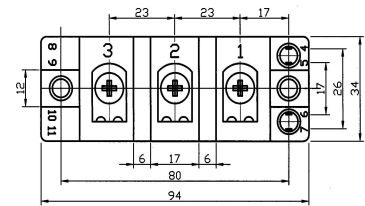
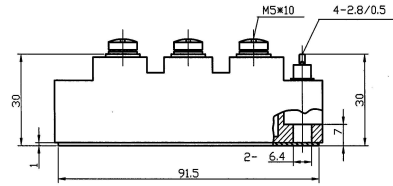
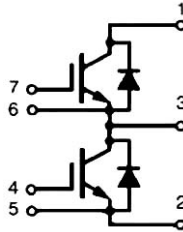
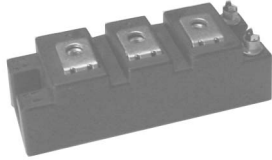


SII50N06

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	$T_c = 25(80)^\circ\text{C}$, $T_{vj} = 150^\circ\text{C}$	75(50)	A
I_{CRM}	$T_c = 80^\circ\text{C}$, $t_P = 1\text{ms}$	100	A
P_{tot}	$T_c = 25^\circ\text{C}$, $T_{vj} = 150^\circ\text{C}$	280	W
V_{GES}		+20	V
Diode Wechselrichter/ Diode Inverter			
V_{RRM}		600	V
I_F		50	A
I_{FRM}	$t_P = 1\text{ms}$	100	A
I^2_t	$V_R = 0\text{V}$, $t_P = 10\text{ms}$; $T_{vj} = 125^\circ\text{C}$	450	A^2s
Module Isolation/ Module Isolation			
V_{ISOL}	RMS, $f = 50\text{Hz}$, $t = 1\text{min}$, NTC connect to Baseplate	2500	V

SII50N06

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}	$V_{GE} = V_{CE}$, $I_c = 1.0\text{mA}$	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
$V_{CE(sat)}$	$I_c = 300\text{A}$; $V_{GE} = 15\text{V}$; $T_j = 25(125)^\circ\text{C}$		2.1(2.4)	2.6(2.9)	V
C_{ies}	under following conditions		2.2		nF
C_{res}	$V_{GE} = 0$, $V_{CE} = 25\text{V}$, $f = 1\text{MHz}$		0.2		
L_{CE}			40		nH
I_{sc}	$t_p \leq 10\mu\text{s}$, $V_{GE} \leq 15\text{V}$, $T_{vj} = 125^\circ\text{C}$, $V_{cc} = 360\text{V}$		225		A
$t_{d(on)}$	under following conditions: $V_{CC} = 300\text{V}$, $I_c = 50\text{A}$		40(42)		ns
t_r	$R_{Gon} = R_{Goff} = 2.7\Omega$, $T_j = 25(125)^\circ\text{C}$		9(10)		ns
$t_{d(off)}$	$V_{GE} = \pm 15\text{V}$		120(130)		ns
t_f			12(21)		ns
$E_{on}(E_{off})$	$T_j = 25(125)^\circ\text{C}$, $L_s = 35\text{nH}$		0.5(1.0)		mJ
$R_{CC+EE'}$			1.2		$\text{m}\Omega$
R_{thJC}			0.44		K/W
Diode Wechselrichter/ Diode Inverter					
V_F	under following condition $I_F = 50\text{A}$; $V_{GE} = 0\text{V}$; $T_j = 25(125)^\circ\text{C}$		1.25(1.2)	1.6(-)	V
I_{RM}	$I_F = 50\text{A}$; $T_j = 25(125)^\circ\text{C}$		88(92)		A
Q_r	$-di/dt = 2900\text{A}/\mu\text{s}$		3.4(5.6)		μC
E_{rec}	$V_{GE} = -10\text{V}$, $V_R = 300\text{V}$		-(1.5)		mJ
R_{thJC}				0.8	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

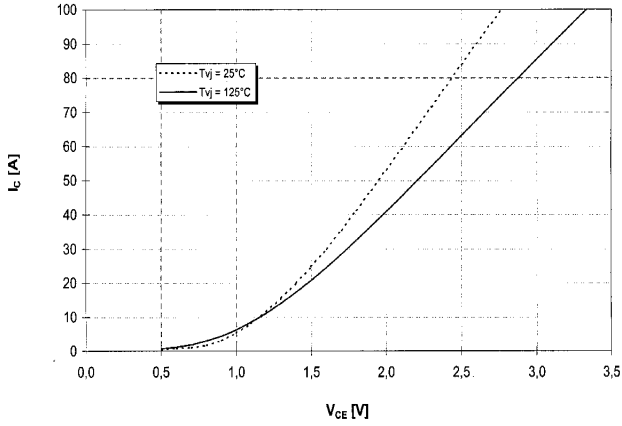
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NPT IGBT Modules

Ausgangskennlinie (typisch)
Output characteristic (typical)

$$I_c = f(V_{CE})$$

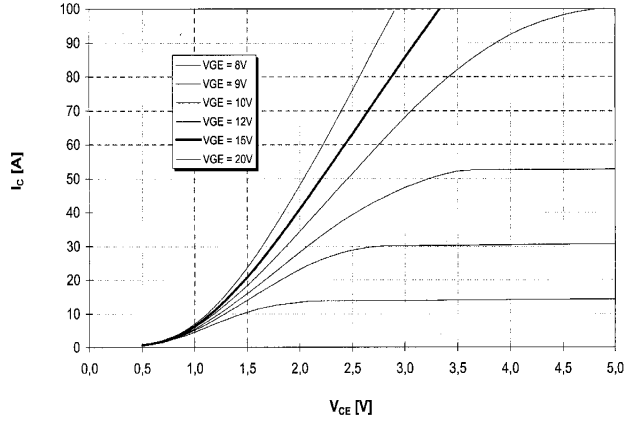
$V_{GE} = 15V$



Ausgangskennlinienfeld (typisch)
Output characteristic (typical)

$$I_c = f(V_{CE})$$

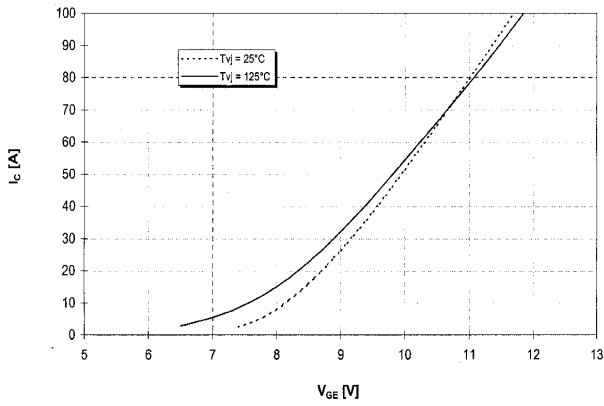
$T_{vj} = 125^\circ C$



Übertragungscharakteristik (typisch)
Transfer characteristic (typical)

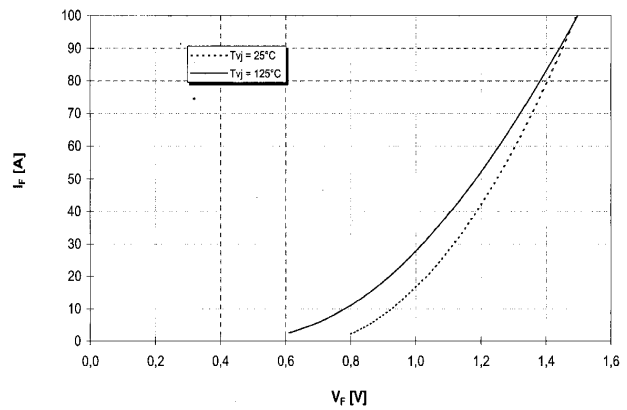
$$I_c = f(V_{GE})$$

$V_{CE} = 20V$



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

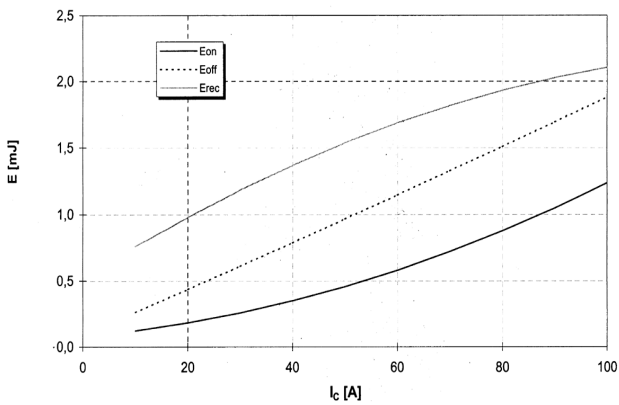
$$I_F = f(V_F)$$



Schaltverluste (typisch)
Switching losses (typical)

$$E_{on} = f(I_c), E_{off} = f(I_c), E_{rec} = f(I_c)$$

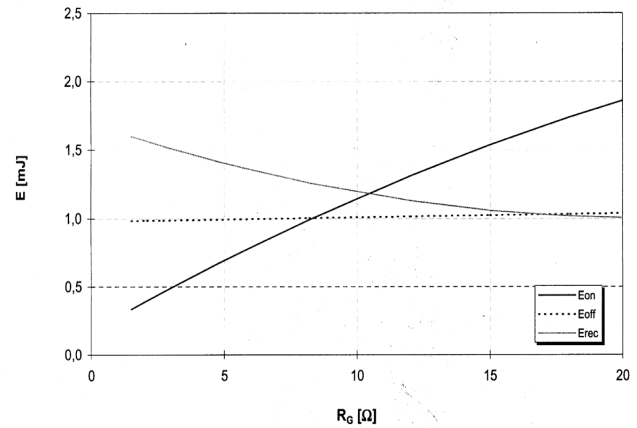
$R_{G, on} = 2.7\Omega, R_{G, off} = 2.7\Omega, V_{CC} = 300V, T_{vj} = 125^\circ C$



Schaltverluste (typisch)
Switching losses (typical)

$$E_{on} = f(R_G), E_{off} = f(R_G), E_{rec} = f(R_G)$$

$I_c = 50A, V_{CC} = 300V, T_{vj} = 125^\circ C$

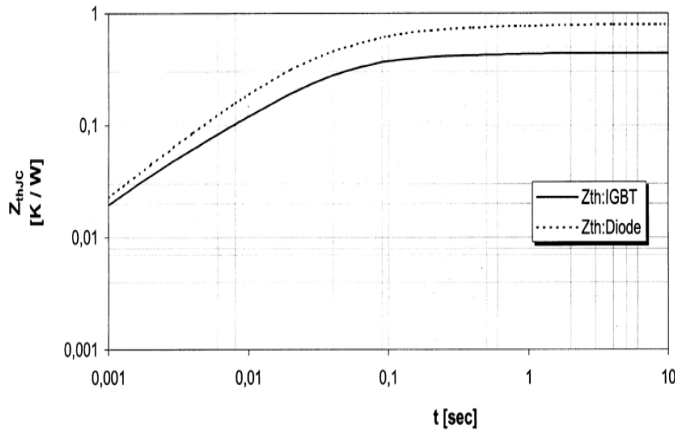


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NPT IGBT Modules

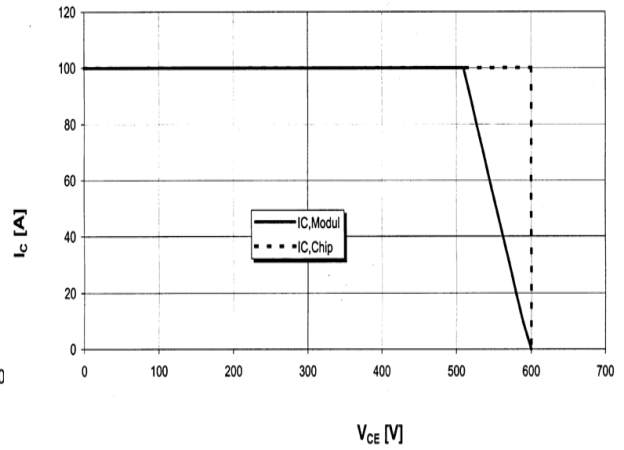
Transienter Wärmewiderstand
Transient thermal impedance

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



Sicherer Arbeitsbereich (RBSOA)

Reverse bias safe operation area (RBSOA) $V_{GE} = +15V, R_{\theta,GR} = 2,7\Omega, T_{JF} = 125^\circ C$



i	1	2	3	4
r_{θ} [K/kW] : IGBT	18,6	230,6	155,1	35,7
τ_{θ} [sec] : IGBT	0,0018	0,0240	0,0651	0,6626
r_{θ} [K/kW] : Diode	281,9	270,4	169,8	77,9
τ_{θ} [sec] : Diode	0,0487	0,0169	0,1069	0,9115