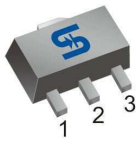
TS9013

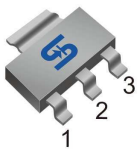
500mA Low Quiescent Current CMOS LDO

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 ±2%
- Internal current limit
- Thermal shutdown protection

Ordering Information

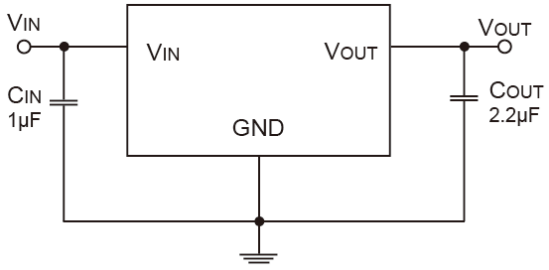
Part No.	Package	Packing
TS9013xCW RP	SOT-223	2.5Kpcs / 13” Reel
TS9013xCW RPG	SOT-223	2.5Kpcs / 13” Reel
TS9013xCY RM	SOT-89	1Kpcs / 7” Reel
TS9013xCY RMG	SOT-89	1Kpcs / 7” Reel

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		Io	500	mA
Power Dissipation (without heat sink)	SOT-89	P_D	0.5	W
	SOT-223		0.7	
Operating Junction Temperature Range		Tj	-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.

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

Parameter	Conditions		Min	Typ	Max	Unit
Output Voltage	V_{IN}=Vo + 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}=Vo + 1V, Io =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}=Vo+1V,		500	--	--	mA
Input Stability	V_O+1V ≤ Vin ≤ V_O+2V, Io=1mA		--	0.2	0.3	%
Load Regulation (Note1)	V_{IN}=Vo+1V, 1mA ≤ IL ≤ 500mA	TS90135	--	40	80	mV
		TS9013S				
	V_{IN}=Vo+1V, 1mA ≤ IL ≤ 500mA	TS9013K	--	40	90	
		TS9013D				
Dropout Voltage (Note 2)	Io=300mA	TS90135	--	300	500	mV
		TS9013S				
	Io=500mA	TS90135	--	500	600	
		TS9013S				
	Io=500mA	TS9013K	--	600	850	
		TS9013D				
Quiescent Current	V_{IN}=Vo+1V, Io=0A		--	15	25	uA
Output Current Limit	V_{OUT} < 0.4V		550	--	--	mA
Power Supply Rejection Ratio	At f=100KHz, Io=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

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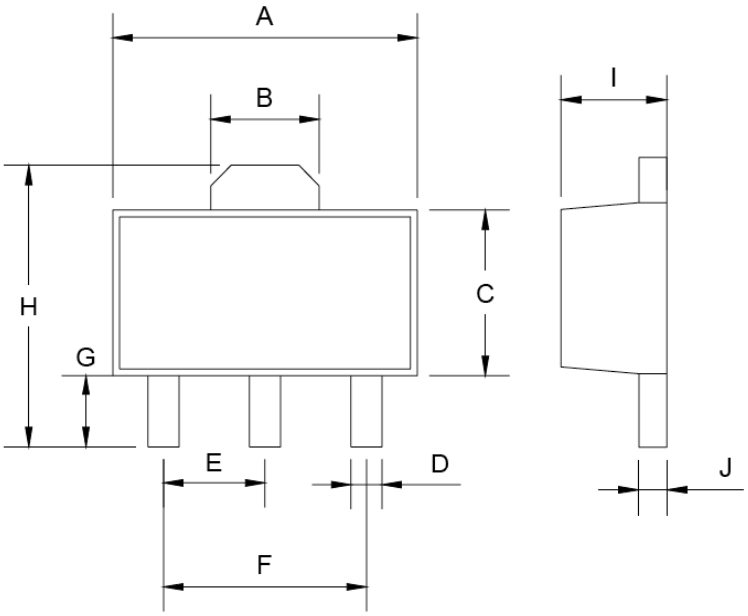
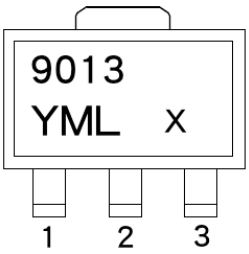
SOT-89 Mechanical Drawing



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
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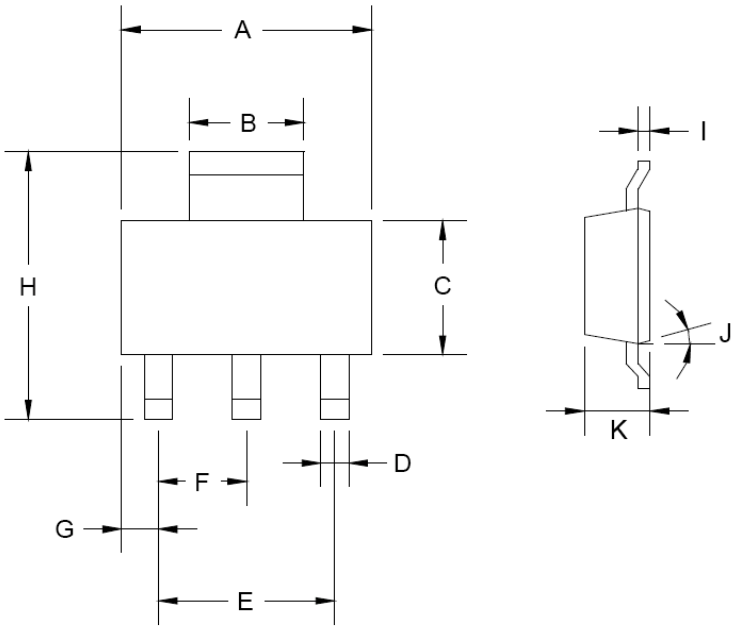
L = Lot Code

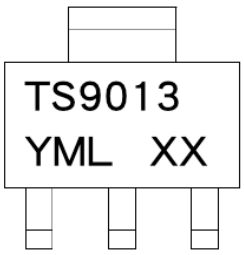
X = Fixed Output Voltage Code
18=1.8V, **25**=2.5V, **33**=3.3V, **50**=5.0V.

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



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