

**DMV1500H**

## DAMPER + MODULATION DIODE FOR VIDEO

**Table 1: Main Product Characteristics**

	DAMPER	MODUL.
I <sub>F(AV)</sub>	6 A	3 A
V <sub>RRM</sub>	1500 V	600 V
t <sub>rr</sub> (max)	125 ns	50 ns
V <sub>F</sub> (max)	1.7 V	1.4 V

**FEATURES AND BENEFITS**

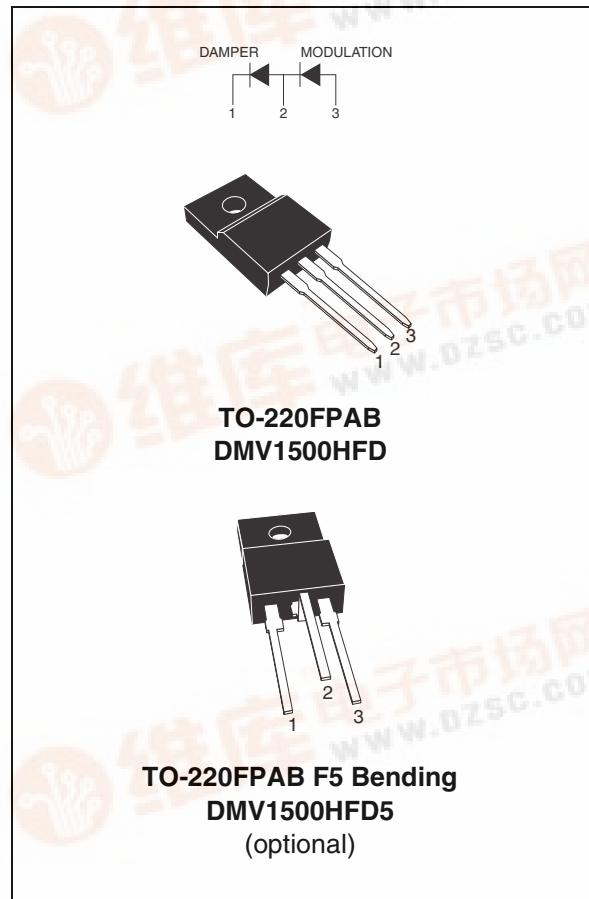
- Full kit in one package
- High breakdown voltage capability
- Very fast recovery diode
- Specified turn on switching characteristics
- Low static and peak forward voltage drop for low dissipation
- Insulated version:  
Insulated voltage = 2000 V<sub>RMS</sub>  
Capacitance = 7 pF
- Planar technology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

**Order Codes**

Part Number	Marking
DMV1500HFD	DMV1500H
DMV1500HFD5	DMV1500H



## DMV1500H

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**Table 3: Absolute Maximum Ratings**

Symbol	Parameter	Value		Unit
		Damper	Modul.	
V <sub>RRM</sub>	Repetitive peak reverse voltage	1500	600	V
I <sub>FSM</sub>	Surge non repetitive forward current   tp = 10ms sinusoidal	80	35	A
T <sub>stg</sub>	Storage temperature range	-40 to +150		°C
T <sub>j</sub>	Maximum operating junction temperature	150		°C

**Table 4: Thermal Resistance**

Symbol	Parameter	Value		Unit
R <sub>th(j-c)</sub>	Junction to case thermal resistance	3.6		°C/W

**Table 5: Static Electrical Characteristics**

Symbol	Parameter	Test conditions		Value				Unit	
				T <sub>j</sub> = 25°C		T <sub>j</sub> = 125°C			
				Typ.	Max.	Typ.	Max.		
I <sub>R</sub> *	Reverse leakage current	Damper	V <sub>R</sub> = 1500 V		100	100	1000	µA	
		Modul.	V <sub>R</sub> = 600 V		20	3	50		
V <sub>F</sub> **	Forward voltage drop	Damper	I <sub>F</sub> = 6 A	1.5	2.3	1.25	1.7	V	
		Modul.	I <sub>F</sub> = 3 A		1.8	1.1	1.4		

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 :

$$\text{DAMPER: } P = 1.35 \times I_F(\text{AV}) + 0.59 \times I_F^2(\text{RMS})$$

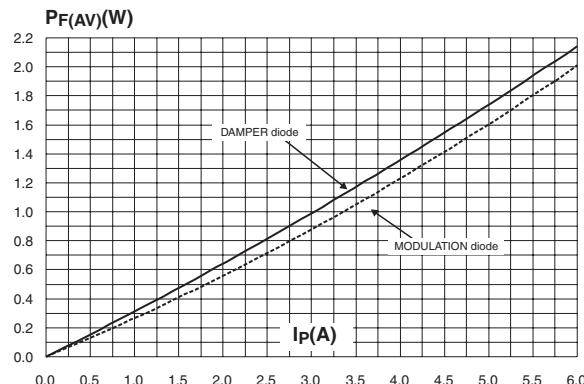
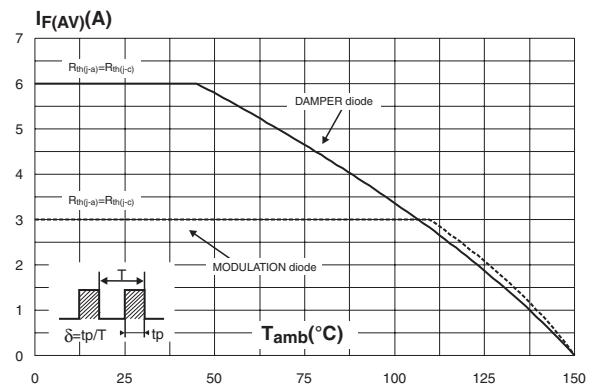
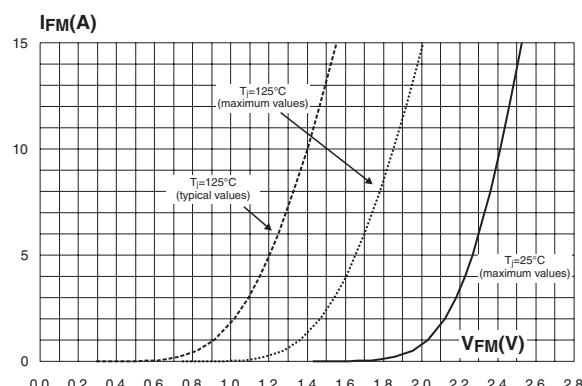
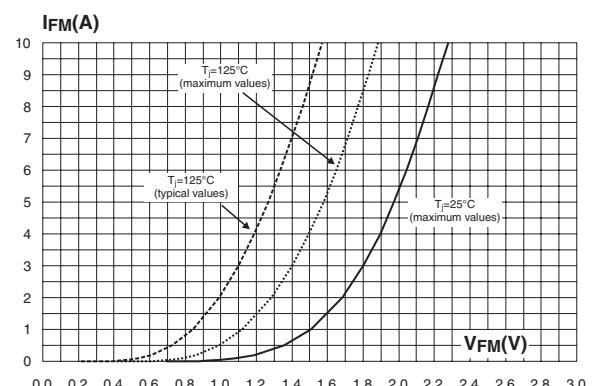
$$\text{MODULATION: } P = 1.12 \times I_F(\text{AV}) + 0.092 \times I_F^2(\text{RMS})$$

**Table 6: Recovery Characteristics**

Symbol	Parameter	Test conditions		Value				Unit	
				Damper		Modul.			
				Typ.	Max.	Typ.	Max.		
t <sub>rr</sub>	Reverse recovery time	I <sub>F</sub> = 100mA	T <sub>j</sub> = 25°C	625		110	350	ns	
		I <sub>R</sub> =100mA I <sub>RR</sub> = 10mA I <sub>F</sub> = 1A dI <sub>F</sub> /dt = -50 A/µs V <sub>R</sub> =30V	T <sub>j</sub> = 25°C	95	125	35	50		

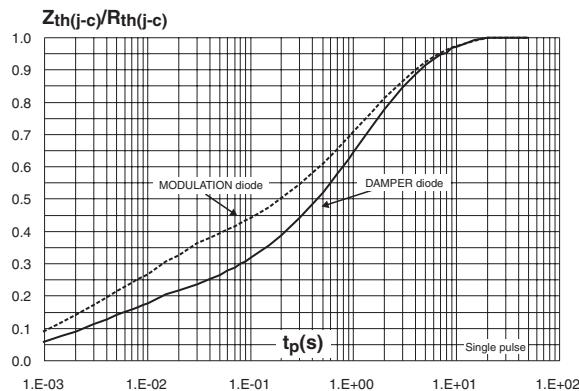
**Table 7: Turn-On Switching Characteristics**

Symbol	Parameter	Test conditions			Value		Unit
			Typ.	Max.			
$t_{fr}$	Forward recovery time	<b>Damper</b>	$I_F = 6 \text{ A}$ $dI_F/dt = 80 \text{ A}/\mu\text{s}$ $V_{FR} = 3 \text{ V}$	$T_j = 100^\circ\text{C}$	350		ns
		<b>Modul.</b>	$I_F = 3 \text{ A}$ $dI_F/dt = 80 \text{ A}/\mu\text{s}$ $V_{FR} = 2 \text{ V}$	$T_j = 100^\circ\text{C}$		240	
$V_{FP}$	Peak forward voltage	<b>Damper</b>	$I_F = 6 \text{ A}$ $dI_F/dt = 80 \text{ A}/\mu\text{s}$	$T_j = 100^\circ\text{C}$	18	25	V
		<b>Modul.</b>	$I_F = 3 \text{ A}$ $dI_F/dt = 80 \text{ A}/\mu\text{s}$	$T_j = 100^\circ\text{C}$		8	

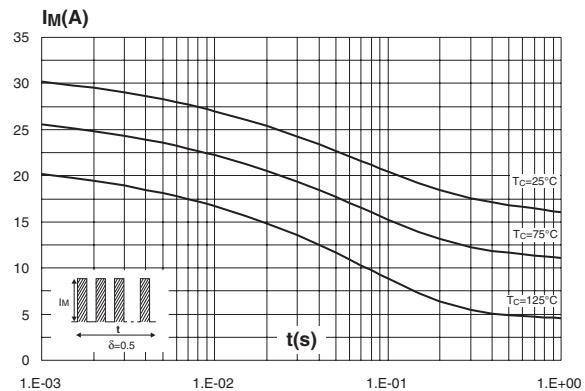
**Figure 1: Power dissipation versus peak forward current (triangular waveform,  $\delta=0.45$ )****Figure 2: Average forward current versus ambient temperature****Figure 3: Forward voltage drop versus forward current (damper diode)****Figure 4: Forward voltage drop versus forward current (modulation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

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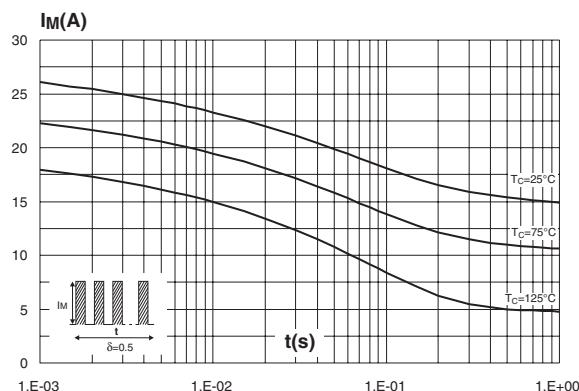
**Figure 5: Relative variation of thermal impedance junction to case versus pulse duration**



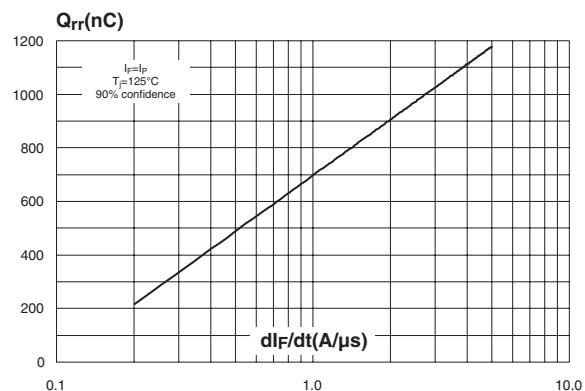
**Figure 6: Non repetitive peak forward current versus overload duration (damper diode)**



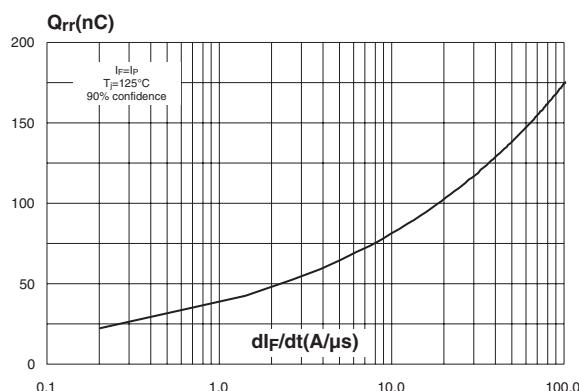
**Figure 7: Non repetitive peak forward current versus overload duration (modulation diode)**



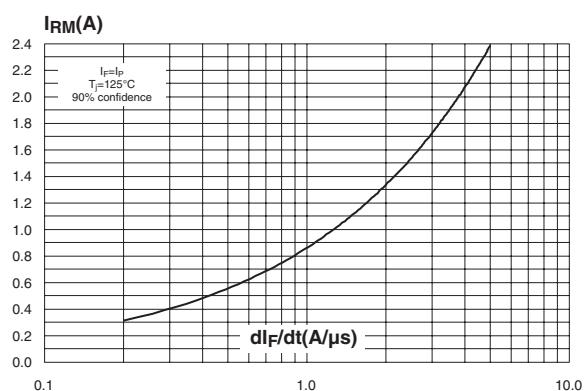
**Figure 8: Reverse recovery charges versus dI<sub>F</sub>/dt (damper diode)**



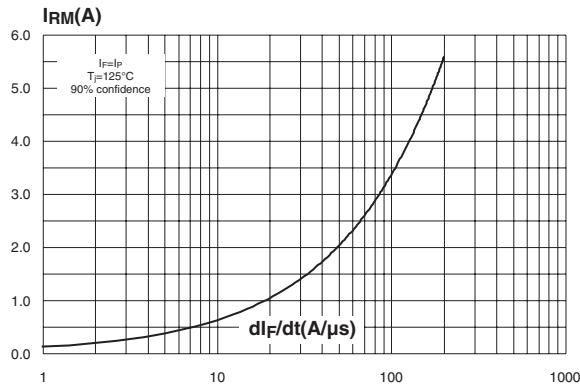
**Figure 9: Reverse recovery charges versus dI<sub>F</sub>/dt (modulation diode)**



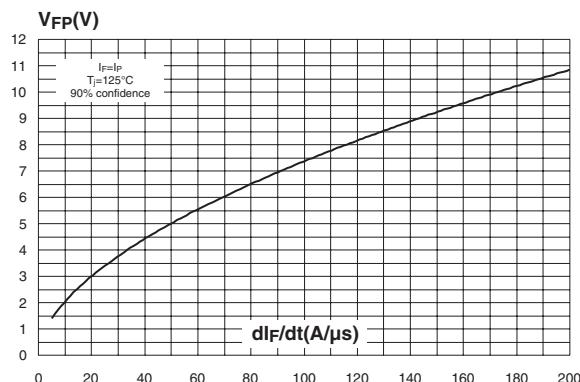
**Figure 10: Peak reverse recovery current versus dI<sub>F</sub>/dt (damper diode)**



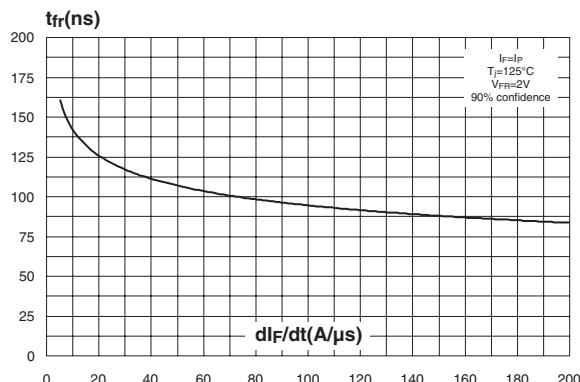
**Figure 11: Peak reverse recovery current versus  $dI_F/dt$  (modulation diode)**



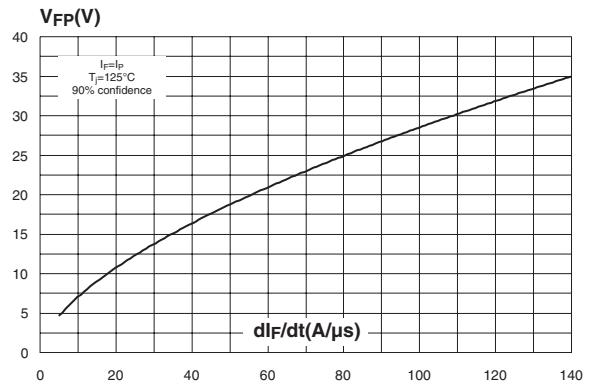
**Figure 13: Transient peak forward voltage versus  $dI_F/dt$  (modulation diode)**



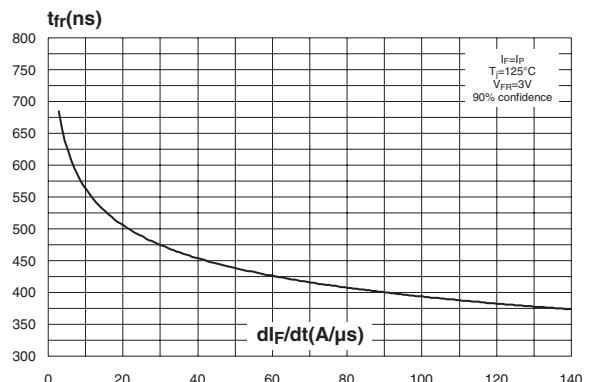
**Figure 15: Forward recovery time versus  $dI_F/dt$  (modulation diode)**



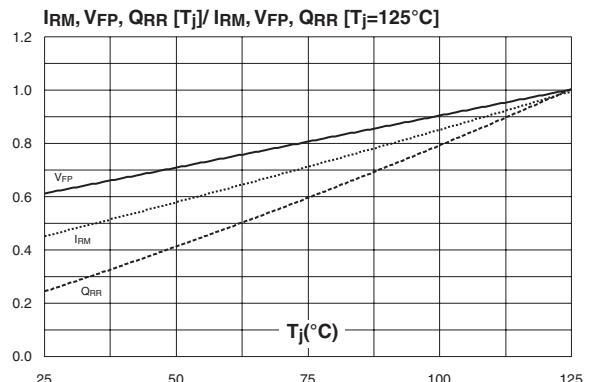
**Figure 12: Transient peak forward voltage versus  $dI_F/dt$  (damper diode)**



**Figure 14: Forward recovery time versus  $dI_F/dt$  (damper diode)**



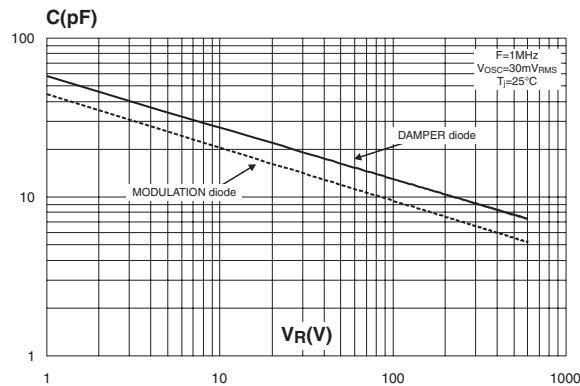
**Figure 16: Relative variation of dynamic parameters versus junction temperature**



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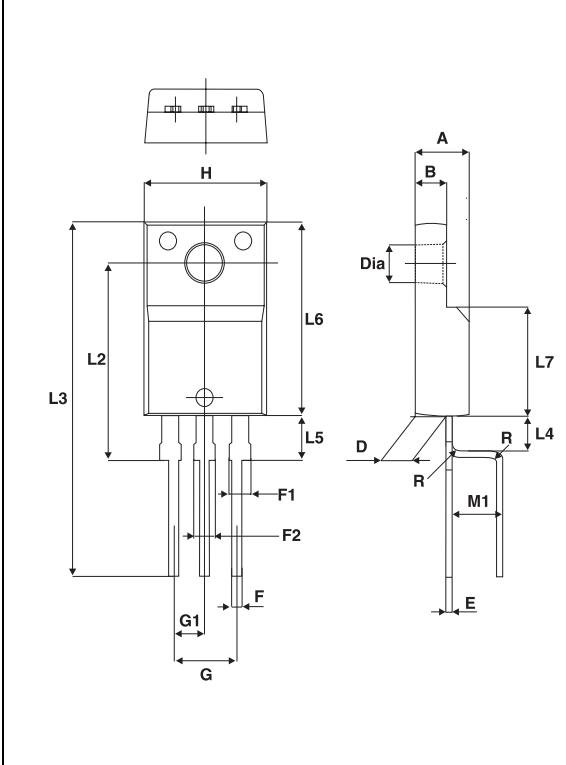
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**Figure 17: Junction capacitance versus reverse voltage applied (typical values)**



**Figure 18: 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

**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
DMV1500HFD	DMV1500H	TO-220FPAB	2.4 g	50	Tube
DMV1500HFD5	DMV1500H	TO-220FPAB F5	2.4 g	45	Tube

**Table 9: Revision History**

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

## DMV1500H

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