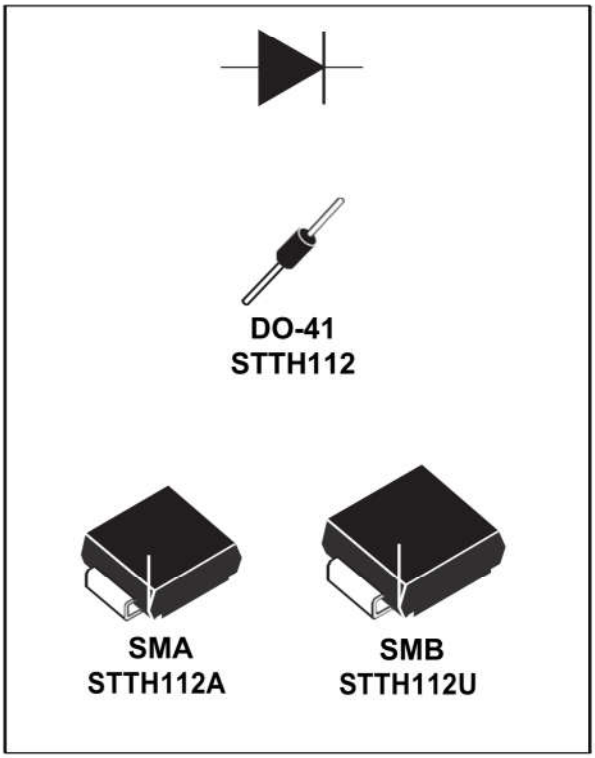
Hottech®
Semiconductor

# STTH112

## High voltage ultrafast rectifier

## Main product characteristics

| | |
|---|---|
| $I_{F(AV)}$ | 1 A |
| $V_{RRM}$ | 1200 V |
| $T_{j\ (max)}$ | 175° C |
| $V_{F\ (max)}$ | 1.65 V |




## Features and benefits

- Low forwarded voltage drop
- High reliability
- High surge current capability
- Soft switching for reduced EMI disturbances
- Planar technology

## Description

The STTH112, which is using ultrafast high voltage planar technology, is specially suited for free-wheeling, clamping, snubbering, demagnetization in power supplies and other power switching applications

**Table 1. Absolute ratings (limiting values)**

| Symbol | Parameter | | | Value | Unit |
|---|---|---|---|---|---|
| $V_{RRM}$ | Repetitive peak reverse voltage | | | 1200 | V |
| $V_{(RMS)}$ | RMS voltage | | | 850 | V |
| $I_{F(AV)}$ | Average forward current | Tl = 85° C δ = 0.5 | DO-41 | 1 | A |
| | | Tl = 115° C δ = 0.5 | SMA | | |
| | | Tl = 125° C δ =0 .5 | SMB | | |
| $I_{FSM}$ | Forward surge current t = 8.3 ms | | DO-41 | 20 | A |
| | | | SMA | 18 | |
| | | | SMB | | |
| $T_{stg}$ | Storage temperature range | | | - 50 + 175 | °C |
| $T_j$ | Maximum operating junction temperature | | | + 175 | °C |

# 2.Electrical characteristics

**Table 2. Thermal parameters**

| Symbol | Parameter | | | Value | 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 | L = 10 mm | DO-41 | 110 | |

**Table 3. Static electrical characteristics**

| Symbol | Parameter | Tests conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $I_R$ | Reverse leakage current | $V_R$ = 1200V | $T_j$ = 25° C | | | 5 | µA |
| | | | $T_j$ = 125° C | | | 50 | |
| $V_F$ | Forward voltage drop | $I_F$ = 1 A | $T_j$ = 25° C | | | 1.9 | V |
| | | | $T_j$ = 125° C | | 1.17 | 1.65 | |
| | | | $T_j$ = 150° C | | 1.10 | 1.55 | |

**Table 4. Dynamic electrical characteristics**

| Symbol | Parameter | Tests conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $t_{rr}$ | Reverse recovery time | $I_F$ = 0.5 A<br>$I_{rr}$ = 0.25 A $I_R$ = 1A | $T_j$ = 25° C | | | 75 | ns |
| $t_{fr}$ | Forward recovery time | $I_F$ = 1 A<br>$dI_F/dt$ = 50 A/µs<br>$V_{FR}$ = 1.1 x $V_{Fmax}$ | $T_j$ = 25° C | | | 500 | ns |
| $V_{FP}$ | Forward recovery voltage | | | | | 30 | V |

**Figure 1. Conduction losses versus average current**

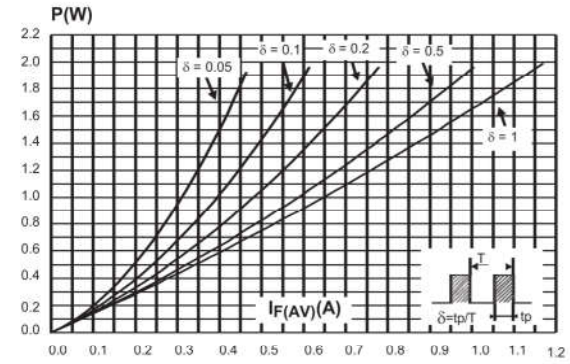



**Figure 2. Forward voltage drop versus forward current.**

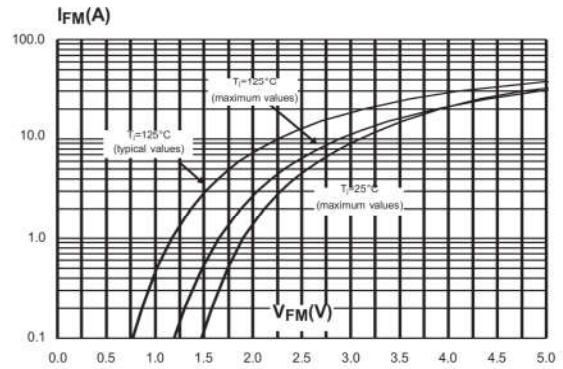


**Figure 3.** **Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4, $L_{leads}$ = 10mm) (DO-41).**

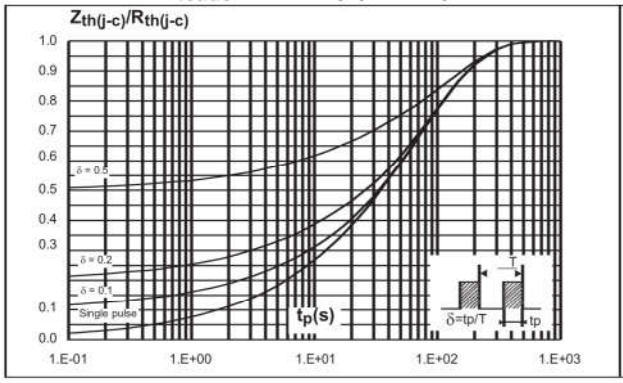



**Figure 4.** **Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4) (SMA).**

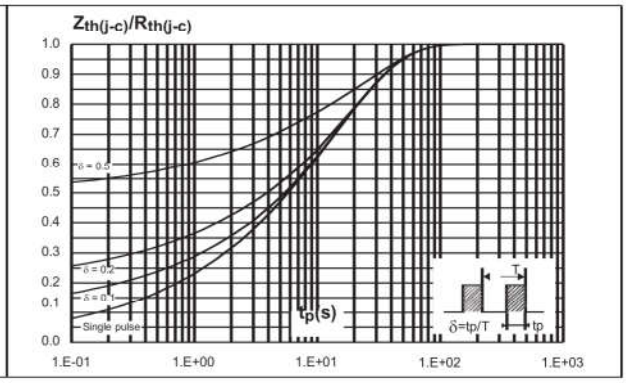



**Figure 5.** **Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4)(SMB).**

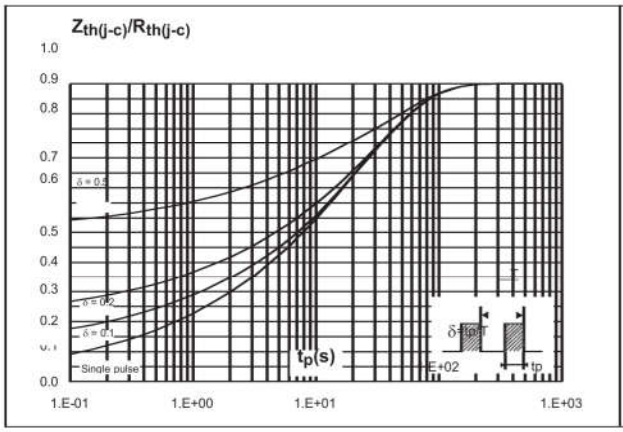



**Figure 6.** **Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed circuit board FR4, copper thickness: 35 µm) (DO-41, SMB).**

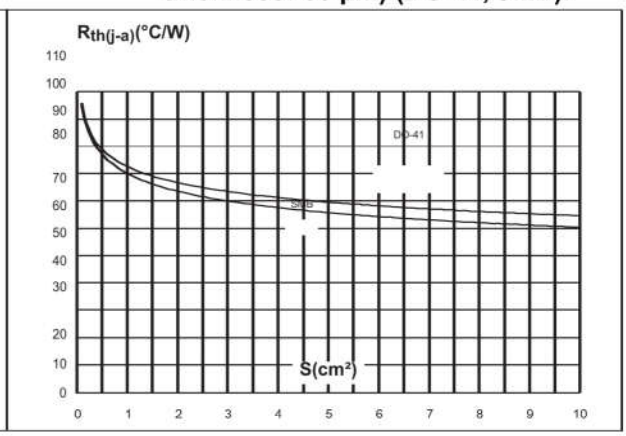
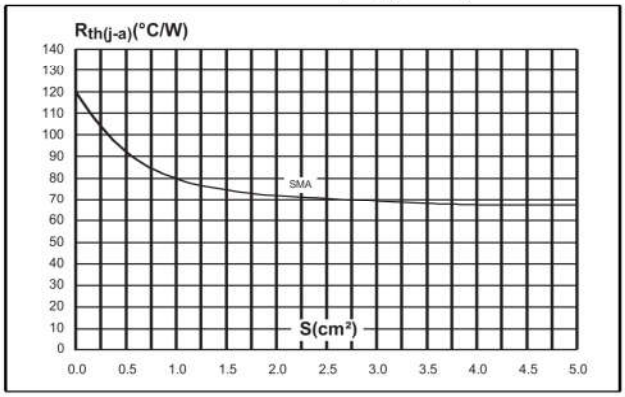


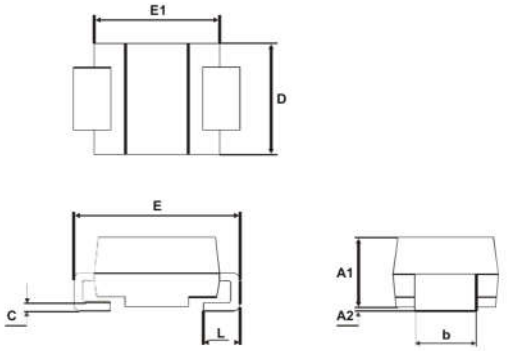

**Figure 7.** **Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed circuit board FR4, copper thickness: 35 µm) (SMA).**



# 1 Package mechanical data

Epoxy meets UL 94, V0

**Table 5. 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 8. Footprint (dimensions in mm)**

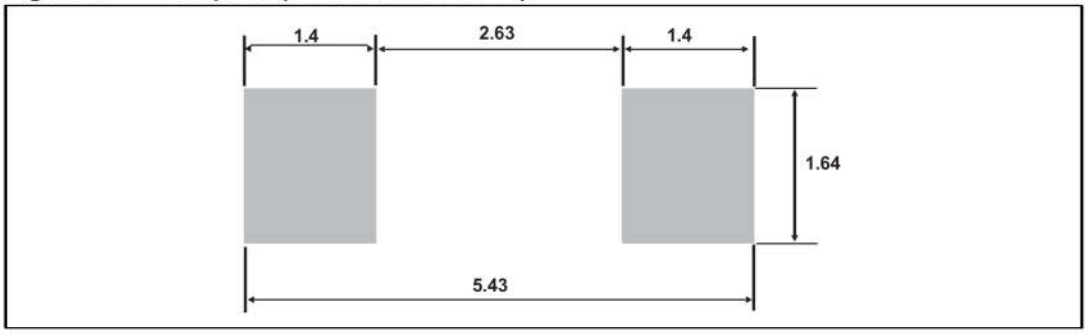
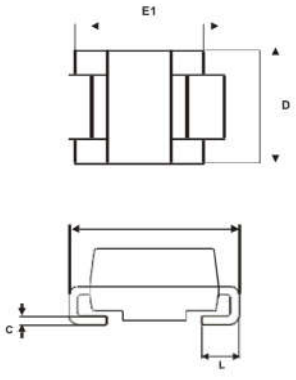


**Table 6. SMB dimensions**




| 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 |
| D | 3.30 | 3.95 | 0.130 | 0.156 |
| E | 5.10 | 5.60 | 0.201 | 0.220 |
| E1 | 4.05 | 4.60 | 0.159 | 0.181 |
| L | 0.75 | 1.50 | 0.030 | 0.059 |

**Figure 9. Footprint (dimensions in mm)**

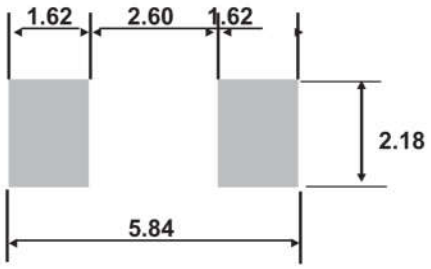
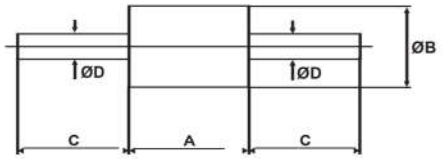



**Table 7. DO-41 dimensions**




| 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 | 28 | | 1.102 | |
| D | 0.712 | 0.863 | 0.028 | 0.034 |