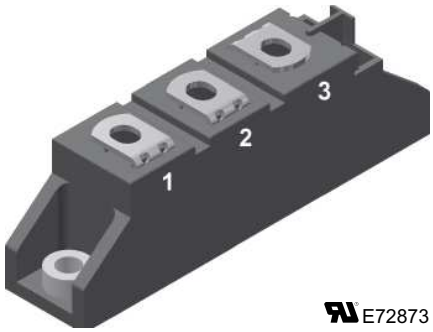
FRED Module

V_{RRM} = 1200 V
I_{FAV} = 75 A
t_{rr} = 230 ns

Fast Recovery Epitaxial Diode

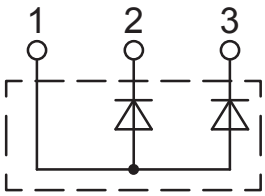
Part number

MEA 75-12DA
MEK 75-12DA
MEE 75-12DA



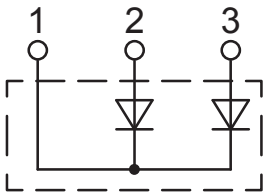
E72873
Backside: isolated

Common Anode



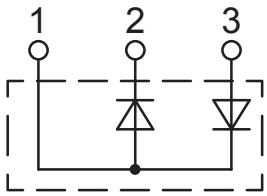
MEA 75-12DA

Common Cathode



MEK 75-12DA

Phase-Leg



MEE 75-12DA

Features / Advantages:

- Planar passivated chips
- 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

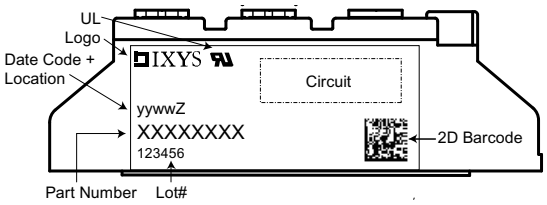
Package: TO-240AA

- Isolation voltage: 4800 V~
- Industry standard outline
- RoHS compliant
- Height: 30 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

Diode				Ratings			
Symbol	**Definitions**	**Conditions**		**min.**	**typ.**	**max.**	
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			1200	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1200	V
I_R	*reverse current*	$V_R = V_{RRM}$	T_{VJ} = 25°C			2	mA
		$V_R = 0.8 \cdot V_{RRM}$	T_{VJ} = 25°C			0.5	mA
		$V_R = 0.8 \cdot V_{RRM}$	T_{VJ} = 125°C			34	mA
V_F	*forward voltage*	I_F = 100 A	T_{VJ} = 25°C			2.17	V
			T_{VJ} = 125°C			1.85	V
		I_F = 300 A	T_{VJ} = 25°C			2.64	V
			T_{VJ} = 125°C			2.58	V
I_{FRMS}	*RMS forward current*		T_C = 75°C			107	A
I_{FAV} ①	*average forward current*	T_C = 75°C rectangular, d = 0.5	T_{VJ} = 150°C			75	A
V_{T0}	*threshold voltage*	for power-loss calculations only	$T_{VJ} = T_{VJM}$			1.48	V
r_T	*slope resistance*					3.65	mΩ
R_{thJC}	*thermal resistance junction to case*					0.45	K/W
R_{thCH}	*thermal resistance junction to heatsink*				0.10		K/W
P_{tot}			T_C = 25°C			280	W
I_{FSM}	*max. surge forward current*	t = 10 ms (50 Hz), sine	T_{VJ} = 45°C			1200	A
		t = 8.3 ms (60 Hz), sine				1300	A
		t = 10 ms (50 Hz), sine	T_{VJ} = 150°C			1080	A
		t = 8.3 ms (60 Hz), sine				1170	A
I^2t	*I^2t value for fusing*	t = 10 ms (50 Hz), sine	T_{VJ} = 45°C			7200	A^2s
		t = 8.3 ms (60 Hz), sine				7100	A^2s
		t = 10 ms (50 Hz), sine	T_{VJ} = 150°C			5800	A^2s
		t = 8.3 ms (60 Hz), sine				5700	A^2s
t_{rr}	*max. reverse recovery current*	I_F = 70 A; V_R = 600 V	T_{VJ} = 25°C		140	200	ns
			T_{VJ} = 100°C		230	300	ns
I_{RM}	*reverse recovery time*	-di/dt = 400 A/µs; L ≤ 0.05 µH	T_{VJ} = 25°C		25	30	A
			T_{VJ} = 100°C		33	40	A

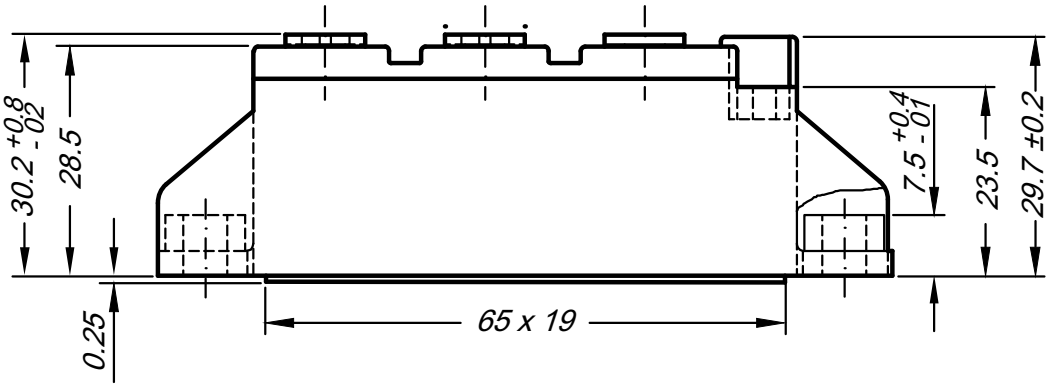
① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5

Package	TO-240AA				Ratings			
Symbol	Definitions	Conditions			min.	typ.	max.	
I_{RMS}	*RMS current*	per terminal					200	A
T_{VJ}	*virtual junction temperature*				-40		150	°C
T_{op}	*operation temperature*				-40		125	°C
T_{stg}	*storage temperature*				-40		125	°C
Weight						76		g
M_D	*mounting torque*				2.5		4	Nm
M_T	*terminal torque*				2.5		4	Nm
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	13.0	9.7			mm
$d_{Spb/Apb}$			*terminal to backside*	16.0	16.0			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA		4800			V
		t = 1 minute			4000			V

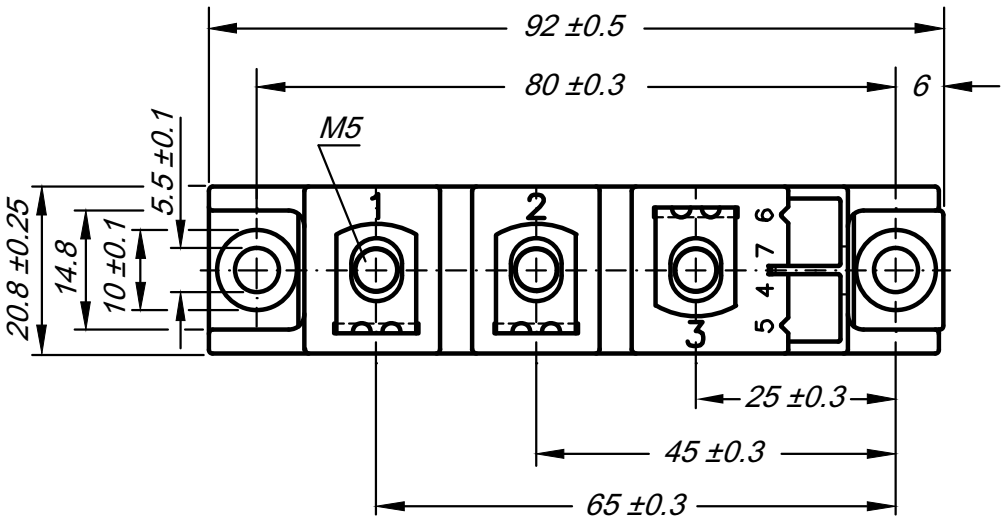


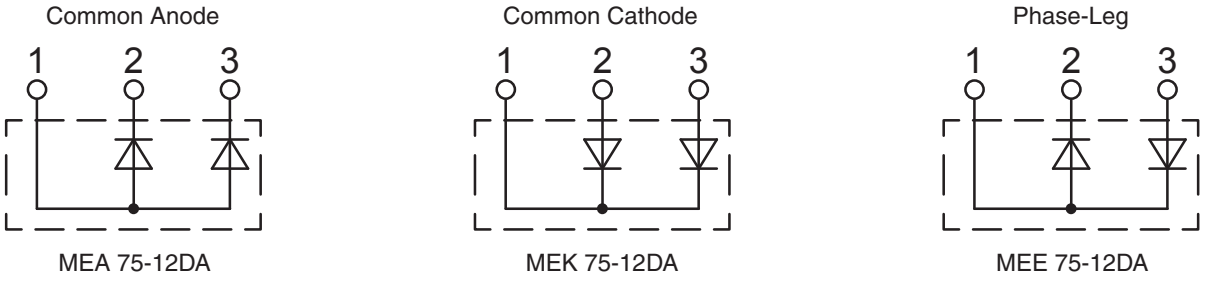
Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MEA 75-12DA	MEA 75-12DA	Box	36	469130
Standard	MEK 75-12DA	MEK 75-12DA	Box	36	468541
Standard	MEE 75-12DA	MEE 75-12DA	Box	36	469297

Outlines TO-240AA



General tolerance: DIN ISO 2768 class „c“





Curves

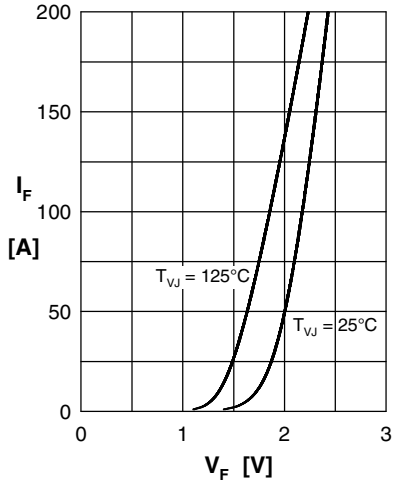


Fig. 1 Typ. forward current I_F vs. voltage drop V_F per leg

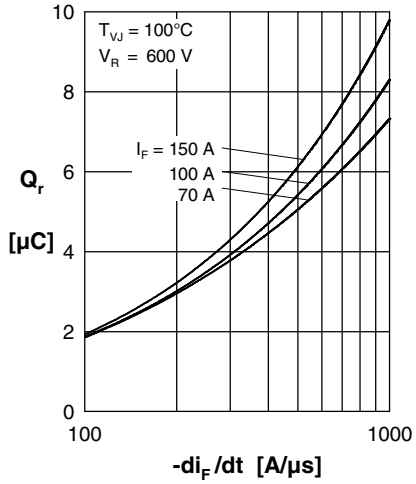


Fig. 2 Typ. reverse recovery charge Q_r versus -di$_F$/dt

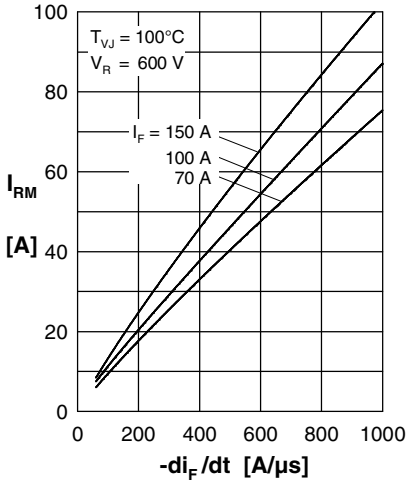


Fig. 3 Typ. peak reverse current I_{RM} versus -di$_F$/dt

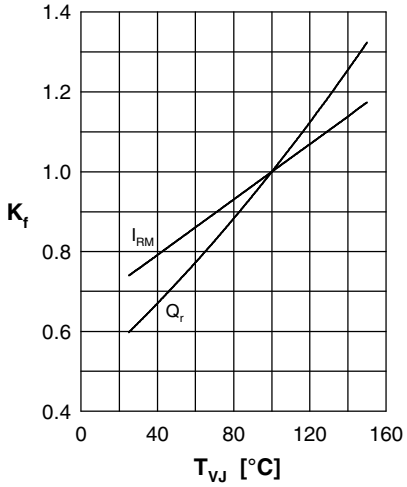


Fig. 4 Typ. dynamic parameters Q_r, I_{RM} vs. junction temperature T_{VJ}

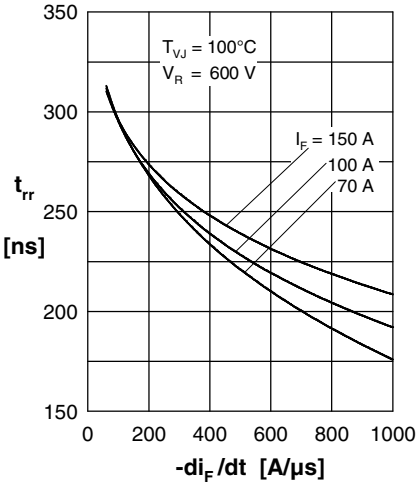


Fig. 5 Typ. recovery time t_{rr} versus -di$_F$/dt

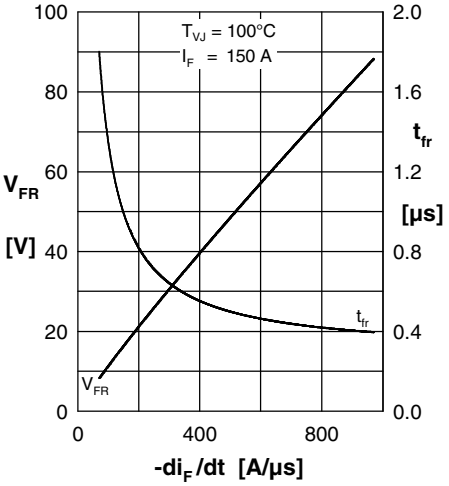


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus -di$_F$/dt

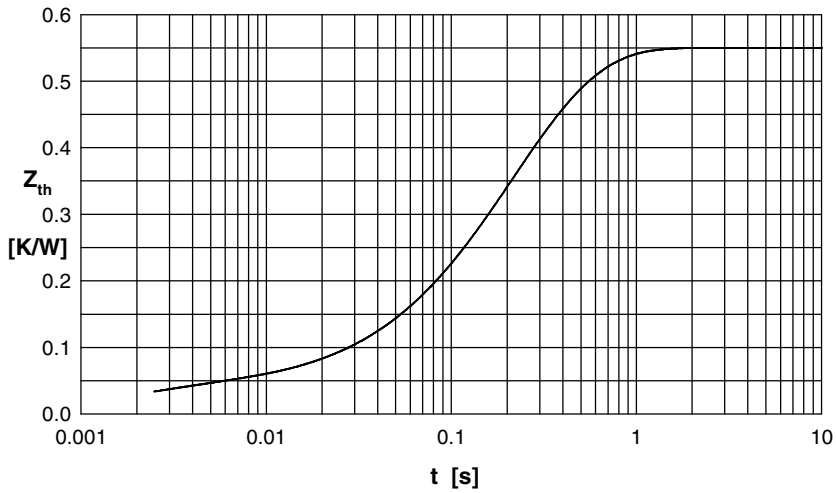


Fig. 7 Typ. transient thermal impedance junction to heatsink

Constants for Z_{thJS} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.037	0.002
2	0.138	0.134
3	0.093	0.250
4	0.282	0.274