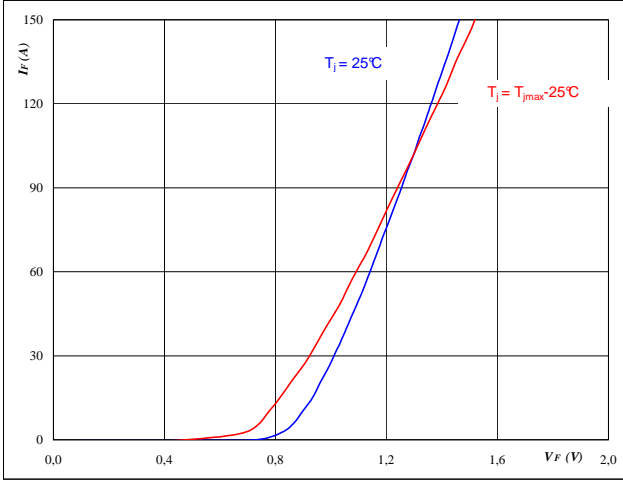


D8,D9,D10,D11,D12,D13

Figure 1 D8,D9,D10,D11,D12,D13 diode

Typical diode forward current as a function of forward voltage

$I_F = f(V_F)$

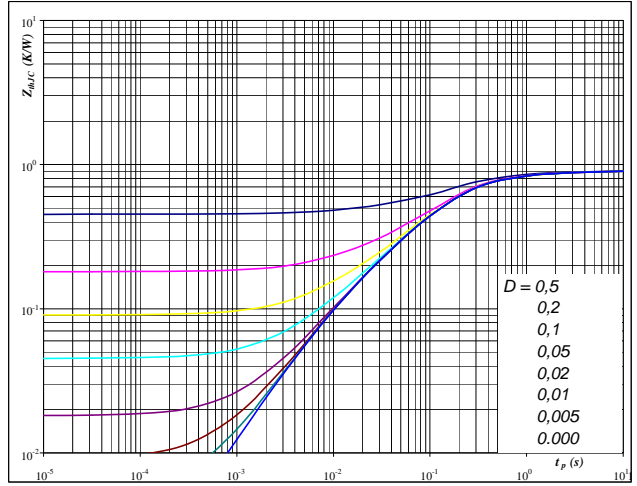


At
 $t_p = 250 \mu s$

Figure 2 D8,D9,D10,D11,D12,D13 diode

Diode transient thermal impedance as a function of pulse width

$Z_{thJH} = f(t_p)$

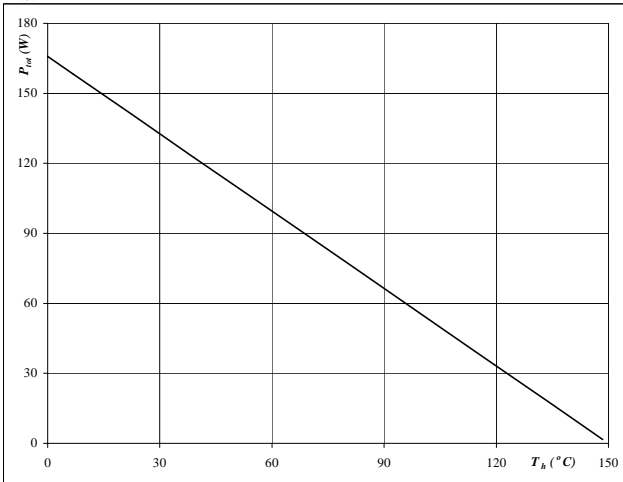


At
 $D = t_p / T$
 $R_{thJH} = 0,90 \text{ K/W}$

Figure 3 D8,D9,D10,D11,D12,D13 diode

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_h)$

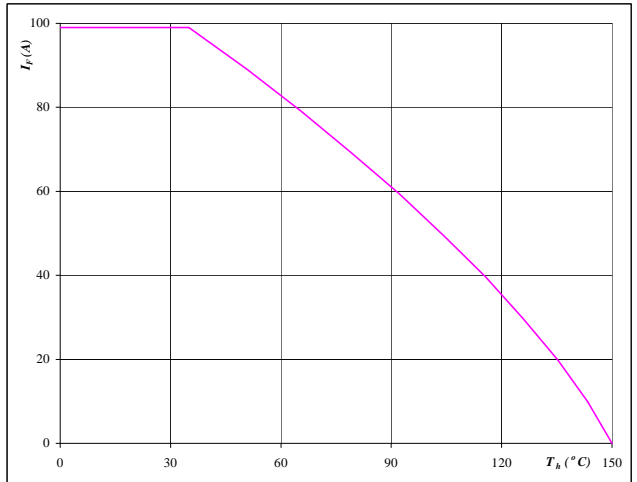


At
 $T_j = 150 \text{ °C}$

Figure 4 D8,D9,D10,D11,D12,D13 diode

Forward current as a function of heatsink temperature

$I_F = f(T_h)$



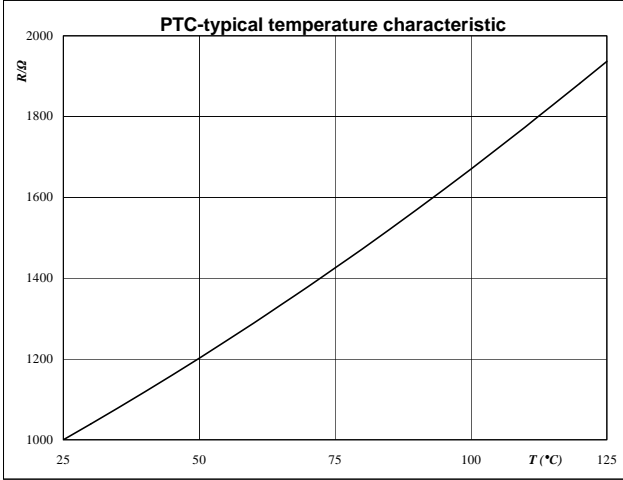
At
 $T_j = 150 \text{ °C}$

Thermistor

Figure 1 Thermistor

Typical PTC characteristic
as a function of temperature

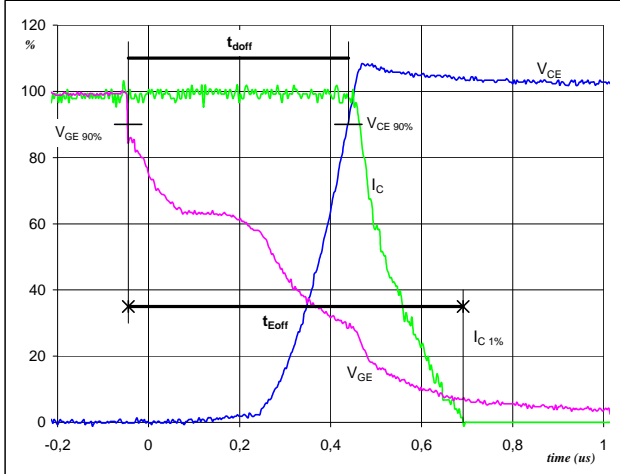
$$R_T = f(T)$$



Switching Definitions Output Inverter

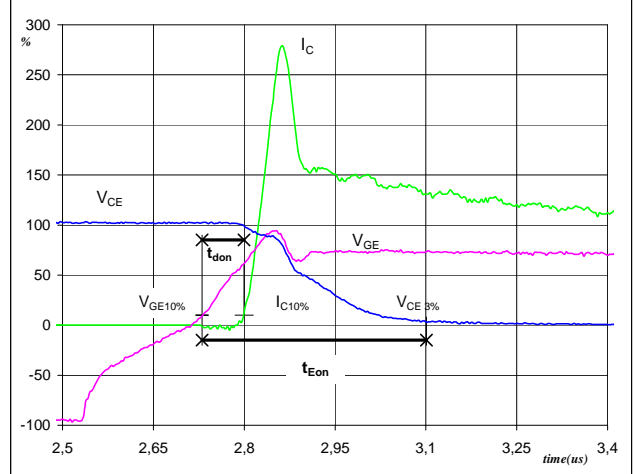
General conditions	
T_j	= 125 °C
R_{gon}	= 18 Ω
R_{goff}	= 18 Ω

Figure 1 Output inverter IGBT

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


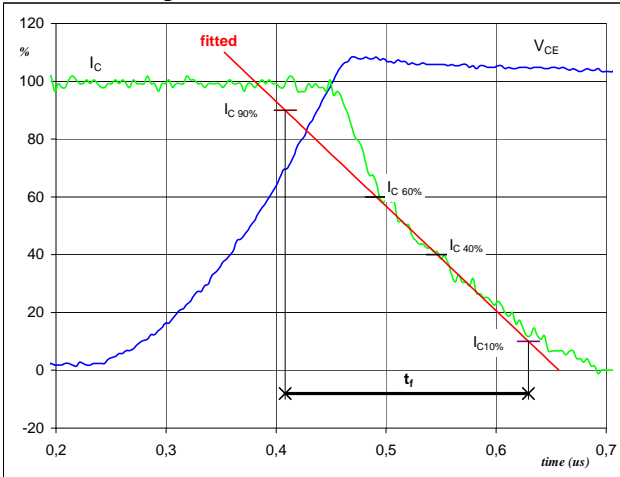
$V_{GE}(0\%) =$	-15	V
$V_{GE}(100\%) =$	15	V
$V_C(100\%) =$	600	V
$I_C(100\%) =$	50	A
$t_{doff} =$	0,49	μ s
$t_{Eoff} =$	0,74	μ s

Figure 2 Output inverter IGBT

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


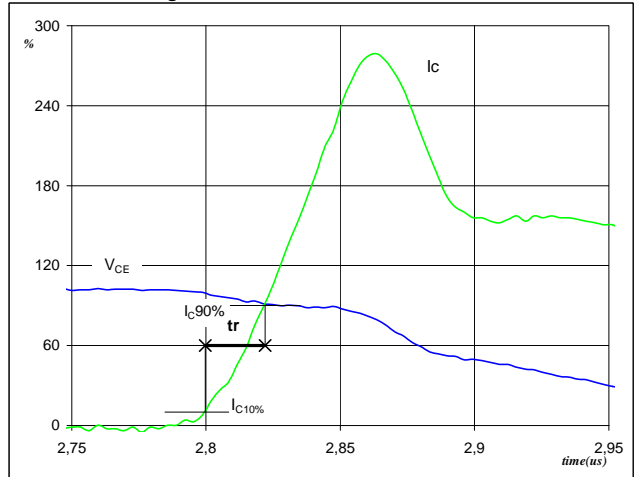
$V_{GE}(-100\%) =$	-15	V
$V_{GE}(100\%) =$	15	V
$V_C(100\%) =$	600	V
$I_C(100\%) =$	50	A
$t_{don} =$	0,07	μ s
$t_{Eon} =$	0,37	μ s

Figure 3 Output inverter IGBT

Turn-off Switching Waveforms & definition of t_f


$V_C(100\%) =$	600	V
$I_C(100\%) =$	50	A
$t_f =$	0,20	μ s

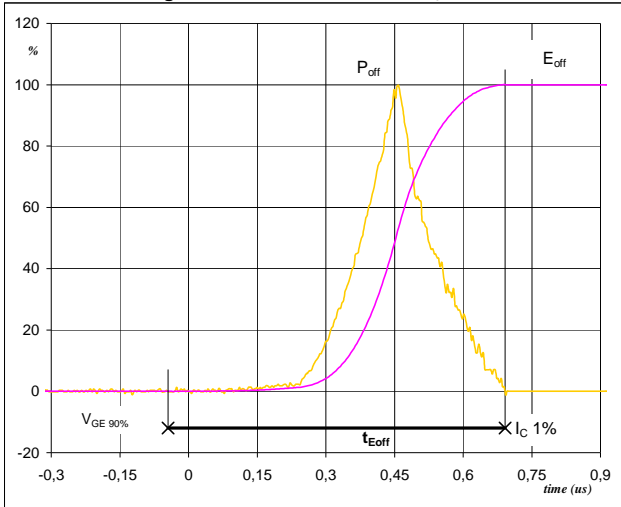
Figure 4 Output inverter IGBT

Turn-on Switching Waveforms & definition of t_r


$V_C(100\%) =$	600	V
$I_C(100\%) =$	50	A
$t_r =$	0,46	μ s

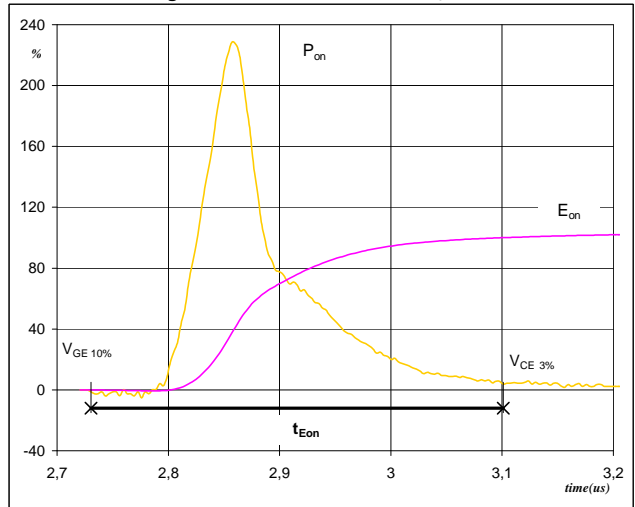
Switching Definitions Output Inverter

Figure 5 Output inverter IGBT

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


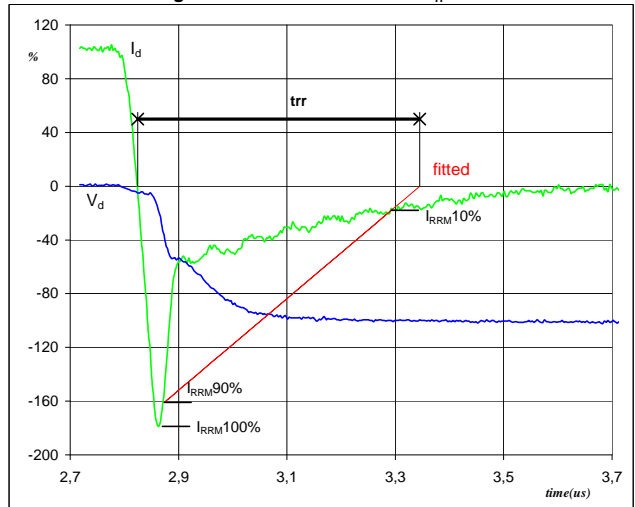
$P_{off} (100\%) =$	29,81	kW
$E_{off} (100\%) =$	89,18	mJ
$t_{Eoff} =$	0,74	μs

Figure 6 Output inverter IGBT

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


$P_{on} (100\%) =$	29,81	kW
$E_{on} (100\%) =$	12,42	mJ
$t_{Eon} =$	0,37	μs

Figure 7 Output inverter FWD

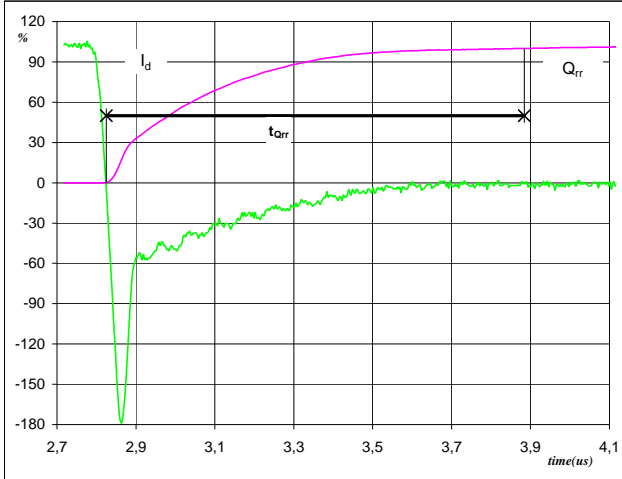
Turn-off Switching Waveforms & definition of t_{rr}


$V_d (100\%) =$	600	V
$I_d (100\%) =$	50	A
$I_{RRM} (100\%) =$	89	A
$t_{rr} =$	0,46	μs

Switching Definitions Output Inverter

Figure 8 Output inverter FWD

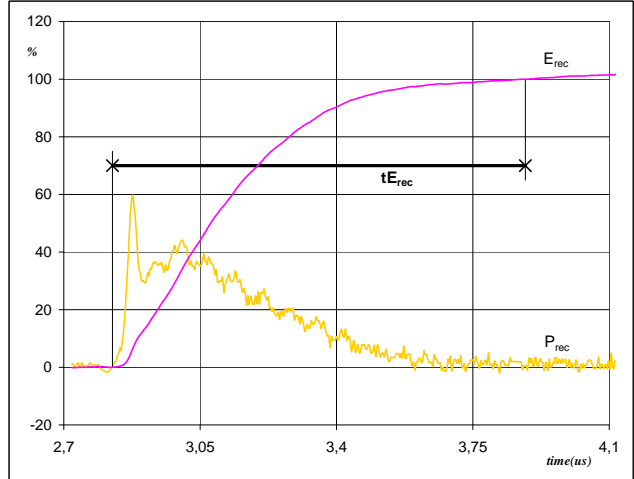
Turn-on Switching Waveforms & definition of t_{Qrr}
 (t_{Qrr} = integrating time for Q_{rr})



I_d (100%) =	50	A
Q_{rr} (100%) =	12,42	μC
t_{Qrr} =	1,06	μs

Figure 9 Output inverter FWD

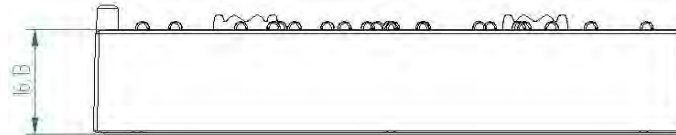
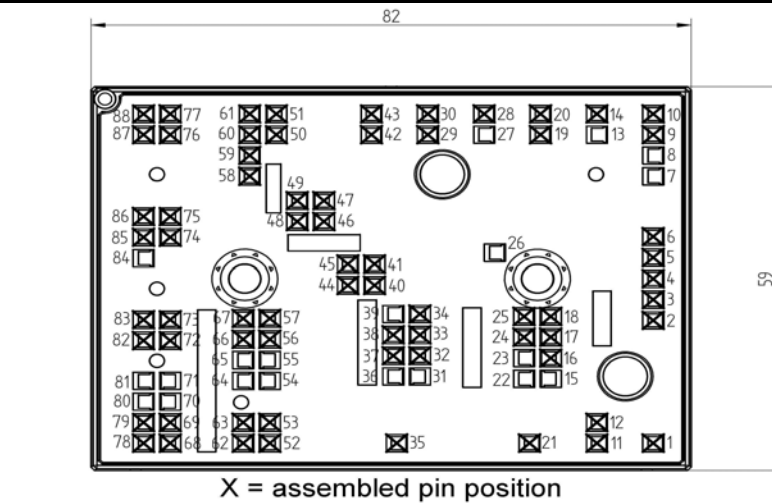
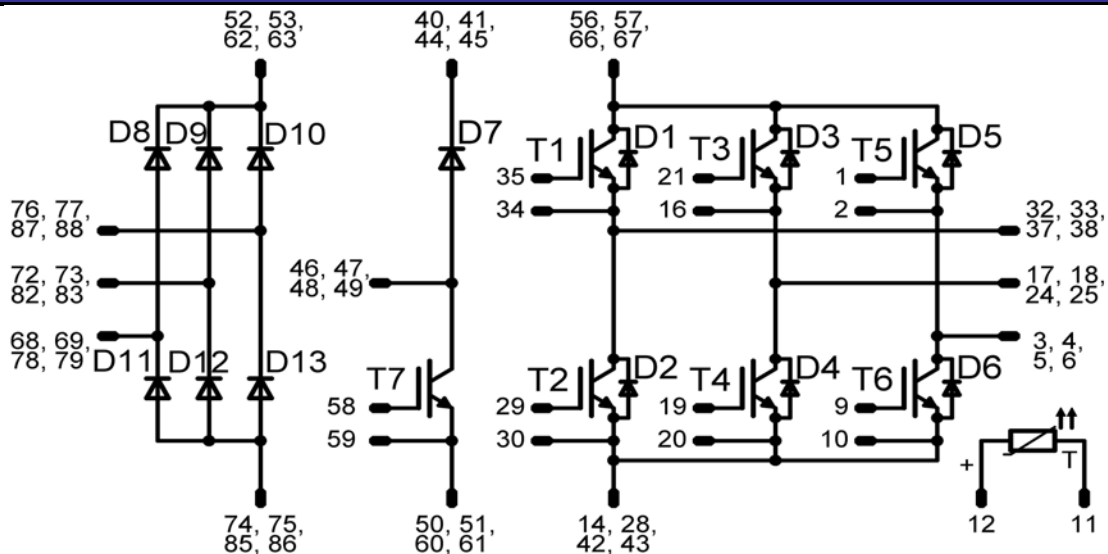
Turn-on Switching Waveforms & definition of t_{Erec}
 (t_{Erec} = integrating time for E_{rec})



P_{rec} (100%) =	29,81	kW
E_{rec} (100%) =	5,09	mJ
t_{Erec} =	1,06	μs

Ordering Code and Marking - Outline - Pinout
Ordering Code & Marking

Version	Ordering Code	in DataMatrix as	in packaging barcode as
with std lid (black V23990-K32-T-PM)	V23990-K249-A-/0A/-PM	K249A	K249A-/0A/
with std lid (black V23990-K32-T-PM) and P12	V23990-K249-A-/1A/-PM	K249A	K249A-/1A/
with thin lid (white V23990-K33-T-PM)	V23990-K249-A-/0B/-PM	K249A	K249A-/0B/
with thin lid (white V23990-K33-T-PM) and P12	V23990-K249-A-/1B/-PM	K249A	K249A-/1B/

Outline

Pinout


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