

## 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

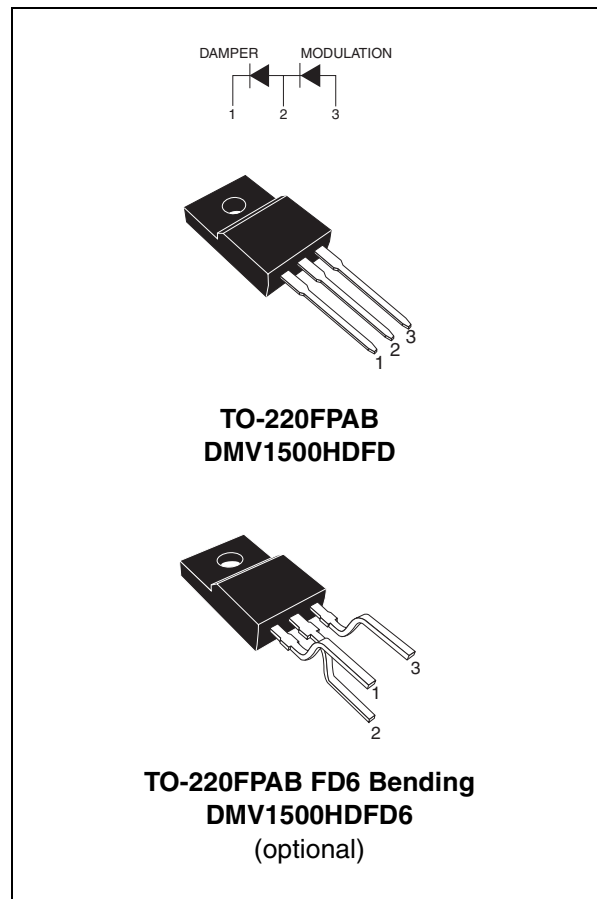
- Full kit in one package
- High breakdown voltage capability
- Very fast recovery diode
- Specified turn on switching characteristics
- Low static and peak forward voltage drop for low dissipation
- Insulated version:  
Insulated voltage = 2000 V<sub>RMS</sub>  
Capacitance = 7 pF
- Planar technology 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	$\mu A$
		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,  $\delta=0.45$ )

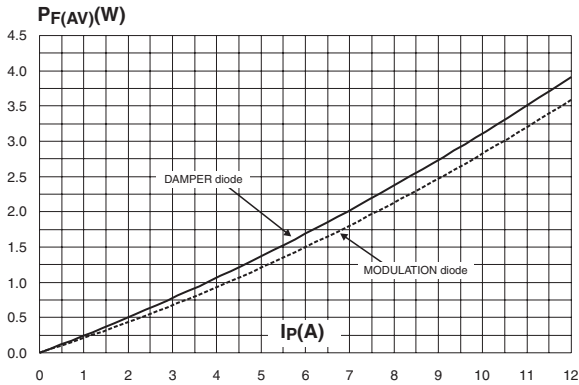


Figure 2: Average forward current versus ambient temperature

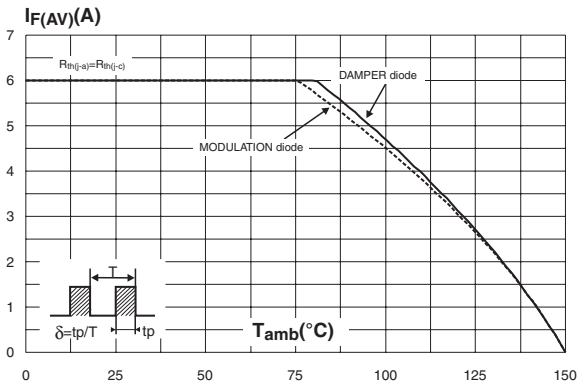


Figure 3: Forward voltage drop versus forward current (damper diode)

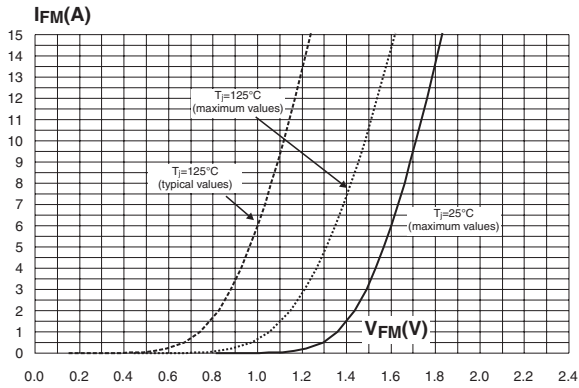


Figure 4: Forward voltage drop versus forward current (modulation diode)

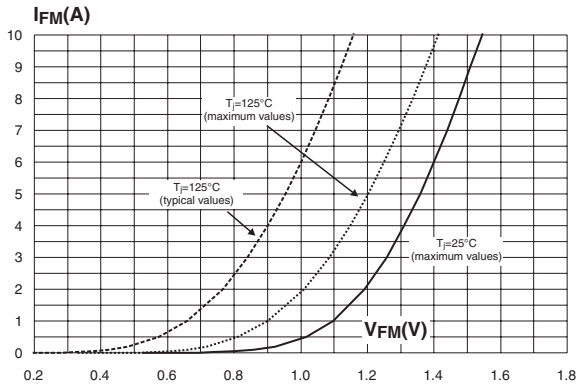


Figure 5: Relative variation of thermal impedance junction to case versus pulse duration

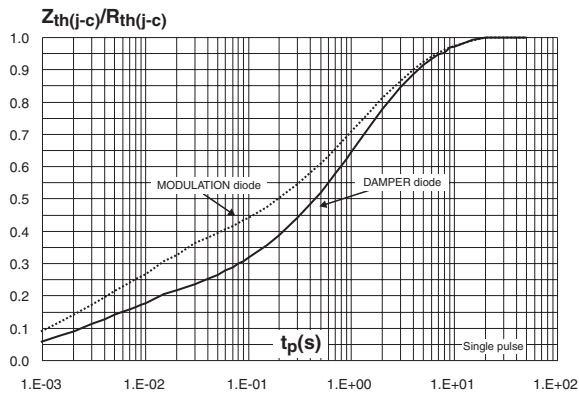


Figure 6: Reverse recovery charges versus  $di_F/dt$  (damper diode, typical values)

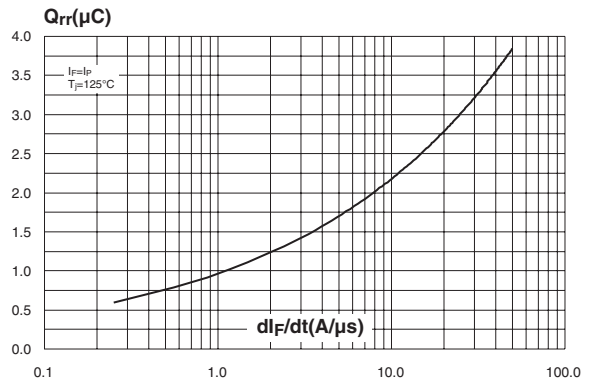


Figure 7: Reverse recovery charges versus  $di_F/dt$  (modulation diode, typical values)

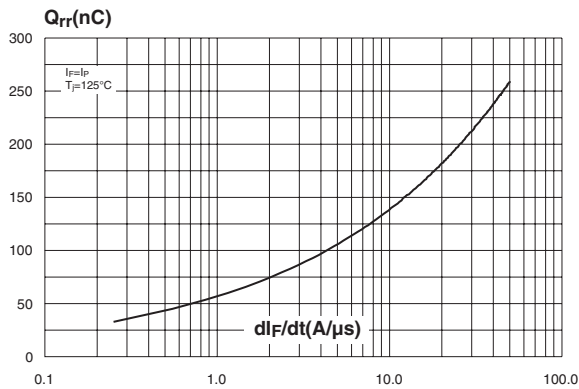


Figure 8: Peak reverse recovery current versus  $di_F/dt$  (damper diode, typical values)

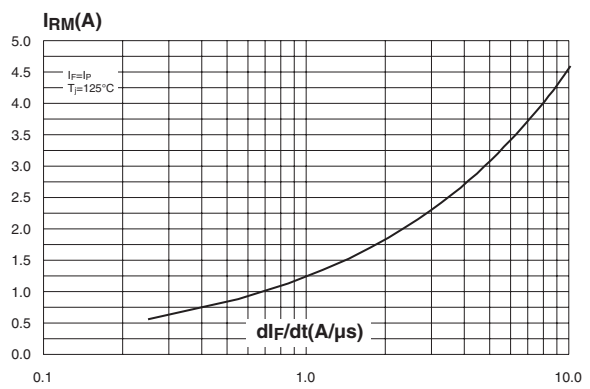


Figure 9: Peak reverse recovery current versus  $di_F/dt$  (modulation diode, typical values)

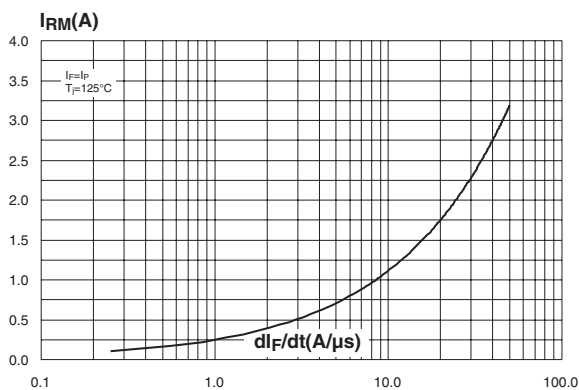
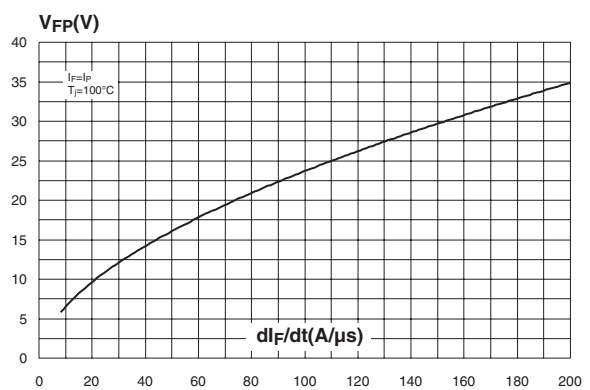
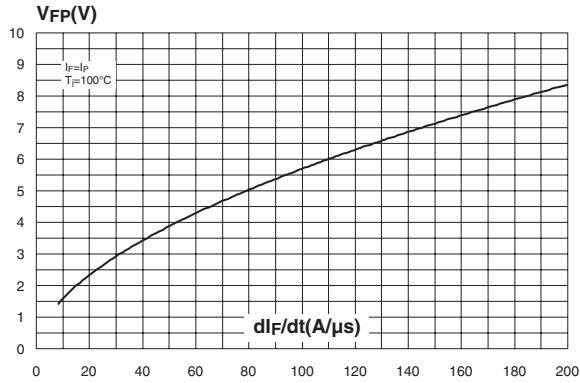


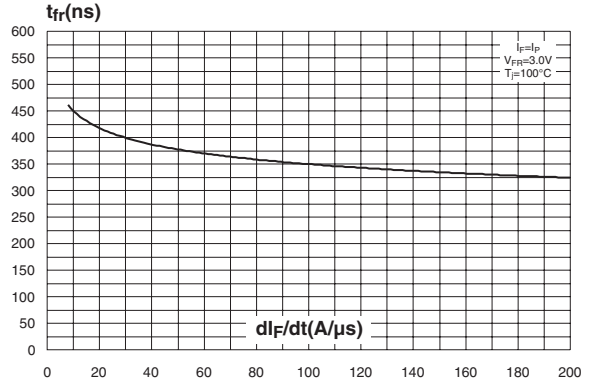
Figure 10: Transient peak forward voltage versus  $di_F/dt$  (damper diode, typical values)



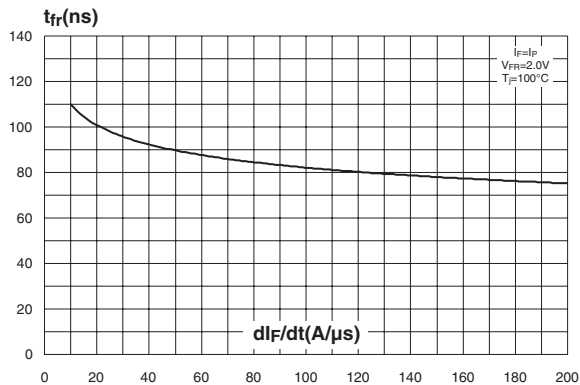
**Figure 11: Transient peak forward voltage versus  $di_F/dt$  (modulation diode, typical values)**



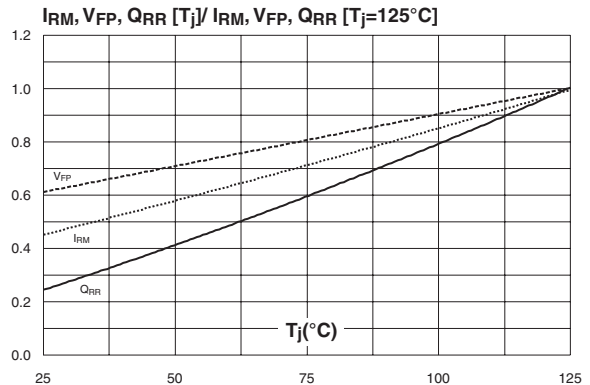
**Figure 12: Forward recovery time versus  $di_F/dt$  (damper diode, typical values)**



**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)**

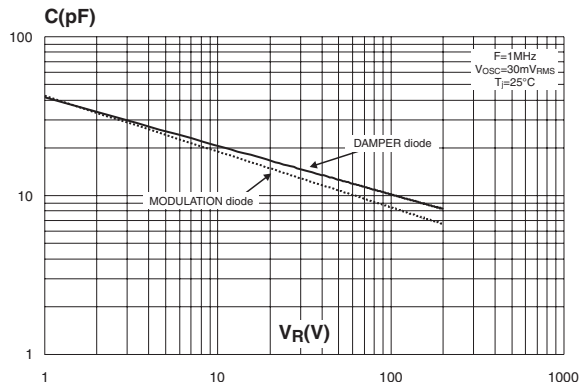


Figure 17: TO-220FPAB FD6 Option Package Mechanical Data

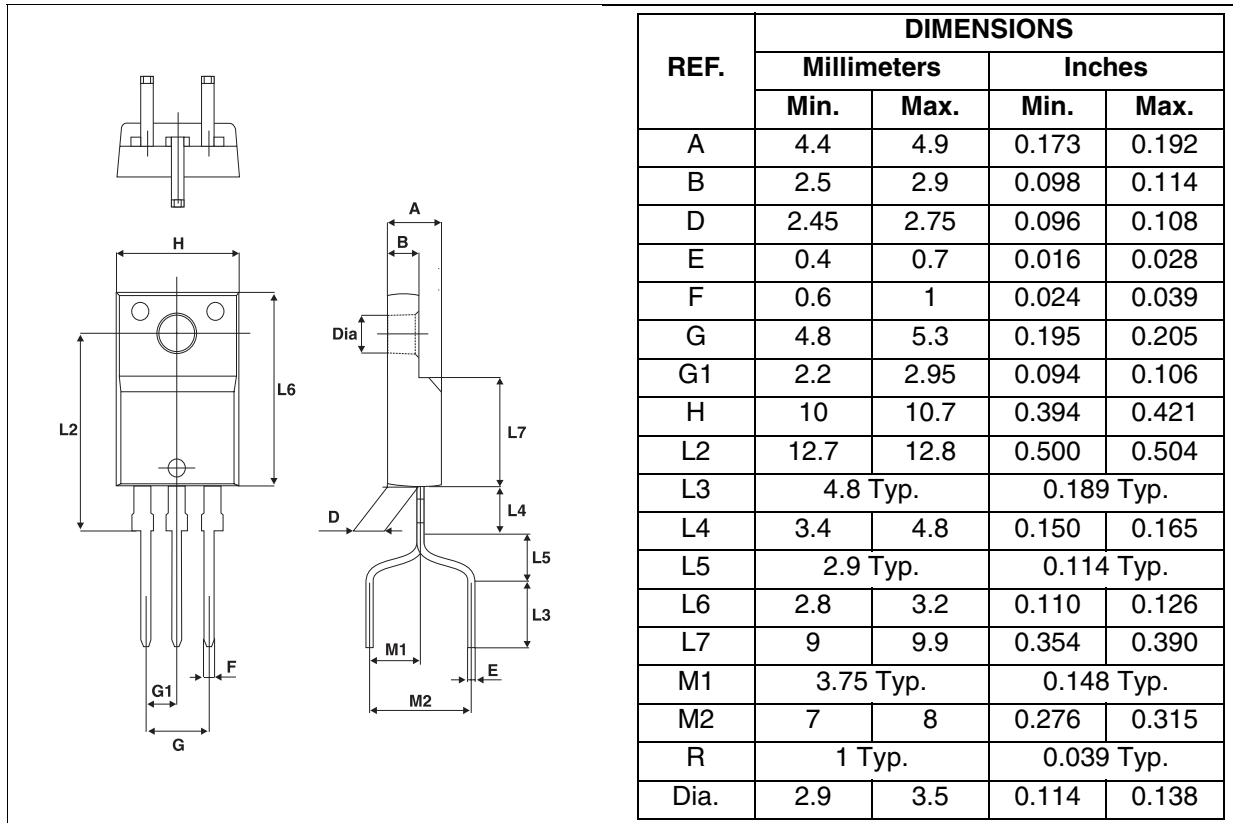


Figure 18: TO-220FPAB FD6 PCB layout (typical, in millimeters)

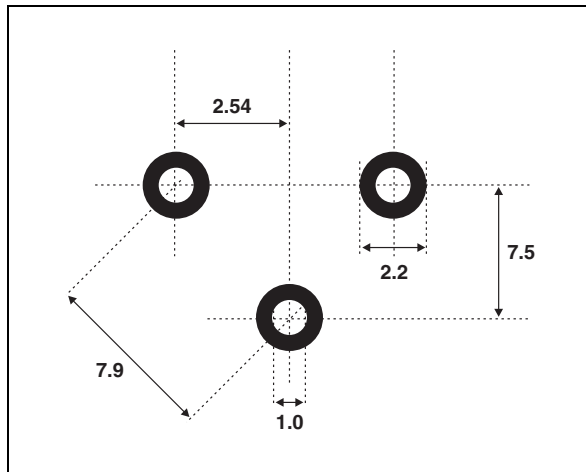


Figure 19: TO-220FPAB Package Mechanical Data

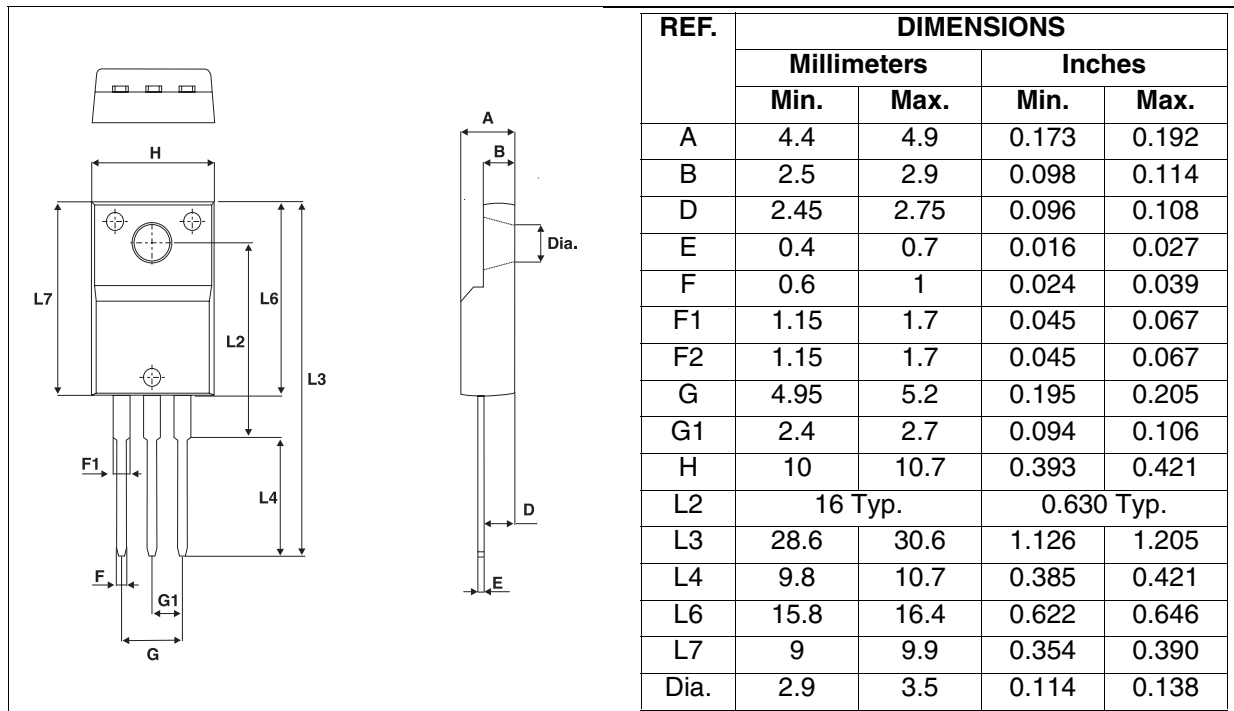


Table 8: Ordering Information

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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