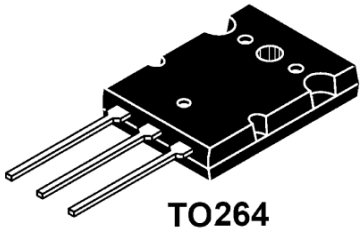
IGBT



Features

- 1200V,75A
- $V_{CE(sat)(typ.)}$=1.65V@V_{GE}=15V,I_C=75A
- High speed switching
- Higher system efficiency
- Soft current turn-off waveforms
- Square RBSOA

General Description

JIAEN Trench IGBTs offer lower losses and higher energy efficiency for application such as Motor control, general inverter and other soft switching applications.

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{CES}	Collector-Emitter Voltage	1200	V
V_{GES}	Gate-Emitter Voltage	± 30	V
I_C	Continuous Collector Current (T_C=25℃)	150	A
	Continuous Collector Current (T_C=100℃)	75	A
I_{CM}	Pulsed Collector Current (Note 1)	225	A
I_F	Diode Continuous Forward Current (T_C=100℃)	75	A
I_{FM}	Diode Maximum Forward Current (Note 1)	225	A
t_{sc}	Short Circuit Withstand Time	10	us
P_D	Maximum Power Dissipation (T_C=25℃)	694	W
	Maximum Power Dissipation (T_C=100℃)	278	W
T_J	Operating Junction Temperature Range	-55 to +150	℃
T_{STG}	Storage Temperature Range	-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Max.	Units
$R_{th\ j\text{-}c}$	Thermal Resistance, Junction to case for IGBT	0.18	℃/ W
$R_{th\ j\text{-}c}$	Thermal Resistance, Junction to case for Diode	0.5	℃/ W
$R_{th\ j\text{-}a}$	Thermal Resistance, Junction to Ambient	25	℃/ W

Electrical Characteristics (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{CES}	Collector-Emitter Breakdown Voltage	V_{GE}= 0V, I_C= 250uA	1200	-	-	V
I_{CES}	Collector-Emitter Leakage Current	V_{CE}= 1200V, V_{GE}= 0V	-	-	100	uA
I_{GES}	Gate Leakage Current, Forward	V_{GE}= ± 30V, V_{CE}= 0V	-	-	± 100	nA
$V_{GE(th)}$	Gate Threshold Voltage	V_{GE}= V_{CE}, I_C= 250uA	4.0	-	7.0	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	V_{GE}=15V, I_C= 75A	-	1.65	2.3	V
Q_g	Total Gate Charge	V_{CC}=960V V_{GE}=15V IC=75A	-	472		nC
Q_{ge}	Gate-Emitter Charge		-	118		nC
Q_{gc}	Gate-Collector Charge		-	251		nC
$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V V_{GE}=15V I_C=75A R_G=15Ω Inductive Load T_C=25 ℃	-	188	-	ns
t_r	Turn-on Rise Time		-	115	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	762	-	ns
t_f	Turn-off Fall Time		-	137	-	ns
Eon	Turn-on Switching Loss		-	11.7	-	mJ
Eoff	Turn-off Switching Loss		-	6.8	-	mJ
Ets	Total Switching Loss		-	18.5	-	mJ
C_{ies}	Input Capacitance	V_{CE}=25V V_{GE}=0V f = 1MHz	-	9860	-	pF
C_{oes}	Output Capacitance		-	281	-	pF
C_{res}	Reverse Transfer Capacitance		-	17	-	pF

Electrical Characteristics of Diode (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_F	Diode Forward Voltage	I_F=75A	-	1.85	3.0	V
t_{rr}	Diode Reverse Recovery Time	V_{CE} = 600V I_F= 75A dIF/dt = 700A/us	-	580		ns
I_{rr}	Diode peak Reverse Recovery Current		-	31.3		A
Q_{rr}	Diode Reverse Recovery Charge		-	1250		nC

Notes：

1. Repetitive Rating: Pulse width limited by maximum junction temperature

Typical Performance Characteristics

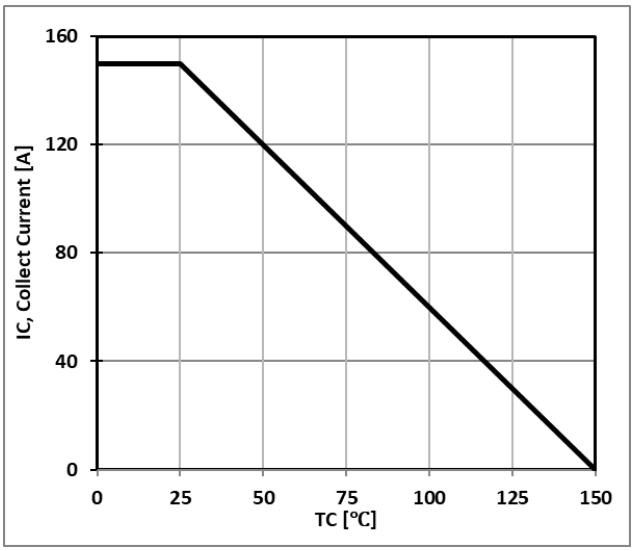


Figure 1: Maximum DC Collector Current VS. case temprature

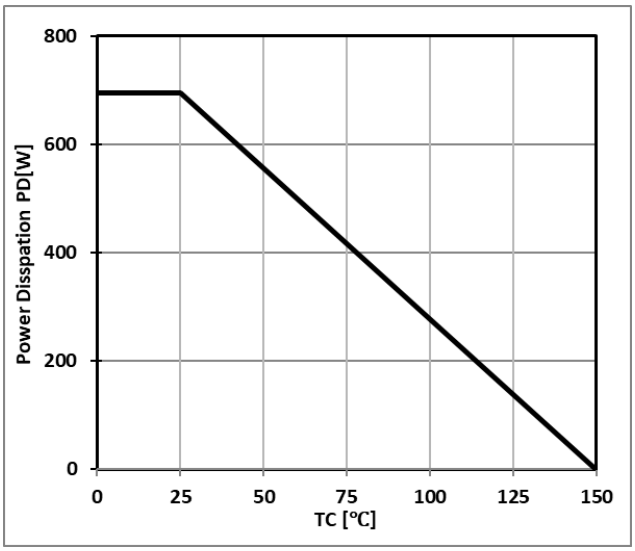


Figure 2: Power Dissipation VS. Case Temperature

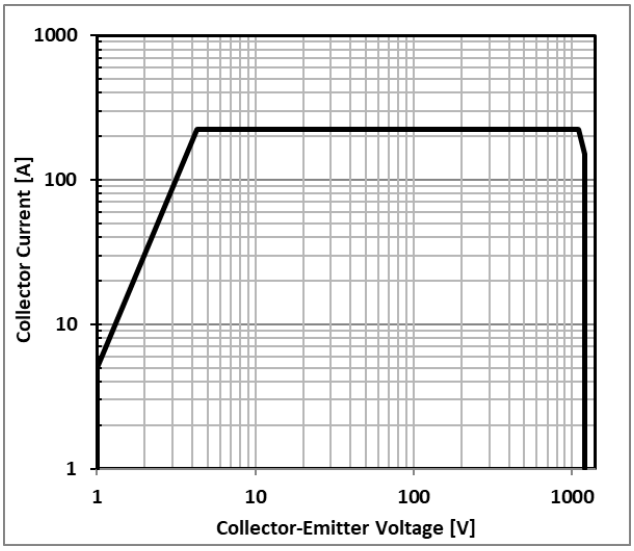


Figure 3: Reverse Bias SOA,TJ=125℃,VGE=15V

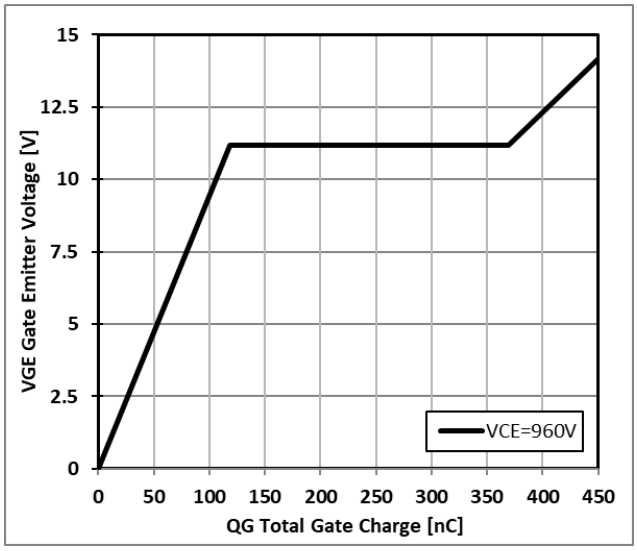


Figure 4: Typical Gate charge VS. VGE,IC=75A

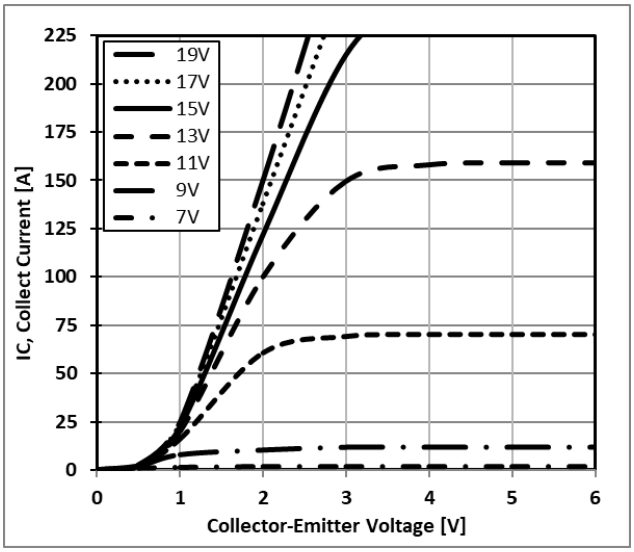


Figure 5: Typical IGBT Output characteristics, TC=25℃;tp=300us

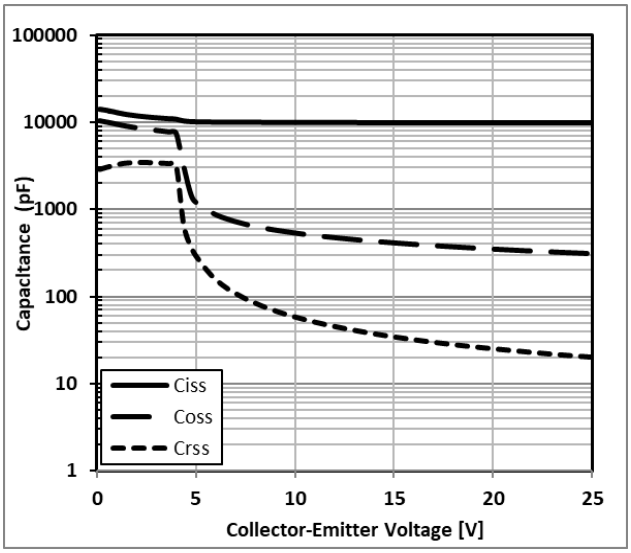
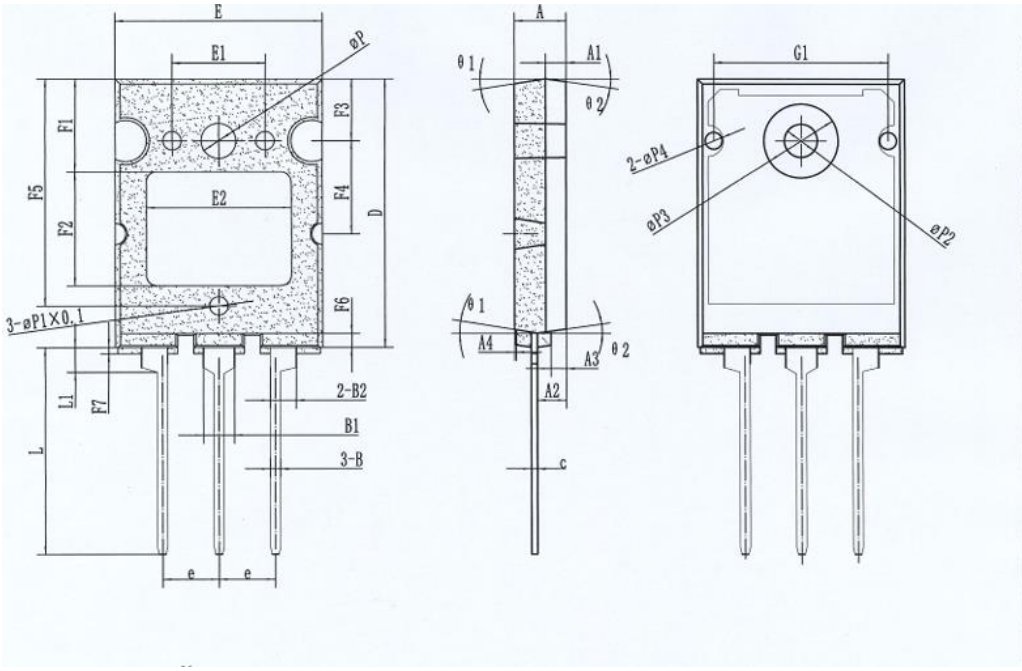


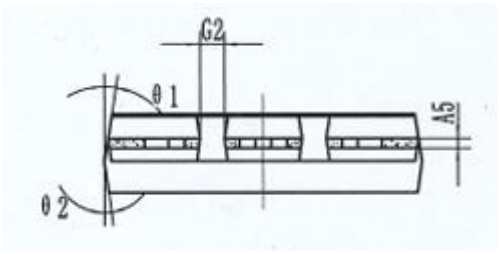
Figure 6: Typical Capacitance VS. VCE,, VGE=0V,f=1MHz

TO-264 PACKAGE OUTLINE



COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	1.90	2.00	2.10
A2	2.70	2.80	2.90
A3		1.50 REF	
A4		0.15 REF	
A5	0.40	0.60	0.80
B	0.90	1.00	1.10
B1	3.05	3.15	3.25
B2	2.50	2.65	2.75
C	0.50	0.60	0.70
D	25.80	26.00	26.20
e		5.45 BSC	
E	19.80	20.00	20.20
E1	8.90	9.00	9.10
E2		14.00 REF	
F1		9.00 REF	
F2		11.00 REF	
F3	5.80	6.00	6.20
F4	8.80	9.00	9.20
F5		22.00 REF	
F6		1.35 REF	
F7	0.00	0.60	0.80
G1	16.75	16.85	16.95
G2	1.40	1.50	1.60
L	19.70	20.10	20.50
L1	2.40	2.50	2.60
ΦP	3.20	3.40	3.60
ΦP1	1.60	1.80	2.00
ΦP2	3.00	3.20	3.40
ΦP3	7.10	7.20	7.30
ΦP4	1.55	1.65	1.75
θ1	7°	9°	11°
θ2	6°	8°	10°



R1.0：初版

R2.0：VCESAT：1.55V→1.65V

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