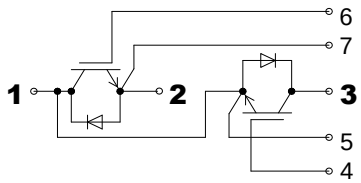
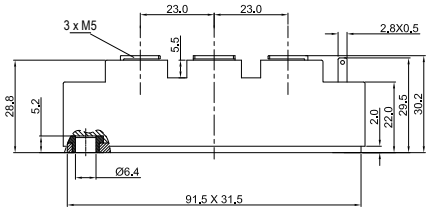
SGG145T120UC1

IGBT Modules

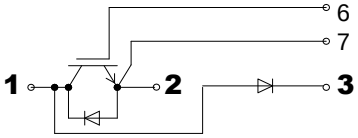
SGG145T120UC1
(Half Bridge)



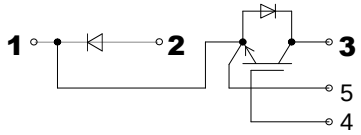
Dimensions in mm (1mm = 0.0394")

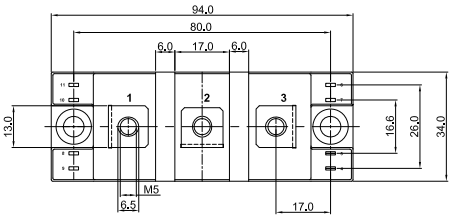


SGD145T120UC1
(Boost Chopper)



SDG145T120UC1
(Buck Chopper)





Absolute Maximum Ratings

T_C = 25°C, unless otherwise specified

Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_C	T_C= 25(80)°C	223(150)	A
I_{CRM}	T_C= 25°C, t_P =1ms	450	A
V_{GES}		±20	V
T_{Vj}		-40...+175	°C
Inverse Diode			
I_F = -I_C	T_C= 25(80)°C	223(150)	A
I_{FRM}	T_C= 25°C, t_P =1ms	450	A
I_{FSM}	t_P =10ms; sin.;T_j=150°C	770	A
Module			
$I_{t(RMS)}$	$T_{teminal}$ = 80°C	500	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 parallelling
- MOS input, voltage controlled
- Soft switching 4.0 generation FWD 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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SGG145T120UC1

IGBT Modules

Characteristics $T_C = 25^oC$, unless otherwise specified

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, I_C =6mA	5.0	5.8	6.5	V
I_{CES}	V_{GE} = 0; $V_{CE} = V_{CES}$; $T_j = 25^oC$			2.0	mA
$V_{CE(TO)}$	$T_j = 25^oC$		0.8	0.9	V
r_{CE}	V_{GE} = 15V, $T_j = 25(125)^oC$		7.0(10.3)	8.0(11.0)	mΩ
$V_{CE(sat)}$	I_C =150A; V_{GE} = 15V; chip level		1.90	2.20	V
C_{ies}	under following conditions V_{GE} = 0, V_{CE} = 25V, f = 1MHz		8.80		nF
C_{oes}			0.58		
C_{res}			0.47		
L_{CE}				20	nH
$R_{CC'+EE'}$	res., terminal-chip $T_C = 25(125)^oC$		0.25(0.5)		mΩ
$t_{d(on)}$	under following conditions: V_{CC} = 600V, I_C = 150A $R_{Gon} = R_{Goff}$ = 1Ω , $T_j = 150^oC$ V_{GE} = ± 15V		175		ns
t_r			38		ns
$t_{d(off)}$			400		ns
t_f			78		ns
$E_{on}(E_{off})$			18(14.2)		mJ
Inverse Diode under following conditions:					
$V_F = V_{EC}$	I_F =150A; V_{GE} = 0V; $T_j = 25^oC$		2.18	2.50	V
$V_{(FO)}$	$T_j = 25(150)^oC$		1.3(0.95)	1.5(1.1)	V
r_F	$T_j = 25(150)^oC$		5.8(8.0)	6.4(8.8)	mΩ
I_{RRM}	I_F = 150A; $T_j = 150^oC$ di/dt = 3100A/us V_{GE} =±15V		116		A
Q_{rr}			26		uC
E_{rr}			9		mJ
Thermal Characteristics					
$R_{th(j-c)}$	per IGBT			0.25	K/W
$R_{th(j-c)D}$	per Inverse Diode			0.40	K/W
$R_{th(c-s)}$	per module			0.075	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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IGBT Modules

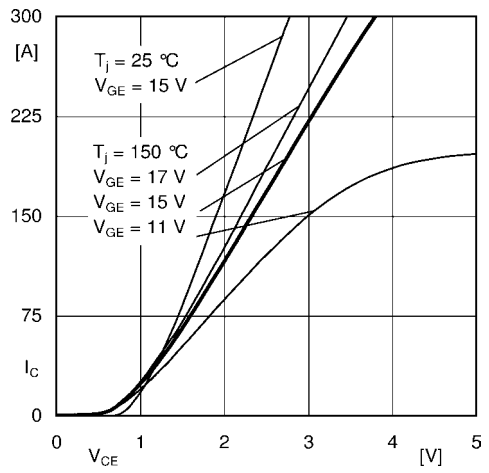

Fig. 1: Typ. output characteristic, inclusive $R_{CC'+EE'}$

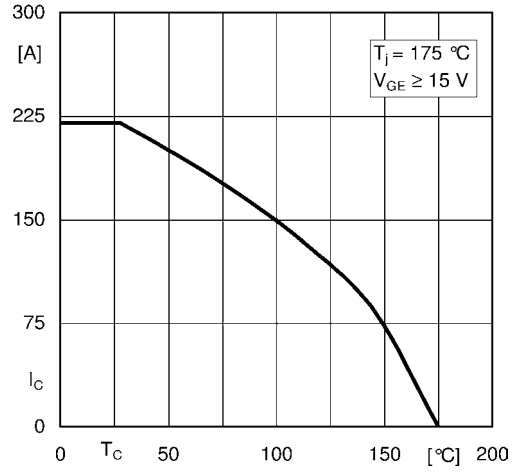

Fig. 2: Rated current vs. temperature $I_C = f(T_C)$

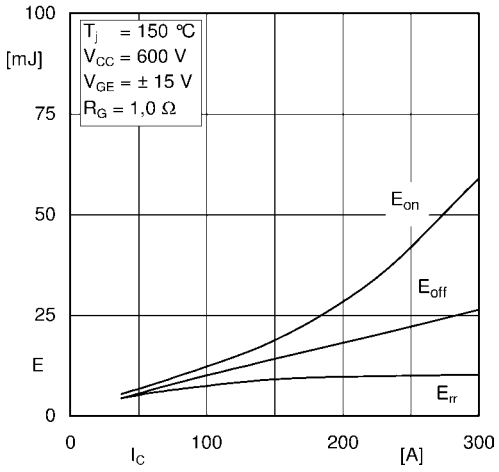

Fig. 3: Typ. turn-on /-off energy = f (I_C)

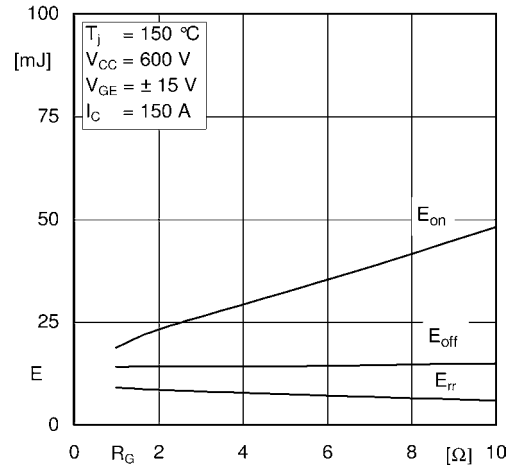

Fig. 4: Typ. turn-on /-off energy = f (R_G)

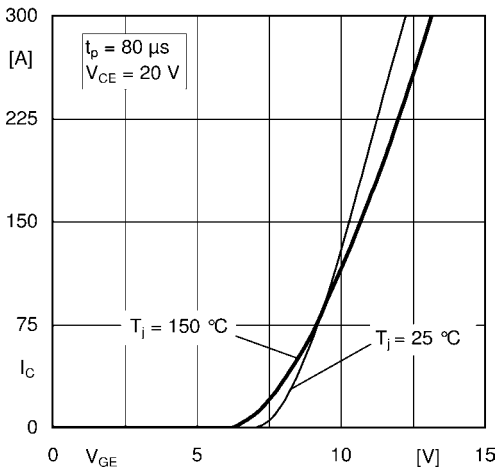

Fig. 5: Typ. transfer characteristic

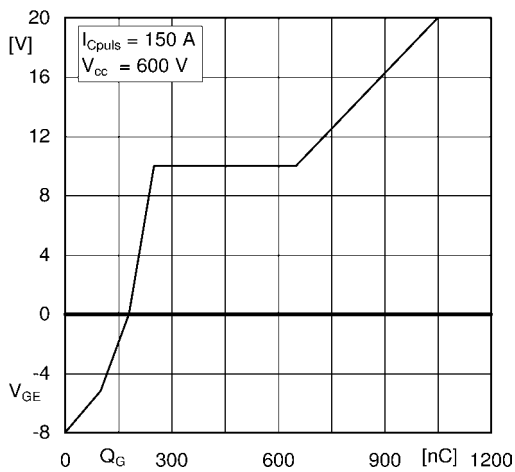

Fig. 6: Typ. gate charge characteristic

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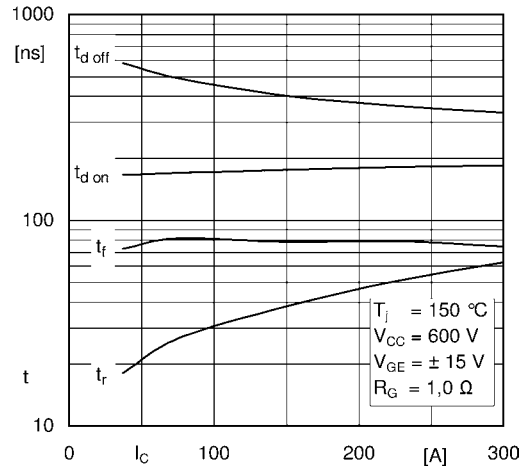

Fig. 7: Typ. switching times vs. I_C

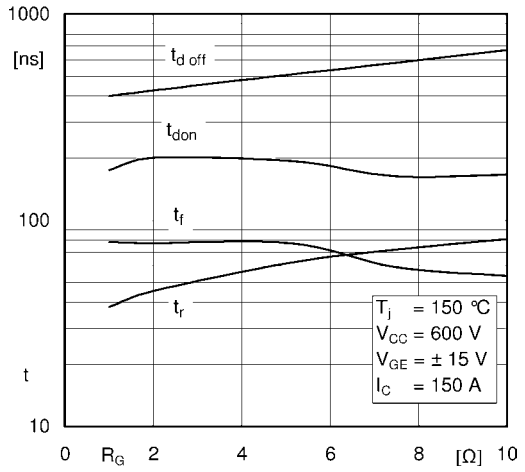

Fig. 8: Typ. switching times vs. gate resistor R_G

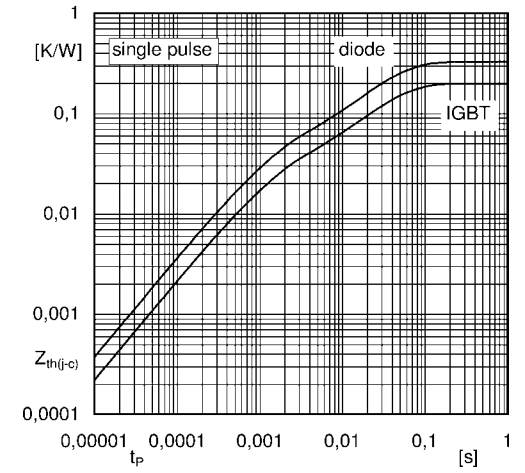

Fig. 9: Transient thermal impedance

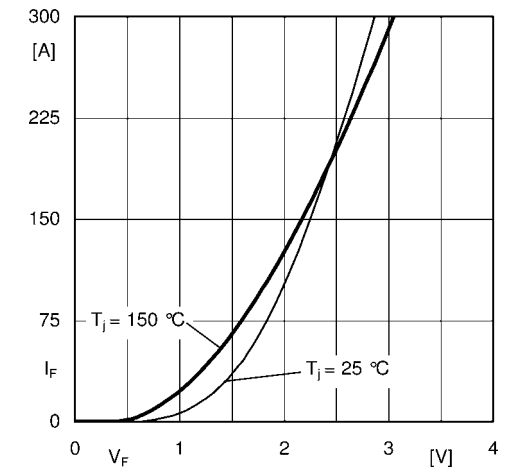

Fig. 10: Typ. FRD diode forward charact., incl. $R_{CC'+EE'}$

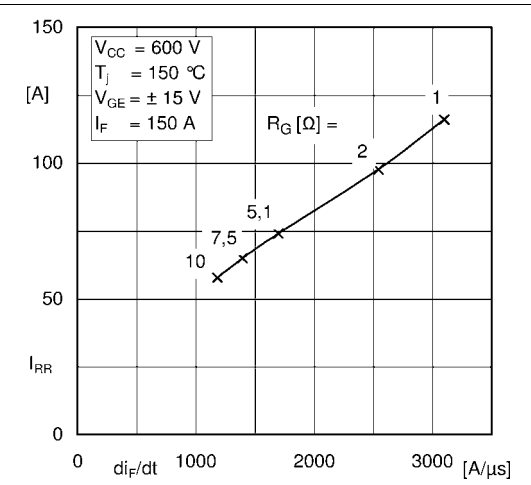

Fig. 11: FRD diode peak reverse recovery current

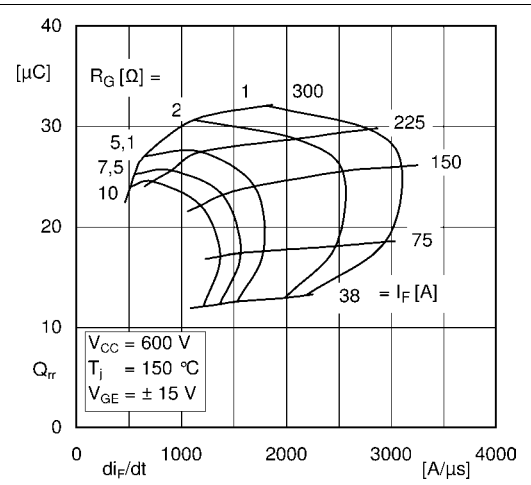

Fig. 12: Typ. FRD diode peak reverse recovery charge

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