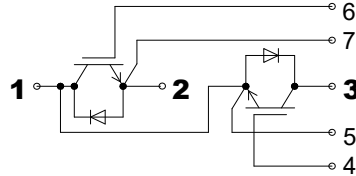


SGG200T60UC2

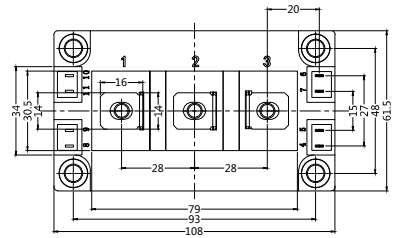
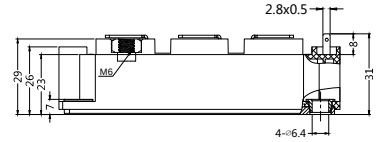
IGBT Modules



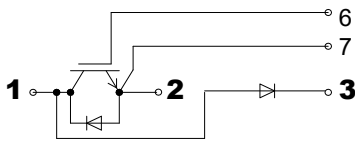
**SGG200T60UC2
2 (Half Bridge)**



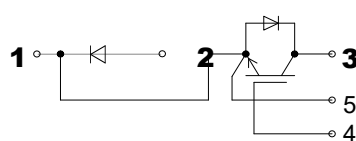
Dimensions in mm (1mm = 0.0394")



**SGD200T60UC2
(Boost Chopper)**



**SDG200T60UC2
(Buck Chopper)**



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

Symbol	Conditions	Values	Units
IGBT			
V_{CES}		600	V
I_C	$T_C=25(100)^\circ\text{C}$	400(200)	A
I_{CRM}	$T_C=25^\circ\text{C}, t_P=1\text{ms}$	400	A
V_{GES}		± 20	V
T_{Vj}		$-40 \dots +175$	$^\circ\text{C}$
Inverse Diode			
$I_F = -I_C$	$T_C=25(80)^\circ\text{C}$	400(200)	A
I_{FRM}	$T_C=25^\circ\text{C}, t_P=1\text{ms}$	400	A
I_{FSM}	$t_P = 10\text{ms}; \sin 180^\circ; T_J=25^\circ\text{C}$	1450	A
V_{RRM}		600	V
Module			
$I_{t(RMS)}$	$T_{terminal}=80^\circ\text{C}$	200	A
T_{stg}		$-40 \sim 125$	$^\circ\text{C}$
V_{isol}	AC, 1min	2500	V

Features

- Trench FS IGBT technology
- Low switching losses
- Switching frequency up to 30kHz
- Square RBSOA, no latch up
- High short circuit capability
- Positive temperature coefficient for easy paralleling
- MOS input, voltage controlled
- Soft switching 4.0 generation diode Technology
- Package with copper baseplate
- Isolation voltage 2500 V

Application

- Inverter welding Machines



Advantages

- space and weight savings
- reduced protection circuits

Sirectifier®

SGG200T60UC2

IGBT Modules

Characteristics

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

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=3\text{mA}$	4.5	5.5	6.5	V
I_{CES}	$V_{GE}=0; V_{CE}=V_{CES}; T_j=25^\circ\text{C}$			0.40	mA
$V_{CE(TO)}$	$T_j=25^\circ\text{C}$		0.9	1.0	V
r_{CE}	$V_{GE}=15\text{V}, T_j=25(150)^\circ\text{C}$		2.8(4.3)	4.5(6.0)	$\text{m}\Omega$
$V_{CE(sat)}$	$I_C=200\text{A}; V_{GE}=15\text{V}; \text{chip level}$		1.65	1.90	V
C_{ies}	under following conditions $V_{GE}=0, V_{CE}=25\text{V}, f=1\text{MHz}$		11.80		nF
C_{oes}			0.70		
C_{res}			0.38		
L_{CE}				30	nH
$R_{CC'+EE'}$	res., terminal-chip $T_c=25(125)^\circ\text{C}$		0.75(1.02)		$\text{m}\Omega$
$t_{d(on)}$	under following conditions: $V_{CC}=300\text{V}, I_C=200\text{A}$ $R_{Gon}=R_{Goff}=\Omega, T_j=150^\circ\text{C}$ $V_{GE}=\pm 15\text{V}$		128		ns
t_r			70		ns
$t_{d(off)}$			505		ns
t_f			48		ns
$E_{on}/E_{off}/E_{ts}$			14/7.8/21.8		mJ
Inverse Diode under following conditions:					
$V_F = V_{EC}$	$I_F=200\text{A}; V_{GE}=0\text{V}; T_j=25^\circ\text{C}$		1.55		V
$V_{(FO)}$	$T_j=25(125)^\circ\text{C}$		0.95(1.05)	1.00(1.20)	V
r_F	$T_j=25(125)^\circ\text{C}$		22(24)	25(27)	$\text{m}\Omega$
I_{RM}	$I_F=300\text{A}; T_j=125^\circ\text{C}$		100		A
Q_{rr}	$di/dt=100\text{A}/\mu\text{s}$		30		μC
E_{rr}	$V_{GE}=\pm 15\text{V}$		5.8		mJ
Thermal Characteristics					
$R_{th(j-c)}$	per IGBT			0.20	K/W
$R_{th(j-c)D}$	per Inverse Diode			0.38	K/W
$R_{th(c-s)}$	per module			0.065	K/W
Mechanical Data					
M_s	to heatsink M6	3		5	Nm
M_t	to terminals M6	2.5		5	Nm
Weight	typical			325	g

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IGBT Modules

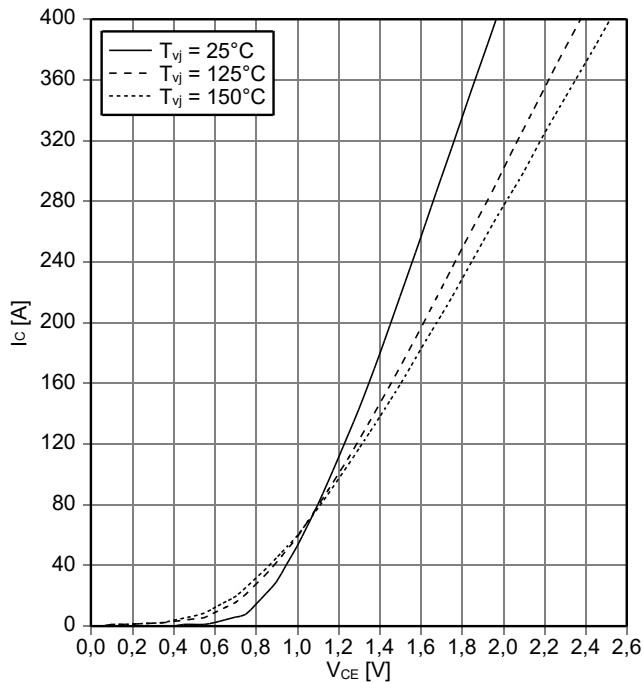


Fig.1 Output characteristic IGBT, Inverter (typical) $I_C = f(V_{CE})$ $V_{GE} = 15\text{V}$

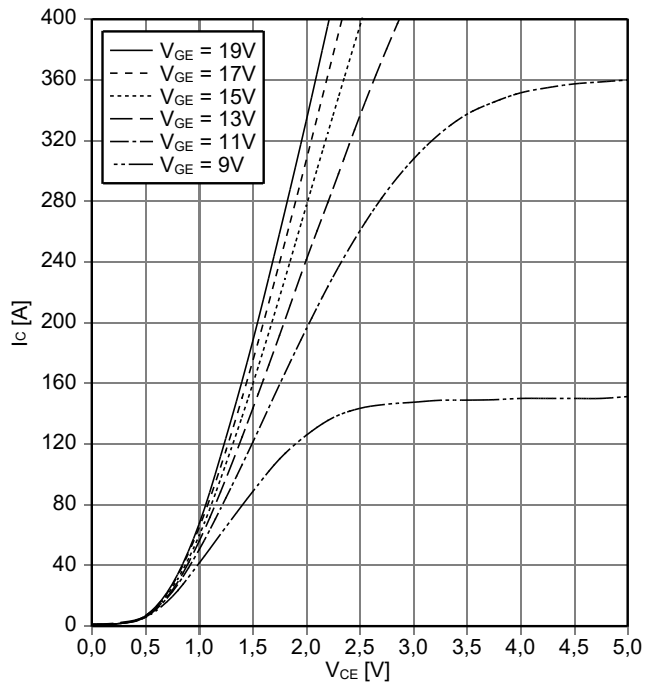


Fig.2 Output characteristic IGBT, Inverter (typical) $I_C = f(V_{CE})$ $T_{vj} = 150^\circ\text{C}$

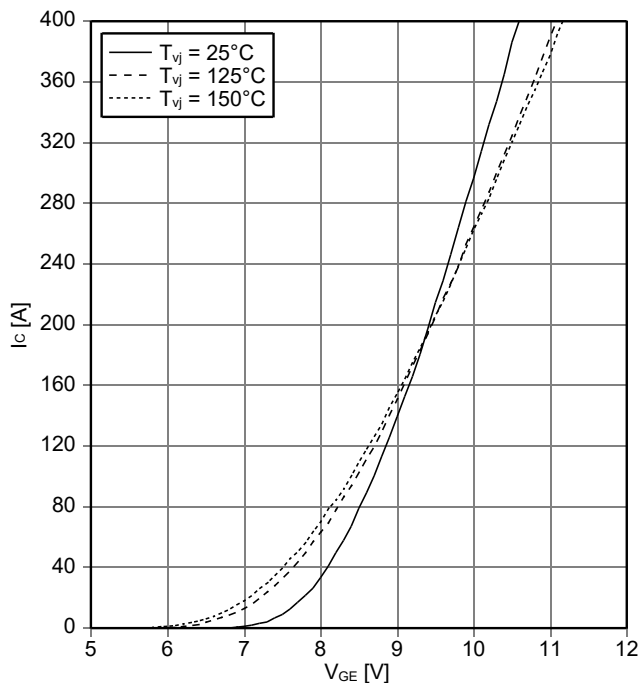


Fig.3 Transfer characteristic IGBT, Inverter (typical) $I_C = f(V_{GE})$ $V_{CE} = 20\text{V}$

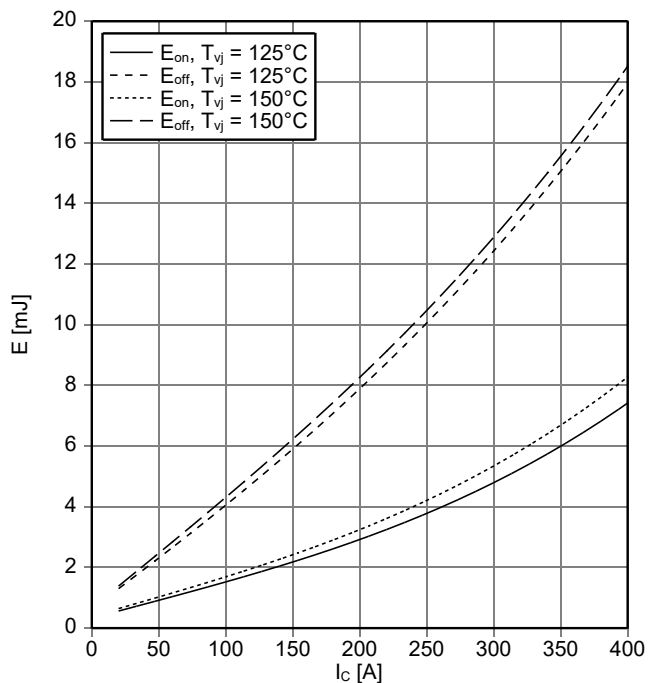


Fig.4 Switching losses IGBT, Inverter (typical)
 $E_{on} = f(I_C), E_{off} = f(I_C), V_{GE} = \pm 15\text{V}, R_{Gon} = 3.9\ \Omega,$
 $R_{Goff} = 3.9\ \Omega, V_{CE} = 300\text{V}$

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IGBT Modules

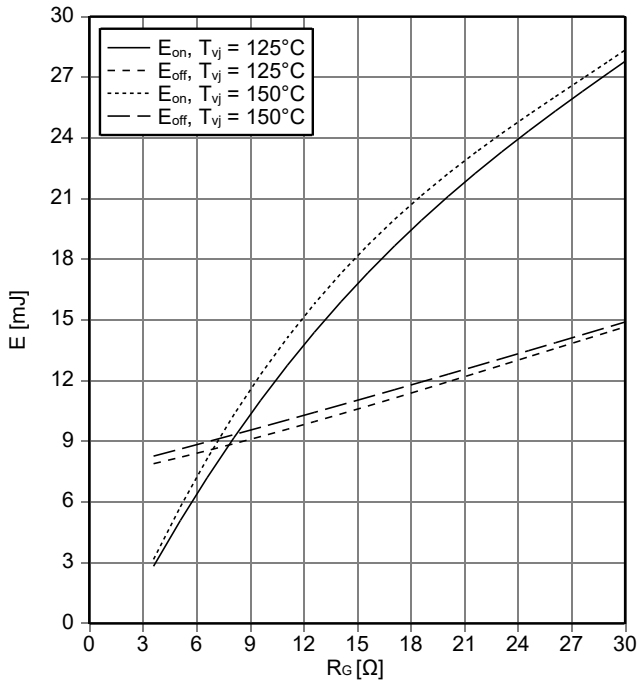


Fig.5 Switching losses IGBT, Inverter (typical)
 $E_{on}=f(R_G), E_{off}=f(R_G), V_{GE}=\pm 15\text{V}, I_C=200\text{A}, V_{CE}300\text{V}$

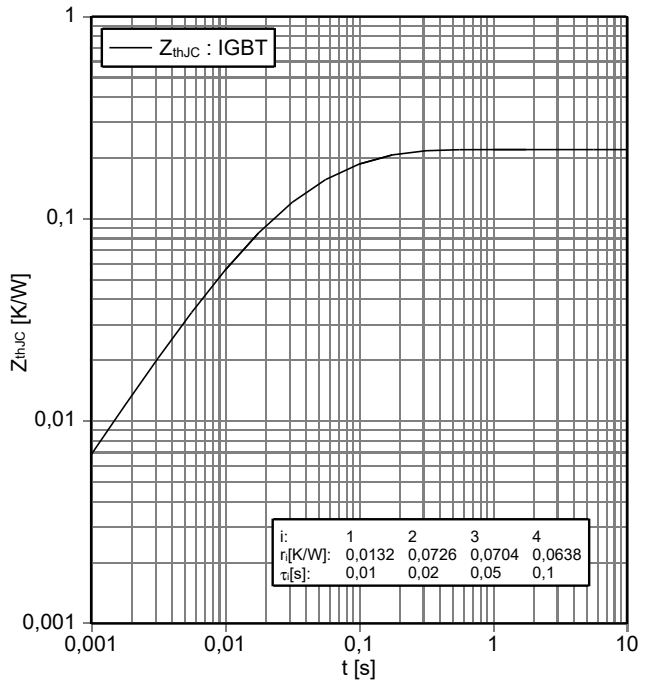


Fig.6 Transient thermal impedance IGBT, Inverter
 $Z_{thJ}=f(t)$

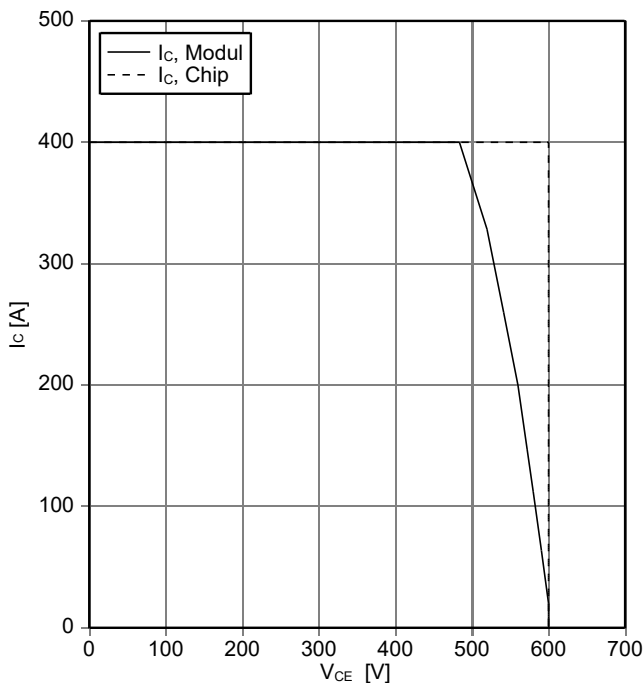


Fig.7 Reverse bias safe operating area IGBT, Inverter (RBSOA)
 $I_C=f(V_{CE}), V_{GE}=\pm 15\text{V}, R_{Goff}=3.9\Omega, T_{vj}=150^\circ\text{C}$

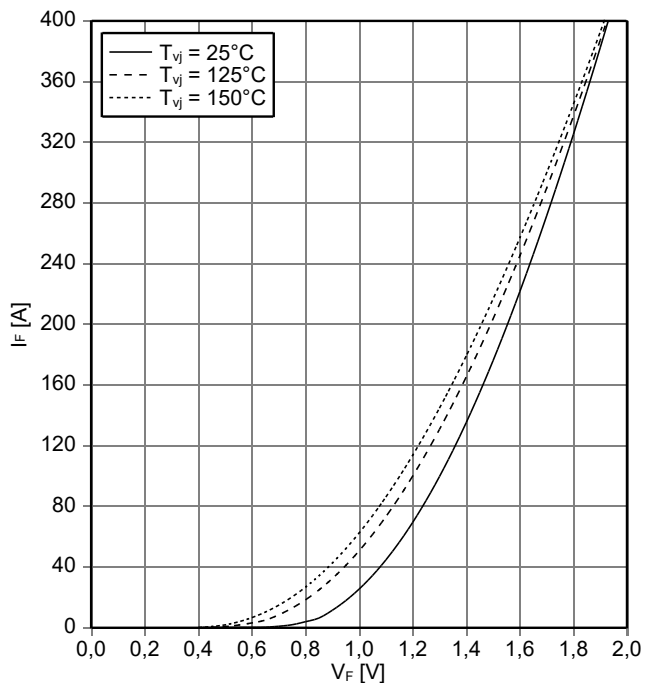


Fig.8 Forward characteristic of Diode, Inverter (typical)
 $I_F=f(V_F)$

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IGBT Modules

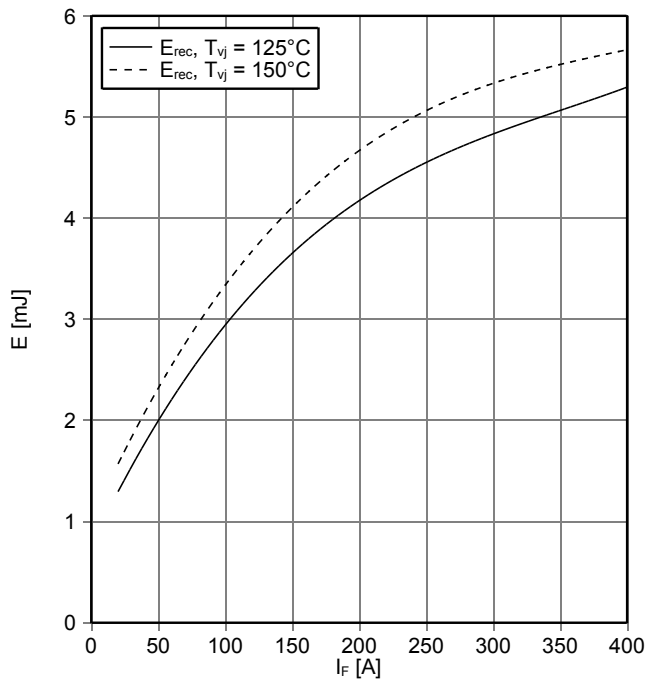


Fig.9 Switching losses Diode, Inverter (typical)

$E_{rec}=f(I_F), R_{Gon}=3.9\Omega, V_{CE}=300\text{V}$

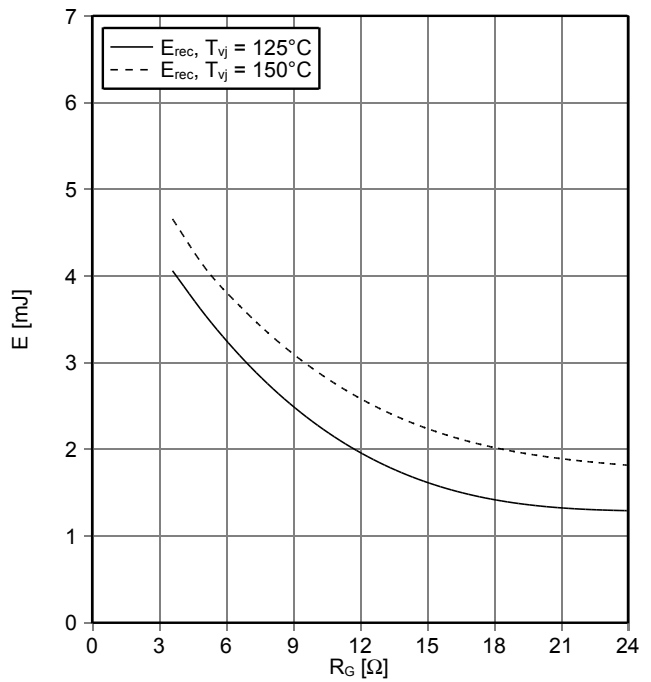


Fig.10 Switching losses Diode, Inverter (typical)

$E_{rec}=f(R_G), I_F=200\text{A}, V_{CE}=300\text{V}$

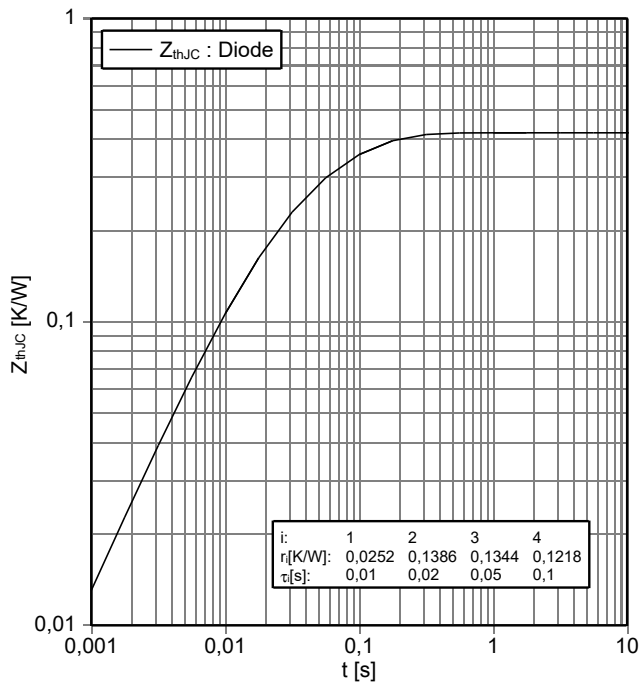


Fig.11 Transient thermal impedance Diode, Inverter

$Z_{thJC}=f(t)$

i:	1	2	3	4
r_i [K/W]:	0,0252	0,1386	0,1344	0,1218
τ_i [s]:	0,01	0,02	0,05	0,1