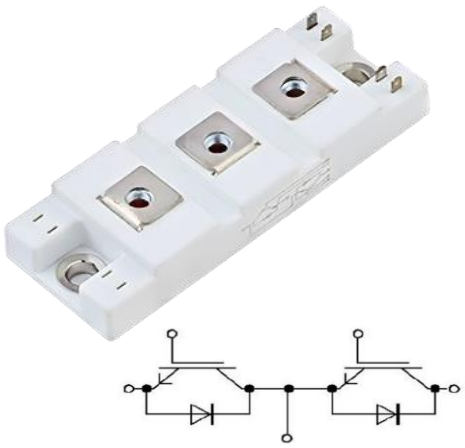
34MM Standard housing IGBT MODULE

DESCRIPTION

34mm standard housing IGBT module with
high speed Planar-FS IGBT and Fast Recovery Diode chip.

VCES	VCEsat		Icnom/ICRM
1200V	T_{vj}=25℃	2.45V	100A/200A
	Tvj= 150℃	2.9V	



FEATURES

- Half-bridge module
- Increased blocking voltage to 1200V
- Low switching losses
- Positive temperature coefficient
- Low reverse recovery charge
- high flexibility and reliability

APPLICATIONS

- Welding machine
- High Frequency Switching Application
- High Power Converters
- UPS systems

MAXIMUM RATED VALUES(IGBT)

Parameter	Symbol	Conditions	Values	Units
Collector-emitter voltage	VCES	Tvj=25℃, VGE=0V	1200	V
Continuous collector current	Icnom	Tc= 100℃, Tvjmax= 175℃	100	A
Repetitive peak collector current	ICRM	tp= 1ms, Tvj=25℃	200	A
Gate-emitter peak voltage	VGES	Tvj=25℃	±20	V
SC data	ISC	VGE≤15V, VCC=800V VCEmax=VCES-LsCE*di/dt tp≤10μs, Tvj= 150℃	400	A
Total power dissipation	Ptot	Tc=25℃, Tvj max= 175℃	535	W

CHARACTERISTICS VALUES(IGBT)

Parameter	Symbol	Conditions	Values			Units
			Min.	Typ.	Max.	
Collector-emitter breakdown voltage	VBRCES	VGE=0V,IC= 100μA	1200			V
Collector-emitter saturation voltage	VCE sat	IC= 100A, VGE= 15V, Tvj=25℃	1.8	2.45	2.9	V
		IC= 100A, VGE= 15V, Tvj= 150℃		2.9		V
Gate-emitter threshold voltage	VGEth	VCE=VGE , IC=3mA, Tvj=25℃	5.0	6.0	7.0	V

Gate charge	QG	VGE=-8V...+15V		0.7		nC
Integrated gate resistor	RG	Tvj=25℃		5		Ω
Input capacitance	Cies	Tvj=25℃,f= 1MHz,VGE=0V,VCE=25V		4.29		nF
Output capacitance	Coes	Tvj=25℃,f= 1MHz,VGE=0V,VCE=25V		0.55		nF
Reverse transfer capacitance	Cres	Tvj=25℃,f= 1MHz,VGE=0V,VCE=25V		0.21		nF
Collector-emitter cut-off current	ICES	VCE= 1200V, VGE=0V, Tvj=25℃			500	μA
Gate-emitter leakage current	IGES	VCE=0V, VGE=20V, Tvj=25℃			100	nA
Turn-on delay time, inductive load	td on	IC= 100A, VCE=600V, VGE=-8V/+15V RGon=5Ω ,RGoff=5Ω	Tvj=25℃	135		ns
			Tvj= 150℃	155		ns
Rise time, inductive load	tr		Tvj=25℃	40		ns
			Tvj= 150℃	56		ns
Turn-off delay time, inductive load	td off		Tvj=25℃	323		ns
			Tvj= 150℃	421		ns
Fall time, inductive load	tf		Tvj=25℃	52		ns
			Tvj= 150℃	102		ns
Turn-on energy loss per pulse	Eon	IC= 100A, VCE=600V, VGE=-8V/+15V, RGon=13.6Ω , RGoff=30Ω, Lσ=45nH	Tvj=25℃	13.2		mJ
			Tvj= 150℃	17.6		mJ
Turn-off energy loss per pulse	Eoff		Tvj=25℃	5.9		mJ
			Tvj= 150℃	8.4		mJ

MAXIMUM RATED VALUES(FRD)

Parameter	Symbol	Conditions	Values	Units
Repetitive peak reverse voltage	VRRM	Tvj =25℃	1200	V
Continuous forward current	IF		100	A
Maximum repetitive forward current	IFRM	Pulse, tp = 1ms, Tvj =25℃	200	A
I2t-value	I2t	VR =0V, tp = 10ms, Tvj = 125℃ VR =0V, tp = 10ms, Tvj = 150℃	1900 1800	A2 s

CHARACTERISTICS VALUES(FRD)

Parameter	Symbol	Conditions	Values			Units
			Min.	Typ.	Max.	

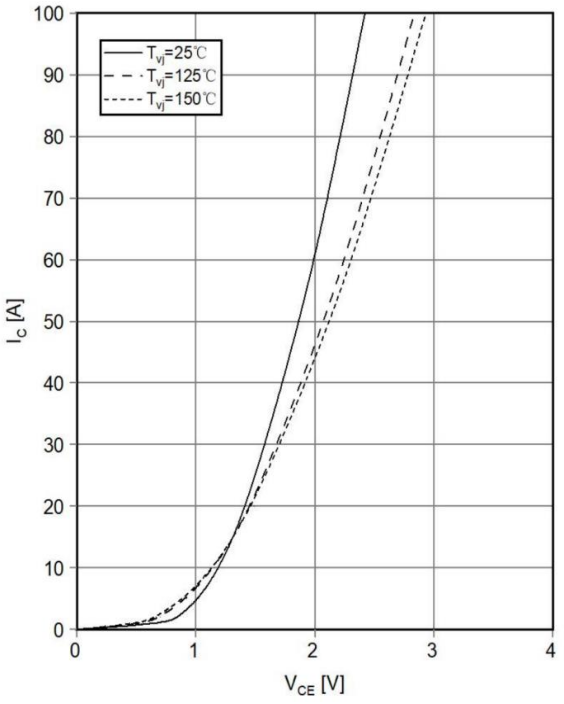
Breakdown voltage	V(BR)	IR= 100μA,Tvj=25℃		1200			V
Reverse current	IR	VR= 1200V,Tvj=25℃				100	μA
Forward voltage	VF	IF=60A, VGE=0V,	Tvj=25℃	1.5	1.9	2.7	V
			Tvj= 150℃		2		V
Peak reverse recovery current	IRM	IF=60A,VR=600V, VGE=-8V/+15V, diF/dt= 1350A/μs Lσ=45nH	Tvj=25℃		42		A
			Tvj= 150℃		50		A
Recovered charge	Qr		Tvj=25℃		2.77		μC
			Tvj= 150℃		8.27		μC
Reverse recovery energy	Erec		Tvj=25℃		1.29		mJ
			Tvj= 150℃		3.82		mJ

MODULE

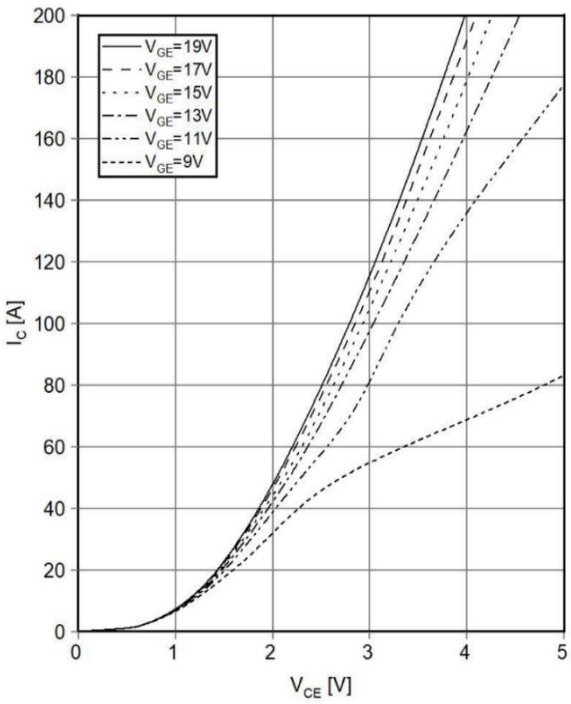
Parameter	Symbol	Conditions	Values			Units
			Min.	Typ.	Max.	
Maximum junction temperature	Tvj max				150	℃
Temperature under switching conditions	Tvj op		-40		150	℃
Storage temperature	Tstg		-40		125	℃
IGBT, thermal resistance, junction to case	Rthjc IGBT	Per IGBT			0.28	K/W
Diode, thermal resistance, junction to case	Rthjc Diode	Per diode			0.49	K/W
Stray inductance module	LsCE			28		nH
Module lead resistance, terminals-chip	RCC'+EE	Tvj=25℃, per switch		0.65		mΩ
Isolation test voltage	Visol	AC, RMS, f=50Hz, t= 1min		2.5		kV
Creepage distance	ds	Terminal to terminal		17.0		mm
		Terminal to base		20.0		mm
Clearance distance in air	da	Terminal to terminal		17.0		mm
		Terminal to base		9.5		mm
Comperative tracking index	CTI		>200			
Mounting torque for module mounting	M	Screw M6	3.0		5.0	N·m
Internal isolation	-	Basic insulation	Al2O3			-
Material of module baseplate	-		Cu			-
Dimensions	L* W* H		94x34x30.2			mm
Weight	G		160			g

CHARACTERISTICS DIAGRAMS

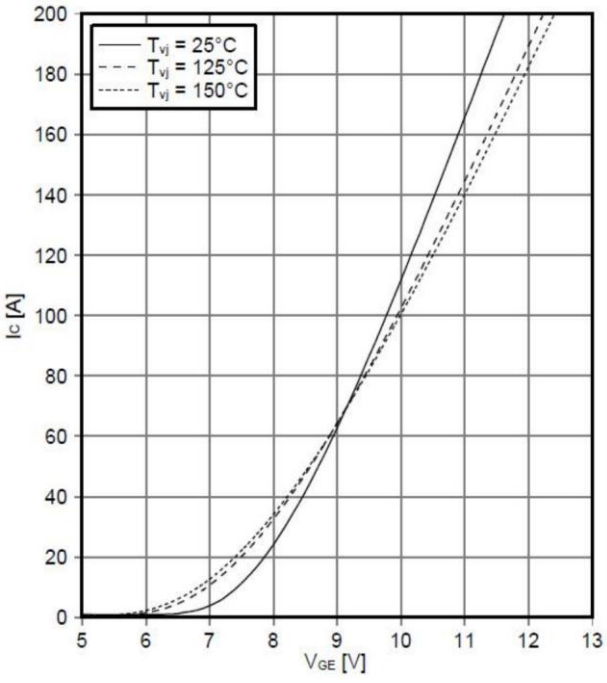
Output characteristic IGBT,
Inverter(typical) IC=f(VCE) VGE=15V



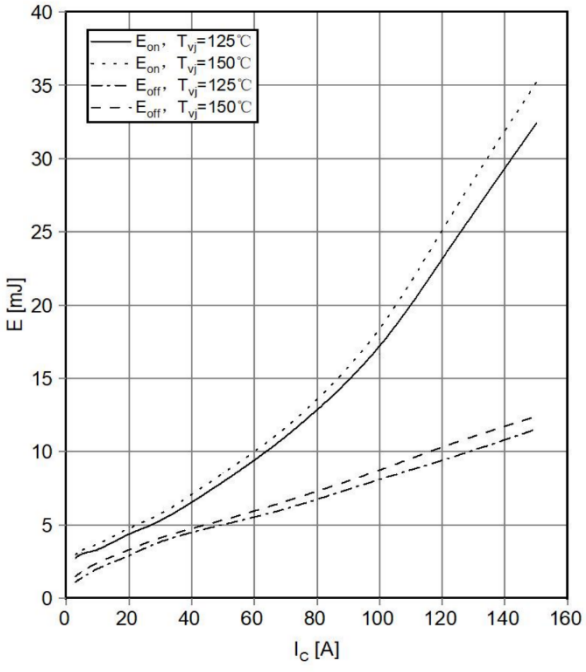
Output characteristic IGBT,
Invertertypical) IC=f(VCE) Tvj=150℃



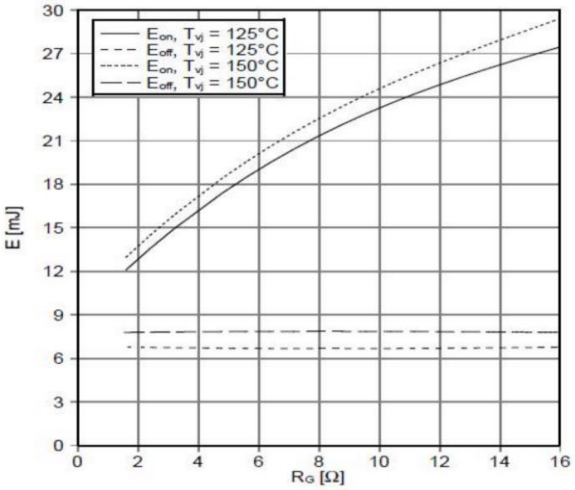
Transfer characteristic IGBT,
Inverter(typical) IC=f(VGE) VCE=20V



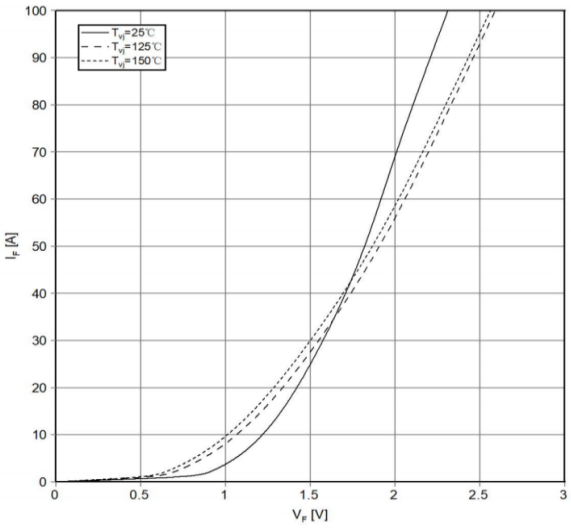
Switching losses IGBT, Inverter(typical)
Eon=f(IC), Eoff=f(IC) VGE=-8V/+15V,
RGon=13.6Ω , RGoff=30Ω , VCE=600V



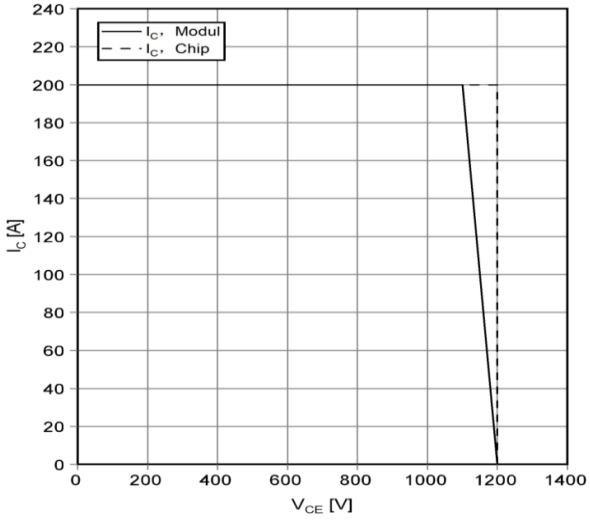
Switching losses IGBT, Inverter(typical)
Eon=f(RG), Eoff=f(RG) VGE=±15V, IC=100A, VCE=600V



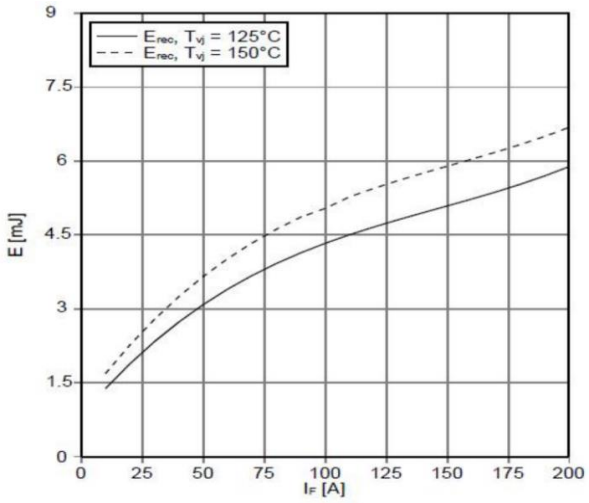
Forward characteristic of Diode, Inverter(typical)
IF=f(VF)



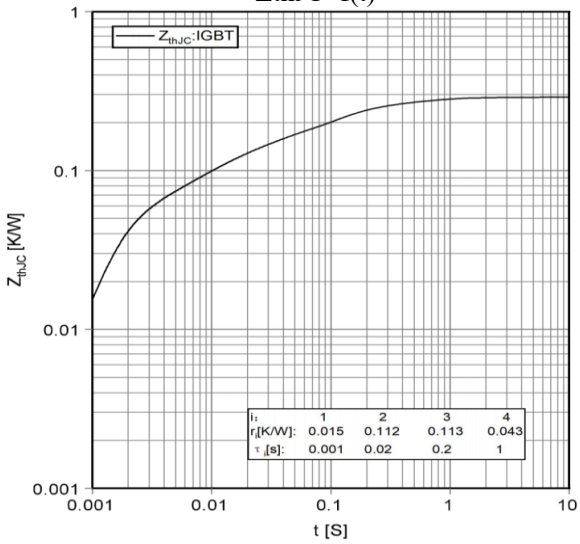
Reverse bias safe operating area IGBT, Inverter(RBSOA)
IC=f(VCE), VGE=±15V, RGoff=5Ω , Tvj=150°C



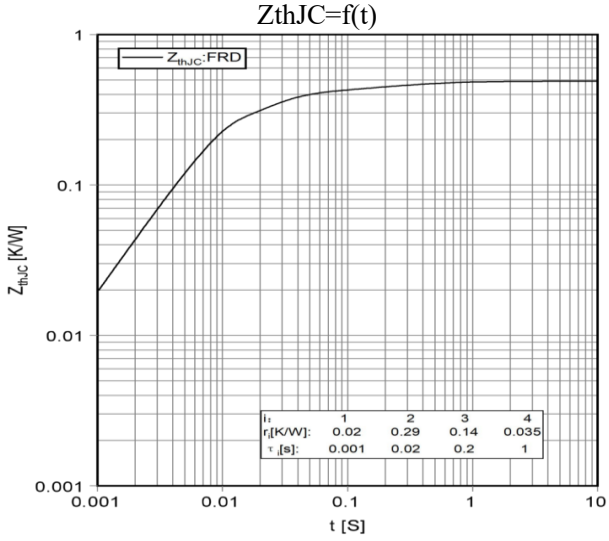
Switching losses Diode, Inverter(typical) Erec=f(IF)
RGon=5Ω , VCE=600V



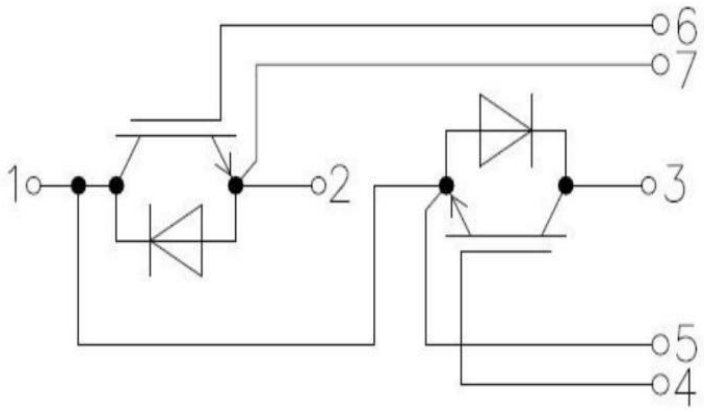
Transient thermal impedance IGBT, Inverter
ZthJC=f(t)



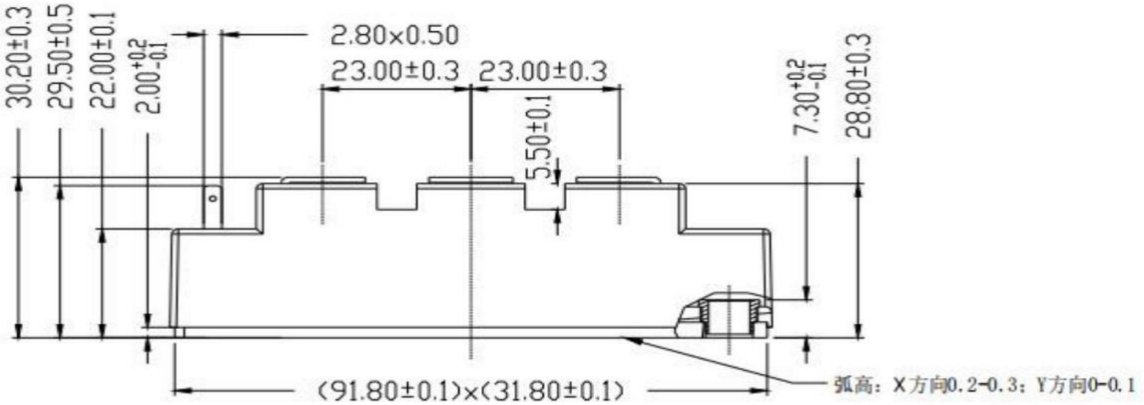
Transient thermal impedance Diode, Inverter
ZthJC=f(t)

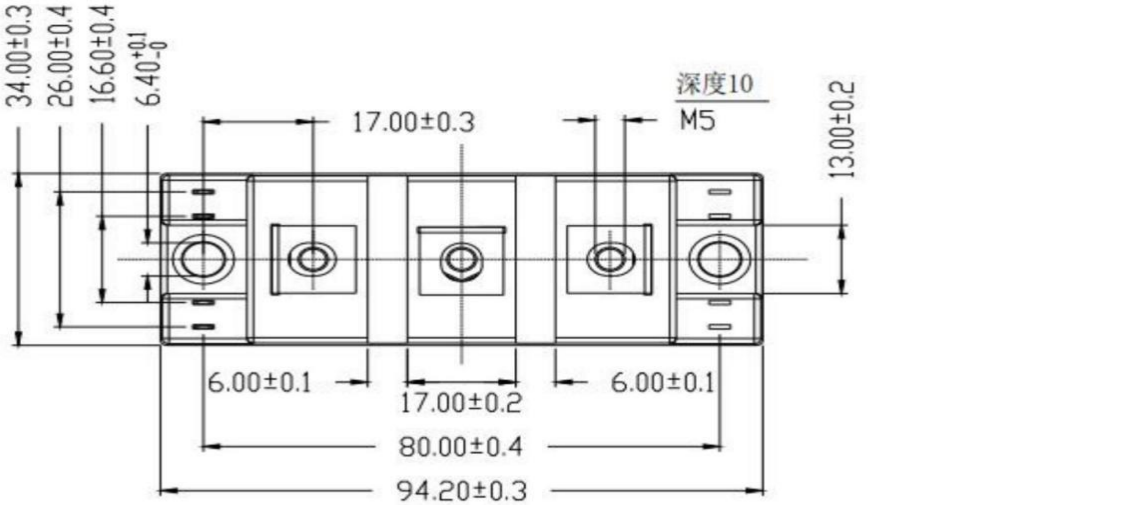


CIRCUIT DIAGRAM



PACKAGE OUTLINES





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Date of change	Rev #	revise content
2023/9/3	A/0	First edition release