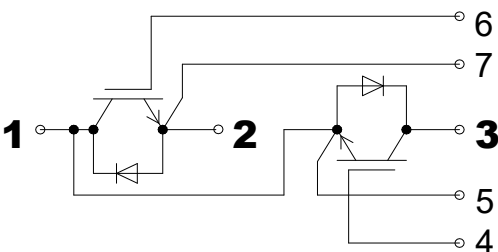


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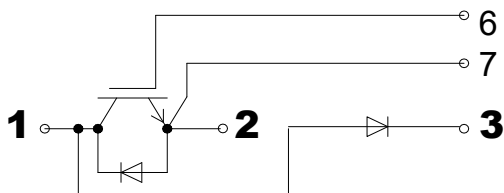
Ultra Fast IGBT Modules



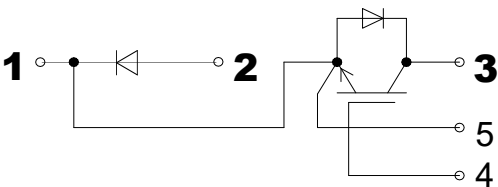
SGG400N125UC2



SGD400N125UC2



SDG400N125UC2



Symbol	Test Condition	Value	Unit
IGBT			
V _{CES}		1200	V
I _C	T _C = 25(100)°C per chip	400(300)	A
V _{GES}		±20	V
T _{vj} (T _{stg})		-40 ~ +150(125)	°C
P _{tot}		2350	W
INVERSE DIODE			
I _F	T _C =25(100)°C per chip	400(300)	A
I _{FM}	T _C =25(100)°C per chip	800(600)	A
V _R RM		1200	V
I _{FSM}	T _j =150°C, t _p =10ms	2950	A

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Ultra Fast IGBT Modules

Symbol	Test Conditions	Min	Typ	Max	Unit
IGBT Tc = 25°C unless otherwise specified					
VGE(th)	VGE=VCE, IC=12mA	4.5	5.5	6.5	V
ICES	VGE = 0; VCE=VCES; Tj=25(125)°C		0.55(3.50)	0.65(4.00)	mA
VCE(TO)	Tj=25(125)°C		1.4(1.7)		V
rCE	VGE=15V Tj=25(125)°C		10.0(8.0)	11.0(9.5)	mΩ
VCE(sat)	IC=300A; VGE=15V; chip level		2.50	3.25	V
Cies	VGE=0V, VCE=25V, f=1MHz		22.0	30.0	nF
Coes			3.30	3.90	
Cres			1.20	1.60	
LCE				20	nH
RCC'+EE'	Terminal to Case, Tc=25(125)°C		0.35(0.50)		mΩ
td(on)	Vcc = 600V, Ic = 300A RGON = RGOFF = 3Ω Tj=125°C VGE=±15V		70		ns
tr			49		ns
td(off)			499		ns
tf			32		ns
Eon/Eoff			17.0/18.0		mJ
INVERSE DIODE Tc = 25°C unless otherwise specified					
VF	IF =300A; VGE=0V; Tj = 25°C		2.2	2.5	V
Qrr	IF=300A; VR=300V; Tj=25°C di/dt = 600A/us, VGE=-15V		12.5		μC
IRRM			85		A
Erec			17.0		mJ
THERMAL CHARACTERISTICS					
Rth(j-c)	per IGBT			0.055	K/W
Rth(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

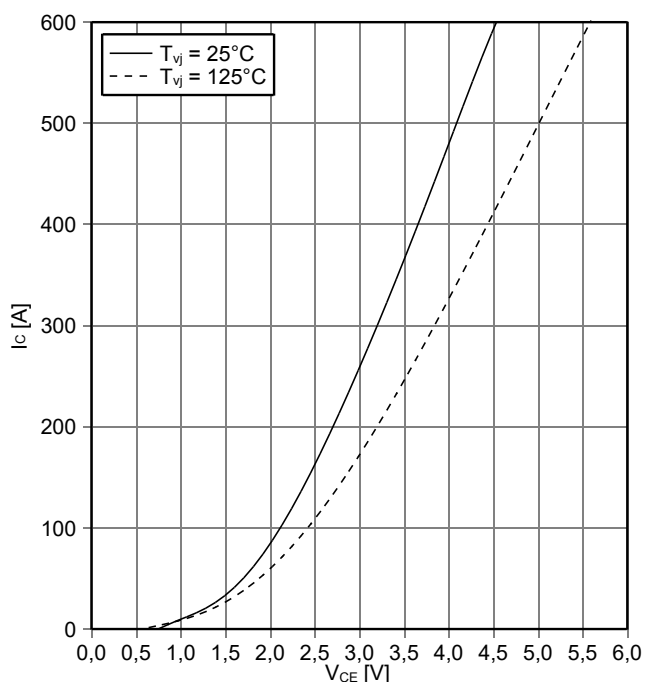
- Welding inverters
- Inductive Heating
- This type IGBT can be equivalent for SEMIKRON SKM400GB125D or Infineon FF300R12KS4

Advantages

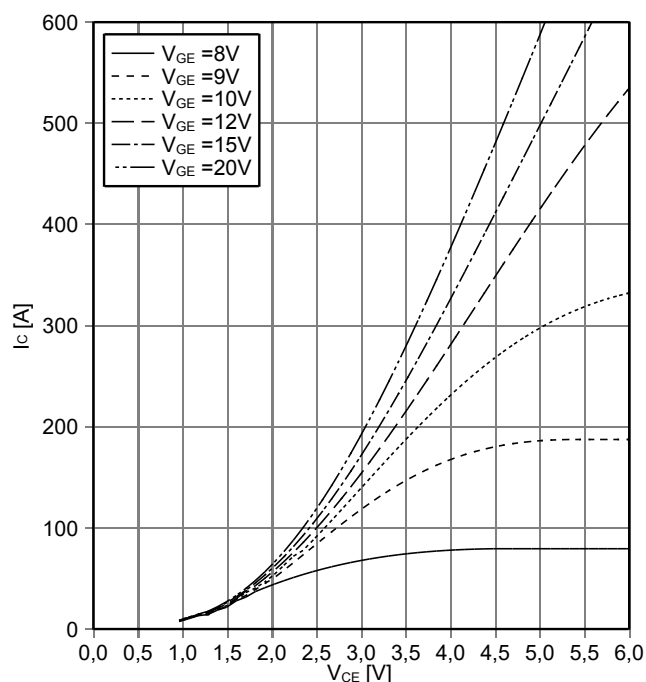
- Space and weight savings
- Reduced protection circuits

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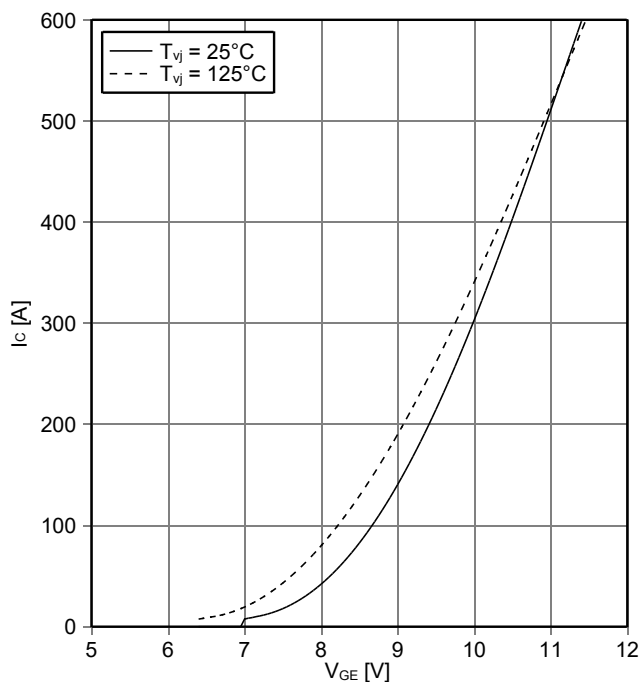
Ultra Fast IGBT Modules



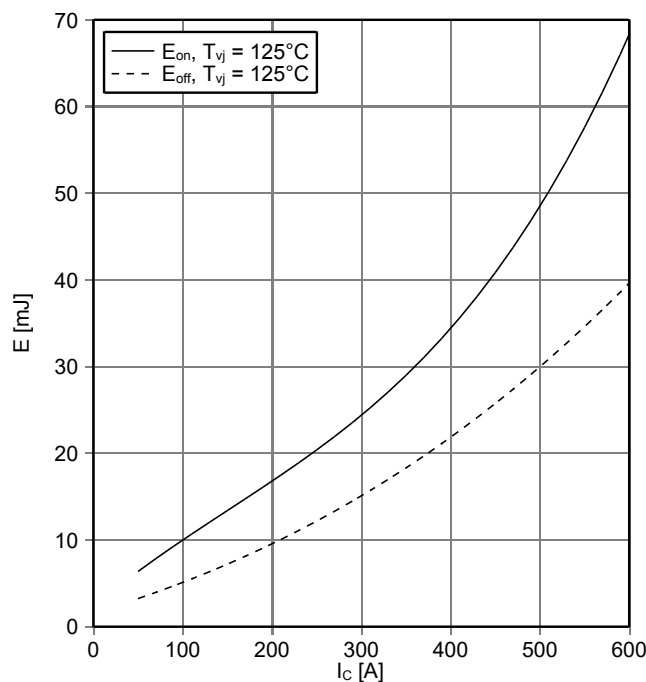
Output characteristic IGBT, Inverter (typical)
 $I_C = f(V_{CE}), V_{GE} = 15\text{ V}$



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



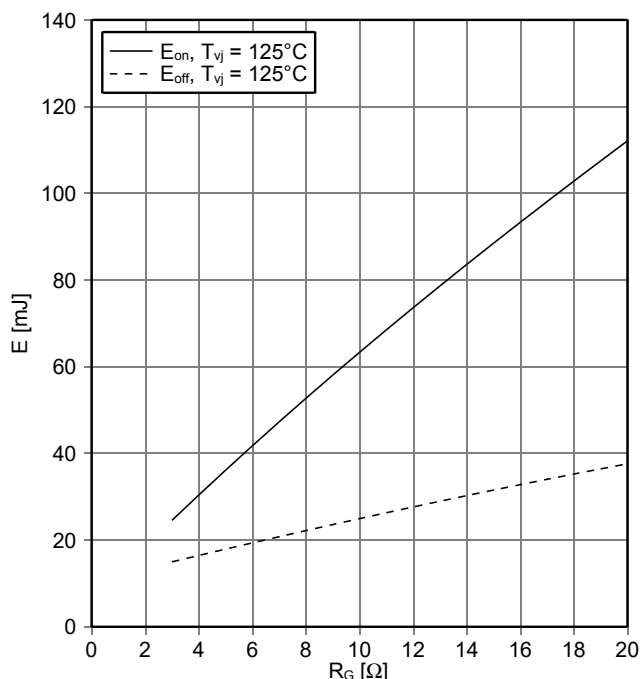
Transfer characteristic IGBT, Inverter (typical)
 $I_C = f(V_{GE})$
 $V_{CE} = 20\text{ V}$



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

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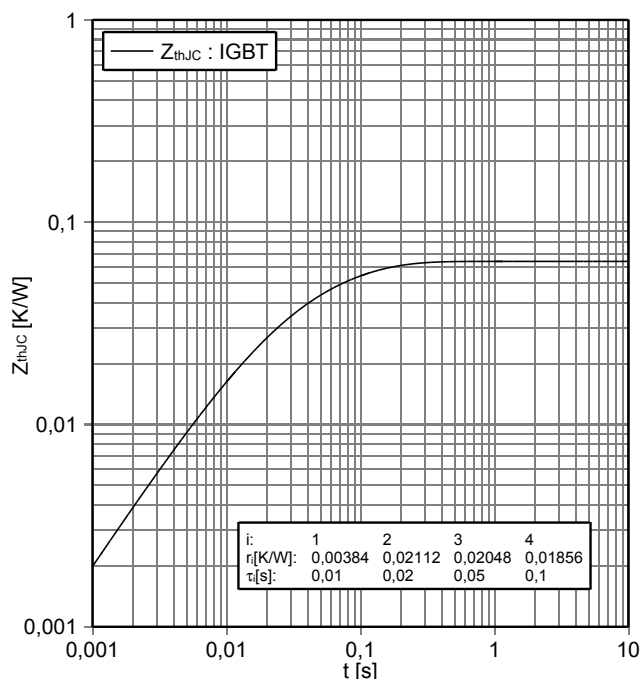
Ultra Fast IGBT Modules



Switching losses IGBT, Inverter (typical)

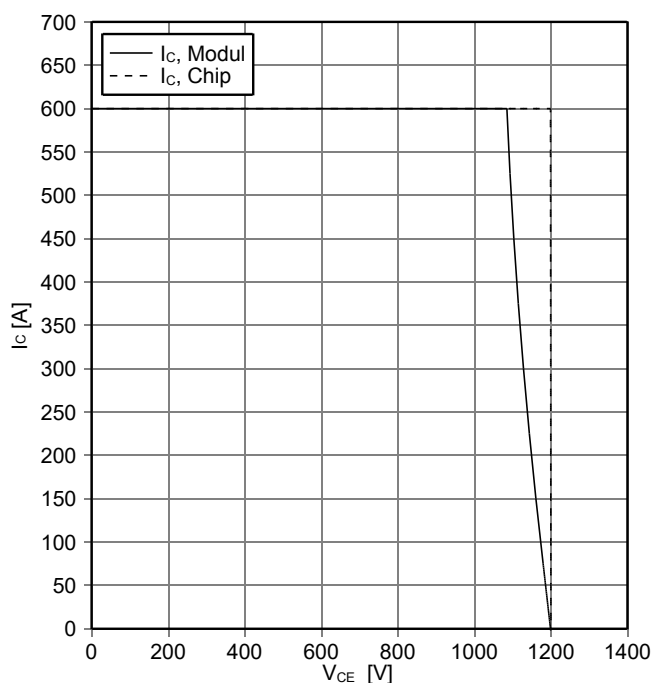
$$E_{on} = f(R_G), E_{off} = f(R_G)$$

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



Transient thermal impedance IGBT, Inverter

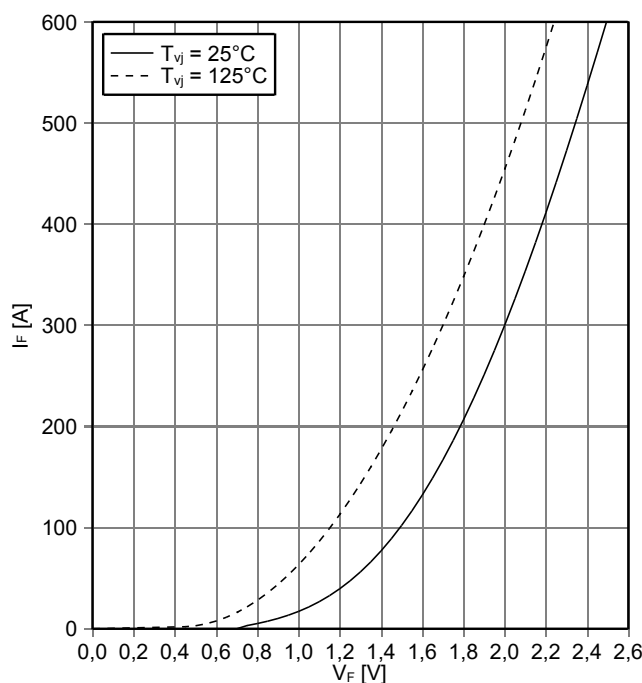
$$Z_{thJC} = f(t)$$



Reverse bias safe operating area IGBT, Inverter

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

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

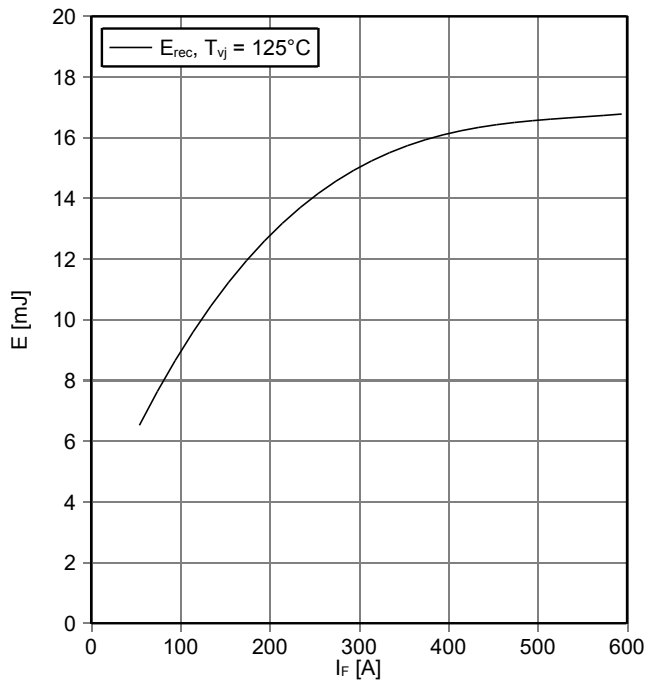


Forward characteristic of Diode, Inverter (typical)

$$I_F = f(V_F)$$

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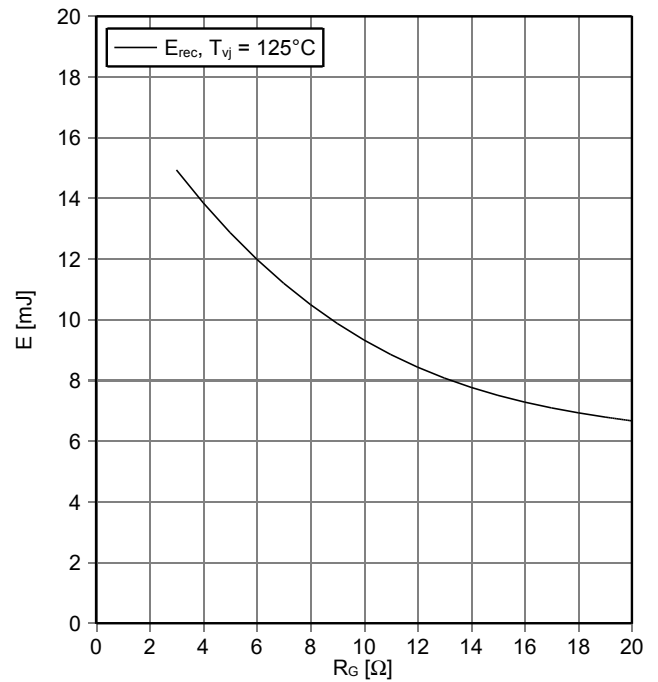
Ultra Fast IGBT Modules



Switching losses Diode, Inverter (typical)

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

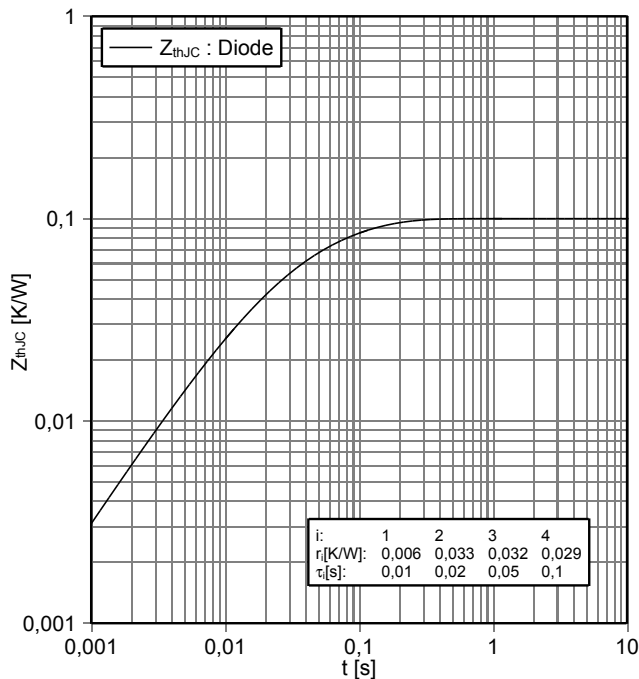
$$R_{Gon} = 3 \Omega, V_{CE} = 600 \text{ V}$$



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

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

i:	1	2	3	4
r_i [K/W]:	0,006	0,033	0,032	0,029
τ_i [s]:	0,01	0,02	0,05	0,1

SGG400N125UC2

Ultra Fast IGBT Modules

