

## SMAJ Plastic-Encapsulate Diodes

### ES1A THRU ES1J Super Fast Recovery Rectifier Diodes

#### Features

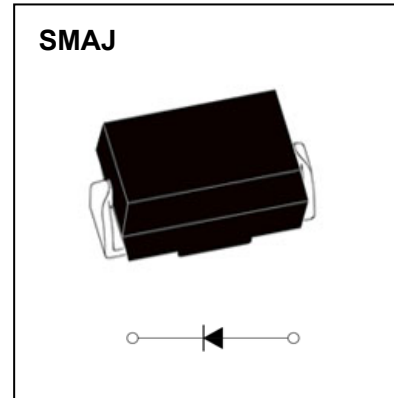
- $I_{F(AV)}$  1A
- $V_{RRM}$  50V-600V
- High surge current capability
- Polarity: Color band denotes cathode

#### Applications

- Rectifier

#### Marking

- ES1X
- X : From A To J



#### Limiting Values(Absolute Maximum Rating)

| Item   | Symbol         | Unit             | Test Conditions   | ES1        |     |     |     |     |     |     |     |
|--|----------------|------------------|---|------------|-----|-----|-----|-----|-----|-----|-----|
|  |                |                  |   | A          | B   | C   | D   | E   | G   | H   | J   |
| Repetitive Peak Reverse Voltage                  | $V_{RRM}$      | V                |   | 50         | 100 | 150 | 200 | 300 | 400 | 500 | 600 |
| Maximum RMS Voltage                              | $V_{RMS}$      | V                |   | 35         | 70  | 105 | 140 | 210 | 280 | 350 | 420 |
| Average Forward Current                          | $I_{F(AV)}$    | A                | 60Hz Half-sine wave,<br>Resistance load, $T_a=75^\circ\text{C}$ | 1.0        |     |     |     |     |     |     |     |
| Surge(Non-repetitive)Forward Current             | $I_{FSM}$      | A                | 60Hz Half-sine wave,<br>1 cycle, $T_a=25^\circ\text{C}$         | 30         |     |     |     |     |     |     |     |
| Operation Junction and Storage Temperature Range | $T_J, T_{STG}$ | $^\circ\text{C}$ |   | -55 ~ +150 |     |     |     |     |     |     |     |

#### Electrical Characteristics (T=25°C Unless otherwise specified)

| Item                          | Symbol           | Unit                      | Test Condition  | ES1                     |    |     |      |   |      |   |   |
|-------------------------------|------------------|---------------------------|---|-------------------------|----|-----|------|---|------|---|---|
|                               |                  |                           |   | A                       | B  | C   | D    | E | G    | H | J |
| Peak Forward Voltage          | $V_F$            | V                         | $I_F=1.0\text{A}$                                       | 0.95                    |    |     | 1.25 |   | 1.70 |   |   |
| Maximum reverse recovery time | $t_{rr}$         | ns                        | $I_F=0.5\text{A}, I_R=1.0\text{A}, I_{rr}=0.25\text{A}$ | 35                      |    |     |      |   |      |   |   |
| Peak Reverse Current          | $I_{RRM1}$       | $\mu\text{A}$             | $V_{RM}=V_{RRM}$  | $T_a=25^\circ\text{C}$  |    | 5   |      |   |      |   |   |
|                               | $I_{RRM2}$       |                           |   | $T_a=100^\circ\text{C}$ |    | 100 |      |   |      |   |   |
| Thermal Resistance(Typical)   | $R_{\theta J-A}$ | $^\circ\text{C}/\text{W}$ | Between junction and ambient                            |                         | 55 |     |      |   |      |   |   |
|                               | $R_{\theta J-L}$ |                           | Between junction and terminal                           |                         | 25 |     |      |   |      |   |   |

#### Notes:

Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pad areas

# Typical Characteristics

FIG.1: FORWARD CURRENT DERATING CURVE

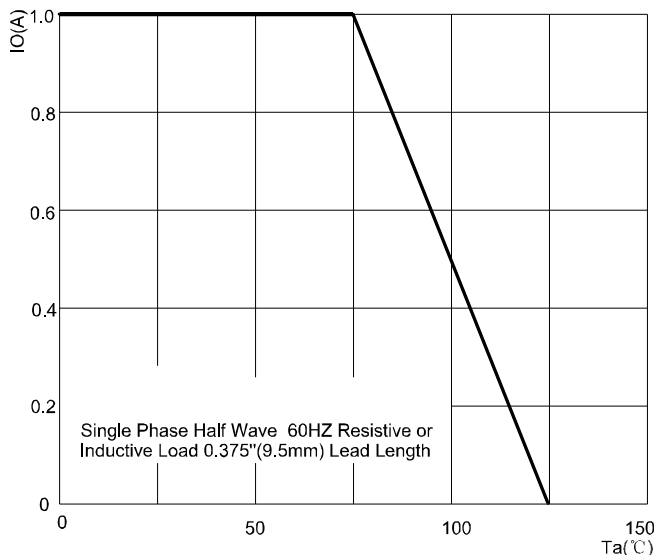


FIG.2: MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

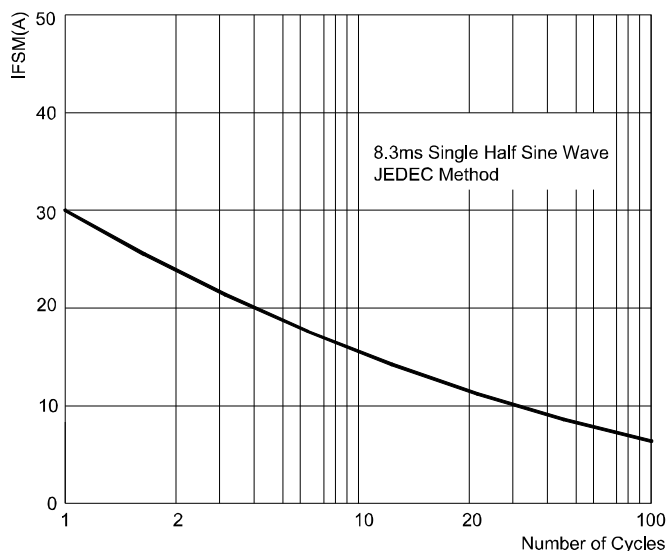


FIG.3: TYPICAL FORWARD CHARACTERISTICS

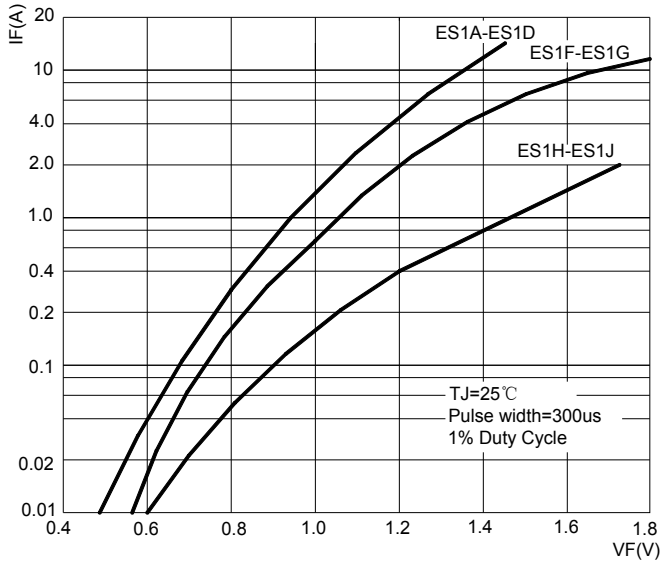


FIG.4: TYPICAL REVERSE CHARACTERISTICS

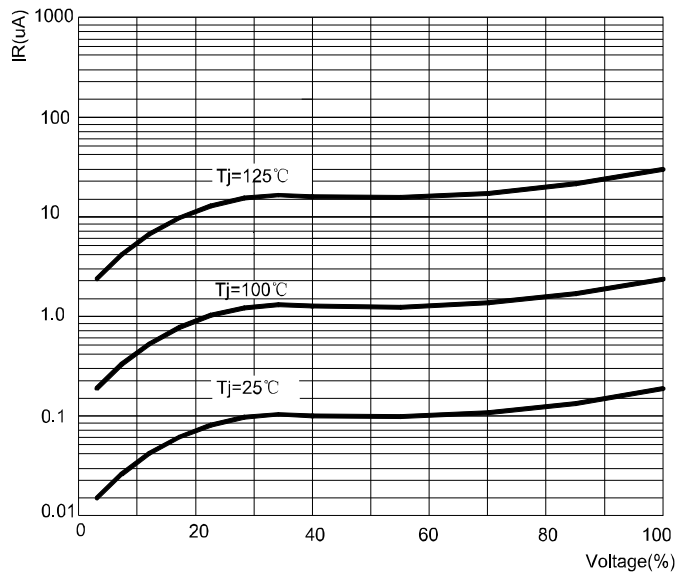
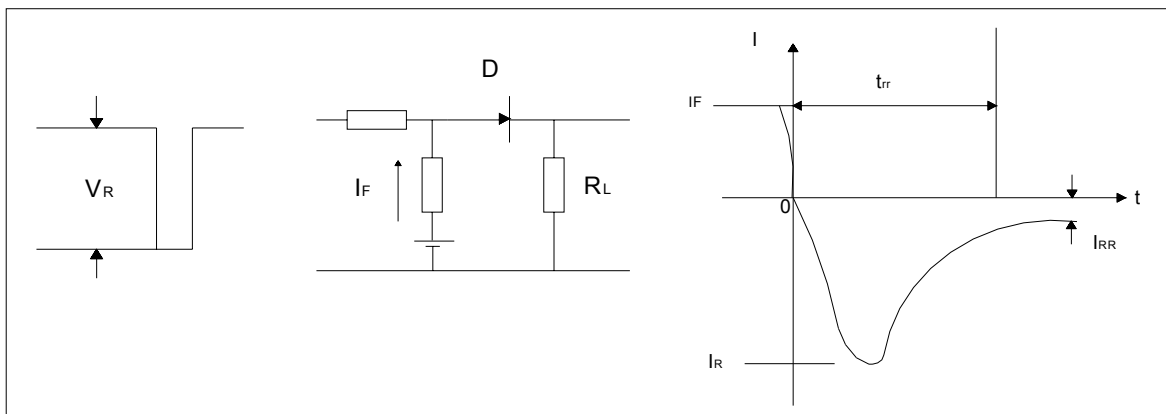
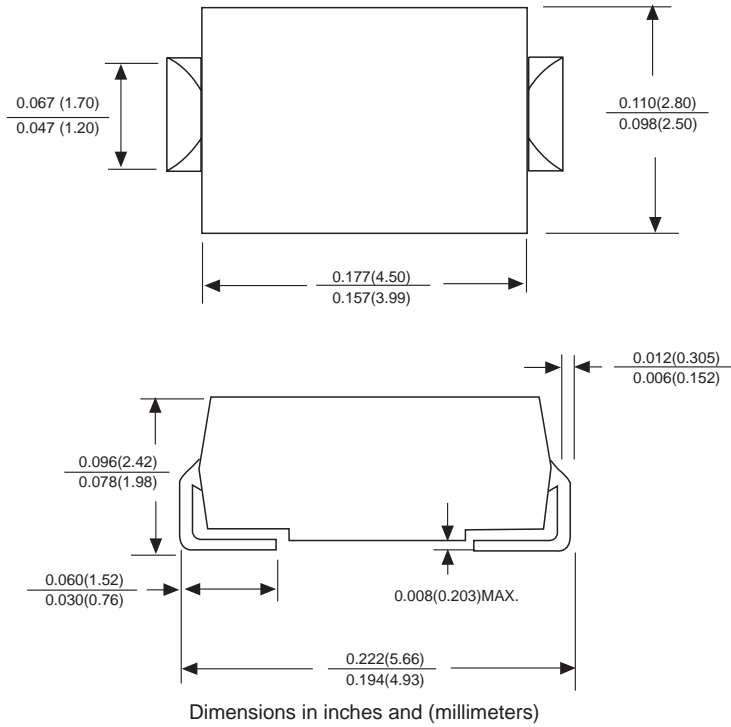


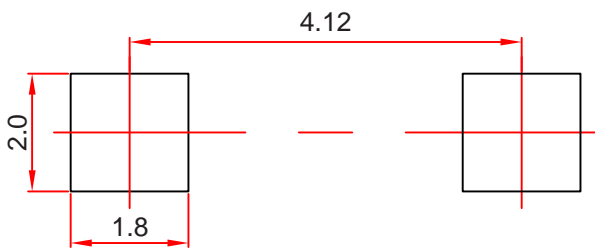
FIG.5: Diagram of circuit and Testing wave form of reverse recovery time



## SMAJ Package Outline Dimensions



## SMAJ Suggested Pad Layout



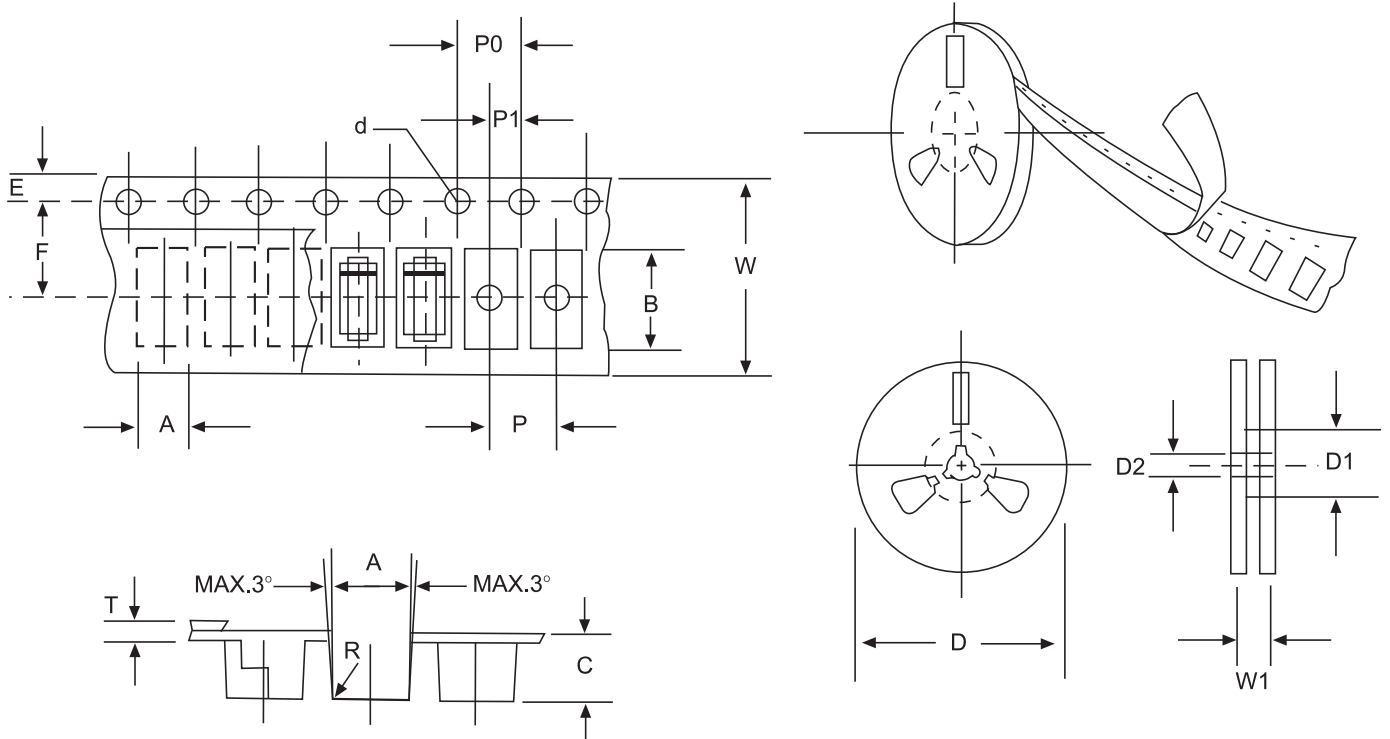
### Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

### NOTICE

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# Reel Taping Specifications For Surface Mount Devices-SMAJ



**FIG: CONFIGURATION OF SURFACE MOUNTED DEVICES TAPING**

| ITEM                  | SYMBOL | SMAJ mm(inch)             |
|-----------------------|--------|---------------------------|
| Carrier width         | A      | 2.79±0.1(0.110±0.004)     |
| Carrier length        | B      | 5.33±0.1(0.210±0.004)     |
| Carrier depth         | C      | 2.36±0.1(0.093±0.004)     |
| Sprocket hole         | d      | 1.55±0.05(0.061±0.002)    |
| Reel outside diameter | D      | 279±2.0 (11± 0.079)       |
| Reel inner diameter   | D1     | 75 ±1.0 ( 2.95 ±0.039)    |
| Feed hole diameter    | D2     | 13±0.5(0.512±0.020)       |
| Stroket hole position | E      | 1.75±0.1(0.069±0.004)     |
| Punch hole position   | F      | 5.5±0.05(0.217±0.002)     |
| Punch hole pitch      | P      | 4.0±0.1(0.157±0.004)      |
| Sprocket hole pitch   | P0     | 4.0±0.1(0.157±0.004)      |
| Embossment center     | P1     | 2.0±0.1(0.079±0.004)      |
| Totall tape thickness | T      | 0.28±0.02(0.011 ±0.0008 ) |
| Tape width            | W      | 12.0±0.2(0.472±0.008)     |
| Reel width            | W1     | 16.8±2.0(0.661±0.079)     |

NOTE: Devices are packed in accordance with EIA standard RS-481-A and specification given above.

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