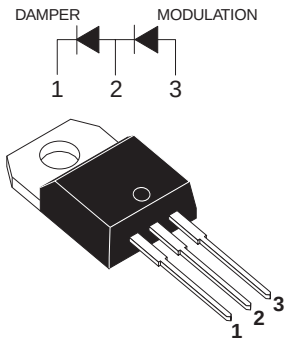
DMV1500M

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



Insulated TO-220AB
(Bending option F5 available)

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		

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 : * tp = 380 µs, δ < 2%
**tp = 5 ms, δ < 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 : * tp = 380 µs, δ < 2%
** tp = 5 ms, δ < 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 = 100mA I_R = 100mA I_{RR} = 10mA	Tj = 25°C	750		ns
t_{rr}	Reverse recovery time	I_F = 1A dI_F/dt = -50A/µs V_R = 30V	Tj = 25°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 = 100mA I_R = 100mA I_{RR} = 10mA	Tj = 25°C	110	350	ns
t_{rr}	Reverse recovery time	I_F = 1A dI_F/dt = -50A/µs V_R = 30V	Tj = 25°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 = 6A dI_F/dt = 80A/µs V_{FR} = 3V	Tj = 100°C	570		ns
V_{FP}	Peak forward voltage	I_F = 6A dI_F/dt = 80A/µs	Tj = 100°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 = 3A dI_F/dt = 80A/µs V_{FR} = 2V	Tj = 100°C		240	ns
V_{FP}	Peak forward voltage	I_F = 3A dI_F/dt = 80A/µs	Tj = 100°C		8	V

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

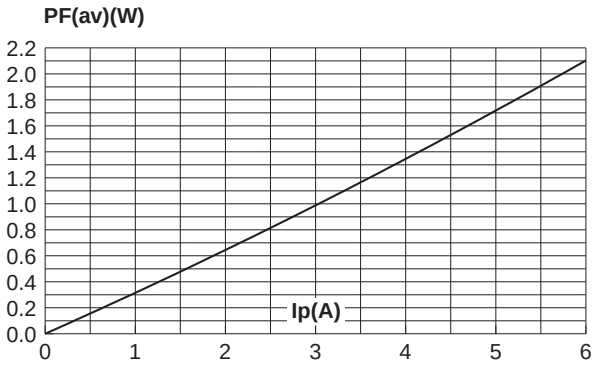


Fig. 1-2: Power dissipation versus peak forward current (triangular waveform, δ = 0.45) (modulation diode).

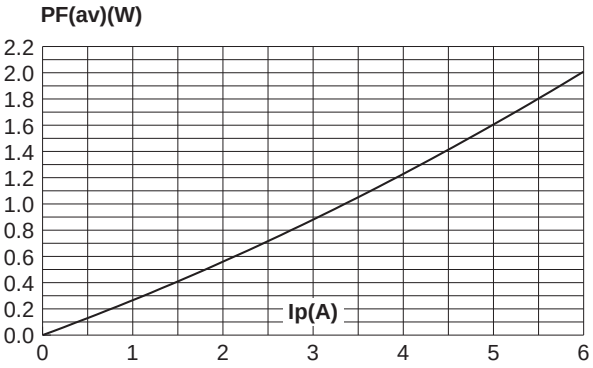


Fig. 2-1: Average forward current versus ambient temperature (damper diode).

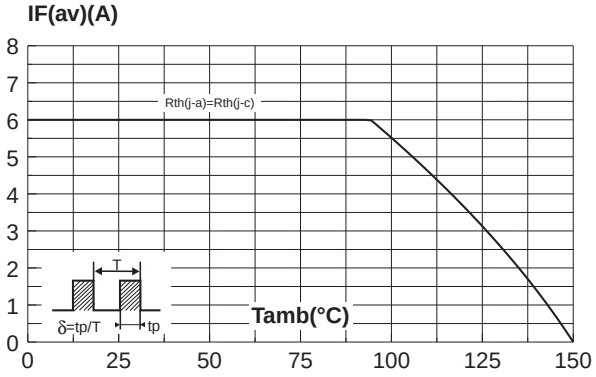


Fig. 2-2: Average forward current versus ambient temperature (modulation diode).

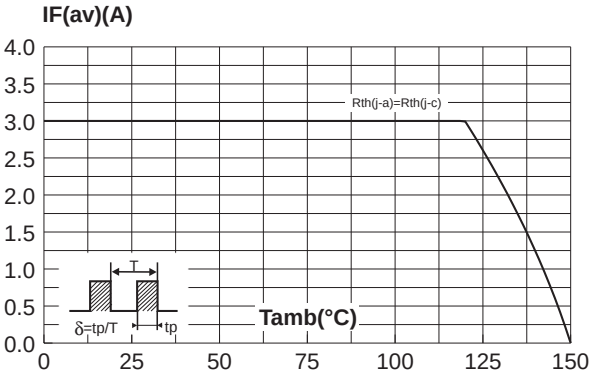


Fig. 3-1: Forward voltage drop versus forward current (damper diode).

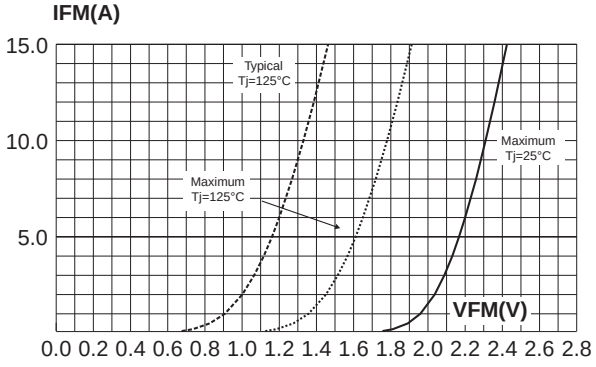


Fig. 3-2: Forward voltage drop versus forward current (modulation diode).

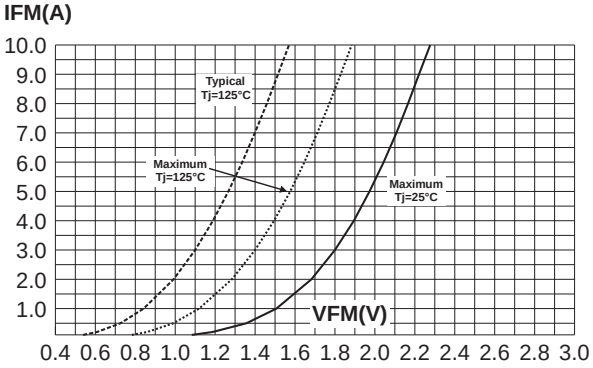


Fig. 4: Relative variation of thermal impedance junction to case versus pulse duration.

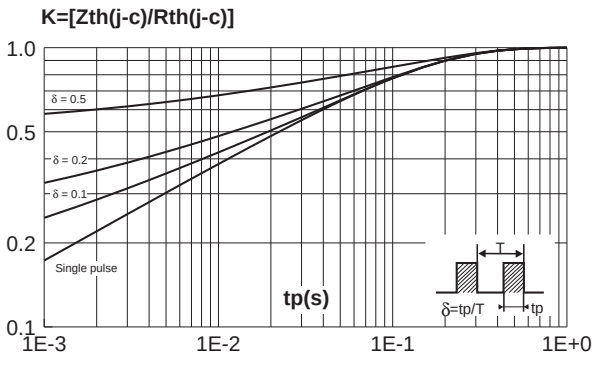


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (damper diode).

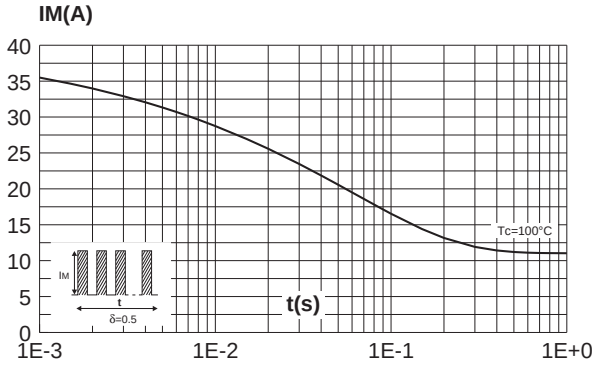


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (modulation diode).

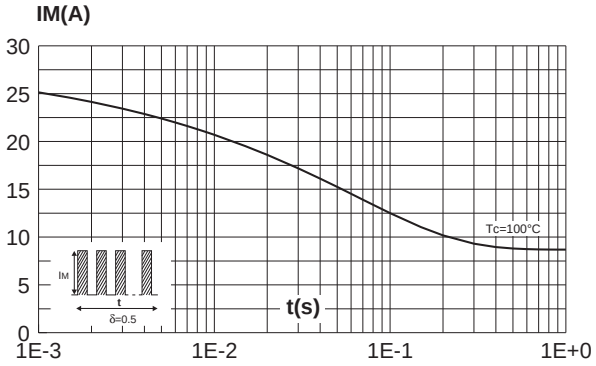


Fig. 6-1: Reverse recovery charges versus dIF/dt (damper diode).

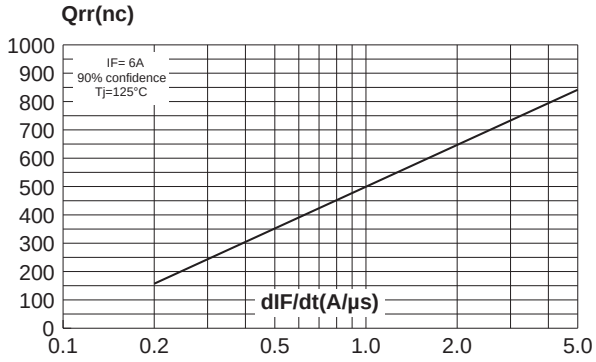


Fig. 6-2: Reverse recovery charges versus dIF/dt (modulation diode).

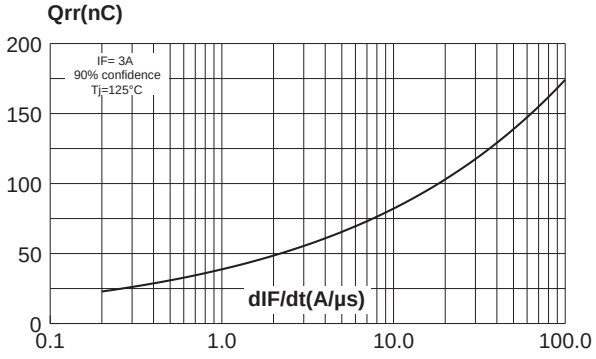


Fig. 7-1: Reverse recovery current versus dIF/dt (damper diode).

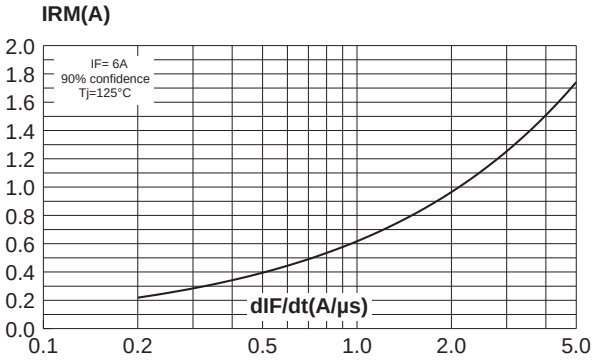


Fig. 7-2: Reverse recovery current versus dIF/dt (modulation diode).

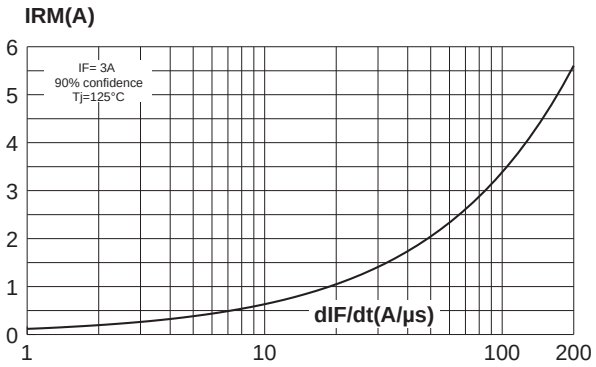


Fig. 8-1: Transient peak forward voltage versus dIF/dt (damper diode).

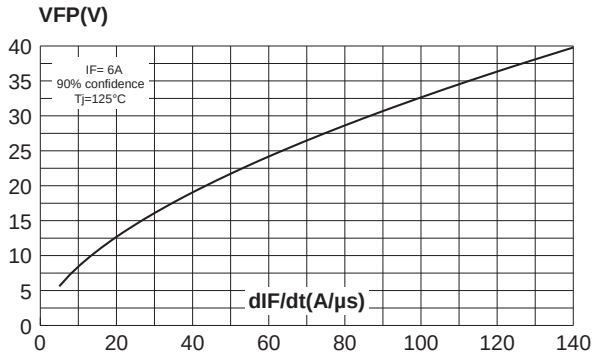


Fig. 8-2: Transient peak forward voltage versus dIF/dt (modulation diode).

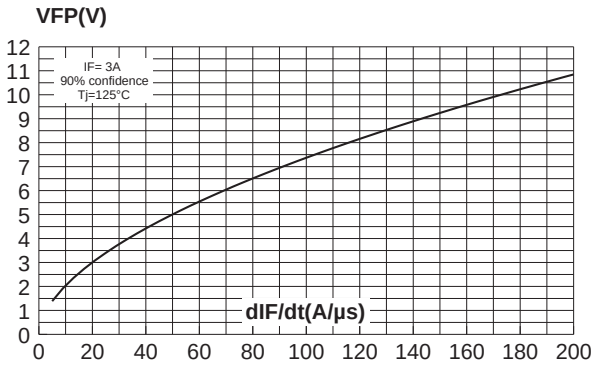


Fig. 9-1: Forward recovery time versus dIF/dt (damper diode).

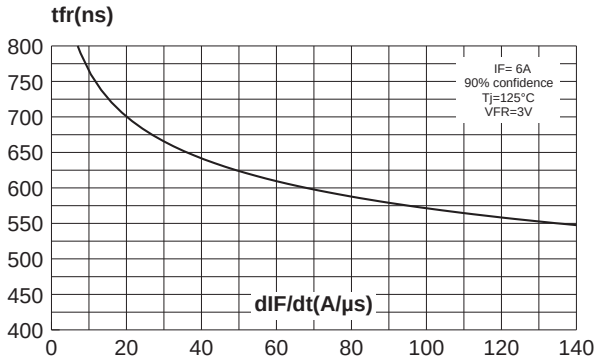


Fig. 9-2: Forward recovery time versus dIF/dt (modulation diode).

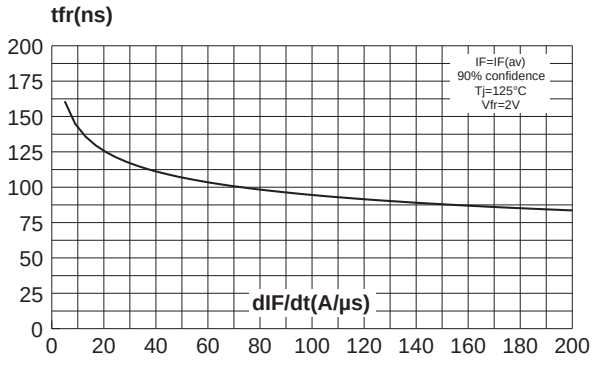


Fig. 10: Dynamic parameters versus junction temperature (damper & modulation diodes).

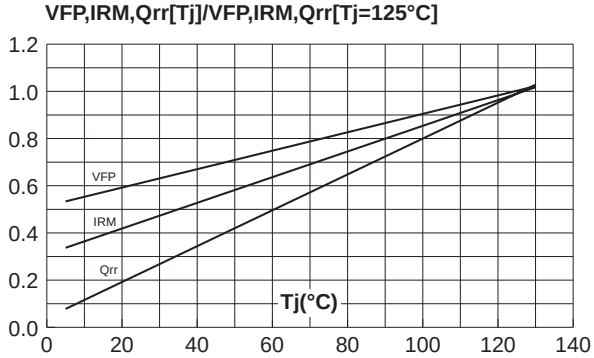
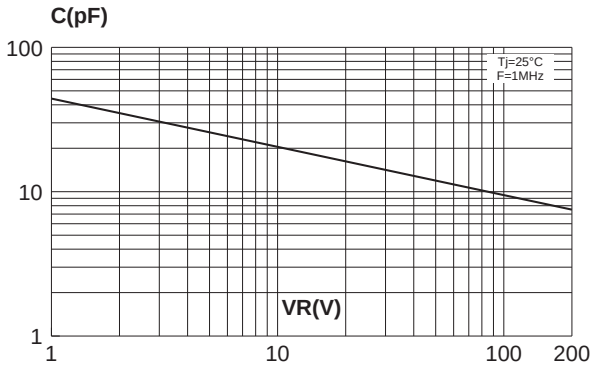
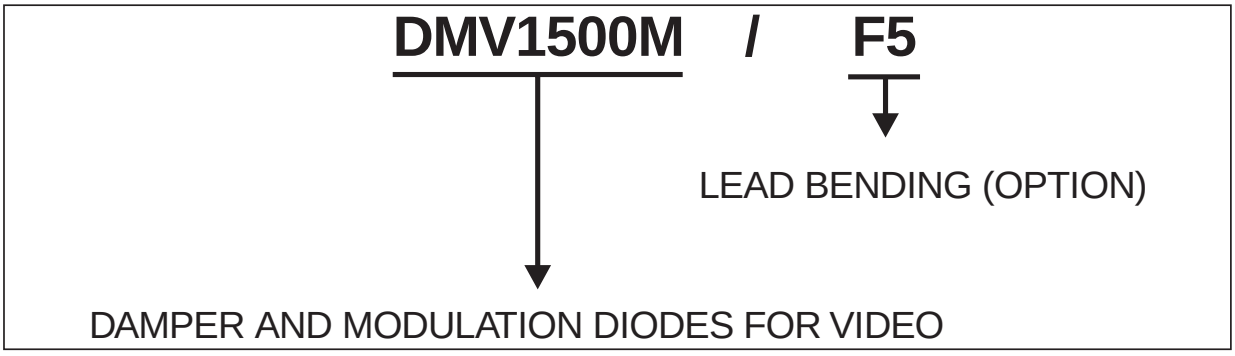


Fig. 11: Junction capacitance versus reverse voltage applied (typical values) (damper & modulation diodes).

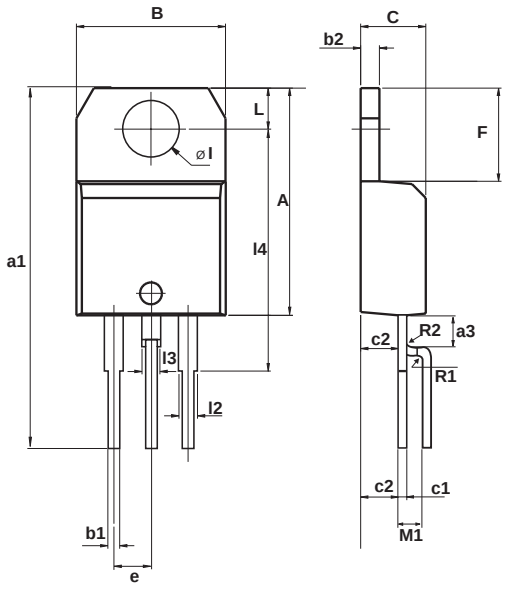


ORDERING INFORMATION



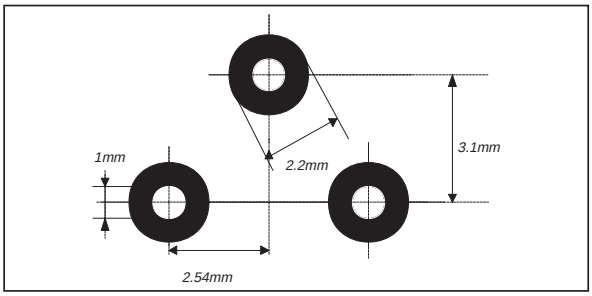
PACKAGE MECHANICAL DATA

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
l2	1.14	1.70	0.044	0.066
l3	1.14	1.70	0.044	0.066
l4	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.	

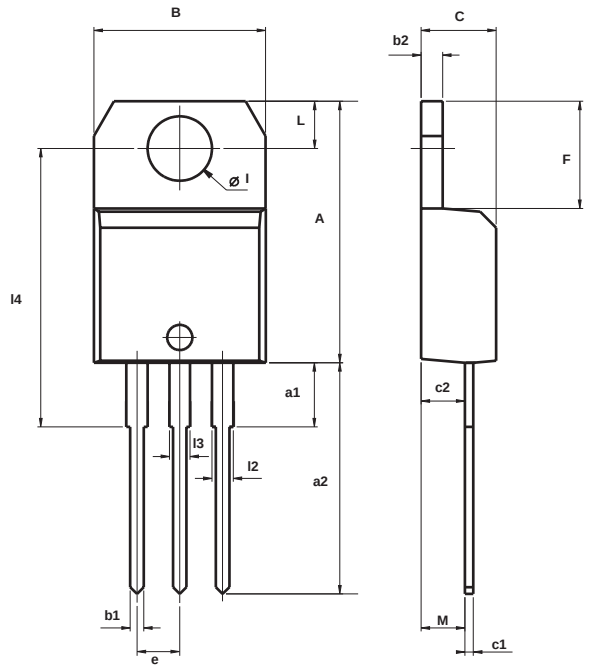
PRINTED CIRCUIT LAYOUT FOR F5 LAYOUT



- 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
l4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
l2	1.14		1.70	0.044		0.066
l3	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