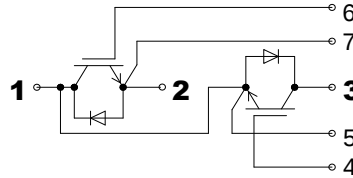


SGG145T60UC1

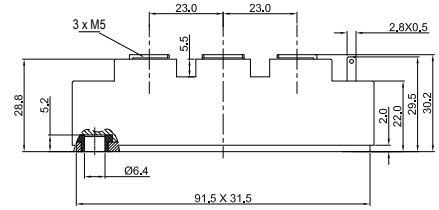
IGBT Modules



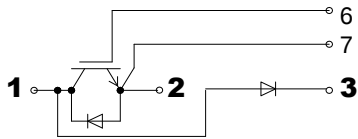
**SGG145T60UC1
(Half Bridge)**



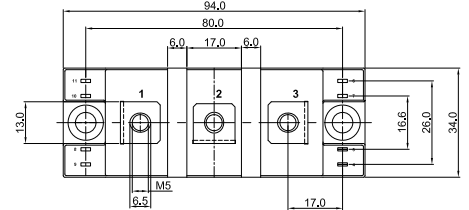
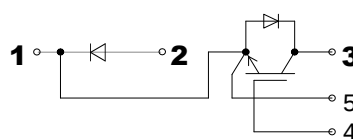
Dimensions in mm (1mm = 0.0394")



**SGD145T60UC1
(Boost Chopper)**



**SDG145T60UC1
(Buck Chopper)**



Absolute Maximum Ratings

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

Symbol	Conditions	Values	Units
IGBT			
V_{CES}		600	V
I_C	$T_C = 25(80)^\circ\text{C}$	290(145)	A
I_{CRM}	$T_C = 25^\circ\text{C}$, $t_P = 1\text{ms}$	290	A
V_{GES}		± 20	V
T_{Vj}		$-40 \dots +175$	$^\circ\text{C}$
Inverse Diode			
$I_F = -I_C$	$T_C = 25(80)^\circ\text{C}$	290(145)	A
I_{FRM}	$T_C = 25^\circ\text{C}$, $t_P = 1\text{ms}$	290	A
I_{FSM}	$t_P = 10\text{ms}$; $\sin$; $T_j = 150^\circ\text{C}$	770	A
Module			
$I_{t(RMS)}$	$T_{terminal} = 80^\circ\text{C}$	300	A
T_{stg}		$-40 \sim 125$	$^\circ\text{C}$
V_{Isol}	AC, 1min	4000	V

Features

- Trench Field Stop Technology
- Low switching losses
- Switching frequency up to 30kHz
- Square RBSOA, no latch up
- High short circuit capability
- Positive temperature coefficient for easy paralleling
- MOS input, voltage controlled
- Soft switching 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



SGG145T60UC1

IGBT Modules

Characteristics

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

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 1.5\text{mA}$	4.3	5.2	6.1	V
I_{CES}	$V_{GE} = 0$; $V_{CE} = V_{CES}$; $T_J = 25^{\circ}\text{C}$			2.0	mA
$V_{CE(TO)}$	$T_J = 25^{\circ}\text{C}$		0.8	0.9	V
r_{CE}	$V_{GE} = 15\text{V}$, $T_J = 25(125)^{\circ}\text{C}$		7.0(10.3)	8.0(11.0)	$\text{m}\Omega$
$V_{CE(sat)}$	$I_C = 145\text{A}$; $V_{GE} = 15\text{V}$; chip level		1.65	2.10	V
C_{ies}	under following conditions $V_{GE} = 0$, $V_{CE} = 25\text{V}$, $f = 1\text{MHz}$		8.80		nF
C_{oes}			0.28		
C_{res}			0.27		
L_{CE}				20	nH
R_{CC+EE}	res., terminal-chip $T_C = 25(125)^{\circ}\text{C}$		0.25(0.5)		$\text{m}\Omega$
$t_{d(on)}$	under following conditions: $V_{CC} = 600\text{V}$, $I_C = 145\text{A}$ $R_{Gon} = R_{Goff} = 1\Omega$, $T_J = 150^{\circ}\text{C}$ $V_{GE} = \pm 15\text{V}$		68		ns
t_r			163		ns
$t_{d(off)}$			208		ns
t_f			73		ns
$E_{on}(E_{off})$	$T_C = 150^{\circ}\text{C}$		8.4(2.4)		mJ
Inverse Diode under following conditions:					
$V_F = V_{EC}$	$I_F = 145\text{A}$; $V_{GE} = 0\text{V}$; $T_J = 25^{\circ}\text{C}$		1.48	2.00	V
$V_{(FO)}$	$T_J = 25(150)^{\circ}\text{C}$		1.3(0.95)	1.5(1.1)	V
r_F	$T_J = 25(150)^{\circ}\text{C}$		5.8(8.0)	6.4(8.8)	$\text{m}\Omega$
I_{RRM}	$I_F = 145\text{A}$; $T_J = 150^{\circ}\text{C}$		17		A
Q_{rr}	$di/dt = 3100\text{A/us}$		7.4		μC
E_{rr}	$V_{GE} = \pm 15\text{V}$		1.8		mJ
Thermal Characteristics					
$R_{th(j-c)}$	per IGBT			0.24	K/W
$R_{th(j-c)D}$	per Inverse Diode			0.37	K/W
$R_{th(c-s)}$	per module			0.145	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

Sirectifier®

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IGBT Modules

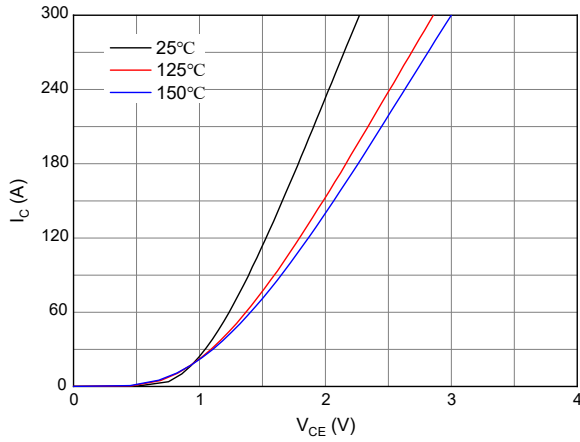


Fig.1. Typical output characteristics ($V_{GE}=15V$)

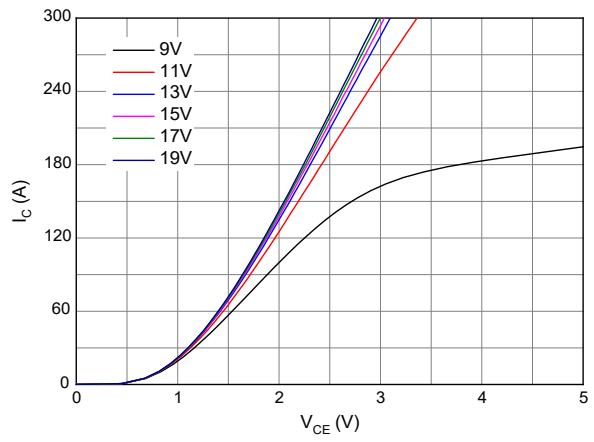


Fig.2. Typical output characteristics ($T_{vj}=150^{\circ}C$)

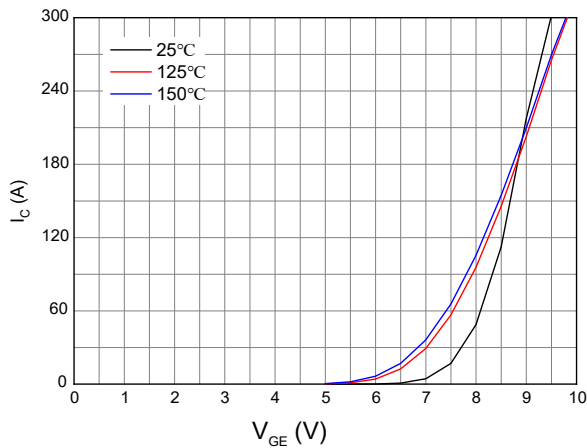


Fig.3. Typical transfer characteristic ($V_{CE}=20V$)

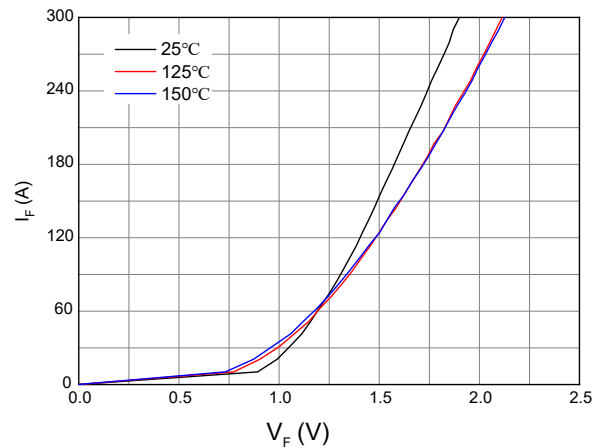


Fig.4. Forward characteristic of Diode

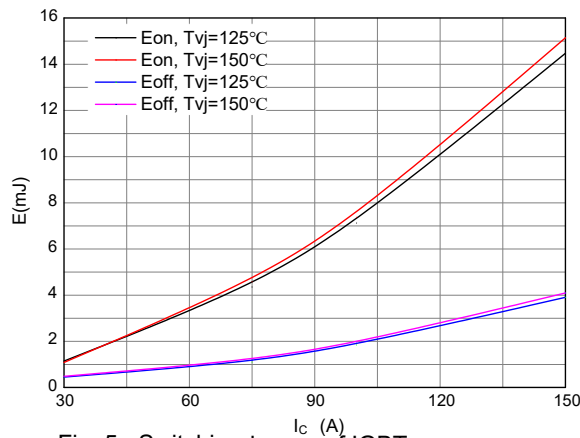


Fig.5. Switching losses of IGBT
 $V_{GE}=\pm 15V$, $R_{Gon}=8\Omega$, $R_{Goff}=8\Omega$, $V_{CE}=400V$

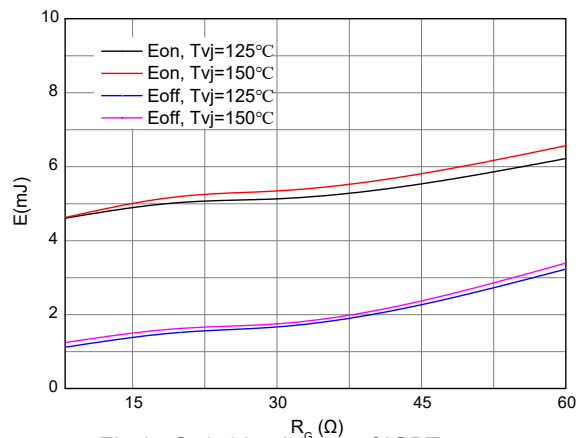


Fig.6. Switching losses of IGBT
 $V_{GE}=\pm 15V$, $I_C=75A$, $V_{CE}=400V$

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IGBT Modules

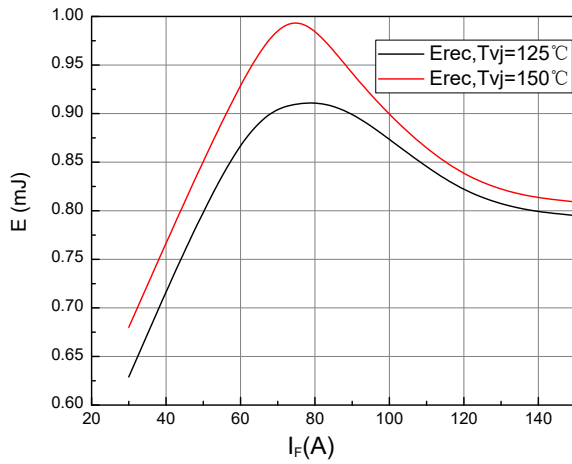


Fig. 7. Switching losses of Diode
 $R_{g\text{on}}=8\Omega$, $V_{CE}=400\text{V}$

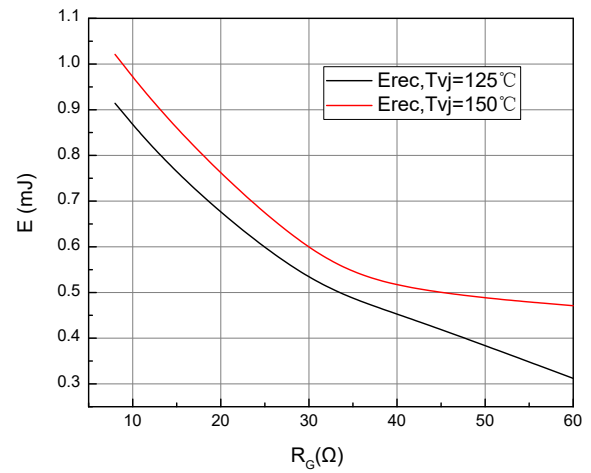


Fig. 8. Switching losses of Diode
 $I_F=75\text{A}$, $V_{CE}=400\text{V}$

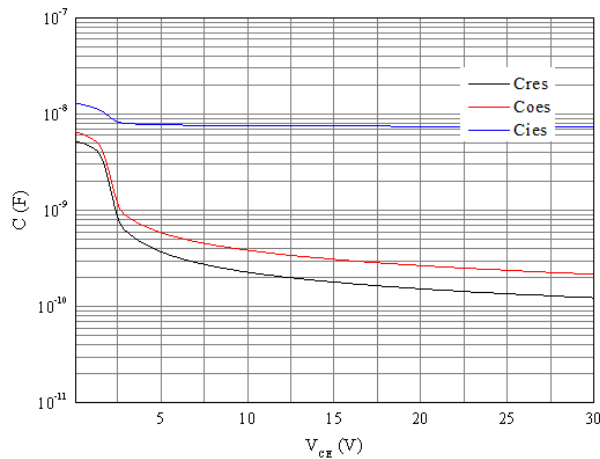


Fig. 9. Capacitance characteristic