



Modify Record :

版次	新版本	旧版本	修改单位	修改内容
2023-09-13	1.0	NA	研发部	新文件制成

General Description

SE83XX series is designed for power-sensitive applications. It includes a precision and high voltage input stage, an ultra-low-power bias current branch, and results in a ultra-low-power and low-dropout linear regulator.

The SE83XX operates from an input voltage of $V_{OUT}+1V$ to 40V, consumes only 3 μ A of quiescent current, and offers 1% initial accuracy and low dropout voltage, 300mV typical at 100mA.

SE83XX has 8.0V, 9.0V, 12V fixed voltage versions.

Other features include short-circuit protection and thermal shutdown protection.

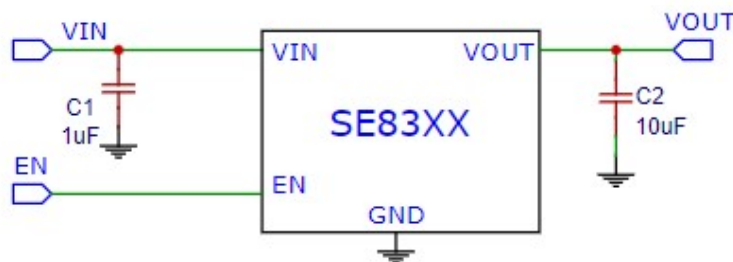
Features

- Ultra Low Quiescent Current: 3 μ A(Typ.)
- Wide Operating Voltage: $V_{OUT}+1V$ to 40V
- High output current: $\geq 300mA$
- System startup with no overshoot
- Short circuit protection is designed with no overshoot
- Low Dropout Voltage
- High Accuracy Output Voltage: $\pm 1\%$
- Excellent power / load transient response
- Low temperature coefficient: $\pm 100ppm/^{\circ}C$
- Thermal and Short-Circuit Protection
- SOT-89、SOT-23、SOT23-5 package
- Customer Pin Assignments are available

Applications

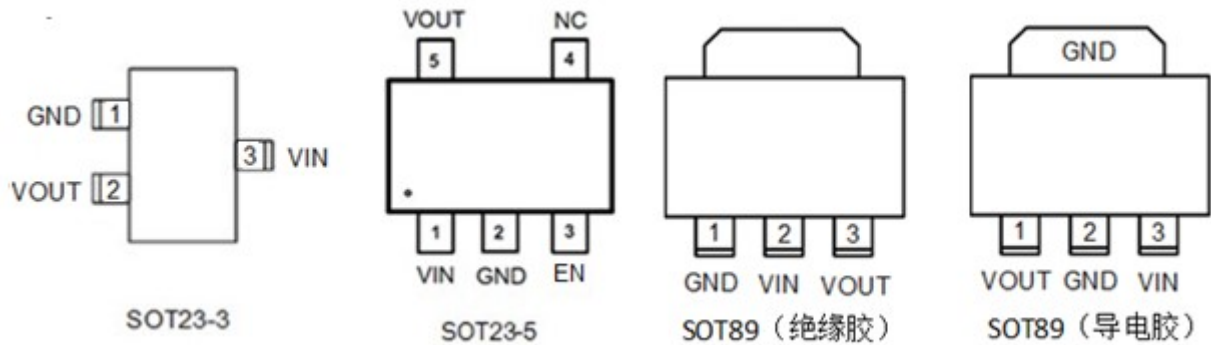
- Battery-powered Smoke sensor
- Smoke sensor
- Microcontrollers
- Household appliances and instruments

Application Diagram



Pin Configuration

(Customer pin assignments are available)

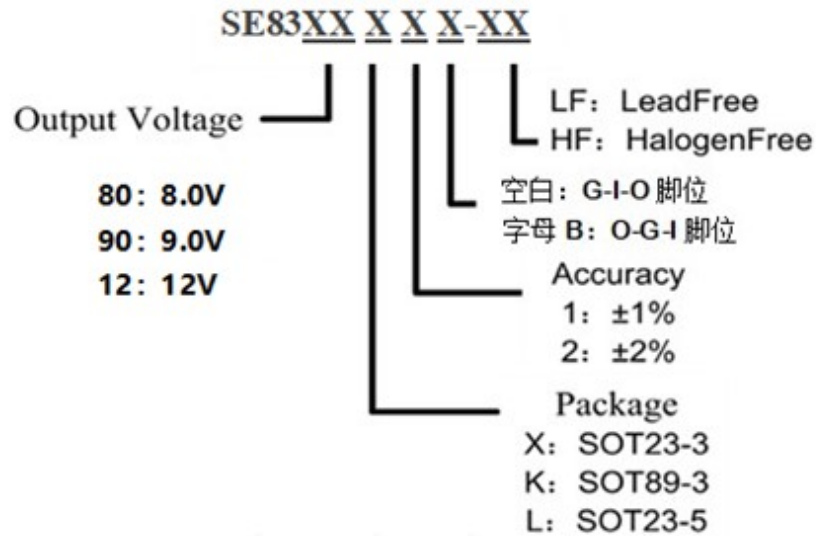


PIN Definitions

Pin Name	Number SOT23-3	Number SOT23-5	Number SOT89(绝)	Number SOT89(导)	Function Description
GND	1	2	1	2	Ground
VOUT	2	5	3	1	Output Voltage
VIN	3	1	2	3	Power Supply Input
EN	N/A	3	N/A	N/A	High Enable / Low Disable
NC	N/A	4	N/A	N/A	Not Connected

Absolute Maximum Rating

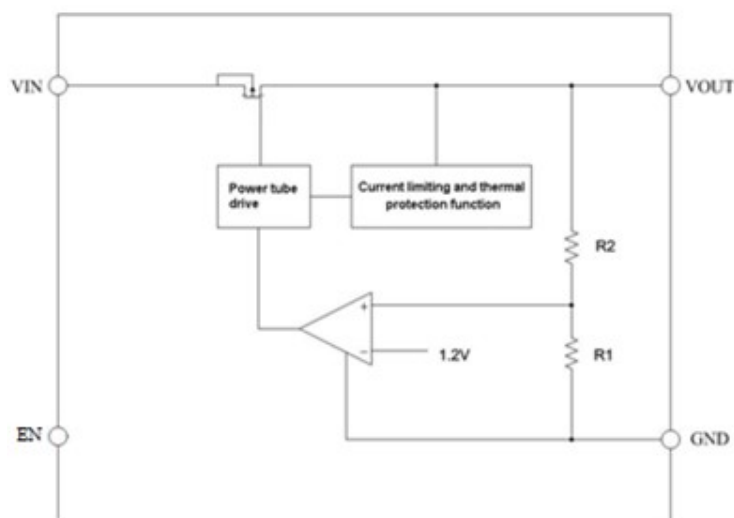
Symbol	Parameter	Value	Units
V_{IN}	Input Supply Voltage	45	V
V_{OUT}	Output Voltage	12	
T_A	Operating Temperature	-40---105	°C
T_{STG}	Storage Temperature	-40---150	
T_J	Maximum Junction Temperature	150	
T_{LEAD}	Lead Temperature (Soldering) 10 seconds	260	
θ_{JA}	Thermal Resistance, Junction-to-Ambient	165(SOT89)	°C/W
		280(SOT23)	
P_D	Power Consumption	750 (SOT89)	mW
		250 (SOT23)	
Electrostatic discharge rating	Human Body Model (HBM)	4	kV
	Charged Device Model (MM)	100	V

Ordering Information


Part Number	Marking Information	Package	Specs	Packing	Remarks
SE83XX XXX-HF	<u>83</u> XXz	SOT23-3	3K/disc, 30K/box, 120K/case	Tape On Reel, 7-inch plastic disc in vacuum- sealed aluminum bag, with disccant inserted.	Number Underline: year; XX means Voltage; z means week; YY means year; WW means week; HF: Halogen Free.
	<u>83</u> XXz	SOT23-5	1K/disc, 10K/box, 40K/case		
	SE83XX YYWW-HF	SOT89			

Operating Rating

Parameter	Value	Units
Operating Temperature	-20 $^{\circ}$ C~85	$^{\circ}$ C
Storage Temperature	-40 $^{\circ}$ C~125	$^{\circ}$ C
Lead Temperature (Soldering) 10 seconds	260	$^{\circ}$ C

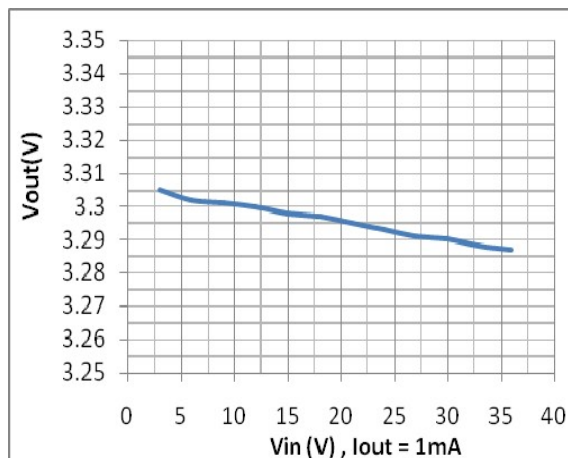
Block Diagram


Electrical Characteristics

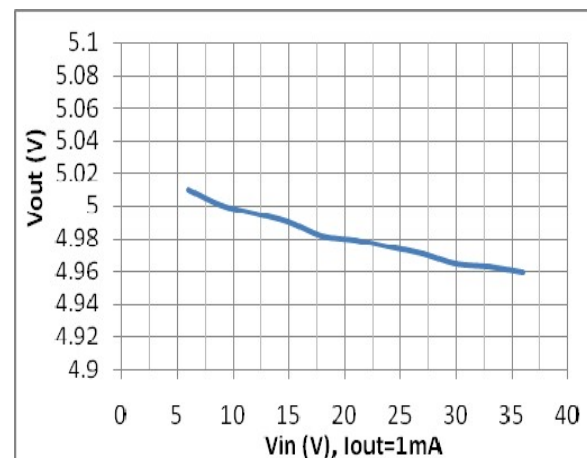
($V_{IN}=V_{OUT}+1V$; $T_j=25^{\circ}C$ unless otherwise noted.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{IN}	Input Supply Voltage		3.0		40	V
V_{OUT}	Output Voltage Accuracy	$I_{OUT}=10mA$	-1%		1%	V
			-2%		2%	V
I_Q	Quiescent Current			3.0	6.0	μA
I_{OUT}	Output Current			300		mA
V_{DROP}	Dropout Voltage	$I_{OUT}=10mA$ $\Delta V_{OUT} = -V_{OUT} * 2\%$		30		mV
		$I_{OUT}=100mA$ $\Delta V_{OUT} = -V_{OUT} * 2\%$		300		mV
		$I_{OUT}=200mA$ $\Delta V_{OUT} = -V_{OUT} * 2\%$		600		mV
V_{LR}	Load Regulation	$1mA \leq I_{OUT} \leq 100mA$		40		mV
V_{SR}	Line Regulation	$I_{OUT}=1mA$, $V_{IN}=(V_{OUT}+1V)$ to 30V		0.02		%/V
PSRR	Power Supply Rejection Ratio	$V_{in}=12V$, $I_{out}=10mA$ $F=1KHz, V_{out}=3.3V$	—	80	—	dB
V_{ENH}	Enable High Level	Enabled	1	—	—	V
V_{ENL}	Enable Low Level	Disabled	—	—	0.4	V
I_{EN}	EN Current	$EN=0 \sim V_{IN}(R_{EN}=100K)$		1		μA
I_{LIMIT}	Current Limit	$V_{IN}=(V_{OUT}+1V)$ to 30V $R_{LOAD}=V_{OUT}/1A$		450		mA
T_{SHDN}	Thermal Protection			150		$^{\circ}C$
TC_{VOUT}	Output Voltage Temperature Coefficient	$I_{OUT}=10mA$ $-40^{\circ}C \leq T_{AMB} \leq 100^{\circ}C$		±100		ppm/ $^{\circ}C$

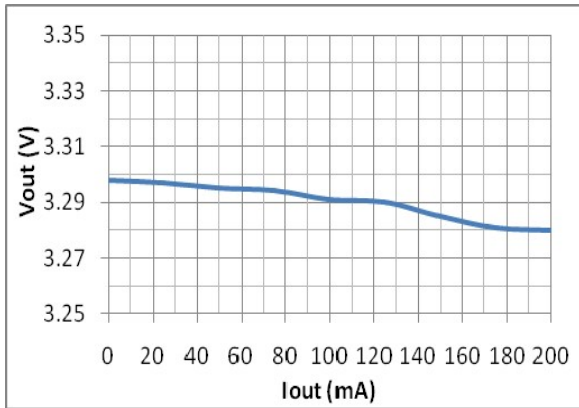
Typical Performance Characteristics



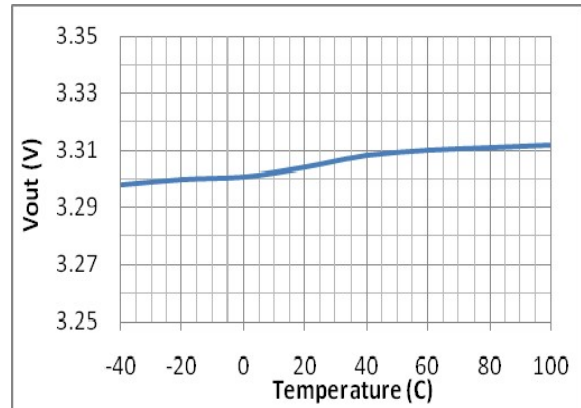
$V_{OUT}: 3.3V$



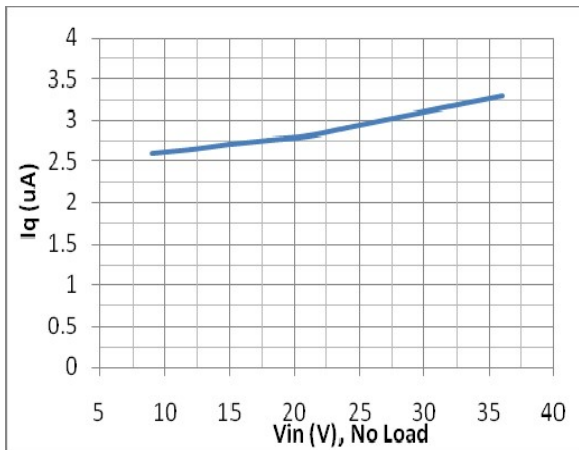
$V_{OUT}: 5.0V$



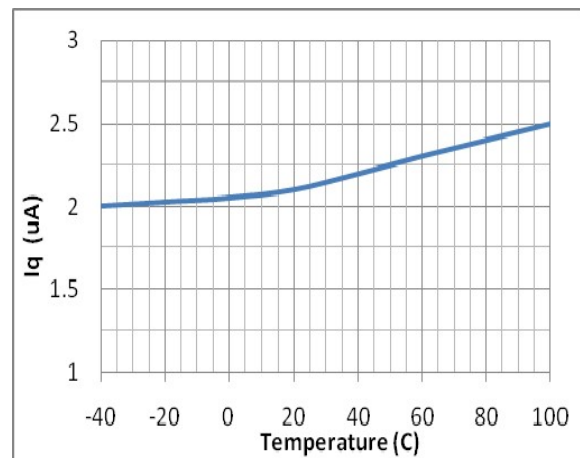
V_{OUT}: 3.3V



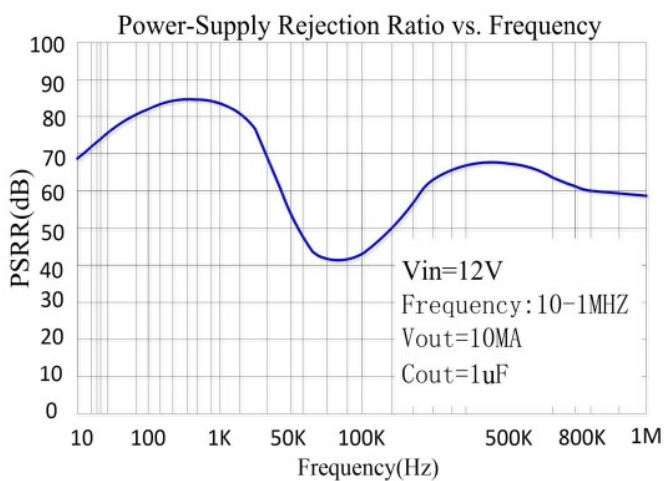
V_{OUT}: 3.3V



V_{OUT}: 3.3V

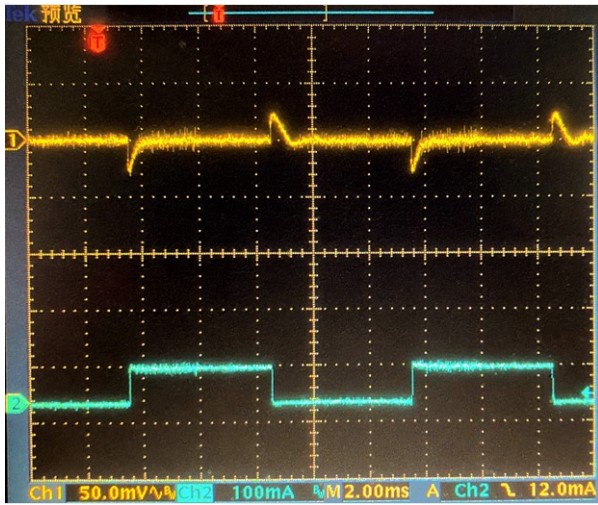


V_{OUT}: 5.0V



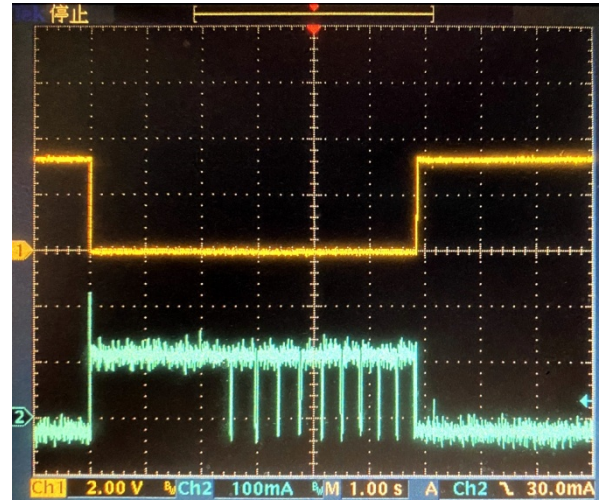


Load Transient ($V_{in}=12V$)
10mA~100mA

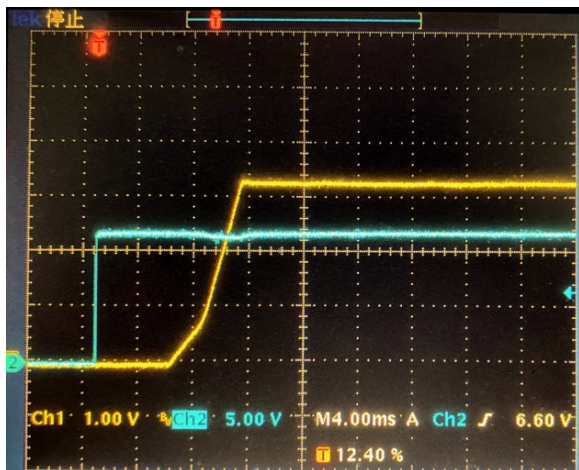


EN OFF \rightarrow ON

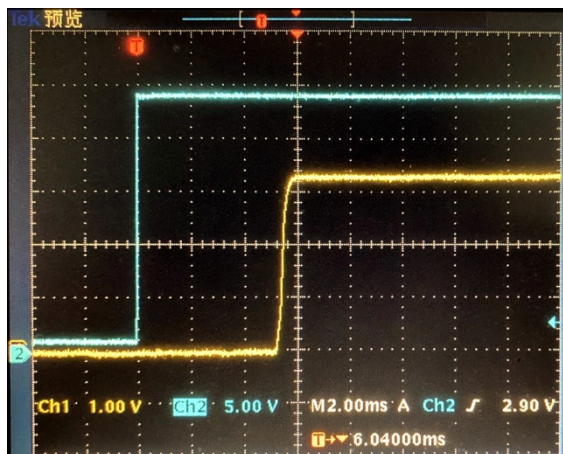
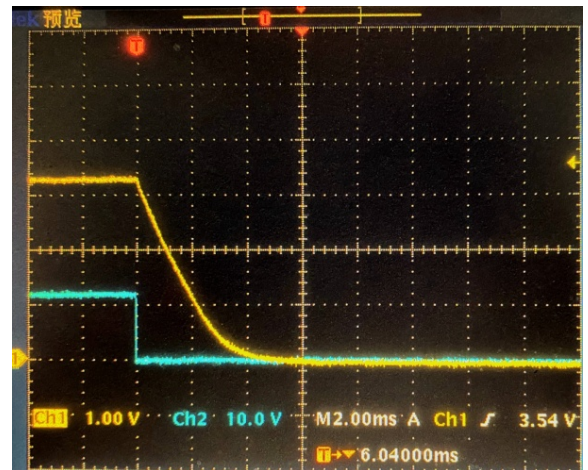
Short-Circuit and OTP ($V_{in}=24V$)



EN ON \rightarrow OFF (No Load)
Discharge



VCC Power ON



APPLICATION INFORMATION

INPUT CAPACITOR

An input ceramic capacitor of 1μF is required between the VIN and GND pin. The capacitor shall be placed as close as possible to VIN pin, and the wide copper trace is also recommended.

OUTPUT CAPACITOR

The recommended is 10uF ceramic capacitor. The minimum capacitance for stable and correct operation is 1μF. The higher the value of this output capacitor, the lower the ripple during the operations. The output capacitor should be placed as close to the Output Pin as possible. The wide copper trace is recommended.

NO-LOAD STABILITY

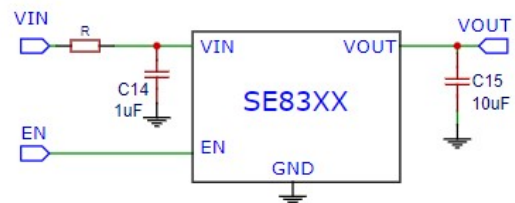
The SE83XX will remain stable and in regulation with no external load. This is especially important in CMOS RAM keep-alive applications.

FOLD-BACK SHORT-CIRCUIT PROTECTION

When short-circuit occurs, SE83XX will fold back the short-circuit currents to a pre-determined lower level, This will reduce excessive heat in otherwise large current conditions. This feature provides another level of protection to IC itself and also the whole system.

IN-RUSH CURRENT AND VOLTAGE

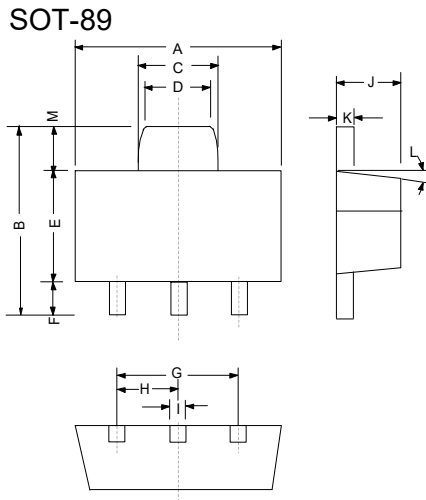
The following figure shows a typical application circuit for the SE83XX devices. Please keep in mind that in-rush current can push up the Vin overshoot by as much as 50%. For example, when Vin=30V, the in-rush caused spike voltage can be as high as 45V. Therefore the voltage rating of Cin needs to be higher than 50% of the application.



In live insertion application, it is suggested that R, C1 are selected as following:

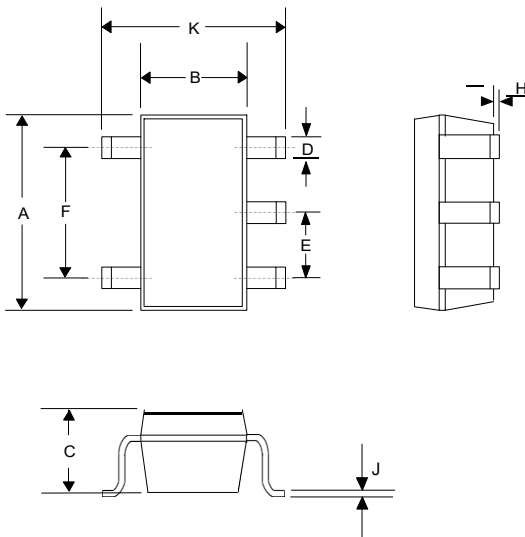
- 1.C1=10μF ~ 100μF ceramic or electrolytic capacitor with maximum voltage greater than 50V.
- 2.If the maximum current is known, for example at 10mA, and the Vin(min)=15V and Vin(max)=30V, then around 7~8V voltage drop on this R is allowed, therefor the $R=7.5V/10mA=750ohms$. Please note that the maximum power on this resistor is $10mA*7.5V=75mW$, so a resistor with about 1/8W rating is sufficient.

Outline Drawing for SOT-89



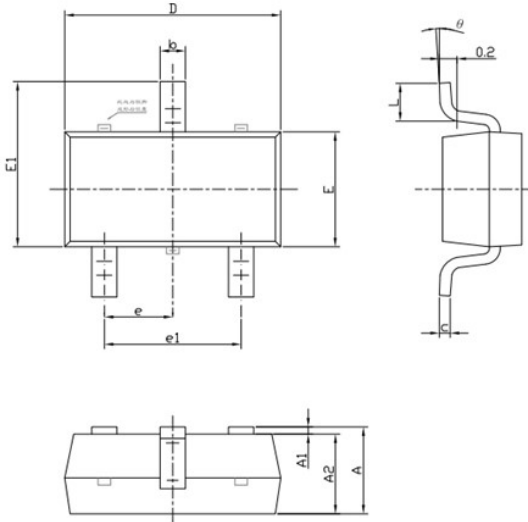
DIMENSIONS				
DIM ^N	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.173	0.181	4.400	4.600
B	0.159	0.167	4.050	4.250
C	0.067	0.075	1.700	1.900
D	0.051	0.059	1.300	1.500
E	0.094	0.102	2.400	2.600
F	0.035	0.047	0.890	1.200
G	0.118REF		3.00 REF	
H	0.059REF		1.50 REF	
I	0.016	0.020	0.400	0.520
J	0.055	0.063	1.400	1.600
K	0.014	0.016	0.350	0.410
L	10 °TYP		10 °TYP	
M	0.028REF		0.70 REF	

Outline Drawing for SOT-23-5



DIMENSIONS				
DIM ^N	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.110	0.120	2.80	3.05
B	0.059	0.070	1.50	1.75
C	0.036	0.051	0.90	1.30
D	0.014	0.020	0.35	0.50
E	-	0.037	-	0.95
F	-	0.075	-	1.90
H	-	0.006	-	0.15
J	0.0035	0.008	0.090	0.20
K	0.102	0.118	2.60	3.00

Outline Drawing for SOT-23-3



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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