

# 1N5221 THRU 1N5276

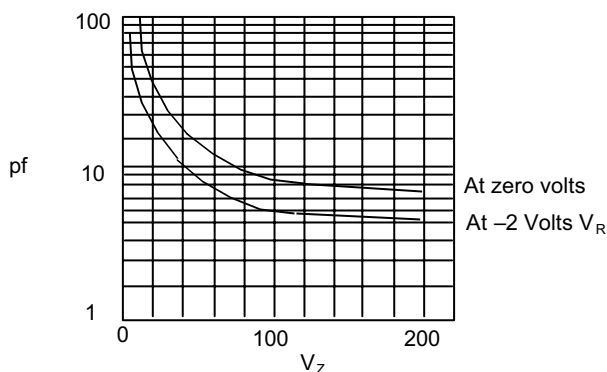
## Features

- Wide Voltage Range Available
- Glass Package
- High Temp Soldering: 260°C for 10 Seconds At Terminals
- Marking : Cathode band and type number
- Lead Free Finish/Rohs Compliant (Note1) ("P" Suffix designates Compliant. See ordering information)
- Moisture Sensitivity: Level 1 per J-STD-020C

## Maximum Ratings

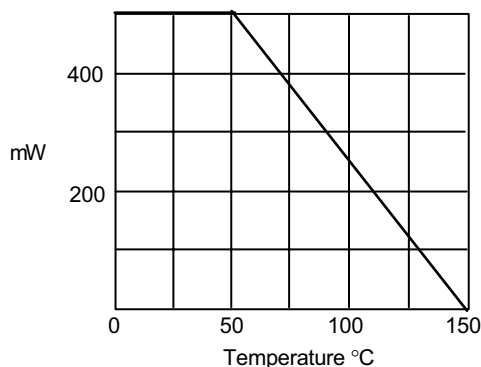
- Operating Temperature: -55°C to +150°C
- Storage Temperature: -55°C to +150°C
- 500 mWatt DC Power Dissipation
- Power Derating: 4.0mW/°C above 50°C
- Forward Voltage @ 200mA: 1.1 Volts

Figure 1 - Typical Capacitance



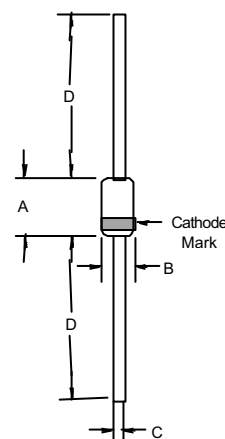
Typical Capacitance (pf) – versus – Zener voltage ( $V_Z$ )

Figure 2 - Derating Curve



Power Dissipation (mW) - Versus - Temperature °C

## DO-35



| DIMENSIONS |        |      |       |      |      |
|------------|--------|------|-------|------|------|
| DIM        | INCHES |      | MM    |      | NOTE |
|            | MIN    | MAX  | MIN   | MAX  |      |
| A          | ---    | .166 | ---   | 4.2  |      |
| B          | ---    | .079 | ---   | 2.00 |      |
| C          | ---    | .020 | ---   | .52  |      |
| D          | 1.000  | ---  | 25.40 | ---  |      |

Note: 1. Lead in Glass Exemption Applied, see EU Directive Annex 5.

# 1N5221 thru 1N5276

## ELECTRICAL CHARACTERISTICS @25°C

| MCC<br>PART<br>NUMBER | NOMINAL ZENER<br>VOLTAGE $V_Z$ @ $I_{ZT}$<br><br>VOLTS | TEST<br>CURRENT $I_{ZT}$<br><br>mA | MAXIMUM ZENER IMPEDANCE<br>'B' SUFFIX ONLY<br>$Z_{ZT}$ @ $I_{ZT}$ $Z_{ZK}$ @ $I_{ZK} = 0.25\text{mA}$<br>OHMS                      OHMS |      | MAXIMUM REVERSE<br>LEAKAGE CURRENT<br>$I_R$ @ $V_R$<br>$\mu\text{A}$ VOLTS |     | MAX. ZENER VOLTAGE<br>TEMP COEFFICIENT 'B'<br>SUFFIX ONLY<br>% / °C |
|-----------------------|--------------------------------------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------|----------------------------------------------------------------------------|-----|---------------------------------------------------------------------|
|                       |                                                        |                                    |                                                                                                                                         |      |                                                                            |     |                                                                     |
| 1N5221                | 2.4                                                    | 20                                 | 30                                                                                                                                      | 1200 | 100                                                                        | 1.0 | -0.085                                                              |
| 1N5222                | 2.5                                                    | 20                                 | 30                                                                                                                                      | 1250 | 100                                                                        | 1.0 | -0.085                                                              |
| 1N5223                | 2.7                                                    | 20                                 | 30                                                                                                                                      | 1300 | 75                                                                         | 1.0 | -0.080                                                              |
| 1N5224                | 2.8                                                    | 20                                 | 30                                                                                                                                      | 1400 | 75                                                                         | 1.0 | -0.080                                                              |
| 1N5225                | 3.0                                                    | 20                                 | 29                                                                                                                                      | 1600 | 50                                                                         | 1.0 | -0.075                                                              |
| 1N5226                | 3.3                                                    | 20                                 | 28                                                                                                                                      | 1600 | 25                                                                         | 1.0 | -0.070                                                              |
| 1N5227                | 3.6                                                    | 20                                 | 24                                                                                                                                      | 1700 | 15                                                                         | 1.0 | -0.065                                                              |
| 1N5228                | 3.9                                                    | 20                                 | 23                                                                                                                                      | 1900 | 10                                                                         | 1.0 | -0.060                                                              |
| 1N5229                | 4.3                                                    | 20                                 | 22                                                                                                                                      | 2000 | 5.0                                                                        | 1.0 | $\pm 0.055$                                                         |
| 1N5230                | 4.7                                                    | 20                                 | 19                                                                                                                                      | 1900 | 5.0                                                                        | 2.0 | $\pm 0.030$                                                         |
| 1N5231                | 5.1                                                    | 20                                 | 17                                                                                                                                      | 1600 | 5.0                                                                        | 2.0 | $\pm 0.030$                                                         |
| 1N5232                | 5.6                                                    | 20                                 | 11                                                                                                                                      | 1600 | 5.0                                                                        | 3.0 | +0.038                                                              |
| 1N5233                | 6.0                                                    | 20                                 | 7.0                                                                                                                                     | 1600 | 5.0                                                                        | 3.5 | +0.038                                                              |
| 1N5234                | 6.2                                                    | 20                                 | 7.0                                                                                                                                     | 1000 | 5.0                                                                        | 4.0 | +0.045                                                              |
| 1N5235                | 6.8                                                    | 20                                 | 5.0                                                                                                                                     | 750  | 3.0                                                                        | 5.0 | +0.050                                                              |
| 1N5236                | 7.5                                                    | 20                                 | 6.0                                                                                                                                     | 500  | 3.0                                                                        | 6.0 | +0.058                                                              |
| 1N5237                | 8.2                                                    | 20                                 | 8.0                                                                                                                                     | 500  | 3.0                                                                        | 6.5 | +0.062                                                              |
| 1N5238                | 8.7                                                    | 20                                 | 8.0                                                                                                                                     | 600  | 3.0                                                                        | 6.5 | +0.065                                                              |
| 1N5239                | 9.1                                                    | 20                                 | 10                                                                                                                                      | 600  | 3.0                                                                        | 7.0 | +0.068                                                              |
| 1N5240                | 10                                                     | 20                                 | 17                                                                                                                                      | 600  | 3.0                                                                        | 8.0 | +0.075                                                              |
| 1N5241                | 11                                                     | 20                                 | 22                                                                                                                                      | 600  | 2.0                                                                        | 8.4 | +0.076                                                              |
| 1N5242                | 12                                                     | 20                                 | 30                                                                                                                                      | 600  | 1.0                                                                        | 9.1 | +0.077                                                              |
| 1N5243                | 13                                                     | 9.5                                | 13                                                                                                                                      | 600  | 0.5                                                                        | 9.9 | +0.079                                                              |
| 1N5244                | 14                                                     | 9.0                                | 15                                                                                                                                      | 600  | 0.1                                                                        | 10  | +0.082                                                              |
| 1N5245                | 15                                                     | 8.5                                | 16                                                                                                                                      | 600  | 0.1                                                                        | 11  | +0.082                                                              |
| 1N5246                | 16                                                     | 7.8                                | 17                                                                                                                                      | 600  | 0.1                                                                        | 12  | +0.083                                                              |
| 1N5247                | 17                                                     | 7.4                                | 19                                                                                                                                      | 600  | 0.1                                                                        | 13  | +0.084                                                              |
| 1N5248                | 18                                                     | 7.0                                | 21                                                                                                                                      | 600  | 0.1                                                                        | 14  | +0.085                                                              |
| 1N5249                | 19                                                     | 6.6                                | 23                                                                                                                                      | 600  | 0.1                                                                        | 14  | +0.086                                                              |
| 1N5250                | 20                                                     | 6.2                                | 25                                                                                                                                      | 600  | 0.1                                                                        | 15  | +0.086                                                              |
| 1N5251                | 22                                                     | 5.6                                | 29                                                                                                                                      | 600  | 0.1                                                                        | 17  | +0.087                                                              |
| 1N5252                | 24                                                     | 5.2                                | 33                                                                                                                                      | 600  | 0.1                                                                        | 18  | +0.088                                                              |
| 1N5253                | 25                                                     | 5.0                                | 35                                                                                                                                      | 600  | 0.1                                                                        | 19  | +0.089                                                              |
| 1N5254                | 27                                                     | 4.6                                | 41                                                                                                                                      | 600  | 0.1                                                                        | 21  | +0.090                                                              |
| 1N5255                | 28                                                     | 4.5                                | 44                                                                                                                                      | 600  | 0.1                                                                        | 21  | +0.091                                                              |
| 1N5256                | 30                                                     | 4.2                                | 49                                                                                                                                      | 600  | 0.1                                                                        | 23  | +0.091                                                              |
| 1N5257                | 33                                                     | 3.8                                | 58                                                                                                                                      | 700  | 0.1                                                                        | 25  | +0.092                                                              |
| 1N5258                | 36                                                     | 3.4                                | 70                                                                                                                                      | 700  | 0.1                                                                        | 27  | +0.093                                                              |
| 1N5259                | 39                                                     | 3.2                                | 80                                                                                                                                      | 800  | 0.1                                                                        | 30  | +0.094                                                              |
| 1N5260                | 43                                                     | 3.0                                | 93                                                                                                                                      | 900  | 0.1                                                                        | 33  | +0.095                                                              |
| 1N5261                | 47                                                     | 2.7                                | 105                                                                                                                                     | 1000 | 0.1                                                                        | 36  | +0.095                                                              |
| 1N5262                | 51                                                     | 2.5                                | 125                                                                                                                                     | 1100 | 0.1                                                                        | 39  | +0.096                                                              |
| 1N5263                | 56                                                     | 2.2                                | 150                                                                                                                                     | 1300 | 0.1                                                                        | 43  | +0.096                                                              |
| 1N5264                | 60                                                     | 2.1                                | 170                                                                                                                                     | 1400 | 0.1                                                                        | 46  | +0.097                                                              |
| 1N5265                | 62                                                     | 2.0                                | 185                                                                                                                                     | 1400 | 0.1                                                                        | 47  | +0.097                                                              |
| 1N5266                | 68                                                     | 1.8                                | 230                                                                                                                                     | 1600 | 0.1                                                                        | 52  | +0.097                                                              |
| 1N5267                | 75                                                     | 1.7                                | 270                                                                                                                                     | 1700 | 0.1                                                                        | 56  | +0.098                                                              |
| 1N5268                | 82                                                     | 1.5                                | 330                                                                                                                                     | 2000 | 0.1                                                                        | 62  | +0.098                                                              |
| 1N5269                | 87                                                     | 1.4                                | 370                                                                                                                                     | 2200 | 0.1                                                                        | 68  | +0.099                                                              |
| 1N5270                | 91                                                     | 1.4                                | 400                                                                                                                                     | 2300 | 0.1                                                                        | 69  | +0.099                                                              |
| 1N5271                | 100                                                    | 1.3                                | 500                                                                                                                                     | 2600 | 0.1                                                                        | 76  | +0.110                                                              |
| 1N5272                | 110                                                    | 1.1                                | 750                                                                                                                                     | 3000 | 0.1                                                                        | 84  | +0.110                                                              |
| 1N5273                | 120                                                    | 1.0                                | 900                                                                                                                                     | 4000 | 0.1                                                                        | 91  | +0.110                                                              |
| 1N5274                | 130                                                    | 0.95                               | 1100                                                                                                                                    | 4500 | 0.1                                                                        | 99  | +0.110                                                              |
| 1N5275                | 140                                                    | 0.90                               | 1300                                                                                                                                    | 4500 | 0.1                                                                        | 106 | +0.110                                                              |
| 1N5276                | 150                                                    | 0.85                               | 1500                                                                                                                                    | 5000 | 0.1                                                                        | 114 | +0.110                                                              |

NOTE 1: Table as shown lists type numbers, which indicate a tolerance of  $\pm 20\%$  with guaranteed limits on only  $V_Z$ ,  $I_R$ , and  $V_F$ . Devices with guaranteed limits on all six parameters are indicated by suffix "A" for  $\pm 10\%$ , "B" for  $\pm 5\%$ , "C" for  $\pm 2\%$  tolerance

NOTE 2: The electrical characteristics are measured after allowing the device to stabilize for 20 seconds.

NOTE 3: Temperature coefficient ( $\alpha_{VZ}$ ). Test conditions for temperature coefficient are as follows:

a.  $I_{ZT} = 7.5\text{mA}$ ,  $T_1 = 25^\circ\text{C}$ ,  $T_2 = 125^\circ\text{C}$  (1N5221 thru 1N5242)

b.  $I_{ZT} = \text{Rated } I_{ZT}$ ,  $T_1 = 25^\circ\text{C}$ ,  $T_2 = 125^\circ\text{C}$  (1N5243 thru 1N5276)

Device to be temperature stabilized with current applied prior to reading breakdown voltage at the specified ambient temperature.

# 1N5221 thru 1N5276

Figure 1  
Zener Voltage versus Zener Current –  $V_z = 1$  thru 16 Volts

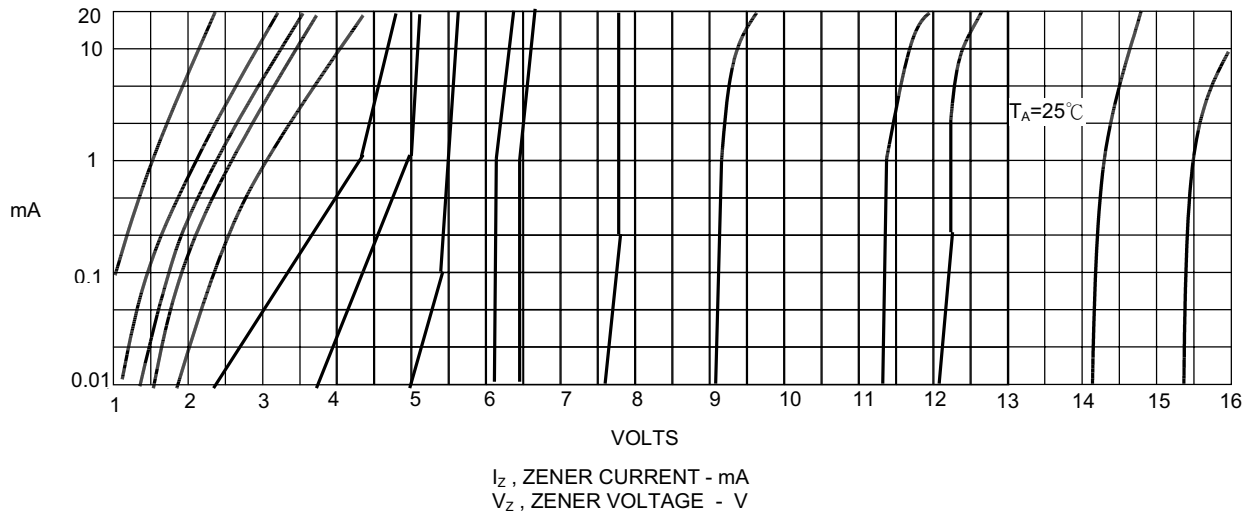
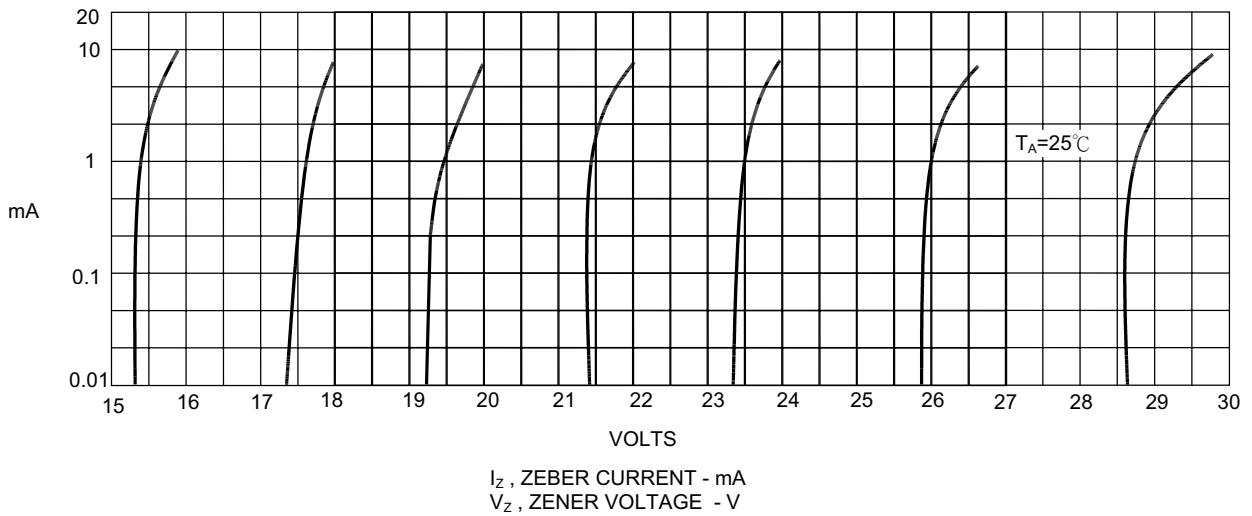


Figure 2  
Zener Voltage versus Zener Current –  $V_z = 15$  thru 30 Volts



## 1N5221 thru 1N5276

Figure 3  
Zener Voltage versus Zener Current –  $V_Z = 30$  thru 75 Volts

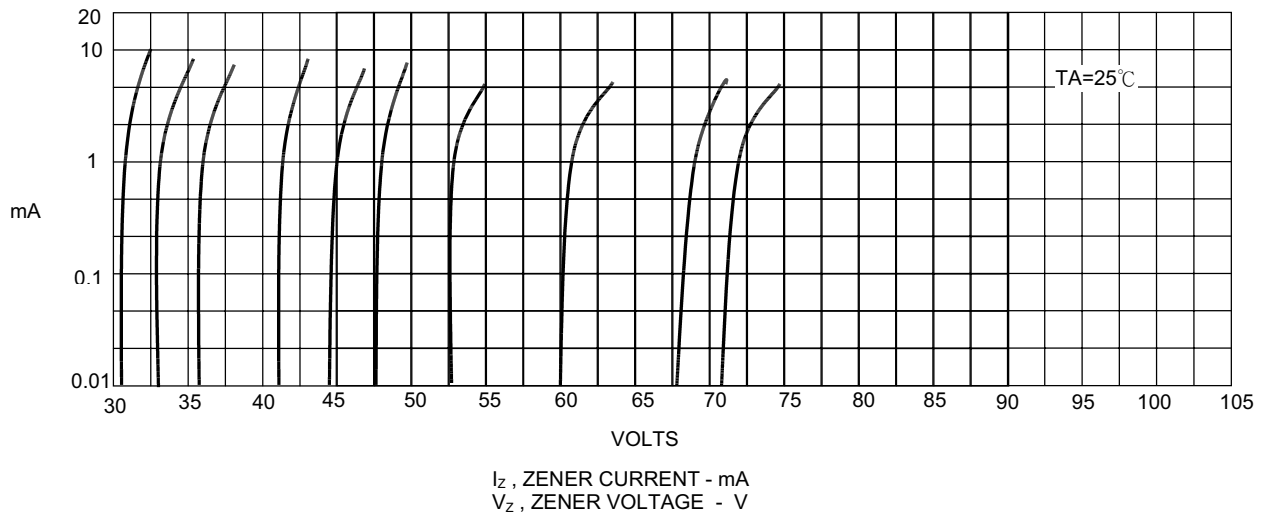
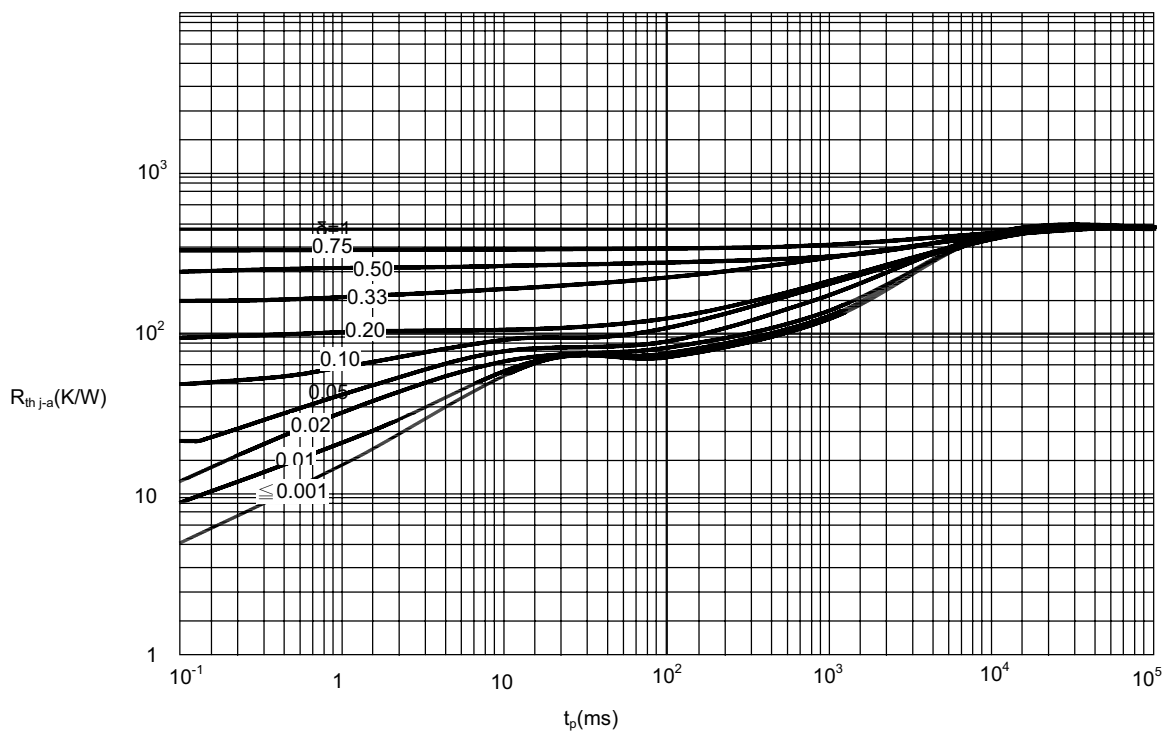


Figure 4  
Thermal resistance from junction to ambient as a function of pulse duration



## Ordering Information

| Device           | Packing                    |
|------------------|----------------------------|
| (Part Number)-TP | Tape&Reel; 10Kpcs/Reel     |
| (Part Number)-AP | Ammo Packing;5Kpcs/AmmoBox |
| (Part Number)-BP | Bulk;500pcs/Bag            |

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| <a href="#"><u>1N5247B-TP</u></a> | <a href="#"><u>1N5235B-TP</u></a> | <a href="#"><u>1N5261B-TP</u></a> | <a href="#"><u>1N5251B-TP</u></a> | <a href="#"><u>1N5224B-TP</u></a> | <a href="#"><u>1N5223B-TP</u></a> | <a href="#"><u>1N5256B-TP</u></a> | <a href="#"><u>1N5255B-TP</u></a> |
| <a href="#"><u>1N5241B-TP</u></a> | <a href="#"><u>1N5262B-TP</u></a> | <a href="#"><u>1N5252B-TP</u></a> | <a href="#"><u>1N5231B-TP</u></a> | <a href="#"><u>1N5246B-TP</u></a> | <a href="#"><u>1N5239B-TP</u></a> | <a href="#"><u>1N5232B-TP</u></a> | <a href="#"><u>1N5226B-TP</u></a> |
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| <a href="#"><u>1N5227B-TP</u></a> | <a href="#"><u>1N5228B-TP</u></a> | <a href="#"><u>1N5253B-TP</u></a> | <a href="#"><u>1N5244B-TP</u></a> |                                   |                                   |                                   |                                   |