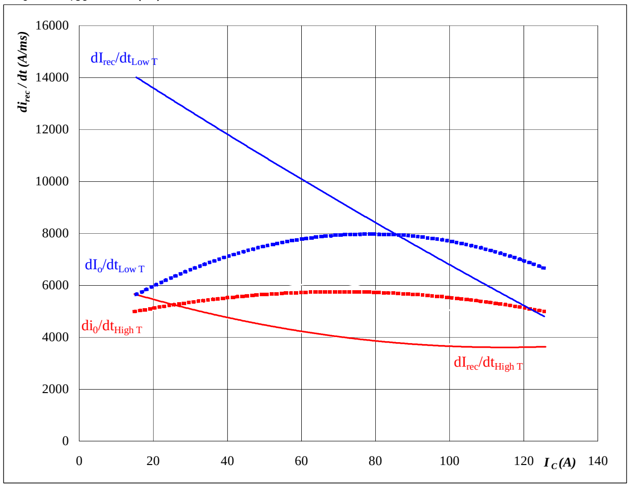
Input Boost

Figure 17 FWD

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

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



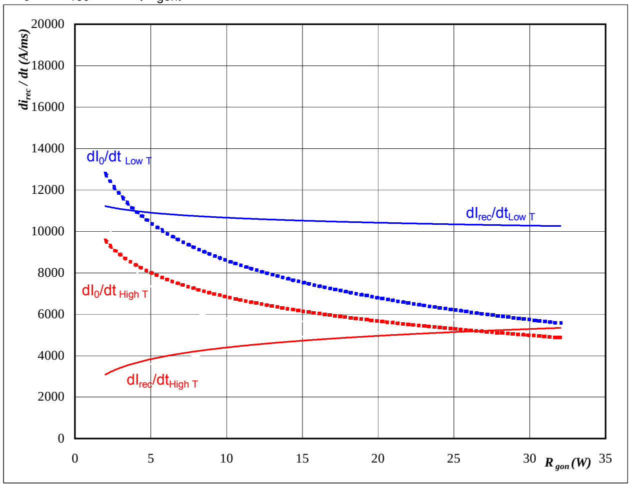
At

T_j =	25/126	°C
V_{CE} =	350	V
V_{GE} =	15	V
R_{gon} =	8	Ω

Figure 18 FWD

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

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



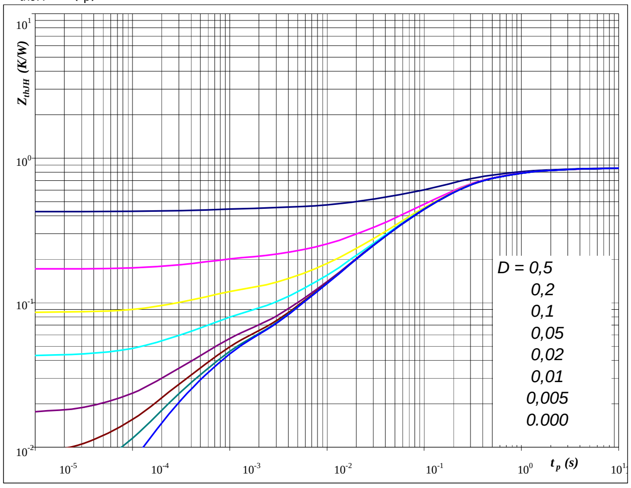
At

T_j =	25/126	°C
V_R =	350	V
I_F =	70	A
V_{GE} =	15	V

Figure 19 IGBT

IGBT transient thermal impedance as a function of pulse width

$Z_{thJH} = f(t_p)$



At

D =	t_p / T	
R_{thJH} =	0,85	K/W

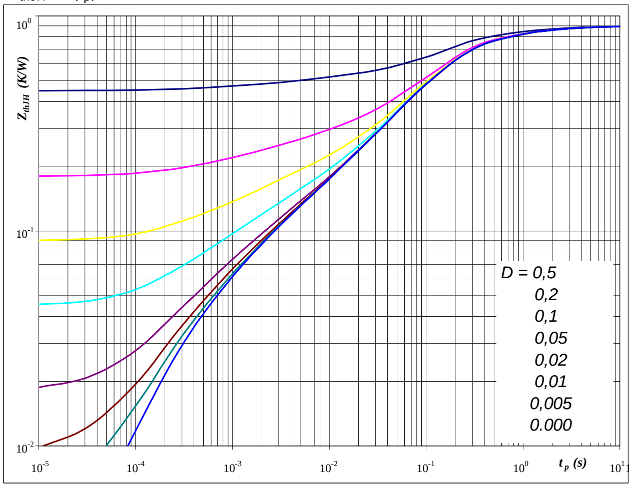
IGBT thermal model values

R (C/W)	Tau (s)
0,10	1,8E+00
0,32	2,8E-01
0,30	8,4E-02
0,09	1,2E-02
0,04	5,0E-04

Figure 20 FWD

FRED transient thermal impedance as a function of pulse width

$Z_{thJH} = f(t_p)$



At

D =	t_p / T	
R_{thJH} =	0,90	K/W

FRED thermal model values

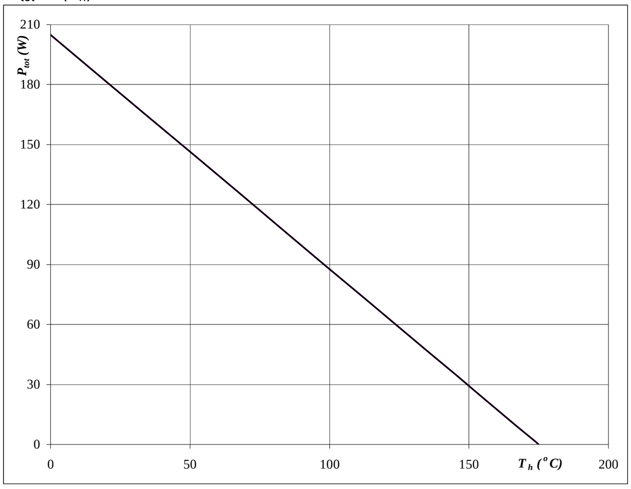
R (C/W)	Tau (s)
0,04	5,0E+00
0,17	7,0E-01
0,47	1,4E-01
0,11	2,5E-02
0,07	2,6E-03
0,03	3,4E-04

Input Boost

Figure 21 IGBT

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_h)$



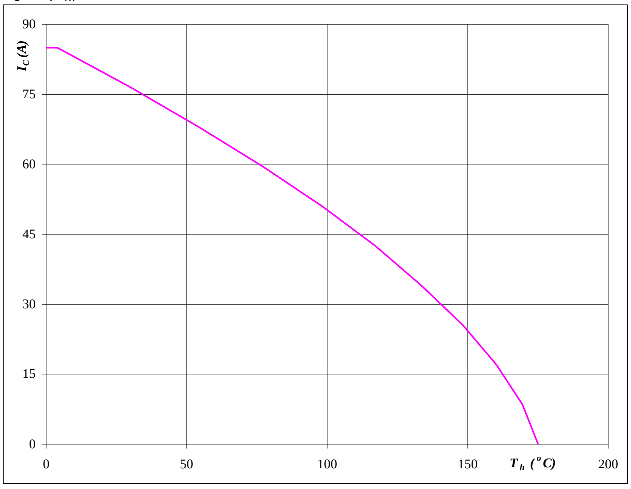
At

T_j = 175 °C

Figure 22 IGBT

Collector current as a function of heatsink temperature

$I_C = f(T_h)$



At

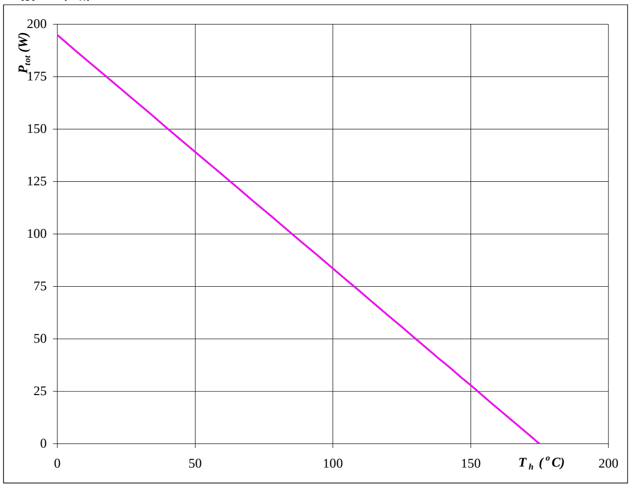
T_j = 175 °C

V_{GE} = 15 V

Figure 23 FWD

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_h)$



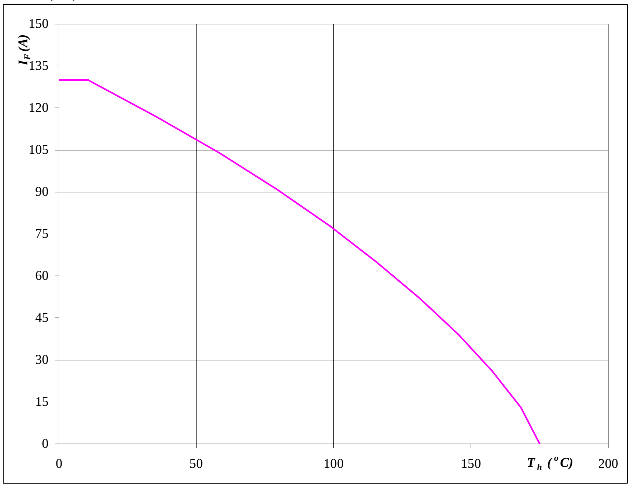
At

T_j = 175 °C

Figure 24 FWD

Forward current as a function of heatsink temperature

$I_F = f(T_h)$



At

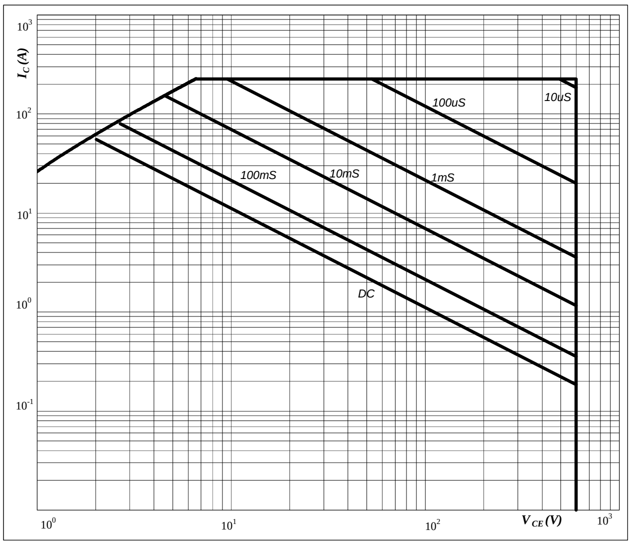
T_j = 175 °C

Input Boost

Figure 25 IGBT

Safe operating area as a function of collector-emitter voltage

$I_C = f(V_{CE})$



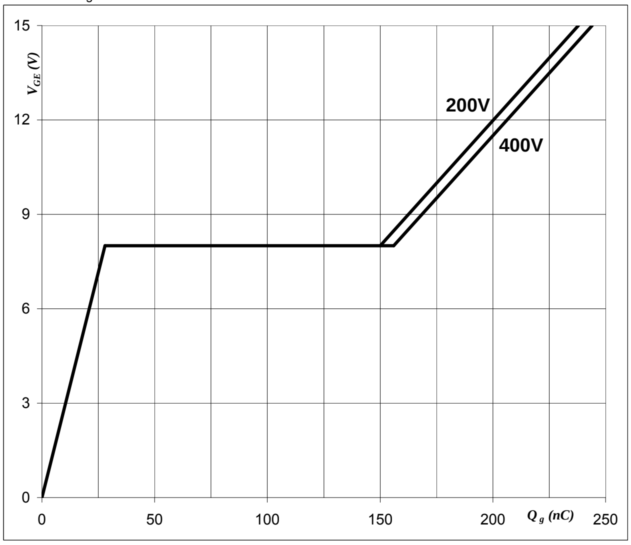
At

D =	single pulse	
Th =	80	°C
V_{GE} =	15	V
T_j =	T_{jmax}	°C

Figure 26 IGBT

Gate voltage vs Gate charge

$V_{GE} = f(Q_g)$



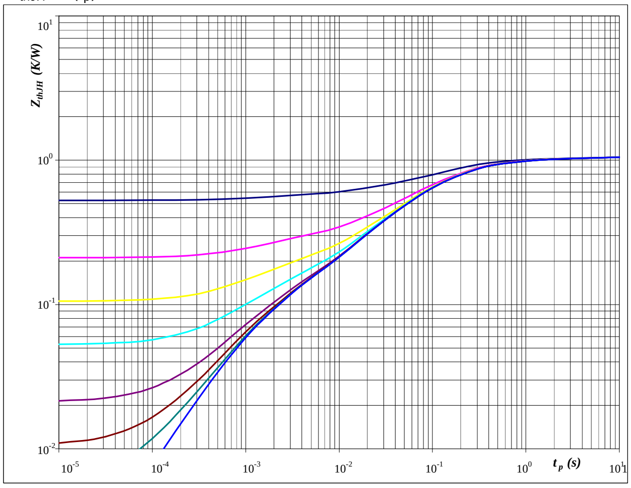
At

I_C =	75	A

Figure 27 MOSFET

MOSFET transient thermal impedance as a function of pulse width

$Z_{thJH} = f(t_p)$



At

D =	t_p / T	
R_{thJH} =	1,05	K/W

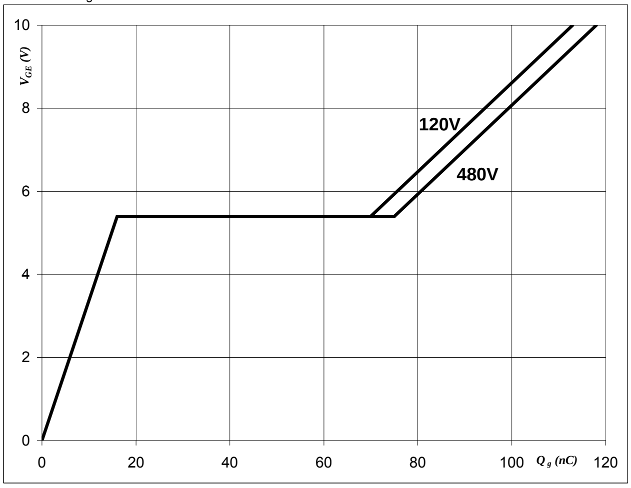
MOSFET thermal model values

R (C/W)	Tau (s)
0,06	3,4E+00
0,23	4,0E-01
0,53	8,8E-02
0,15	1,5E-02
0,08	1,3E-03
0,05	4,7E-04

Figure 28 MOSFET

Gate voltage vs Gate charge

$V_{GE} = f(Q_g)$



At

I_C =	18	A

Thermistor

Figure 1	Thermistor

Typical NTC characteristic
as a function of temperature

$R_T = f(T)$

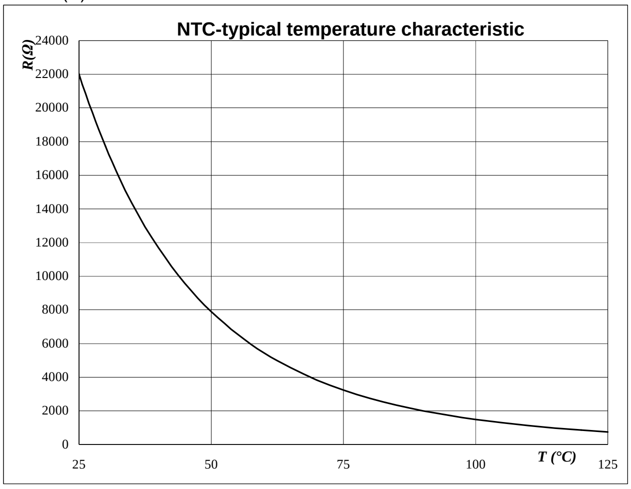


Figure 2	Thermistor

Typical NTC resistance values

$$R(T) = R_{25} \cdot e^{\left(B_{25/100} \cdot \left(\frac{1}{T} - \frac{1}{T_{25}}\right)\right)} \quad [\Omega]$$

Switching Definitions INPUT BOOST MOSFET+IGBT

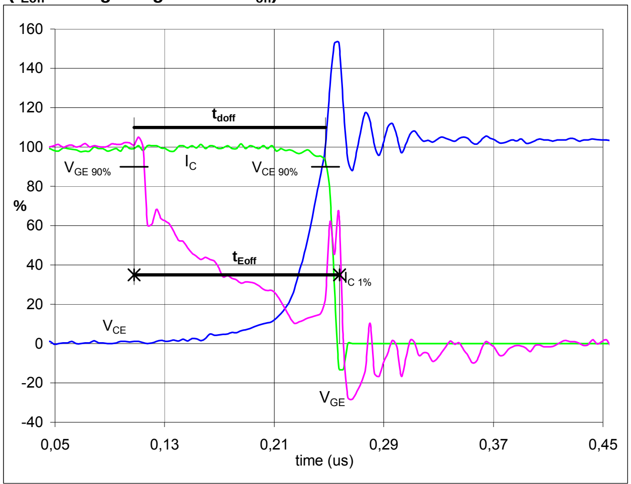
General conditions

T_j	=	125 °C
$R_{gon\ IGBT}$	=	8 Ω
$R_{goff\ IGBT}$	=	8 Ω

MOSFET turn off delayed by 100ns

Figure 1 INPUT BOOST MOSFET+IGBT

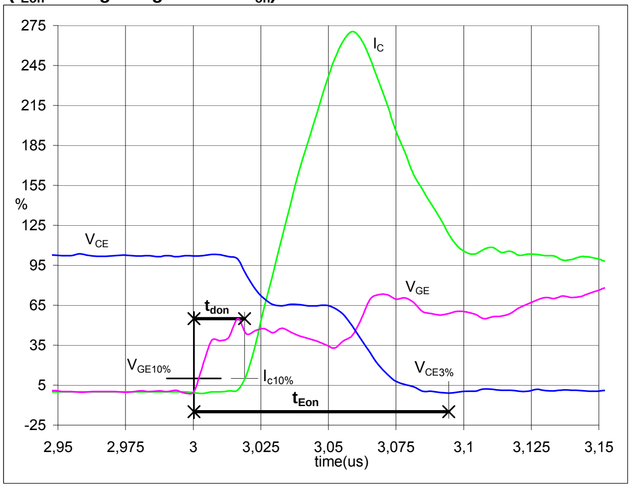
Turn-off Switching Waveforms & definition of t_{doff}, t_{Eoff}
(t_{Eoff} = integrating time for E_{off})



V_{GE} (0%) =	0	V
V_{GE} (100%) =	15	V
V_C (100%) =	350	V
I_C (100%) =	70	A
t_{doff} =	0,23	µs
t_{Eoff} =	0,15	µs

Figure 2 INPUT BOOST MOSFET+IGBT

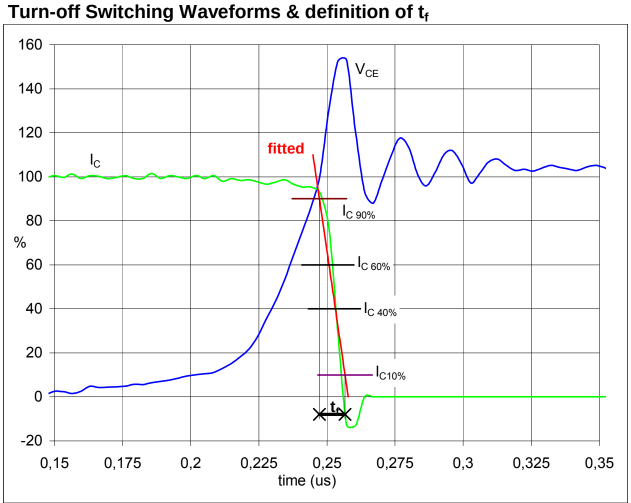
Turn-on Switching Waveforms & definition of t_{don}, t_{Eon}
(t_{Eon} = integrating time for E_{on})



V_{GE} (0%) =	0	V
V_{GE} (100%) =	15	V
V_C (100%) =	350	V
I_C (100%) =	70	A
t_{don} =	0,02	µs
t_{Eon} =	0,09	µs

Figure 3 INPUT BOOST MOSFET+IGBT

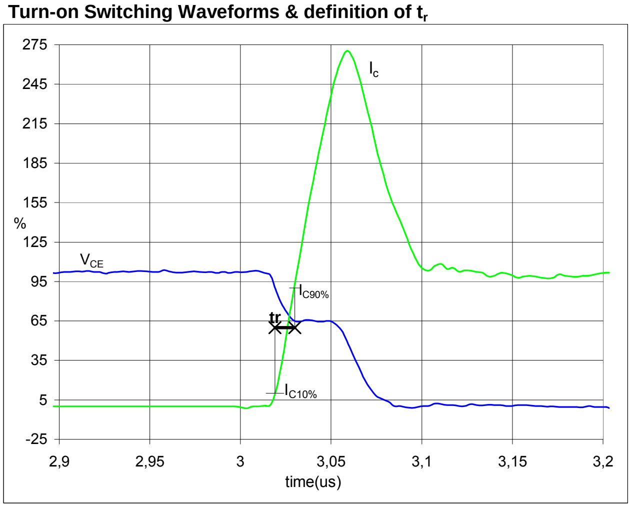
Turn-off Switching Waveforms & definition of t_f



V_C (100%) =	350	V
I_C (100%) =	70	A
t_f =	0,005	µs

Figure 4 INPUT BOOST MOSFET+IGBT

Turn-on Switching Waveforms & definition of t_r

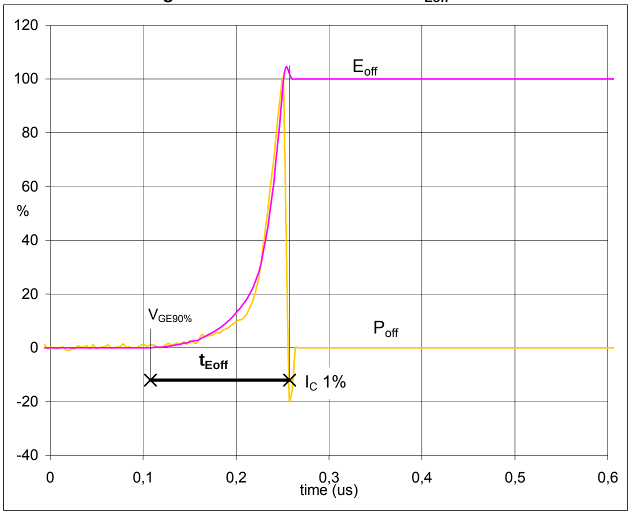


V_C (100%) =	350	V
I_C (100%) =	70	A
t_r =	0,010	µs

Switching Definitions INPUT BOOST MOSFET+IGBT

Figure 5 INPUT BOOST MOSFET+IGBT

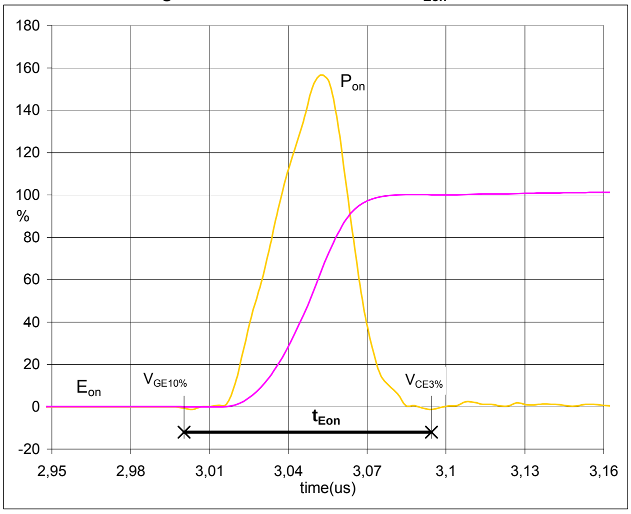
Turn-off Switching Waveforms & definition of t_{Eoff}



P_{off} (100%) =	24,65	kW
E_{off} (100%) =	0,63	mJ
t_{Eoff} =	0,15	μs

Figure 6 INPUT BOOST MOSFET+IGBT

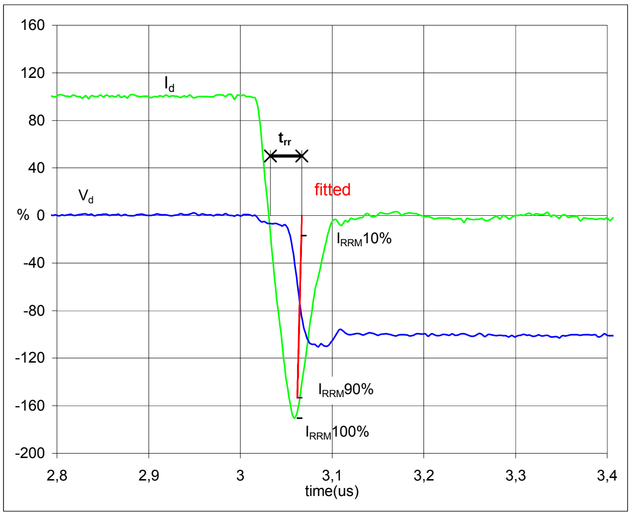
Turn-on Switching Waveforms & definition of t_{Eon}



P_{on} (100%) =	24,65	kW
E_{on} (100%) =	1,26	mJ
t_{Eon} =	0,09	μs

Figure 7 INPUT BOOST MOSFET+IGBT

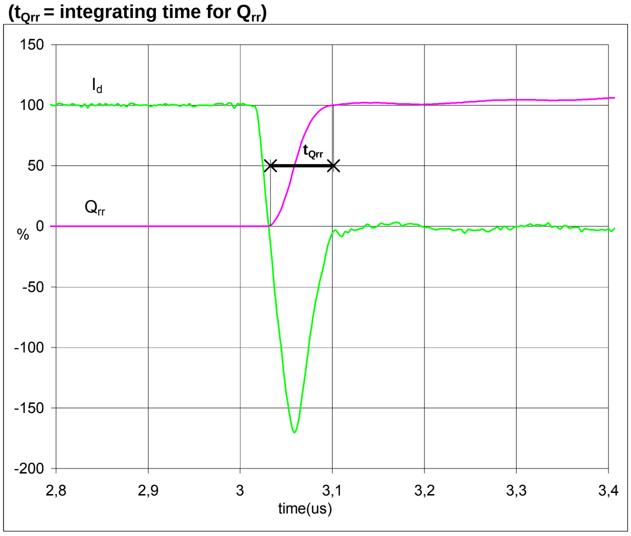
Turn-off Switching Waveforms & definition of t_{rr}



V_d (100%) =	350	V
I_d (100%) =	70	A
I_{RRM} (100%) =	-121	A
t_{rr} =	0,068	μs

Figure 8 INPUT BOOST MOSFET+IGBT

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



I_d (100%) =	70	A
Q_{rr} (100%) =	4,38	μC
t_{Qrr} =	0,07	μs

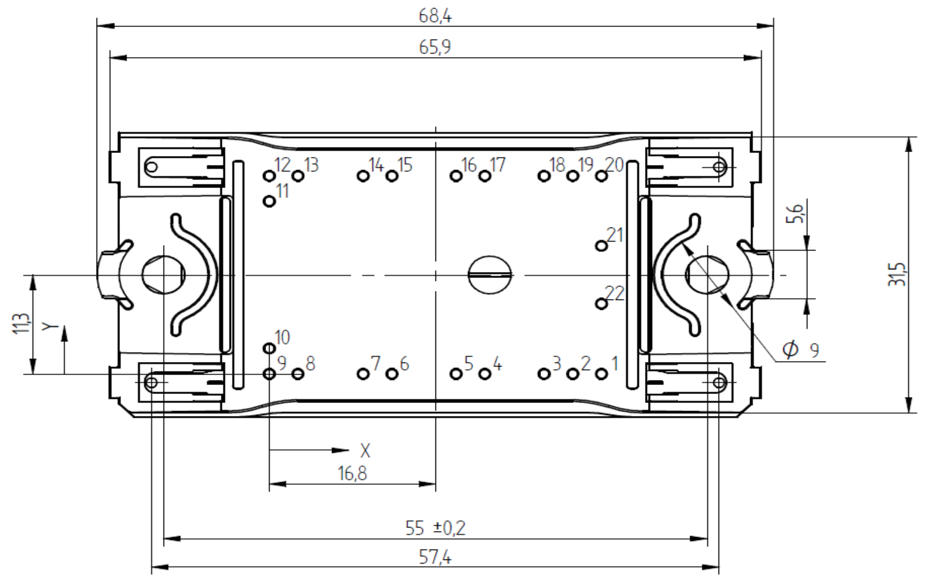
Ordering Code and Marking - Outline - Pinout

Ordering Code & Marking

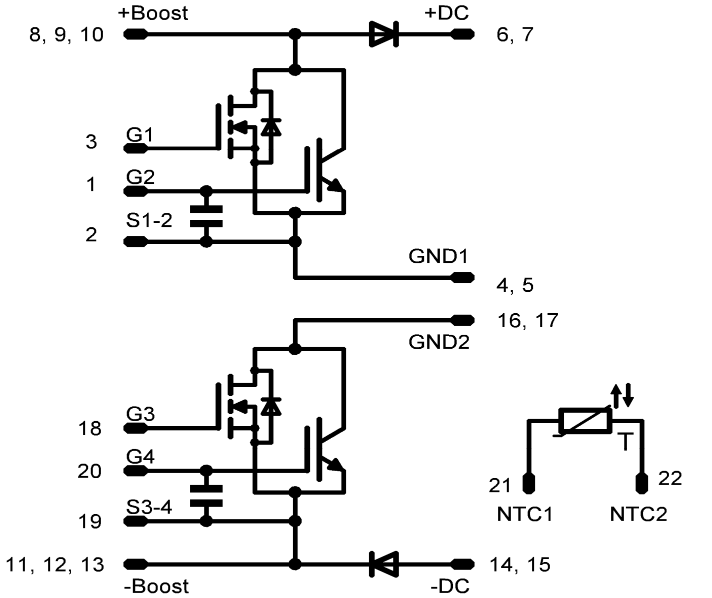
Version	Ordering Code	in DataMatrix as	in packaging barcode as
without thermal paste 12mm housing	10-FZ06NBA084FP10-M306L38	M306L38	M306L38

Outline

Pin table		
Pin	X	Y
1	33,6	0
2	30,7	0
3	27,8	0
4	21,8	0
5	18,9	0
6	12,4	0
7	9,5	0
8	2,9	0
9	0	0
10	0	2,9
11	0	19,7
12	0	22,6
13	2,9	22,6
14	9,5	22,6
15	12,4	22,6
16	18,9	22,6
17	21,8	22,6
18	27,8	22,6
19	30,7	22,6
20	33,6	22,6
21	33,6	14,6
22	33,6	8



Pinout



PRODUCT STATUS DEFINITIONS

Datasheet Status	Product Status	Definition
Target	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice. The data contained is exclusively intended for technically trained staff.
Preliminary	First Production	This datasheet contains preliminary data, and supplementary data may be published at a later date. Vincotech reserves the right to make changes at any time without notice in order to improve design. The data contained is exclusively intended for technically trained staff.
Final	Full Production	This datasheet contains final specifications. Vincotech reserves the right to make changes at any time without notice in order to improve design. The data contained is exclusively intended for technically trained staff.

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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.