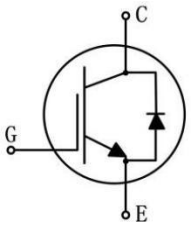
Trench Field-stop IGBT Discrete

Parameter	Value	Unit
V_{CE}	1200	V
I_C	75	A
$V_{CE(sat)}$	1.75	V



---Marking
---Tracking code

TO-247-3L

Features

- Maximum Junction Temperature 175℃
- Low EMI
- Advanced Field Stop Technology
- Pb-free Lead Plating;RoHS Compliant

Applications

- Energy storage
- photovoltaic string inverter
- solar string inverter
- uninterruptible power supply

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CES}	1200	V
Gate-emitter voltage	V_{GES}	±20	V
Continuous collector current(T_C=25℃)	I_C	150	A
Continuous collector current(T_C=100℃)		75	A
Pulsed Collector Current(Note 1)	I_{CM}	300	A
Diode continuous forward current(T_C=25℃)	I_F	150	A
Diode continuous forward current(T_C=100℃)		75	A
Maximum Power Dissipation (T_C=25℃)	P_D	750	W
Short circuit withstand time	t_{sc}	10	us
Operating junction temperature range	T_J	-40 to+175	℃
Storage temperature range	T_{STG}	-55 to+150	℃

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance,junction to case for IGBT	$R_{\theta JC}$	0.2	℃/W
Thermal resistance,junction to ambient	$R_{\theta JA}$	25	℃/W

Electrical Characteristics of IGBT (T_{vj}=25℃ unless otherwise specified)

Static characteristics

Parameter	Symbol	Test condition	Value			Unit
			Min.	Typ.	Max.	
Collector-emitter breakdown voltage	B_{VCES}	V_{GE}=0V,I_C=500μA	1200	-	-	V
Collector-emitter leakage current	I_{CES}	V_{CE}=1200V,V_{GE}=0V	-	-	200	μA
Gate leakage current,forward	I_{GES}	V_{GE}=20V,V_{CE}=0V	-	-	200	nA
Gate Leakage Current,reverse		V_{GE}=-20V,V_{CE}=0V	-	-	200	nA
Gate threshold voltage	$V_{GE(th)}$	V_{GE}=V_{CE},I_C=2.4mA	5	5.8	6.6	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	V_{GE}=15V,I_C=75A(T_J=25℃)	-	1.75	2.2	V
Total gate charge	Q_G	V_{CC}=600V V_{GE}=15V I_C=75A	-	540	-	nC
Input Capacitance	C_{ies}	V_{CE}=25V V_{GE}=0V f=1MHz	-	5748	-	pF
Output Capacitance	C_{oes}		-	334	-	pF
Reverse Transfer Capacitance	C_{res}			185	-	pF

IGBT Switching Characteristics

Parameter	Symbol	Test condition	Value			Unit
			Min.	Typ.	Max.	
Turn-on delay time	$t_{d(on)}$	V_{CC}=600V V_{GE}=±15V I_C=75A R_G=10Ω Inductive load T_C=25℃	-	75	-	ns
Turn-on Rise time	t_r		-	245	-	ns
Turn-off delay time	$t_{d(off)}$		-	172	-	ns
Turn-off Fall time	t_f		-	215	-	ns
Turn-on Switching Loss	E_{on}		-	10.8	-	mJ
Turn-off Switching Loss	E_{off}		-	6.7	-	mJ
Total switching Loss	E_{ts}		-	17.5	-	mJ

Diode Characteristics

Parameter	Symbol	Test condition	Value			Unit
			Min.	Typ.	Max.	
Diode forward voltage	V_F	I_F=75A,T_{vj}=25℃	-	1.8	2.5	V
Diode reverse recovery time	t_{rr}	V_R=600V I_F=75A diF/dt=200A/μs T_C=25℃	-	60	-	ns
Diode peak reverse recovery current	I_{rr}		-	50	-	A
Diode reverse recovery charge	Q_{rr}		-	1200	-	nC

Typical Characteristics

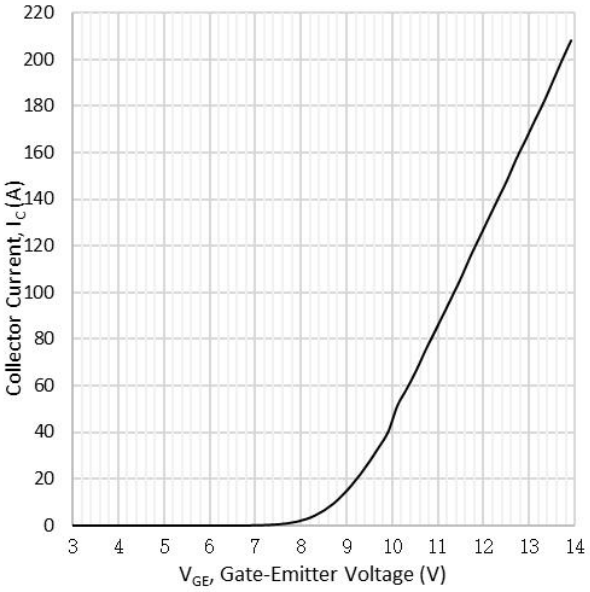


Fig 1.Typical transfer characteristics (V_{CE}=20V)

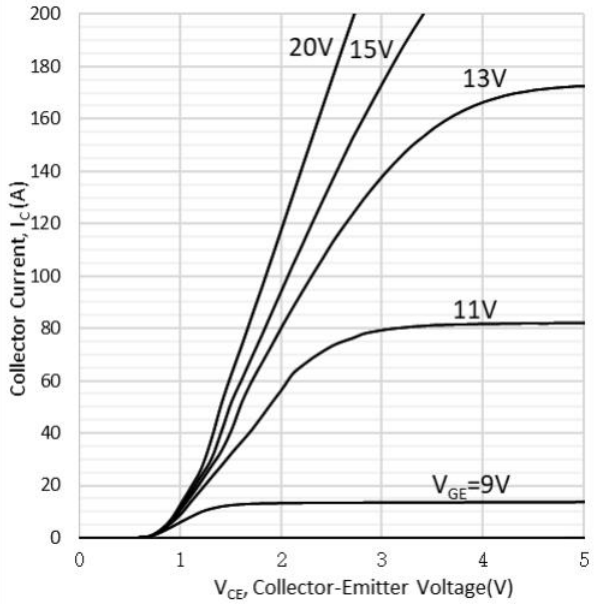


Fig 2.Typical output characteristic(T_{vj}=25℃)

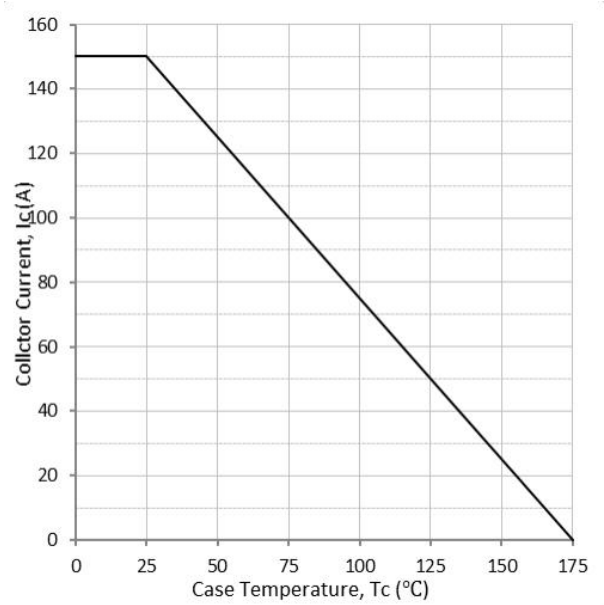


Fig 3.Collector current as a function of case temperature(V_{GE}≥15V,T_{vj}≤175℃)

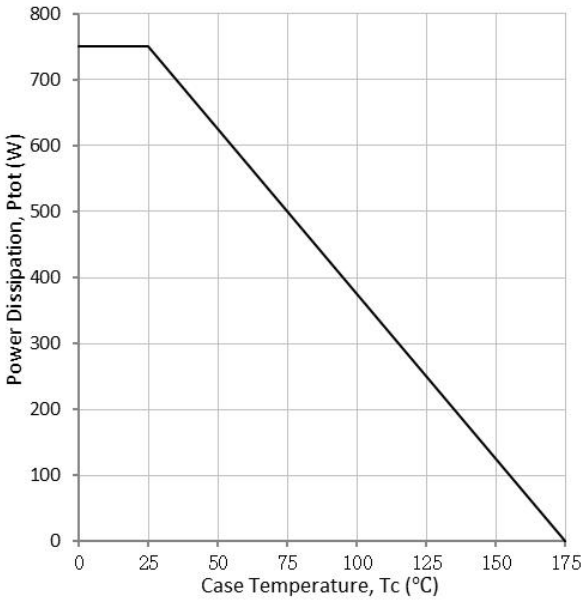


Fig 4.Power dissipation as a function of case temperature(T_{vj}≤175℃)

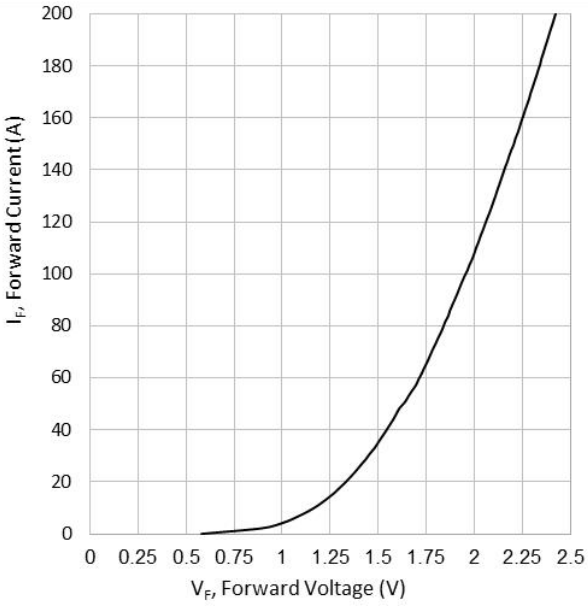


Fig 5.Typical diode forward current vs. forward voltage

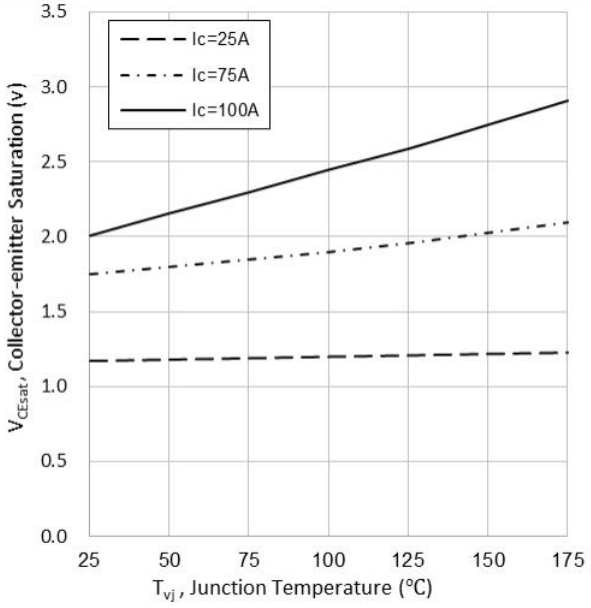


Fig. 6 Typical collector-emitter saturation voltage as a function of junction temperature(V_{GE}=15V)

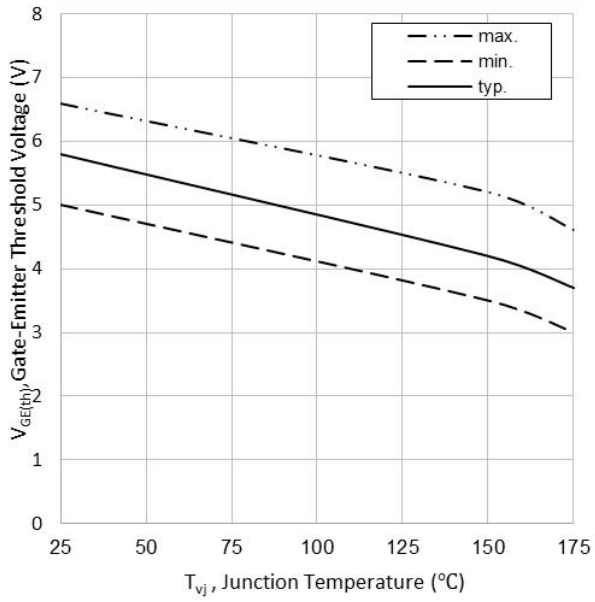


Fig 7.Gate-emitter threshold voltage as a function of junction temperature(I_C=2.4mA)

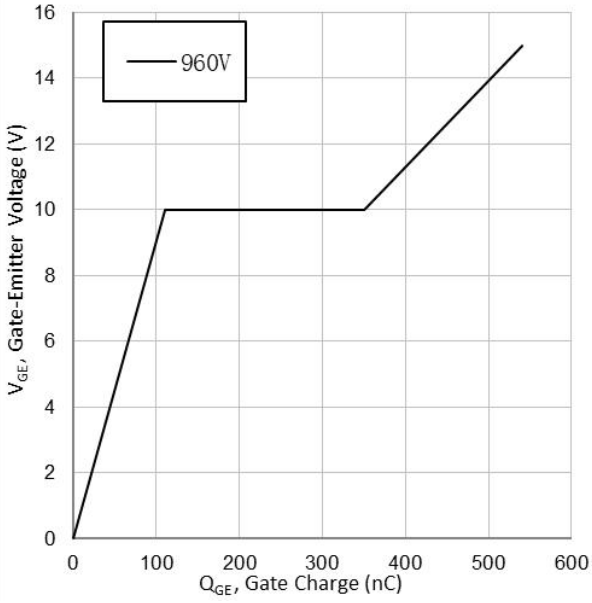


Fig 8.Typical gate charge

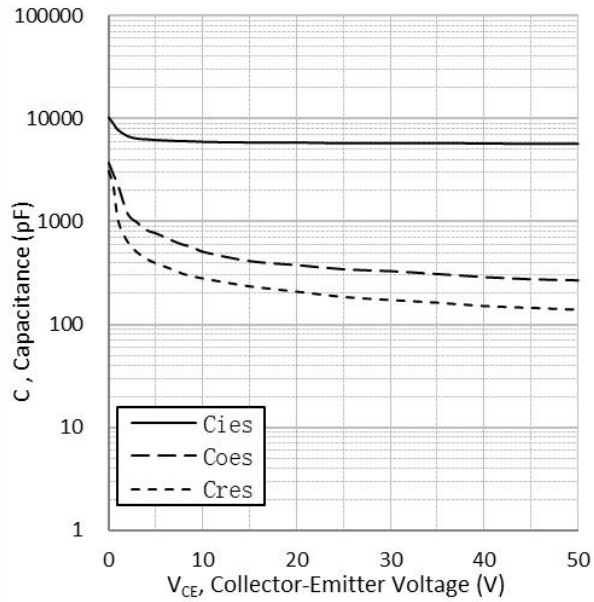
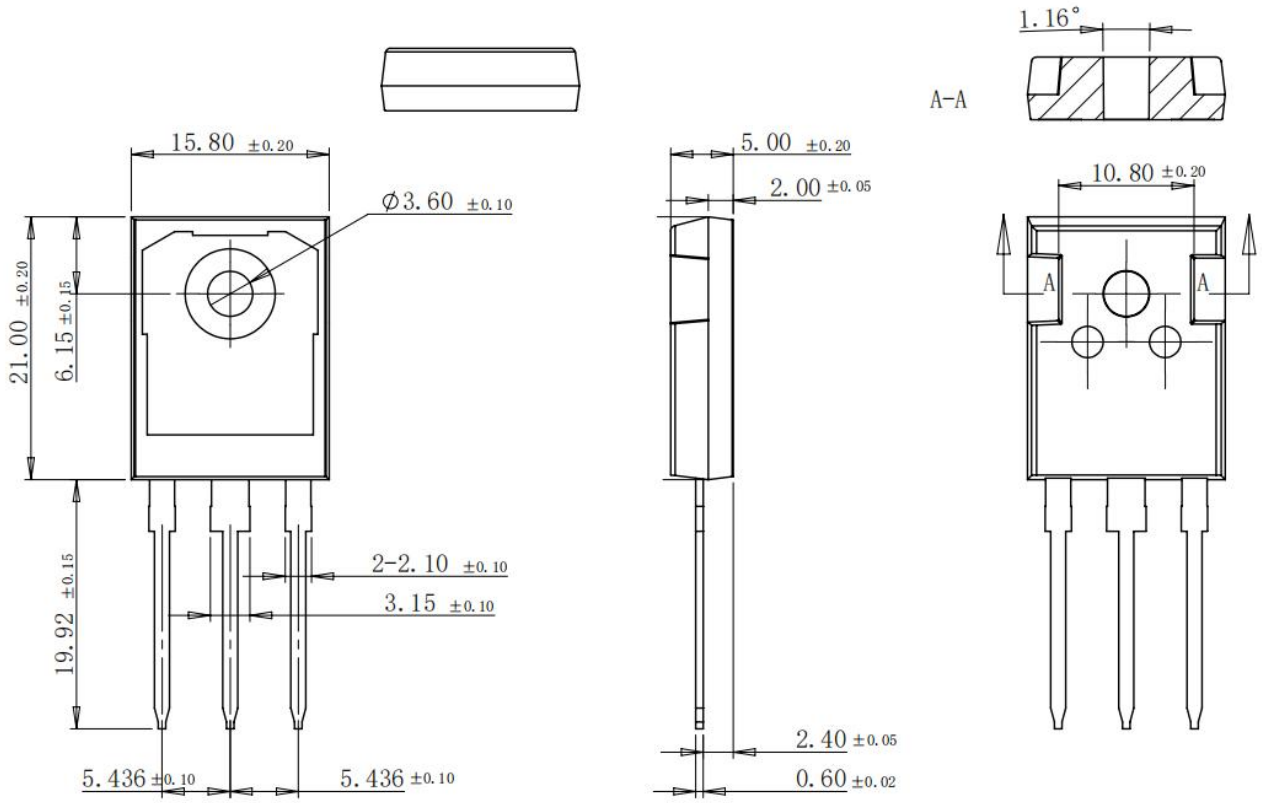


Fig 9.Typical capacitance as a function of collector-emitter voltage(V_{GE}=0V,f=1MHz)

Package Outlines (Unit：mm)

TO-247-3L



***Important Usage Information and Disclaimer**

The specifications of Zhuhai Hypersemi Co., Ltd. products are not guarantees of product characteristics. They reflect typical performance expected in standard applications, which may vary with specific uses. Users must conduct prior testing for their applications and make necessary adjustments.
Users are responsible for the safety of applications utilizing our products and must implement adequate safety measures to prevent physical injury, fire, or other risks in case of product failure. It is the user's duty to ensure that application designs comply with all applicable laws and standards. Our products must not be used in any applications where a product failure could reasonably result in personal injury, unless specifically authorized in a signed document by Zhuhai Hypersemi Co., Ltd.
No representations or warranties are made regarding the accuracy or completeness of this information, including any claims of non-infringement of third-party intellectual property rights. Zhuhai Hypersemi Co., Ltd. assumes no liability for any applications or uses of its products and does not grant any licenses to its intellectual property rights or those of others. We also make no claims regarding non-infringement of third-party intellectual property rights that may arise from applications.
Due to technical requirements, our products may contain hazardous substances. For details, please contact your nearest sales office. This document replaces all previous information and may be updated. We reserve the right to make changes.