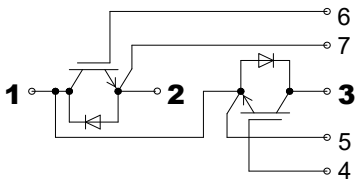
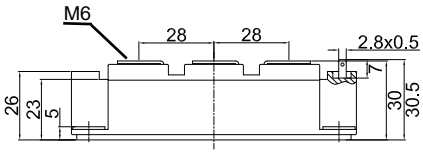
SGG400T60UC2

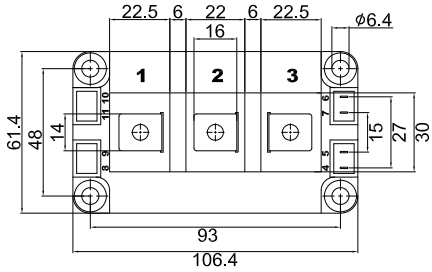
IGBT Modules

SGG400T60UC2
(Half Bridge)

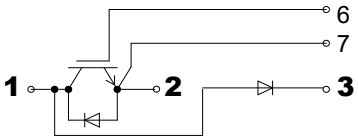


Dimensions in mm (1mm = 0.0394")

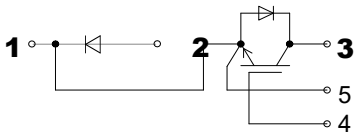




SGD400T60UC2
(Boost Chopper)



SDG400T60UC2
(Buck Chopper)



T_C = 25°C, unless otherwise specified

Symbol	Conditions	Values	Units
IGBT			
V_{CES}		600	V
I_C	T_C= 25(100)°C	800(400)	A
I_{CRM}	T_C= 25°C, t_P =1ms	800	A
V_{GES}		±20	V
T_{Vj}		-40...+175	°C
Inverse Diode			
I_F = -I_C	T_C= 25(80)°C	800(400)	A
I_{FRM}	T_C= 25°C, t_P =1ms	800	A
I_{FSM}	t_P =10ms; sin180° ; T_j=25°C	800	A
V_{RRM}		600	V
Module $I_{t(RMS)}$	$T_{teminal}$ = 80°C	400	A
T_{stg}		-40~125	°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 parallelling
- MOS input, voltage controlled
- Soft swithcing FWD diode Technology
- Package with copper baseplate
- Isolation voltage 2500 V

Application

- Inverter welding Machines
- UPS systems
- Power converters

Advantages

- space and weight savings
- reduced protection circuits

RoHS Compliant

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SGG400T60UC2

IGBT Modules

Characteristics $T_C = 25^oC$, unless otherwise specified

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C =3mA	4.5	5.0	6.0	V
I_{CES}	V_{GE} = 0; V_{CE} = V_{CES}; T_j = 25°C			0.10	mA
$V_{CE(TO)}$	T_j = 25°C		0.9	1.0	V
r_{CE}	V_{GE} = 15V, T_j = 25(150)°C		1.4(0.8)	2.4(0.9)	mΩ
$V_{CE(sat)}$	I_C =400A; V_{GE} = 15V; chip level		1.65	2.10	V
C_{ies}	under following conditions		25		nF
C_{oes}	V_{GE} = 0, V_{CE} = 25V, f = 1MHz		0.96		
C_{res}			0.75		
L_{CE}				30	nH
$R_{CC'+EE'}$	res., terminal-chip T_C = 25(125)°C		0.65(1.09)		mΩ
$t_{d(on)}$	under following conditions:		108		ns
t_r	V_{CC} = 300V, I_C = 400A		52		ns
$t_{d(off)}$	R_{Gon} = R_{Goff} = 1Ω , T_j = 150°C		450		ns
t_f	V_{GE} = ± 15V		69		ns
$E_{on}/E_{off}/E_{ts}$			2.2/16.4/18.6		mJ
Inverse Diode	under following conditions: I_F =400A;				
V_F = V_{EC}	V_{GE} = 0V; T_j = 25°C		1.55		V
$V_{(FO)}$	T_j = 25(125)°C		0.9(0.80)	1.1(1.0)	V
r_F	T_j = 25(125)°C		1.7(2.4)	2.1(2.7)	mΩ
I_{RM}	I_F = 300A; T_j = 125°C		216		A
Q_{rr}	di/dt = 100A/us		15		uC
E_{rr}	V_{GE} =±15V		4.8		mJ
Thermal Characteristics					
$R_{th(j-c)}$	per IGBT			0.12	K/W
$R_{th(j-c)D}$	per Inverse Diode			0.22	K/W
$R_{th(c-s)}$	per module			0.08	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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Fig.1 Output characteristic IGBT,Inverter (typical)
$I_C = f(V_{CE})$
V_{GE} = 15 V

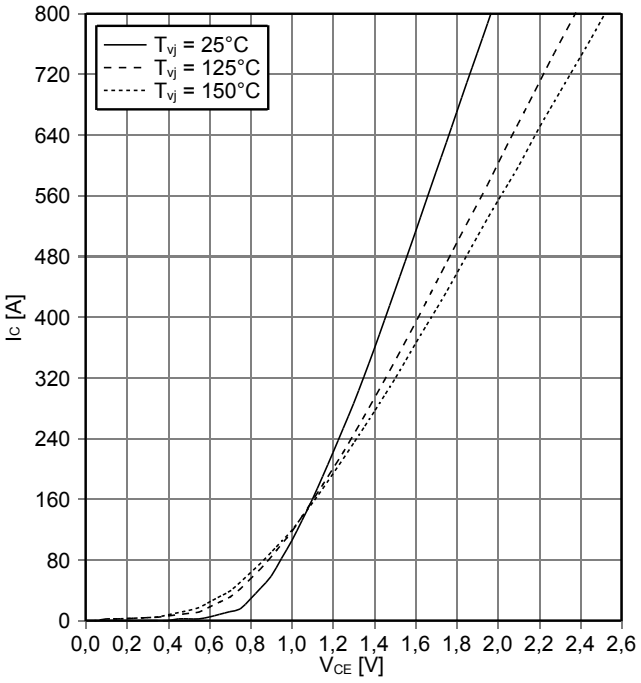

Fig.2 Output characteristic IGBT,Inverter (typical)
$I_C = f(V_{CE})$
T_{vj} = 150°C

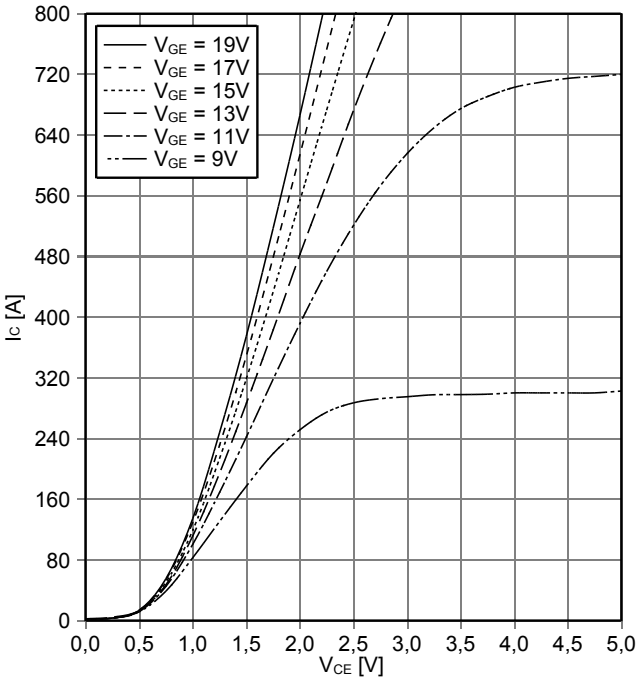

Fig.3 Transfer characteristic IGBT,Inverter(typical)
$I_C = f(V_{GE})$
V_{CE} = 20 V

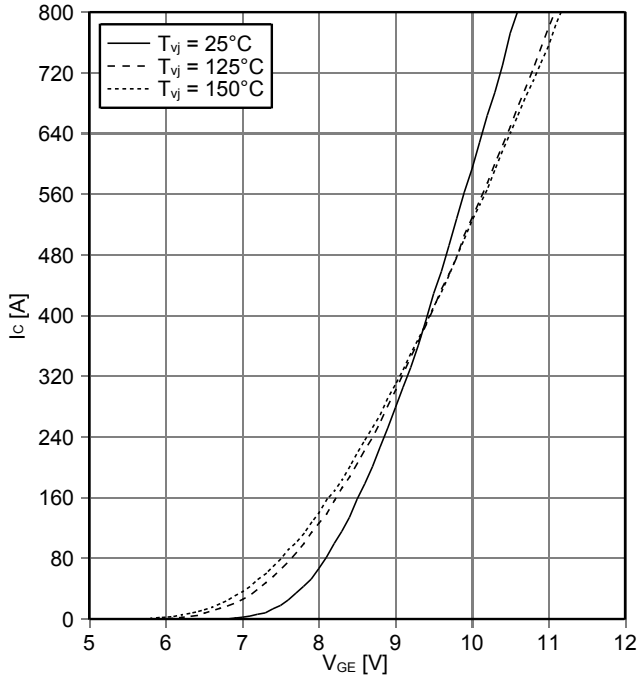

Fig.4 Switching losses IGBT,Inverter (typical)
$E_{on} = f(I_C)$, $E_{off} = f(I_C)$
V_{GE} = ±15 V, R_{Gon} = 2.4 Ω, R_{Goff} = 2.4 Ω, V_{CE} = 300 V

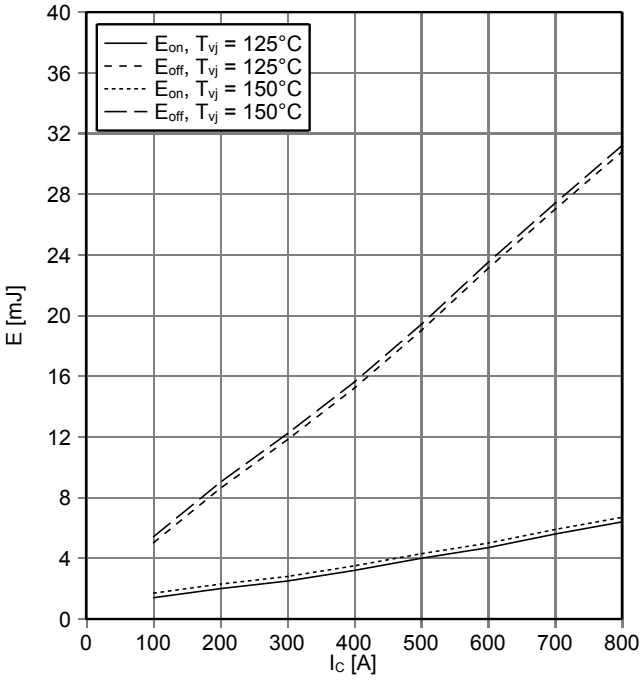

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Fig.5 Switching losses IGBT,Inverter (typical)
$E_{on} = f(R_G)$, $E_{off} = f(R_G)$
$V_{GE} = \pm 15$ V, $I_C = 300$ A, $V_{CE} = 300$ V

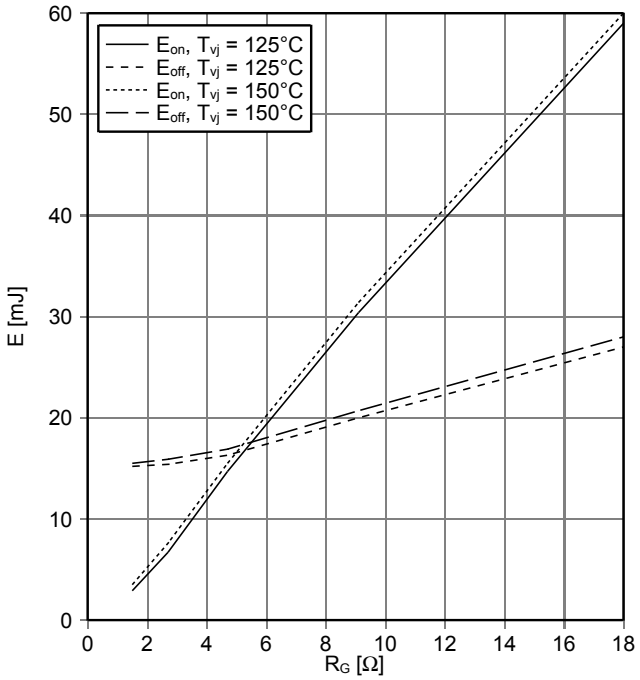

Fig.6 Transient thermal impedance IGBT,Inverter
$Z_{thJC} = f(t)$

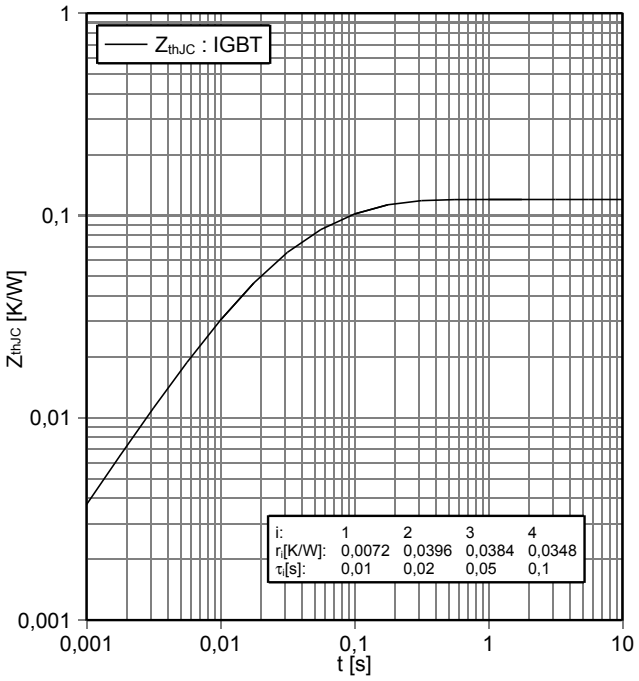

Fig.7 Reverse bias safe operating area IGBT,Inverter (RBSOA)
$I_C = f(V_{CE})$
$V_{GE} = \pm 15$ V, $R_{Goff} = 2.4\ \Omega$, $T_{vj} = 150°C$

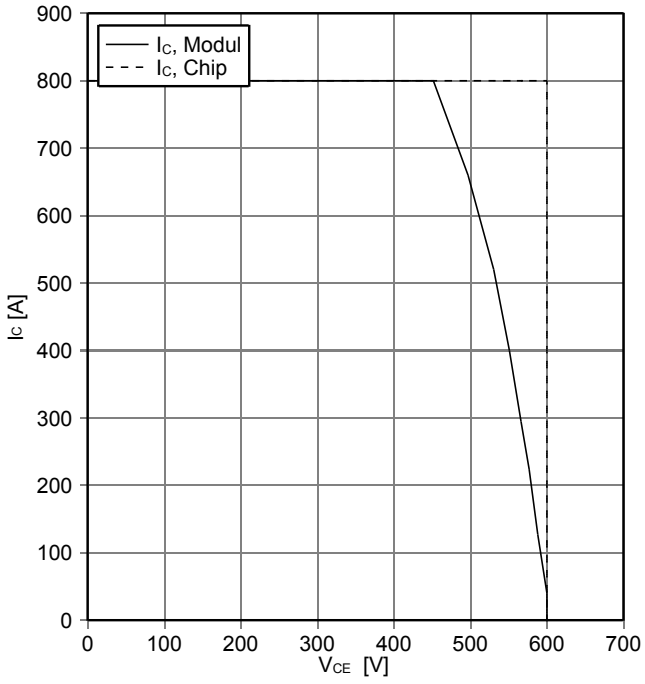

Fig.8 Forward characteristic of Diode, Inverter (typical)
$I_F = f(V_F)$

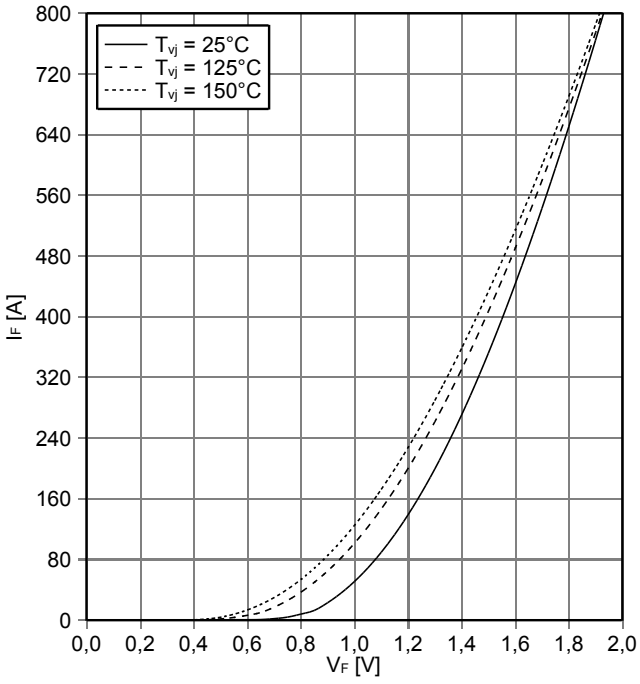

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Fig.9 Switching losses Diode, Inverter (typical)
$E_{rec} = f(I_F)$
$R_{Gon} = 2.4\ \Omega$, $V_{CE} = 300$ V

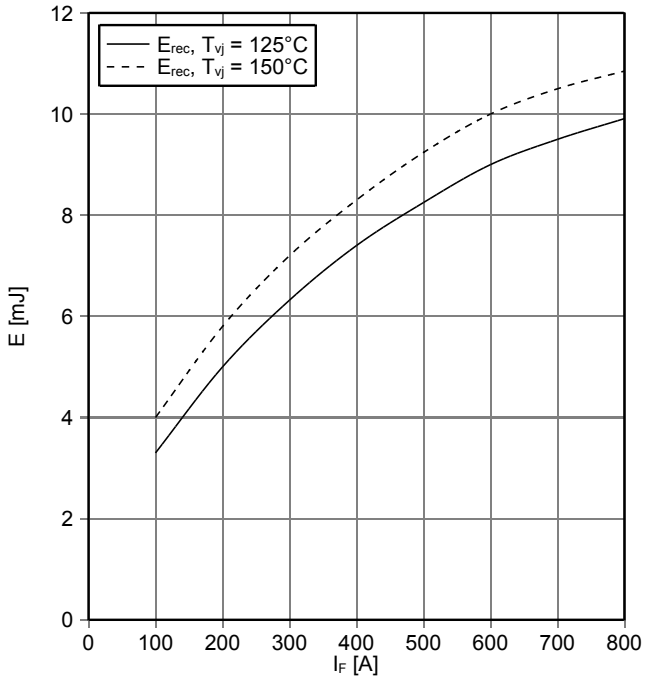


Fig.10 Switching losses Diode, Inverter (typical)
$E_{rec} = f(R_G)$
$I_F = 300$ A, $V_{CE} = 300$ V

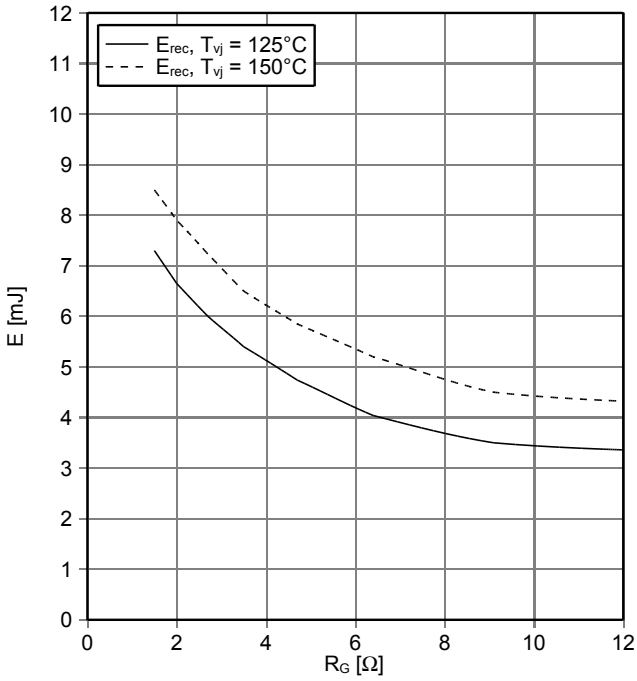
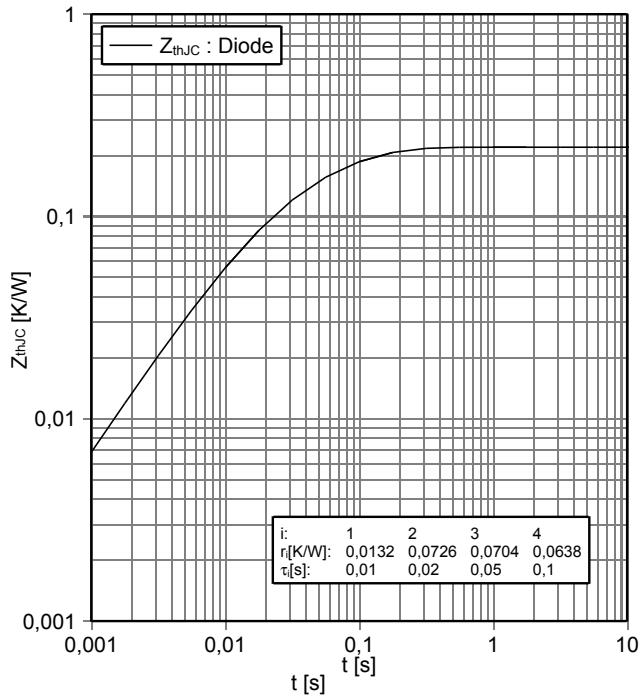


Fig.11 Transient thermal impedance Diode, Inverter
$Z_{thJC} = f(t)$



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