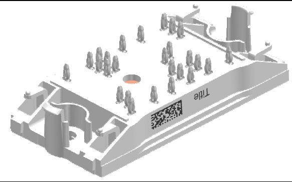
flow3xPHASE-SiC 1200V/80mΩ

Features

- SiC-Power MOSFET´s and Schottky Diodes
- 3 phase inverter topology with split output
- Improved switching behavior (reduced turn on energy and X-conduction)
- Ultra Low Inductance with integrated DC-capacitors
- Switching frequency >100kHz
- Temperature sensor

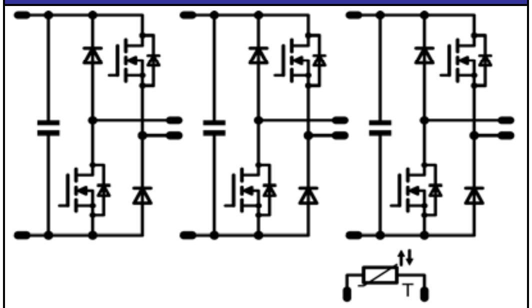
flow **0 12mm housing**



Target Applications

- Solar Inverter
- Charger
- Power Supply

Schematic



Types

- 10-PZ126PA080ME-M909F18Y

Maximum Ratings

Tj=25℃, unless otherwise specified

Parameter	Symbol	Condition		Value	Unit
Buck Boost MOSFET					
Drain to source breakdown voltage	V_{DS}			1200	V
DC drain current	I_D	$T_j=T_j max$	$T_h=80℃$ $T_c=80℃$	16 20	A
Pulsed drain current	I_{Dpulse}	t_p limited by $T_j max$		60	A
Power dissipation	P_{tot}	$T_j=T_j max$	$T_h=80℃$ $T_c=80℃$	39 59	W
Gate-source peak voltage	V_{GS}			-10/25	V
Maximum Junction Temperature	$T_j max$			150	℃
Buck Boost FWD					
Peak Repetitive Reverse Voltage	V_{RRM}			1200	V
Forward average current	I_{FAV}	$T_j=T_j max$	$T_h=80℃$ $T_c=80℃$	13 16	A
Non-Repetitive Peak Forward Surge Current	I_{FSM}	$t_p=10ms$	$T_j=25℃$	64	A
Repetitive Peak Forward Surge Current	I_{FRM}	t_p limited by $T_j max$		39	A
Power dissipation per Diode	P_{tot}	$T_j=T_j max$	$T_h=80℃$ $T_c=80℃$	34 51	W
Maximum Junction Temperature	$T_j max$			175	℃

Maximum Ratings

Tj=25℃, unless otherwise specified

Parameter	Symbol	Condition	Value	Unit
DC link Capacitor				
Max.DC voltage	V_{MAX}	Tc=25℃	1000	V
Thermal Properties				
Storage temperature	T_{stg}		-40…+125	℃
Operation temperature under switching condition	T_{op}		-40…+(Tjmax - 25)	℃
Insulation Properties				
Insulation voltage		t=2s DC voltage	4000	V
Creepage distance			min 12,7	mm
Clearance			min 12,7	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	
Buck Boost MOSFET										
Static drain to source ON resistance	$R_{DS(on)}$		20		20	Tj=25℃ Tj=125℃		0,08 0,14		Ω
Gate threshold voltage	$V_{(GS)th}$	$V_{DS} = V_{GS}$		10	0,001	Tj=25℃ Tj=125℃	1,7	2,2		V
Gate to Source Leakage Current	I_{gss}		20	0		Tj=25℃ Tj=125℃			250	nA
Zero Gate Voltage Drain Current	I_{dss}		0	1200		Tj=25℃ Tj=125℃			100	µA
Internal Gate Resistance	R_G	f=1MHz; V_{AC}=25mV						4,6		Ω
Total gate charge	Q_g							49,2		
Gate to source charge	Q_{gs}		0/20	800	20			10,8		nC
Gate to drain charge	Q_{gd}					Tj=25℃		18		
Input capacitance	C_{iss}							950		
Output capacitance	C_{oss}	f=1MHz	0	1000				80		pF
Reverse transfer capacitance	C_{rss}							6,5		
Thermal resistance chip to heatsink per chip	R_{thJH}	Phase-Change Material						1,79		K/W
Buck Boost FWD										
Forward voltage	V_F				7,5	Tj=25℃ Tj=125℃		1,45 1,75	1,8	V
Reverse leakage current	I_{rm}			1200		Tj=25℃ Tj=125℃			250	µA
Thermal resistance chip to heatsink per chip	R_{thJH}	Phase-Change Material						2,81		K/W
Booster Configuration MOSFET										
Turn On Delay Time	$t_{d(ON)}$					Tj=25℃ Tj=125℃		11 11		
Rise Time	t_r					Tj=25℃ Tj=125℃		5 4		ns
Turn off delay time	$t_{d(OFF)}$	Rgoff=0 Ω Rgon=0 Ω	16	700	16	Tj=25℃ Tj=125℃		37 39		
Fall time	t_f					Tj=25℃ Tj=125℃		13 14		
Turn-on energy loss per pulse	E_{on}					Tj=25℃ Tj=125℃		0,112 0,103		mWs
Turn-off energy loss per pulse	E_{off}					Tj=25℃ Tj=125℃		0,058 0,058		
Booster Configuration FWD										
Peak recovery current	I_{RRM}					Tj=25℃ Tj=125℃		18 19		A
Reverse recovery time	t_{rr}					Tj=25℃ Tj=125℃		10 10		ns
Reverse recovery charge	Q_{rr}	Rgon=0 Ω	16	700	16	Tj=25℃ Tj=125℃		0,094 0,098		µC
Reverse recovered energy	E_{rec}					Tj=25℃ Tj=125℃		0,026 0,031		mWs
Peak rate of fall of recovery current	di(rec)max /dt					Tj=25℃ Tj=125℃		4563 4485		A/µs
Half Bridge Configuration FWD										
Peak reverse recovery current	I_{RRM}					Tj=25℃ Tj=125℃		26 34		A
Reverse recovery time	t_{rr}					Tj=25℃ Tj=125℃		16 15		ns
Reverse recovered charge	Q_{rr}	Rgon=0 Ω	-5/16	700	16	Tj=25℃ Tj=125℃		0,232 0,234		µC
Peak rate of fall of recovery current	di(rec)max /dt					Tj=25℃ Tj=125℃		6761 9363		A/µs
Reverse recovered energy	Erec					Tj=25℃ Tj=125℃		0,084 0,081		mWs

Characteristic Values

Parameter	Symbol	Conditions	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	Value Min	Value Typ	Value Max	Unit
Half Bridge Configuration MOSFET										
Turn On Delay Time	$t_{d(ON)}$	Rgoff=0 Ω Rgon=0 Ω	-5/16	700	16	Tj=25℃ Tj=125℃		14 13		ns
Rise Time	t_r					Tj=25℃ Tj=125℃		4 4		ns
Turn off delay time	$t_{d(OFF)}$					Tj=25℃ Tj=125℃		45 48		ns
Fall time	t_f					Tj=25℃ Tj=125℃		7 6		ns
Turn-on energy loss per pulse	E_{on}					Tj=25℃ Tj=125℃		0,152 0,140		mWs
Turn-off energy loss per pulse	E_{off}					Tj=25℃ Tj=125℃		0,057 0,058		mWs
Splitted Output Configuration MOSFET										
Turn-on delay time	$t_{d(on)}$	Rgoff=4 Ω Rgon=4 Ω	-8/16	700	16	Tj=25℃ Tj=125℃		15 14		ns
Rise time	t_r					Tj=25℃ Tj=125℃		4 3		ns
Turn-off delay time	$t_{d(off)}$					Tj=25℃ Tj=125℃		30 32		ns
Fall time	t_f					Tj=25℃ Tj=125℃		17 13		ns
Turn-on energy loss per pulse	E_{on}					Tj=25℃ Tj=125℃		0,058 0,042		mWs
Turn-off energy loss per pulse	E_{off}					Tj=25℃ Tj=125℃		0,075 0,074		mWs
Splitted Output Configuration FWD										
Peak reverse recovery current	I_{RRM}	Rgon=4 Ω	-8/16	700	16	Tj=25℃ Tj=125℃		15 17		A
Reverse recovery time	t_{rr}					Tj=25℃ Tj=125℃		34 49		ns
Reverse recovered charge	Q_{rr}					Tj=25℃ Tj=125℃		0,2 0,3		µC
Peak rate of fall of recovery current	di(rec)max /dt					Tj=25℃ Tj=125℃		2741 3343		A/µs
Reverse recovery energy	E_{rec}					Tj=25℃ Tj=125℃		0,04 0,05		mWs

Characteristic Values

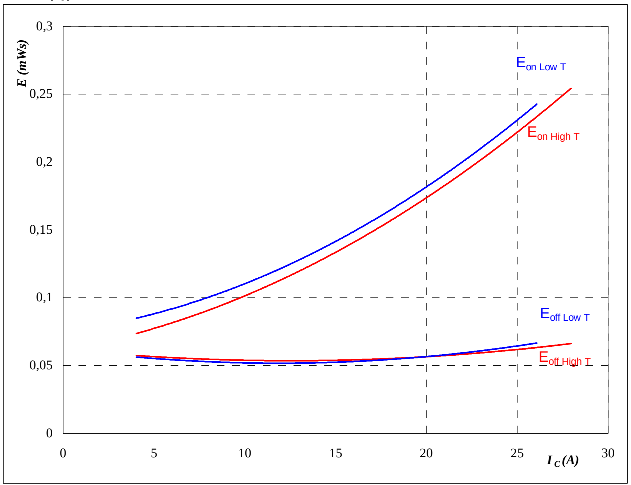
Parameter	Symbol	Conditions					Value			Unit
			V_{GE} [V] or V_{GS} [V]	V_r [V] or V_{CE} [V] or V_{DS} [V]	I_C [A] or I_F [A] or I_D [A]	T_j	Min	Typ	Max	
DC link Capacitor										
C value	C							47		nF
Thermistor										
Rated resistance	R					T=25℃		22000		Ω
Deviation of R25	ΔR/R	R100=1486 Ω				T=25℃	-5		5	%
Power dissipation	P					T=25℃		200		mW
Power dissipation constant						T=25℃		2		mW/K
B-value	B(25/50)	Tol. ±3%				T=25℃		3950		K
B-value	B(25/100)	Tol. ±3%				T=25℃		3996		K
Vincotech NTC Reference									B	

Half Bridge Configuration

Figure 1	MOSFET

Typical switching energy losses as a function of collector current

E = f(I_C)



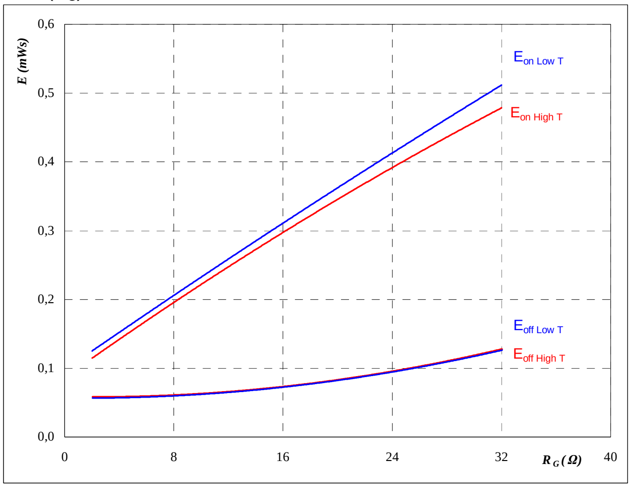
With an inductive load at

T_j =	25/125	℃
V_{CE} =	700	V
V_{GE} =	-5/16	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

Figure 2	MOSFET

Typical switching energy losses as a function of gate resistor

E = f(R_G)



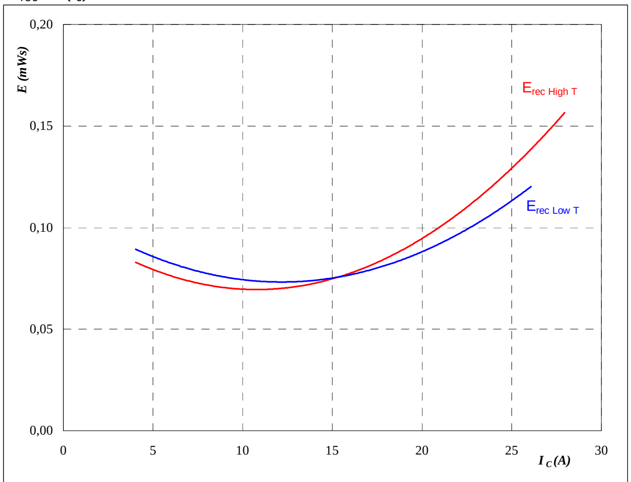
With an inductive load at

T_j =	25/125	℃
V_{CE} =	700	V
V_{GE} =	-5/16	V
I_C =	16	A

Figure 3	FWD

Typical reverse recovery energy loss as a function of collector current

E_{rec} = f(I_c)



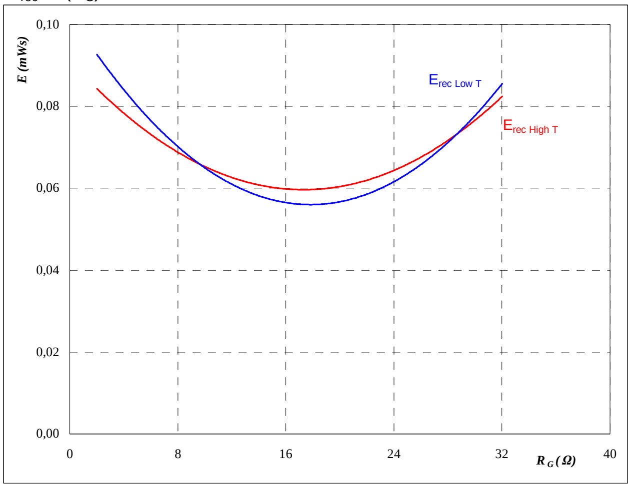
With an inductive load at

T_j =	25/125	℃
V_{CE} =	700	V
V_{GE} =	-5/16	V
R_{gon} =	4	Ω

Figure 4	FWD

Typical reverse recovery energy loss as a function of gate resistor

E_{rec} = f(R_G)



With an inductive load at

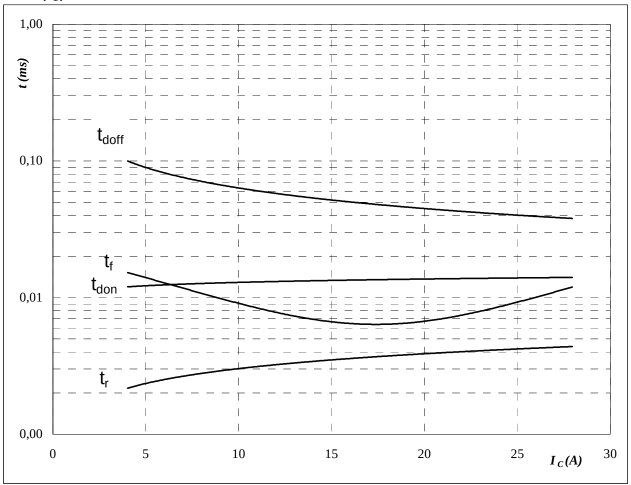
T_j =	25/125	℃
V_{CE} =	700	V
V_{GE} =	-5/16	V
I_C =	16	A

Half Bridge Configuration

Figure 5 MOSFET

Typical switching times as a function of collector current

t = f(I_C)



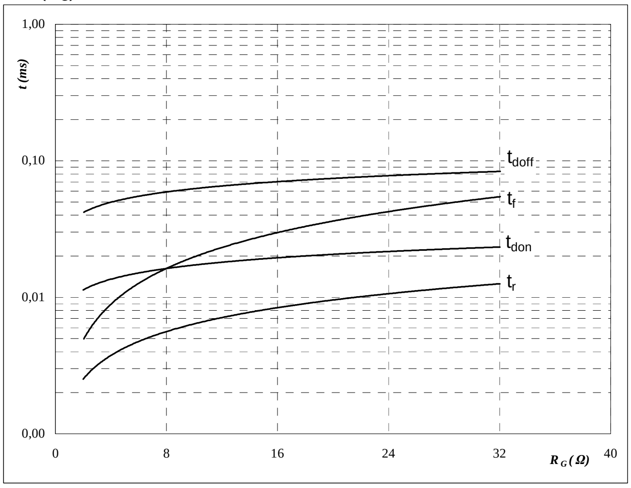
With an inductive load at

T_j =	125	°C
V_{CE} =	700	V
V_{GE} =	-5/16	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

Figure 6 MOSFET

Typical switching times as a function of gate resistor

t = f(R_G)



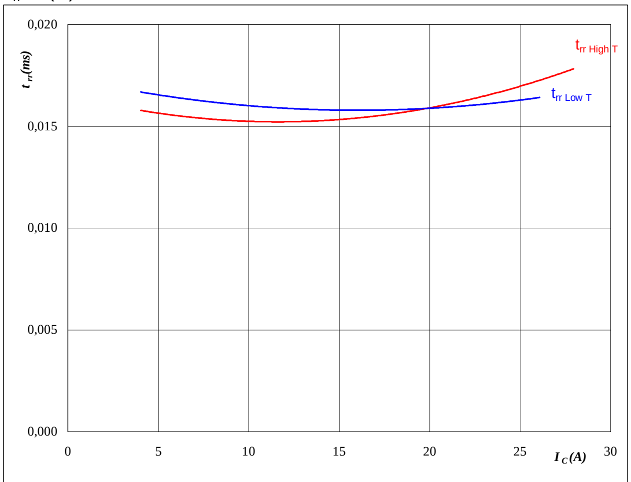
With an inductive load at

T_j =	125	°C
V_{CE} =	700	V
V_{GE} =	-5/16	V
I_C =	16	A

Figure 7 FWD

Typical reverse recovery time as a function of collector current

t_{rr} = f(Ic)



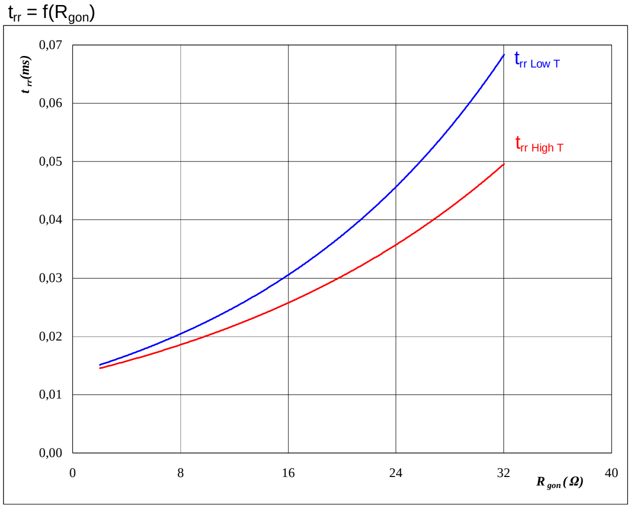
At

T_j =	25/125	°C
V_{CE} =	700	V
V_{GE} =	-5/16	V
R_{gon} =	4	Ω

Figure 8 FWD

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

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



At

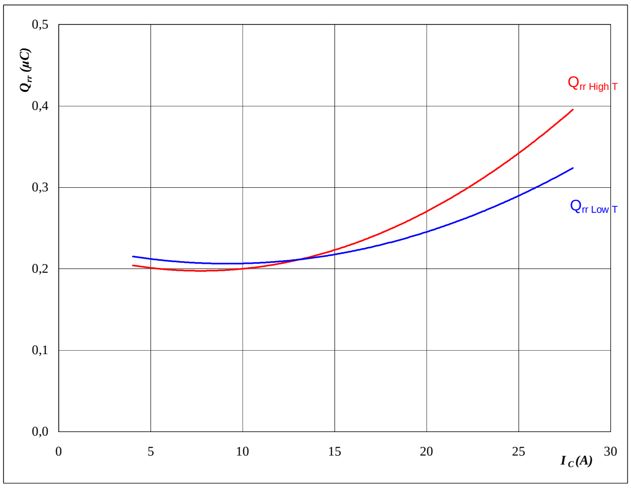
T_j =	25/125	°C
V_R =	700	V
I_F =	16	A
V_{GE} =	-5/16	V

Half Bridge Configuration

Figure 9 FWD

Typical reverse recovery charge as a function of collector current

$Q_{rr} = f(I_C)$



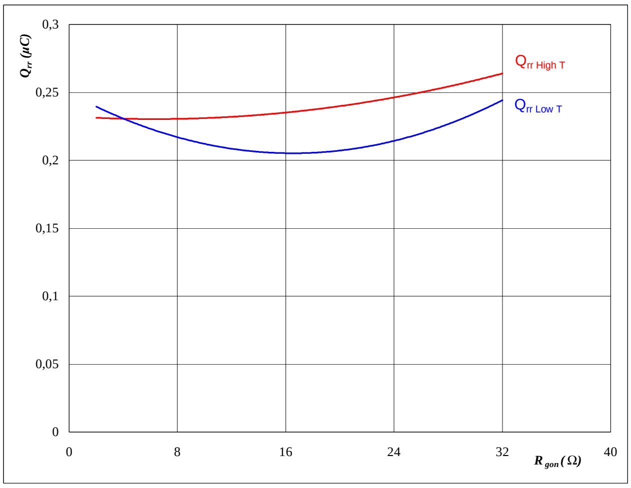
At

T_j =	25/125	°C
V_{CE} =	700	V
V_{GE} =	-5/16	V
R_{gon} =	4	Ω

Figure 10 FWD

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

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



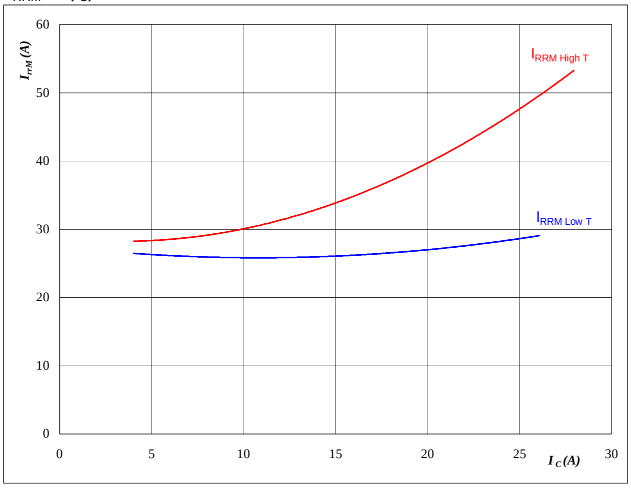
At

T_j =	25/125	°C
V_R =	700	V
I_F =	16	A
V_{GE} =	-5/16	V

Figure 11 FWD

Typical reverse recovery current as a function of collector current

$I_{RRM} = f(I_C)$



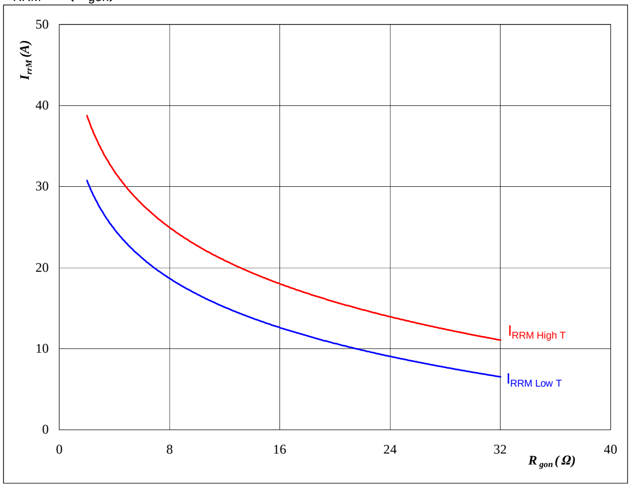
At

T_j =	25/125	°C
V_{CE} =	700	V
V_{GE} =	-5/16	V
R_{gon} =	4	Ω

Figure 12 FWD

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

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



At

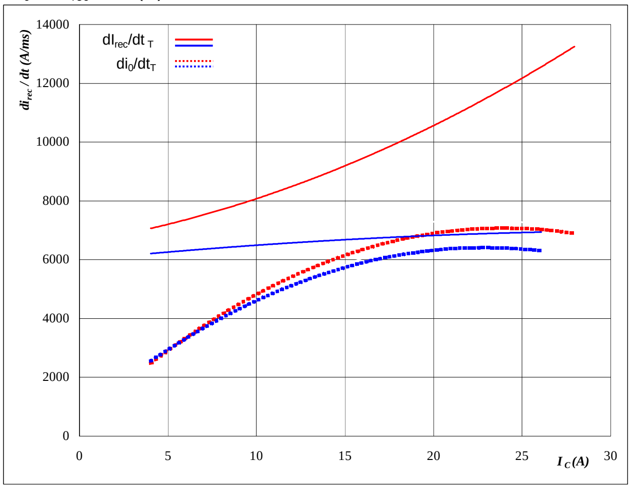
T_j =	25/125	°C
V_R =	700	V
I_F =	16	A
V_{GE} =	-5/16	V

Half Bridge Configuration

Figure 13 FWD

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

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



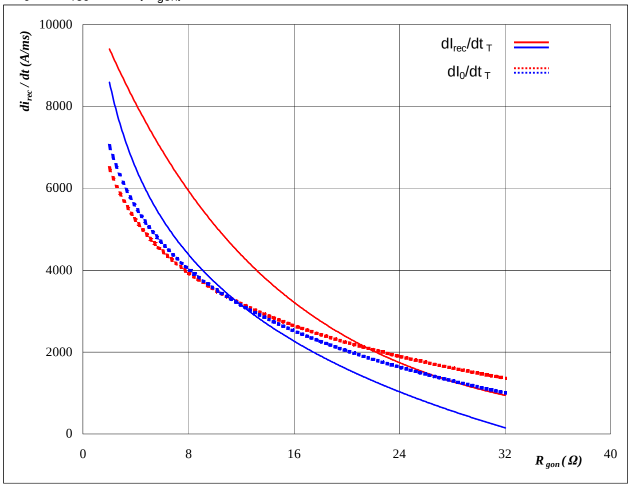
At

T_j =	25/125	℃
V_{CE} =	700	V
V_{GE} =	-5/16	V
R_{gon} =	4	Ω

Figure 14 FWD

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

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



At

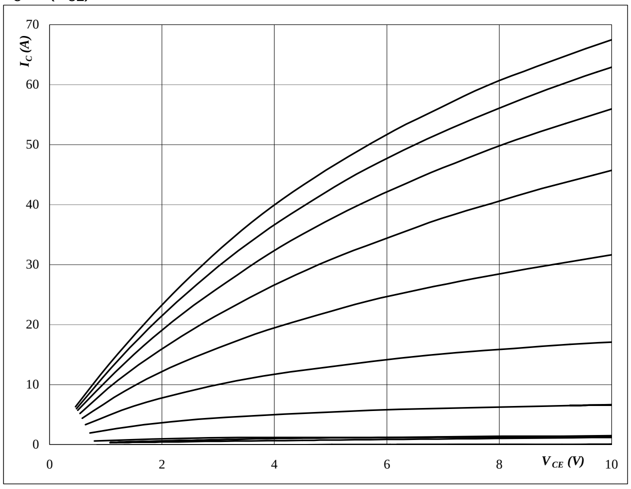
T_j =	25/125	℃
V_R =	700	V
I_F =	16	A
V_{GE} =	-5/16	V

Buck Boost

Figure 1	MOSFET

Typical output characteristics

$I_C = f(V_{CE})$



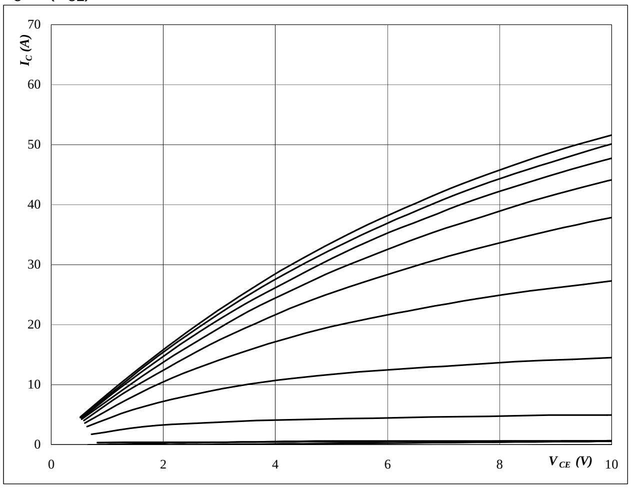
At

t_p =	250	μs
T_j =	25	℃
V_{GE} from	0 V to 20 V in steps of 2 V	

Figure 2	MOSFET

Typical output characteristics

$I_C = f(V_{CE})$



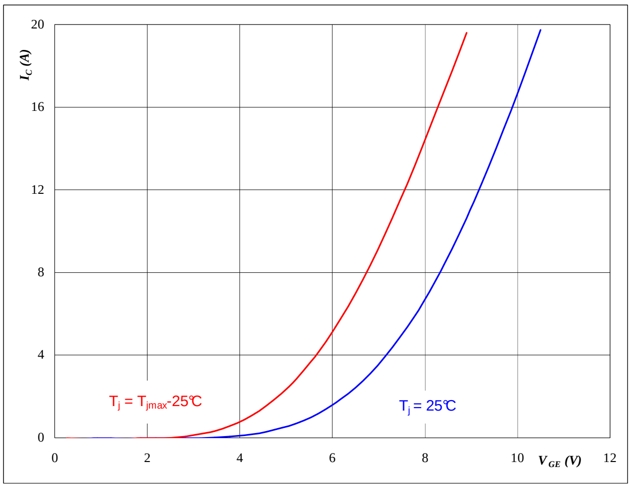
At

t_p =	250	μs
T_j =	125	℃
V_{GE} from	0 V to 20 V in steps of 2 V	

Figure 3	MOSFET

Typical transfer characteristics

$I_C = f(V_{GE})$



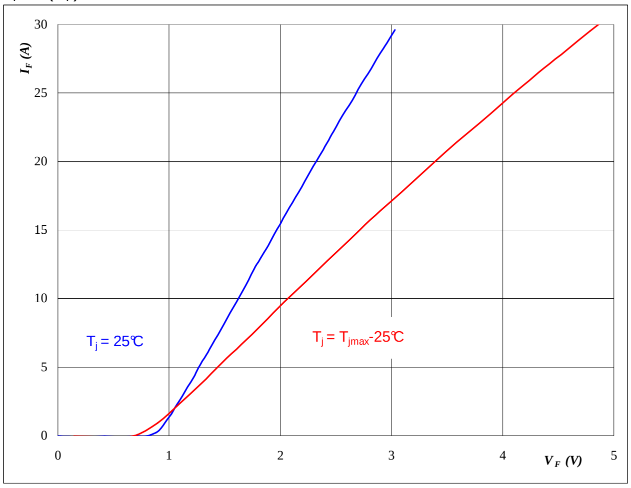
At

t_p =	250	μs
V_{CE} =	10	V

Figure 4	FWD

Typical diode forward current as a function of forward voltage

$I_F = f(V_F)$



At

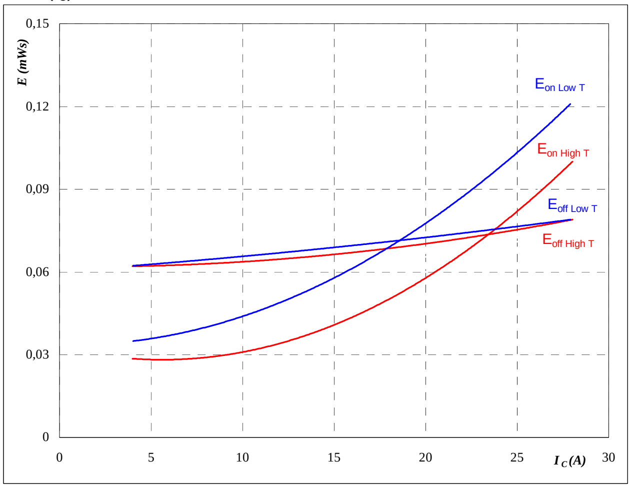
t_p =	250	μs

Splitted Configuration

Figure 5 MOSFET

Typical switching energy losses as a function of collector current

E = f(I_C)



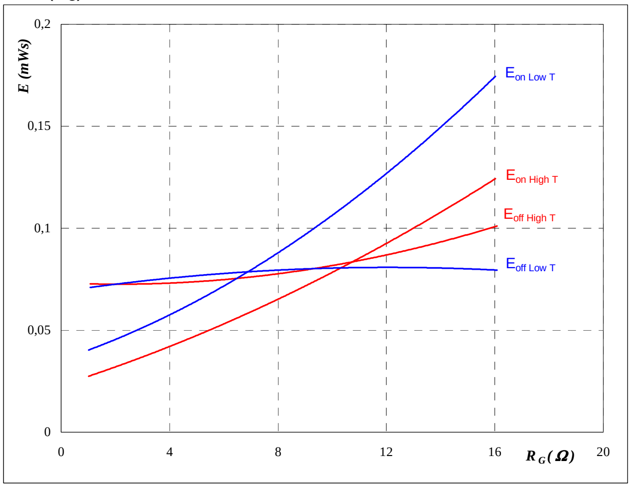
With an inductive load at

T_j =	25/126	°C
V_{CE} =	700	V
V_{GE} =	16/-8	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

Figure 6 MOSFET

Typical switching energy losses as a function of gate resistor

E = f(R_G)



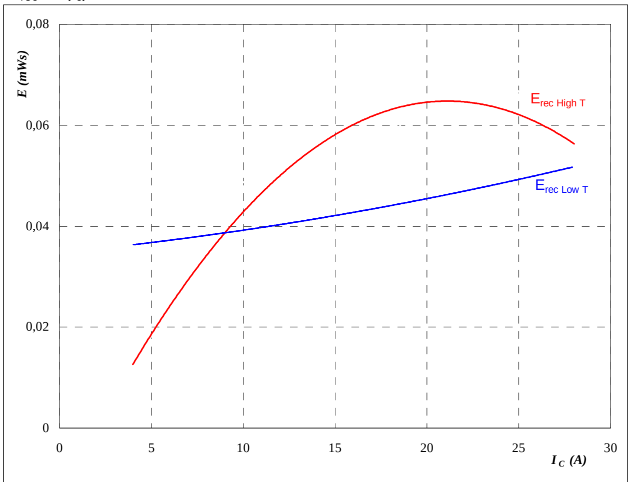
With an inductive load at

T_j =	25/126	°C
V_{CE} =	700	V
V_{GE} =	16/-8	V
I_C =	16	A

Figure 7 FWD

Typical reverse recovery energy loss as a function of collector current

E_{rec} = f(I_c)



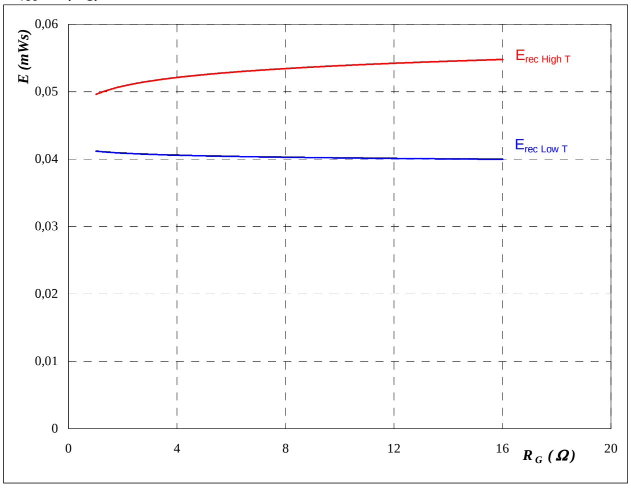
With an inductive load at

T_j =	25/126	°C
V_{CE} =	700	V
V_{GE} =	16/-8	V
R_{gon} =	4	Ω

Figure 8 FWD

Typical reverse recovery energy loss as a function of gate resistor

E_{rec} = f(R_G)



With an inductive load at

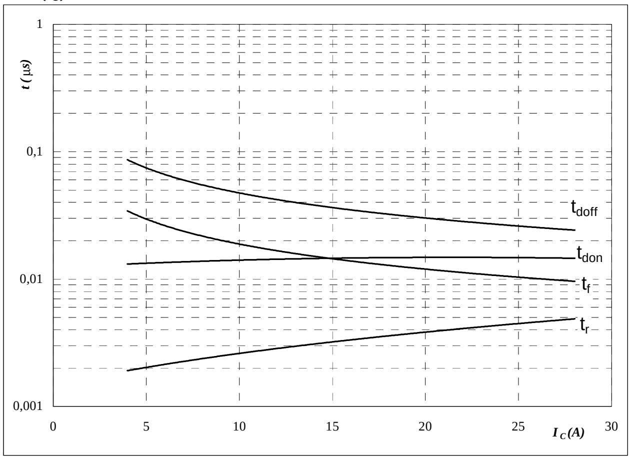
T_j =	25/126	°C
V_{CE} =	700	V
V_{GE} =	16/-8	V
I_C =	16	A

Splitted Configuration

Figure 9 MOSFET

Typical switching times as a function of collector current

$t = f(I_C)$



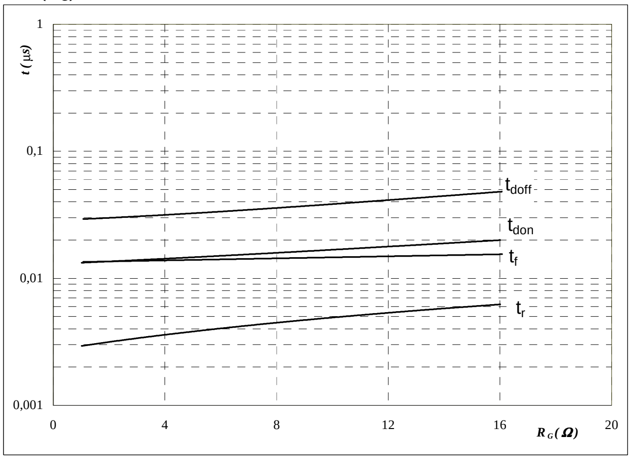
With an inductive load at

T_j =	126	°C
V_{CE} =	700	V
V_{GE} =	16/-8	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

Figure 10 MOSFET

Typical switching times as a function of gate resistor

$t = f(R_G)$



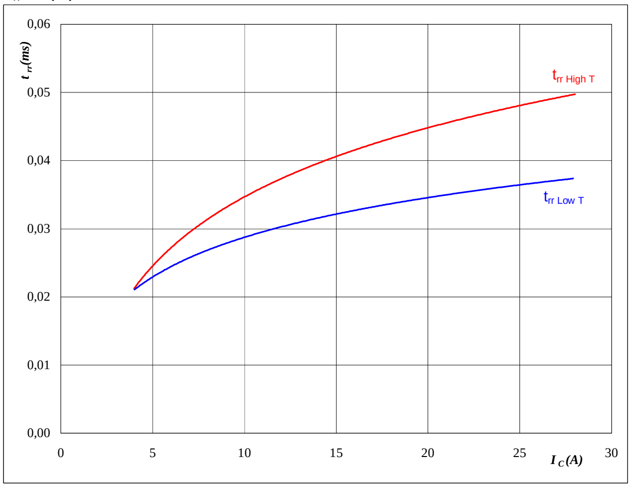
With an inductive load at

T_j =	126	°C
V_{CE} =	700	V
V_{GE} =	16/-8	V
I_C =	16	A

Figure 11 FWD

Typical reverse recovery time as a function of collector current

$t_{rr} = f(Ic)$



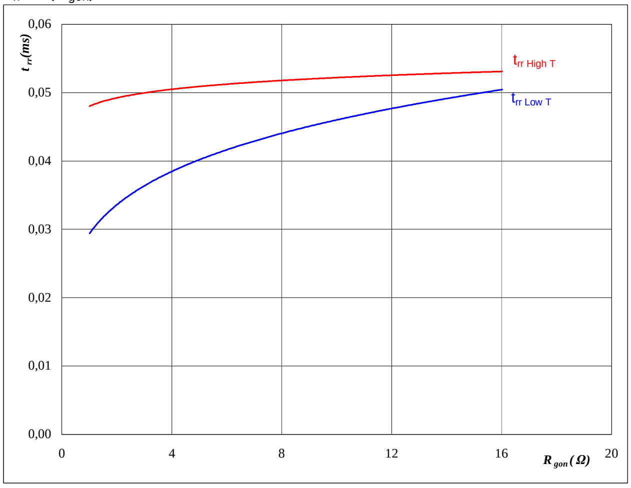
At

T_j =	25/126	°C
V_{CE} =	700	V
V_{GE} =	16/-8	V
R_{gon} =	4	Ω

Figure 12 FWD

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

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



At

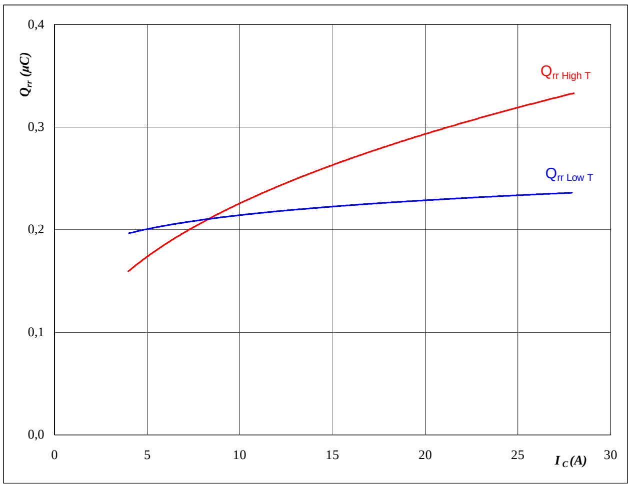
T_j =	25/126	°C
V_R =	700	V
I_F =	16	A
V_{GE} =	16/-8	V

Splitted Configuration

Figure 13 FWD

Typical reverse recovery charge as a function of collector current

$Q_{rr} = f(I_C)$



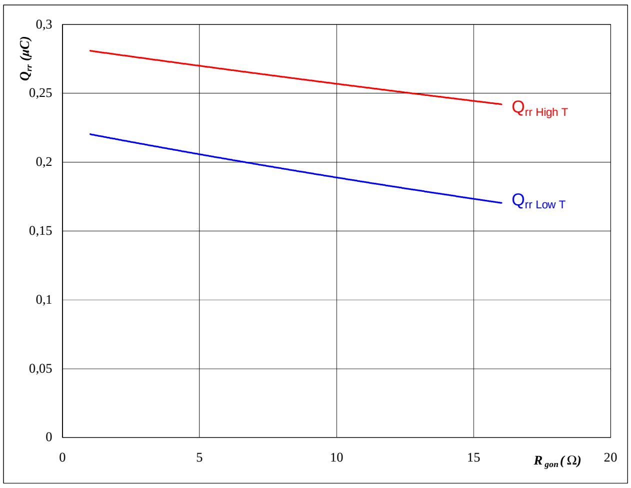
At

T_j =	25/126	°C
V_{CE} =	700	V
V_{GE} =	16/-8	V
R_{gon} =	4	Ω

Figure 14 FWD

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

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



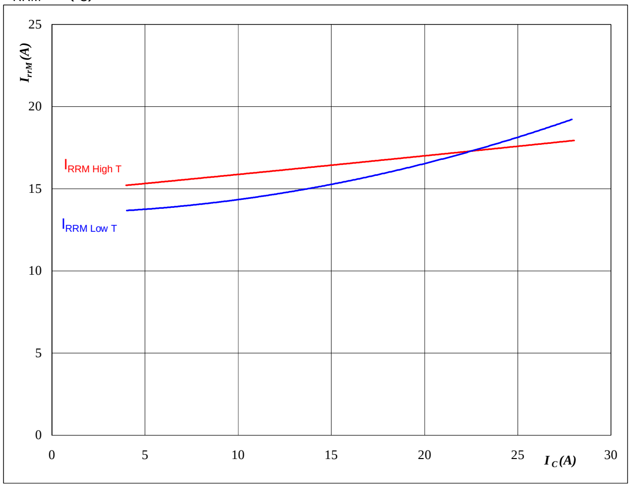
At

T_j =	25/126	°C
V_R =	700	V
I_F =	16	A
V_{GE} =	16/-8	V

Figure 15 FWD

Typical reverse recovery current as a function of collector current

$I_{RRM} = f(I_C)$



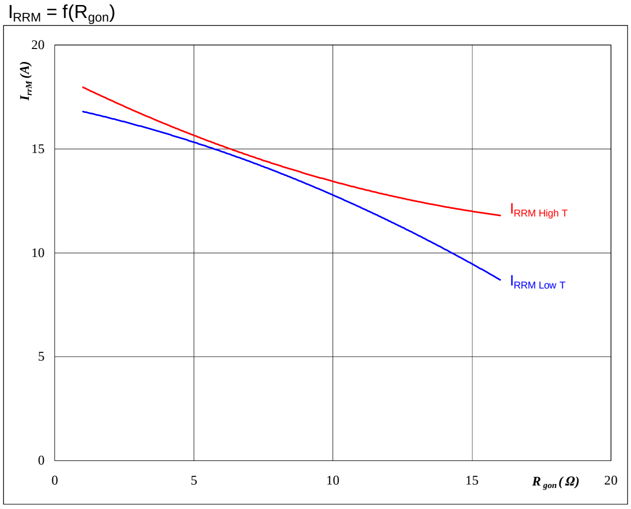
At

T_j =	25/126	°C
V_{CE} =	700	V
V_{GE} =	16/-8	V
R_{gon} =	4	Ω

Figure 16 FWD

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

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



At

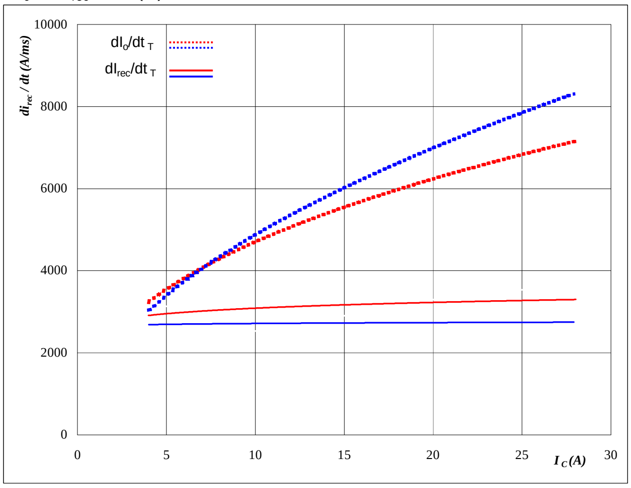
T_j =	25/126	°C
V_R =	700	V
I_F =	16	A
V_{GE} =	16/-8	V

Splitted Configuration

Figure 17	FWD

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

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



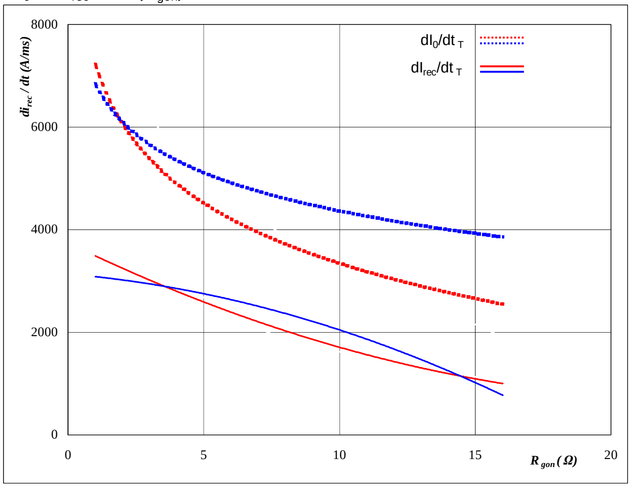
At

T_j =	25/126	℃
V_{CE} =	700	V
V_{GE} =	16/-8	V
R_{gon} =	4	Ω

Figure 18	FWD

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

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



At

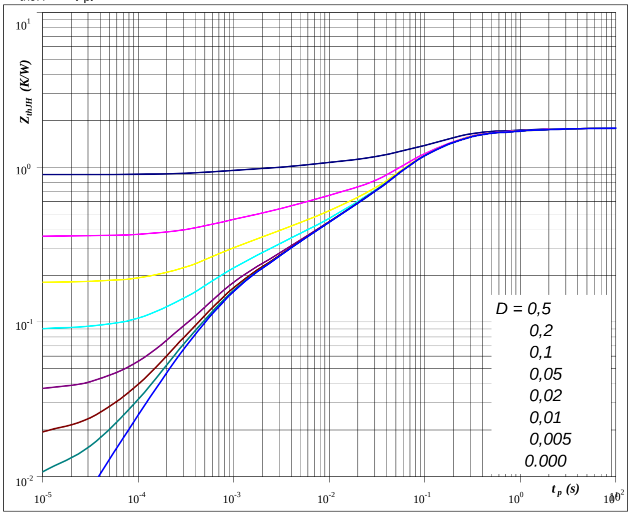
T_j =	25/126	℃
V_R =	700	V
I_F =	16	A
V_{GE} =	16/-8	V

Buck Boost

Figure 19	MOSFET

MOSFET transient thermal impedance
as a function of pulse width

$Z_{thJH} = f(t_p)$



At

D = tp / T

R_{thJH} = 1,79 K/W

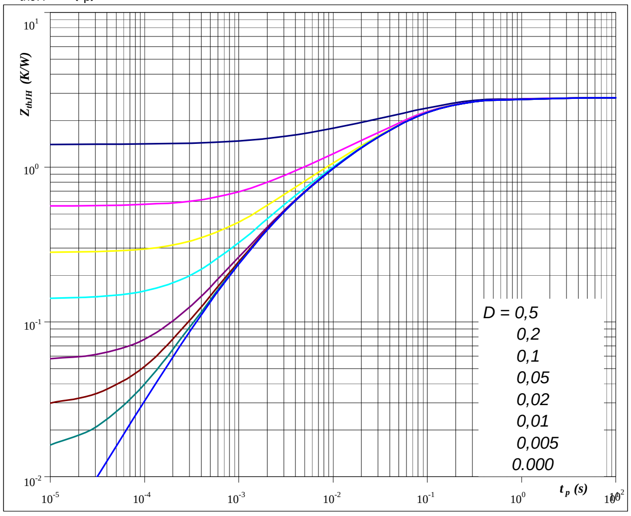
IGBT thermal model values

R (C/W)	Tau (s)
0,12	1,7E+00
0,33	2,5E-01
1,01	7,6E-02
0,19	5,1E-03
0,14	6,5E-04

Figure 20	FWD

FWD transient thermal impedance
as a function of pulse width

$Z_{thJH} = f(t_p)$



At

D = tp / T

R_{thJH} = 2,81 K/W

FWD thermal model values

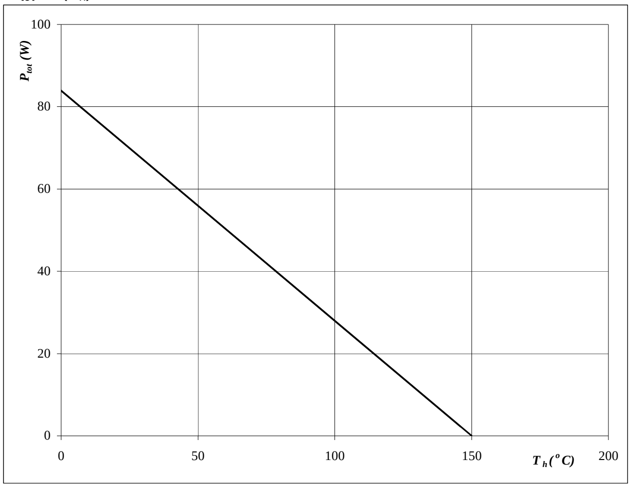
R (C/W)	Tau (s)
0,08	2,3E+00
0,21	3,3E-01
1,43	6,8E-02
0,71	1,2E-02
0,33	2,4E-03
0,05	5,2E-04

Buck Boost

Figure 21 MOSFET

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_h)$



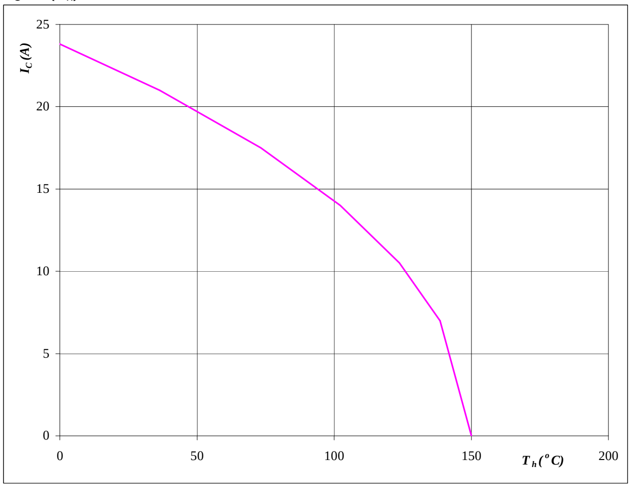
At

T_j = 150 ºC

Figure 22 MOSFET

Collector current as a function of heatsink temperature

$I_C = f(T_h)$



At

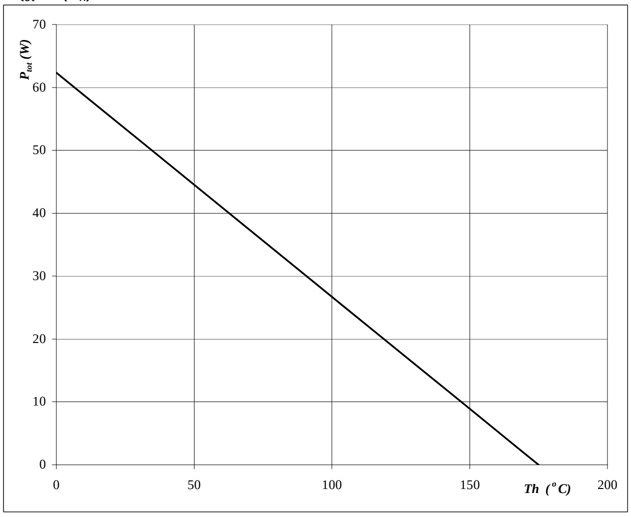
T_j = 150 ºC

V_{GE} = 15 V

Figure 23 FWD

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_h)$



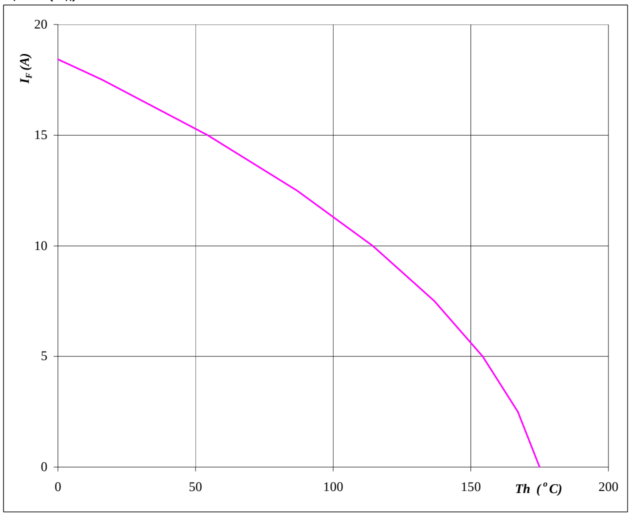
At

T_j = 175 ºC

Figure 24 FWD

Forward current as a function of heatsink temperature

$I_F = f(T_h)$



At

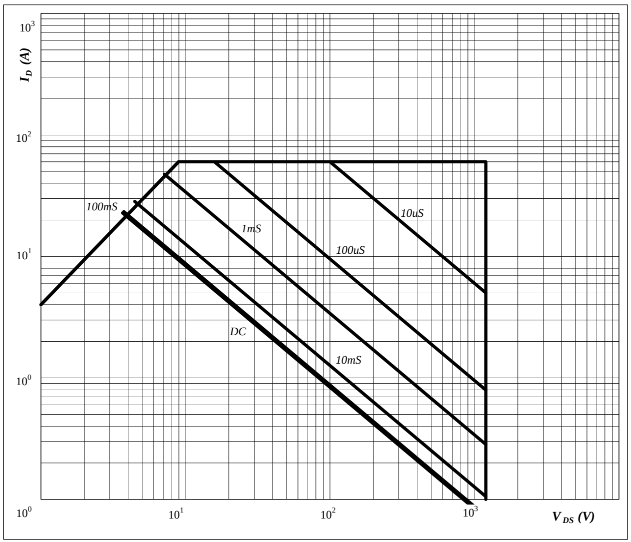
T_j = 175 ºC

Buck Boost

Figure 25	MOSFET

Safe operating area as a function of drain-source voltage

$I_D = f(V_{DS})$



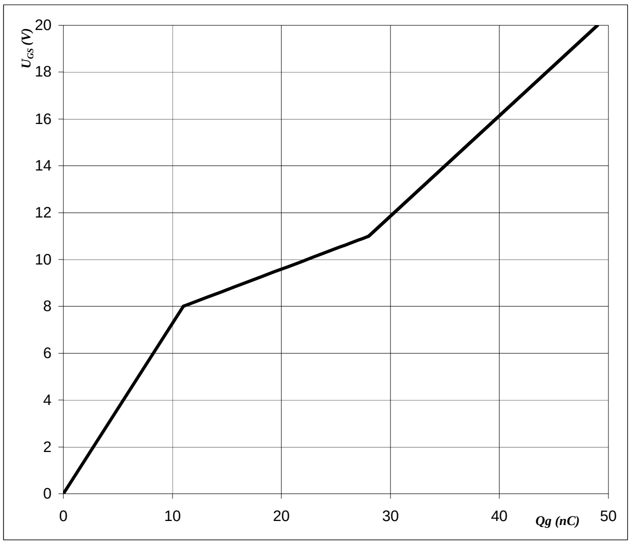
At

D =	single pulse	
T_h =	80	ºC
V_{GS} =	0	V
T_j =	T_{jmax}	ºC

Figure 26	MOSFET

Gate voltage vs Gate charge

$V_{GS} = f(Qg)$



At

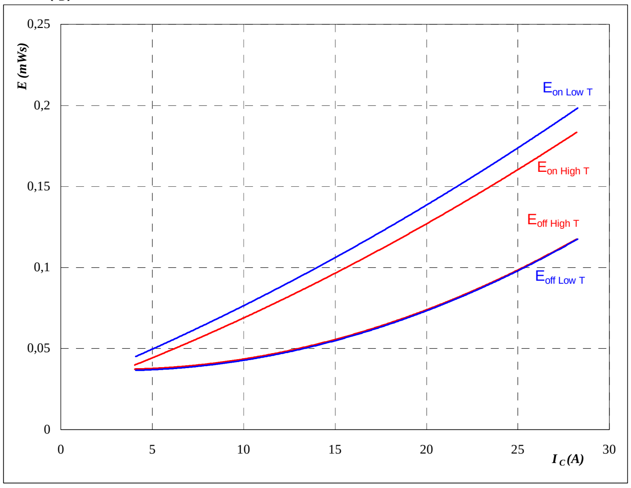
I_{DS} =	20	A
V_{DS}=	800	V
I_{GS}=	10	mA
T_j =	25	ºC

Booster Configuration

Figure 1 MOSFET

Typical switching energy losses
as a function of collector current

$E = f(I_D)$



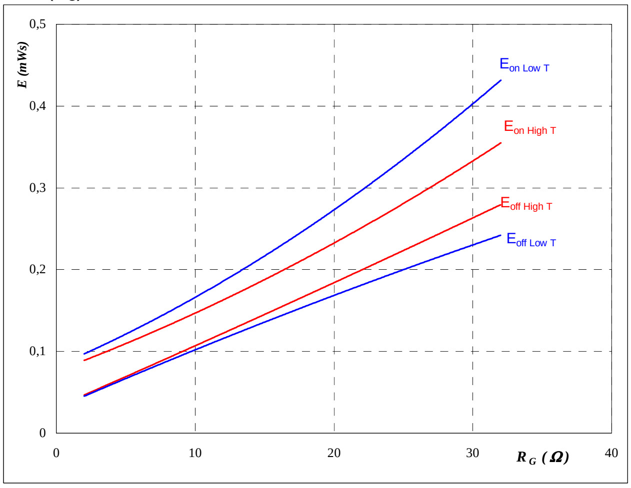
With an inductive load at

T_j =	25/125	°C
V_{DS} =	700	V
V_{GS} =	16	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

Figure 2 MOSFET

Typical switching energy losses
as a function of gate resistor

$E = f(R_G)$



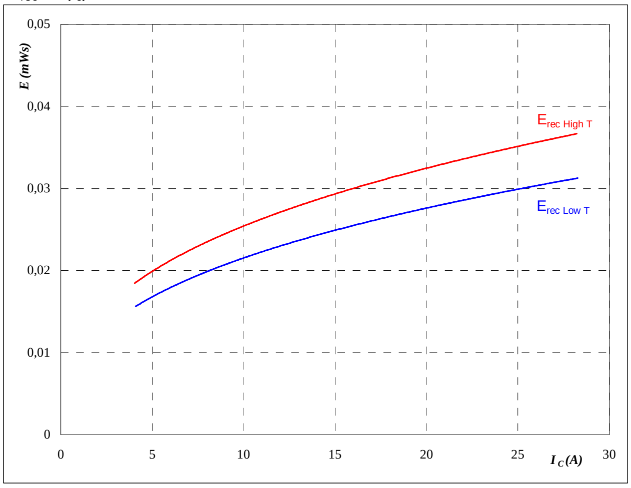
With an inductive load at

T_j =	25/125	°C
V_{DS} =	700	V
V_{GS} =	16	V
I_D =	16	A

Figure 3 FWD

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

$E_{rec} = f(I_c)$



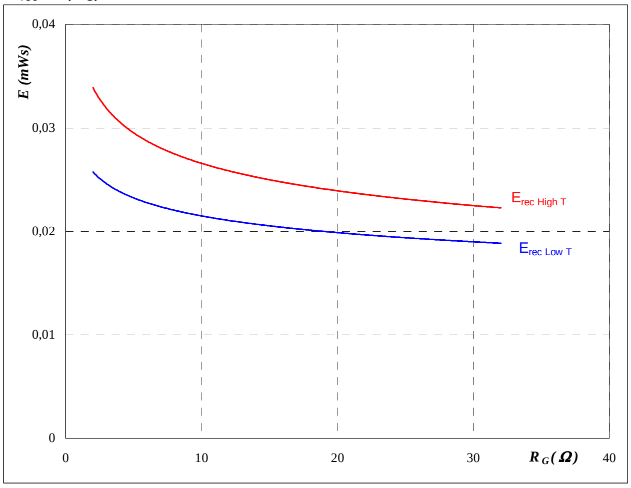
With an inductive load at

T_j =	25/125	°C
V_{DS} =	700	V
V_{GS} =	16	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

Figure 4 FWD

Typical reverse recovery energy loss
as a function of gate resistor

$E_{rec} = f(R_G)$



With an inductive load at

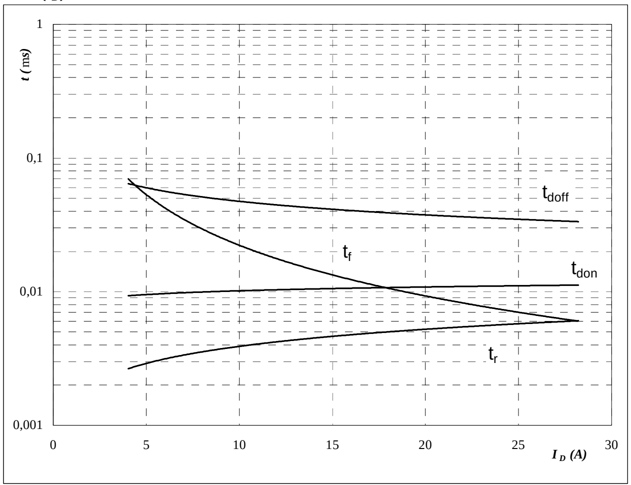
T_j =	25/125	°C
V_{DS} =	700	V
V_{GS} =	16	V
I_D =	16	A

Booster Configuration

Figure 5 MOSFET

Typical switching times as a function of collector current

t = f(I_D)



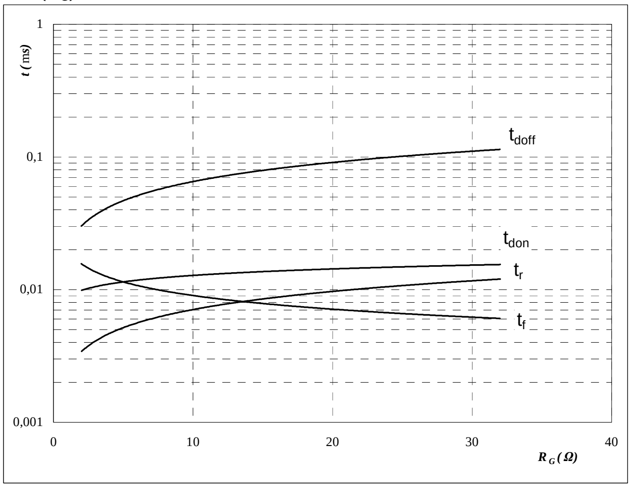
With an inductive load at

T_j =	125	℃
V_{DS} =	700	V
V_{GS} =	16	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

Figure 6 MOSFET

Typical switching times as a function of gate resistor

t = f(R_G)



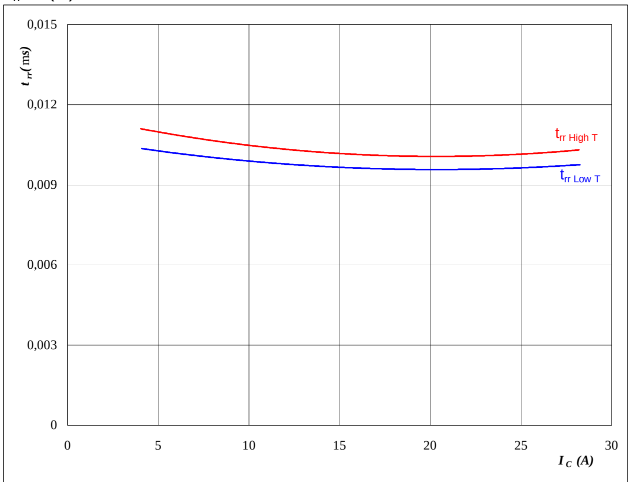
With an inductive load at

T_j =	125	℃
V_{DS} =	700	V
V_{GS} =	16	V
I_C =	16	A

Figure 7 FWD

Typical reverse recovery time as a function of collector current

t_{rr} = f(Ic)



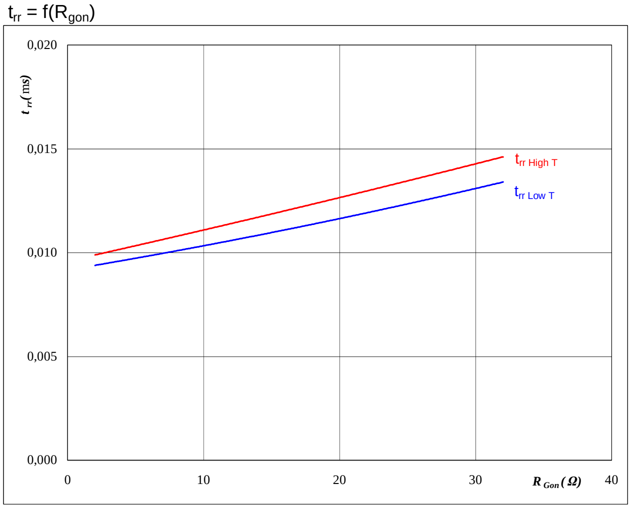
At

T_j =	25/125	℃
V_{CE} =	700	V
V_{GE} =	16	V
R_{gon} =	4	Ω

Figure 8 FWD

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

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



At

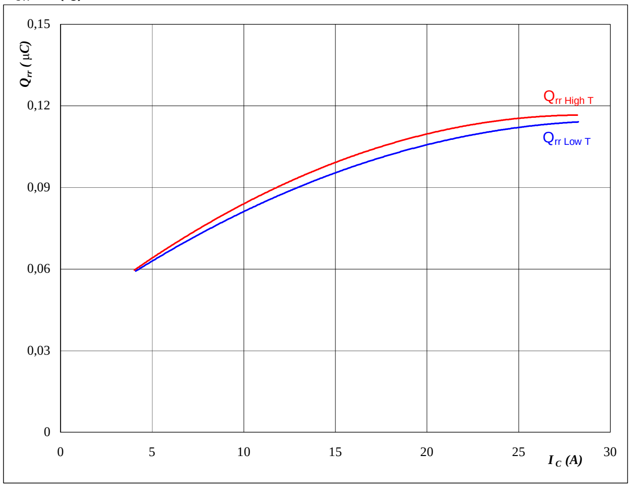
T_j =	25/125	℃
V_R =	700	V
I_F =	16	A
V_{GS} =	16	V

Booster Configuration

Figure 9 FWD

Typical reverse recovery charge as a function of collector current

$Q_{rr} = f(I_C)$



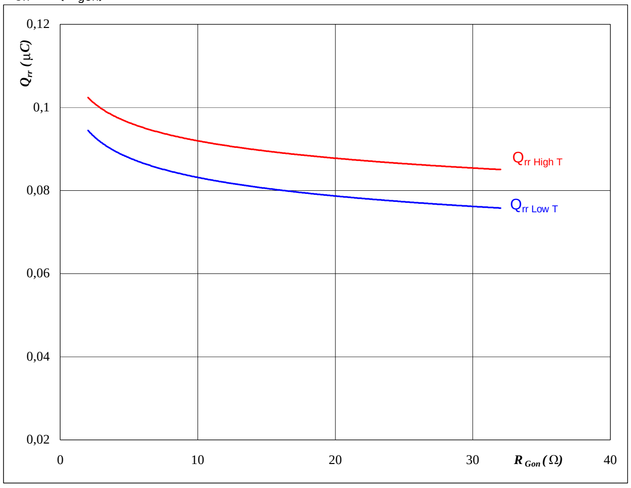
At

T_j =	25/125	℃
V_{CE} =	700	V
V_{GE} =	16	V
R_{gon} =	4	Ω

Figure 10 FWD

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

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



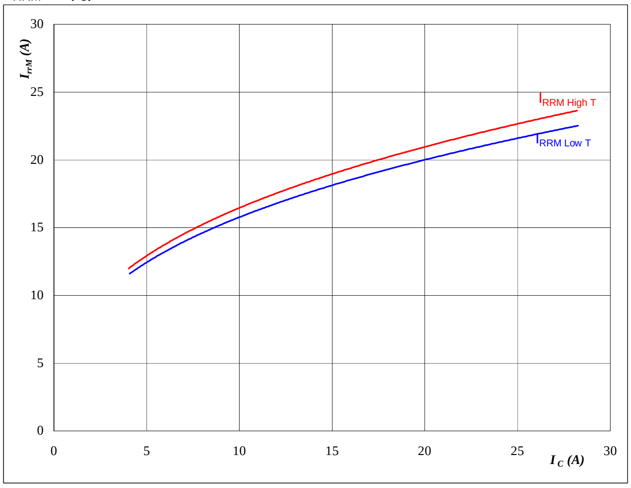
At

Tj =	25/125	℃
VR =	700	V
IF =	16	A
VGS =	16	V

Figure 11 FWD

Typical reverse recovery current as a function of collector current

$I_{RRM} = f(I_C)$



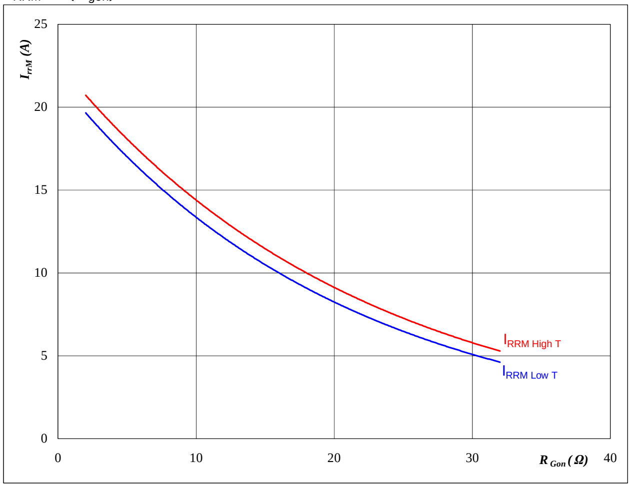
At

T_j =	25/125	℃
V_{CE} =	700	V
V_{GE} =	16	V
R_{gon} =	4	Ω

Figure 12 FWD

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

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



At

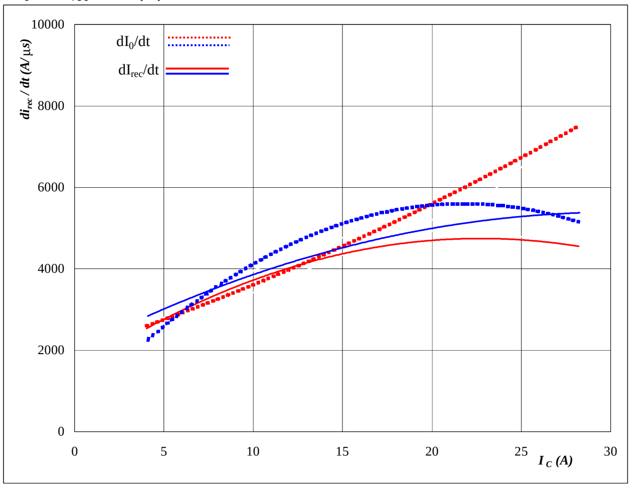
T_j =	25/125	℃
V_R =	700	V
I_F =	16	A
V_{GS} =	16	V

Booster Configuration

Figure 13 FWD

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

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



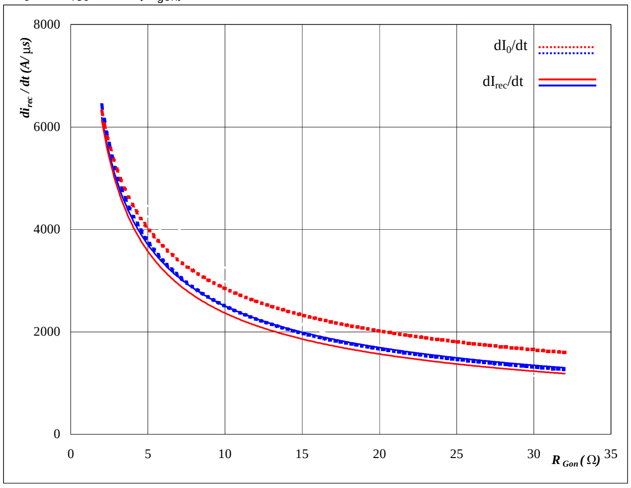
At

T_j =	25/125	°C
V_{CE} =	700	V
V_{GE} =	16	V
R_{gon} =	4	Ω

Figure 14 FWD

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

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



At

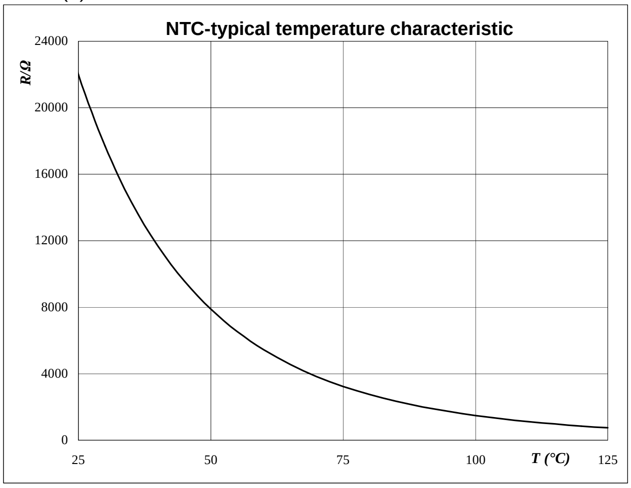
T_j =	25/125	°C
V_R =	700	V
I_F =	16	A
V_{GS} =	16	V

Thermistor

Figure 1 Thermistor

Typical NTC characteristic
as a function of temperature

$R_T = f(T)$



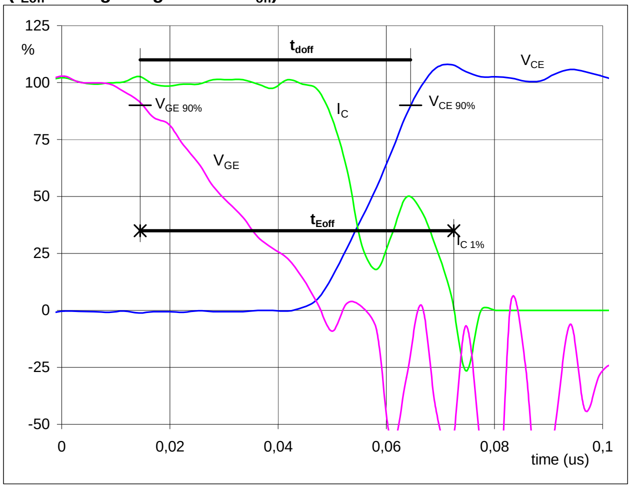
Switching Definitions Half Bridge Configuration

General conditions

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

Figure 1 MOSFET

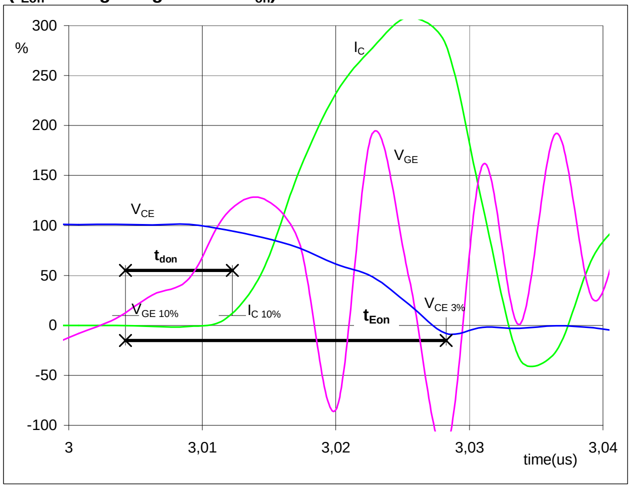
Turn-off Switching Waveforms & definition of t_{doff}, t_{Eoff}
(t_{Eoff} = integrating time for E_{off})



V_{GE} (0%) =	0	V
V_{GE} (100%) =	16	V
V_C (100%) =	700	V
I_C (100%) =	16	A
t_{doff} =	0,048	μs
t_{Eoff} =	0,058	μs

Figure 2 MOSFET

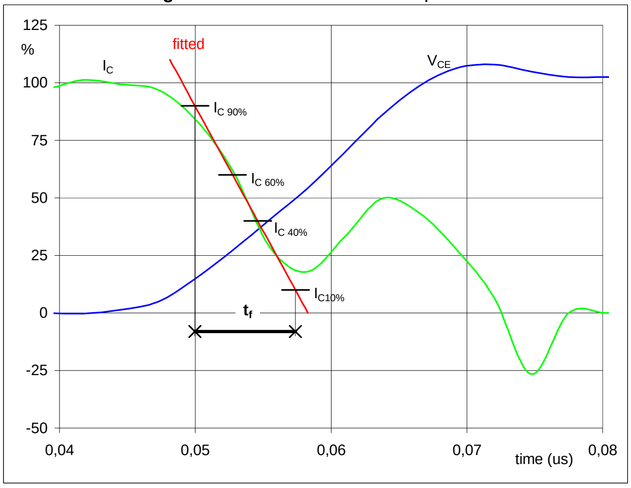
Turn-on Switching Waveforms & definition of t_{don}, t_{Eon}
(t_{Eon} = integrating time for E_{on})



V_{GE} (0%) =	0	V
V_{GE} (100%) =	16	V
V_C (100%) =	700	V
I_C (100%) =	16	A
t_{don} =	0,013	μs
t_{Eon} =	0,024	μs

Figure 3 MOSFET

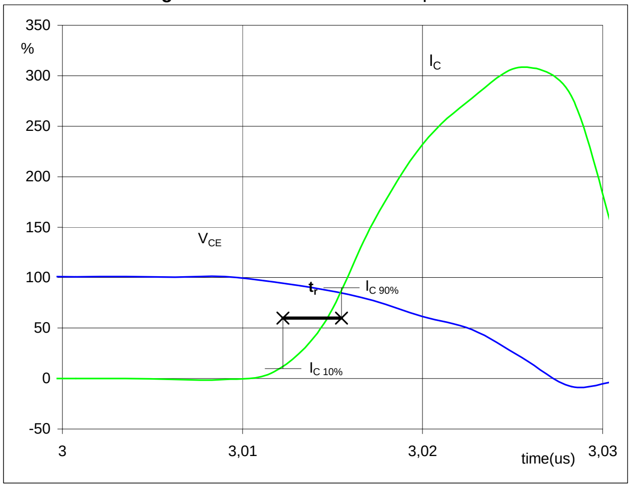
Turn-off Switching Waveforms & definition of t_f



V_C (100%) =	700	V
I_C (100%) =	16	A
t_f =	0,006	μs

Figure 4 MOSFET

Turn-on Switching Waveforms & definition of t_r

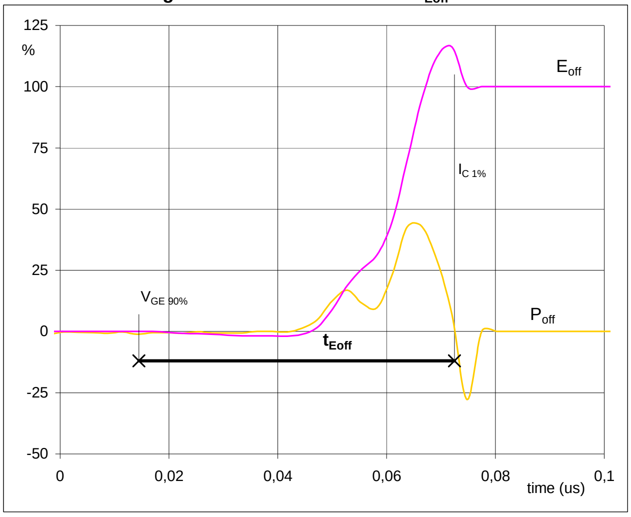


V_C (100%) =	700	V
I_C (100%) =	16	A
t_r =	0,004	μs

Switching Definitions Half Bridge Configuration

Figure 5 MOSFET

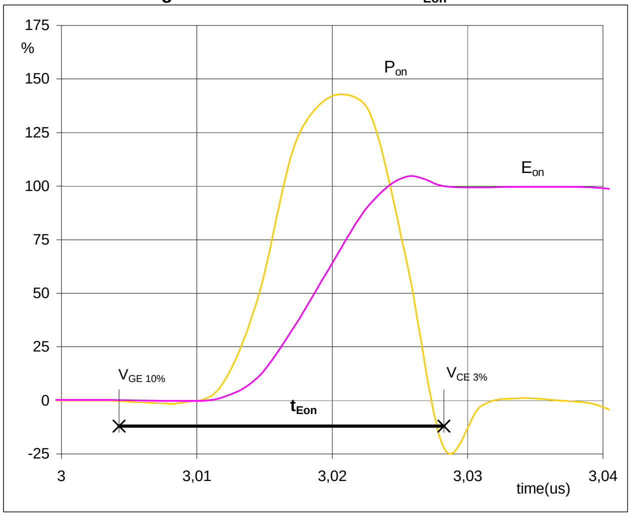
Turn-off Switching Waveforms & definition of t_{Eoff}



P_{off} (100%) =	11,17	kW
E_{off} (100%) =	0,06	mJ
t_{Eoff} =	0,058	μs

Figure 6 MOSFET

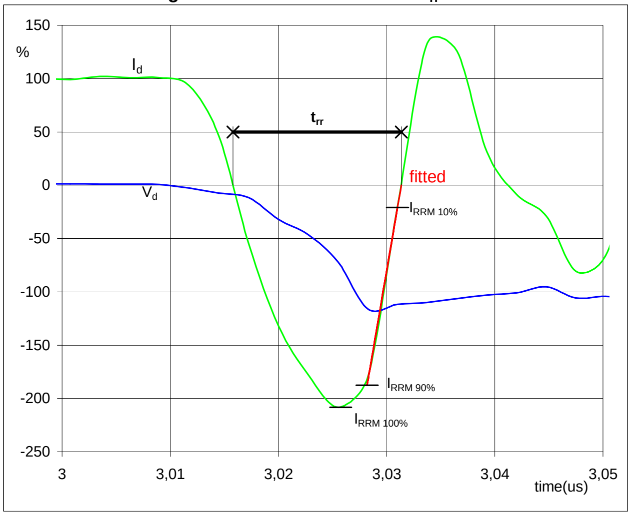
Turn-on Switching Waveforms & definition of t_{Eon}



P_{on} (100%) =	11,17	kW
E_{on} (100%) =	0,14	mJ
t_{Eon} =	0,024	μs

Figure 7 FWD

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

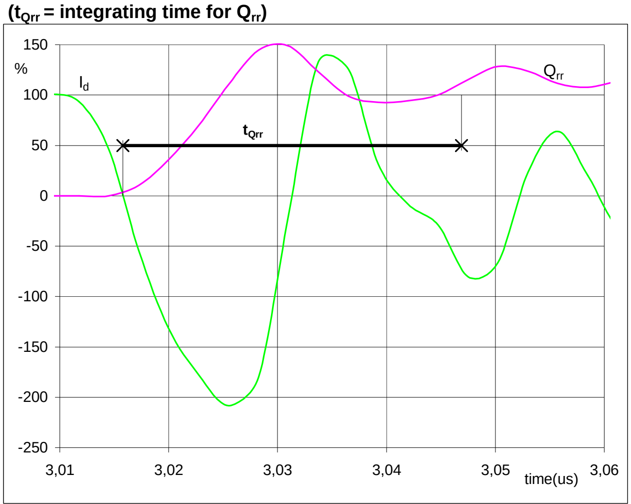


V_d (100%) =	700	V
I_d (100%) =	16	A
I_{RRM} (100%) =	-34	A
t_{rr} =	0,015	μs

Switching Definitions Half Bridge Configuration

Figure 8 FWD

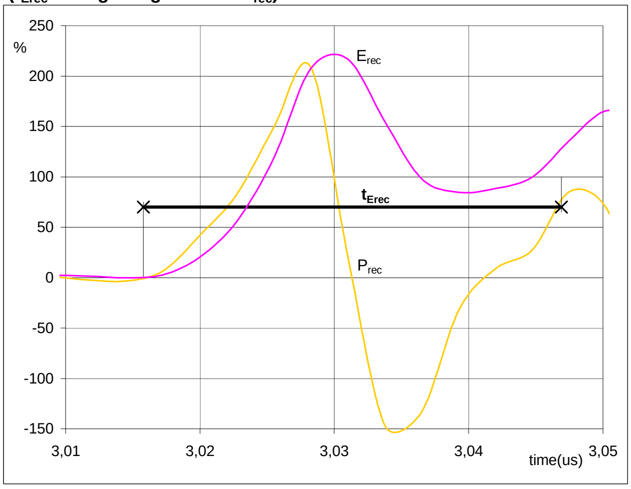
Turn-on Switching Waveforms & definition of t_{Qrr}
(t_{Qrr} = integrating time for Q_{rr})



I_d (100%) =	16	A
Q_{rr} (100%) =	0,23	μC
t_{Qrr} =	0,031	μs

Figure 9 FWD

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

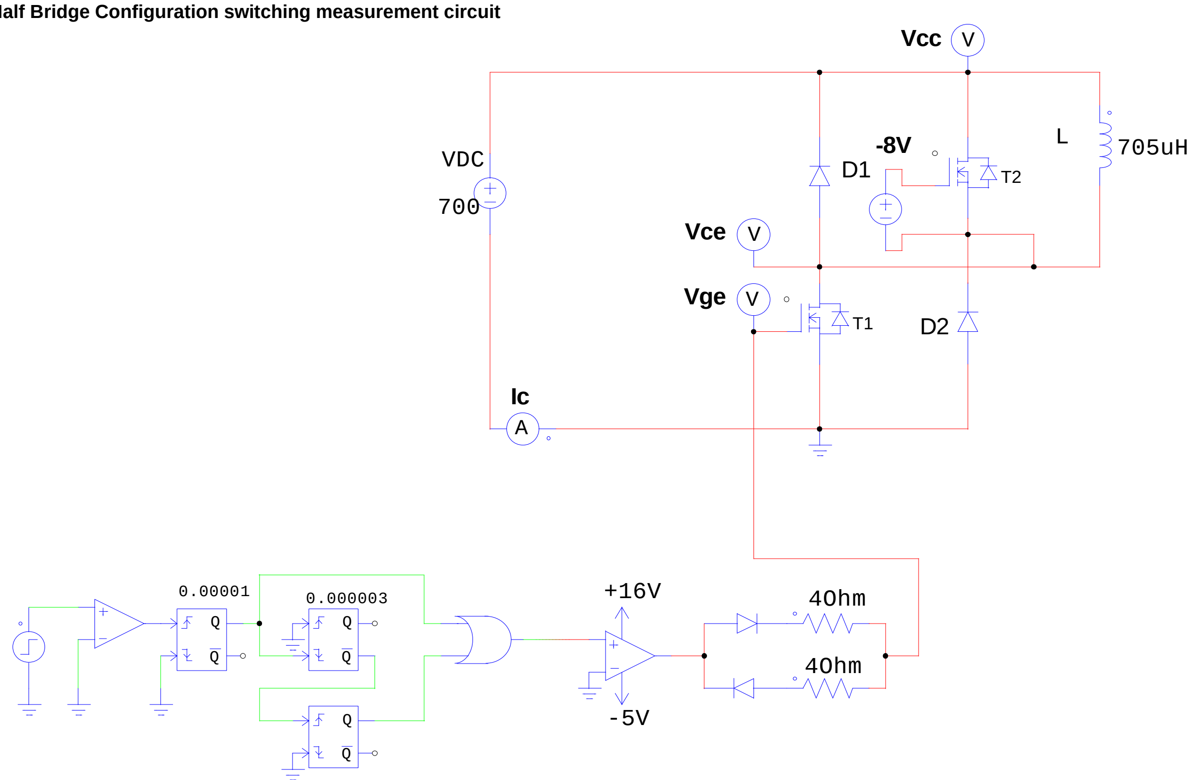


P_{rec} (100%) =	11,17	kW
E_{rec} (100%) =	0,08	mJ
t_{Erec} =	0,031	μs

Measurement circuit

Figure 10

Half Bridge Configuration switching measurement circuit



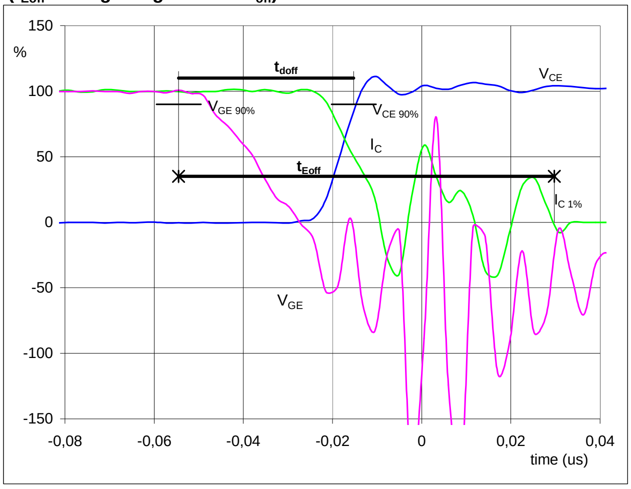
Switching Definitions Splitted Configuration

General conditions

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

Figure 1 MOSFET

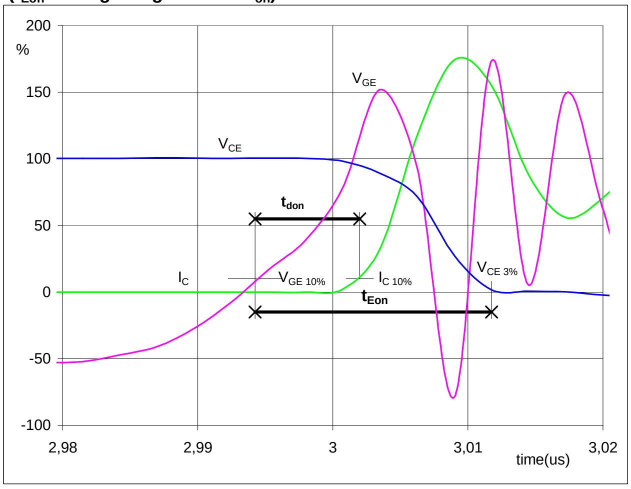
Turn-off Switching Waveforms & definition of t_{doff}, t_{Eoff}
(t_{Eoff} = integrating time for E_{off})



V_{GE} (0%) =	0	V
V_{GE} (100%) =	16	V
V_C (100%) =	700	V
I_C (100%) =	16	A
t_{doff} =	0,032	μs
t_{Eoff} =	0,084	μs

Figure 2 MOSFET

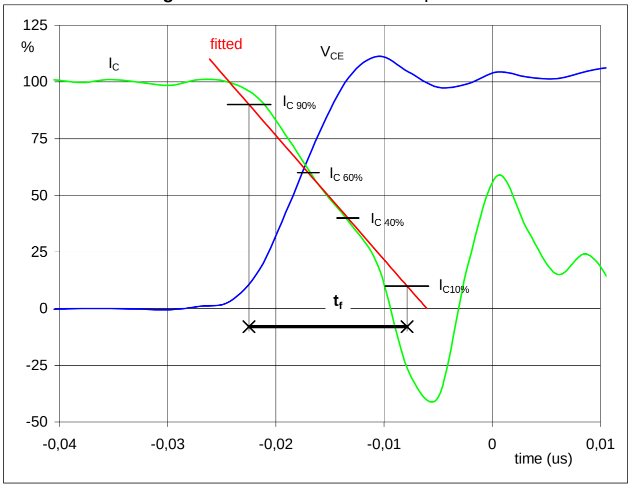
Turn-on Switching Waveforms & definition of t_{don}, t_{Eon}
(t_{Eon} = integrating time for E_{on})



V_{GE} (0%) =	0	V
V_{GE} (100%) =	16	V
V_C (100%) =	700	V
I_C (100%) =	16	A
t_{don} =	0,014	μs
t_{Eon} =	0,017	μs

Figure 3 MOSFET

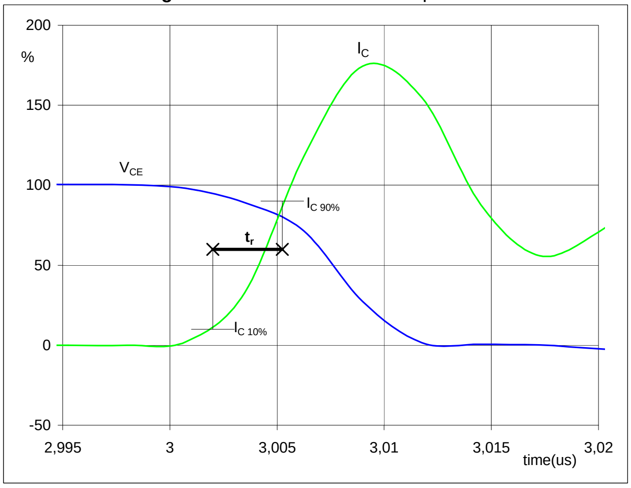
Turn-off Switching Waveforms & definition of t_f



V_C (100%) =	700	V
I_C (100%) =	16	A
t_f =	0,013	μs

Figure 4 MOSFET

Turn-on Switching Waveforms & definition of t_r

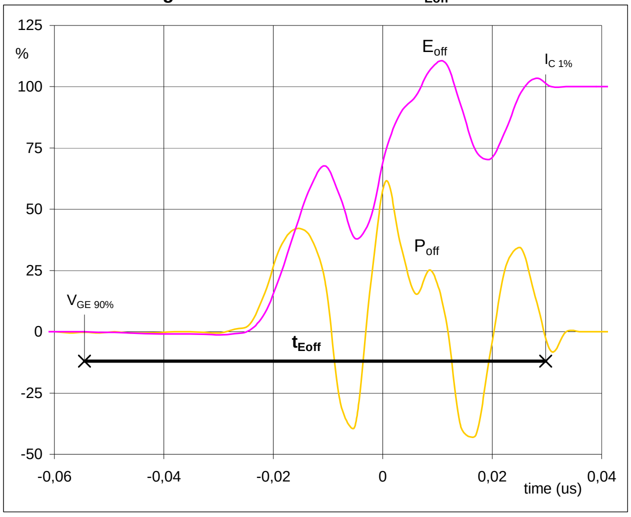


V_C (100%) =	700	V
I_C (100%) =	16	A
t_r =	0,003	μs

Switching Definitions Splitted Configuration

Figure 5 MOSFET

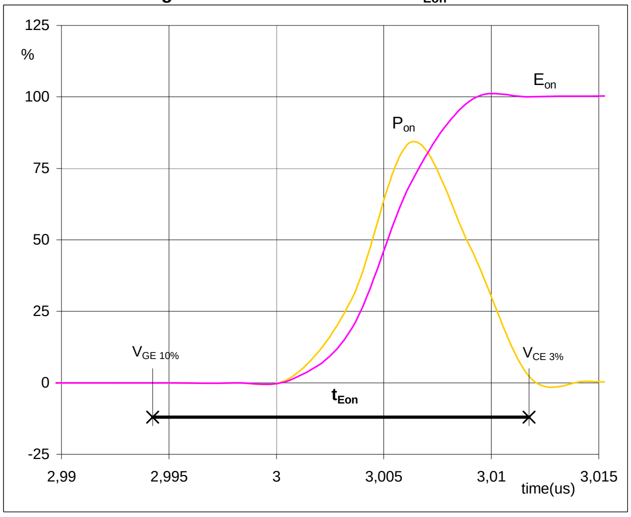
Turn-off Switching Waveforms & definition of t_{Eoff}



P_{off} (100%) =	11,19	kW
E_{off} (100%) =	0,074	mJ
t_{Eoff} =	0,084	μs

Figure 6 MOSFET

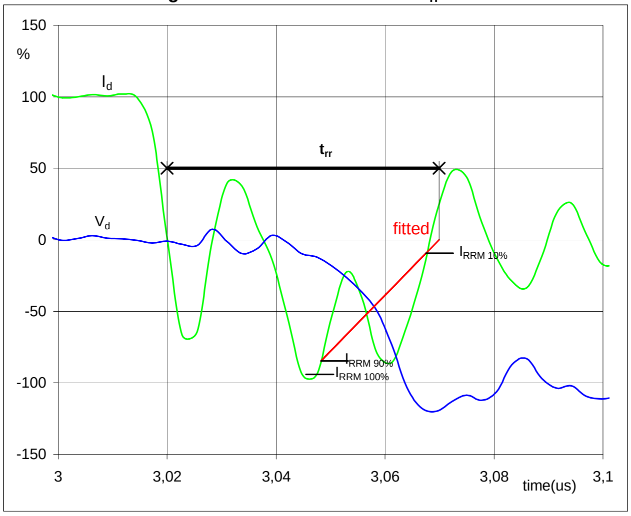
Turn-on Switching Waveforms & definition of t_{Eon}



P_{on} (100%) =	11,19	kW
E_{on} (100%) =	0,041	mJ
t_{Eon} =	0,017	μs

Figure 7 FWD

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

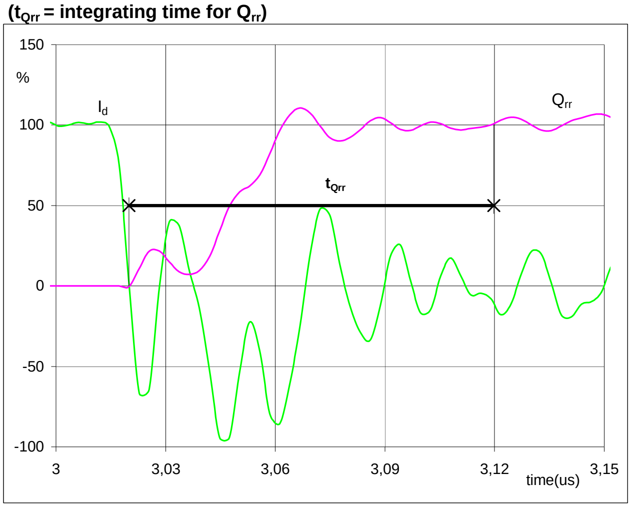


V_d (100%) =	700	V
I_d (100%) =	16	A
I_{RRM} (100%) =	-17	A
t_{rr} =	0,049	μs

Switching Definitions Splitted Configuration

Figure 8 FWD

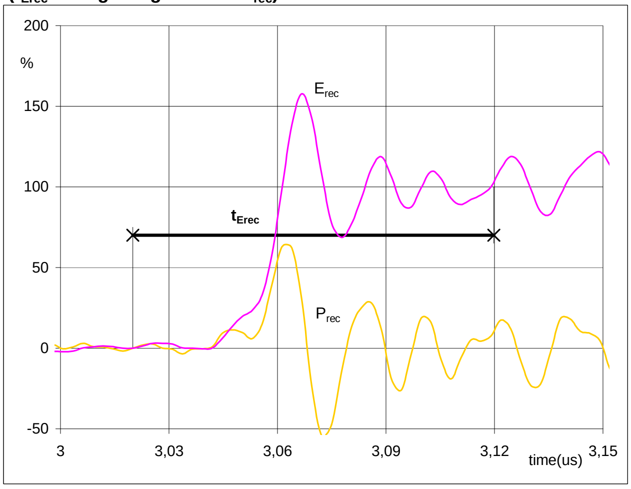
Turn-on Switching Waveforms & definition of t_{Qrr}
(t_{Qrr} = integrating time for Q_{rr})



I_d (100%) =	16	A
Q_{rr} (100%) =	0,27	μC
t_{Qrr} =	0,100	μs

Figure 9 FWD

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

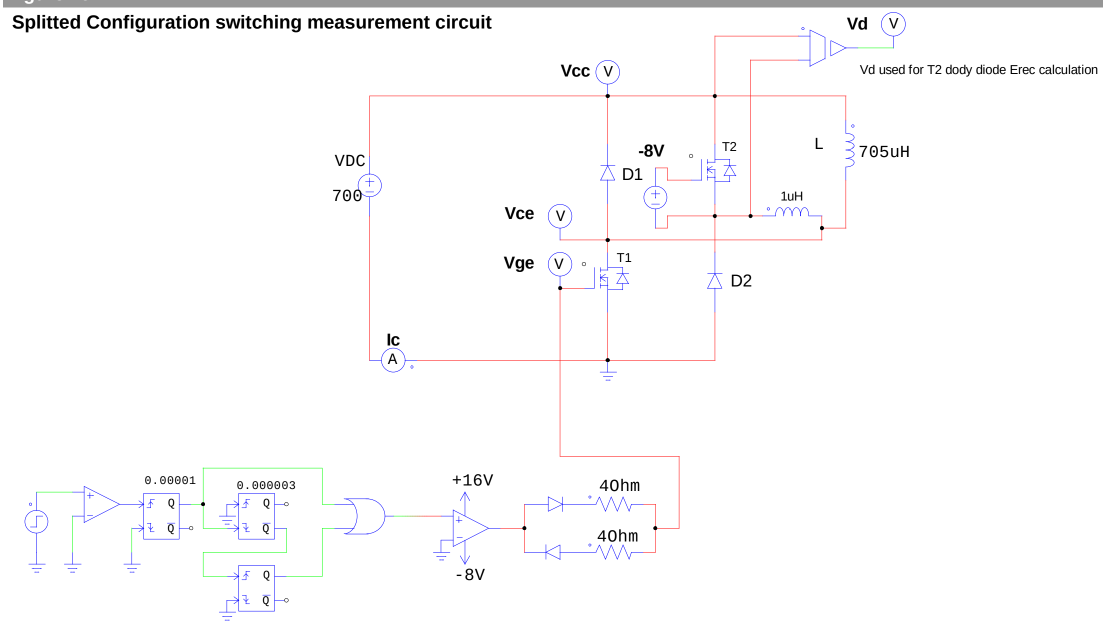


P_{rec} (100%) =	11,19	kW
E_{rec} (100%) =	0,05	mJ
t_{Erec} =	0,100	μs

Measurement circuit

Figure 10

Splitted Configuration switching measurement circuit



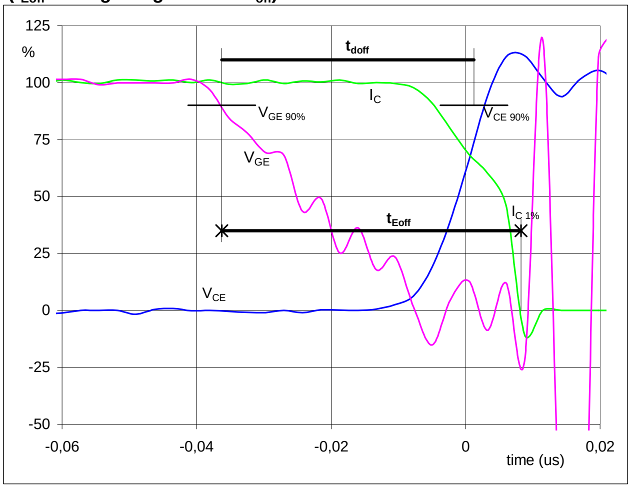
Switching Definitions Booster Configuration

General conditions

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

Figure 1 MOSFET

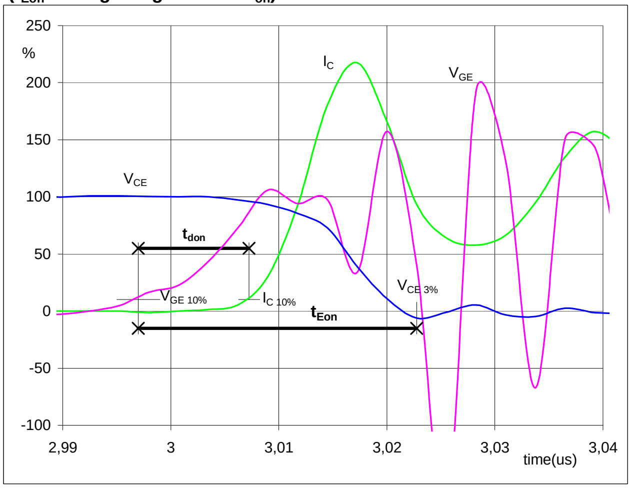
Turn-off Switching Waveforms & definition of t_{doff}, t_{Eoff}
(t_{Eoff} = integrating time for E_{off})



V_{GE} (0%) =	0	V
V_{GE} (100%) =	16	V
V_C (100%) =	700	V
I_C (100%) =	16	A
t_{doff} =	0,039	μs
t_{Eoff} =	0,044	μs

Figure 2 MOSFET

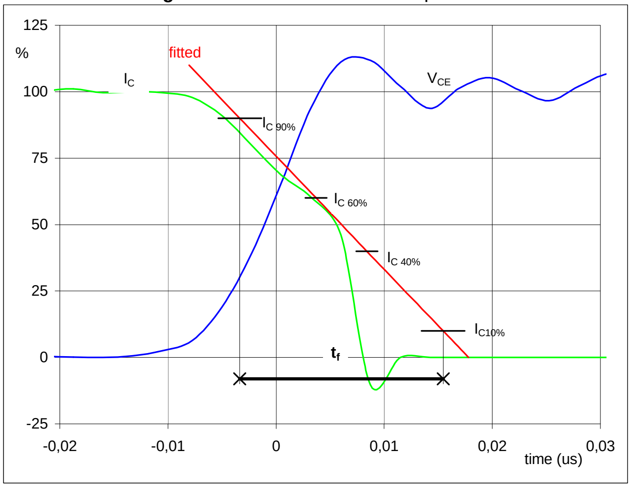
Turn-on Switching Waveforms & definition of t_{don}, t_{Eon}
(t_{Eon} = integrating time for E_{on})



V_{GE} (0%) =	0	V
V_{GE} (100%) =	16	V
V_C (100%) =	700	V
I_C (100%) =	16	A
t_{don} =	0,011	μs
t_{Eon} =	0,026	μs

Figure 3 MOSFET

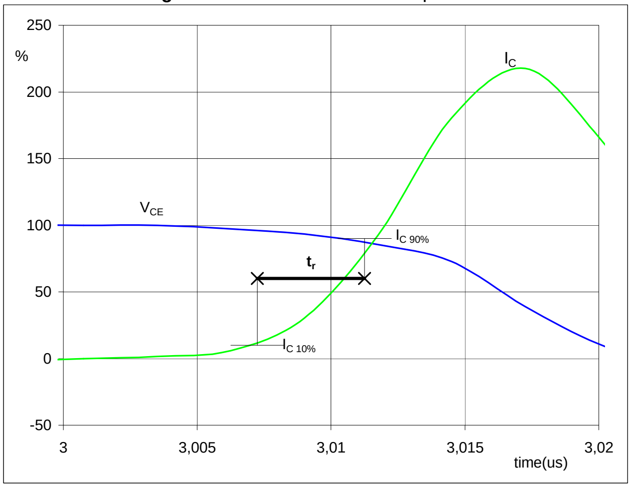
Turn-off Switching Waveforms & definition of t_f



V_C (100%) =	700	V
I_C (100%) =	16	A
t_f =	0,014	μs

Figure 4 MOSFET

Turn-on Switching Waveforms & definition of t_r

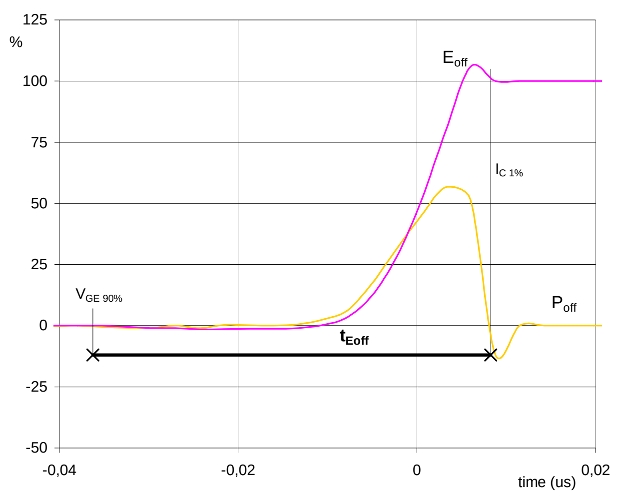


V_C (100%) =	700	V
I_C (100%) =	16	A
t_r =	0,004	μs

Switching Definitions Booster Configuration

Figure 5 MOSFET

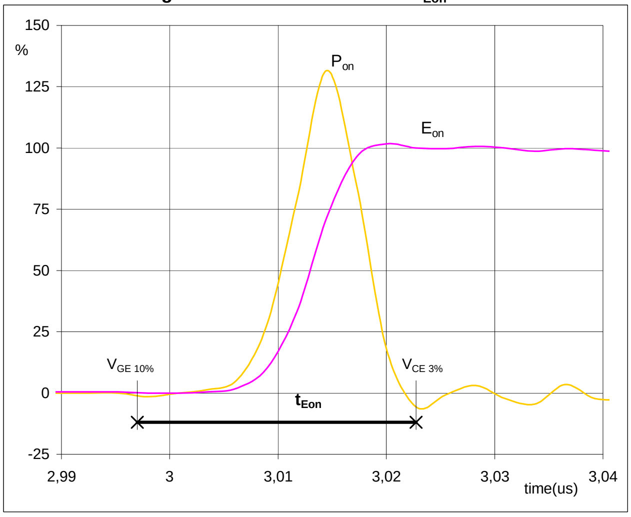
Turn-off Switching Waveforms & definition of t_{Eoff}



P_{off} (100%) =	11,15	kW
E_{off} (100%) =	0,06	mJ
t_{Eoff} =	0,044	μs

Figure 6 MOSFET

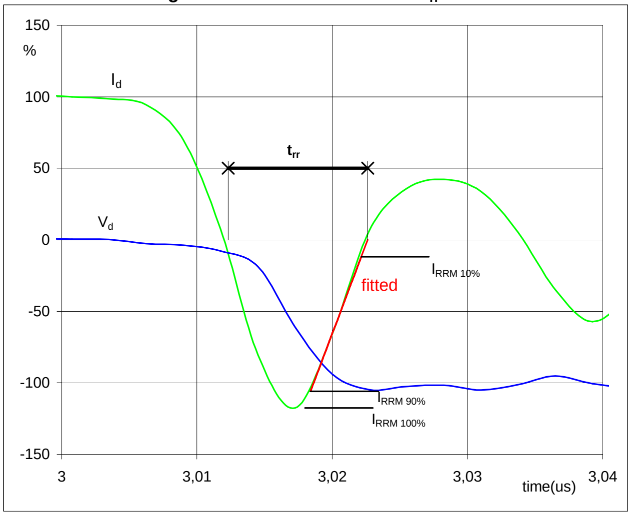
Turn-on Switching Waveforms & definition of t_{Eon}



P_{on} (100%) =	11,15	kW
E_{on} (100%) =	0,10	mJ
t_{Eon} =	0,026	μs

Figure 7 FWD

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

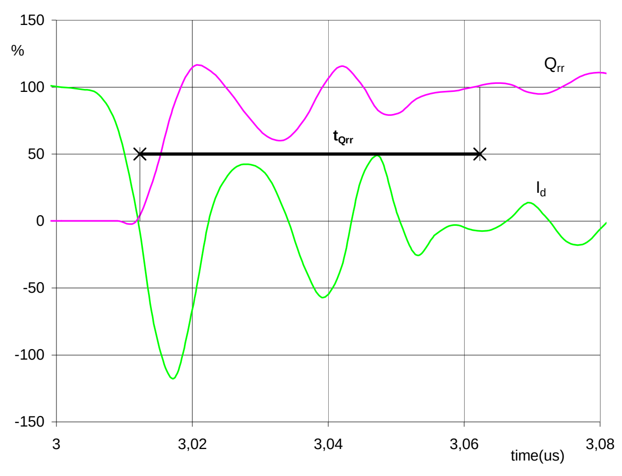


V_d (100%) =	700	V
I_d (100%) =	16	A
I_{RRM} (100%) =	-19	A
t_{rr} =	0,010	μs

Switching Definitions Booster Configuration

Figure 8 FWD

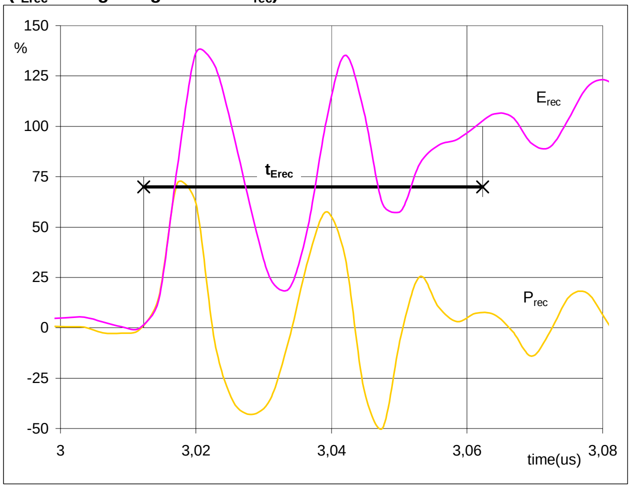
Turn-on Switching Waveforms & definition of t_{Qrr}
(t_{Qrr} = integrating time for Q_{rr})



I_d (100%) =	16	A
Q_{rr} (100%) =	0,10	µC
t_{Qrr} =	0,050	µs

Figure 9 FWD

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

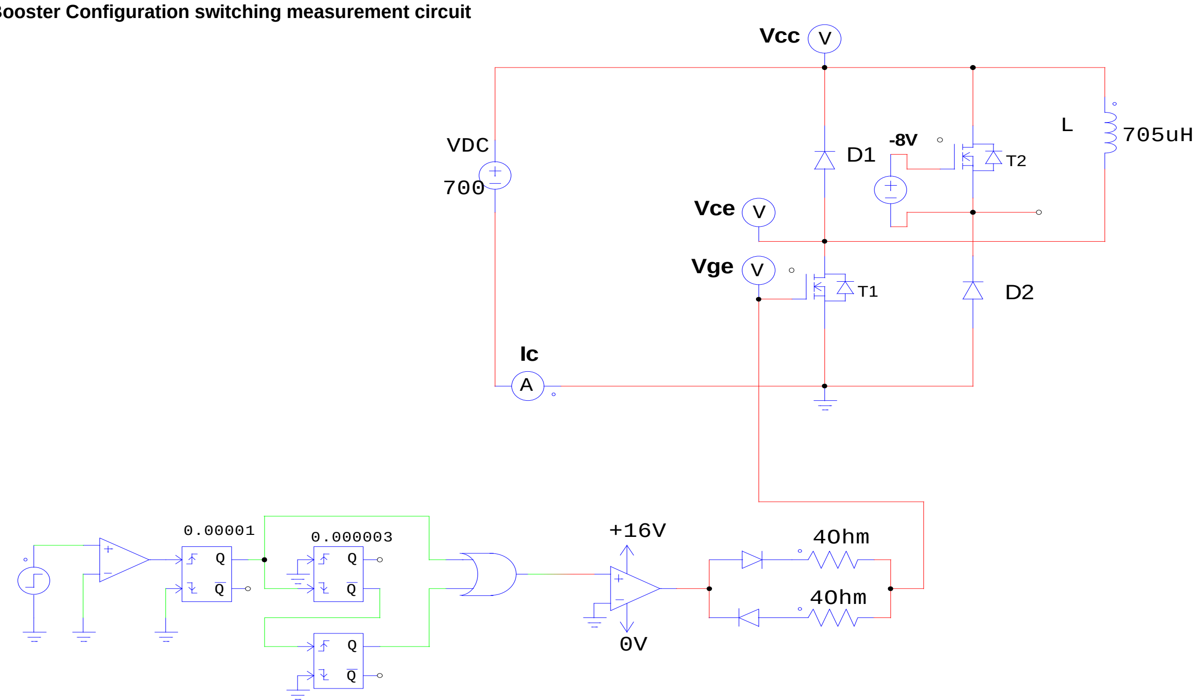


P_{rec} (100%) =	11,15	kW
E_{rec} (100%) =	0,03	mJ
t_{Erec} =	0,050	µs

Measurement circuit

Figure 10

Booster Configuration switching measurement circuit



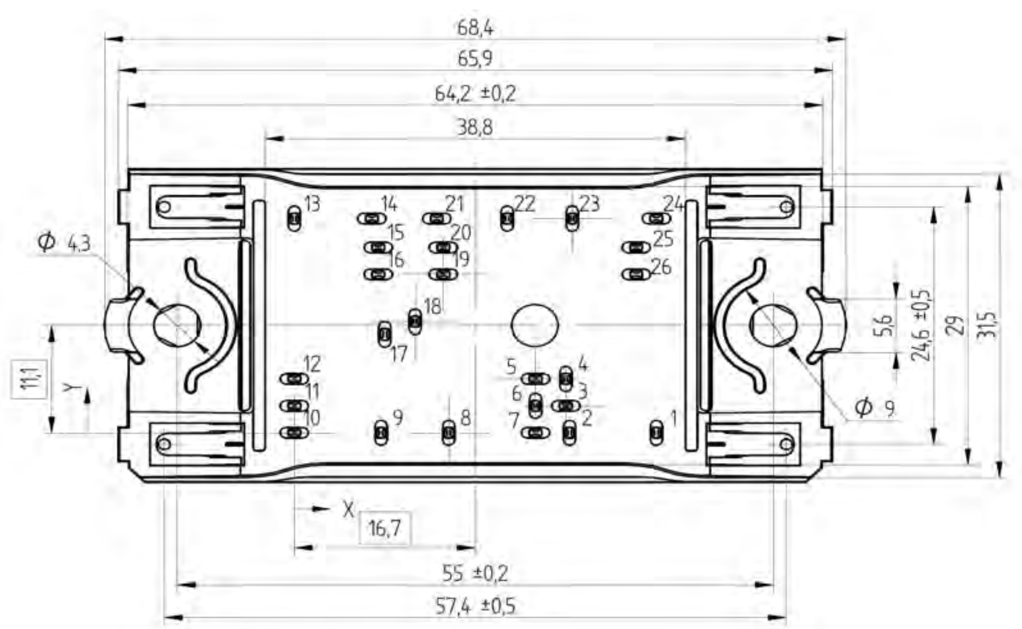
Ordering Code and Marking - Outline - Pinout

Ordering Code & Marking

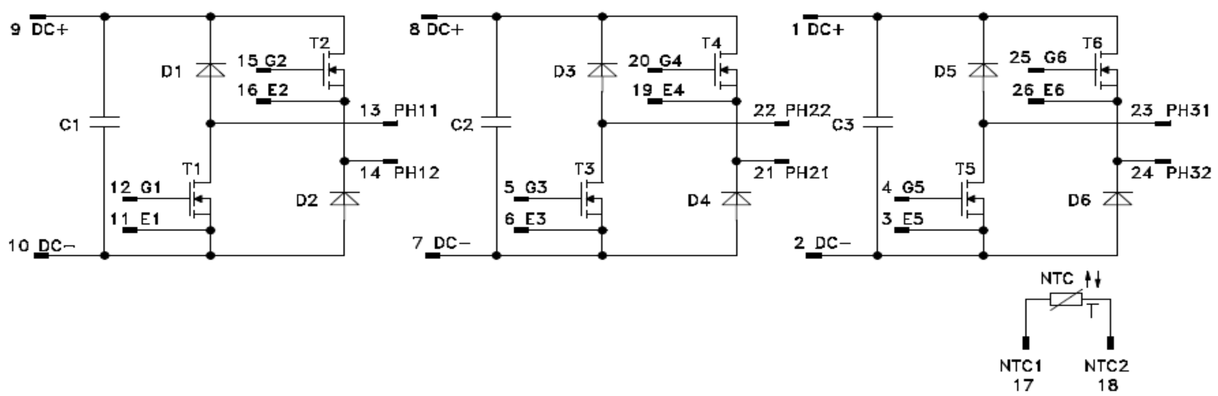
Version	Ordering Code	in DataMatrix as	in packaging barcode as
w/o thermal paste 12mm housing with Press-fit pin	10-PZ126PA080ME-M909F18Y	M909L18Y	M909L18Y

Outline

Pin table		
Pin	X	Y
1	33,4	0
2	25,4	0
3	25,05	2,8
4	25,05	5,6
5	22,25	5,6
6	22,25	2,8
7	22,25	0
8	14,25	0
9	8	0
10	0	0
11	0	2,8
12	0	5,6
13	0	22,2
14	7,15	22,2
15	7.75	19,2
16	7,75	16,4
17	8,35	10,2
18	11,15	11,5
19	13,75	16,4
20	13,75	19,2
21	13,15	22,2
22	19,65	22,2
23	25,65	22,2
24	33,4	22,2
25	31,55	19,2
26	31,55	16,4



Pinout



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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.