

# HER201 THRU HER208

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## HER201 THRU HER208

## 2.0A Axial Leaded High Efficiency Rectifiers-50-1000V

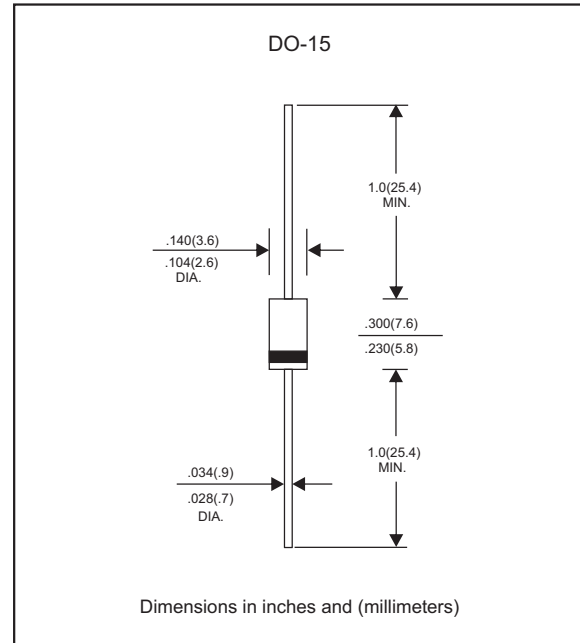
## Features

- Axial lead type devices for through hole design.
- High current capability.
- Ultrafast recovery time for high efficiency.
- High surge current capability.
- Silicon rubber coating chip junction.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen free parts, ex. HER201-H.

## Mechanical data

- Epoxy : UL94-V0 rated flame retardant
- Case : Molded plastic, DO-15
- Lead : Axial leads, solderable per MIL-STD-202, Method 208 guaranteed
- Polarity: Color band denotes cathode end
- Mounting Position : Any
- Weight : Approximated 0.40 gram

## Package outline

Maximum ratings and Electrical Characteristics (AT  $T_A=25^\circ\text{C}$  unless otherwise noted)

| PARAMETER                  | CONDITIONS                                        | Symbol    | MIN. | TYP. | MAX. | UNIT             |
|----------------------------|---------------------------------------------------|-----------|------|------|------|------------------|
| Forward rectified current  | Ambient temperature = $50^\circ\text{C}$          | $I_O$     |      |      | 2.0  | A                |
| Forward surge current      | 8.3ms single half sine-wave (JEDEC method)        | $I_{FSM}$ |      |      | 60   | A                |
| Reverse current            | $V_R = V_{RRM}$ $T_J = 25^\circ\text{C}$          | $I_R$     |      |      | 5.0  | $\mu\text{A}$    |
|                            | $V_R = V_{RRM}$ $T_J = 100^\circ\text{C}$         |           |      |      | 150  |                  |
| Diode junction capacitance | $f=1\text{MHz}$ and applied 4V DC reverse voltage | $C_J$     |      | 30   |      | pF               |
| Storage temperature        |                                                   | $T_{STG}$ | -65  |      | +175 | $^\circ\text{C}$ |

| SYMBOLS | V <sub>RRM</sub> <sup>*1</sup><br>(V) | V <sub>RMS</sub> <sup>*2</sup><br>(V) | V <sub>R</sub> <sup>*3</sup><br>(V) | V <sub>F</sub> <sup>*4</sup><br>(V) | t <sub>rr</sub> <sup>*5</sup><br>(ns) | Operating<br>temperature<br>T <sub>J</sub> , (°C) |
|---------|---------------------------------------|---------------------------------------|-------------------------------------|-------------------------------------|---------------------------------------|---------------------------------------------------|
| HER201  | 50                                    | 35                                    | 50                                  | 1.00                                | 50                                    | -55 to +125                                       |
| HER202  | 100                                   | 70                                    | 100                                 |                                     |                                       |                                                   |
| HER203  | 200                                   | 140                                   | 200                                 |                                     |                                       |                                                   |
| HER204  | 300                                   | 210                                   | 300                                 | 1.30                                |                                       |                                                   |
| HER205  | 400                                   | 280                                   | 400                                 |                                     |                                       |                                                   |
| HER206  | 600                                   | 420                                   | 600                                 | 1.85                                | 75                                    |                                                   |
| HER207  | 800                                   | 560                                   | 800                                 |                                     |                                       |                                                   |
| HER208  | 1000                                  | 700                                   | 1000                                |                                     |                                       |                                                   |

\*1 Repetitive peak reverse voltage

\*2 RMS voltage

\*3 Continuous reverse voltage

\*4 Maximum forward voltage@ $I_F=2.0\text{A}$ 

\*5 Maximum Reverse recovery time, note 1

Note 1. Reverse recovery time test condition,  $I_F=0.5\text{A}$ ,  $I_R=1.0\text{A}$ ,  $I_{RR}=0.25\text{A}$

## Rating and characteristic curves (HER201 THRU HER208)

FIG.1-TYPICAL FORWARD CHARACTERISTICS

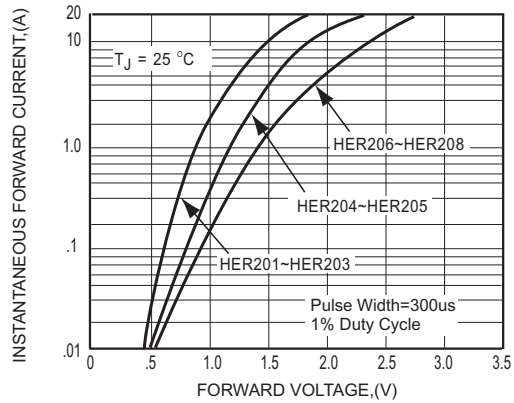


FIG.2-TYPICAL FORWARD CURRENT DERATING CURVE

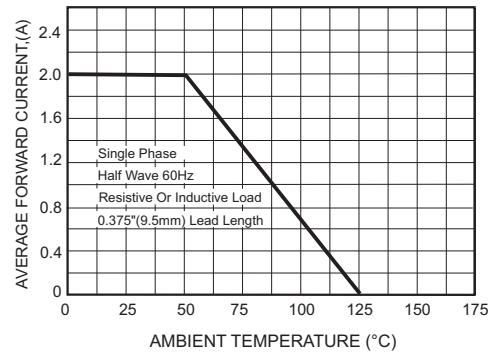
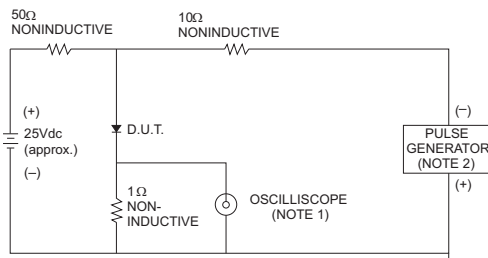


FIG.3- TEST CIRCUIT DIAGRAM AND REVERSE RECOVERY TIME CHARACTERISTICS



NOTES: 1. Rise Time= 7ns max., Input Impedance= 1 megohm, 22pF.  
2. Rise Time= 10ns max., Source Impedance= 50 ohms.

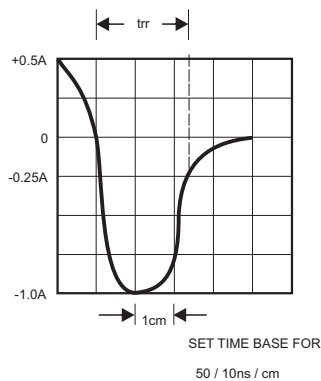


FIG.4-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

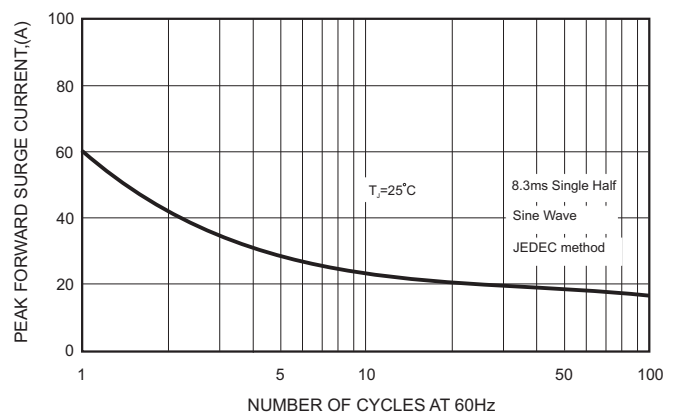
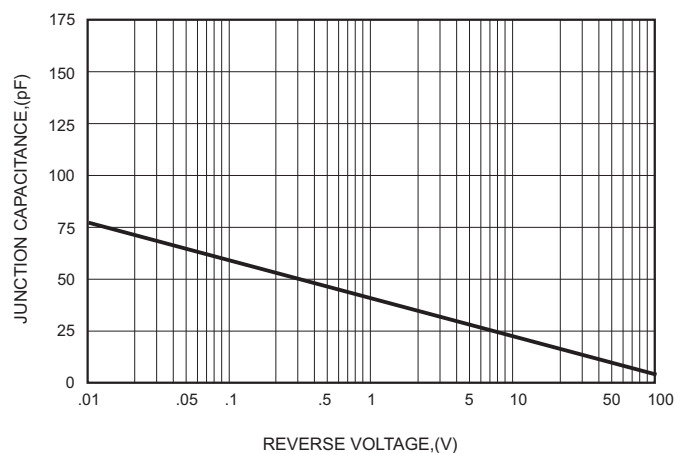


FIG.5-TYPICAL JUNCTION CAPACITANCE



## HER201 THRU HER208

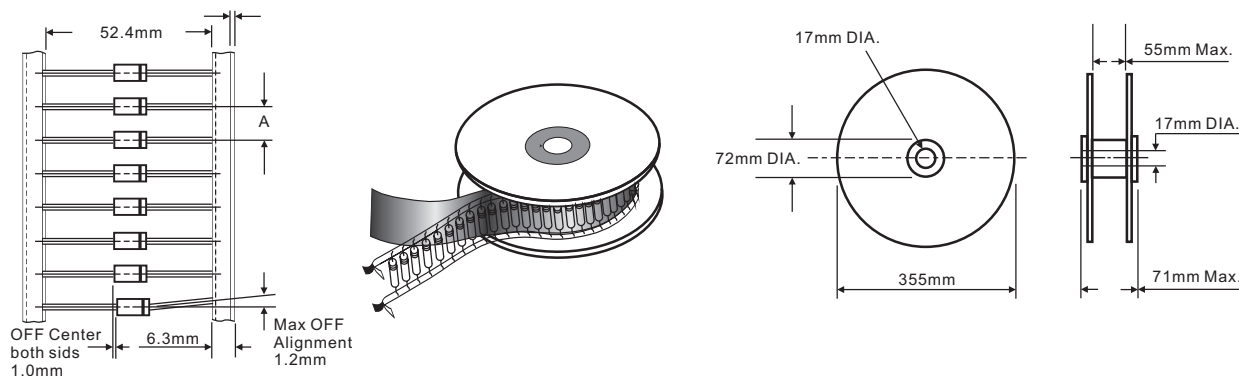
## Pinning information

| Pin                        | Simplified outline                                                                     | Symbol                                                                                  |
|----------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Pin1 cathode<br>Pin2 anode | 1  2 | 1  2 |

## Marking

| Type number | Marking code |
|-------------|--------------|
| HER201      | HER201       |
| HER202      | HER202       |
| HER203      | HER203       |
| HER204      | HER204       |
| HER205      | HER205       |
| HER206      | HER206       |
| HER207      | HER207       |
| HER208      | HER208       |

## Taping &amp; bulk specifications for AXIAL devices



## REEL PACKING

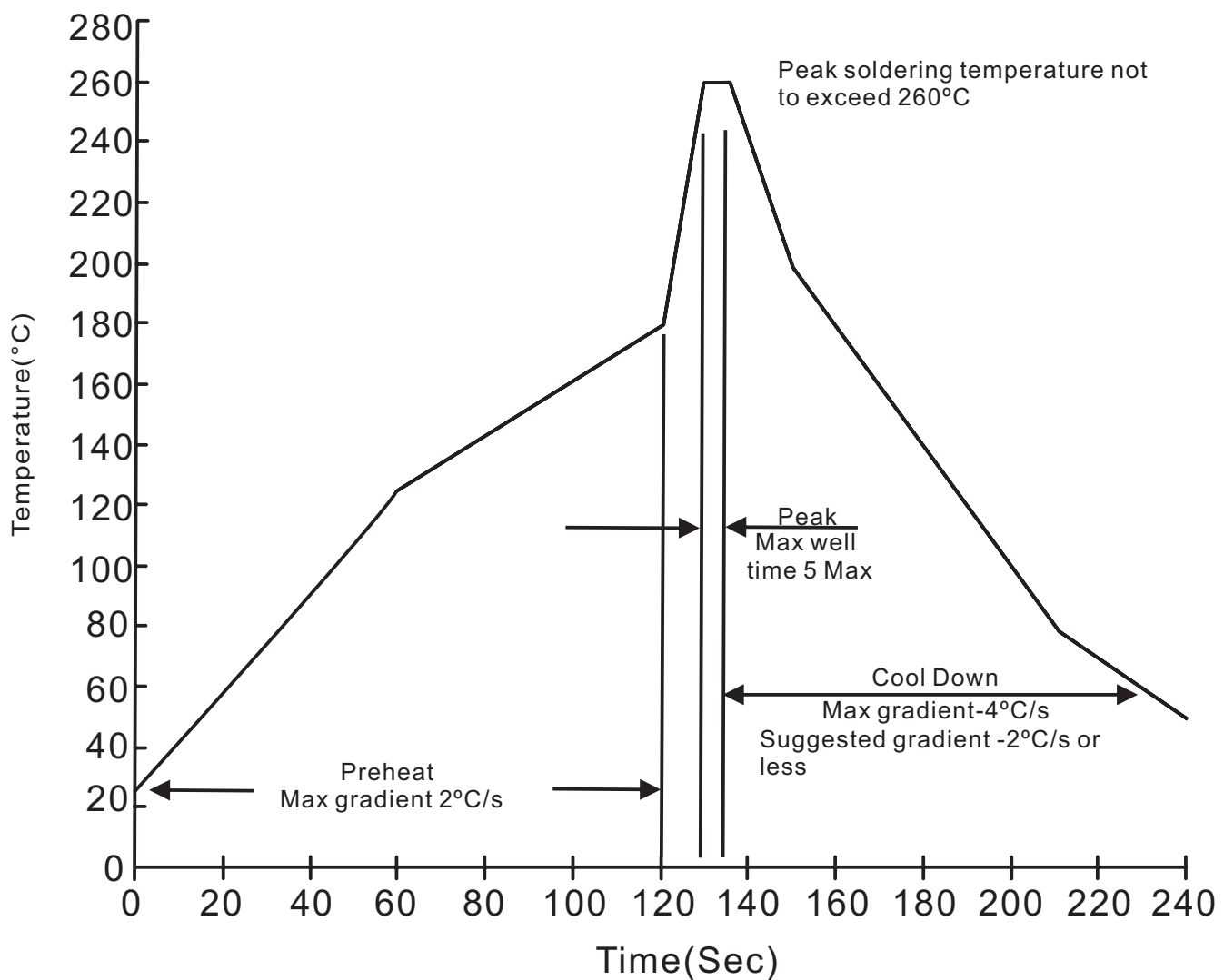
| DEVICE CASE TYPE | Q'TY 1 (PCS / REEL) | COMPONENT SPACING "A" in FIG. A | CARTON SIZE (m/m) | Q'TY 2 (PCS / CARTON) | APPROX. CROSS WEIGHT(kg) |
|------------------|---------------------|---------------------------------|-------------------|-----------------------|--------------------------|
| DO-15            | 4,000               | 5 mm                            | 380 * 340 * 370   | 16,000                | 9.9                      |

## AMMO PACKING

| DEVICE CASE TYPE | Q'TY 1 (PCS / BOX) | INNER BOX SIZE (m/m) | CARTON SIZE (m/m) | Q'TY 2 (PCS / CARTON) | APPROX. CROSS WEIGHT(kg) |
|------------------|--------------------|----------------------|-------------------|-----------------------|--------------------------|
| DO-15            | 3,000              | 260 * 83 * 160       | 440 * 270 * 340   | 30,000                | 14.3                     |

**HER201 THRU HER208****BULK PACKING**

| DEVICE<br>CASE<br>TYPE | Q'TY 1<br>(PCS / BOX) | INNER<br>BOX SIZE<br>(m/m) | CARTON<br>SIZE<br>(m/m) | Q'TY 2<br>(PCS / CARTON) | APPROX.<br>CROSS<br>WEIGHT(kg) |
|------------------------|-----------------------|----------------------------|-------------------------|--------------------------|--------------------------------|
| DO-15                  | 500                   | 194 * 84 * 20              | 465 * 220 * 260         | 25,000                   | 12.9                           |

**Suggested thermal profiles for soldering processes****1. Lead free temperature profile wave-soldering**

## HER201 THRU HER208

## High reliability test capabilities

| Item Test                         | Conditions                                                                                                                                 | Reference                     |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| 1. Solder Resistance              | at $260\pm 5^{\circ}\text{C}$ for $10\pm 2\text{sec.}$<br>immerse body into solder $1/16''\pm 1/32''$                                      | MIL-STD-750D<br>METHOD-2031   |
| 2. Solderability                  | at $245\pm 5^{\circ}\text{C}$ for 5 sec.                                                                                                   | MIL-STD-202F<br>METHOD-208    |
| 3. Pull Test                      | 1.0kg in axial lead direction for 10 sec.<br>$I_F = I_O$                                                                                   | MIL-STD-202F<br>METHOD-211A   |
| 4. Bend Lead                      | 1.0kg weight applied to each lead bending<br>arc $90^{\circ}\pm 5^{\circ}$ for 3 times                                                     | MIL-STD-202F<br>METHOD-211A   |
| 5. High Temperature Reverse Bias  | $V_R = 80\%$ rate at $T_J = 125^{\circ}\text{C}$ for 168 hrs.                                                                              | MIL-STD-750D<br>METHOD-1038   |
| 6. Forward Operation Life         | Rated average rectifier current at $T_A = 25^{\circ}\text{C}$ for 500hrs.                                                                  | MIL-STD-750D<br>METHOD-1027   |
| 7. Intermittent Operation Life    | $T_A = 25^{\circ}\text{C}$ , $I_F = I_O$<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   |
| 8. Pressure Cooker                | $15P_{SIG}$ at $T_A = 121^{\circ}\text{C}$ for 4 hrs.                                                                                      | JESD22-A102                   |
| 9. Temperature Cycling            | $-55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$ dwelled for 30 min.<br>and transferred for 5min. total 10 cycles.                          | MIL-STD-750D<br>METHOD-1051   |
| 10. Forward Surge                 | 8.3ms single half sine-wave one surge.                                                                                                     | MIL-STD-750D<br>METHOD-4066-2 |
| 11. Humidity                      | at $T_A = 85^{\circ}\text{C}$ , RH=85% for 1000hrs.                                                                                        | MIL-STD-750D<br>METHOD-1021   |
| 12. High Temperature Storage Life | at $175^{\circ}\text{C}$ for 1000 hrs.                                                                                                     | MIL-STD-750D<br>METHOD-1031   |

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