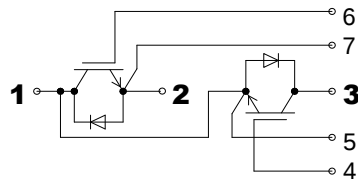


SGG400T170UC2

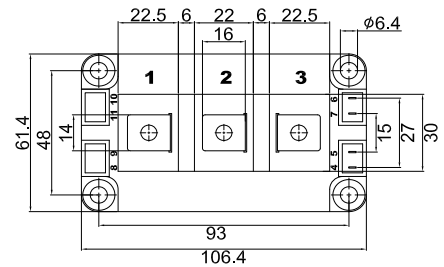
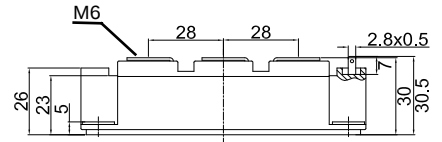
IGBT Modules



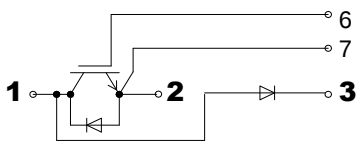
SGG400T170UC2



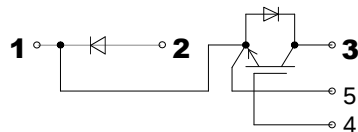
Dimensions in mm (1mm = 0.0394")



SGD400T170UC2



SDG400T170UC2



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

Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1700	V
I_C	$T_C = 25(100)^{\circ}\text{C}$	800(400)	A
I_{CRM}	$T_C = 25^{\circ}\text{C}$, $t_P = 1\text{ms}$	800	A
V_{GES}		± 20	V
T_{Vj}		$-40 \dots +175$	$^{\circ}\text{C}$
Inverse Diode			
V_{RRM}	$T_C = 25(80)^{\circ}\text{C}$	1700	V
$I_F = -I_C$		800(400)	A
I_{FRM}	$T_C = 25^{\circ}\text{C}$, $t_P = 1\text{ms}$	800	A
I_{FSM}	$t_P = 10\text{ms}$; sin.; $T_j = 150^{\circ}\text{C}$	400	A
Module			
$I_{t(RMS)}$	$T_{terminal} = 80^{\circ}\text{C}$	400	A
T_{stg}		$-40 \sim 125$	$^{\circ}\text{C}$
V_{Isol}	AC, 1min	4000	V

Features

- Trench FS technology
- Low switching losses
- Square RBSOA, no latch up
- High short circuit capability
- Positive temperature coefficient for easy paralleling
- Soft switching FWD Technology
- Package with copper base plate
- Isolation voltage 4000V

Application

- AC and DC motor control
- AC servo and robot drives
- power supplies
- welding inverters



Advantages

- space and weight savings
- reduced protection circuits

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SGG400T170UC2

IGBT Modules

Characteristics

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

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 12\text{mA}$	5.5	6.0	6.52	V
I_{CES}	$V_{GE} = 0$; $V_{CE} = V_{CES}$; $T_j = 25^{\circ}\text{C}$			1.0	mA
$V_{CE(TO)}$	$T_j = 25^{\circ}\text{C}$		0.86	0.96	V
r_{CE}	$V_{GE} = 15\text{V}$, $T_j = 25(150)^{\circ}\text{C}$		7.0(10.1)	7.9(10.7)	$\text{m}\Omega$
$V_{CE(sat)}$	$I_C = 400\text{A}$; $V_{GE} = 15\text{V}$; chip level		2.15	2.50	V
C_{ies}	under following conditions $V_{GE} = 0$, $V_{CE} = 25\text{V}$, $f = 1\text{MHz}$		101.0		nF
C_{oes}			3.19		
C_{res}			0.88		
L_{CE}				20	nH
$R_{CC'+EE'}$	res., terminal-chip $T_C = 25(125)^{\circ}\text{C}$		0.26(0.6)		$\text{m}\Omega$
$t_{d(on)}$	under following conditions: $V_{CC} = 900\text{V}$, $I_C = 400\text{A}$ $R_{Gon} = R_{Goff} = 1\Omega$, $T_j = 150^{\circ}\text{C}$ $V_{GE} = \pm 15\text{V}$		795		ns
t_r			172		ns
$t_{d(off)}$			700		ns
t_f			580		ns
$E_{on}(E_{off})$			84.7(88.1)		mJ
Inverse Diode					
V_{RRM}	under following conditions: $I_F = 400\text{A}$; $V_{GE} = 0\text{V}$; $T_j = 25^{\circ}\text{C}$	1700			V
$V_F = V_{EC}$			2.68	3.30	V
$V_{(FO)}$	$T_j = 25(150)^{\circ}\text{C}$		1.4(1.15)	1.8(1.45)	V
r_F	$T_j = 25(150)^{\circ}\text{C}$		6.0(8.4)	6.6(9.0)	$\text{m}\Omega$
I_{RRM}	$I_F = 400\text{A}$; $T_j = 150^{\circ}\text{C}$		190		A
Q_{rr}	$di/dt = 3100\text{A/us}$		19		μC
E_{rr}	$V_{GE} = \pm 15\text{V}$		67		mJ
Thermal Characteristics					
$R_{th(j-c)}$	per IGBT			0.110	K/W
$R_{th(j-c)D}$	per Inverse Diode			0.190	K/W
$R_{th(c-s)}$	per module			0.069	K/W
Mechanical Data					
M_s	to heatsink M6	3		5	Nm
M_t	to terminals M6	2.5		5	Nm
Weight	typical			320	g

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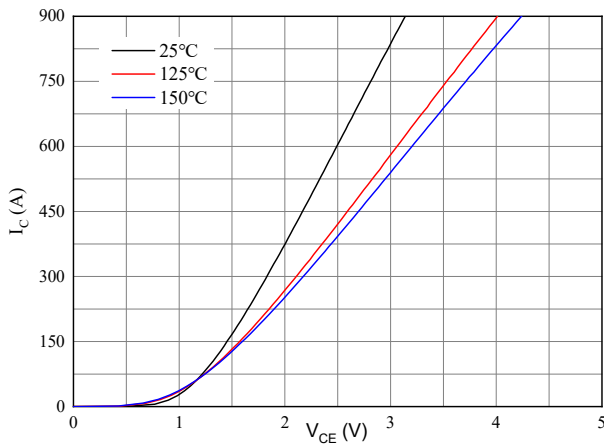


Figure 1. Typical output characteristics ($V_{GE}=15V$)

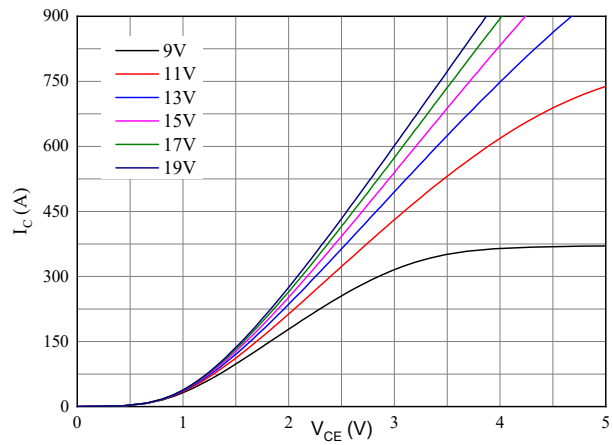


Figure 2. Typical output characteristics ($T_{vj}=150^{\circ}C$)

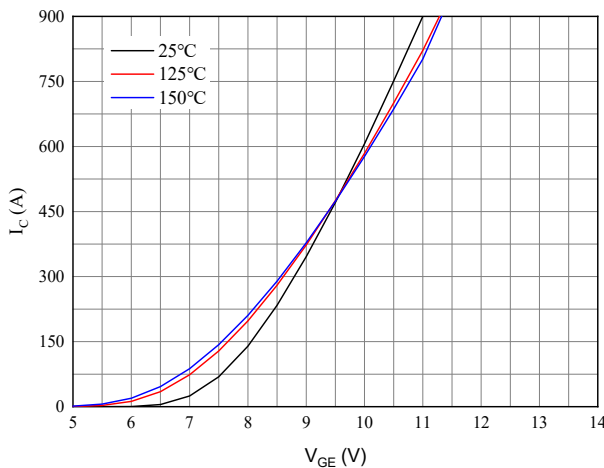


Figure 3. Typical transfer characteristic ($V_{CE}=20V$)

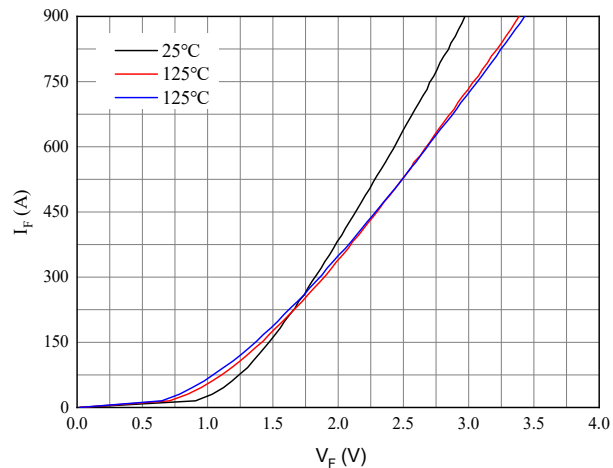


Figure 4. Forward characteristic of Diode

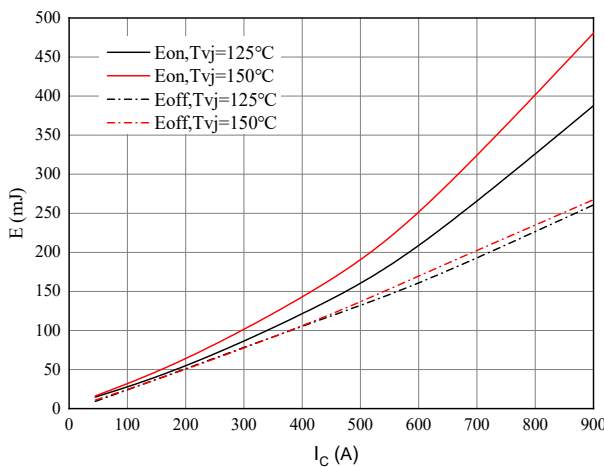


Figure 5. Switching losses of IGBT

$V_{GE}=\pm 15V$, $R_{Gon}=2.5\Omega$, $R_{Goff}=2.5\Omega$, $V_{CE}=900V$

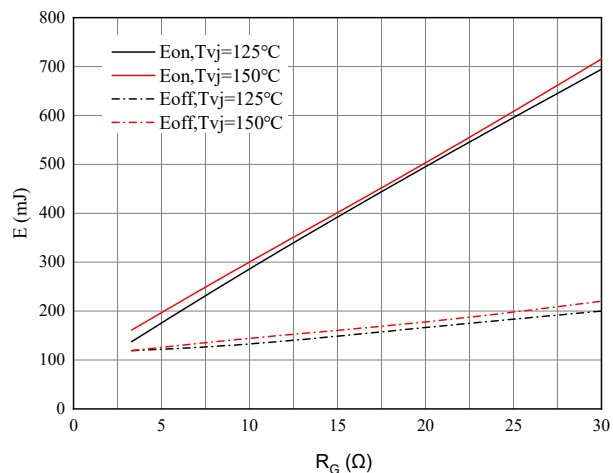


Figure 6. Switching losses of IGBT

$V_{GE}=\pm 15V$, $I_C=400A$, $V_{CE}=900V$



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IGBT Modules

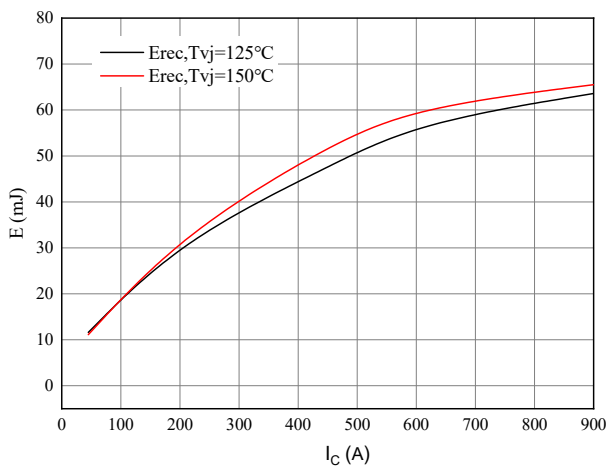


Figure 7. Switching losses of Diode
 $R_{Gon}=2.5\Omega$, $V_{CE}=900V$

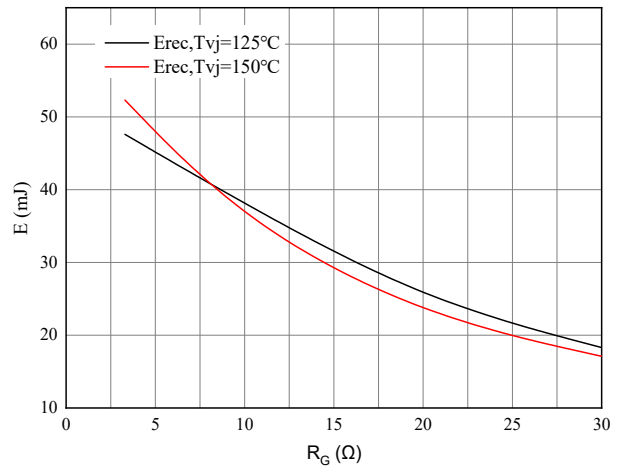


Figure 8. Switching losses of Diode
 $I_F=300A$, $V_{CE}=900V$

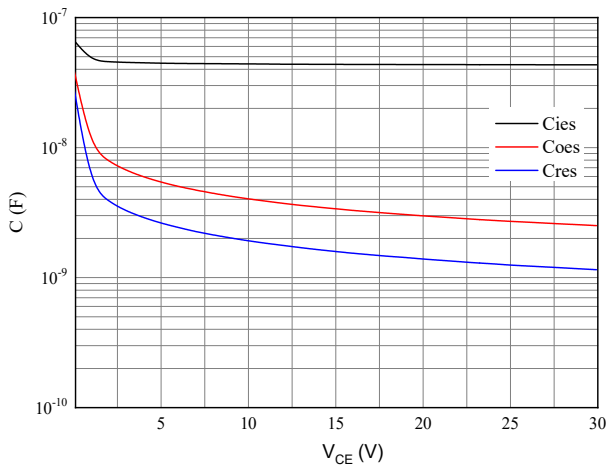


Figure 9. Capacitance characteristic