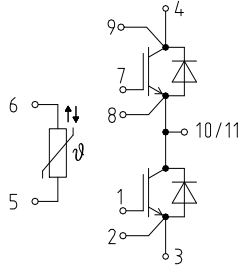
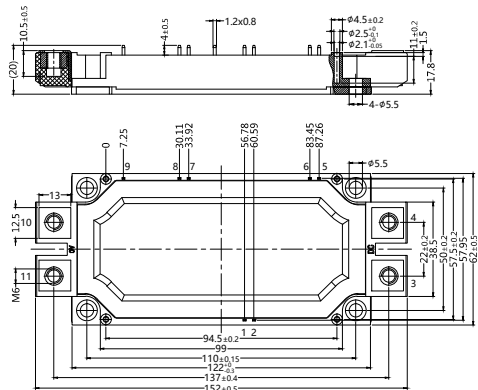


SGG450T170UC5

IGBT Modules



Dimensions in mm (1mm = 0.0394")



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

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

SGG450T170UC5

IGBT Modules

Characteristics

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

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 8\text{mA}$	5.0	5.8	6.5	V
I_{CES}	$V_{GE} = 0; V_{CE} = V_{CES}; T_j = 25^{\circ}\text{C}$			4.0	mA
$V_{CE(TO)}$	$T_j = 25^{\circ}\text{C}$		0.8	0.9	V
r_{CE}	$V_{GE} = 15\text{V}, T_j = 25(125)^{\circ}\text{C}$		3.30(5.00)	3.80(5.30)	m Ω
$V_{CE(sat)}$	$I_C = 450\text{A}; V_{GE} = 15\text{V};$ chip level		2.10	2.55	V
C_{ies}	under following conditions		44.00		nF
C_{oes}	$V_{GE} = 0, V_{CE} = 25\text{V}, f = 1\text{MHz}$		1.29		
C_{res}			1.08		
L_{CE}				20	nH
$R_{CC'+EE'}$	res., terminal-chip $T_c = 25(125)^{\circ}\text{C}$		1.2(1.65)		m Ω
$t_{d(on)}$	under following conditions: $V_{CC} = 900\text{V}, I_C = 450\text{A}$		250		ns
t_r	$R_{Gon} = R_{Goff} = 3\Omega, T_j = 125^{\circ}\text{C}$		108		ns
$t_{d(off)}$	$V_{GE} = \pm 15\text{V}$		610		ns
t_f			510		ns
$E_{on}(E_{off})$			133(118)		mJ
Inverse Diode under following conditions:					
$V_F = V_{EC}$	$I_F = 450\text{A}; V_{GE} = 0\text{V}; T_j = 25^{\circ}\text{C}$		2.40	2.92	V
$V_{(FO)}$	$T_j = 25^{\circ}\text{C}$		1.40	1.60	V
r_F	$T_j = 25^{\circ}\text{C}$		3.6	3.9	m Ω
I_{RRM}	$I_F = 450\text{A}; T_j = 125^{\circ}\text{C}$		230		A
Q_{rr}	$di/dt = 3300\text{A/us}$		80		μC
E_{rr}	$V_{GE} = \pm 15\text{V}$		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}	$T_c = 100^{\circ}\text{C} (R_{25} = 5\text{ k}\Omega)$		493 $\pm$ 5%		Ω
$B_{100/125}$	$R(T) = R_{100} \exp[B_{100/125}(1/T - 1/T_{100})]; T[\text{K}];$		3550 $\pm$ 2%		K

Sirectifier®

SGG450T170UC5

IGBT Modules

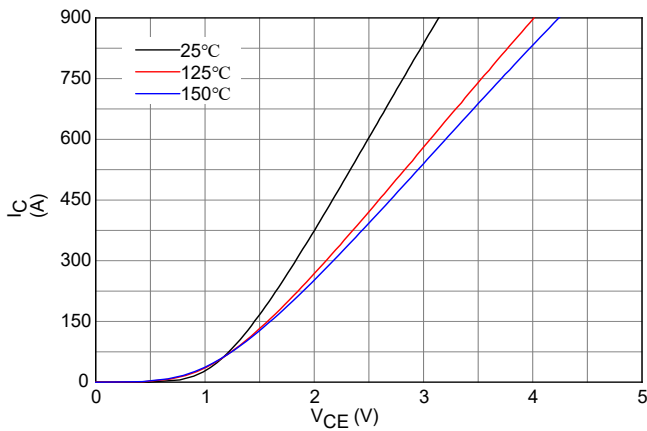


Figure 1. Typical output characteristics (VGE=15V)

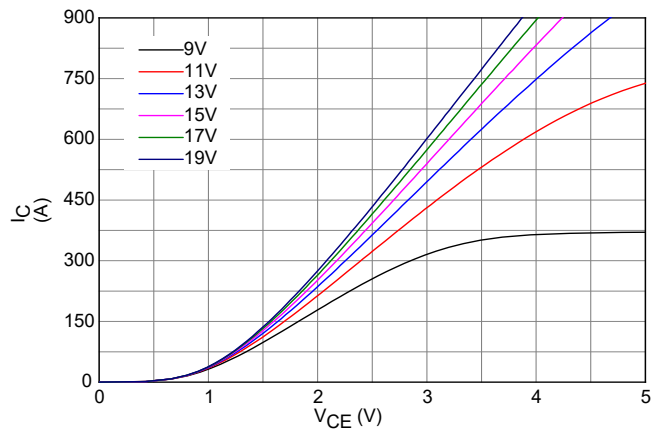


Figure 2. Typical output characteristics (TVj=150°C)

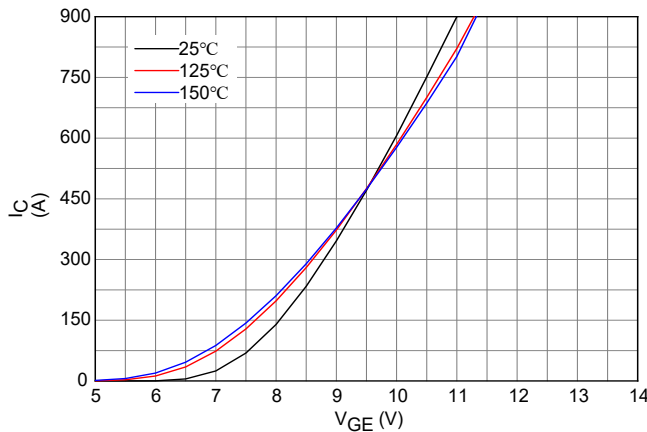


Figure 3. Typical transfer characteristic (VCE=20V)

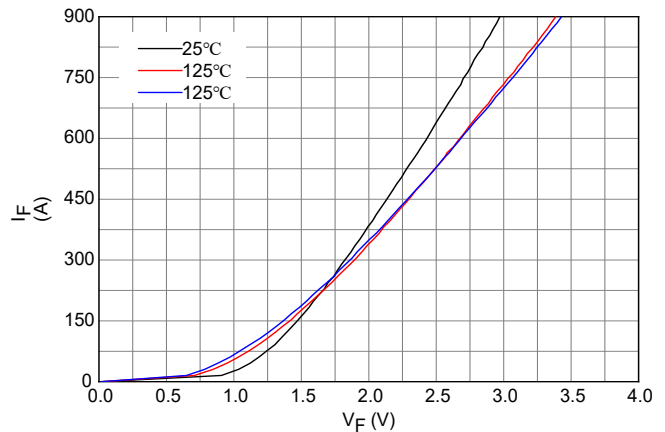


Figure 4. Forward characteristic of Diode

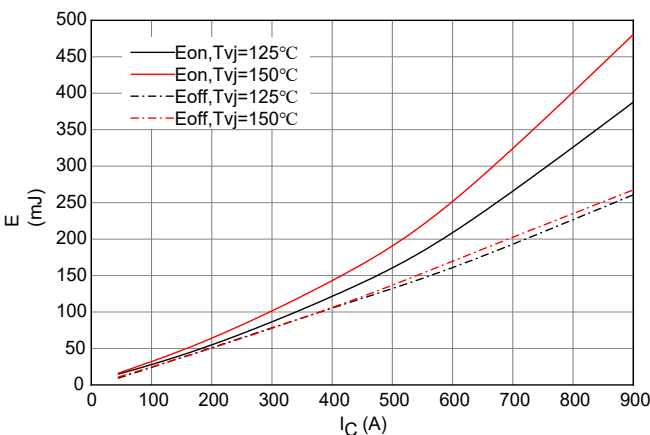


Figure 5. Switching losses of IGBT
VGE=±15V, RGon=3.3Ω, RGoff=3.3Ω, VCE=900V

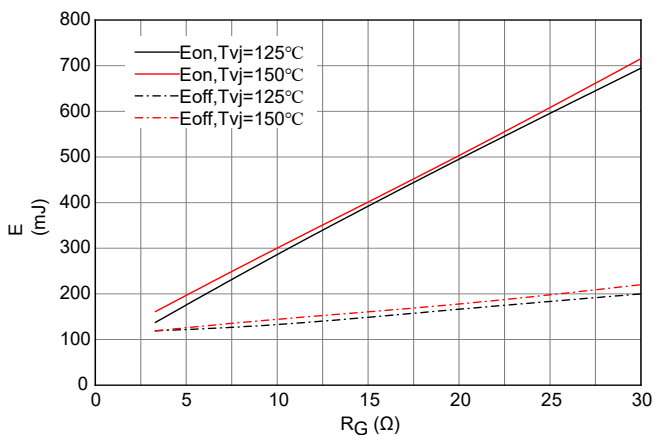


Figure 6. Switching losses of IGBT
VGE=±15V, IC=450A, VCE=900V

Sirectifier®

SGG450T170UC5

IGBT Modules

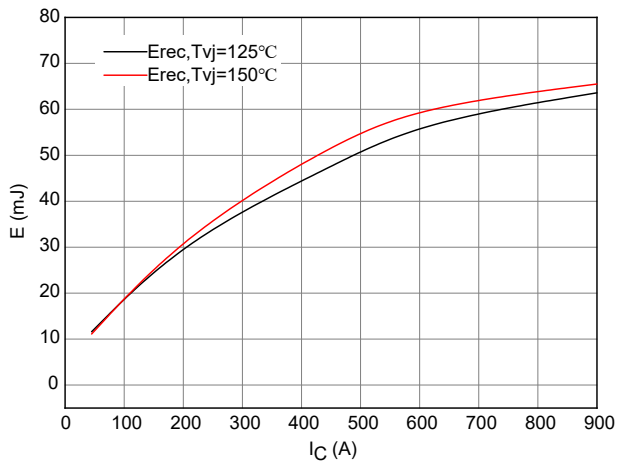


Figure 7. Switching losses of Diode
 $R_{Gon}=3.3\Omega$, $V_{CE}=900V$

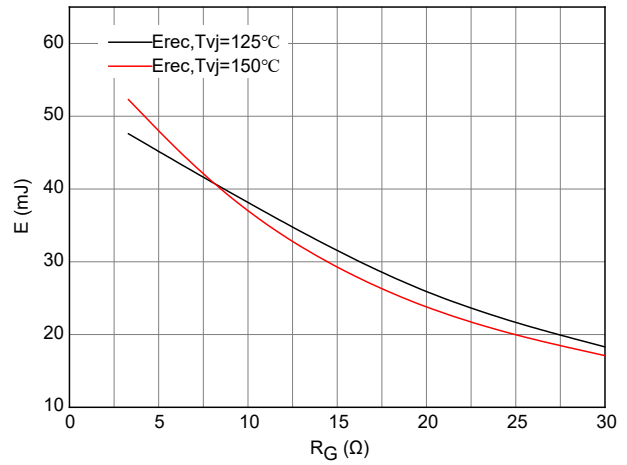


Figure 8. Switching losses of Diode
 $I_F=450A$, $V_{CE}=900V$

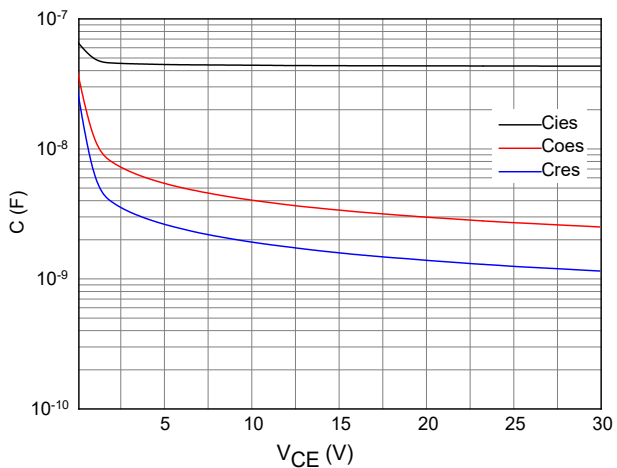


Figure 9. Capacitance characteristic

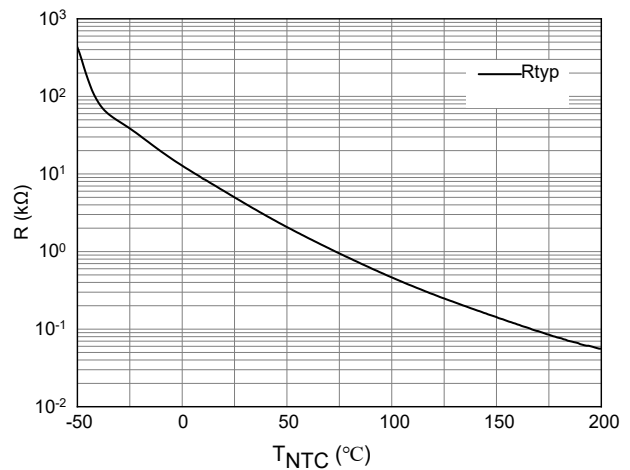


Figure 10. NTC-Themistor-temperature characteristic