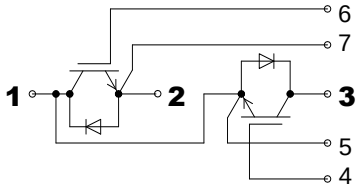
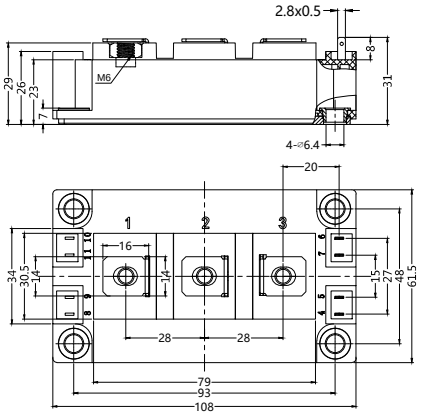
SGG300NF120UC2

IGBT Modules

SGG300NF120UC2



Dimensions in mm (1mm = 0.0394")



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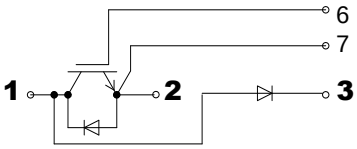

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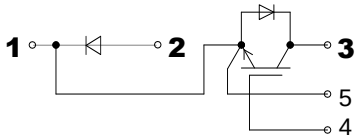

T_C = 25°C, unless otherwise specified

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			
$I_{t(RMS)}$	$T_{teminal}$ = 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 swithcing FWD Technology
- Package with copper base plate
- Isolation voltage 4000 V

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°C, unless otherwise specified

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 8 mA	4.5	5.0	5.7	V
I_{CES}	V_{GE} = 0; V_{CE} = V_{CES}; T_j = 25°C			0.3	mA
$V_{CE(TO)}$	T_j = 25°C		1.00	1.15	V
r_{CE}	V_{GE} = 15V, T_j = 25(125)°C		4.5(6.0)	6.0(7.5)	mΩ
$V_{CE(sat)}$	I_C =300A; V_{GE} = 15V; chip level		2.10	2.35	V
C_{ies} C_{oes} C_{res}	under following conditions V_{GE} = 0, V_{CE} = 25V, f = 1MHz		16.8 2.70 2.00		nF
L_{CE}				20	nH
$R_{CC'+EE'}$	res., terminal-chip T_C = 25(125)°C		0.35(0.52)		mΩ
$t_{d(on)}$ t_r $t_{d(off)}$ t_f	under following conditions: V_{CC} = 600V, I_C = 300A R_{Gon} = R_{Goff} = 10Ω, T_j = 125°C V_{GE} = ± 15V		33 56 270 84		ns ns ns ns
E_{on}(E_{off})			4.5(2.6)		mJ
Inverse Diode under following conditions:					
V_F = V_{EC}	I_F =300A; V_{GE} = 0V; T_j = 25°C		2.90	3.52	V
$V_{(FO)}$	T_j = 25(150)°C		1.1(0.8)	1.4(1.0)	V
r_F	T_j = 25(150)°C		4.5(4.9)	5.3(5.6)	mΩ
I_{RRM} Q_{rr} E_{rr}	I_F = 300A; T_j = 150°C di/dt = 8800A/us V_{GE} = 15V		300 56 26		A uC 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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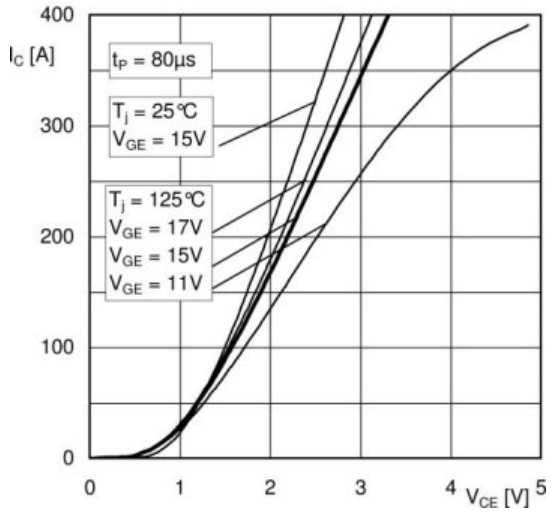

Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

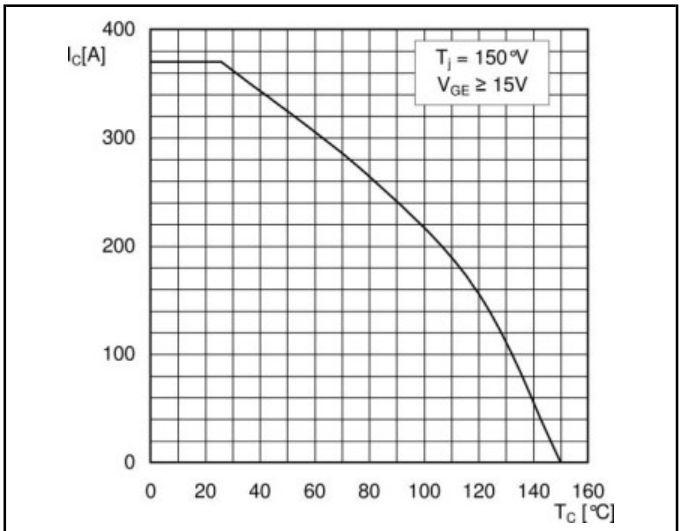

Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

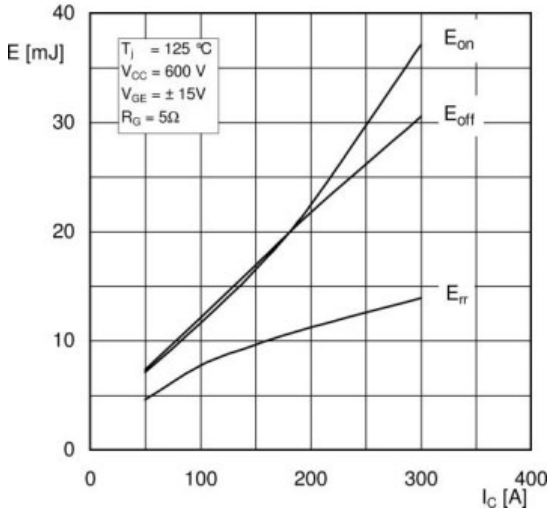

Fig. 3 Typ. turn-on /-off energy = f (I_C)

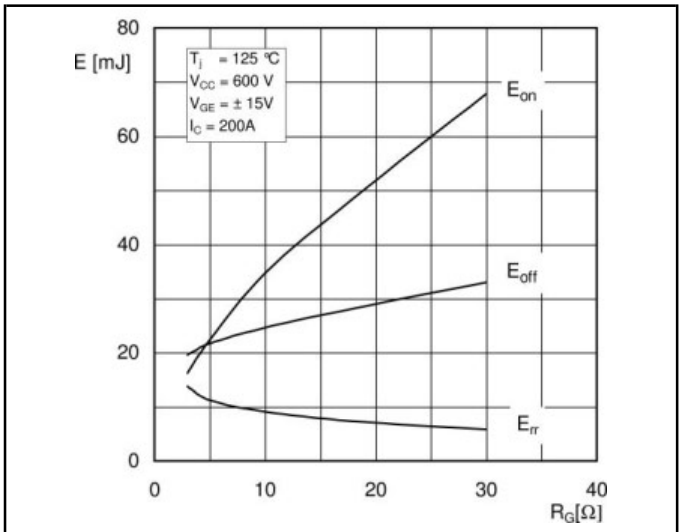

Fig. 4 Typ. turn-on /-off energy = f (R_G)

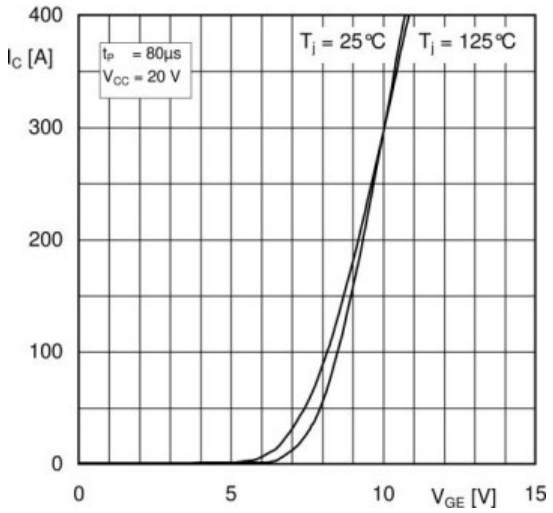

Fig. 5 Typ. transfer characteristic

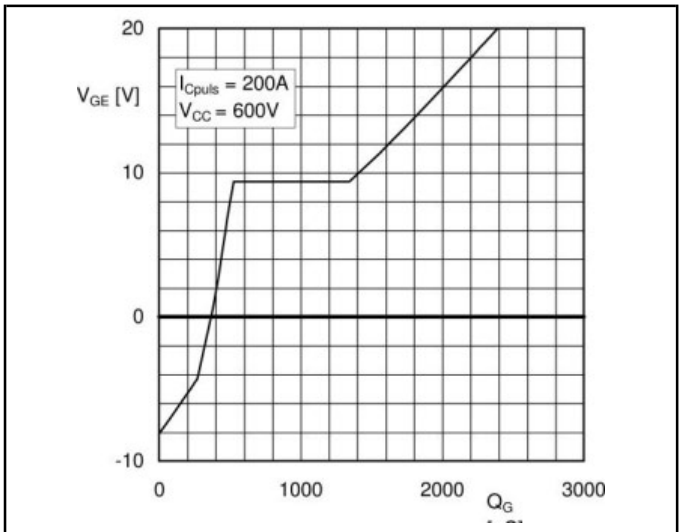

Fig. 6 Typ. gate charge characteristic

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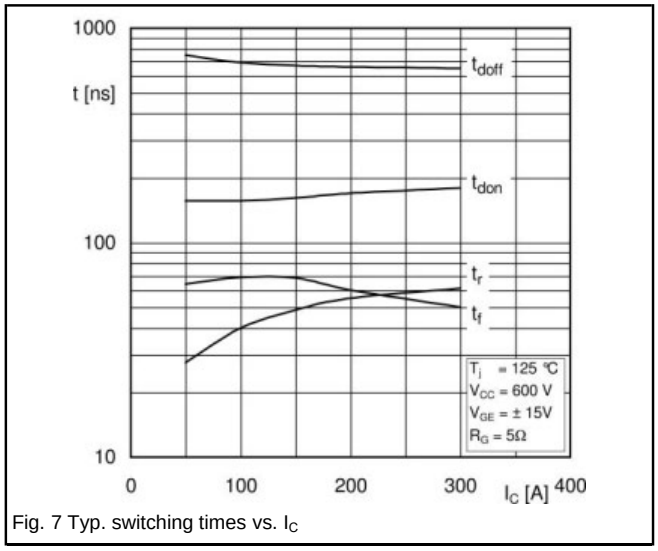

Fig. 7 Typ. switching times vs. I_C

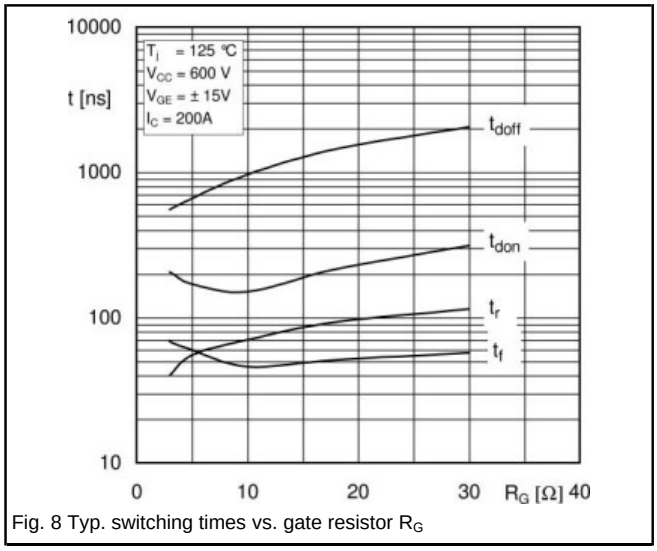

Fig. 8 Typ. switching times vs. gate resistor R_G

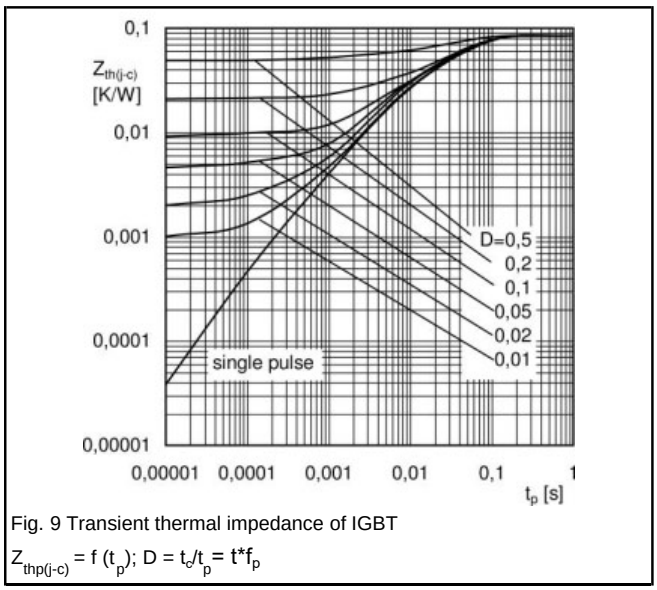

Fig. 9 Transient thermal impedance of IGBT

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

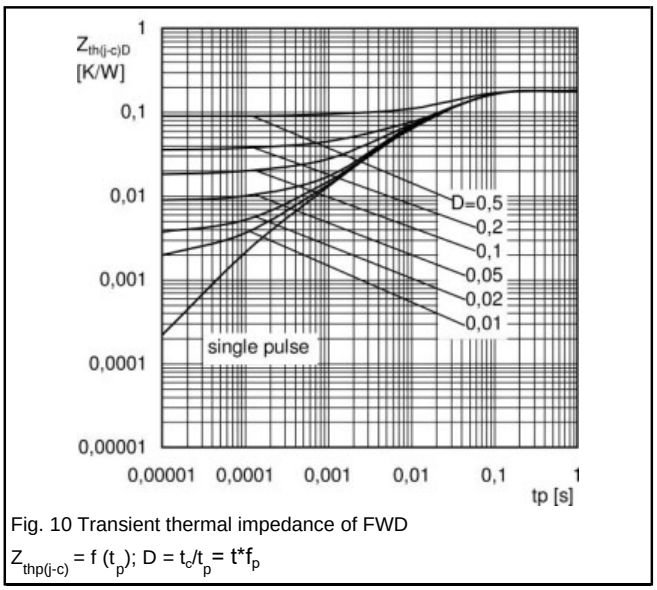

Fig. 10 Transient thermal impedance of FWD

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

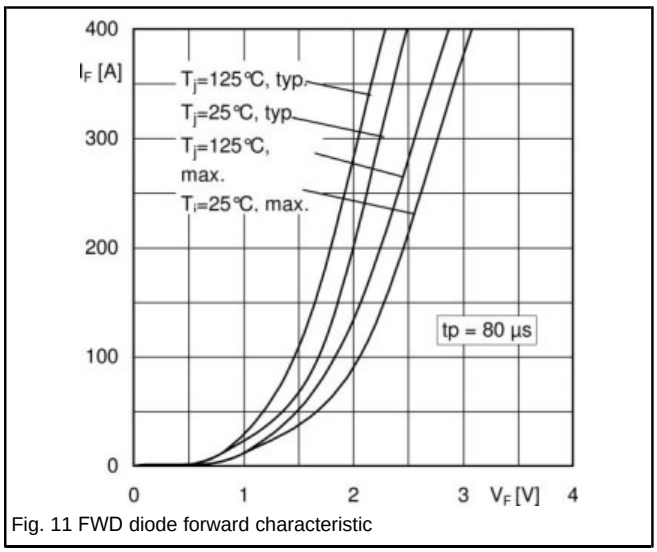

Fig. 11 FWD diode forward characteristic

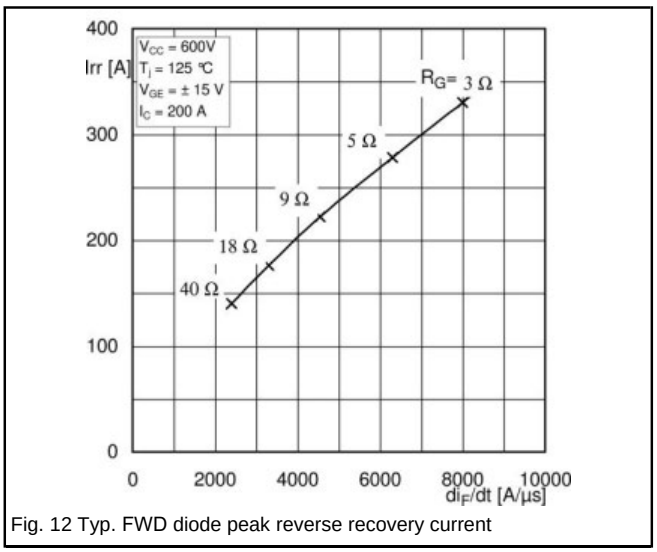

Fig. 12 Typ. FWD diode peak reverse recovery current

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