

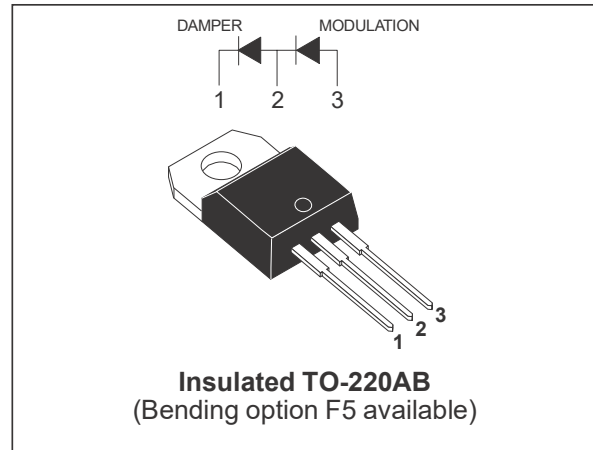
## DAMPER + MODULATION DIODE FOR VIDEO

### MAIN PRODUCT CHARACTERISTICS

	MODUL	DAMPER
$I_{F(AV)}$	3 A	6 A
$V_{RRM}$	600 V	1500 V
$t_{rr} (max)$	50 ns	135 ns
$V_F (max)$	1.4 V	1.65 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 = 2500  $V_{RMS}$   
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-220AB package includes both the DAMPER diode and the MODULATION diode. Assembled on automated line, it offers excellent insulating and dissipating characteristics, thanks to the internal ceramic insulation layer.

### ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter	Value		Unit
		MODUL	DAMPER	
$V_{RRM}$	Repetitive peak reverse voltage	600	1500	V
$I_{FSM}$	Surge non repetitive forward current	35	75	A
$T_{stg}$	Storage temperature range	- 40 to + 150		°C
$T_j$	Maximum operating junction temperature	150		

## DMV1500M

### THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Damper junction to case	4.8	°C/W
$R_{th(j-c)}$	Modulation junction to case	6	

### STATIC ELECTRICAL CHARACTERISTICS OF THE DAMPER DIODES

Symbol	Parameter	Test conditions	Value				Unit
			Tj = 25°C		Tj = 125°C		
			Typ.	Max.	Typ.	Max.	
$V_F$ *	Forward voltage drop	$I_F = 6\text{ A}$	1.4	2.2	1.2	1.65	V
$I_R$ **	Reverse leakage current	$V_R = 1500\text{ V}$		100	100	1000	μA

Pulse test : \*  $t_p = 380\ \mu\text{s}$ ,  $\delta < 2\%$   
 \*\*  $t_p = 5\ \text{ms}$ ,  $\delta < 2\%$

To evaluate the maximum conduction losses of the DAMPER diode use the following equations :

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

### STATIC ELECTRICAL CHARACTERISTICS OF THE MODULATION DIODE

Symbol	Parameter	Test conditions	Value				Unit
			Tj = 25°C		Tj = 125°C		
			Typ.	Max.	Typ.	Max.	
$V_F$ *	Forward voltage drop	$I_F = 3\text{ A}$		1.8	1.1	1.4	V
$I_R$ **	Reverse leakage current	$V_R = 600\text{ V}$		20	3	50	μA

Pulse test : \*  $t_p = 380\ \mu\text{s}$ ,  $\delta < 2\%$   
 \*\*  $t_p = 5\ \text{ms}$ ,  $\delta < 2\%$

To evaluate the maximum conduction losses of the MODULATION diode use the following equations :

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

### RECOVERY CHARACTERISTICS OF THE DAMPER DIODE

Symbol	Parameter	Test conditions	Value		Unit	
			Typ.	Max.		
$t_{rr}$	Reverse recovery time	$I_F = 100\text{ mA}$ $I_R = 100\text{ mA}$ $I_{RR} = 10\text{ mA}$		750	ns	
$t_{rr}$	Reverse recovery time	$I_F = 1\text{ A}$ $dI_F/dt = -50\text{ A}/\mu\text{s}$ $V_R = 30\text{ V}$		110	135	ns

## RECOVERY CHARACTERISTICS OF THE MODULATION DIODE

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

## TURN-ON SWITCHING CHARACTERISTICS OF THE DAMPER DIODE

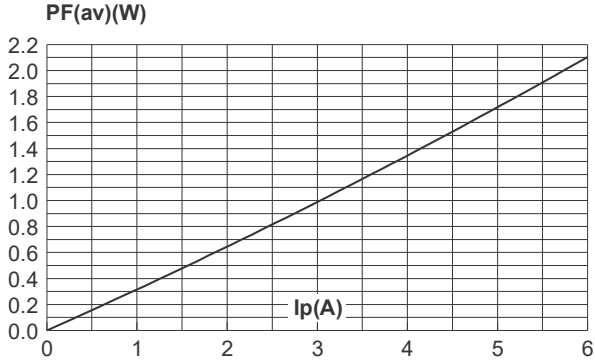
Symbol	Parameter	Test conditions		Value		Unit
				Typ.	Max.	
$t_{fr}$	Forward recovery time	$I_F = 6\text{A}$ $dI_F/dt = 80\text{A}/\mu\text{s}$ $V_{FR} = 3\text{V}$	$T_j = 100^\circ\text{C}$	570		ns
$V_{FP}$	Peak forward voltage	$I_F = 6\text{A}$ $dI_F/dt = 80\text{A}/\mu\text{s}$	$T_j = 100^\circ\text{C}$	21	28	V

## TURN-ON SWITCHING CHARACTERISTICS OF THE MODULATION DIODE

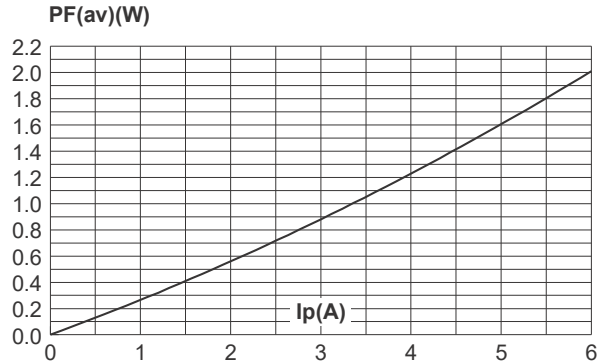
Symbol	Parameter	Test conditions		Value		Unit
				Typ.	Max.	
$t_{fr}$	Forward recovery time	$I_F = 3\text{A}$ $dI_F/dt = 80\text{A}/\mu\text{s}$ $V_{FR} = 2\text{V}$	$T_j = 100^\circ\text{C}$		240	ns
$V_{FP}$	Peak forward voltage	$I_F = 3\text{A}$ $dI_F/dt = 80\text{A}/\mu\text{s}$	$T_j = 100^\circ\text{C}$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

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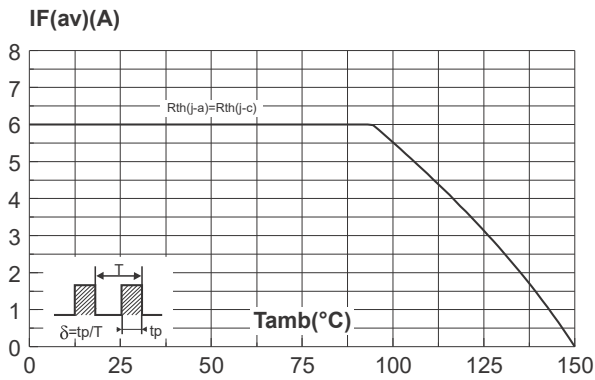
**Fig. 1-1:** Power dissipation versus peak forward current (triangular waveform,  $\delta = 0.45$ ) (damper diode).



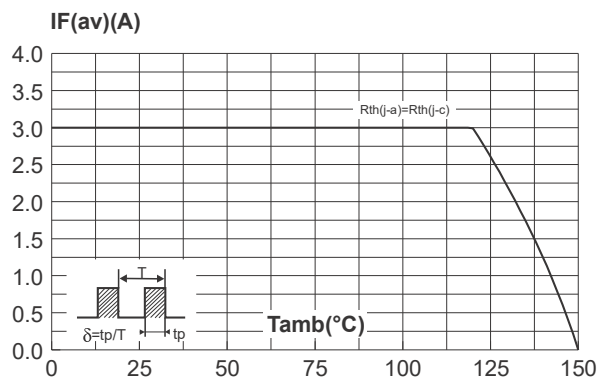
**Fig. 1-2:** Power dissipation versus peak forward current (triangular waveform,  $\delta = 0.45$ ) (modulation diode).



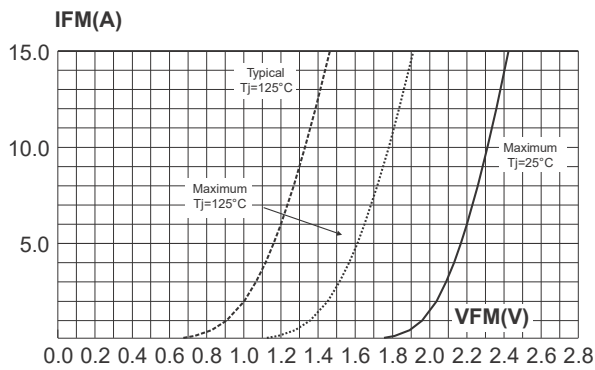
**Fig. 2-1:** Average forward current versus ambient temperature (damper diode).



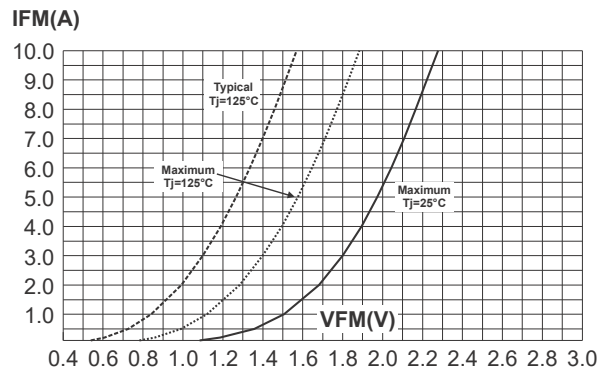
**Fig. 2-2:** Average forward current versus ambient temperature (modulation diode).



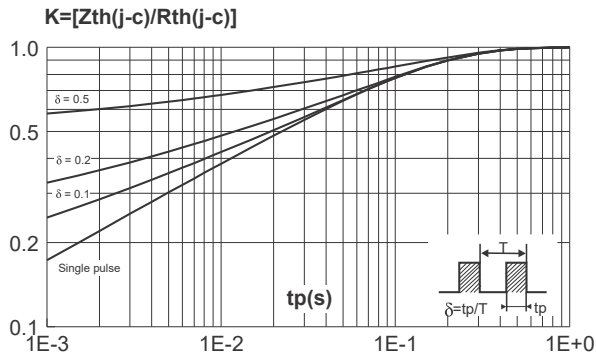
**Fig. 3-1:** Forward voltage drop versus forward current (damper diode).



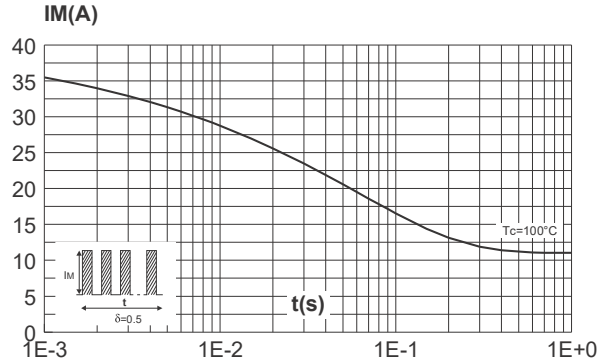
**Fig. 3-2:** Forward voltage drop versus forward current (modulation diode).



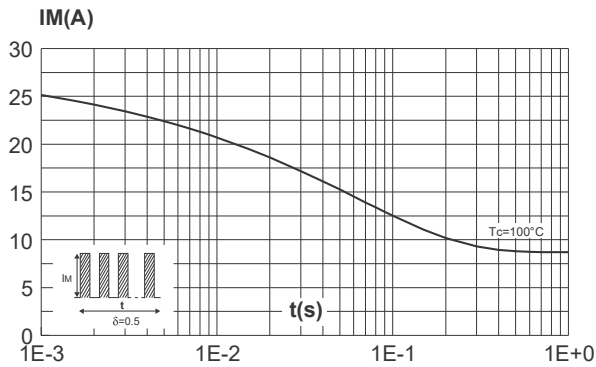
**Fig. 4:** Relative variation of thermal impedance junction to case versus pulse duration.



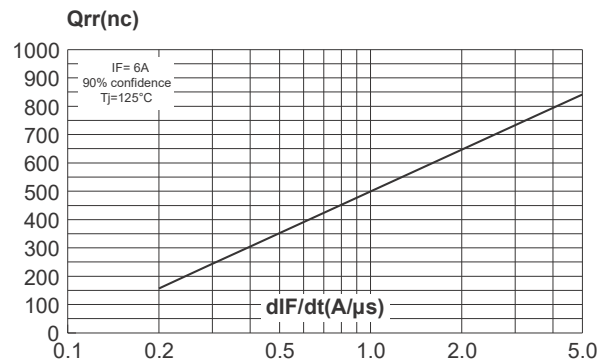
**Fig. 5-1:** Non repetitive surge peak forward current versus overload duration (damper diode).



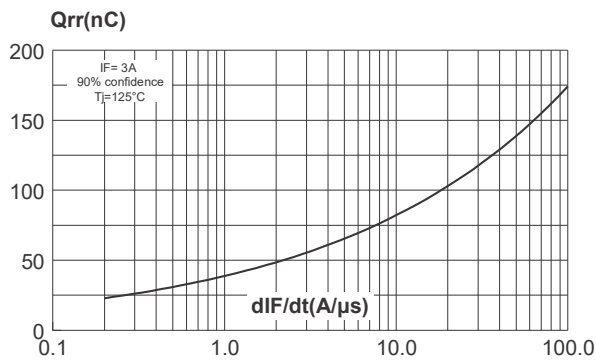
**Fig. 5-2:** Non repetitive surge peak forward current versus overload duration (modulation diode).



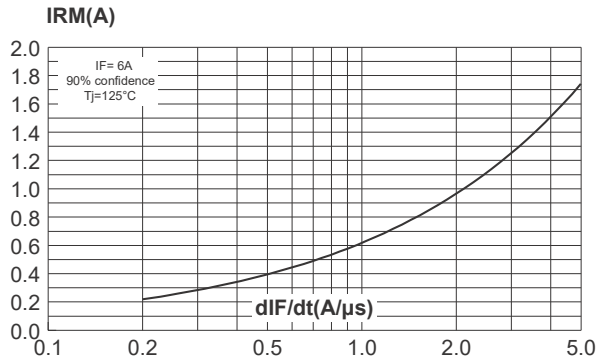
**Fig. 6-1:** Reverse recovery charges versus dIF/dt (damper diode).



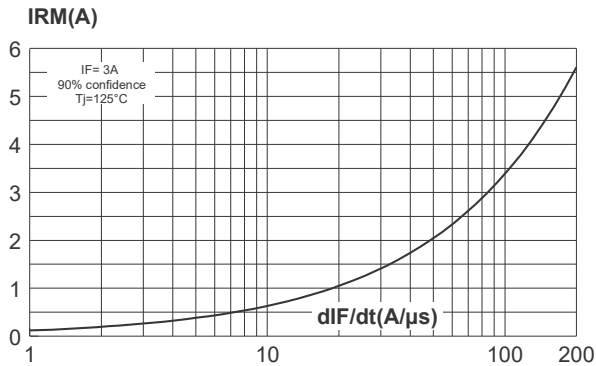
**Fig. 6-2:** Reverse recovery charges versus dIF/dt (modulation diode).



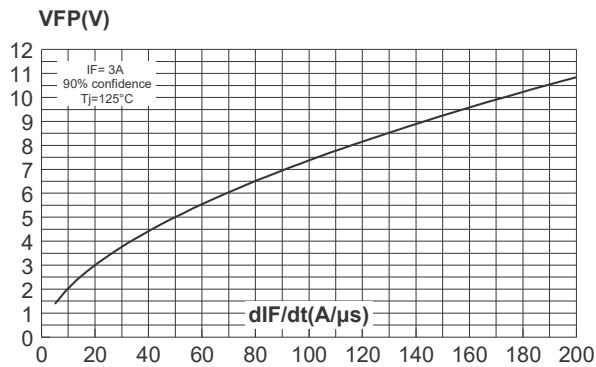
**Fig. 7-1:** Reverse recovery current versus dIF/dt (damper diode).



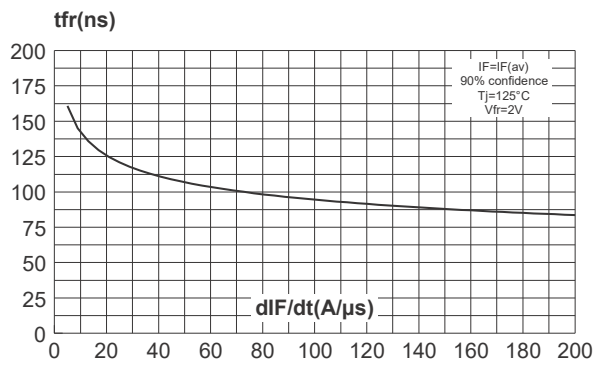
**Fig. 7-2:** Reverse recovery current versus  $dI_F/dt$  (modulation diode).



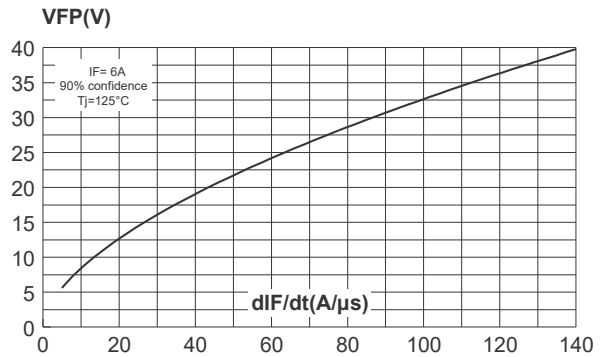
**Fig. 8-2:** Transient peak forward voltage versus  $dI_F/dt$  (modulation diode).



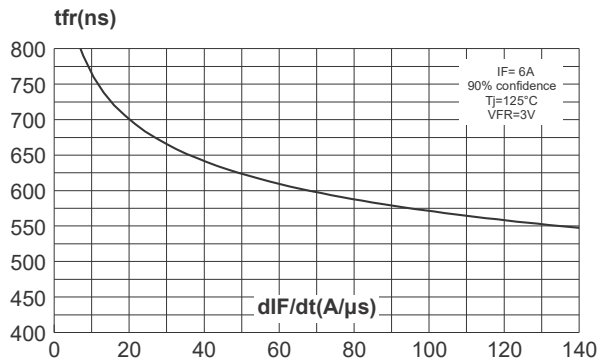
**Fig. 9-2:** Forward recovery time versus  $dI_F/dt$  (modulation diode).



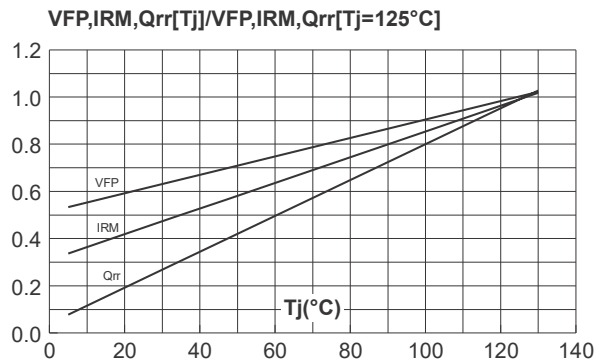
**Fig. 8-1:** Transient peak forward voltage versus  $dI_F/dt$  (damper diode).



**Fig. 9-1:** Forward recovery time versus  $dI_F/dt$  (damper diode).

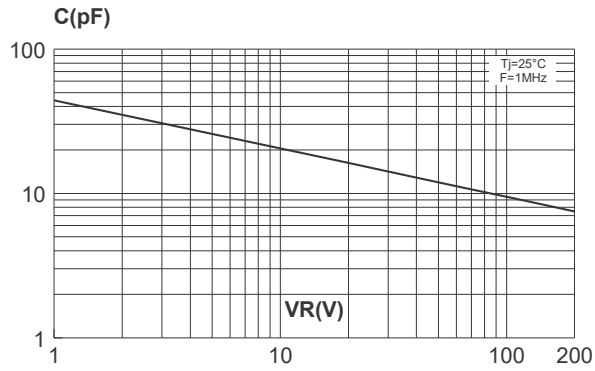


**Fig. 10:** Dynamic parameters versus junction temperature (damper & modulation diodes).

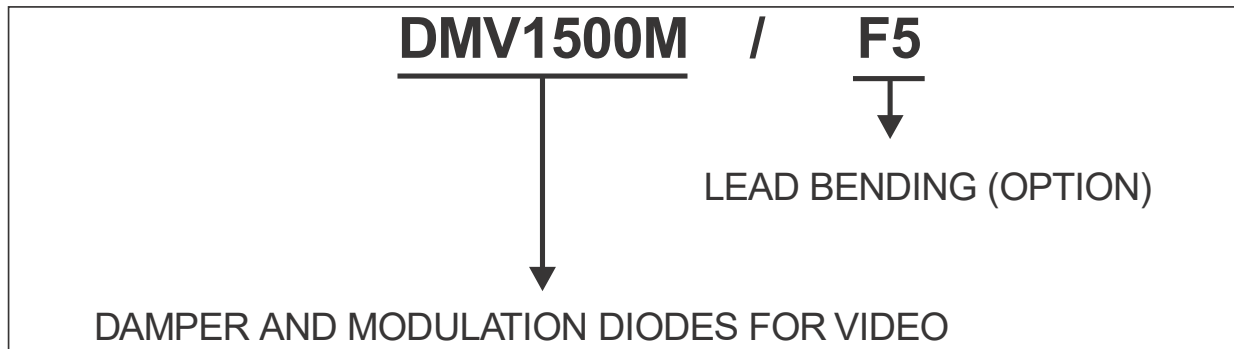


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**Fig. 11:** Junction capacitance versus reverse voltage applied (typical values) (damper & modulation diodes).

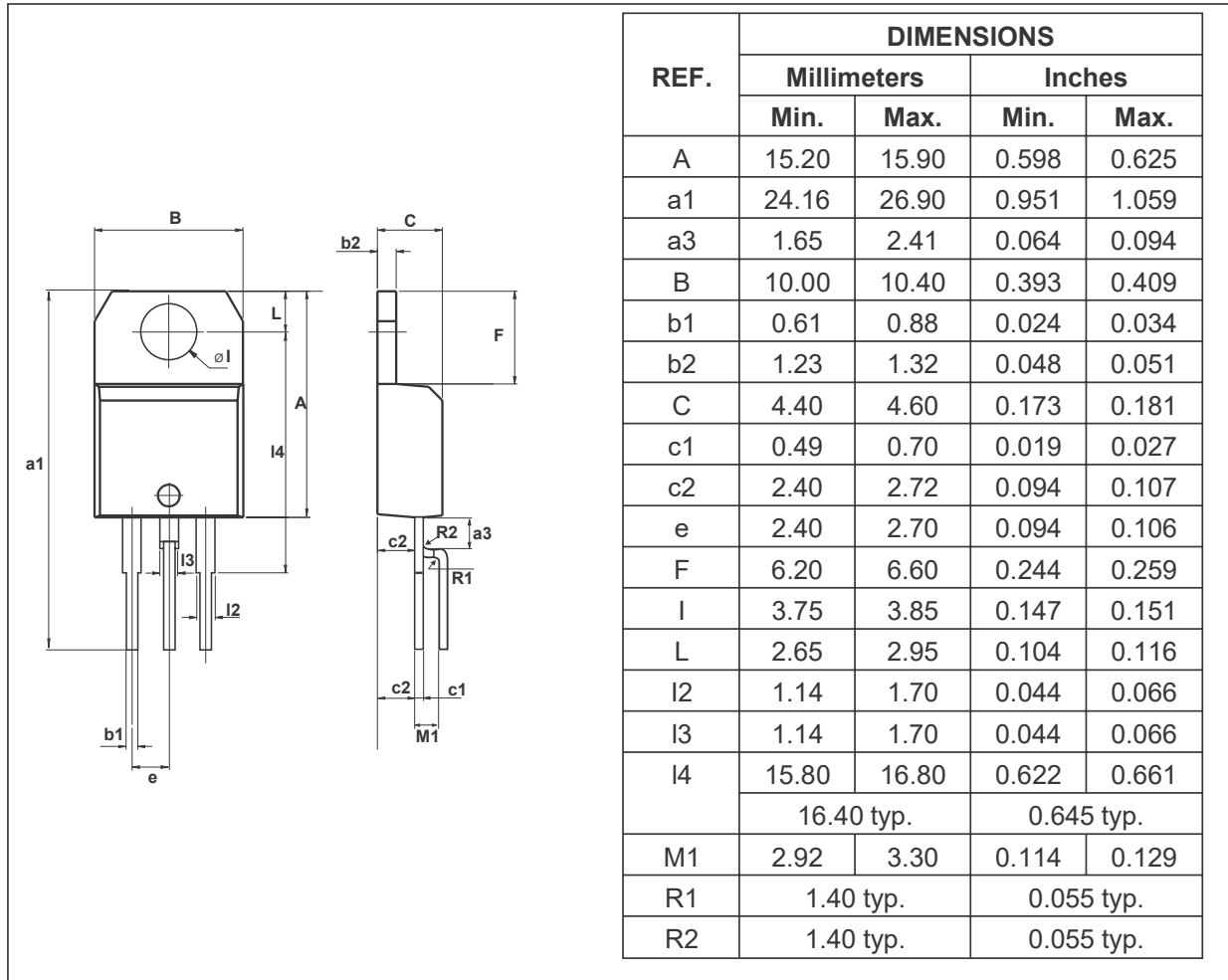


### ORDERING INFORMATION

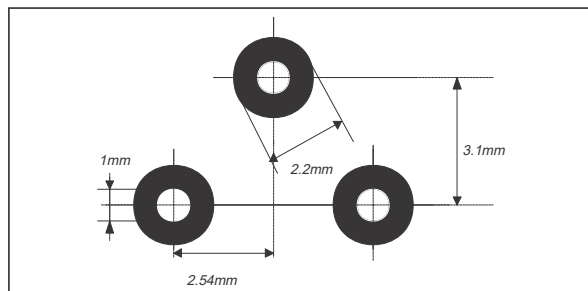


# DMV1500M

## PACKAGE MECHANICAL DATA TO-220AB F5 OPTION



### PRINTED CIRCUIT LAYOUT FOR F5 LAYOUT



- Cooling method: by conduction (c)
- Recommended torque value: 0.8 m.N.
- Maximum torque value: 1 m.N.



**PACKAGE MECHANICAL DATA**  
 TO-220AB

REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.598		0.625
a1		3.75			0.147	
a2	13.00		14.00	0.511		0.551
B	10.00		10.40	0.393		0.409
b1	0.61		0.88	0.024		0.034
b2	1.23		1.32	0.048		0.051
C	4.40		4.60	0.173		0.181
c1	0.49		0.70	0.019		0.027
c2	2.40		2.72	0.094		0.107
e	2.40		2.70	0.094		0.106
F	6.20		6.60	0.244		0.259
I	3.75		3.85	0.147		0.151
I4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
I2	1.14		1.70	0.044		0.066
I3	1.14		1.70	0.044		0.066
M		2.60			0.102	

- Cooling method: by conduction (c)
- Recommended torque value: 0.8 m.N.
- Maximum torque value: 1 m.N.

Type	Marking	Package	Weight	Base qty	Delivery mode
DMV1500M DMV1500MF5	DMV1500M	TO-220AB	2.2 g.	50	Tube

- Epoxy meets UL94, V0

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