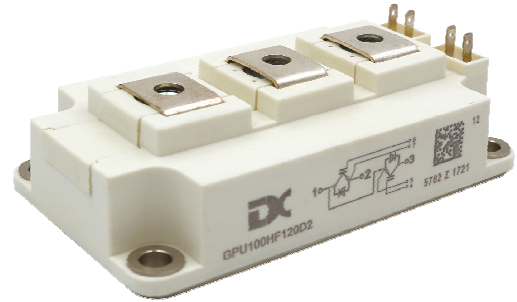


1200V/200A 2 in one-package

Preliminary Data

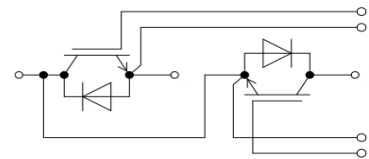
Features:

- 1200V/200A, $V_{CE(sat)(typ)} = 2.30V$
- SPT (Soft Punch Through) technology
- Lower losses
- Higher system efficiency
- Excellent short-circuit capability
- Square RBSOA



General Applications:

Daxin'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	$T_C = 25^\circ C$	400	A
		$T_C = 100^\circ C$	200	
I_{CM}	Pulse Collector Current	$T_J = 150^\circ C$	400	A
P_D	Maximum Power Dissipation (IGBT)	$T_C = 25^\circ C, T_J = 150^\circ C$	835	W
t_{sc}	Short Circuit Withstand Time		> 10	μs
T_J	Maximum IGBT Junction Temperature		150	$^\circ C$
T_{JOP}	Maximum Operating Junction Temperature Range		-40 to +150	$^\circ C$
T_{stg}	Storage Temperature Range		-40 to +125	$^\circ C$

Absolute Maximum Ratings of Freewheeling Diode

V_{RRM}	Repetitive Peak Reverse Voltage Preliminary Data		1200	V
I_F	Diode Continuous Forward Current	$T_C = 25^\circ C$	400	A
		$T_C = 100^\circ C$	200	
I_{FM}	Diode Maximum Forward Current		400	A

Electrical Characteristics of IGBT at $T_J = 25^\circ\text{C}$ (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	$V_{GE} = \pm 30V, V_{CE} = 0V$		400	nA
$V_{GE(th)}$	Gate Threshold Voltage	$I_C = 1mA, V_{CE} = V_{GE}$	4.5	5.7	V
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage (Module Level)	$I_C = 200A, V_{GE} = 15V$	$T_J = 25^\circ\text{C}$	2.30	V
			$T_J = 125^\circ\text{C}$	2.70	

Switching Characteristics of IGBT

t _{d(on)}	Turn-on Delay Time	V _{CC} = 600V I _C = 200A R _G = 4.7Ω V _{GE} = ±15V Inductive Load	T _J = 25°C		80		ns
			T _J = 125°C		85		
t _r	Turn-on Rise Time		T _J = 25°C		75		ns
			T _J = 125°C		80		
t _{d(off)}	Turn-off Delay Time		T _J = 25°C		550		ns
			T _J = 125°C		620		
t _f	Turn-off Fall Time		T _J = 25°C		100		ns
			T _J = 125°C		120		
E _{on}	Turn-on Switching Loss		T _J = 25°C		7.0		mJ
			T _J = 125°C		9.5		
E _{off}	Turn-off Switching Loss		T _J = 25°C		8.5		mJ
			T _J = 125°C		12.0		
Q _g	Total Gate Charge		T _J = 25°C		1500		nC
R _{gint}	Integrated gate resistor	f = 1M; V _{pp} = 1V	T _J = 25°C		2.5		Ω
C _{ies}	Input Capacitance	V _{CE} = 25V V _{GE} = 0V f = 1MHz	T _J = 25°C		15.5		nF
C _{oes}	Output Capacitance		T _J = 25°C		2.1		
C _{res}	Reverse Transfer Capacitance		T _J = 25°C		1.2		
R _{θJC}	Thermal Resistance, Junction-to-Case (IGBT)					0.150	°C/W

Electrical and Switching Characteristics of Freewheeling Diode

V _F	Diode Forward Voltage	I _F = 200A , 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 = 200A, di/dt=2600A/μs, V _{rr} = 600V,	T _J = 25°C		160		ns
			T _J = 125°C		220		
I _{rr}	Diode Peak Reverse Recovery Current		T _J = 25°C		170		A
			T _J = 125°C		210		
Q _{rr}	Diode Reverse Recovery Charge		T _J = 25°C		16.5		uC
			T _J = 125°C		26.5		
E _{rr}	Diode Reverse Recovery Energy		T _J = 25°C		5.50		mJ
			T _J = 125°C		10.5		
R _{θJC}	Thermal Resistance, Junction-to-Case (Diode)					0.157	°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		$^\circ C/W$
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

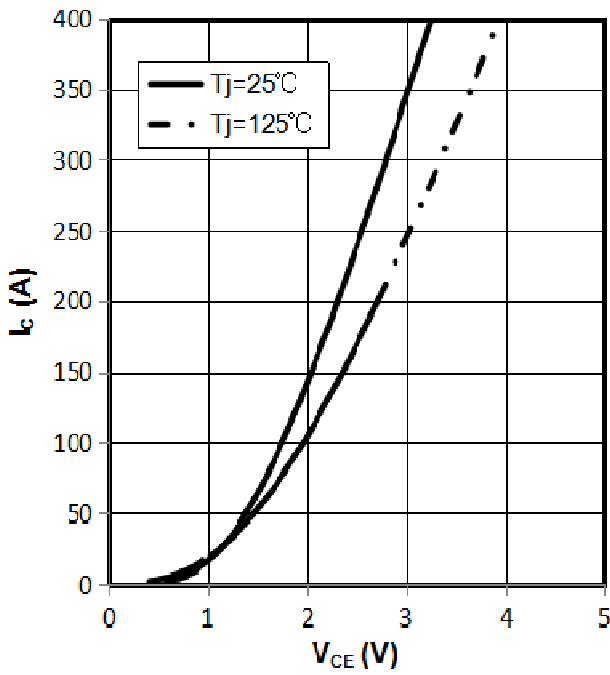


Fig 1. output characteristic IGBT,
 $I_c=f(V_{CE}), V_{GE}=15V$

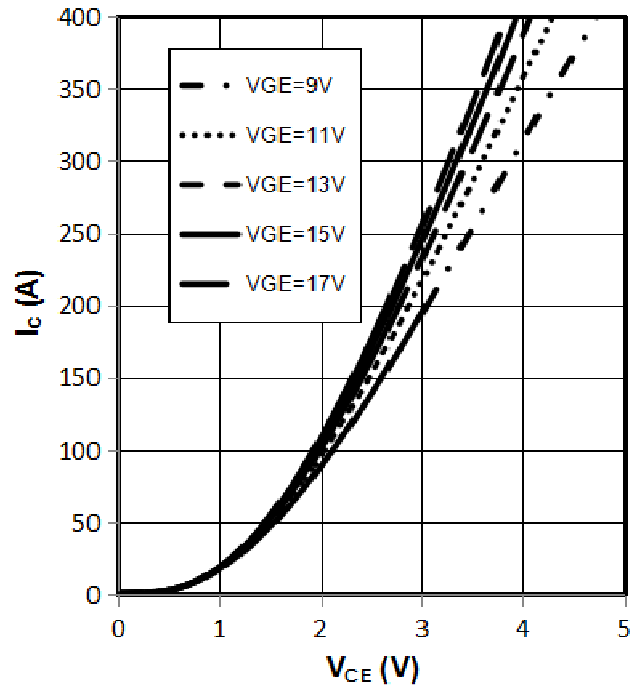


Fig 2. output characteristic IGBT,
 $I_c=f(V_{CE}), T_j=125^\circ C$

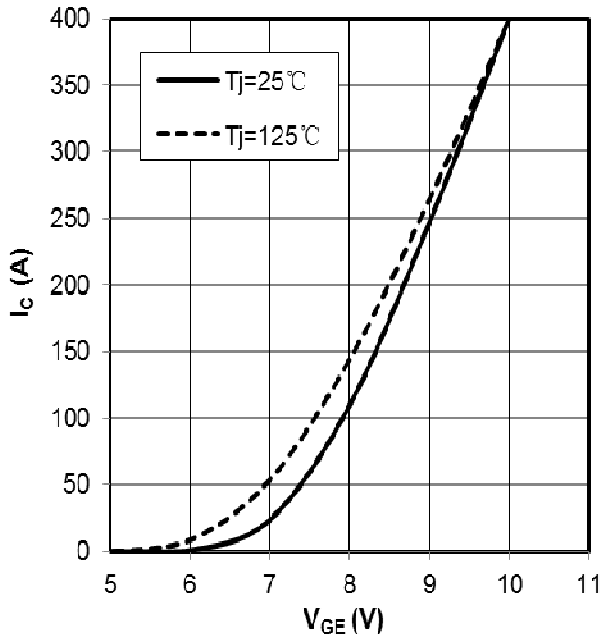


Fig 3. transfer characteristic IGBT,
 $I_c=f(V_{GE}), V_{CE}=20V$

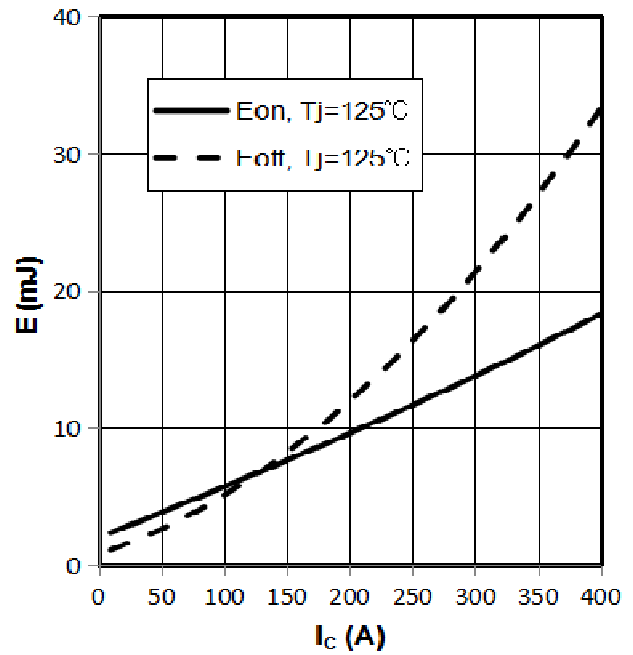


Fig 4. switching losses IGBT, $E_{on}=f(I_c), E_{off}=f(I_c)$,
 $V_{GE}=\pm 15V, R_{Gon}=4.7\Omega, R_{Goff}=4.7\Omega, V_{CE}=600V$

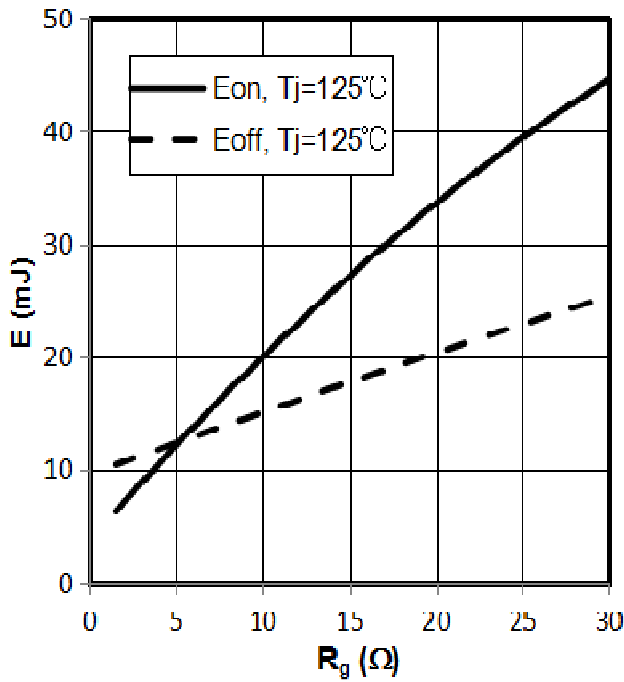


Fig 5. switching losses IGBT, $E_{on}=f(R_g)$, $E_{off}=f(R_g)$,
 $V_{GE}=\pm 15V$, $I_C=200A$, $V_{CE}=600V$

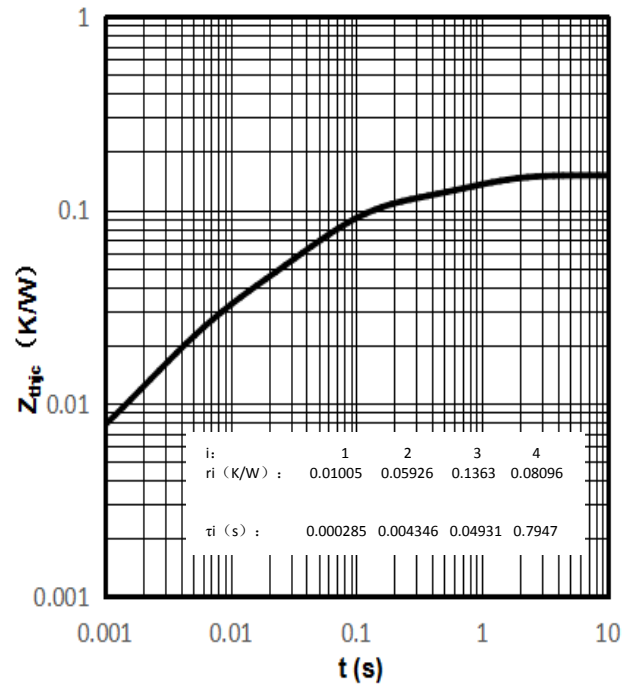


Fig 6. transient thermal impedance IGBT, $Z_{thjc}=f(t)$

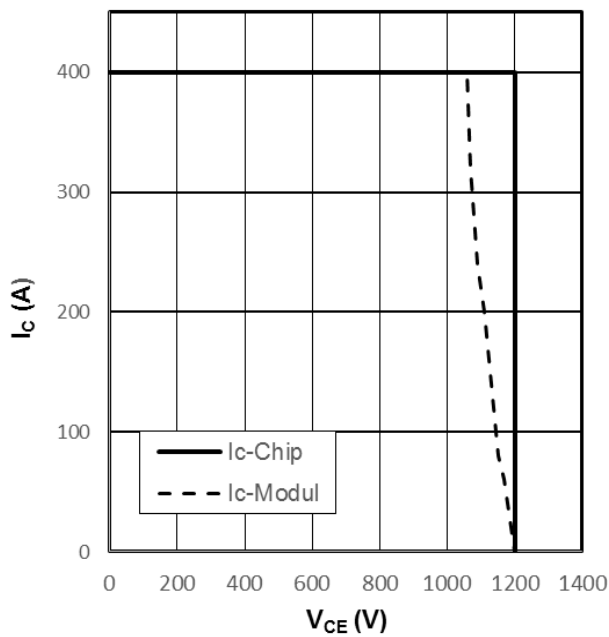


Fig 7. reverse bias safe operating area IGBT,
 $I_C=f(V_{CE})$, $V_{GE}=\pm 15V$, $R_{Goff}=4.7\Omega$, $T_j=125^\circ C$

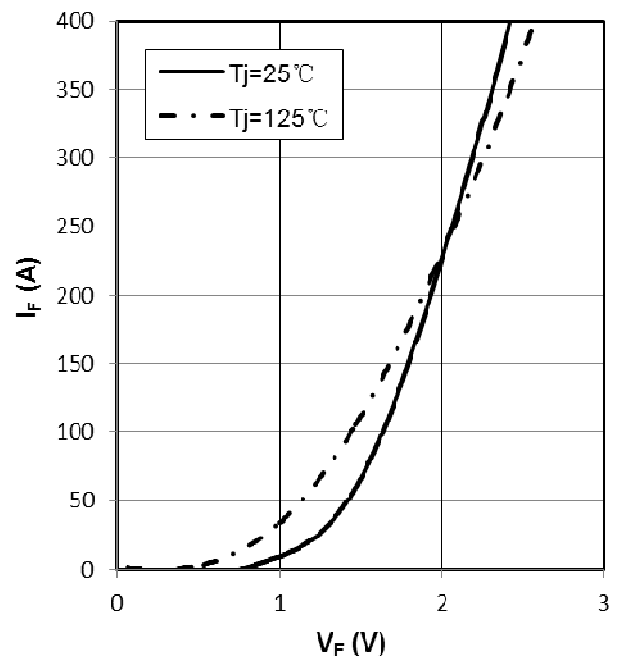


Fig 8. forward characteristic of Diode ,
 $I_F=f(V_F)$

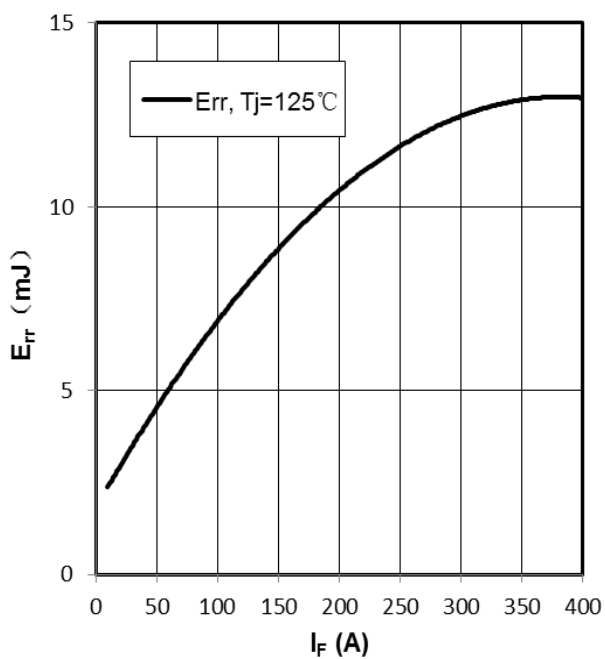


Fig 9. switching losses Diode,
 $E_{rr}=f(I_F)$, $R_{Gon}=4.7\Omega$, $V_{CE}=600V$

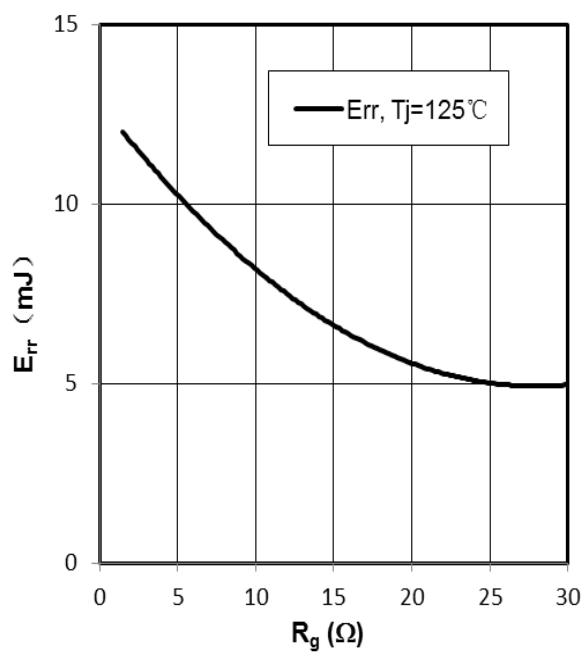
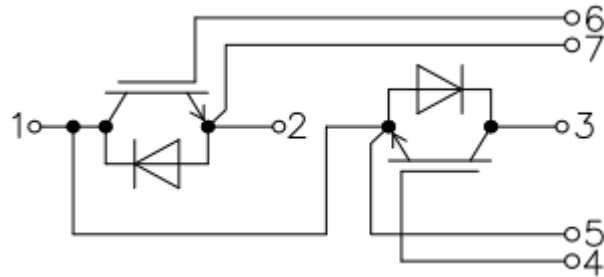


Fig 10. switching losses Diode,
 $E_{rr}=f(R_g)$, $I_F=200A$, $V_{CE}=600V$

Internal Circuit:



Package Dimension
Dimensions in Millimeters

