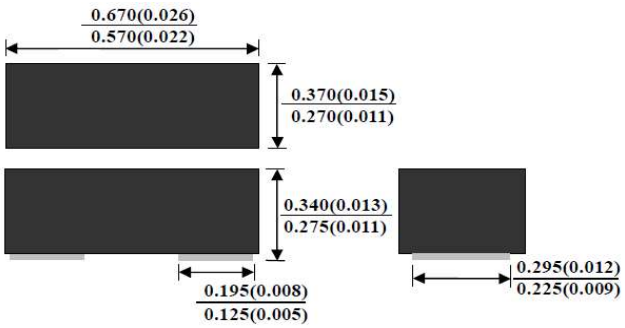
# SE05S3BPDB

## *ESD PROTECTION DIODE*

### *FEATURES*

· Bi-directional ESD protection
· IEC61000-4-2 25KV(Contact), 30KV(air)
· Ultra small SMD package:0201
· Operating voltage: 5V
· Suffix "H" indicates Halogen-free parts, ex. SE05S3BPDBH

**DFN0603 (0201)**




**Dimensions in inchs millimeters and (inchs)**

### *APPLICATIONS*

· Computers and peripherals
· High speed data lines
· Audio and video equipment
· Cellular handsets and accessories
· Portable electronics

### *MECHANICAL DATA*

Case : DFN0603(0201) standard package
Terminals : Au plated, Solderable per MIL-STD-750, method 2026
Meet MSL 1 requirement
Epoxy: UL 94V-O rate flame retardant

### *PIN CONFIGURATION*

### *Maximum Ratings (Rating at 25°C ambient temperature unless otherwise specified)*

| Parameter | | Symbol | Value | Units |
|---|---|---|---|---|
| IEC 61000-4-2 ESD Voltage | Air Model<br>Contact Model | $V_{ESD}$ | ±30<br>±25 | kV |
| Peak Pulse Power tp=8/20 us | | $P_{PP}$ | 50 | W |
| Maximum Peak Pulse Current tp=8/20 us | | $I_{PP}$ | 3.5 | A |
| Operating Junction Temperature | | $T_j$ | -55 to +125 | ℃ |
| Storage Temperature Range | | $T_{stg}$ | -55 to +150 | ℃ |

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### *Electrical Charateristics ($T_a$=25 ℃ unless otherwise specified)*

| Parameter | Test conditions | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Reverse stand off voltage | - | $V_{RWM}$ | - | - | 5 | V |
| Reverse leakage current | $V_{RWM}$=5V | $I_R$ | - | - | 10 | nA |
| Reverse breakdown voltage | $I_T$=1mA | $V_{(BR)}$ | 5.6 | - | 9.0 | V |
| Clamping voltage | Ipp=1A, tp=8/20 μs | $V_C$ | - | - | 12 | V |
| | Ipp=3.0A, tp=8/20 μs | $V_C$ | - | - | 17 | V |
| Clamping voltage | Ipp=-5.0A, TLP=0.2/100ns | $V_C$ | | -15 | | V |
| | Ipp=5.0A, TLP=0.2/100ns | $V_C$ | | 15 | | V |
| | Ipp=-30A, TLP=0.2/100ns | $V_C$ | | -20 | | V |
| | Ipp=-30, TLP=0.2/100ns | $V_C$ | | 20 | | V |
| Junction capacitance | Between I/O Pin and GND $V_R$=0V，f=1MHz | $C_j$ | - | 3 | 10 | pF |
| Dynamic Resistance | Tp=100ns | $R_D$ | - | 0.23 | - | Ω |

1) TLP Settings: tp=100ns, tr=0.2ns, ITLP and VTLP averaging window: $t_1$=70ns to $t_2$=90ns.

2) Dynamic resistance calculated from $I_{TLP}$=-5A to $I_{TLP}$=-30A and $I_{TLP}$=+5A to $I_{TLP}$=+30A

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### *RATINGS AND CHARACTERISTIC CURVES*

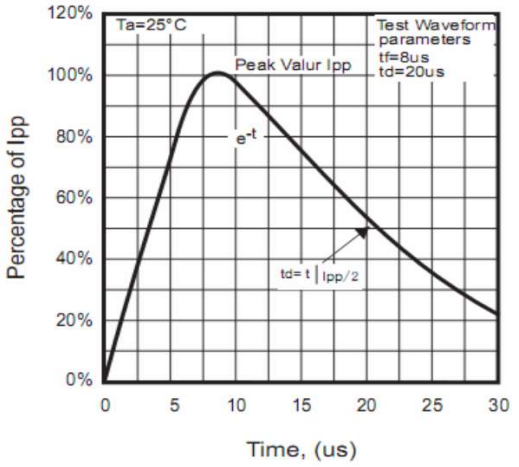


**Fig.1 8/20 μS Peak Pulse Current Wave From Acc. IEC 61000-4-5**

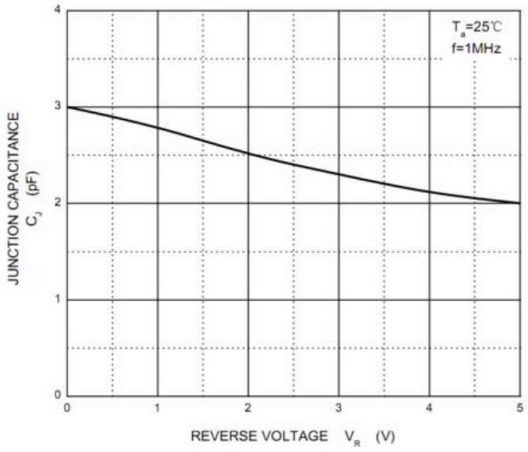


**Fig.2 Typical Capacitance Between Temerals Characteristics**

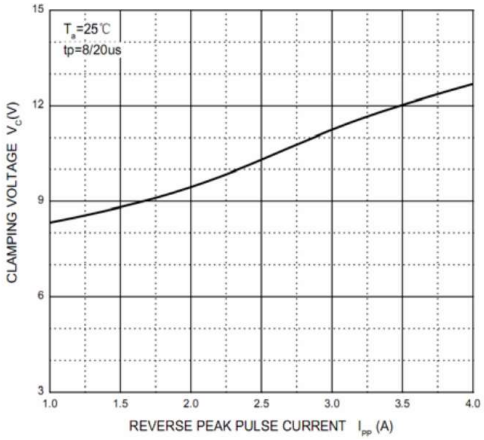


**Fig.3 Clamping Voltage vs Peak Pulse Current**

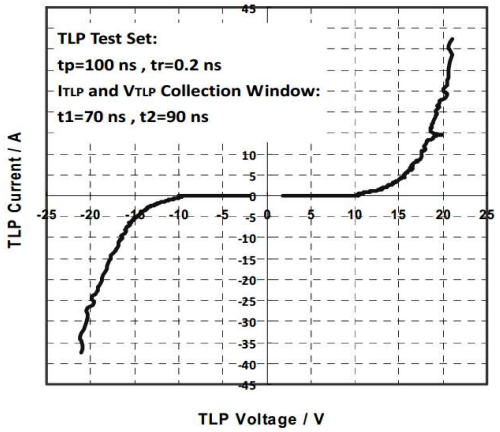


**Fig.4 TLP Measurement**

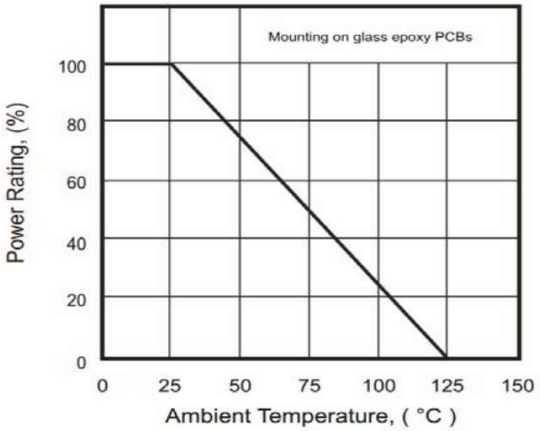


**Fig.5 Power Derating Curve**

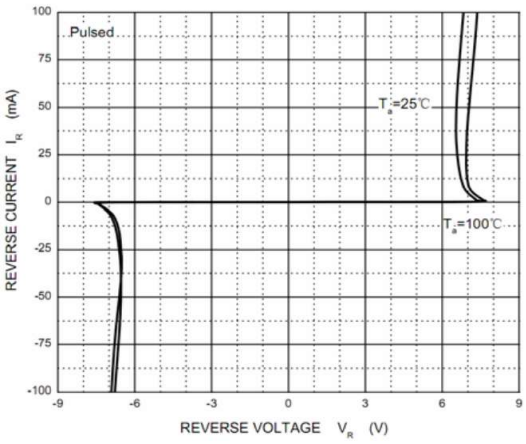


**Fig.6 Reverse Characteristics**

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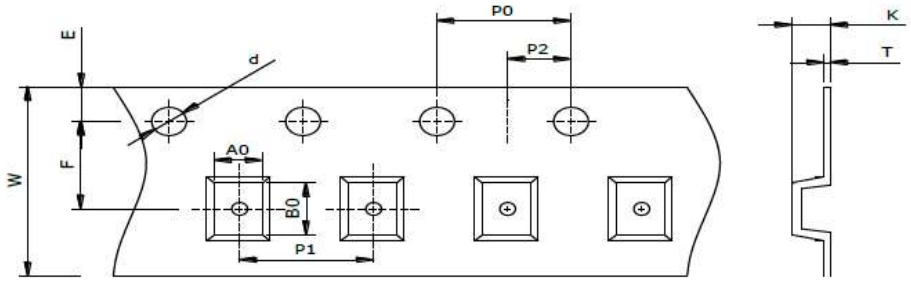
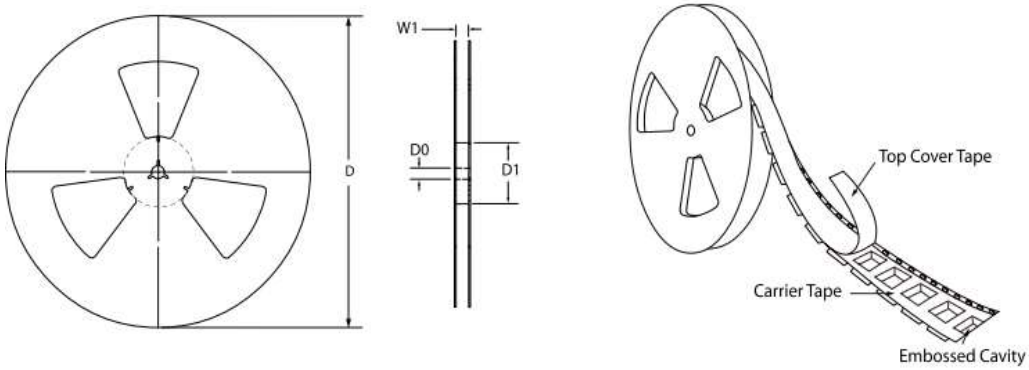
## *ESD PROTECTION DIODE*

### *TAPE & REEL SPECIFICATION*



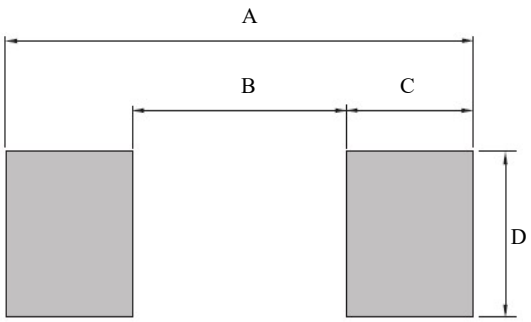




| Item | Symbol | DFN0603 (0201) |
|---|---|---|
| Carrier width | $A_0$ | 0.37 ± 0.05 |
| Carrier length | $B_0$ | 0.67 ± 0.05 |
| Carrier depth | K | 0.50 ± 0.05 |
| Sprocket hole | d | 1.50 ± 0.10 |
| Reel outside diameter | D | 178.00 ± 2.00 |
| Feed hole width | $D_0$ | 13.00 ± 0.20 |
| Reel inner diameter | $D_1$ | MIN. 54.00 |
| Sprocke hole position | E | 1.75 ± 0.10 |
| Punch hole position | F | 3.50 ± 0.10 |
| Sprocke hole pitch | $P_0$ | 4.00 ± 0.10 |
| Punch hole pitch | $P_1$ | 4.00 ± 0.10 |
| Embossment center | $P_2$ | 2.00 ± 0.10 |
| Overall tape thickness | T | 0.18 ± 0.05 |
| Tape width | W | 8.00 ± 0.20 |
| Reel width | W1 | MAX. 13.50 |

### *ORDER INFORMATION*

| Package | Marking Code | Reel Size | Quantity |
|---|---|---|---|
| DFN0603 (0201) | I | 7" | 10,000 |

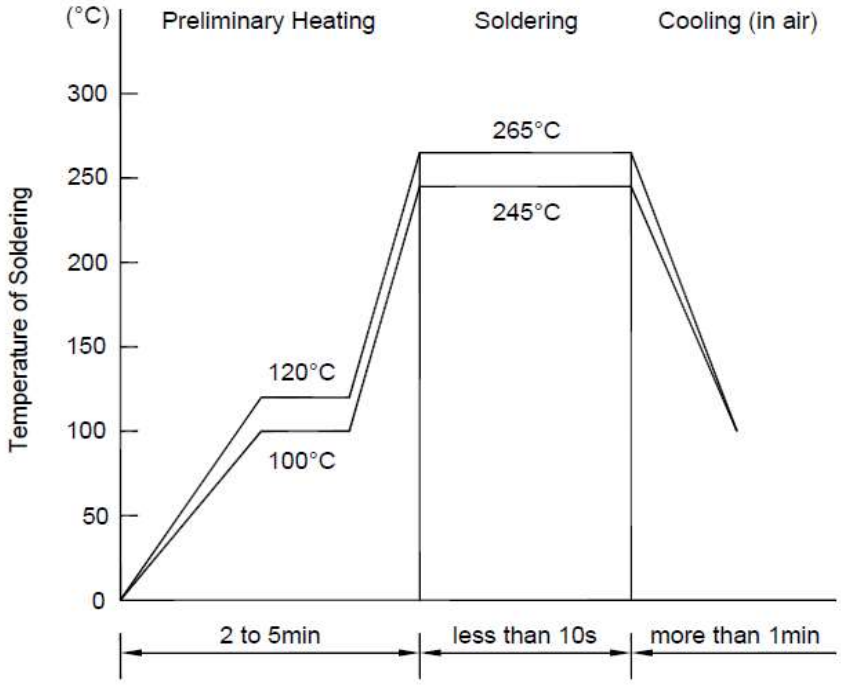
## *SUGGESTED SOLDER PAD LAYOUT*



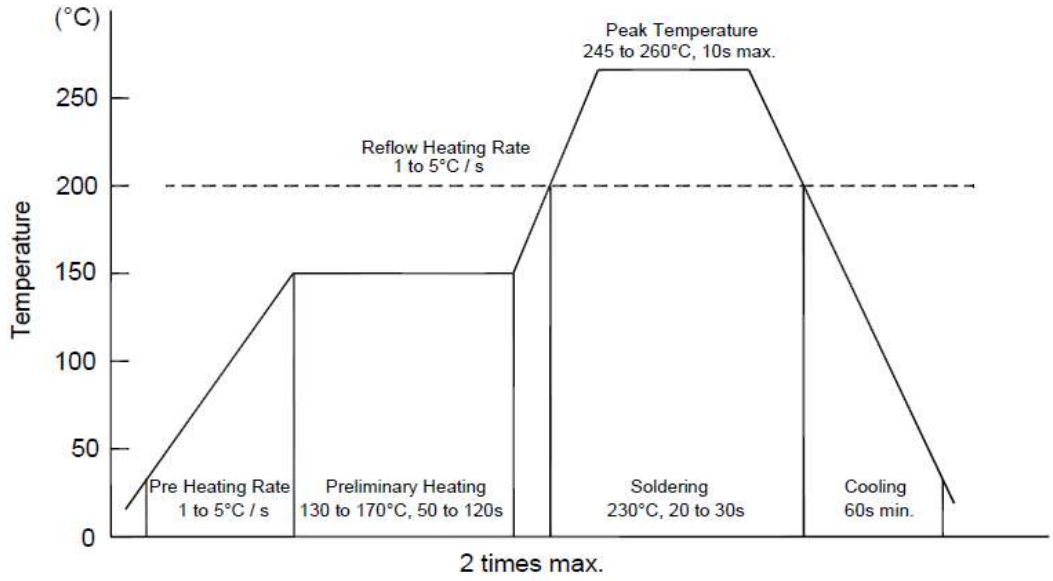

| PACKAGE | A | B | C | D |
|---|---|---|---|---|
| DFN0603 (0201) | 0.64 | 0.20 | 0.22 | 0.36 |

## *CONDITION OF SOLDERING*

**Recommended condition of flow soldering**



**Recommended condition of reflow soldering**




Recommended peak temperature is over 245℃. If peak temperature is below 245℃, you may adjust the following parameters; time length of peak temperature (longer), time length of soldering (longer), thickness of solder paste (thicker)

**Condition of hand soldering**

Temperature: 370℃
Time: 3s max.
Times: one time