

FRED Module

Fast Recovery Epitaxial Diode

Single Diode

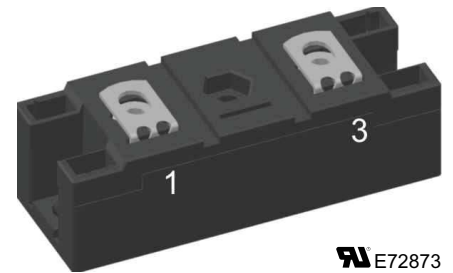
$$V_{RRM} = 1200 \text{ V}$$


$$I_{FAVM} = 453 \text{ A}$$

$$t_{rr} = 500 \text{ ns}$$

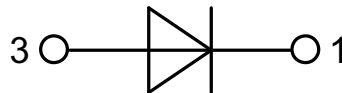
Part number

MEO 450-12DA



 E72873

Backside: isolated



Features / Advantages:

- International standard package with DCB ceramic base plate
- Planar passivated chips
- Short recovery time
- Low switching losses
- Soft recovery behaviour
- High reliability circuit operation
- Low voltage peaks for reduced protection circuits
- Low noise switching
- Low losses

Applications:

- Antiparallel diode for high frequency switching devices
- Free wheeling diode in converters and motor control circuits
- Inductive heating and melting
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Package: Y4-M6

- Isolation voltage: 3600 V~
- Industry standard outline
- Soldering pins for PCB mounting
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

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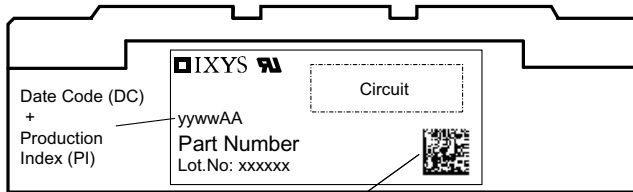


Diode				Ratings			
Symbol	Definitions	Conditions	min.	typ.	max.		
V_{RSM}	max. non-repetitive reverse		$T_{VJ} = 25^{\circ}C$			1200	V
V_{RRM}	max. repetitive reverse		$T_{VJ} = 25^{\circ}C$			1200	V
I_R	reverse current	$V_R = V_{RRM}$ $V_R = 0.8 \cdot V_{RRM}$ $V_R = 0.8 \cdot V_{RRM}$	$T_{VJ} = 25^{\circ}C$			24	mA
			$T_{VJ} = 25^{\circ}C$			6	mA
			$T_{VJ} = 125^{\circ}C$			120	mA
V_F	forward voltage	$I_F = 300 A$	$T_{VJ} = 25^{\circ}C$			1.78	V
			$T_{VJ} = 125^{\circ}C$			1.51	V
		$I_F = 520 A$	$T_{VJ} = 25^{\circ}C$			1.96	V
			$T_{VJ} = 125^{\circ}C$			1.76	V
I_{FRMS}	RMS forward current		$T_C = 75^{\circ}C$			640	A
I_{FAV} ①	average forward current	$T_C = 75^{\circ}C$ rectangular, d = 0.5	$T_{VJ} = 150^{\circ}C$			453	A
V_{TO}	threshold voltage	for power-loss calculations only	$T_{VJ} = T_{VJM}$			1.16	V
r_T	slope resistance					1.15	mΩ
R_{thJC}	thermal resistance junction to case					0.071	K/W
R_{thCH}	thermal resistance junction to heatsink				0.043		K/W
P_{tot}	total power dissipation		$T_{VJ} = 25^{\circ}C$			1750	W
I_{FSM}	max. surge forward current	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	$T_{VJ} = 45^{\circ}C$			4.80	kA
						5.28	kA
			$T_{VJ} = 150^{\circ}C$			4.32	kA
						4.75	kA
I^2t	I^2t value for fusing	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	$T_{VJ} = 45^{\circ}C$			115.2	kA ² s
						117.1	kA ² s
			$T_{VJ} = 150^{\circ}C$			93.3	kA ² s
						94.8	kA ² s
t_{rr}	max. reverse recovery current	$I_F = 450 A$; $-di_F/dt = 800 A/\mu s$	$T_{VJ} = 25^{\circ}C$		250	300	ns
			$T_{VJ} = 100^{\circ}C$		500	600	ns
I_{RM}	reverse recovery time	$V_R = 600 V$; $L \leq 0.05 \mu H$	$T_{VJ} = 25^{\circ}C$		80	100	A
			$T_{VJ} = 100^{\circ}C$		125	150	A

① I_{FAVM} rating includes reverse blocking losses at T_{VJM} , $V_R = 0.8 V_{RRM}$, duty cycle d = 0.5

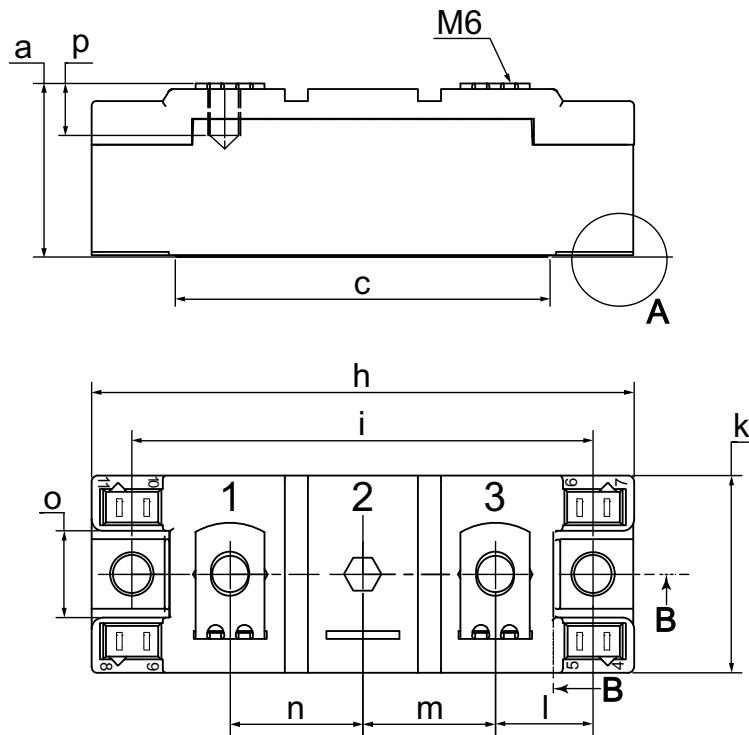


Package Y4-M6				Ratings		
Symbol	Definitions	Conditions	min.	typ.	max.	
I_{RMS}	RMS current	per terminal			300	A
T_{VJ}	virtual junction temperature		-40		150	°C
T_{op}	operation temperature		-40		125	°C
T_{stg}	storage temperature		-40		125	°C
Weight					108	g
M_D	mounting torque		2.25		2.75	Nm
M_T	terminal torque		4.5		5.5	Nm
$d_{Spp/App}$	creepage distance on surface striking distance through air	terminal to terminal	14.0	10.0		mm
$d_{Spb/Apb}$		terminal to backside	16.0	16.0		mm
V_{ISOL}	isolation voltage	t = 1 second t = 1 minute	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA		3600 3000	V V

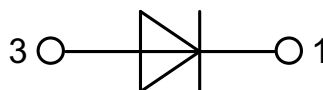
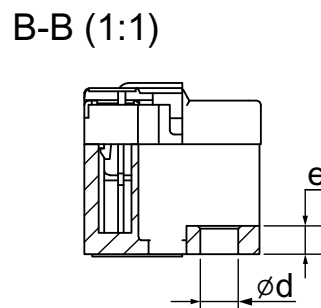
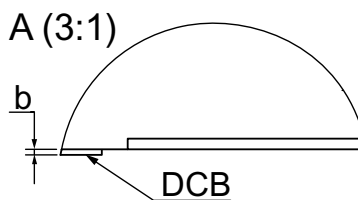


Data Matrix: part no. (1-19), DC + PI (20-25), lot.no.# (26-31), blank (32), serial no.# (33-36)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MEO 450-12DA	MEO 450-12DA	Box	6	464635

Outlines Y4-M6


Dim.	MIN [mm]	MAX [mm]	MIN [inch]	MAX [inch]
a	30.0	30.6	1.181	1.205
b	typ. 0.25		typ. 0.010	
c	64.0	65.0	2.520	2.559
d	6.5	7.0	0.256	0.275
e	4.9	5.1	0.193	0.201
h	93.5	94.5	3.681	3.720
i	79.5	80.5	3.130	3.169
k	33.4	34.0	1.315	1.339
l	16.7	17.3	0.657	0.681
m	22.7	23.3	0.894	0.917
n	22.7	23.3	0.894	0.917
o	14.0	15.0	0.551	0.591
p	typ. 10.5		typ. 0.413	



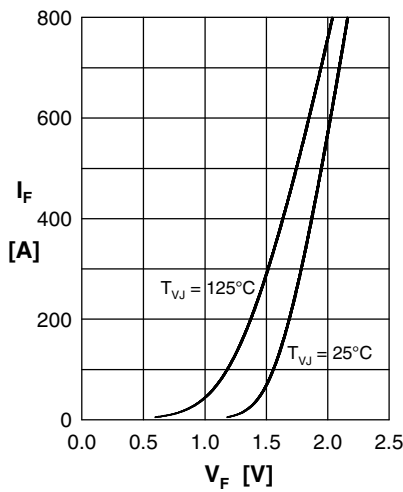
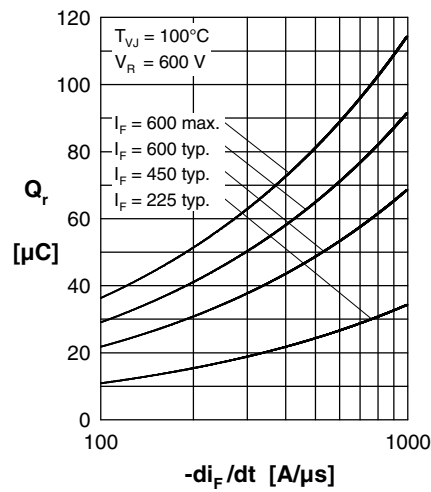
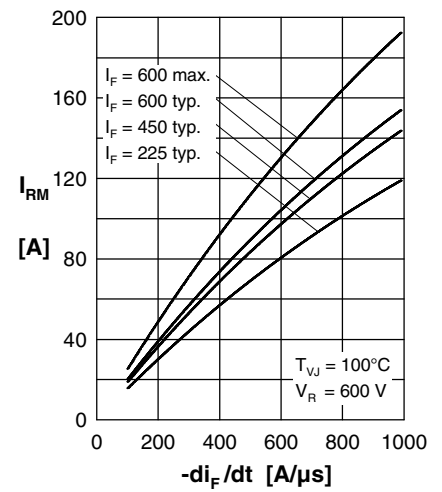
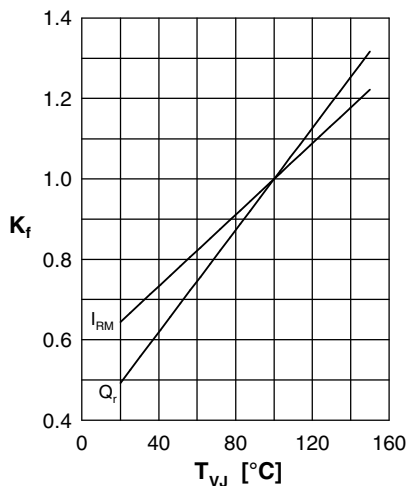
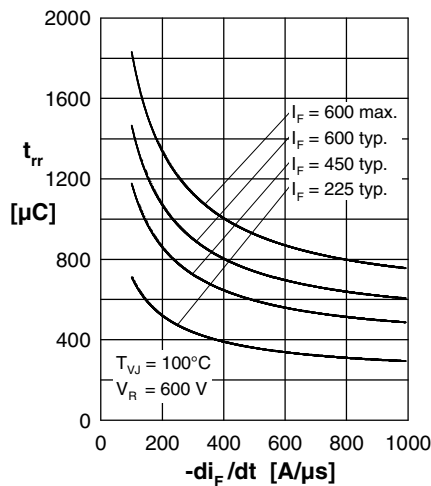
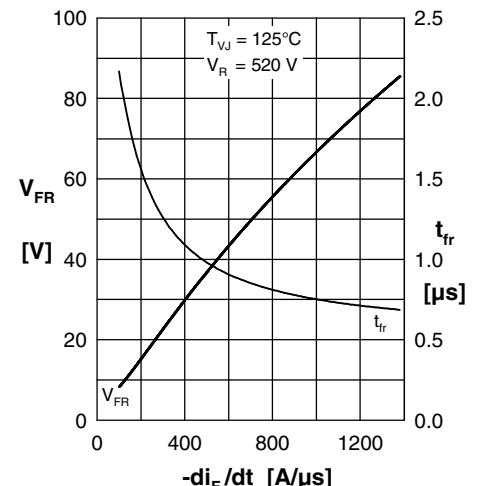
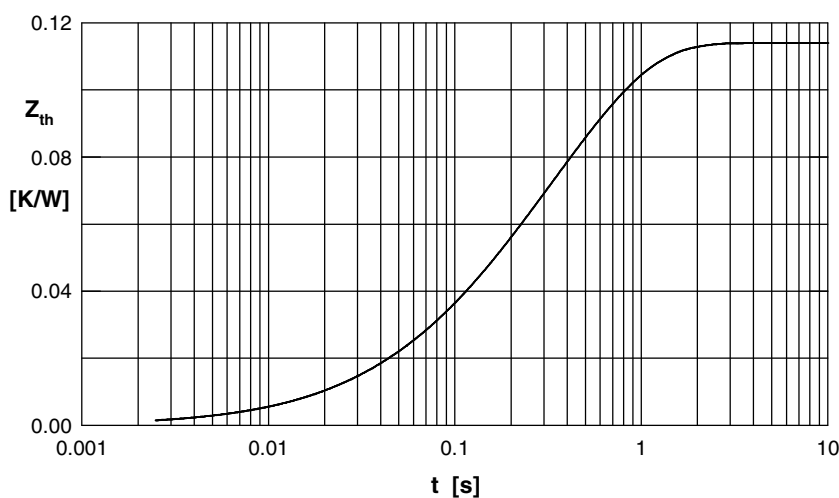
Curves

 Fig. 1 Typ. forward current I_F vs. V_F

 Fig. 2 Typ. reverse recovery charge Q_r versus $-di_F/dt$

 Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

 Fig. 4 Typ. dynamic parameters Q_r , I_{RM} versus T_{VJ}

 Fig. 5 Typ. recovery time t_{rr} vs. $-di_F/dt$

 Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus T_{VJ}


Fig. 7 Typ. transient thermal impedance junction to case

 Constants for Z_{thJS} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.001	0.08
2	0.004	0.024
3	0.027	0.112
4	0.082	0.464