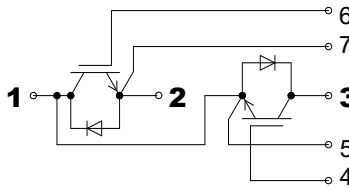


SGG450T120UC2

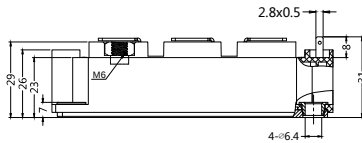
IGBT Modules



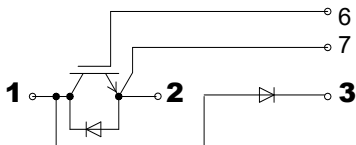
SGG450T120UC2



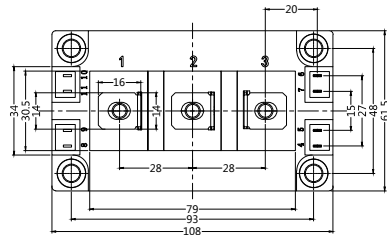
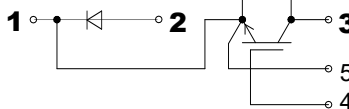
Dimensions in mm (1mm = 0.0394")



SGD450T120UC2



SDG450T120UC2



T_C=25°C, unless otherwise specified

Symbol	Conditions	Values	Units
IGBT			
V _{CES}		1200	V
I _{Cnom}	T _C = 25(80)°C	580(450)	A
I _{CRM}	T _C = 25°C, t _p = 1ms	1350	A
V _{GES}		+20	V
T _{Vj}		-40...+175	°C
Inverse Diode			
I _F	T _C =25(80)°C	460(345)	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 _{terminal} = 80°C	500	A
T _{stg}		-40~125	°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 parallelling
- 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

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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)	m Ω
$V_{CE(sat)}$	$I_C=450\text{A}$; $V_{GE}=15\text{V}$; chip level		1.84	2.50	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)		m Ω
$t_{d(on)}$	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:					
$V_F = V_{EC}$	$I_F=450\text{A}$; $V_{GE}=0\text{V}$; $T_J=25^{\circ}\text{C}$		2.10	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)	m Ω
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

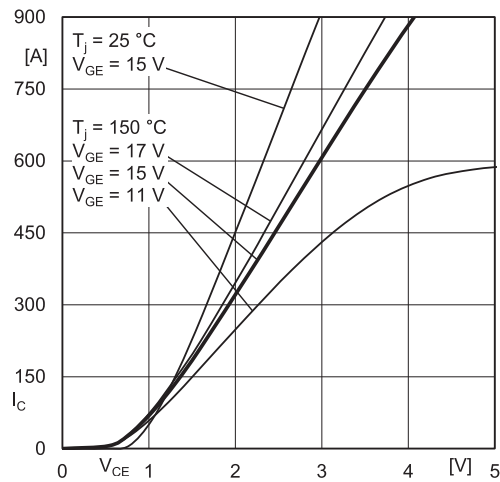


Fig. 1: Typ. output characteristic, inclusive $R_{CC} + E_{CE}$

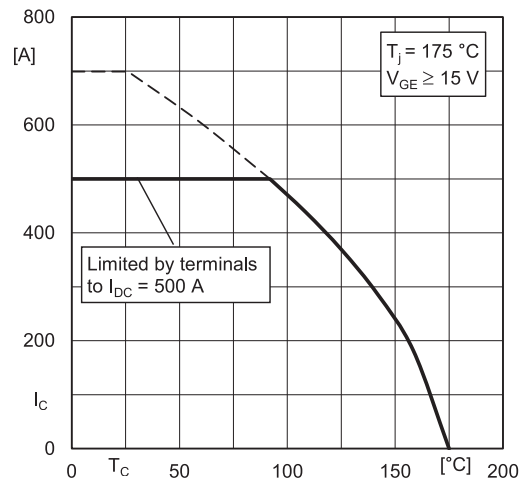


Fig. 2: Rated current vs. temperature $I_C = f(T_C)$

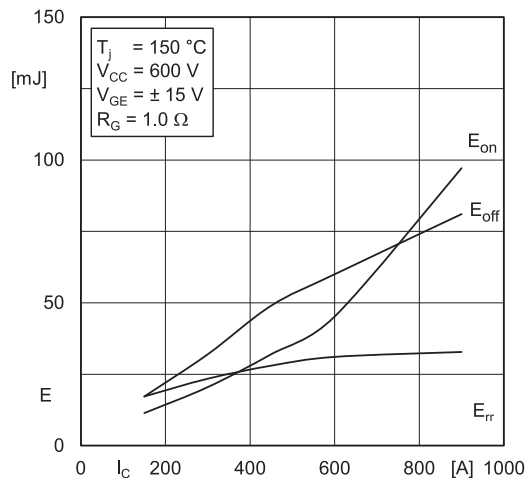


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

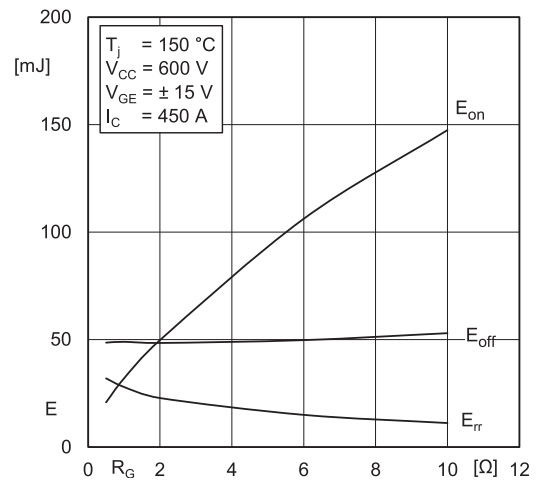


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

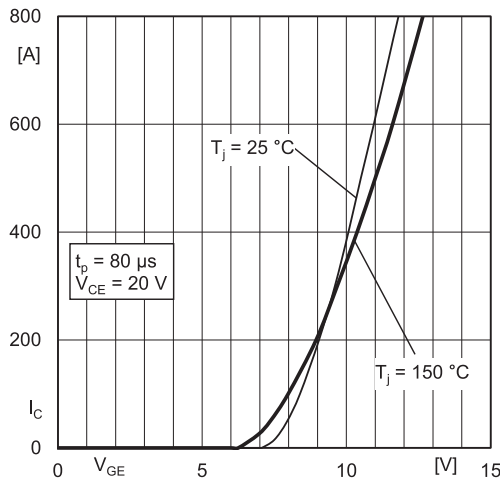


Fig. 5: Typ. transfer characteristic

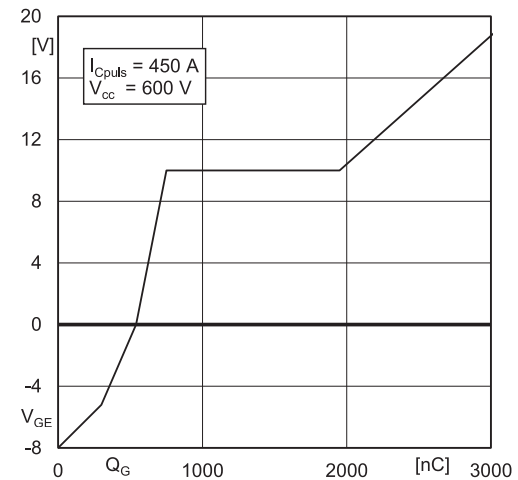


Fig. 6: Typ. gate charge characteristic

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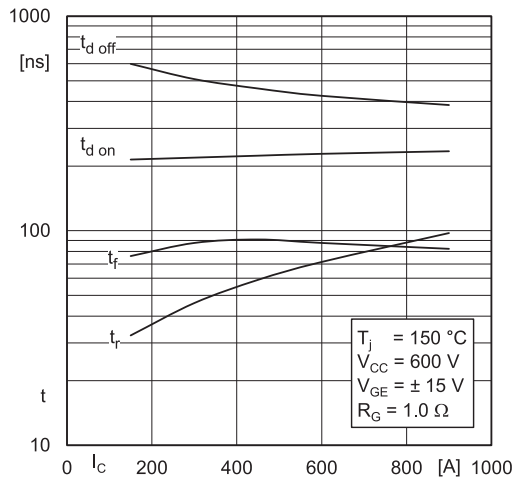


Fig. 7: Typ. switching times vs. I_C

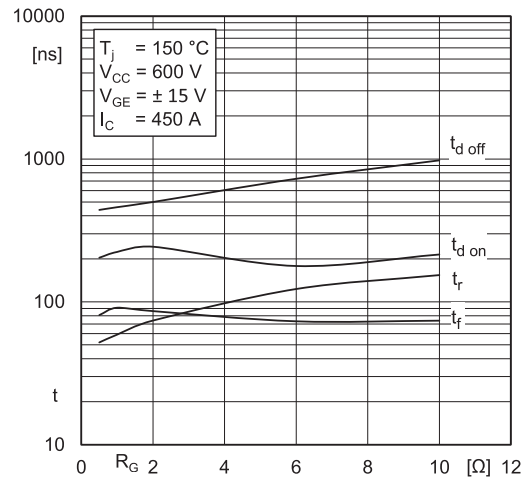


Fig. 8: Typ. switching times vs. gate resistor R_G

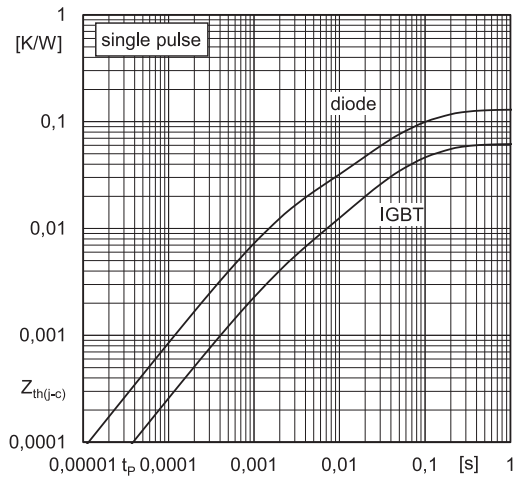


Fig. 9: Transient thermal impedance

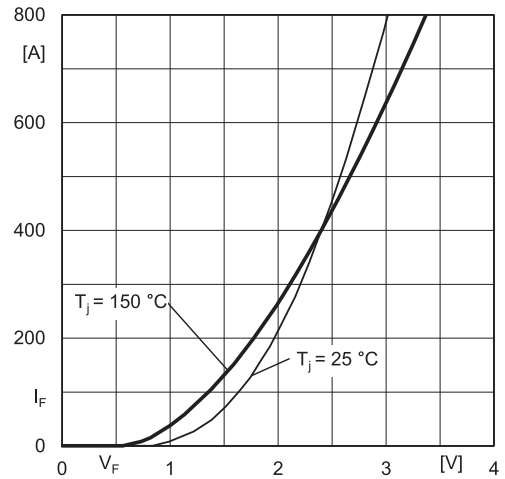


Fig. 10: Typ. FRD diode forward charact., incl. $R_{CC'+EE'}$

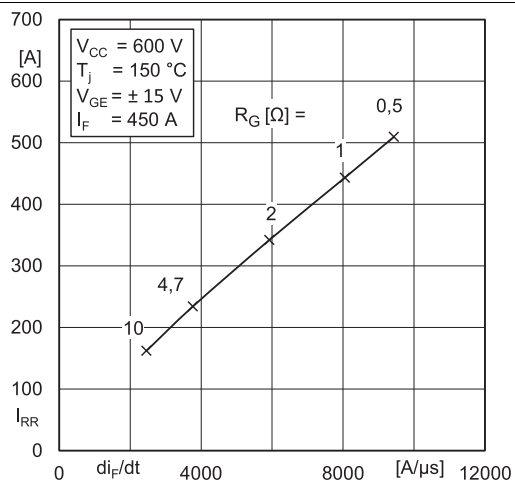


Fig. 11: FRD diode peak reverse recovery current

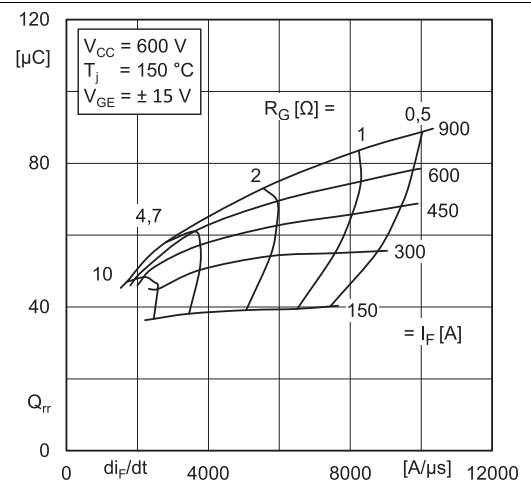


Fig. 12: Typ. FRD diode peak reverse recovery charge