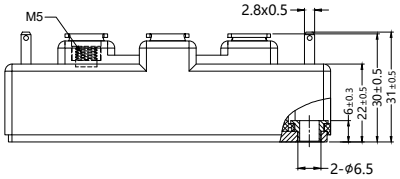
S4G75N125UC9

H bridge IGBT modules

Dimension: mm

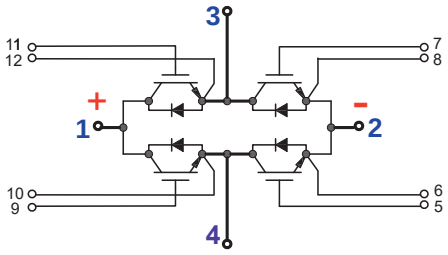


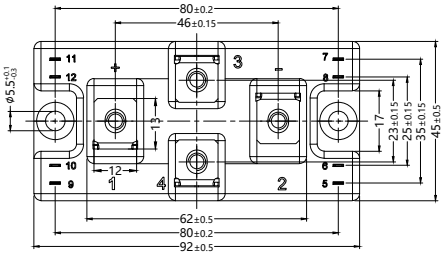
V_{CES} = 1200V

I_{C25} = 4X75A

$V_{CEsat(typ)}$ =3.20V

$E_{off(typ)}$ = 2.50 mJ





Absolute Maximum Ratings				
Symbol	**Test Conditions**		**Values**	**Unit**
IGBT				
V_{CES}	T_j =25°C		1200	V
I_C	T_j = 175 °C	T_C =25°C	75	A
		T_C =100°C	50	A
I_{Cnom}	T_C = 100 °C Every chip		50	A
I_{CRM}	I_{CRM} = 3xI_{Cnom}		150	A
V_{GES}			-20 ... +20	V
tpsc	V_{CC} = 800 V V_{GE} ≤ 15 V V_{CES} ≤ 1200 V	T_j =150°C	10	µs
T_j			-40 ... 175	°C
Inverse diode				
I_F	T_j = 175 °C	T_C =25°C	100	A
		T_C =100°C	50	A
I_{Fnom}			50	A
I_{FRM}	I_{FRM} = 3xI_{Fnom}		150	A
I_{FSM}	t_p = 10 ms, sin 180°, T_j =25°C		150	A
T_j			-40 ... 150	°C
$I_{t(RMS)}$	$T_{terminal}$ =80°C		100	A
T_{stg}			-40 ... 125	°C
V_{Isol}	AC sinus 50 Hz, t = 1 min		4000	V

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S4G75N125UC9

H bridge IGBT modules

Characteristics						
Symbol	**Test Conditions**		**min.**	**typ.**	**max.**	**Unit**
IGBT						
$V_{CE(sat)}$	I_C =50A V_{GE} =15V chiplevel	T_j =25°C		3.20	3.70	V
		T_j =150°C		3.80	4.30	V
V_{CE0}	chiplevel	T_j =25°C		0.8	0.9	V
		T_j =150°C		0.7	0.8	V
r_{CE}	V_{GE} =15V chiplevel	T_j =25°C		21.00	24.00	mΩ
		T_j =150°C		30.00	32.00	mΩ
$V_{GE(th)}$	$V_{GE}=V_{CE}$, I_C = 1.7 mA		5	5.8	6.5	V
I_{CES}	V_{GE} =0V	T_j =25°C			1	mA
	V_{CE} = 1200 V	T_j =150°C				mA
C_{ies}	V_{CE} =25V V_{GE} =0V	f=1MHz		3.37		nF
C_{oes}		f=1 MHz		0.20		nF
C_{res}		f=1MHz		0.19		nF
Q_G	V_{GE} = - 8 V...+ 15 V			280		nC
R_{Gint}	T_j =25°C			4.0		Ω
$t_{d(on)}$	V_{CC} = 600 V I_C =50A V_{GE} =±15V $R_{G\ on}$ =8.2Ω $R_{G\ off}$ =8.2 Ω di/dt_{on} = 1700 A/µs di/dt_{off} =670A/µs	T_j =150°C		118		ns
t_r		T_j =150°C		29		ns
E_{on}		T_j =150°C		5.55		mJ
$t_{d(off)}$		T_j =150°C		355		ns
t_f		T_j =150°C		75		ns
E_{off}		T_j =150°C		2.50		mJ
$R_{th(j-c)}$	per IGBT				0.53	K/W

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H bridge IGBT modules

Characteristics						
Symbol	**Test Conditions**		**min.**	**typ.**	**max.**	**Unit**
Inverse diode						
$V_F = V_{EC}$	I_F =50A V_{GE} =0V chiplevel	T_j =25°C		2.22	2.54	V
		T_j =150°C		2.18	2.50	V
V_{F0}	chiplevel	T_j =25°C		1.3	1.5	V
		T_j =150°C		0.9	1.1	V
r_F	chiplevel	T_j =25°C		18.4	20.8	mΩ
		T_j =150°C		25.6	28.0	mΩ
I_{RRM}	I_F =50A di/dt_{off} =1380A/μs V_{GE} =±15V V_{CC} = 600 V	T_j =150°C		25		A
Q_{rr}		T_j =150°C		8.7		μC
E_{rr}		T_j =150°C		3.8		mJ
$R_{th(j-c)}$	per diode				0.84	K/W
Module						
L_{CE}					30	nH
$R_{CC'+EE'}$	terminal-chip	T_C =25°C		0.65		mΩ
		T_C =125°C		1		mΩ
$R_{th(c-s)}$	per module			0.04	0.05	K/W
M_s	to heat sink M5		3		5	Nm
M_t		to terminals M5	2.5		5	Nm
						Nm
Weight					170	g

Features

- NPT Technology IGBT
- Fast Recovery Free Wheeling Diode
- Low Switching Losses
- Vce(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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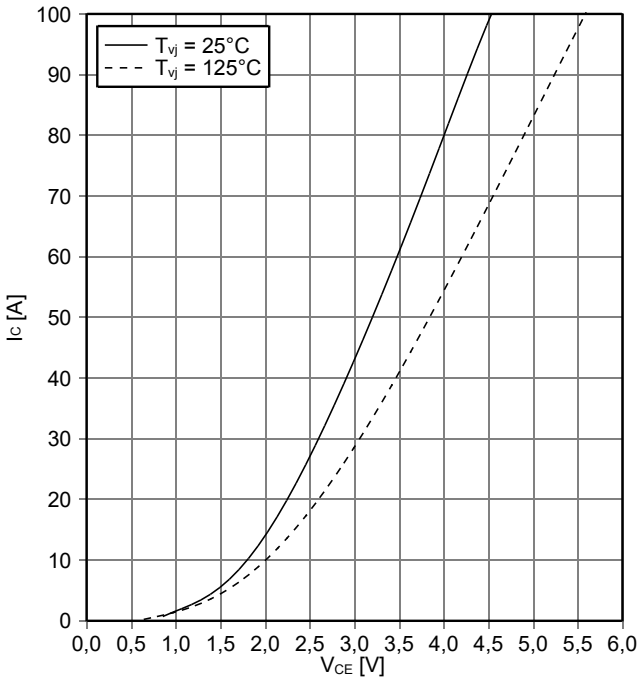

Fig.1 Output characteristic IGBT,Inverter (typical)
$I_C = f(V_{CE})$
V_{GE} = 15 V

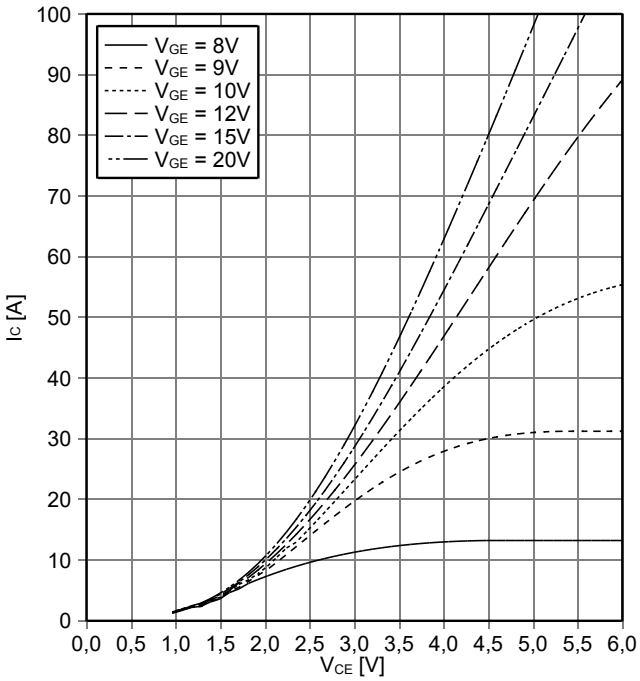

Fig.2 Output characteristic IGBT,Inverter (typical)
$I_C = f(V_{CE})$
T_{vj} = 125°C

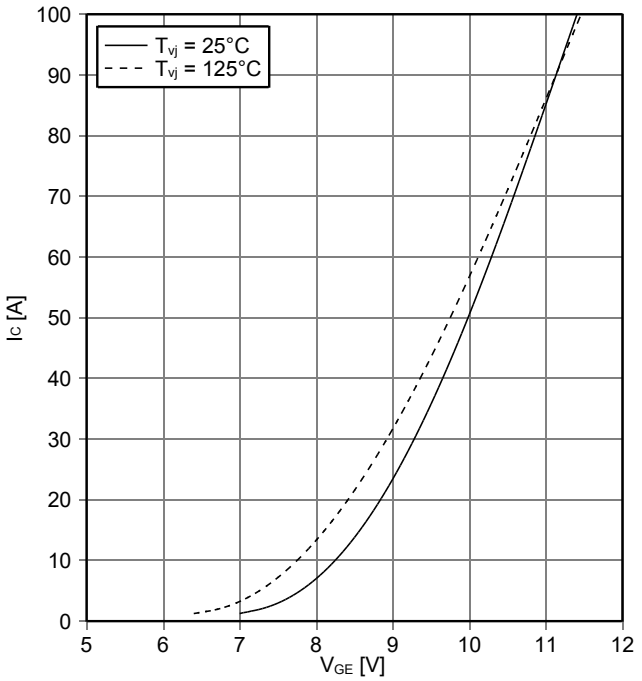

Fig.3 Transfer characteristic IGBT,Inverter(typical)
$I_C = f(V_{GE})$
V_{CE} = 20 V

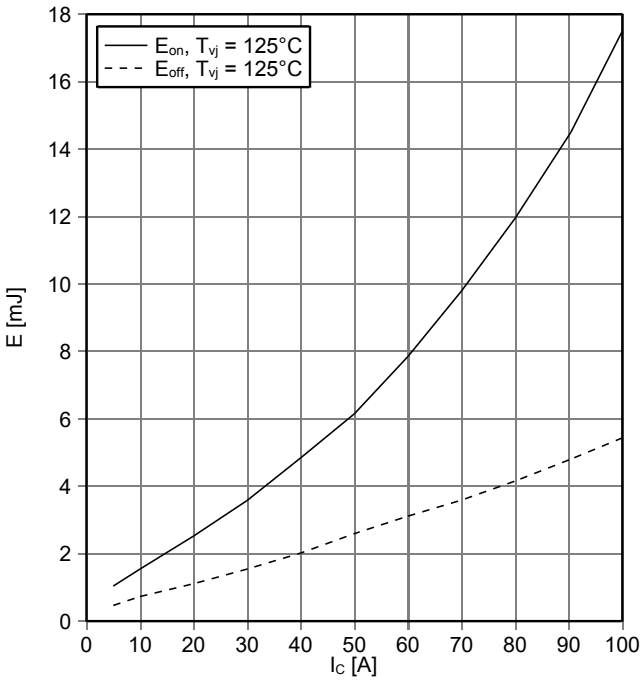

Fig.4 Switching losses IGBT,Inverter (typical)
$E_{on} = f(I_C)$, $E_{off} = f(I_C)$
V_{GE} = ±15 V, R_{Gon} = 13 Ω, R_{Goff} = 13 Ω, V_{CE} = 600 V

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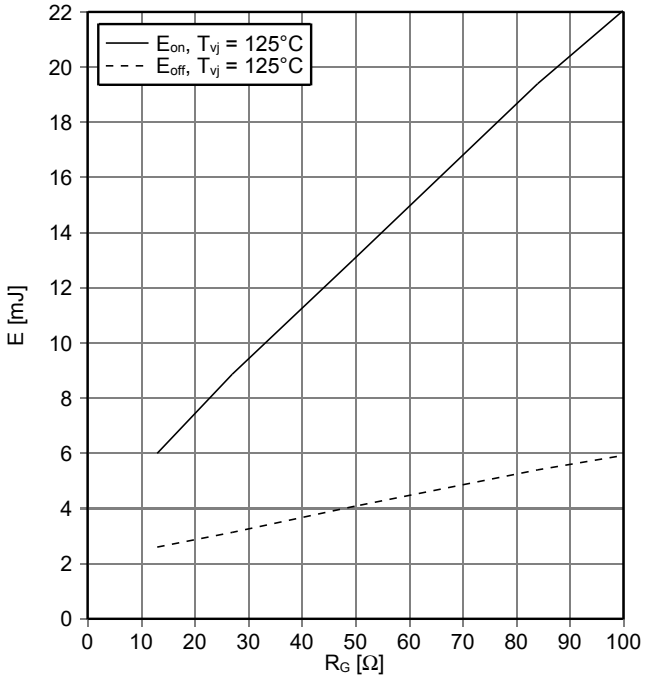

Fig.5 Switching losses IGBT,Inverter (typical)
$E_{on} = f(R_G)$, $E_{off} = f(R_G)$
V_{GE} = ±15 V, I_C = 50 A, V_{CE} = 600 V

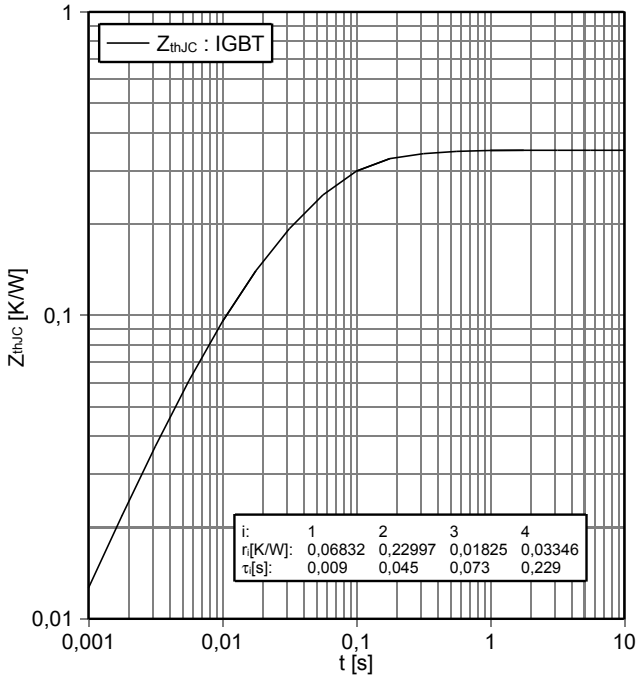

Fig.6 Transient thermal impedance IGBT,Inverter
$Z_{thJC} = f(t)$

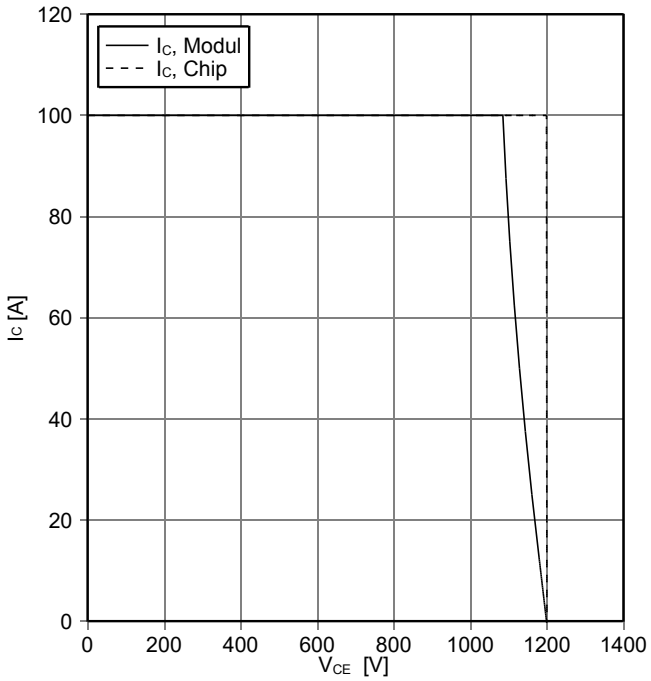

Fig.7 Reverse bias safe operating area IGBT,Inverter (RBSOA)
$I_C = f(V_{CE})$
V_{GE} = ±15 V, R_{Goff} = 13 Ω, T_{vj} = 125°C

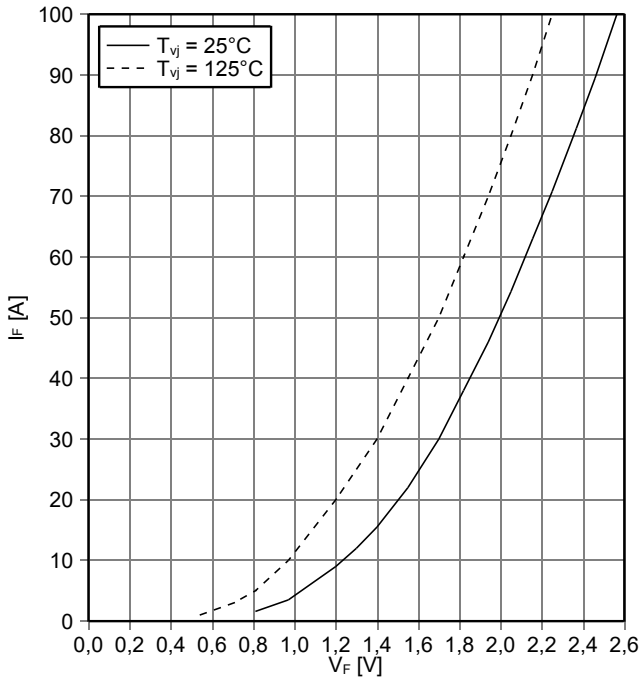

Fig.8 Forward characteristic of Diode, Inverter (typical)
$I_F = f(V_F)$

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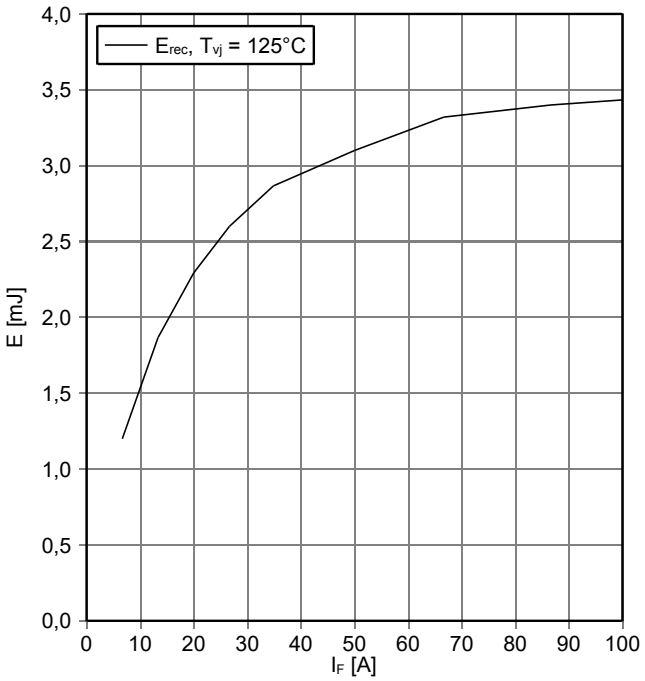

Fig.9 Switching losses Diode, Inverter (typical)
$E_{rec} = f(I_F)$
$R_{Gon} = 13\ \Omega$, $V_{CE} = 600$ V

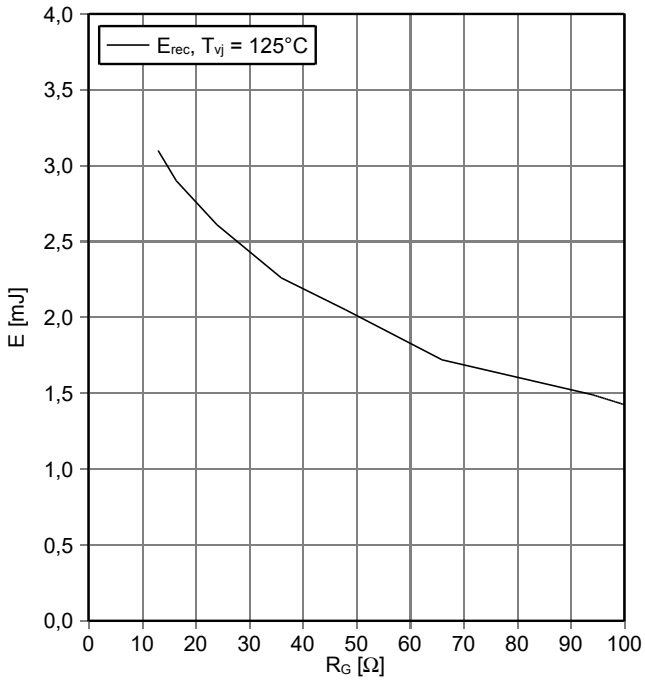

Fig.10 Switching losses Diode, Inverter (typical)
$E_{rec} = f(R_G)$
$I_F = 50$ A, $V_{CE} = 600$ V

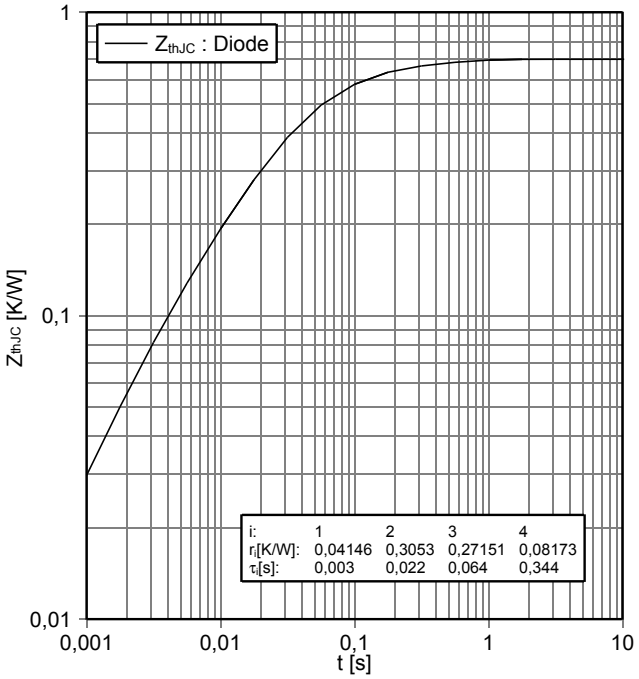

Fig.10 Transient thermal impedance Diode, Inverter
$Z_{thJC} = f(t)$

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