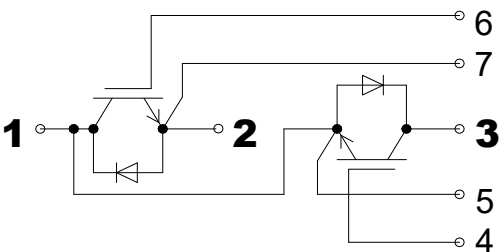


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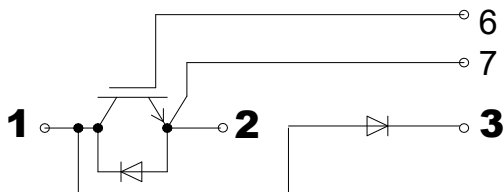
Ultra Fast IGBT Modules



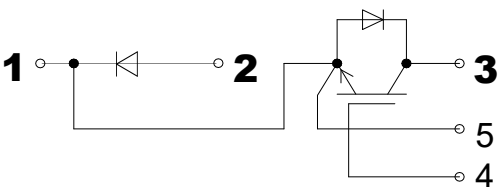
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SDG145N125UC1



Symbol	Test Condition	Value	Unit
IGBT			
V_{CES}		1200	V
I_C	$T_C = 25(100)^{\circ}\text{C}$ per chip	145(100)	A
V_{GES}		± 20	V
T_{vj} (T_{stg})		$-40 \sim +150(125)^{\circ}\text{C}$	
P_{tot}		450	W
INVERSE DIODE			
I_F	$T_C = 25(100)^{\circ}\text{C}$ per chip	145(100)	A
I_{FM}		200	A
V_{RRM}		1200	V
I^2t	$T_j = 125^{\circ}\text{C}$, $t = 10\text{ms}$, $V_R = 0\text{V}$	2000	A^2s

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Symbol	Test Conditions	Min	Typ	Max	Unit
IGBT Tc = 25°C unless otherwise specified					
$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=2mA$	4.5	5.5	6.5	V
I_{CES}	$V_{GE}=0; V_{CE}=V_{CES}; T_j=25(125)^{\circ}C$		0.15	0.5	mA
$V_{CE(TO)}$	$T_j=25(125)^{\circ}C$		1.4(1.6)	1.6(1.8)	V
r_{CE}	$V_{GE}=15V$		11(15)	14(19)	mΩ
$V_{CE(sat)}$	$I_C=100A; V_{GE}=15V; \text{chip level}$		2.5	3.5	V
C_{ies}	$V_{GE}=0V, V_{CE}=25V, f=1MHz$		6.0		nF
C_{oes}			0.80		
C_{res}			0.40		
LCE				30	nH
RCC'+EE'	Termial to Case, $T_c=25^{\circ}C$		0.35		mΩ
$t_{d(on)}$	$V_{CC} = 600V, I_C = 100A$ $R_{GON} = R_{GOFF} = 10\Omega$ $T_j=125^{\circ}C$ $V_{GE}=\pm 15V$		25		ns
t_r			50		ns
$t_{d(off)}$			290		ns
t_f			90		ns
E_{on}/E_{off}			4.50/2.30		mJ
INVERSE DIODE Tc = 25°C unless otherwise specified					
V_F	$I_F = 100A; V_{GE}=0V; T_j = 25^{\circ}C$		1.9	2.2	V
Q_{rr}	$I_F=100A; V_R=300V;$ $T_j=25^{\circ}C \text{ di/dt} = 600A/us,$ $V_{GE}=-15V$		8.5		μC
I_{RRM}			75		A
E_{rec}			2.30		mJ
THERMAL CHARACTERISTICS					
$R_{th(j-c)}$	per IGBT			0.31	K/W
$R_{th(j-c)D}$	per FRD			0.45	K/W
Mechanical Data					
Ms		2.5		4	Nm
Weight			158		g

Features

- NPT Technology IGBT
- Fast Recovery Free Wheeling Diode
- Low Switching Losses
- $V_{ce(sat)}$ with positive temperature coefficient
- Fast Switching and short tail current
- Switched mode power supplies at $f_{sw}>20KHz$
- Resonant inverters up to 100KHz
- Electronic Welders at $f_{sw}>20KHz$

Application

- Welding inverters
- Inductive Heating

Advantages

- Space and weight savings
- Reduced protection circuits

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Fig 1. output characteristic IGBT,
 $I_c=f(V_{CE}), V_{GE}=15V$

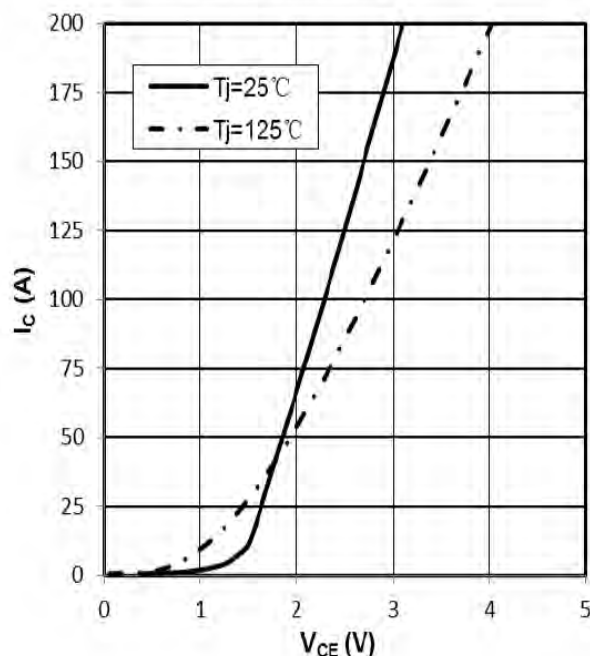


Fig 2. output characteristic IGBT,
 $I_c=f(V_{CE}), T_j=125^\circ\text{C}$

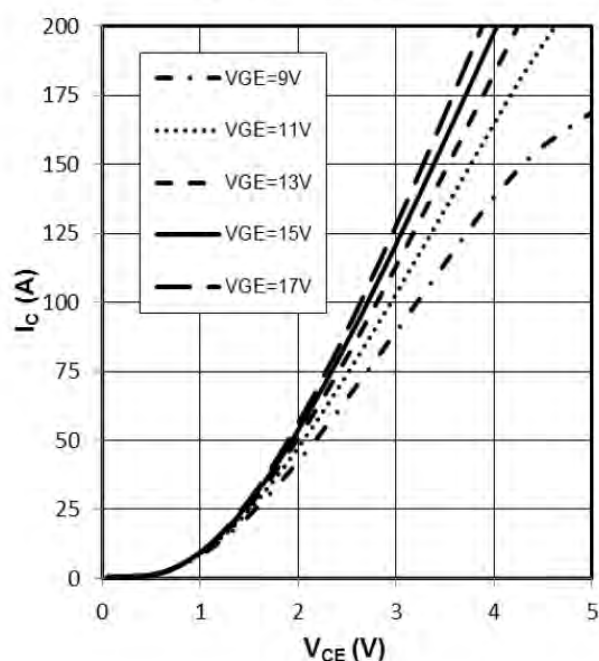


Fig 3. transfer characteristic IGBT,
 $I_c=f(V_{GE}), V_{CE}=20V$

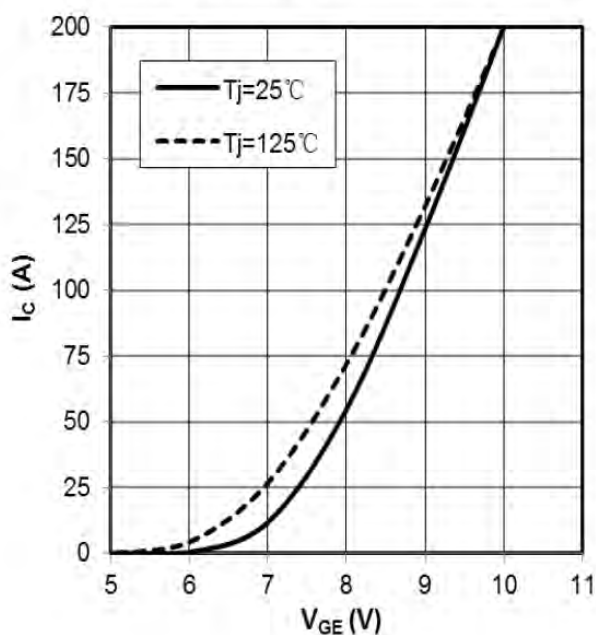
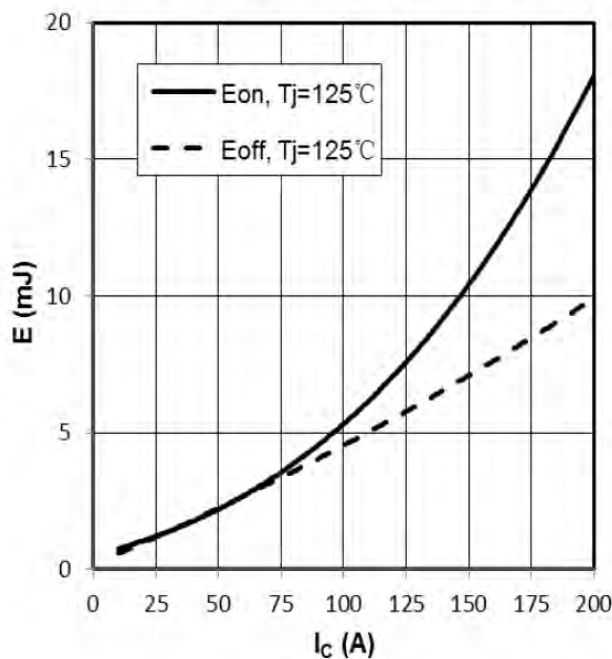


Fig 4. switching losses IGBT, $E_{on}=f(I_c), E_{off}=f(I_c)$,
 $V_{GE}=\pm 15V, R_{Gon}=5.6\Omega, R_{Goff}=5.6\Omega, V_{CE}=600V$



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Fig 5. switching losses IGBT,
 $E_{on}=f(R_g), E_{off}=f(R_g), V_{GE}=\pm 15V, I_C=100A, V_{CE}=600V$

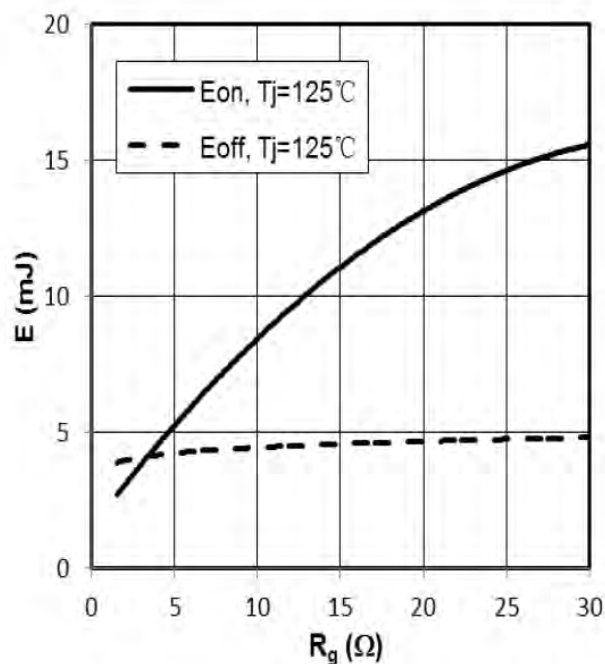


Fig 6. transient thermal impedance IGBT, $Z_{thjc}=f(t)$

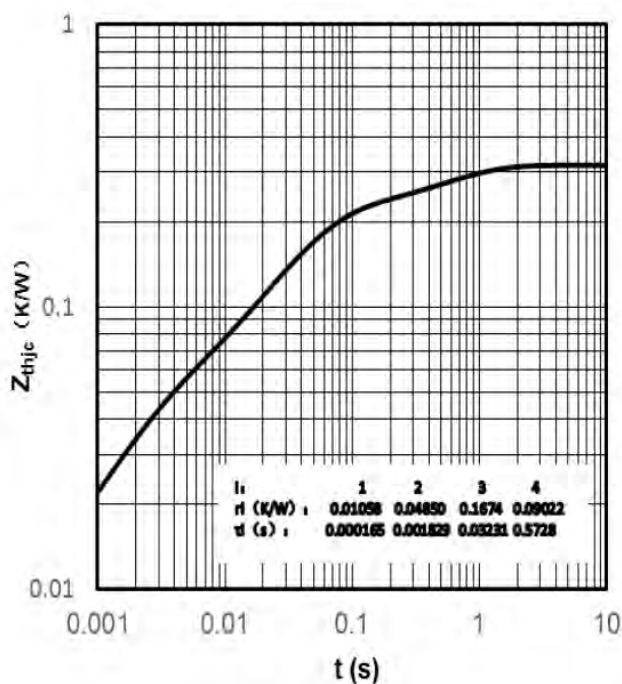


Fig 7. reverse bias safe operating area IGBT,
 $I_C=f(V_{CE}), V_{GE}=\pm 15V, R_{goff}=5.6\Omega, T_{vj}=125^\circ C$

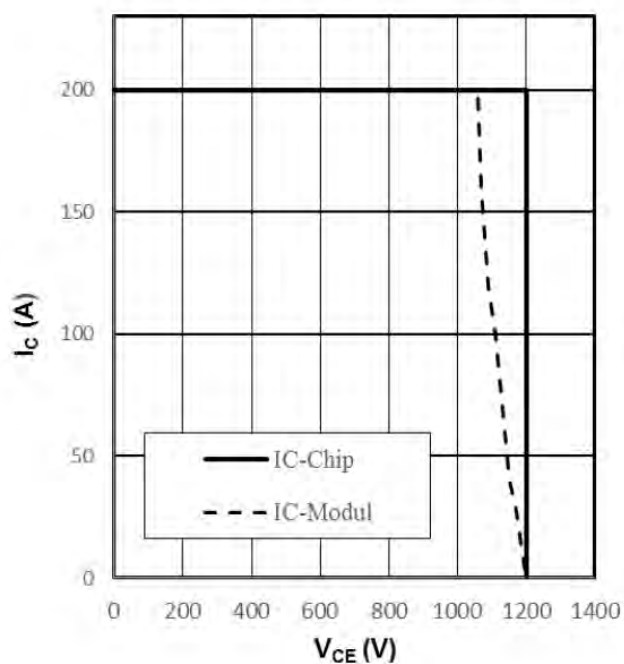
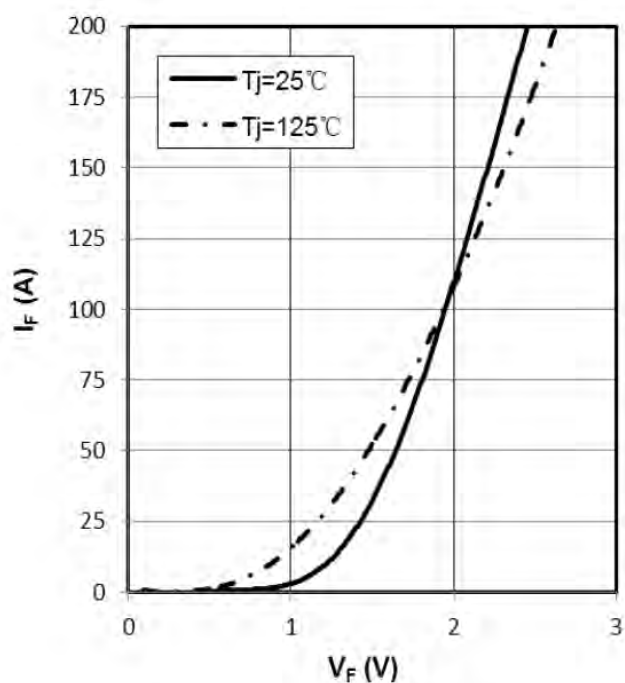


Fig 8. forward characteristic of Diode, $I_F=f(V_F)$



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Fig 9. switching losses Diode,
 $E_{rr}=f(I_F), R_{Gon}=7.5\Omega, V_{CE}=600V$

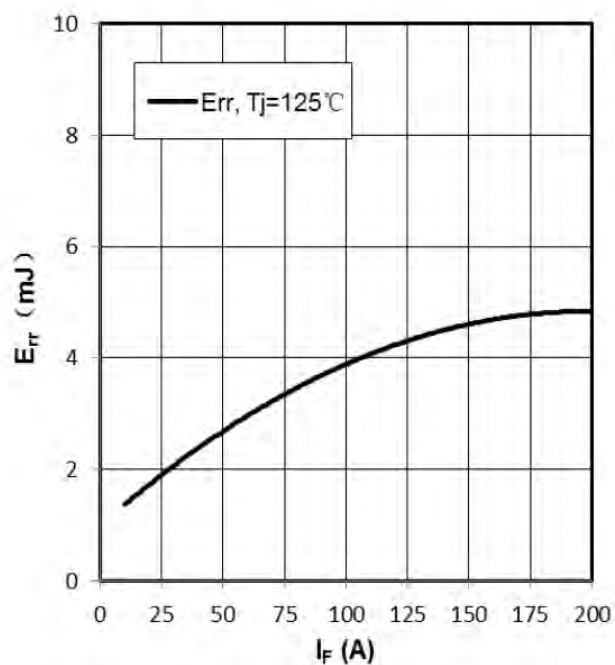
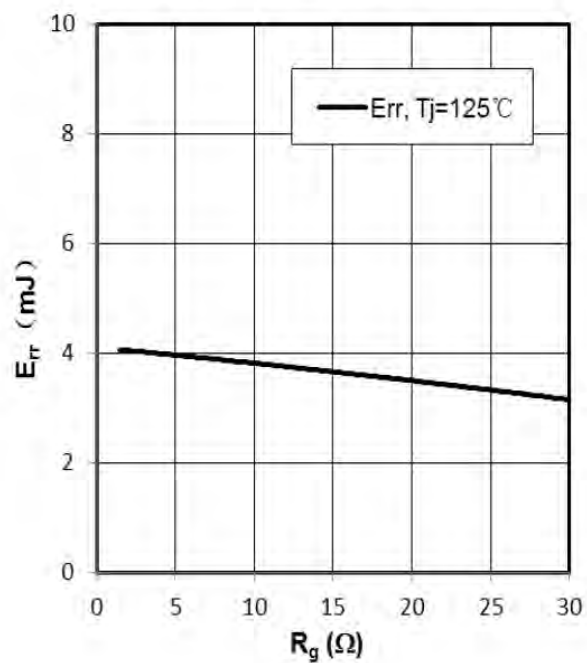


Fig 10. switching losses Diode,
 $E_{rr}=f(R_g), I_F=100A, V_{CE}=600V$



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