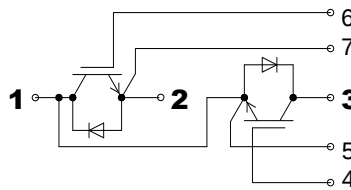


SGG450T120UC2

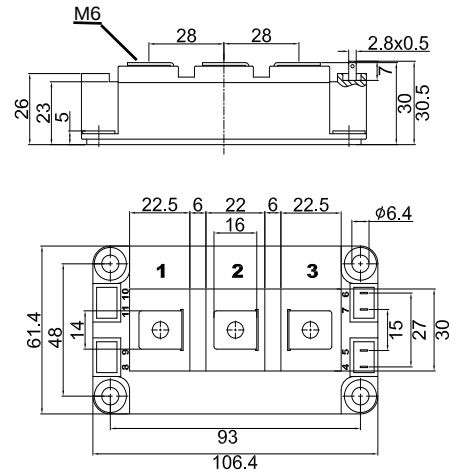
IGBT Modules



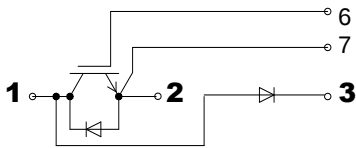
SGG450T120UC2



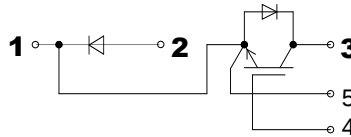
Dimensions in mm (1mm = 0.0394")



SGD450T120UC2



SDG450T120UC2



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

Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_{Cnom}		450	A
I_{CRM}	$T_C = 25^{\circ}\text{C}$, $t_P = 1\text{ms}$	1350	A
V_{GES}		± 20	V
T_{Vj}		$-40 \dots +175$	$^{\circ}\text{C}$
Inverse Diode			
I_F	$T_C = 25(80)^{\circ}\text{C}$	460(345)	A
I_{FRM}	$T_C = 25^{\circ}\text{C}$, $t_P = 1\text{ms}$	1200	A
I_{FSM}	$t_P = 10\text{ms}$; $\sin$; $T_j = 150^{\circ}\text{C}$	1980	A
Module			
$I_{t(RMS)}$	$T_{terminal} = 80^{\circ}\text{C}$	500	A
T_{stg}		$-40 \sim 125$	$^{\circ}\text{C}$
V_{isol}	AC, 1min	4000	V

Features

- Trench FS 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 diode Technology
- Package with copper baseplate
- 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



SGG450T120UC2

IGBT Modules

Characteristics

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

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 15.2\text{mA}$	5.3	5.8	6.3	V
I_{CES}	$V_{GE} = 0; V_{CE} = V_{CES}; T_j = 25^{\circ}\text{C}$			5.0	mA
$V_{CE(TO)}$	$T_j = 25^{\circ}\text{C}$		0.8	0.9	V
r_{CE}	$V_{GE} = 15\text{V}, T_j = 25(150)^{\circ}\text{C}$		2.30(3.45)	2.60(3.60)	$\text{m}\Omega$
$V_{CE(sat)}$	$I_C = 450\text{A}; V_{GE} = 15\text{V}; \text{chip level}$		1.84	2.10	V
C_{ies}	under following conditions $V_{GE} = 0, V_{CE} = 25\text{V}, f = 1\text{MHz}$		27.6		nF
C_{oes}			1.72		
C_{res}			1.48		
L_{CE}			15		nH
$R_{CC'+EE'}$	res., terminal-chip $T_C = 25(125)^{\circ}\text{C}$		0.55(0.85)		$\text{m}\Omega$
$t_{d(on)}$	under following conditions: $V_{CC} = 600\text{V}, I_C = 450\text{A}$ $R_{Gon} = R_{Goff} = 1\Omega, T_j = 150^{\circ}\text{C}$ $V_{GE} = \pm 15\text{V}$		224		ns
t_r			59		ns
$t_{d(off)}$			465		ns
t_f			91		ns
$E_{on}(E_{off})$			33(49)		mJ
Inverse Diode under following conditions:					
$V_F = V_{EC}$	$I_F = 450\text{A}; V_{GE} = 0\text{V}; T_j = 25^{\circ}\text{C}$		2.30	2.62	V
$V_{(FO)}$	$T_j = 25(150)^{\circ}\text{C}$		1.3(0.9)	1.5(1.1)	V
r_F	$T_j = 25(150)^{\circ}\text{C}$		2.3(3.1)	2.5(3.4)	$\text{m}\Omega$
I_{RRM}	$I_F = 450\text{A}; T_j = 150^{\circ}\text{C}$		440		A
Q_{rr}	$di/dt = 8800\text{A/us}$		65		μC
E_{rr}	$V_{GE} = 15\text{V}$		28		mJ
Thermal Characteristics					
$R_{th(j-c)}$	per IGBT			0.062	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
Weight	typical			325	g

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IGBT Modules

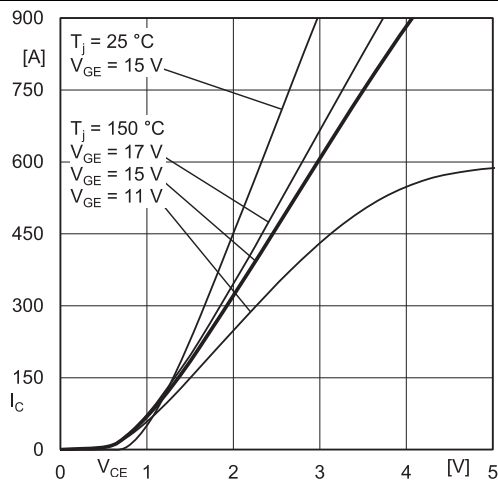


Fig. 1: Typ. output characteristic, inclusive $R_{CC'+EE'}$

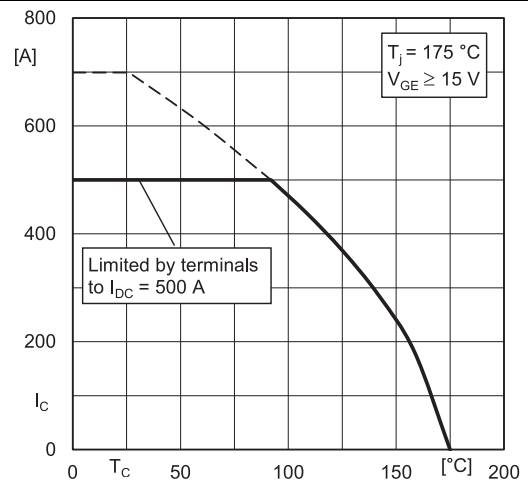


Fig. 2: Rated current vs. temperature $I_C = f(T_C)$

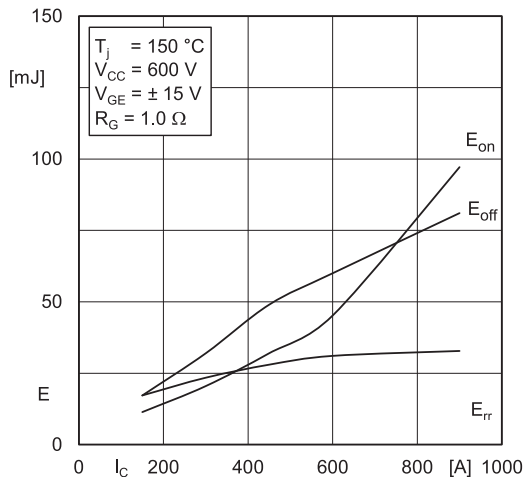


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

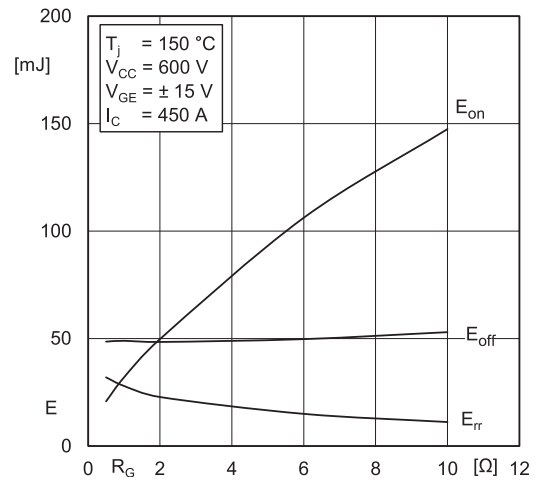


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

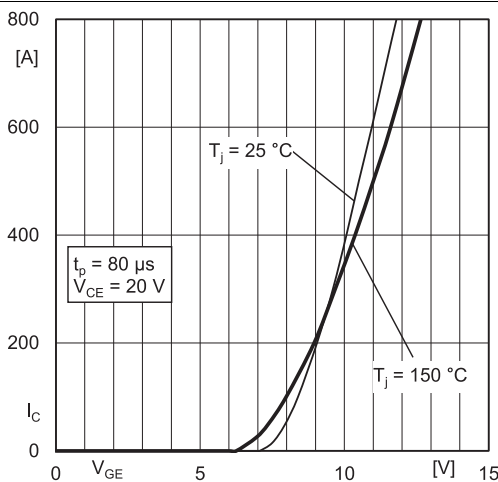


Fig. 5: Typ. transfer characteristic

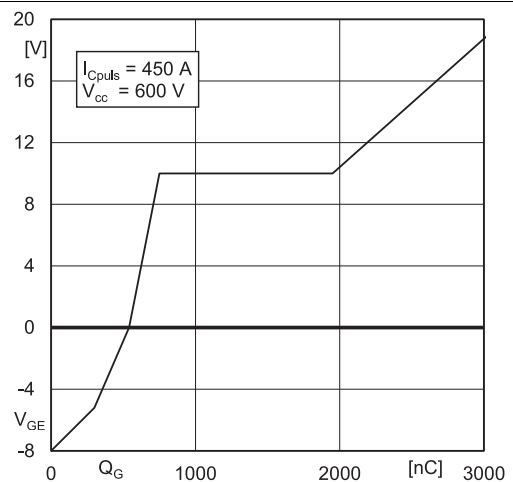


Fig. 6: Typ. gate charge characteristic

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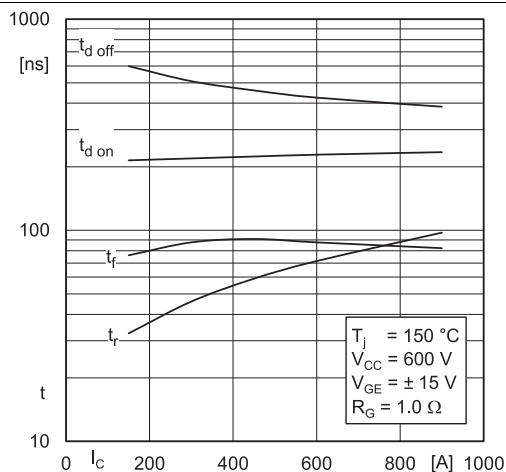


Fig. 7: Typ. switching times vs. I_C

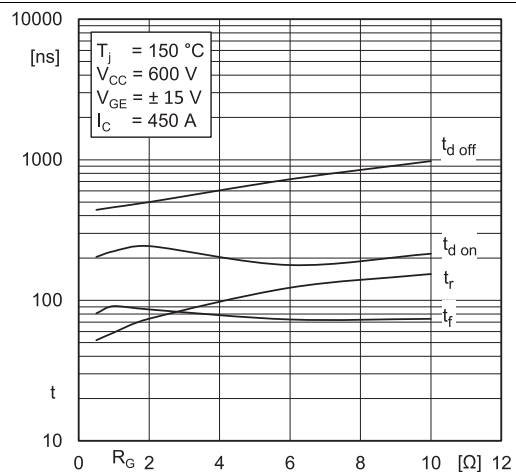


Fig. 8: Typ. switching times vs. gate resistor R_G

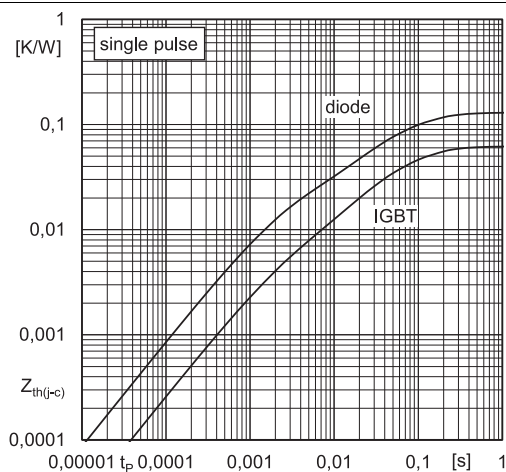


Fig. 9: Transient thermal impedance

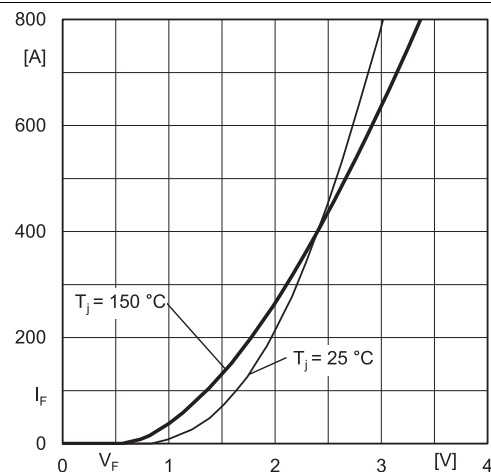


Fig. 10: Typ. FRD diode forward charact., incl. $R_{CC}+EE'$

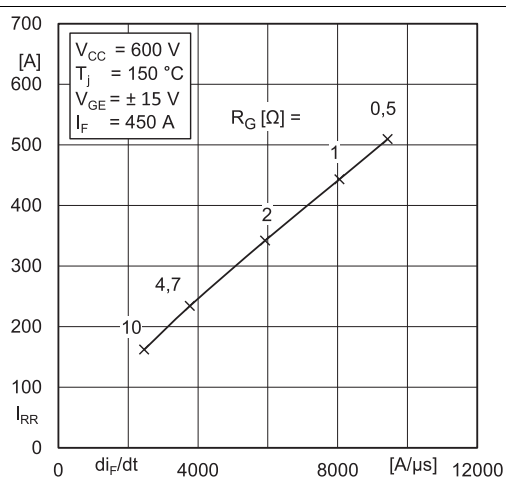


Fig. 11: FRD diode peak reverse recovery current

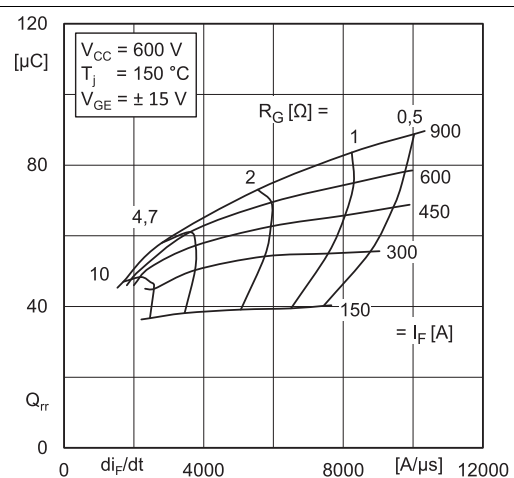


Fig. 12: Typ. FRD diode peak reverse recovery charge