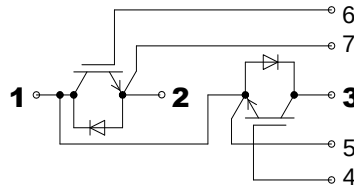


SGG300NF120UC2

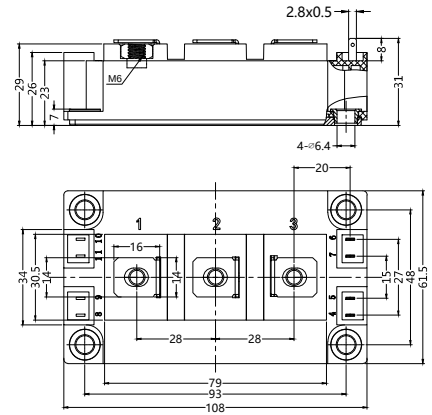
IGBT Modules



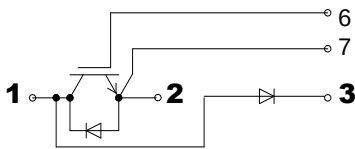
SGG300NF120UC2



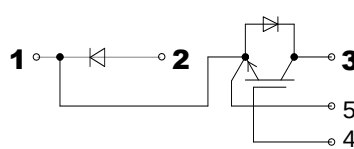
Dimensions in mm (1mm = 0.0394")



SGD300NF120UC2



SDG300NF120UC2



T_c = 25°C, unless otherwise specified

Symbol	Conditions	Values	Units
IGBT			
V _{CES}		1200	V
I _{Cnom}		300	A
I _{CRM}	T _C = 25°C, t _P =1ms	750	A
V _{GES}		±20	V
T _{vj}		-40...+175	°C
Inverse Diode			
I _F	T _C = 25(80)°C	450(300)	A
I _{FRM}	T _C = 25°C, t _P =1ms	750	A
I _{FSM}	t _P =10ms; sin.; T _j =150°C	1480	A
Module			
I _{t(RMS)}	T _{terminal} = 80°C	500	A
T _{stg}		-40~125	°C
V _{Isol}	AC, 1min	4000	V

Features

- Planar Gate Field Stop IGBT technology
- Low switching losses
- Switching frequency > 20kHz
- Square RBSOA, no latch up
- High short circuit capability
- Positive temperature coefficient for easy parallelling
- 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

Advantages

- space and weight savings
- reduced protection circuits



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SGG300NF120UC2

IGBT Modules

Characteristics

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

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 8\text{ mA}$	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}	$V_{GE} = 15\text{V}$, $T_j = 25(125)^{\circ}\text{C}$		4.5(6.0)	6.0(7.5)	$\text{m}\Omega$
$V_{CE(sat)}$	$I_C = 300\text{A}$; $V_{GE} = 15\text{V}$; chip level		2.10	2.35	V
C_{ies}	under following conditions $V_{GE} = 0$, $V_{CE} = 25\text{V}$, $f = 1\text{MHz}$		16.8		nF
C_{oes}			2.70		
C_{res}			2.00		
L_{CE}				20	nH
$R_{CC'+EE'}$	res., terminal-chip $T_C = 25(125)^{\circ}\text{C}$		0.35(0.52)		$\text{m}\Omega$
$t_{d(on)}$	under following conditions: $V_{CC} = 600\text{V}$, $I_C = 300\text{A}$ $R_{Gon} = R_{Goff} = 10\Omega$, $T_j = 125^{\circ}\text{C}$ $V_{GE} = \pm 15\text{V}$		33		ns
t_r			56		ns
$t_{d(off)}$			270		ns
t_f			84		ns
$E_{on}(E_{off})$			4.5(2.6)		mJ
Inverse Diode under following conditions:					
$V_F = V_{EC}$	$I_F = 300\text{A}$; $V_{GE} = 0\text{V}$; $T_j = 25^{\circ}\text{C}$		2.90	3.52	V
$V_{(FO)}$	$T_j = 25(150)^{\circ}\text{C}$		1.1(0.8)	1.4(1.0)	V
r_F	$T_j = 25(150)^{\circ}\text{C}$		4.5(4.9)	5.3(5.6)	$\text{m}\Omega$
I_{RRM}	$I_F = 300\text{A}$; $T_j = 150^{\circ}\text{C}$		300		A
Q_{rr}	$di/dt = 8800\text{A/us}$		56		μC
E_{rr}	$V_{GE} = 15\text{V}$		26		mJ
Thermal Characteristics					
$R_{th(j-c)}$	per IGBT			0.089	K/W
$R_{th(j-c)D}$	per Inverse Diode			0.180	K/W
$R_{th(c-s)}$	per module			0.039	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

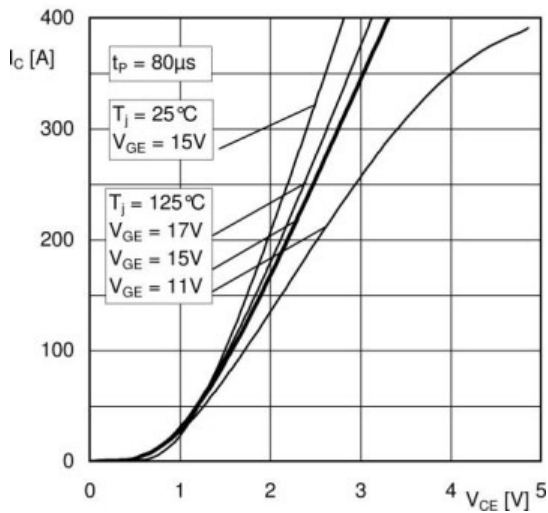


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

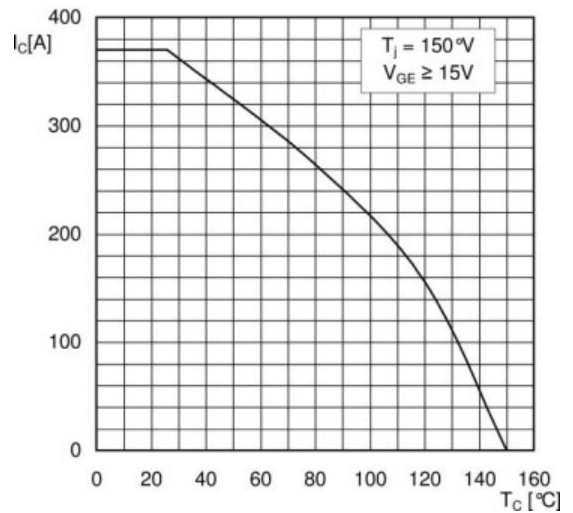


Fig. 2 Rated current vs. temperature $I_C = f(T_c)$

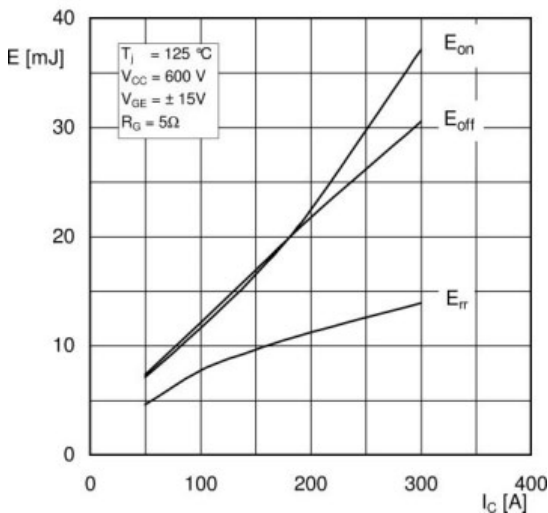


Fig. 3 Typ. turn-on /-off energy = $f(I_C)$

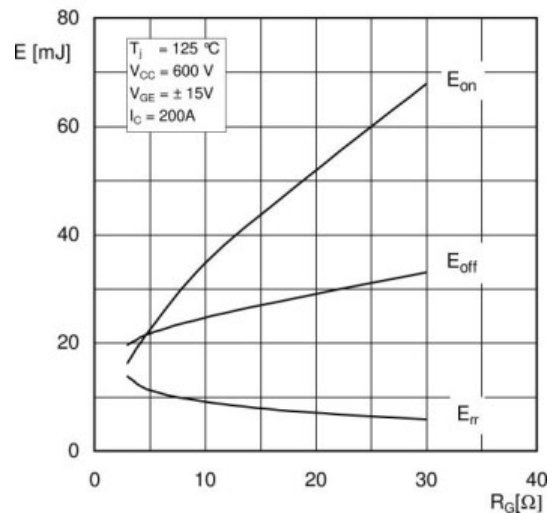


Fig. 4 Typ. turn-on /-off energy = $f(R_G)$

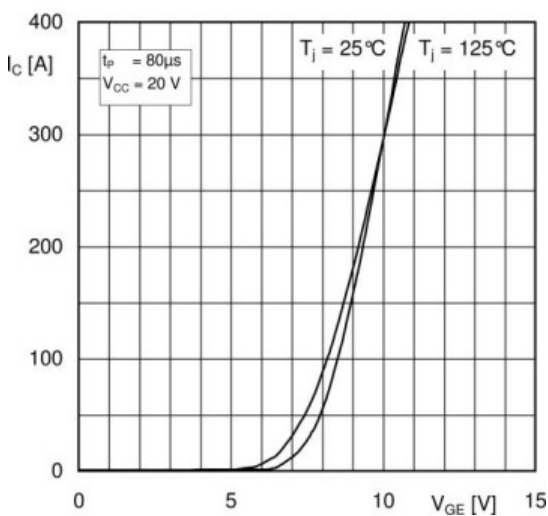


Fig. 5 Typ. transfer characteristic

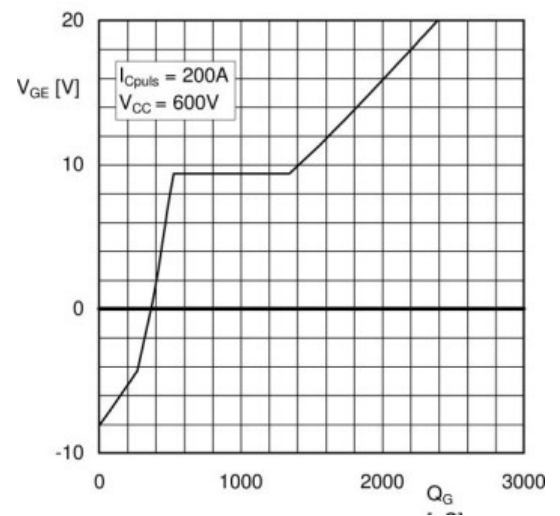


Fig. 6 Typ. gate charge characteristic

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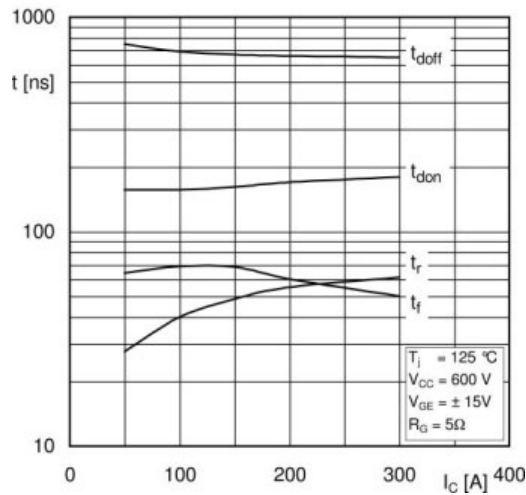


Fig. 7 Typ. switching times vs. I_C

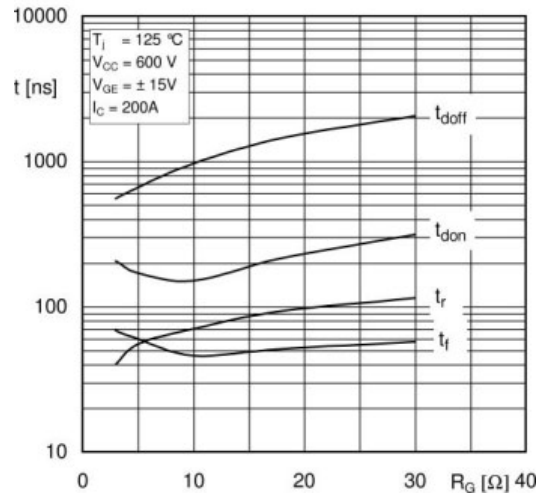


Fig. 8 Typ. switching times vs. gate resistor R_G

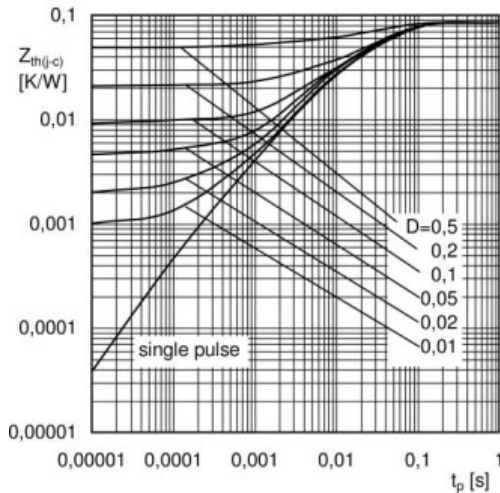


Fig. 9 Transient thermal impedance of IGBT

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

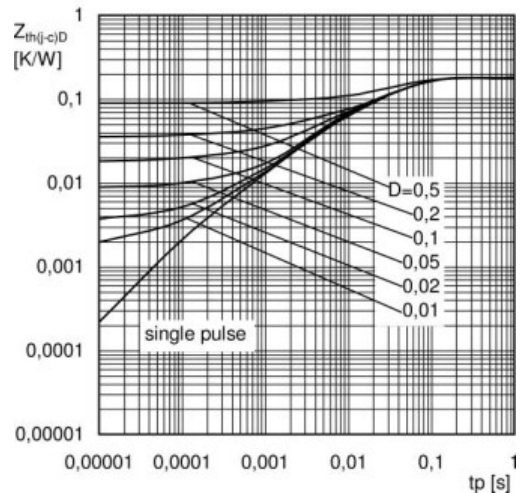


Fig. 10 Transient thermal impedance of FWD

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

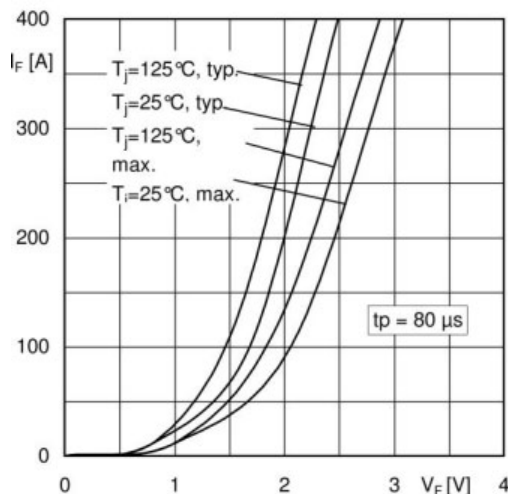


Fig. 11 FWD diode forward characteristic

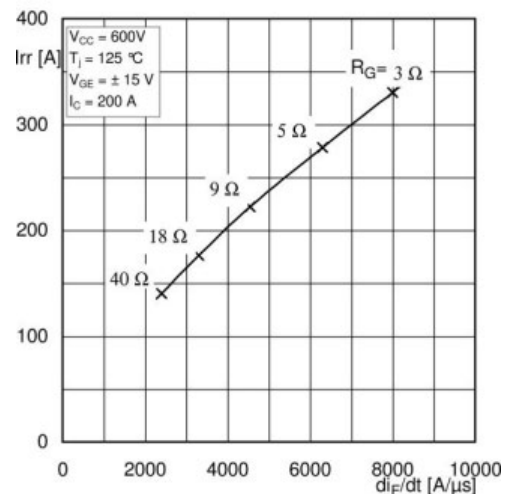


Fig. 12 Typ. FWD diode peak reverse recovery current