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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 2.2μF 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, 15μA(typ.) @V_O=5V
- Output voltage ±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

Pb-Free RoHS COMPLIANT HALOGEN FREE

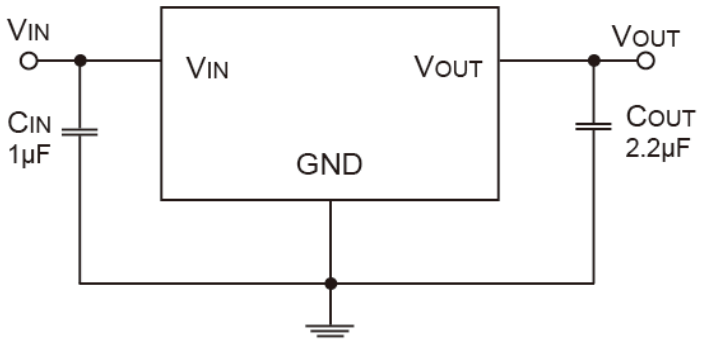
SOT-89

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°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		Io	500	mA
Power Dissipation (without heat sink)	SOT-89	P_D	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 SPECIFICATIONS (T_A = 25°C unless otherwise noted)						
PARAMETER	**CONDITIONS**		**MIN**	**TYP**	**MAX**	**UNIT**
Output Voltage	$V_{IN}=V_O$ + 1V, Io =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:

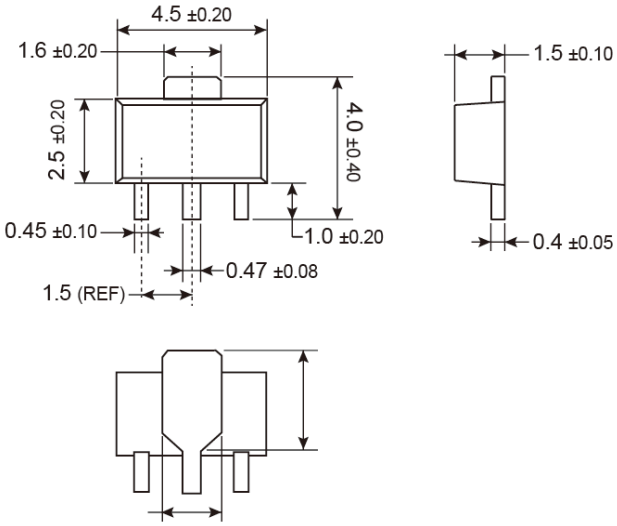
1. Regulation is measured at constant junction temperature, using pulsed ON time.
2. Dropout is measured at constant junction temperature, using pulsed ON time, and the criterion is V_{OUT} inside target value +/- 3%.

ORDERING INFORMATION

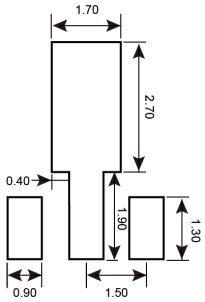
OUTPUT VOLTAGE	PART NO.	PACKAGE	PACKING
1.8V	TS9013DCW RPG	SOT-223	2,500pcs / 13” Reel
	TS9013DCY RMG	SOT-89	1,000pcs / 7” Reel
2.5V	TS9013KCW RPG	SOT-223	2,500pcs / 13” Reel
3.3V	TS9013SCW RPG	SOT-223	2,500pcs / 13” Reel
	TS9013SCY RMG	SOT-89	1,000pcs / 7” Reel
5V	TS90135CW RPG	SOT-223	2,500pcs / 13”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

PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

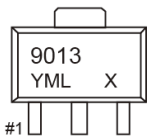
SOT-89



SUGGESTED PAD LAYOUT (Unit: Millimeters)



MARKING DIAGRAM



Y = Year Code

M = Month Code for Halogen Free Product

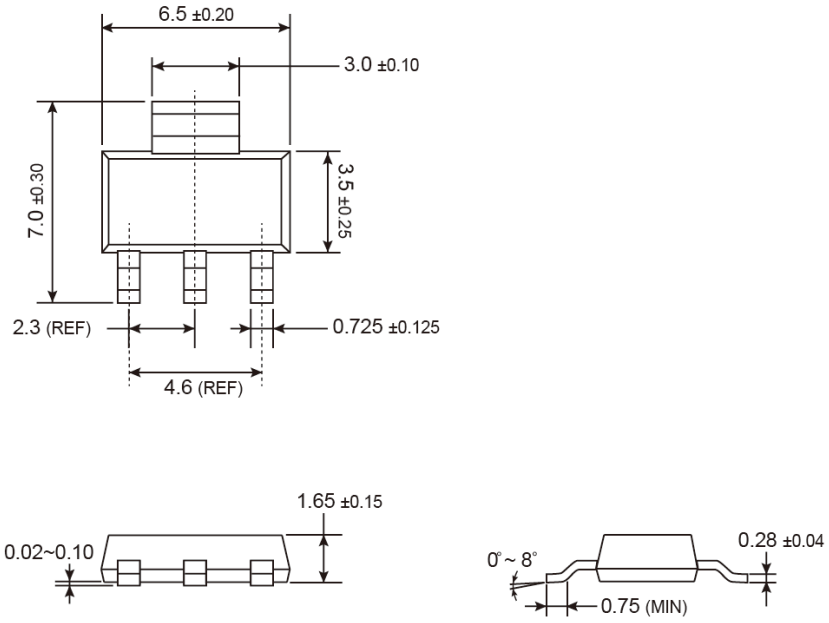
	O	=Jan	**P**	=Feb	**Q**	=Mar	**R** =Apr
`	**S**	=May	**T**	=Jun	**U**	=Jul	**V** =Aug
	W	=Sep	**X**	=Oct	**Y**	=Nov	**Z** =Dec

L = Lot Code (1~9, A~Z)

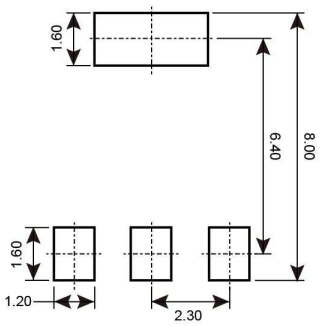
X = Fixed Output Voltage Code
18=1.8V, **33**=3.3V, **50**=5.0V..

PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

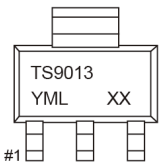
SOT-223



SUGGESTED PAD LAYOUT (Unit: Millimeters)



MARKING DIAGRAM



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