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BAT46WS
Schottky Diodes

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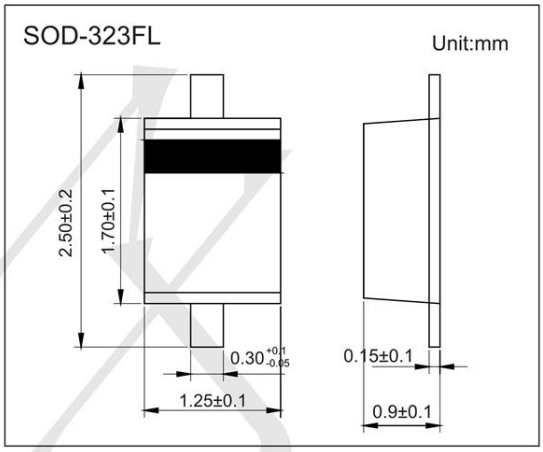
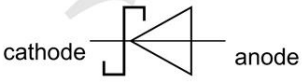
Features

- Low forward voltage
- Reverse voltage $V_R \leqslant 100$ V
- Low capacitance
- High-speed switching
- Very small and flat lead SMD plastic package





■ Absolute Maximum Ratings Ta = 25℃

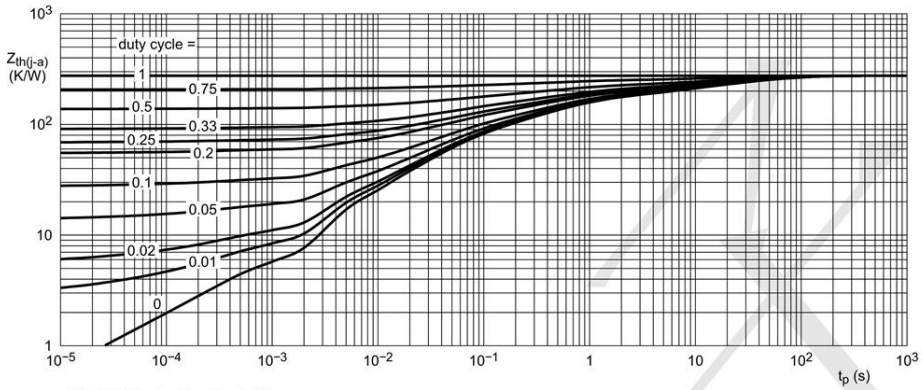
Parameter		Symbol	Rating	Unit
Reverse Voltage		V_{RM}	100	V
Forward Current		I_F	250	mA
Non-Repetitive Peak Forward Current		I_{FSM}	2.5	A
Power Dissipation	(Note.1)	P_d	400	mW
	(Note.2)		715	
Thermal Resistance Junction to Ambient	(Note.1)	$R_{\theta JA}$	310	℃/W
	(Note.2)		175	
Thermal Resistance Junction to Solder Point		$R_{\theta JSP}$	35	
Junction Temperature		T_J	150	℃
Storage Temperature range		T_{stg}	-65 to 150	

Note.1:Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

Note.2:Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^3.

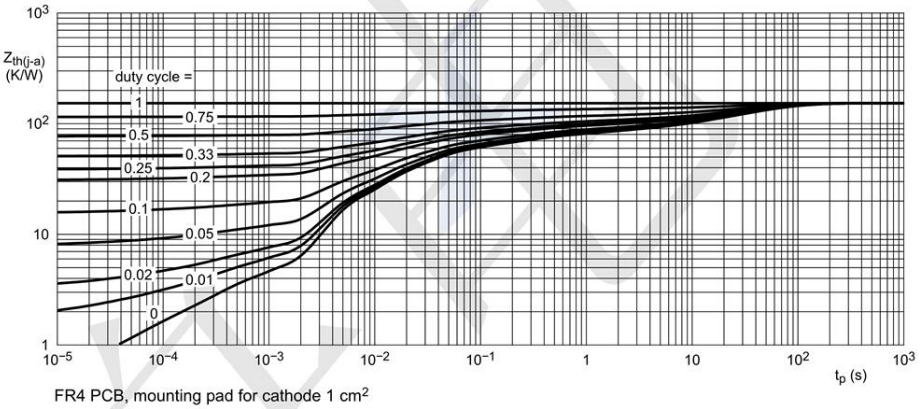
■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reverse breakdown voltage	V_R	I_R= 100 uA	100			V
Forward voltage	V_F	I_F= 0.1 mA			200	mV
		I_F= 10 mA			350	
		I_F= 10 mA , T_J = -40℃			470	
		I_F= 50 mA			475	
		I_F= 50 mA , T_J = -40℃			560	
		I_F= 250 mA			850	
Reverse voltage leakage current	I_R	V_R= 1.5 V			0.5	uA
		V_R= 1.5 V , T_J = 60℃			12	
		V_R= 10 V			0.8	
		V_R= 10 V , T_J = 60℃			20	
		V_R= 50 V			2	
		V_R= 50 V , T_J = 60℃			44	
		V_R= 75 V			4	
		V_R= 75 V , T_J = 60℃			80	
		V_R= 100 V			9	
		V_R= 100 V , T_J = 60℃			120	
		V_R= 100 V , T_J = 85℃			600	
Junction capacitance	C_j	V_R= 0 V, f= 1 MHz			39	pF
		V_R= 1 V, f= 1 MHz			21	
Reverse recovery time	t_{rr}	I_F=I_R=10mA,Irr=0.1xI_R, R_L=100Ω			5.9	ns



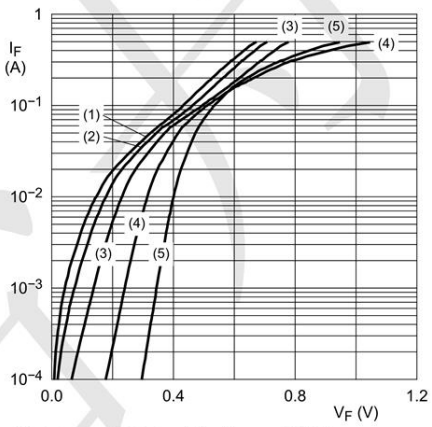
FR4 PCB, standard footprint

Fig 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values



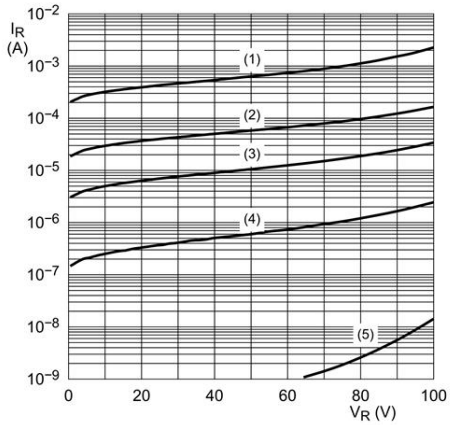
FR4 PCB, mounting pad for cathode 1 cm^2

Fig 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values



(1) T_{amb} = 150 °C (4) T_{amb} = 25 °C
(2) T_{amb} = 125 °C (5) T_{amb} = -40 °C
(3) T_{amb} = 85 °C

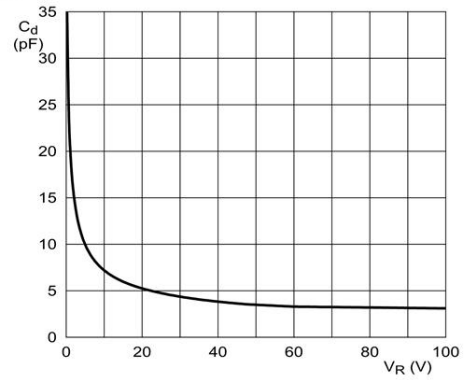
Fig 3. Forward current as a function of forward voltage; typical values



(1) T_{amb} = 125 °C (4) T_{amb} = 25 °C
(2) T_{amb} = 85 °C (5) T_{amb} = - 40 °C
(3) T_{amb} = 60 °C

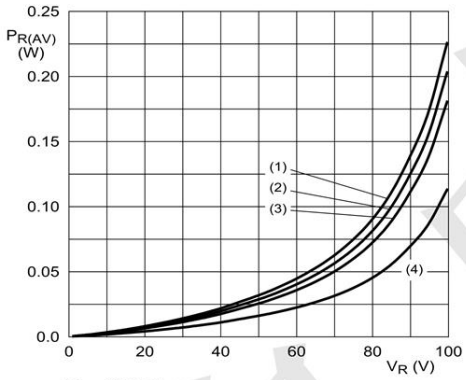
Fig 4. Reverse current as a function of reverse voltage; typical values

■ Typical Characterisitics



f = 1 MHz; T_{amb} = 25 C

Fig 5. Diode capacitance as a function of reverse voltage; typical values

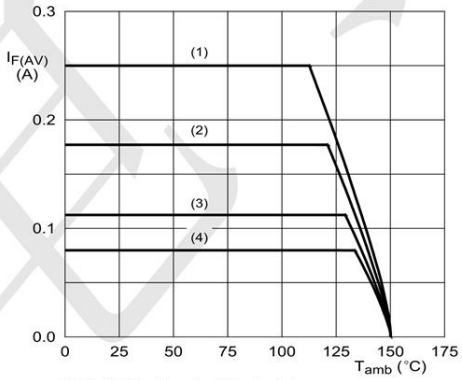


T_j = 125 °C

(1) δ = 1 (3) δ = 0.8

(2) δ = 0.9 (4) δ = 0.5

Fig 6. Average reverse power dissipation as a function of reverse voltage; typical values



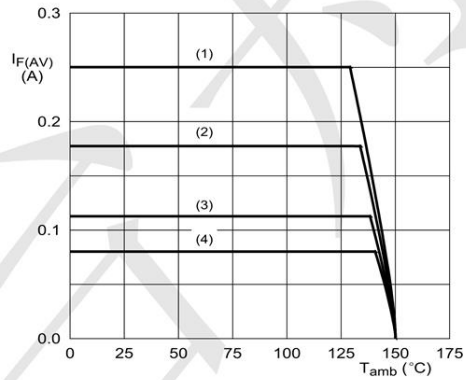
FR4 PCB, standard footprint

T_j = 150 °C

(1) δ = 1; DC (3) δ = 0.2; f = 20 kHz

(2) δ = 0.5; f = 20 kHz (4) δ = 0.1; f = 20 kHz

Fig 7. Average forward current as a function of ambient temperature; typical values



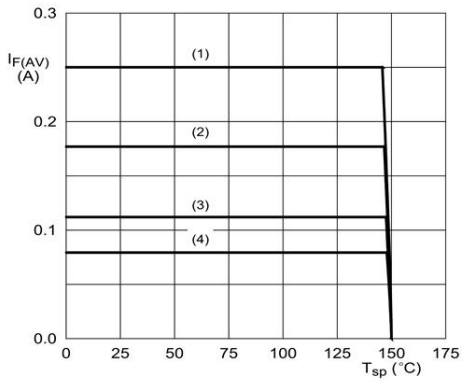
FR4 PCB, mounting pad for cathode 1 cm^2

T_j = 150 °C

(1) δ = 1; DC (3) δ = 0.2; f = 20 kHz

(2) δ = 0.5; f = 20 kHz (4) δ = 0.1; f = 20 kHz

Fig 8. Average forward current as a function of ambient temperature; typical values

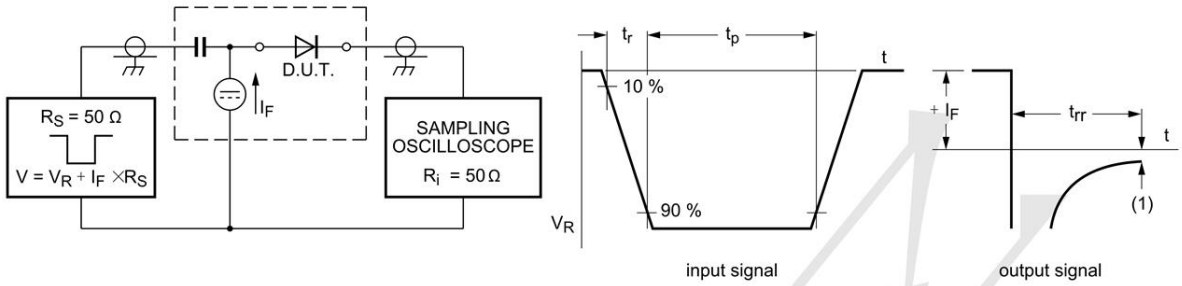


T_j = 150 °C

(1) δ = 1; DC (3) δ = 0.2; f = 20 kHz

(2) δ = 0.5; f = 20 kHz (4) δ = 0.1; f = 20 kHz

Fig 9. Average forward current as a function of solder point temperature; typical values



(1) I_R = 1 mA

Input signal: reverse pulse rise time t_r = 0.6 ns; reverse voltage pulse duration t_p = 100 ns; duty cycle δ = 0.05

Oscilloscope: rise time t_r = 0.35 ns

Fig 10. Reverse recovery time test circuit and waveforms

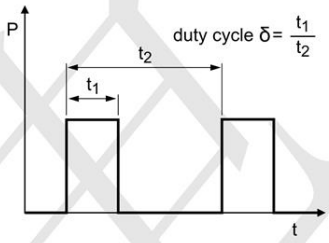
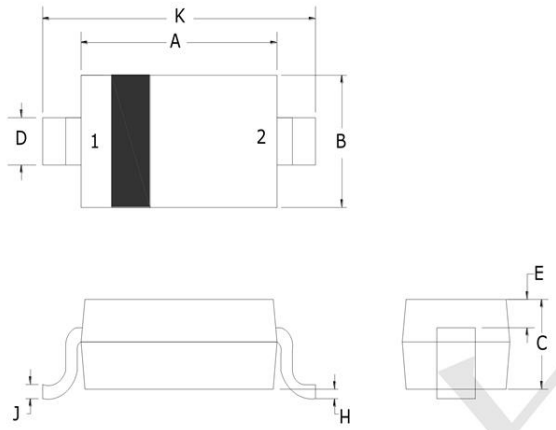


Fig 11. Duty cycle definition

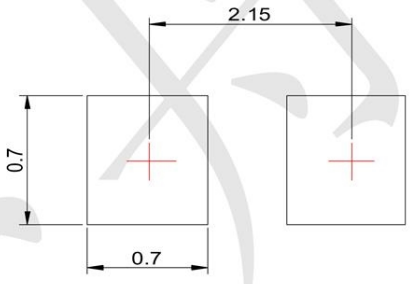
The current ratings for the typical waveforms as shown in Figure 7, 8 and 9 are calculated according to the equations: $I_{FAV} = I_M X\delta$ with I_M defined as peak current, $I_{RMS} = I_{F(AV)}$ at DC, and $I_{RMS} = I_M X \sqrt{\delta}$ with I_{RMS} defined as RMS current.

Outline Drawing - SOD-323



Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	1.60	1.80	0.063	0.071
B	1.2	1.40	0.047	0.055
C	0.80	0.90	0.031	0.035
D	0.25	0.35	0.010	0.014
E	0.15REF		0.006REF	
H	0	0.10	0	0.004
J	0.08	0.15	0.003	0.006
K	2.50	2.70	0.098	0.106

Land Pattern - SOD-323



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