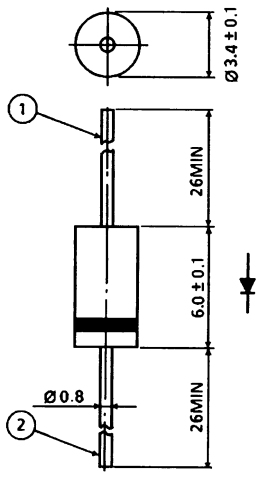
TOSHIBA Rectifier Silicon Diffused Type

1S1830, 1S1885, 1S1887, 1S1888

General Purpose Rectifier Applications

- Average Forward Current: $I_{F\ (AV)}$ = 1.0 A (Ta = 65°C)
- Repetitive Peak Reverse Voltage: V_{RRM} = 100 V, 400 V, 600 V, 1000 V

Unit: mm



JEDEC	DO-15
JEITA	SC-39
TOSHIBA	3-3B1A

Weight: 0.42 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

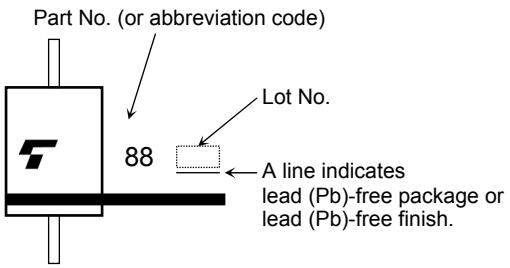
Characteristics		Symbol	Rating	Unit
Repetitive peak reverse voltage	1S1885	V_{RRM}	100	V
	1S1887		400	
	1S1888		600	
	1S1830		1000	
Average forward current (Ta = 65°C)		$I_{F\ (AV)}$	1.0	A
Peak one cycle surge forward current (non repetitive)	1S1830	I_{FSM}	45 (50 Hz)	A
			49 (60 Hz)	
	1S1885 1S1887 1S1888		60 (50 Hz)	
			66 (60 Hz)	
Junction temperature		T_j	−40 to 150	°C
Storage temperature range		T_{stg}	−40 to 150	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings. Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Peak forward voltage	V_{FM}	I_{FM} = 1.5 A	—	—	1.2	V
Repetitive peak reverse current	$I_{RRM\ (1)}$	V_{RRM} = Rated	—	—	10	μA
	$I_{RRM\ (2)}$	V_{RRM} = Rated, T_j = 150°C	—	—	400	
Thermal resistance (junction to ambient)	$R_{th\ (j\text{-}a)}$	DC	—	—	100	°C/W

Marking



Abbreviation Code	Part No.
30	1S1830
85	1S1885
87	1S1887
88	1S1888

Handling Precaution

The absolute maximum ratings denote the absolute maximum ratings, which are rated values and must not be exceeded during operation, even for an instant. The following are the general derating methods that we recommend when you design a circuit with a device.

V_{RRM}: We recommend that the worst case voltage, including surge voltage, be no greater than 80% of the absolute maximum rating of V_{RRM} for a DC circuit and be no greater than 50% of that of V_{RRM} for an AC circuit. V_{RRM} has a temperature coefficient of 0.1%/°C. Take this temperature coefficient into account designing a device at low temperature.

$I_{F(AV)}$: We recommend that the worst case current be no greater than 80% of the absolute maximum rating of $I_{F(AV)}$. Carry out adequate heat design. If you can't design a circuit with excellent heat radiation, set the margin by using an allowable Tamax-$I_{F(AV)}$ curve.

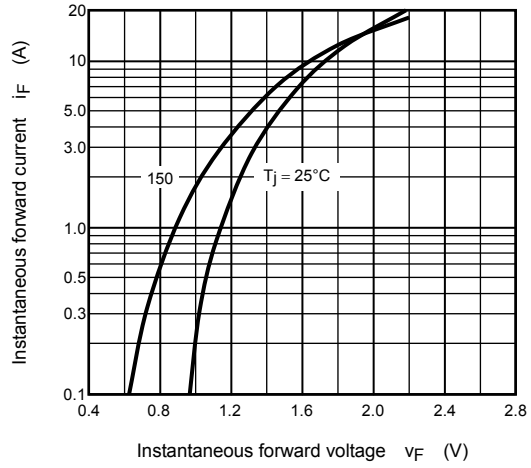
This rating specifies the non-repetitive peak current in one cycle of a 50-Hz sine wave, condition angle 180. Therefore, this is only applied for an abnormal operation, which seldom occurs during the lifespan of the device.

We recommend that a device be used at a Tj of below 120°C under the worst load and heat radiation conditions.

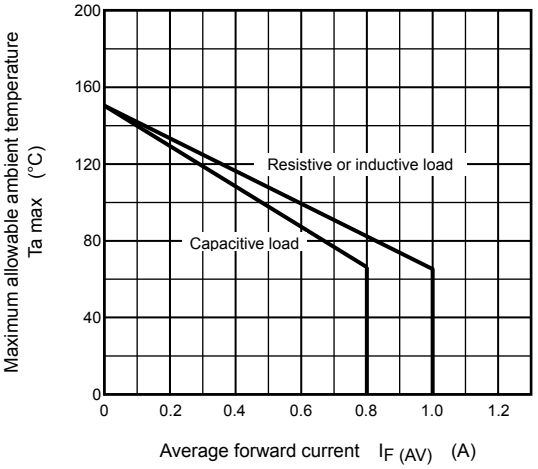
Thermal resistance between junction and ambient fluctuates depending on the device's mounting condition. When using a device, design a circuit board and a soldering land size to match the appropriate thermal resistance value.

Please refer to the Rectifiers databook for further information.

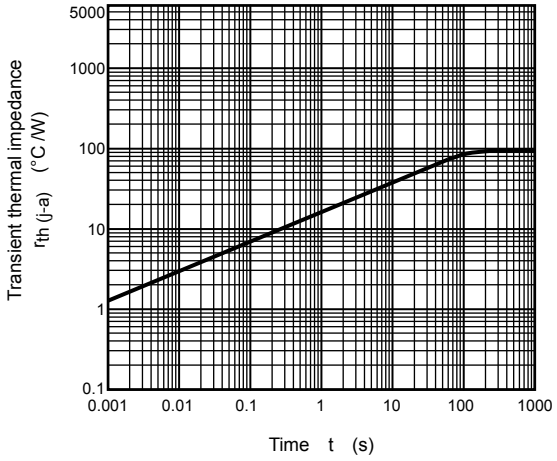
$i_F - v_F$



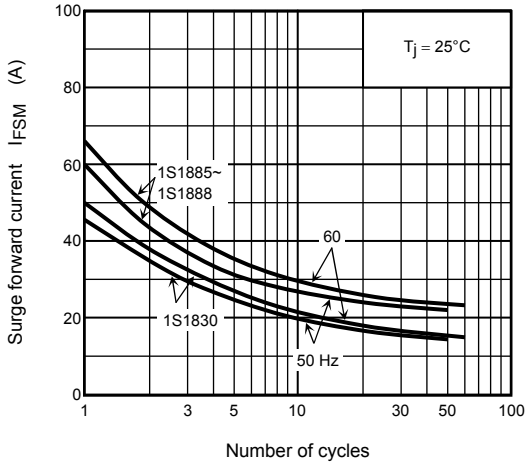
Ta max – $I_{F\ (AV)}$



$r_{th\ (j\text{-}a)} - t$



Surge forward current (non-repetitive)



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