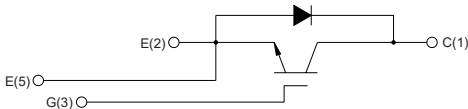


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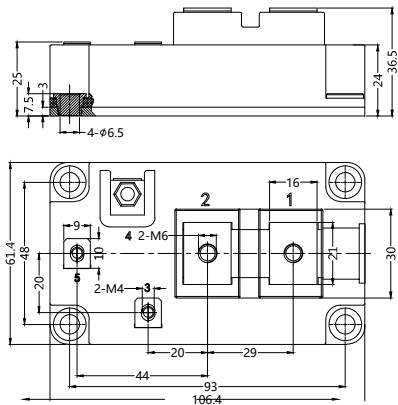
IGBT Modules



SGO800T120UC3



Dimensions in mm (1mm = 0.0394")



T_c = 25°C, unless otherwise specified

Symbol	Conditions	Values	Units
IGBT			
V _{CES}		1200	V
I _{Cnom}		800	A
I _{CRM}	T _C = 25°C, t _P =1ms	1600	A
V _{GES}		±20	V
T _{Vj}		-40...+175	°C
Inverse Diode			
I _F	T _C = 25(80)°C	920(800)	A
I _{FRM}	T _C = 25°C, t _P =1ms	1600	A
I _{FSM}	t _P =10ms; sin.; T _j =150°C	9360	A
Module			
I _{t(RMS)}	T _{terminal} = 80°C	800	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 paralleling
- MOS input, voltage controlled
- Soft switching 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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IGBT Modules

Characteristics

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

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 8\text{mA}$	5.0	5.8	6.5	V
I_{CES}	$V_{GE} = 0; V_{CE} = V_{CES}; T_j = 25(125)^{\circ}\text{C}$			5.0	mA
$V_{CE(TO)}$	$T_j = 25^{\circ}\text{C}$		0.8	0.9	V
r_{CE}	$V_{GE} = 15\text{V}, T_j = 25(150)^{\circ}\text{C}$		1.0(0.9)	1.2(1.1)	m Ω
$V_{CE(sat)}$	$I_C = 800\text{A}; V_{GE} = 15\text{V}$		1.90	2.15	V
C_{ies}	under following conditions $V_{GE} = 0, V_{CE} = 25\text{V}, f = 1\text{MHz}$		43		nF
C_{oes}			2.25		
C_{res}			1.95		
L_{CE}			20		nH
$R_{CC'+EE'}$	res., terminal-chip $T_C = 25(125)^{\circ}\text{C}$		0.18(0.22)		m Ω
$t_{d(on)}$	under following conditions: $V_{CC} = 600\text{V}, I_C = 800\text{A}$ $R_{Gon} = R_{Goff} = 3\Omega, T_j = 150^{\circ}\text{C}$ $V_{GE} = \pm 15\text{V}$		220		ns
t_r			100		ns
$t_{d(off)}$			860		ns
t_f			135		ns
$E_{on}(E_{off})$			65(95)		mJ
Inverse Diode under following conditions:					
$V_F = V_{EC}$	$I_F = 800\text{A}; V_{GE} = 0\text{V}; T_j = 25(150)^{\circ}\text{C}$		2.20(2.15)	2.52(2.47)	V
$V_{(FO)}$	$T_j = 25(150)^{\circ}\text{C}$		1.00(0.80)	1.10(0.90)	V
r_F	$T_j = 25(150)^{\circ}\text{C}$		1.00(1.33)	1.17(1.50)	m Ω
I_{RRM}	$I_F = 800\text{A}; T_j = 125^{\circ}\text{C}$		544		A
Q_{rr}	$di/dt = 4450\text{A/us}$		123		μC
E_{rr}	$V_{GE} = 15\text{V}$		59		mJ
FWD under following conditions:					
$V_F = V_{EC}$	$I_F = 800\text{A}; V_{GE} = 0\text{V}; T_j = 25(150)^{\circ}\text{C}$		2.20(2.15)	2.52(2.47)	V
$V_{(FO)}$	$T_j = 25(150)^{\circ}\text{C}$		1.00(0.80)	1.10(0.90)	V
r_F	$T_j = 25(150)^{\circ}\text{C}$		1.00(1.33)	1.17(1.50)	m Ω
I_{RRM}	$I_F = 800\text{A}; T_j = 125^{\circ}\text{C}$		544		A
Q_{rr}	$di/dt = 4450\text{A/us}$		123		μC
E_{rr}	$V_{GE} = 15\text{V}$		59		mJ
Thermal Characteristics					
$R_{th(j-c)}$	per IGBT			0.042	K/W
$R_{th(j-c)D}$	per Inverse Diode			0.090	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			330	g

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IGBT Modules

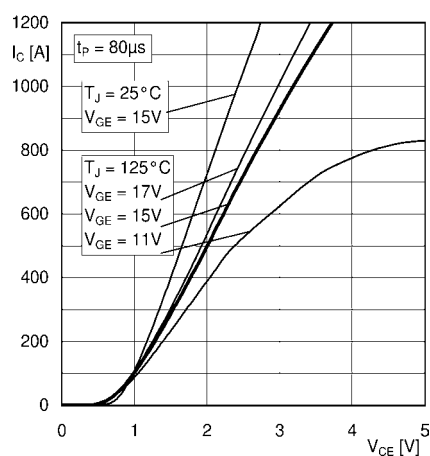


Fig. 1: Typ. output characteristic, inclusive RCC' + EE'

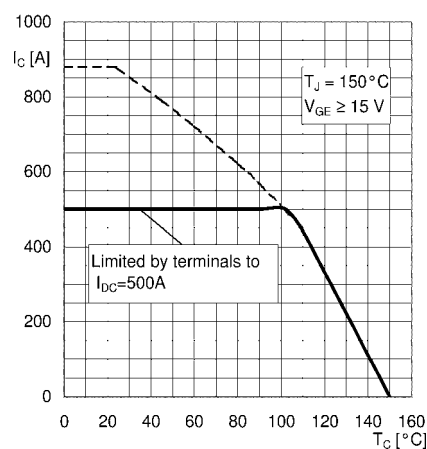


Fig. 2: Rated current vs. temperature $I_C = f(T_C)$

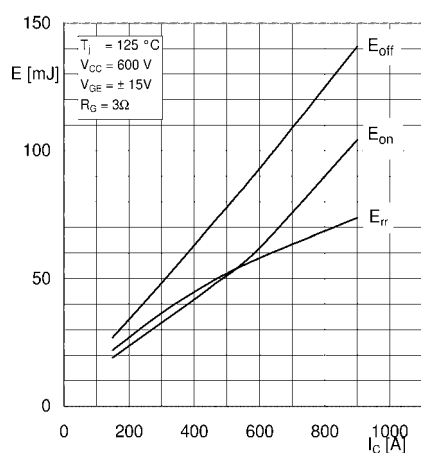


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

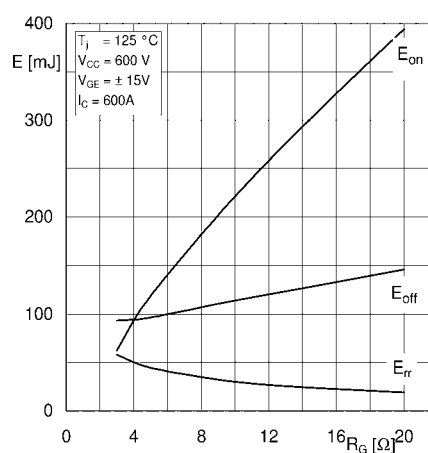


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

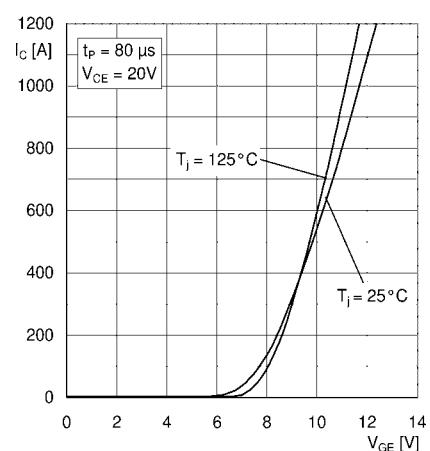


Fig. 5: Typ. transfer characteristic

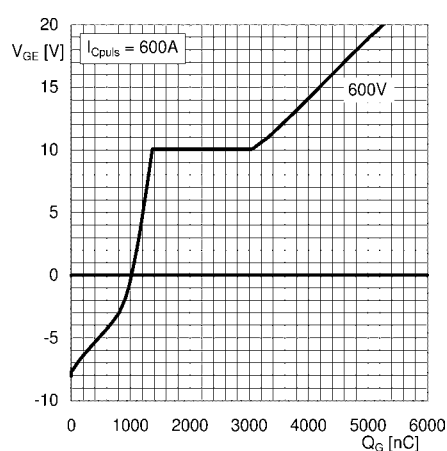


Fig. 6: Typ. gate charge characteristic

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IGBT Modules

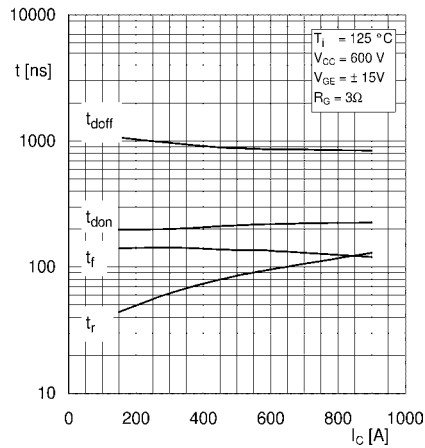


Fig. 7: Typ. switching times vs. I_C

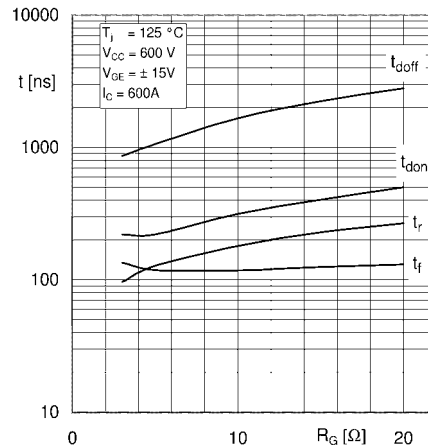


Fig. 8: Typ. switching times vs. gate resistor R_G

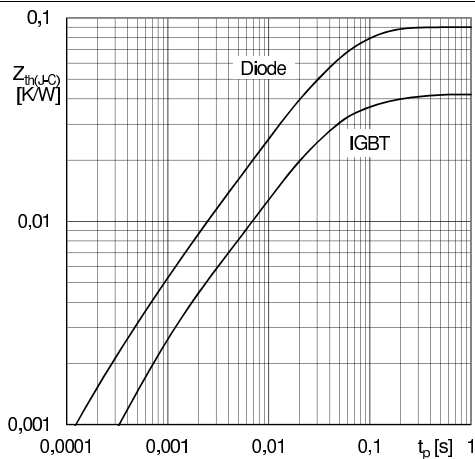


Fig. 9: Transient thermal impedance

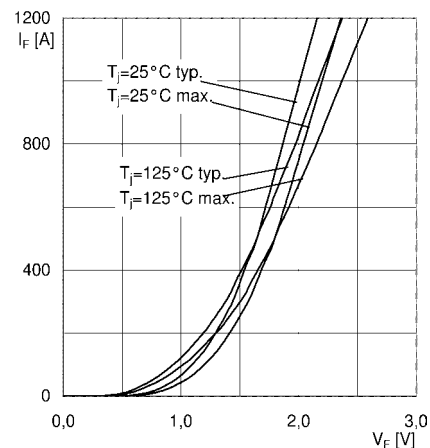


Fig. 10: Typ. CAL diode forward charact., incl. $R_{GG'} + E_E'$

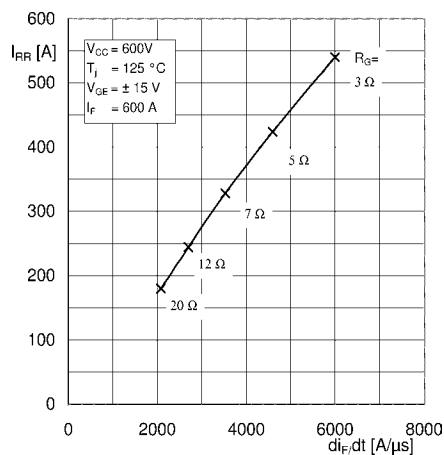


Fig. 11: Typ. CAL diode peak reverse recovery current

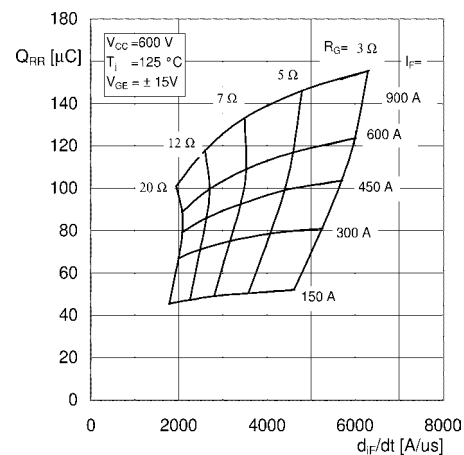


Fig. 12: Typ. CAL diode peak reverse recovery charge