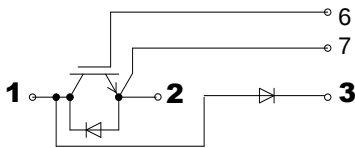


SGG200NF120UC2

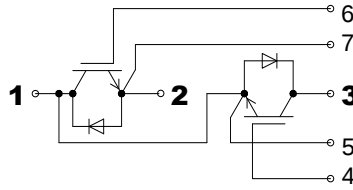
IGBT Modules



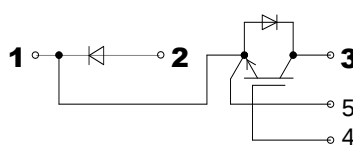
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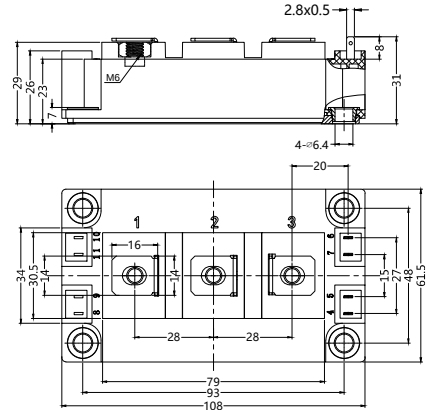
SGG200NF120UC2



SDG200NF120UC2



Dimensions in mm (1mm = 0.0394")



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

Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_{Cnom}		200	A
I_{CRM}	$T_c = 25^{\circ}\text{C}$, $t_p = 1\text{ms}$	300	A
V_{GES}		± 20	V
T_{vj}		$-40 \dots +175$	$^{\circ}\text{C}$
Inverse Diode			
I_F	$T_c = 25(80)^{\circ}\text{C}$	300(200)	A
I_{FRM}	$T_c = 25^{\circ}\text{C}$, $t_p = 1\text{ms}$	300	A
I_{FSM}	$t_p = 10\text{ms}$; $\sin$; $T_j = 150^{\circ}\text{C}$	1480	A
Module			
$I_{t(RMS)}$	$T_{terminal} = 80^{\circ}\text{C}$	500	A
T_{stg}		$-40 \sim 125$	$^{\circ}\text{C}$
V_{isol}	AC, 1min	4000	V

Features

- Planar Gate Field Stop IGBT technology
- Low switching losses
- Switching frequency $> 20\text{kHz}$
- Square RBSOA, no latch up
- High short circuit capability
- Positive temperature coefficient for easy paralleling
- MOS input, voltage controlled
- 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
- Induction heating

Advantages

- space and weight savings
- reduced protection circuits



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SGG200NF120UC2

IGBT Modules

Characteristics

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

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 10\text{mA}$	4.5	5.0	5.7	V
I_{CES}	$V_{GE} = 0$; $V_{CE} = V_{CES}$; $T_J = 25^\circ\text{C}$			0.3	mA
$V_{CE(TO)}$	$T_J = 25^\circ\text{C}$		1.00	1.15	V
r_{CE}	$V_{GE} = 15\text{V}$, $T_J = 25(150)^\circ\text{C}$		5.75(7.75)	7.51(9.75)	m Ω
$V_{CE(sat)}$	$I_C = 200\text{A}$; $V_{GE} = 15\text{V}$; chip level		2.10	2.35	V
C_{ies}	under following conditions		11.8		nF
C_{oes}	$V_{GE} = 0$, $V_{CE} = 25\text{V}$, $f = 1\text{MHz}$		3.70		
C_{res}			2.20		
L_{CE}				30	nH
R_{CC+EE}	res., terminal-chip $T_C = 25(125)^\circ\text{C}$		0.37(0.59)		m Ω
$t_{d(on)}$	under following conditions:		23		ns
t_r	$V_{CC} = 600\text{V}$, $I_C = 200\text{A}$		46		ns
$t_{d(off)}$	$R_{Gon} = R_{Goff} = 10\Omega$, $T_J = 125^\circ\text{C}$		270		ns
t_f	$V_{GE} = \pm 15\text{V}$		83		ns
$E_{on}(E_{off})$			4.1(2.1)		mJ
Inverse Diode under following conditions:					
$V_F = V_{EC}$	$I_F = 200\text{A}$; $V_{GE} = 0\text{V}$; $T_J = 25^\circ\text{C}$		2.20	2.52	V
$V_{(FO)}$	$T_J = 25(150)^\circ\text{C}$		1.0(0.7)	1.3(0.9)	V
r_F	$T_J = 25(150)^\circ\text{C}$		3.1(3.9)	3.3(4.2)	m Ω
I_{RRM}	$I_F = 200\text{A}$; $T_J = 150^\circ\text{C}$		300		A
Q_{rr}	$di/dt = 8800\text{A/us}$		54		μC
E_{rr}	$V_{GE} = 15\text{V}$		22		mJ
Thermal Characteristics					
$R_{th(j-c)}$	per IGBT			0.099	K/W
$R_{th(j-c)D}$	per Inverse Diode			0.230	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			325	g

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IGBT Modules

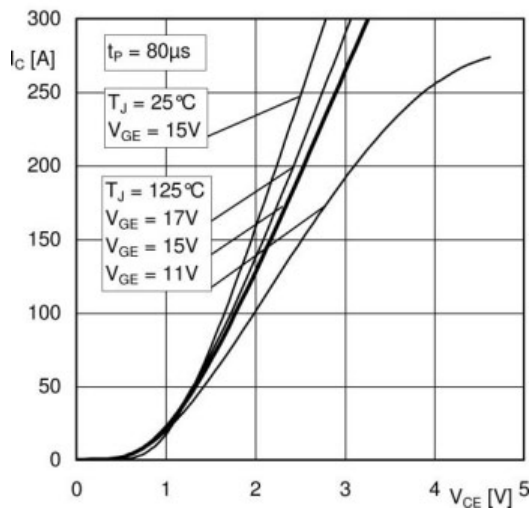


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

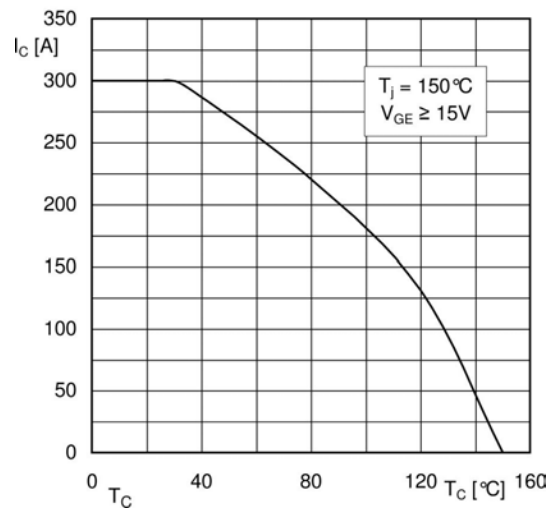


Fig. 2 Rated current vs. temperature $I_C = f(T)_C$

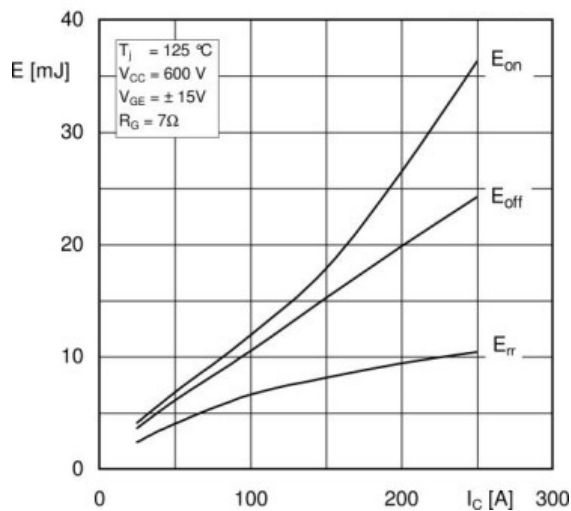


Fig. 3 Typ. turn-on /-off energy = $f(I_C)$

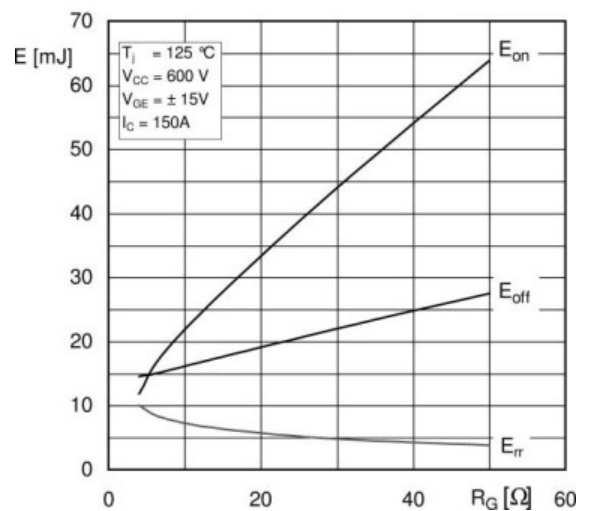


Fig. 4 Typ. turn-on /-off energy = $f(R_G)$

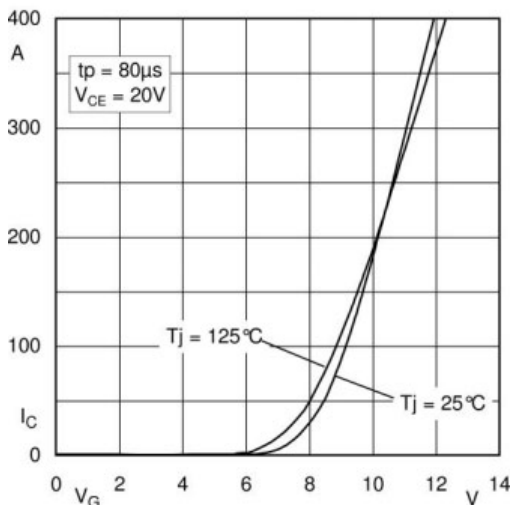


Fig. 5 Typ. transfer characteristic

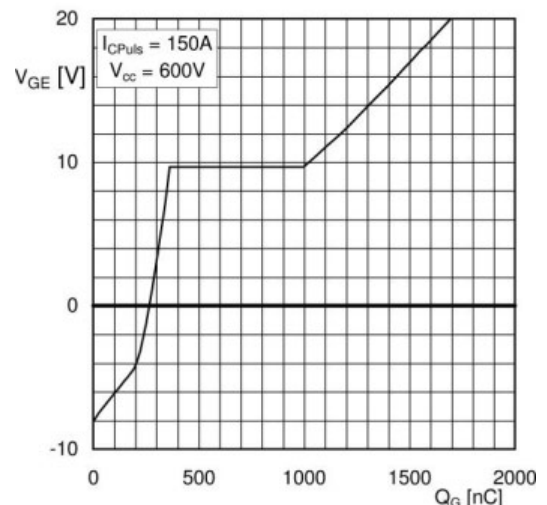


Fig. 6 Typ. gate charge characteristic

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IGBT Modules

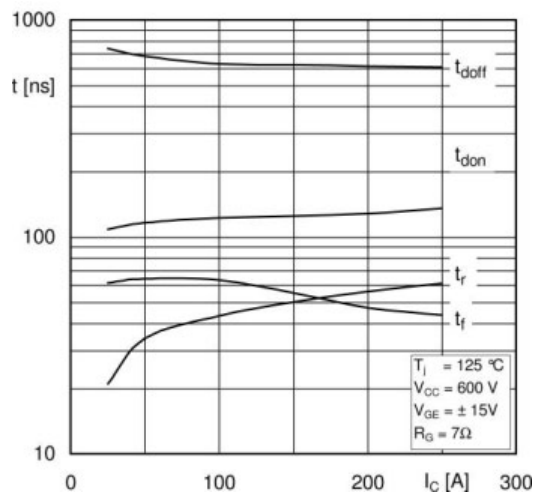


Fig. 7 Typ. switching times vs. I_C

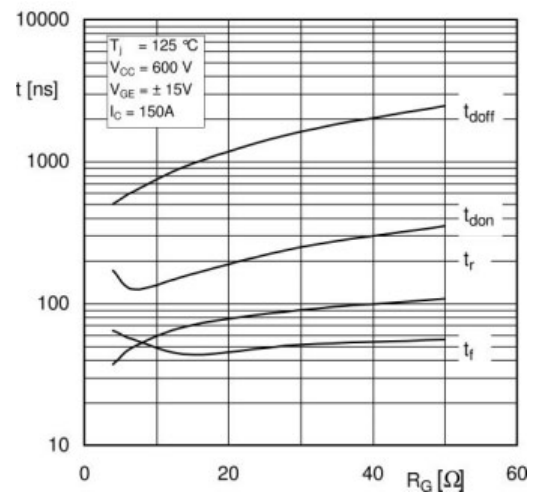


Fig. 8 Typ. switching times vs. gate resistor R_G

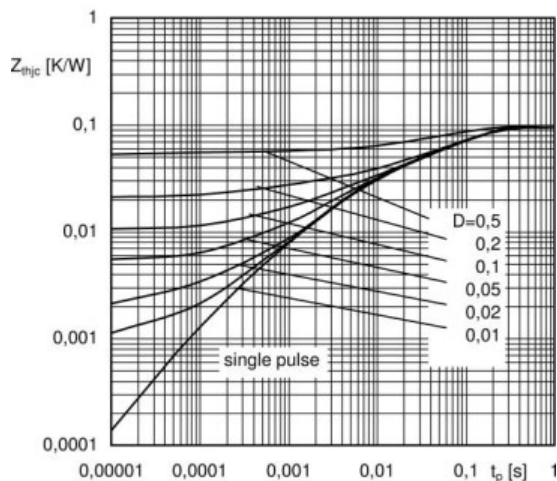


Fig. 9 Transient thermal impedance of IGBT

$$Z_{th(j-c)} = f(t_p); D = t/t_c = t/t_p$$

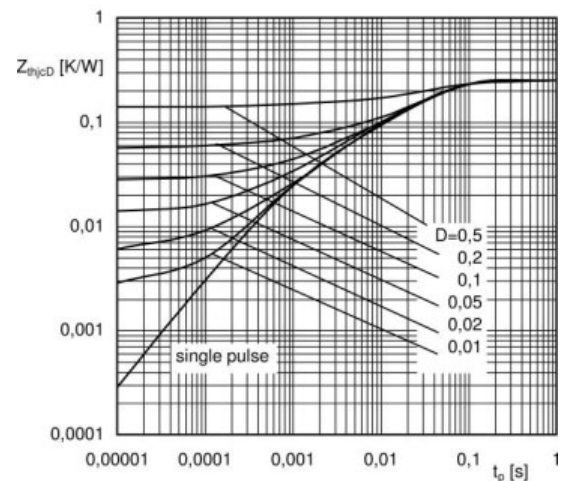


Fig. 10 Transient thermal impedance of FWD

$$Z_{th(j-c)} = f(t_p); D = t/t_c = t/t_p$$

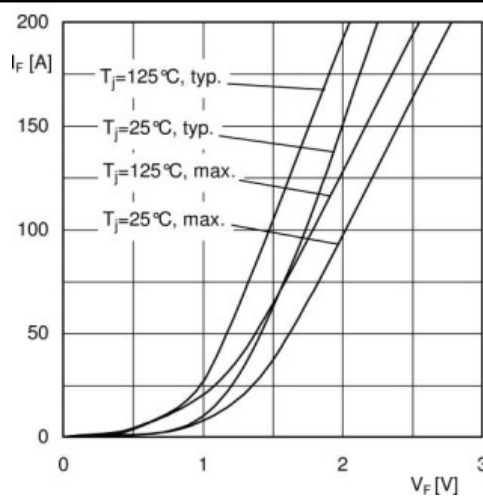


Fig. 11 FWD diode forward characteristic

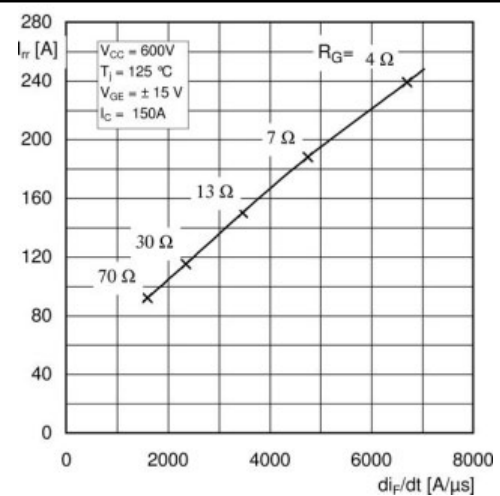


Fig. 12 Typ. FWD diode peak reverse recovery current