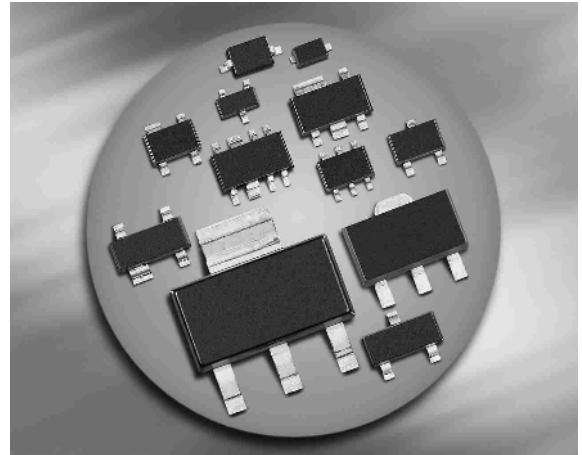
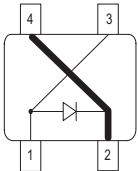


Silicon RF Switching Diode

- 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 $\lambda/4$ lines
- Pb-free (RoHS compliant) package



BAR81W



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

* series inductance chip to ground

Maximum Ratings at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Value	Unit
Diode reverse voltage	V_R	30	V
Forward current	I_F	100	mA
Total power dissipation $T_S \leq 138^\circ\text{C}$	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 $T_A = 25^\circ\text{C}$, unless otherwise specified

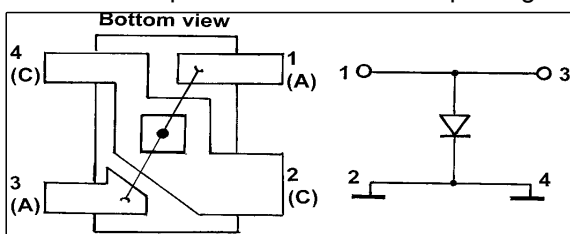
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Reverse current $V_R = 20\text{ V}$	I_R	-	-	20	nA
Forward voltage $I_F = 100\text{ mA}$	V_F	-	0.93	1	V

AC Characteristics

Diode capacitance $V_R = 1\text{ V}, f = 1\text{ MHz}$ $V_R = 3\text{ V}, f = 1\text{ MHz}$	C_T	-	0.6	1	pF
		-	0.57	0.9	
Forward resistance $I_F = 5\text{ mA}, f = 100\text{ MHz}$	r_f	-	0.7	1	Ω
Charge carrier life time $I_F = 10\text{ mA}, I_R = 6\text{ mA}$, measured at $I_R = 3\text{ mA}$, $R_L = 100\ \Omega$	τ_{rr}	-	80	-	ns
I-region width	W_I	-	3.5	-	μm
Shunt Insertion loss ¹⁾ $I_F = 10\text{ mA}, f = 1.89\text{ GHz}$	I_L	-	30	-	dB
Shunt isolation ¹⁾ $V_R = 3\text{ V}, f = 1.89\text{ GHz}$	I_{SO}	-	0.7	-	

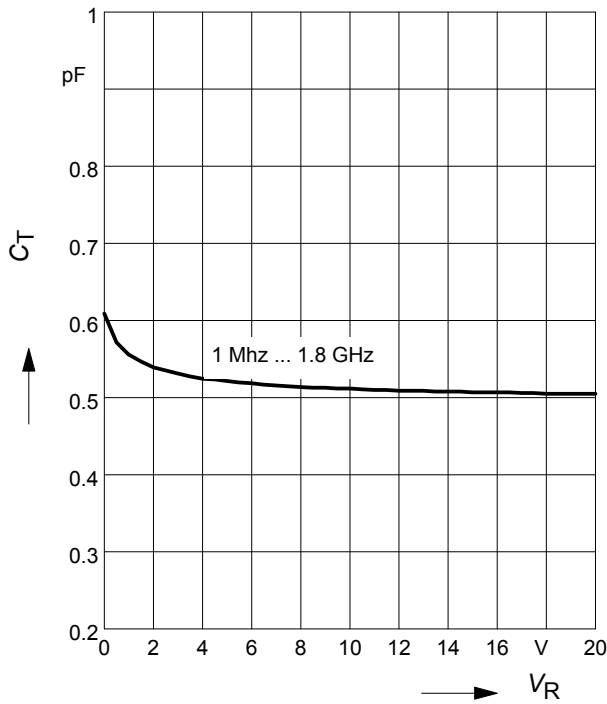
Configuration of the shunt-diode

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


¹For more information please refer to Application Note 049.

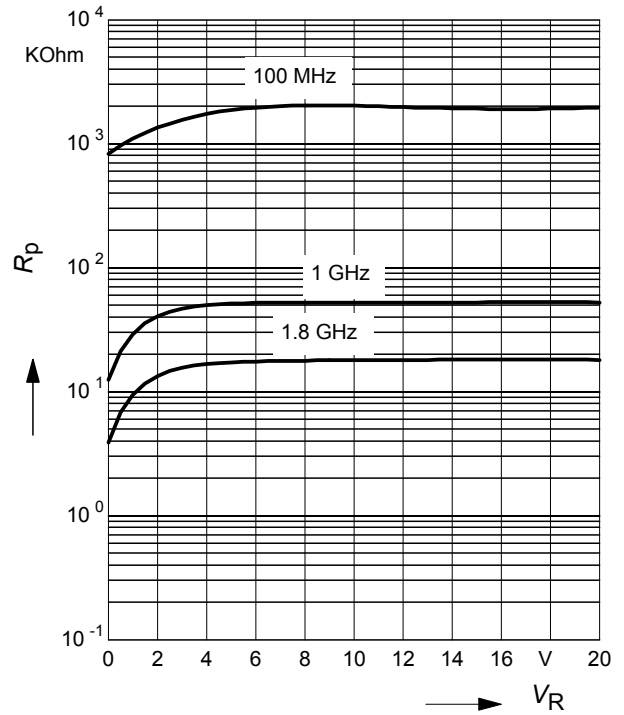
Diode capacitance $C_T = f(V_R)$

$f = \text{Parameter}$



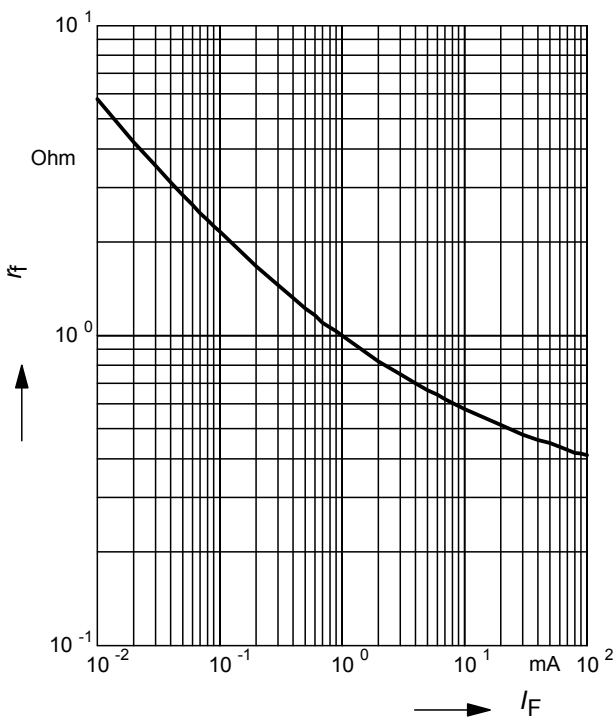
Reverse parallel resistance $R_P = f(V_R)$

$f = \text{Parameter}$



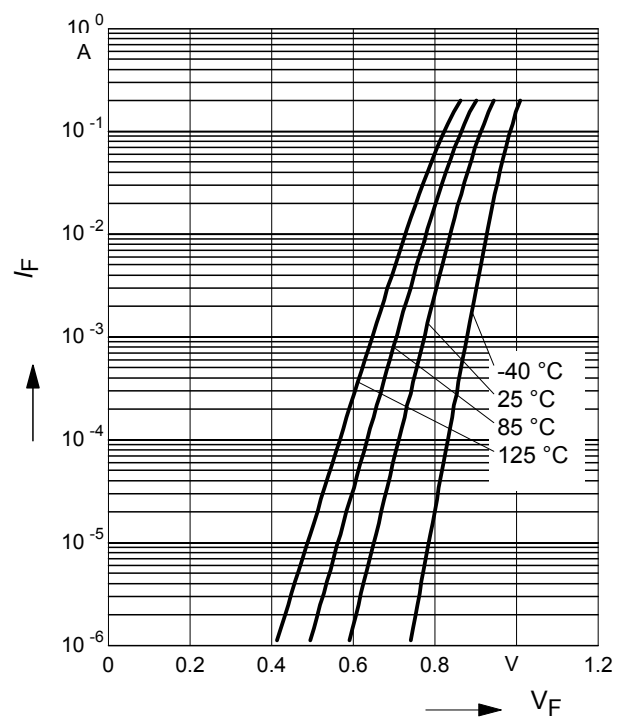
Forward resistance $r_f = f(I_F)$

$f = 100\text{MHz}$



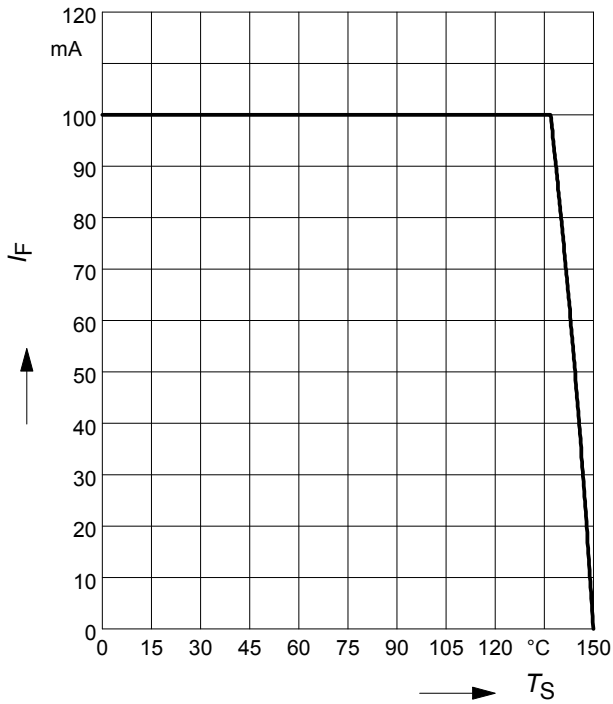
Forward current $I_F = f(V_F)$

$T_A = \text{Parameter}$



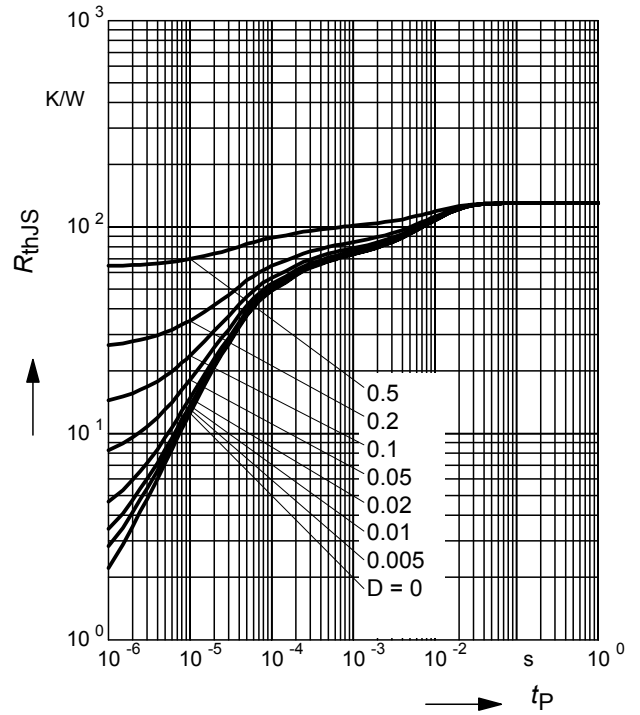
Forward current $I_F = f(T_S)$

BAR81W



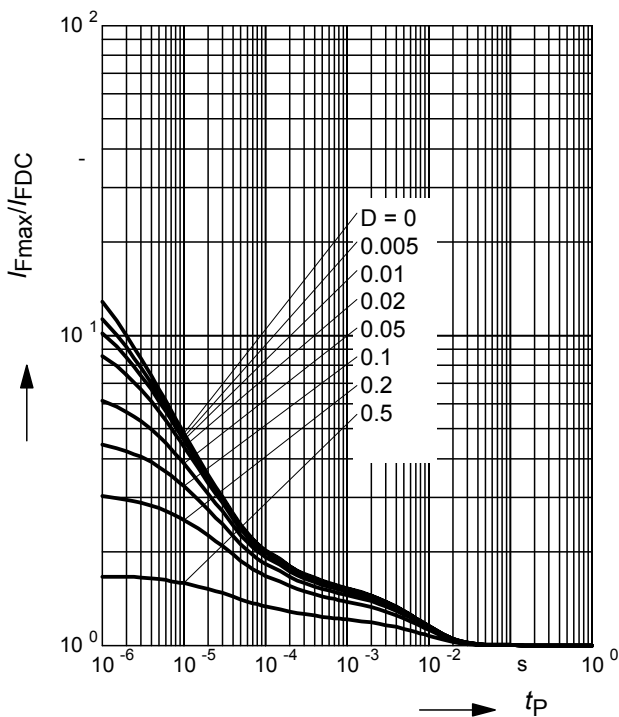
Permissible Puls Load $R_{thJS} = f(t_p)$

BAR81W



Permissible Pulse Load

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



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