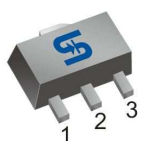


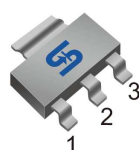
SOT-89



Pin Definition:

1. Ground
2. Input
3. Output

SOT-223



Pin Definition:

1. Input
2. Ground
3. Output

General Description

TS9013 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 2.2uF or greater can be used as an output capacitor.

TS9013 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.

Features

- Output current up to 500mA
- Low power consumption, 15uA(typ) @Vo=5V
- Output voltage $\pm 2\%$
- Internal current limit
- Thermal shutdown protection

Ordering Information

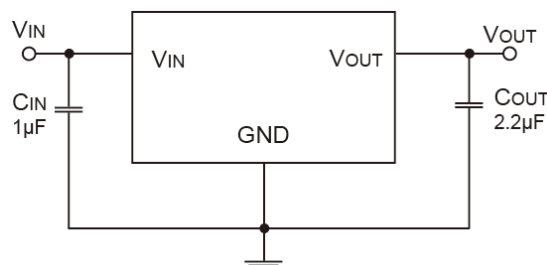
Part No.	Package	Packing
TS9013xCW RP	SOT-223	2.5Kpcs / 13" Reel
TS9013xCW RPG	SOT-223	2.5Kpcs / 13" Reel
TS9013xCY RM	SOT-89	1Kpcs / 7" Reel
TS9013xCY RMG	SOT-89	1Kpcs / 7" Reel

Note: Refer to detail ordering information table.

Applications

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

Typical Application Circuit



Absolute Maximum Rating

Parameter	Symbol	Limit	Unit
Input Supply Voltage	V_{IN}	12	V
Recommend Operating Input Voltage	V_{IN}	10	V
Output Current	I_O	500	mA
Power Dissipation (without heat sink)	P_D	0.5	W
		0.7	
Operating Junction Temperature Range	T_J	-40 ~ +150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-65 ~ +150	$^{\circ}\text{C}$
Lead Soldering Temperature (260 $^{\circ}\text{C}$)		5	S

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

Electrical Characteristics (Ta = 25°C unless otherwise noted)

Parameter	Conditions		Min	Typ	Max	Unit
Output Voltage	$V_{IN}=V_O + 1V$, $I_O =1mA$,	TS90135	4.90	5.0	5.10	V
		TS9013S	3.23	3.3	3.36	
		TS9013K	2.45	2.5	2.55	
		TS9013D	1.76	1.8	1.83	
	$V_{IN}=V_O + 1V$, $I_O =1mA \sim 500mA$	TS90135	4.85	5.0	5.10	V
		TS9013S	3.20	3.3	3.36	
		TS9013K	2.42	2.5	2.55	
		TS9013D	1.74	1.8	1.83	
Maximum Output Current	$V_{IN}=V_O+1V$,		500	--	--	mA
Input Stability	$V_O+1V \leq V_{in} \leq V_O+2V$, $I_O=1mA$		--	0.2	0.3	%
Load Regulation (Note1)	$V_{IN}=V_O+1V$, $1mA \leq I_L \leq 500mA$	TS90135	--	40	80	mV
		TS9013S				
	$V_{IN}=V_O+1V$, $1mA \leq I_L \leq 500mA$	TS9013K	--	40	90	
		TS9013D				
Dropout Voltage (Note 2)	$I_O=300mA$	TS90135	--	300	500	mV
		TS9013S				
	$I_O=500mA$	TS90135	--	500	600	
		TS9013S				
	$I_O=500mA$	TS9013K	--	600	850	
		TS9013D				
Quiescent Current	$V_{IN}=V_O+1V$, $I_O=0A$		--	15	25	uA
Output Current Limit	$V_{OUT} < 0.4V$		550	--	--	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.

Note 2: Dropout is measured at constant junction temperature, using pulsed ON time, and the criterion is V_{OUT} inside target value +/-3%.

Ordering information

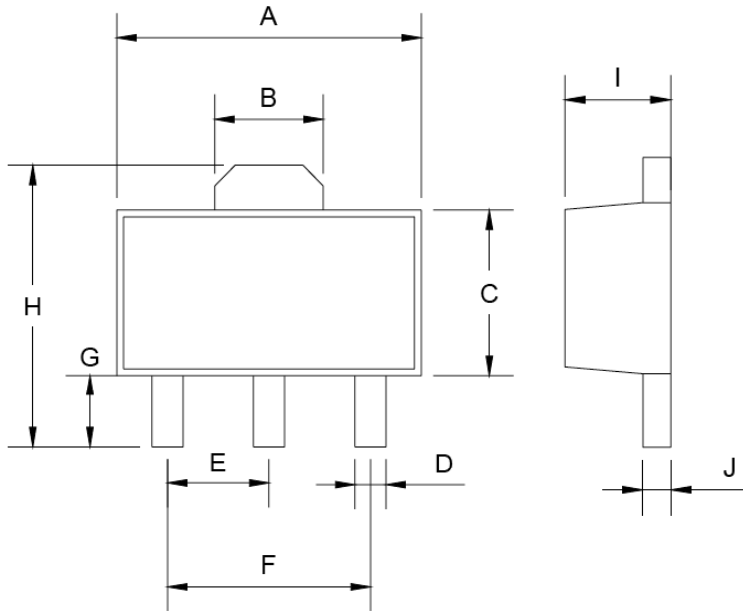
Voltage	SOT-223	SOT-89
1.8V	TS9013DCW RP TS9013DCW RPG	TS9013DCY RM TS9013DCY RMG
2.5V	TS9013KCW RP TS9013KCW RPG	TS9013KCY RM TS9013KCY RMG
3.3V	TS9013SCW RP TS9013SCW RPG	TS9013SCY RM TS9013SCY RMG
5V	TS90135CW RP TS90135CW RPG	

Packing code information

Packing	RP: 2.5kpcs / 13"Reel RPG: 2.5kpcs / 13"Reel	RM: 1kpcs / 7" Reel RMG: 1kpcs / 7" Reel
---------	---	---

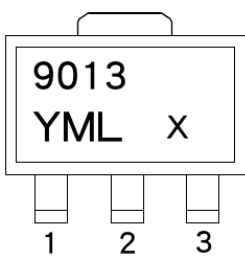
"G" denotes for Halogen Free

SOT-89 Mechanical Drawing



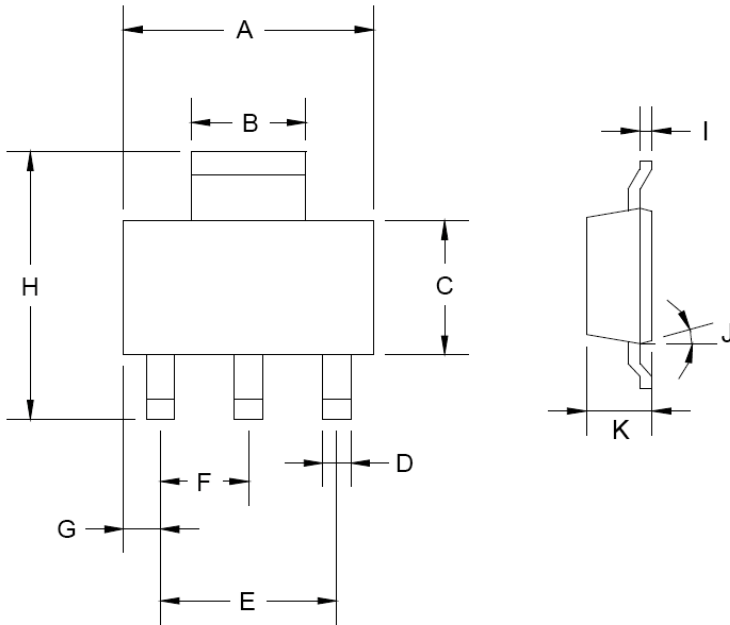
SOT-89 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.40	4.60	0.173	0.181
B	1.40	1.75	0.055	0.069
C	2.40	2.60	0.094	0.102
D	0.36	0.48	0.014	0.018
E	1.40	1.60	0.054	0.063
F	2.90	3.10	0.114	0.122
G	0.89	1.20	0.035	0.047
H	--	4.25	--	0.167
I	1.40	1.60	0.055	0.068
J	0.38	0.43	0.014	0.017

Marking Diagram



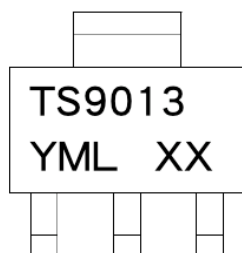
- Y** = Year Code
M = Month Code
 (A=Jan, B=Feb, C=Mar, D=Apl, E=May, F=Jun, G=Jul, H=Aug, I=Sep, J=Oct, K=Nov, L=Dec)
 = Month Code for Halogen Free Product
 (O=Jan, P=Feb, Q=Mar, R=Apl, S=May, T=Jun, U=Jul, V=Aug, W=Sep, X=Oct, Y=Nov, Z=Dec)
L = Lot Code
X = Fixed Output Voltage Code
 18=1.8V, 25=2.5V, 33=3.3V, 50=5.0V.

SOT-223 Mechanical Drawing



SOT-223 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	6.350	6.850	0.250	0.270
B	2.900	3.100	0.114	0.122
C	3.450	3.750	0.136	0.148
D	0.595	0.635	0.023	0.025
E	4.550	4.650	0.179	0.183
F	2.250	2.350	0.088	0.093
G	0.835	1.035	0.032	0.041
H	6.700	7.300	0.263	0.287
I	0.250	0.355	0.010	0.014
J	10°	16°	10°	16°
K	1.550	1.800	0.061	0.071

Marking Diagram



- Y** = Year Code
- M** = Month Code
 - (A=Jan, B=Feb, C=Mar, D=Apl, E=May, F=Jun, G=Jul, H=Aug, I=Sep, J=Oct, K=Nov, L=Dec)
 - = Month Code for Halogen Free Product
 - (O=Jan, P=Feb, Q=Mar, R=Apl, S=May, T=Jun, U=Jul, V=Aug, W=Sep, X=Oct, Y=Nov, Z=Dec)
- L** = Lot Code
- X** = Fixed Output Voltage Code
 - 18=1.8V, 25=2.5V, 33=3.3V, 50=5.0V.

Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.