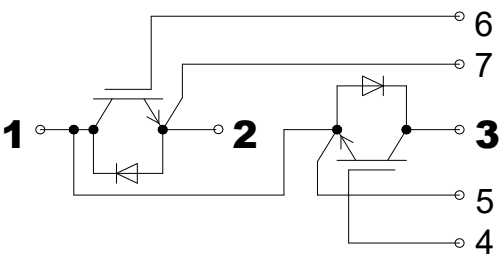


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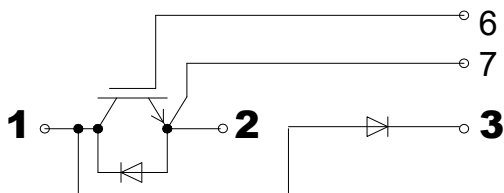
Ultra Fast IGBT Modules



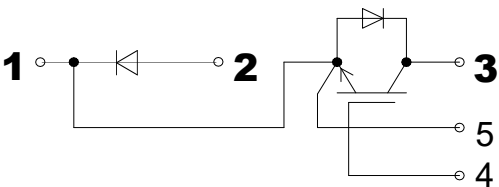
SGG400N125UC2



SGD400N125UC2



SDG400N125UC2



Symbol	Test Condition	Value	Unit
IGBT			
V_{CES}		1200	V
I_C	$T_C = 25(100)^{\circ}\text{C}$ per chip	400(300)	A
V_{GES}		± 20	V
T_{vj} (T_{stg})		$-40 \sim +150(125)$	$^{\circ}\text{C}$
P_{tot}		2350	W
INVERSE DIODE			
I_F	$T_C = 25(100)^{\circ}\text{C}$ per chip	400(300)	A
I_{FM}	$T_C = 25(100)^{\circ}\text{C}$ per chip	800(600)	A
V_{RRM}		1200	V
I_{FSM}	$T_j = 150^{\circ}\text{C}$, $t_p = 10\text{ms}$	2950	A

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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 =12mA	4.5	5.5	6.5	V
I _{CES}	V _{GE} =0; V _{CE} =V _{CES} ; T _j =25(125)°C		0.55(3.50)	0.65(4.00)	mA
V _{CE(TO)}	T _j =25(125)°C		1.4(1.7)		V
r _{CE}	V _{GE} =15V		10.0(8.0)	11.0(9.5)	mΩ
V _{CE(sat)}	I _C =300A; V _{GE} =15V; chip level		2.50	3.25	V
C _{ies}	V _{GE} =0V, V _{CE} =25V, f=1MHz		22.0	30.0	nF
C _{oes}			3.30	3.90	
C _{res}			1.20	1.60	
LCE				20	nH
RCC'+EE'	Terminal to Case, Tc=25(125)°C		0.35(0.50)		mΩ
t _{d(on)}	V _{CC} = 600V, I _C = 300A R _{GON} = R _{GOFF} = 3Ω T _j =125°C V _{GE} =±15V		70		ns
t _r			49		ns
t _{d(off)}			499		ns
t _f			32		ns
E _{on} /E _{off}			17.0/18.0		mJ
INVERSE DIODE Tc = 25°C unless otherwise specified					
V _F	I _F =300A; V _{GE} =0V; T _j = 25°C		2.2	2.5	V
Q _{rr}	I _F =300A; V _R =300V; T _j =25°C di/dt = 600A/us, V _{GE} =-15V		12.5		μC
I _{RRM}			85		A
E _{rec}			17.0		mJ
THERMAL CHARACTERISTICS					
R _{th(j-c)}	per IGBT			0.055	K/W
R _{th(j-c)D}	per FRD			0.125	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 $f_{sw}>25KHz$
- Resonant inverters up to 100KHz
- Electronic Welders at $f_{sw}>20KHz$

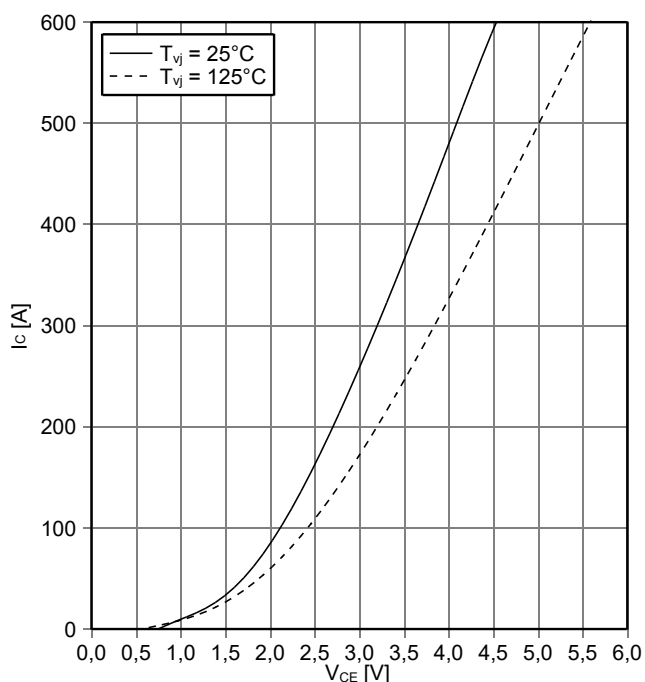
Application

- Welding inverters
- Inductive Heating
- Space and weight savings
- Reduced protection circuits
- This type IGBT can be equivalent for SEMIKRON SKM400GB125D or Infineon FF300R12KS4

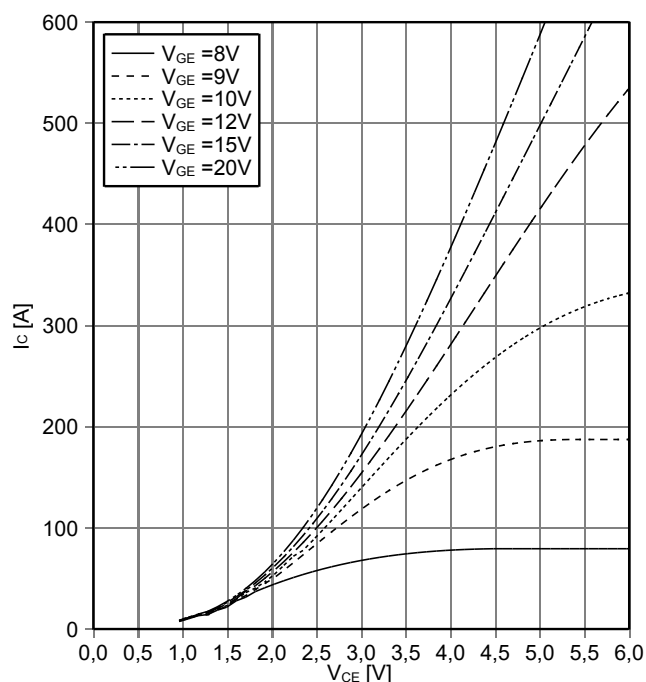
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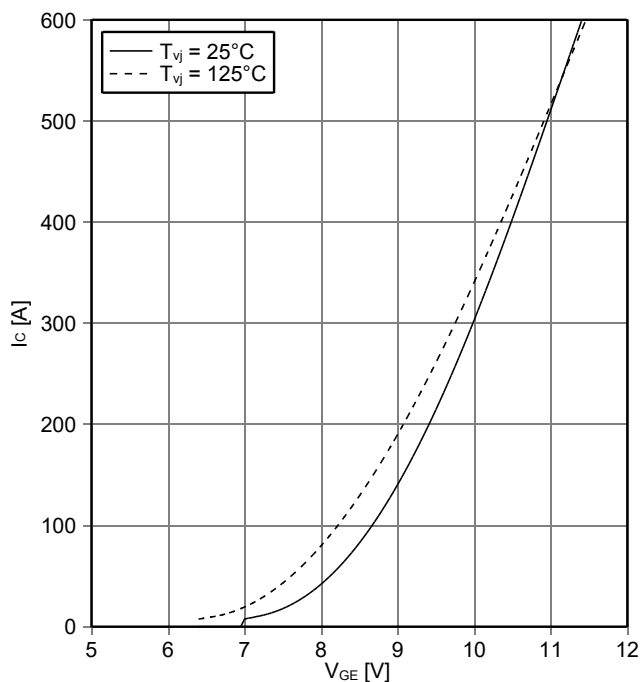
Ultra Fast IGBT Modules



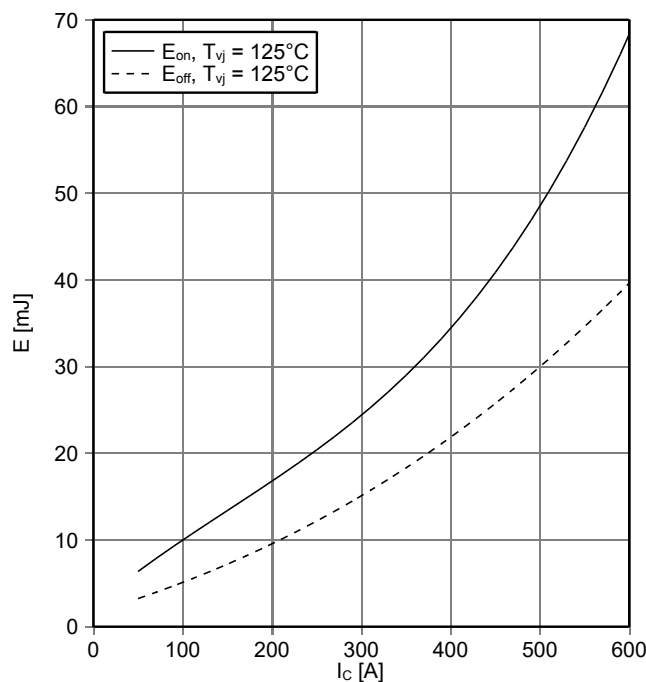
Output characteristic IGBT, Inverter (typical)
 $I_C = f(V_{CE}), V_{GE} = 15\text{ V}$



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



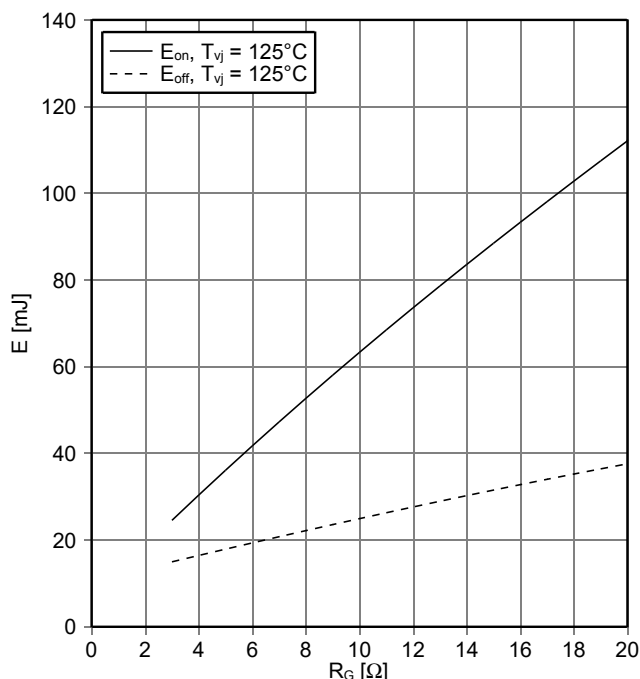
Transfer characteristic IGBT, Inverter (typical)
 $I_C = f(V_{GE})$
 $V_{CE} = 20\text{ V}$



Switching losses IGBT, Inverter (typical)
 $E_{on} = f(I_C), E_{off} = f(I_C)$
 $V_{GE} = \pm 15\text{ V}, R_{Gon} = 3\ \Omega, R_{Goff} = 3\ \Omega, V_{CE} = 600\text{ V}$

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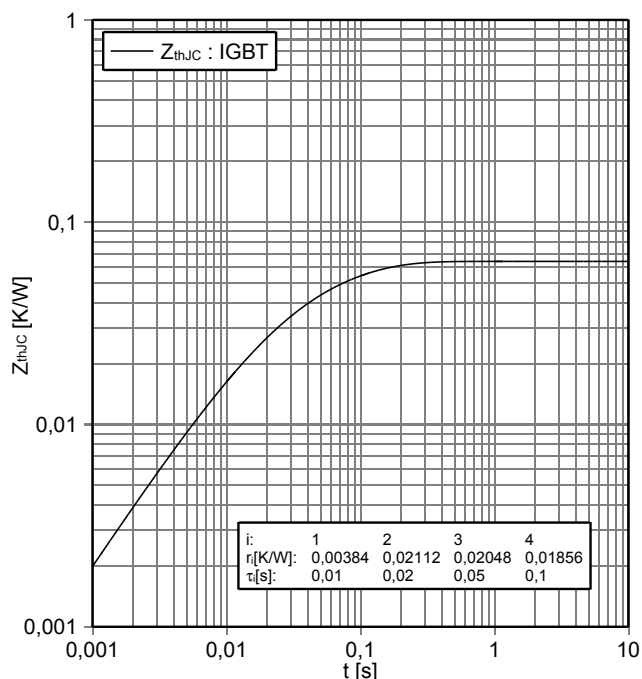
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Switching losses IGBT, Inverter (typical)

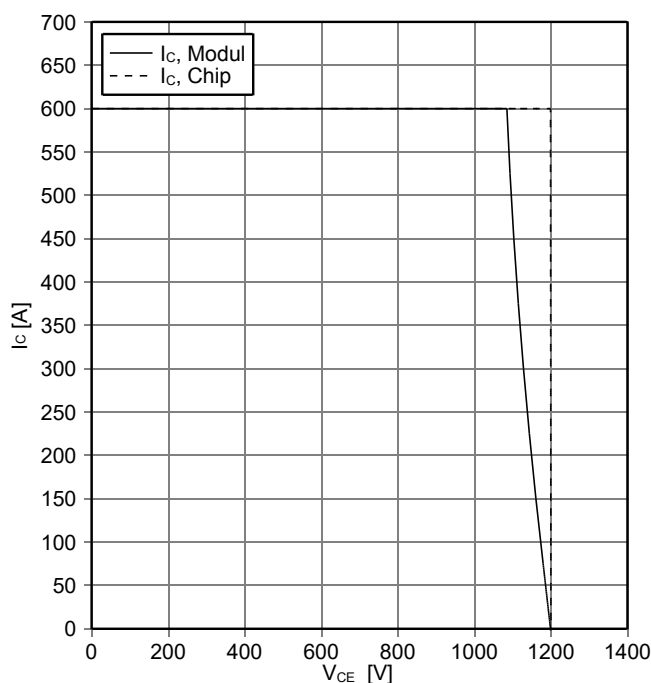
$$E_{on} = f(R_G), E_{off} = f(R_G)$$

$$V_{GE} = \pm 15 \text{ V}, I_C = 300 \text{ A}, V_{CE} = 600 \text{ V}$$



Transient thermal impedance IGBT, Inverter

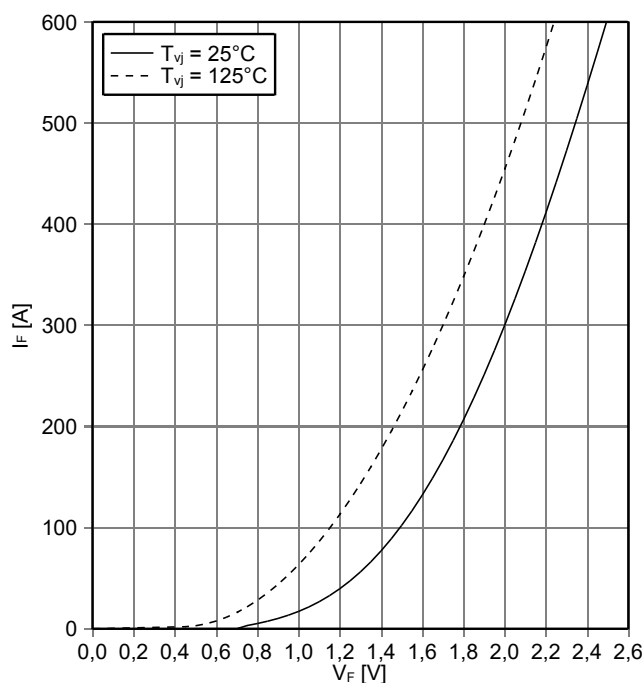
$$Z_{thJC} = f(t)$$



Reverse bias safe operating area IGBT, Inverter

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

$$V_{GE} = \pm 15 \text{ V}, R_{Goff} = 3 \Omega, T_{vj} = 125^\circ\text{C}$$

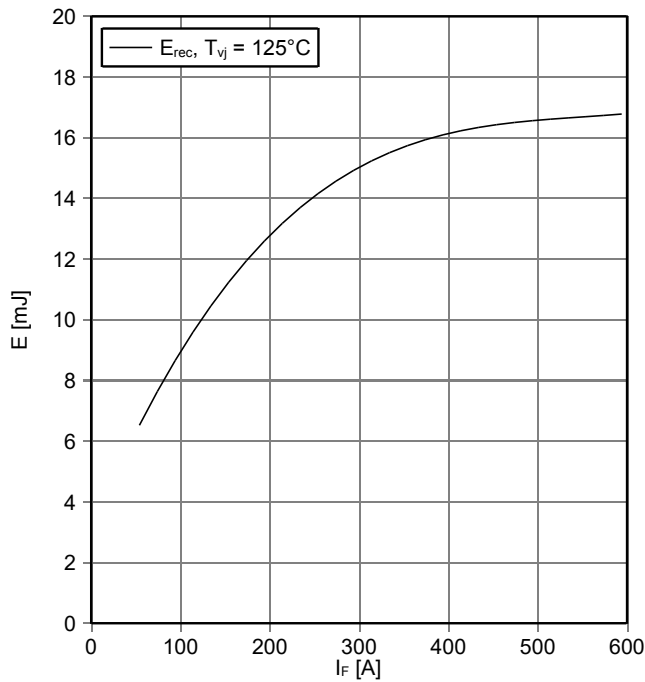


Forward characteristic of Diode, Inverter (typical)

$$I_F = f(V_F)$$

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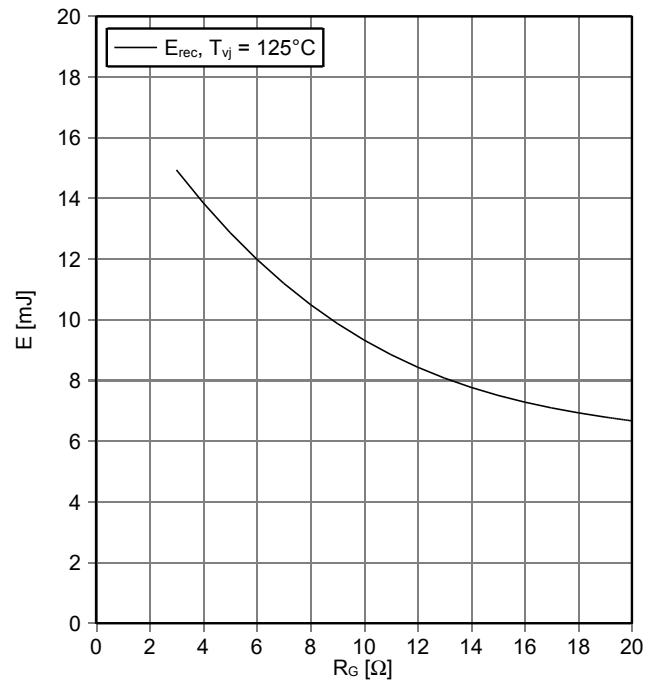
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Switching losses Diode, Inverter (typical)

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

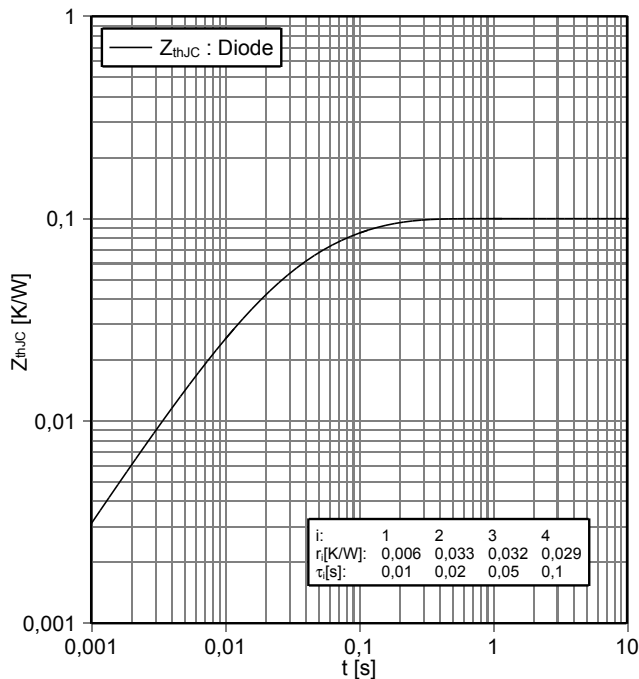
$R_{Gon} = 3 \Omega$, $V_{CE} = 600 \text{ V}$



Switching losses Diode, Inverter (typical)

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

$I_F = 300 \text{ A}$, $V_{CE} = 600 \text{ V}$



Transient thermal impedance Diode, Inverter

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

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