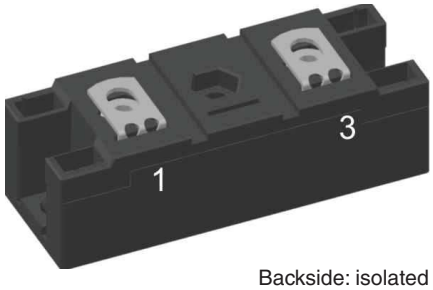
Fast Recovery Epitaxial Diode (FRED)

V_{RRM} = 200 V
I_{FAVM} = 582 A
t_{rr} = 150 ns

Single Diode

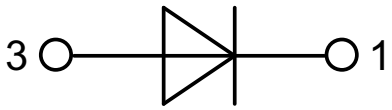
Part number

MEO 550-02DA



Backside: isolated

E72873



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

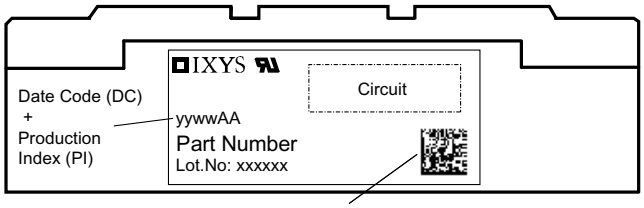
Package: Y4-M6

- 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			200	V
V_{RRM}	*max. repetitive reverse*		T_{VJ} = 25°C			200	V
I_R	*reverse current*	$V_R = V_{RRM}$	T_{VJ} = 25°C			5	mA
		$V_R = 0.8 \cdot V_{RRM}$	T_{VJ} = 25°C			4	mA
		$V_R = 0.8 \cdot V_{RRM}$	T_{VJ} = 125°C			160	mA
V_F	*forward voltage*	I_F = 300 A	T_{VJ} = 25°C			1.10	V
			T_{VJ} = 125°C			0.84	V
		I_F = 520 A	T_{VJ} = 25°C			1.25	V
			T_{VJ} = 125°C			1.08	V
I_{FRMS}	*RMS forward current*		T_C = 75°C			822	A
I_{FAVM} ①	*max. average forward current*	rectangular, d = 0.5	T_C = 75°C			582	A
V_{T0}	*threshold voltage*	for power-loss calculations only	$T_{VJ} = T_{VJM}$			0.52	V
r_T	*slope resistance*					1.06	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°C			1750	W
I_{FSM}	*max. surge forward current*	t = 10 ms (50 Hz), sine	T_{VJ} = 45°C			4.80	kA
		t = 8.3 ms (60 Hz), sine				5.28	kA
		t = 10 ms (50 Hz), sine	T_{VJ} = 150°C			4.32	kA
		t = 8.3 ms (60 Hz), sine				4.75	kA
I^2t	*I^2t value for fusing*	t = 10 ms (50 Hz), sine	T_{VJ} = 45°C			115.2	kA^2s
		t = 8.3 ms (60 Hz), sine				117.1	kA^2s
		t = 10 ms (50 Hz), sine	T_{VJ} = 150°C			93.3	kA^2s
		t = 8.3 ms (60 Hz), sine				94.8	kA^2s
t_{rr}	*max. reverse recovery current*	I_F = 500 A; $-di_F/dt$ = 200 A/µs	T_{VJ} = 25°C		60	100	ns
			T_{VJ} = 100°C		150	200	ns
I_{RM}	*reverse recovery time*	V_R = 100 V; L ≤ 0.05 µH	T_{VJ} = 25°C		7	9	A
			T_{VJ} = 100°C		13	15	A

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

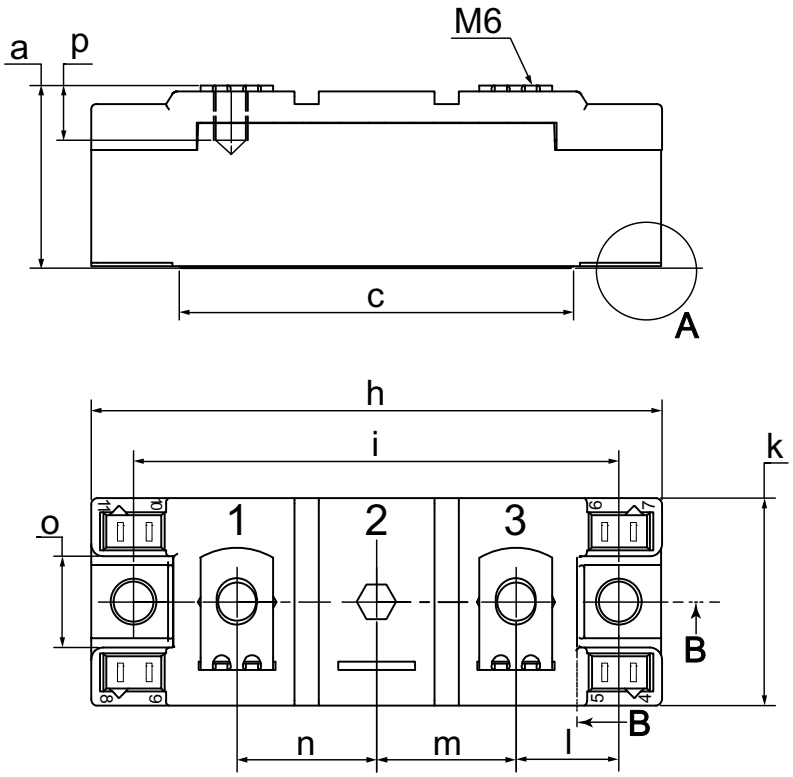
Package	Y4-M6				Ratings			
Symbol	**Definitions**	**Conditions**			**min.**	**typ.**	**max.**	
I_{RMS}	*RMS current*	per terminal					300	A
T_{VJ} T_{op} T_{stg}	*virtual junction temperature* *operation temperature* *storage temperature*				-40 -40 -40		150 125 125	°C °C °C
Weight						108		g
M_D	*mounting 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)

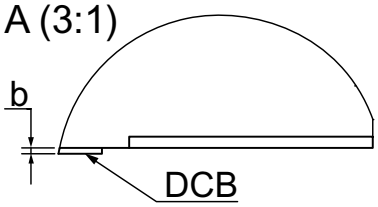
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MEO 550-02DA	MEO 550-02DA	Box	6	464651

Outlines Y4-M6

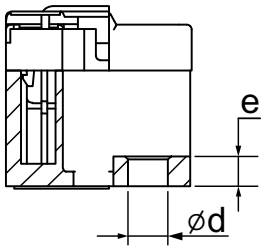


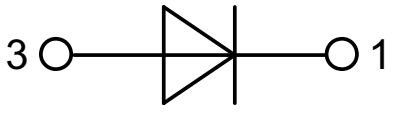
Dim.	MIN [mm]	MAX [mm]	MIN [inch]	MAX [inch]
a	30.0	30.6	1.181	1.205
b	typ. 0.25		typ. 0.010	
c	64.0	65.0	2.520	2.559
d	6.5	7.0	0.256	0.275
e	4.9	5.1	0.193	0.201
h	93.5	94.5	3.681	3.720
i	79.5	80.5	3.130	3.169
k	33.4	34.0	1.315	1.339
l	16.7	17.3	0.657	0.681
m	22.7	23.3	0.894	0.917
n	22.7	23.3	0.894	0.917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

A (3:1)



B-B (1:1)





Curves

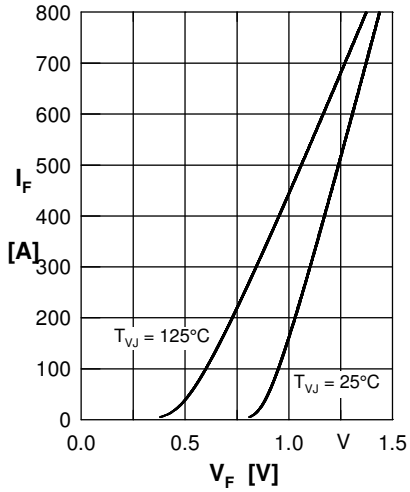


Fig. 1 Forward current I_F vs voltage drop V_F per leg

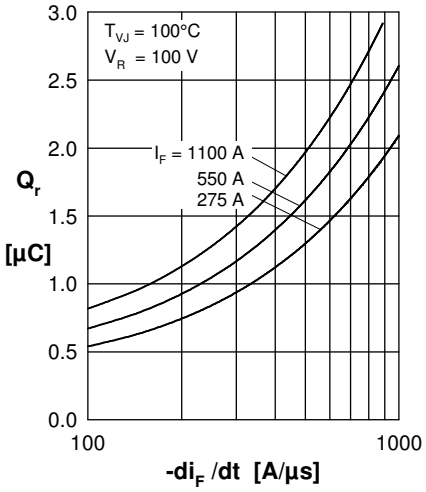


Fig. 2 Reverse recovery charge Q_r versus -di$_F$/dt

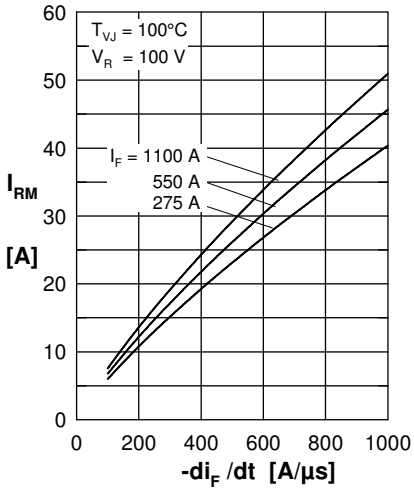


Fig. 3 Peak reverse current I_{RM} versus -di$_F$/dt

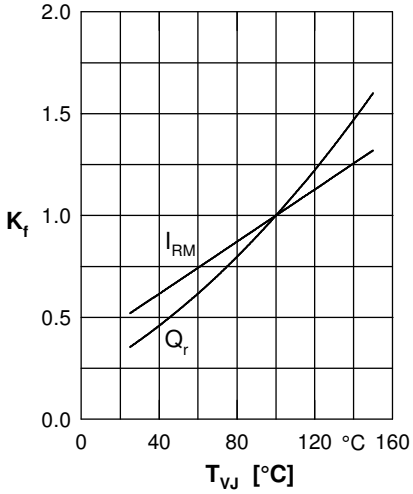


Fig. 4 Dynamic parameters Q_r, I_{RM} vs. junction temperature T_{VJ}

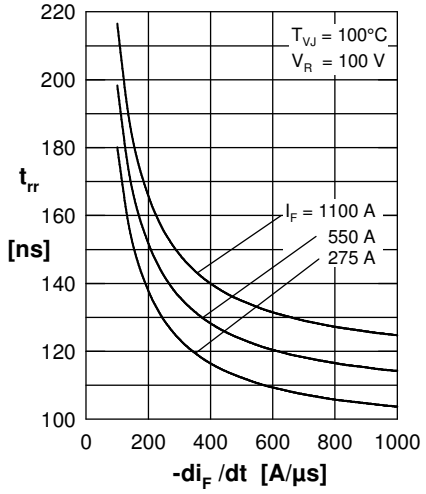


Fig. 5 Recovery time t_{rr} vs. -di$_F$/dt

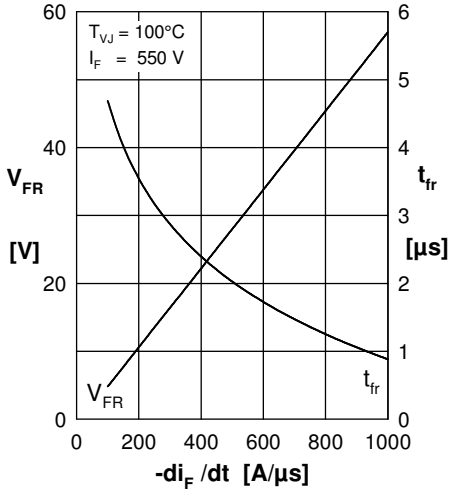
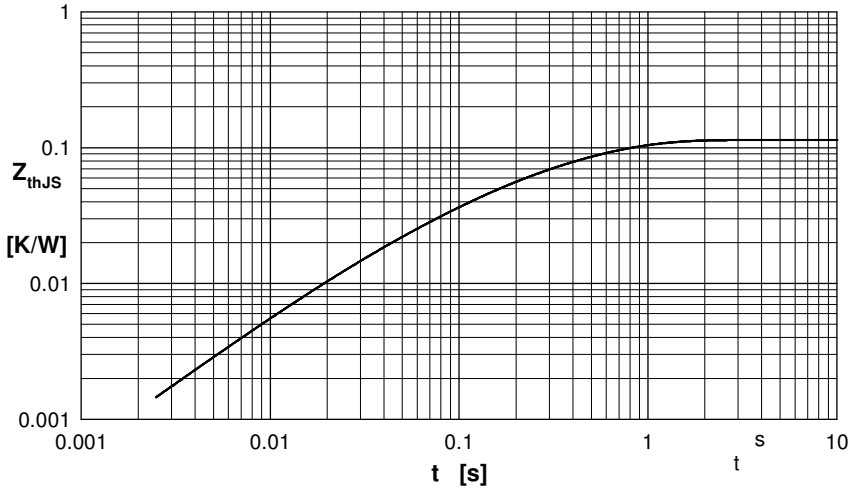


Fig. 6 Peak forward voltage V_{FR} & t_{fr} versus -di$_F$/dt



Constants for Z_{thJS} calculation:

i	R_{thi} [K/W]	t_i [s]
1	0.001	0.080
2	0.004	0.024
3	0.027	0.112
4	0.082	0.464

Fig. 7 Transient thermal impedance junction to heatsink

Mouser Electronics

Authorized Distributor

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IXYS:

MEO550-02DA

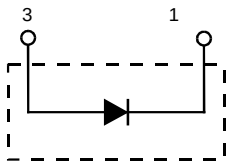
IXYS

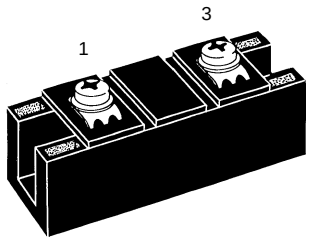
Fast Recovery Epitaxial Diode (FRED) Module

MEO 550-02 DA

V_{RRM} = 200 V
I_{FAVM} = 582 A
t_{rr} = 150 ns

V_{RSM} V	V_{RRM} V	Type
200	200	MEO 550-02DA





Symbol	Test Conditions	Maximum Ratings	
I_{FRMS}	T_C = 75°C	822	A
I_{FAVM} ①	T_C = 75°C; rectangular, d = 0.5	582	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}	2880	A
I_{FSM}	T_{VJ} = 45°C; t = 10 ms (50 Hz), sine	4800	A
	t = 8.3 ms (60 Hz), sine	5280	A
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	4320	A
	t = 8.3 ms (60 Hz), sine	4750	A
I^2t	T_{VJ} = 45°C; t = 10 ms (50 Hz), sine	115200	A^2s
	t = 8.3 ms (60 Hz), sine	117100	A^2s
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	93300	A^2s
	t = 8.3 ms (60 Hz), sine	94800	A^2s
T_{VJ}		-40...+150	°C
T_{stg}		-40...+125	°C
T_{Smax}		110	°C
P_{tot}	T_C = 25°C	1750	W
V_{ISOL}	50/60 Hz, RMS t = 1 min	3000	V~
	I_{ISOL} ≤ 1 mA t = 1 s	3600	V~
M_d	Mounting torque (M6)	2.25-2.75/20-25	Nm/lb.in.
	Terminal connection torque (M6)	4.50-5.50/40-48	Nm/lb.in.
d_S	Creep distance on surface	12.7	mm
d_A	Strike distance through air	9.6	mm
a	Maximum allowable acceleration	50	m/s^2
Weight		150	g

Symbol	Test Conditions	Characteristic Values (per diode) typ.	max.	
I_R	T_{VJ} = 25°C V_R = V_{RRM}		5	mA
	T_{VJ} = 25°C V_R = 0.8 • V_{RRM}		4	mA
	T_{VJ} = 125°C V_R = 0.8 • V_{RRM}		160	mA
V_F	I_F = 300 A; T_{VJ} = 125°C		0.84	V
	T_{VJ} = 25°C		1.10	V
	I_F = 520 A; T_{VJ} = 125°C		1.08	V
	T_{VJ} = 25°C		1.25	V
V_{T0}	For power-loss calculations only		0.52	V
r_T			1.06	mΩ
R_{thJH}	DC current		0.114	K/W
R_{thJC}	DC current		0.071	K/W
t_{rr}	I_F = 500 A; T_{VJ} = 100°C	150	200	ns
I_{RM}	V_R = 100 V; T_{VJ} = 25°C		9	A
	-di/dt = 200 A/µs; T_{VJ} = 100°C		15	A

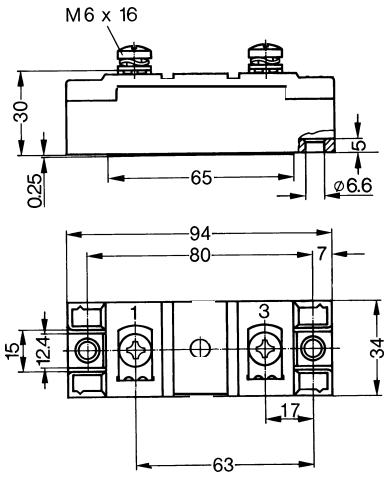
① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, V_R = 0.6 V_{RRM}, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

Features
- International standard package with DCB ceramic base plate
- Planar passivated chips
- Short recovery time
- Low switching losses
- Soft recovery behaviour
- Isolation voltage 3600 V~
- UL registered E 72873

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

Advantages
- High reliability circuit operation
- Low voltage peaks for reduced protection circuits
- Low noise switching
- Low losses

Dimensions in mm (1 mm = 0.0394")



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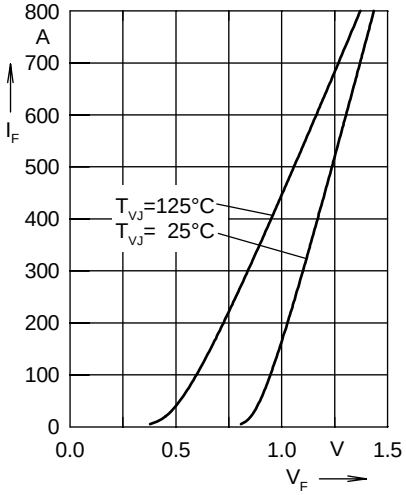

Fig. 1 Forward current I_F versus max. voltage drop V_F per leg

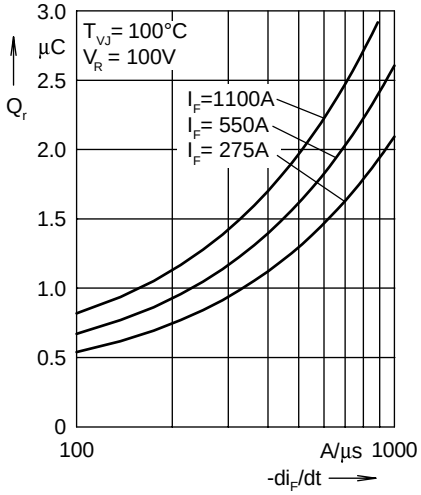

Fig. 2 Typ. reverse recovery charge Q_r versus $-di_F/dt$

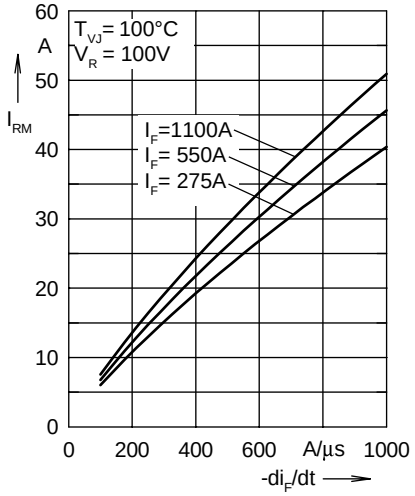

Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

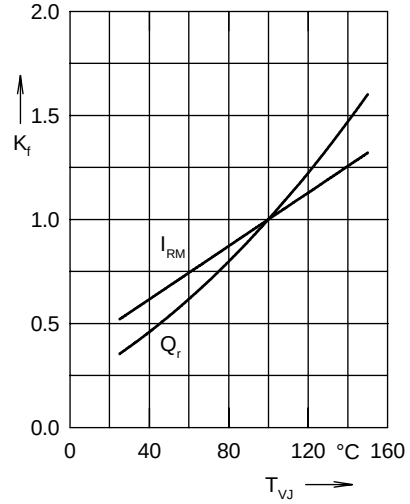

Fig. 4 Dynamic parameters Q_r, I_{RM} versus junction temperature T_{VJ}

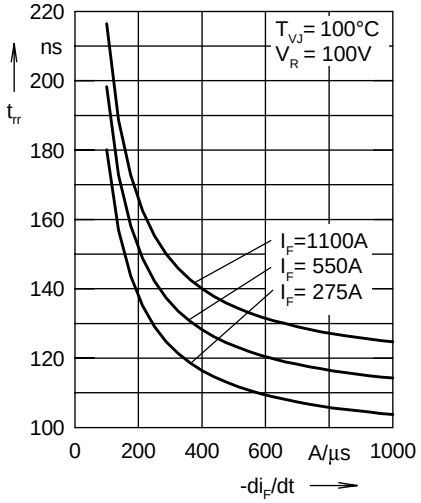

Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

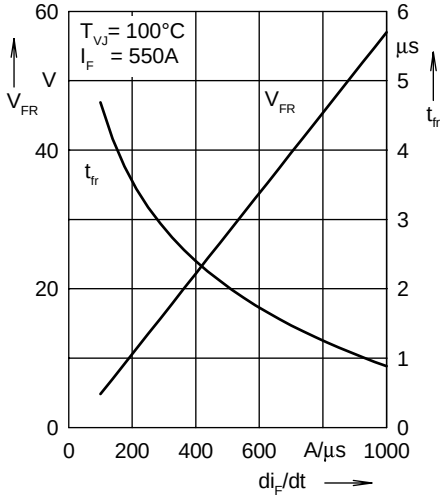

Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

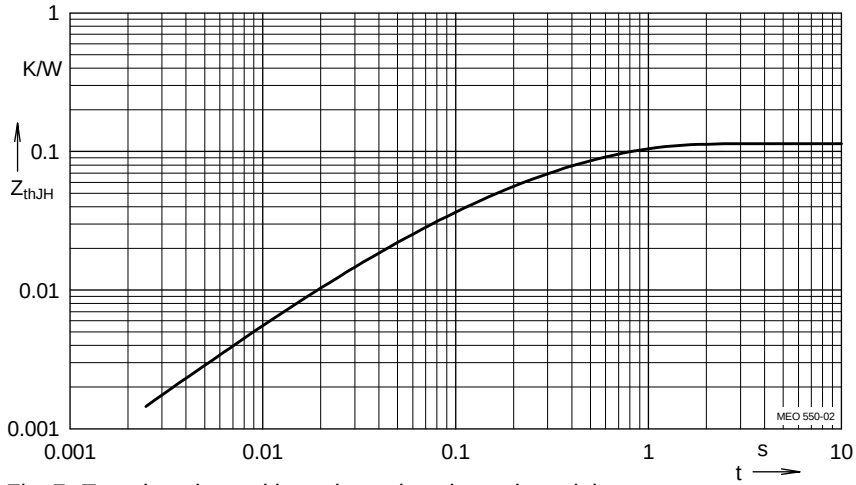

Fig. 7 Transient thermal impedance junction to heatsink

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