TAIWAN SEMICONDUCTOR

RoHS COMPLIANCE

TS1115

500mA Low Dropout Positive Voltage Regulator

TO-92

SOT-223

Pin Definition:
1. Fixed / Adj
2. Output
3. Input

SOT-89

Pin Definition:

TS1115	TS1115A
1. Fixed / Adj	1. Output
2. Output	2. Fixed / Adj
3. Input	3. Input

General Description

The TS1115 Series are high performance positive voltage regulators are designed for use in applications requiring low dropout performance at full rated current, Additionally, the TS1115 Series provides excellent regulation over variations due to changes in line, load and temperature. Outstanding features include low dropout performance at rated current, fast transient response, internal current limiting and thermal shutdown protection of the output device. The TS1115 Series are three terminal regulators with fixed and adjustable voltage options available in popular packages.

Features

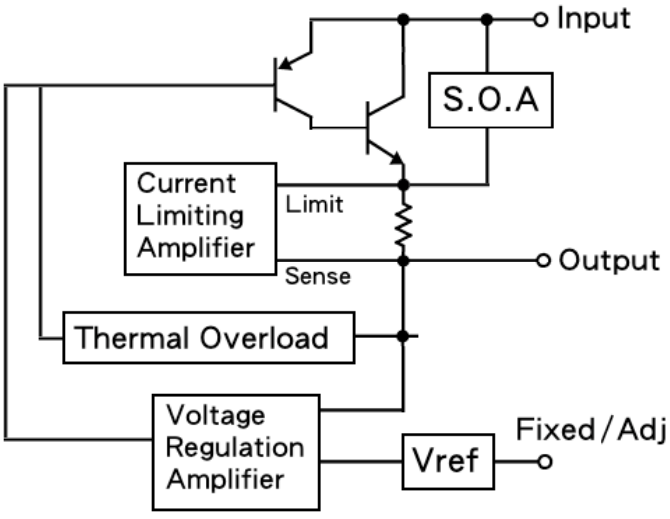
- Low Dropout Performance 1.5V max.
- Fill Current Rating Over Line and Temperature
- Fast Transient Response
- ±2% Total Output Regulation Over Line, Load and Temperature
- Adjust Pin Current max 90uA Over Temperature
- Line Regulation Typical 0.015%
- Load Regulation Typical 0.05%
- Fixed / Adjustable Output Voltage
- TO-92, SOT-223 and SOT-89 Package

Ordering Information

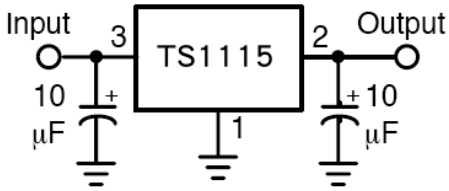
Part No.	Package	Packing
TS1115CT**xx** B0	TO-92	1Kpcs / Bulk
TS1115CW**xx** RP	SOT-223	2.5Kpcs / 13” Reel
TS1115CY**xx** RM	SOT-89	1Kpcs / 7” Reel
TS1115ACY**xx** RM	SOT-89	1Kpcs / 7” Reel

Note: Where **xx** denotes voltage option, available are 5.0V, 3.3V, 2.5V, 1.8V and 1.5V. Leave blank for adjustable version. Contact factory for additional voltage options.

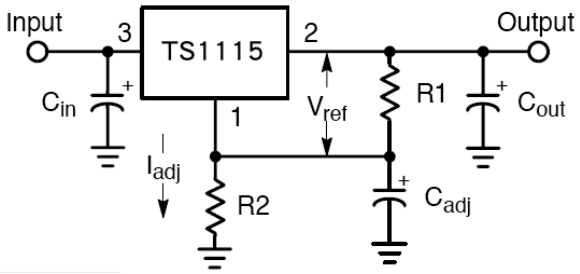
Block Diagram



Typical Application Circuit



Fixed Output Voltage Version



Vout = Vref(1+R2/R1) + Iadj R2

Adjustable Output Voltage Version

TS1115

500mA Low Dropout Positive Voltage Regulator

Absolute Maximum Rating (Note 1)

Parameter		Symbol	Limit	Unit
Input Supply Voltage		V_{IN}	15	V
Operation Input Supply Voltage (Recommend)		V_{IN} (Opr. Typ.)	7	V
Power Dissipation (Note 2)		P_D	Internal limited	
Thermal Resistance Junction to Ambient	TO-92	Θ_{JA}	160	°C/W
	SOT-223		110	
	SOT-89		180	
Operating Junction Temperature Range		T_J	0 ~+125	°C
Storage Temperature Range		T_{STG}	-65 ~ +150	°C
Lead Soldering Temperature (260°C)			5	S

Electrical Specification (Ta = 25°C, unless otherwise specified.)

Parameter	Conditions	Min	Typ	Max	Unit
Reference Voltage	V_{IN} = 2.75, Io=500mA	1.225	1.25	1.275	V
Output Voltage	V_{IN} = 3V~7V, Io=500mA	1.470	1.5	1.530	V
	V_{IN} = 3.3V~7V, Io=500mA	1.764	1.8	1.836	V
	V_{IN} = 4V~7V, Io=500mA	2.450	2.5	2.550	V
	V_{IN} = 4.8V~7V, Io=500mA	3.235	3.3	3.366	V
	V_{IN} = 6.5V~7V, Io=500mA	4.900	5.0	5.100	V
Line Regulation	Vo+1.5V ≤ V_{IN} ≤ 7V, Io= 10mA	--	0.015	0.2	%
Load Regulation (Note 1,2)	V_{IN} = V_{OUT} +1.5V Io= 10mA ~ 500mA	--	0.05	1.0	%
Dropout Voltage	Io=500mA, ΔV_{OUT} = 1% V_{OUT}	--	1.3	1.5	V
Quiescent Current	V_{IN} = 5V	--	8	10	mA
Adjustable Pin Current		--	90	--	uA
Output Current Limit	V_{IN} - V_{OUT} = 3V	1.1	--	--	A
Temperature Stability	Io=10mA,	--	0.5	--	%
Ripple Rejection	F= 120Hz, Io= 500mA, C_{OUT} = 25uF, V_{IN} = Vout+3V	--	60	70	dB

Note 1: See thermal regulation specification for changes in output voltage due to heating effects. Line and load regulation are measured at a constant junction temperature by low duty cycle pulse testing. Load regulation is measured at the output lead = 1/18" from the package.

Note 2: Line and load regulation are guaranteed up to the maximum power dissipation of 15W. Power dissipation is determined by the input / output voltage difference and the output current. Guaranteed maximum power dissipation will not be available over the full input / output voltage range.

Note 3: Quiescent current is defined as the minimum output current required to maintain the regulation.

Electrical Characteristics Curve

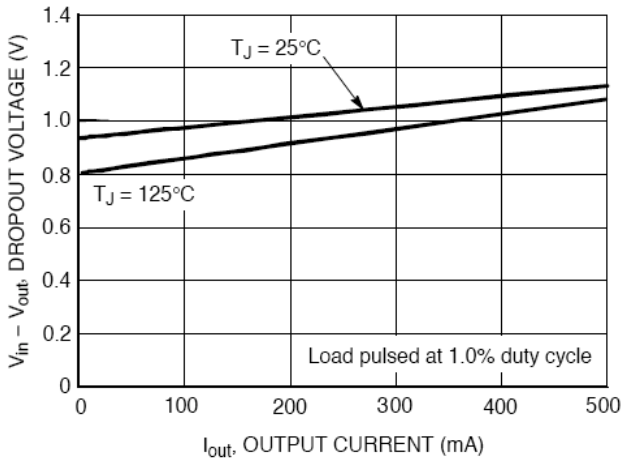


Figure 1. Vdrop vs. Output Current

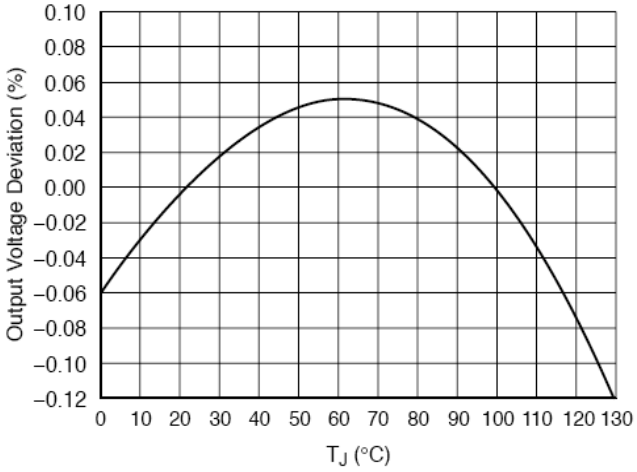


Figure 2. Reference Voltage vs. Temperature

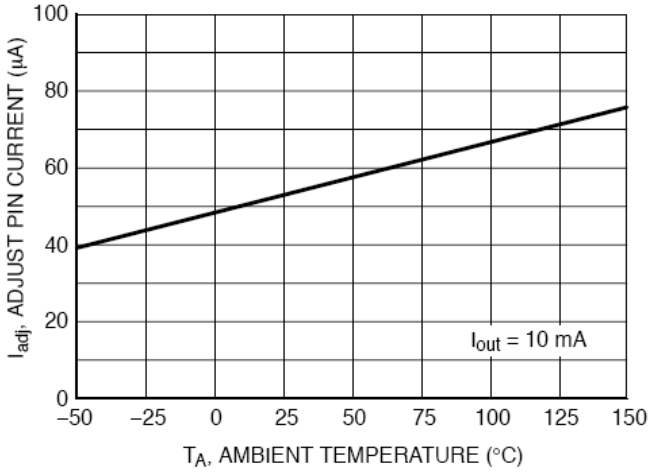


Figure 3. Iadj Pin vs. Temperature

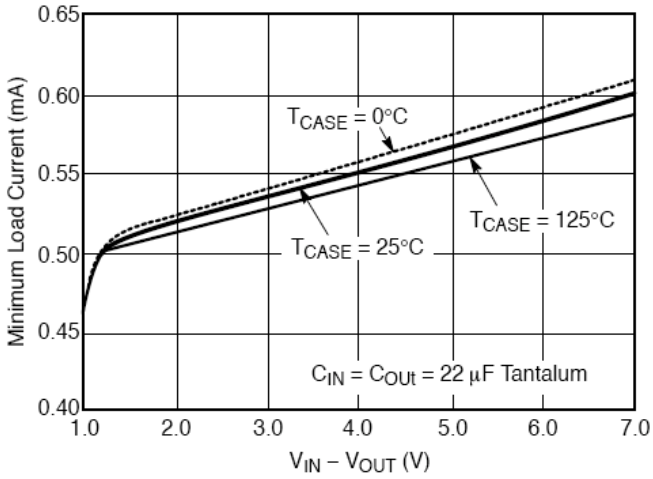


Figure 4. Minimum Load Current

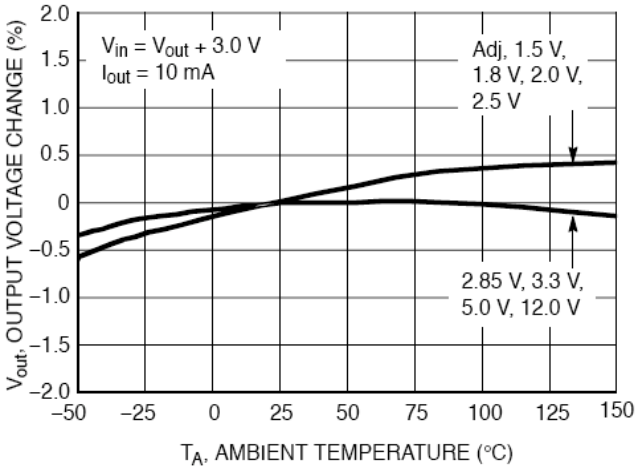


Figure 5. Vout Change vs. Temperature

Application Information

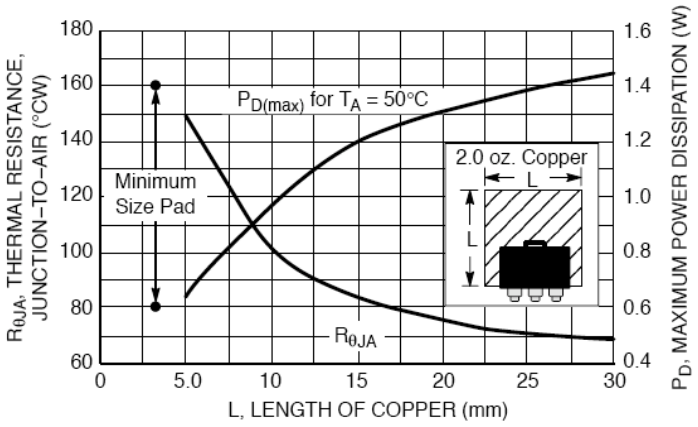


Figure 6 – SOT-223 Thermal Resistance and Maximum Power Dissipation vs. P.C.B Copper Length

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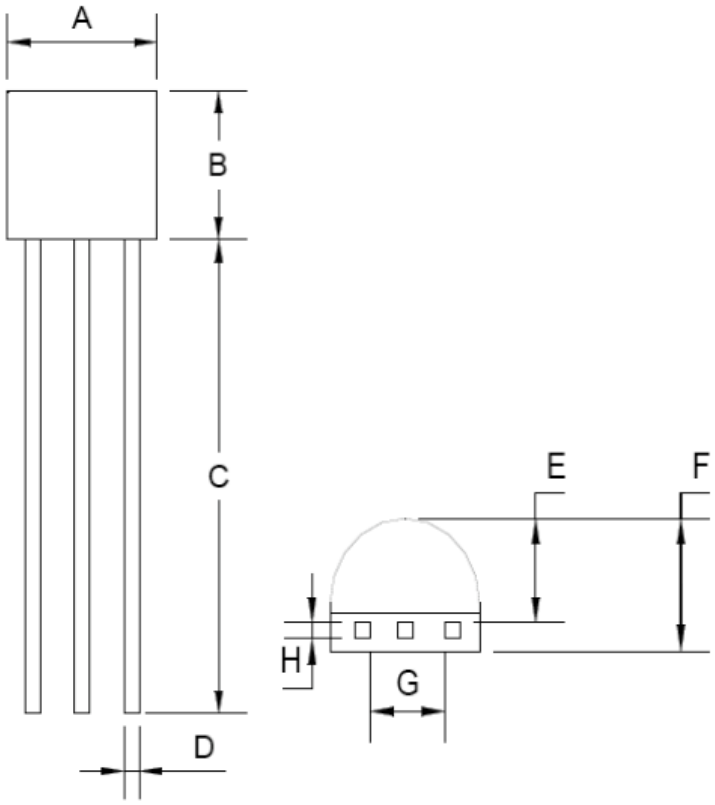
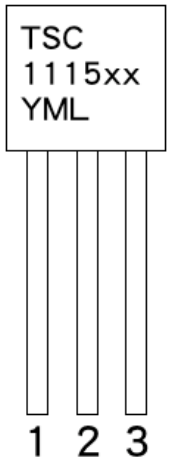
TO-92 Mechanical Drawing



TO-92 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.70	0.169	0.185
B	4.30	4.70	0.169	0.185
C	14.30(typ)		0.563(typ)	
D	0.43	0.49	0.017	0.019
E	2.19	2.81	0.086	0.111
F	3.30	3.70	0.130	0.146
G	2.42	2.66	0.095	0.105
H	0.37	0.43	0.015	0.017

Marking Diagram



XX = Voltage Code
(**15**=1.5V, **18**=1.8V, **25**=2.5V, **33**=3.3V, **50**=5V)
= Leave Blank for Adjustable type
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)
L = Lot Code

TS1115

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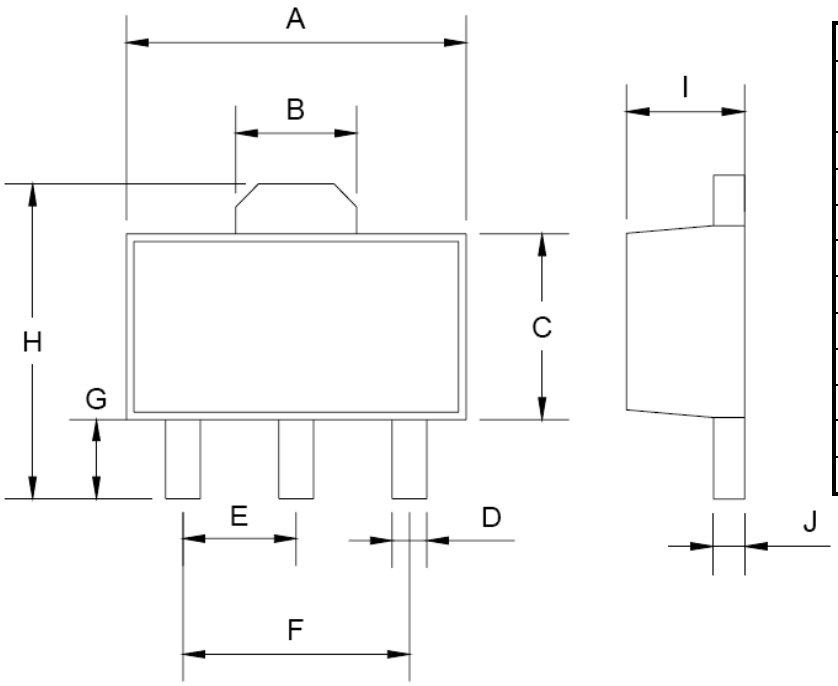
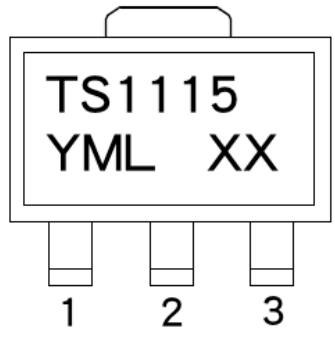
SOT-89 Mechanical Drawing



SOT-89 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.40	4.60	0.173	0.181
B	1.50	1.7	0.059	0.070
C	2.30	2.60	0.090	0.102
D	0.40	0.52	0.016	0.020
E	1.50	1.50	0.059	0.059
F	3.00	3.00	0.118	0.118
G	0.89	1.20	0.035	0.047
H	4.05	4.25	0.159	0.167
I	1.4	1.6	0.055	0.068
J	0.35	0.44	0.014	0.017

Marking Diagram



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= Package Code for Adjustable type
(CY = SOT-89)

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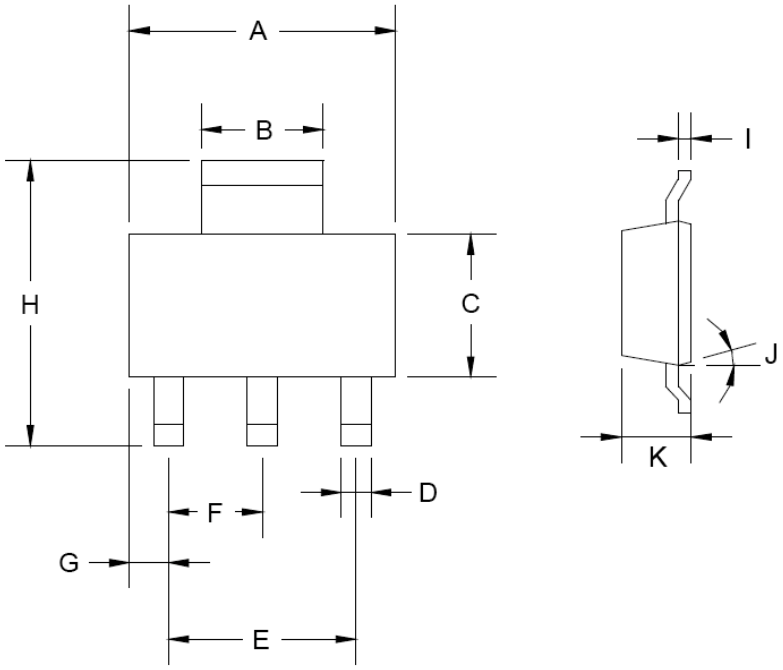
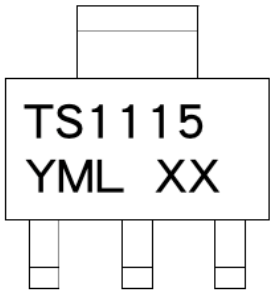
SOT-223 Mechanical Drawing



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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= Package Code for Adjustable type
(CW = SOT-223)

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