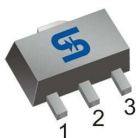




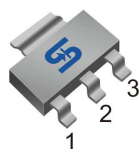
SOT-89



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

Applications

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

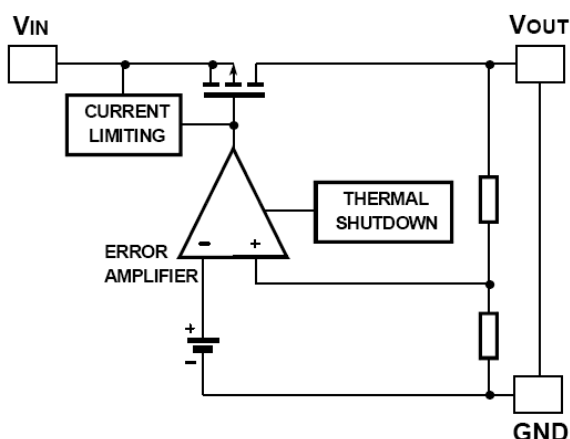
Ordering Information

Part No.	Package	Packing
TS9013x <u>C</u> W RP	SOT-223	2.5Kpcs / 13" Reel
TS9013x <u>C</u> W RPG	SOT-223	2.5Kpcs / 13" Reel
TS9013x <u>C</u> Y RM	SOT-89	1Kpcs / 7" Reel
TS9013x <u>C</u> Y RMG	SOT-89	1Kpcs / 7" Reel

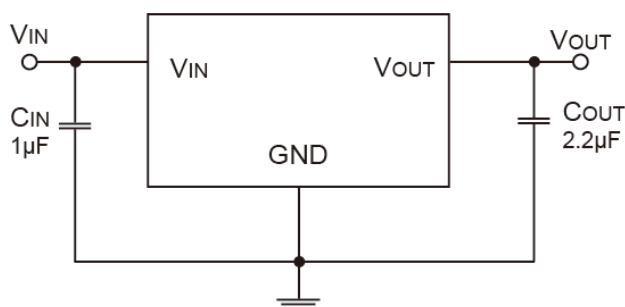
Note: Refer to detail ordering information table.

"G" denotes for Halogen Free

Block Diagram



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)	SOT-89	0.5	W
	SOT-223	0.7	
Operating Junction Temperature Range	T_j	-40 ~ +150	°C
Storage Temperature Range	T_{STG}	-65 ~ +150	°C
Lead Soldering Temperature (260°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	

Notes:

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

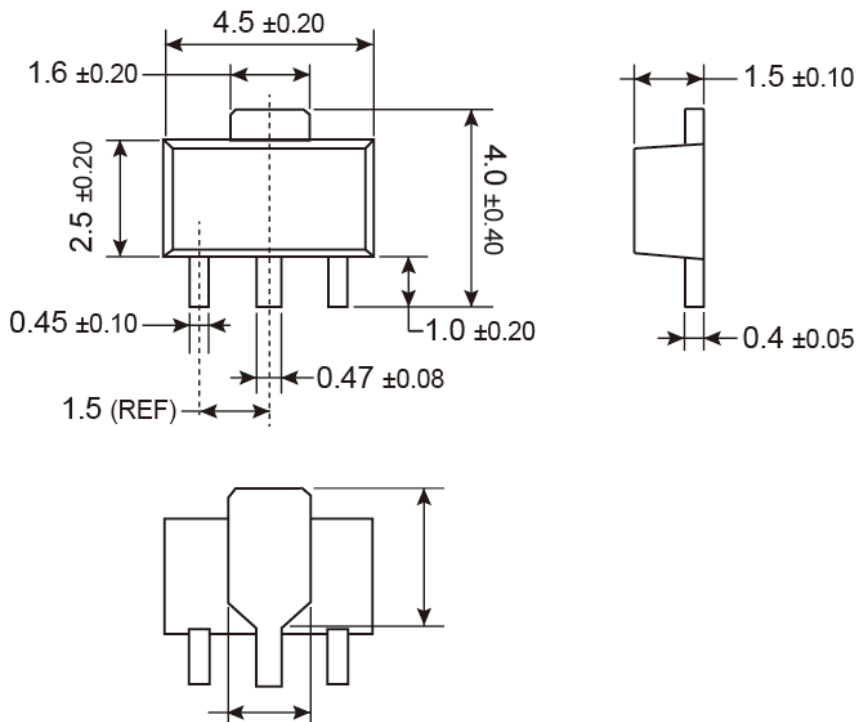


Ordering information

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	

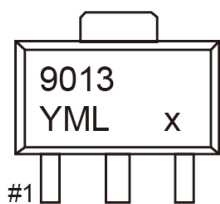
Note: "G" denotes for Halogen Free

SOT-89 Mechanical Drawing



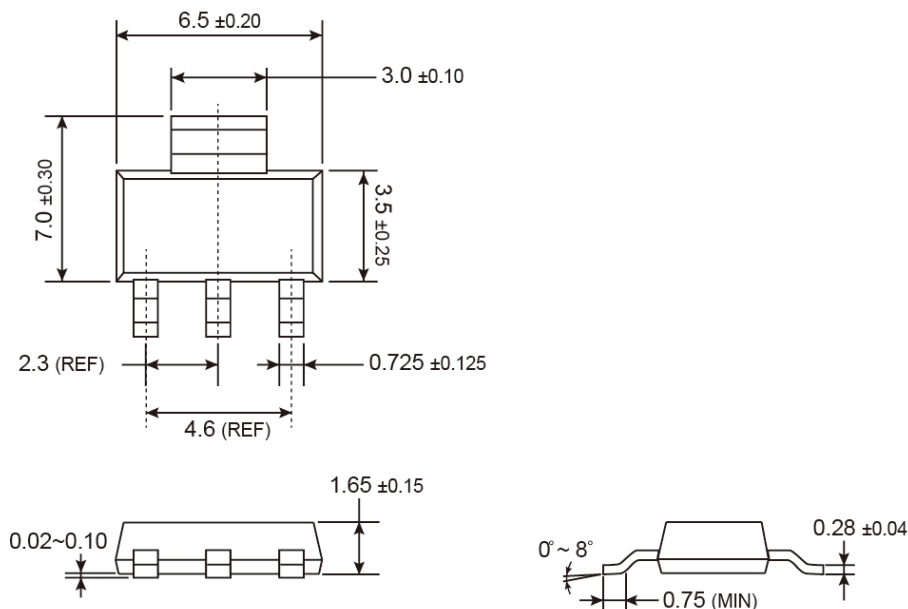
Unit: Millimeters

Marking Diagram



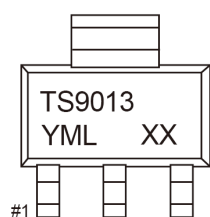
- Y** = Year Code
- M** = Month Code
 (A=Jan, B=Feb, C=Mar, D=Apl, E=May, F=Jun, G=Jul, H=Aug, I=Sep, J=Oct, K=Nov, L=Dec)
 = Month Code for Halogen Free Product
 (O=Jan, P=Feb, Q=Mar, R=Apl, S=May, T=Jun, U=Jul, V=Aug, W=Sep, X=Oct, Y=Nov, Z=Dec)
- L** = Lot Code
- X** = Fixed Output Voltage Code
 18=1.8V,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

SOT-223 Mechanical Drawing



Unit: Millimeters

Marking Diagram



- = Year Code
- = Month Code
(**A**=Jan, **B**=Feb, **C**=Mar, **D**=Apr, **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**=Apr, **S**=May, **T**=Jun, **U**=Jul, **V**=Aug, **W**=Sep, **X**=Oct, **Y**=Nov, **Z**=Dec)
- = Lot Code
- = Fixed Output Voltage Code
18=1.8V, **25**=2.5V, **33**=3.3V, **50**=5.0V.

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