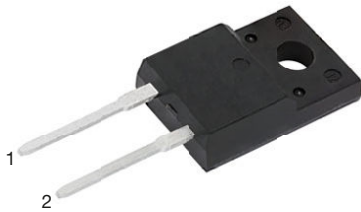
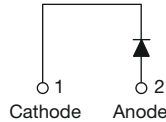


## High Voltage, Input Rectifier Diode, 20 A



2L TO-220 FullPAK



### FEATURES

- Very low forward voltage drop
- 150 °C max. operating junction temperature
- Glass passivated pellet chip junction
- Designed and qualified according to JEDEC®-JESD 47
- Fully isolated package ( $V_{INS} = 2500 V_{RMS}$ )
- UL pending
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### PRIMARY CHARACTERISTICS

|                       |                   |
|-----------------------|-------------------|
| $I_{F(AV)}$           | 20 A              |
| $V_R$                 | 800 V, 1200 V     |
| $V_F$ at $I_F$        | 1.1 V             |
| $I_{FSM}$             | 300 A             |
| $T_J$ max.            | 150 °C            |
| Package               | 2L TO-220 FullPAK |
| Circuit configuration | Single            |

### APPLICATIONS

- Input rectification
- Vishay Semiconductors switches and output rectifiers which are available in identical package outlines

### DESCRIPTION

High voltage rectifiers optimized for very low forward voltage drop with moderate leakage.

These devices are intended for use in main rectification (single or three phase bridge).

### OUTPUT CURRENT IN TYPICAL APPLICATIONS

| APPLICATIONS  | SINGLE-PHASE BRIDGE | THREE-PHASE BRIDGE | UNITS |
|---|---------------------|--------------------|-------|
| Capacitive input filter $T_A = 55$ °C, $T_J = 125$ °C common heatsink of 1 °C/W | 18                  | 22                 | A     |

### MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL      | CHARACTERISTICS     | VALUES      | UNITS |
|-------------|---------------------|-------------|-------|
| $I_{F(AV)}$ | Sinusoidal waveform | 20          | A     |
| $V_{RRM}$   | Range               | 800, 1200   | V     |
| $I_{FSM}$   |                     | 300         | A     |
| $V_F$       | 10 A, $T_J = 25$ °C | 1.0         | V     |
| $T_J$       |                     | -40 to +150 | °C    |

### VOLTAGE RATINGS

| PART NUMBER     | $V_{RRM}$ , MAXIMUM PEAK REVERSE VOLTAGE<br>V | $V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE<br>V | $I_{RRM}$ AT 150 °C<br>mA |
|-----------------|---|--|---------------------------|
| VS-20ETS08FP-M3 | 800   | 900  | 1                         |
| VS-20ETS12FP-M3 | 1200  | 1300   |                           |



| ABSOLUTE MAXIMUM RATINGS                            |               |   |        |                   |
|---|---------------|---|--------|-------------------|
| PARAMETER   | SYMBOL        | TEST CONDITIONS   | VALUES | UNITS             |
| Maximum average forward current                     | $I_{F(AV)}$   | $T_C = 51\text{ }^\circ\text{C}$ , 180° conduction half sine wave | 20     | A                 |
| Maximum peak one cycle non-repetitive surge current | $I_{FSM}$     | 10 ms sine pulse, rated $V_{RRM}$ applied                         | 250    |                   |
|   |               | 10 ms sine pulse, no voltage reapplied                            | 300    |                   |
| Maximum $I^2t$ for fusing                           | $I^2t$        | 10 ms sine pulse, rated $V_{RRM}$ applied                         | 316    | A <sup>2</sup> s  |
|   |               | 10 ms sine pulse, no voltage reapplied                            | 442    |                   |
| Maximum $I^2\sqrt{t}$ for fusing                    | $I^2\sqrt{t}$ | $t = 0.1\text{ ms to }10\text{ ms}$ , no voltage reapplied        | 4420   | A <sup>2</sup> √s |

| ELECTRICAL SPECIFICATIONS       |             |  |                                   |       |    |
|---------------------------------|-------------|--|-----------------------------------|-------|----|
| PARAMETER                       | SYMBOL      | TEST CONDITIONS                        | VALUES                            | UNITS |    |
| Maximum forward voltage drop    | $V_{FM}$    | 20 A, $T_J = 25\text{ }^\circ\text{C}$ | 1.1                               | V     |    |
| Forward slope resistance        | $r_t$       | $T_J = 150\text{ }^\circ\text{C}$      | 10.4                              | mΩ    |    |
| Threshold voltage               | $V_{F(TO)}$ |  | 0.85                              | V     |    |
| Maximum reverse leakage current | $I_{RM}$    | $V_R = \text{Rated } V_{RRM}$          | $T_J = 25\text{ }^\circ\text{C}$  | 0.1   | mA |
|                                 |             |  | $T_J = 150\text{ }^\circ\text{C}$ | 1.0   |    |

| THERMAL - MECHANICAL SPECIFICATIONS             |                |                                       |             |                        |
|---|----------------|---------------------------------------|-------------|------------------------|
| PARAMETER                                       | SYMBOL         | TEST CONDITIONS                       | VALUES      | UNITS                  |
| Maximum junction and storage temperature range  | $T_J, T_{Stg}$ |                                       | -40 to +150 | °C                     |
| Maximum thermal resistance, junction to case    | $R_{thJC}$     | DC operation                          | 2.8         | °C/W                   |
| Maximum thermal resistance, junction to ambient | $R_{thJA}$     |                                       | 62          |                        |
| Typical thermal resistance, case to heatsink    | $R_{thCS}$     | Mounting surface, smooth, and greased | 0.5         |                        |
| Approximate weight                              |                |                                       | 2           | g                      |
|   |                |                                       | 0.07        | oz.                    |
| Mounting torque                                 | minimum        |                                       | 6.0 (5.0)   | kgf · cm<br>(lbf · in) |
|   | maximum        |                                       | 12 (10)     |                        |
| Marking device                                  |                | Case style 2L TO-220 FullPAK          | 20ETS08FP   |                        |
|   |                |                                       | 20ETS12FP   |                        |

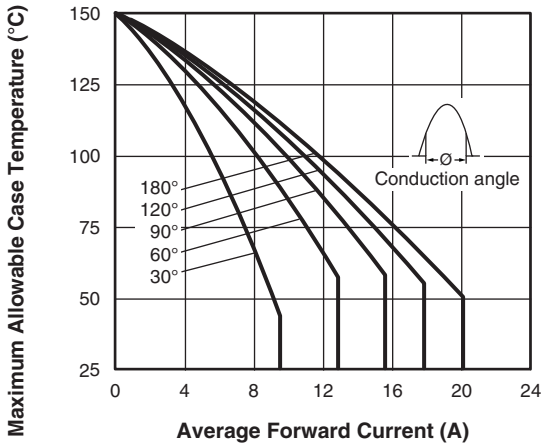


Fig. 1 - Current Rating Characteristics

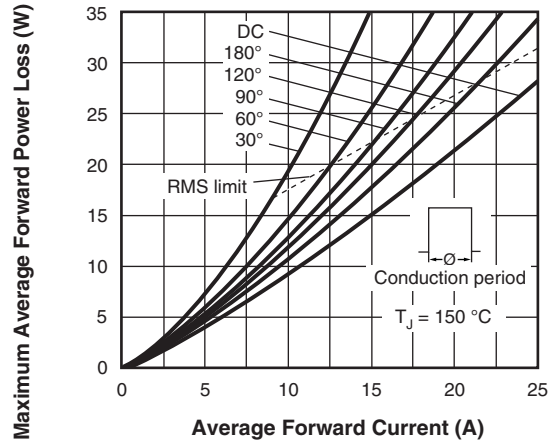


Fig. 4 - Forward Power Loss Characteristics

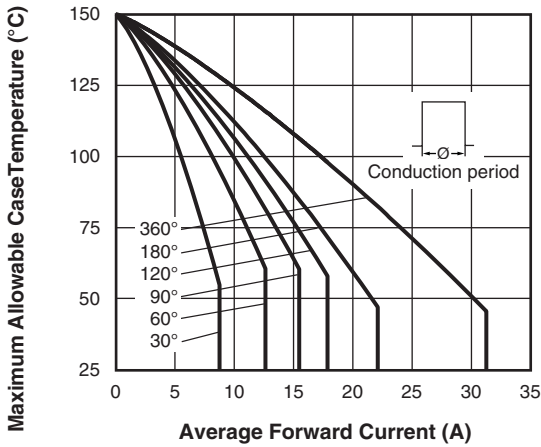


Fig. 2 - Current Rating Characteristics

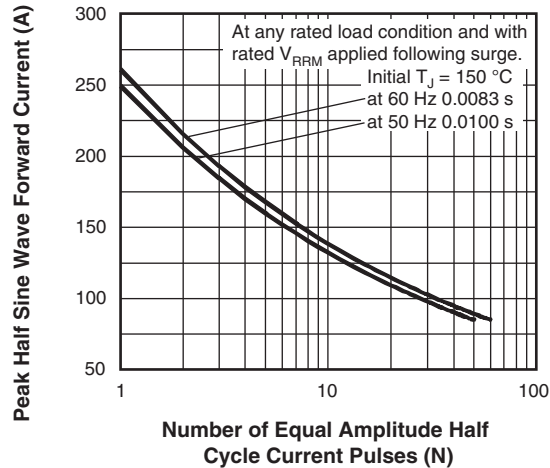


Fig. 5 - Maximum Non-Repetitive Surge Current

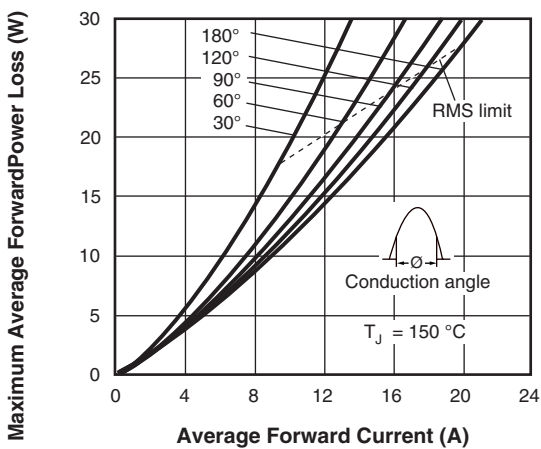


Fig. 3 - Forward Power Loss Characteristics

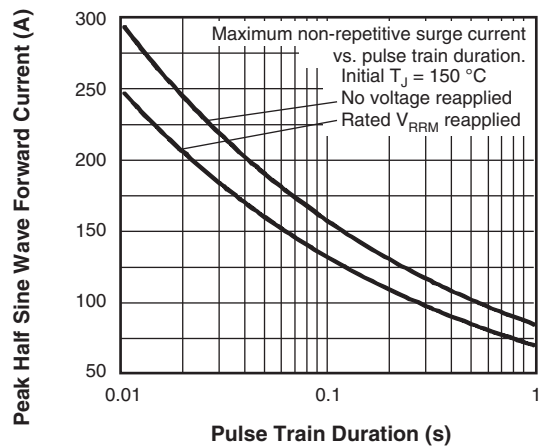


Fig. 6 - Maximum Non-Repetitive Surge Current

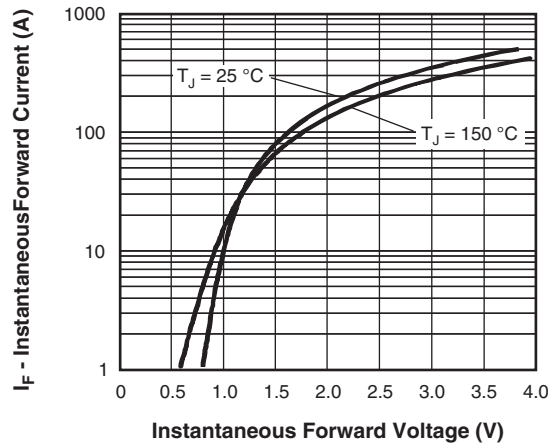


Fig. 7 - Forward Voltage Drop Characteristics

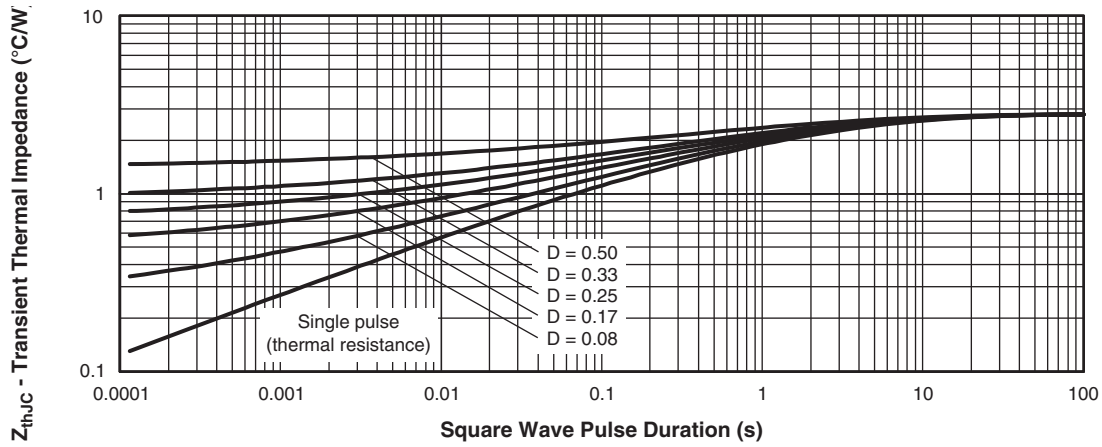
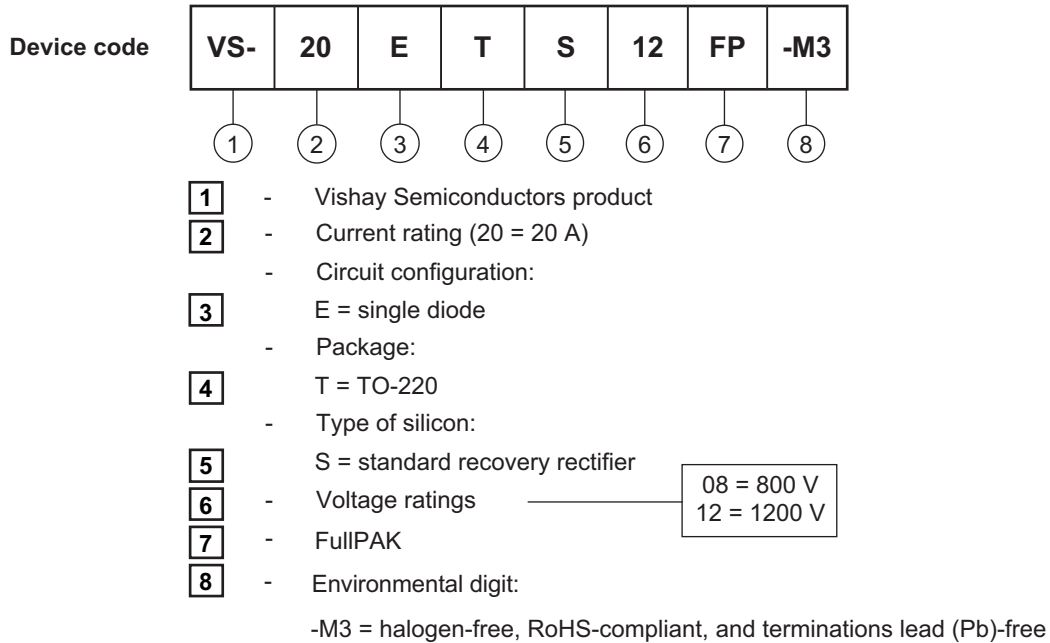


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics



## ORDERING INFORMATION TABLE



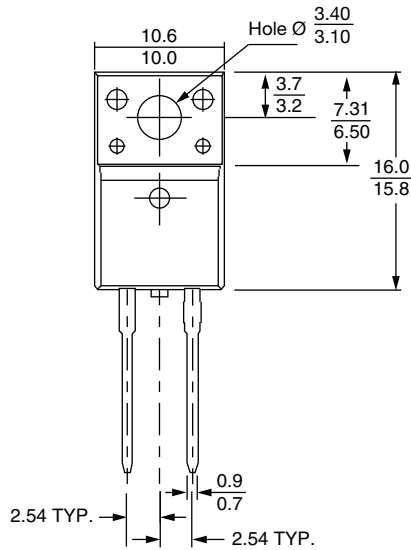
| ORDERING INFORMATION (Example) |                  |                        |                          |
|--------------------------------|------------------|------------------------|--------------------------|
| PREFERRED P/N                  | QUANTITY PER T/R | MINIMUM ORDER QUANTITY | PACKAGING DESCRIPTION    |
| VS-20ETS08FP-M3                | 50               | 1000                   | Antistatic plastic tubes |
| VS-20ETS12FP-M3                | 50               | 1000                   | Antistatic plastic tubes |

| LINKS TO RELATED DOCUMENTS |  |
|----------------------------|--|
| Dimensions                 | <a href="http://www.vishay.com/doc?96157">www.vishay.com/doc?96157</a> |
| Part marking information   | <a href="http://www.vishay.com/doc?95392">www.vishay.com/doc?95392</a> |



## 2L TO-220 FullPAK

**DIMENSIONS** in millimeters



Bottom view





## Disclaimer

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