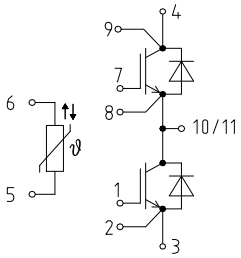
SGG700T120UC5

IGBT Modules



Features

- Infineon Trench Field Stop IGBT4 technology
- Low switching losses
- Switching frequency up to 20KHz
- Square RBSOA, no latch up
- High short circuit capability
- Positive temperature coefficient for easy parallelling
- MOS input, voltage controlled
- SEMIKRON CAL4 Ultra fast free wheeling diodes
- Package with copper base plate
- Isolation voltage 4000 V

Application

- AC and DC motor control
- AC servo and robot drives
- power supplies
- welding inverters

Advantages

- space and weight savings
- reduced protection circuits

T_C = 25°C, unless otherwise specified

Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_C	T_C= 25(80)°C	909(700)	A
I_{CRM}	T_C= 25°C, t_P =1ms	1400	A
V_{GES}		±20	V
T_{Vj}		-40...+175	°C
Inverse Diode			
I_F = -I_C	T_C= 25(80)°C	799(600)	A
I_{FRM}	T_C= 25°C, t_P =1ms	1500	A
I_{FSM}	t_P =10ms; sin.;T_j=150°C	2750	A
Module T_{stg}		-40~125	°C
$\mathbf{V}_{Isol}$	AC, 1min	4000	V
$\mathbf{P}_{tot}$	Tj=Tjmax	1400	W

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Characteristics $T_C = 25^oC$, unless otherwise specified

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, I_C =8mA	5.0	5.8	6.5	V
I_{CES}	V_{GE} = 0; $V_{CE} = V_{CES}$; $T_j = 25^oC$			4.0	mA
$V_{CE(TO)}$	$T_j = 25^oC$		0.8	0.9	V
r_{CE}	V_{GE} = 15V, T_j = 25(125)^oC		3.30(5.00)	3.80(5.30)	mΩ
$V_{CE(sat)}$	I_C =700A; V_{GE} = 15V; chip level		1.80	2.05	V
C_{ies}	under following conditions		135		nF
C_{oes}	V_{GE} = 0, V_{CE} = 25V, f = 1MHz		3.22		
C_{res}			1.54		
L_{CE}				20	nH
$R_{CC'+EE'}$	res., terminal-chip $T_C = 25(125)^oC$		1.2(1.65)		mΩ
$t_{d(on)}$	under following conditions:		550		ns
t_r	V_{CC} = 600V, I_C = 700A		95		ns
$t_{d(off)}$	$R_{Gon} = R_{Goff}$ = 2Ω, $T_j = 125^oC$		450		ns
t_f	V_{GE} = ± 15V		90		ns
$E_{on}(E_{off})$			80(65)		mJ
Inverse Diode under following conditions:					
$V_F = V_{EC}$	I_F =700A; V_{GE} = 0V; $T_j = 25^oC$		2.10	2.52	V
$V_{(FO)}$	$T_j = 25^oC$		1.30	1.50	V
r_F	$T_j = 25^oC$		3.0	3.4	mΩ
I_{RRM}	I_F = 700A; $T_j = 125^oC$		430		A
Q_{rr}	di/dt = 8300A/us		150		uC
E_{rr}	V_{GE} = ±15V		43		mJ
Thermal Characteristics					
$R_{th(j-c)}$	per IGBT			0.084	K/W
$R_{th(j-c)D}$	per Inverse Diode			0.110	K/W
$R_{th(c-s)}$	per module			0.048	K/W
Mechanical Data					
M_s	to heatsink M5	3		6	Nm
M_t	to terminals M6	3		6	Nm
Weight	typical			350	g
Temperature Sensor					
R_{100}	T_C=100°C (R_{25}=5 kΩ)		493 ± 5%		Ω
$B_{100/125}$	$R(T)=R_{100}\exp[B_{100/125}(1/T-1/T_{100})]$; T[K];		3550 ±2%		K

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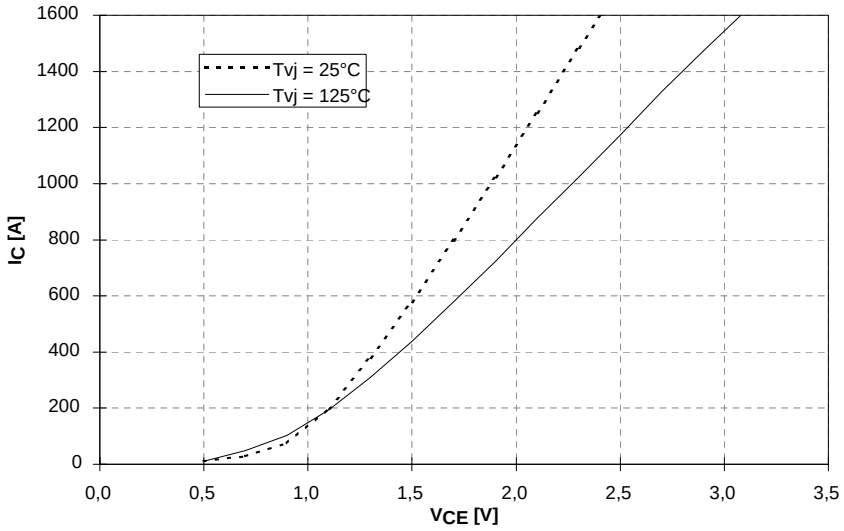
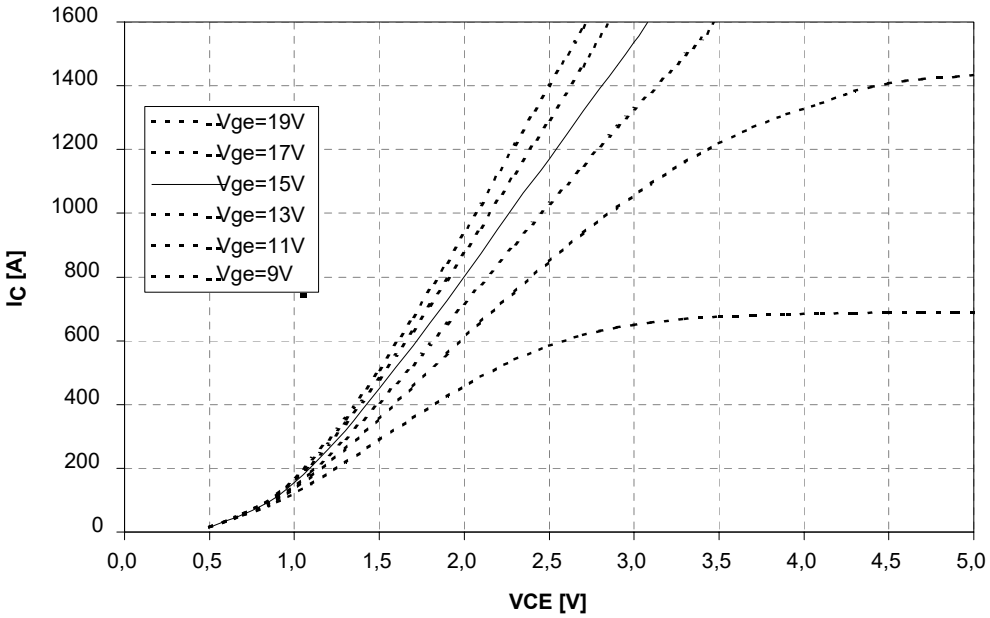


output characteristic (typical)

$I_C = f(V_{CE})$
$V_{GE} = 15V$



output characteristic (typical)

IC= f(VCE)
Tvj= 125°C

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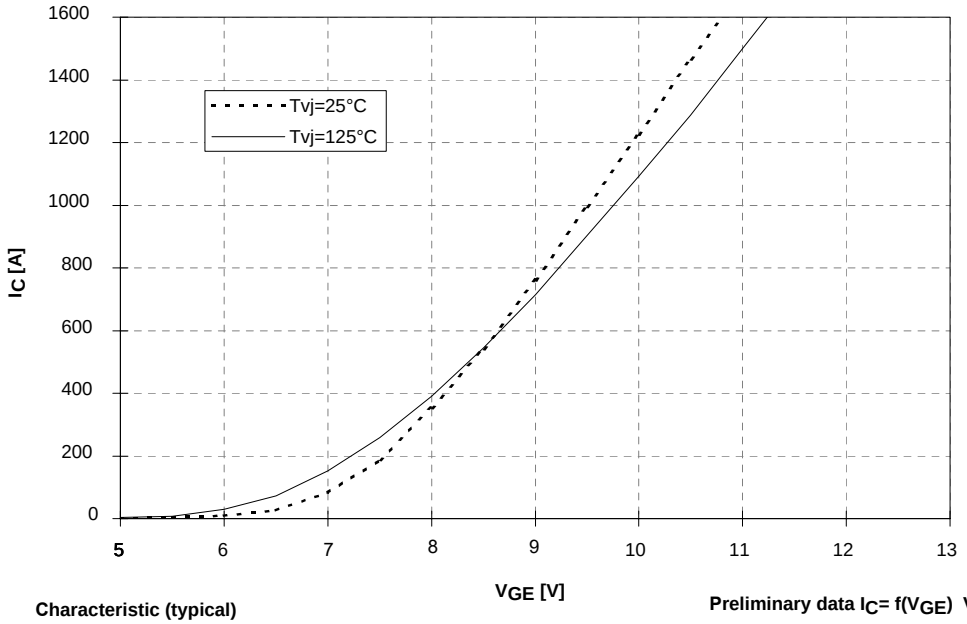
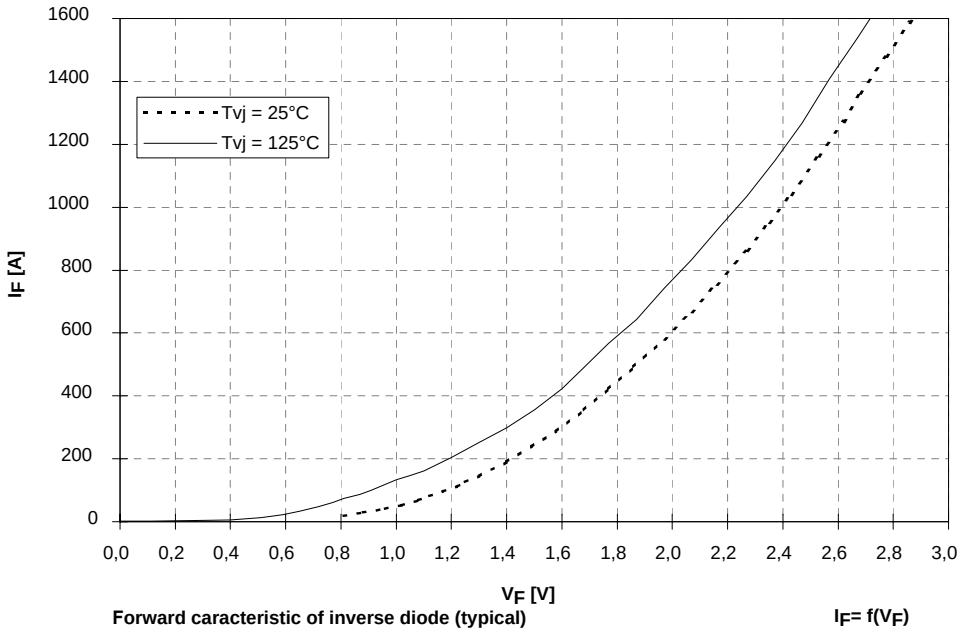


Characteristic (typical)

Preliminary data $I_C = f(V_{GE})$ V_{CE}= 20V



Forward caracteristic of inverse diode (typical)

$I_F = f(V_F)$

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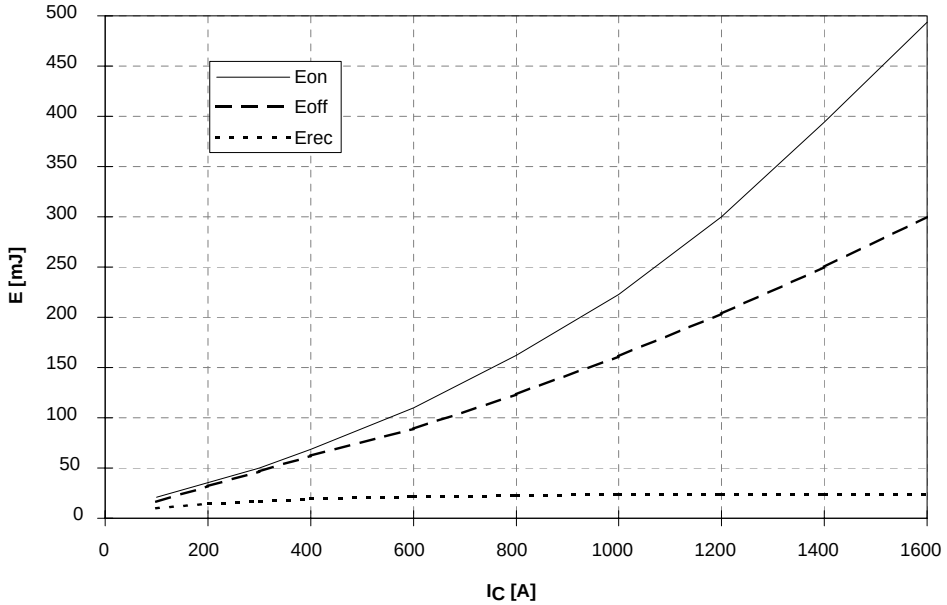
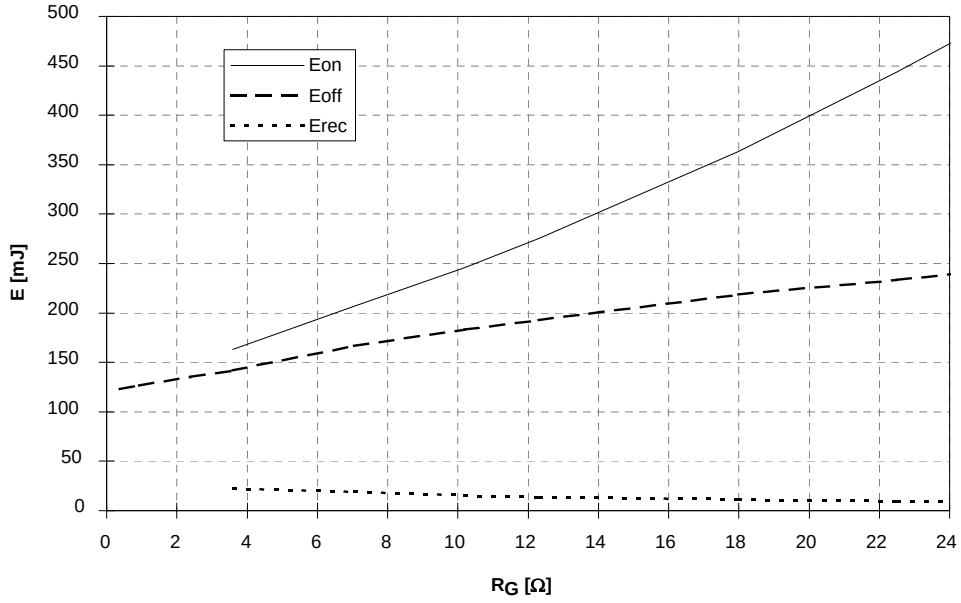


Switching losses (typical)

$E_{on} = f(I_C)$, $E_{off} = f(I_C)$, $E_{rec} = f(I_C)$ V_{GE}=±15V,
R_{gon}=3,3Ω, R_{goff}=0,39Ω, V_{CE}=600V, T_{vj}=125°C



Switching losses (typical)

$E_{on} = f(R_G)$, $E_{off} = f(R_G)$, $E_{rec} = f(R_G)$ V_{GE}=±15V,
I_C=800A, V_{CE}=600V, T_{vj}=125°C

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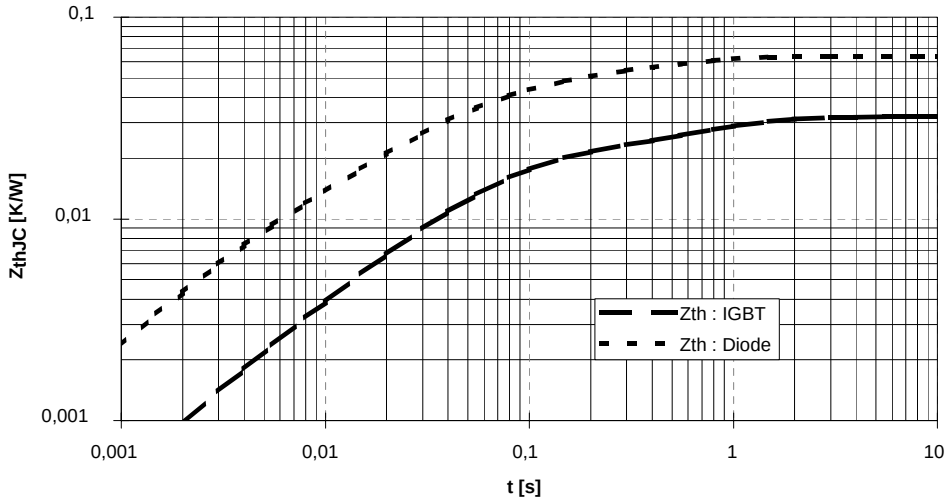
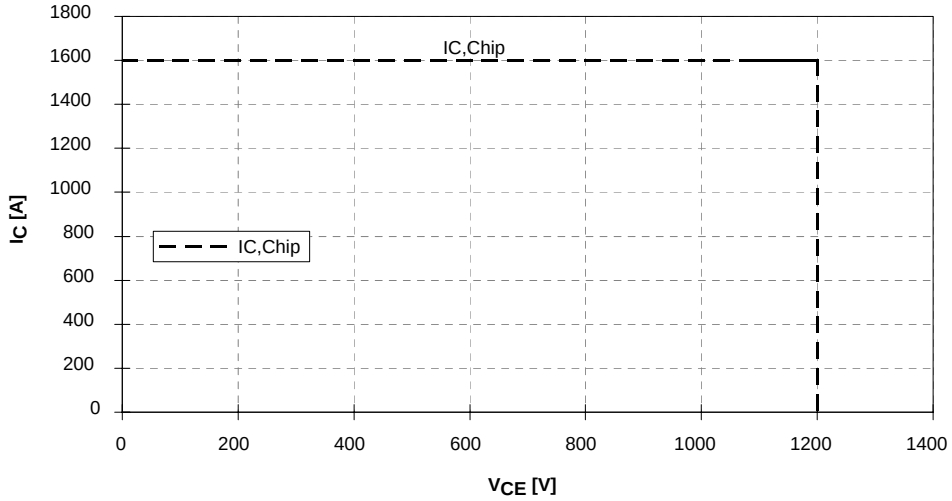
IGBT Modules



i	1	2	3	4
r_i [K/kW] : IGBT	13,45	16,12	1,83	0,60
τ_i [s] : IGBT	6,897E-01	5,634E-02	2,997E-02	3,820E-03
r_i [K/kW] : Diode	18,37	20,16	21,17	4,30
τ_i [s] : Diode	4,452E-01	7,451E-02	2,647E-02	2,850E-03

Transient thermal impedance $Z_{thJC} = f(t)$



Reverse bias safe operation area (RBSOA) V_{GE}=±15V, T_{vj}=125°C

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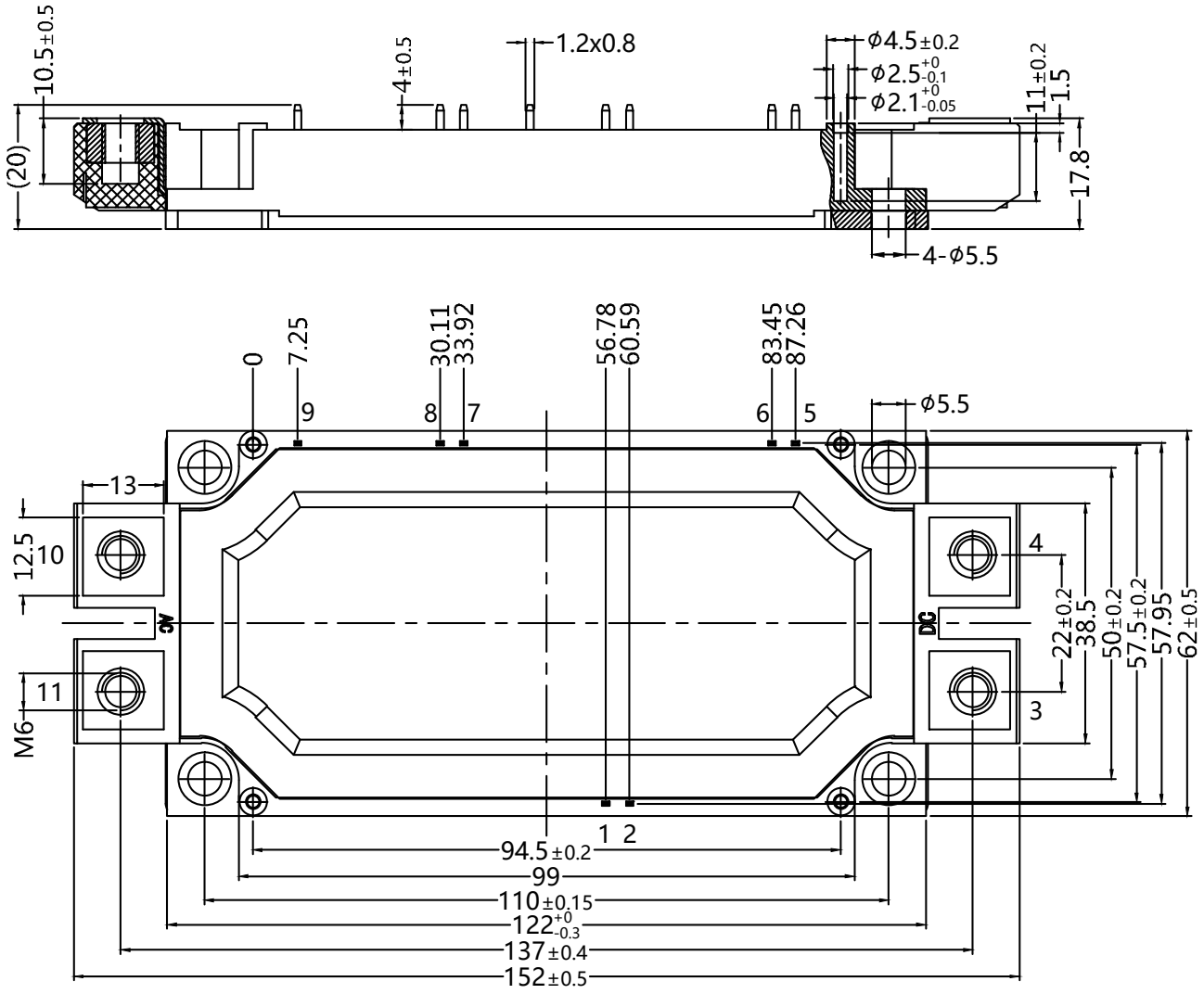

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