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BAT20J

HIGH EFFICIENCY SWITCHING AND ULTRA LOW LEAKAGE CURRENT SCHOTTKY DIODE

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	1 A
V_{RRM}	23 V
I_R 25°C(max) @ 15V	12 µA
Tj (max)	150 °C





SOD-323

FEATURES AND BENEFITS

- Low conduction losses
- Very low reverse current
- Negligible switching losses
- Low capacitance diode
- Low forward and reverse recovery times
- Extremely fast switching
- Surface mount device

DESCRIPTION

The BAT20J is using 23V schottky barrier diode encapsulated on a SOD-323 package. This is specially suited for switching mode in mobile phone and PDA power management applications or LED driver circuits (step up converters).

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		23	V
$I_{F(RMS)}$	Repetitive peak forward current		2	A
$I_{F(AV)}$	Average forward current	$\delta = 0.38$	1	A
I_{FSM}	Surge non repetitive forward current (t_p=10ms sinusoidal)		5	A
T_{stg}	Maximum storage temperature range		- 65 to +150	°C
Tj	Maximum operating junction temperature *		150	°C
TL	Maximum temperature for soldering during *		260	°C

* : $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ thermal runaway condition for a diode on its own heatsink

Order code

Part Number	Marking
BAT20JFILM	20

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THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
$R_{th\ (j-a)}$	Junction to Ambient (*)	600	°C/W

(*) Mounted on epoxy board without copper heat sink.

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameters	Tests conditions		Min.	Typ.	Max.	Unit
I_R *	Reverse leakage current (see **note 1**)	Tj = 25°C	V_R = 5 V V_R = 8 V V_R = 15 V		0.65 0.88 3.00	2 3 12	µA
I_R *	Reverse leakage current	Tj = 85°C	V_R = 5 V V_R = 8 V V_R = 15 V		55 70 120	120 150 250	
V_F **	Forward voltage drop	Tj = 25°C	I_F = 10 mA I_F = 100 mA I_F = 1 A		0.28 0.35 0.54	0.31 0.40 0.62	V

* Pulse test tp = 380 µs, $\delta < 2\%$

** Pulse test tp = 5 ms, $\delta < 2\%$

Note 1: I_R at 23 V and Tj = 25°C is equal to 60 µA typ.

DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameters	Tests conditions	Min.	Typ.	Max.	Unit
C_d	Diode capacitance	V_R = 5 V F = 1 MHz		20	30	pF

To evaluate the maximum conduction losses, use the following equations :

$P = 0.32 \times I_{F(AV)} + 0.23 \times I_F{}^2{}_{(RMS)}$

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Fig. 1: Peak forward current versus ambient temperature (δ = 0.11).

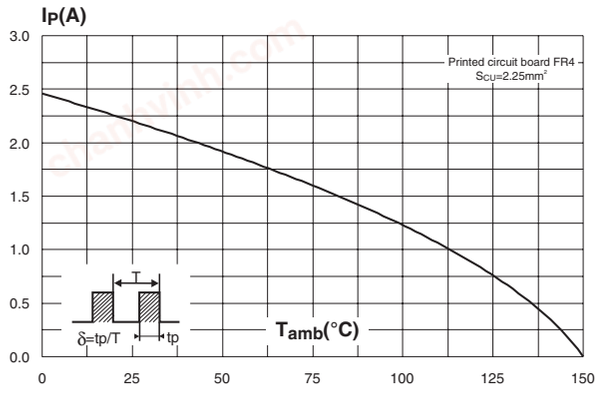


Fig. 2: Average forward current versus ambient temperature (δ = 0.5).

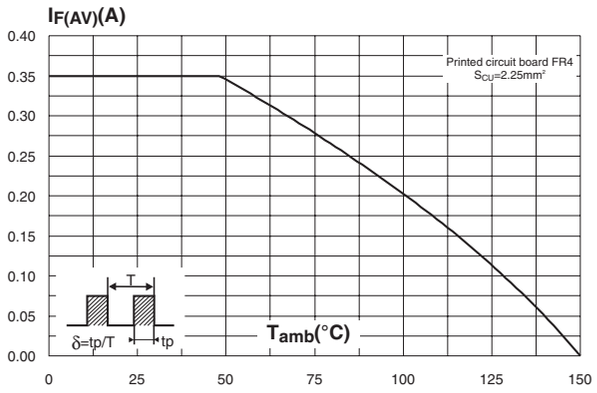


Fig. 3: Relative variation of thermal impedance junction to ambient versus pulse duration .

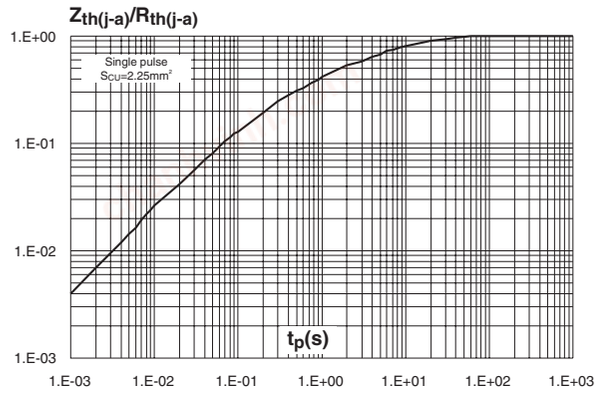


Fig. 4: Reverse leakage currrent versus reverse voltage applied (typical values).

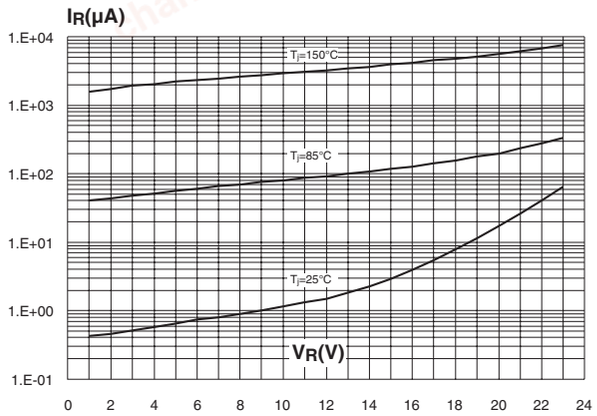


Fig. 5: Relative variation of reverse leakage currrent versus junction temperature (typical values).

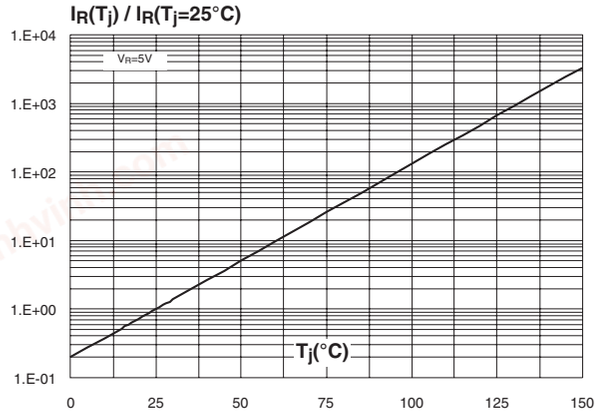
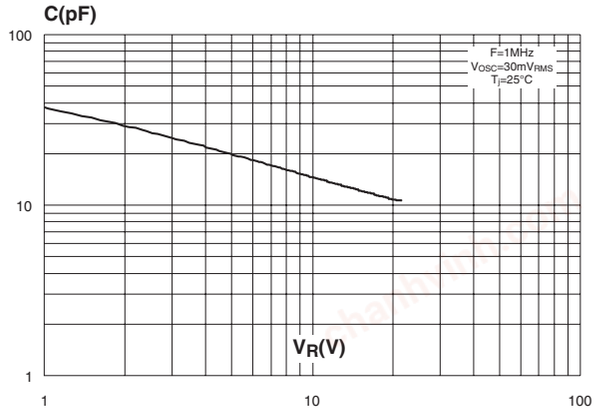


Fig. 6: Junction capacitance versus reverse voltage applied (typical values).



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Fig. 7-1: Forward voltage drop versus forward current (typical values, high level).

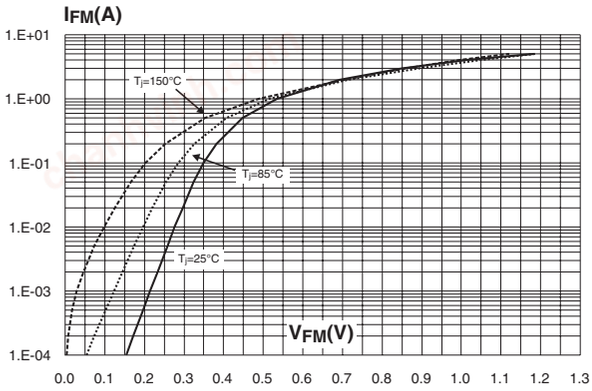


Fig. 7-2: Forward voltage drop versus forward current (low level).

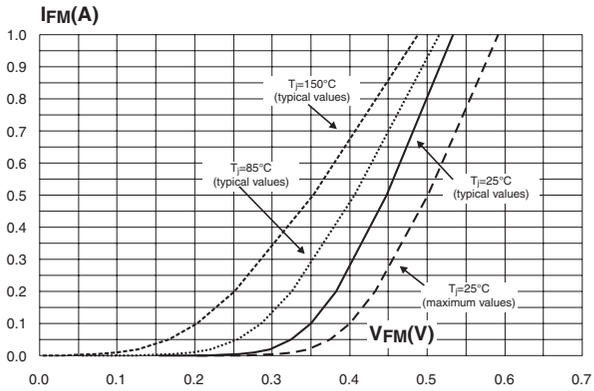


Fig. 8: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed circuit board FR4, e_{CU}=35µm, typical values).

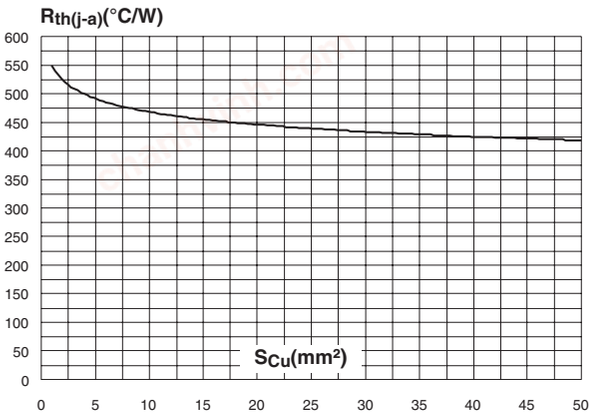
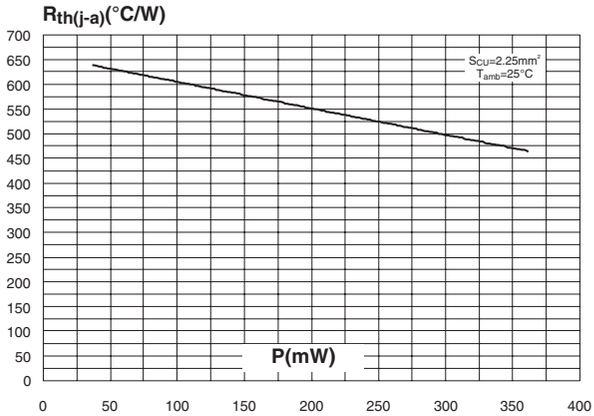


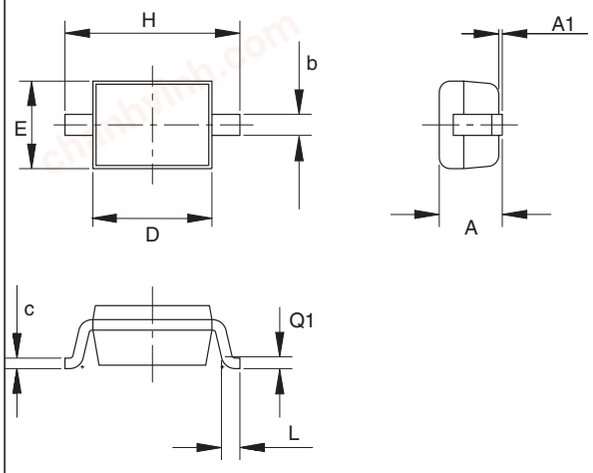
Fig. 9: Thermal resistance junction to ambient versus power dissipation (epoxy printed circuit board FR4, e_{CU}=35µm, typical values).



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PACKAGE MECHANICAL DATA

SOD-323



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		1.13		0.045
A1	0	0.1	0	0.004
b	0.25	0.44	0.01	0.017
c	0.1	0.25	0.004	0.01
D	1.52	1.8	0.06	0.071
E	1.11	1.35	0.044	0.053
H	2.3	2.7	0.09	0.106
L	0.1	0.46	0.004	0.02
Q1	0.1	0.41	0.004	0.016

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
BAT20JFILM	20	SOD-323	0.005g	3000	Tape & reel

- Epoxy meets UL94,V0

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