



# MMBZ5221BTW~MMBZ5262BTW

## SURFACE MOUNT SILICON ZENER DIODES

**VOLTAGE** 2.4 to 51 Volt    **POWER** 200 mWatt

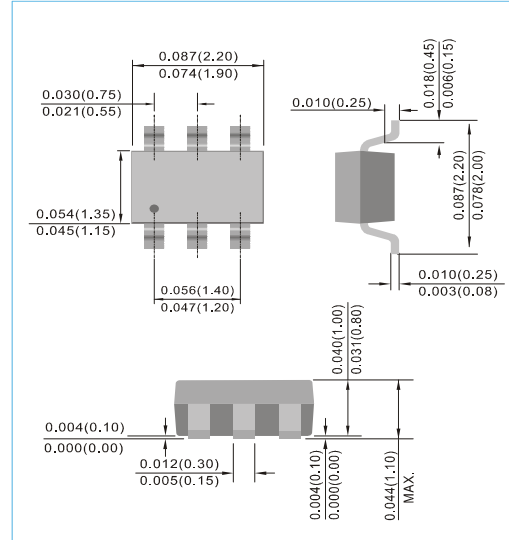
**SOT-363**    Unit : inch(mm)

### FEATURES

- Planar Die Construction
- 200mW Power Dissipation
- Zener Voltages from 2.4~51V
- Ideally Suited for Automated Assembly Processes
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Green molding compound as per IEC61249 Std. . (Halogen Free)

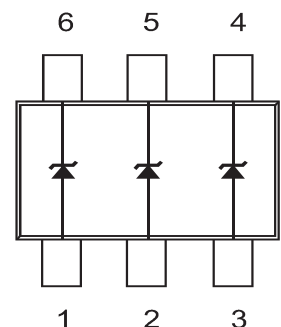
### MECHANICAL DATA

- Case: SOT-363, Plastic
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0002 ounces, 0.006 grams



## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C unless otherwise noted)

| PARAMETER  | SYMBOL                            | VALUE       | UNITS |
|--|-----------------------------------|-------------|-------|
| Power Dissipation (Note A)   | P <sub>D</sub>                    | 200         | mW    |
| Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (Notes B) | I <sub>FSM</sub>                  | 2           | A     |
| Operating Junction Temperature and Storage Temperature Range                                 | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C    |



### NOTES :

- A. Mounted on 5mm<sup>2</sup> (0.013mm thick) land areas.
- B. Measured on 8.3ms, single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum.



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| Part Number                    | Nominal Zener Voltage            |        |        | Max. Zener Impedance              |      |                                   |      | Max Reverse Leakage Current     |      | Marking Code |
|--------------------------------|----------------------------------|--------|--------|-----------------------------------|------|-----------------------------------|------|---------------------------------|------|--------------|
|                                | V <sub>Z</sub> @ I <sub>ZT</sub> |        |        | Z <sub>VT</sub> @ I <sub>ZT</sub> |      | Z <sub>VK</sub> @ I <sub>ZK</sub> |      | I <sub>R</sub> @ V <sub>R</sub> |      |              |
|                                | Nom. V                           | Min. V | Max. V | Ω                                 | mA   | Ω                                 | mA   | μA                              | V    |              |
| <b>200 mWatts Zener Diodes</b> |                                  |        |        |                                   |      |                                   |      |                                 |      |              |
| MMBZ5221BTW                    | 2.4                              | 2.28   | 2.52   | 30                                | 20.0 | 1200                              | 0.25 | 100                             | 1.0  | C1           |
| MMBZ5222BTW                    | 2.5                              | 2.38   | 2.63   | 30                                | 20.0 | 1250                              | 0.25 | 100                             | 1.0  | C2           |
| MMBZ5223BTW                    | 2.7                              | 2.57   | 2.84   | 30                                | 20.0 | 1300                              | 0.25 | 75                              | 1.0  | C3           |
| MMBZ5224BTW                    | 2.8                              | 2.66   | 2.94   | 30                                | 20.0 | 1400                              | 0.25 | 75                              | 1.0  | C4           |
| MMBZ5225BTW                    | 3.0                              | 2.85   | 3.15   | 30                                | 20.0 | 1600                              | 0.25 | 50                              | 1.0  | C5           |
| MMBZ5226BTW                    | 3.3                              | 3.14   | 3.47   | 28                                | 20.0 | 1600                              | 0.25 | 25                              | 1.0  | D1           |
| MMBZ5227BTW                    | 3.6                              | 3.42   | 3.78   | 24                                | 20.0 | 1700                              | 0.25 | 15                              | 1.0  | D2           |
| MMBZ5228BTW                    | 3.9                              | 3.71   | 4.10   | 23                                | 20.0 | 1900                              | 0.25 | 10                              | 1.0  | D3           |
| MMBZ5229BTW                    | 4.3                              | 4.09   | 4.52   | 22                                | 20.0 | 2000                              | 0.25 | 5.0                             | 1.0  | D4           |
| MMBZ5230BTW                    | 4.7                              | 4.47   | 4.94   | 19                                | 20.0 | 1900                              | 0.25 | 5.0                             | 2.0  | D5           |
| MMBZ5231BTW                    | 5.1                              | 4.85   | 5.36   | 17                                | 20.0 | 1600                              | 0.25 | 5.0                             | 2.0  | E1           |
| MMBZ5232BTW                    | 5.6                              | 5.32   | 5.88   | 11                                | 20.0 | 1600                              | 0.25 | 5.0                             | 3.0  | E2           |
| MMBZ5233BTW                    | 6.0                              | 5.70   | 6.30   | 7                                 | 20.0 | 1600                              | 0.25 | 5.0                             | 3.5  | E3           |
| MMBZ5234BTW                    | 6.2                              | 5.89   | 6.51   | 7                                 | 20.0 | 1000                              | 0.25 | 5.0                             | 4.0  | E4           |
| MMBZ5235BTW                    | 6.8                              | 6.46   | 7.14   | 5                                 | 20.0 | 750                               | 0.25 | 3.0                             | 5.0  | E5           |
| MMBZ5236BTW                    | 7.5                              | 7.13   | 7.88   | 6                                 | 20.0 | 500                               | 0.25 | 3.0                             | 6.0  | F1           |
| MMBZ5237BTW                    | 8.2                              | 7.79   | 8.61   | 8                                 | 20.0 | 500                               | 0.25 | 3.0                             | 6.5  | F2           |
| MMBZ5238BTW                    | 8.7                              | 8.27   | 9.14   | 8                                 | 20.0 | 600                               | 0.25 | 3.0                             | 6.5  | F3           |
| MMBZ5239BTW                    | 9.1                              | 8.65   | 9.56   | 10                                | 20.0 | 600                               | 0.25 | 3.0                             | 7.0  | F4           |
| MMBZ5240BTW                    | 10                               | 9.50   | 10.50  | 17                                | 20.0 | 600                               | 0.25 | 3.0                             | 8.0  | F5           |
| MMBZ5241BTW                    | 11                               | 10.45  | 11.55  | 22                                | 20.0 | 600                               | 0.25 | 2.0                             | 8.4  | H1           |
| MMBZ5242BTW                    | 12                               | 11.40  | 12.60  | 30                                | 20.0 | 600                               | 0.25 | 1.0                             | 9.1  | H2           |
| MMBZ5243BTW                    | 13                               | 12.35  | 13.65  | 13                                | 9.5  | 600                               | 0.25 | 0.5                             | 9.9  | H3           |
| MMBZ5244BTW                    | 14                               | 13.30  | 14.70  | 15                                | 9.0  | 600                               | 0.25 | 0.1                             | 10.5 | H4           |
| MMBZ5245BTW                    | 15                               | 14.25  | 15.75  | 16                                | 8.5  | 600                               | 0.25 | 0.1                             | 11.0 | H5           |
| MMBZ5246BTW                    | 16                               | 15.20  | 16.80  | 17                                | 7.8  | 600                               | 0.25 | 0.1                             | 12.0 | J1           |
| MMBZ5247BTW                    | 17                               | 16.15  | 17.85  | 19                                | 7.5  | 600                               | 0.25 | 0.1                             | 13.0 | J2           |
| MMBZ5248BTW                    | 18                               | 17.10  | 18.90  | 21                                | 7.0  | 600                               | 0.25 | 0.1                             | 14.0 | J3           |
| MMBZ5249BTW                    | 19                               | 18.05  | 19.95  | 23                                | 6.6  | 600                               | 0.25 | 0.1                             | 14.0 | J4           |
| MMBZ5250BTW                    | 20                               | 19.00  | 21.00  | 25                                | 6.2  | 600                               | 0.25 | 0.1                             | 15.0 | J5           |
| MMBZ5251BTW                    | 22                               | 20.90  | 23.10  | 29                                | 5.6  | 600                               | 0.25 | 0.1                             | 17.0 | K1           |
| MMBZ5252BTW                    | 24                               | 22.80  | 25.20  | 33                                | 5.2  | 600                               | 0.25 | 0.1                             | 18.0 | K2           |
| MMBZ5253BTW                    | 25                               | 23.75  | 26.25  | 35                                | 5.0  | 600                               | 0.25 | 0.1                             | 19.0 | K3           |
| MMBZ5254BTW                    | 27                               | 25.65  | 28.35  | 41                                | 5.0  | 600                               | 0.25 | 0.1                             | 21.0 | K4           |
| MMBZ5255BTW                    | 28                               | 26.60  | 29.40  | 44                                | 4.5  | 600                               | 0.25 | 0.1                             | 21.0 | K5           |
| MMBZ5256BTW                    | 30                               | 28.50  | 31.50  | 49                                | 4.2  | 600                               | 0.25 | 0.1                             | 23.0 | M1           |
| MMBZ5257BTW                    | 33                               | 31.35  | 34.65  | 58                                | 3.8  | 700                               | 0.25 | 0.1                             | 25.0 | M2           |
| MMBZ5258BTW                    | 36                               | 34.20  | 37.80  | 70                                | 3.4  | 700                               | 0.25 | 0.1                             | 27.0 | M3           |
| MMBZ5259BTW                    | 39                               | 37.05  | 40.95  | 80                                | 3.2  | 800                               | 0.25 | 0.1                             | 30.0 | M4           |
| MMBZ5260BTW                    | 43                               | 40.85  | 45.15  | 93                                | 3.0  | 900                               | 0.25 | 0.1                             | 33.0 | M5           |
| MMBZ5261BTW                    | 47                               | 44.65  | 49.35  | 105                               | 2.7  | 1000                              | 0.25 | 0.1                             | 36.0 | N1           |
| MMBZ5262BTW                    | 51                               | 48.45  | 53.55  | 125                               | 2.5  | 1100                              | 0.25 | 0.1                             | 39.0 | N2           |



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## CHARACTERISTIC CURVES

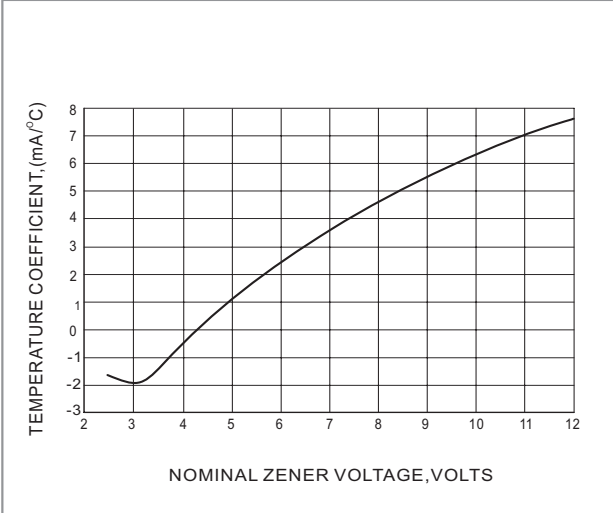


Fig.1 TEMPERATURE COEFFICIENTS

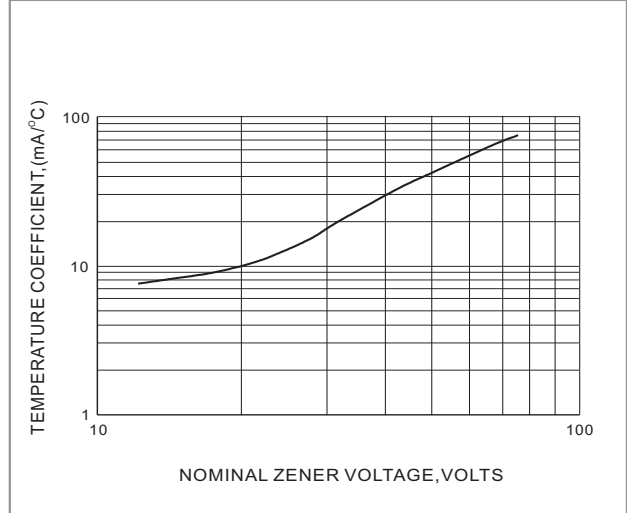


Fig.2 TEMPERATURE COEFFICIENTS

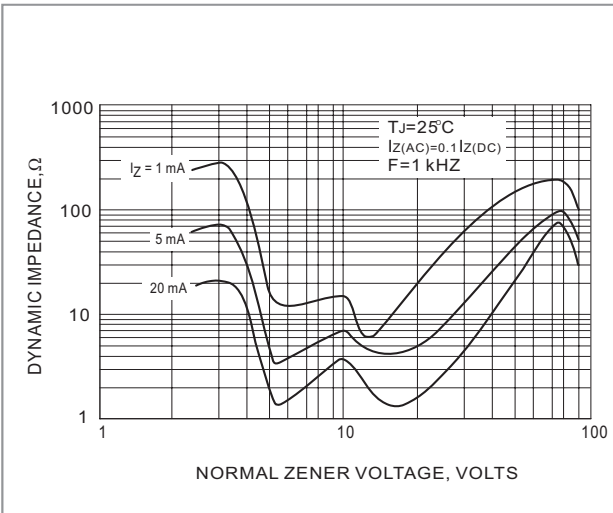


Fig.3 EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE

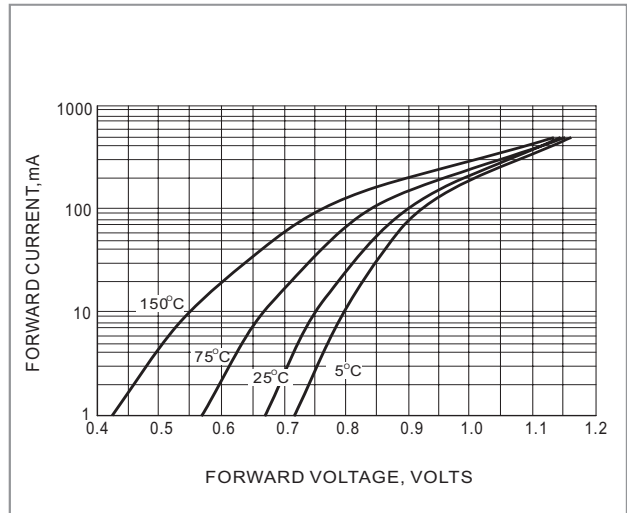


Fig.4 TYPICAL FORWARD VOLTAGE

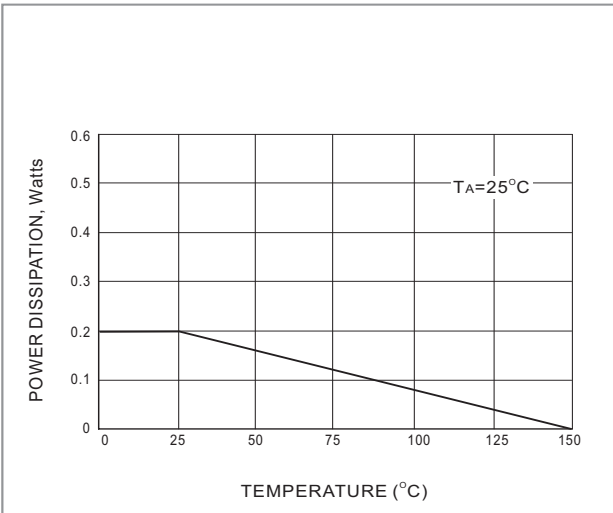


Fig.5 STEADY STATE POWER DERATING

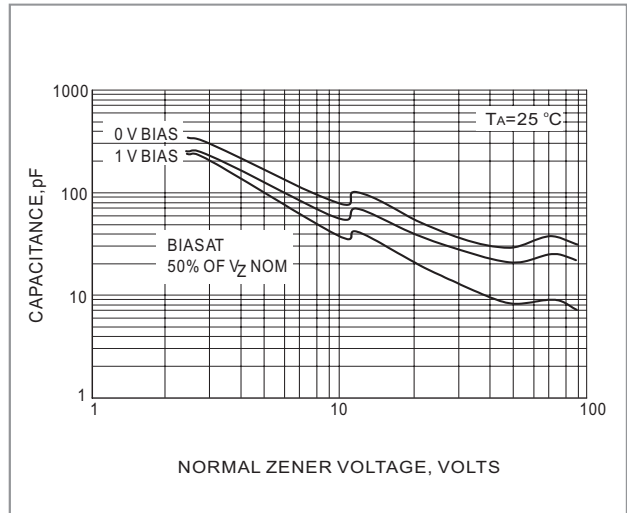


Fig.6 TYPICAL CAPACITANCE



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## CHARACTERISTIC CURVES

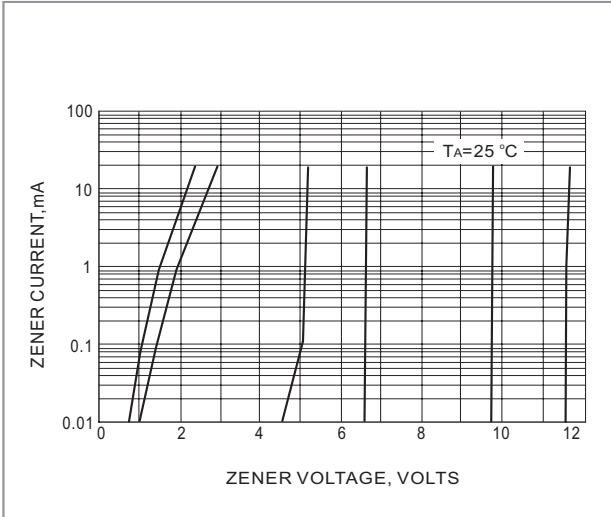


Fig.7 ZENER VOLTAGE VERSUS ZENER CURRENT

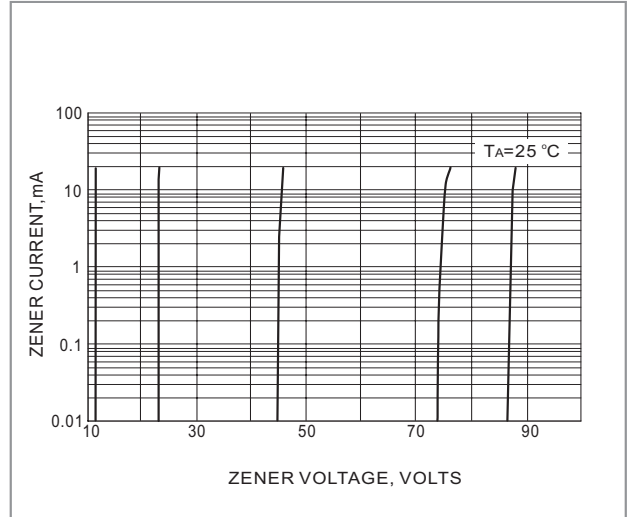


Fig.8 ZENER VOLTAGE VERSUS ZENER CURRENT

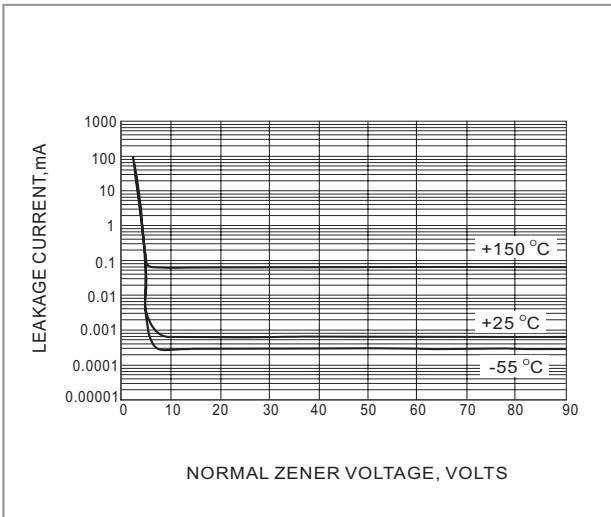
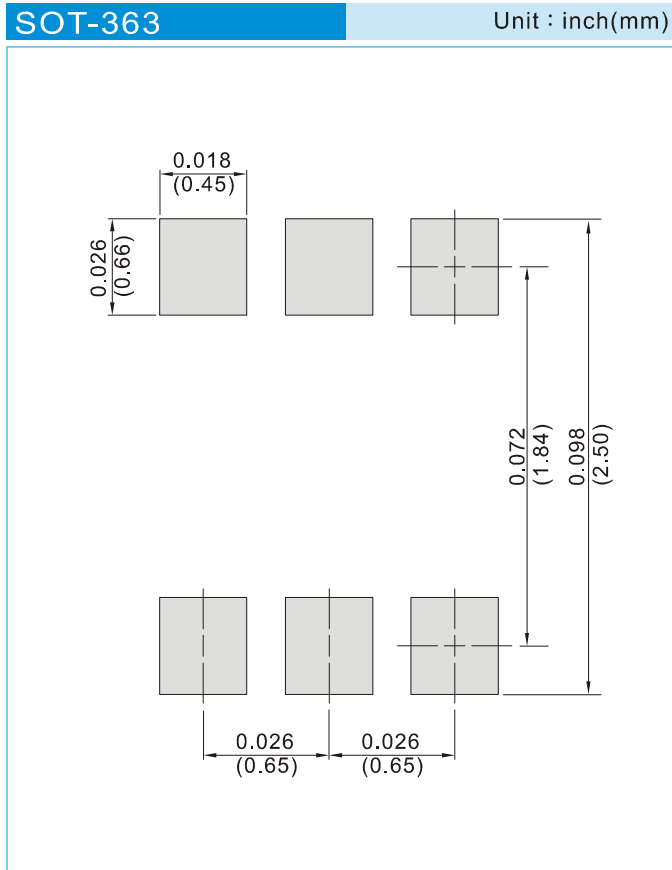


Fig.9 TYPICAL LEAKAGE CURRENT



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## MOUNTING PAD LAYOUT



## ORDER INFORMATION

- Packing information  
T/R - 10K per 13" plastic Reel  
T/R - 3K per 7" plastic Reel



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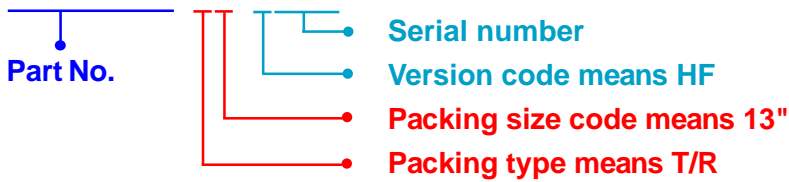
## Part No\_packing code\_Version

MMBZ5221BTW\_R1\_00001

MMBZ5221BTW\_R2\_00001

For example :

**RB500V-40\_R2\_00001**



| Packing Code <b>XX</b>               |                      |                                  |                      | Version Code <b>XXXXX</b> |                      |                                       |
|--------------------------------------|----------------------|----------------------------------|----------------------|---------------------------|----------------------|---------------------------------------|
| Packing type                         | 1 <sup>st</sup> Code | Packing size code                | 2 <sup>nd</sup> Code | HF or RoHS                | 1 <sup>st</sup> Code | 2 <sup>nd</sup> ~5 <sup>th</sup> Code |
| Tape and Ammunition Box (T/B)        | A                    | N/A                              | 0                    | HF                        | 0                    | serial number                         |
| Tape and Reel (T/R)                  | R                    | 7"                               | 1                    | RoHS                      | 1                    | serial number                         |
| Bulk Packing (B/P)                   | B                    | 13"                              | 2                    |                           |                      |                                       |
| Tube Packing (T/P)                   | T                    | 26mm                             | X                    |                           |                      |                                       |
| Tape and Reel (Right Oriented) (TRR) | S                    | 52mm                             | Y                    |                           |                      |                                       |
| Tape and Reel (Left Oriented) (TRL)  | L                    | PANASERT T/B CATHODE UP (PBCU)   | U                    |                           |                      |                                       |
| FORMING                              | F                    | PANASERT T/B CATHODE DOWN (PBCD) | D                    |                           |                      |                                       |



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