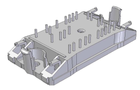
flow PFC 0 — 600 V/ 2 x 99mOhm / 200 kHz

Features
- Vincotech clip-in housing
- Compact and low inductance design
- Suitable for Interleaved topology
- Suitable for curent sensing in drain
- CP series CoolMOS™ and SiC boost FRED

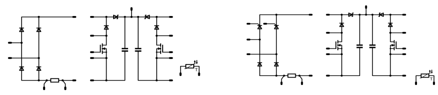
flow 0 housing



Target Applications
- PFC for welding
- PFC for SMPS
- PFC for motor drives
- PFC for UPS
- PFC for battery charger

Schematic

FZ062TA099FH   FZ062TA099FH01



Types
- FZ062TA099FH; without SCR, current sense in drain
- FZ062TA099FH01; with SCR, current sense in drain

CoolMOS is a trademark of Infineon Technologies AG

Maximum Ratings

T_j=25°C, unless otherwise specified

Parameter	Symbol	Condition	Value	Unit
Input Rectifier Diode				
Repetitive peak reverse voltage	V_{RRM}		1600	V
DC forward current	I_F	$T_j=T_jmax$ T_h=80°C	35	A
Surge forward current	I_{FSM}	t_p=10ms T_j=25°C	250	A
I2t-value	I^2t	t_p=10ms T_j=25°C	310	A^2s
Power dissipation	P_{tot}	$T_j=T_jmax$ T_h=80°C	40	W
Maximum Junction Temperature	T_{jmax}		150	°C
Input Rectifier Thyristor				
Repetitive peak reverse voltage	V_{RRM}		800	V
DC forward current	I_F	$T_j=T_jmax$ T_h=80°C	34	A
Surge forward current	I_{FSM}	t_p=10ms T_j=25°C	250	A
I2t-value	I^2t	t_p=10ms T_j=25°C	310	A^2s
Power dissipation	P_{tot}	$T_j=T_jmax$ T_h=80°C	44	W
Maximum Junction Temperature	T_{jmax}		150	°C
PFC MOSFET				
Drain to source voltage	V_{DS}		600	V
DC drain current	I_D	$T_j=T_jmax$ T_h=80°C	16	A
Pulsed drain current	I_{Dpulse}	t_p limited by T_jmax	93	A
Avalanche energy, single pulse	E_{AS}	I_D=11 A V_{DD}=50 V	800	mJ
Avalanche energy, repetitive	E_{AR}	I_D=11A t_{AR} limited by Tjmax V_{DD}=50V	1,2	mJ
Avalanche current, repetitive	I_{AR}	t_p limited by Tjmax	11	A

Maximum Ratings

T_j=25°C, unless otherwise specified

Parameter	Symbol	Condition		Value	Unit
dv/dt ruggedness	dv/dt	V_{DS}=0...480V		50	V/ns
Reverse diode dv/dt	dv/dt			15	V/ns
Power dissipation	P_{tot}	T_j=$T_j$max	T_h=80°C	62	W
Gate-source peak voltage	V_{GS}			+/- 20	V
Maximum Junction Temperature	T_{jmax}			150	°C
C.T. Inverse diode					
Peak Repetitive Reverse Voltage	V_{RRM}	T_j=25°C		600	V
DC forward current	I_F	T_j=$T_j$max	T_h=80°C	8	A
Repetitive peak forward current	I_{FRM}	t_p limited by $T_j$max		16	A
Power dissipation	P_{tot}	T_j=$T_j$max	T_h=80°C	14	W
Maximum Junction Temperature	T_{jmax}			175	°C
PFC Diode					
Peak Repetitive Reverse Voltage	V_{RRM}	T_j=25°C		600	V
DC forward current	I_F	T_j=$T_j$max	T_h=80°C	19	A
Repetitive peak forward current	I_{FRM}	t_p limited by $T_j$max		64	A
Power dissipation	P_{tot}	T_j=$T_j$max	T_h=80°C	37	W
Maximum Junction Temperature	T_{jmax}			175	°C
PFC Shunt					
DC forward current	I_F		T_c=25°C	31,6	A
Power dissipation	P_{tot}		T_c=25°C	10	W
DC link Capacitor					
Max.DC voltage	V_{MAX}		T_c=25°C	500	V
Thermal Properties					
Storage temperature	T_{stg}			-40...+125	°C
Operation temperature under switching condition	T_{op}			-40...+(Tjmax - 25)	°C
Insulation Properties					
Insulation voltage	V_{is}	t=2s	DC voltage	4000	V
Creepage distance				min 12,7	mm
Clearance				9,42	mm

Characteristic Values

Parameter	Symbol	Conditions					Value			Unit
			V_{GE} [V] or V_{GS} [V]	V_r [V] or V_{CE} [V] or V_{DS} [V]	I_C [A] or I_F [A] or I_D [A]	T_j	Min	Typ	Max	
Input Rectifier Diode										
Forward voltage	V_F				30	Tj=25°C Tj=125°C		1,16 1,11	1,4	V
Threshold voltage (for power loss calc. only)	V_{to}				30	Tj=25°C Tj=125°C		0,9 0,77		V
Slope resistance (for power loss calc. only)	r_t				30	Tj=25°C Tj=125°C		9 12		mΩ
Reverse current	I_r			1500		Tj=25°C Tj=150°C			0,02 2	mA
Thermal resistance chip to heatsink	$R_{th(j-s)}$	Thermal grease thickness≤50um λ =1 W/mK						1,72		K/W
Input Rectifier Thyristor										
Forward voltage	V_F				30	Tj=25°C Tj=125°C		1,25 1,22	1,6	V
Threshold voltage (for power loss calc. only)	V_{to}				30	Tj=25°C Tj=125°C		0,93 0,82		V
Slope resistance (for power loss calc. only)	r_t				30	Tj=25°C Tj=125°C		0,011 0,014		mΩ
Reverse current	I_r			800		Tj=25°C Tj=125°C			0,05 2	mA
Gate controlled delay time	t_{GD}	Ig=0,5A dig/dt=0,5A/us		VD=1/2Vdrm		Tj=25°C			2	μs
Gate controlled rise time	t_{GR}	Ig=0,2A dig/dt=0,2A/us				Tj=25°C		<1		μs
Critical rate of rise of off-state voltage	$(dv/dt)_{cr}$			VD=2/3Vdrm		Tj=125°C			500	V/μs
Critical rate of rise of on-state current	$(di/dt)_{cr}$	Ig=0,2A f=50Hz		VD=2/3Vdrm	40	Tj=125°C			150	A/μs
Circuit commutated turn-off time	t_q	VD=2/3Vdrm tp=200us		100	26	Tj=125°C		150		μs
Holding current	I_H	VD=6V				Tj=25°C			50	mA
Latching current	I_L	tp=10us Ig=0,2A				Tj=25°C			90	mA
Gate trigger voltage	V_{GT}	VD=6V				Tj=25°C Tj=-40°C			1,3 1,6	V
Gate trigger current	I_{GT}	VD=6V				Tj=25°C Tj=-40°C	11		28 50	mA
Gate non-trigger voltage	V_{GD}			VD=1/2Vdrm		Tj=125°C			0,2	V
Gate non-trigger current	I_{GD}			VD=1/2Vdrm		Tj=125°C			1	mA
Thermal resistance chip to heatsink	$R_{th(j-s)}$	Thermal grease thickness≤50um λ = 1 W/mK						1,57		K/W
PFC MOSFET										
Avalanche breakdown voltage	$V_{(BR)DS}$		0		0,0003	Tj=25°C	600			V
Static drain to source ON resistance	$r_{DS(on)}$		10		18	Tj=25°C Tj=125°C		111 223		mΩ
Gate threshold voltage	$V_{(GS)th}$		Vds		0,0012	Tj=25°C Tj=125°C	2,5	3,0	3,9	V
Gate to Source Leakage Current	I_{GSS}		20	0		Tj=25°C Tj=125°C			200	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	600		Tj=25°C Tj=125°C			10	uA
Turn On Delay Time	$t_{d(on)}$	Rgoff=4 Ω Rgon=4 Ω	10	400	15	Tj=25°C Tj=125°C		21 21		ns
Rise Time	t_r					Tj=25°C Tj=125°C		4 4		
Turn off delay time	$t_{d(off)}$					Tj=25°C Tj=125°C		71 73		
Fall time	t_f					Tj=25°C Tj=125°C		3 3		
Turn-on energy loss	E_{on}					Tj=25°C Tj=125°C		0,055 0,059		mWs
Turn-off energy loss	E_{off}					Tj=25°C Tj=125°C		0,008 0,013		
Total gate charge	Q_{GE}		0	400	18	Tj=25°C Tj=125°C		60		nC
Gate to source charge	Q_{GS}					Tj=25°C Tj=125°C		14		
Gate to drain charge	Q_{GD}					Tj=25°C Tj=125°C		20		
Input capacitance	C_{iss}	f=1MHz	0	100		Tj=25°C		2800		pF
Output capacitance	C_{oss}							130		
Reverse transfer capacitance	C_{rss}							2,5		
Thermal resistance chip to heatsink	$R_{th(j-s)}$	Thermal grease thickness≤50um λ = 1 W/mK						1,13		K/W

Characteristic Values

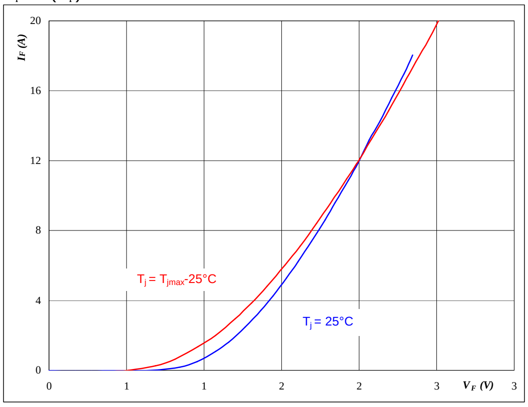
Parameter	Symbol	Conditions					Value			Unit
			V_{GE} [V] or V_{GS} [V]	V_r [V] or V_{CE} [V] or V_{DS} [V]	I_C [A] or I_F [A] or I_D [A]	T_j	Min	Typ	Max	
C.T. Inverse diode										
Diode forward voltage	V_F				6	Tj=25°C Tj=125°C		1,66 1,61	2	V
Thermal resistance chip to heatsink	$R_{th(j-s)}$	Thermal grease thickness≤50um λ = 1 W/mK						5,12		K/W
PFC Diode										
Forward voltage	V_F				16	Tj=25°C Tj=150°C		1,53 1,68	1,8	V
Reverse leakage current	I_{rm}			600		Tj=25°C Tj=150°C			400	µA
Peak recovery current	I_{RRM}	Rgon=4 Ω	10	400	15	Tj=25°C Tj=150°C		24,4 21,9		A
Reverse recovery time	t_{rr}					Tj=25°C Tj=150°C		8 8		ns
Reverse recovery charge	Q_{rr}					Tj=25°C Tj=150°C		0,11 0,09		µC
Reverse recovered energy	E_{rec}					Tj=25°C Tj=150°C		0,02 0,02		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					Tj=25°C Tj=150°C		9935 7532		A/µs
Thermal resistance chip to heatsink	$R_{th(j-s)}$	Thermal grease thickness≤50um λ = 1 W/mK						2,56		K/W
PFC Shunt										
R1 value	R						9,4	10	10,6	mΩ
Temperature coeficient	tc	20°C to 60°C						< 50		ppm/K
Internal heat resistance	R thi							< 6.5		K/W
Inductance	L							< 3		nH
DC link Capacitor										
C value	C						480	540	600	nF
Thermistor										
Rated resistance	R					25		21,5		kΩ
Deviation of R100	$\Delta_{R/R}$	R100=1486 Ω				100	-4,5		+4,5	%
Power dissipation	P					25		210		mW
Power dissipation constant						25		3,5		mW/K
B-value	$B_{(25/50)}$					25		3884		K
B-value	$B_{(25/100)}$					25		3964		K
Vincotech NTC Reference									F	

PFC Switch & C.T. Inverse Diode

Figure 1 Inverse diode

Typical diode forward current as a function of forward voltage

$I_F = f(V_F)$

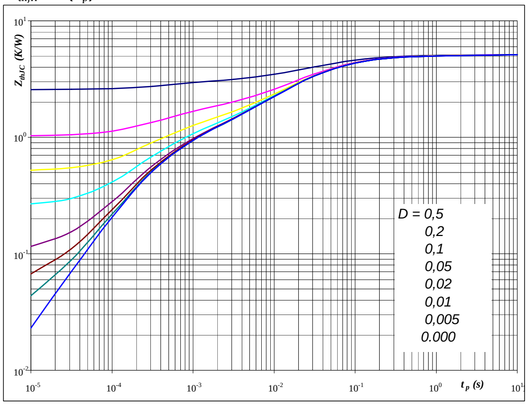


t_p = 250 μs

Figure 2 Inverse diode

Diode transient thermal impedance as a function of pulse width

$Z_{thJH} = f(t_p)$



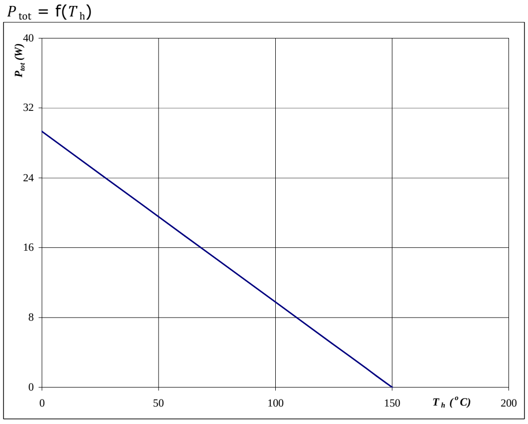
D = t_p / T

R_{thJH} = 5,12 K/W

Figure 3 Inverse diode

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_h)$

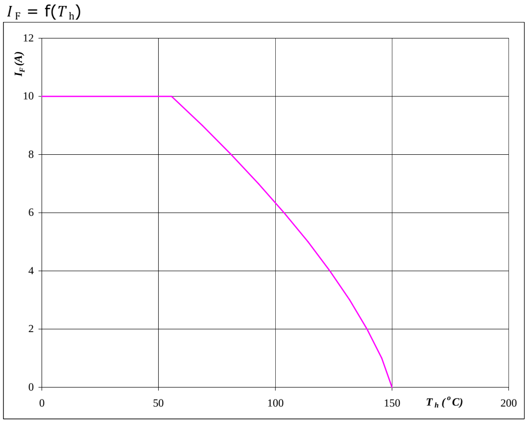


T_j = 150 ºC

Figure 4 Inverse diode

Forward current as a function of heatsink temperature

$I_F = f(T_h)$



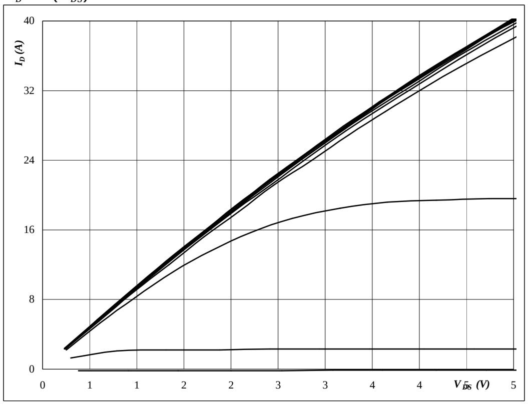
T_j = 150 ºC

PFC

Figure 1 PFC MOSFET

Typical output characteristics

$I_D = f(V_{DS})$

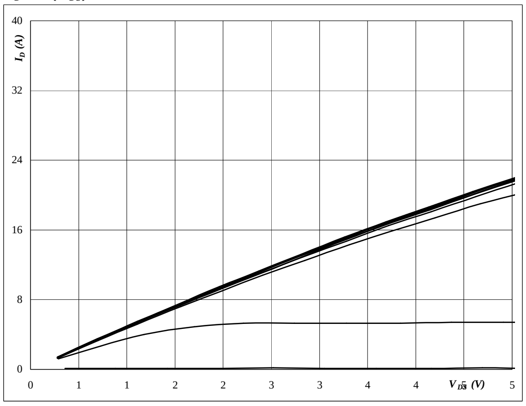


t_p =	250	μs
T_j =	25	°C
V_{GS} from	3 V to 13 V in steps of 1 V	

Figure 2 PFC MOSFET

Typical output characteristics

$I_D = f(V_{DS})$

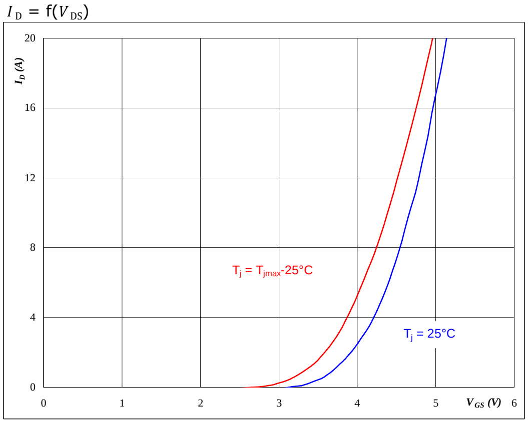


t_p =	250	μs
T_j =	125	°C
V_{GS} from	3 V to 13 V in steps of 1 V	

Figure 3 PFC MOSFET

Typical transfer characteristics

$I_D = f(V_{DS})$

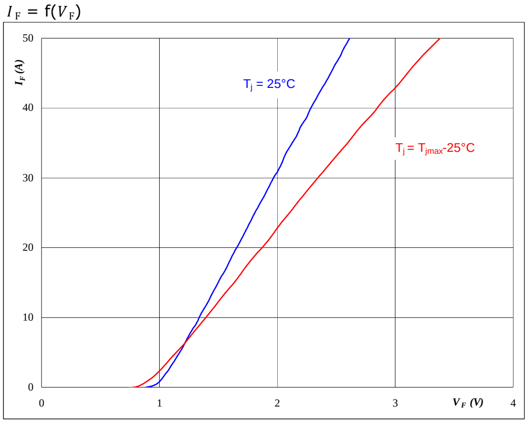


t_p =	250	μs
V_{DS} =	10	V

Figure 4 PFC MOSFET

Typical diode forward current as a function of forward voltage

$I_F = f(V_F)$



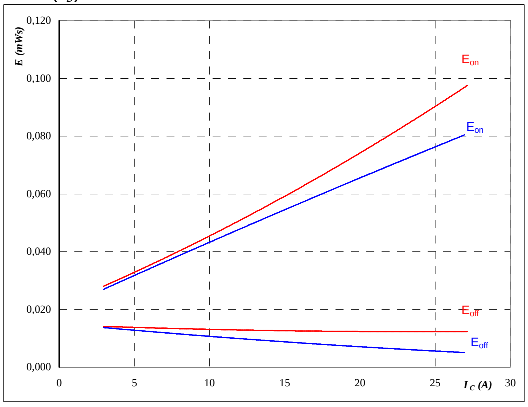
t_p =	250	μs

PFC

Figure 5 PFC MOSFET

Typical switching energy losses
as a function of collector current

$E = f(I_D)$



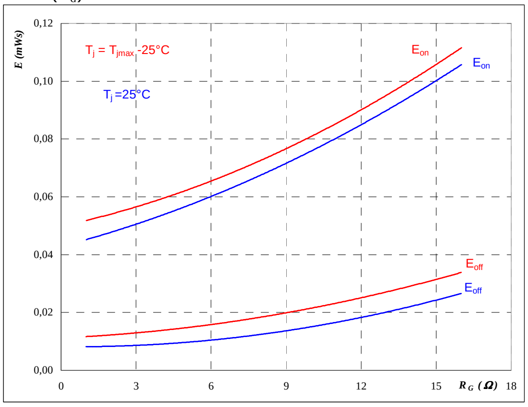
inductive load

T_j =	25/125	°C
V_{DS} =	400	V
V_{GS} =	10	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

Figure 6 PFC MOSFET

Typical switching energy losses
as a function of gate resistor

$E = f(R_G)$



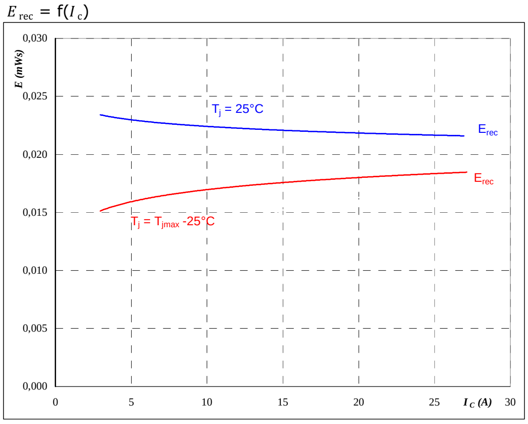
inductive load

T_j =	25/125	°C
V_{DS} =	400	V
V_{GS} =	10	V
I_D =	15	A

Figure 7 PFC MOSFET

Typical reverse recovery energy loss
as a function of collector (drain) current

$E_{rec} = f(I_c)$



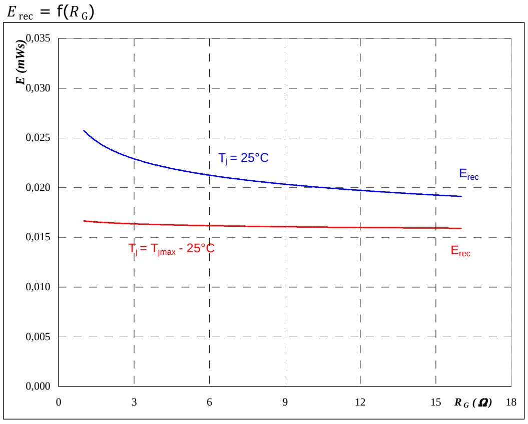
inductive load

T_j =	25/125	°C
V_{DS} =	400	V
V_{GS} =	10	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

Figure 8 PFC MOSFET

Typical reverse recovery energy loss
as a function of gate resistor

$E_{rec} = f(R_G)$



inductive load

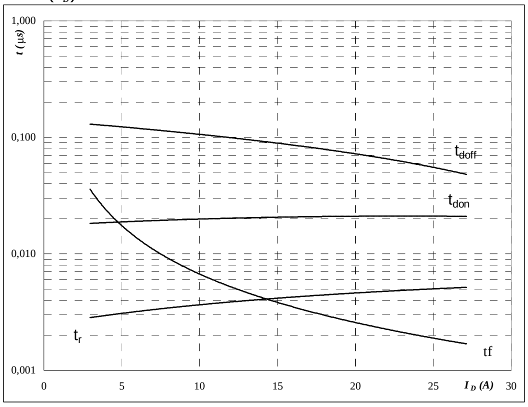
T_j =	25/125	°C
V_{DS} =	400	V
V_{GS} =	10	V
I_D =	15	A

PFC

Figure 9 PFC MOSFET

Typical switching times as a function of collector current

$t = f(I_D)$



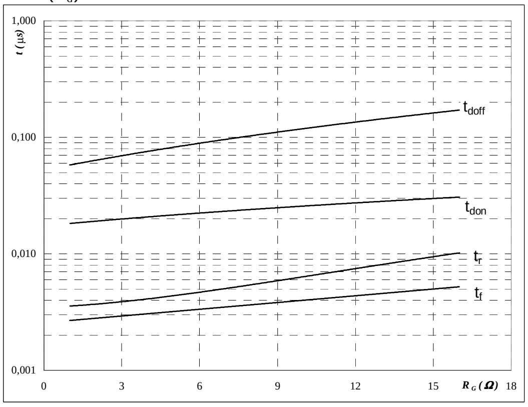
inductive load

T_j =	125	°C
V_{DS} =	400	V
V_{GS} =	10	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

Figure 10 PFC MOSFET

Typical switching times as a function of gate resistor

$t = f(R_G)$



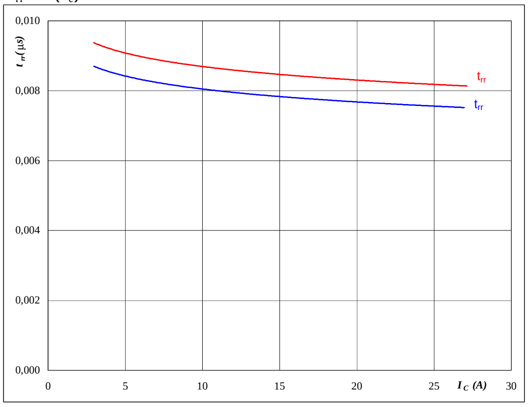
inductive load

T_j =	125	°C
V_{DS} =	400	V
V_{GS} =	10	V
I_C =	15	A

Figure 11 PFC FWD

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_c)$

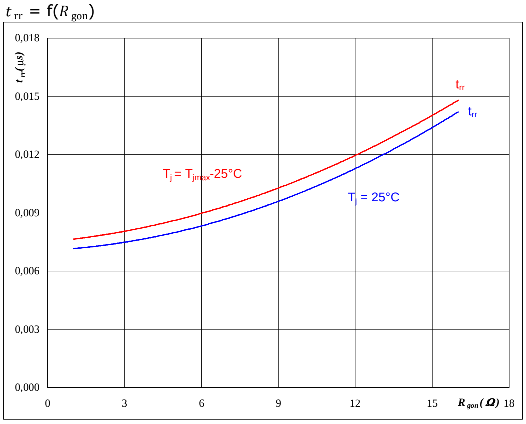


T_j =	25/125	°C
V_{CE} =	400	V
V_{GE} =	10	V
R_{gon} =	4	Ω

Figure 12 PFC FWD

Typical reverse recovery time as a function of IGBT turn on gate resistor

$t_{rr} = f(R_{gon})$



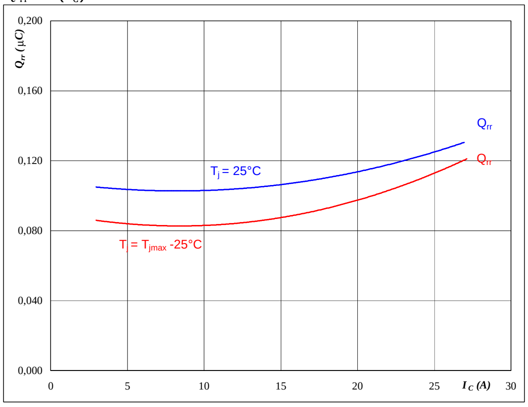
T_j =	25/125	°C
V_R =	400	V
I_F =	15	A
V_{GS} =	10	V

PFC

Figure 13 PFC FWD

Typical reverse recovery charge as a function of collector current

$Q_{rr} = f(I_C)$

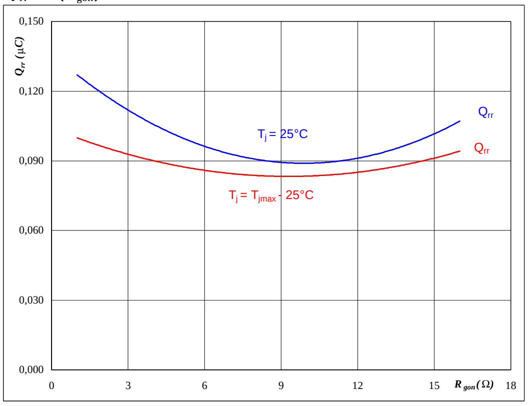


T_j =	25/125	°C
V_{CE} =	400	V
V_{GE} =	10	V
R_{gon} =	4	Ω

Figure 14 PFC FWD

Typical reverse recovery charge as a function of IGBT turn on gate resistor

$Q_{rr} = f(R_{gon})$

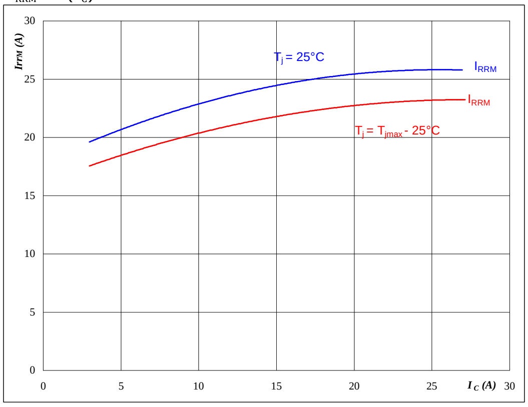


T_j =	25/125	°C
V_R =	400	V
I_F =	15	A
V_{GS} =	10	V

Figure 15 PFC FWD

Typical reverse recovery current as a function of collector current

$I_{RRM} = f(I_C)$

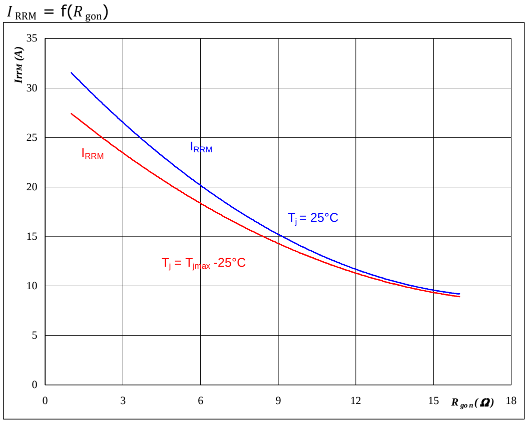


T_j =	25/125	°C
V_{CE} =	400	V
V_{GE} =	10	V
R_{gon} =	4	Ω

Figure 16 PFC FWD

Typical reverse recovery current as a function of IGBT turn on gate resistor

$I_{RRM} = f(R_{gon})$



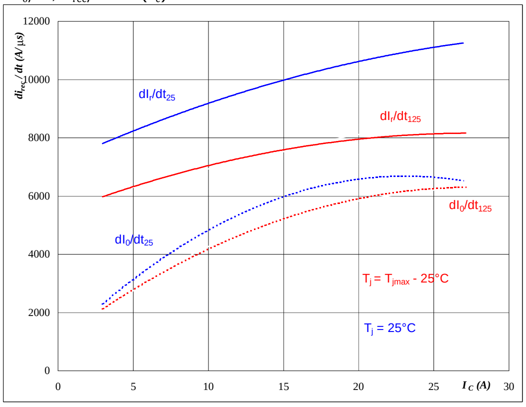
T_j =	25/125	°C
V_R =	400	V
I_F =	15	A
V_{GS} =	10	V

PFC

Figure 17 PFC FWD

Typical rate of fall of forward and reverse recovery current as a function of collector current

$dI_0/dt, dI_{rec}/dt = f(I_c)$

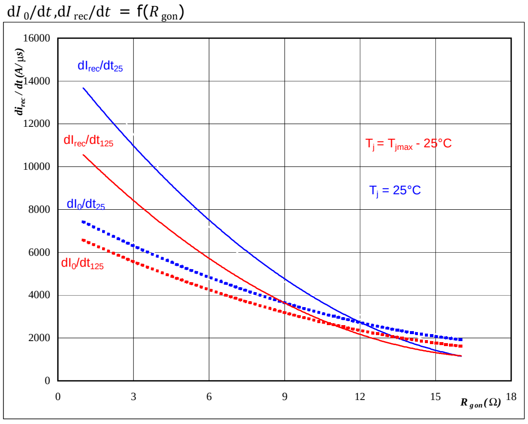


T_j =	25/125	°C
V_{CE} =	400	V
V_{GE} =	10	V
R_{gon} =	4	Ω

Figure 18 PFC FWD

Typical rate of fall of forward and reverse recovery current as a function of IGBT turn on gate resistor

$dI_0/dt, dI_{rec}/dt = f(R_{gon})$

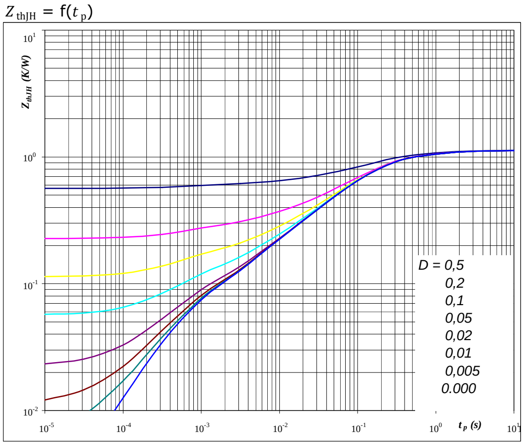


T_j =	25/125	°C
V_R =	400	V
I_F =	15	A
V_{GS} =	10	V

Figure 19 PFC MOSFET

IGBT/MOSFET transient thermal impedance as a function of pulse width

$Z_{thJH} = f(t_p)$



D = t_p / T

R_{thJH} = 1,13 K/W

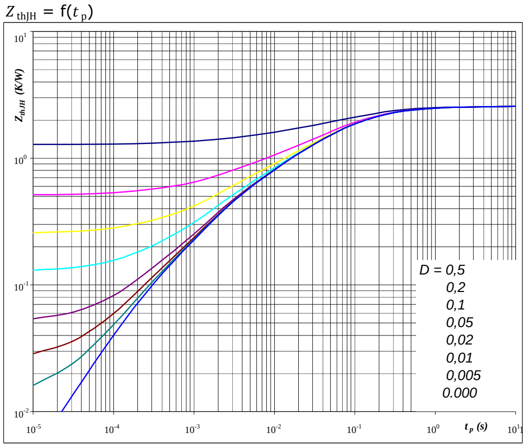
IGBT thermal model values

R (K/W)	Tau (s)
0,026	8,47E+00
0,127	1,17E+00
0,544	1,77E-01
0,266	4,73E-02
0,107	7,23E-03
0,062	5,51E-04

Figure 20 PFC FWD

FWD transient thermal impedance as a function of pulse width

$Z_{thJH} = f(t_p)$



D = t_p / T

R_{thJH} = 2,56 K/W

FWD thermal model values

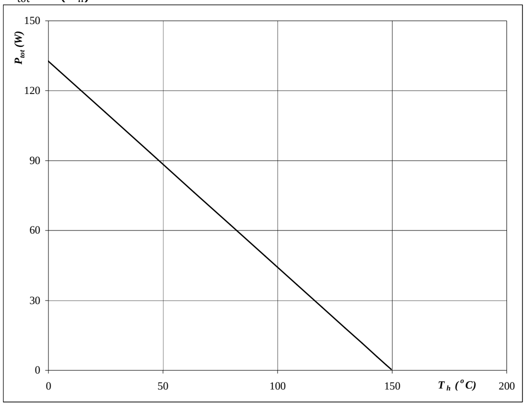
R (K/W)	Tau (s)
0,12	2,23E+00
0,49	2,82E-01
1,11	6,57E-02
0,49	1,17E-02
0,30	2,09E-03
0,05	2,12E-04

PFC

Figure 21 PFC MOSFET

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_h)$

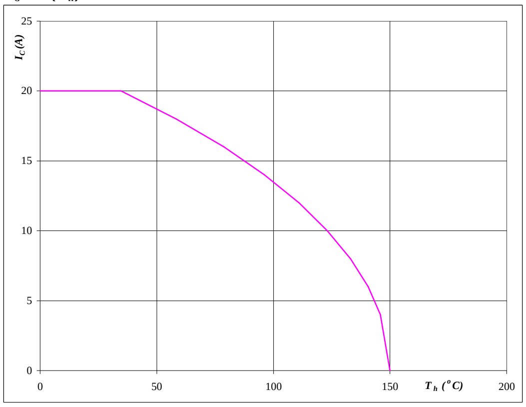


T_j = 150 °C

Figure 22 PFC MOSFET

Collector/Drain current as a function of heatsink temperature

$I_C = f(T_h)$



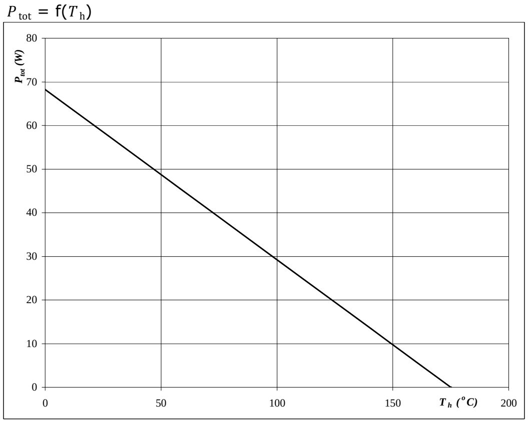
T_j = 150 °C

V_{GS} = 10 V

Figure 23 PFC FWD

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_h)$

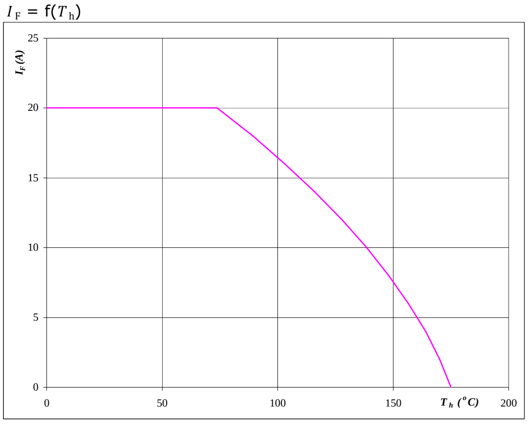


T_j = 175 °C

Figure 24 PFC FWD

Forward current as a function of heatsink temperature

$I_F = f(T_h)$



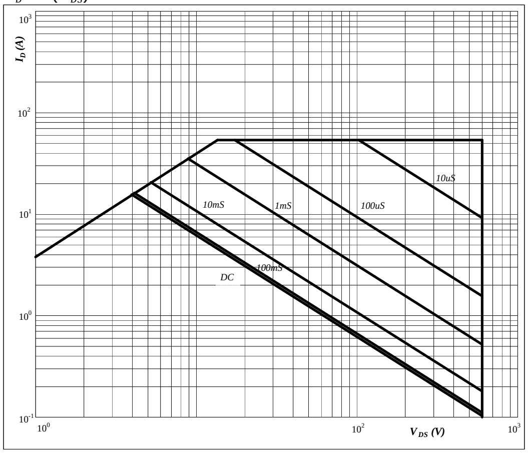
T_j = 175 °C

PFC

Figure 25 PFC MOSFET

Safe operating area as a function of drain-source voltage

$I_D = f(V_{DS})$

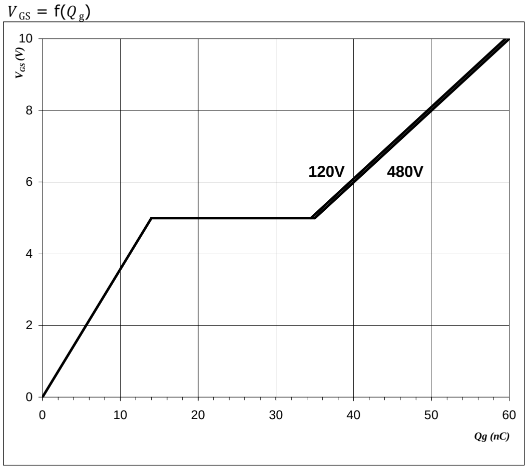


D = single pulse
T_h = 80 ºC
V_{GS} = 10 V
T_j = T_{jmax} ºC

Figure 26 PFC MOSFET

Gate voltage vs Gate charge

$V_{GS} = f(Q_g)$



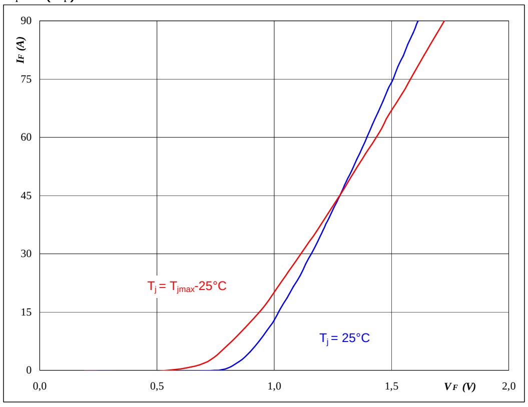
I_D = 15 A

Input Rectifier Bridge

Figure 1 Rectifier diode

Typical diode forward current as a function of forward voltage

$I_F = f(V_F)$

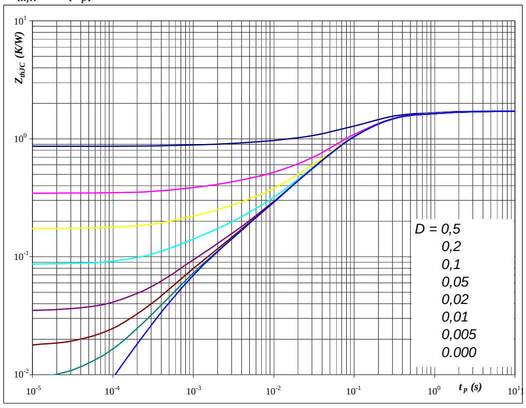


t_p = 250 µs

Figure 2 Rectifier diode

Diode transient thermal impedance as a function of pulse width

$Z_{thJH} = f(t_p)$



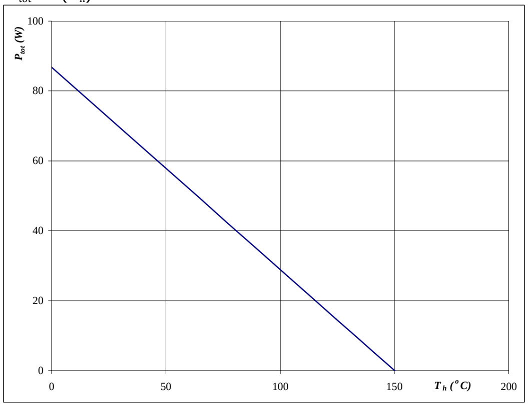
$D = t_p / T$

R_{thJH} = 1,728 K/W

Figure 3 Rectifier diode

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_h)$

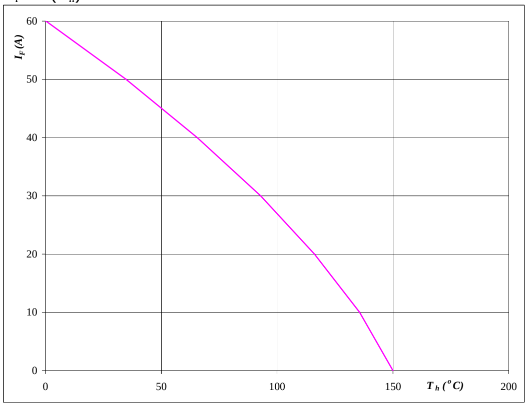


T_j = 150 ºC

Figure 4 Rectifier diode

Forward current as a function of heatsink temperature

$I_F = f(T_h)$



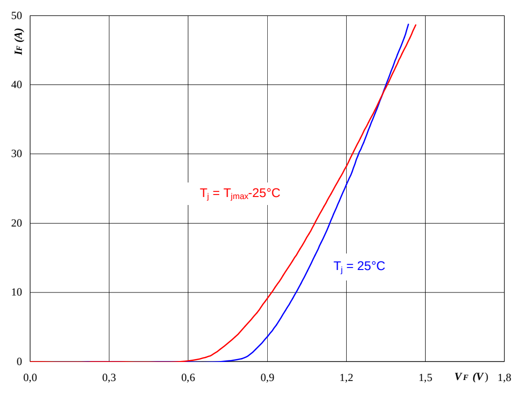
T_j = 150 ºC

Thyristor

Figure 1 Thyristor

Typical thyristor forward current as a function of forward voltage

$I_F = f(V_F)$

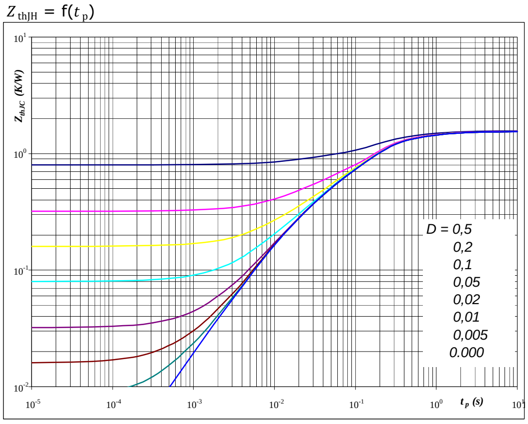


t_p = 250 μs

Figure 2 Thyristor

Thyristor transient thermal impedance as a function of pulse width

$Z_{thJH} = f(t_p)$



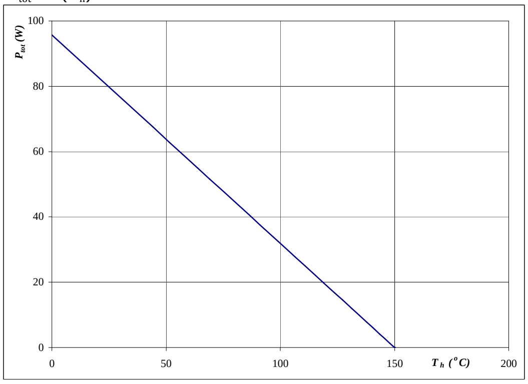
$D = t_p / T$

R_{thJH} = 1,57 K/W

Figure 3 Thyristor

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_h)$

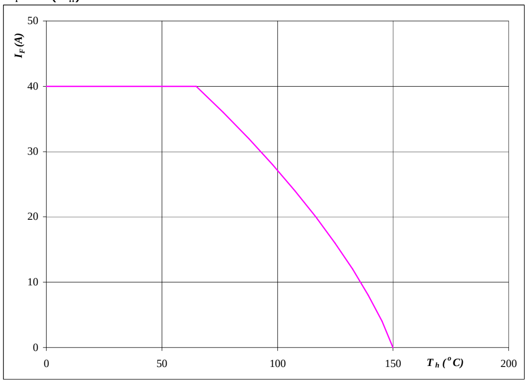


T_j = 150 ºC

Figure 4 Thyristor

Forward current as a function of heatsink temperature

$I_F = f(T_h)$

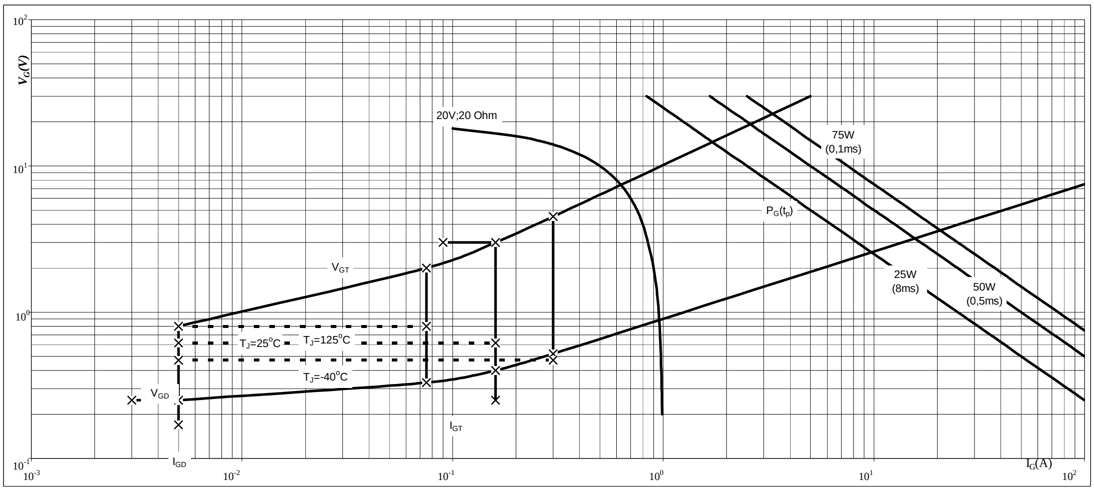


T_j = 150 ºC

Thyristor

Figure 5 Thyristor

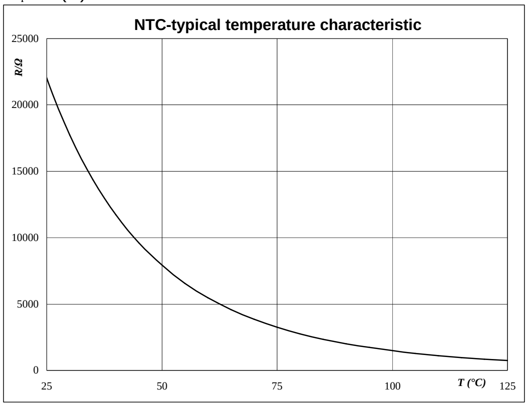
Gate trigger characteristics



Thermistor

Figure 1 Thermistor

Typical NTC characteristic
as a function of temperature
R_T = f(T)



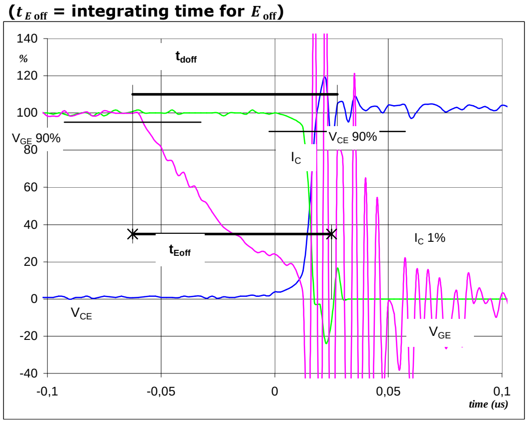
Switching Definitions PFC

General conditions

T_j	=	125 °C
R_{gon}	=	4 Ω
R_{goff}	=	4 Ω

Figure 1 PFC MOSFET

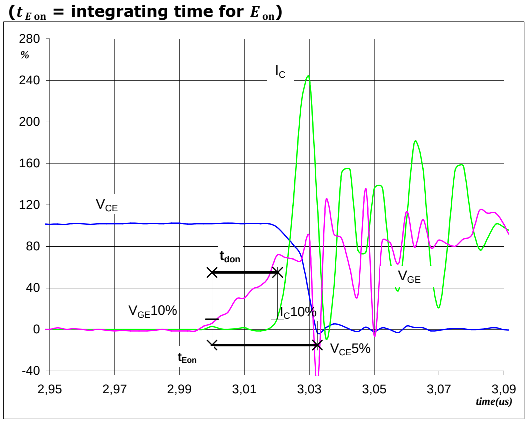
Turn-off Switching Waveforms & definition of t_{doff}, t_{Eoff}
(t_{Eoff} = integrating time for E_{off})



V_{GE} (0%) =	0	V
V_{GE} (100%) =	10	V
V_C (100%) =	400	V
I_C (100%) =	15	A
t_{doff} = V_{RRM}	0,07	μs
t_{Eoff} =	0,09	μs

Figure 2 PFC MOSFET

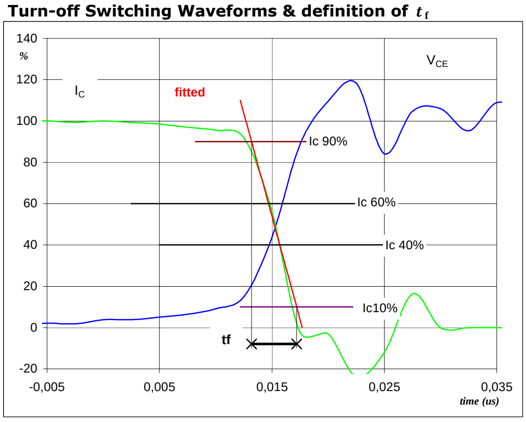
Turn-on Switching Waveforms & definition of t_{don}, t_{Eon}
(t_{Eon} = integrating time for E_{on})



V_{GE} (0%) =	0	V
V_{GE} (100%) =	10	V
V_C (100%) =	400	V
I_C (100%) =	15	A
t_{don} =	0,02	μs
t_{Eon} =	0,03	μs

Figure 3 PFC MOSFET

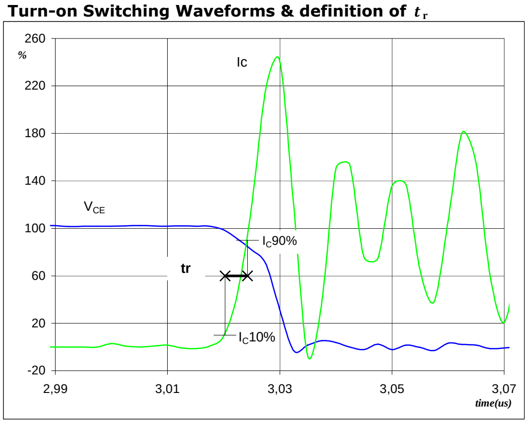
Turn-off Switching Waveforms & definition of t_f



V_C (100%) =	400	V
I_C (100%) =	15	A
t_f =	0,003	μs

Figure 4 PFC MOSFET

Turn-on Switching Waveforms & definition of t_r

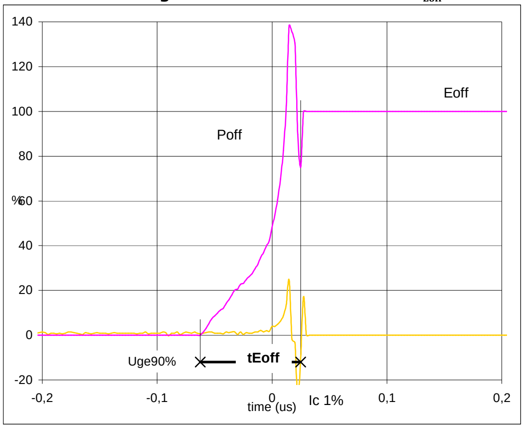


V_C (100%) =	400	V
I_C (100%) =	15	A
t_r =	0,004	μs

Switching Definitions PFC

Figure 5 PFC MOSFET

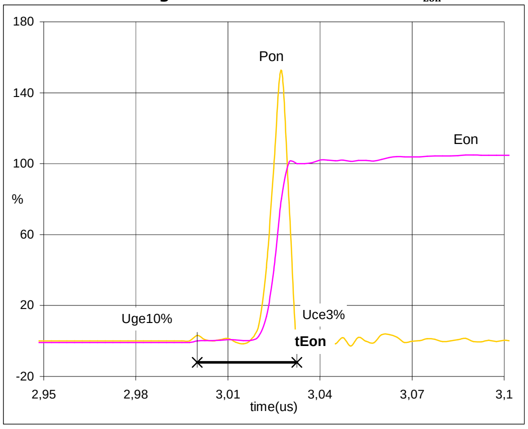
Turn-off Switching Waveforms & definition of t_{Eoff}



P_{off} (100%) =	6,00	kW
E_{off} (100%) =	0,01	mJ
$t_{E\ off}$ =	0,09	µs

Figure 6 PFC MOSFET

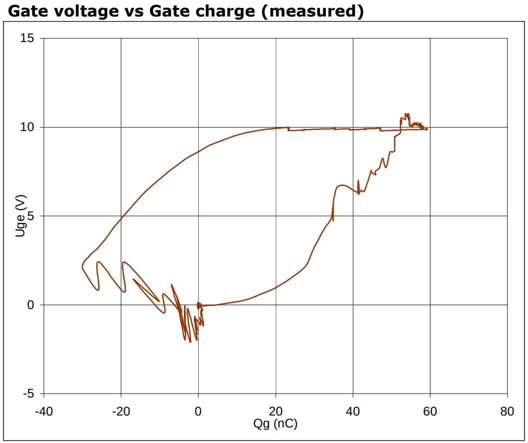
Turn-on Switching Waveforms & definition of t_{Eon}



P_{on} (100%) =	6,002	kW
E_{on} (100%) =	0,06	mJ
$t_{E\ on}$ =	0,0325	µs

Figure 7 PFC MOSFET

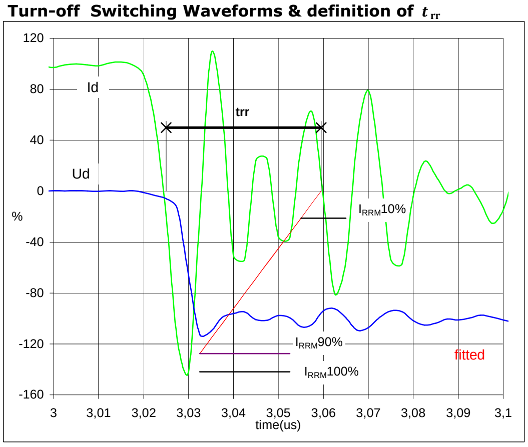
Gate voltage vs Gate charge (measured)



$V_{GE\ off}$ =	0	V
$V_{GE\ on}$ =	10	V
V_{C} (100%) =	400	V
I_{C} (100%) =	15	A
Q_{g} =	59,01	nC

Figure 8 PFC FRED

Turn-off Switching Waveforms & definition of t_{rr}

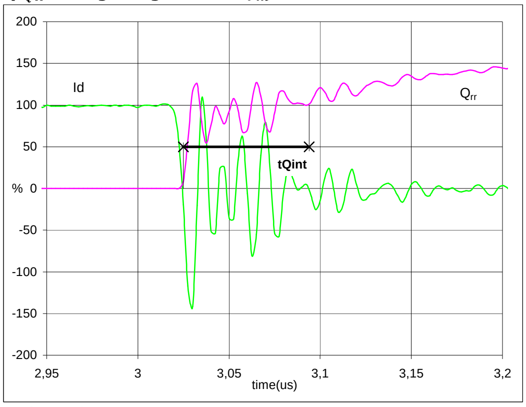


V_{d} (100%) =	400	V
I_{d} (100%) =	15	A
I_{RRM} (100%) =	-22	A
t_{rr} =	0,01	µs

Switching Definitions PFC

Figure 9 PFC FRED

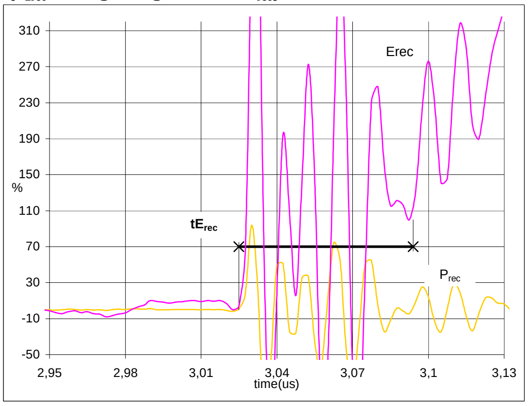
Turn-on Switching Waveforms & definition of t_{Qrr}
($t_{Q\,rr}$= integrating time for Q_{rr})



I_d (100%) =	15	A
Q_{rr} (100%) =	0,09	µC
tQint =	0,07	µs

Figure 10 PFC FRED

Turn-on Switching Waveforms & definition of t_{Erec}
(t_{Erec}= integrating time for E_{rec})



P_{rec} (100%) =	6,00	kW
E_{rec} (100%) =	0,02	mJ
$t_{E\,rec}$ =	0,07	µs

Ordering Code and Marking - Outline - Pinout

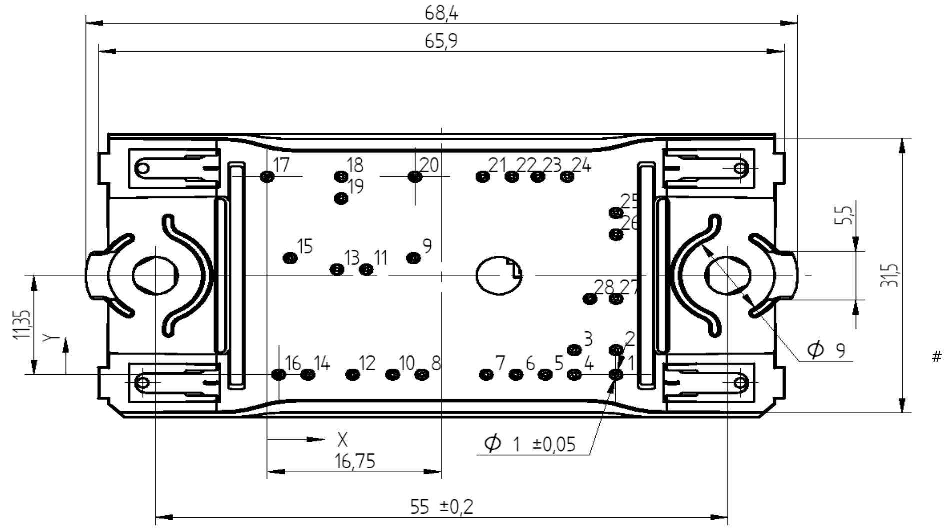
Ordering Code & Marking

Version	Ordering Code	in DataMatrix as	in packaging barcode as
without SCR, current sense in collector	10-FZ062TA099FH-P980D18	P980D18	P980D18
with SCR, current sense in collector	10-FZ062TA099FH01-P980D28	P980D28	P980D28

Outline

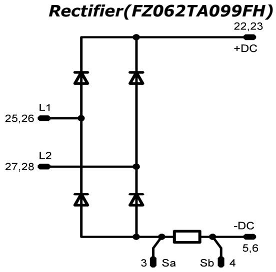
Pin table

Pin	X	Y
1	33,5	0
2	33,5	2,8
3	29,5	2,8
4	29,5	0
5	26,7	0
6	23,9	0
7	21,05	0
8	14,85	0
9	14,05	13,35
10	12,05	0
11	9,5	12,05
12	8,2	0
13	6,7	12,05
14	3,9	0
15	2,2	13,35
16	1,1	0
17	0	22,7
18	7,1	22,7
19	7,1	20,2
20	14,2	22,7
21	20,7	22,7
22	23,5	22,7
23	26	22,7
24	28,8	22,7
25	33,5	18,55
26	33,5	16,05
27	33,5	8,7
28	31	8,7

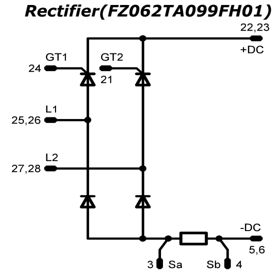


Pinout

Rectifier(FZ062TA099FH)

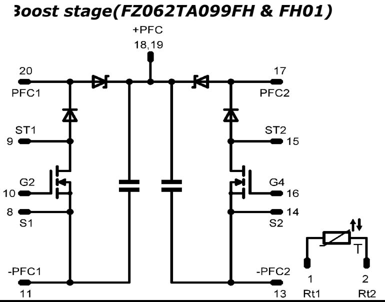


Rectifier(FZ062TA099FH01)



Pin nr. 21 & 24 without electrical connection

Boost stage(FZ062TA099FH & FH01)



Pin nr. 7 & 12 without electrical connection

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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.