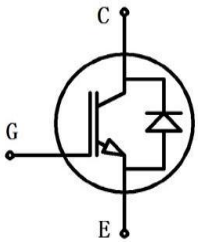
Trench Field-stop IGBT Discretes

VCES	VCEsat		Ic
1350V	T_{vj}=25℃	2.3V	30A/60A
	Tvj= 150℃	2.8V	



G C E TO-3PN

FEATURES

- Trench and Field-stop technology
- Low collector to emitter saturation voltage
- Optimized for Fast Switching
- Easy parallel switching capability
- Short circuit withstands time-10μs

APPLICATIONS

- Induction Heating
- Soft switching application

Absolute Maximum Ratings of IGBT (TJ= 25°C unless otherwise noted)

Symbol	Parameter	Conditions	Value	Unit
VCES	Collector to Emitter Voltage		1350	V
VGES	Continuous Gate to Emitter Voltage		±20	V
Ic	Continuous Collector Current	Tc=100℃	30	A
		Tc=25℃	60	A
IcM	Pulse Collector Current	Pulse width limited by Tjmax	120	A
PD	Maximum Power Dissipation (IGBT)	Tc=25℃,Tj=150℃	347	W
tsc	Short Circuit Withstand Time	Vcc=600V,VGE≤15V	10	μs

Electrical Characteristics of IGBT(T=25℃)

Static characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unitt
VGE(th)	Gate-Emitter Threshold Voltage	Ic=1mA,VcE=VGE, Tj=25℃		4.9	5.9	6.9	V
VCE(sat)	Collector-Emitter Saturation Voltage	Ic=30A, VGE=15V	Tj=25℃	-	2.3		V
			T=125℃	-	2.8	-	
IcES	Collector-Emitter Leakage Current	VGE=0V, VcE=VCES,Tj=25℃		-	-	1.0	mA
IGES	Gate-Emitter Leakage Current	VGE=±20V, VcE=0V,Tj=25℃		-100	-	100	nA
Ciss	Input capacitance	VcE=25V, VGE=0V, f=1MHz		-	2485	-	pF
Coss	Output capacitance			-	157	-	
Crss	Reverse transfer capacitance			-	72	-	
Rgint	Internal gate resistor				1.3		Ω

Switching Characteristics

td(on)	Turn-on Delay Time	Vcc=600V,Ic=30A, VGE=±15V,L=525uH, Rg=4.8Ω	Tj=25℃		21		ns
			Tj=125℃		21		
tr	Rise Time		Tj=25℃		24		ns
			TJ=125℃		25		
ta(off)	Turn-off Delay Time		Tj=25℃		93		ns
			Tj=125℃		100		
tr	Fall Time		Tj=25℃		286		ns
			Tj=125℃		360		
Eon	Turn-on Switching Loss		Tj=25℃		3.0		mJ
			Tj=125℃		3.3		
Eoff	Turn-off Switching Loss		Tj=25℃		1.5		mJ
			Tj=125℃		2.3		
ReJC	Junction-To-Case (IGBT)				0.36		K/W

Electrical Characteristics of Diode (TJ = 25°C unless otherwise noted)
Static characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
VFM	Forward Voltage	Ir=30A,VGE=0V	TJ = 25℃		2.4		V
			TJ = 150℃		2.6		

Switching Characteristics

I	Peak Reverse Recovery Current	I=30A, Vcc=600V, VGE=-15V, L=525uH, Rg=4.8Ω	Tj=25℃		54		A
			Tj=125℃		68		
Qr	Reverse Recovery Charge		Tj=25℃		4.5		μC
			Tj=125℃		7.3		
Erec	Reverse Recovery Energy		Tj=25℃		1.9		mJ
			Tj=125℃		3.3		
ReJC	Junction-To-Case(Diode)				0.95		K/W

Module Characteristics

Tj	Maximum Junction Temperature			150	℃
TJoP	Maximum Operating Junction Temperature Range	-55		+150	℃
Tstg	Storage Temperature	-55		+150	℃

Characteristics diagrams

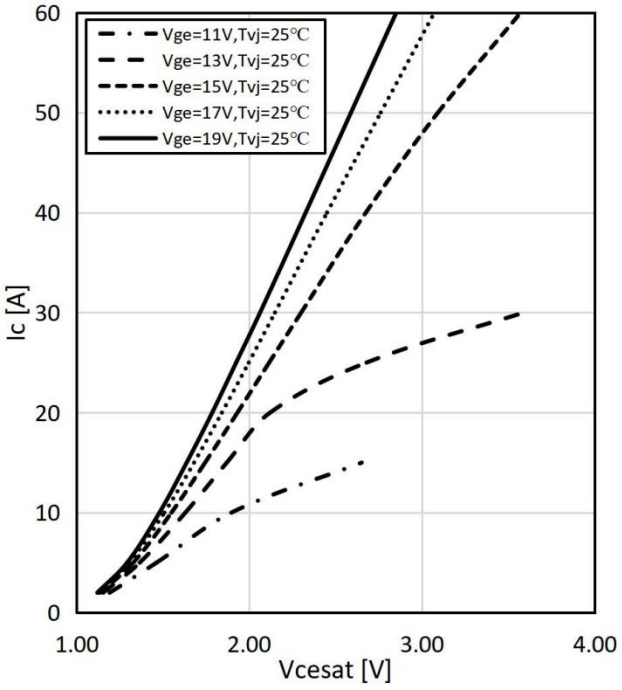


Fig.1 output characteristic IGBT Inverter(typical)

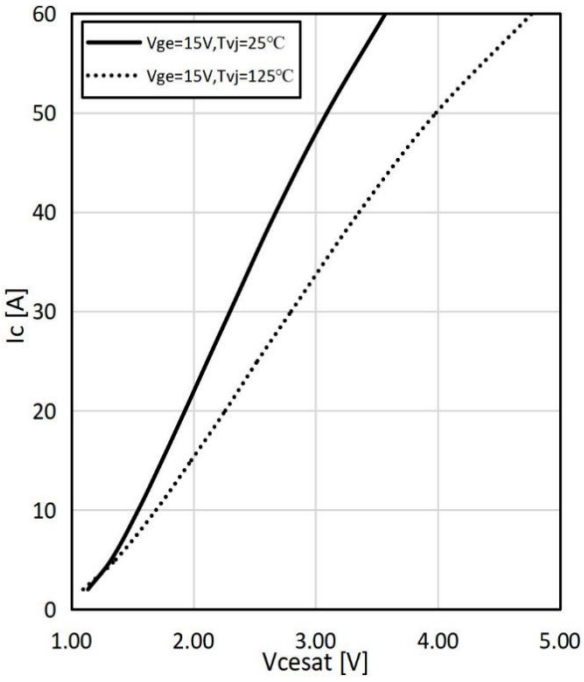


Fig.2 output characteristic IGBT Inverter(typical)

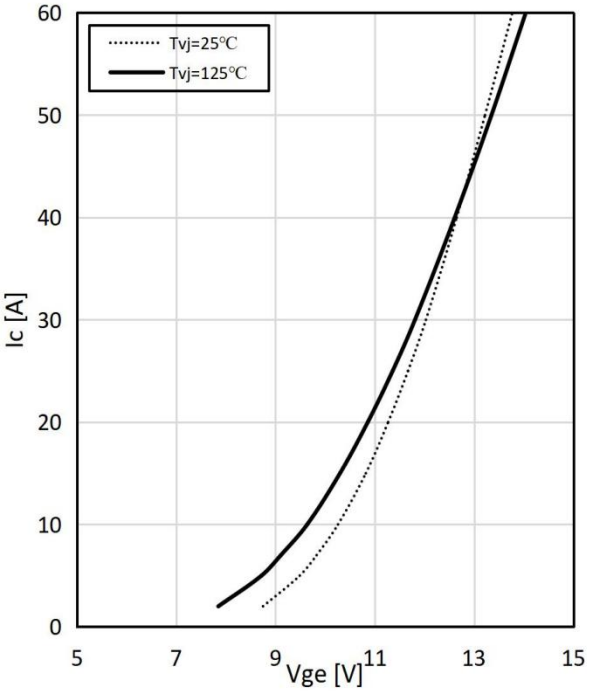


Fig.3 transfer characteristic IGBT Inverter(typical)

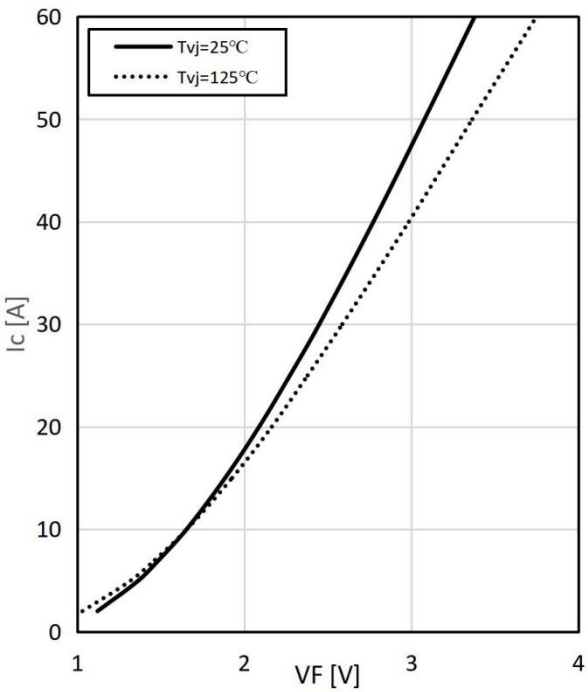


Fig.4 forward characteristic of Diode Inverter(typical)

Vcc=600V, VCE=±15V, RG=4.8Ω

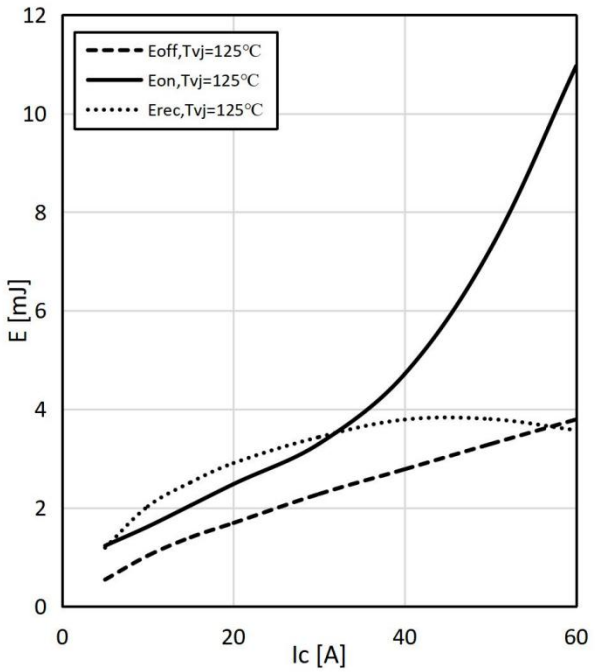


Fig.5 switching losses IGBT Inverter (typical)

Vcc=600V, VCE=±15V, Ic=30A

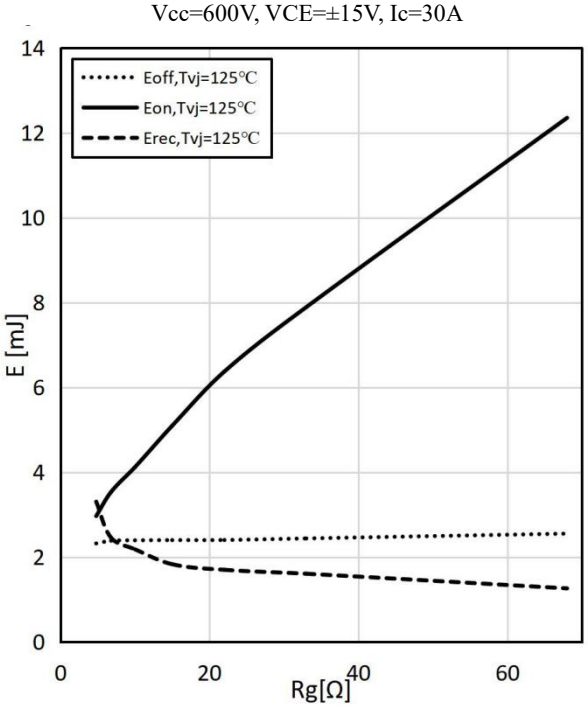


Fig.6 switching Losses vs. Gate Resistance (typical)

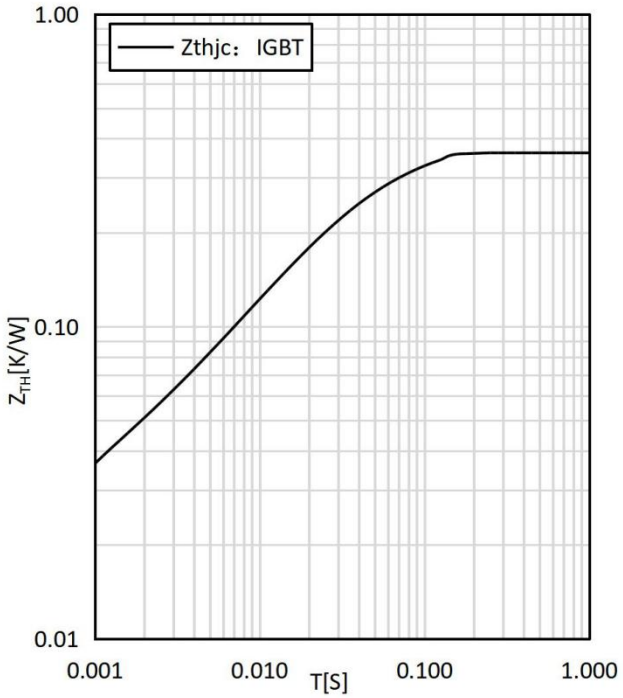


Fig.7 transient thermal impedance IGBT

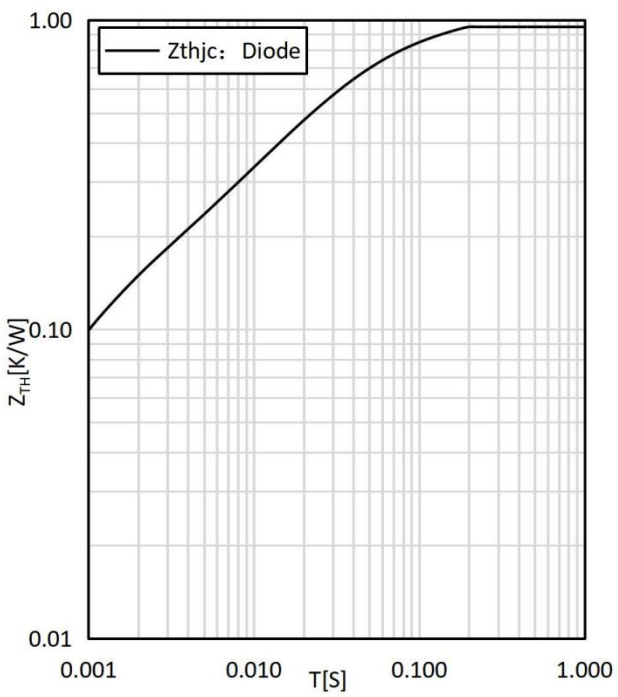
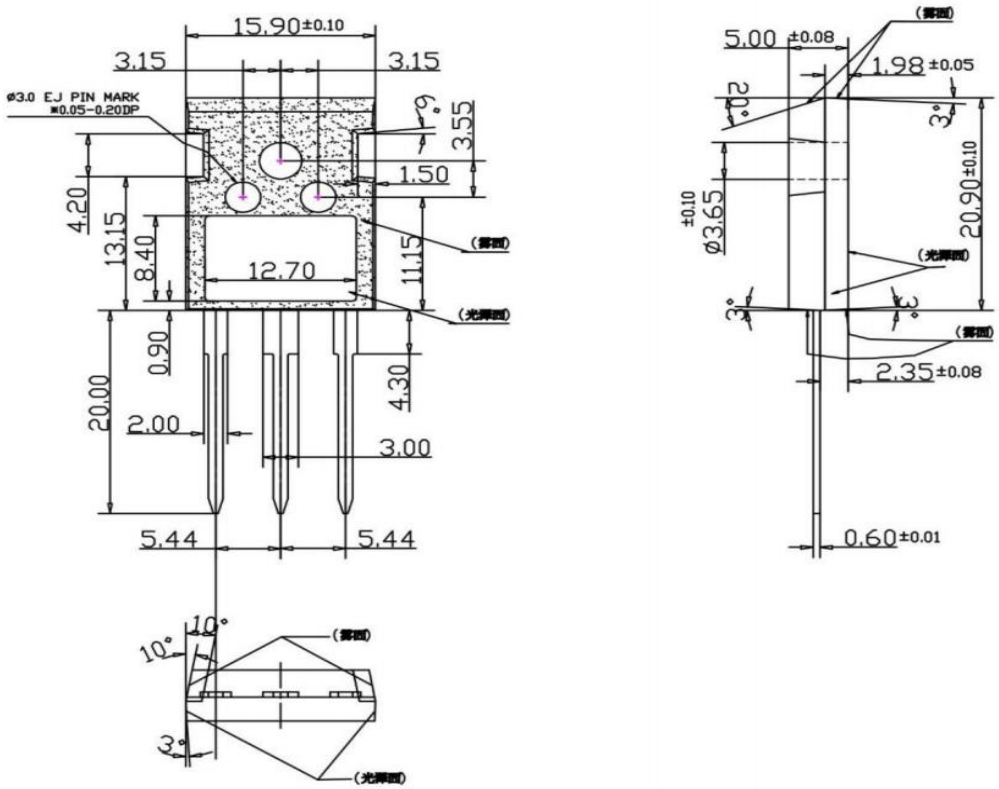


Fig.8 transient thermal impedance Diode

Package outline (mm)



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3) Mitigate risks of accidents, fires, or societal damages resulting from product use.
4) Designers must ensure Hypersemi products operate strictly within specified parameters defined in the latest product specifications.