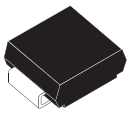
# STTH110/A

## HIGH VOLTAGE ULTRAFAST RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

| | |
|---|---|
| $I_{F(AV)}$ | 1 A |
| $V_{RRM}$ | 1000 V |
| Tj (max) | 175 °C |
| $V_F$ (max) | 1.42 V |

**DO-41**
**STTH110**



**SMA**
**STTH110A**

### FEATURES AND BENEFITS

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

### DESCRIPTION

The STTH110, which is using ST ultrafast high voltage planar technology, is specially suited for free-wheeling, clamping, snubbering, demagnetization in power supplies and other power switching applications.

### ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | | Value | Unit |
|---|---|---|---|---|---|
| $V_{RRM}$ | Repetitive peak reverse voltage | | | 1000 | V |
| $V_{(RMS)}$ | RMS voltage | | | 700 | V |
| $I_{F(AV)}$ | Average forward current | Tl = 100°C δ =0.5 | DO-41 | 1 | A |
| | | Tl = 125°C δ =0.5 | SMA | 1 | |
| $I_{FSM}$ | Forward surge current t = 8.3 ms | | DO-41 | 20 | A |
| | | | SMA | 18 | |
| $T_{stg}$ | Storage temperature range | | | - 50 + 175 | °C |
| Tj | Maximum operating junction temperature | | | + 175 | °C |

## THERMAL PARAMETERS

| Symbol | Parameter | | | Value | Unit |
|---|---|---|---|---|---|
| $R_{th\ (j-l)}$ | Junction to lead | L = 10 mm | DO-41 | 45 | °C/W |
| | | | SMA | 30 | |
| $R_{th\ (j-a)}$ | Junction to ambient | L = 10 mm | DO-41 | 110 | |

## STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Tests conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $I_R$ | Reverse leakage current | $V_R$ = 1000V | Tj = 25°C | | | 10 | µA |
| | | | Tj = 125°C | | | 50 | |
| $V_F$ | Forward voltage drop | $I_F$ = 1 A | Tj = 25°C | | | 1.7 | V |
| | | | Tj = 150°C | | 0.98 | 1.42 | |

To evaluate the maximum conduction losses use the following equation :
$P = 1.20 \times I_{F(AV)} + 0.225 \times I_F{}^2{}_{(RMS)}$

## DYNAMIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Tests conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $t_{rr}$ | Reverse recovery time | $I_F$ = 0.5 A<br>Irr = 0.25 A $I_R$ = 1A | Tj = 25°C | | | 75 | ns |
| $t_{fr}$ | Forward recovery time | $I_F$ = 1 A<br>$dI_F/dt$ = 50 A/µs<br>$V_{FR} = 1.1 \times V_F max$ | Tj = 25°C | | | 300 | ns |
| $V_{FP}$ | Forward recovery voltage | | | | | 18 | V |

**Fig. 1:** Conduction losses versus average current.

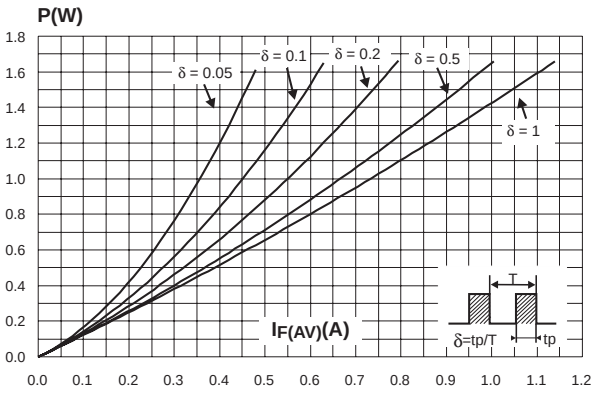



**Fig. 2:** Forward voltage drop versus forward current.

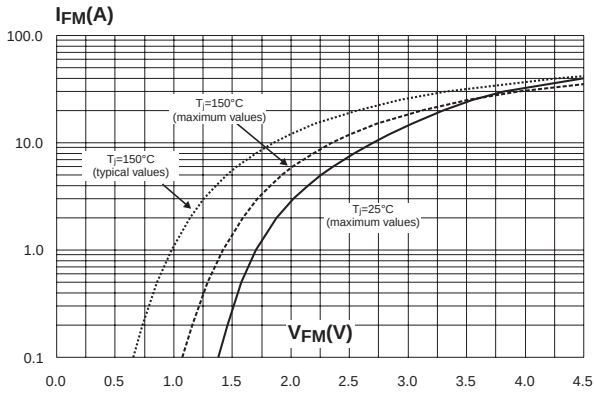



**Fig. 3-1:** Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4, $L_{leads}$ = 10mm) (DO-41).

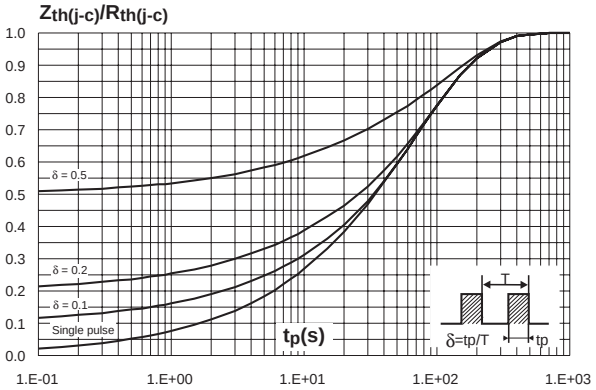



**Fig. 3-2:** Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4) (SMA).

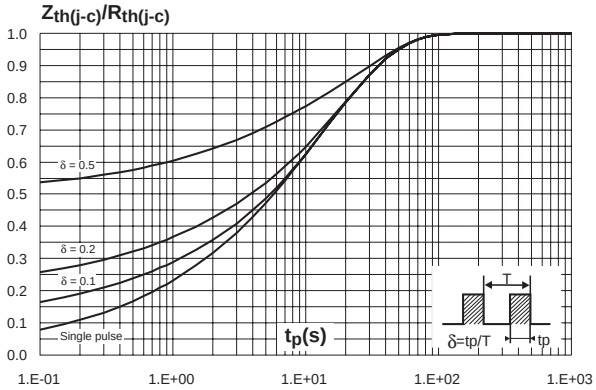



**Fig. 4-1:** Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed circuit board FR4, copper thickness: 35µm) (DO-41).

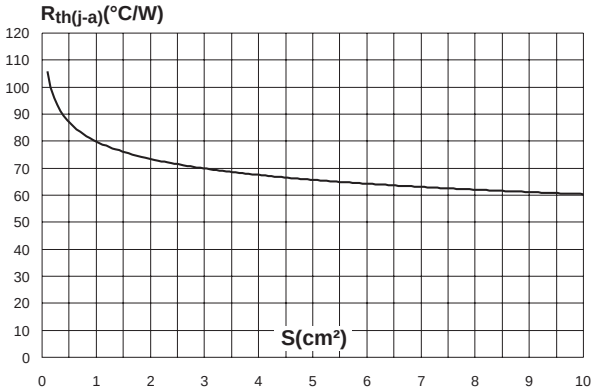
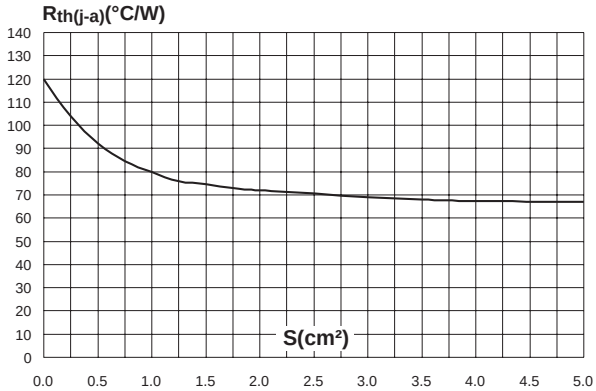
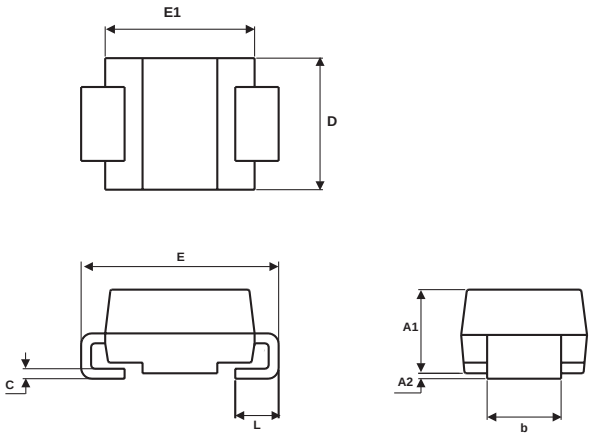



**Fig. 4-2:** Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed circuit board FR4, copper thickness: 35µm) (SMA).



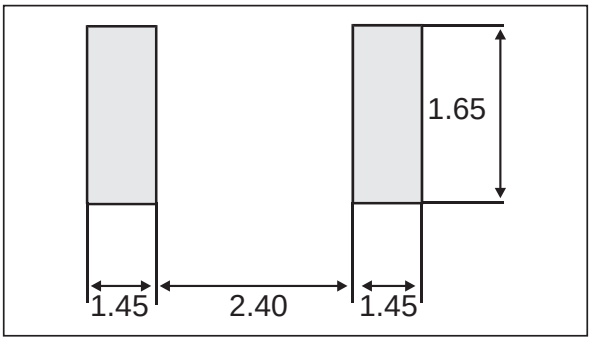
## PACKAGE MECHANICAL DATA

SMA




| REF. | DIMENSIONS | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A1 | 1.90 | 2.70 | 0.075 | 0.106 |
| A2 | 0.05 | 0.20 | 0.002 | 0.008 |
| b | 1.25 | 1.65 | 0.049 | 0.065 |
| c | 0.15 | 0.41 | 0.006 | 0.016 |
| E | 4.80 | 5.60 | 0.189 | 0.220 |
| E1 | 3.95 | 4.60 | 0.156 | 0.181 |
| D | 2.25 | 2.95 | 0.089 | 0.116 |
| L | 0.75 | 1.60 | 0.030 | 0.063 |

**FOOTPRINT** (in millimeters)



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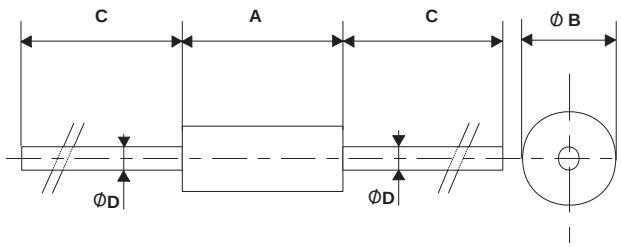
DO-41




| 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 |

| Ordering code | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| STTH110 | STTH110 | DO-41 | 0.34 g | 2000 | Ammopack |
| STTH110A | H10 | SMA | 0.068 g | 5000 | Tape & reel |
| STTH110RL | STTH110 | DO-41 | 0.34 g | 5000 | Tape & reel |

- Epoxy meets UL 94,V0