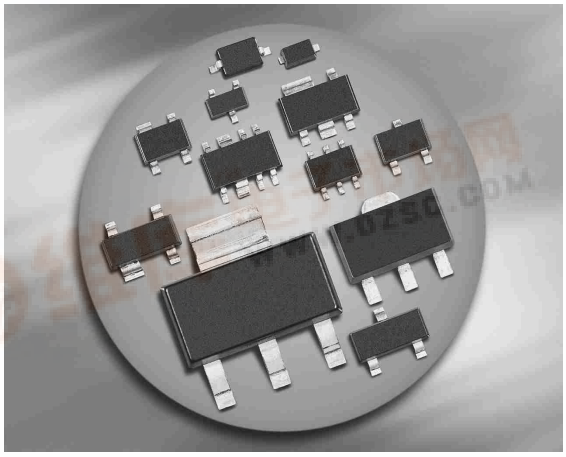
Silicon RF Switching Diode

- Designed for use in shunt configuration in high performance RF switches
- High shunt signal isolation
- Low shunt insertion loss
- Optimized for short - open transformation using λ/4 lines



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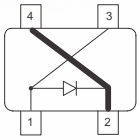


Type	Package	Configuration	L_S(nH)	Marking
BAR81W	SOT343	single shunt-diode	0.15*	BBs

* series inductance chip to ground

Maximum Ratings at T_A = 25°C, unless otherwise specified

Parameter	Symbol	Value	Unit
Diode reverse voltage	V_R	30	V
Forward current	I_F	100	mA
Total power dissipation $T_s \leq 138$°C	P_{tot}	100	mW
Junction temperature	T_j	150	°C
Operating temperature range	T_{op}	-55 ... 125	
Storage temperature	T_{stg}	-55 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point[1)]	R_{thJS}	≤ 120	K/W

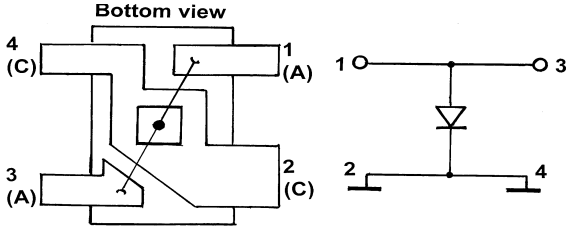
[1]For calculation of R_{thJA} please refer to Application Note Thermal Resistance

Electrical Characteristics at T_A = 25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Reverse current V_R = 20 V	I_R	-	-	20	nA
Forward voltage I_F = 100 mA	V_F	-	0.93	1	V
AC Characteristics					
Diode capacitance V_R = 1 V, f = 1 MHz V_R = 3 V, f = 1 MHz	C_T	 - -	 0.6 0.57	 1 0.9	pF
Forward resistance I_F = 5 mA, f = 100 MHz	r_f	-	0.7	1	Ω
Charge carrier life time I_F = 10 mA, I_R = 6 mA, measured at I_R = 3 mA, R_L = 100 Ω	τ_{rr}	-	80	-	ns
I-region width	W_I	-	3.5	-	µm
Shunt insertion loss[1)] V_R = 3 V, f = 1.89 GHz	$\lvert S_{21}\rvert^2$	-	0.7	-	dB
Shunt isolation[1)] I_F = 10 mA , f = 1.89 GHz	$\lvert S_{21}\rvert^2$	-	30	-	

Configuration of the shunt-diode

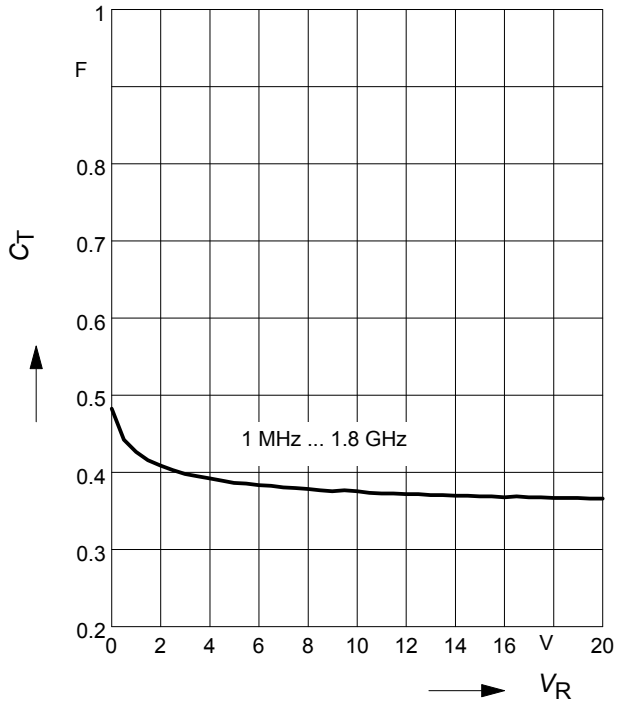
- A perfect ground is essential for optimum isolation
- The anode pins should be used as passage for RF



[1]For more information please refer to Application Note 049.

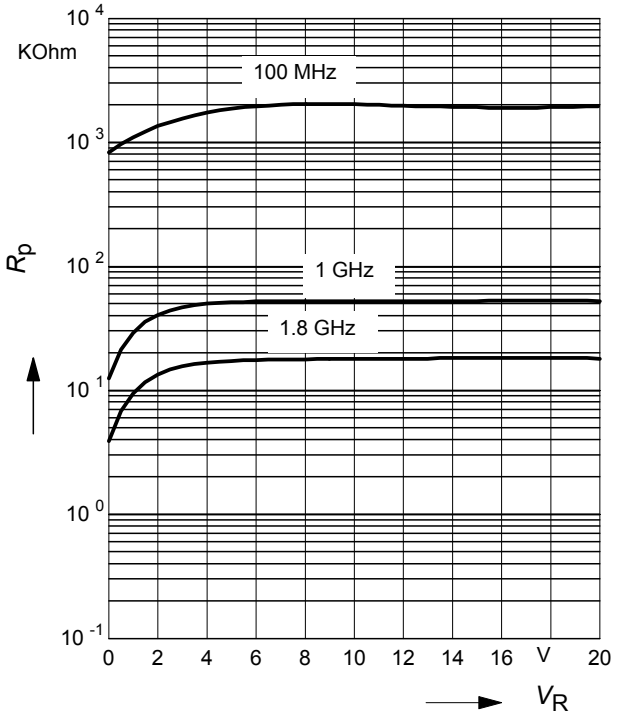
Diode capacitance $C_T = f(V_R)$

f = Parameter



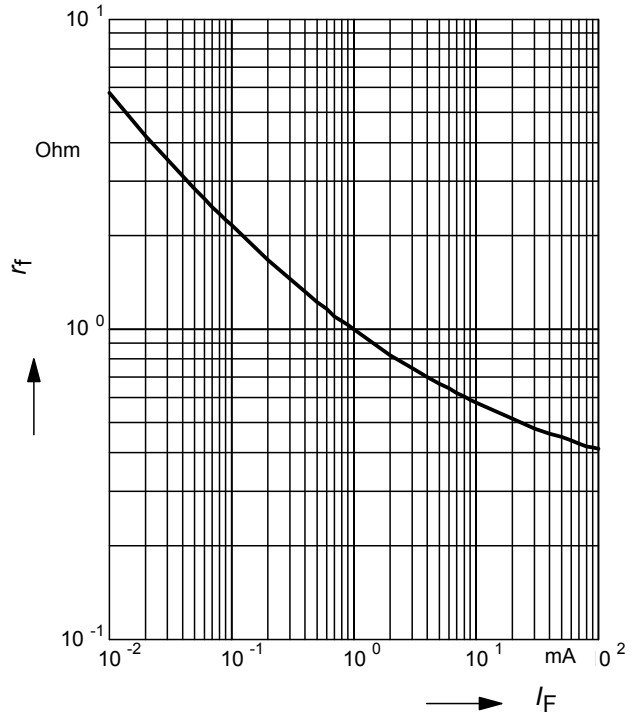
Reverse parallel resistance $R_P = f(V_R)$

f = Parameter



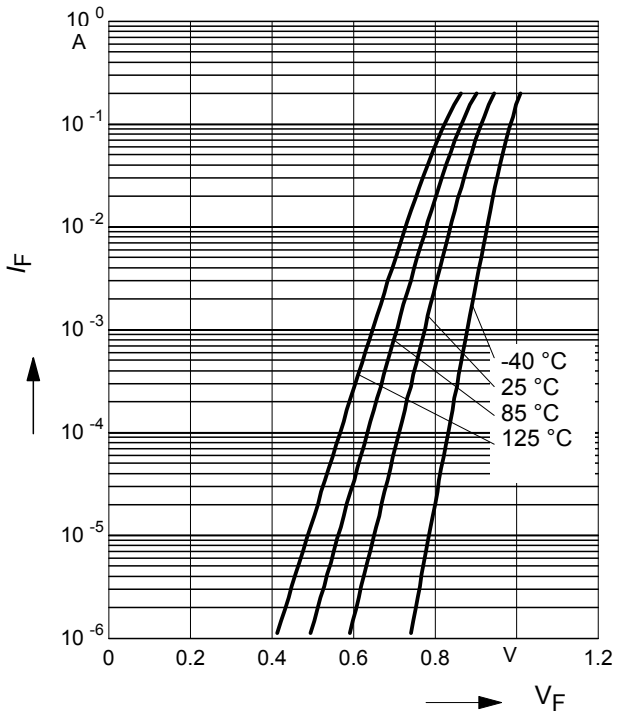
Forward resistance $r_f = f(I_F)$

f = 100MHz



Forward current $I_F = f(V_F)$

T_A = Parameter



Forward current $I_F = f(T_S)$

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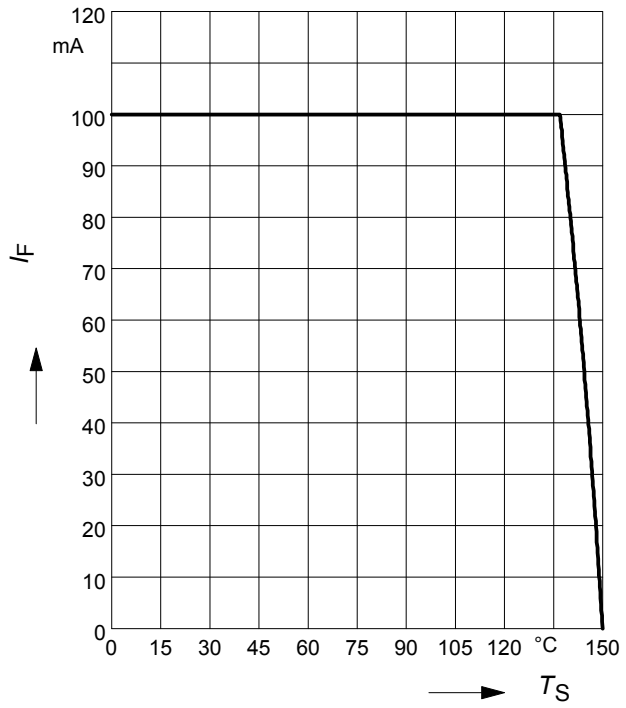

Permissible Puls Load $R_{thJS} = f(t_p)$

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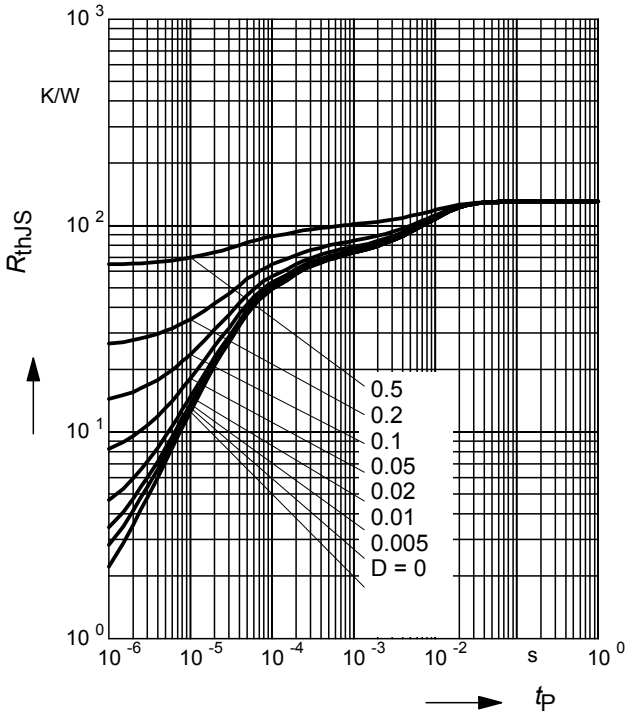

Permissible Pulse Load

$I_{Fmax}/I_{FDC} = f(t_p)$ BAR81W