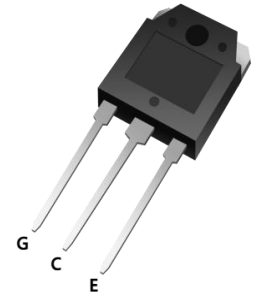
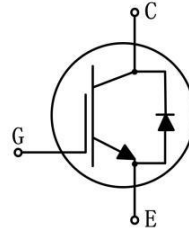


Trench Field-stop IGBT Discrete

Parameter	Value	Unit
V_{CE}	1350	V
I_C	30	A
$V_{CE(sat)}$	2.3	V



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-10 μ s

Applications

- Induction Heating
- Soft switching application

Maximum Ratings (T_J= 25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Value	Unit
V_{CES}	Collector to Emitter Voltage		1350	V
V_{GES}	Continuous Gate to Emitter Voltage		± 20	V
I_C	Continuous Collector Current	$T_C=100^\circ C$	30	A
		$T_C=25^\circ C$	60	A
I_{CM}	Pulse Collector Current	Pulse width limited by T _{Jmax}	120	A
P_D	Maximum Power Dissipation (IGBT)	$T_C=25^\circ C, T_J=150^\circ C$	347	W
t_{sc}	Short Circuit Withstand Time	$V_{CC}=600V, V_{GE}\leq 15V$	10	μ s

Electrical Characteristics of IGBT (T_J= 25°C unless otherwise noted)

Static characteristics

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C=1mA, V_{CE}=V_{GE}, T_J=25^\circ C$	4.9	5.9	6.9	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=30A, V_{GE}=15V, T_J=25^\circ C$	-	2.3	-	V
		$T_J=125^\circ C$	-	2.8	-	
I_{CES}	Collector-Emitter Leakage Current	$V_{GE}=0V, V_{CE}=V_{CES}, T_J=25^\circ C$	-	-	1.0	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=\pm 20V, V_{CE}=0V, T_J=25^\circ C$	-100	-	100	nA
C_{iss}	Input capacitance	$V_{CE}=25V, V_{GE}=0V, f=1MHz$	-	2485	-	pF
C_{oss}	Output capacitance		-	157	-	
C_{riss}	Reverse transfer capacitance		-	72	-	
R_{gint}	Internal gate resistor			1.3		Ω

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V, I_C=30A,$ $V_{GE}=\pm 15V, L=525\mu H,$ $R_g=4.8\Omega$	$T_j=25^\circ C$	21	ns
			$T_j=125^\circ C$	21	
t_r	Rise Time		$T_j=25^\circ C$	24	ns
			$T_j=125^\circ C$	25	
$t_{d(off)}$	Turn-off Delay Time		$T_j=25^\circ C$	93	ns
			$T_j=125^\circ C$	100	
t_f	Fall Time		$T_j=25^\circ C$	286	ns
			$T_j=125^\circ C$	360	
E_{on}	Turn-on Switching Loss		$T_j=25^\circ C$	3.0	mJ
			$T_j=125^\circ C$	3.3	
E_{off}	Turn-off Switching Loss	$T_j=25^\circ C$	1.5	mJ	
		$T_j=125^\circ C$	2.3		
$R_{\theta JC}$	Junction-To-Case (IGBT)		0.36	K/W	

Electrical Characteristics of Diode ($T_j = 25^\circ C$ unless otherwise noted)
Static characteristics

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
V_{FM}	Forward Voltage	$I_F=30A, V_{GE}=0V$	$T_j=25^\circ C$		2.4	V
			$T_j=150^\circ C$		2.6	

Switching Characteristics

I_{rr}	Peak Reverse Recovery Current	$I_F=30A,$ $V_{CC}=600V,$ $V_{GE}=-15V, L=525\mu H,$ $R_g=4.8\Omega$	$T_j=25^\circ C$	54	A
			$T_j=125^\circ C$	68	
Q_{rr}	Reverse Recovery Charge		$T_j=25^\circ C$	4.5	μC
			$T_j=125^\circ C$	7.3	
E_{rec}	Reverse Recovery Energy		$T_j=25^\circ C$	1.9	mJ
			$T_j=125^\circ C$	3.3	
$R_{\theta JC}$	Junction-To-Case(Diode)			0.95	K/W

Module Characteristics

T_j	Maximum Junction Temperature		150	$^\circ C$
T_{JoP}	Maximum Operating Junction Temperature Range	-55	+150	$^\circ C$
T_{stg}	Storage Temperature	-55	+150	$^\circ C$

Typical Characteristics

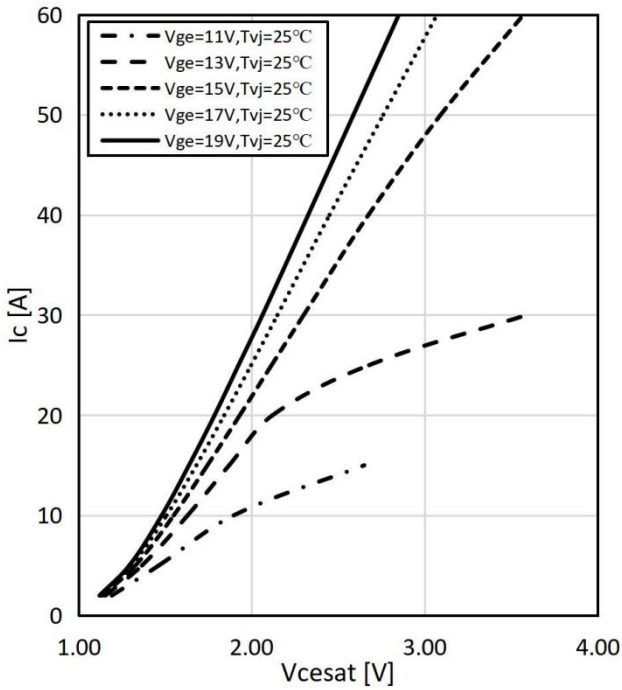


Fig.1 Output characteristic IGBT Inverter (typical)

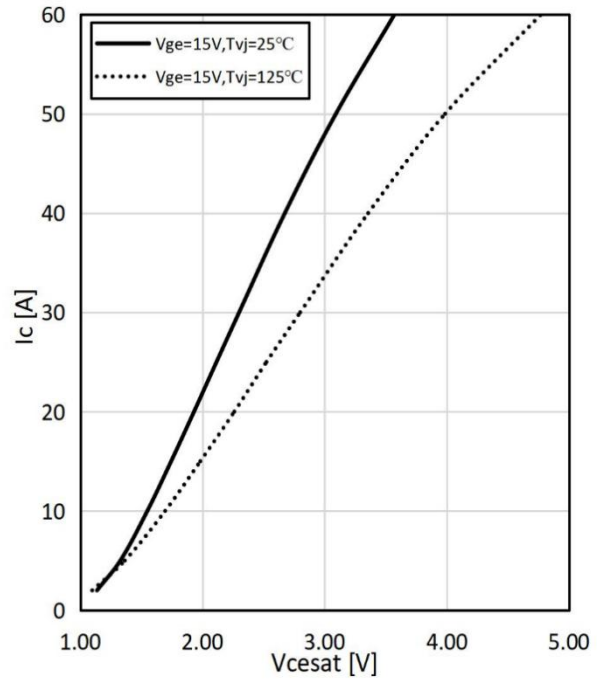


Fig.2 Output characteristic IGBT Inverter (typical)

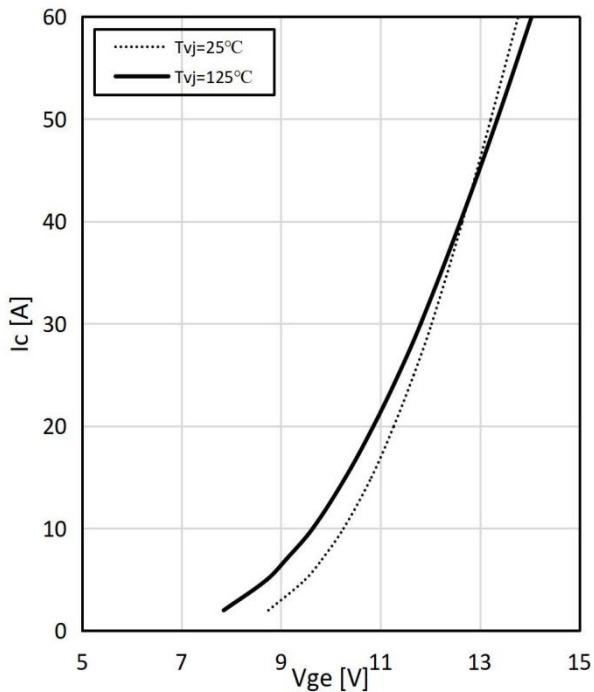


Fig.3 Transfer characteristic IGBT Inverter (typical)

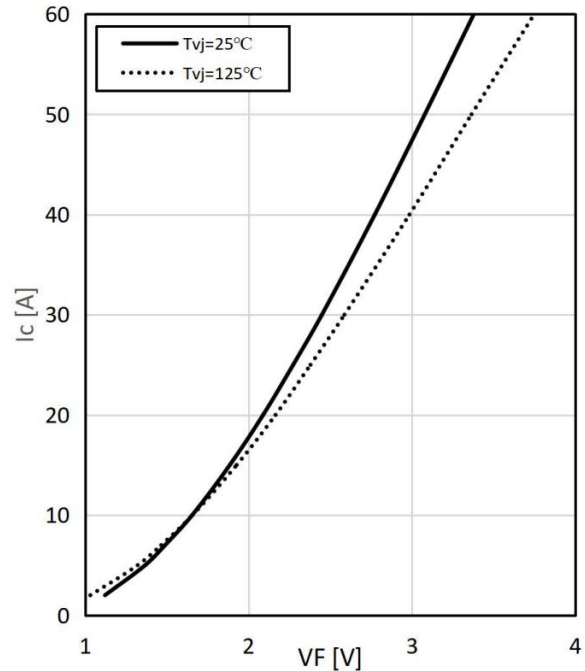


Fig.4 Forward characteristic of Diode Inverter (typical)

VCC=600V, VCE=±15V, RG=4.8Ω

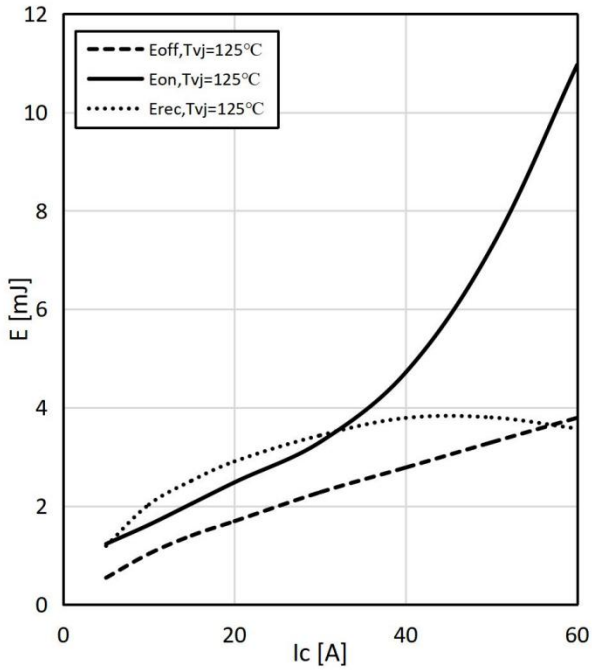


Fig.5 Switching losses IGBT Inverter (typical)

VCC=600V, VCE=±15V, Ic=30A

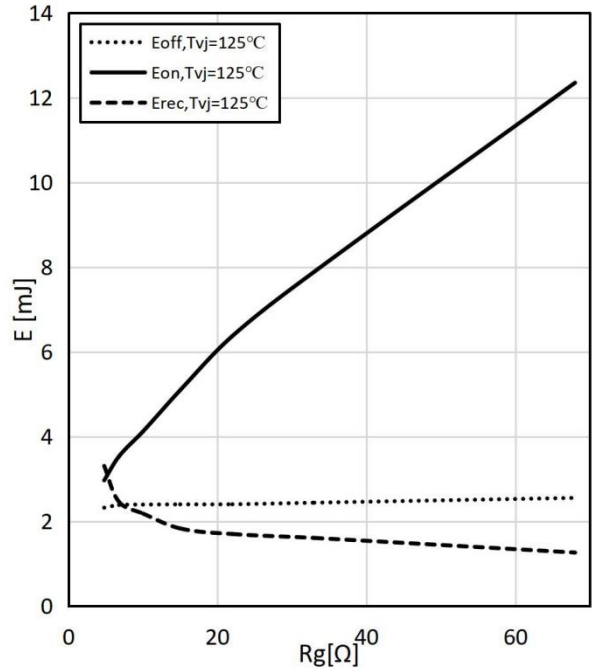


Fig.6 Switching Losses vs. Gate Resistance (typical)

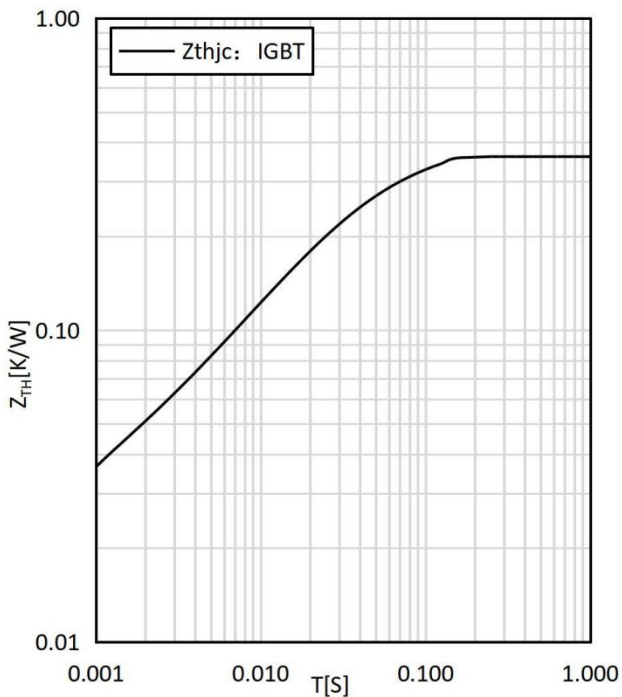


Fig.7 Transient thermal impedance IGBT

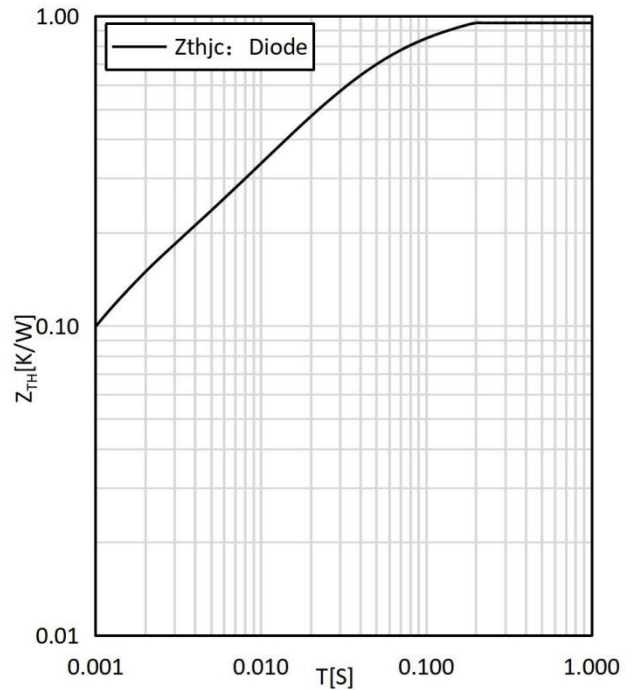
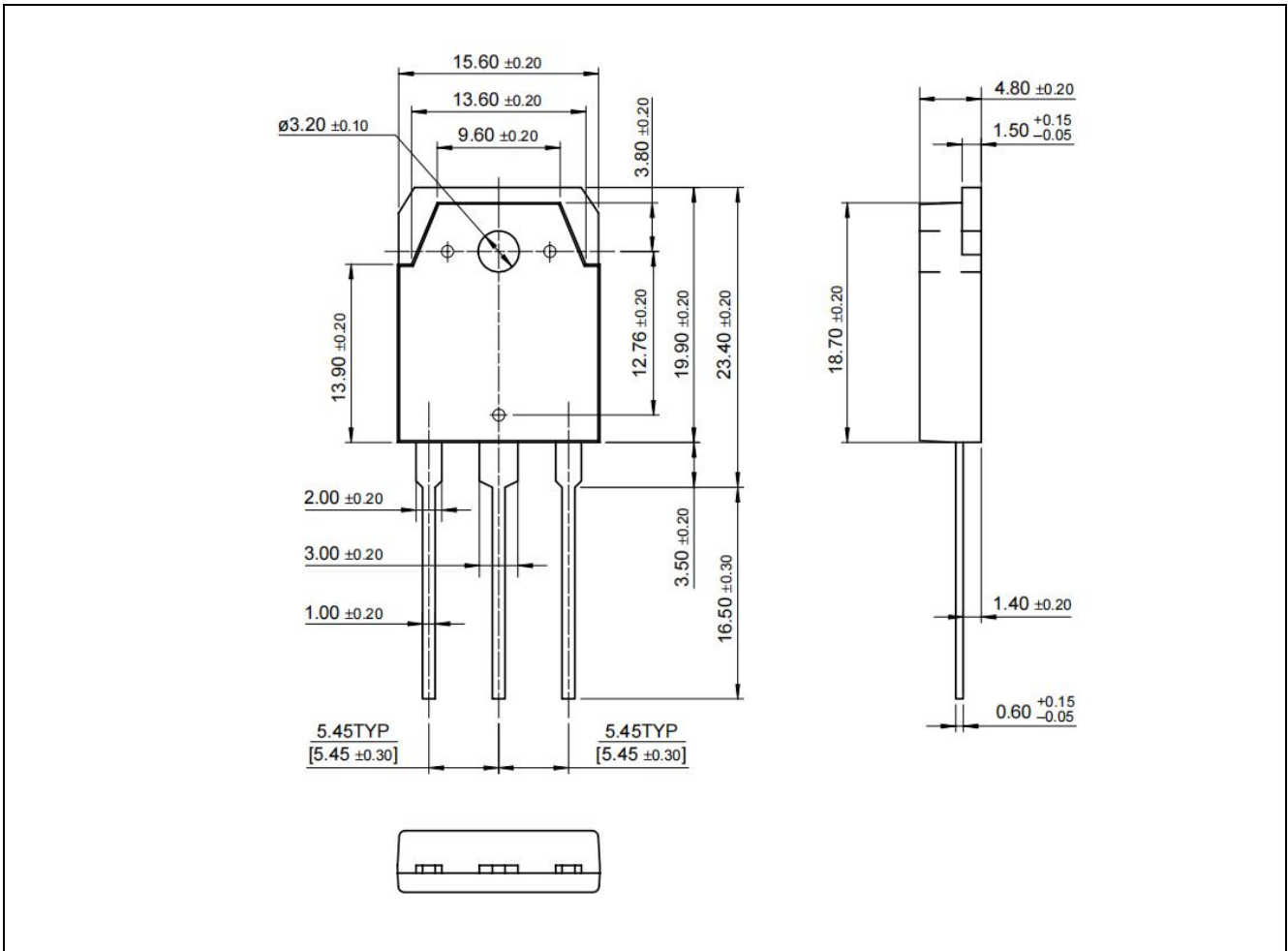


Fig.8 Transient thermal impedance Diode

Package Outlines (Unit: mm)

TO-3PN



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