

1 Characteristics

Table 2. Absolute ratings (limiting values)

| Symbol | Parameter | | | Value | Unit |
|---------------------|--|-----------|------------------------------------|--------------|------|
| V _{RRM} | Repetitive peak reverse voltage | | | 600 | V |
| I _{F(RMS)} | Forward rms current | DO-41 | | 10 | A |
| | | SMA / SMB | | 7 | |
| I _{F(AV)} | Average forward current | DO-41 | T _c = 100 °C δ = 0.5 | 1 | A |
| | | SMA | T _c = 125 °C δ = 0.5 | | |
| | | SMB | T _c = 135 °C δ = 0.5 | | |
| I _{FSM} | Surge non repetitive forward current | DO-41 | t _p = 10ms sinusoidal | 25 | A |
| | | SMA / SMB | | 20 | |
| T _{stg} | Storage temperature range | | | -65 to + 175 | °C |
| T _j | Maximum operating junction temperature | | | 175 | °C |

Table 3. Thermal resistance

| Symbol | Parameter | | | Value (max) | Unit |
|---------------|------------------------------------|-----------|-------|-------------|------|
| $R_{th(j-l)}$ | Junction to lead | L = 10 mm | DO-41 | 45 | °C/W |
| | | | SMA | 30 | |
| | | | SMB | 25 | |
| $R_{th(j-a)}$ | Junction to ambient ⁽¹⁾ | L = 10 mm | DO-41 | 70 | °C/W |

1. $R_{th(j-a)}$ is measured with a copper area $S = S_{cm2}$ (see [Figure 14](#)).

Table 4. Static electrical characteristics

| Symbol | Parameter | Test conditions | | Min. | Typ. | Max. | Unit |
|--------|-------------------------|-----------------------|-------------------|------|------|------|---------------|
| I_R | Reverse leakage current | $T_j = 25\text{ °C}$ | $V_R = V_{RRM}$ | | | 1 | μA |
| | | $T_j = 150\text{ °C}$ | | | 10 | 75 | |
| V_F | Forward voltage drop | $T_j = 25\text{ °C}$ | $I_F = 1\text{A}$ | | | 1.7 | V |
| | | $T_j = 150\text{ °C}$ | | | 1.0 | 1.25 | |

To evaluate the conduction losses use the following equation: $P = 1.03 \times I_{F(AV)} + 0.27 I_{F(RMS)}^2$

Table 5. Dynamic characteristics

| Symbol | Parameter | Test conditions | | Min. | Typ. | Max. | Unit |
|----------|--------------------------|------------------------------------|---|------|------|------|------|
| t_{rr} | Reverse recovery time | $T_J = 25\text{ }^{\circ}\text{C}$ | $I_F = 0.5\text{ A}$ $I_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$ | | | 25 | ns |
| | | | $I_F = 1\text{ A}$ $di_F/dt = -50\text{ A}/\mu\text{s}$ $V_R = 30\text{ V}$ | | 30 | 45 | |
| t_{fr} | Forward recovery time | $T_J = 25\text{ }^{\circ}\text{C}$ | $I_F = 1\text{ A}$ $di_F/dt = 100\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$ | | | 100 | ns |
| V_{FP} | Forward recovery voltage | $T_J = 25\text{ }^{\circ}\text{C}$ | $I_F = 1\text{ A}$ $di_F/dt = 100\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$ | | | 10 | V |

Figure 1. Conduction losses versus average forward current

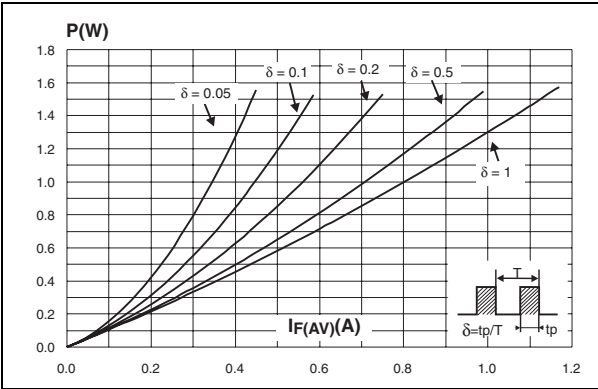


Figure 2. Forward voltage drop vs forward current

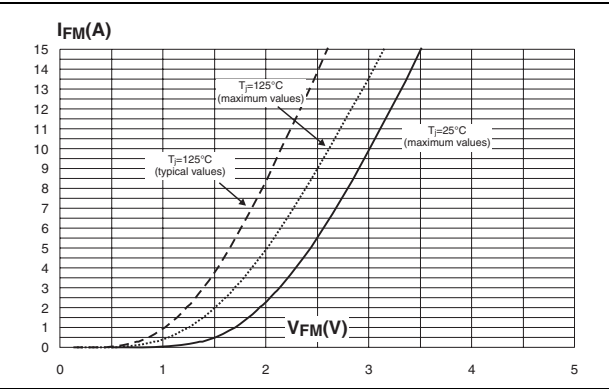


Figure 3. Relative variation of thermal impedance junction to case vs pulse duration (DO-41)

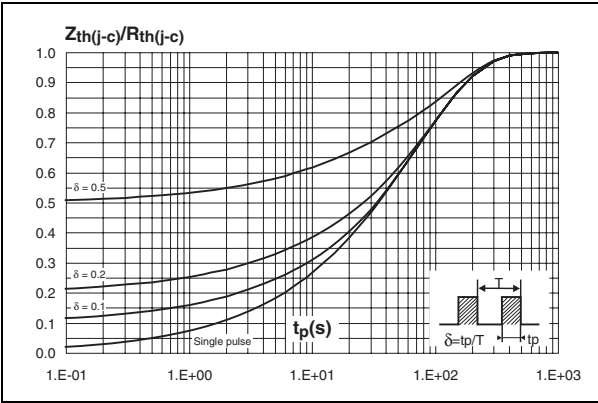


Figure 4. Relative variation of thermal impedance junction to case vs pulse duration (SMA)

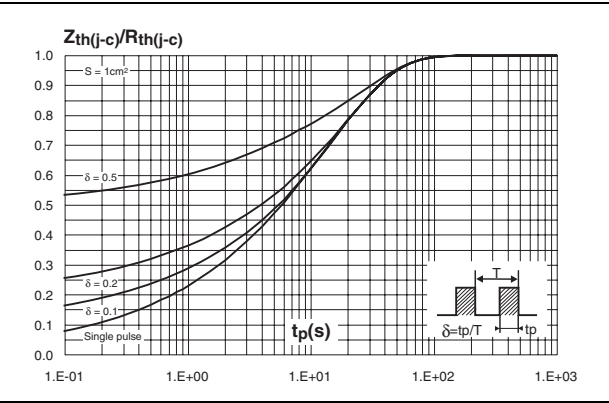


Figure 5. Relative variation of thermal impedance junction to case vs pulse duration (SMB)

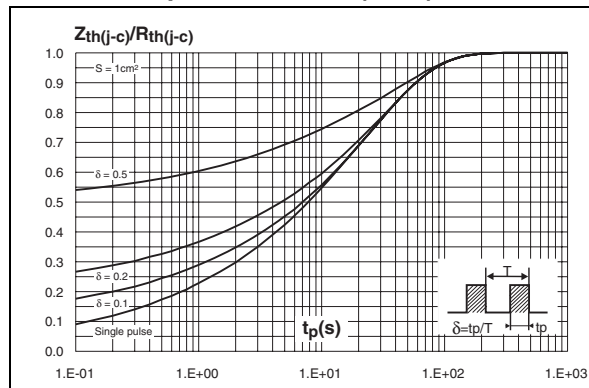


Figure 6. Peak reverse recovery current vs di_F/dt (typical values)

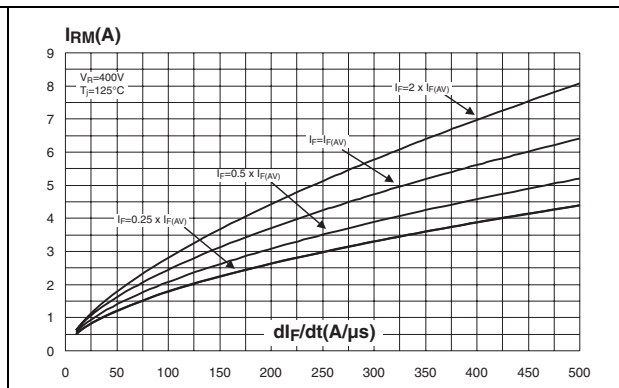


Figure 7. Reverse recovery time versus di_F/dt (typical values)

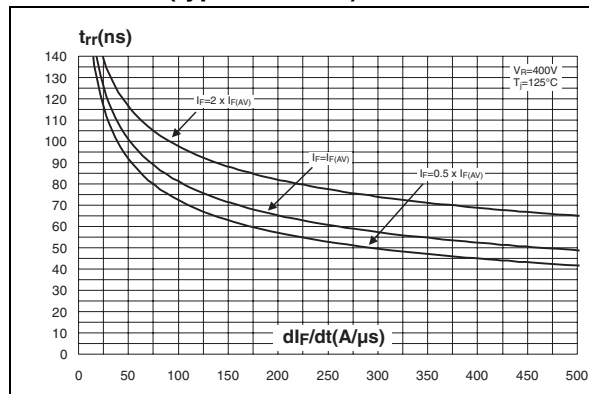


Figure 8. Reverse recovery charges versus di_F/dt (typical values)

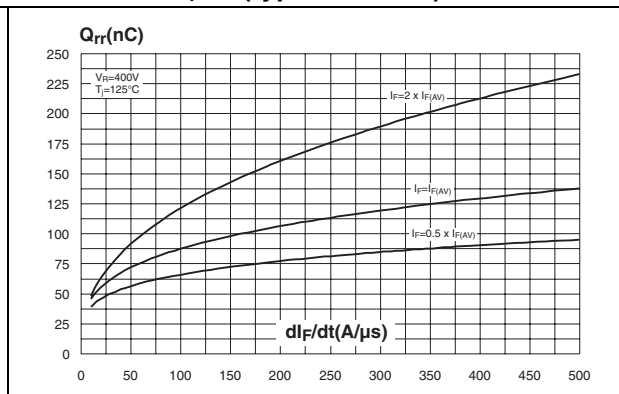


Figure 9. Reverse recovery softness factor vs di_F/dt (typical values)

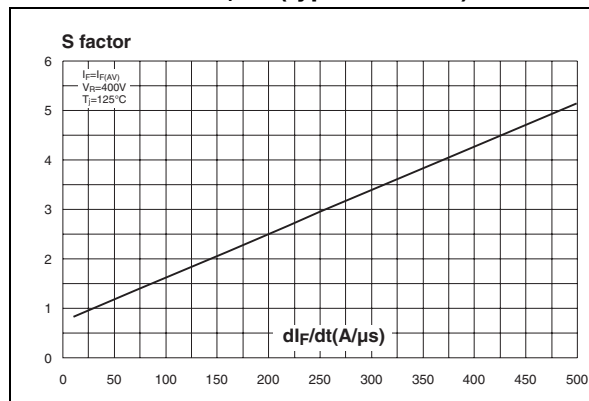


Figure 10. Relative variations of dynamic parameters vs junction temperature

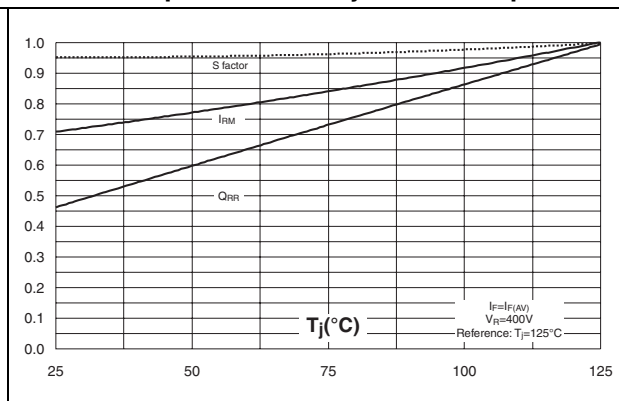


Figure 11. Transient peak forward voltage vs dI_F/dt (typical values)

Figure 12. Forward recovery time vs dI_F/dt (typical values)

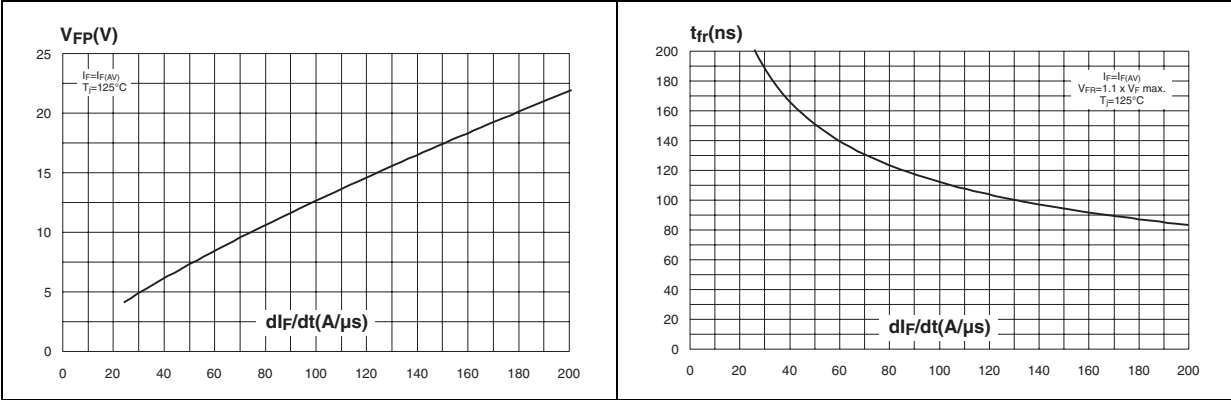


Figure 13. Junction capacitance versus reverse voltage applied (typical values)

Figure 14. Thermal resistance junction to ambient versus copper surface under each lead

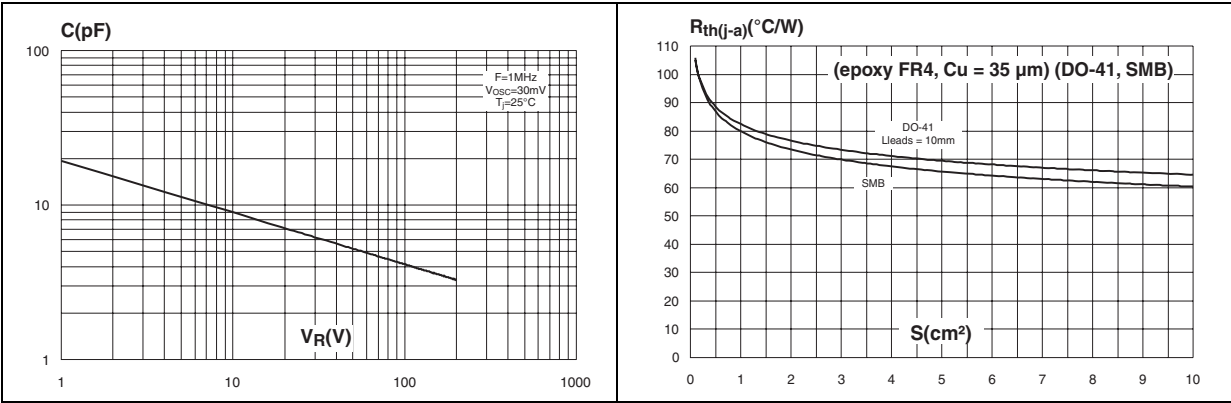
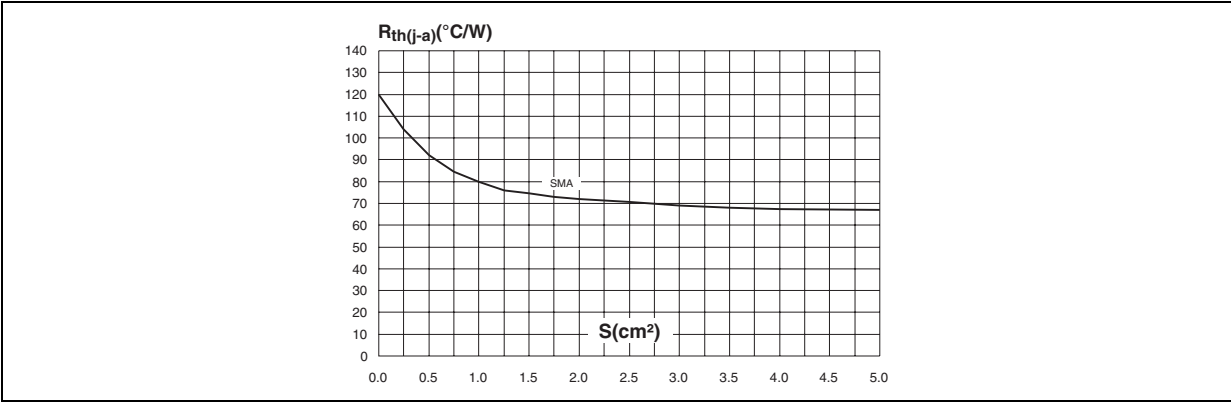


Figure 15. Thermal resistance junction to ambient versus copper surface under each lead (epoxy FR4, Cu = 35 μm) (SMA)



2 Package information

- Epoxy meets UL94, V0
- Lead-free packages

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Table 6. SMA dimensions

| Ref. | Dimensions | | | |
|------|-------------|------|--------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A1 | 1.90 | 2.45 | 0.075 | 0.094 |
| A2 | 0.05 | 0.20 | 0.002 | 0.008 |
| b | 1.25 | 1.65 | 0.049 | 0.065 |
| c | 0.15 | 0.40 | 0.006 | 0.016 |
| D | 2.25 | 2.90 | 0.089 | 0.114 |
| E | 4.80 | 5.35 | 0.189 | 0.211 |
| E1 | 3.95 | 4.60 | 0.156 | 0.181 |
| L | 0.75 | 1.50 | 0.030 | 0.059 |

Figure 16. Footprint (dimensions in mm)

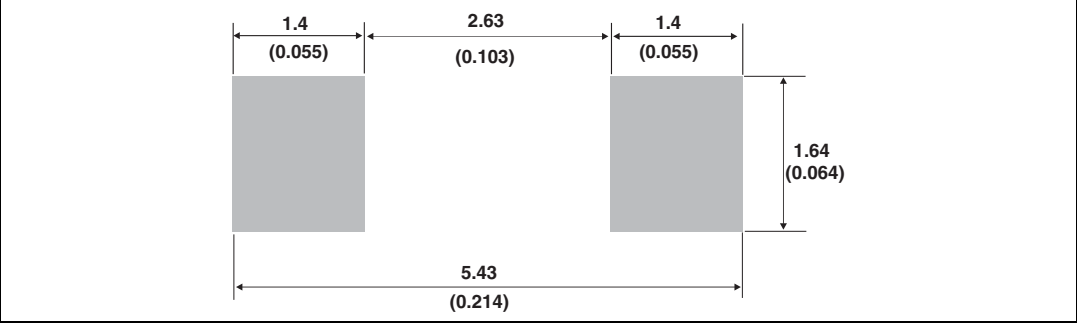


Table 7. SMB dimensions

| Ref. | Dimensions | | | |
|------|-------------|------|--------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A1 | 1.90 | 2.45 | 0.075 | 0.096 |
| A2 | 0.05 | 0.20 | 0.002 | 0.008 |
| b | 1.95 | 2.20 | 0.077 | 0.087 |
| c | 0.15 | 0.40 | 0.006 | 0.016 |
| E | 5.10 | 5.60 | 0.201 | 0.220 |
| E1 | 4.05 | 4.60 | 0.159 | 0.181 |
| D | 3.30 | 3.95 | 0.130 | 0.156 |
| L | 0.75 | 1.50 | 0.030 | 0.059 |

Figure 17. Footprint (dimensions in mm)

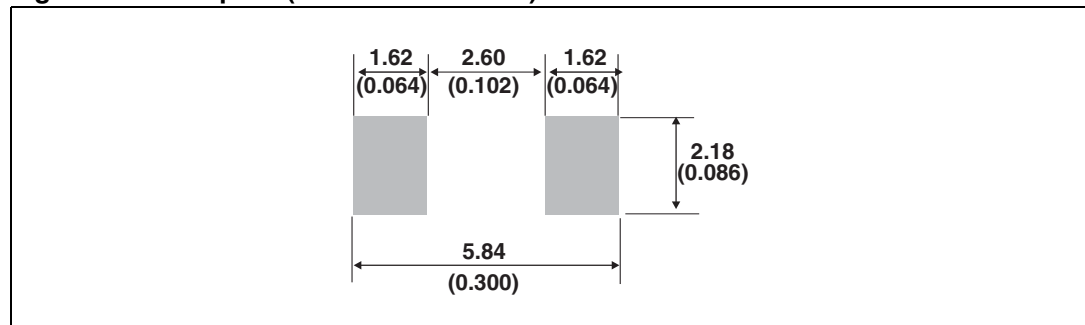


Table 8. DO-41 (plastic) dimensions

| Ref. | Dimensions | | | |
|------|-------------|------|--------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 4.07 | 5.20 | 0.160 | 0.205 |
| B | 2.04 | 2.71 | 0.080 | 0.107 |
| C | 25.4 | | 1 | |
| D | 0.71 | 0.86 | 0.028 | 0.034 |

3 Ordering information

Table 9. Ordering information

| Order code | Marking | Package | Weight | Base qty | Delivery mode |
|------------|----------|---------|---------|----------|---------------|
| STTH1R06 | STTH1R06 | DO-41 | 0.34 g | 2000 | Ammopack |
| STTH1R06RL | STTH1R06 | DO-41 | 0.34 g | 5000 | Tape and reel |
| STTH1R06A | HR6 | SMA | 0.068 g | 5000 | Tape and reel |
| STTH1R06U | BR6 | SMB | 0.11 g | 2500 | Tape and reel |

4 Revision history

Table 10. Document revision history

| Date | Revision | Changes |
|-------------|----------|---|
| Apr-2003 | 1 | First issue. |
| 07-Sep-2004 | 2 | DO-41 and SMA packages added. |
| 24-Feb-2005 | 3 | SMA package dimensions update. Reference A1 max. changed from 2.70 mm (0.106 inc.) to 2.03 mm (0.080). |
| 02-Jul-2007 | 4 | Reformatted to current standards. Added cathode bars to cover illustrations. Updated dimensions and footprint illustrations for SMA and SMB packages. Corrected part number in Table 9. |
| 30-Sep-2009 | 5 | Updated table 8 package dimensions. |

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