Performance Characteristics



Typical Circuit

A.AC Input



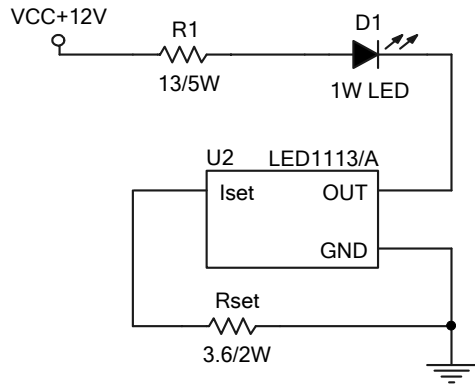
$$I_{OUT} = 1.25V / 60 = 21\text{mA}$$

$$V_{OUT} \geq 2.5V$$

- $13V - V_{LED} - V_{SET} = 1.25V$
 $IC's PD = (1.25 * 0.02) = 0.03W$
- $18V - V_{LED} - V_{SET} = 6.25V$
 $IC's PD = (6.25 * 0.02) = 0.13W$

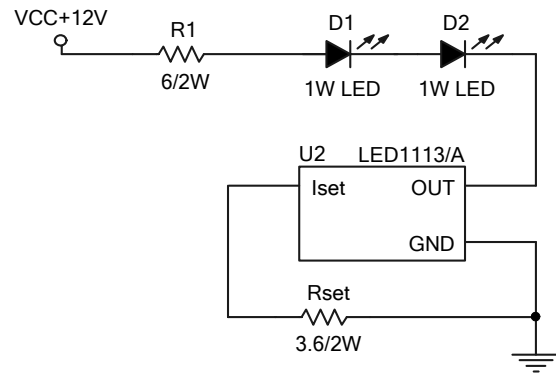
$$V_{LED} = 10.5V (3.5V * 3LED)$$

B.DC Input



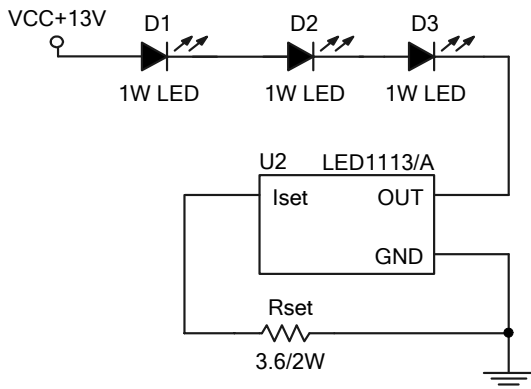
$I_{OUT}=1.25V/3.6=347mA$
 $V_{OUT} \geq 2.5V$
 1. $R1=13$, $V_{R1}=4.51V$
 $R1$'s $PD=4.51 \times 0.347=1.57W$
 2. $12V - V_{R1} - V_{LED} - V_{SET}=2.74V$
 IC 's $PD=(2.74 \times 0.347)=0.95W$

$V_{LED}=3.5V$



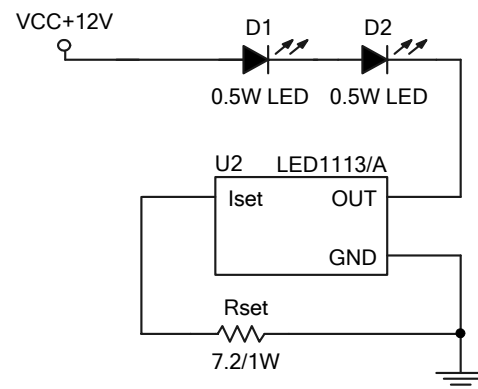
$I_{OUT}=1.25V/3.6=347mA$
 $V_{OUT} \geq 2.5V$
 1. $R1=6$, $V_{R1}=2.08V$
 $R1$'s $PD=2.08 \times 0.347=0.73W$
 2. $12V - V_{R1} - V_{LED} - V_{SET}=1.67V$
 IC 's $PD=1.67 \times 0.347=0.58W$

$V_{LED}=7V$



$I_{OUT}=1.25V/3.6=347mA$
 $V_{OUT} \geq 2.5V$
 $13V - V_{LED} - V_{SET}=2.02V$
 IC 's $PD=1.25 \times 0.347=0.4W$

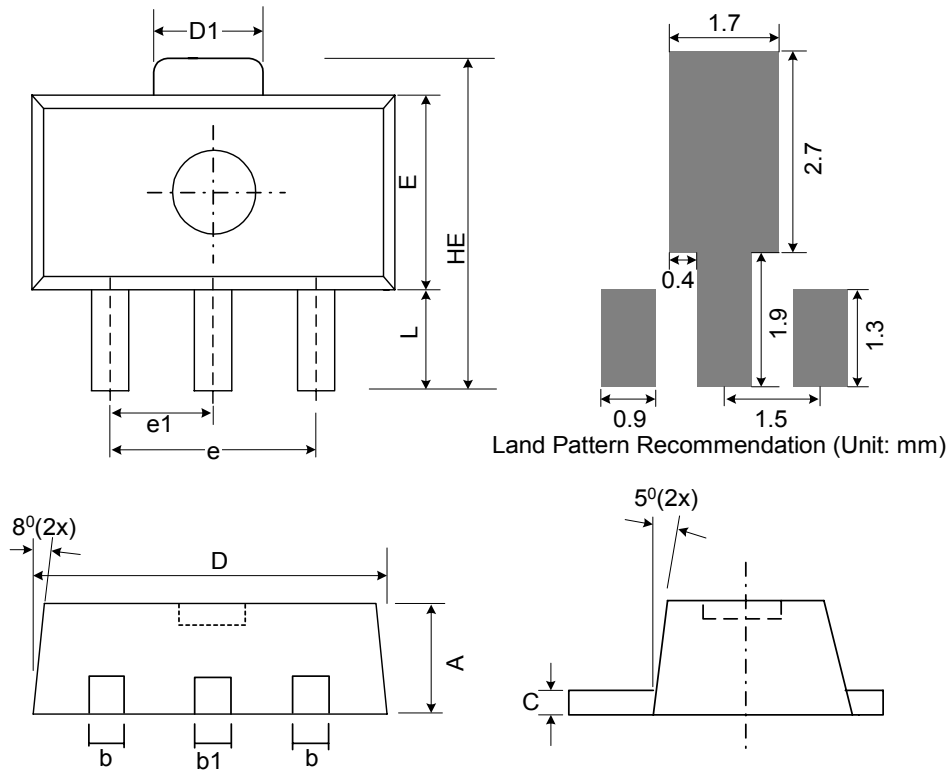
$V_{LED}=10.5V(3.5V \times 3LED)$



$I_{OUT}=1.25V/7.2=174mA$
 $V_{OUT} \geq 2.5V$
 $12V - V_{LED} - V_{SET}=3.75V$
 IC 's $PD=3.75 \times 0.174=0.65W$

$V_{LED}=7V$

■ Package Dimension



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.40	1.50	1.60	0.055	0.059	0.063
B	0.36	0.42	0.48	0.014	0.016	0.018
b1	0.41	0.47	0.53	0.016	0.043	0.051
C	0.35	0.39	0.43	0.014	0.015	0.017
D	4.40	4.50	4.60	0.173	0.177	0.181
D1	1.40	1.60	1.75	0.055	0.062	0.069
e	2.90	3.00	3.10	0.114	0.118	0.122
e1	1.45	1.50	1.55	0.057	0.059	0.061
E	2.35	2.48	2.60	0.093	0.098	0.102
HE	3.94	-	4.25	0.155	-	0.167
L	0.80	-	1.20	0.031	-	0.047