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# STPS2H100

## Power Schottky rectifier

### Features

- Negligible switching losses
- High junction temperature capability
- Low leakage current
- Good trade-off between leakage current and forward voltage drop
- Avalanche capability specified

### Description

Schottky rectifiers designed for high frequency miniature switched mode power supplies such as adaptators and on board DC/DC converters. Available in SMA, SMB, low-profile SMB.

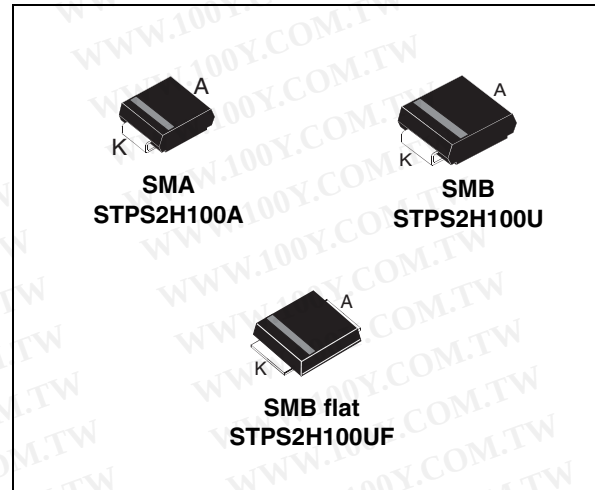


Table 1. Device summary

| Symbol      | Value  |
|-------------|--------|
| $I_{F(AV)}$ | 2 A    |
| $V_{RRM}$   | 100 V  |
| $T_j$ (max) | 175 °C |
| $V_F$ (max) | 0.65 V |

# 1 Characteristics

**Table 2. Absolute ratings (limiting values)**

| Symbol      | Parameter                                     |                                                              | Value                                                           | Unit               |
|-------------|-----------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------|--------------------|
| $V_{RRM}$   | Repetitive peak reverse voltage               |                                                              | 100                                                             | V                  |
| $I_{F(AV)}$ | Average forward current                       | SMA / SMB $T_L = 130\text{ }^{\circ}\text{C}$ $\delta = 0.5$ | 2                                                               | A                  |
|             |                                               | SMB flat $T_L = 150\text{ }^{\circ}\text{C}$ $\delta = 0.5$  |                                                                 |                    |
| $I_{FSM}$   | Surge non repetitive forward current          |                                                              | $t_p = 10\text{ ms}$ sinusoidal                                 | A                  |
| $P_{ARM}$   | Repetitive peak avalanche power               |                                                              | $t_p = 1\text{ }\mu\text{s}$ $T_j = 25\text{ }^{\circ}\text{C}$ | W                  |
| $T_{stg}$   | Storage temperature range                     |                                                              | -65 to + 175                                                    | $^{\circ}\text{C}$ |
| $T_j$       | Operating junction temperature <sup>(1)</sup> |                                                              | 175                                                             | $^{\circ}\text{C}$ |

1.  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$  condition to avoid thermal runaway for a diode on its own heatsink

**Table 3. Thermal resistance**

| Symbol        | Parameter        |          | Value | Unit                 |
|---------------|------------------|----------|-------|----------------------|
| $R_{th(j-l)}$ | Junction to lead | SMA      | 30    | $^{\circ}\text{C/W}$ |
|               |                  | SMB      | 25    |                      |
|               |                  | SMB flat | 15    |                      |

**Table 4. Static electrical characteristics**

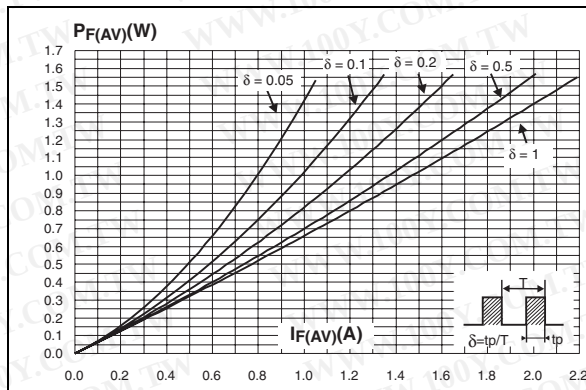
| Symbol      | Parameter               | Test conditions                     |                    | Min. | Typ. | Max. | Unit          |
|-------------|-------------------------|-------------------------------------|--------------------|------|------|------|---------------|
| $I_R^{(1)}$ | Reverse leakage current | $T_j = 25\text{ }^{\circ}\text{C}$  | $V_R = V_{RRM}$    |      |      | 1    | $\mu\text{A}$ |
|             |                         | $T_j = 125\text{ }^{\circ}\text{C}$ |                    |      | 0.4  | 1    | mA            |
| $V_F^{(2)}$ | Forward voltage drop    | $T_j = 25\text{ }^{\circ}\text{C}$  | $I_F = 2\text{ A}$ |      |      | 0.79 | V             |
|             |                         | $T_j = 125\text{ }^{\circ}\text{C}$ |                    |      | 0.6  | 0.65 |               |
|             |                         | $T_j = 25\text{ }^{\circ}\text{C}$  | $I_F = 4\text{ A}$ |      |      | 0.88 |               |
|             |                         | $T_j = 125\text{ }^{\circ}\text{C}$ |                    |      | 0.69 | 0.74 |               |

1. Pulse test:  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$

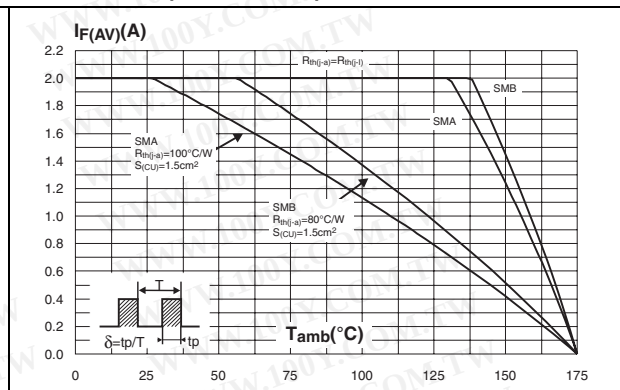
2. Pulse test:  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

To evaluate the conduction losses use the following equation:  $P = 0.56 \times I_{F(AV)} + 0.045 I_F^2_{(RMS)}$

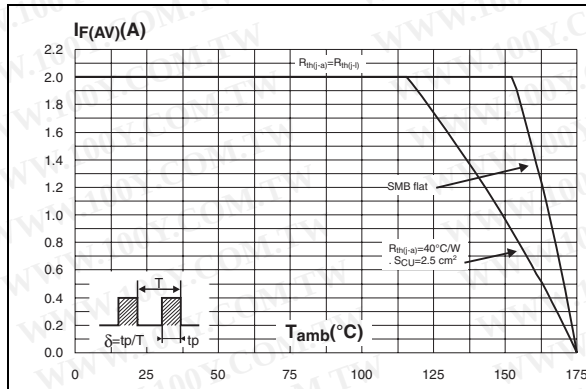
**Figure 1. Average forward power dissipation versus average forward current**



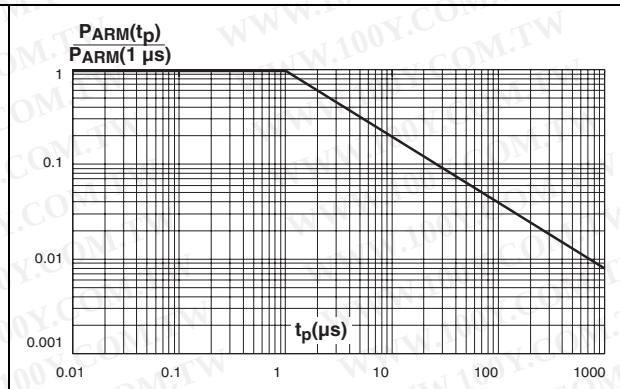
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ ) (SMA / SMB)**



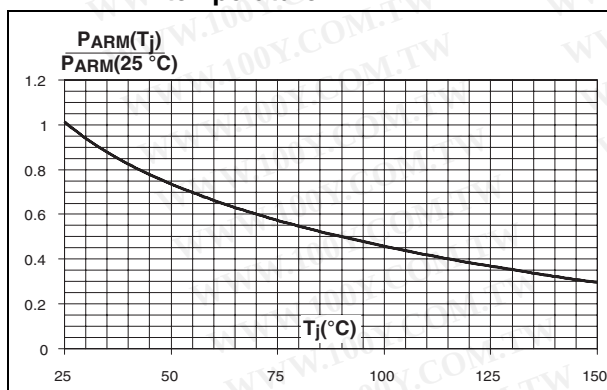
**Figure 3. Average forward current versus ambient temperature ( $\delta = 0.5$ ) (SMB flat)**



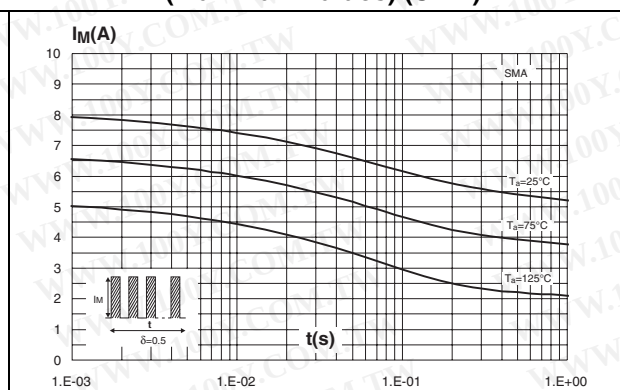
**Figure 4. Normalized avalanche power derating versus pulse duration**



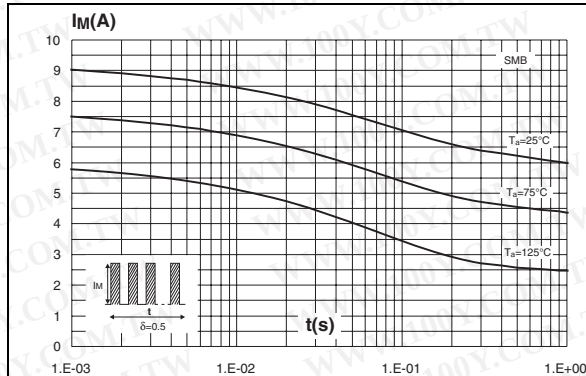
**Figure 5. Normalized avalanche power derating versus junction temperature**



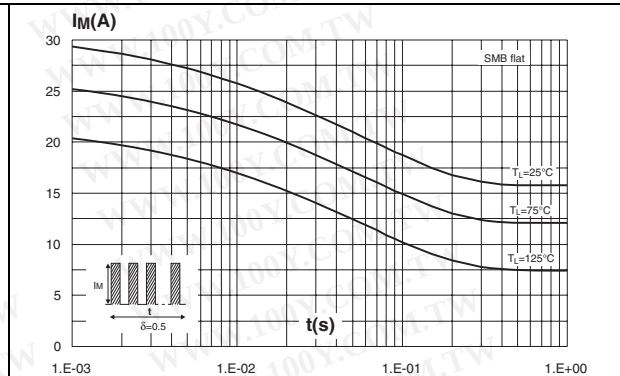
**Figure 6. Non repetitive surge peak forward current versus overload duration (maximum values) (SMA)**



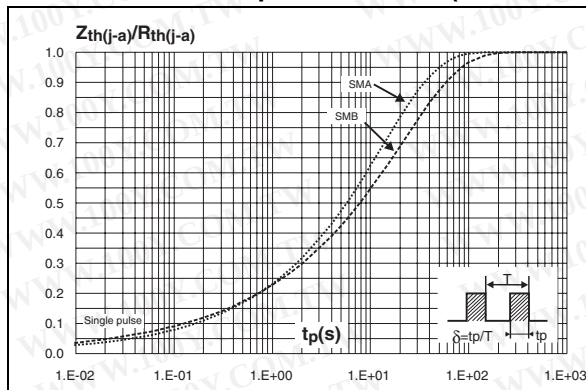
**Figure 7. Non repetitive surge peak forward current versus overload duration (maximum values) (SMB)**



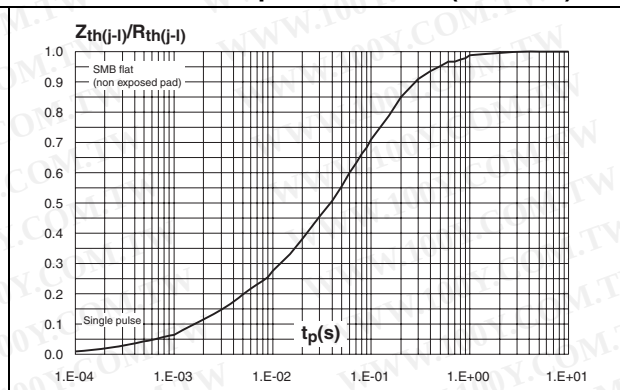
**Figure 8. Non repetitive surge peak forward current versus overload duration (maximum values) (SMB flat)**



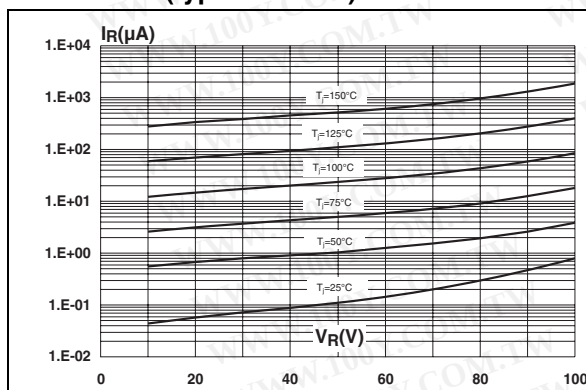
**Figure 9. Relative variation of thermal impedance junction to ambient versus pulse duration (SMA / SMB)**



**Figure 10. Relative variation of thermal impedance junction to lead versus pulse duration (SMB flat)**



**Figure 11. Reverse leakage current versus reverse voltage applied (typical values)**



**Figure 12. Junction capacitance versus reverse voltage applied (typical values)**

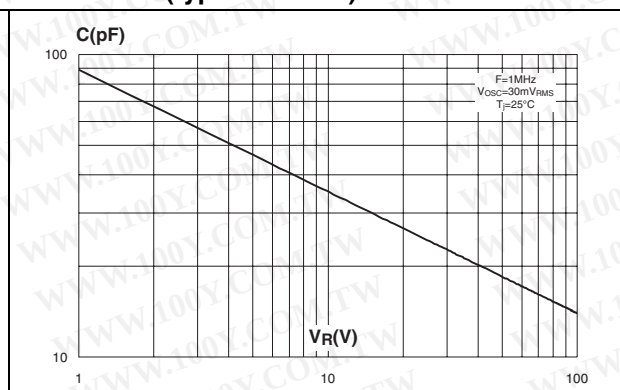


Figure 13. Forward voltage drop versus forward current (low level)

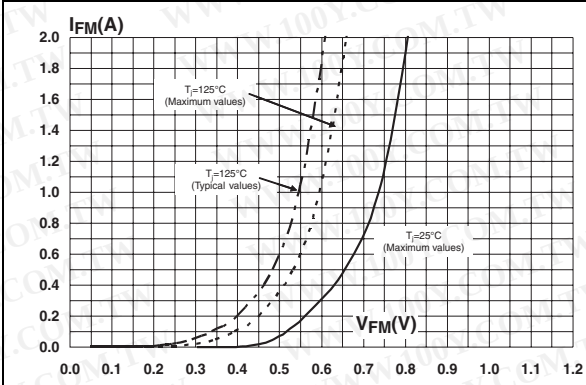


Figure 14. Forward voltage drop versus forward current (high level)

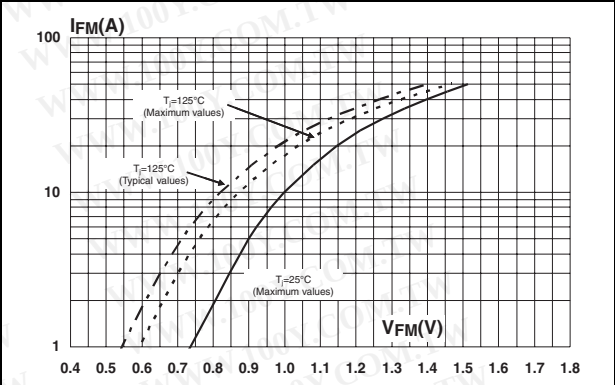


Figure 15. Thermal resistance junction to ambient versus copper surface under each lead (SMA)

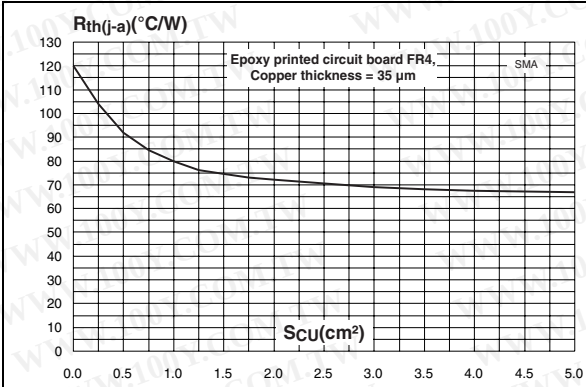


Figure 16. Thermal resistance junction to ambient versus copper surface under each lead (SMB)

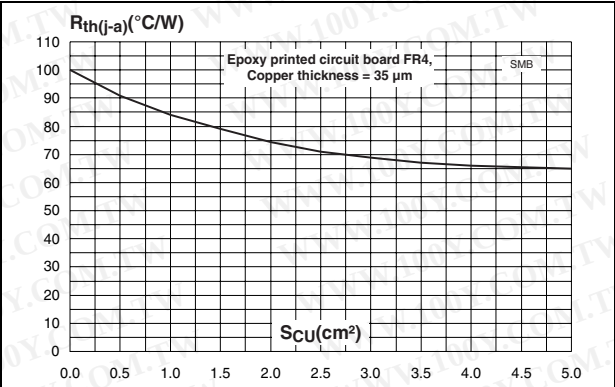
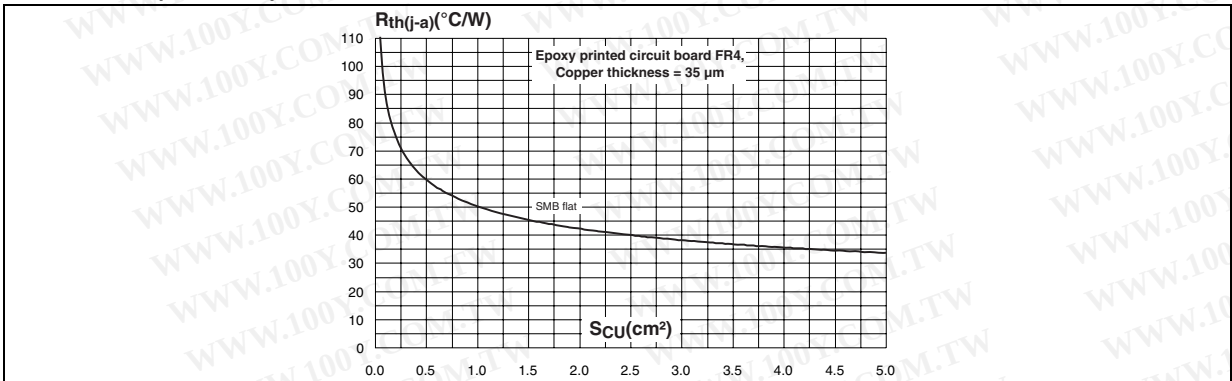


Figure 17. Thermal resistance junction to ambient versus copper surface under each lead (SMB flat)



# 2 Package information

- Epoxy meets UL94, V0
- Lead-free package

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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 18. SMA footprint (dimensions in mm)

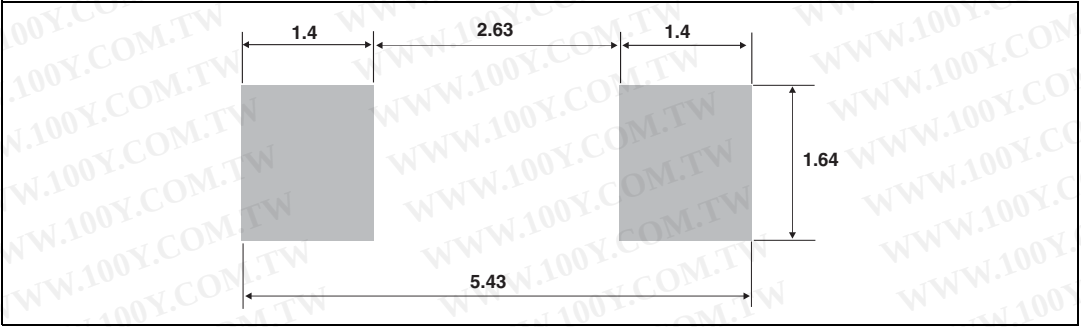


Table 6. SMB dimensions

| 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 |
| 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 19. SMB footprint (dimensions in mm)

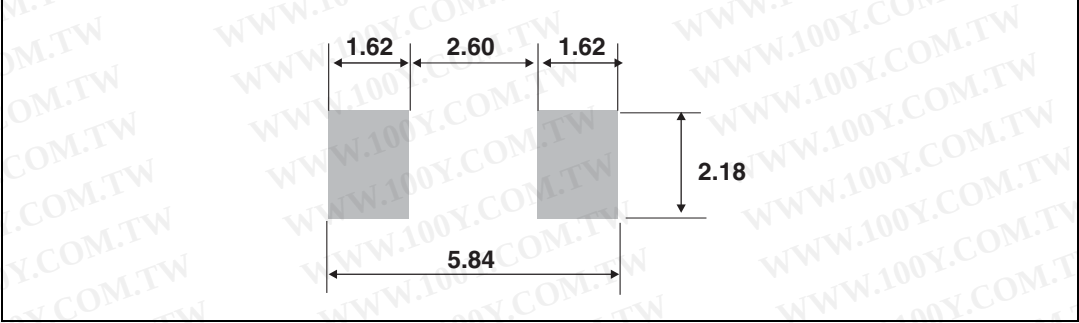
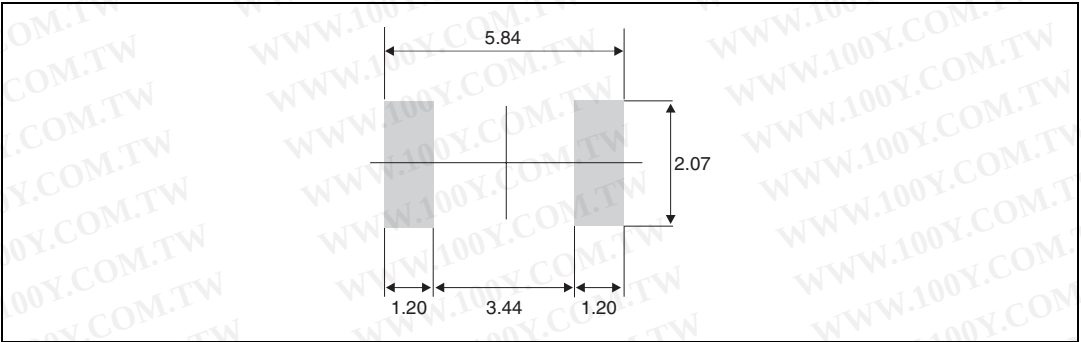


Table 7. SMB flat dimensions

| Ref.             | Dimensions  |      |      |        |       |       |
|------------------|-------------|------|------|--------|-------|-------|
|                  | Millimeters |      |      | Inches |       |       |
|                  | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A                | 0.90        |      | 1.10 | 0.035  |       | 0.043 |
| b <sup>(1)</sup> | 1.95        |      | 2.20 | 0.077  |       | 0.087 |
| c <sup>(1)</sup> | 0.15        |      | 0.40 | 0.006  |       | 0.016 |
| D                | 3.30        |      | 3.95 | 0.130  |       | 0.156 |
| E                | 5.10        |      | 5.60 | 0.200  |       | 0.220 |
| E1               | 4.05        |      | 4.60 | 0.189  |       | 0.181 |
| L                | 0.75        |      | 1.50 | 0.029  |       | 0.059 |
| L1               |             | 0.40 |      |        | 0.016 |       |
| L2               |             | 0.60 |      |        | 0.024 |       |

1. Applies to plated leads

Figure 20. SMB flat footprint (dimensions in mm)



### 3 Ordering information

**Table 8. Ordering information**

| Order code  | Marking | Package  | Weight  | Base qty | Delivery mode |
|-------------|---------|----------|---------|----------|---------------|
| STPS2H100A  | S21     | SMA      | 0.068 g | 5000     | Tape and reel |
| STPS2H100U  | G21     | SMB      | 0.107 g | 2500     | Tape and reel |
| STPS2H100UF | FG21    | SMB flat | 0.050 g | 5000     | Tape and reel |

### 4 Revision history

**Table 9. Document revision history**

| Date        | Revision | Changes                                                                                                      |
|-------------|----------|--------------------------------------------------------------------------------------------------------------|
| Jul-2003    | 4A       | Last update.                                                                                                 |
| Aug-2004    | 5        | SMA package dimensions update. Reference A1 max. changed from 2.70 (0.106 inches) to 2.03 mm (0.080 inches). |
| 08-Feb-2007 | 6        | Reformatted to current standards. Added ECOPACK statement. Added SMB flat package.                           |
| 15-Feb-2010 | 7        | Updated weight for SMB flat in <a href="#">Table 8</a> .                                                     |

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