

| DYNAMIC RECOVERY CHARACTERISTICS ($T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise specified) | | | | | | |
|--|-----------|---|------|------|------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNITS |
| Reverse recovery time | t_{rr} | $I_F = 1.0\text{ A}$, $di_F/dt = 100\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$ | - | 26 | - | ns |
| | | $T_J = 25\text{ }^{\circ}\text{C}$ | - | 100 | - | |
| | | $T_J = 125\text{ }^{\circ}\text{C}$ | - | 150 | - | |
| Peak recovery current | I_{RRM} | $T_J = 25\text{ }^{\circ}\text{C}$ | - | 12 | - | A |
| | | $T_J = 125\text{ }^{\circ}\text{C}$ | - | 22 | - | |
| Reverse recovery charge | Q_{rr} | $T_J = 25\text{ }^{\circ}\text{C}$ | - | 530 | - | nC |
| | | $T_J = 125\text{ }^{\circ}\text{C}$ | - | 1550 | - | |
| Reverse recovery time | t_{rr} | $T_J = 25\text{ }^{\circ}\text{C}$ | - | 80 | - | ns |
| | | $T_J = 125\text{ }^{\circ}\text{C}$ | - | 120 | - | |
| Peak recovery current | I_{RRM} | $T_J = 25\text{ }^{\circ}\text{C}$ | - | 22 | - | A |
| | | $T_J = 125\text{ }^{\circ}\text{C}$ | - | 37 | - | |
| Reverse recovery charge | Q_{rr} | $T_J = 25\text{ }^{\circ}\text{C}$ | - | 900 | - | nC |
| | | $T_J = 125\text{ }^{\circ}\text{C}$ | - | 2300 | - | |

| THERMAL - MECHANICAL SPECIFICATIONS | | | | | | |
|--|-------------------|-------------------------|--------------|------|------------|-----------------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNITS |
| Thermal resistance, junction-to-case | R_{thJC} | | - | - | 1.2 | $^{\circ}\text{C}/\text{W}$ |
| Weight | | | - | 2.0 | - | g |
| | | | - | 0.07 | - | oz. |
| Mounting torque | | | 6.0 (5.0) | - | 12 (10) | kgf · cm (lbf · in) |
| Maximum junction and storage temperature range | T_J , T_{stg} | | -55 | - | 175 | $^{\circ}\text{C}$ |
| Marking device | | Case style: 2L TO-220AC | E5TX3012 | | | |

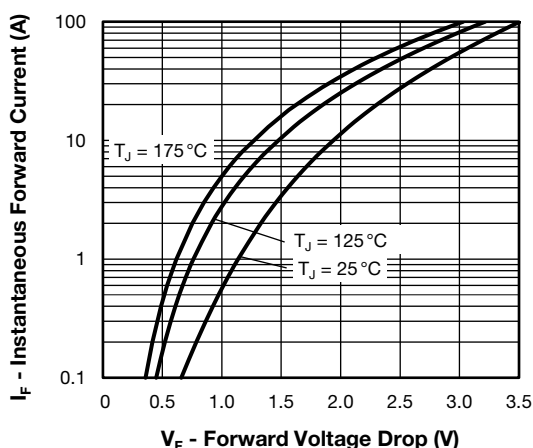


Fig. 1 - Typical Forward Voltage Drop Characteristics

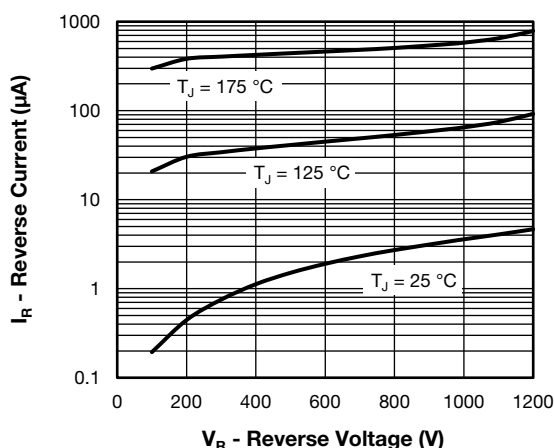


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

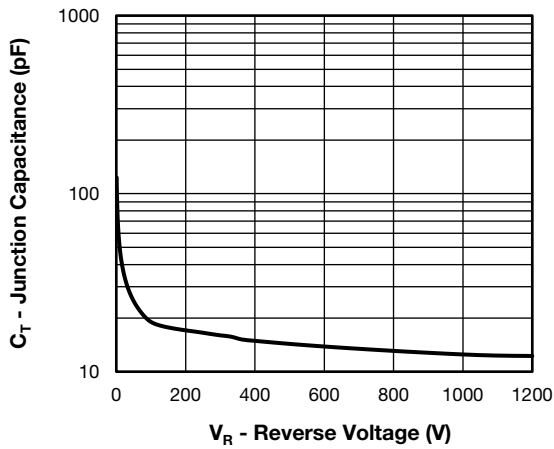


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

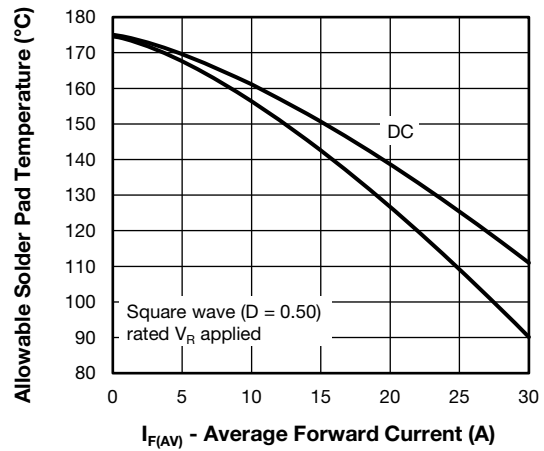
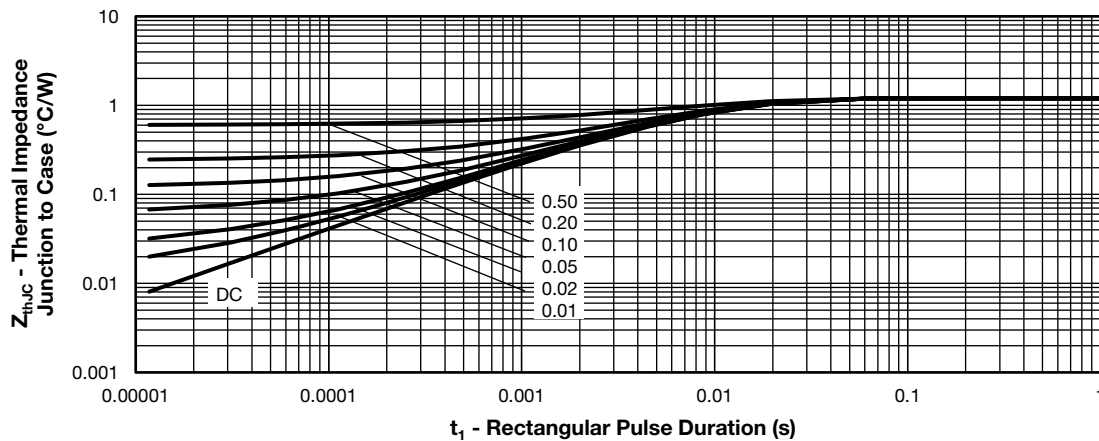
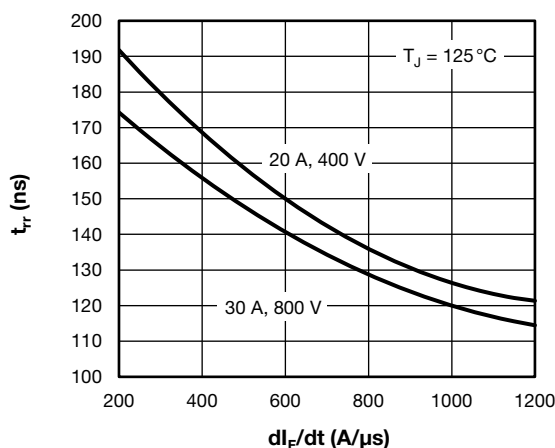
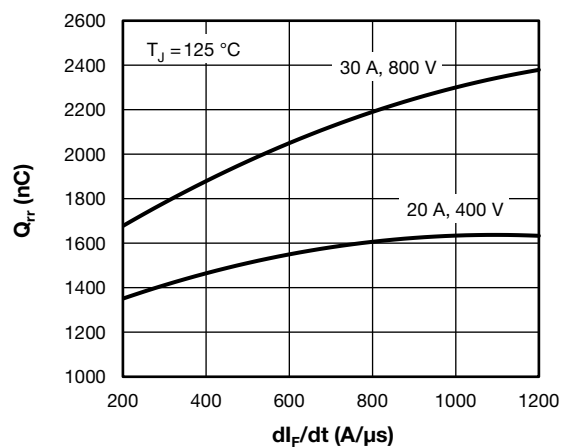


Fig. 4 - Maximum Allowable Case Temperature vs. Average Forward Current


Fig. 5 - Thermal Impedance Z_{thJC} Characteristics

Fig. 6 - Typical Reverse Recovery Time vs. dI_F/dt

Fig. 7 - Typical Stored Charge vs. dI_F/dt

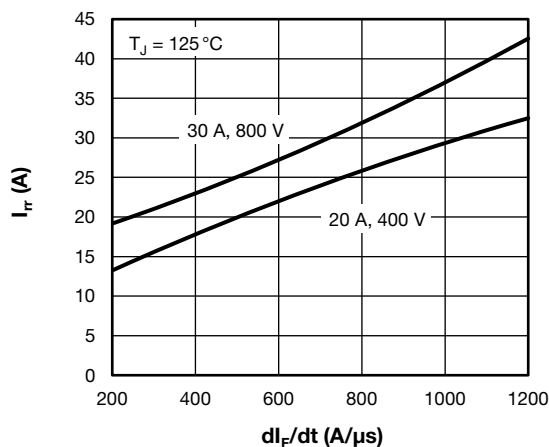


Fig. 8 - Typical Recovery Current vs. di_F/dt

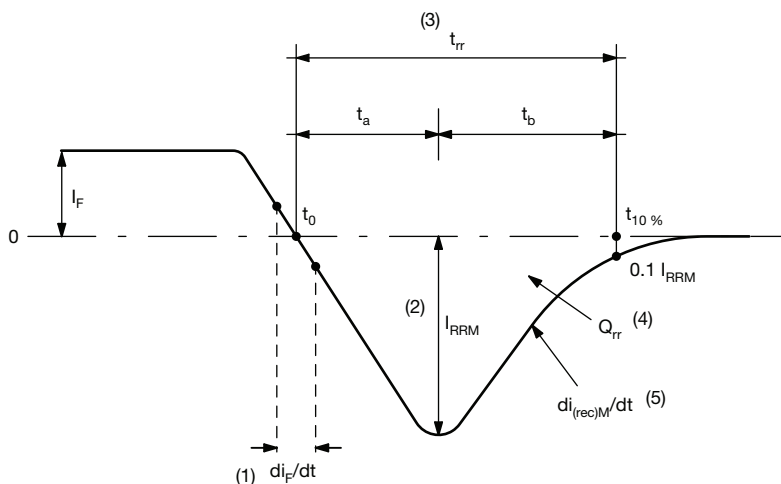


Fig. 9 - Reverse Recovery Waveform and Definitions

Notes

- (1) di_F/dt - rate of change of current through zero crossing
- (2) I_{RRM} - peak reverse recovery current
- (3) t_{rr} - reverse recovery time measured from t_0 , crossing point of negative going I_F , to point $t_{10\%}$, $0.1 I_{RRM}$
- (4) Q_{rr} - area under curve defined by t_0 and $t_{10\%}$

$$Q_{rr} = \int_{t_0}^{t_{10\%}} I(t) dt$$

- (5) $di_{(rec)M}/dt$ - peak rate of change of current during t_b portion of t_{rr}



ORDERING INFORMATION TABLE

| | | | | | | | | |
|-------------|-----|---|---|---|---|----|----|-----|
| Device code | VS- | E | 5 | T | X | 30 | 12 | -N3 |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

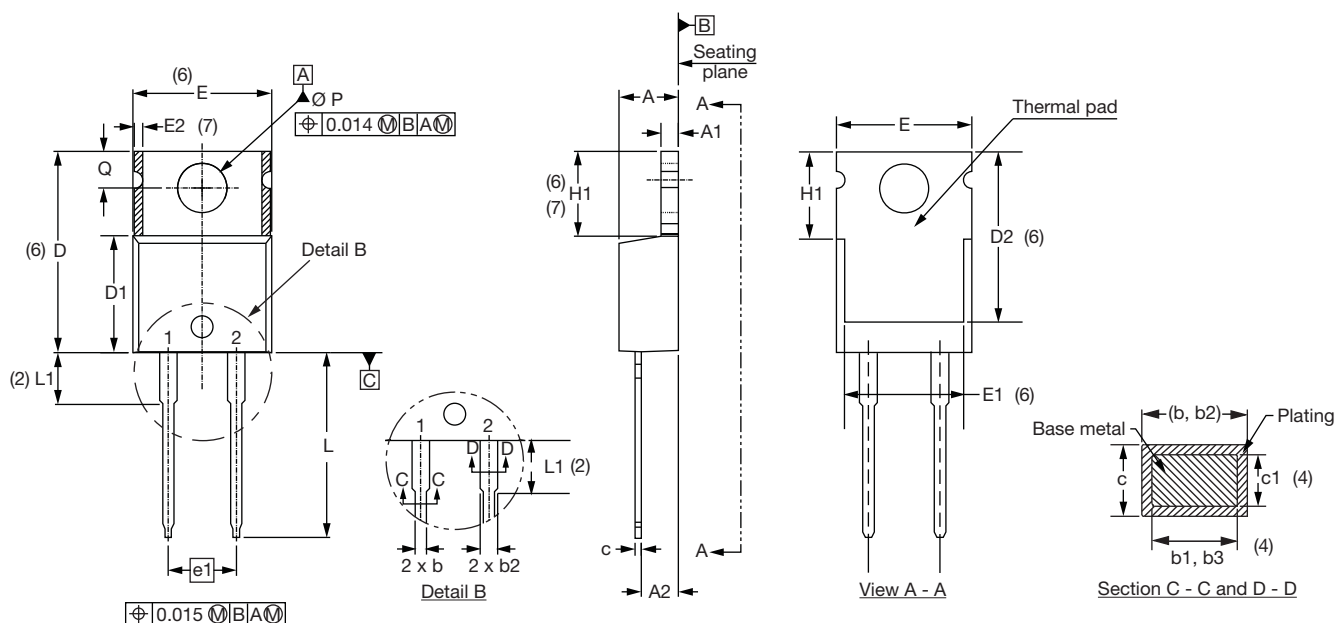
- 1 - Vishay Semiconductors product
- 2 - E = single diode
- 3 - 5 = Fred generation 5
- 4 - Package:
T = TO-220AC 2L
- 5 - X = hyperfast recovery
- 6 - Current rating (30 = 30 A)
- 7 - Voltage rating (12 = 1200 V)
- 8 - Environmental digit:
-N3 = halogen-free, RoHS-compliant, and totally lead (Pb)-free

| ORDERING INFORMATION (Example) | | | |
|--------------------------------|-------------------|------------------------|-------------------------|
| PREFERRED P/N | QUANTITY PER TUBE | MINIMUM ORDER QUANTITY | PACKAGING DESCRIPTION |
| VS-E5TX3012-N3 | 50 | 1000 | Antistatic plastic tube |

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|--|
| Dimensions | www.vishay.com/doc?96069 |
| Part marking information | www.vishay.com/doc?95391 |
| SPICE model | www.vishay.com/doc?96701 |

2L TO-220AC

DIMENSIONS in millimeters and inches



| SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|--------|-------------|-------|--------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | |
| A | 4.25 | 4.65 | 0.167 | 0.183 | |
| A1 | 1.14 | 1.40 | 0.045 | 0.055 | |
| A2 | 2.56 | 2.92 | 0.101 | 0.115 | |
| b | 0.69 | 1.01 | 0.027 | 0.040 | |
| b1 | 0.38 | 0.97 | 0.015 | 0.038 | 4 |
| b2 | 1.20 | 1.73 | 0.047 | 0.068 | |
| b3 | 1.14 | 1.73 | 0.045 | 0.068 | 4 |
| c | 0.36 | 0.61 | 0.014 | 0.024 | |
| c1 | 0.36 | 0.56 | 0.014 | 0.022 | 4 |
| D | 14.85 | 15.25 | 0.585 | 0.600 | 3 |
| D1 | 8.38 | 9.02 | 0.330 | 0.355 | |
| D2 | 11.68 | 12.88 | 0.460 | 0.507 | 6 |
| E | 10.11 | 10.51 | 0.398 | 0.414 | 3, 6 |

Notes

- (1) Dimensioning and tolerancing as per ASME Y14.5M-1994
- (2) Lead dimension and finish uncontrolled in L1
- (3) Dimension D, D1 and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outermost extremes of the plastic body
- (4) Dimension b1, b3 and c1 apply to base metal only
- (5) Controlling dimension: inches
- (6) Thermal pad contour optional within dimensions E, H1, D2 and E1
- (7) Dimension E2 x H1 define a zone where stamping and singulation irregularities are allowed
- (8) Outline conforms to JEDEC® TO-220, except D2, where JEDEC® minimum is 0.480"



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