FRED Module

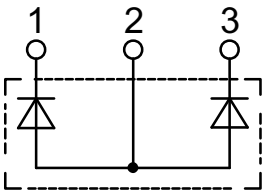
Fast Recovery Epitaxial Diode

V_{RRM} = 1200 V
I_{FAVM} = 260 A
t_{rr} = 400 ns

Part number
MEA 250-12DA
MEK 250-12DA
MEE 250-12DA

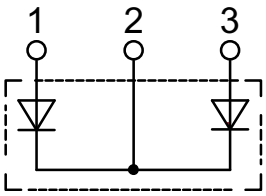
E72873
Backside: isolated

Common Anode



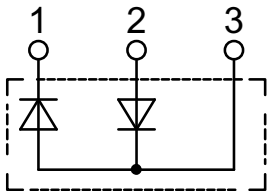
MEA 250-12DA

Common Cathode



MEK 250-12DA

Phase-Leg



MEE 250-12DA

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

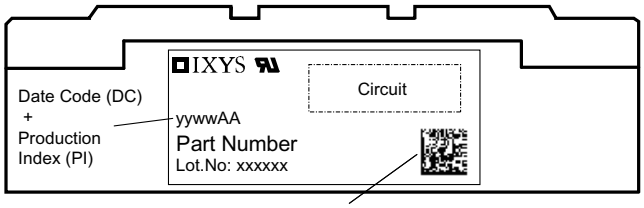
Applications:
- Antiparallel diode for high frequency switching devices
- Free wheeling diode in converters and motor control circuits
- Inductive heating and melting
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Package: Y4-M6
- Isolation voltage: 3600 V~
- Industry standard outline
- Soldering pins for PCB mounting
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

Diode				Ratings			
Symbol	**Definitions**	**Conditions**		**min.**	**typ.**	**max.**	
V_{RSM}	*max. non-repetitive reverse*		T_{VJ} = 25°C			1200	V
V_{RRM}	*max. repetitive reverse*		T_{VJ} = 25°C			1200	V
I_R	*reverse current*	$V_R = V_{RRM}$	T_{VJ} = 25°C			12	mA
		$V_R = 0.8 \cdot V_{RRM}$	T_{VJ} = 25°C			3	mA
		$V_R = 0.8 \cdot V_{RRM}$	T_{VJ} = 125°C			60	mA
V_F	*forward voltage*	I_F = 150 A	T_{VJ} = 25°C			1.69	V
			T_{VJ} = 125°C			1.38	V
		I_F = 260 A	T_{VJ} = 25°C			1.80	V
			T_{VJ} = 125°C			1.54	V
I_{FRMS}	*RMS forward current*		T_C = 75°C			367	A
I_{FAV} ①	*average forward current*	T_C = 75°C rectangular, d = 0.5	T_{VJ} = 150°C			260	A
V_{T0}	*threshold voltage*	for power-loss calculations only	$T_{VJ} = T_{VJM}$			1.16	V
r_T	*slope resistance*					1.46	mΩ
R_{thJC}	*thermal resistance junction to case*					0.143	K/W
R_{thCH}	*thermal resistance junction to heatsink*				0.085		K/W
P_{tot}	*total power dissipation*		T_{VJ} = 25°C			875	W
I_{FSM}	*max. surge forward current*	t = 10 ms (50 Hz), sine	T_{VJ} = 45°C			2.40	kA
		t = 8.3 ms (60 Hz), sine				2.64	kA
		t = 10 ms (50 Hz), sine	T_{VJ} = 150°C			2.16	kA
		t = 8.3 ms (60 Hz), sine				2.38	kA
I^2t	*I^2t value for fusing*	t = 10 ms (50 Hz), sine	T_{VJ} = 45°C			28.8	kA^2s
		t = 8.3 ms (60 Hz), sine				29.3	kA^2s
		t = 10 ms (50 Hz), sine	T_{VJ} = 150°C			23.3	kA^2s
		t = 8.3 ms (60 Hz), sine				23.8	kA^2s
t_{rr}	*max. reverse recovery current*	I_F = 250 A; $-di_F/dt$ = 400 A/µs	T_{VJ} = 25°C		200	250	ns
			T_{VJ} = 100°C		400	500	ns
I_{RM}	*reverse recovery time*	V_R = 600 V; L ≤ 0.05 µH	T_{VJ} = 25°C		44	52	A
			T_{VJ} = 100°C		68	80	A

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

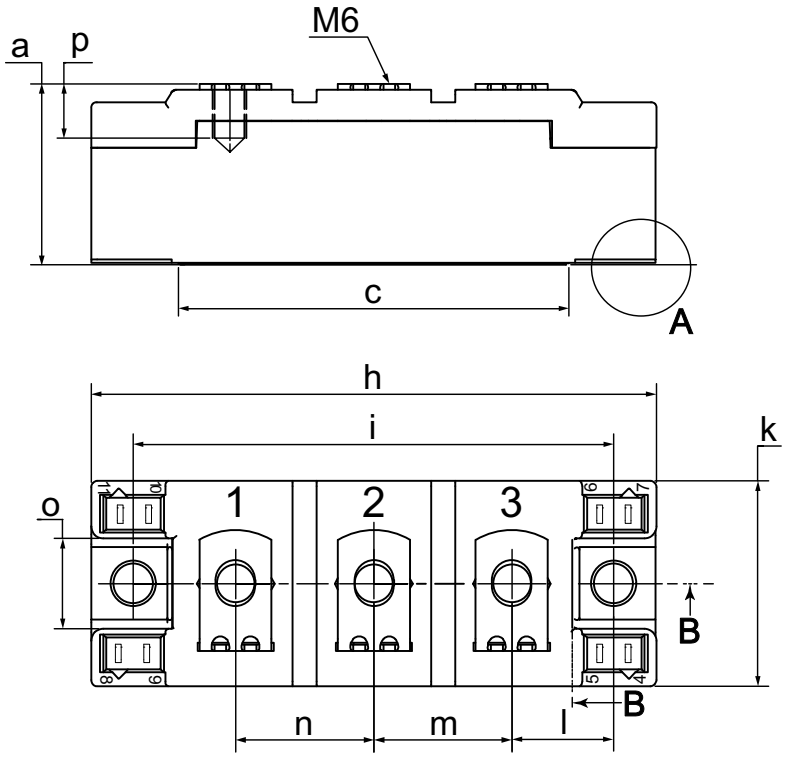
Package	Y4-M6				Ratings			
Symbol	Definitions	Conditions			min.	typ.	max.	
I_{RMS}	*RMS current*	per terminal					300	A
T_{VJ} T_{op} T_{stg}	*virtual junction temperature* *operation temperature* *storage temperature*				-40 -40 -40		150 125 125	°C °C °C
Weight						126		g
M_D	*mounting torque*				2.25		2.75	Nm
M_T	*terminal torque*				4.5		5.5	Nm
$d_{Spp/App}$ $d_{Spb/Apb}$	*creepage distance on surface* | *striking distance through air*		terminal to terminal terminal to backside	14.0 16.0	10.0 16.0			mm mm
V_{ISOL}	*isolation voltage*	t = 1 second t = 1 minute	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA		3600 3000			V V



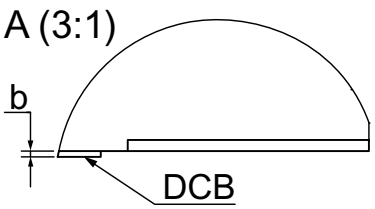
Data Matrix: *part no.* (1-19), DC + *PI* (20-25), *lot.no.#* (26-31), *blank* (32), *serial no.#* (33-36)

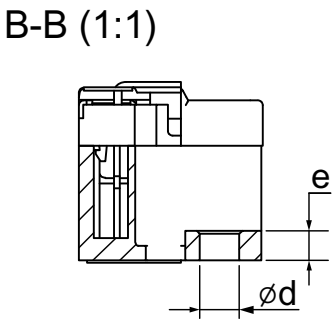
Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MEA 250-12DA	MEA 250-12DA	Box	36	464678
Standard	MEK 250-12DA	MEK 250-12DA	Box	36	464627
Standard	MEE 250-12DA	MEE 250-12DA	Box	36	464694

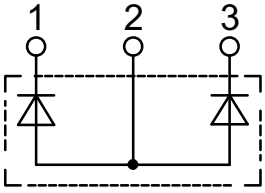
Outlines Y4-M6



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	

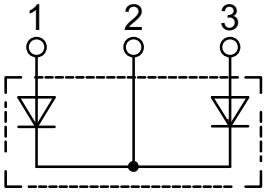






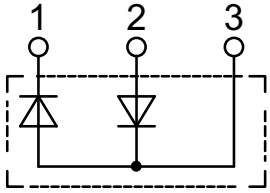
Common Anode

MEA 250-12DA



Common Cathode

MEK 250-12DA



Phase-Leg

MEE 250-12DA

Curves

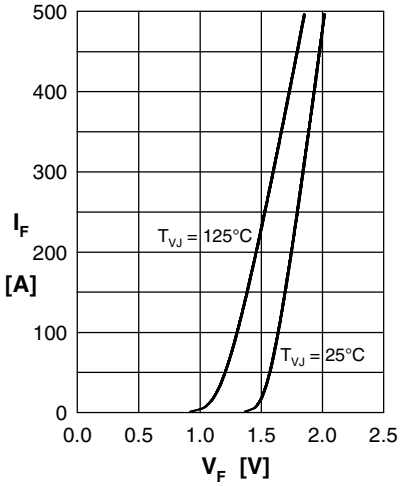


Fig. 1 Typ. forward current I_F vs. voltage drop V_F per leg

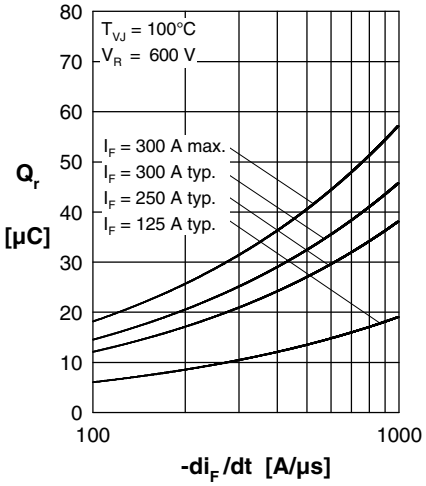


Fig. 2 Typ. reverse recovery charge Q_r versus $-di_F/dt$

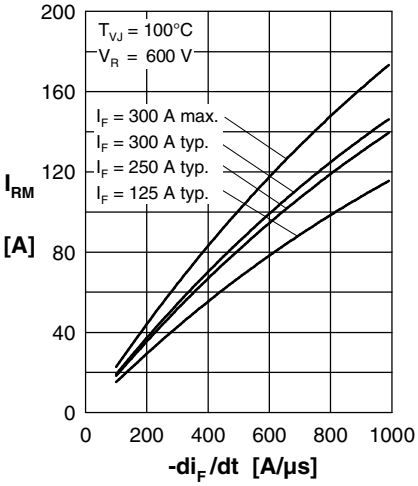


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

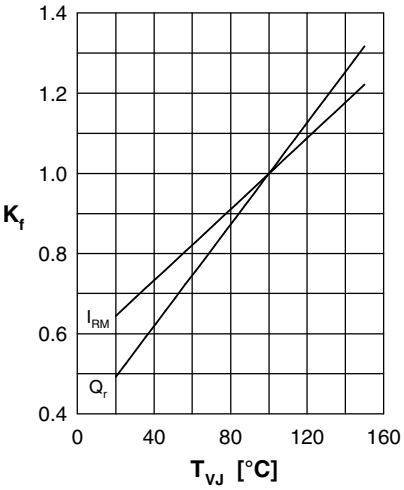


Fig. 4 Typ. dynamic parameters Q_r, I_{RM} versus junction temperature T_{VJ}

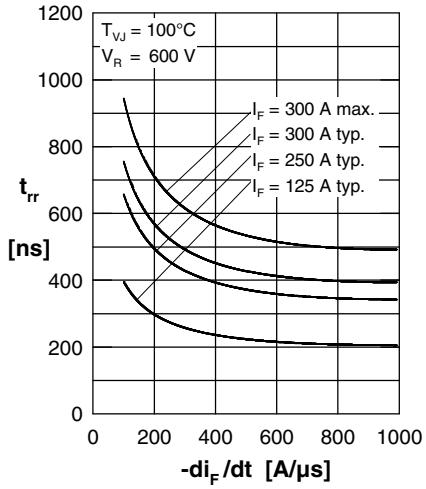


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

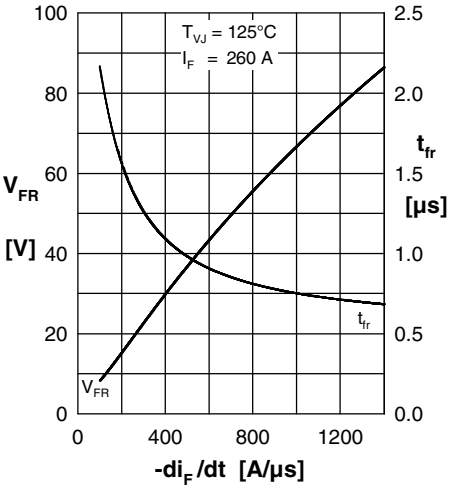


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus $-di_F/dt$

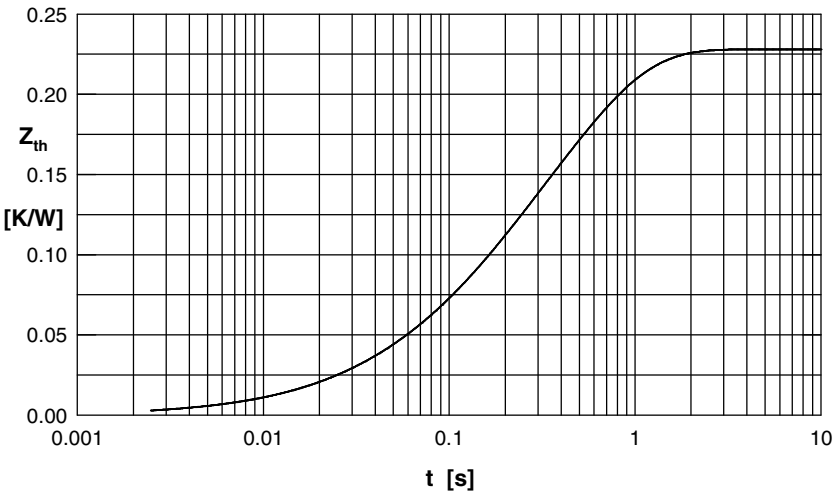


Fig. 7 Typ. transient thermal impedance junction to heatsink

Constants for Z_{thJS} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.002	0.08
2	0.008	0.024
3	0.054	0.112
4	0.164	0.464