1200V/450A Brake-Chopper modules ***Preliminary Data***

Features :

- 1200V/450A,$VCE_{(sat)(typ)}$=2.30V
- SPT（Soft Punch Through）technology
- Lower losses
- Higher system efficiency
- Excellent short-circuit capability
- Square RBSOA

General Applications：

huajing's IGBTs offer ultrafast switching speed for application such as welding, inductive heating, UPS and other high frequency applications

Equivalent Circuit Schematic

Absolute Maximum Ratings of IGBT

V_{CES}	Collector to Emitter Voltage		1200	V
V_{GES}	Continuous Gate to Emitter Voltage		±30	V
I_C	Continuous Collector Current	T_C = 25°C	900	A
		T_C = 100°C	450	
I_{CM}	Pulse Collector Current	T_J = 150°C	900	A
P_D	Maximum Power Dissipation (IGBT)	T_C = 25°C, T_J = 150°C	1360	W
t_{sc}	Short Circuit Withstand Time		> 10	μs
T_J	Maximum IGBT Junction Temperature		150	°C
T_{JOP}	Maximum Operating Junction Temperature Range		-40 to +150	°C
T_{stg}	Storage Temperature Range		-40 to +125	°C

Absolute Maximum Ratings of Diode

V_{RRM}	Repetitive Peak Reverse Voltage Preliminary Data		1200	V
I_F	Diode Continuous Forward Current	T_C = 25°C	900	A
		T_C = 100°C	450	
I_{FM}	Diode Maximum Forward Current		900	A

Electrical Characteristics of IGBT at TJ = 25°C (Unless Otherwise Specified)

Parameter		Test Conditions		Min	Typ	Max	Unit
BV_{CES}	Collector to Emitter Breakdown Voltage	V_{GE} = 0V, I_C = 1mA		1200			V
I_{CES}	Collector to Emitter Leakage Current	V_{GE} = 0V,V_{CE} = V_{CES}				5	mA
I_{GES}	Gate to Emitter Leakage Current	V_{GE} = ±30V, V_{CE} = 0V				400	nA
$V_{GE(th)}$	Gate Threshold Voltage	I_C = 2mA, V_{CE} = V_{GE}		4.5		5.7	V
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage (Module Level)	I_C = 450A, V_{GE} = 15V	T_J = 25°C		2.30	2.50	V
			T_J = 125°C		2.70		

Switching Characteristics of IGBT

$t_{d(on)}$	Turn-on Delay Time	V_{CC} = 900V I_C = 450A R_G = 1.1Ω V_{GE} = ±15V Inductive Load	T_J = 25°C		65		ns
			T_J = 125°C		70		
t_r	Turn-on Rise Time		T_J = 25°C		110		ns
			T_J = 125°C		120		
$t_{d(off)}$	Turn-off Delay Time		T_J = 25°C		520		ns
			T_J = 125°C		580		
t_f	Turn-off Fall Time		T_J = 25°C		100		ns
			T_J = 125°C		130		
E_{on}	Turn-on Switching Loss		T_J = 25°C		20.5		mJ
			T_J = 125°C		31.0		
E_{off}	Turn-off Switching Loss		T_J = 25°C		35.0		mJ
			T_J = 125°C		52.0		
Q_g	Total Gate Charge		T_J = 25°C		4560		nC
R_{gint}	Integrated gate resistor	f = 1M; Vpp = 1V	T_J = 25°C		2.5		Ω
C_{ies}	Input Capacitance	V_{CE} = 25V V_{GE} = 0V f = 1MHz	T_J = 25°C		21.5		nF
C_{oes}	Output Capacitance		T_J = 25°C		3.30		
C_{res}	Reverse Transfer Capacitance		T_J = 25°C		1.90		
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (IGBT)					0.092	°C/W

Brake-Chopper an Freewheeling Diode Electrical Switching Characteristics

V_F	Diode Forward Voltage	I_F = 450A , V_{GE} = 0V	T_J = 25°C		1.90	2.20	V
			T_J = 125°C		1.90		
t_{rr}	Diode Reverse Recovery Time	I_F = 450A, di/dt=8500A/μs, V_{rr} = 600V,	T_J = 25°C		230		ns
			T_J = 125°C		400		
I_{rr}	Diode Peak Reverse Recovery Current		T_J = 25°C		450		A
			T_J = 125°C		760		
Q_{rr}	Diode Reverse Recovery Charge		T_J = 25°C		58.0		uC
			T_J = 125°C		85.0		
E_{rr}	Diode Reverse Recovery Energy		T_J = 25°C		18.0		mJ
			T_J = 125°C		29.5		
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (Diode)					0.095	°C/W

Module Characteristics

Parameter		Min.	Typ.	Max.	Unit
V_{iso}	Isolation Voltage (All Terminals Shorted),f = 50Hz, 1minute	2500			V
$R_{\theta CS}$	Case-To-Sink(Conductive Grease Applied)		0.1		°C/W
M	Power Terminals Screw: M6	3.0		5.0	N·m
M	Mounting Screw: M6	4.0		6.0	N·m
G	Weight		315		g

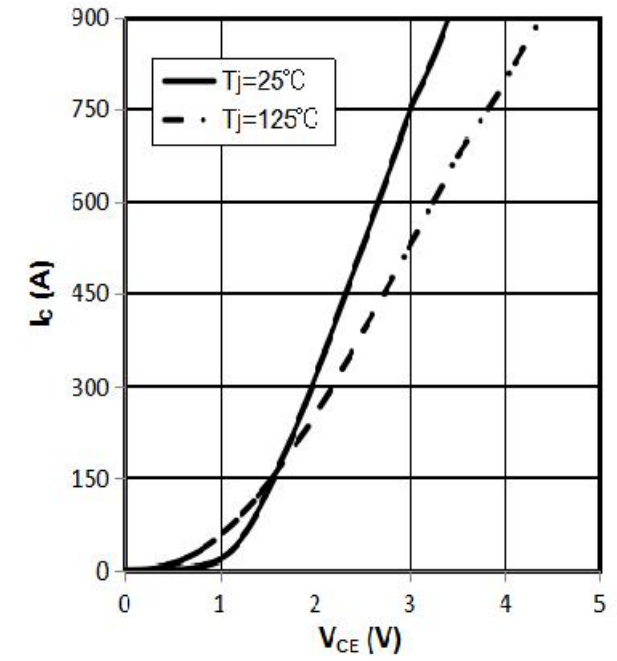


Fig 1. output characteristic IGBT，
$I_C=f(V_{CE})$,VGE=15V

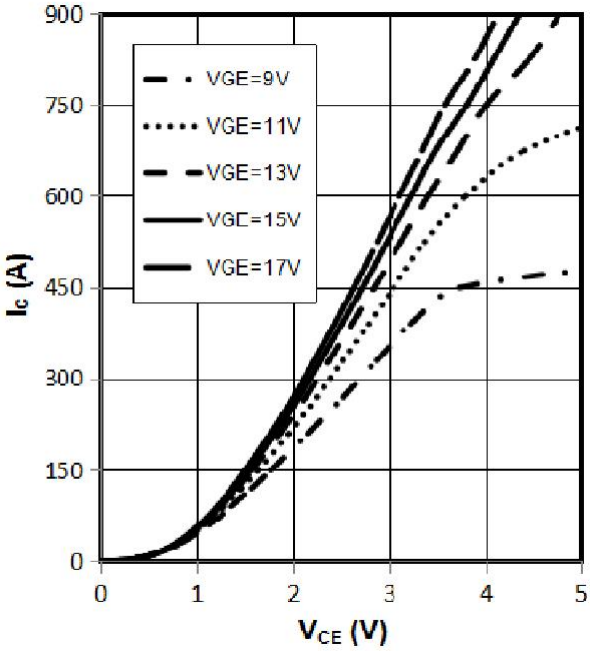


Fig 2. output characteristic IGBT，
$I_C=f(V_{CE})$,T_j=125℃

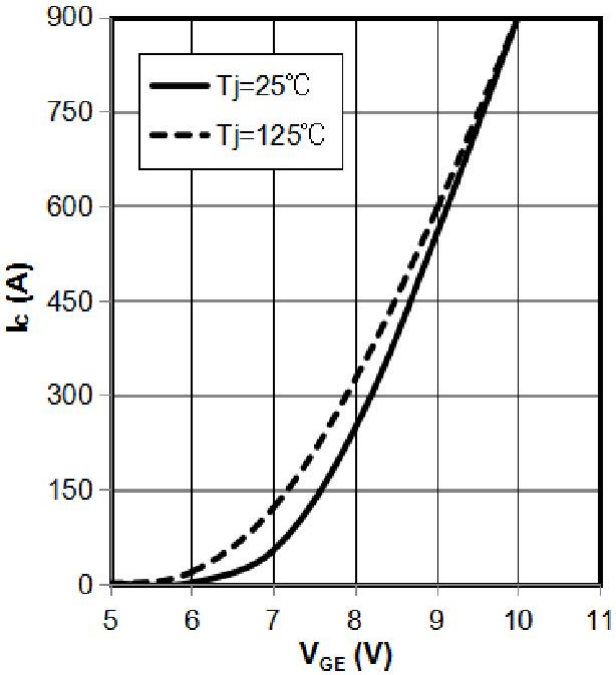


Fig 3. transfer characteristic IGBT，
$I_C=f(V_{GE})$,V_{CE}=20V

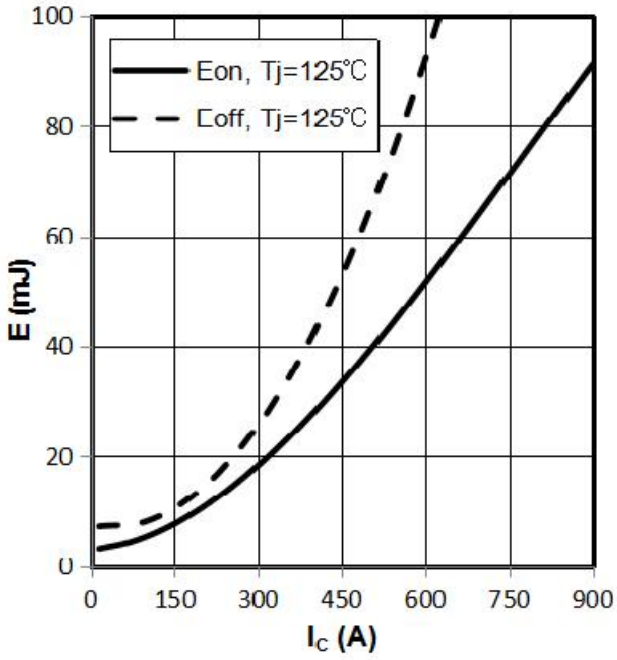


Fig 4. switching losses IGBT, $E_{on}=f(Ic)$,$E_{off}=f(I_c)$,
V_{GE}=±15V,R_{Gon}=1.1Ω,R_{Goff}=1.1Ω,V_{CE}=600V

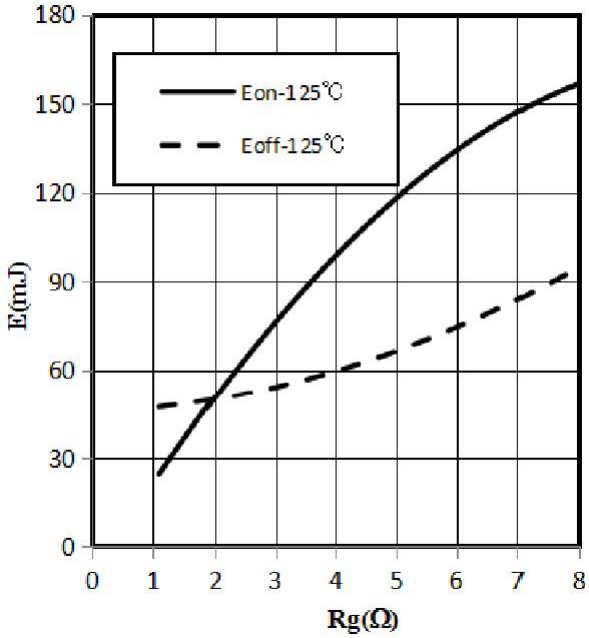


Fig 5. switching losses IGBT, $E_{on}=f(R_G)$,$E_{off}=f(R_G)$, V_{GE}=±15V,I_C=300A,V_{CE}=600V

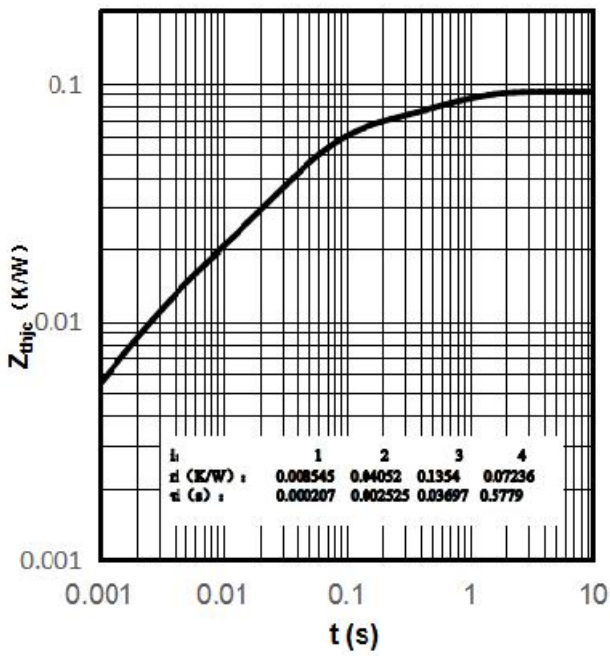


Fig 6. transient thermal impedance IGBT , Zthjc=f(t)

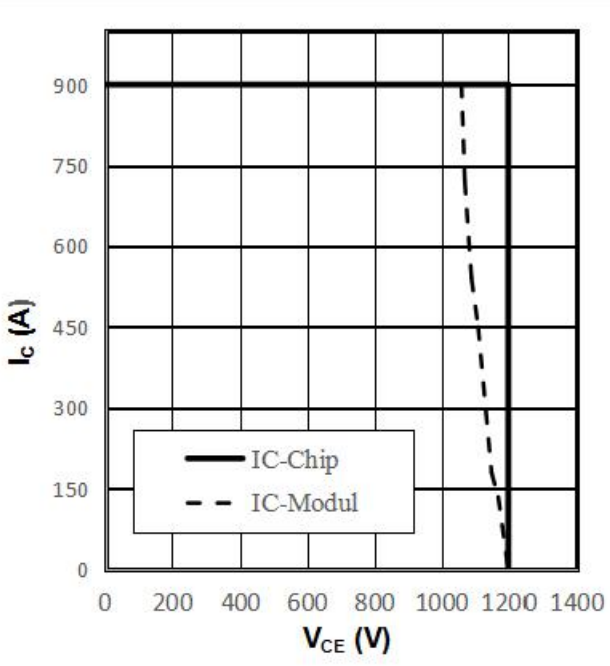


Fig 7. reverse bias safe operating area IGBT, $I_C=f(V_{CE})$,V_{GE}=±15V,R_{Goff}=3.3Ω，Tvj=125℃

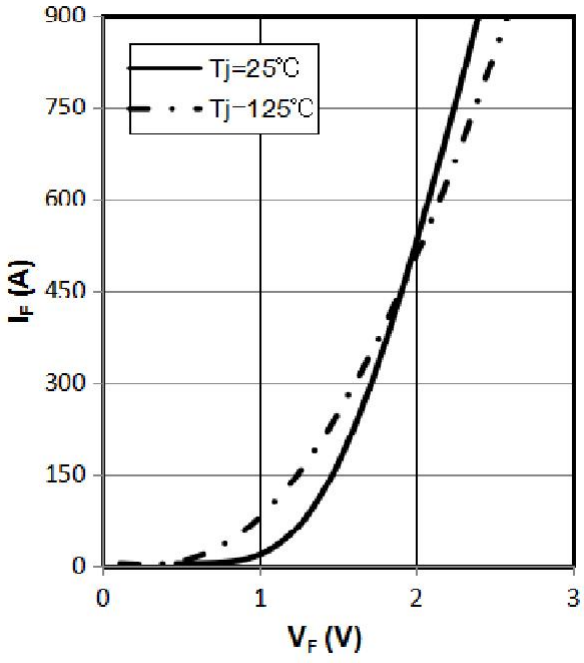
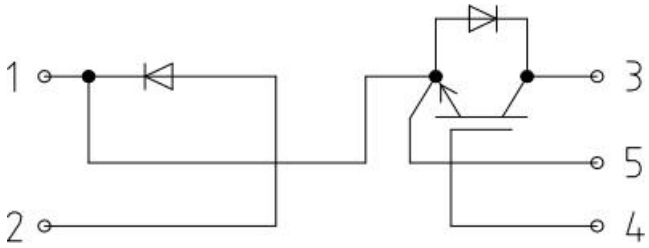


Fig 8. forward characteristic of Diode， $I_F=f(V_F)$

Internal Circuit:



Package Dimension
Dimensions in Millimeters