

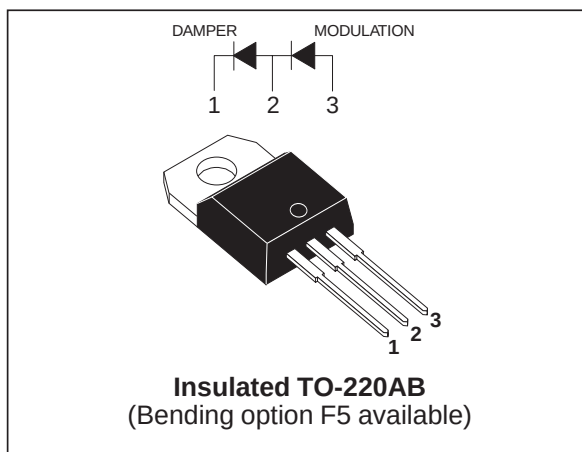
DAMPER + MODULATION DIODE FOR VIDEO

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	tp = 10 ms sinusoidal	35	75	A
T _{stg}	Storage temperature range		- 40 to + 150		°C
T _j	Maximum operating junction temperature		150		

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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 A	1.4	2.2	1.2	1.65	V
I _R **	Reverse leakage current	V _R = 1500V		100	100	1000	μA

Pulse test : * $t_p = 380\text{ μs}$, $\delta < 2\%$

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

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

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

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 = 3A		1.8	1.1	1.4	V
I _R **	Reverse leakage current	V _R = 600V		20	3	50	μA

Pulse test : * $t_p = 380\text{ μs}$, $\delta < 2\%$

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

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

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

RECOVERY CHARACTERISTICS OF THE DAMPER DIODE

Symbol	Parameter	Test conditions		Value		Unit
				Typ.	Max.	
t_{rr}	Reverse recovery time	$I_F = 100\text{ mA}$ $I_R = 100\text{ mA}$ $I_{RR} = 10\text{ mA}$	$T_j = 25^\circ\text{C}$	750		ns
t_{rr}	Reverse recovery time	$I_F = 1\text{ A}$ $dI_F/dt = -50\text{ A/μs}$ $V_R = 30\text{ V}$	$T_j = 25^\circ\text{C}$	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).

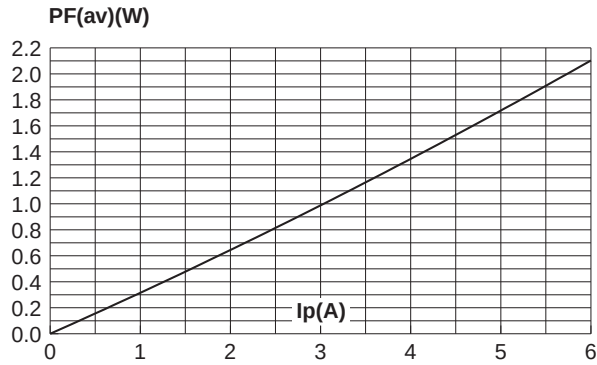


Fig. 2-1: Average forward current versus ambient temperature (damper diode).

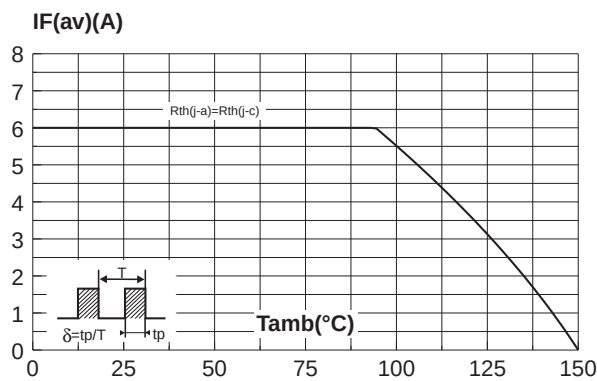


Fig. 3-1: Forward voltage drop versus forward current (damper diode).

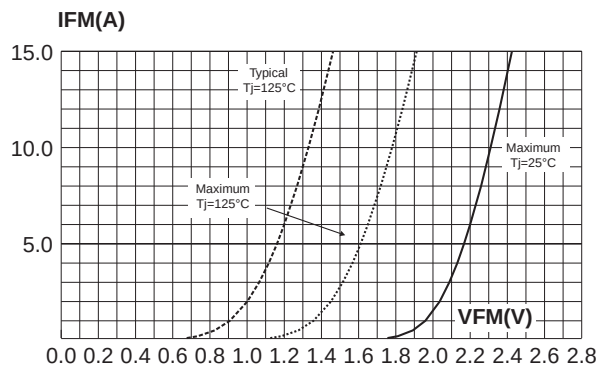


Fig. 1-2: Power dissipation versus peak forward current (triangular waveform, $\delta = 0.45$) (modulation diode).

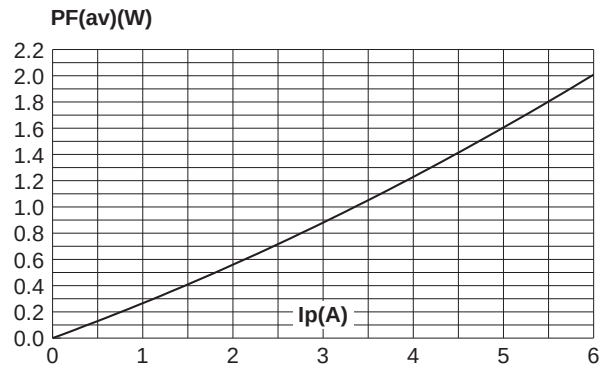


Fig. 2-2: Average forward current versus ambient temperature (modulation diode).

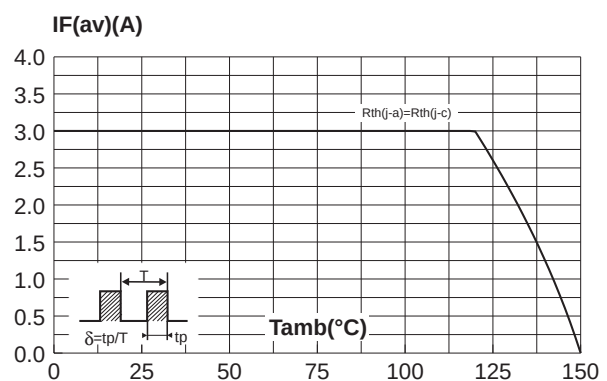


Fig. 3-2: Forward voltage drop versus forward current (modulation diode).

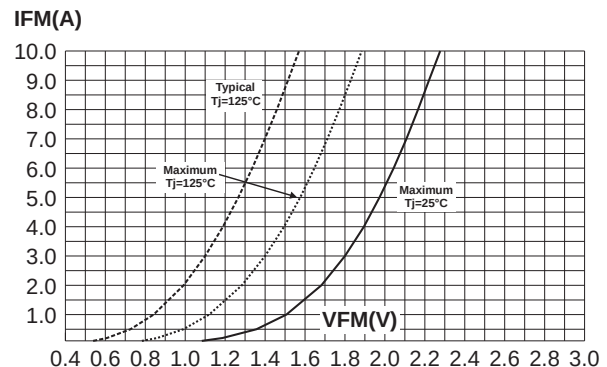


Fig. 4: Relative variation of thermal impedance junction to case versus pulse duration.

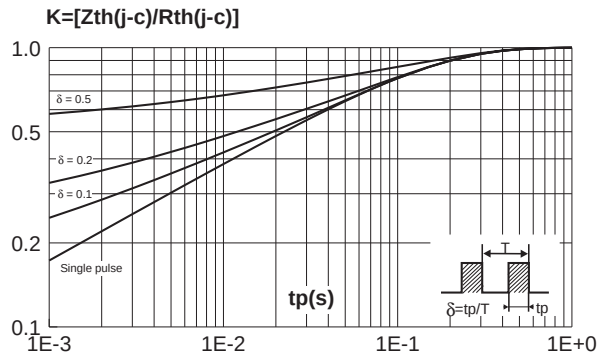


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (damper diode).

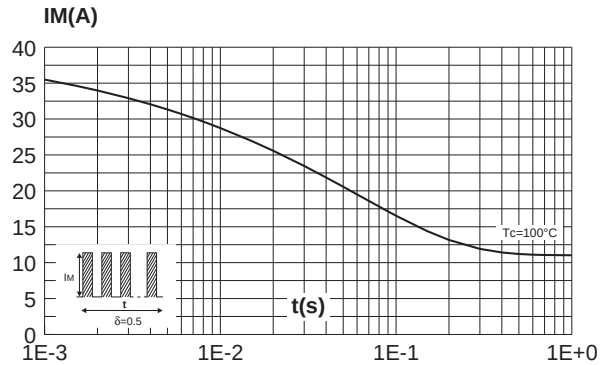


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (modulation diode).

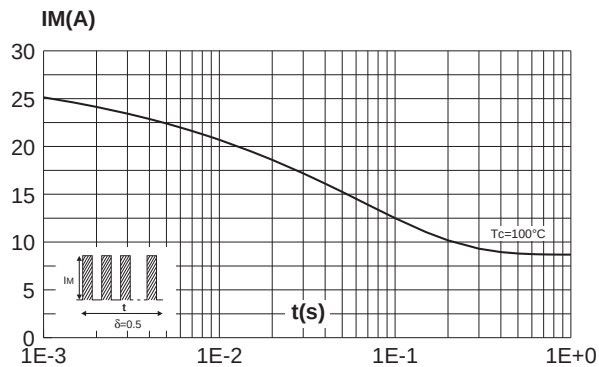


Fig. 6-1: Reverse recovery charges versus dI_F/dt (damper diode).

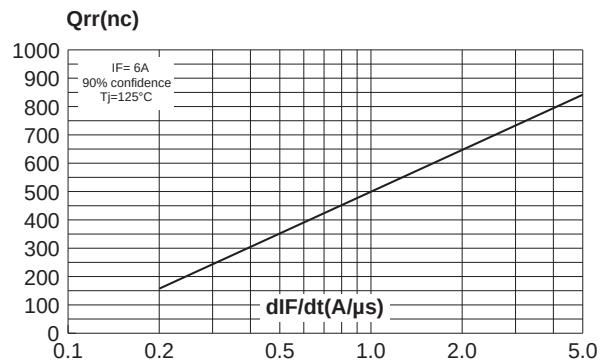


Fig. 6-2: Reverse recovery charges versus dI_F/dt (modulation diode).

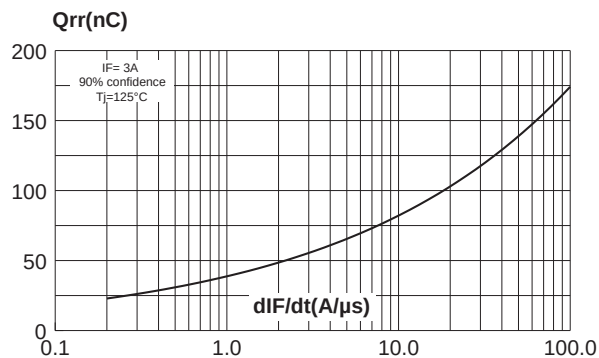


Fig. 7-1: Reverse recovery current versus dI_F/dt (damper diode).

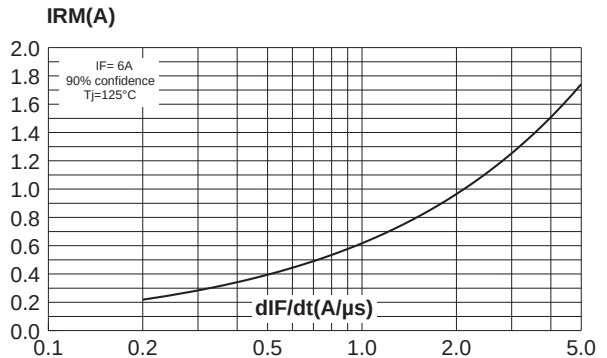


Fig. 7-2: Reverse recovery current versus dI_F/dt (modulation diode).

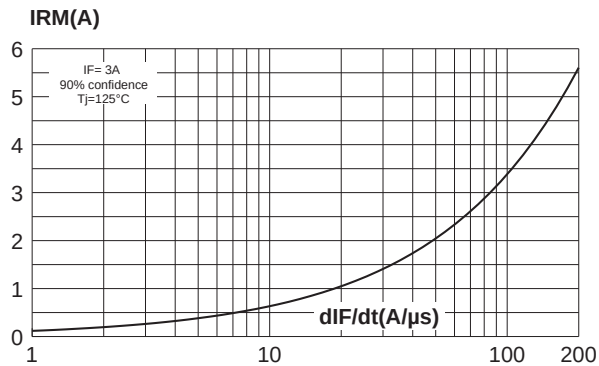


Fig. 8-1: Transient peak forward voltage versus dI_F/dt (damper diode).

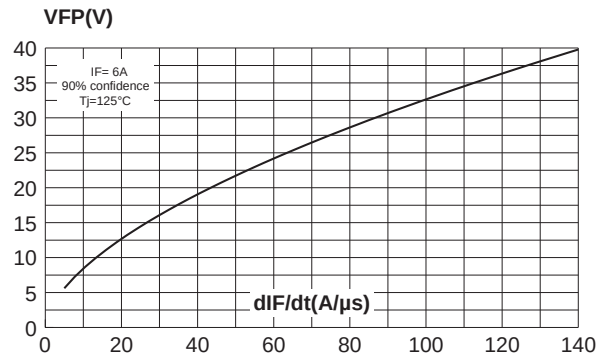


Fig. 8-2: Transient peak forward voltage versus dI_F/dt (modulation diode).

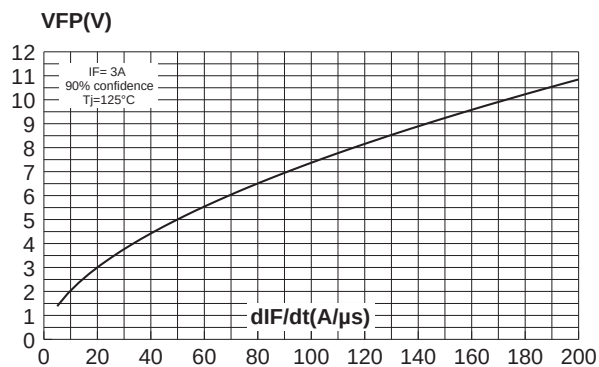


Fig. 9-1: Forward recovery time versus dI_F/dt (damper diode).

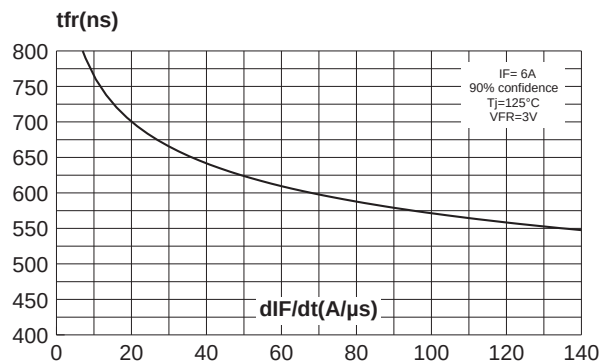


Fig. 9-2: Forward recovery time versus dI_F/dt (modulation diode).

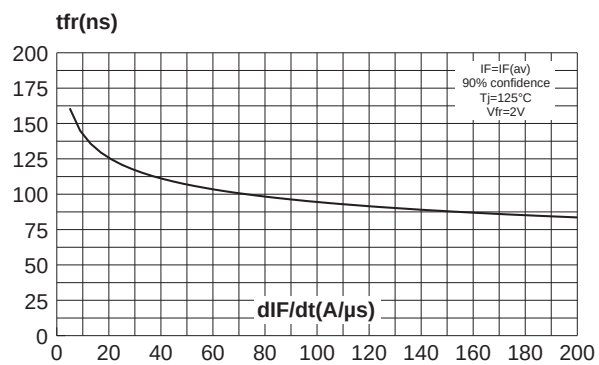
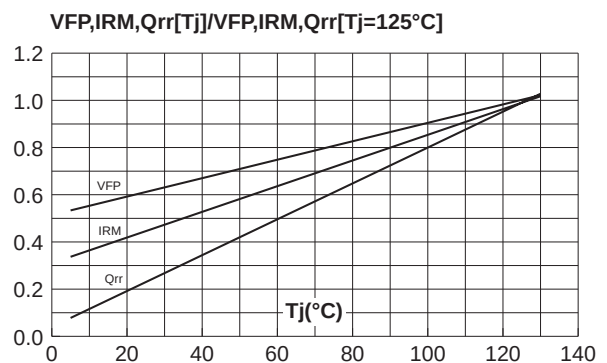
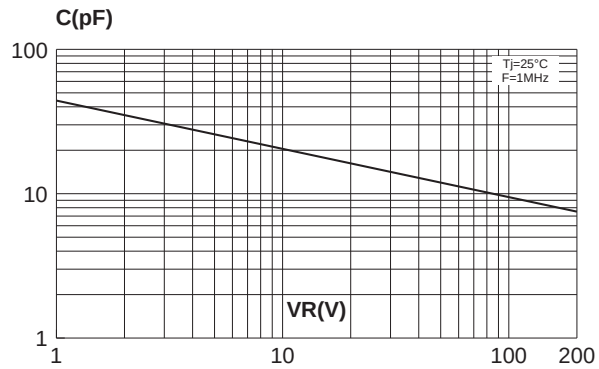


Fig. 10: Dynamic parameters versus junction temperature (damper & modulation diodes).

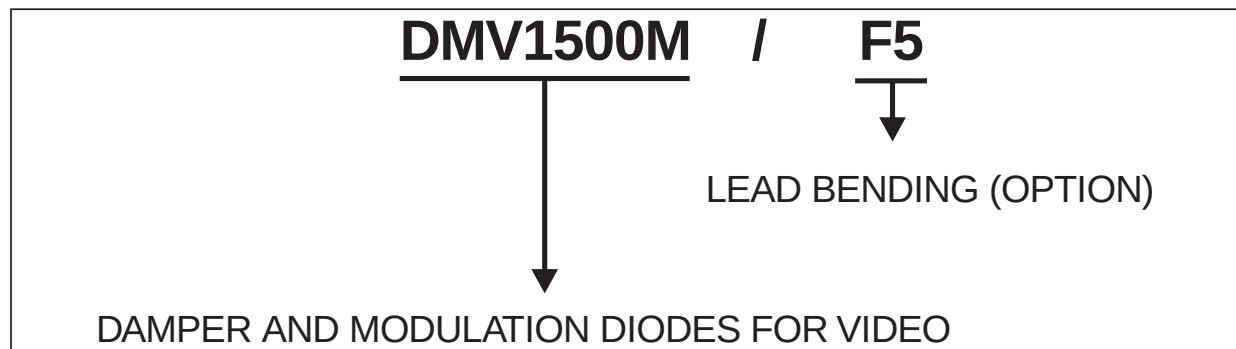


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Fig. 11: Junction capacitance versus reverse voltage applied (typical values) (damper & modulation diodes).



ORDERING INFORMATION

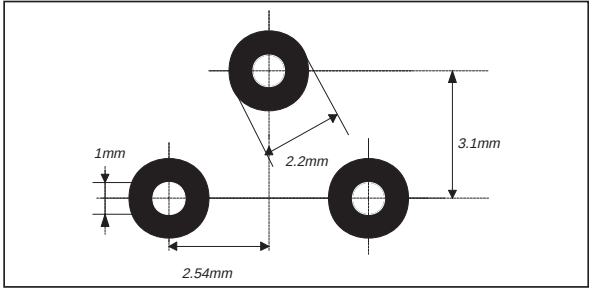


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PACKAGE MECHANICAL DATA
TO-220AB F5 OPTION

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	15.20	15.90	0.598	0.625
a1	24.16	26.90	0.951	1.059
a3	1.65	2.41	0.064	0.094
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
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
I4	15.80	16.80	0.622	0.661
	16.40 typ.		0.645 typ.	
M1	2.92	3.30	0.114	0.129
R1	1.40 typ.		0.055 typ.	
R2	1.40 typ.		0.055 typ.	

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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