

DAMPER + MODULATION DIODE FOR VIDEO

Table 1: Main Product Characteristics

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

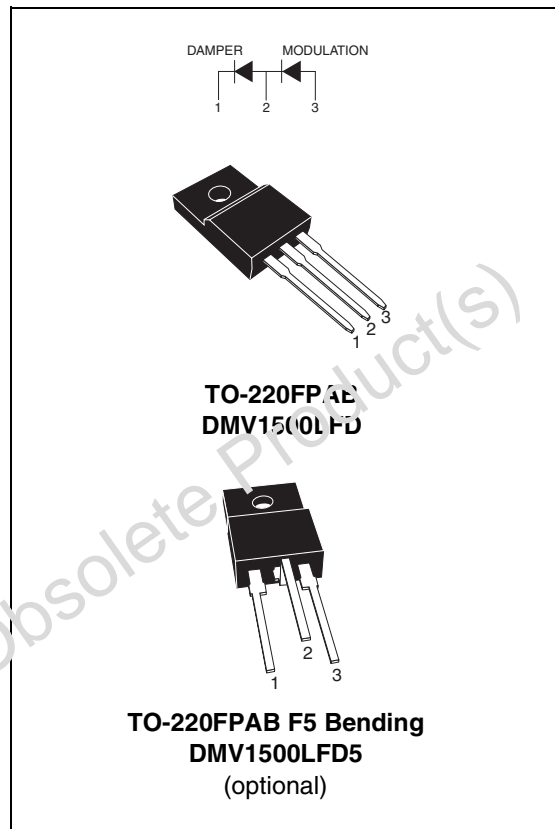
High voltage semiconductor, especially designed for horizontal deflection stage in standard and high resolution video display with E/W correction.

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
DMV1500LFD	DMV1500L
DMV1500LFD5	DMV1500L



DMV1500L

Table 3: Absolute Maximum Ratings

Symbol	Parameter	Value		Unit
		Damper	Modul.	
V_{RRM}	Repetitive peak reverse voltage	1500	600	V
I_{FSM}	Surge non repetitive forward current tp = 10ms sinusoidal	50	35	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	4.0	°C/W

Table 5: Static Electrical Characteristics

Symbol	Parameter	Test conditions	Value				Unit
			$T_j = 25^\circ\text{C}$		$T_j = 125^\circ\text{C}$		
			Typ.	Max.	Typ.	Max.	
I_R^*	Reverse leakage current	Damper $V_R = 1500\text{ V}$		100	100	1000	μA
		Modul. $V_R = 600\text{ V}$		20	3	50	
V_F^{**}	Forward voltage drop	Damper $I_F = 4\text{ A}$	1.2	1.7	1.1	1.5	V
		Modul. $I_F = 3\text{ A}$		1.8	1.1	1.4	

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

** tp = 380 μs , $\delta < 2\%$

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

DAMPER: $P = 1.2 \times I_{F(AV)} + 0.075 \times I_F^2(\text{RMS})$

MODULATION: $P = 1.12 \times I_{F(AV)} + 0.092 \times I_F^2(\text{RMS})$

Table 6: Recovery Characteristics

Symbol	Parameter	Test conditions	Value				Unit
			Damper		Modul.		
			Typ.	Max.	Typ.	Max.	
t_{rr}	Reverse recovery time	$I_F = 100\text{mA}$ $I_R = 100\text{mA}$ $I_{RR} = 10\text{mA}$ $T_j = 25^\circ\text{C}$	850		110	350	ns
		$I_F = 1\text{A}$ $dI_F/dt = -50\text{ A}/\mu\text{s}$ $V_R = 30\text{V}$ $T_j = 25^\circ\text{C}$	130	170	35	50	

Table 7: Turn-On Switching Characteristics

Symbol	Parameter	Test conditions		Value		Unit	
				Typ.	Max.		
t_{fr}	Forward recovery time	Damper	$I_F = 4\text{ A}$ $di_F/dt = 80\text{ A}/\mu\text{s}$ $V_{FR} = 3\text{ V}$	$T_j = 100^\circ\text{C}$		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	
		Modul.	$I_F = 3\text{ A}$ $di_F/dt = 80\text{ A}/\mu\text{s}$ $V_{FR} = 2\text{ V}$	$T_j = 100^\circ\text{C}$		240	
V_{FP}	Peak forward voltage	Damper	$I_F = 4\text{ A}$ $di_F/dt = 80\text{ A}/\mu\text{s}$	$T_j = 100^\circ\text{C}$	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	
		Modul.	$I_F = 3\text{ A}$ $di_F/dt = 80\text{ A}/\mu\text{s}$	$T_j = 100^\circ\text{C}$		8	

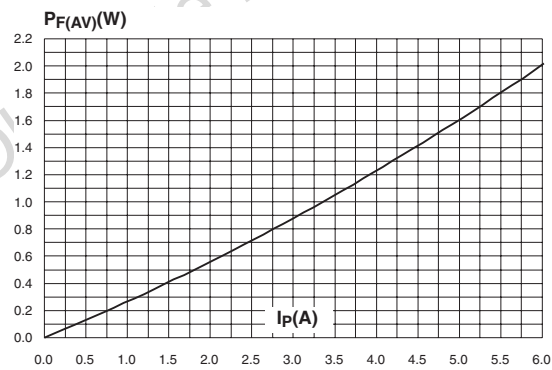
Figure 1: Power dissipation versus peak forward current (triangular waveform, $\delta=0.45$)

Figure 2: Average forward current versus ambient temperature

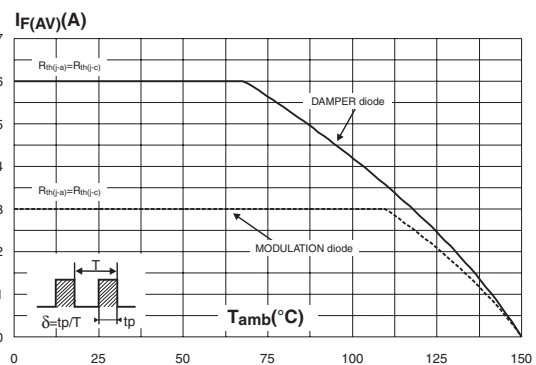


Figure 3: Forward voltage drop versus forward current (damper diode)

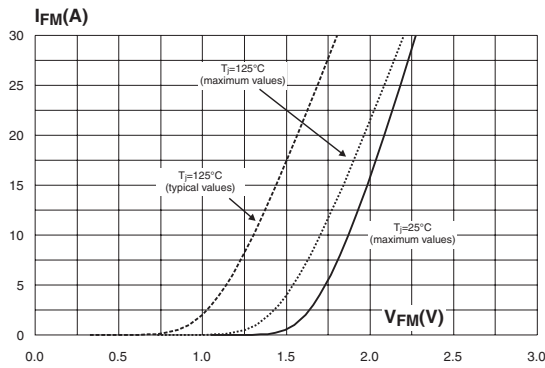


Figure 4: Forward voltage drop versus forward current (modulation diode)

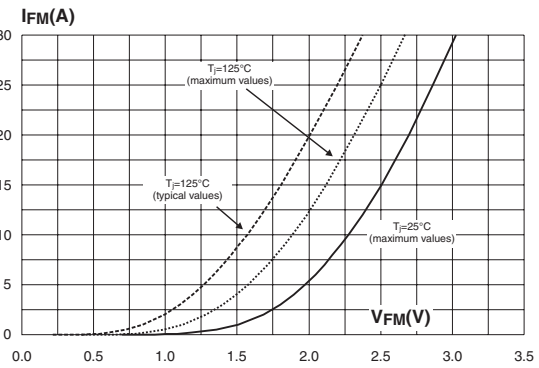


Figure 5: Relative variation of thermal impedance junction to case versus pulse duration

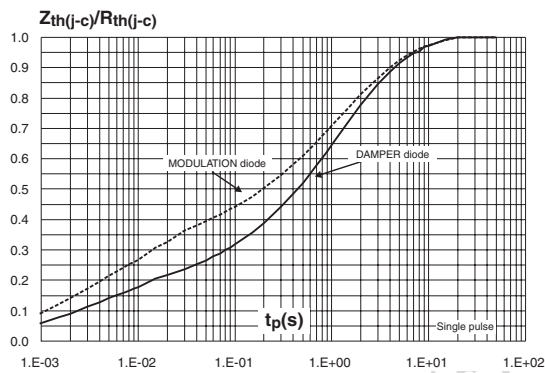


Figure 6: Non repetitive peak forward current versus overload duration (damper diode)

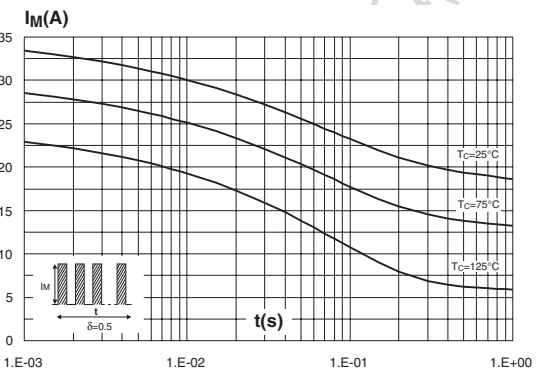


Figure 7: Non repetitive peak forward current versus overload duration (modulation diode)

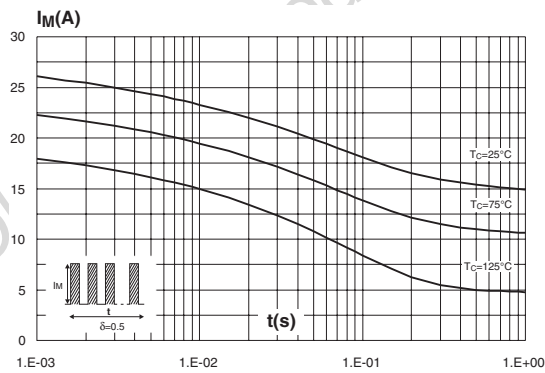


Figure 8: Reverse recovery charges versus di/dt (damper diode)

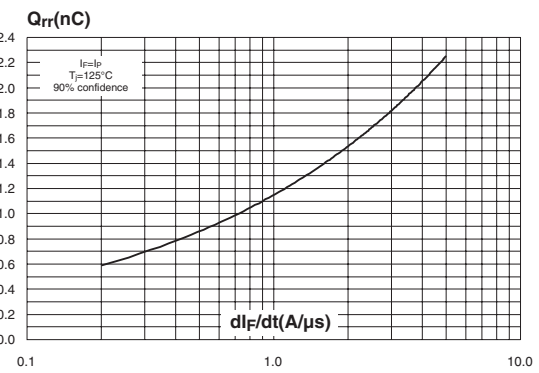


Figure 9: Reverse recovery charges versus di_F/dt (modulation diode)

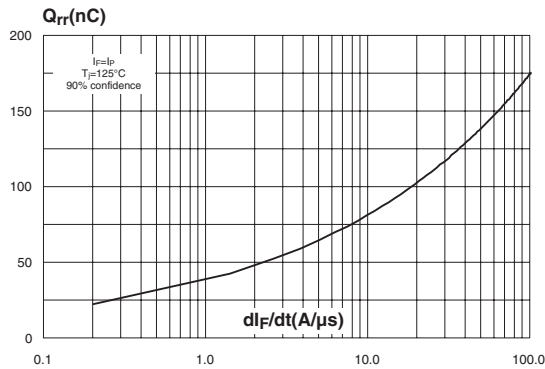


Figure 10: Peak reverse recovery current versus di_F/dt (damper diode)

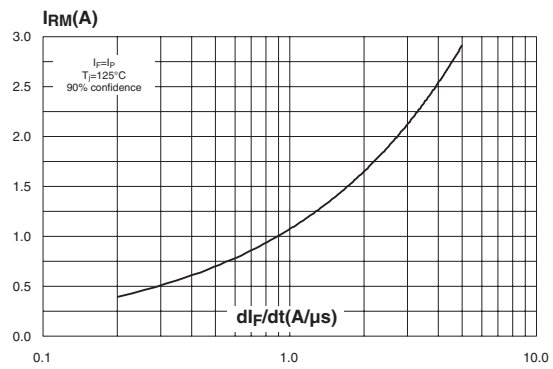


Figure 11: Peak reverse recovery current versus di_F/dt (modulation diode)

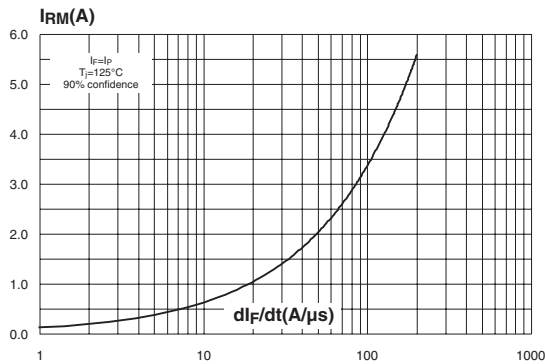


Figure 12: Transient peak forward voltage versus di_F/dt (damper diode)

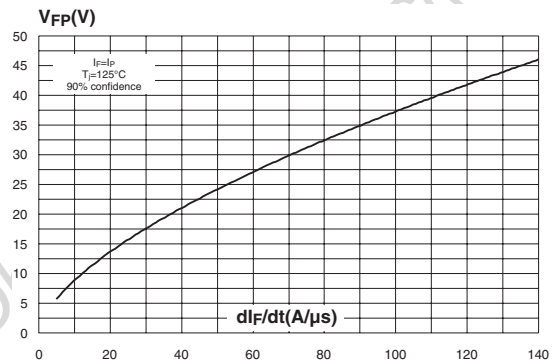


Figure 13: Transient peak forward voltage versus di_F/dt (modulation diode)

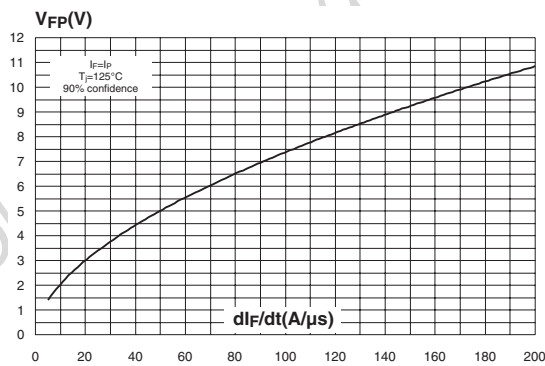


Figure 14: Forward recovery time versus di_F/dt (damper diode)

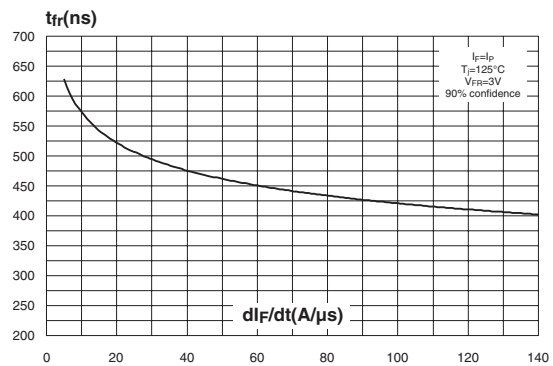


Figure 15: Forward recovery time versus di_F/dt (modulation diode)

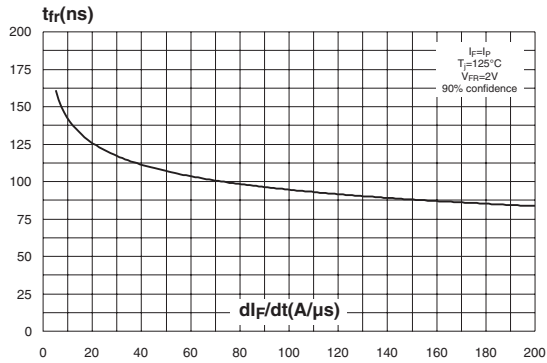


Figure 16: Relative variation of dynamic parameters versus junction temperature

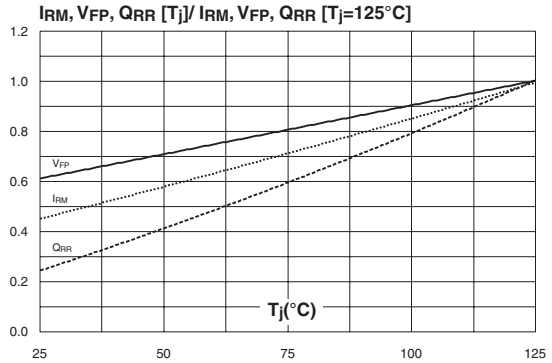


Figure 17: Junction capacitance versus reverse voltage applied (typical values)

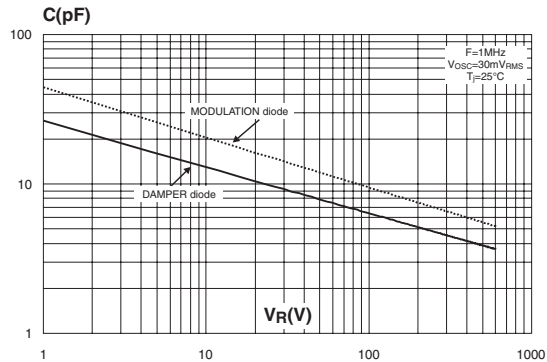
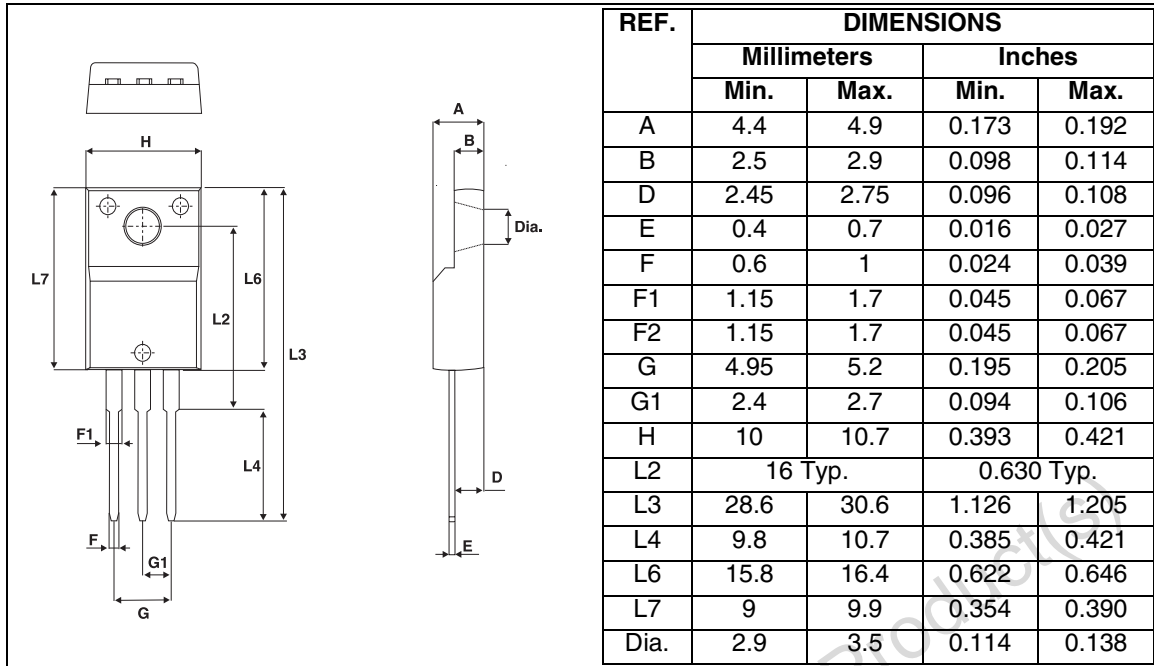


Figure 18: TO-220FPAB Package Mechanical Data



DMV1500L

Figure 19: TO-220FPAB F5 Bending (option) Package Mechanical Data

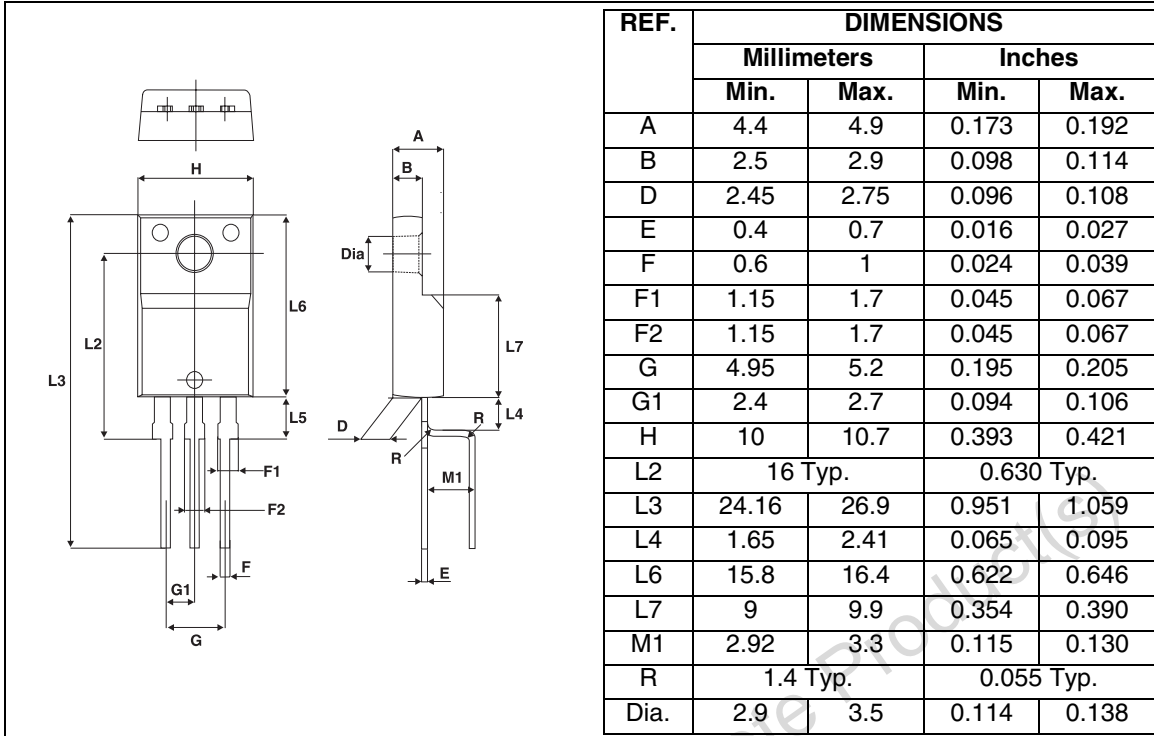


Table 8: Ordering Information

Part Number	Marking	Package	Weight	Base qty	Delivery mode
DMV1500LFD	DMV1500L	TO-220FPAB	2.4 g	50	Tube
DMV1500LFD5	DMV1500L	TO-220FPAB F5	2.4 g	45	Tube

Table 9: Revision History

Date	Revision	Description of Changes
07-Sep-2004	1	First issue

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