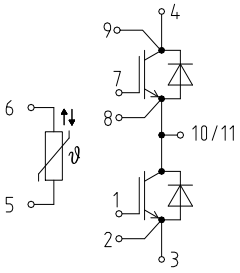
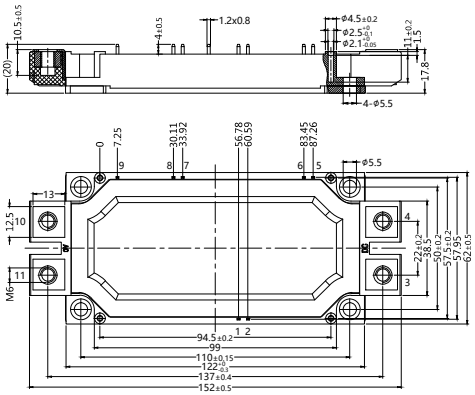
SGG450T170UC5

IGBT Modules



Dimensions in mm (1mm = 0.0394")



T_C = 25°C, unless otherwise specified

Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1700	V
I_C	T_C= 100°C	450	A
I_{CRM}	T_C= 25°C, t_P =1ms	900	A
V_{GES}		±20	V
T_{Vj}		-40...+175	°C
Inverse Diode			
I_F = -I_C	T_C= 100°C	450	A
I_{FRM}	T_C= 25°C, t_P =1ms	900	A
I_{FSM}	t_P =10ms; sin.;T_j=150°C	1480	A
Module			
$I_{t(RMS)}$	$T_{teminal}$ = 100°C	600	A
T_{stg}		-40~125	°C
V_{Isol}	AC, 1min	4000	V
P_{tot}	T_C = 25°C, $T_{vj\ max}$ = 175°C	2500	W

Features

- Trench Field Stop IGBT technology
- Low Switching losses
- Switching frequency upto 20KHz
- Square RBSOA, no latch up
- High short circuit capability Positive temperature coefficient for easy parallelling
- MOS input, voltage controlled
- Ultra fast free wheeling diodes
- Package with copper baseplate
- Isolation voltage 4000 V

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

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, I_C =8mA	5.0	5.8	6.5	V
I_{CES}	V_{GE} = 0; $V_{CE} = V_{CES}$; $T_j = 25^oC$			4.0	mA
$V_{CE(TO)}$	$T_j = 25^oC$		0.8	0.9	V
r_{CE}	V_{GE} = 15V, T_j = 25(125)^oC		3.30(5.00)	3.80(5.30)	mΩ
$V_{CE(sat)}$	I_C =450A; V_{GE} = 15V; chip level		2.10	2.55	V
C_{ies}	under following conditions		44.00		
C_{oes}	V_{GE} = 0, V_{CE} = 25V, f = 1MHz		1.29		nF
C_{res}			1.08		
L_{CE}				20	nH
$R_{CC'+EE'}$	res., terminal-chip T_C = 25(125)^oC		1.2(1.65)		mΩ
	under following conditions:				
$t_{d(on)}$	V_{CC} = 900V, I_C = 450A		250		ns
t_r	$R_{Gon} = R_{Goff}$ = 3Ω, T_j = 125^oC		108		ns
$t_{d(off)}$	V_{GE} = ± 15V		610		ns
t_f			510		ns
$E_{on}(E_{off})$			133(118)		mJ
Inverse Diode under following conditions:					
$V_F = V_{EC}$	I_F =450A; V_{GE} = 0V; T_j = 25^oC		2.40	2.92	V
$V_{(FO)}$	$T_j = 25^oC$		1.40	1.60	V
r_F	$T_j = 25^oC$		3.6	3.9	mΩ
I_{RRM}	I_F = 450A; T_j = 125^oC		230		A
Q_{rr}	di/dt = 3300A/us		80		uC
E_{rr}	V_{GE} = ±15V		43		mJ
Thermal Characteristics					
$R_{th(j-c)}$	per IGBT			0.094	K/W
$R_{th(j-c)D}$	per Inverse Diode			0.150	K/W
$R_{th(c-s)}$	per module			0.011	K/W
Mechanical Data					
M_s	to heatsink M5	3		6	Nm
M_t	to terminals M6	3		6	Nm
Weight	typical			350	g
Temperature Sensor					
R_{100}	T_C=100°C (R_{25}=5 kΩ)		493 ± 5%		Ω
$B_{100/125}$	$R(T)=R_{100}\exp[B_{100/125}(1/T-1/T_{100})]$; T[K];		3550 ±2%		K

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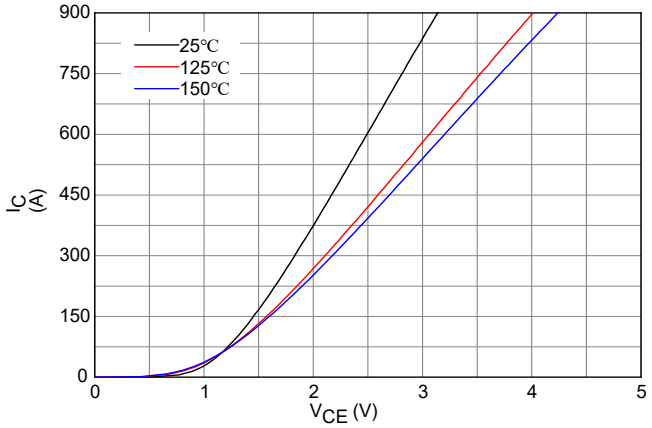

Figure 1. Typical output characteristics (VGE=15V)

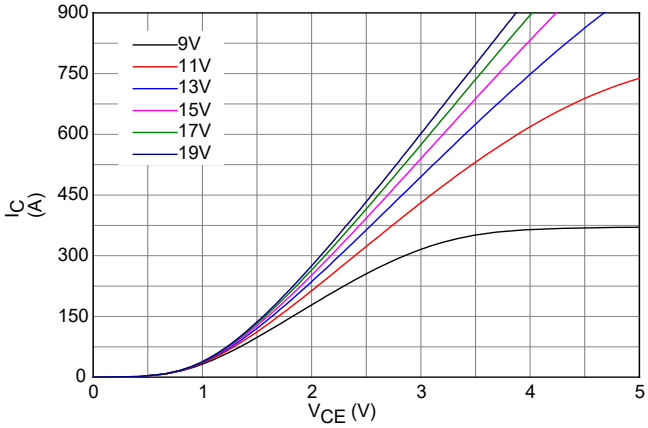

Figure 2. Typical output characteristics (T_{vj}=150℃)

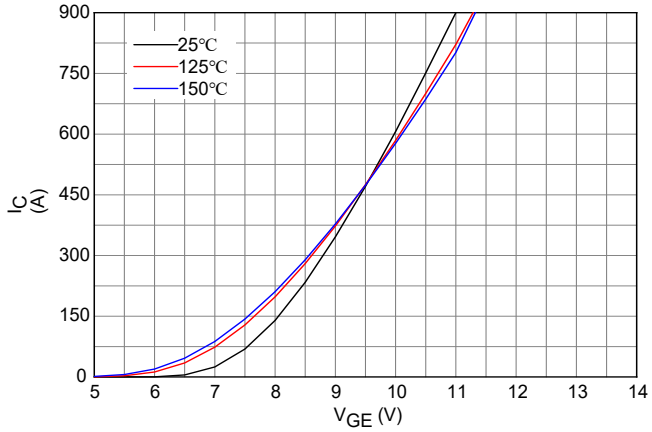

Figure 3. Typical transfer characteristic(VCE=20V)

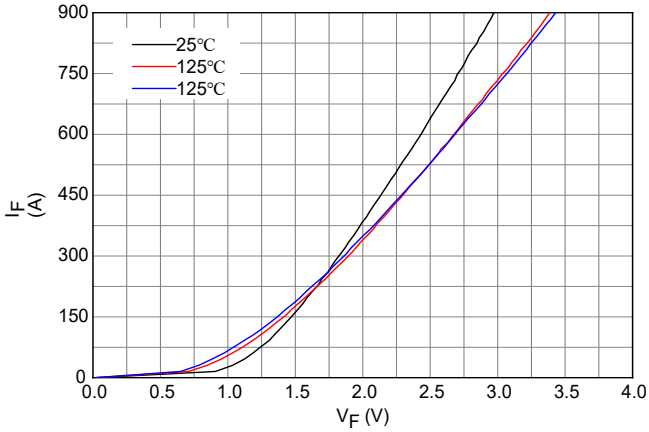

Figure 4. Forward characteristic of Diode

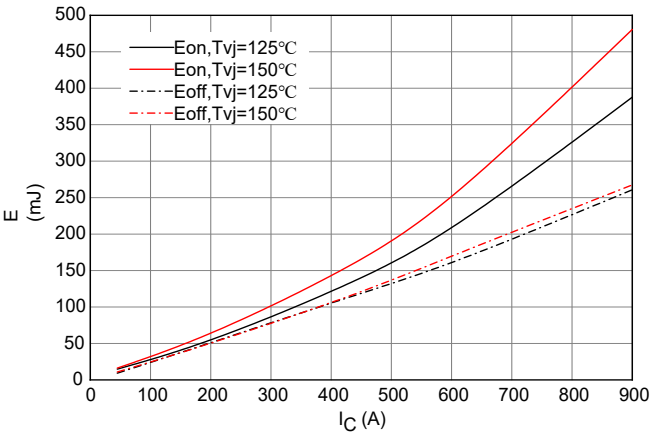

Figure 5. Switching losses of IGBT

VGE=±15V, RGon=3.3Ω, RGoff=3.3Ω, VCE=900V

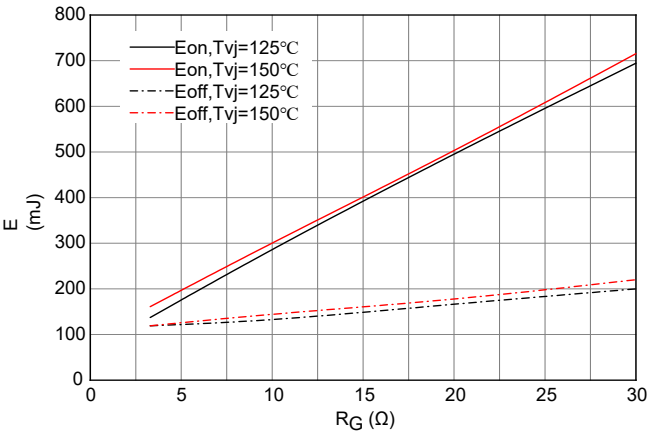

Figure 6. Switching losses of IGBT

VGE=±15V, IC=450A, VCE=900V

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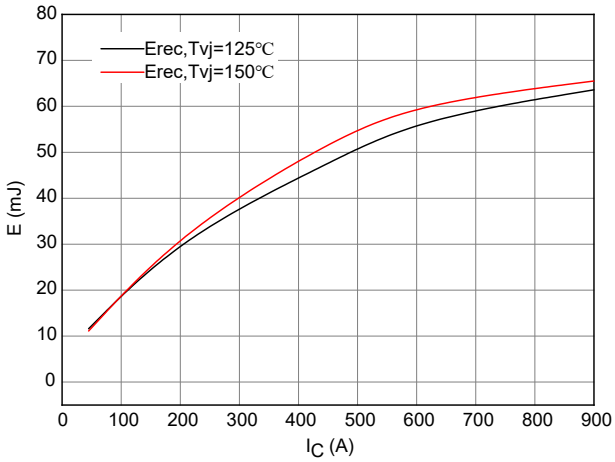

Figure 7. Switching losses of Diode
RGon=3.3Ω, VCE=900V

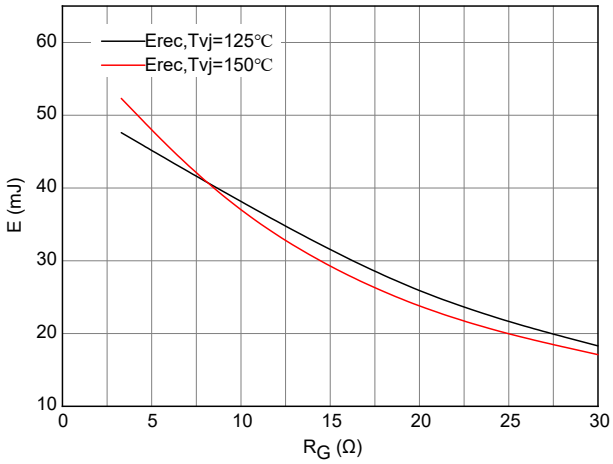

Figure 8. Switching losses of Diode
IF=450A, VCE=900V

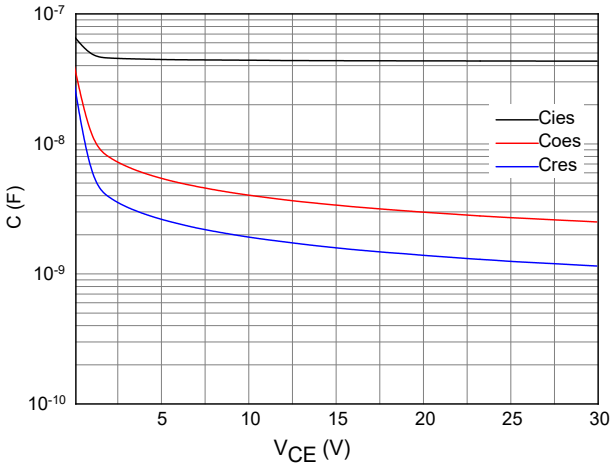

Figure 9. Capacitance characteristic

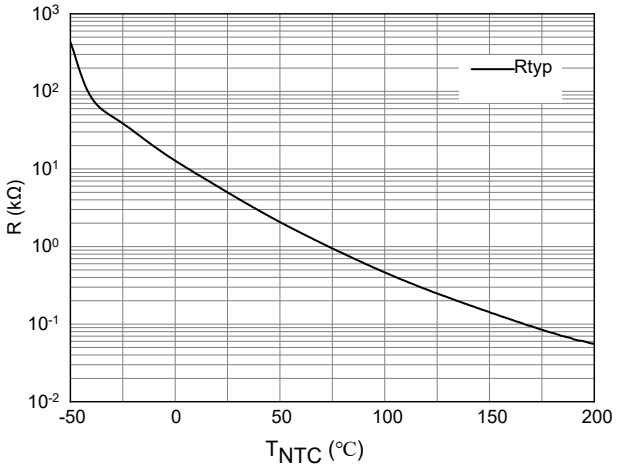

Figure 10. NTC-Themistor-temperature characteristic

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