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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

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HZU Series

Silicon Epitaxial Planar Zener Diodes for Stabilizer



ADE-208-024G (Z)

Rev.7
Dec. 2002

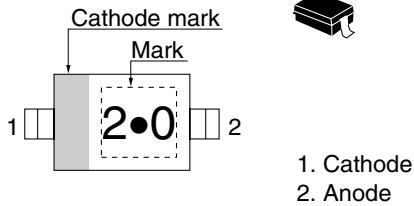
Features

- Ultra small Resin Package (URP) is suitable for surface mount design.
- These diodes are delivered taped.

Ordering Information

| Type No. | Mark | Package Code |
|------------|------------------|--------------|
| HZU Series | Let to Mark Code | URP |

Pin Arrangement



HZU Series

Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Value | Unit |
|----------------------|--------|-------------|------|
| Power dissipation | Pd *1 | 200 | mW |
| Junction temperature | Tj | 150 | °C |
| Storage temperature | Tstg | -55 to +150 | °C |

Note: 1. With P.C. Board.

Electrical Characteristics

(Ta = 25°C)

| Type | Grade | Zener Voltage | | Reverse Current | | Dynamic Resistance | | |
|--------|-------|-----------------------|------|---------------------|---------------------|--------------------|--------------------|---------------------|
| | | V _z (V) *1 | | Test Condition | I _R (μA) | Test Condition | r _d (Ω) | Test Condition |
| | | Min | Max | I _z (mA) | Max | V _R (V) | Max | I _z (mA) |
| HZU2.0 | B | 1.90 | 2.20 | 5 | 120 | 0.5 | 100 | 5 |
| HZU2.2 | B | 2.10 | 2.40 | 5 | 120 | 0.7 | 100 | 5 |
| HZU2.4 | B | 2.30 | 2.60 | 5 | 120 | 1.0 | 100 | 5 |
| HZU2.7 | B | 2.50 | 2.90 | 5 | 120 | 1.0 | 110 | 5 |
| | B1 | 2.50 | 2.75 | | | | | |
| | B2 | 2.65 | 2.90 | | | | | |
| HZU3.0 | B | 2.80 | 3.20 | 5 | 50 | 1.0 | 120 | 5 |
| | B1 | 2.80 | 3.05 | | | | | |
| | B2 | 2.95 | 3.20 | | | | | |
| HZU3.3 | B | 3.10 | 3.50 | 5 | 20 | 1.0 | 130 | 5 |
| | B1 | 3.10 | 3.35 | | | | | |
| | B2 | 3.25 | 3.50 | | | | | |
| HZU3.6 | B | 3.40 | 3.80 | 5 | 10 | 1.0 | 130 | 5 |
| | B1 | 3.40 | 3.65 | | | | | |
| | B2 | 3.55 | 3.80 | | | | | |
| HZU3.9 | B | 3.70 | 4.10 | 5 | 10 | 1.0 | 130 | 5 |
| | B1 | 3.70 | 3.97 | | | | | |
| | B2 | 3.87 | 4.10 | | | | | |

Note: 1. Tested with pulse (P_w = 40 ms).

| Type | Grade | Zener Voltage | | Reverse Current | | | Dynamic Resistance | |
|--------|-------|---------------|------|-----------------|------------------|----------------|--------------------|----------------|
| | | V_z (V) *1 | | Test Condition | I_R (μ A) | Test Condition | r_d (Ω) | Test Condition |
| | | Min | Max | I_z (mA) | Max | V_R (V) | Max | I_z (mA) |
| HZU4.3 | B | 4.01 | 4.48 | 5 | 10 | 1.0 | 130 | 5 |
| | B1 | 4.01 | 4.21 | | | | | |
| | B2 | 4.15 | 4.34 | | | | | |
| | B3 | 4.28 | 4.48 | | | | | |
| HZU4.7 | B | 4.42 | 4.90 | 5 | 10 | 1.0 | 130 | 5 |
| | B1 | 4.42 | 4.61 | | | | | |
| | B2 | 4.55 | 4.75 | | | | | |
| | B3 | 4.69 | 4.90 | | | | | |
| HZU5.1 | B | 4.84 | 5.37 | 5 | 5 | 1.5 | 130 | 5 |
| | B1 | 4.84 | 5.04 | | | | | |
| | B2 | 4.98 | 5.20 | | | | | |
| | B3 | 5.14 | 5.37 | | | | | |
| HZU5.6 | B | 5.31 | 5.92 | 5 | 5 | 2.5 | 80 | 5 |
| | B1 | 5.31 | 5.55 | | | | | |
| | B2 | 5.49 | 5.73 | | | | | |
| | B3 | 5.67 | 5.92 | | | | | |
| HZU6.2 | B | 5.86 | 6.53 | 5 | 2 | 3.0 | 50 | 5 |
| | B1 | 5.86 | 6.12 | | | | | |
| | B2 | 6.06 | 6.33 | | | | | |
| | B3 | 6.26 | 6.53 | | | | | |
| HZU6.8 | B | 6.47 | 7.14 | 5 | 2 | 3.5 | 30 | 5 |
| | B1 | 6.47 | 6.73 | | | | | |
| | B2 | 6.65 | 6.93 | | | | | |
| | B3 | 6.86 | 7.14 | | | | | |
| HZU7.5 | B | 7.06 | 7.84 | 5 | 2 | 4.0 | 30 | 5 |
| | B1 | 7.06 | 7.36 | | | | | |
| | B2 | 7.28 | 7.60 | | | | | |
| | B3 | 7.52 | 7.84 | | | | | |
| HZU8.2 | B | 7.76 | 8.64 | 5 | 2 | 5.0 | 30 | 5 |
| | B1 | 7.76 | 8.10 | | | | | |
| | B2 | 8.02 | 8.36 | | | | | |
| | B3 | 8.28 | 8.64 | | | | | |

Note: 1. Tested with pulse ($P_w = 40$ ms).

HZU Series

| Type | Grade | Zener Voltage | | Reverse Current | | Dynamic Resistance | | |
|--------|-------|--------------------------|-------|-----------------|------------------|--------------------|--------------------|----------------|
| | | V_z (V) * ¹ | | Test Condition | I_R (μ A) | Test Condition | r_d (Ω) | Test Condition |
| | | Min | Max | I_z (mA) | Max | V_R (V) | Max | I_z (mA) |
| HZU9.1 | B | 8.56 | 9.55 | 5 | 2 | 6.0 | 30 | 5 |
| | B1 | 8.56 | 8.93 | | | | | |
| | B2 | 8.85 | 9.23 | | | | | |
| | B3 | 9.15 | 9.55 | | | | | |
| HZU10 | B | 9.45 | 10.55 | 5 | 2 | 7.0 | 30 | 5 |
| | B1 | 9.45 | 9.87 | | | | | |
| | B2 | 9.77 | 10.21 | | | | | |
| | B3 | 10.11 | 10.55 | | | | | |
| HZU11 | B | 10.44 | 11.56 | 5 | 2 | 8.0 | 30 | 5 |
| | B1 | 10.44 | 10.88 | | | | | |
| | B2 | 10.76 | 11.22 | | | | | |
| | B3 | 11.10 | 11.56 | | | | | |
| HZU12 | B | 11.42 | 12.60 | 5 | 2 | 9.0 | 35 | 5 |
| | B1 | 11.42 | 11.90 | | | | | |
| | B2 | 11.74 | 12.24 | | | | | |
| | B3 | 12.08 | 12.60 | | | | | |
| HZU13 | B | 12.47 | 13.96 | 5 | 2 | 10.0 | 35 | 5 |
| | B1 | 12.47 | 13.03 | | | | | |
| | B2 | 12.91 | 13.49 | | | | | |
| | B3 | 13.37 | 13.96 | | | | | |
| HZU15 | B | 13.84 | 15.52 | 5 | 2 | 11.0 | 40 | 5 |
| | B1 | 13.84 | 14.46 | | | | | |
| | B2 | 14.34 | 14.98 | | | | | |
| | B3 | 14.85 | 15.52 | | | | | |
| HZU16 | B | 15.37 | 17.09 | 5 | 2 | 12.0 | 40 | 5 |
| | B1 | 15.37 | 16.01 | | | | | |
| | B2 | 15.58 | 16.51 | | | | | |
| | B3 | 16.35 | 17.09 | | | | | |
| HZU18 | B | 16.94 | 19.03 | 5 | 2 | 13.0 | 45 | 5 |
| | B1 | 16.94 | 17.70 | | | | | |
| | B2 | 17.56 | 18.35 | | | | | |
| | B3 | 18.21 | 19.03 | | | | | |

Note: 1. Tested with pulse ($P_w = 40$ ms).

| Type | Grade | Zener Voltage | | Reverse Current | | Dynamic Resistance | | |
|-------|-------|--------------------------|-------|-----------------|------------------|--------------------|--------------------|----------------|
| | | V_z (V) * ¹ | | Test Condition | I_R (μ A) | Test Condition | r_d (Ω) | Test Condition |
| | | Min | Max | I_z (mA) | Max | V_R (V) | Max | I_z (mA) |
| HZU20 | B | 18.86 | 21.08 | 5 | 2 | 15.0 | 50 | 5 |
| | B1 | 18.86 | 19.70 | | | | | |
| | B2 | 19.52 | 20.39 | | | | | |
| | B3 | 20.21 | 21.08 | | | | | |
| HZU22 | B | 20.88 | 23.17 | 5 | 2 | 17.0 | 55 | 5 |
| | B1 | 20.88 | 21.77 | | | | | |
| | B2 | 21.54 | 22.47 | | | | | |
| | B3 | 22.23 | 23.17 | | | | | |
| HZU24 | B | 22.93 | 25.57 | 5 | 2 | 19.0 | 60 | 5 |
| | B1 | 22.93 | 23.96 | | | | | |
| | B2 | 23.72 | 24.78 | | | | | |
| | B3 | 24.54 | 25.57 | | | | | |
| HZU27 | B | 25.10 | 28.90 | 2 | 2 | 21.0 | 70 | 2 |
| HZU30 | B | 28.00 | 32.00 | 2 | 2 | 23.0 | 80 | 2 |
| HZU33 | B | 31.00 | 35.00 | 2 | 2 | 25.0 | 80 | 2 |
| HZU36 | B | 34.00 | 38.00 | 2 | 2 | 27.0 | 90 | 2 |

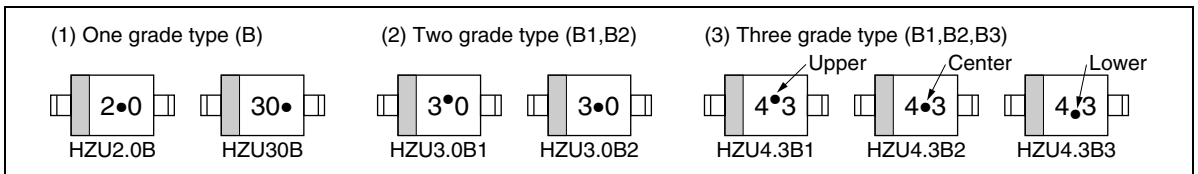
Note: 1. Tested with pulse ($P_w = 40$ ms).

HZU Series

Mark Code

| Type | Grade | Mark No. | Type | Grade | Mark No. | Type | Grade | Mark No. |
|--------|-------|----------|--------|-------|----------|-------|-------|----------|
| HZU2.0 | B | 2•0 | HZU6.2 | B1 | 6•2 | HZU13 | B1 | 13• |
| HZU2.2 | B | 2•2 | | B2 | 6•2 | | B2 | 13• |
| HZU2.4 | B | 2•4 | | B3 | 6•2 | | B3 | 13• |
| HZU2.7 | B1 | 2•7 | HZU6.8 | B1 | 6•8 | HZU15 | B1 | 15• |
| | B2 | 2•7 | | B2 | 6•8 | | B2 | 15• |
| HZU3.0 | B1 | 3•0 | | B3 | 6•8 | | B3 | 15• |
| | B2 | 3•0 | HZU7.5 | B1 | 7•5 | HZU16 | B1 | 16• |
| HZU3.3 | B1 | 3•3 | | B2 | 7•5 | | B2 | 16• |
| | B2 | 3•3 | | B3 | 7•5 | | B3 | 16• |
| HZU3.6 | B1 | 3•6 | HZU8.2 | B1 | 8•2 | HZU18 | B1 | 18• |
| | B2 | 3•6 | | B2 | 8•2 | | B2 | 18• |
| HZU3.9 | B1 | 3•9 | | B3 | 8•2 | | B3 | 18• |
| | B2 | 3•9 | HZU9.1 | B1 | 9•1 | HZU20 | B1 | 20• |
| HZU4.3 | B1 | 4•3 | | B2 | 9•1 | | B2 | 20• |
| | B2 | 4•3 | | B3 | 9•1 | | B3 | 20• |
| | B3 | 4•3 | HZU10 | B1 | 10• | HZU22 | B1 | 22• |
| HZU4.7 | B1 | 4•7 | | B2 | 10• | | B2 | 22• |
| | B2 | 4•7 | | B3 | 10• | | B3 | 22• |
| | B3 | 4•7 | HZU11 | B1 | 11• | HZU24 | B1 | 24• |
| HZU5.1 | B1 | 5•1 | | B2 | 11• | | B2 | 24• |
| | B2 | 5•1 | | B3 | 11• | | B3 | 24• |
| | B3 | 5•1 | HZU12 | B1 | 12• | HZU27 | B | 27• |
| HZU5.6 | B1 | 5•6 | | B2 | 12• | HZU30 | B | 30• |
| | B2 | 5•6 | | B3 | 12• | HZU33 | B | 33• |
| | B3 | 5•6 | | | | HZU36 | B | 36• |

Notes: 1. Example of Marking



2. The grade B type includes from B1 min. to B3 (or B2) max.
3. B grade is standard and has better delivery, These are marked one of B1, B2, B3.
4. Type No. is as follows; HZU2.0B, HZU2.2B, ... HZU36B. (B grade)
5. Type No. is as follows; HZU2.7B1, HZU2.7B2, ... HZU24B3. (B 1, B2,B3 grade)

Main Characteristic

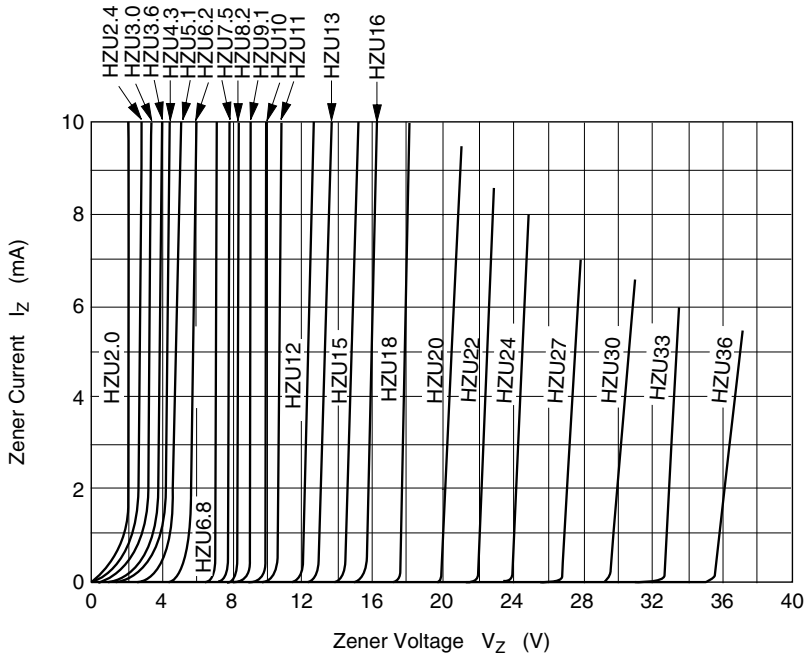


Fig.1 Zener current vs. Zener voltage

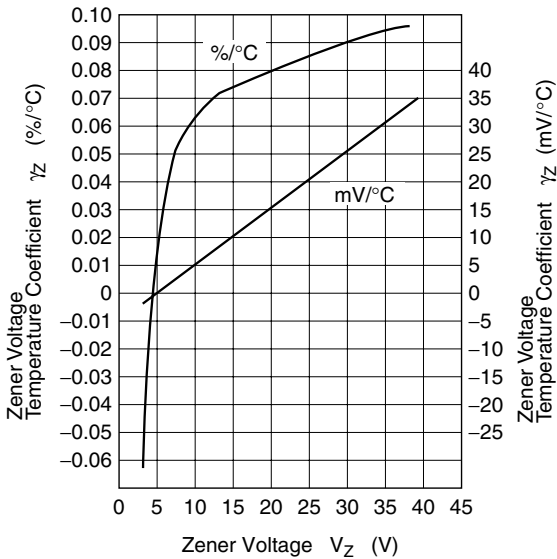


Fig.2 Temperature Coefficient vs. Zener voltage

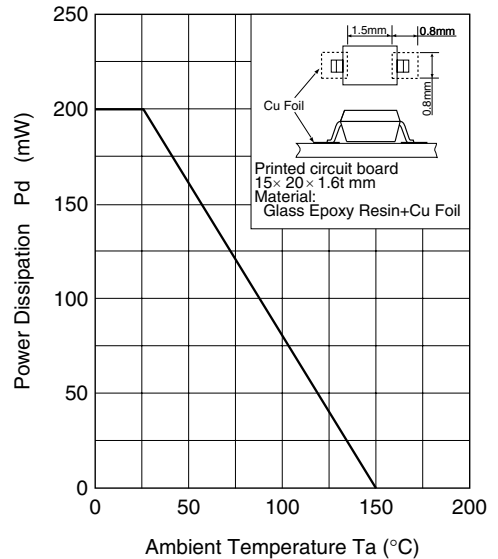
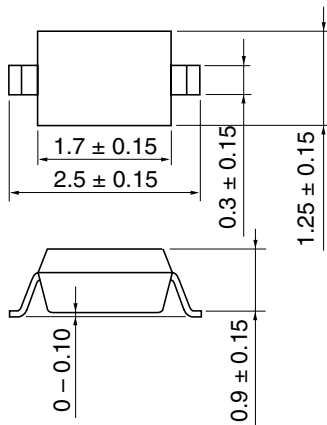


Fig.3 Power Dissipation vs. Ambient Temperature

Package Dimensions

As of July, 2002

Unit: mm



| | |
|------------------------|----------|
| Hitachi Code | URP |
| JEDEC | Conforms |
| JEITA | — |
| Mass (reference value) | 0.004 g |

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HITACHI

Hitachi, Ltd.

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 Tel: (03) 3270-2111 Fax: (03) 3270-5109

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| | | | |
|--|---|--|---|
| <p>Hitachi Semiconductor (America) Inc. 179 East Tasman Drive San Jose, CA 95134 Tel: <1> (408) 433-1990 Fax: <1> (408) 433-0223</p> | <p>Hitachi Europe Ltd. Electronic Components Group Whitebrook Park Lower Cookham Road Maidenhead Berkshire SL6 8YA, United Kingdom Tel: <44> (1628) 585000 Fax: <44> (1628) 778322</p> | <p>Hitachi Asia Ltd. Hitachi Tower 16 Collyer Quay #20-00 Singapore 049318 Tel : <65>-6538-6533/6538-8577 Fax : <65>-6538-6933/6538-3877 URL : http://semiconductor.hitachi.com.sg</p> | <p>Hitachi Asia (Hong Kong) Ltd. Group III (Electronic Components) 7/F., North Tower World Finance Centre, Harbour City, Canton Road Tsim Sha Tsui, Kowloon Hong Kong Tel : <852>-2735-9218 Fax : <852>-2730-0281 URL : http://semiconductor.hitachi.com.hk</p> |
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