# DF15005-S THRU DF1510-S

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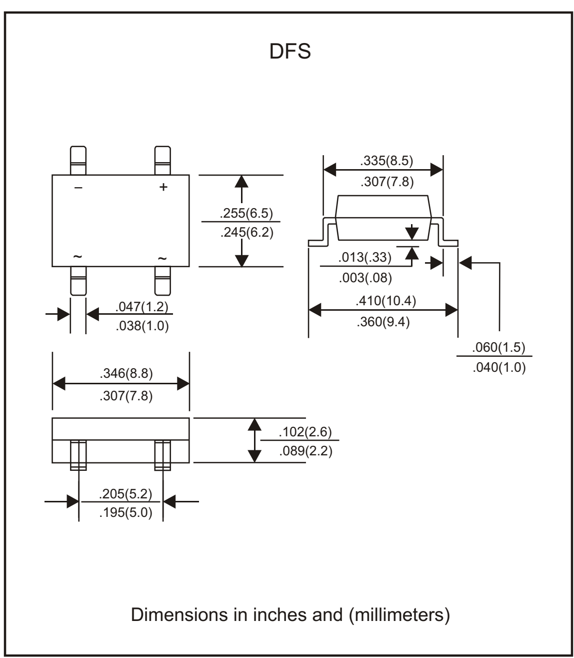
# DF15005-S THRU DF1510-S

## 1.5A Miniature Glass Passivated Single-Phase Surface Mount Bridge Rectifiers-50-1000V

## Features

- Surge overload ratings to 50 amperes peak.
- Surface mount type for automated replacement.
- Ideal for printed board.
- Low forward drop down voltage.
- Reliable low cost construction utilizing molded plastic technology results in inexpensive product.
- Glass passivated chip junctions.
- Lead-free parts meet RoHS requirments.
- UL recognized file # E321971

## Package outline



Dimensions in inches and (millimeters)

## Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, DFS
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : marked on body
- Mounting Position : Any
- Weight : Approximated 1.00 gram

## Maximum ratings (AT $T_A$=25°C unless otherwise noted)

| PARAMETER | CONDITIONS | Symbol | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Forward rectified current | See Fig.1 | $I_O$ | | | 1.5 | A |
| Forward surge current | 8.3ms single half sine-wave superimposed on rate load (JEDEC methode) | $I_{FSM}$ | | | 50 | A |
| Reverse current | $V_R$ = $V_{RRM}$ $T_A$ = 25°C | $I_R$ | | | 10 | uA |
| | $V_R$ = $V_{RRM}$ $T_A$ = 100°C | | | | 500 | |
| Storage temperature | | $T_{STG}$ | -65 | | +175 | °C |

| SYMBOLS | $V_{RRM}$ *1 (V) | $V_{RMS}$ *2 (V) | $V_R$ *3 (V) | $V_F$ *4 (V) | Operating temperature $T_J$, (°C) |
|---|---|---|---|---|---|
| DF15005-S | 50 | 35 | 50 | 1.10 | -55 to +150 |
| DF1501-S | 100 | 70 | 100 | | |
| DF1502-S | 200 | 140 | 200 | | |
| DF1504-S | 400 | 280 | 400 | | |
| DF1506-S | 600 | 420 | 600 | | |
| DF1508-S | 800 | 560 | 800 | | |
| DF1510-S | 1000 | 700 | 1000 | | |

*1 Repetitive peak reverse voltage

*2 RMS voltage

*3 Continuous reverse voltage

*4 Maximum forward voltage

# Rating and characteristic curves (DF15005-S THRU DF1510-S)

FIG.1-TYPICAL FORWARD CURRENT
DERATING CURVE

AVERAGE FORWARD CURRENT,(A)
1.8
1.5
1.2
0.9
0.6
0.3
0
Single Phase
Half Wave 60Hz
Resistive Or Inductive Load
0 25 50 75 100 125 150 175
CASE TEMPERATURE,(°C)

FIG.2-MAXIMUM NON-REPETITIVE FORWARD
SURGE CURRENT

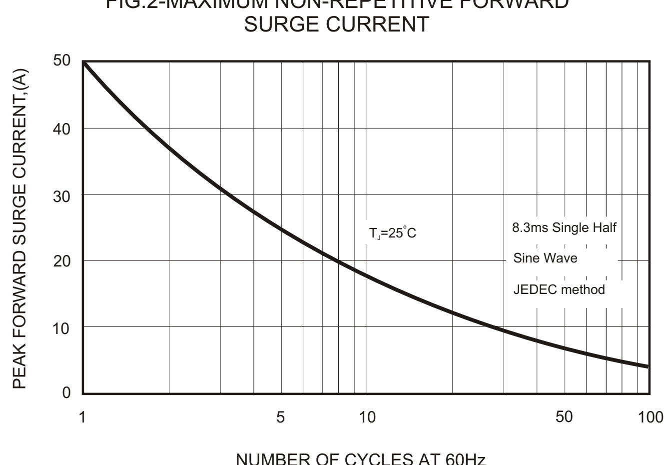



FIG.3-TYPICAL FORWARD
CHARACTERISTICS

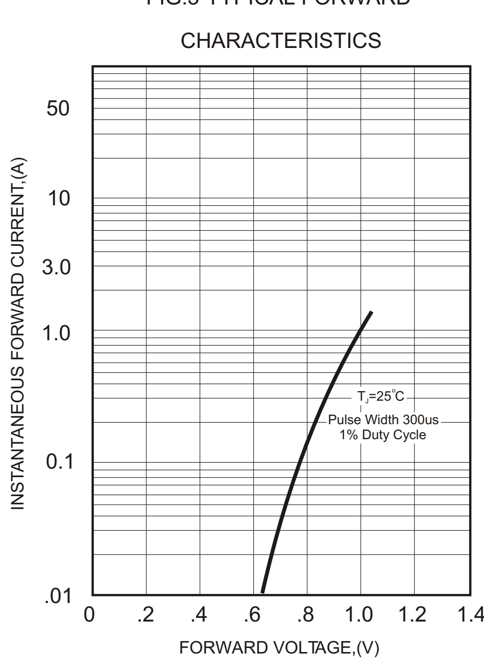
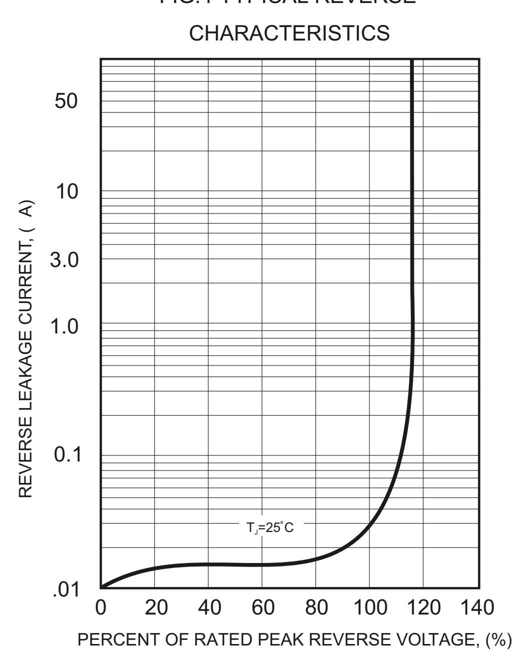



FIG.4-TYPICAL REVERSE
CHARACTERISTICS



# DF15005-S THRU DF1510-S

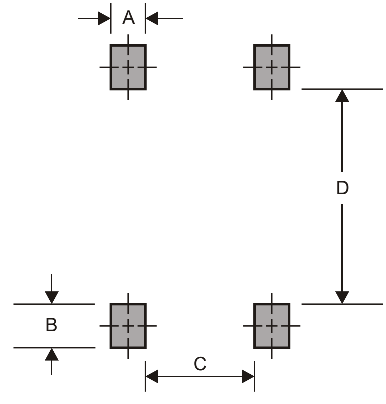
## Pinning information

| Simplified outline | Symbol |
|---|---|
| | |

## Marking

| Type number | Marking code |
|---|---|
| DF15005-S | DF15005S |
| DF1501-S | DF1501S |
| DF1502-S | DF1502S |
| DF1504-S | DF1504S |
| DF1506-S | DF1506S |
| DF1508-S | DF1508S |
| DF1510-S | DF1510S |

## Suggested solder pad layout

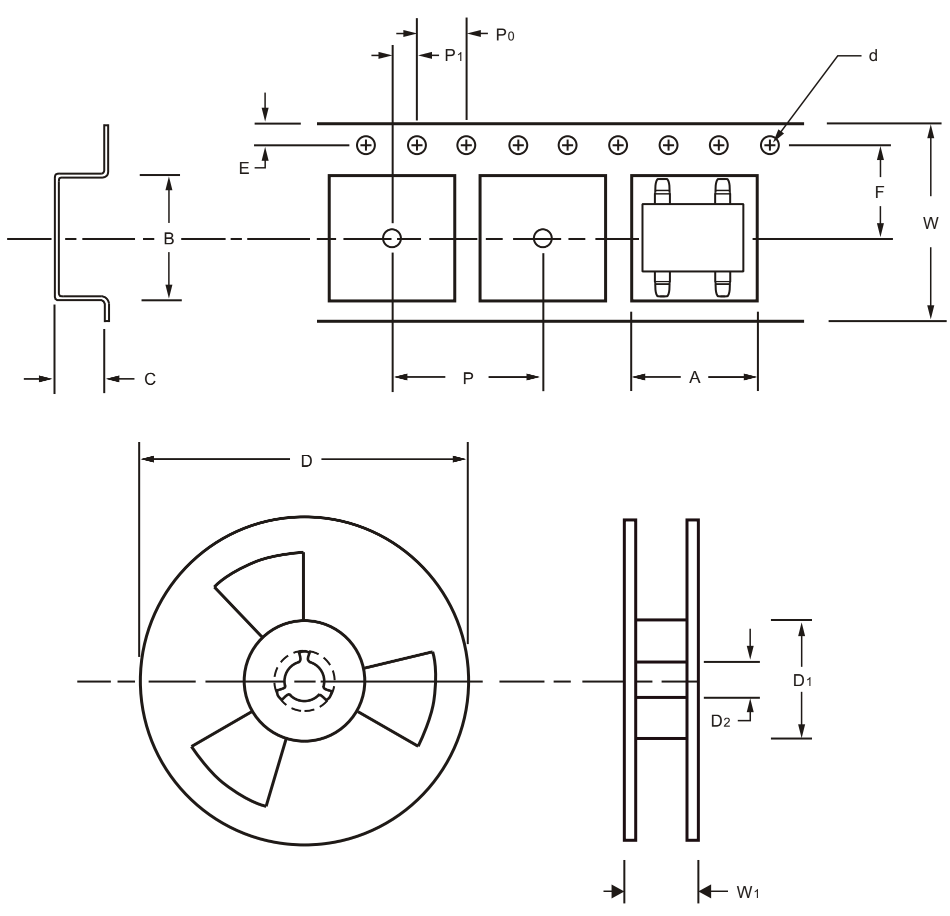



Dimensions in inches and (millimeters)

| PACKAGE | A | B | C | D |
|---|---|---|---|---|
| DBS | 0.059 (1.50) | 0.047 (1.20) | 0.157 (4.00) | 0.291 (7.40) |

# DF15005-S THRU DF1510-S

## Packing information




unit:mm

| Item | Symbol | Tolerance | DFS |
|---|---|---|---|
| Carrier width | A | 0.1 | 8.64 |
| Carrier length | B | 0.1 | 10.41 |
| Carrier depth | C | 0.1 | 3.50 |
| Sprocket hole | d | 0.1 | 1.50 |
| 13" Reel outside diameter | D | 2.0 | 330.00 |
| 13" Reel inner diameter | $D_1$ | min | 50.00 |
| 7" Reel outside diameter | D | 2.0 | - |
| 7" Reel inner diameter | $D_1$ | min | - |
| Feed hole diameter | $D_2$ | 0.5 | 13.00 |
| Sprocket hole position | E | 0.1 | 1.75 |
| Punch hole position | F | 0.1 | 7.50 |
| Punch hole pitch | P | 0.1 | 12.00 |
| Sprocket hole pitch | $P_0$ | 0.1 | 4.00 |
| Embossment center | $P_1$ | 0.1 | 2.00 |
| Overall tape thickness | T | 0.1 | 0.30 |
| Tape width | W | 0.3 | 16.00 |
| Reel width | $W_1$ | 1.0 | 22.00 |

Note:Devices are packed in accor dance with EIA standar RS-481-A and specifications listed above.

# DF15005-S THRU DF1510-S

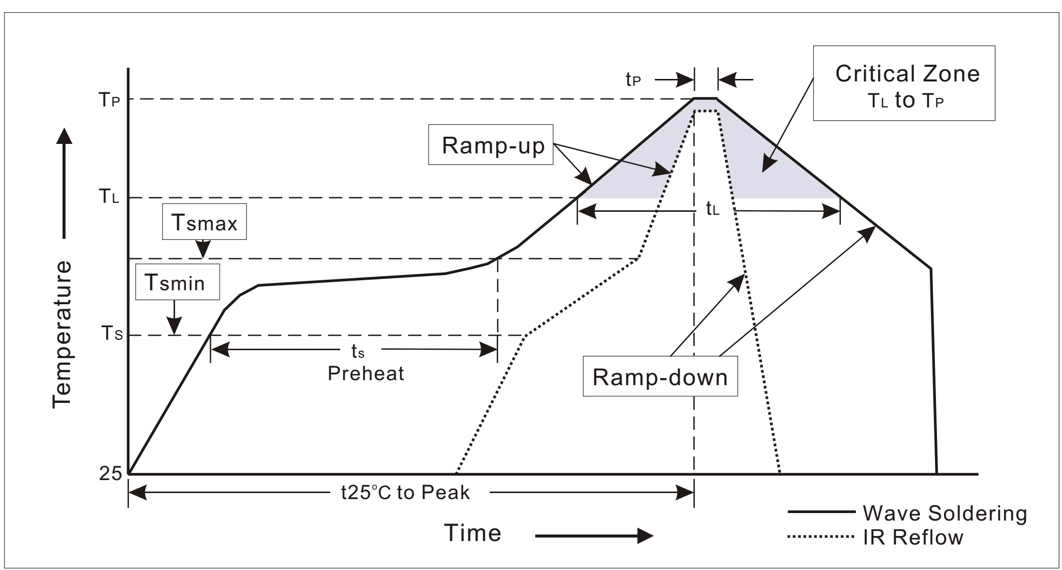
## Reel packing and tube packing

| PACKAGE | REEL SIZE | REEL (pcs) | COMPONENT SPACING (m/m) | BOX (pcs) | INNER BOX (m/m) | REEL DIA, (m/m) | CARTON SIZE (m/m) | CARTON (pcs) | APPROX. GROSS WEIGHT (kg) |
|---|---|---|---|---|---|---|---|---|---|
| DFS | 13" | 1000 | 12.0 | 2000 | 335*335*50 | 330 | 370*370*360 | 12,000 | 11.0 |

| PACKAGE | TUBE (pcs) | TUBE SIZE (m/m) | BOX (pcs) | INNER BOX (m/m) | CARTON SIZE (m/m) | CARTON (pcs) | APPROX. GROSS WEIGHT (kg) |
|---|---|---|---|---|---|---|---|
| DFS | 50 | 423*13.0*3.6 | 5000 | 470*145*73 | 490*240*310 | 30,000 | 17.0 |

## Suggested thermal profiles for soldering processes

1.Storage environment: Temperature=10°C~35°C Humidity=65%±15%
2.Reflow soldering of surface-mount devices




3.Flow (wave)soldering (solder dipping)

| Profile Feature | Soldering Condition |
|---|---|
| Average ramp-up rate($T_L$ to $T_P$) | <3°C/sec |
| Preheat<br>-Temperature Min(Tsmin)<br>-Temperature Max(Tsmax)<br>-Time(min to max)($t_s$) | <br>100°C<br>150°C<br>60~120sec |
| Tsmax to $T_L$<br>-Ramp-upRate | <br><3°C/sec |
| Time maintained above:<br>-Temperature($T_L$)<br>-Time($t_L$) | <br>183°C<br>60~150sec |
| Peak Temperature($T_P$) | 255°C-0/+5°C |
| Time within 5°C of actual Peak Temperature($t_P$) | 10~30sec |
| Ramp-down Rate | <6°C/sec |
| Time 25°C to Peak Temperature | <6minutes |

# DF15005-S THRU DF1510-S

## High reliability test capabilities

| Item Test | Conditions | Reference |
|---|---|---|
| 1. Solder Resistance | at 260±5°C for 10±2sec.<br>immerse body into solder 1/16"±1/32" | MIL-STD-750D<br>METHOD-2031 |
| 2. Solderability | at 245±5°C for 5 sec. | MIL-STD-202F<br>METHOD-208 |
| 3. High Temperature Reverse Bias | $V_R$=80% rate at $T_A$=150°C for 168 hrs. | MIL-STD-750D<br>METHOD-1026 |
| 4. Forward Operation Life | Rated average rectifier current at T=25°C for 500hrs. | MIL-STD-750D<br>METHOD-1027 |
| 5. Intermittent Operation Life | $T_A$ = 25°C, $I_F$ = $I_O$<br>On state: power on for 5 min.<br>off state: power off for 5 min.<br>on and off for 500 cycles. | MIL-STD-750D<br>METHOD-1036 |
| 6. Pressure Cooker | 15$P_{SIG}$ at $T_A$=121°C for 4 hrs. | |
| 7. Temperature Cycling | -55°C to +125°C dwelled for 30 min.<br>and transferred for 5min. total 10 cycles. | MIL-STD-750D<br>METHOD-1051 |
| 8. Thermal Shock | 0°C for 5 min. rise to 100°C for 5 min. total 10 cycles. | MIL-STD-750D<br>METHOD-1056 |
| 9. Forward Surge | 8.3ms single half sine-wave superimposed<br>on rated load, one surge. | MIL-STD-750D<br>METHOD-4066-2 |
| 10. Humidity | at $T_A$=65°C, RH=98% for 1000hrs. | MIL-STD-750D<br>METHOD-1038 |
| 11. High Temperature Storage Life | at 175°C for 1000 hrs. | MIL-STD-750D<br>METHOD-1031 |
| 12. Solvent Resistance | Dip into Freon at 25°C for 1 min. | MIL-STD-202F<br>METHOD-215 |