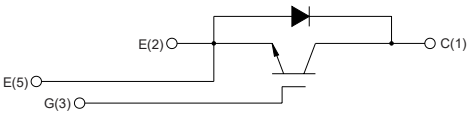
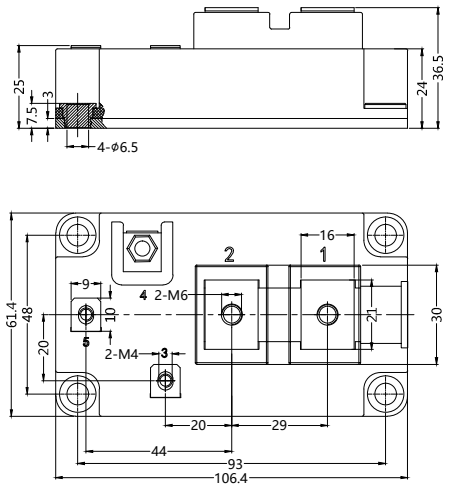
SGO400T120UC3

IGBT Modules

SGO400T120UC3



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	800	A
V_{GES}		±20	V
T_{Vj}		-40...+175	°C
Inverse Diode			
I_F	T_C=25(80)°C	600(400)	A
I_{FRM}	T_C=25°C,t_P =1ms	800	A
I_{FSM}	t_P=10ms; sin180°;T_j=45°C	2500	A
Module			
$I_{t(RMS)}$	$T_{teminal}$=80°C	500	A
T_{stg}		-40~125	°C
V_{Isol}	AC,1min	4000	V

Features

- Trench Field Stop IGBT4 technology
- Low switching losses
- Switching frequency up to 20kHz
- Square RBSOA, no latch up
- High short circuit capability
- Positive temperature coefficient for easy parallelling
- MOS input, voltage controlled
- Soft swithcing 4.0 generation free wheeling diode 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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Characteristics T_C = 25°C, unless otherwise specified

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	V_{GE}=V_{CE},I_C=15mA	5.0	5.8	6.5	V
I_{CES}	V_{GE}=0;V_{CE}=V_{CES};T_j=125°C			5	mA
$V_{CE(TO)}$	T_j=25°C		0.8	0.9	V
r_{CE}	V_{GE}=15V,T_j=25(150°C)		2.5(3.7)	2.8(4.0)	mΩ
$V_{CE(sat)}$	I_C=400A; V_{GE}=15V;chip level		1.95	2.35	V
C_{ies}	under following conditions		24.3		nF
C_{oes}	V_{GE}=0,V_{CE}=25V,f=1MHz		1.61		
C_{res}			1.38		
L_{CE}				20	nH
$R_{CC'+EE'}$	res.,terminal-chip T_C=25(125)°C		0.25(0.5)		mΩ
$t_{d(on)}$	under following conditions:		235		ns
t_r	V_{CC}=600V, I_C=400A		50		ns
$t_{d(off)}$	R_{Gon}=R_{Goff}=1Ω,T_j=150°C		495		ns
t_f	V_{GE}=±15V		88		ns
E_{on}(E_{off})			27(45)		mJ
Inverse Diode	nder following conditions:				
V_F = V_{EC}	I_F=400A;V_{GE}=0V;T_j=25(150)°C		2.20(2.15)	2.52(2.47)	V
$V_{(FO)}$	T_j=25(150)°C		1.30(0.90)	1.50(1.10)	V
r_F	T_j=25(150)°C		2.3(3.3)	2.5(3.4)	mΩ
I_{RRM}	I_F=400A;T_j=150°C		440		A
Q_{rr}	di/dt =7200A/us		77		uC
E_{rr}	V_{GE}=15V		36		mJ
Thermal Characteristics					
$R_{th(j-c)}$	per IGBT			0.072	K/W
$R_{th(j-c)D}$	per Inverse Diode			0.14	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
	to terminals M4	1.1		2	
Weight	typical			328	g

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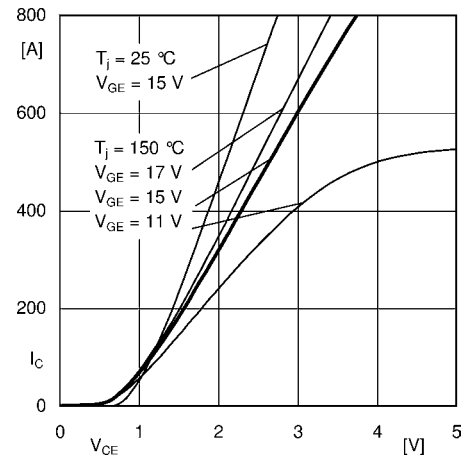

Fig. 1: Typ. output characteristic, inclusive $R_{CC'+\ EE'}$

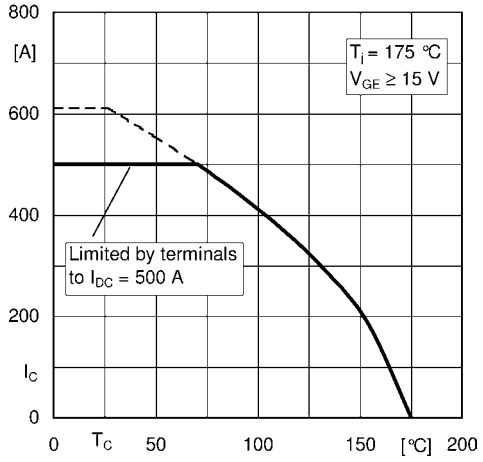

Fig. 2: Rated current vs. temperature $I_C = f(T_C)$

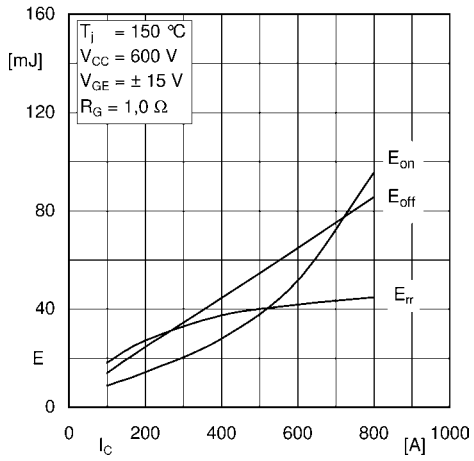

Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

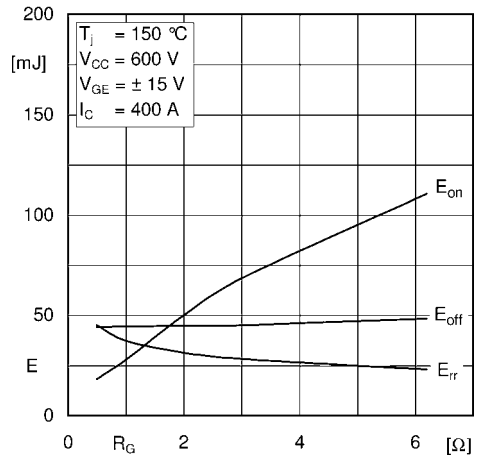

Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

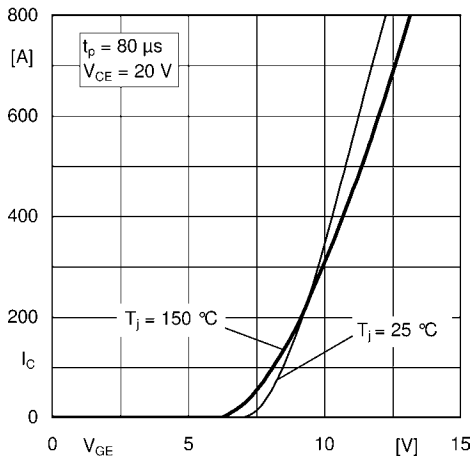

Fig. 5: Typ. transfer characteristic

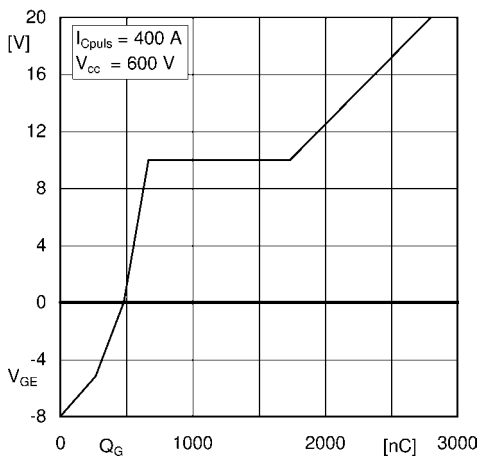

Fig. 6: Typ. gate charge characteristic

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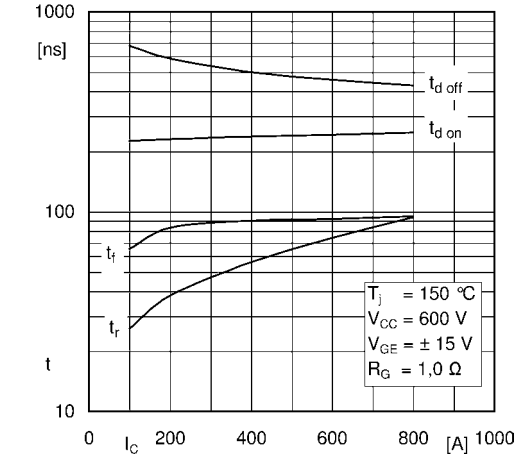

Fig. 7: Typ. switching times vs. I_C

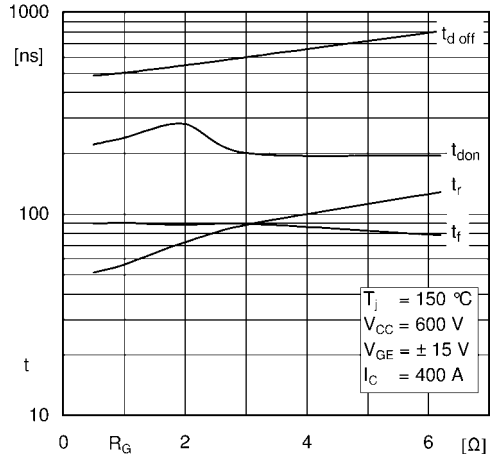

Fig. 8: Typ. switching times vs. gate resistor R_G

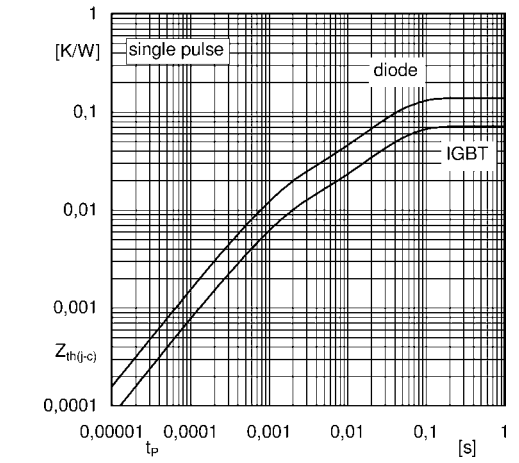

Fig. 9: Transient thermal impedance

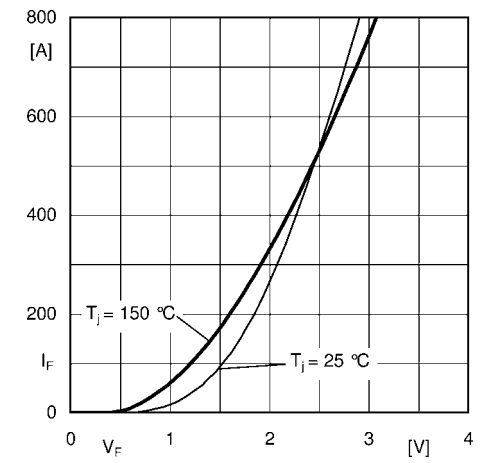

Fig. 10: Typ. FWD diode forward charact., incl. $R_{CC'+EE'}$

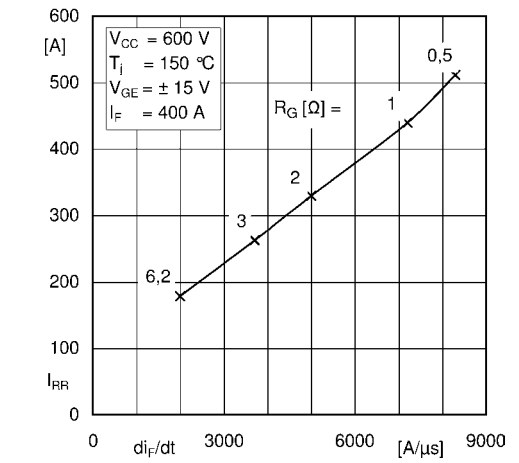

Fig. 11: FWD diode peak reverse recovery current

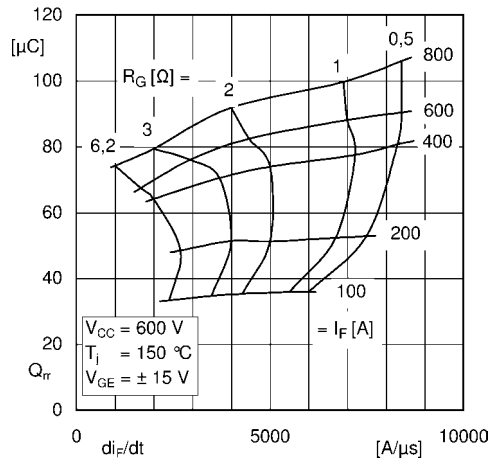

Fig. 12: Typ. FWD diode peak reverse recovery charge

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