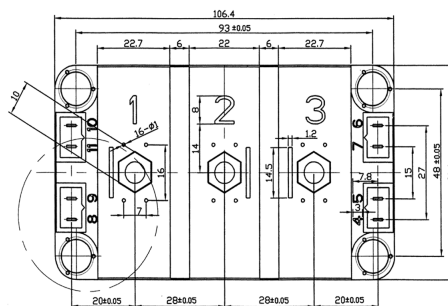
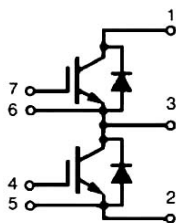
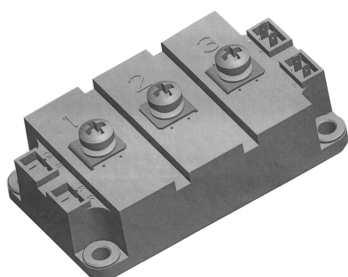


SII300N06

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	$T_c = 25(65)^\circ\text{C}$	275(300)	A
I_{CRM}	$T_c = 65^\circ\text{C}$, $t_P = 1\text{ms}$	600	A
P_{tot}	$T_c = 25^\circ\text{C}$, $T_{vj} = 150^\circ\text{C}$	1250	W
V_{GES}		± 20	V
Diode Wechselrichter/ Diode Inverter			
I_F		300	A
I_{FRM}	$t_P = 1\text{ms}$	600	A
I^2t	$V_R = 0\text{V}$, $t_P = 10\text{ms}$; $T_{vj} = 125^\circ\text{C}$	19.2	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}	$V_{GE} = V_{CE}, I_C = 6.0\text{mA}$	4.5	5.5	6.5	V
I_{CES}	$V_{GE} = 0; V_{CE} = 600\text{V}, T_j = 25(125)^{\circ}\text{C}$		2(2000)	1000	μA
I_{GES}	$V_{CE} = 0; V_{GE} = 20\text{V}$			400	nA
$V_{CE(sat)}$	$I_C = 300\text{A}; V_{GE} = 15\text{V}; T_j = 25(125)^{\circ}\text{C}$		1.95(2.2)	2.45(-)	V
C_{ies}	under following conditions		13		nF
C_{res}	$V_{GE} = 0, V_{CE} = 25\text{V}, f = 1\text{MHz}$		1.1		nF
L_{CE}			40		nH
I_{sc}	$t_p \leq 10\mu\text{s}, V_{GE} \leq 15\text{V}, T_{vj} = 125^{\circ}\text{C}, V_{cc} = 360\text{V}$		1350		A
$t_{d(on)}$	under following conditions: $V_{CC} = 300\text{V}, I_C = 300\text{A}$		95(105)		ns
t_r	$R_{Gon} = R_{Goff} = 3.3\Omega, T_j = 25(125)^{\circ}\text{C}$		69(71)		ns
$t_{d(off)}$	$V_{GE} = \pm 15\text{V}$		320(355)		ns
t_f			42(47)		ns
$E_{on}(E_{off})$	$T_j = 25(125)^{\circ}\text{C}, L_s = 35\text{nH}$		6.5(11)		mJ
$R_{CC'+EE'}$			0.6		$\text{m}\Omega$
R_{thJC}				0.1	K/W
Diode Wechselrichter/ Diode Inverter					
V_F	under following condition $I_F = 300\text{A}; V_{GE} = 0\text{V}; T_j = 25(125)^{\circ}\text{C}$		1.25(1.2)	1.6(-)	V
I_{RM}	$I_F = 300\text{A}; T_j = 25(125)^{\circ}\text{C}$		205(256)		A
Q_r	$-di/dt = 4200\text{A}/\mu\text{s}$		19(34)		μC
E_{rec}	$V_{GE} = -10\text{V}, V_R = 300\text{V}$		-(7.0)		mJ
R_{thJC}				0.21	K/W
R_{thCK}			0.01		K/W
T_{VJ}			-40...+125		$^{\circ}\text{C}$
T_{VJM}			150		$^{\circ}\text{C}$
T_{stg}			-40...+125		$^{\circ}\text{C}$
Mechanical Data					
M_s	to heatsink M6	3		5	Nm
M_t	to terminals M5	2.5		5	Nm
w				325	g

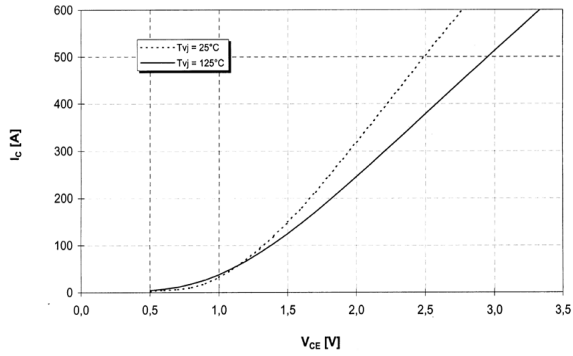
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NPT IGBT Modules

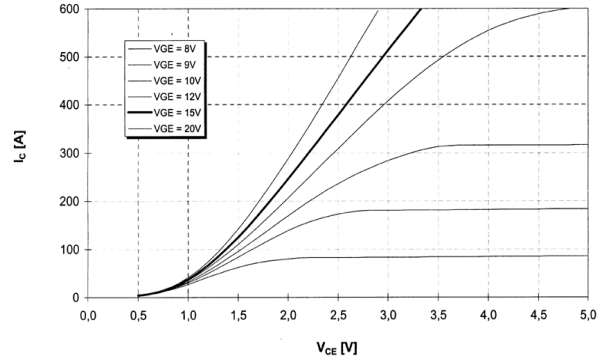
Ausgangskennlinie (typisch)
Output characteristic (typical)

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



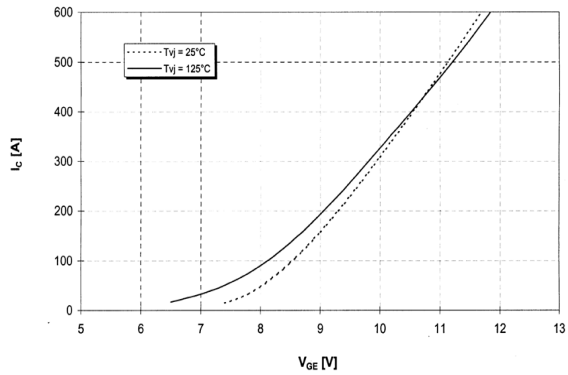
Ausgangskennlinienfeld (typisch)
Output characteristic (typical)

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



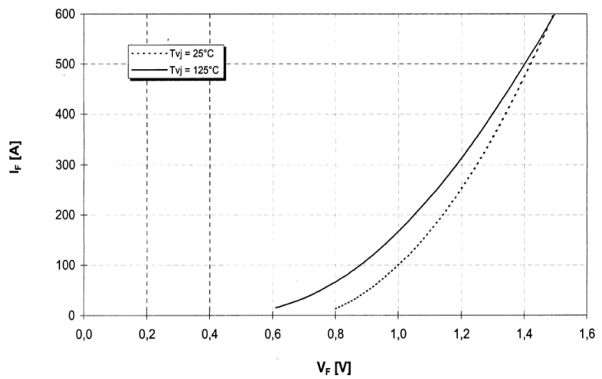
Übertragungscharakteristik (typisch)
Transfer characteristic (typical)

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



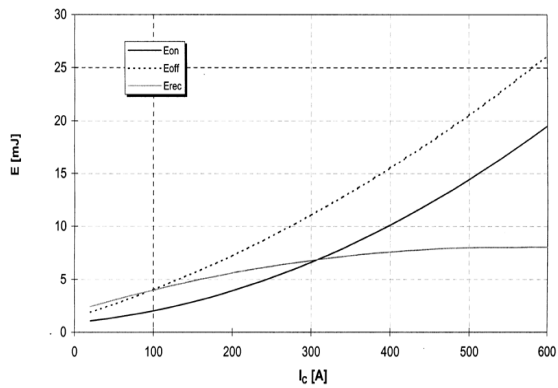
Durchlaßkennlinie der Inversdiode (typisch)
Forward characteristic of inverse diode (typical)

$I_F = f(V_F)$



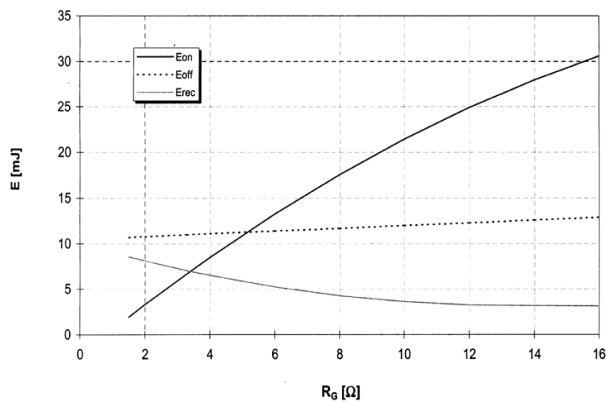
Schaltverluste (typisch)
Switching losses (typical)

$E_{on} = f(I_c), E_{off} = f(I_c), E_{rec} = f(I_c)$
 $R_{\theta, on} = 3,3\Omega, R_{\theta, off} = 3,3\Omega, V_{CC} = 300V, T_{vj} = 125^\circ C$



Schaltverluste (typisch)
Switching losses (typical)

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



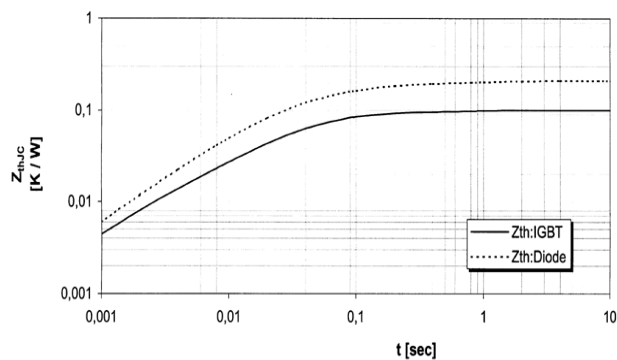
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NPT IGBT Modules

Transienter Wärmewiderstand
Transient thermal impedance

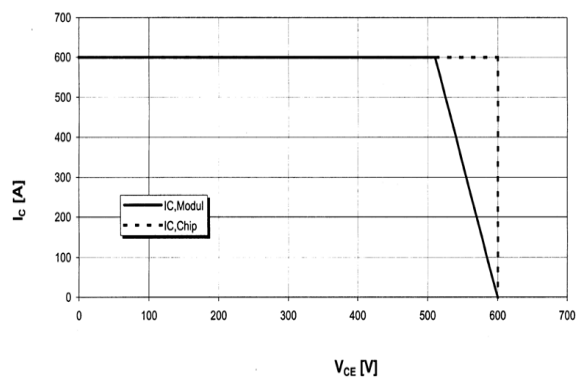
$$Z_{thJC} = f(t)$$



i	1	2	3	4
r_i [K/kW] : IGBT	4,2	52,4	35,2	8,1
τ_i [sec] : IGBT	0,0018	0,0240	0,0651	0,6626
r_i [K/kW] : Diode	74,0	71,0	44,6	20,4
τ_i [sec] : Diode	0,0487	0,0169	0,1069	0,9115

Sicherer Arbeitsbereich (RBSOA)

Reverse bias safe operation area (RBSOA) $V_{CE} = +15V, R_{\theta,cr} = 3,3\Omega, T_V = 125^\circ C$



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