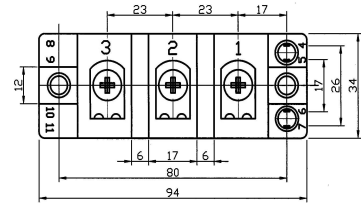
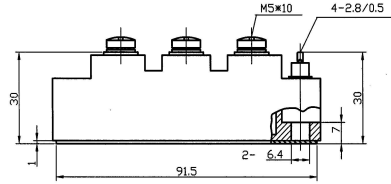
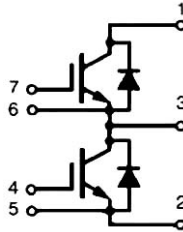
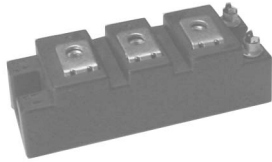


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NPT IGBT Modules

Dimensions in mm (1mm = 0.0394")



Absolute Maximum Ratings

$T_c = 25^\circ\text{C}$, unless otherwise specified

Symbol	Conditions	Values	Units
IGBT Wechselrichter/ IGBT Inverter			
V_{CES}		600	V
I_c	$T_c = 25(75)^\circ\text{C}$	100(75)	A
I_{CRM}	$T_c = 75^\circ\text{C}$, $t_P = 1\text{ms}$	150	A
P_{tot}	$T_c = 25^\circ\text{C}$, $T_{vj} = 150^\circ\text{C}$	355	W
V_{GES}		+20	V
Diode Wechselrichter/ Diode Inverter			
I_F		75	A
I_{FRM}	$t_P = 1\text{ms}$	150	A
I^2t	$V_R = 0\text{V}$, $t_P = 10\text{ms}$; $T_{vj} = 125^\circ\text{C}$	450	A^2s
Module Isolation/ Module Isolation			
V_{ISOL}	RMS, $f = 50\text{Hz}$, $t = 1\text{min}$, NTC connect to Baseplate	2500	V

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NPT IGBT Modules

Characteristics

$T_c = 25^\circ\text{C}$, unless otherwise specified

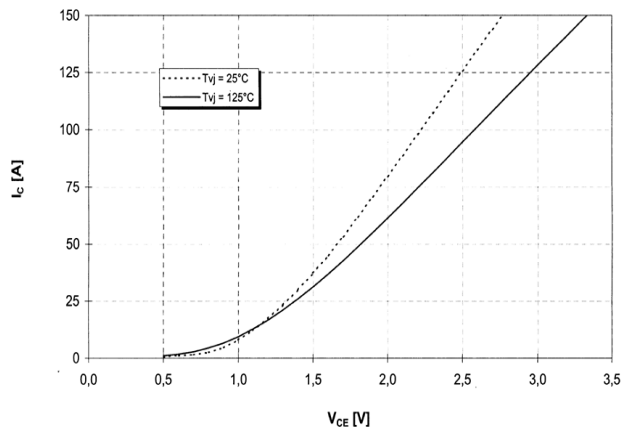
Symbol	Conditions	min.	typ.	max.	Units
IGBT Wechselrichter/ IGBT Inverter					
V_{GEth}	$V_{GE} = V_{CE}, I_c = 1.5\text{mA}$	4.5	5.5	6.5	V
I_{CES}	$V_{GE} = 0; V_{CE} = 600\text{V}, T_j = 25(125)^\circ\text{C}$		1(1000)	500	μA
I_{GES}	$V_{CE}=0; V_{GE}=20\text{V}$			400	nA
$V_{CE(sat)}$	$I_c = 75\text{A}; V_{GE} = 15\text{V}; T_j = 25(125)^\circ\text{C}$		1.95(2.2)	2.45(-)	V
C_{ies}	under following conditions		3.3		nF
C_{res}	$V_{GE} = 0, V_{CE} = 25\text{V}, f = 1\text{MHz}$		0.3		
L_{CE}			40		nH
I_{sc}	$t_p \leq 10\mu\text{s}, V_{GE} \leq 15\text{V}, T_{vj} = 125^\circ\text{C}, V_{cc} = 360\text{V}$		340		A
$t_{d(on)}$	under following conditions: $V_{CC} = 300\text{V}, I_c = 75\text{A}$		63(65)		ns
t_r	$R_{Gon} = R_{Goff} = 3.0\Omega, T_j = 25(125)^\circ\text{C}$		22(25)		ns
$t_{d(off)}$	$V_{GE} = \pm 15\text{V}$		155(170)		ns
t_f			20(35)		ns
$E_{on}(E_{off})$	$T_j = 25(125)^\circ\text{C}, L_s = 30\text{nH}$		0.7(2.4)		mJ
$R_{CC+EE'}$			1.2		$\text{m}\Omega$
R_{thJC}			0.35		K/W
Diode Wechselrichter/ Diode Inverter					
V_F	under following condition $I_F = 75\text{A}; V_{GE} = 0\text{V}; T_j = 25(125)^\circ\text{C}$		1.25(1.2)	1.6(-)	V
I_{RM}	$I_F = 75\text{A}; T_j = 25(125)^\circ\text{C}$		95(115)		A
Q_r	$-di/dt = 3000\text{A}/\mu\text{s}$		5.1(7.9)		μC
E_{rec}	$V_{GE} = -10\text{V}, V_R = 300\text{V}$		-(2.3)		mJ
R_{thJC}				0.66	K/W
R_{thCK}			0.03		
T_{VJ}			-40...+125		$^\circ\text{C}$
T_{VJM}			150		
T_{stg}			-40...+125		
Mechanical Data					
M_s	to heatsink M6	3		5	Nm
M_t	to terminals M5	2.5		5	Nm
w				160	g

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NPT IGBT Modules

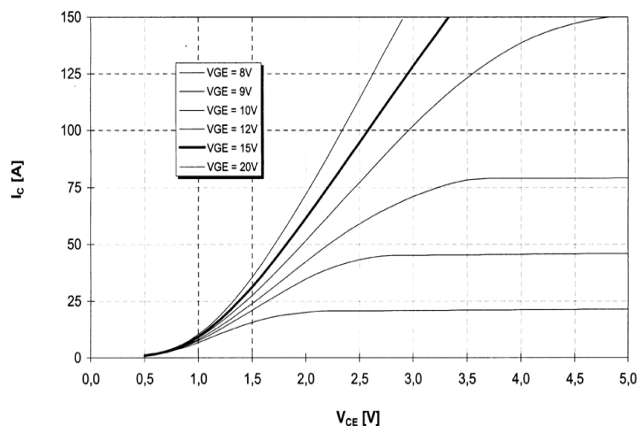
Ausgangskennlinie (typisch)
Output characteristic (typical)

$I_C = f(V_{CE})$
 $V_{GE} = 15V$



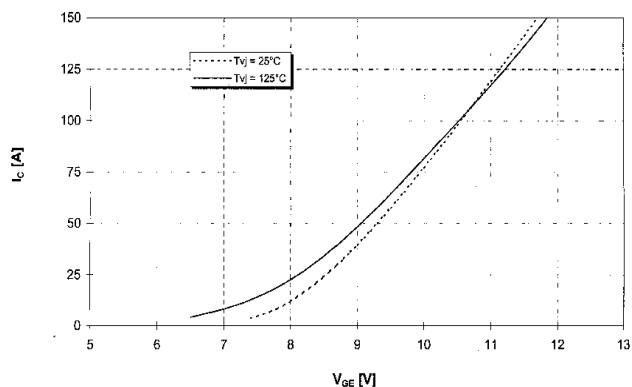
Ausgangskennlinienfeld (typisch)
Output characteristic (typical)

$I_C = f(V_{CE})$
 $T_{vj} = 125^\circ C$



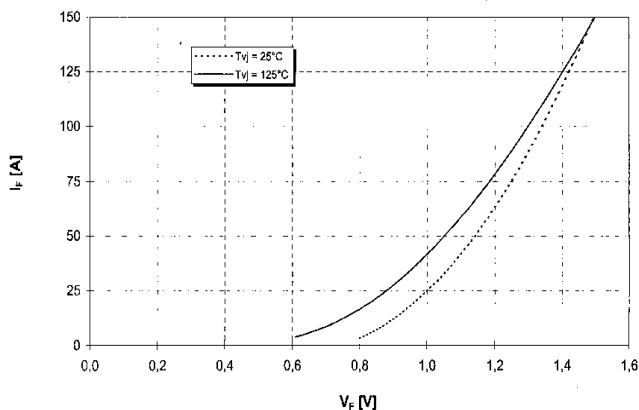
Übertragungscharakteristik (typisch)
Transfer characteristic (typical)

$I_C = f(V_{GE})$
 $V_{CE} = 20V$



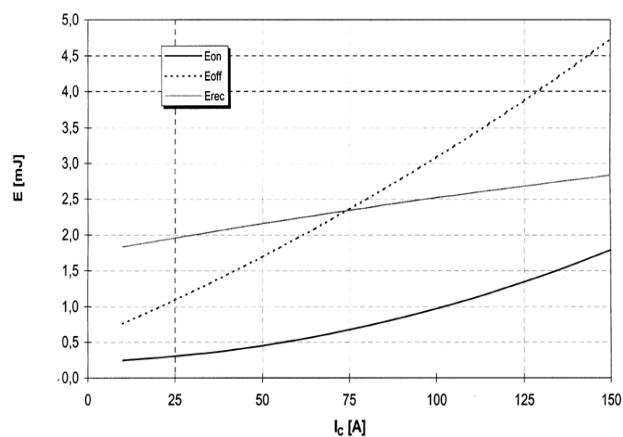
Durchlaßkennlinie der Inversdiode (typisch)
Forward characteristic of inverse diode (typical)

$I_F = f(V_F)$



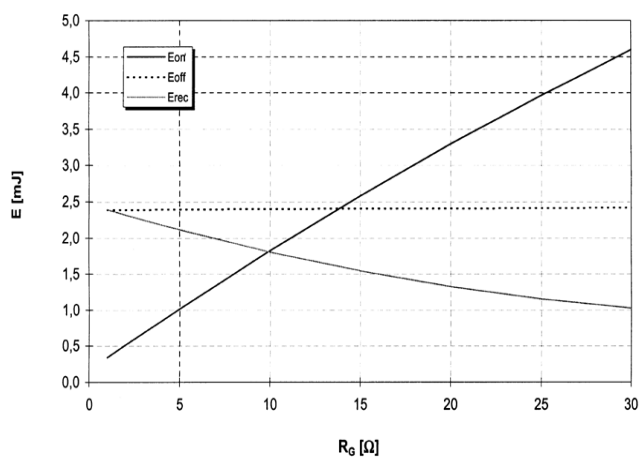
Schaltverluste (typisch)
Switching losses (typical)

$E_{on} = f(I_C), E_{off} = f(I_C), E_{rec} = f(I_C)$
 $R_{G,on} = 3.0\Omega, R_{G,off} = 3.0\Omega, V_{CC} = 300V, T_{vj} = 125^\circ C$



Schaltverluste (typisch)
Switching losses (typical)

$E_{on} = f(R_G), E_{off} = f(R_G), E_{rec} = f(R_G)$
 $I_C = 75A, V_{CC} = 300V, T_{vj} = 125^\circ C$

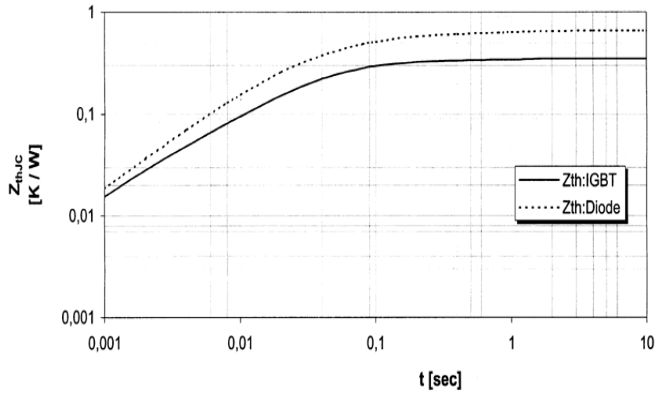


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NPT IGBT Modules

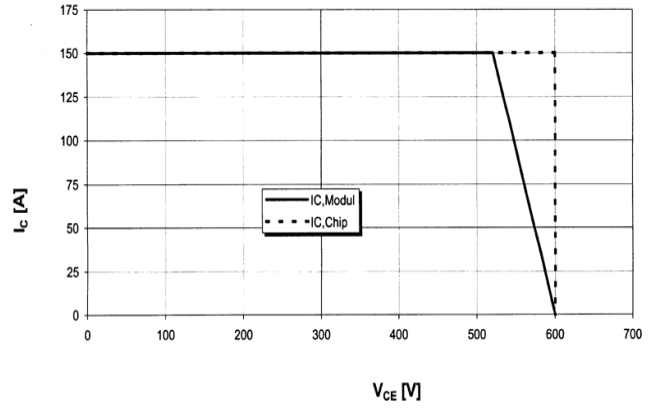
Transienter Wärmewiderstand
Transient thermal impedance

$$Z_{thJC} = f(t)$$



i	1	2	3	4
r_{θ} [K/kW] : IGBT	14,8	183,4	123,4	28,4
τ_i [sec] : IGBT	0,0018	0,0240	0,0651	0,6626
r_{θ} [K/kW] : Diode	232,6	223,1	140,1	64,2
τ_i [sec] : Diode	0,0487	0,0169	0,1069	0,9115

Sicherer Arbeitsbereich (RBSOA)
Reverse bias safe operation area (RBSOA) $V_{GE} = +15V, R_{\theta,CH} = 3,0\Omega, T_J = 125^\circ C$



V_{CE} [V]