

DAMPER + MODULATION DIODE FOR VIDEO

Table 1: Main Product Characteristics

	DAMPER	MODUL.
$I_{F(AV)}$	6 A	3 A
V_{RRM}	1500 V	600 V
$t_{rr} (max)$	135 ns	50 ns
$V_F (max)$	1.65V	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
DMV1500MFD	DMV1500M
DMV1500MFD5	DMV1500M

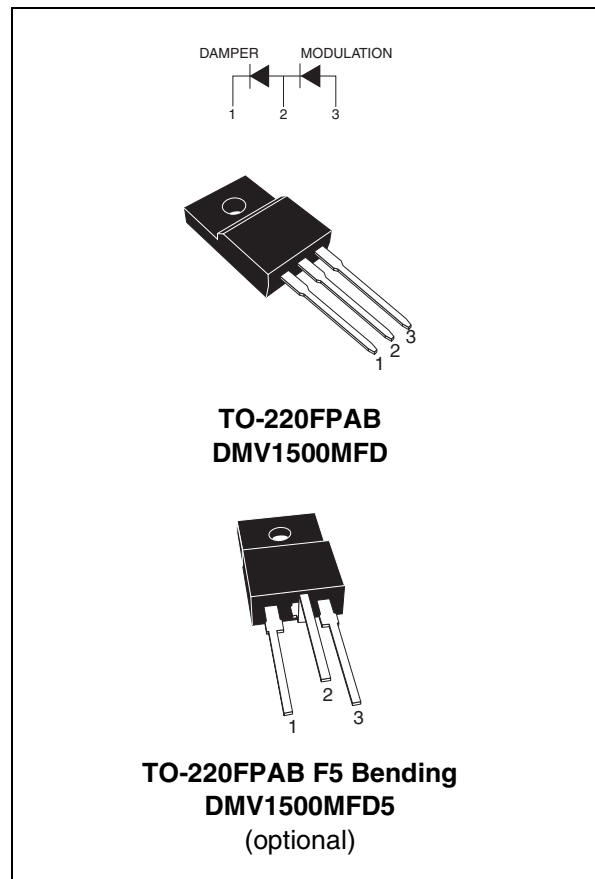


Table 3: Absolute Maximum Ratings

Symbol	Parameter	Value		Unit
		Damper	Modul.	
V_{RRM}	Repetitive peak reverse voltage	1500	600	V
I_{FSM}	Surge non repetitive forward current	75	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	3.7	°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
		Modulation $V_R = 600\text{ V}$		20	3	50	
V_F^{**}	Forward voltage drop	Damper $I_F = 6\text{ A}$	1.4	2.2	1.2	1.65	V
		Modulation $I_F = 3\text{ A}$		1.8	1.1	1.4	

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

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

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

DAMPER: $P = 1.37 \times I_{F(AV)} + 0.047 \times I_F^2(\text{RMS})$

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	$I_F = 100\text{ mA}$ $I_R = 100\text{ mA}$ $I_{RR} = 10\text{ mA}$ $T_j = 25^\circ\text{C}$	750		110	350	ns
		$I_F = 1\text{ A}$ $dI_F/dt = -50\text{ A}/\mu\text{s}$ $V_R = 30\text{ V}$ $T_j = 25^\circ\text{C}$	110	135	35	50	

Table 7: Turn-On Switching Characteristics

Symbol	Parameter	Test conditions	Value		Unit
			Typ.	Max.	
t_{fr}	Forward recovery time	Damper $I_F = 6\text{ A}$ $di_F/dt = 80\text{ A}/\mu\text{s}$ $V_{FR} = 3\text{ V}$ $T_j = 100^\circ\text{C}$	570		ns
		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 $I_F = 6\text{ A}$ $di_F/dt = 80\text{ A}/\mu\text{s}$ $T_j = 100^\circ\text{C}$	21	28	V
		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, $\delta=0.45$)

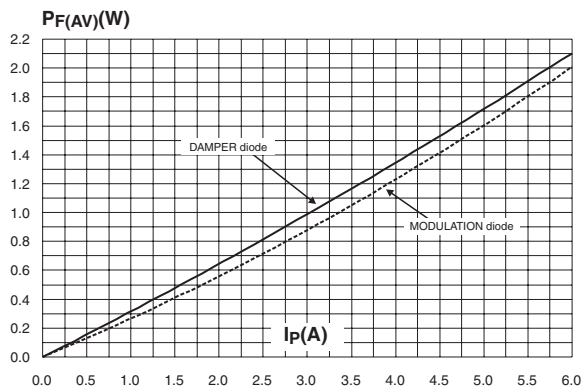


Figure 2: Average forward current versus ambient temperature

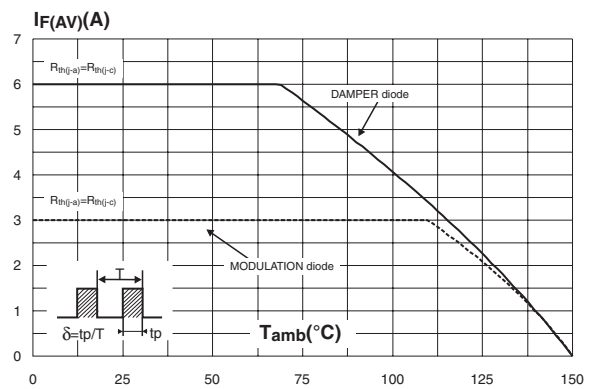


Figure 3: Forward voltage drop versus forward current (damper diode)

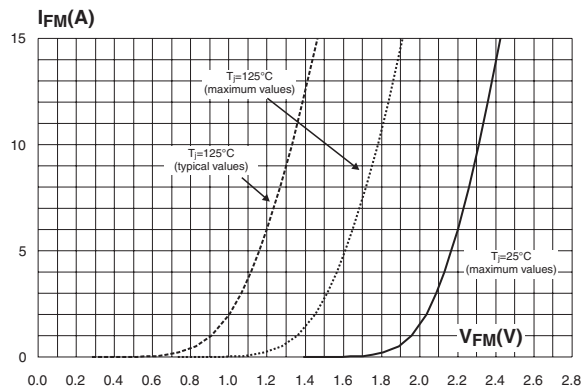


Figure 4: Forward voltage drop versus forward current (modulation diode)

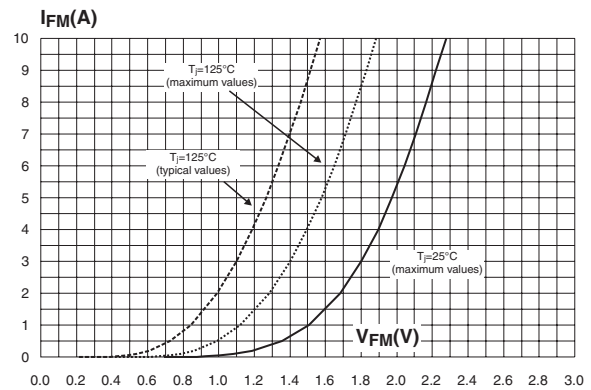


Figure 5: Relative variation of thermal impedance junction to case versus pulse duration

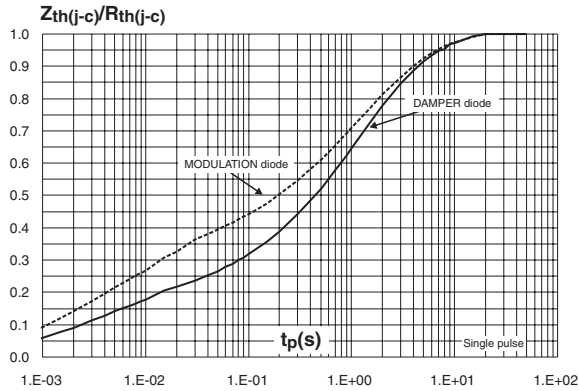


Figure 6: Non repetitive peak forward current versus overload duration (damper diode)

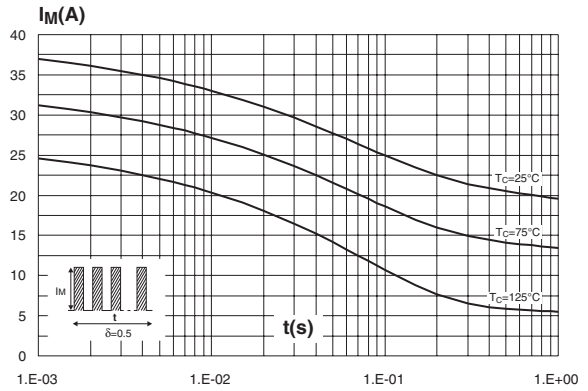


Figure 7: Non repetitive peak forward current versus overload duration (modulation diode)

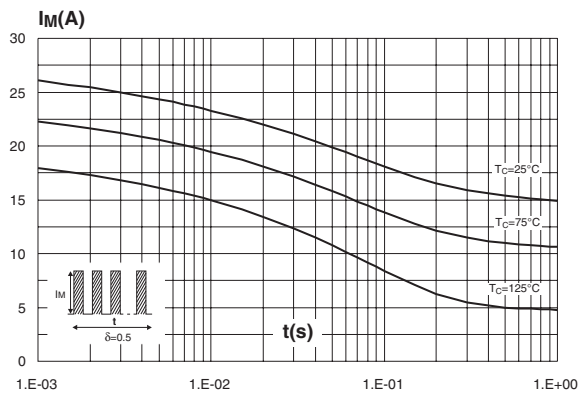


Figure 8: Reverse recovery charges versus di_F/dt (damper diode)

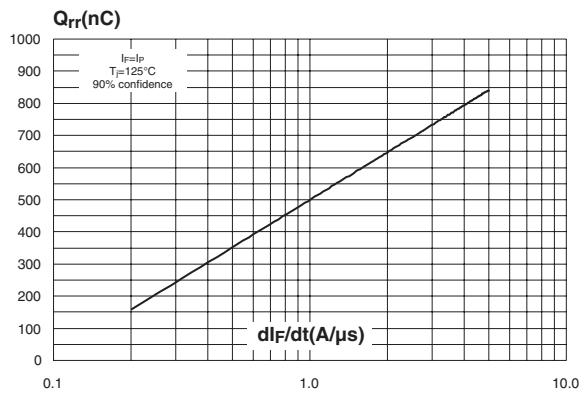


Figure 9: Reverse recovery charges versus di_F/dt (modulation diode)

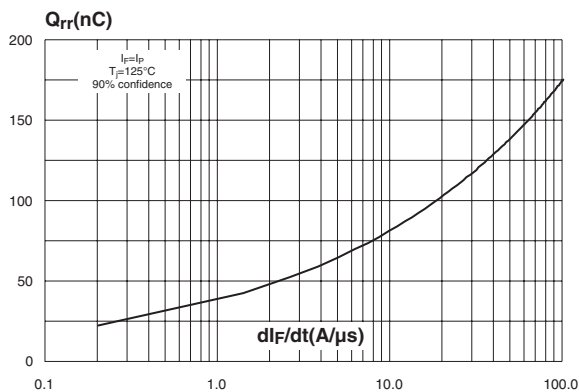


Figure 10: Peak reverse recovery current versus di_F/dt (damper diode)

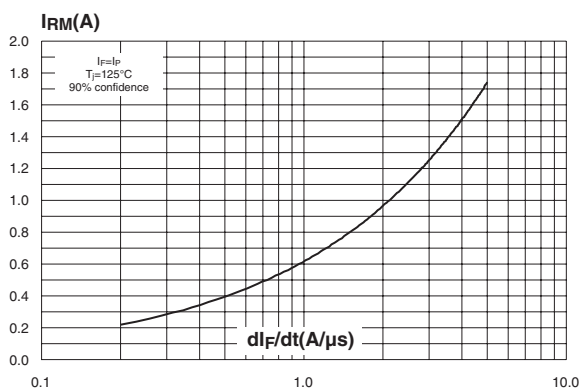


Figure 11: Peak reverse recovery current versus di_F/dt (modulation diode)

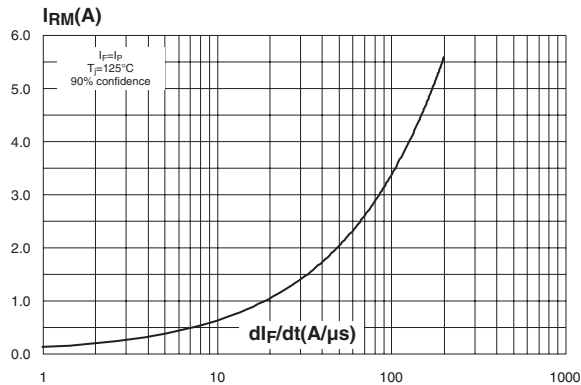


Figure 12: Transient peak forward voltage versus di_F/dt (damper diode)

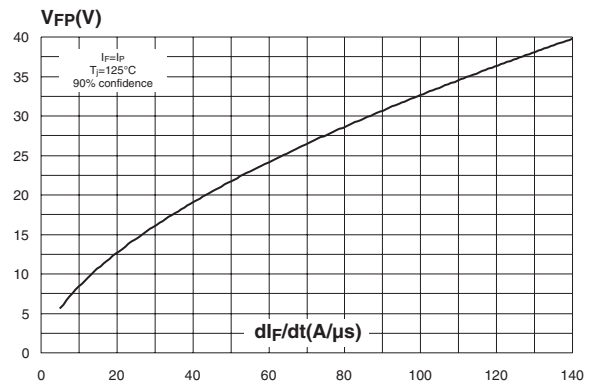


Figure 13: Transient peak forward voltage versus di_F/dt (modulation diode)

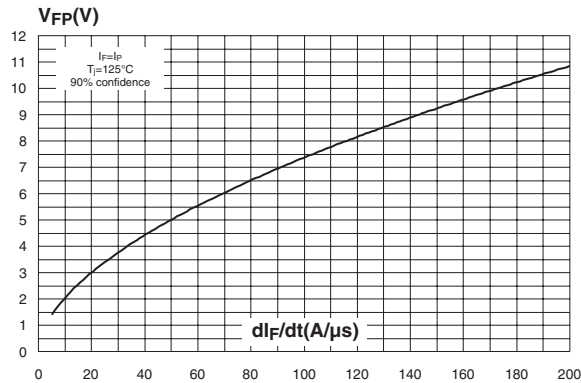


Figure 14: Forward recovery time versus di_F/dt (damper diode)

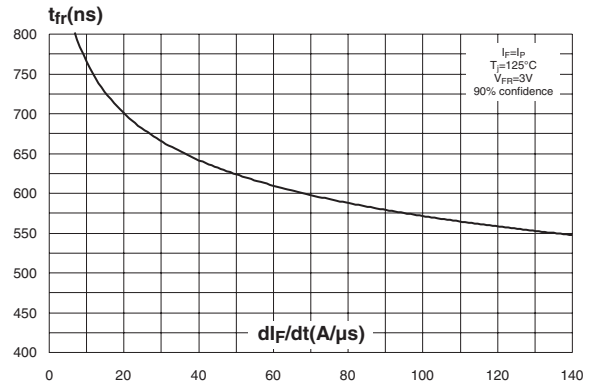


Figure 15: Forward recovery time versus di_F/dt (modulation diode)

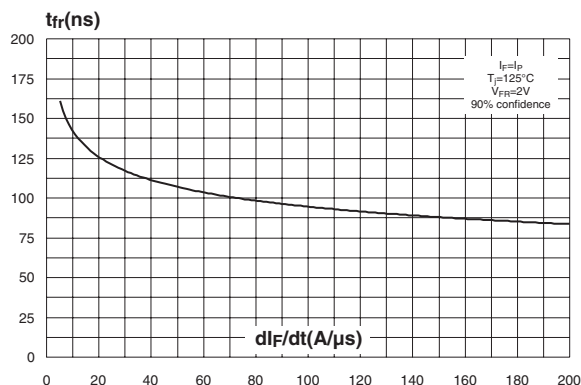


Figure 16: Relative variation of dynamic parameters versus junction temperature

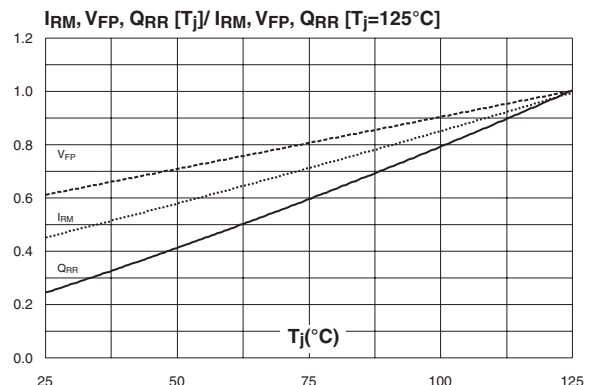


Figure 17: Junction capacitance versus reverse voltage applied (typical values)

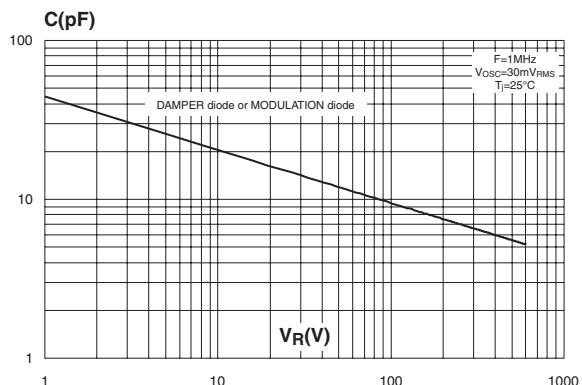


Figure 18: TO-220FPAB Package Mechanical Data

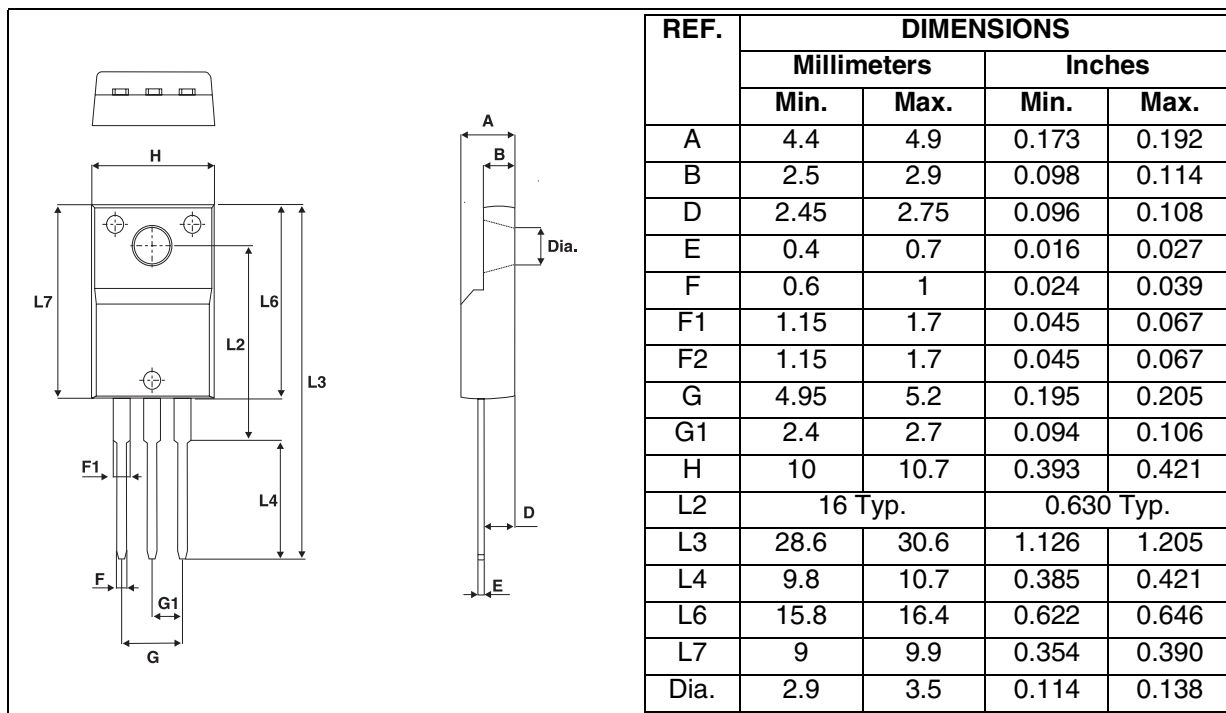


Figure 19: TO-220FPAB F5 Bending (option) Package Mechanical Data

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	24.16	26.9	0.951	1.059
L4	1.65	2.41	0.065	0.095
L6	15.8	16.4	0.622	0.646
L7	9	9.9	0.354	0.390
M1	2.92	3.3	0.115	0.130
R	1.4 Typ.		0.055 Typ.	
Dia.	2.9	3.5	0.114	0.138

Table 8: Ordering Information

Part Number	Marking	Package	Weight	Base qty	Delivery mode
DMV1500MFD	DMV1500M	TO-220FPAB	2.4 g	50	Tube
DMV1500MFD5	DMV1500M	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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