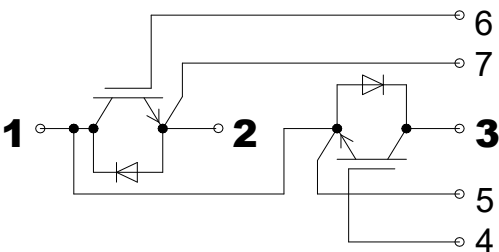


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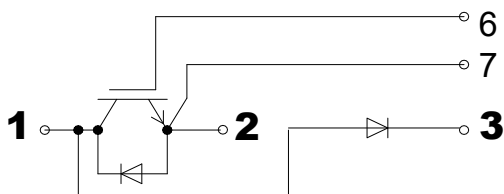
Ultra Fast IGBT Modules



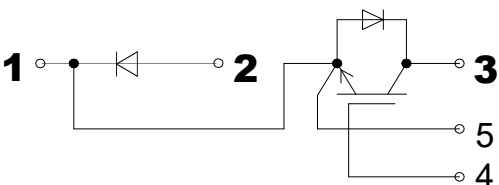
SGG75N125UC1



SGD75N125UC1



SDG75N125UC1



Symbol	Test Condition	Value	Unit
IGBT			
V_{CES}		1200	V
I_C	$T_C = 25(100)^{\circ}\text{C}$ per chip	75(50)	A
V_{GES}		± 20	V
T_{vj} (T_{stg})		$-40 \sim +150(125)$	$^{\circ}\text{C}$
P_{tot}		250	W
INVERSE DIODE			
I_F	$T_C = 25(100)^{\circ}\text{C}$ per chip	100(50)	A
I_{FM}		150	A
V_{RRM}		1200	V
I^2t	$T_j = 125^{\circ}\text{C}$, $t = 10\text{ms}$, $V_R = 0\text{V}$	1200	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 =1.7mA	4.5	5.5	6.5	V
I _{CES}	V _{GE} =0; V _{CE} =V _{CES} ; T _j =25(125)°C		0.15	0.5	mA
V _{CE(TO)}	T _j =25(125)°C		0.8(0.7)	0.9(0.8)	V
r _{CE}	V _{GE} =15V		21(30)	24(32)	mΩ
V _{CE(sat)}	I _C =50A; V _{GE} =15V; chip level		3.2	3.7	V
C _{ies}	V _{GE} =0V, V _{CE} =25V, f=1MHz		3.3		nF
C _{oes}			0.20		
C _{res}			0.20		
LCE				30	nH
RCC'+EE'	Termial to Case, Tc=25°C		0.35		mΩ
t _{d(on)}	V _{CC} = 600V, I _C = 50A R _{GON} = R _{GOFF} = 8.2Ω T _j =150°C V _{GE} =±15V		118		ns
t _r			28		ns
t _{d(off)}			350		ns
t _f			75		ns
E _{on} /E _{off}			5.50/2.30		mJ
INVERSE DIODE Tc = 25°C unless otherwise specified					
V _F	I _F =50A; V _{GE} =0V; T _j = 25°C		2.2	2.5	V
Q _{rr}	I _F =50A; V _R =300V; T _j =25°C di/dt = 600A/us, V _{GE} =-15V		2.2		μC
I _{RRM}			25		A
E _{rec}			3.30		mJ
THERMAL CHARACTERISTICS					
R _{th(j-c)}	per IGBT			0.35	K/W
R _{th(j-c)D}	per FRD			0.96	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 $f_{sw}>25KHz$
- Resonant inverters up to 100KHz
- Electronic Welders at $f_{sw}>25KHz$

Application

- Welding inverters
- Inductive Heating

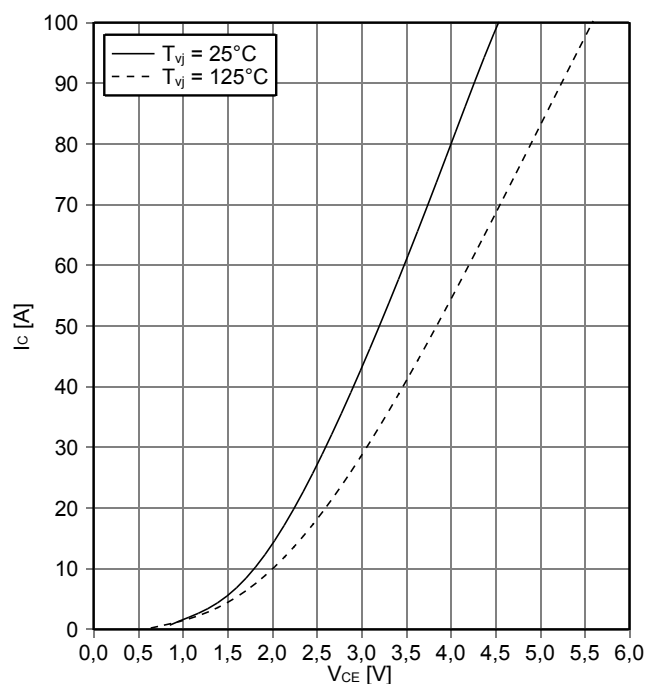
Advantages

- Space and weight savings
- Reduced protection circuits

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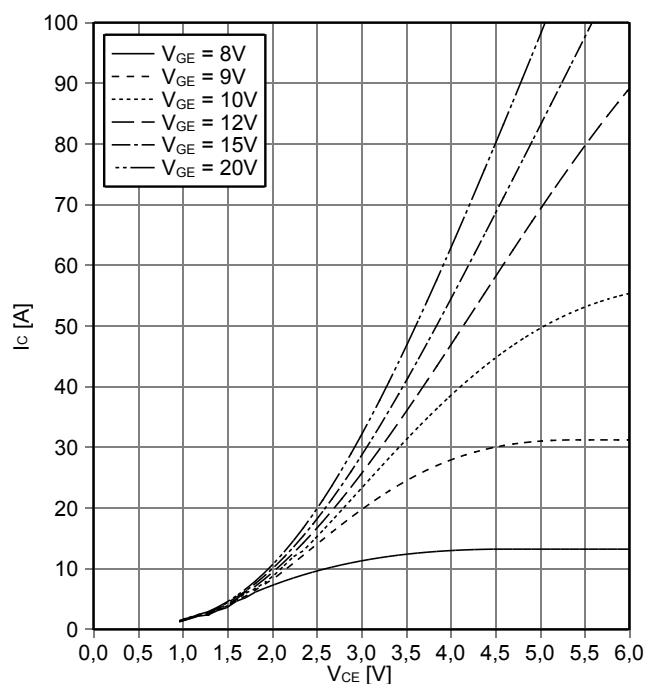
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Output characteristic IGBT, Inverter (typical)

$$I_C = f(V_{CE})$$

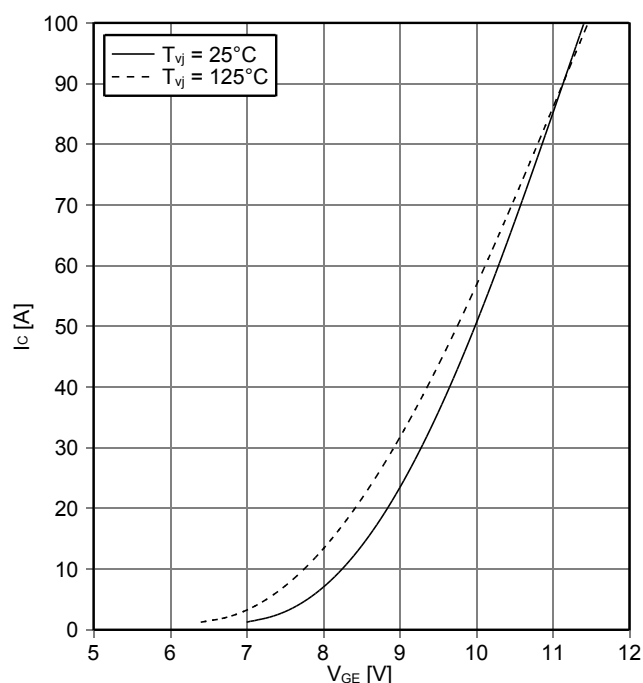
$$V_{GE} = 15\text{ V}$$



Output characteristic IGBT, Inverter (typical)

$$I_C = f(V_{CE})$$

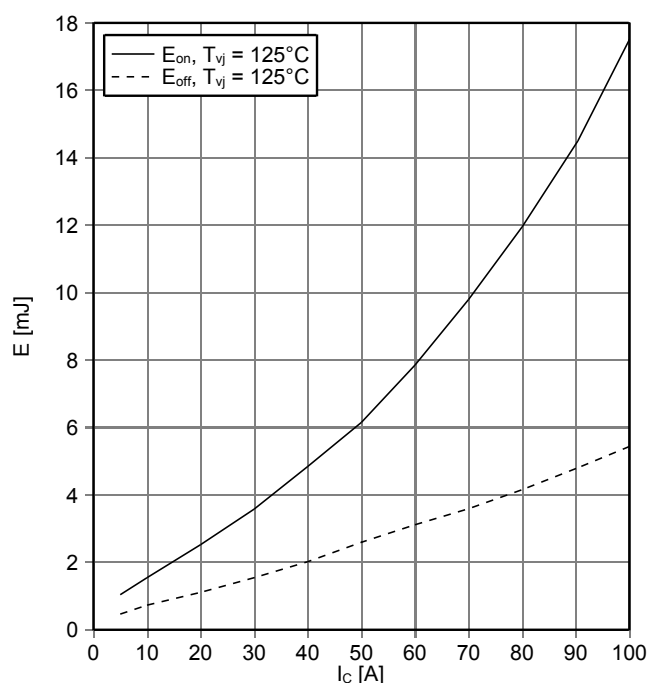
$$T_{vj} = 125^\circ\text{C}$$



Transfer characteristic IGBT, Inverter (typical)

$$I_C = f(V_{GE})$$

$$V_{CE} = 20\text{ V}$$



Switching losses IGBT, Inverter (typical)

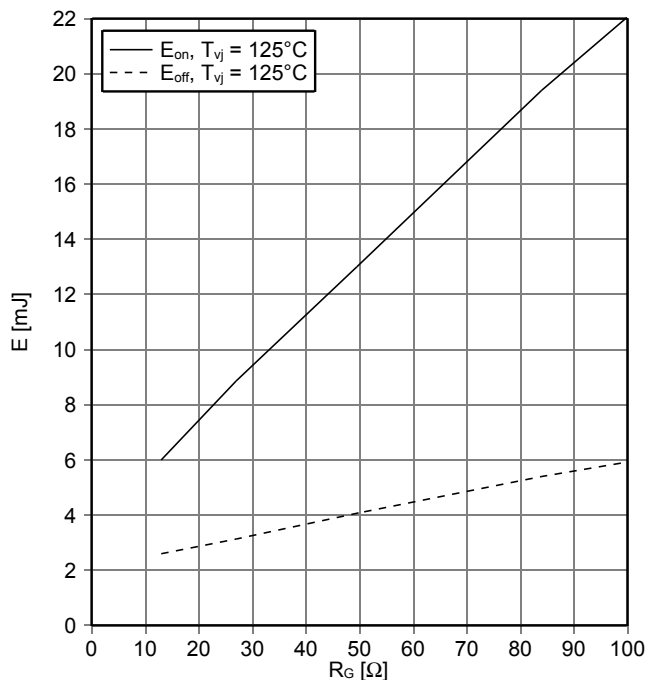
$$E_{on} = f(I_C), E_{off} = f(I_C)$$

$$V_{GE} = \pm 15\text{ V}, R_{Gon} = 13\Omega, R_{Goff} = 13\Omega, V_{CE} = 600\text{ V}$$

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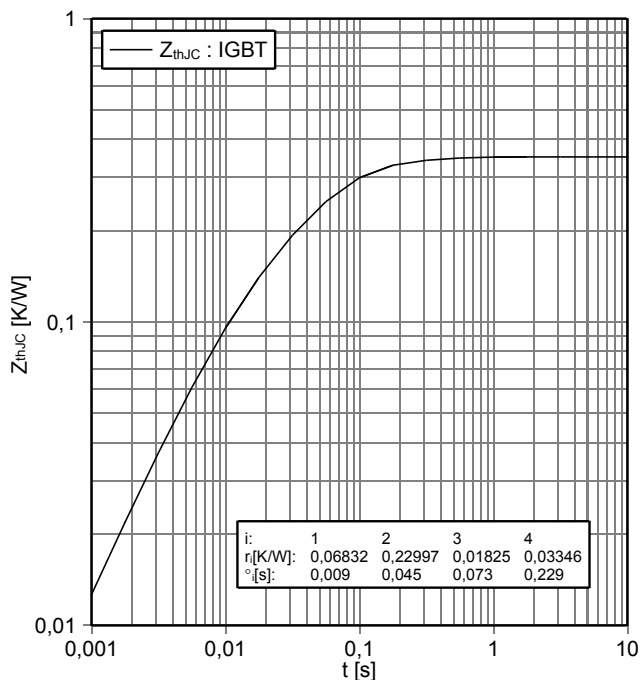
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Switching losses IGBT, Inverter (typical)

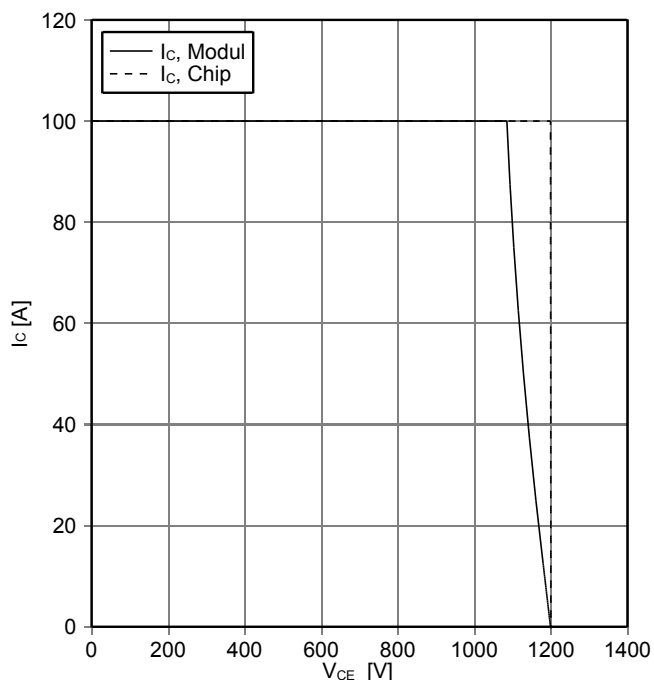
$E_{on} = f(R_G), E_{off} = f(R_G)$

$V_{GE} = \pm 15 \text{ V}, I_C = 50 \text{ A}, V_{CE} = 600 \text{ V}$



Transient thermal impedance IGBT, Inverter

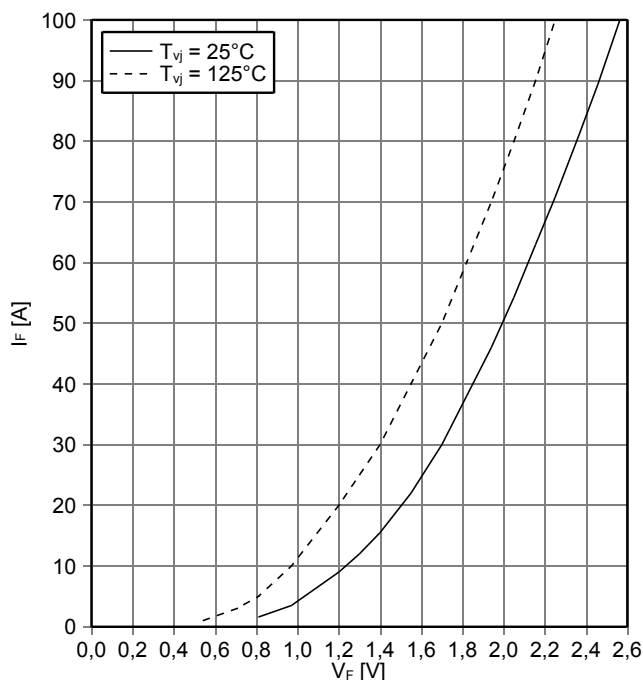
$Z_{thJC} = f(t)$



Reverse bias safe operating area IGBT, Inverter

(RBSOA) $I_C = f(V_{CE})$

$V_{GE} = \pm 15 \text{ V}, R_{Goff} = 13 \Omega, T_j = 125^{\circ}\text{C}$



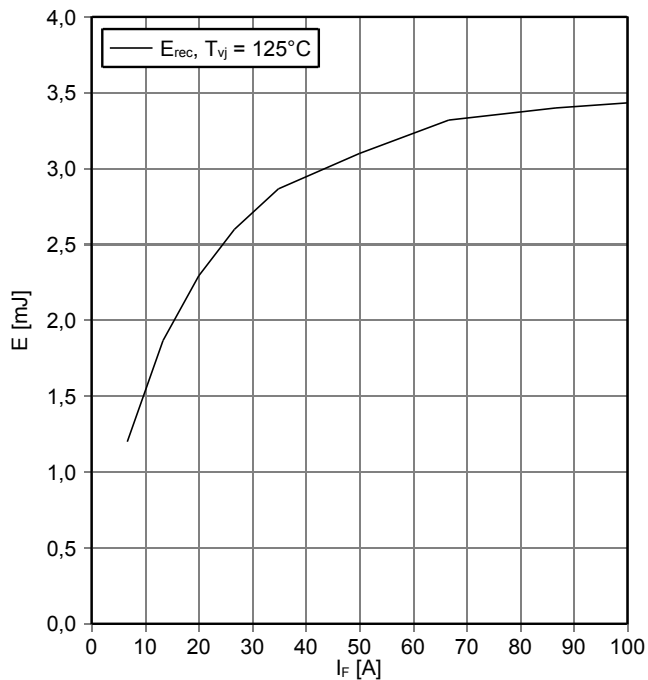
Forward characteristic of Diode, Inverter (typical)

$I_F = f(V_F)$

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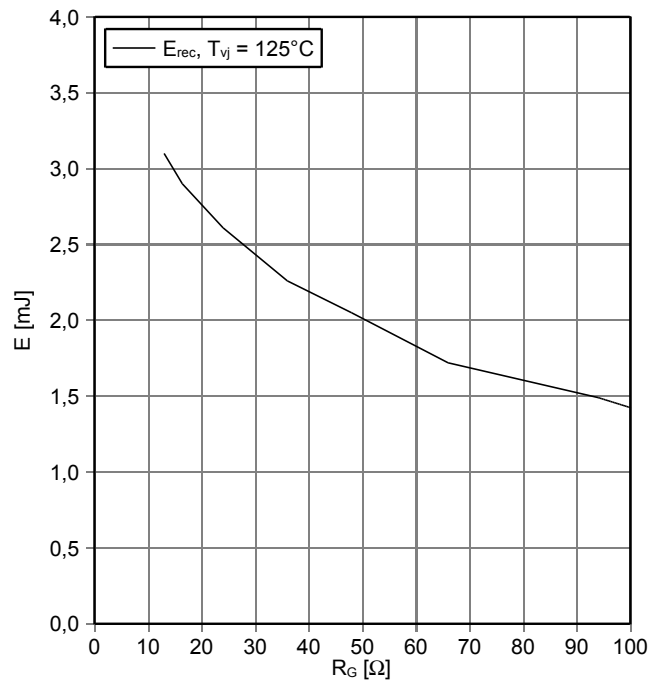
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Ultra Fast IGBT Modules



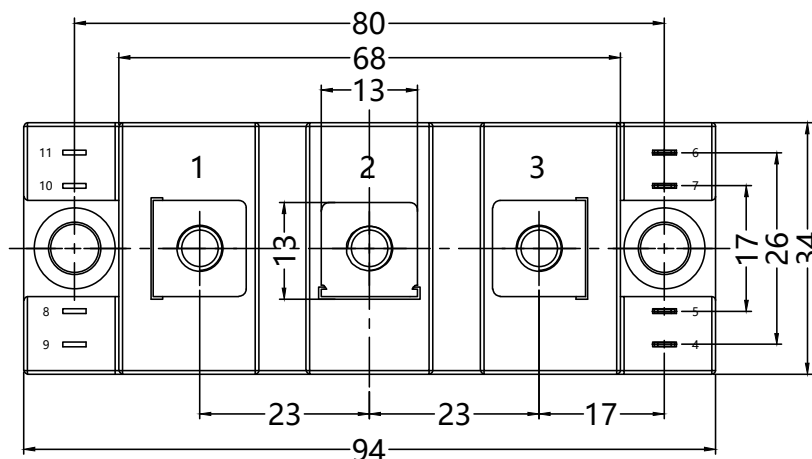
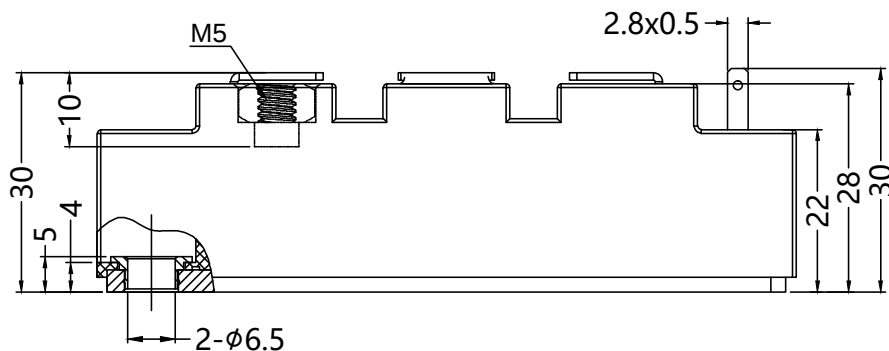
Switching losses Diode, Inverter (typical)

$E_{rec} = f(I_F)$
 $R_{Gon} = 13 \Omega$, $V_{CE} = 600 \text{ V}$



Switching losses Diode, Inverter (typical)

$E_{rec} = f(R_G)$
 $I_F = 50 \text{ A}$, $V_{CE} = 600 \text{ V}$



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