

## 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 <sub>DRM</sub>   | Repetitive peak off-state voltage                     | 30                                | V    |    |
| I <sub>F(AV)</sub> | Continuous forward current                            | 0.1                               | A    |    |
| I <sub>FSM</sub>   | Surge non repetitive forward current                  | t <sub>p</sub> = 10 ms sinusoidal | 0.75 | A  |
| P <sub>tot</sub>   | Power dissipation <sup>(1)</sup>                      | T <sub>amb</sub> = 25 °C          | 250  | mW |
| T <sub>stg</sub>   | Maximum Storage temperature range                     | - 65 to + 150                     | °C   |    |
| T <sub>j</sub>     | Maximum operating junction temperature <sup>(2)</sup> | 150                               | °C   |    |
| T <sub>L</sub>     | Maximum temperature for soldering during 10 s         | 260                               | °C   |    |

1. For double diodes, P<sub>tot</sub> is the total dissipation of both diodes
2.  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$  condition to avoid thermal runaway for a diode on its own heatsink.

**Table 3. Thermal parameter**

| Symbol               | Parameter                          | Value | Unit |
|----------------------|------------------------------------|-------|------|
| R <sub>th(j-a)</sub> | Junction to ambient <sup>(1)</sup> | 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 <sub>BR</sub>    | Breakdown voltage       | T <sub>j</sub> = 25 °C  | I <sub>R</sub> = 100 μA           | 30                      |      |      | V    |   |
| I <sub>R</sub> (1) | Reverse leakage current | T <sub>j</sub> = 25 °C  | V <sub>R</sub> = V <sub>RRM</sub> |                         |      | 500  | nA   |   |
|                    |                         | T <sub>j</sub> = 100 °C |                                   |                         |      | 100  | μA   |   |
| V <sub>F</sub> (2) | Forward voltage drop    | T <sub>j</sub> = 25 °C  | BAR42                             | I <sub>F</sub> = 10 mA  |      | 0.35 | 0.40 | V |
|                    |                         |                         |                                   | I <sub>F</sub> = 50 mA  |      | 0.50 | 0.65 |   |
|                    |                         |                         | BAR43                             | I <sub>F</sub> = 2 mA   | 0.26 |      | 0.33 |   |
|                    |                         |                         |                                   | I <sub>F</sub> = 15 mA  |      |      | 0.45 |   |
|                    |                         |                         | ALL                               | I <sub>F</sub> = 100 mA |      |      | 1    |   |

1. Pulse test: t<sub>p</sub> = 5 ms, δ < 2 %
2. Pulse test: t<sub>p</sub> = 380 μs, δ < 2 %

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

| Symbol | Test conditions  | Min. | Typ. | Max. | Unit |
|--------|--|------|------|------|------|
| C      | Junction capacitance<br>T <sub>j</sub> = 25 °C V <sub>R</sub> = 1 V F = 1 MHz  |      | 7    |      | pF   |
| C      | Reverse recovery time<br>I <sub>F</sub> = 10 mA I <sub>R</sub> = 10 mA<br>T <sub>j</sub> = 25 °C I <sub>rr</sub> = 1 mA R <sub>L</sub> = 100 Ω |      |      | 5    | pF   |
| η      | Detection efficiency<br>C <sub>L</sub> = 300 pF F = 45 MHz<br>T <sub>j</sub> = 25 °C V <sub>i</sub> = 2 V R <sub>L</sub> = 50 Ω                | 80   |      |      | ps   |

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

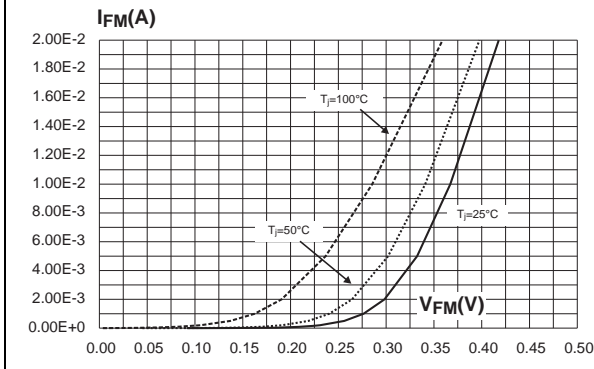


Figure 2. Forward voltage drop versus forward current (typical values, high level)

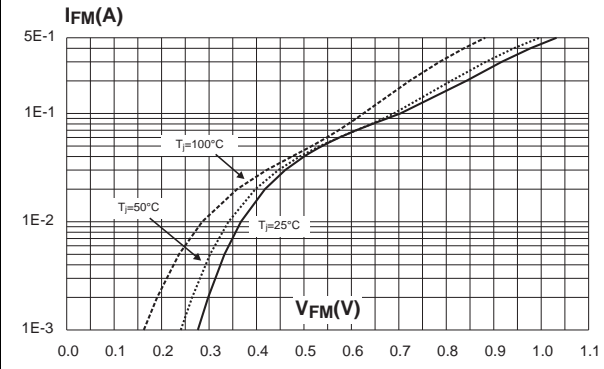


Figure 3. Reverse leakage current versus reverse voltage applied (typical values)

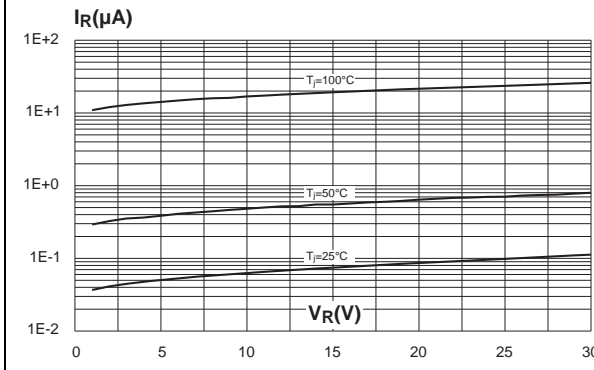
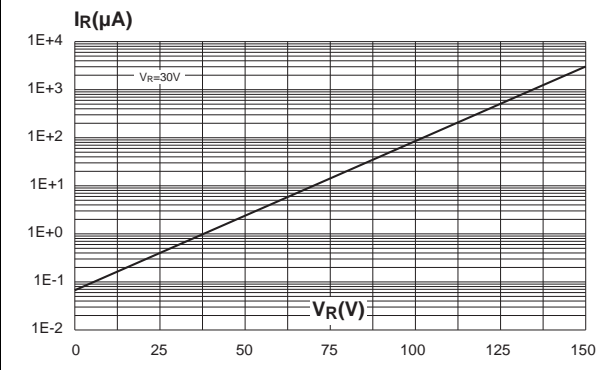
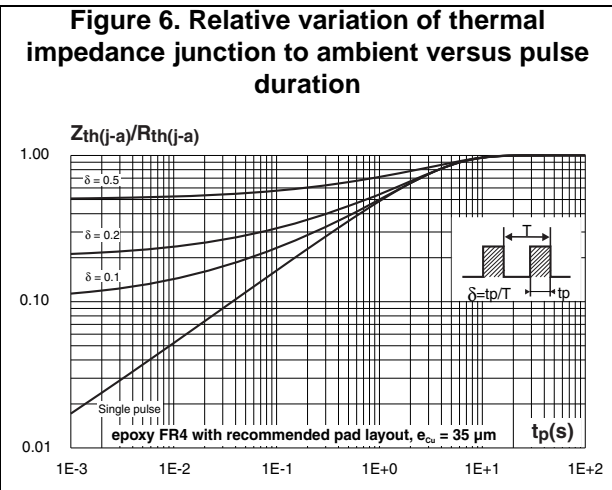
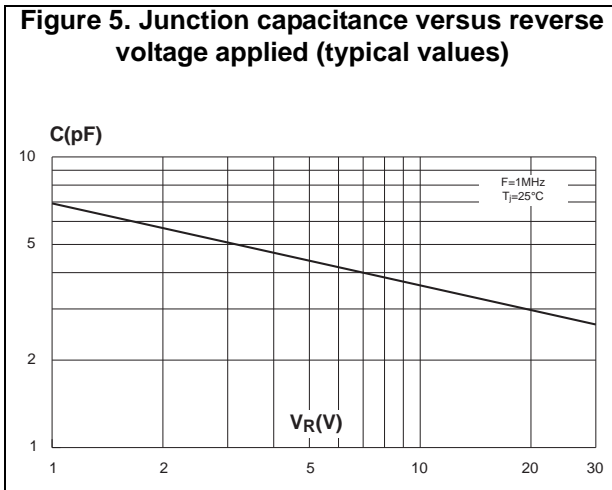
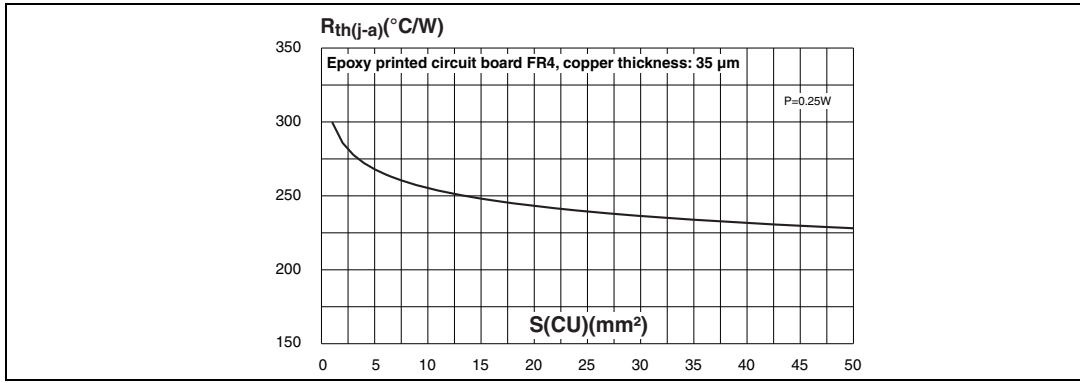


Figure 4. Reverse leakage current versus junction temperature





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



## 2 Package information

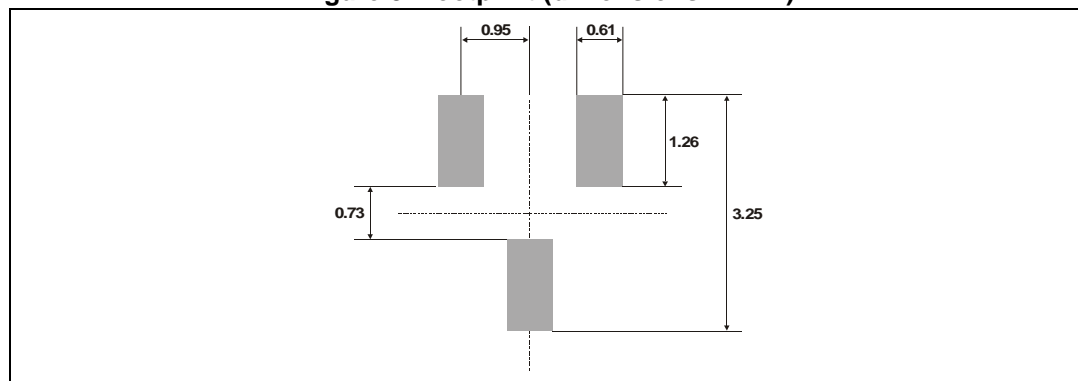
- Epoxy meets UL94, V0
- Lead-free packages

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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.        |
| 18-Jul-2017 | 5        | Updated figure in cover page.     |

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