



TS9011

250mA CMOS Low Dropout Voltage Regulator

TO-92



1 2 3

SOT-89



1 2 3

SOT-23



1 2

Pin assignment

TO-92 & SOT-89

1. Gnd
2. Input
3. Output

SOT-23

1. Gnd
2. Out
3. Input

Low Power Consumption 2uA
Low Drop Out Voltage 0.4V

General Description

The TS9011 series is a positive voltage regulator developed utilizing CMOS technology featured very low power consumption, low dropout voltage and high output voltage accuracy. Built in low on-resistor provides low dropout voltage and large output current. A 1uF or greater can be used as an output capacitor.

The TS9011 series are prevented device failure under the worst operation condition with both thermal shutdown and current fold-back. These series are recommended for configuring portable devices and large current application, respectively.

This series are offered in 3-pin TO-92, SOT-89 and SOT-23 package.

Features

- ◇ Dropout voltage typically 0.38V @Io=200mA (Vo=5V)
- ◇ Output current up to 250mA
- ◇ Low power consumption, 2uA(typ) @Vo=5V
- ◇ Output voltage +/-2%
- ◇ Internal current limit
- ◇ Thermal shutdown protection

Applications

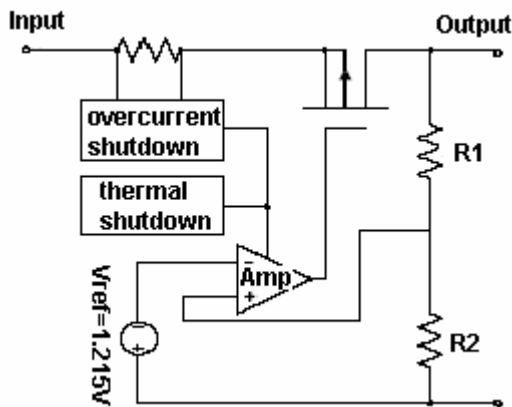
- ◇ Palmtops
- ◇ Video recorders
- ◇ Battery powered equipment
- ◇ PC peripherals
- ◇ CD-ROM
- ◇ Digital signal camera

Ordering Information

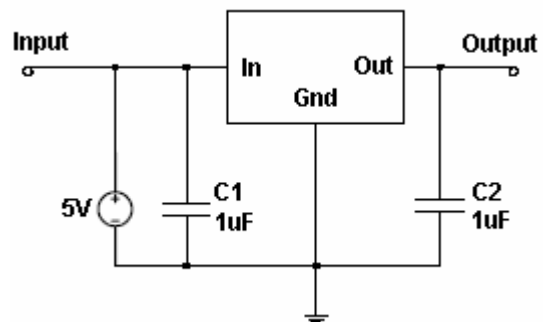
Part No.	Operating Temp. (Ambient)	Package
TS9011xCT	-20 ~ +85 °C	TO-92
TS9011xCX		SOT-23
TS9011xCY		SOT-89

Note: Where **x** denotes voltage option, available are A = 1.5V, D=1.8V, K=2.5V, S=3.3V, 5=5.0V. Contact factory for additional voltage options.

Block Diagram



Typical Application Circuit





Absolute Maximum Rating					
Input Supply Voltage		V _{in(max.)}	+12		V
Input Operating Voltage		V _{in(opr.)}	+10		
Output Current		I _o	P _D / (V _{in} – V _o)		V
Power Dissipation	SOT-23	P _D	0.15		W
	SOT-89		0.50		
	TO-92		0.65		
Operating Junction Temperature Range		T _j	-40 ~ +125		°C
Storage Temperature Range		T _{STG}	-65 ~ +150		°C
Lead Soldering Temperature (260 °C)			10		S

Caution: Stress above the listed absolute rating may cause permanent damage to the device.

Electrical Characteristics

T_a = 25 °C unless otherwise specified.

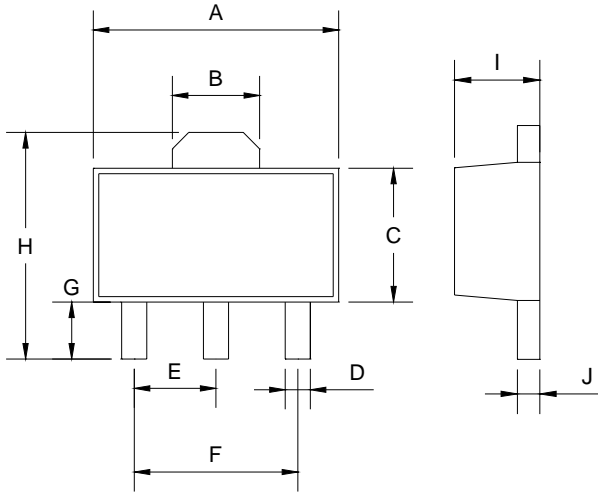
Parameter	Conditions	Min	Typ	Max	Unit	
Output Voltage	V _{in} =V _o + 1V, I _o =40mA,	TS90115	4.900	5.0	5.100	V
		TS9011S	3.234	3.3	3.366	
		TS9011K	2.450	2.5	2.550	
		TS9011D	1.764	1.8	1.836	
		TS9011A	1.47	1.5	1.53	
Maximum Output Current	V _{in} =V _o +1V,	250	--	--	mA	
Input Stability	V _o +1V ≤ V _{in} ≤ V _o +2V, I _o =1mA	--	0.2	0.3	%	
Load Regulation (Note1)	V _{in} =V _o +1V, 1mA ≤ I _L ≤ 100mA	TS90115	--	40	80	mV
		TS9011S				
	V _{in} =V _o +1V, 1mA ≤ I _L ≤ 80mA	TS9011K	--	40	90	
		TS9011D				
		TS9011A				
Dropout Voltage (Note 2)	I _o =250mA	TS90115	--	400	600	mV
	I _o =200mA	TS9011S	--	400	650	
	I _o =160mA	TS9011K	--	400	700	
	I _o =120mA	TS9011D	--	400	750	
	I _o =100mA	TS9011A	--	850	1000	
Quiescent Current	V _{in} =V _o +1V, I _o =0A	--	2	5	uA	
Output Current Limit	V _{out} < 0.4V	--	400	--	mA	
Power Supply Rejection Ratio	At f=100KHz, I _o =10mA,	--	30	--	dB	
Output Voltage Temperature Coefficient (Note 3)		--	100	--	ppm/°C	

Note: 1. Regulation is measured at constant junction temperature, using pulsed ON time.

2. Dropout is measured at constant junction temperature, using pulsed ON time, and the criterion is V_{out} inside target value +/-2%.

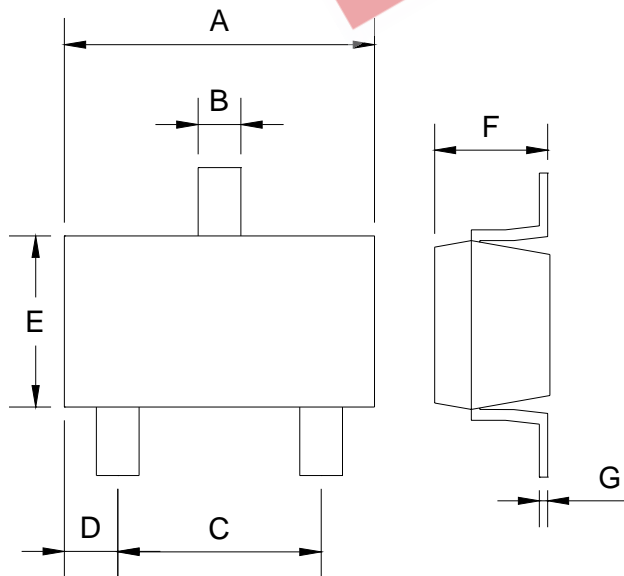
3. Guaranteed by design.

SOT-89 Mechanical Drawing



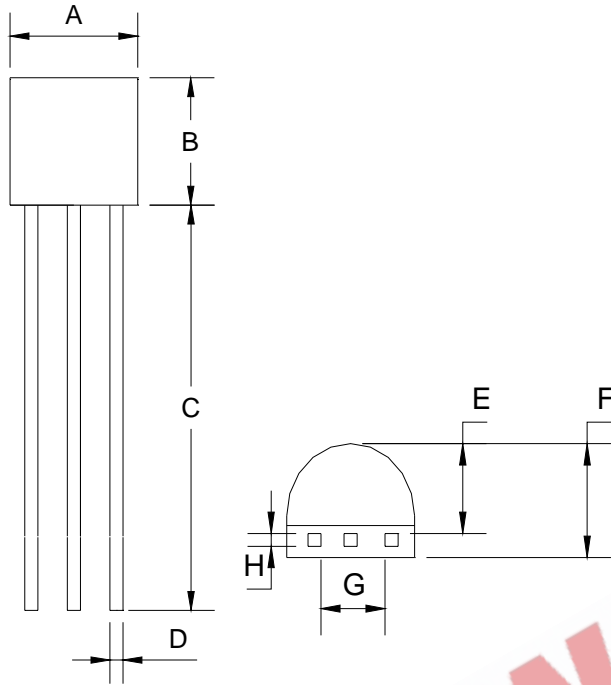
SOT-89 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.40	4.60	0.173	0.181
B	1.50	1.7	0.059	0.070
C	2.30	2.60	0.090	0.102
D	0.40	0.52	0.016	0.020
E	1.50	1.50	0.059	0.059
F	3.00	3.00	0.118	0.118
G	0.89	1.20	0.035	0.047
H	4.05	4.25	0.159	0.167
I	1.4	1.6	0.055	0.068
J	0.35	0.44	0.014	0.017

SOT-23 Mechanical Drawing



SOT-23 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.88	2.91	0.113	0.115
B	0.39	0.42	0.015	0.017
C	1.78	2.03	0.070	0.080
D	0.51	0.61	0.020	0.024
E	1.59	1.66	0.063	0.065
F	1.04	1.08	0.041	0.043
G	0.07	0.09	0.003	0.004

TO-92 Mechanical Drawing



TO-92 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.70	0.169	0.185
B	4.30	4.70	0.169	0.185
C	14.30(typ)		0.563(typ)	
D	0.43	0.49	0.017	0.019
E	2.19	2.81	0.086	0.111
F	3.30	3.70	0.130	0.146
G	2.42	2.66	0.095	0.105
H	0.37	0.43	0.015	0.017

EEPW.com.cn 电子产品世界