

DAMPER + MODULATION DIODE FOR CRT TV

Table 1: Main Product Characteristics

| | DAMPER | MODUL. |
|-------------------|--------|--------|
| $I_{F(AV)}$ | 6 A | 3 A |
| $I_{Fpeak (max)}$ | 12 A | 12 A |
| V_{RRM} | 1500 V | 600 V |
| $t_{rr} (typ)$ | 150 ns | 60 ns |
| $V_F (typ)$ | 1.0 V | 1.0 V |
| $V_{FP} (typ)$ | 21 V | 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 = 2000 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-220FPAB package includes both the DAMPER diode and the MODULATION diode, thanks to a dedicated design.

Assembled on automated line, it offers very low dispersion values on insulating and thermal performances.

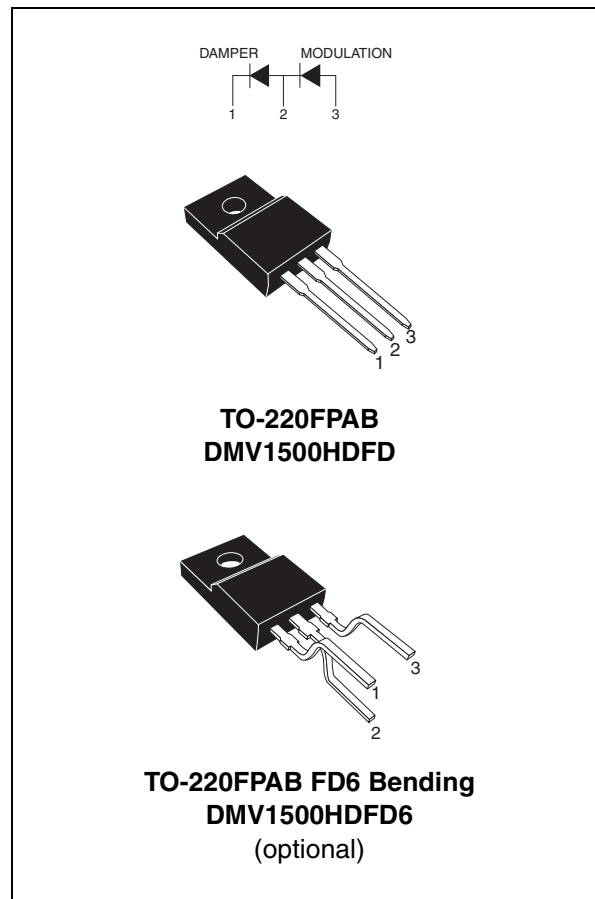


Table 2: Order Codes

| Part Number | Marking |
|--------------|-----------|
| DMV1500HDFD | DMV1500HD |
| DMV1500HDFD6 | DMV1500HD |

Table 3: Absolute Maximum Ratings

| Symbol | Parameter | | Value | | Unit |
|-------------|--|-------------------------|-------------|--------|------|
| | | | Damper | Modul. | |
| V_{RRM} | Repetitive peak reverse voltage | | 1500 | 600 | V |
| I_{Fpeak} | Peak working forward current | $F = 56kHz$ | 12 | 12 | A |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10ms$ sinusoidal | 75 | 50 | A |
| T_{stg} | Storage temperature range | | -40 to +150 | | °C |
| T_j | Maximum operating junction temperature | | 150 | | °C |

Table 4: Thermal Resistance

| Symbol | Parameter | Value | Unit |
|---------------|-------------------------------------|-------|------|
| $R_{th(j-c)}$ | Junction to case thermal resistance | 3.8 | °C/W |

Table 5: Static Electrical Characteristics

| Symbol | Parameter | Test conditions | | Value | | | | Unit |
|------------|-------------------------|-----------------|----------------|--------------------|------|---------------------|------|---------|
| | | | | $T_j = 25^\circ C$ | | $T_j = 125^\circ C$ | | |
| | | | | Typ. | Max. | Typ. | Max. | |
| I_R^* | Reverse leakage current | Damper | $V_R = 1500 V$ | | 100 | 100 | 1000 | μA |
| | | Modul. | $V_R = 600 V$ | | 3 | 3 | 30 | |
| V_F^{**} | Forward voltage drop | Damper | $I_F = 6 A$ | 1.1 | 1.6 | 1 | 1.35 | V |
| | | Modul. | $I_F = 6 A$ | 1.15 | 1.4 | 1 | 1.25 | |

Pulse test: * $t_p = 5 ms, \delta < 2\%$

** $t_p = 380 \mu s, \delta < 2\%$

To evaluate the maximum conduction losses of the **DAMPER** and **MODULATION** diodes use the following equations:

DAMPER: $P = 1.05 \times I_{F(AV)} + 0.05 \times I_F^2 (RMS)$

MODULATION: $P = 0.89 \times I_{F(AV)} + 0.055 \times I_F^2 (RMS)$

Table 6: Recovery Characteristics

| Symbol | Parameter | Test conditions | | Value | | | | Unit |
|----------|-----------------------|--|--------------------|--------|------|--------|------|------|
| | | | | Damper | | Modul. | | |
| | | | | Typ. | Max. | Typ. | Max. | |
| t_{rr} | Reverse recovery time | $I_F = 100mA$ $I_R = 100mA$ $I_{rr} = 10mA$ | $T_j = 25^\circ C$ | 1000 | | 250 | 400 | ns |
| | | $I_F = 1A$ $dI_F/dt = -50 A/\mu s$ $V_R = 30V$ | $T_j = 25^\circ C$ | 150 | 250 | 60 | 85 | |

Table 7: Turn-On Switching Characteristics

| Symbol | Parameter | Test conditions | | Value | | Unit | |
|----------|-----------------------|-----------------|--|---------------------------|------|------|----|
| | | | | Typ. | Max. | | |
| t_{fr} | Forward recovery time | Damper | $I_F = 6\text{ A}$ $di_F/dt = 80\text{ A}/\mu\text{s}$ $V_{FR} = 3\text{ V}$ | $T_j = 100^\circ\text{C}$ | 330 | 470 | ns |
| | | Modul. | $I_F = 6\text{ A}$ $di_F/dt = 80\text{ A}/\mu\text{s}$ $V_{FR} = 2\text{ V}$ | $T_j = 100^\circ\text{C}$ | 85 | 125 | |
| V_{FP} | Peak forward voltage | Damper | $I_F = 6\text{ A}$ $di_F/dt = 80\text{ A}/\mu\text{s}$ | $T_j = 100^\circ\text{C}$ | 21 | 29 | V |
| | | Modul. | $I_F = 6\text{ A}$ $di_F/dt = 80\text{ A}/\mu\text{s}$ | $T_j = 100^\circ\text{C}$ | 5 | 7.5 | |

Figure 1: Power dissipation versus peak forward current (triangular waveform, $\delta=0.45$)

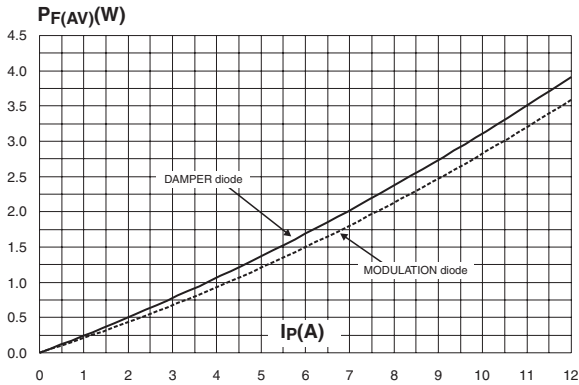


Figure 3: Forward voltage drop versus forward current (damper diode)

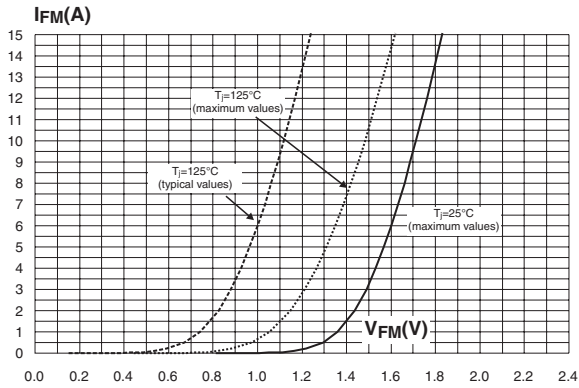


Figure 2: Average forward current versus ambient temperature

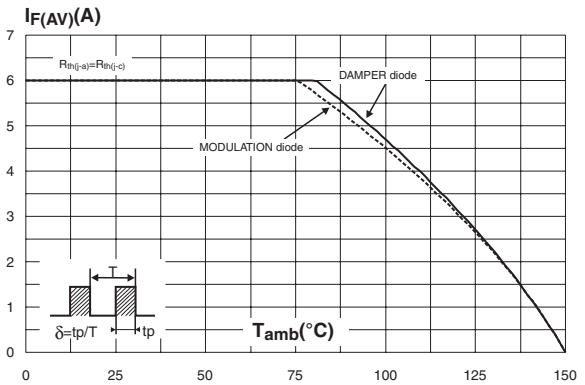


Figure 4: Forward voltage drop versus forward current (modulation diode)

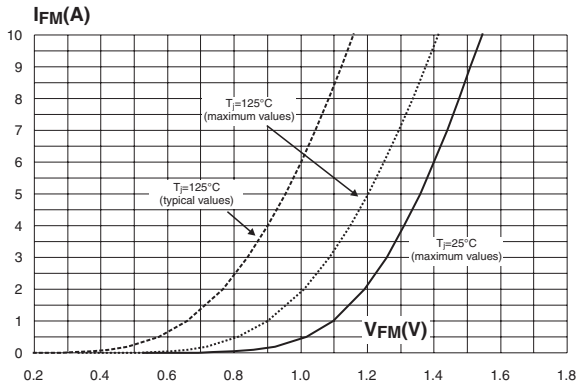


Figure 5: Relative variation of thermal impedance junction to case versus pulse duration

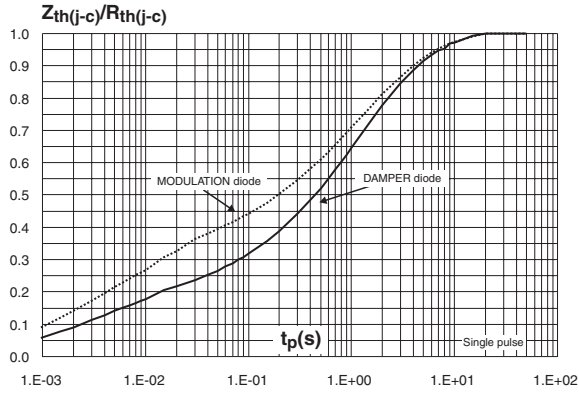


Figure 6: Reverse recovery charges versus di_F/dt (damper diode, typical values)

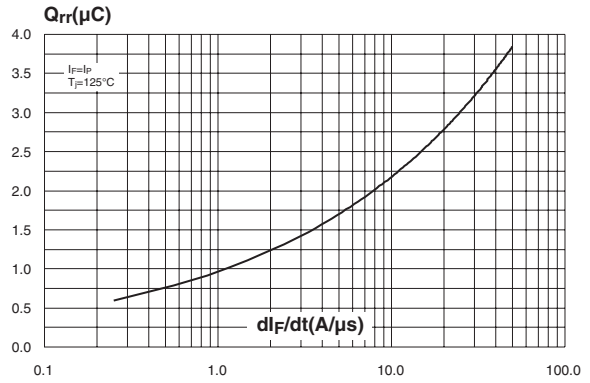


Figure 7: Reverse recovery charges versus di_F/dt (modulation diode, typical values)

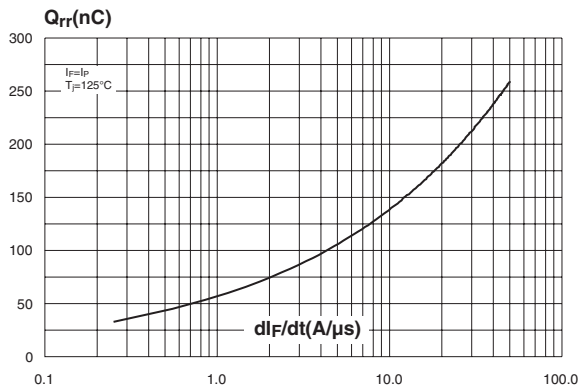


Figure 8: Peak reverse recovery current versus di_F/dt (damper diode, typical values)

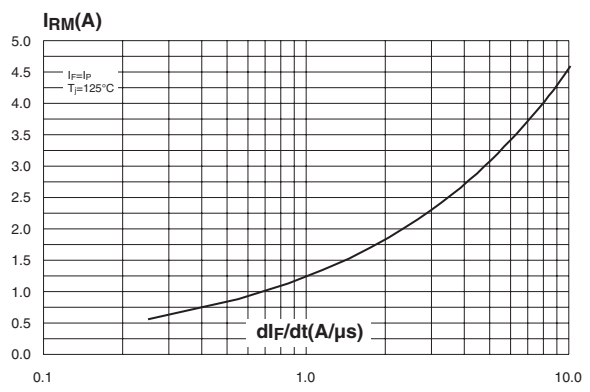


Figure 9: Peak reverse recovery current versus di_F/dt (modulation diode, typical values)

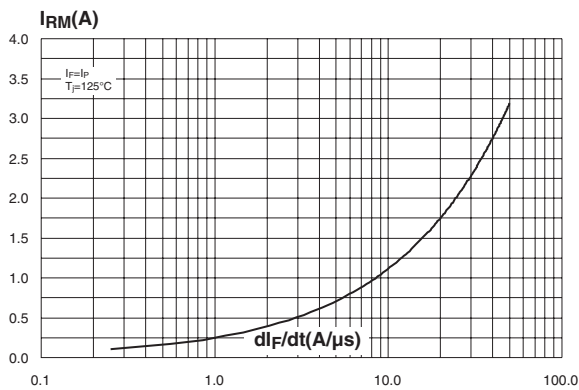


Figure 10: Transient peak forward voltage versus di_F/dt (damper diode, typical values)

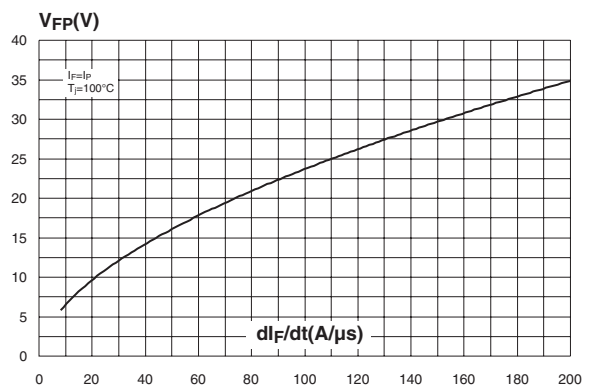


Figure 11: Transient peak forward voltage versus di_F/dt (modulation diode, typical values)

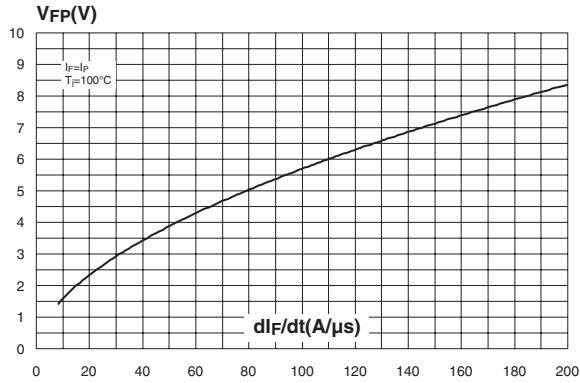


Figure 12: Forward recovery time versus di_F/dt (damper diode, typical values)

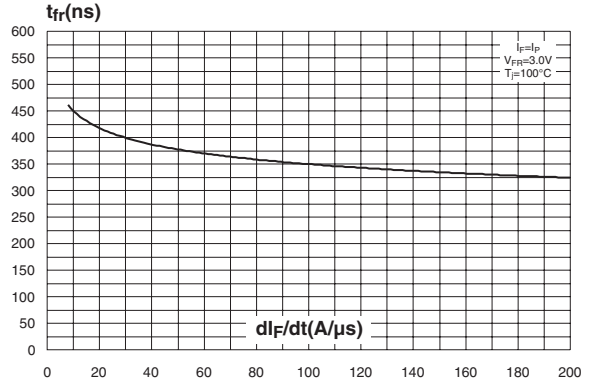


Figure 13: Forward recovery time versus di_F/dt (modulation diode, typical values)

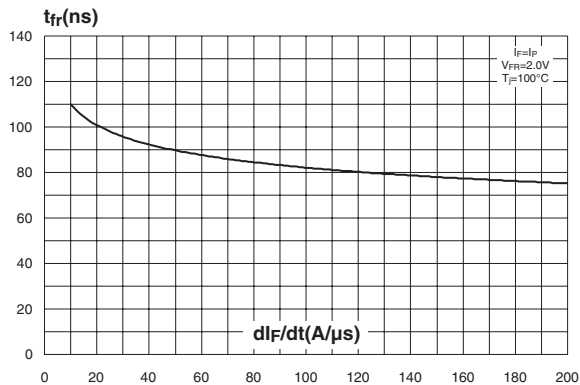


Figure 14: Relative variation of dynamic parameters versus junction temperature

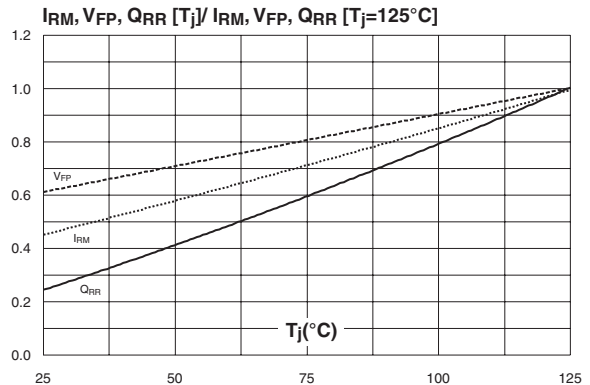


Figure 15: Junction capacitance versus reverse voltage applied (typical values)

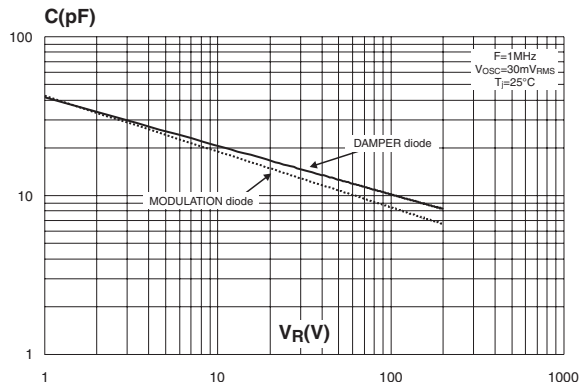


Figure 17: TO-220FPAB FD6 Option Package Mechanical Data

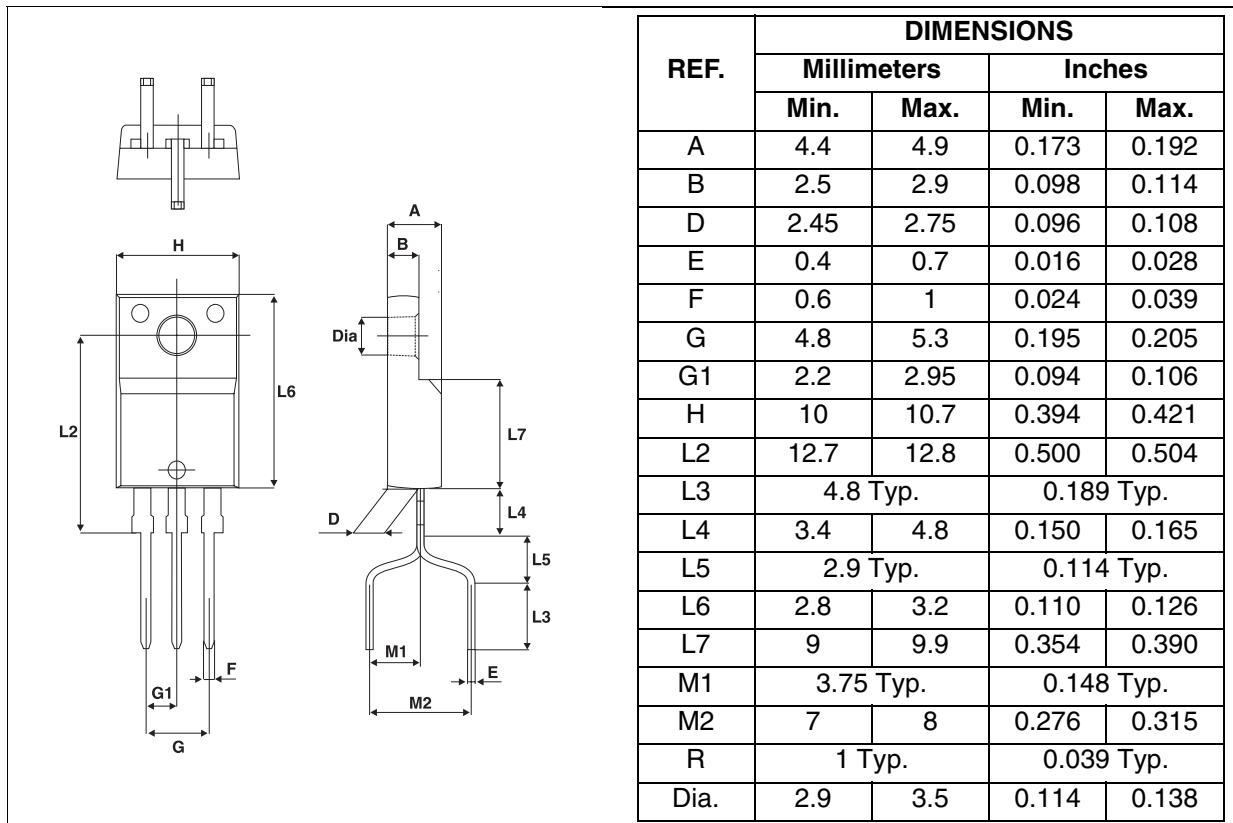


Figure 18: TO-220FPAB FD6 PCB layout (typical, in millimeters)

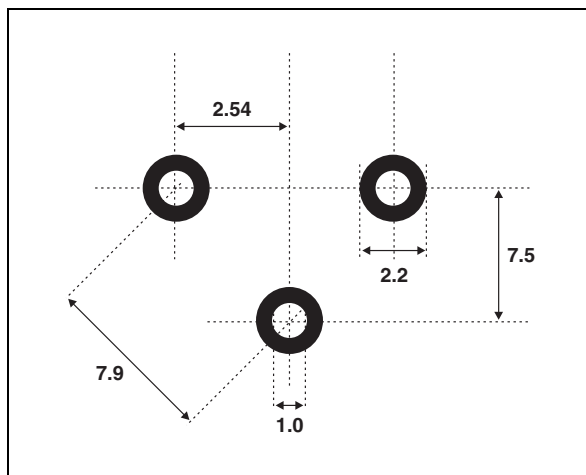


Figure 19: TO-220FPAB Package Mechanical Data

| REF. | DIMENSIONS | | | |
|------|-------------|------|------------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 4.4 | 4.9 | 0.173 | 0.192 |
| B | 2.5 | 2.9 | 0.098 | 0.114 |
| D | 2.45 | 2.75 | 0.096 | 0.108 |
| E | 0.4 | 0.7 | 0.016 | 0.027 |
| F | 0.6 | 1 | 0.024 | 0.039 |
| F1 | 1.15 | 1.7 | 0.045 | 0.067 |
| F2 | 1.15 | 1.7 | 0.045 | 0.067 |
| G | 4.95 | 5.2 | 0.195 | 0.205 |
| G1 | 2.4 | 2.7 | 0.094 | 0.106 |
| H | 10 | 10.7 | 0.393 | 0.421 |
| L2 | 16 Typ. | | 0.630 Typ. | |
| L3 | 28.6 | 30.6 | 1.126 | 1.205 |
| L4 | 9.8 | 10.7 | 0.385 | 0.421 |
| L6 | 15.8 | 16.4 | 0.622 | 0.646 |
| L7 | 9 | 9.9 | 0.354 | 0.390 |
| Dia. | 2.9 | 3.5 | 0.114 | 0.138 |

Table 8: Ordering Information

| Part Number | Marking | Package | Weight | Base qty | Delivery mode |
|--------------|-----------|---------------|--------|----------|---------------|
| DMV1500HDFD | DMV1500HD | TO-220FPAB | 2.4 g | 50 | Tube |
| DMV1500HDFD6 | DMV1500HD | TO-220FPAB F6 | 2.4 g | 45 | Tube |

Table 9: Revision History

| Date | Revision | Description of Changes |
|-------------|----------|------------------------|
| 16-Mar-2005 | 1 | First issue |

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