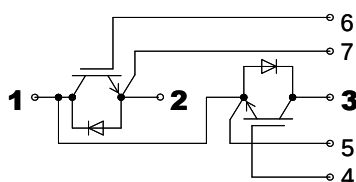


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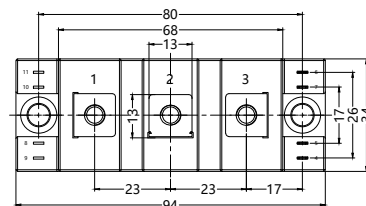
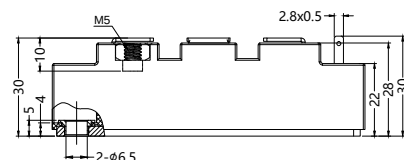
IGBT Modules



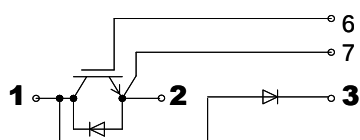
SGG50NF120UC1



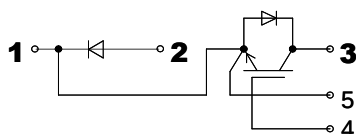
Dimensions in mm (1mm = 0.0394")



SGD50NF120UC1



SDG50NF120UC1



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

Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_C	$T_C = 25(100)^{\circ}\text{C}$	100(50)	A
I_{CRM}	$T_C = 25^{\circ}\text{C}$, $t_P = 1\text{ms}$	200	A
V_{GES}		± 20	V
T_{Vj}		$-40 \dots +175$	$^{\circ}\text{C}$
Inverse Diode			
$I_F = -I_C$	$T_C = 25(80)^{\circ}\text{C}$	40(20)	A
I_{FRM}	$T_C = 25^{\circ}\text{C}$, $t_P = 1\text{ms}$	60	A
I_{FSM}	$t_P = 10\text{ms}$; $\sin 180^{\circ}$; $T_J = 25^{\circ}\text{C}$	90	A
V_{RRM}		1200	V
Module			
$I_{t(RMS)}$	$T_{\text{terminal}} = 80^{\circ}\text{C}$	100	A
T_{stg}		$-40 \sim 125$	$^{\circ}\text{C}$
V_{isol}	AC, 1min	2500	V

Features

- Planar Field Stop technology
- Low switching losses
- Switching frequency upto 20kHz
- Square RBSOA, no latch up
- High short circuit capability
- Positive temperature coefficient for easy paralleling
- MOSinput, voltage controlled
- Soft switching diode Technology
- Package with copper baseplate
- Isolation voltage 4000V

Application

- Inverter Machines

Advantages

- space and weight savings
- reduced protection circuits

SGG50NF120UC1

IGBT Modules

Characteristics

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

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 3\text{mA}$	5.0	6.0	6.8	V
I_{CES}	$V_{GE} = 0$; $V_{CE} = V_{CES}$; $T_J = 25^{\circ}\text{C}$			1.0	mA
$V_{CE(TO)}$	$T_J = 25^{\circ}\text{C}$		0.8	0.9	V
r_{CE}	$V_{GE} = 15\text{V}$, $T_J = 25(150)^{\circ}\text{C}$		14.0(21)	16(22)	m Ω
$V_{CE(sat)}$	$I_C = 50\text{A}$; $V_{GE} = 15\text{V}$; chip level		2.10	2.30	V
C_{ies}	under following conditions $V_{GE} = 0$, $V_{CE} = 25\text{V}$, $f = 1\text{MHz}$		4.8		nF
C_{oes}			0.27		
C_{res}			0.14		
L_{CE}				30	nH
$R_{CC'+EE'}$	res., terminal-chip $T_C = 25(125)^{\circ}\text{C}$		0.65(1.09)		m Ω
$t_{d(on)}$	under following conditions: $V_{CC} = 600\text{V}$, $I_C = 50\text{A}$ $R_{Gon} = R_{Goff} = 1\Omega$, $T_J = 150^{\circ}\text{C}$ $V_{GE} = \pm 15\text{V}$		58		ns
t_r			49		ns
$t_{d(off)}$			295		ns
t_f			40		ns
$E_{on}/E_{off}/E_{ts}$			4.3/2.4/6.7		mJ
Inverse Diode under following conditions:					
$V_F = V_{EC}$	$I_F = 50\text{A}$; $V_{GE} = 0\text{V}$; $T_J = 25^{\circ}\text{C}$		1.90	2.54	V
$V_{(FO)}$	$T_J = 25(150)^{\circ}\text{C}$		1.3(0.90)	1.5(1.1)	V
r_F	$T_J = 25(150)^{\circ}\text{C}$		18(25)	(20)	m Ω
I_{RM}	$I_F = 50\text{A}$; $T_J = 150^{\circ}\text{C}$		5.4		A
Q_{rr}	$di/dt = 100\text{A}/\mu\text{s}$		0.15		μC
E_{rr}	$V_{GE} = \pm 15\text{V}$		3.8		mJ
Thermal Characteristics					
$R_{th(j-c)}$	per IGBT			0.45	K/W
$R_{th(j-c)D}$	per Inverse Diode			1.20	K/W
$R_{th(c-s)}$	per module			0.33	K/W
Mechanical Data					
M_s	to heatsink M5	3		5	Nm
M_t	to terminals M5	2.5		5	Nm
Weight	typical			160	g



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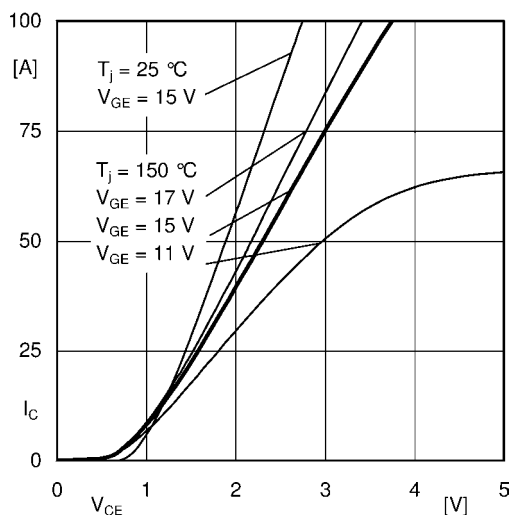


Fig. 1: Typ. output characteristic, inclusive $R_{CC} + EE$

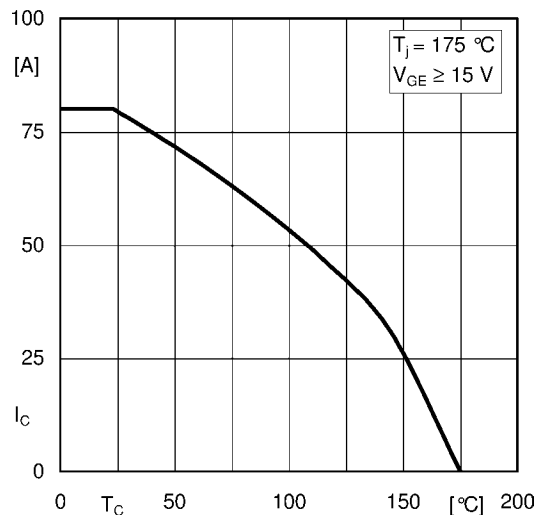


Fig. 2: Rated current vs. temperature $I_C = f(T_C)$

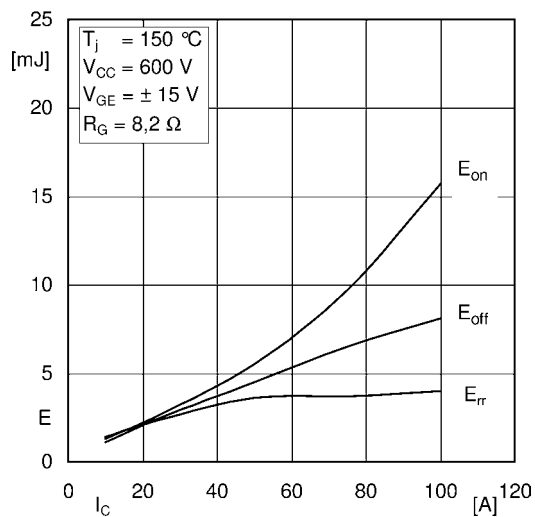


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

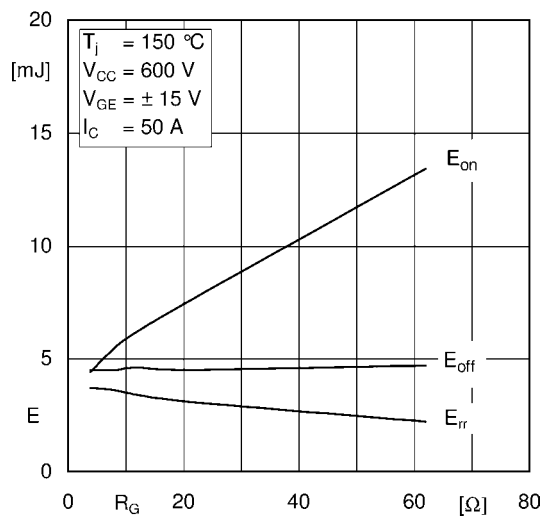
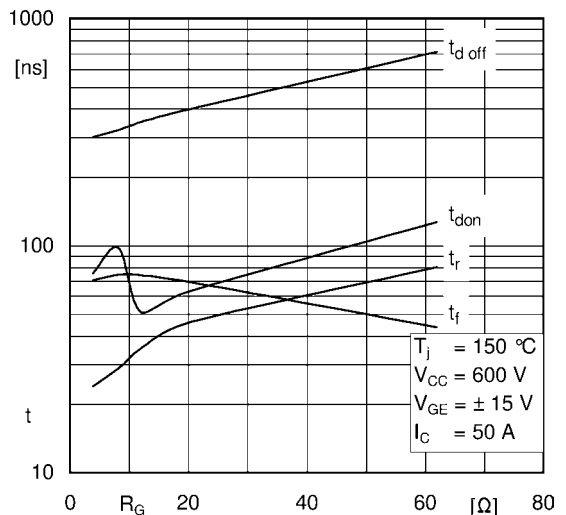
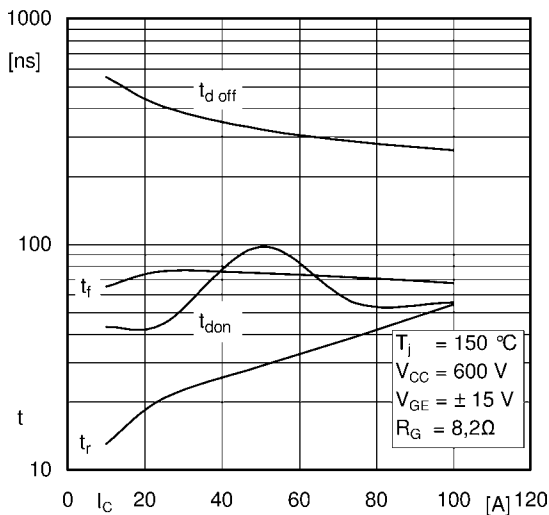
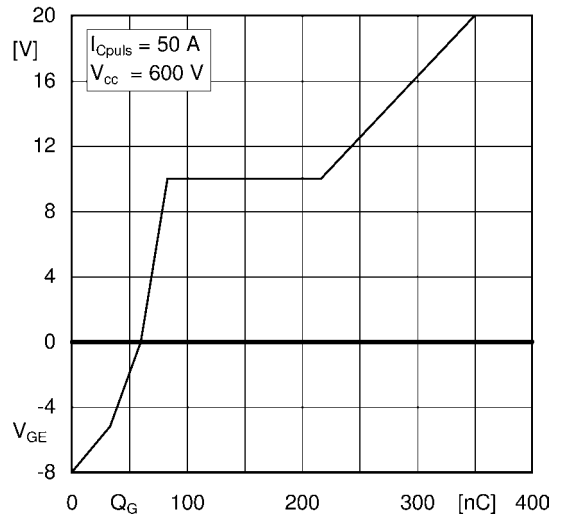
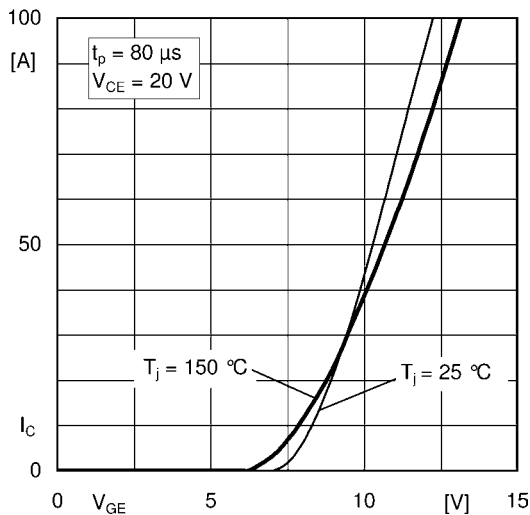


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

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IGBT Modules

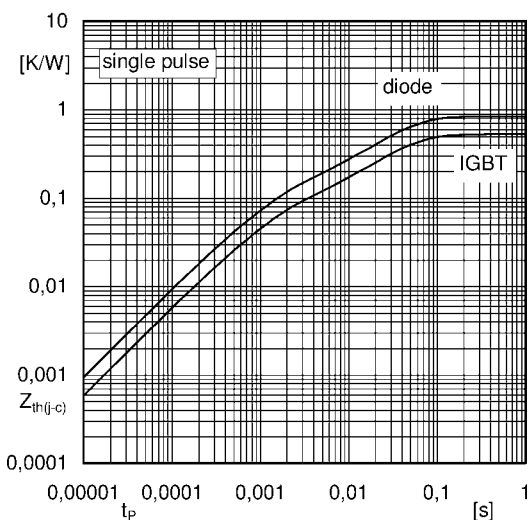


Fig. 9: Transient thermal impedance

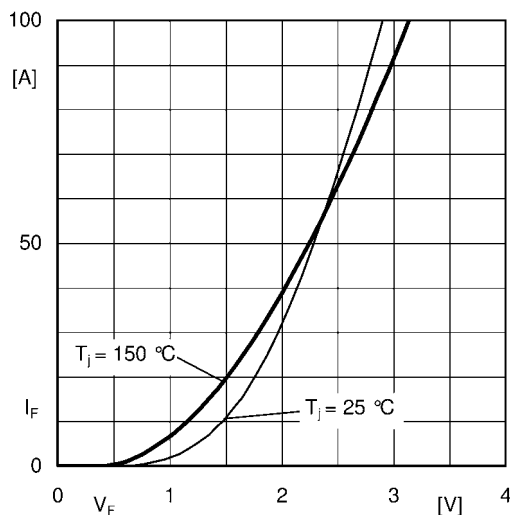


Fig. 10: Typ. FRD diode forward charact., incl. $R_{CC'+EE'}$

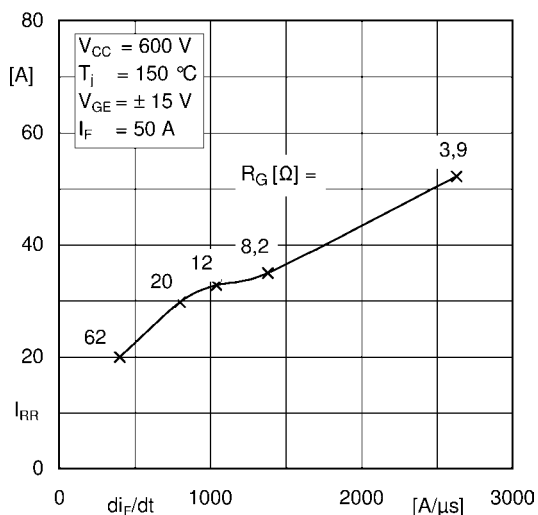


Fig. 11: FRD diode peak reverse recovery current

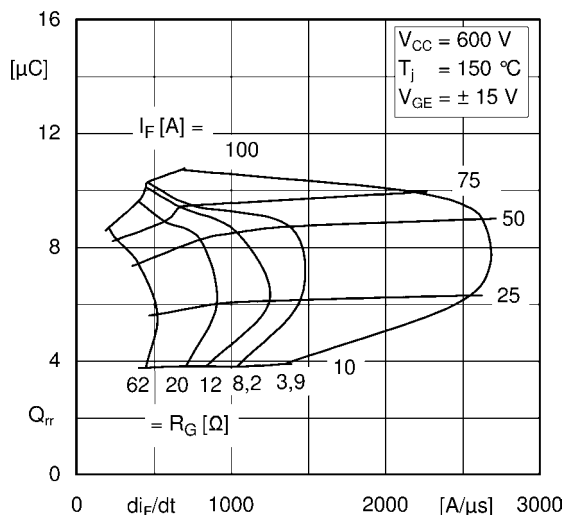


Fig. 12: Typ. FRD diode peak reverse recovery charge

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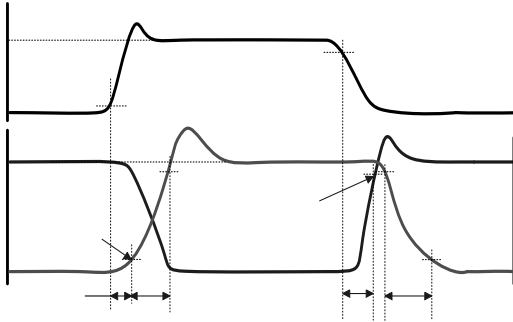


Figure 13. Definition of switching times

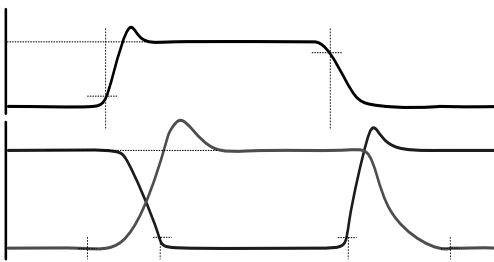


Figure 14. Definition of switching losses

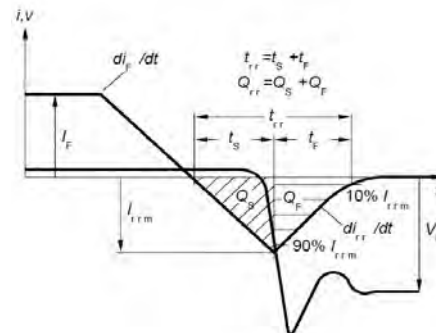


Figure 15. Definition of diodes switching characteristics

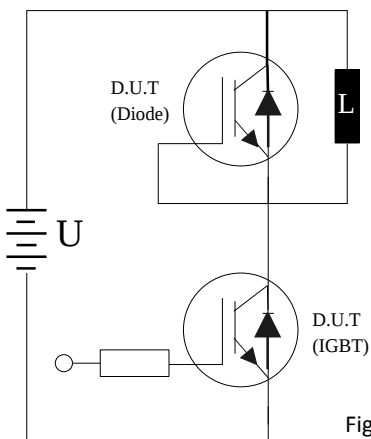


Figure 16. Dynamic test circuit