

DAMPER + MODULATION DIODE FOR VIDEO

Table 1: Main Product Characteristics

	DAMPER	MODUL.
$I_{F(AV)}$	6 A	6 A
V_{RRM}	1500 V	600 V
$t_{rr} (\text{typ})$	150 ns	60 ns
$V_F (\text{typ})$	1.1 V	1.0 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.

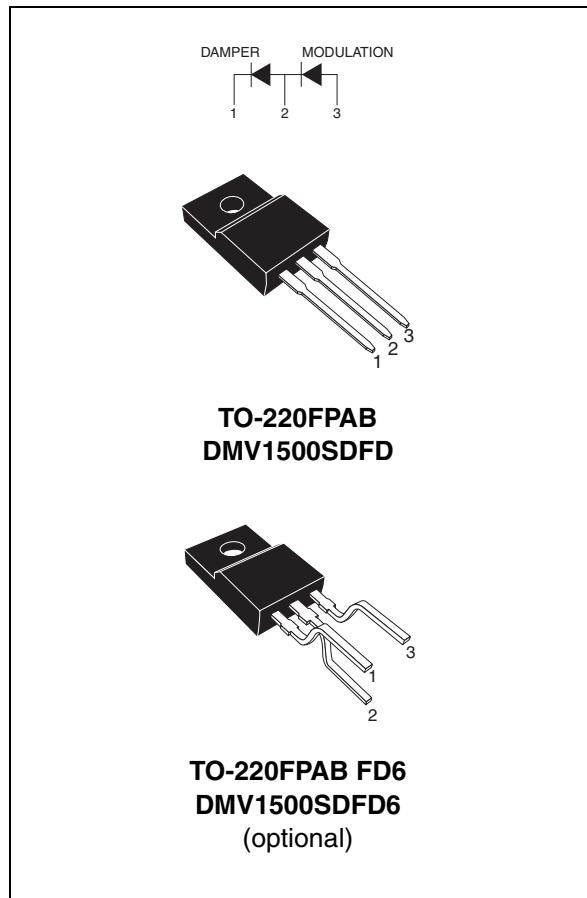


Table 2: Order Codes

Part Number	Marking
DMV1500SDFD	DMV1500SD
DMV1500SDFD6	DMV1500SD

DMV1500SD

Table 3: Absolute Ratings (limiting values, per diode)

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	50	A
T _{stg}	Storage temperature range	-40 to +150		°C
T _j	Maximum operating junction temperature	150		°C

Table 4: Thermal resistances

Symbol	Parameter	Value (max.)	Unit
R _{th(j-c)}	Junction to case thermal resistance	4	°C/W

Table 5: Static Electrical Characteristics

Symbol	Parameter	Test conditions	Value				Unit	
			T _j = 25°C		T _j = 125°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	1.2	1.75	1.1	1.5	V
		Modul.	I _F = 6 A	1.15	1.4	1	1.25	

Pulse test: * tp = 5 ms, δ < 2%

** tp = 380 µs, δ < 2%

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

$$\text{DAMPER: } P = 1.2 \times I_F(\text{AV}) + 0.050 \times I_F^2(\text{RMS})$$

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

Table 6: Recovery Characteristics

Symbol	Parameter	Test conditions	Value				Unit	
			Damper		Modul.			
			Typ.	Max.	Typ.	Max.		
t _{rr}	Reverse recovery time	I _F = 100mA I _R = 100mA I _{RR} = 10mA	T _j = 25°C	1000	2000	250	400	ns
		I _F = 1A dI _F /dt = -50 A/µs V _R = 30V	T _j = 25°C	150	250	60	85	

Table 7: Turn-On Switching Characteristics

Symbol	Parameter	Test conditions			Value		Unit
			Typ.	Max.	Typ.	Max.	
t_{fr}	Forward recovery time	Damper	$I_F = 6 \text{ A}$ $dI_F/dt = 80 \text{ A}/\mu\text{s}$ $V_{FR} = 3 \text{ V}$	$T_j = 100^\circ\text{C}$	350	500	ns
		Modul.	$I_F = 6 \text{ A}$ $dI_F/dt = 80 \text{ A}/\mu\text{s}$ $V_{FR} = 2 \text{ V}$	$T_j = 100^\circ\text{C}$	70	125	
V_{FP}	Peak forward voltage	Damper	$I_F = 6 \text{ A}$ $dI_F/dt = 80 \text{ A}/\mu\text{s}$	$T_j = 100^\circ\text{C}$	26	36	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	

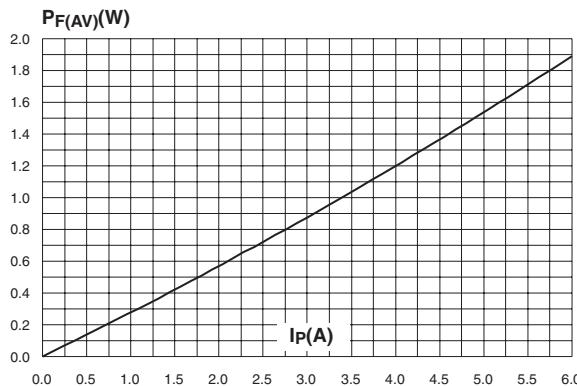
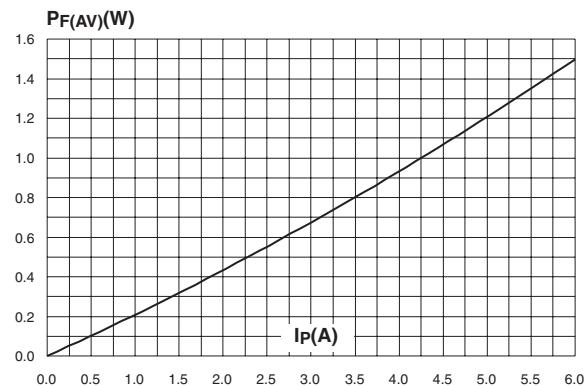
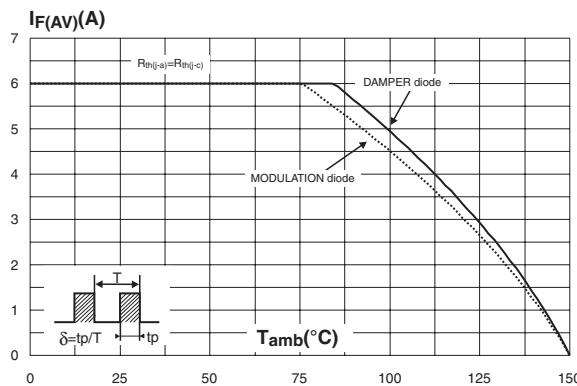
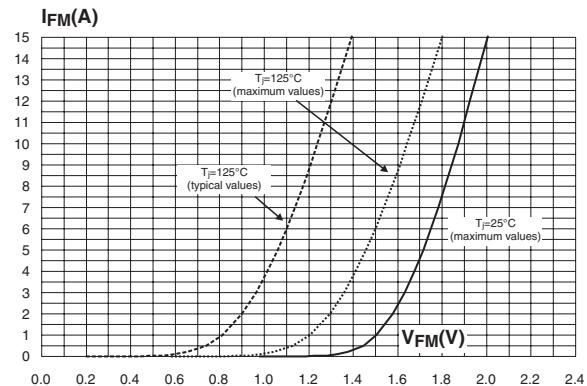
Figure 1: Power dissipation versus peak forward current (triangular waveform, $\delta=0.45$) (damper diode)**Figure 2: Power dissipation versus peak forward current (triangular waveform, $\delta=0.45$) (modulation diode)****Figure 3: Average forward current versus ambient temperature****Figure 4: Forward voltage drop versus forward current (damper diode)**

Figure 5: Forward voltage drop versus forward current (modulation diode)

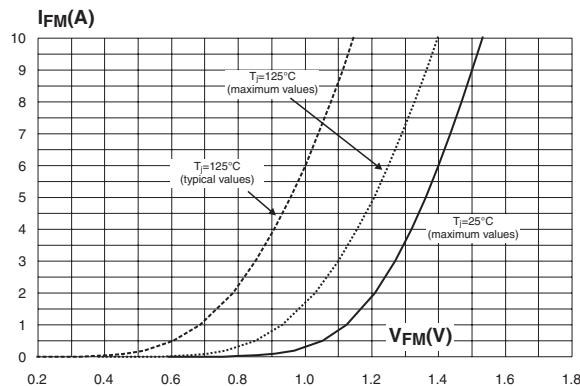


Figure 7: Reverse recovery charges versus dI_F/dt (damper diode)

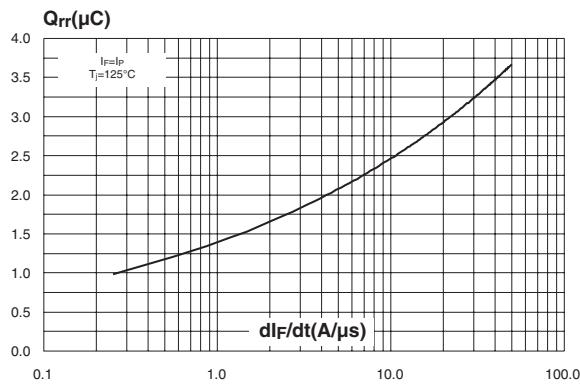


Figure 9: Peak reverse recovery current versus dI_F/dt (damper diode)

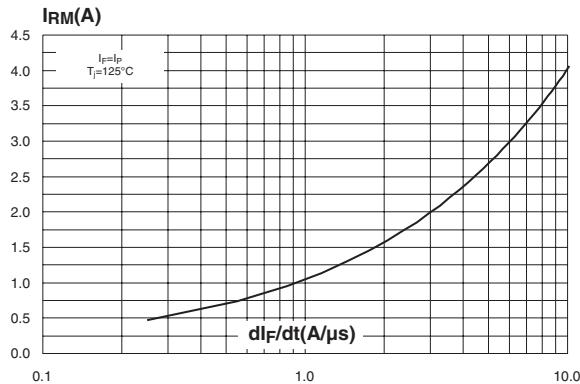


Figure 6: Relative variation of thermal impedance junction to case versus pulse duration

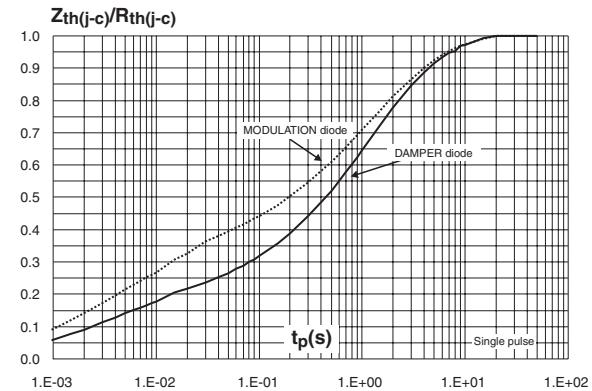


Figure 8: Reverse recovery charges versus dI_F/dt (modulation diode)

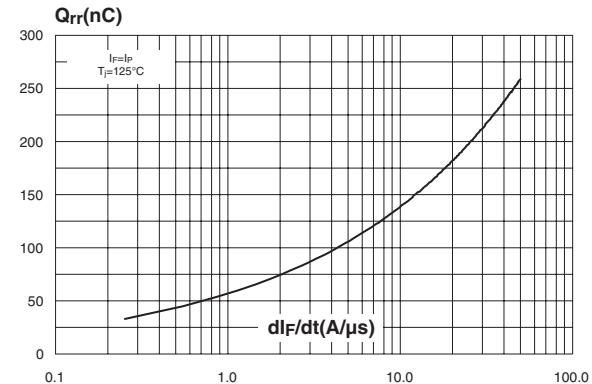


Figure 10: Peak reverse recovery current versus dI_F/dt (modulation diode)

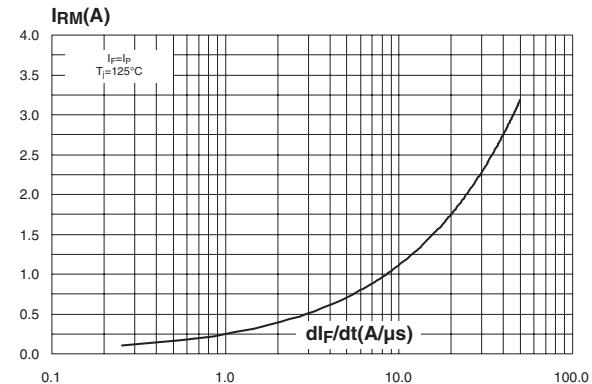


Figure 11: Transient peak forward voltage versus dI_F/dt (damper diode, typical values)

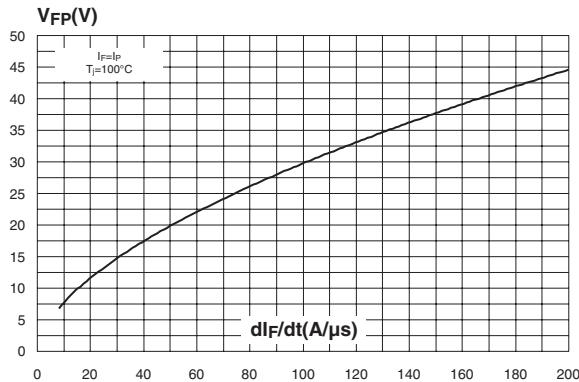


Figure 13: Forward recovery time versus dI_F/dt (damper diode, typical values)

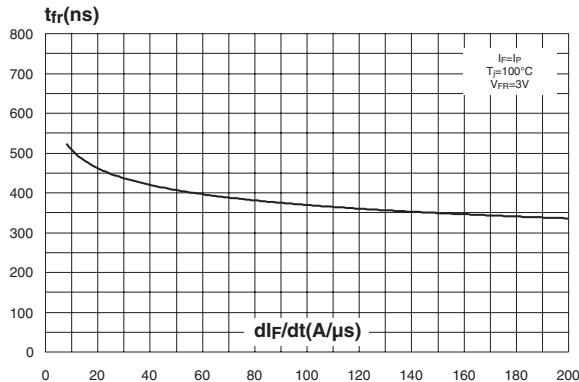


Figure 15: Relative variation of dynamic parameters versus junction temperature

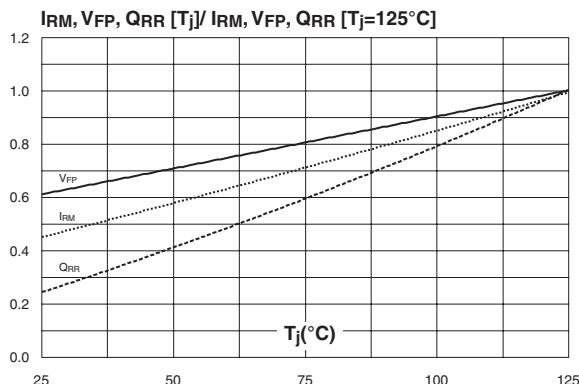


Figure 12: Transient peak forward voltage versus dI_F/dt (modulation diode, typical values)

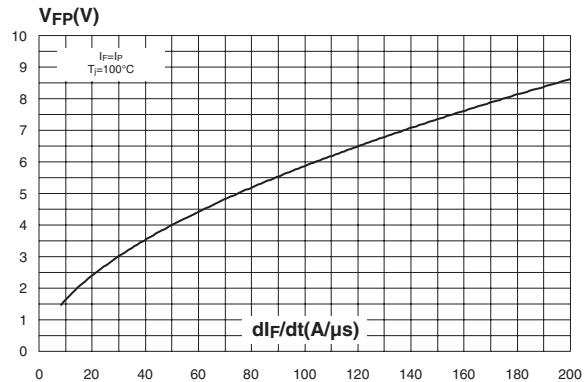


Figure 14: Forward recovery time versus dI_F/dt (modulation diode, typical values)

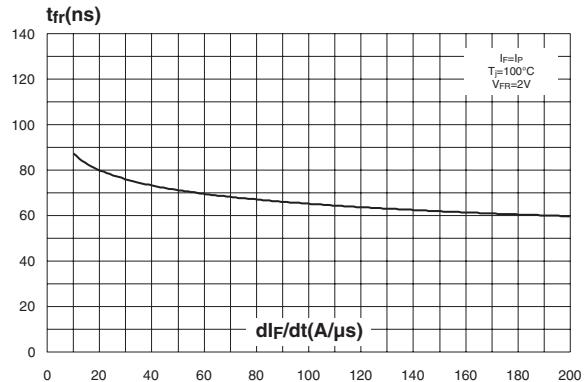
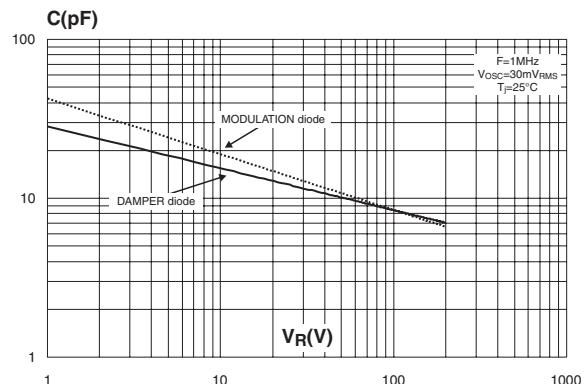
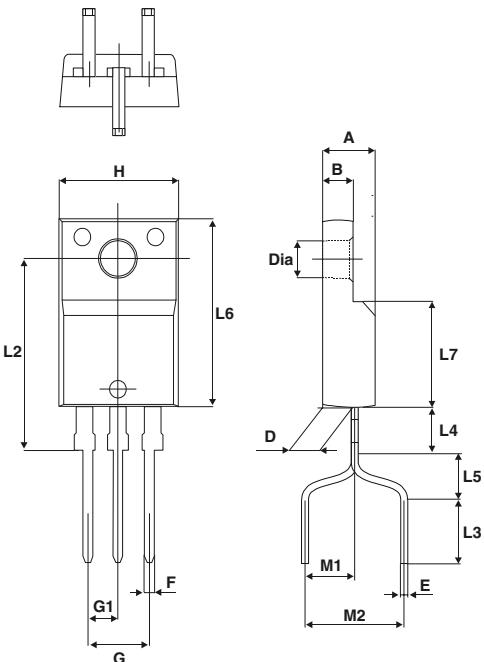


Figure 16: Junction capacitance versus reverse voltage applied (typical values)



DMV1500SD

Figure 17: TO-220FPAB FD6 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	0.028
F	0.6	1	0.024	0.039
G	4.95	5.2	0.195	0.205
G1	2.4	2.7	0.094	0.106
H	10	10.7	0.394	0.421
L2	12.7	12.8	0.500	0.504
L3	4.8 Typ.		0.189 Typ.	
L4	3.8	4.2	0.150	0.165
L6	2.8	3.2	0.110	0.126
L7	9	9.9	0.354	0.390
M1	3.75 Typ.		0.148 Typ.	
M2	7	8	0.276	0.315
R	1 Typ.		0.039 Typ.	
Dia.	2.9	3.5	0.114	0.138

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

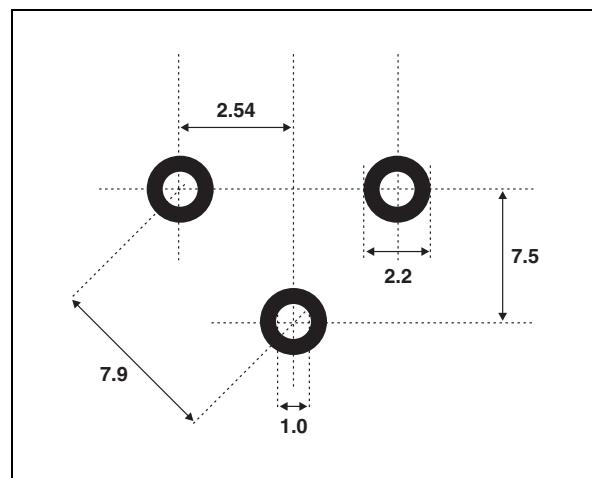


Figure 19: TO-220FPAB Package Mechanical Data

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
DMV1500SDFD	DMV1500SD	TO-220FPAB	2.4 g	50	Tube
DMV1500SDFD6	DMV1500SD	TO-220FPAB FD6	2.4 g	45	Tube

Table 9: Revision History

Date	Revision	Description of Changes
25-Oct-2004	1	First issue

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