

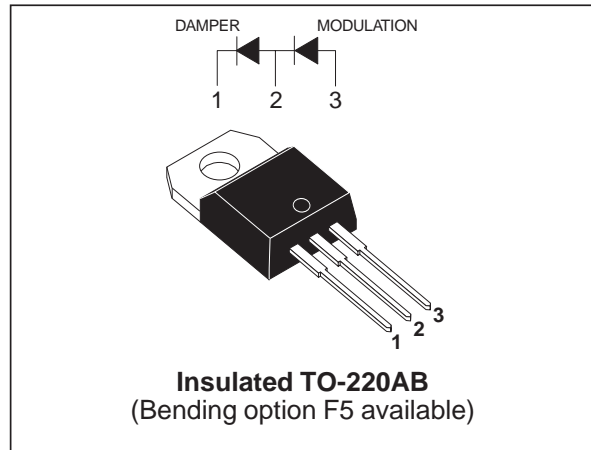
DAMPER + MODULATION DIODE FOR VIDEO

MAIN PRODUCT CHARACTERISTICS

| | MODUL | DAMPER |
|----------------|-------|--------|
| $I_{F(AV)}$ | 3 A | 4 A |
| V_{RRM} | 600 V | 1500 V |
| $t_{rr} (max)$ | 50 ns | 170 ns |
| $V_F (max)$ | 1.4 V | 1.5 V |

FEATURES AND BENEFITS

- Full kit in one package
- High breakdown voltage capability
- Very fast recovery diode
- Specified turn on switching characteristics
- Low static and peak forward voltage drop for low dissipation
- Insulated version:
Insulated voltage = 2500 V_{RMS}
Capacitance = 7 pF
- Planar technology allowing high quality and best electrical characteristics
- Outstanding performance of well proven DTV as damper and new faster Turbo 2 600V technology as modulation



DESCRIPTION

High voltage semiconductor especially designed for horizontal deflection stage in standard and high resolution video display with E/W correction.

The insulated TO-220AB package includes both the DAMPER diode and the MODULATION diode. Assembled on automated line, it offers excellent insulating and dissipating characteristics, thanks to the internal ceramic insulation layer.

ABSOLUTE RATINGS (limiting values, per diode)

| Symbol | Parameter | Value | | Unit |
|-----------|--|---------------|--------|------|
| | | MODUL | DAMPER | |
| V_{RRM} | Repetitive peak reverse voltage | 600 | 1500 | V |
| I_{FSM} | Surge non repetitive forward current | 35 | 50 | A |
| T_{stg} | Storage temperature range | - 40 to + 150 | | °C |
| T_j | Maximum operating junction temperature | 150 | | |

DMV1500L

THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---------------|-----------------------------|-------|------|
| $R_{th(j-c)}$ | Damper junction to case | 5.5 | °C/W |
| $R_{th(j-c)}$ | Modulation junction to case | 6 | |

STATIC ELECTRICAL CHARACTERISTICS OF THE DAMPER DIODES

| Symbol | Parameter | Test conditions | Value | | | | Unit |
|----------|-------------------------|-----------------------|-----------|------|------------|------|------|
| | | | Tj = 25°C | | Tj = 125°C | | |
| | | | Typ. | Max. | Typ. | Max. | |
| V_F * | Forward voltage drop | $I_F = 4\text{ A}$ | 1.2 | 1.7 | 1.1 | 1.5 | V |
| I_R ** | Reverse leakage current | $V_R = 1500\text{ V}$ | | 100 | 100 | 1000 | μA |

Pulse test : * $t_p = 380\ \mu\text{s}$, $\delta < 2\%$
 ** $t_p = 5\ \text{ms}$, $\delta < 2\%$

To evaluate the maximum conduction losses of the DAMPER diode use the following equations :

$$P = 1.2 \times I_F(AV) + 0.075 \times I_F^2(RMS)$$

STATIC ELECTRICAL CHARACTERISTICS OF THE MODULATION DIODE

| Symbol | Parameter | Test conditions | Value | | | | Unit |
|----------|-------------------------|----------------------|-----------|------|------------|------|------|
| | | | Tj = 25°C | | Tj = 125°C | | |
| | | | Typ. | Max. | Typ. | Max. | |
| V_F * | Forward voltage drop | $I_F = 3\text{ A}$ | | 1.8 | 1.1 | 1.4 | V |
| I_R ** | Reverse leakage current | $V_R = 600\text{ V}$ | | 20 | 3 | 50 | μA |

Pulse test : * $t_p = 380\ \mu\text{s}$, $\delta < 2\%$
 ** $t_p = 5\ \text{ms}$, $\delta < 2\%$

To evaluate the maximum conduction losses of the MODULATION diode use the following equations :

$$P = 1.12 \times I_F(AV) + 0.092 \times I_F^2(RMS)$$

RECOVERY CHARACTERISTICS OF THE DAMPER DIODE

| Symbol | Parameter | Test conditions | Value | | Unit | |
|----------|-----------------------|---|-------|------|------|----|
| | | | Typ. | Max. | | |
| t_{rr} | Reverse recovery time | $I_F = 100\text{ mA}$ $I_R = 100\text{ mA}$ $I_{RR} = 10\text{ mA}$ | | 850 | ns | |
| t_{rr} | Reverse recovery time | $I_F = 1\text{ A}$ $dI_F/dt = -50\text{ A}/\mu\text{s}$ $V_R = 30\text{ V}$ | | 130 | 170 | ns |

RECOVERY CHARACTERISTICS OF THE MODULATION DIODE

| Symbol | Parameter | Test conditions | | Value | | Unit |
|----------|-----------------------|--|--------------------------|-------|------|------|
| | | | | Typ. | Max. | |
| t_{rr} | Reverse recovery time | $I_F = 100\text{mA}$ $I_R = 100\text{mA}$ $I_{RR} = 10\text{mA}$ | $T_j = 25^\circ\text{C}$ | 110 | 350 | ns |
| t_{rr} | Reverse recovery time | $I_F = 1\text{A}$ $dI_F/dt = -50\text{A}/\mu\text{s}$ $V_R = 30\text{V}$ | $T_j = 25^\circ\text{C}$ | | 50 | ns |

TURN-ON SWITCHING CHARACTERISTICS OF THE DAMPER DIODE

| Symbol | Parameter | Test conditions | | Value | | Unit |
|----------|-----------------------|---|---------------------------|-------|------|------|
| | | | | Typ. | Max. | |
| t_{fr} | Forward recovery time | $I_F = 4\text{A}$ $dI_F/dt = 80\text{A}/\mu\text{s}$ $V_{FR} = 3\text{V}$ | $T_j = 100^\circ\text{C}$ | | 450 | ns |
| | | $I_F = 6.5\text{A}$ $dI_F/dt = 50\text{A}/\mu\text{s}$ $V_{FR} = 3\text{V}$ | $T_j = 25^\circ\text{C}$ | | 450 | |
| V_{FP} | Peak forward voltage | $I_F = 4\text{A}$ $dI_F/dt = 80\text{A}/\mu\text{s}$ | $T_j = 100^\circ\text{C}$ | 28 | 36 | V |
| | | $I_F = 6.5\text{A}$ $dI_F/dt = 50\text{A}/\mu\text{s}$ | $T_j = 25^\circ\text{C}$ | 13 | 17 | |

TURN-ON SWITCHING CHARACTERISTICS OF THE MODULATION DIODE

| Symbol | Parameter | Test conditions | | Value | | Unit |
|----------|-----------------------|---|---------------------------|-------|------|------|
| | | | | Typ. | Max. | |
| t_{fr} | Forward recovery time | $I_F = 3\text{A}$ $dI_F/dt = 80\text{A}/\mu\text{s}$ $V_{FR} = 2\text{V}$ | $T_j = 100^\circ\text{C}$ | | 240 | ns |
| V_{FP} | Peak forward voltage | $I_F = 3\text{A}$ $dI_F/dt = 80\text{A}/\mu\text{s}$ | $T_j = 100^\circ\text{C}$ | | 8 | V |

Fig. 1-1: Power dissipation versus peak forward current (triangular waveform, $\delta = 0.45$) (damper diode).

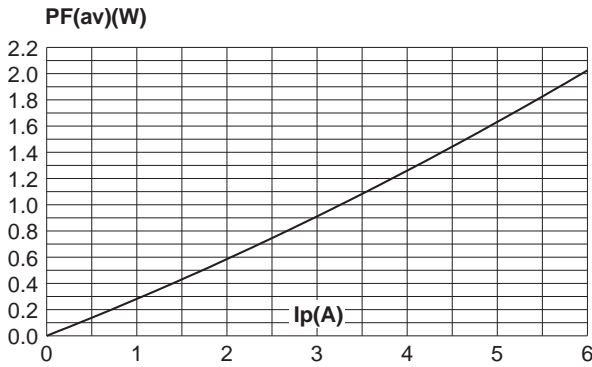


Fig. 1-2: Power dissipation versus peak forward current (triangular waveform, $\delta = 0.45$) (modulation diode).

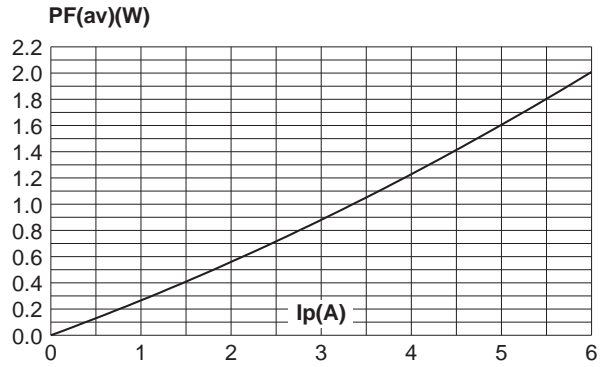


Fig. 2-1: Average forward current versus ambient temperature (damper diode).

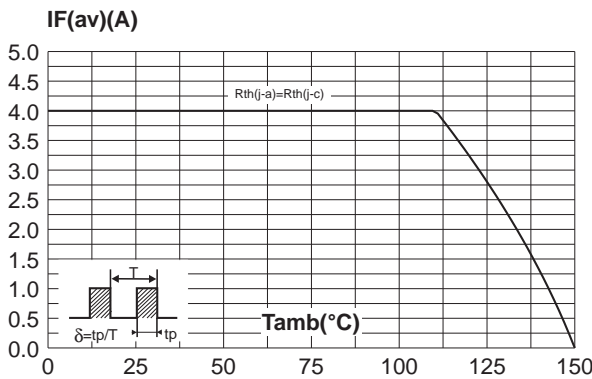


Fig. 2-2: Average forward current versus ambient temperature (modulation diode).

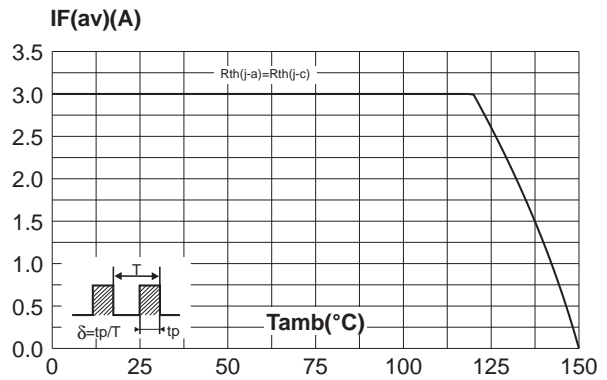


Fig. 3-1: Forward voltage drop versus forward current (damper diode).

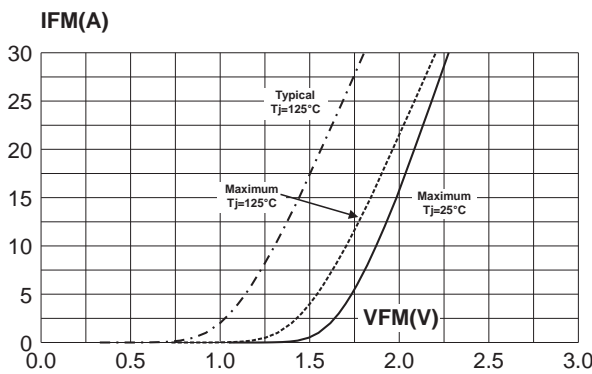


Fig. 3-2: Forward voltage drop versus forward current (modulation diode).

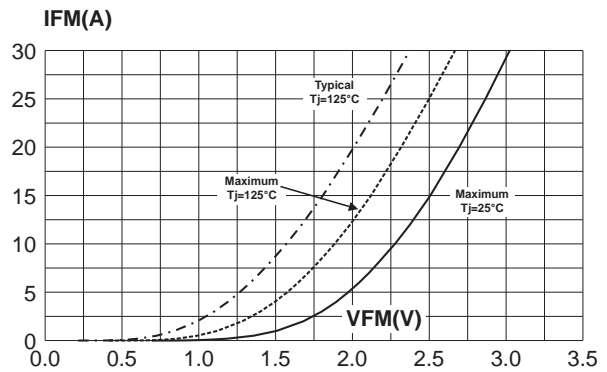


Fig. 4: Relative variation of thermal impedance junction to case versus pulse duration.

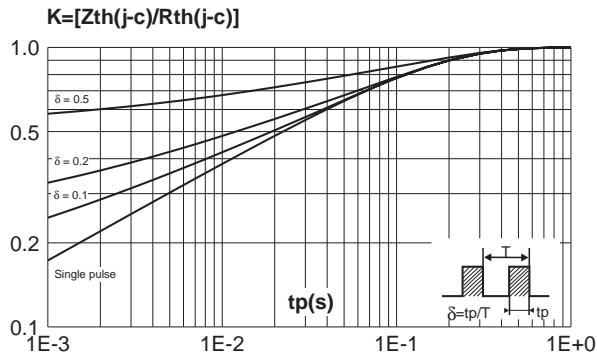


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (damper diode).

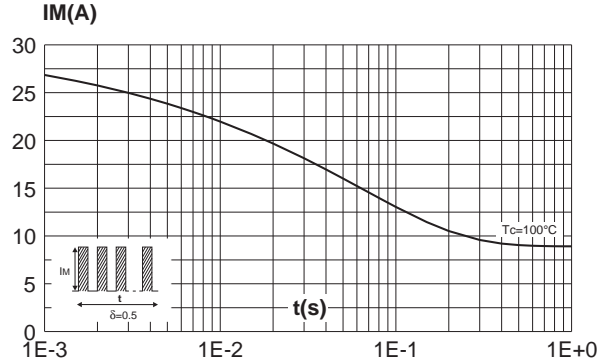


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (modulation diode).

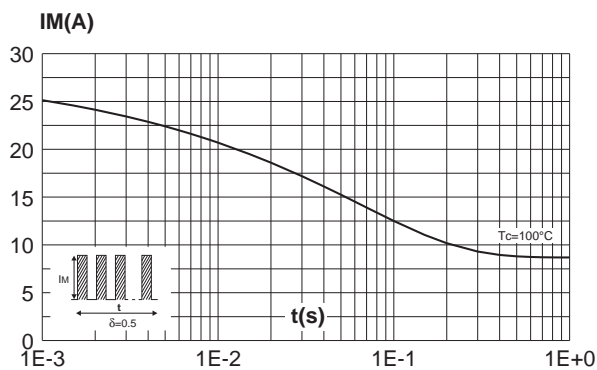


Fig. 6-1: Reverse recovery charges versus dI_F/dt (damper diode).

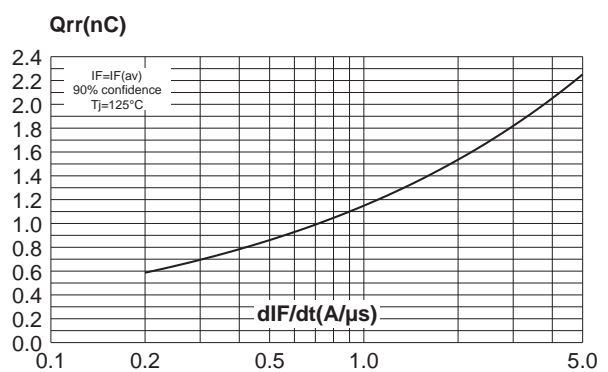


Fig. 6-2: Reverse recovery charges versus dI_F/dt (modulation diode).

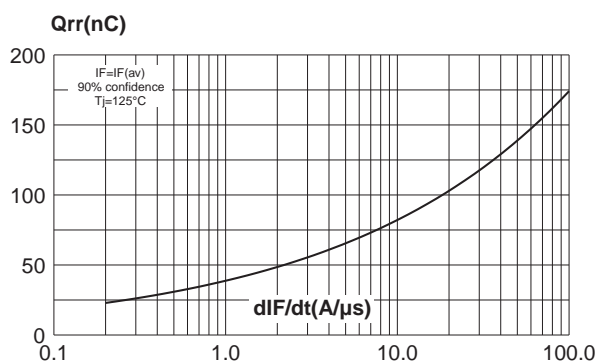


Fig. 7-1: Reverse recovery current versus dI_F/dt (damper diode).

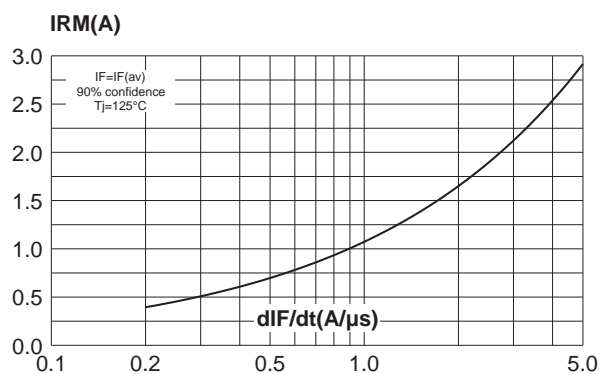


Fig. 7-2: Reverse recovery current versus diF/dt (modulation diode).

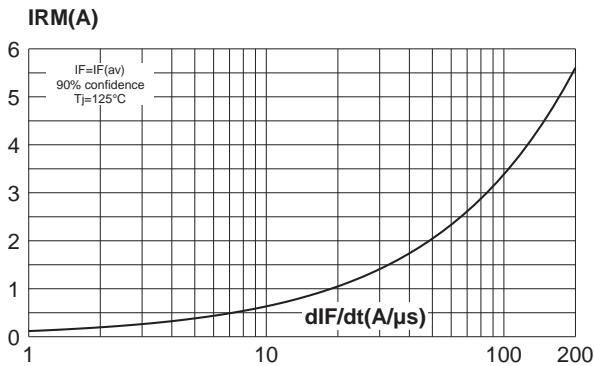


Fig. 8-1: Transient peak forward voltage versus diF/dt (damper diode).

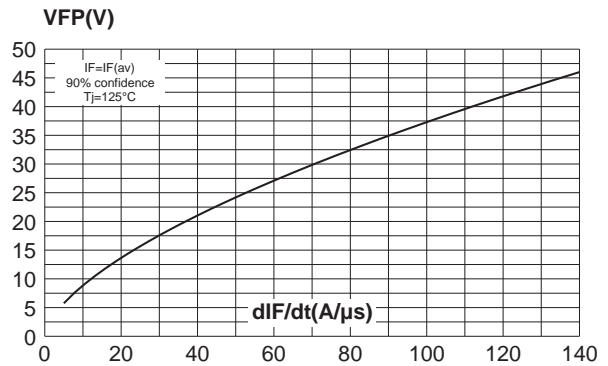


Fig. 8-2: Transient peak forward voltage versus diF/dt (modulation diode).

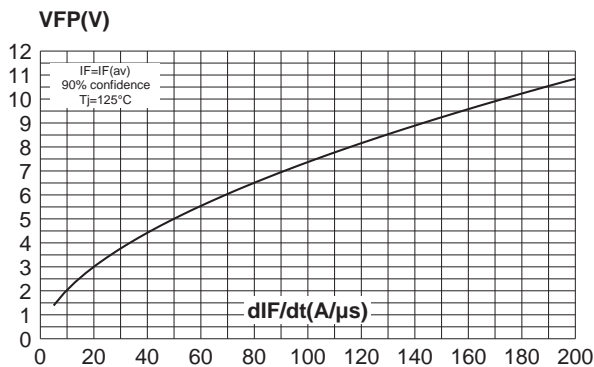


Fig. 9-1: Forward recovery time versus diF/dt (damper diode).

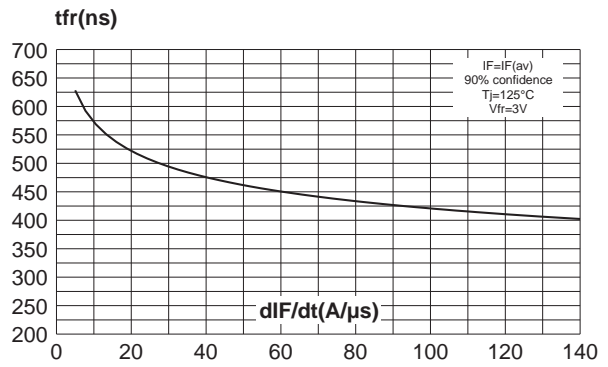


Fig. 9-2: Forward recovery time versus diF/dt (modulation diode).

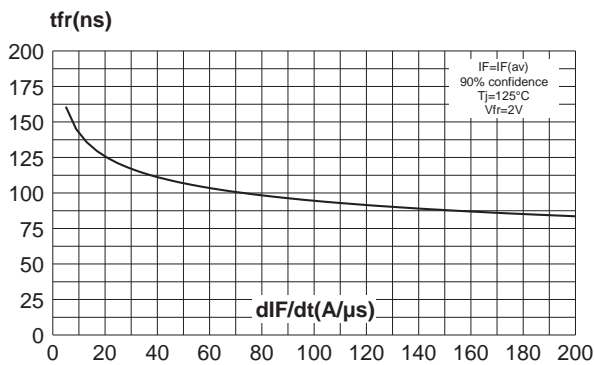


Fig. 10-1: Dynamic parameters versus junction temperature (damper diode).

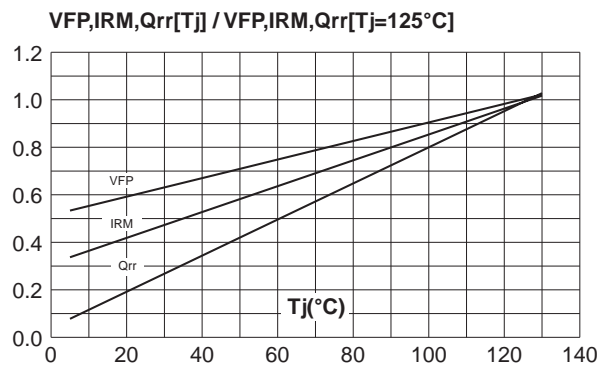


Fig. 10-2: Dynamic parameters versus junction temperature (modulation diode).

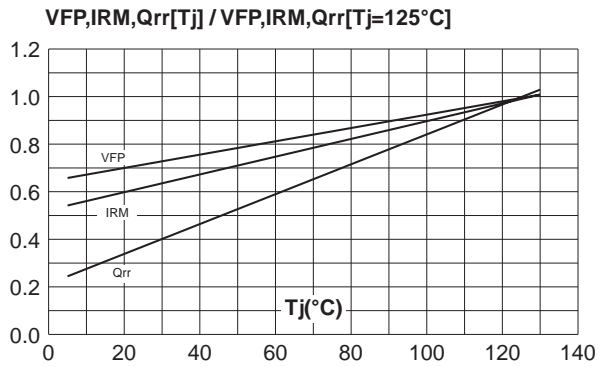
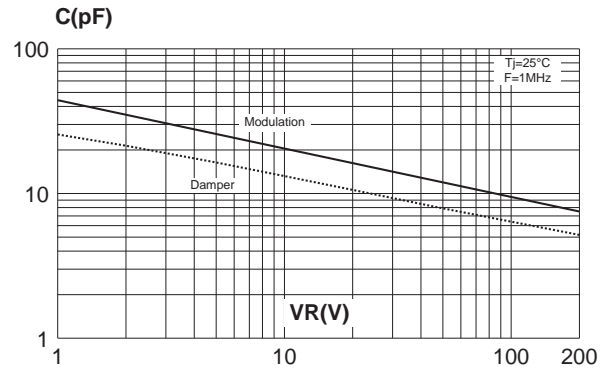
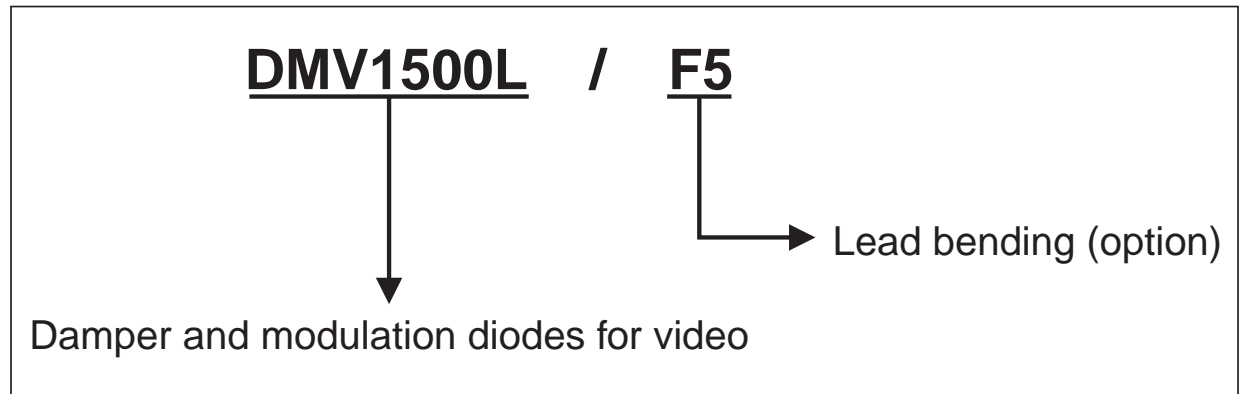


Fig. 11: Junction capacitance versus reverse voltage applied (typical values).

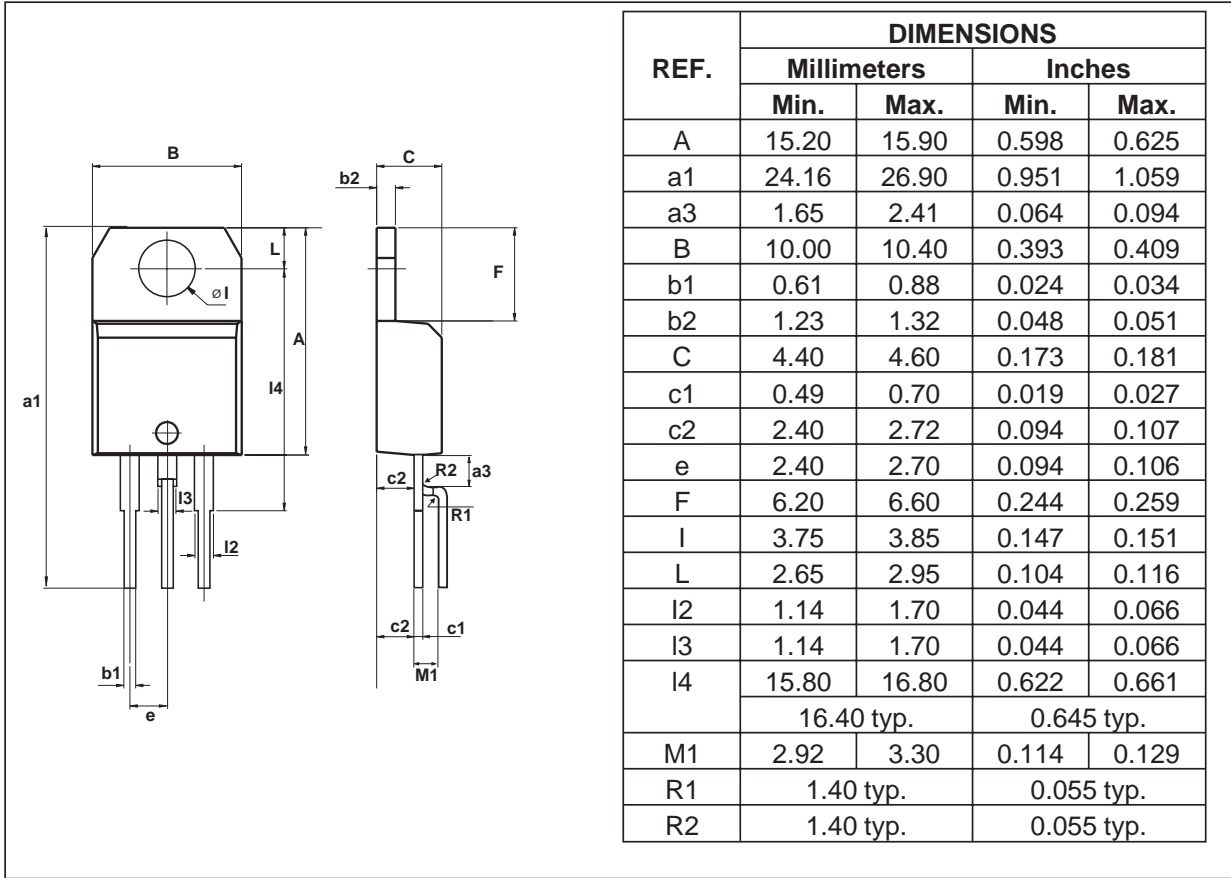


ORDERING INFORMATION

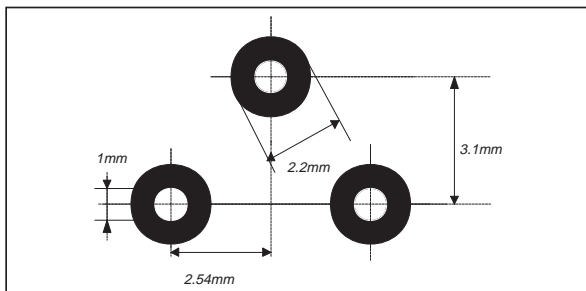


DMV1500L

PACKAGE MECHANICAL DATA TO-220AB F5 OPTION



PRINTED CIRCUIT LAYOUT FOR F5 LAYOUT



- Cooling method: by conduction (c)
- Recommended torque value: 0.8 m.N.
- Maximum torque value: 1 m.N.

PACKAGE MECHANICAL DATA
 TO-220AB

| REF. | DIMENSIONS | | | | | |
|------|-------------|-------|-------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 15.20 | | 15.90 | 0.598 | | 0.625 |
| a1 | | 3.75 | | | 0.147 | |
| a2 | 13.00 | | 14.00 | 0.511 | | 0.551 |
| B | 10.00 | | 10.40 | 0.393 | | 0.409 |
| b1 | 0.61 | | 0.88 | 0.024 | | 0.034 |
| b2 | 1.23 | | 1.32 | 0.048 | | 0.051 |
| C | 4.40 | | 4.60 | 0.173 | | 0.181 |
| c1 | 0.49 | | 0.70 | 0.019 | | 0.027 |
| c2 | 2.40 | | 2.72 | 0.094 | | 0.107 |
| e | 2.40 | | 2.70 | 0.094 | | 0.106 |
| F | 6.20 | | 6.60 | 0.244 | | 0.259 |
| I | 3.75 | | 3.85 | 0.147 | | 0.151 |
| I4 | 15.80 | 16.40 | 16.80 | 0.622 | 0.646 | 0.661 |
| L | 2.65 | | 2.95 | 0.104 | | 0.116 |
| I2 | 1.14 | | 1.70 | 0.044 | | 0.066 |
| I3 | 1.14 | | 1.70 | 0.044 | | 0.066 |
| M | | 2.60 | | | 0.102 | |

- Cooling method: by conduction (c)
- Recommended torque value: 0.8 m.N.
- Maximum torque value: 1 m.N.

| Type | Marking | Package | Weight | Base qty | Delivery mode |
|------------------------|----------|----------|--------|----------|---------------|
| DMV1500L DMV1500LF5 | DMV1500L | TO-220AB | 2.2 g. | 50 | Tube |

- Epoxy meets UL94, V0

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