TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

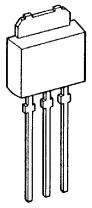
TA48015F

1.5 V

Three-Terminal Low Dropout Voltage Regulator with Output Current of 1 A

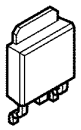
The TA48015F consists of fixed-positive-output, low-dropout regulators with an output current of 1 A (max) that utilize V-PNP transistors for the output stage. This product responds to the need for low-voltage and low-power dissipation devices for use in consumer electronics and industrial appliances.

(1) TA48015F



HSIP3-P-2.30B

(2) TA48015F (TE16L1, N)



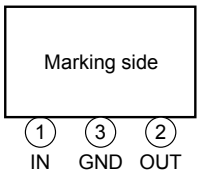
HSOP3-P-2.30D

Weight
HSIP3-P-2.30B : 0.36 g (typ.)
HSOP3-P-2.30D : 0.36 g (typ.)

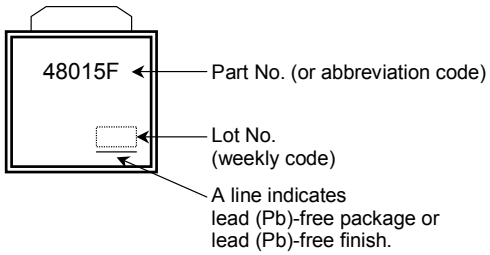
Features

- Maximum output current: 1 A
- Output voltage accuracy: V_{OUT} ± 3% (@T_j = 25°C)
- Low standby current: 800 μA (typ.) (@I_{OUT} = 0 A)
- Low starting quiescent current
- Low-dropout voltage: V_D = 0.8 V (max) (@I_{OUT} = 0.5 A)
- Protection function: over-heat/over-current
- Package type: PW-MOLD
- TA48015F has a lead bending type package which is a surface-mountable package and can be used for reflow soldering.

Pin Assignment



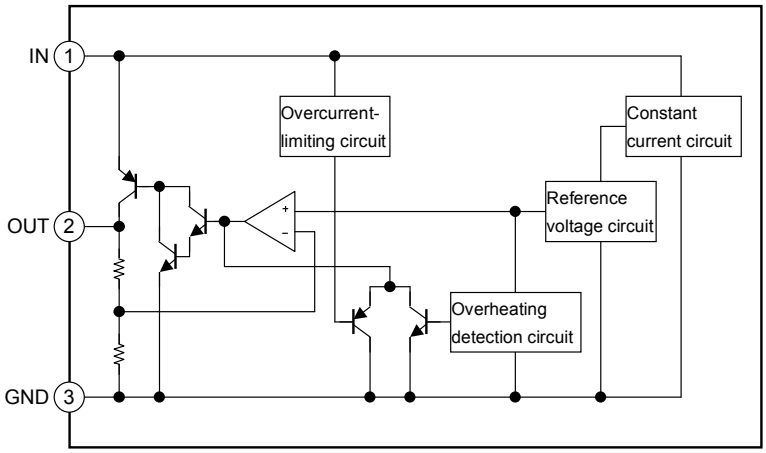
Marking



How to Order

	Product No.	Package	Packing Type and Unit for Orders
(1)	TA48015F	PW-MOLD: Straight-lead package	Loose in bag: 200 (1 bag)
(2)	TA48015F (TE16L1, N)	PW-MOLD: Surface-mount package	Embossed-tape packing: 2000 (1 tape)

Block Diagram



Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
Input voltage		V_{IN}	16	V
Output current		I_{OUT}	1	A
Operating temperature		$Ta_{(opr)}$	−40~85	°C
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	−55~150	°C
Power dissipation	(Ta = 25°C)	P_D	1	W
	(Tc = 25°C)		10	
Thermal resistance	(junction to ambient)	$R_{th\ (j-a)}$	125	°C/W
	(junction to case)	$R_{th\ (j-c)}$	12.5	

Note 1: External current and voltage ((including negative voltage) should not be applied to pins not specified.

Protection Function (reference)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Thermal shutdown	$T_{SD}(T_j)$	—	—	160	—	°C
Peak circuit current	I_{PEAK}	V_{IN} = 3.5 V, T_j = 25°C	—	1.7	—	A
		V_{IN} = 12 V, T_j = 25°C	—	1.8	—	
Short circuit current	I_{SC}	V_{IN} = 3.5 V, T_j = 25°C	—	1.7	—	A
		V_{IN} = 12 V, T_j = 25°C	—	1.8	—	

Note 2: The maximum ratings should not be exceeded when the IC is actually used.

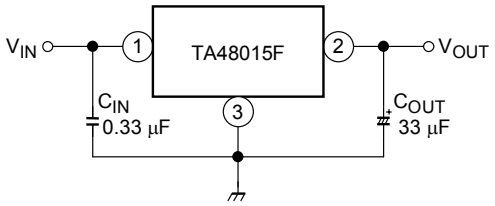
TA48015F
Electrical Characteristics
(Unless otherwise specified, C_{IN} = 0.33 μF, C_{OUT} = 10 μF, T_j = 25°C)

Characteristics	Symbol	Test Conditions	Min	Typ.	Max	Unit
Output voltage	V_{OUT}	V_{IN} = 3.5 V, I_{OUT} = 0.5 A	1.455	1.5	1.545	V
		2.5 V ≦ V_{IN} ≦ 12 V, 5 mA ≦ I_{OUT} ≦ 1 A, 0°C ≦ T_j ≦ 125°C	1.432	1.5	1.568	
Line regulation	Reg·line	2.5 V ≦ V_{IN} ≦ 12 V, I_{OUT} = 0.5 A	—	5	20	mV
Load regulation	Reg·load	V_{IN} = 3.5 V, 5 mA ≦ I_{OUT} ≦ 1 A	—	5	20	mV
Quiescent current	I_B	2.5 V ≦ V_{IN} ≦ 12 V, I_{OUT} = 0 A	—	0.8	1.8	mA
		2.5 V ≦ V_{IN} ≦ 12 V, I_{OUT} = 1 A	—	10	20	
Starting quiescent current	I_{Bstart}	V_{IN} = 2.1 V, I_{OUT} = 0 A	—	0.7	5	mA
		V_{IN} = 2.5 V, I_{OUT} = 1 A	—	10	30	
Output noise voltage	V_{NO}	V_{IN} = 3.5 V, I_{OUT} = 50 mA 10 Hz ≦ f ≦ 100 kHz	—	75	—	μVrms
Ripple rejection	R.R.	2.5 V ≦ V_{IN} ≤ 12 V, I_{OUT} = 50 mA f = 120 Hz	54	70	—	dB
Dropout voltage	V_D	I_{OUT} = 0.5 A	—	0.6	0.8	V
		I_{OUT} = 1 A	—	0.8	—	
Average temperature coefficient of output voltage	T_{CVO}	V_{IN} = 3.5 V, I_{OUT} = 5 mA, 0°C ≦ T_j ≦ 125°C	—	0.14	—	mV/°C

Electrical Characteristics for All Products

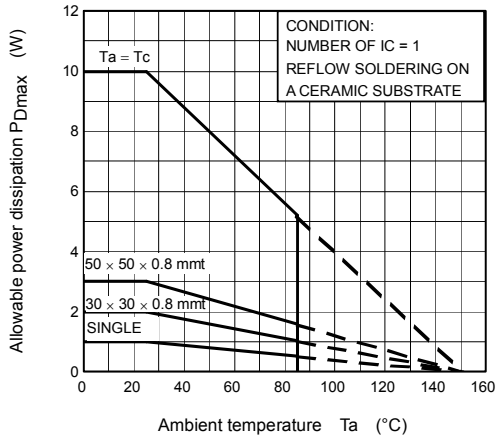
Generally, the characteristics of power supply ICs change according to temperature fluctuations.
The specification T_j = 25℃ is based on a state where temperature increase has no effect (assuming no fluctuation in the characteristics) as ascertained by pulse tests.

Standard Application Circuit

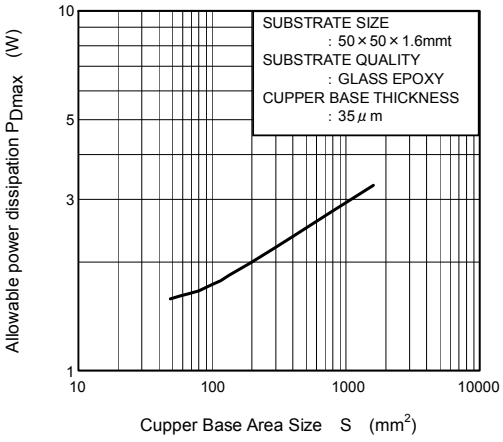


Be sure to connect a capacitor near the input terminal and output terminal between both terminals and GND. The capacitances should be determined experimentally. In particular, adequate investigation should be made so that there is no problem even in high or low temperatures.

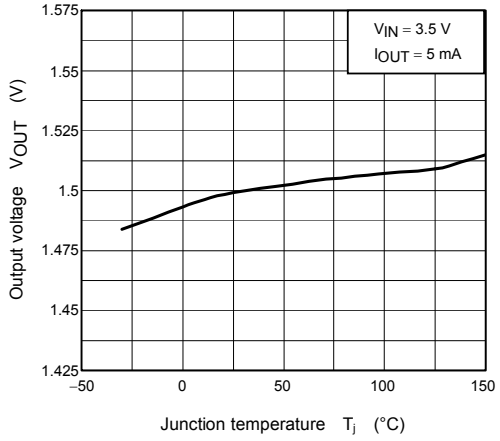
P_{Dmax} – Ta



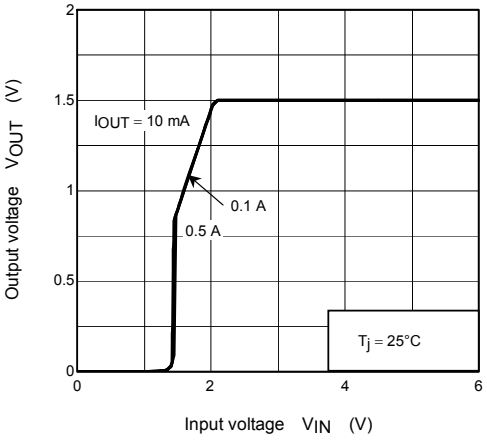
P_{Dmax} – S



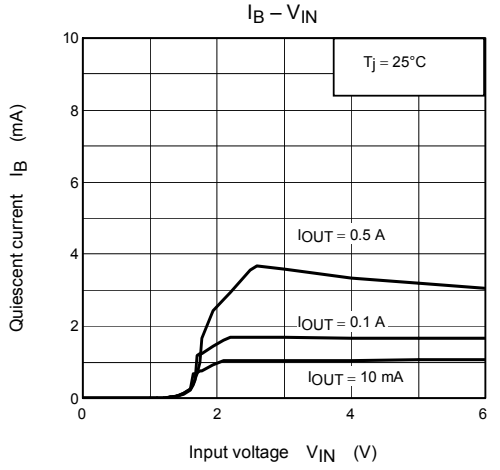
V_{OUT} – T_j



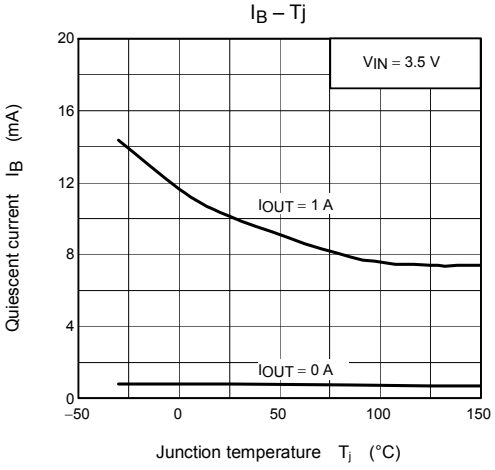
V_{OUT} – V_{IN}



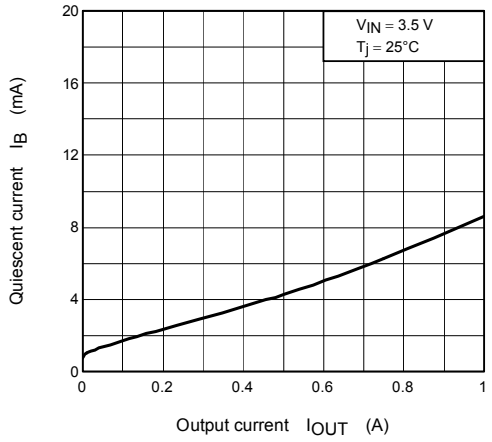
I_B – V_{IN}



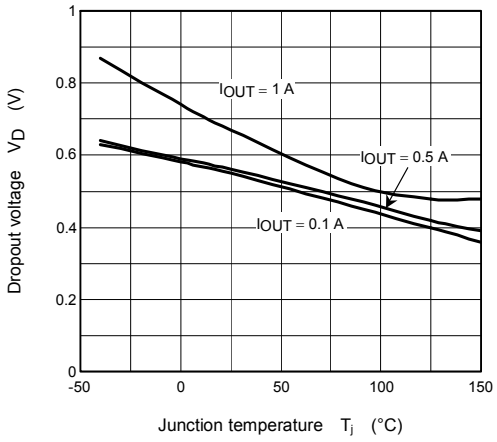
I_B – Tj



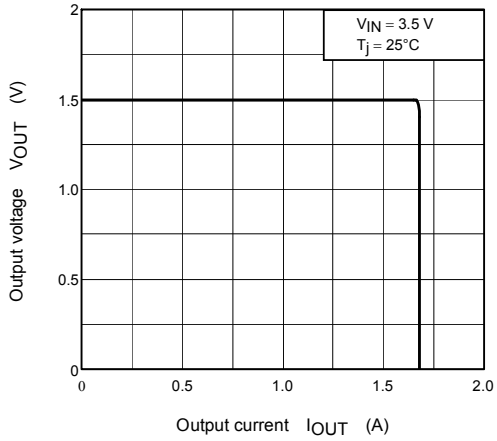
$I_B - I_{OUT}$



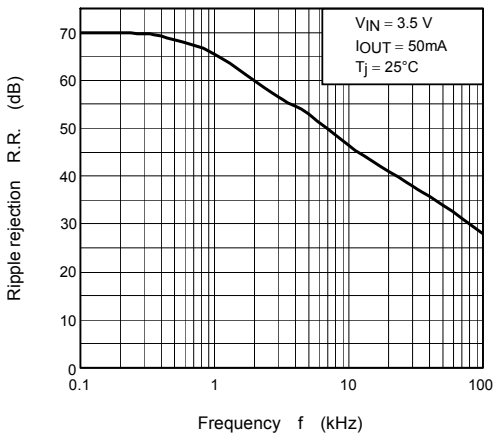
$V_D - T_j$



$V_{OUT} - I_{OUT}$



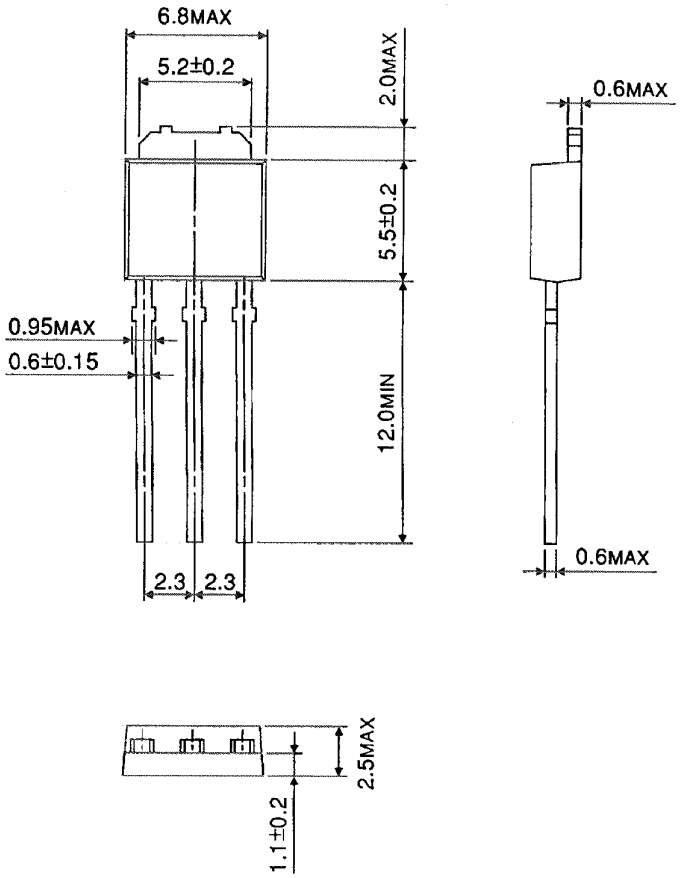
R.R. – f



Package Dimensions

HSIP3-P-2.30B

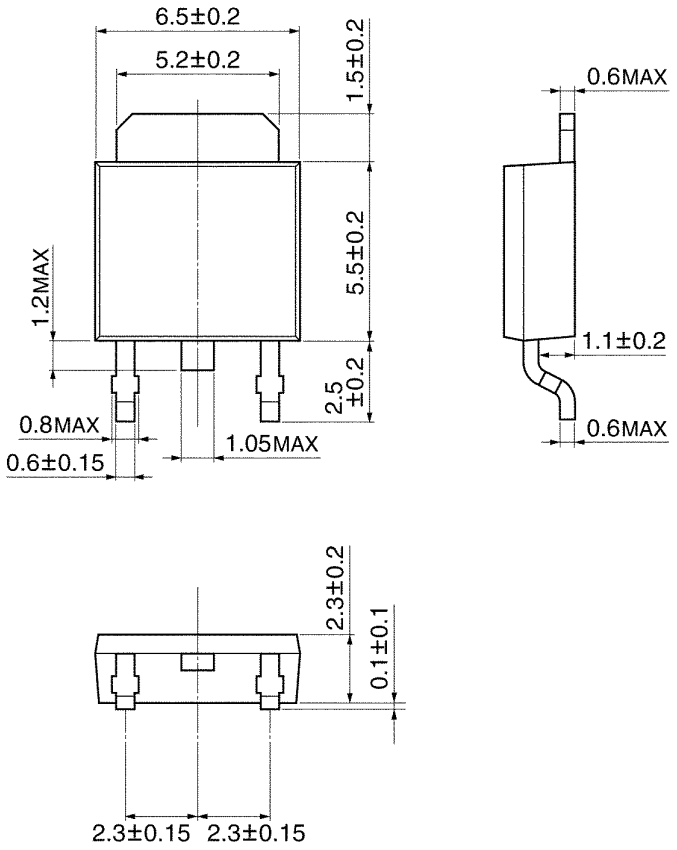
Unit : mm



Weight: 0.36 g (typ.)

Package Dimensions

HSOP3-P-2.30D Unit: mm



Weight: 0.36 g (typ.)

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