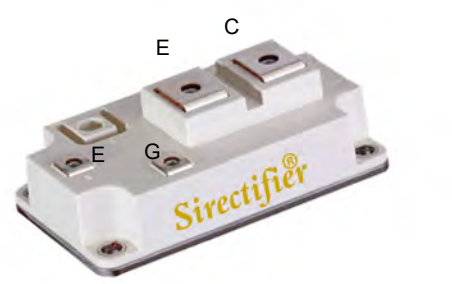
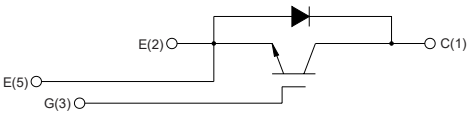
SGO400NF120UC3

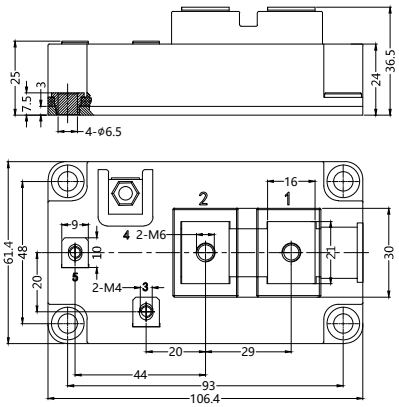
IGBT Modules



SGO400NF120UC3



Dimensions in mm (1mm = 0.0394")



T_C = 25°C, unless otherwise specified

Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_{Cnom}		400	A
I_{CRM}	T_C= 25°C, t_P =1ms	1200	A
V_{GES}		±20	V
T_{Vj}		-40...+175	°C
Inverse Diode			
I_F	T_C= 25(80)°C	440(330)	A
I_{FRM}	T_C= 25°C, t_P =1ms	1200	A
I_{FSM}	t_P =10ms; sin.;T_j=150°C	1980	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 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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SGO400NF120UC3

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 =15.2mA	4.5	5.0	5.7	V
I_{CES}	V_{GE} = 0; $V_{CE} = V_{CES}$; $T_j = 25^oC$			0.5	mA
$V_{CE(TO)}$	$T_j = 25^oC$		1.4	1.6	V
r_{CE}	V_{GE} = 15V, $T_j = 25(150)^oC$		2.75(3.75)	3.51(4.75)	mΩ
$V_{CE(sat)}$	I_C =400A; V_{GE} = 15V; chip level		2.30	2.55	V
C_{ies} C_{oes} C_{res}	under following conditions V_{GE} = 0, V_{CE} = 25V, f = 1MHz		28.8 4.40 2.52		nF
L_{CE}				30	nH
$R_{CC'+EE'}$	res., terminal-chip $T_C = 25(125)^oC$		0.35(0.55)		mΩ
$t_{d(on)}$ t_r $t_{d(off)}$ t_f	under following conditions: V_{CC} = 600V, I_C = 400A $R_{Gon} = R_{Goff}$ = 10Ω, $T_j = 125^oC$ V_{GE} = ± 15V		25 49 290 88		ns ns ns ns
$E_{on}(E_{off})$	$T_C = 25^oC$		70(25)		mJ
Inverse Diode under following conditions:					
$V_F = V_{EC}$	I_F =400A; V_{GE} = 0V; $T_j = 25^oC$		2.20	2.52	V
$V_{(FO)}$	$T_j = 25(150)^oC$		1.3(0.9)	1.5(1.1)	V
r_F	$T_j = 25(150)^oC$		2.3(3.1)	2.5(3.4)	mΩ
I_{RRM} Q_{rr} E_{rr}	I_F = 400A; $T_j = 150^oC$ di/dt = 8800A/us V_{GE} = 15V		450 68 30		A uC mJ
Thermal Characteristics					
$R_{th(j-c)}$	per IGBT			0.072	K/W
$R_{th(j-c)D}$	per Inverse Diode			0.140	K/W
$R_{th(c-s)}$	per module			0.038	K/W
Mechanical Data					
M_s	to heatsink M6	3		5	Nm
M_t	to terminals M6	2.5		5	Nm
Weight	typical			340	g

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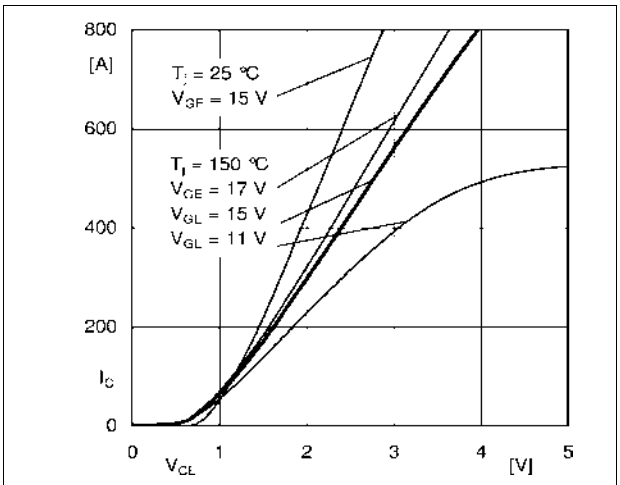

Fig. 1: Typ. output characteristic, inclusive $R_{CC'+EE'}$

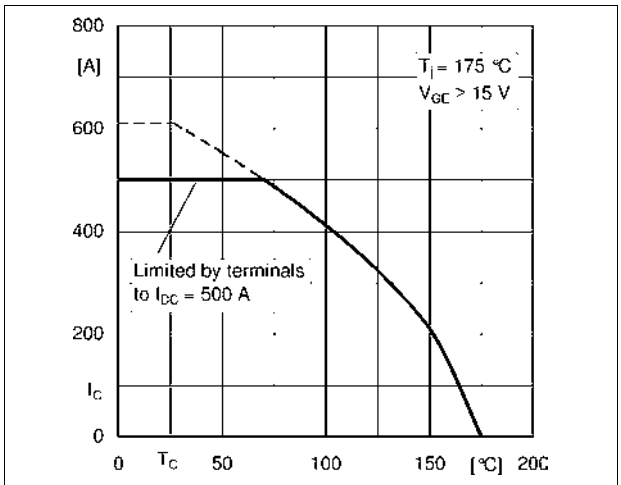

Fig. 2: Rated current vs. temperature $I_C = f(T_C)$

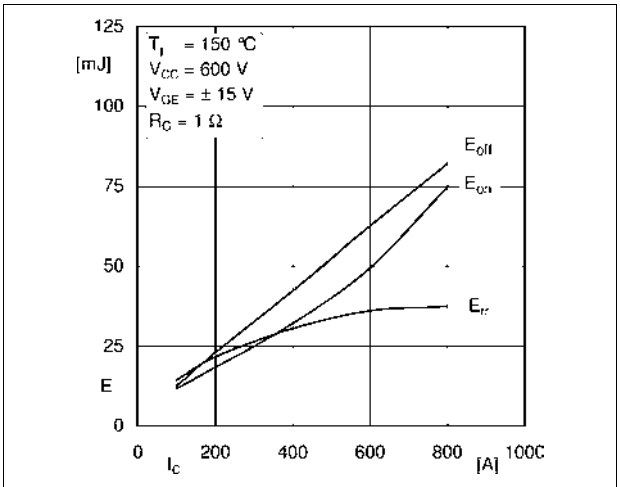

Fig. 3: Typ. turn-on /-off energy = f (I_C)

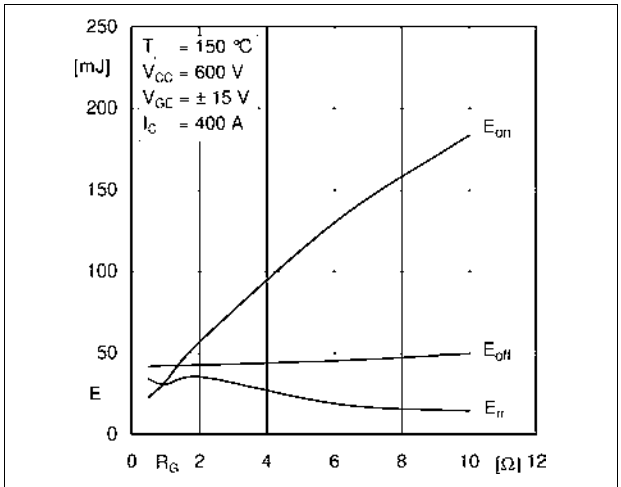

Fig. 4: Typ. turn-on /-off energy = f (R_G)

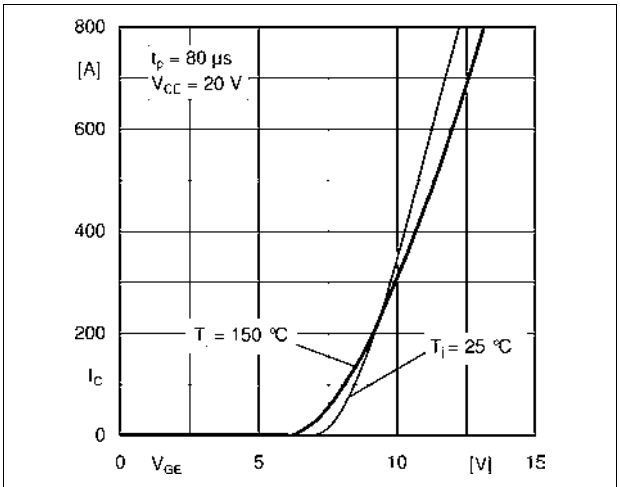

Fig. 5: Typ. transfer characteristic

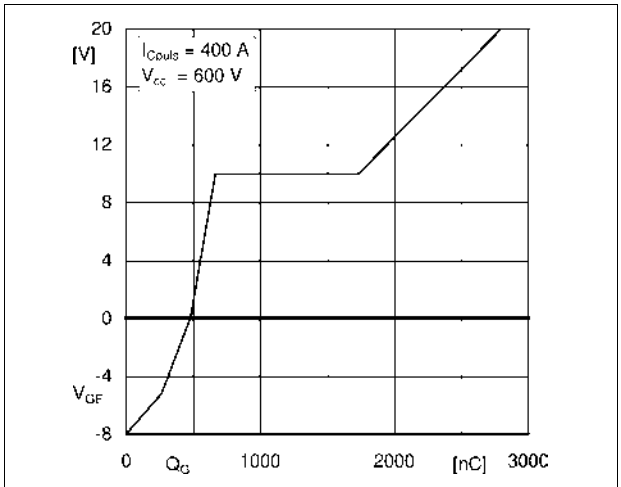

Fig. 6: Typ. gate charge characteristic

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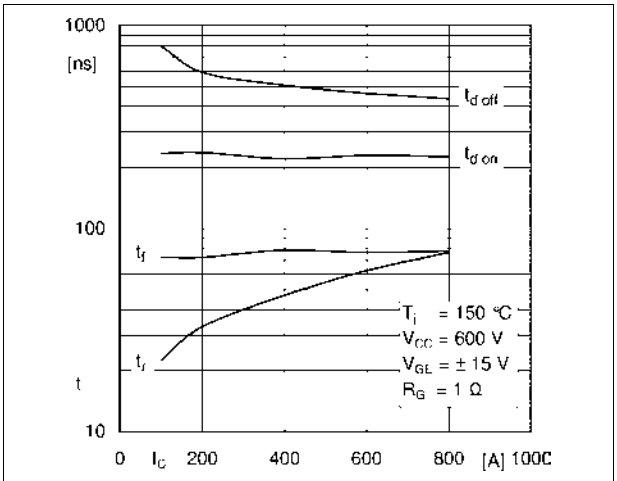

Fig. 7: Typ. switching times vs. I_C

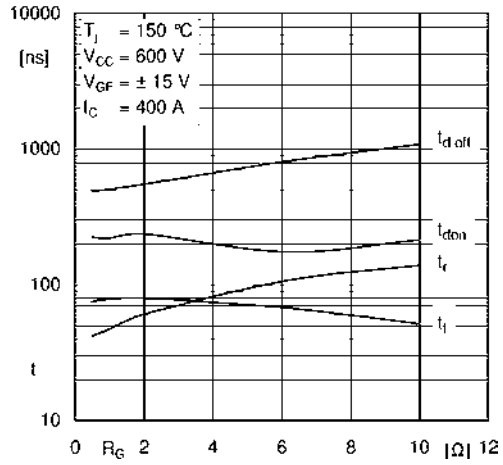

Fig. 8: Typ. switching times vs. gate resistor R_G

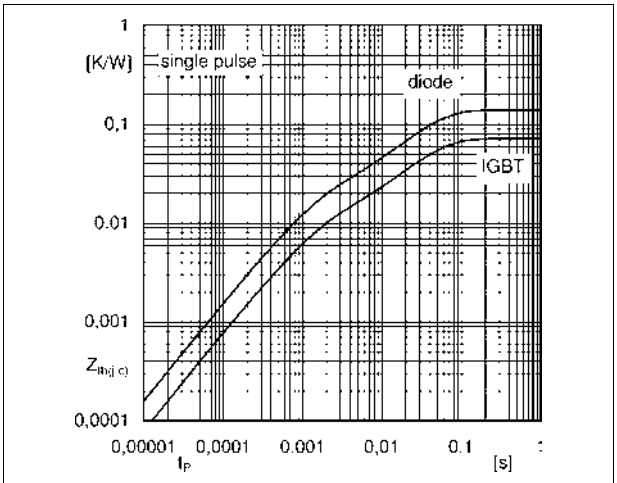

Fig. 9: Transient thermal impedance

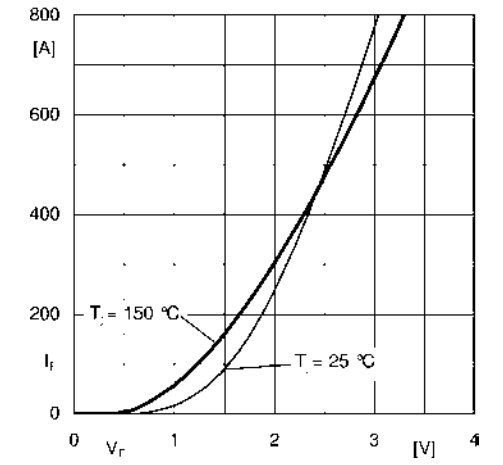

Fig. 10: Typ. FRD diode forward charact., incl. $R_{CC'+\,EE'}$

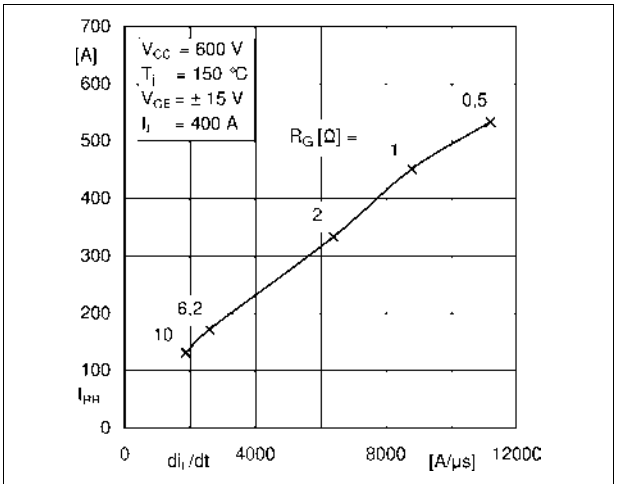

Fig. 11: FRD diode peak reverse recovery current

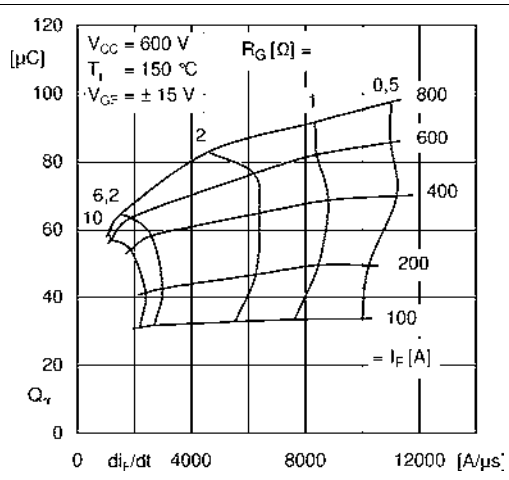

Fig. 12: Typ. FRD diode peak reverse recovery charge

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