

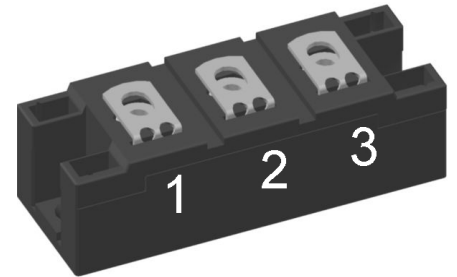
# HiPerFRED Module

$V_{RRM} = 400\text{ V}$   
 $I_{FAV} = 2 \times 300\text{ A}$   
 $t_{rr} = 60\text{ ns}$

## Common Cathode

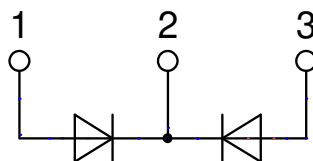
Part number

**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					400	V
$V_{RRM}$	max. repetitive reverse blocking voltage					400	V
$I_R$	reverse current, drain current	$V_R = 400\text{ V}$	$T_{VJ} = 25^\circ\text{C}$			6	mA
		$V_R = 400\text{ V}$	$T_{VJ} = 125^\circ\text{C}$			18	mA
$V_F$	forward voltage drop	$I_F = 300\text{ A}$	$T_{VJ} = 25^\circ\text{C}$			1.36	V
		$I_F = 600\text{ A}$				1.79	V
		$I_F = 300\text{ A}$	$T_{VJ} = 125^\circ\text{C}$			1.20	V
		$I_F = 600\text{ A}$				1.68	V
$I_{FAV}$	average forward current	$T_C = 95^\circ\text{C}$ rectangular $d = 0.5$	$T_{VJ} = 150^\circ\text{C}$			300	A
$V_{FO}$	threshold voltage	} for power loss calculation only				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			$T_C = 25^\circ\text{C}$		1100	W
$I_{FSM}$	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$		$T_{VJ} = 45^\circ\text{C}$		3.00	kA
$C_J$	junction capacitance	$V_R = 200\text{ V}$ $f = 1\text{ MHz}$		$T_{VJ} = 25^\circ\text{C}$		935	pF
$I_{RM}$	max. reverse recovery current	} $I_F = 300\text{ A}; V_R = 200\text{ V}$		$T_{VJ} = 25^\circ\text{C}$		29	A
				$T_{VJ} = 125^\circ\text{C}$		58	A
$t_{rr}$	reverse recovery time	} $-di_F/dt = 400\text{ A}/\mu\text{s}$		$T_{VJ} = 25^\circ\text{C}$		60	ns
				$T_{VJ} = 125^\circ\text{C}$		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	
<b>Weight</b>					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			3600	V	
		t = 1 minute	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA		3000	V	



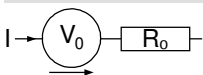
Data Matrix: part no. (1-19), DC + PI (20-25), lot.no.# (26-31), blank (32), serial no.# (33-36)

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

$T_{VJ} = 150$  °C



**Fast Diode**

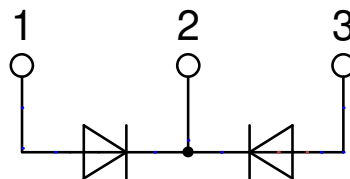
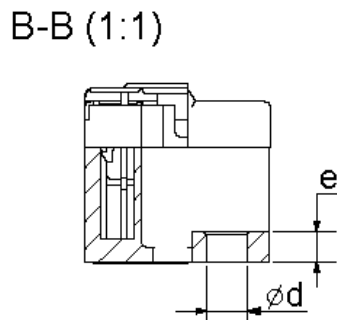
$V_{0\ max}$	threshold voltage	0.74	V
$R_{0\ max}$	slope resistance *	0.17	mΩ



**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	





**Fast Diode**

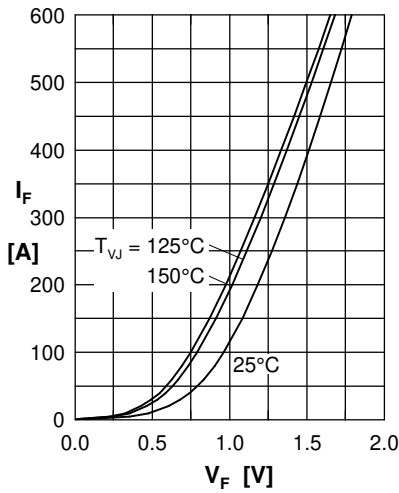


Fig. 1 Forward current  $I_F$  vs.  $V_F$

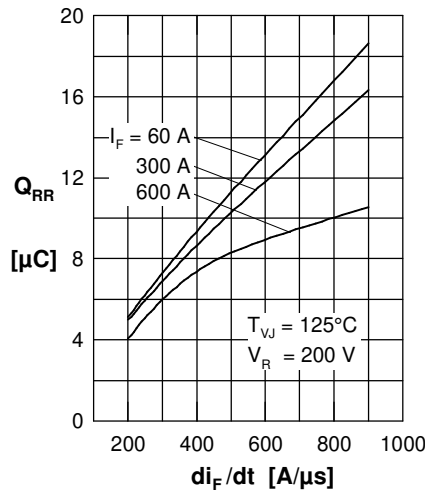


Fig. 2 Typ. reverse recovery charge  $Q_{RR}$  versus  $di_F/dt$

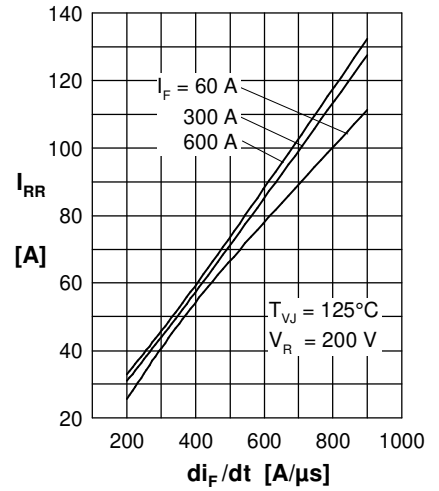


Fig. 3 Typ. reverse recovery current  $I_{RR}$  versus  $di_F/dt$

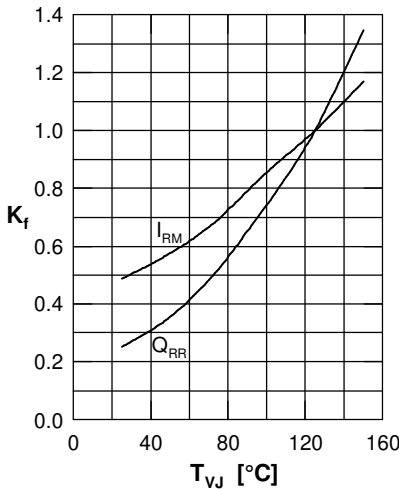


Fig. 4 Typ. dynamic parameters  $Q_{RR}$ ,  $I_{RM}$  versus  $T_{VJ}$

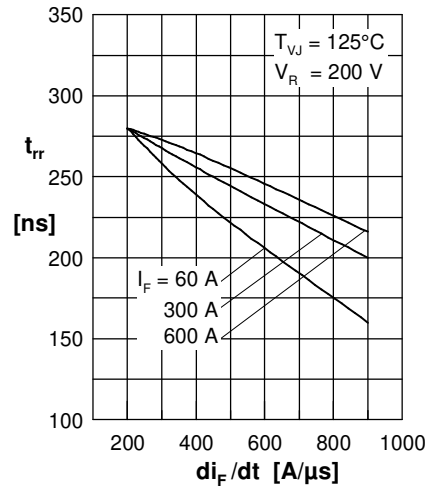


Fig. 5 Typ. reverse recovery time  $t_{rr}$  versus  $di_F/dt$

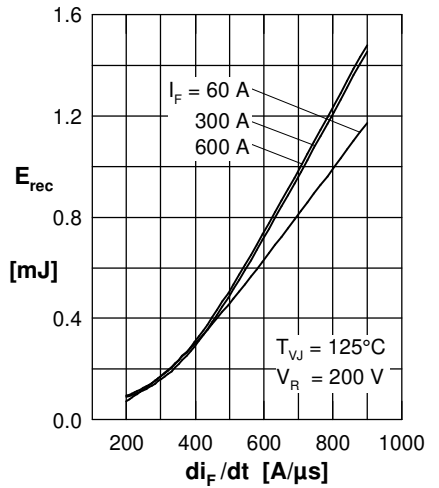


Fig. 7 Typ. recovery energy  $E_{rec}$  versus  $di_F/dt$

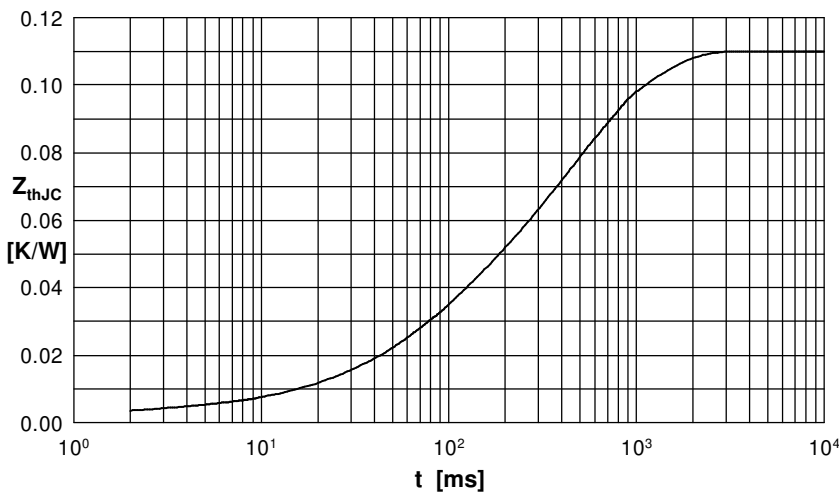


Fig. 8 Transient thermal impedance junction to case

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