

500mA Low Quiescent Current CMOS LDO

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 2.2 μ F 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

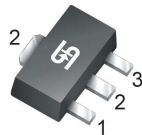
- Output current up to 500mA
- Low power consumption, 15 μ A(typ.) @V_O=5V
- Output voltage $\pm 2\%$
- Internal current limit
- Thermal shutdown protection
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC.
- Halogen-free according to IEC 61249-2-21

APPLICATION

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



SOT-89



Pin Definition:

1. Ground
2. Input
3. Output

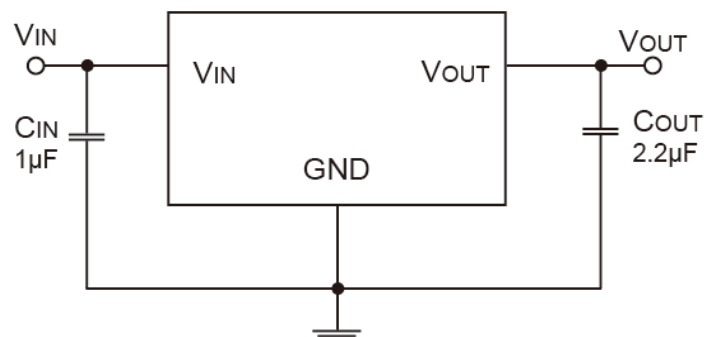
SOT-223



Pin Definition:

1. Input
2. Ground
3. Output

TYPICAL APPLICATION CIRCUIT



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

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	$^\circ\text{C}$
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 SPECIFICATIONS ($T_A = 25^\circ\text{C}$ 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 ~ 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 ≤ V _{IN} ≤ V _O +2V, I _O =1mA		--	0.2	0.3	%
Load Regulation (Note1)	V _{IN} =V _O +1V, 1mA ≤ IL ≤ 500mA	TS90135	--	40	80	mV
		TS9013S				
	V _{IN} =V _O +1V, 1mA ≤ IL ≤ 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	μA
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			--	100	--	ppm/°C

Note:

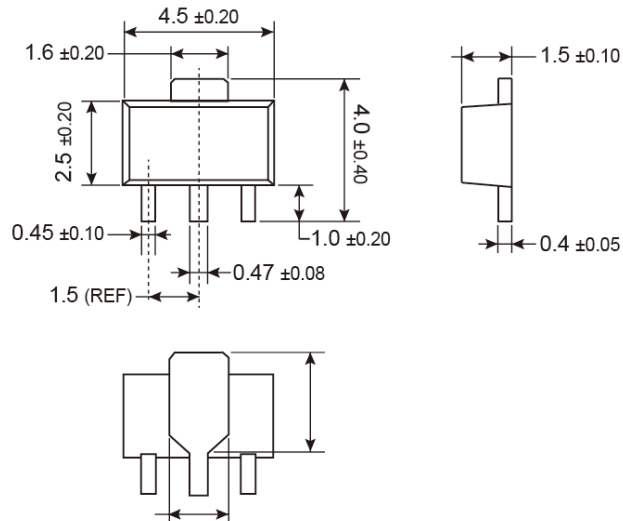
1. Regulation is measured at constant junction temperature, using pulsed ON time.
2. Dropout is measured at constant junction temperature, using pulsed ON time, and the criterion is V_{OUT} inside target value +/- 3%.

ORDERING INFORMATION

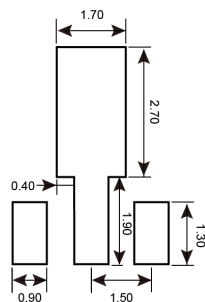
OUTPUT VOLTAGE	PART NO.	PACKAGE	PACKING
1.8V	TS9013DCW RPG	SOT-223	2,500pcs / 13" Reel
	TS9013DCY RMG	SOT-89	1,000pcs / 7" Reel
2.5V	TS9013KCW RPG	SOT-223	2,500pcs / 13" Reel
3.3V	TS9013SCW RPG	SOT-223	2,500pcs / 13" Reel
	TS9013SCY RMG	SOT-89	1,000pcs / 7" Reel
5V	TS90135CW RPG	SOT-223	2,500pcs / 13" Reel

PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

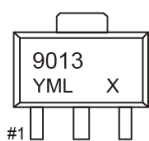
SOT-89



SUGGESTED PAD LAYOUT (Unit: Millimeters)



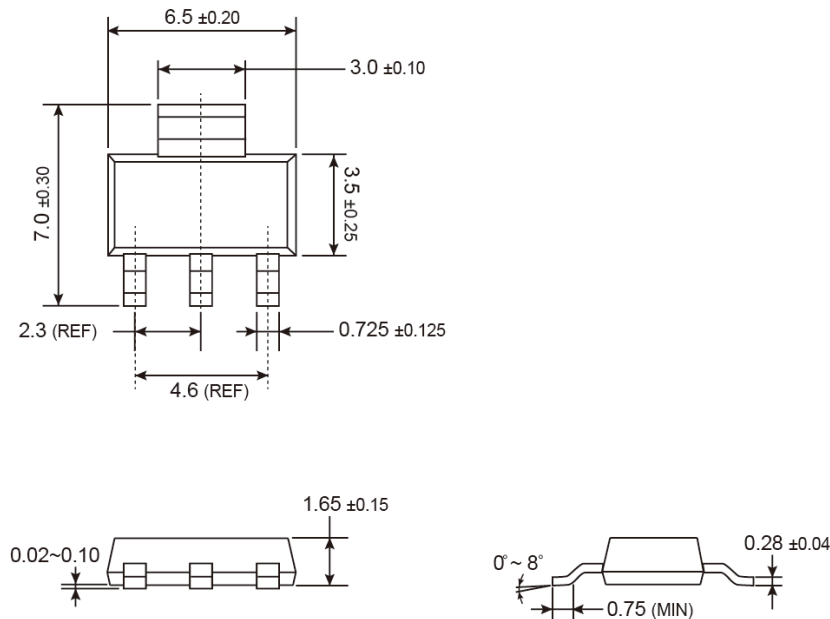
MARKING DIAGRAM



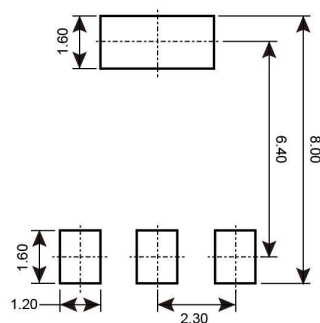
- Y** = Year Code
- M** = Month Code for Halogen Free Product
 - O** =Jan **P** =Feb **Q** =Mar **R** =Apr
 - S** =May **T** =Jun **U** =Jul **V** =Aug
 - W** =Sep **X** =Oct **Y** =Nov **Z** =Dec
- L** = Lot Code (1~9, A~Z)
- X** = Fixed Output Voltage Code
 - 18**=1.8V, **33**=3.3V, **50**=5.0V..

PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

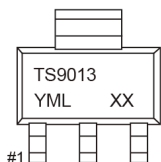
SOT-223



SUGGESTED PAD LAYOUT (Unit: Millimeters)



MARKING DIAGRAM



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18=1.8V, **25**=3.3V, **33**=3.3V, **50**=5.0V..

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