

High Current LED Driver

❖ GENERAL DESCRIPTION

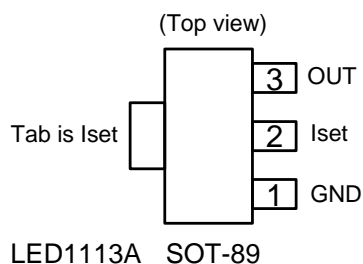
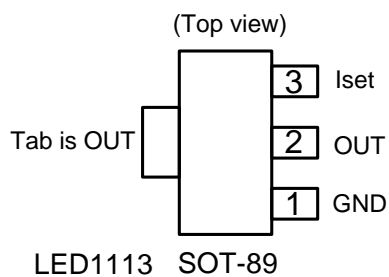
LED1113/A is a low dropout current regulator for high current LED Driver. The output current was decided by external resistor. Build-in thermal shutdown and current limit protection function.

❖ 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
- High Power LED Driver

❖ PIN ASSIGNMENT

The package of LED1113 is SOT89-3L; the pin assignment is given by:



Name	Description
GND	Ground
Iset	Output current set input. Connect a resistor from I _{SET} to GND to set LED current.
OUT	Output pin. The LEDs are connected from these pins to VCC.

❖ ORDER/MARKING INFORMATION

Order Information	Top Marking
<p style="text-align: center;">LED1113 X X X</p> <p style="text-align: center;">Pin Define Package Packing</p> <p>Blank: LED1113 F: SOT89-3L Blank: Bag A: LED1113A A : Taping</p>	<p style="text-align: center;">1 1 1 3 → Part number L Y W X → ID code: internal</p> <p>Output Type F: LED1113 E: LED1113A</p> <p>WW: 01~26(A~Z) 27~52(a~z) Year: A=2010 1=2011</p>

❖ ABSOLUTE MAXIMUM RATINGS

Characteristics	Symbol	Rating	Unit
Output Voltage	V_{OUT}	28	V
Operating Junction Temperature Range	T_{OP}	0 to +125	°C
Maximum junction Temperature	T_J	150	°C
Power Dissipation (PCB=FR4, 2 inch sq.) $T_A=25^{\circ}C, T_J=125^{\circ}C$ (SOT89)	P_D	1110	mW
Storage Temperature	T_{ST}	-65 to +150	°C

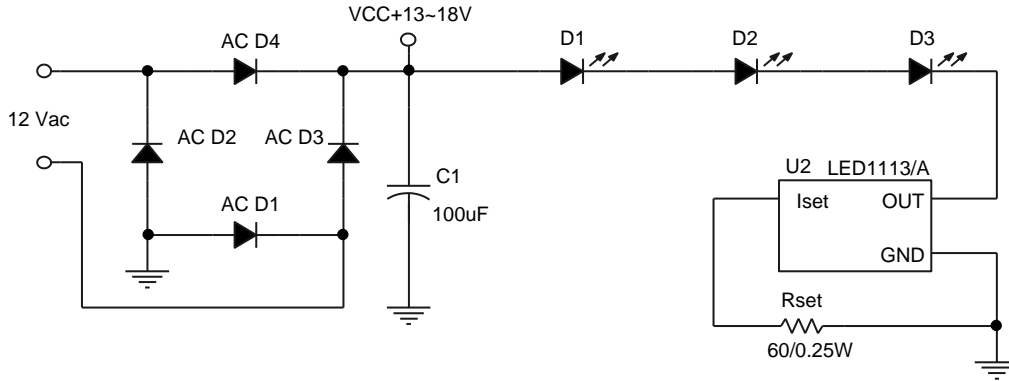
❖ ELECTRICAL CHARACTERISTICS

(Under Operating Conditions, $T_J=25^{\circ}C$)

Characteristics	Conditions	Min	Typ	Max	Units
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 ($V_{OUT}-V_{SET}$)	$I_{OUT} = 500mA, \Delta V_{SET}=2\%V_{SET}$	-	1.1	1.2	V
Output Current (Note 1,2)	1W LED $R_{SET}=3.6\Omega/0.5W$	340	347	354	mA
	0.5W LED $R_{SET}=7.2\Omega$	170	174	177	mA
	20mA LED $R_{SET}=60\Omega$	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

❖ APPLICATION CIRCUIT

(1) AC Input



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

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

$$1. 13V - V_{LED} - V_{SET} = 1.25V$$

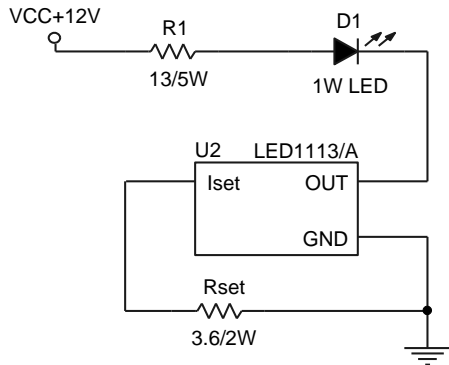
$$IC's PD = (1.25 * 0.02) = 0.03W$$

$$2. 18V - V_{LED} - V_{SET} = 6.25V$$

$$IC's PD = (6.25 * 0.02) = 0.13W$$

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

(2) DC Input



$$I_{OUT} = 1.25V / 3.6 = 347mA$$

$$V_{OUT} = 2.5V$$

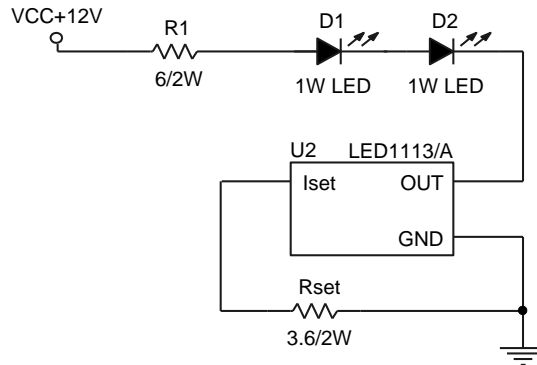
$$1. R1 = 13, VR1 = 4.51V$$

$$R1 PC = 4.51 * 0.347 = 1.57W$$

$$2. 12V - VR1 - V_{LED} - V_{SET} = 2.74V$$

$$IC PD = (2.74 * 0.347) = 0.95W$$

$$V_{LED} = 3.5V$$



$$I_{OUT} = 1.25V / 3.6 = 347mA$$

$$V_{OUT} = 2.5V$$

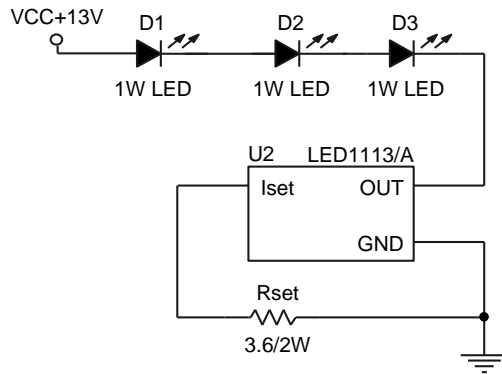
$$1. R1 = 6, VR1 = 2.08V$$

$$R1 PC = 2.08 * 0.347 = 0.73W$$

$$2. 12V - VR1 - V_{LED} - V_{SET} = 1.67V$$

$$IC PC = 1.67 * 0.347 = 0.58W$$

$$V_{LED} = 7V$$



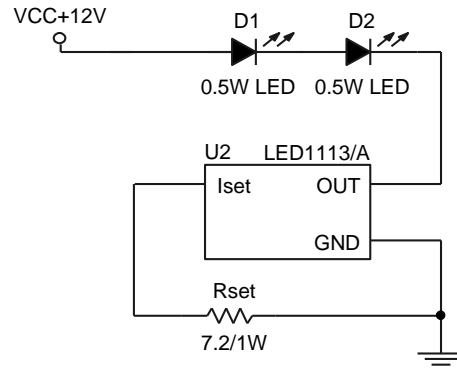
$$I_{OUT} = 1.25V / 3.6 = 347mA$$

$$V_{OUT} = 2.5V$$

$$13V - V_{LED} - V_{SET} = 2.02V$$

$$IC\ PC = 1.25 * 0.347 = 0.4W$$

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



$$I_{OUT} = 1.25V / 7.2 = 174mA$$

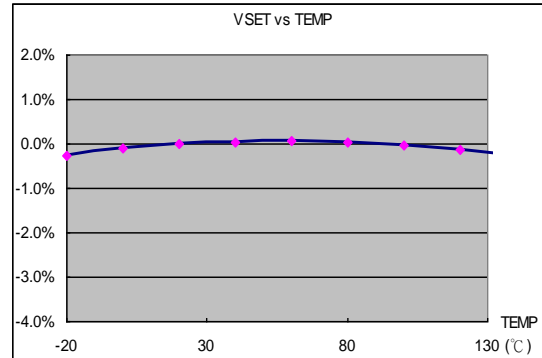
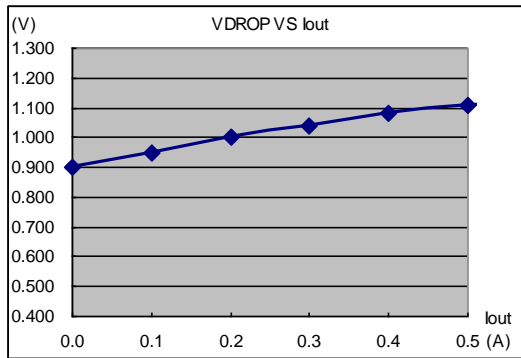
$$V_{OUT} = 2.5V$$

$$12V - V_{LED} - V_{SET} = 3.75V$$

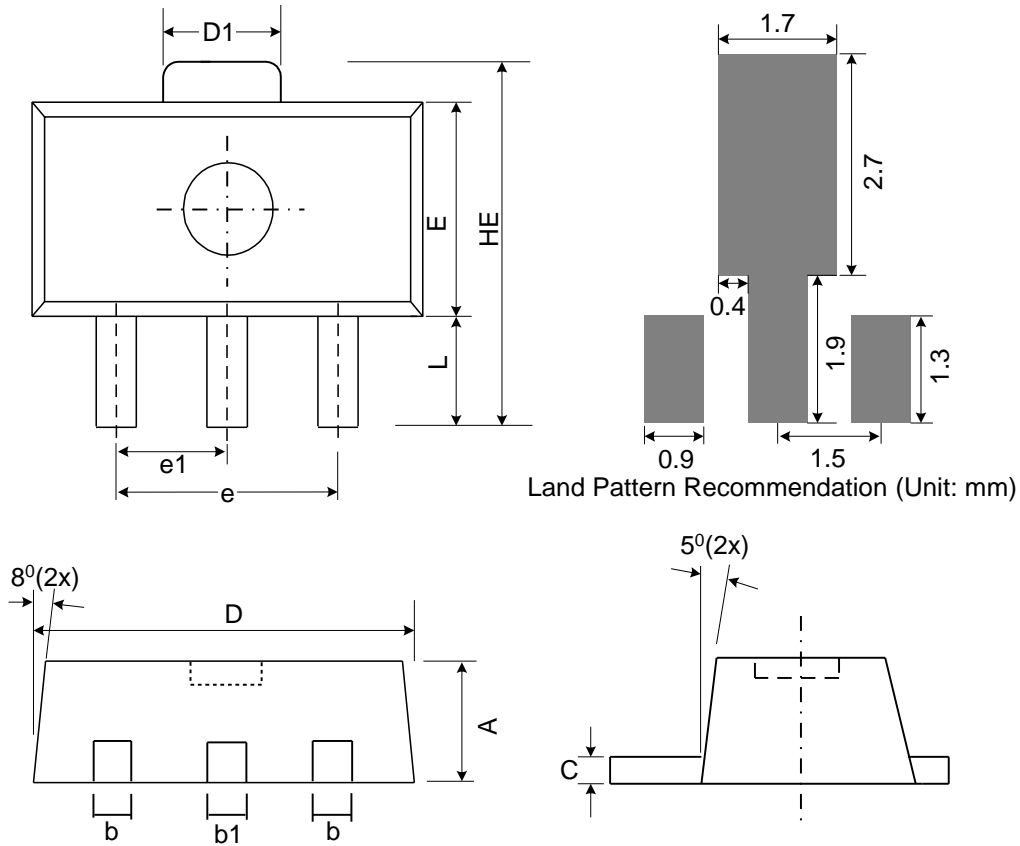
$$IC\ PC = 3.75 * 0.174 = 0.65W$$

$$V_{LED} = 7V$$

❖ TYPICAL CHARACTERISTICS



❖ PACKAGE OUTLINES



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	0.017	0.019
b1	0.44	0.50	0.56	0.017	0.02	0.022
C	0.35	0.40	0.44	0.014	0.016	0.017
D	4.40	4.50	4.60	0.173	0.177	0.181
D1	1.35	1.59	1.83	0.053	0.063	0.072
e	3.0 BSC			0.118 BSC		
e1	1.5 BSC			0.059 BSC		
E	2.29	2.45	2.60	0.09	0.097	0.102
HE	3.94	4.10	4.25	0.155	0.161	0.167
L	0.80	1.00	1.20	0.031	0.04	0.047

JEDEC outline: TO-243 AB