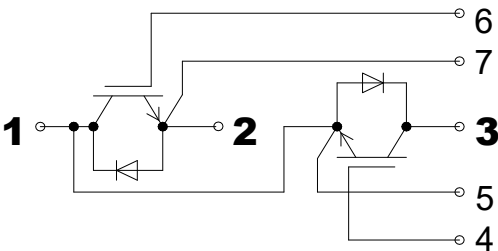


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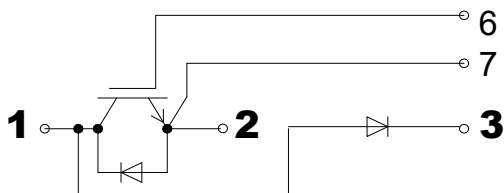
Ultra Fast IGBT Modules



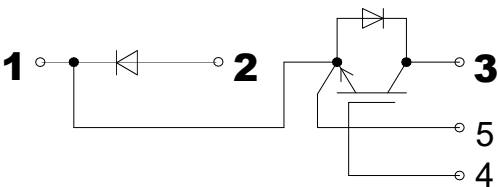
SGG200N125UC2



SGD200N125UC2



SDG200N125UC2



Symbol	Test Condition	Value	Unit
IGBT			
V _{CES}		1200	V
I _C	T _C = 25(100)°C per chip	200(150)	A
V _{GES}		±20	V
T _{vj} (T _{stg})		-40 ~ +150(125)	°C
P _{tot}		1270	W
INVERSE DIODE			
I _F	T _C =25(100)°C per chip	200(100)	A
I _{FM}	T _C =25(100)°C per chip	400(300)	A
V _{RRM}		1200	V
I _{FSM}	T _j =150°C, t _p =10ms	1450	A

SGG200N125UC2

Ultra Fast IGBT Modules

Symbol	Test Conditions	Min	Typ	Max	Unit
IGBT Tc = 25°C unless otherwise specified					
V _{GE(th)}	V _{GE} =V _{CE} , I _C =6mA	4.5	5.5	6.5	V
I _{CES}	V _{GE} = 0; V _{CE} =V _{CES} ; T _j =25(125)°C		0.25(1.50)	0.45(2.00)	mA
V _{CE(TO)}	T _j =25(125)°C		2.0(1.8)	2.5(2.3)	V
r _{CE}	V _{GE} =15V		13.0(15.0)	14.0(19.0)	mΩ
V _{CE(sat)}	I _C =150A; V _{GE} =15V; chip level		3.30	3.75	V
C _{ies}	V _{GE} =0V, V _{CE} =25V, f=1MHz		10.0	13.0	nF
C _{oes}			1.60	2.00	
C _{res}			0.80	1.20	
L _{CE}				20	nH
R _{CC'+EE'}	Terminal to Case, Tc=25(125)°C		0.35(0.50)		mΩ
t _{d(on)}	V _{CC} = 600V, I _C = 150A R _{GON} = R _{G_{OFF}} = 4Ω T _j =125°C V _{GE} =±15V		75		ns
t _r			35		ns
t _{d(off)}			410		ns
t _f			24		ns
E _{on} /E _{off}			14.0/8.0		mJ
INVERSE DIODE Tc = 25°C unless otherwise specified					
V _F	I _F =150A; V _{GE} =0V; T _j = 25°C		1.9	2.5	V
Q _{rr}	I _F =150A; V _R =300V; T _j =25°C di/dt = 600A/us, V _{GE} =-15V		8.5		μC
I _{R_{RM}}			55		A
E _{rec}			12.0		mJ
THERMAL CHARACTERISTICS					
R _{th(j-c)}	per IGBT			0.095	K/W
R _{th(j-c)D}	per FRD			0.250	K/W
Mechanical Data					
Ms		2.5		5	Nm
Weight			320		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

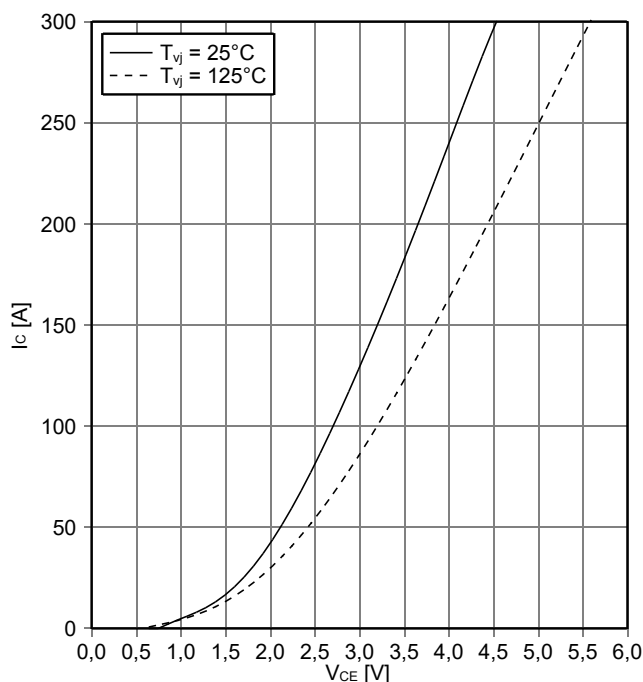
- Welding inverters
- Inductive Heating

Advantages

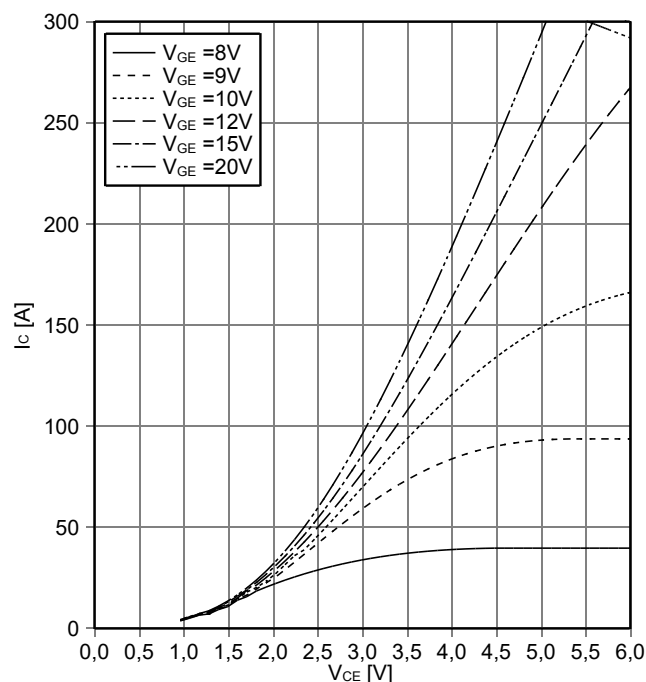
- Space and weight savings
- Reduced protection circuits

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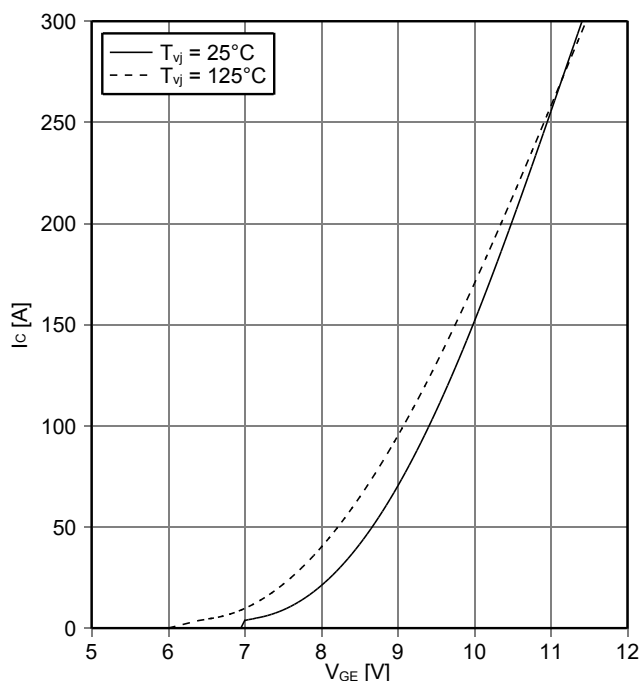
Ultra Fast IGBT Modules



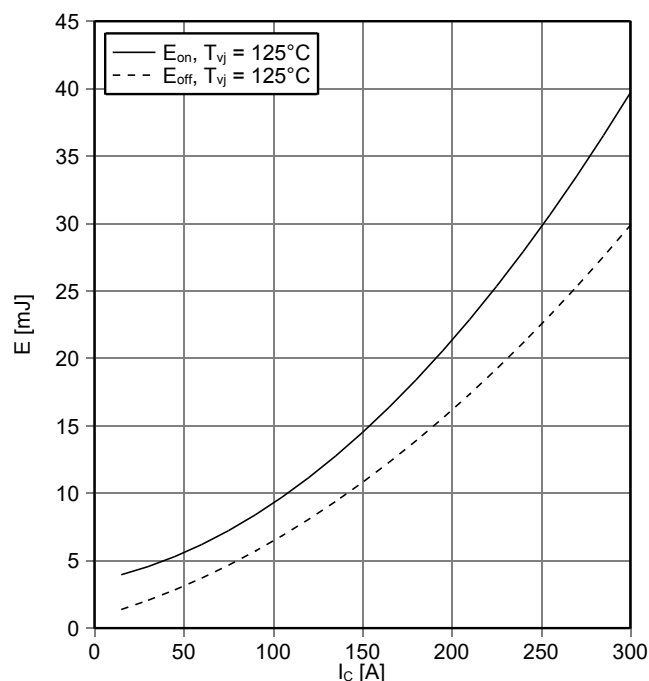
Output characteristic IGBT, Inverter (typical)
 $I_C = f(V_{CE}), V_{GE} = 15\text{ V}$



Output characteristic IGBT, Inverter (typical)
 $I_C = f(V_{CE}), T_{vj} = 125^\circ\text{C}$



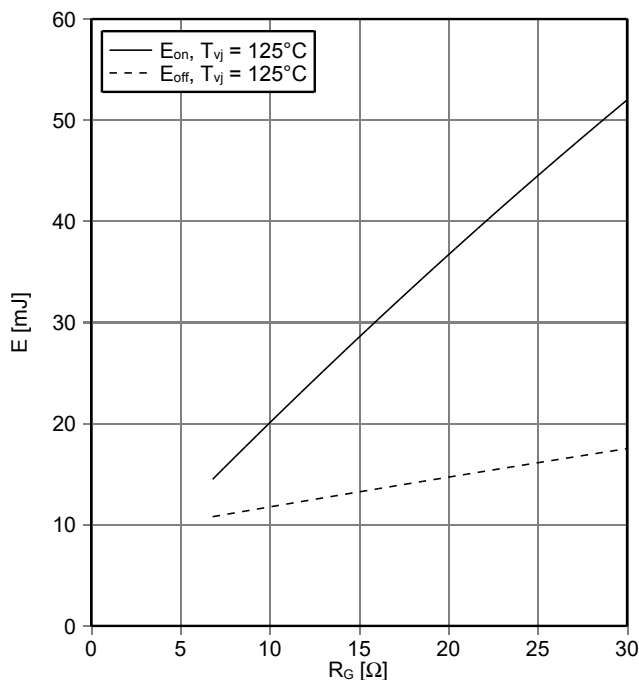
Transfer characteristic IGBT, Inverter (typical)
 $I_C = f(V_{GE}), V_{CE} = 20\text{ V}$



Switching losses IGBT, Inverter (typical)
 $E_{on} = f(I_C), E_{off} = f(I_C)$
 $V_{GE} = \pm 15\text{ V}, R_{Gon} = 6.8\ \Omega, R_{Goff} = 6.8\ \Omega, V_{CE} = 600\text{ V}$

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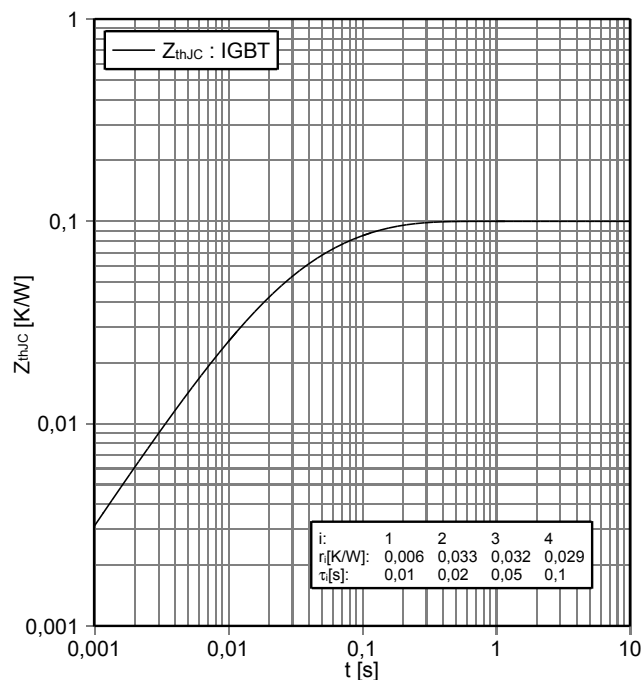
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Switching losses IGBT, Inverter (typical)

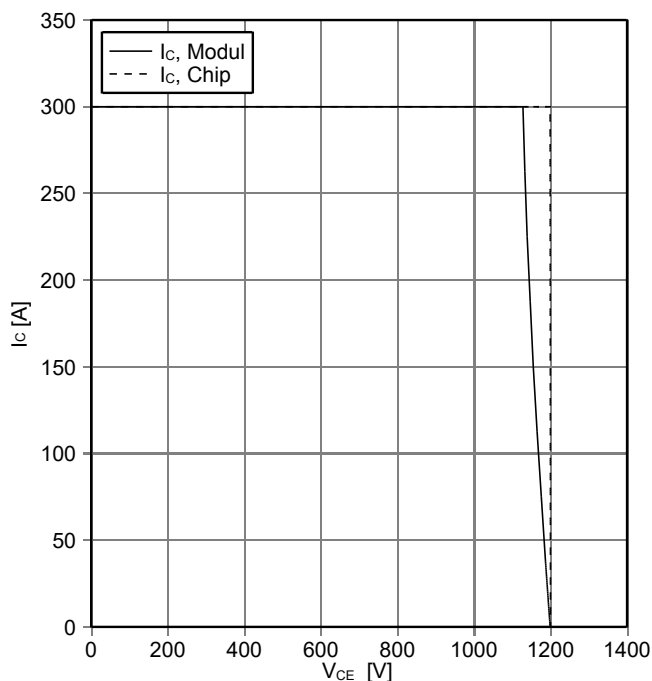
$$E_{on} = f(R_G), E_{off} = f(R_G)$$

$$V_{GE} = \pm 15 \text{ V}, I_c = 150 \text{ A}, V_{CE} = 600 \text{ V}$$



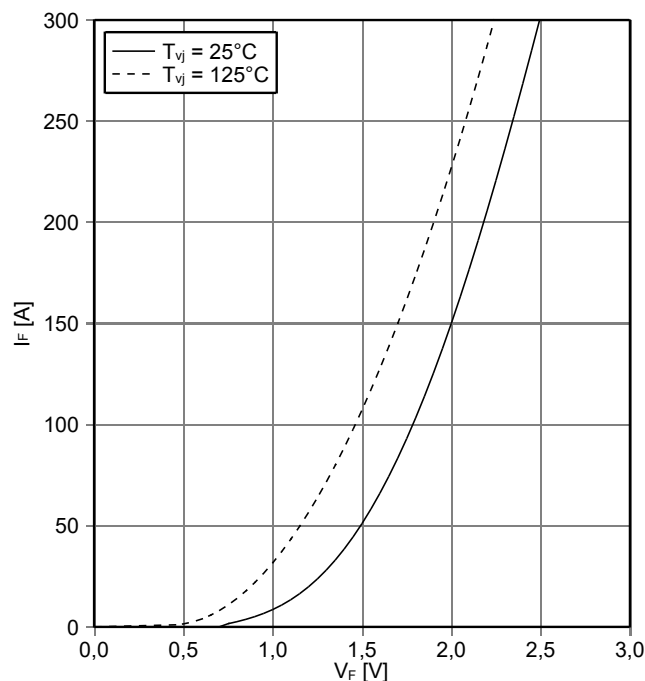
Transient thermal impedance IGBT, Inverter

$$Z_{thJC} = f(t)$$



Reverse bias safe operating area IGBT, Inverter (RBSOA) $I_c = f(V_{CE})$

$$V_{GE} = \pm 15 \text{ V}, R_{Goff} = 6.8 \text{ } \Omega, T_{vj} = 125^\circ\text{C}$$

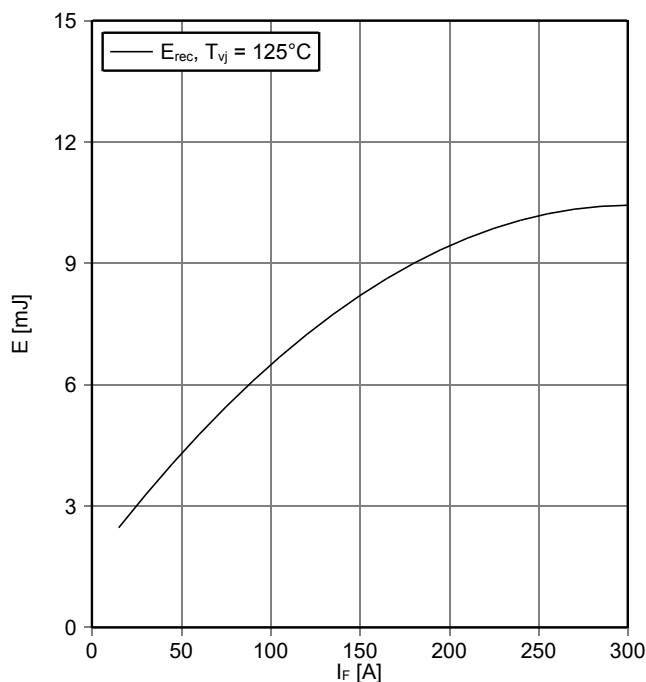


Forward characteristic of Diode, Inverter (typical)

$$I_F = f(V_F)$$

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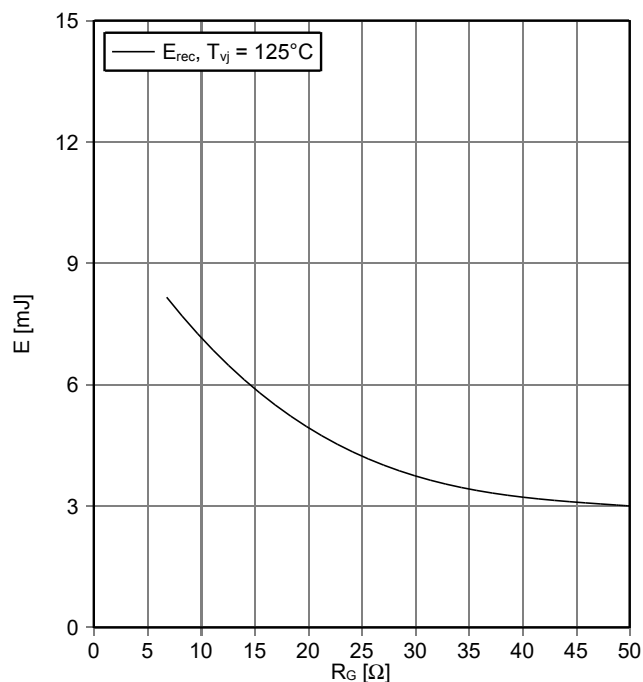
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Switching losses Diode, Inverter (typical)

$$E_{rec} = f(I_F)$$

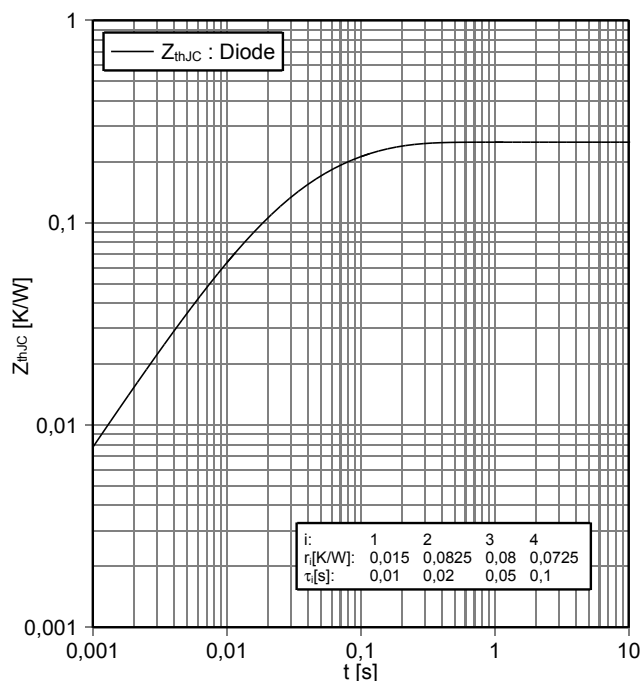
$$R_{Gon} = 6.8 \Omega, V_{CE} = 600 \text{ V}$$



Switching losses Diode, Inverter (typical)

$$E_{rec} = f(R_G)$$

$$I_F = 150 \text{ A}, V_{CE} = 600 \text{ V}$$



Transient thermal impedance Diode, Inverter

$$Z_{thJC} = f(t)$$

i:	1	2	3	4
r_i [K/W]:	0,015	0,0825	0,08	0,0725
τ_i [s]:	0,01	0,02	0,05	0,1

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