**Description**

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

These devices have integrated protection against excessive voltage such as electrostatic discharges.

Features

- Very small conduction losses
- Negligible switching losses
- Low forward voltage drop

1 Characteristics

Table 1. Absolute maximum ratings at 25 °C unless otherwise specified

| Symbol | Parameter | | Value | Unit |
|-----------|---|--|--------------|------|
| V_{RRM} | Repetitive peak reverse voltage | | 30 | V |
| I_F | Forward continuous current | $T_I = 25\text{ °C}$ | 200 | mA |
| I_{FRM} | Repetitive peak forward current | $t_p \leq 1\text{ s}$ $\delta \leq 0.5$ | 500 | mA |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10\text{ ms}$ | 4 | A |
| P_{tot} | Power dissipation | $T_I = 65\text{ °C}$ | 200 | mW |
| T_{stg} | Storage temperature range | | -65 to + 150 | °C |
| T_j | Operating junction temperature range | | -65 to + 125 | °C |
| T_L | Maximum temperature for soldering during 15 s | | 260 | °C |

Table 2. Thermal resistance

| Symbol | Parameter | Value | Unit |
|---------------|-------------------|-------|------|
| $R_{th(j-l)}$ | Junction to leads | 300 | °C/W |

Table 3. Static electrical characteristics

| Symbol | Test conditions | | Min. | Typ. | Max. | Unit |
|-------------|--|--------------|------|------|------|---------------|
| V_{BR} | $T_j = 25\text{ °C}; I_R = 100\text{ }\mu\text{A}$ | | 30 | - | | V |
| $V_F^{(1)}$ | $T_j = 25\text{ °C}; I_F = 200\text{ mA}$ | All types | | - | 1 | V |
| | $T_j = 25\text{ °C}; I_F = 10\text{ mA}$ | TMMBAT42FILM | | - | 0.4 | |
| | $T_j = 25\text{ °C}; I_F = 50\text{ mA}$ | | | - | 0.65 | |
| | $T_j = 25\text{ °C}; I_F = 2\text{ mA}$ | TMMBAT43FILM | 0.26 | - | 0.33 | |
| | $T_j = 25\text{ °C}; I_F = 15\text{ mA}$ | | | - | 0.45 | |
| $I_R^{(1)}$ | $T_j = 25\text{ °C}, V_R = 25\text{ V}$ | | | - | 0.5 | μA |
| | $T_j = 100\text{ °C}, V_R = 25\text{ V}$ | | | - | 100 | |

1. Pulse test: $t_p = 380\text{ }\mu\text{s}$ $\delta < 2\%$

Table 4. Dynamic characteristics

| Symbol | Test conditions | Min. | Typ. | Max. | Unit |
|----------|---|------|------|------|------|
| C | $T_j = 25\text{ °C}; V_R = 1\text{ V}; f = 1\text{ MHz}$ | | 7 | | pF |
| t_{rr} | $T_j = 25\text{ °C}; I_F = 10\text{ mA}; I_R = 10\text{ mA}; I_{RR} = 1\text{ mA}$ $R_L = 100\text{ }\Omega$ | | | 5 | ns |

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

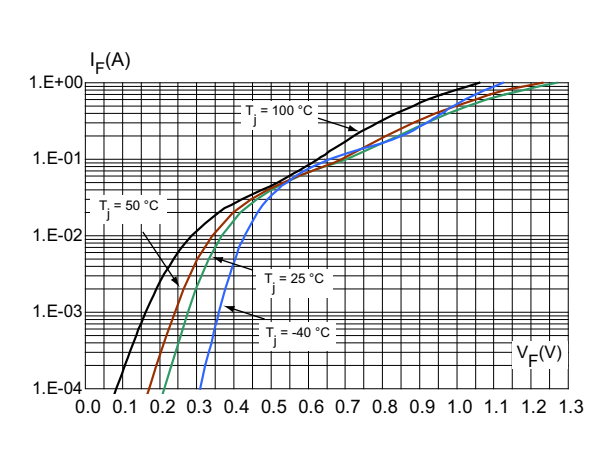


Figure 2. Forward voltage drop versus forward current (typical values)

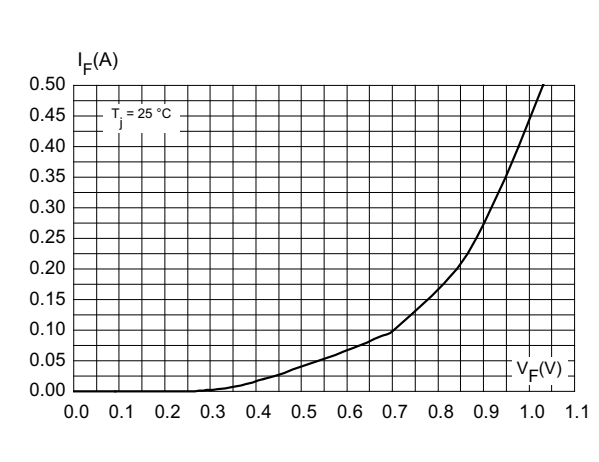


Figure 3. Leakage current versus reverse voltage applied (typical values)

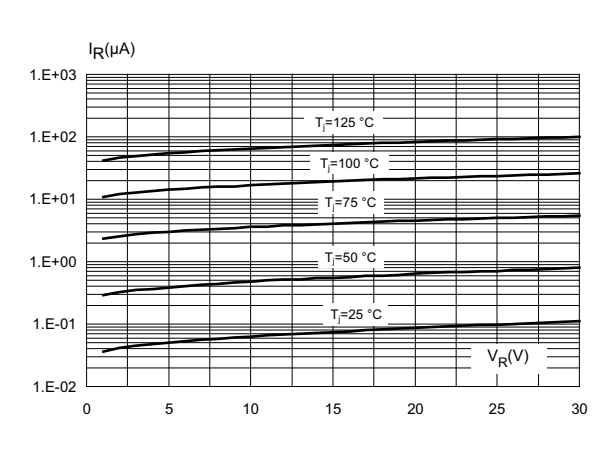
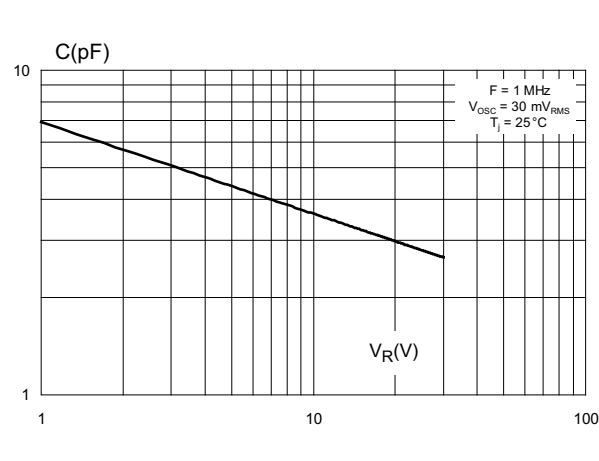


Figure 4. Junction capacitance versus reverse voltage applied (typical values)



2 Package information

- Ring at cathode end.

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.

2.1 MINIMELF package information

Figure 5. MINIMELF package outline

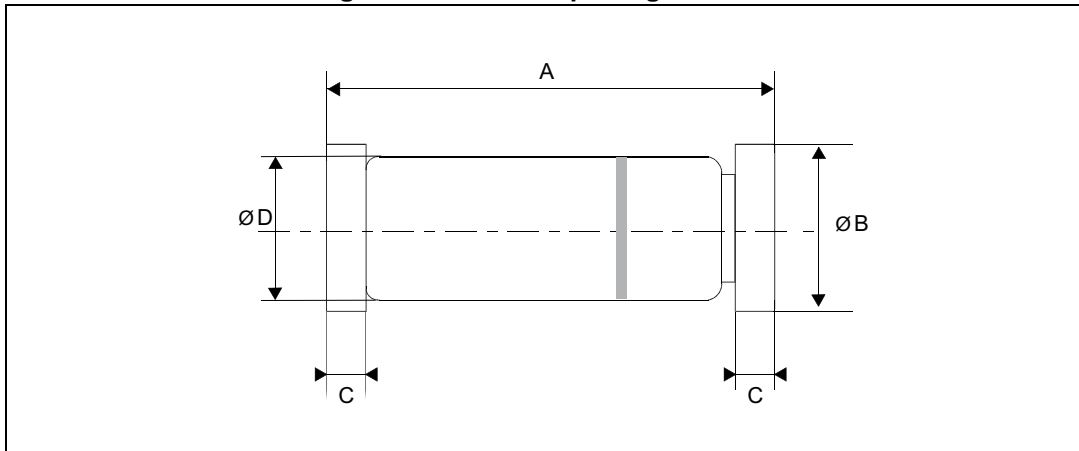
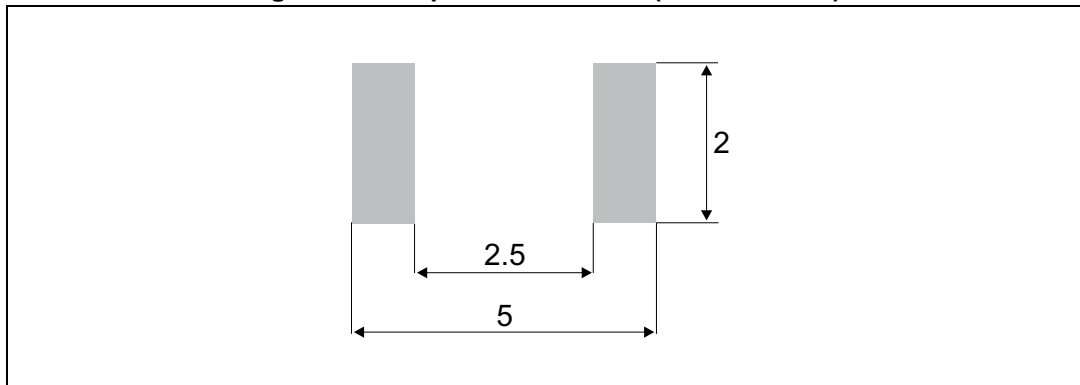


Table 5. MINIMELF mechanical data

| Ref. | Dimensions | | | | | |
|------|-------------|------|------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 3.30 | 3.50 | 3.70 | 0.130 | 0.138 | 0.146 |
| ØB | 1.59 | 1.65 | 1.70 | 0.063 | 0.065 | 0.069 |
| C | 0.40 | 0.50 | 0.60 | 0.016 | 0.020 | 0.024 |
| ØD | | 1.50 | | | 0.059 | |

Figure 6. Foot print dimensions (in millimeters)



3 Ordering information

Table 6. Ordering information

| Order code | Package | Weight | Base qty | Delivery mode |
|--------------|----------|--------|----------|---------------|
| TMMBAT42FILM | MINIMELF | 40 mg | 2500 | Tape and reel |
| TMMBAT43FILM | | | | |

4 Revision history

Table 7. Document revision history

| Date | Revision | Changes |
|-------------|----------|---|
| Aug-1999 | 1A | Last issue. |
| 31-Jul-2014 | 2 | Reformatted to current standards. Added ordering information. |
| 27-Jul-2015 | 3 | Updated MINIMELF package information and reformatted to current standard. Updated Figure 1 , Figure 2 , Figure 3 , and Figure 4 . |

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