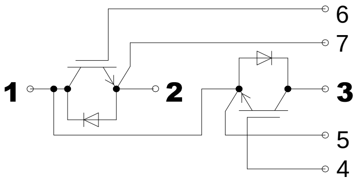
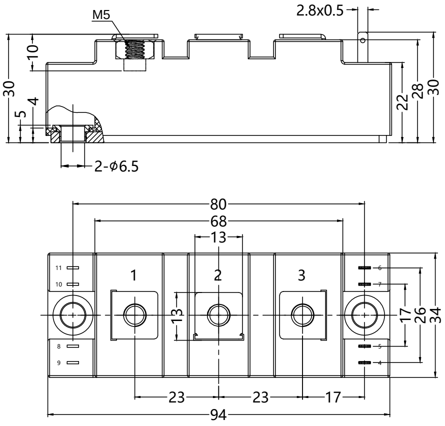
SGG50T120UC1

IGBT Modules

SGG50T120UC1



Dimensions in mm (1mm = 0.0394")



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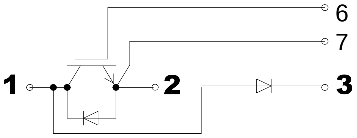

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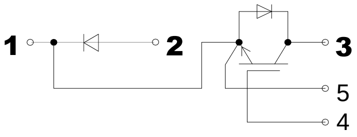

T_C = 25°C, unless otherwise specified

Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_C	T_C= 25(100)°C	100(50)	A
I_{CRM}	T_C= 25°C, t_P =1ms	200	A
V_{GES}		±20	V
T_{Vj}		-40...+175	°C
Invers Diode			
$I_F = -I_C$	T_C= 25(80)°C	40(20)	A
I_{FRM}	T_C= 25°C, t_P =1ms	60	A
I_{FSM}	t_P =10ms; sin180° ; T_j=25°C	90	A
V_{RRM}		1200	V
Module			
$I_{t(RMS)}$	$T_{teminal}$ = 80°C	100	A
T_{stg}		-40~125	°C
V_{Isol}	AC, 1min	2500	V

Features

- Trench FS 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 switching diode Technology
- Package with copper base plate
- Isolation voltage 4000V

Advantages

- space and weight savings
- reduced protection circuits

SGG50T120UC1

IGBT Modules

Characteristics T_C = 25°C, unless otherwise specified

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C =3mA	5.0	6.0	6.8	V
I_{CES}	V_{GE} = 0; V_{CE} = V_{CES}; T_j = 25°C			1.0	mA
$V_{CE(TO)}$	T_j = 25°C		0.8	0.9	V
r_{CE}	V_{GE} = 15V, T_j = 25(150)°C		14.0(21)	16(22)	mΩ
$V_{CE(sat)}$	I_C =50A; V_{GE} = 15V; chip level		2.10	2.30	V
C_{ies}	under following conditions		4.8		nF
C_{oes}	V_{GE} = 0, V_{CE} = 25V, f = 1MHz		0.27		
C_{res}			0.14		
L_{CE}				30	nH
$R_{CC'+EE'}$	res., terminal-chip T_C = 25(125)°C		0.65(1.09)		mΩ
$t_{d(on)}$	under following conditions:		58		ns
t_r	V_{CC} = 600V, I_C = 50A		49		ns
$t_{d(off)}$	R_{Gon} = R_{Goff} = 1Ω， T_j = 150°C		295		ns
t_f	V_{GE} = ± 15V		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 =50A; V_{GE} = 0V; T_j = 25°C		1.90	2.54	V
$V_{(FO)}$	T_j = 25(150)°C		1.3(0.90)	1.5(1.1)	V
r_F	T_j = 25(150)°C		18(25)	20(28)	mΩ
I_{RM}	I_F =50A; T_j = 150°C		5.4		A
Q_{rr}	di/dt = 100A/us		0.15		uC
E_{rr}	V_{GE} =±15V		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

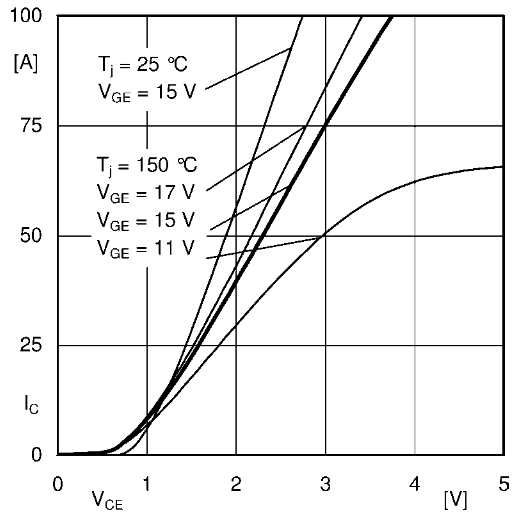

Fig. 1: Typ. output characteristic, inclusive $R_{CC'+ EE'}$

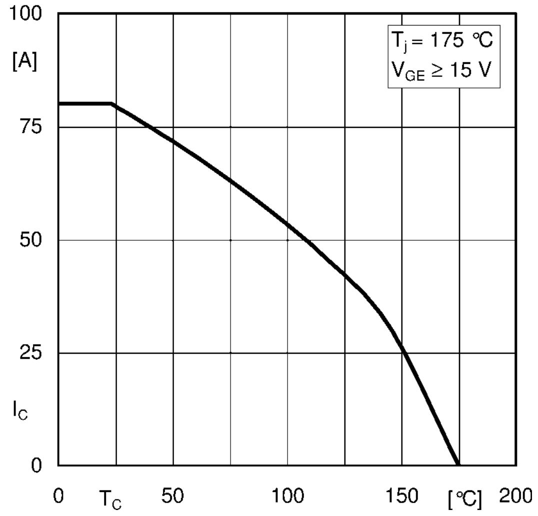

Fig. 2: Rated current vs. temperature $I_C = f(T_C)$

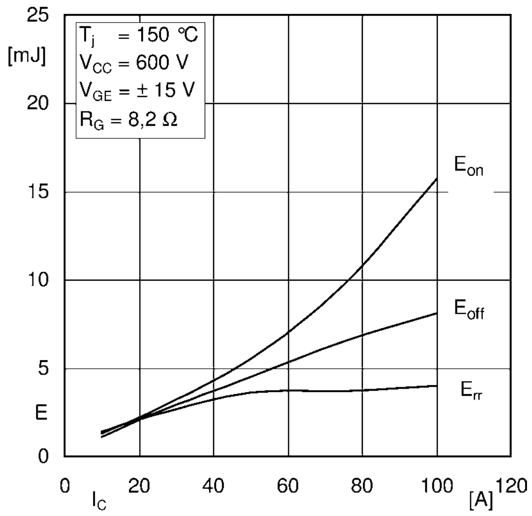

Fig. 3: Typ. turn-on /-off energy = f (I_C)

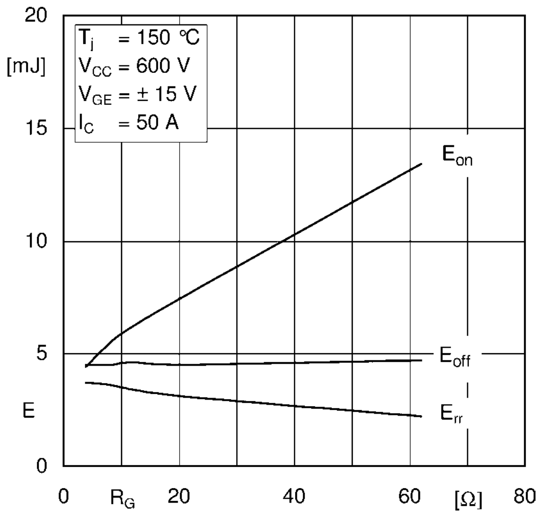

Fig. 4: Typ. turn-on /-off energy = f (R_G)

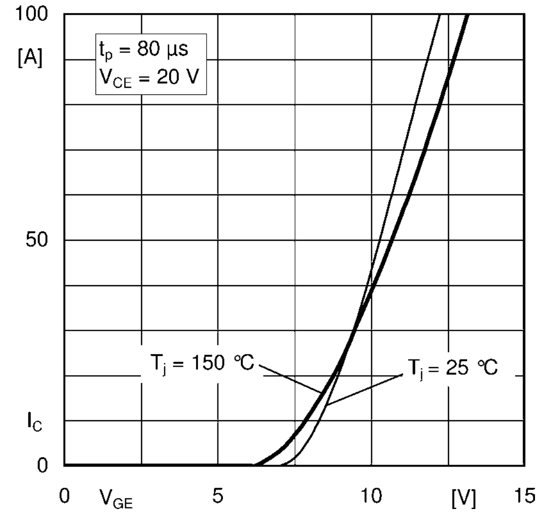

Fig. 5: Typ. transfer characteristic

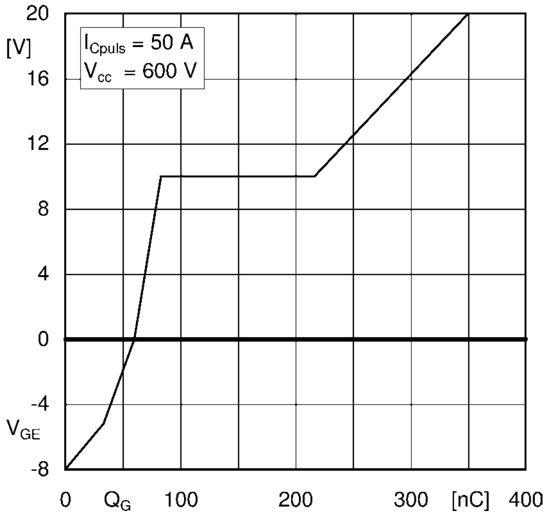

Fig. 6: Typ. gate charge characteristic

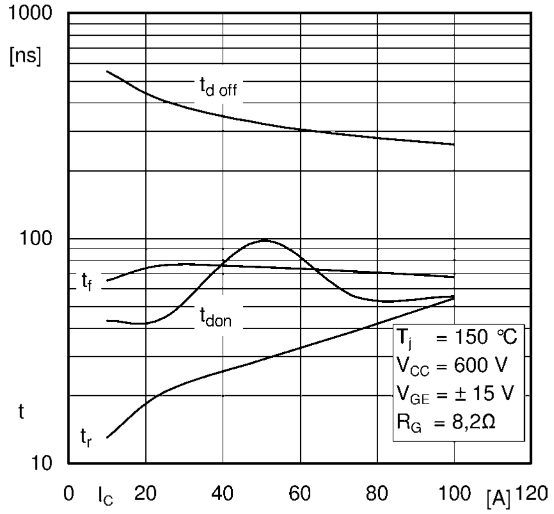

Fig. 7: Typ. switching times vs. I_C

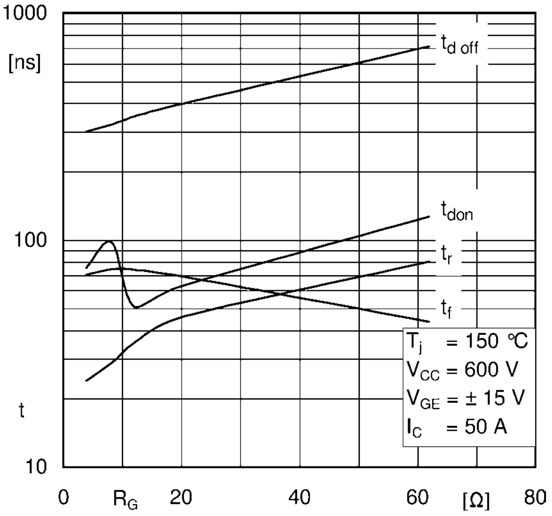

Fig. 8: Typ. switching times vs. gate resistor R_G

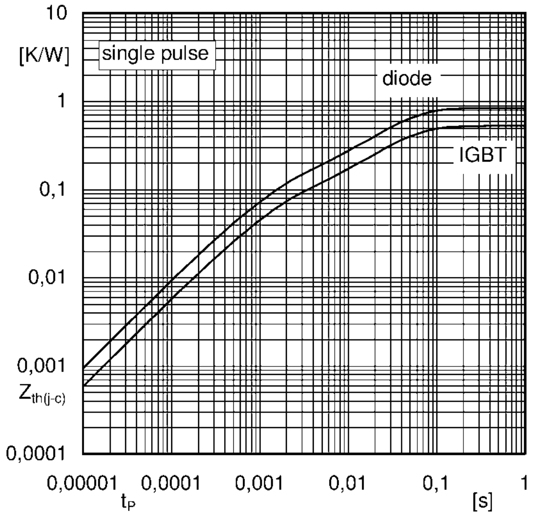

Fig. 9: Transient thermal impedance

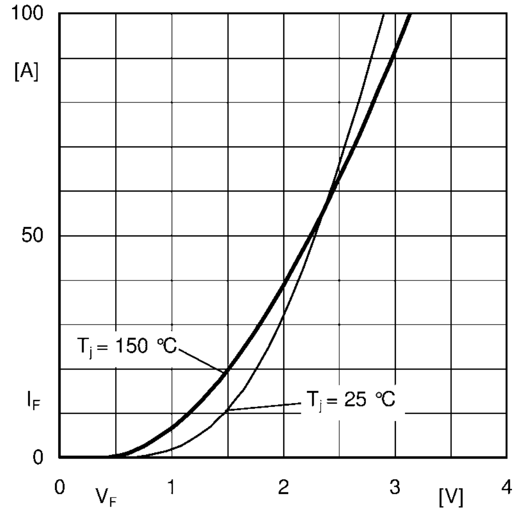

Fig. 10: Typ. FRD diode forward charact., incl. $R_{CC'+EE'}$

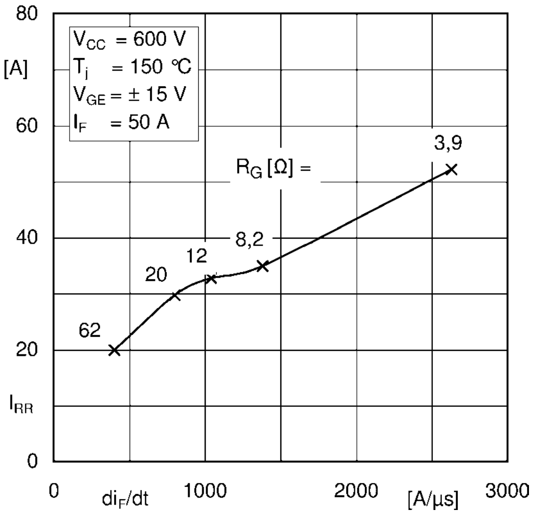

Fig. 11: FRD diode peak reverse recovery current

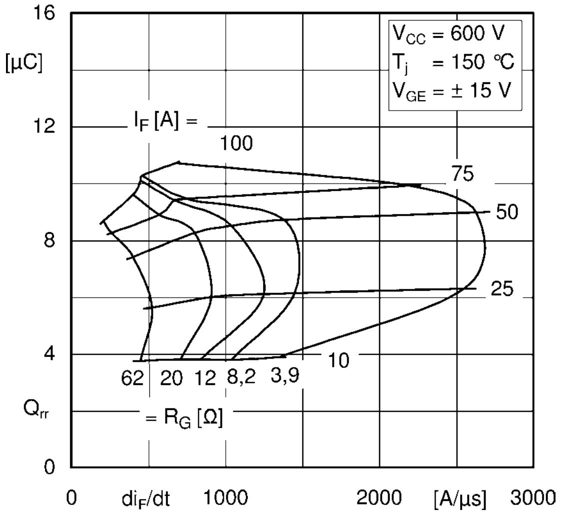

Fig. 12: Typ. FRD diode peak reverse recovery charge

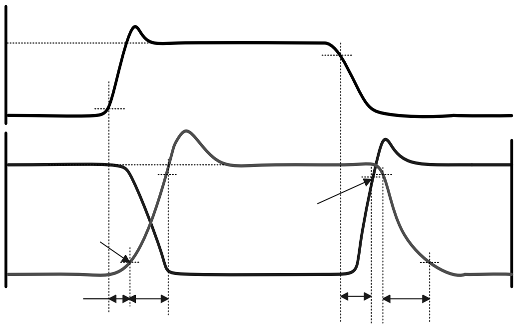

Figure A. Definition of switching times

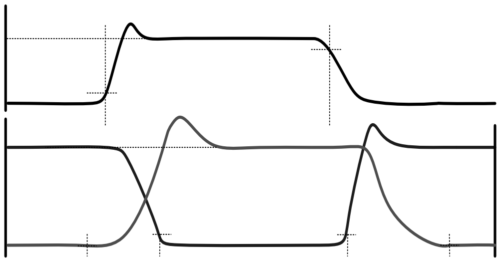

Figure B. Definition of switching losses

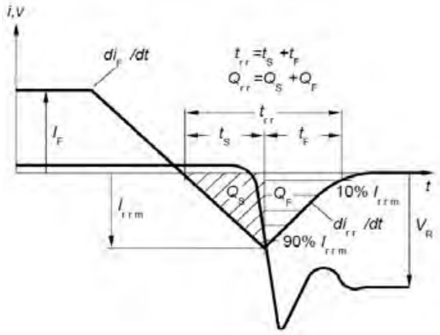

Figure C. Definition of diodes switching characteristics

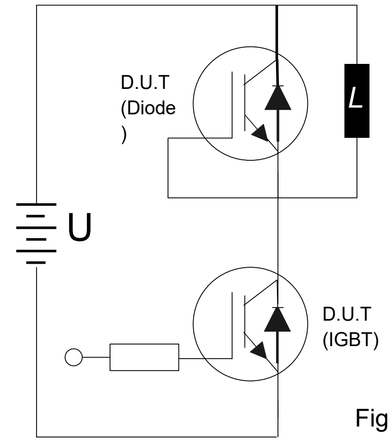

Figure D. Dynamic test circuit