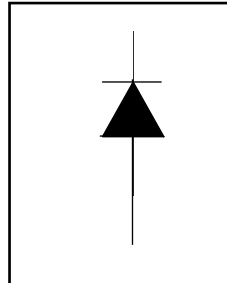


SURFACE MOUNTABLE INPUT RECTIFIER DIODE

Description/Features

The 20ETS..S rectifier series has been optimized for very low forward voltage drop, with moderate leakage. The glass passivation technology used has reliable operation up to 150° C junction temperature.

Typical applications are in input rectification and these products are designed to be used with International Rectifier Switches and Output Rectifiers which are available in identical package outlines.



$$V_F < 1V @ 10A$$

$$I_{FSM} = 300A$$

$$V_{RRM} 800 \text{ to } 1600V$$

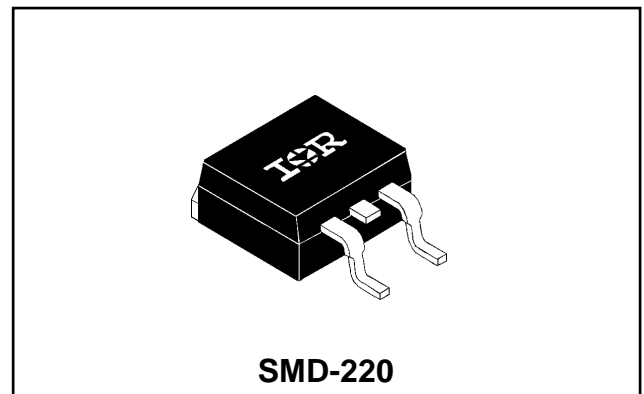
Output Current in Typical Applications

| Applications | Single-phase Bridge | Three-phase Bridge | Units |
|--|---------------------|--------------------|-------|
| NEMA FR-4 or G10 glass fabric-based epoxy with 4 oz (140µm) copper | 3.2 | 5.0 | A |
| Aluminum IMS, $R_{thCA} = 15^{\circ}C/W$ | 8.1 | 13.3 | |
| Aluminum IMS with heatsink, $R_{thCA} = 5^{\circ}C/W$ | 15.7 | 20.0 | |

$T_A = 55^{\circ}C$, $T_J = 125^{\circ}C$, footprint 300mm²

Major Ratings and Characteristics

| Characteristics | 20ETS..S | Units |
|---------------------------------|-------------|-------|
| $I_{F(AV)}$ Sinusoidal waveform | 20 | A |
| V_{RRM} | 800 to 1600 | V |
| I_{FSM} | 300 | A |
| $V_F @ 10A, T_J = 25^{\circ}C$ | 1.0 | V |
| T_J | -40 to 150 | °C |



Voltage Ratings

| Part Number | V_{RRM} , maximum peak reverse voltage V | V_{RSM} , maximum non repetitive peak reverse voltage V | I_{RRM} 150°C mA |
|-------------|---|--|--------------------------|
| 20ETS08S | 800 | 900 | 1 |
| 20ETS12S | 1200 | 1300 | |
| 20ETS16S | 1600 | 1700 | |

Provide terminal coating for voltages above 1200V

Absolute Maximum Ratings

| Parameters | 20ETS..S | Units | Conditions |
|--|----------|---------------|---|
| $I_{F(AV)}$ Max. Average Forward Current | 20 | A | 50% duty cycle @ $T_C = 105^\circ\text{C}$, sinusoidal wave form |
| I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current | 250 | A | 10ms Sine pulse, rated V_{RRM} applied |
| | 300 | | 10ms Sine pulse, no voltage reapplied |
| I^2t Max. I^2t for fusing | 316 | A^2s | 10ms Sine pulse, rated V_{RRM} applied |
| | 442 | | 10ms Sine pulse, no voltage reapplied |
| $I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing | 3160 | $A^2\sqrt{s}$ | $t = 0.1$ to 10ms, no voltage reapplied |

Electrical Specifications

| Parameters | 20ETS..S | Units | Conditions |
|---------------------------------------|----------|-----------|---------------------------------|
| V_{FM} Max. Forward Voltage Drop | 1.1 | V | @ 20A, $T_J = 25^\circ\text{C}$ |
| r_t Forward slope resistance | 10.4 | $m\Omega$ | $T_J = 150^\circ\text{C}$ |
| $V_{F(TO)}$ Threshold voltage | 0.85 | V | |
| I_{RM} Max. Reverse Leakage Current | 0.1 | mA | $T_J = 25^\circ\text{C}$ |
| | 1.0 | | $T_J = 150^\circ\text{C}$ |

$V_R = \text{rated } V_{RRM}$

Thermal-Mechanical Specifications

| Parameters | 20ETS..S | Units | Conditions |
|--|------------|---------------------------|----------------------------------|
| T_J Max. Junction Temperature Range | -40 to 150 | $^\circ\text{C}$ | |
| T_{stg} Max. Storage Temperature Range | -40 to 150 | $^\circ\text{C}$ | |
| Soldering Temperature | 240 | $^\circ\text{C}$ | for 10 seconds (1.6mm from case) |
| R_{thJC} Max. Thermal Resistance Junction to Case | 1.3 | $^\circ\text{C}/\text{W}$ | DC operation |
| R_{thJA} Typ. Thermal Resistance Junction to Ambient (PCB Mount)** | 40 | $^\circ\text{C}/\text{W}$ | |
| wt Approximate Weight | 2 (0.07) | g (oz.) | |
| T Case Style | SMD-220 | | |

**When mounted on 1" square (650mm²) PCB of FR-4 or G-10 material 4 oz (140 μm) copper 40 $^\circ\text{C}/\text{W}$
For recommended footprint and soldering techniques refer to application note #AN-994

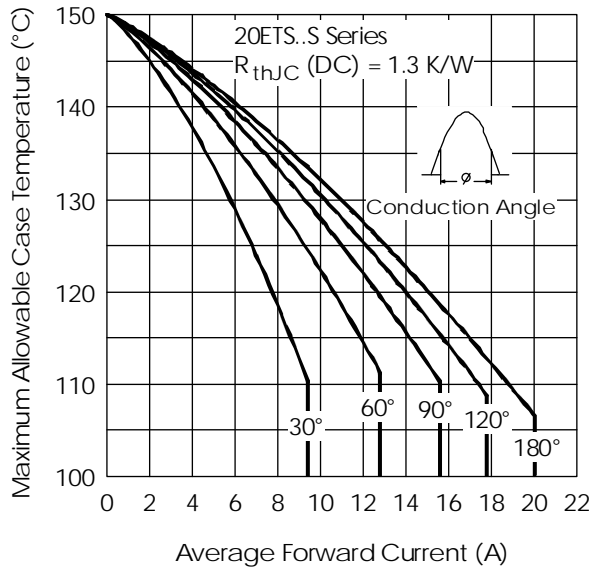


Fig. 1 - Current Rating Characteristics

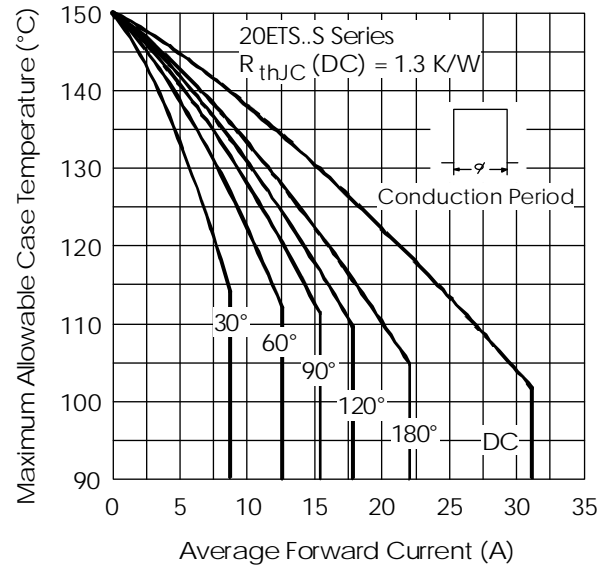


Fig. 2 - Current Rating Characteristics

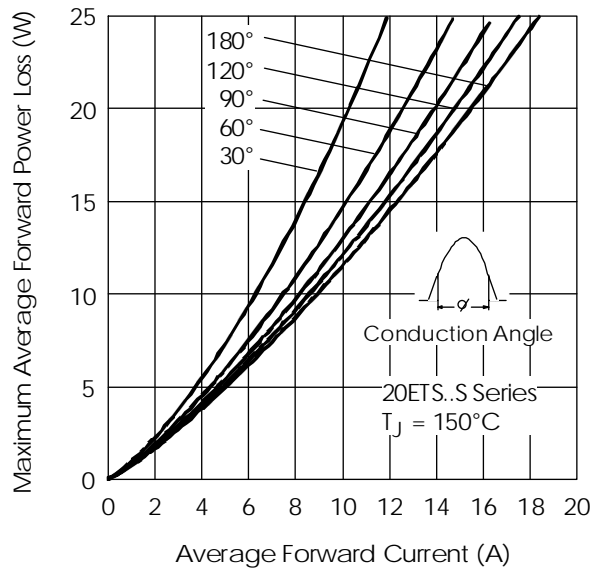


Fig. 3 - Forward Power Loss Characteristics

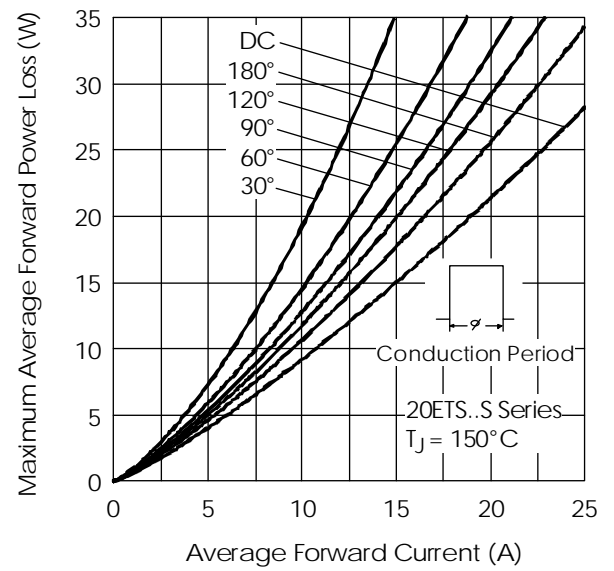


Fig. 4 - Forward Power Loss Characteristics

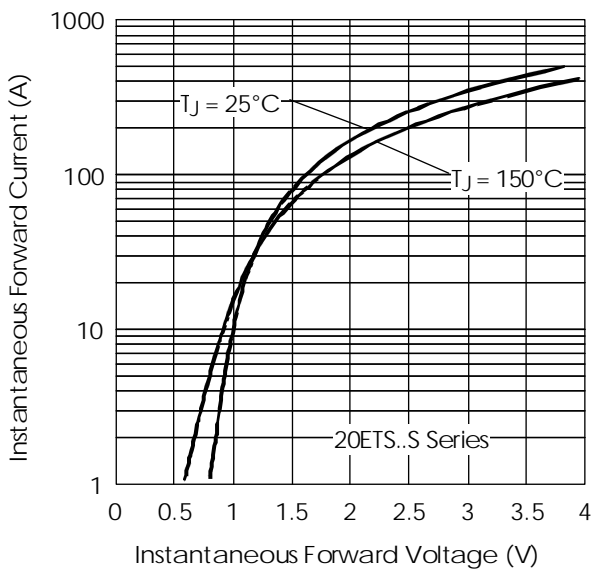


Fig. 5 - Forward Voltage Drop Characteristics

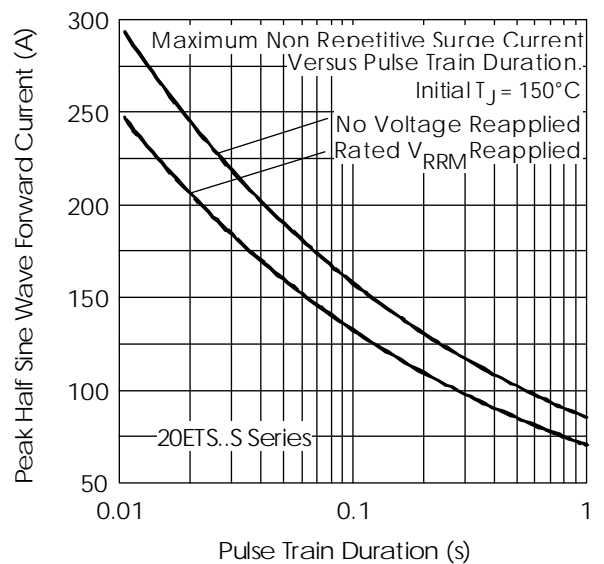


Fig. 6 - Maximum Non-Repetitive Surge Current

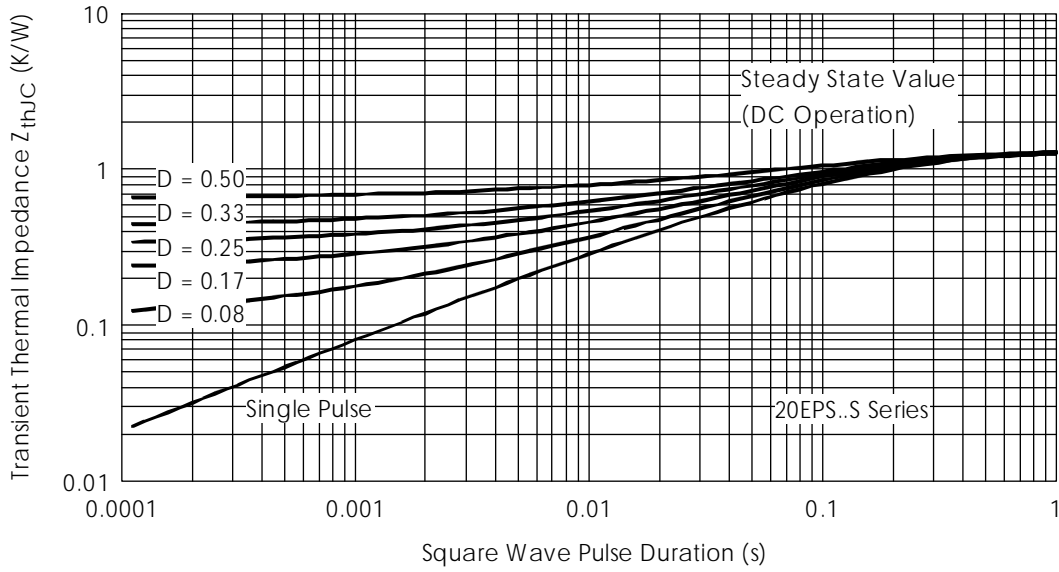
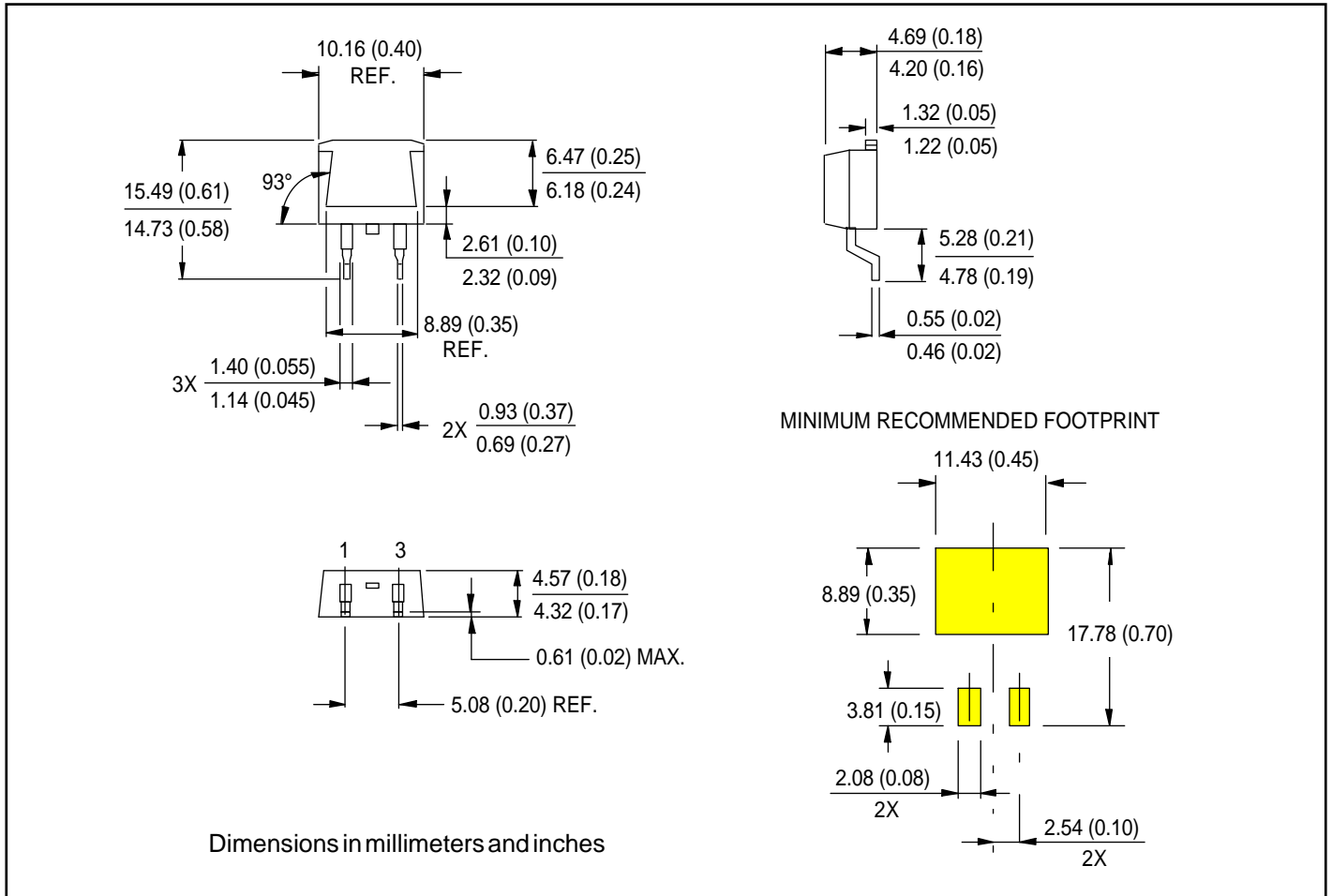
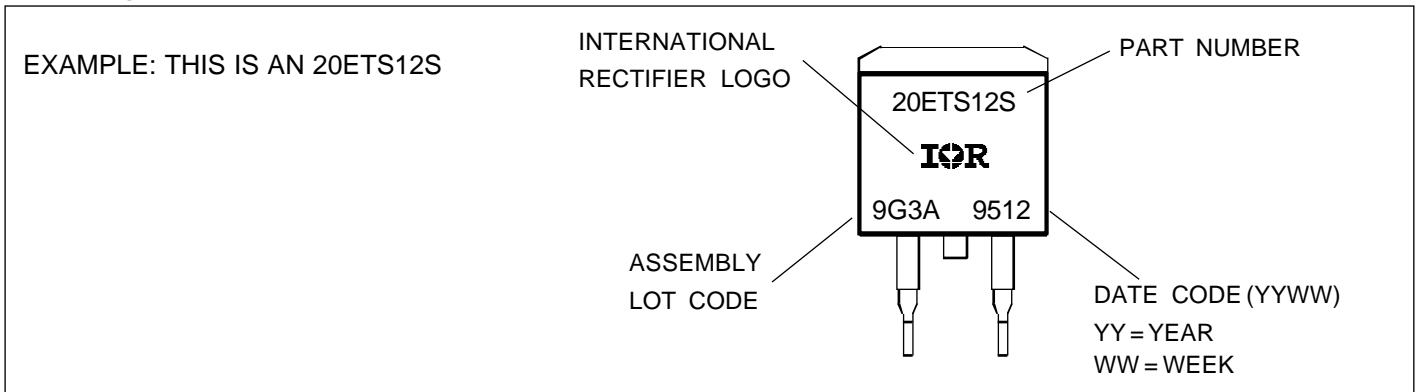


Fig. 7 - Thermal Impedance Z_{thJC} Characteristics

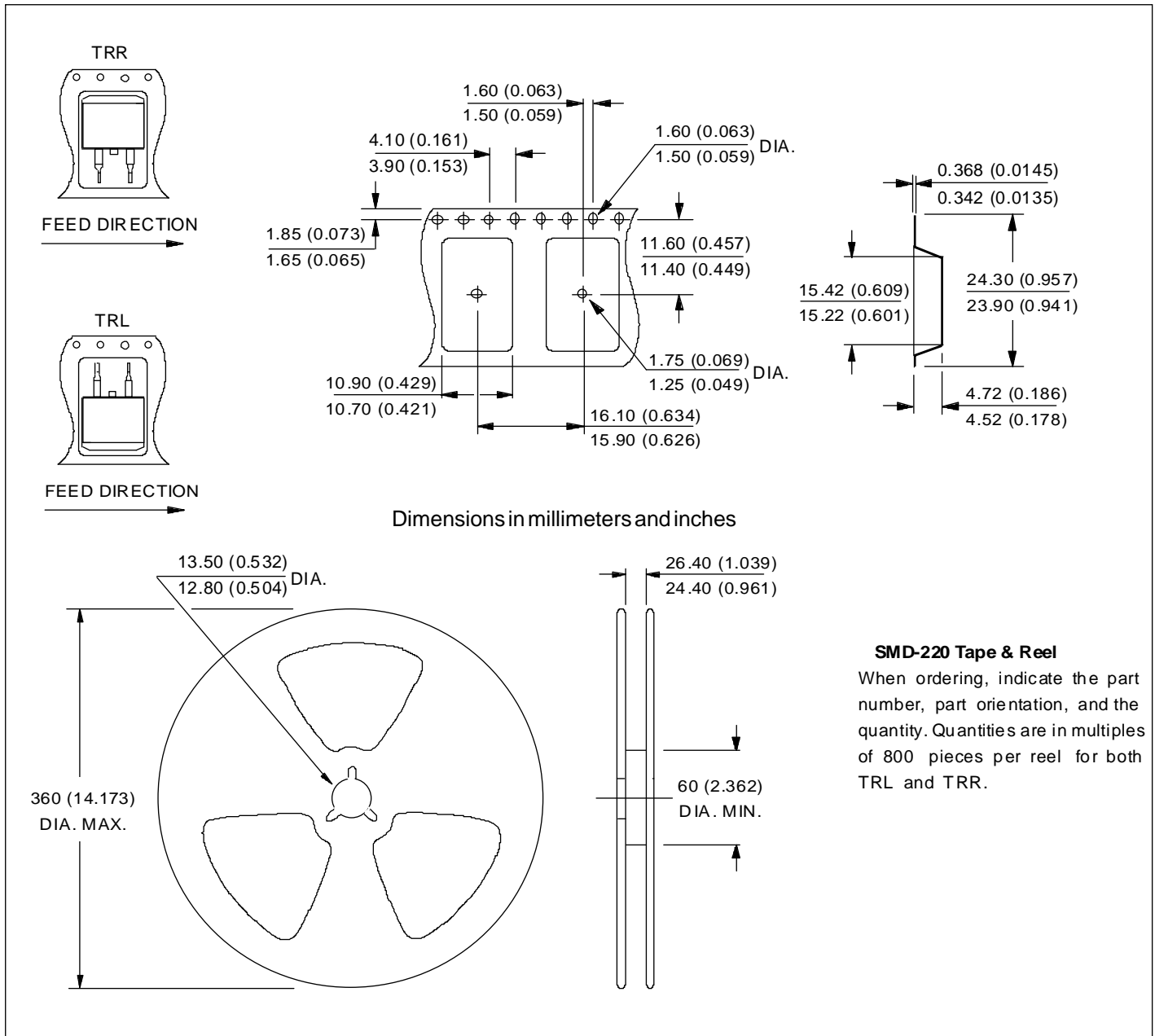
Outline Table



Marking Information

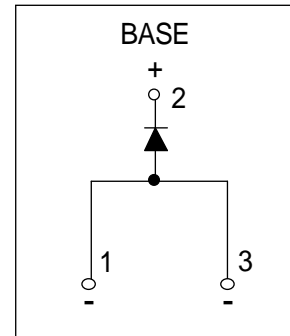
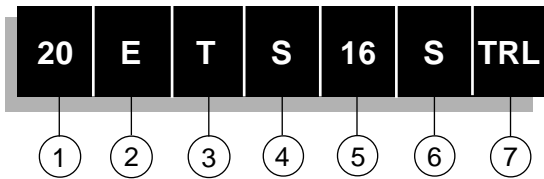


Tape & Reel Information



Ordering Information Table

Device Code



- 1** - Current Rating
- 2** - Circuit Configuration
E = Single Diode
- 3** - Package
T = TO-220AC
- 4** - Type of Silicon
S = Standard Recovery Rectifier
- 5** - Voltage code: Code x 100 = V_{RRM}
- 6** - S = TO-220 SMD 220 Version
- 7** - Tape and Reel Option
TRL = Left Reel
TRR = Right Orientation Reel

| | |
|----|---------|
| 08 | = 800V |
| 12 | = 1200V |
| 16 | = 1600V |

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