

## 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
$t_{rr} (typ)$	150 ns	60 ns
$V_F (typ)$	1.1 V	1.0 V

### FEATURES AND BENEFITS

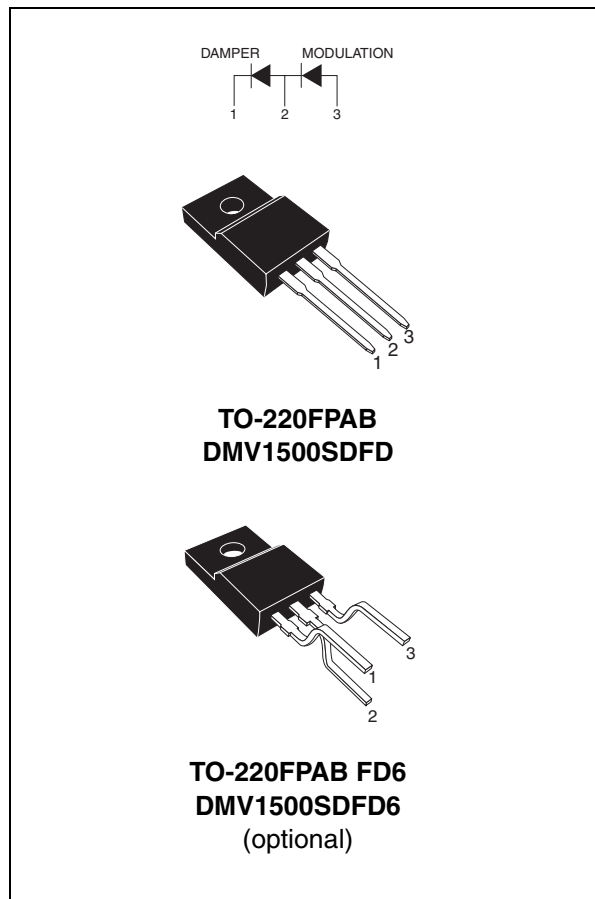
- Full kit in one package
- High breakdown voltage capability
- Very fast recovery diode
- Specified turn on switching characteristics
- Low static and peak forward voltage drop for low dissipation
- Insulated version:
- Insulated voltage = 2000  $V_{RMS}$
- Capacitance = 7 pF
- Planar technology allowing 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	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	
			$T_j = 25^\circ\text{C}$		$T_j = 125^\circ\text{C}$			
			Typ.	Max.	Typ.	Max.		
$I_R^*$	Reverse leakage current	Damper	$V_R = 1500\text{ V}$	100	100	1000	$\mu\text{A}$	
		Modul.	$V_R = 600\text{ V}$	3	3	30		
$V_F^{**}$	Forward voltage drop	Damper	$I_F = 6\text{ A}$	1.2	1.75	1.1	1.5	V
		Modul.	$I_F = 6\text{ A}$	1.15	1.4	1	1.25	

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:**  $P = 1.2 \times I_{F(AV)} + 0.050 \times I_{F(RMS)}^2$

**MODULATION:**  $P = 0.89 \times I_{F(AV)} + 0.055 \times I_{F(RMS)}^2$

**Table 6: Recovery Characteristics**

Symbol	Parameter	Test conditions	Value				Unit	
			Damper		Modul.			
			Typ.	Max.	Typ.	Max.		
$t_{rr}$	Reverse recovery time	$I_F = 100\text{ mA}$ $I_R = 100\text{ mA}$ $I_{RR} = 10\text{ mA}$	$T_j = 25^\circ\text{C}$	1000	2000	250	400	ns
		$I_F = 1\text{ A}$ $dI_F/dt = -50\text{ A}/\mu\text{s}$ $V_R = 30\text{ V}$	$T_j = 25^\circ\text{C}$	150	250	60	85	

Table 7: Turn-On Switching Characteristics

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

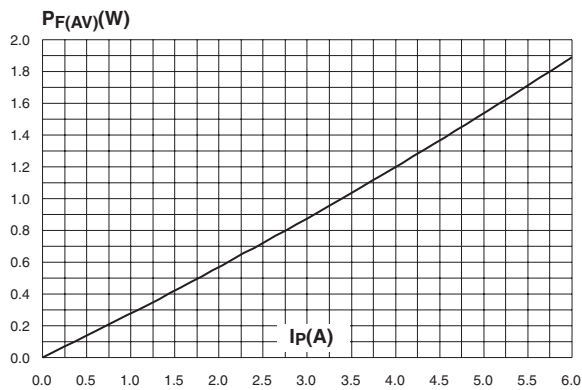


Figure 2: Power dissipation versus peak forward current (triangular waveform,  $\delta=0.45$ ) (modulation diode)

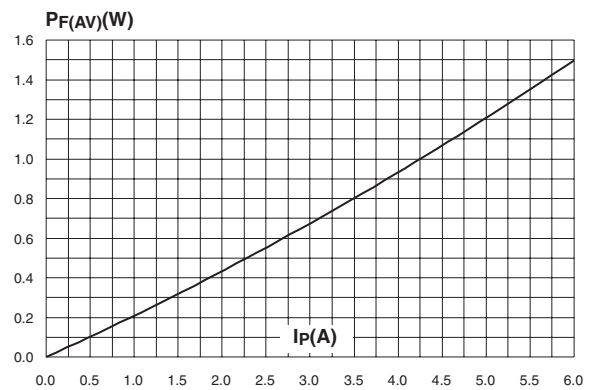


Figure 3: Average forward current versus ambient temperature

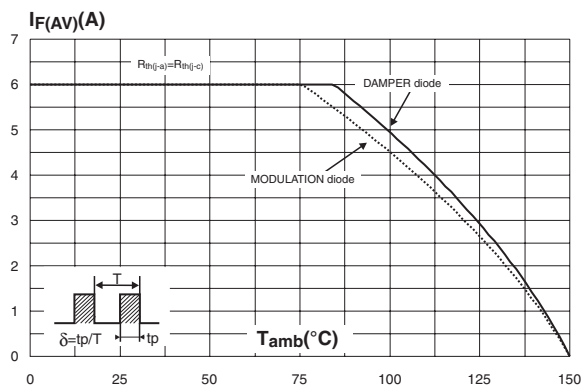
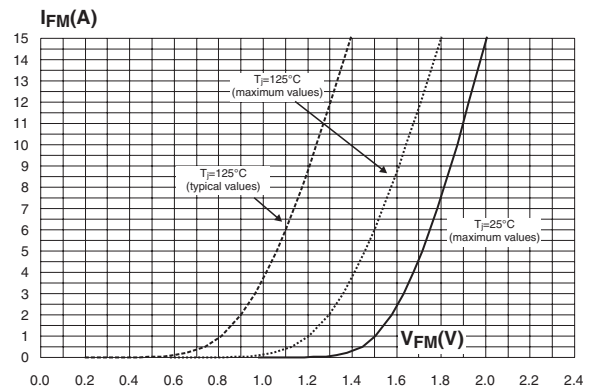
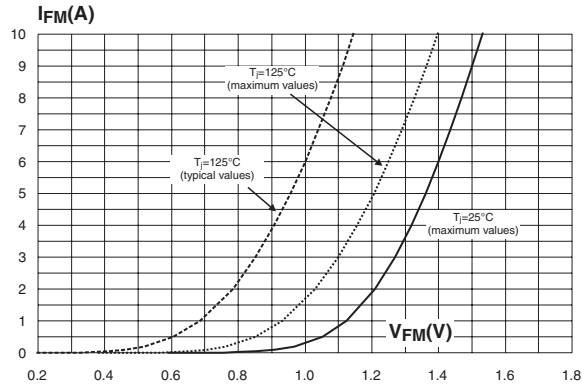


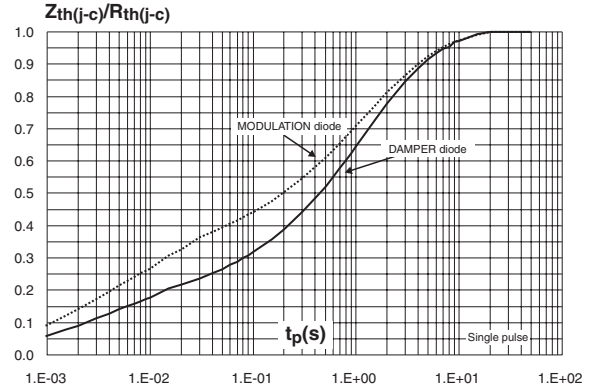
Figure 4: Forward voltage drop versus forward current (damper diode)



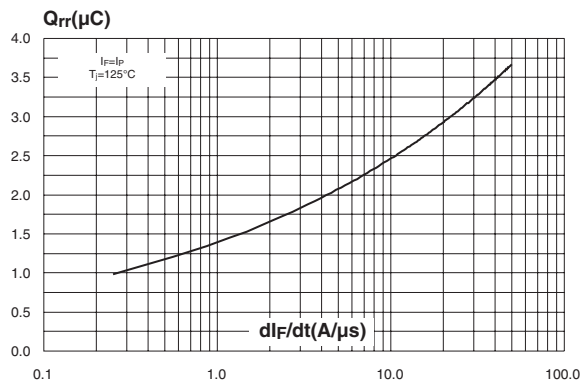
**Figure 5: Forward voltage drop versus forward current (modulation diode)**



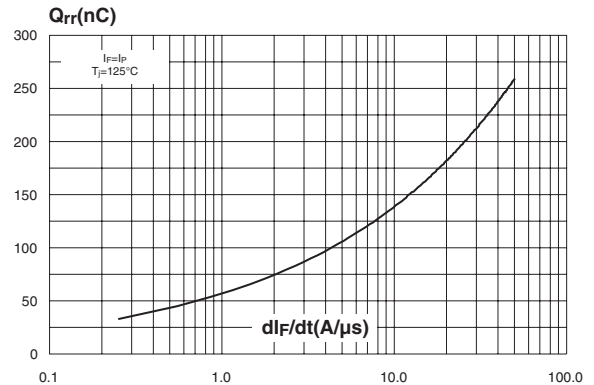
**Figure 6: Relative variation of thermal impedance junction to case versus pulse duration**



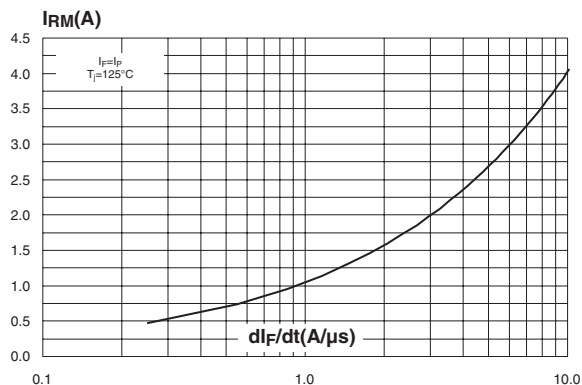
**Figure 7: Reverse recovery charges versus  $di_F/dt$  (damper diode)**



**Figure 8: Reverse recovery charges versus  $di_F/dt$  (modulation diode)**



**Figure 9: Peak reverse recovery current versus  $di_F/dt$  (damper diode)**



**Figure 10: Peak reverse recovery current versus  $di_F/dt$  (modulation diode)**

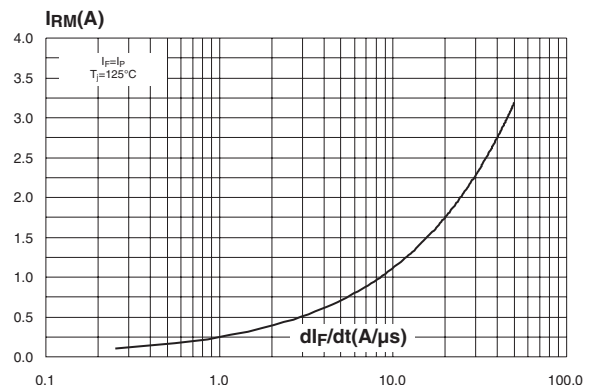


Figure 11: Transient peak forward voltage versus  $di_F/dt$  (damper diode, typical values)

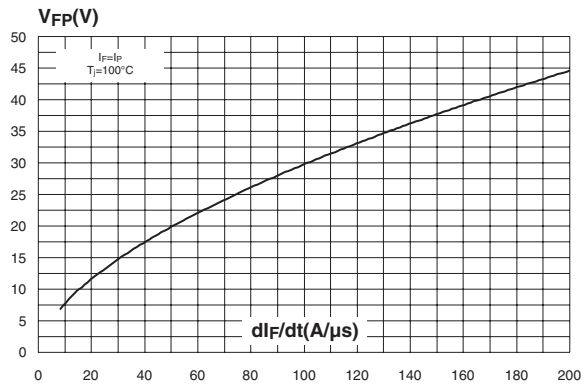


Figure 12: Transient peak forward voltage versus  $di_F/dt$  (modulation diode, typical values)

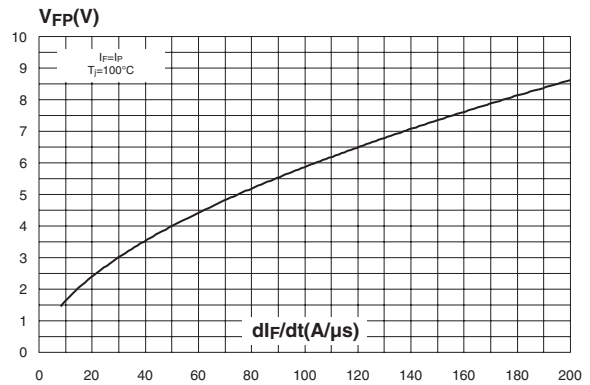


Figure 13: Forward recovery time versus  $di_F/dt$  (damper diode, typical values)

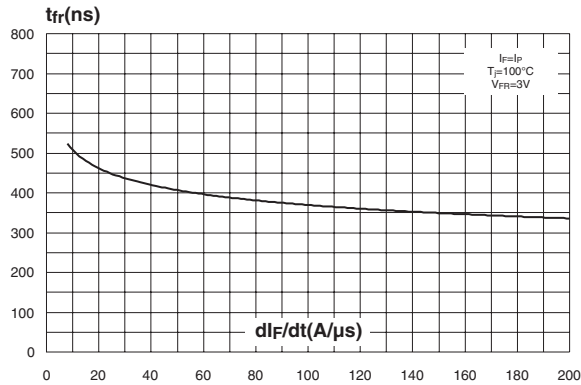


Figure 14: Forward recovery time versus  $di_F/dt$  (modulation diode, typical values)

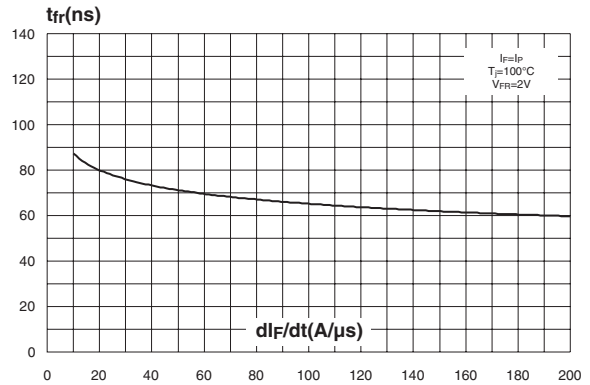


Figure 15: Relative variation of dynamic parameters versus junction temperature

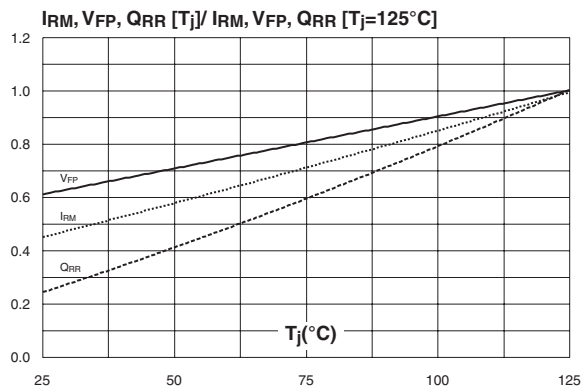


Figure 16: Junction capacitance versus reverse voltage applied (typical values)

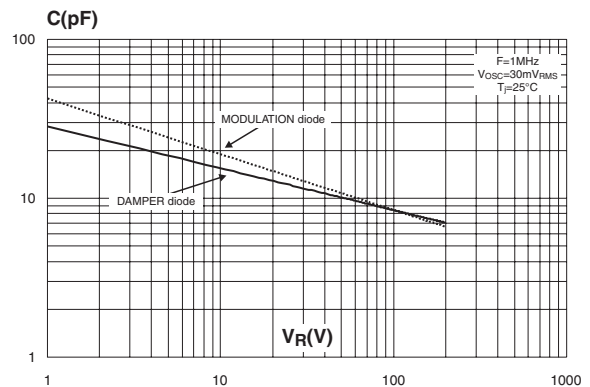


Figure 17: TO-220FPAB FD6 Option Package Mechanical Data

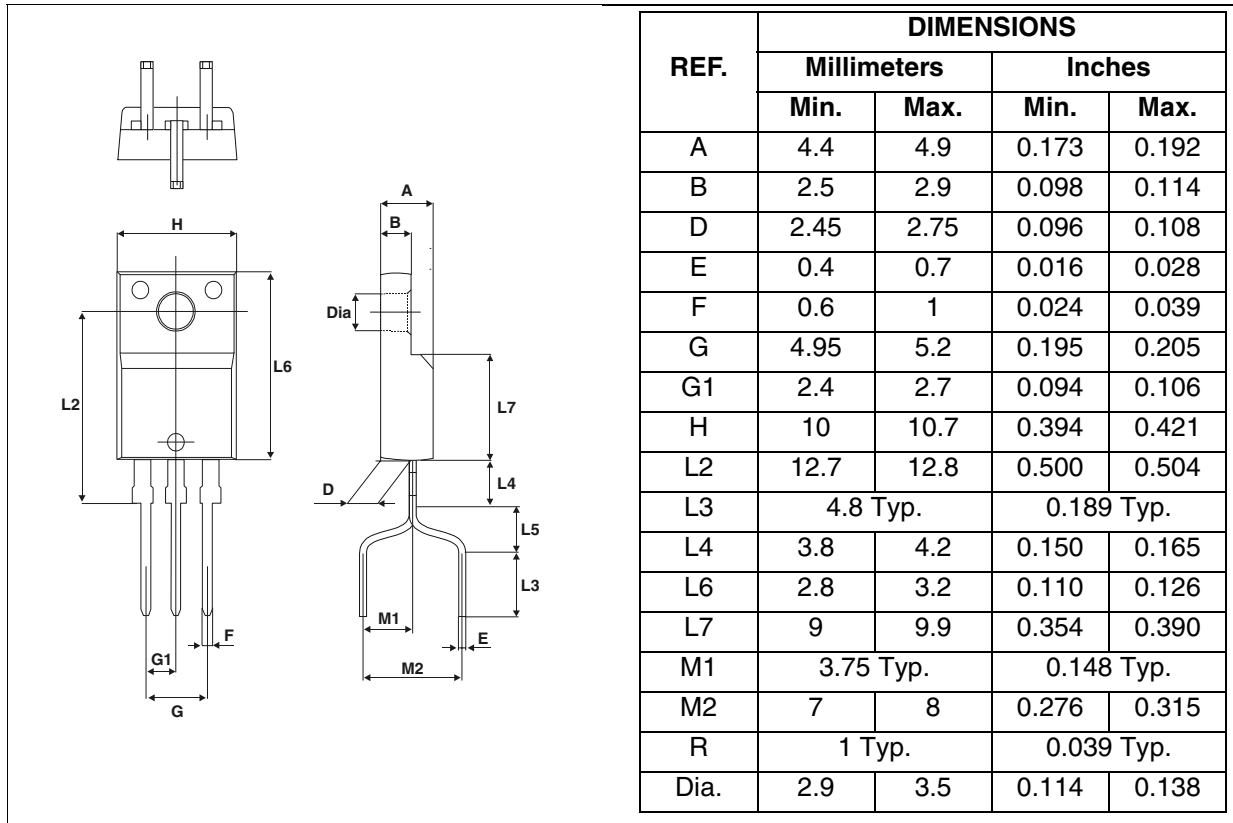


Figure 18: TO-220FPAB FD6 PCB layout (typical, in millimeters)

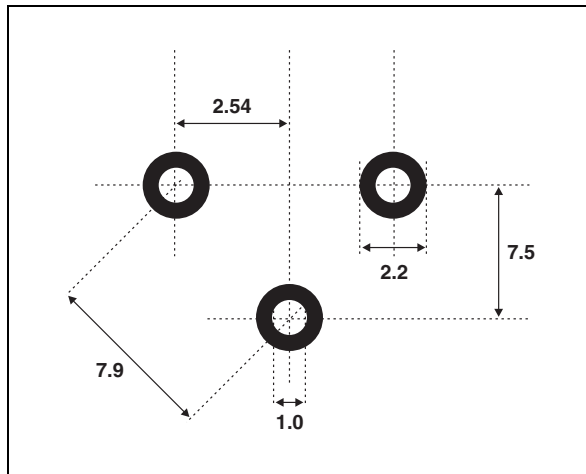


Figure 19: TO-220FPAB Package Mechanical Data

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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