

HiPerFRED Module

$$V_{RRM} = 400 \text{ V}$$

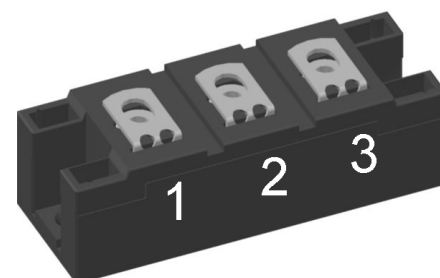
$$I_{FAV} = 2 \times 300 \text{ A}$$

$$t_{rr} = 60 \text{ ns}$$

Common Cathode

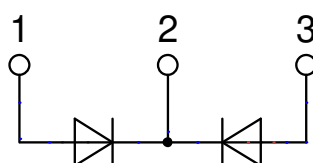
Part number

MEK600-04DA



Backside: isolated

 E72873



Features / Advantages:

- Planar passivated chips
- Low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low I_{rm} -values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{rm} reduces:
 - Power dissipation within the diode
 - Turn-on loss in the commutating switch

Applications:

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode
- Rectifiers in switch mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)

Package: Y4

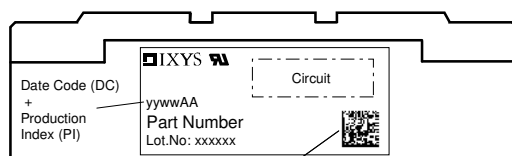
- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Height: 30 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

Disclaimer Notice

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Fast Diode				Ratings				
Symbol	Definition	Conditions		min.	typ.	max.	Unit	
V _{RSM}	max. non-repetitive reverse blocking voltage	T _{VJ} = 25°C				400	V	
V _{RRM}	max. repetitive reverse blocking voltage	T _{VJ} = 25°C				400	V	
I _R	reverse current, drain current	V _R = 400 V	T _{VJ} = 25°C			6	mA	
		V _R = 400 V	T _{VJ} = 125°C			18	mA	
V _F	forward voltage drop	I _F = 300 A	T _{VJ} = 25°C			1.36	V	
		I _F = 600 A				1.79	V	
		I _F = 300 A	T _{VJ} = 125°C			1.20	V	
		I _F = 600 A				1.68	V	
I _{FAV}	average forward current	T _C = 95°C rectangular d = 0.5	T _{VJ} = 150°C			300	A	
V _{F0}	threshold voltage	} for power loss calculation only		T _{VJ} = 150°C		0.74	V	
r _F	slope resistance					1.42	mΩ	
R _{thJC}	thermal resistance junction to case					0.11	K/W	
R _{thCH}	thermal resistance case to heatsink				0.08		K/W	
P _{tot}	total power dissipation	T _C = 25°C				1100	W	
I _{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine; V _R = 0 V		T _{VJ} = 45°C		3.00	kA	
C _J	junction capacitance	V _R = 200 V f = 1 MHz		T _{VJ} = 25°C	935		pF	
I _{RM}	max. reverse recovery current	} I _F = 300 A; V _R = 200 V -di _F /dt = 400 A/μs		T _{VJ} = 25 °C	29		A	
				T _{VJ} = 125 °C	58		A	
t _{rr}	reverse recovery time			T _{VJ} = 25 °C	60		ns	
				T _{VJ} = 125 °C	255		ns	

Package Y4				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
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					150		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	50/60 Hz, RMS; I _{ISOL} ≤ 1 mA	3600			V
		t = 1 minute		3000			V



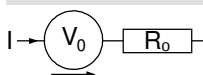
Data Matrix: part no. (1-19), DC + PI (20-25), lot.no.# (26-31), blank (32), serial no.# (33-36)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MEK600-04DA	MEK600-04DA	Box	6	485365

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 150^\circ\text{C}$



Fast Diode

$V_{0\max}$ threshold voltage

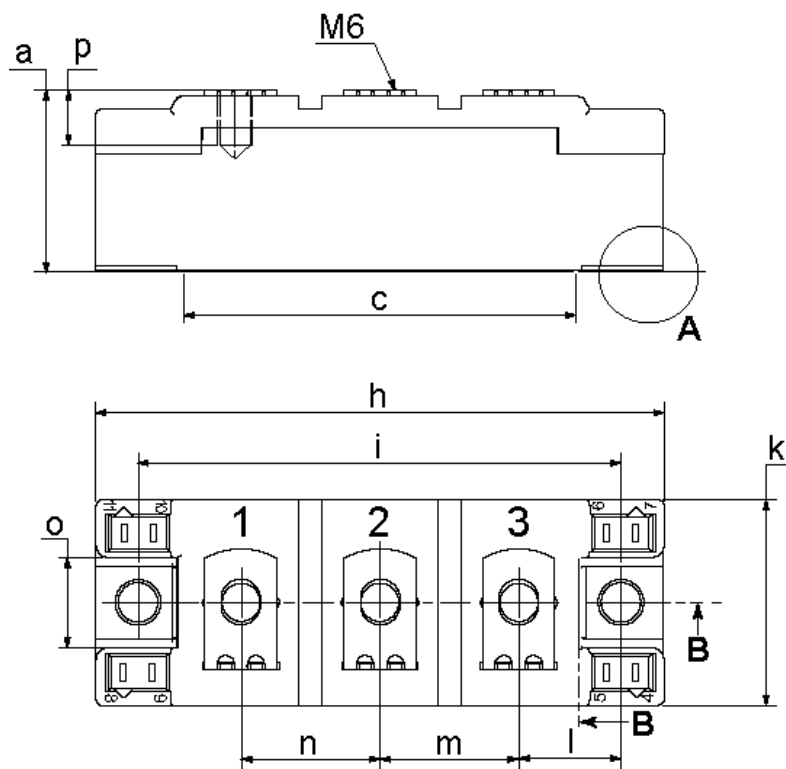
0.74

V

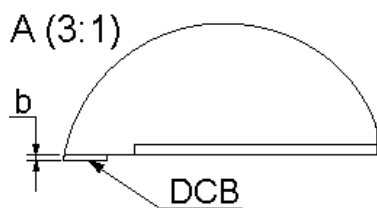
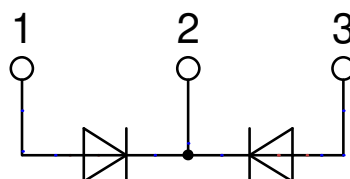
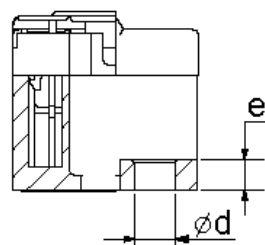
$R_{0\max}$ slope resistance *

0.17

mΩ

Outlines Y4


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	


B-B (1:1)


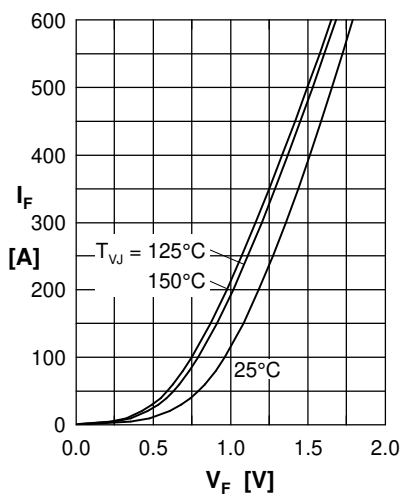
Fast Diode


Fig. 1 Forward current
 I_F vs. V_F

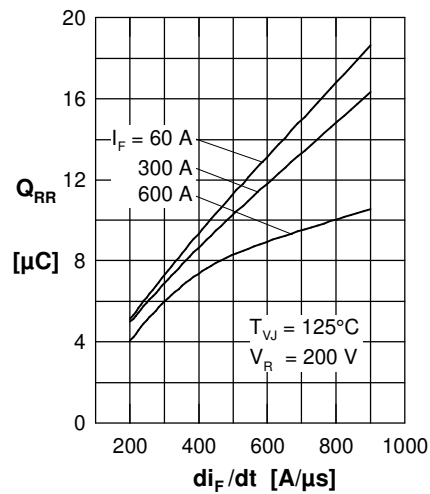


Fig. 2 Typ. reverse recovery charge
 Q_{RR} versus di_F/dt

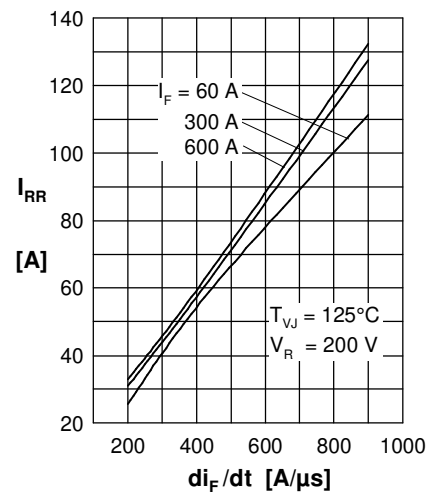


Fig. 3 Typ. reverse recovery current
 I_{RR} versus di_F/dt

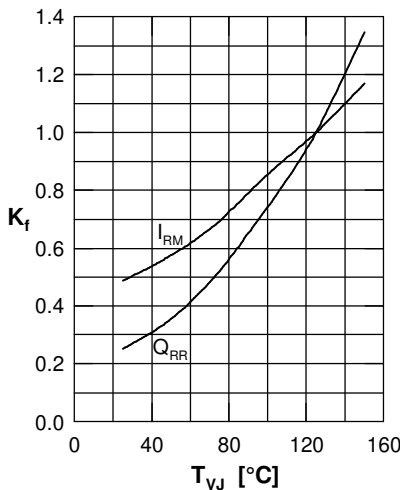


Fig. 4 Typ. dynamic parameters
 Q_{RR} , I_{RM} versus T_{VJ}

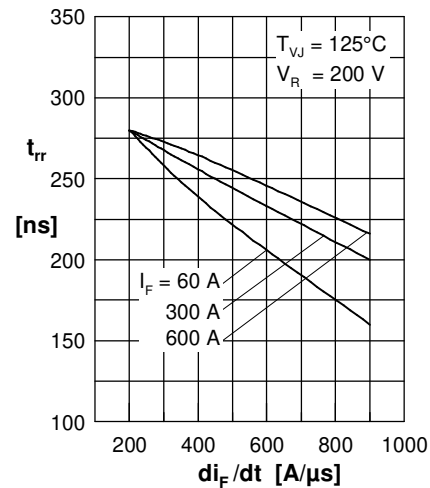


Fig. 5 Typ. reverse recovery time
 t_{rr} versus di_F/dt

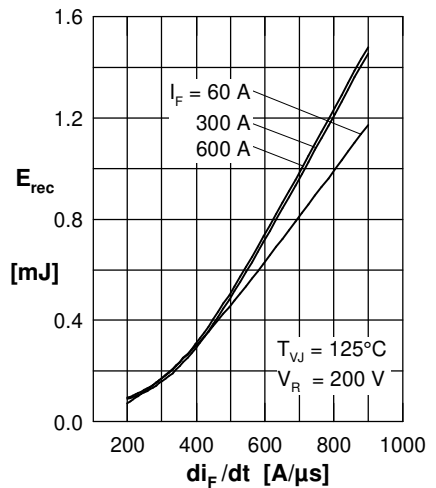


Fig. 7 Typ. recovery energy
 E_{rec} versus di_F/dt

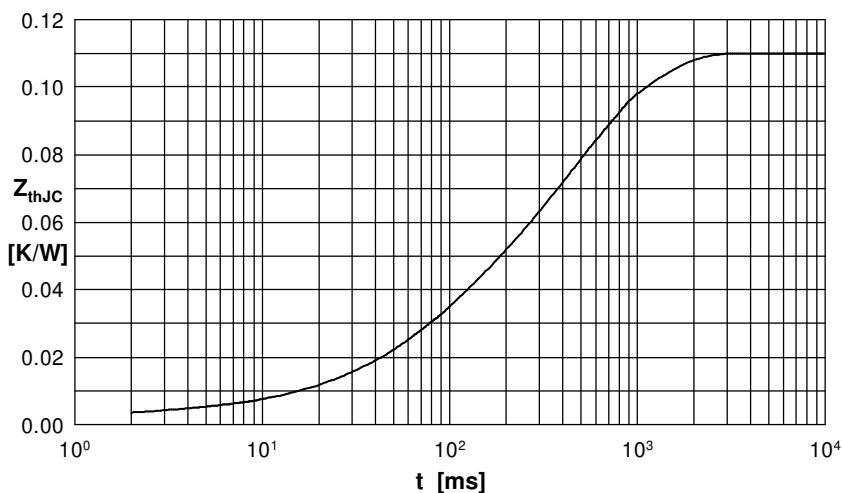


Fig. 8 Transient thermal impedance junction to case

R_{thi} [K/W]	t_i [s]
0.0030	0.001
0.0210	0.070
0.0390	0.380
0.0470	0.610