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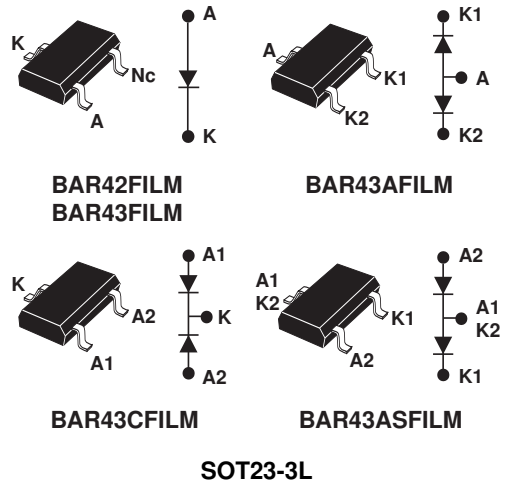
BAR42
BAR43

Small signal Schottky diode

Datasheet - production data



BAR42FILM
BAR43FILM

BAR43AFILM

BAR43CFILM

BAR43ASFILM

SOT23-3L

Description

General purpose metal to silicon diodes featuring very low turn-on voltage and fast switching.

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	0.1 A
V_{RRM}	30 V
T_j	150 °C
V_F (max)	0.33 and 0.40 V

Features

- Very small conduction losses
- Negligible switching losses
- Low forward voltage drop
- Surface mount device

1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{DRM}	Repetitive peak off-state voltage		30	V
$I_{F(AV)}$	Continuous forward current		0.1	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	0.75	A
P_{tot}	Power dissipation(1)	T_{amb} = 25 °C	250	mW
T_{stg}	Maximum Storage temperature range		- 65 to + 150	°C
T_j	Maximum operating junction temperature(2)		150	°C
T_L	Maximum temperature for soldering during 10 s		260	°C

1. For double diodes, P_{tot} is the total dissipation of both diodes
2. $\frac{dPtot}{dTj} < \frac{1}{Rth(j\text{-}a)}$ condition to avoid thermal runaway for a diode on its own heatsink.

Table 3. Thermal parameter

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction to ambient(1)	500	°C/W

1. Mounted on epoxy board with recommended pad layout.

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions			Min.	Typ.	Max.	Unit
V_{BR}	Breakdown voltage	T_j = 25 °C		I_R = 100 µA	30			V
I_R (1)	Reverse leakage current	T_j = 25 °C		$V_R = V_{RRM}$			500	nA
		T_j = 100 °C					100	µA
V_F (2)	Forward voltage drop	T_j = 25 °C	BAR42	I_F = 10 mA		0.35	0.40	V
				I_F = 50 mA		0.50	0.65	
			BAR43	I_F = 2 mA	0.26		0.33	
				I_F = 15 mA			0.45	
			ALL	I_F =100 mA			1	

1. Pulse test: t_p = 5 ms, δ < 2 %
2. Pulse test: t_p = 380 µs, δ < 2 %

Table 5. Dynamic characteristics (Tj = 25 °C)

Symbol	Test conditions		Min.	Typ.	Max.	Unit
C	Junction capacitance	T_j = 25 °C V_R = 1 V F = 1 MHz		7		pF
C	Reverse recovery time	I_F = 10 mA I_R = 10 mA T_j = 25 °C I_{rr} = 1 mA R_L = 100 Ω			5	pF
η	Detection efficiency	C_L = 300 pF F = 45 MHz T_j = 25 °C V_i = 2 V R_L = 50 Ω	80			ps

Figure 1. Forward voltage drop versus forward current (typical values, low level)

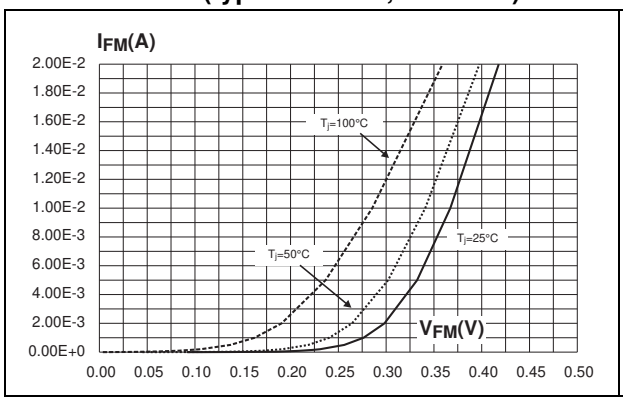


Figure 2. Forward voltage drop versus forward current (typical values, high level)

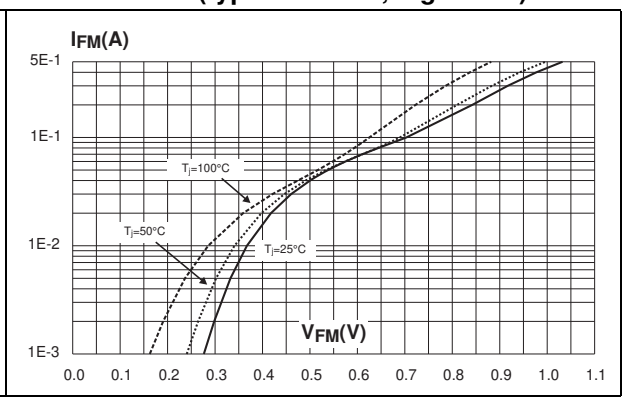


Figure 3. Reverse leakage current versus reverse voltage applied (typical values)

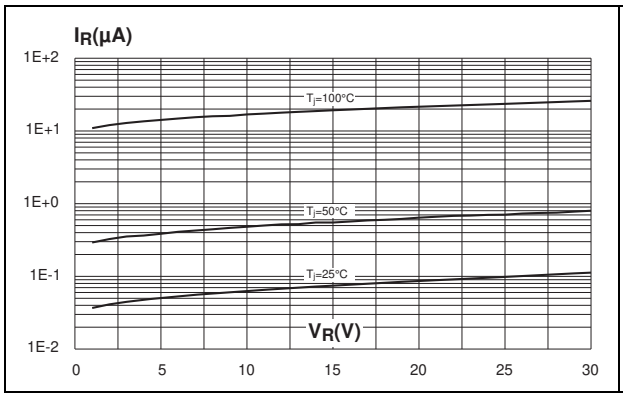


Figure 4. Reverse leakage current versus junction temperature

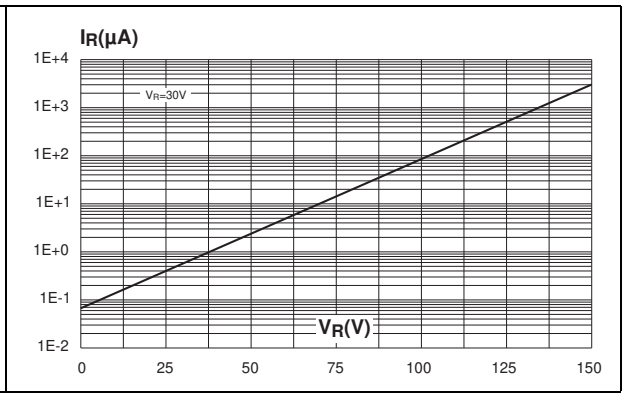


Figure 5. Junction capacitance versus reverse voltage applied (typical values)

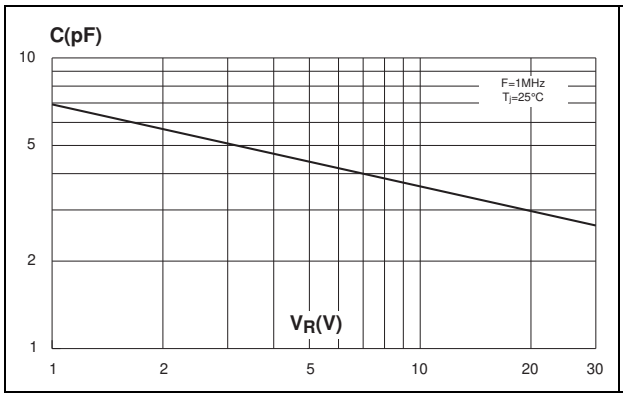


Figure 6. Relative variation of thermal impedance junction to ambient versus pulse duration

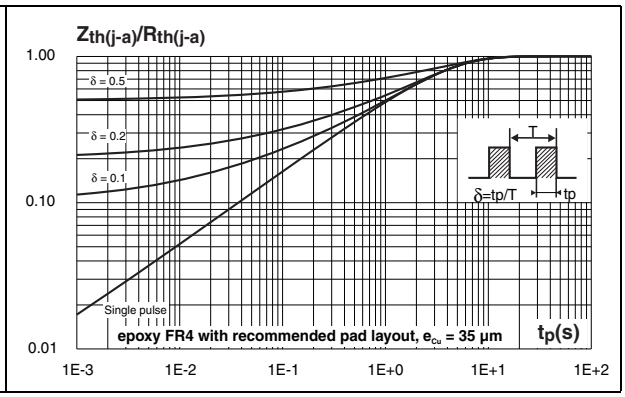
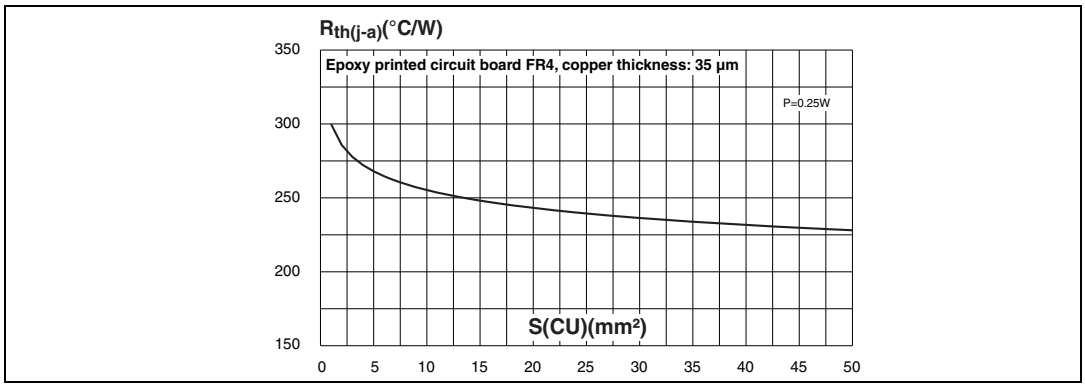


Figure 7. Thermal resistance junction to ambient versus copper surface under each lead

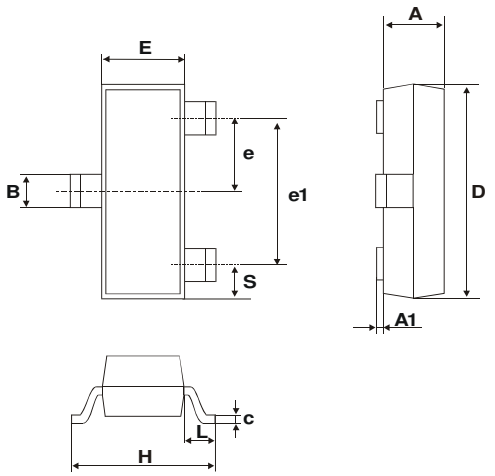


2 Package information

- Epoxy meets UL94, V0
- Lead-free packages

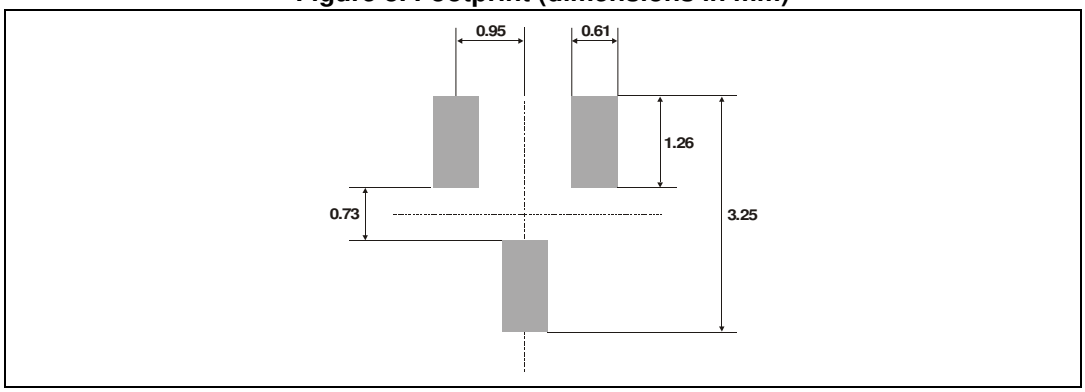
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Table 6. SOT23-3L dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.89	1.4	0.035	0.055
A1	0	0.1	0	0.004
B	0.3	0.51	0.012	0.02
c	0.085	0.18	0.003	0.007
D	2.75	3.04	0.108	0.12
e	0.85	1.05	0.033	0.041
e1	1.7	2.1	0.067	0.083
E	1.2	1.6	0.047	0.063
H	2.1	2.75	0.083	0.108
L	0.6 typ.		0.024 typ.	
S	0.35	0.65	0.014	0.026

Figure 8. Footprint (dimensions in mm)



3 Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base Qty	Delivery mode
BAR42FILM	D94	SOT23-3L	0.01 g	3000	Tape and reel
BAR43FILM	D95				
BAR43AFILM	DB1				
BAR43CFILM	DB2				
BAR43SFILM	DA5				

4 Revision history

Table 8. Document revision history

Date	Revision	Changes
Aug-2001	2B	Last release.
16-Apr-2005	3	Layout update. No content change.
23-Apr-2014	4	Updated ECOPACK statement.