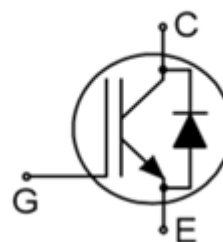


Trench Field-Stop Technology IGBT

Features

- 1350V, 15A
- $V_{CE(sat)}(typ.) = 2.3V @ V_{GE}=15V, I_C=15A$
- Low Switching Losses
- $V_{CE(sat)}$ with Positive Temperature Coefficient
- Pb-free Lead Plating; RoHS Compliant



Applications

- Frequency Converters
- Uninterrupted Power Supply
- Air Conditioning
- Motor Drives

Order codes	V_{CE}	I_C	$V_{CEsat}, T_{vj}=25^{\circ}C$	T_{vjmax}	Marking	Package
XD015H135AN1S3	1350V	15A	2.3V	150 $^{\circ}C$	D15H135AN1	TO247-3

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{CES}	Collector-Emitter Voltage	1350	V
V_{GES}	Gate-Emitter Voltage	± 30	V
I_C	Continuous Collector Current ($T_C=25^{\circ}C$)	15	A
I_{CM}	Pulsed Collector Current (Note 1)	50	A
I_F	Diode Continuous Forward Current ($T_C=100^{\circ}C$)	15	A
I_{FM}	Diode Maximum Forward Current (Note 1)	30	A
P_D	Maximum Power Dissipation ($T_C=25^{\circ}C$)	200	W
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$

Thermal Data

Symbol	Parameter	Max.	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case for IGBT	1.6	$^{\circ}C/W$

Electrical Characteristics (T_c=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{CES}	Collector-Emitter Breakdown Voltage	V _{GE} =0V, I _C =1000μA	1350	---	---	V
I _{CES}	Collector-Emitter Leakage Current	V _{CE} =1200V, V _{GE} =0V	---	---	180	μA
I _{GES}	Gate Leakage Current, Forward	V _{GE} =20V, V _{CE} =0V	---	---	100	nA
	Gate Leakage Current, Reverse	V _{GE} =-20V, V _{CE} =0V	---	---	-100	nA
V _{GE(th)}	Gate Threshold Voltage	V _{GE} =V _{CE} , I _C =0.6mA	3.0	---	6.0	V
V _{CE(sat)}	Collector-Emitter Saturation Voltage	V _{GE} =15V, I _C =15A	---	2.3	2.8	V
Q _G	Total Gate Charge	V _{CC} =960V, V _{GE} =15V I _C =15A	---	125	175	nC
t _{d(on)}	Turn-on Delay Time	V _{CC} =800V V _{GE} =±15V I _C =15A R _G =33Ω Inductive Load T _c =25°C	---	33	46	ns
t _r	Turn-on Rise Time		---	21	36	ns
t _{d(off)}	Turn-off Delay Time		---	223	300	ns
t _f	Turn-off Fall Time		---	150	250	ns
E _{on}	Turn-on Switching Loss		---	0.83	1.4	mJ
E _{off}	Turn-off Switching Loss		---	0.91	1.2	mJ
C _{ies}	Input Capacitance	V _{CE} =25V	---	1250	1550	pF
C _{oes}	Output Capacitance	V _{GE} =0V	---	100	120	pF
C _{res}	Reverse Transfer Capacitance	f =1MHz	---	65	80	pF

Diode Characteristics (T_c=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _F	Diode Forward Voltage	I _F =15A	---	1.9	2.7	V
t _{rr}	Diode Reverse Recovery Time	I _F =15A dI _F /dt=200A/μs	---	210	---	ns
I _{rr}	Diode Peak Reverse Recovery Current		---	27	---	A
Q _{rr}	Diode Reverse Recovery Charge		---	2830	---	nC

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

Typical Characteristics

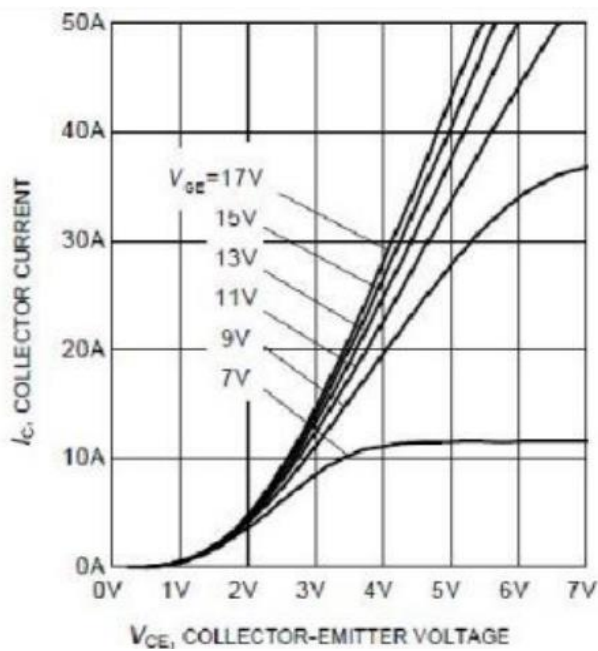


Fig. 1 Typical IGBT Output Characteristics at $T_j=25^\circ\text{C}$

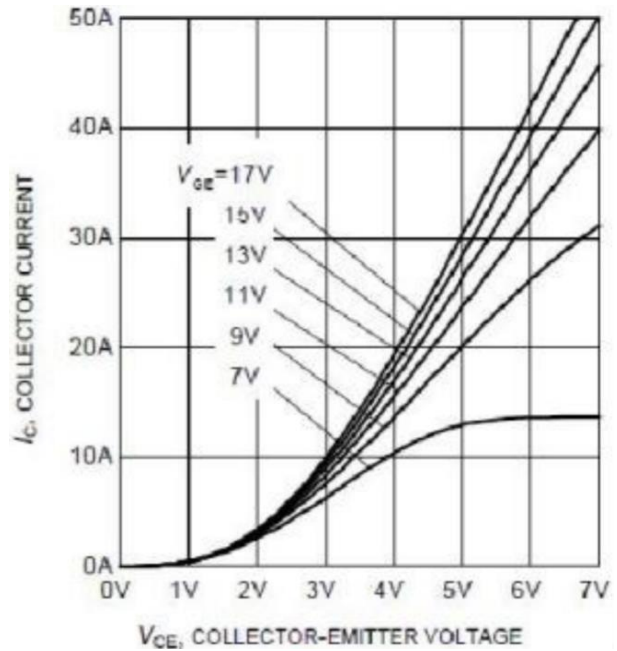


Fig. 2 Typical Transfer Characteristics at $V_{CE}=20\text{V}$

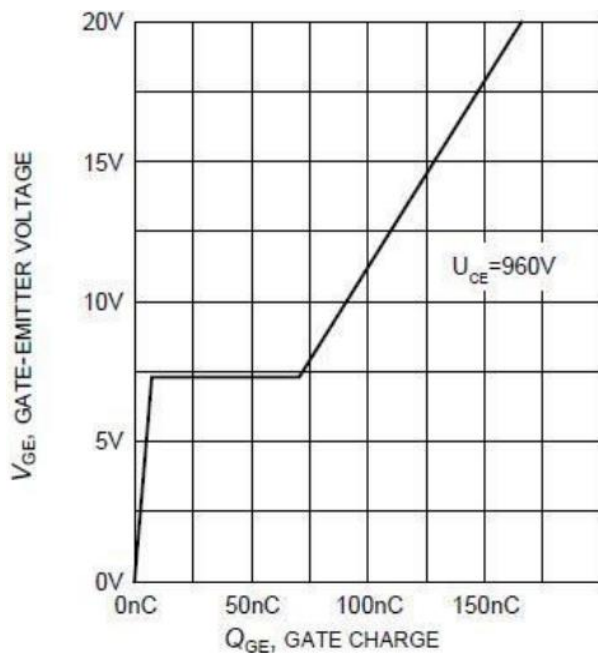


Fig. 3 Gate Charge

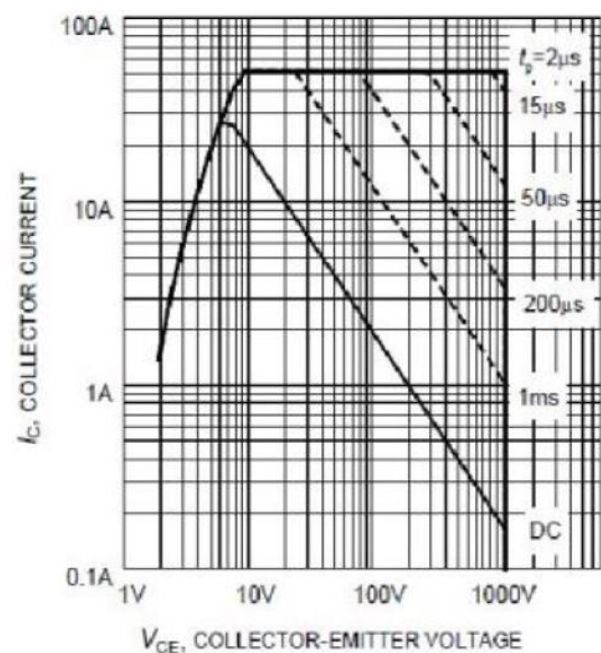
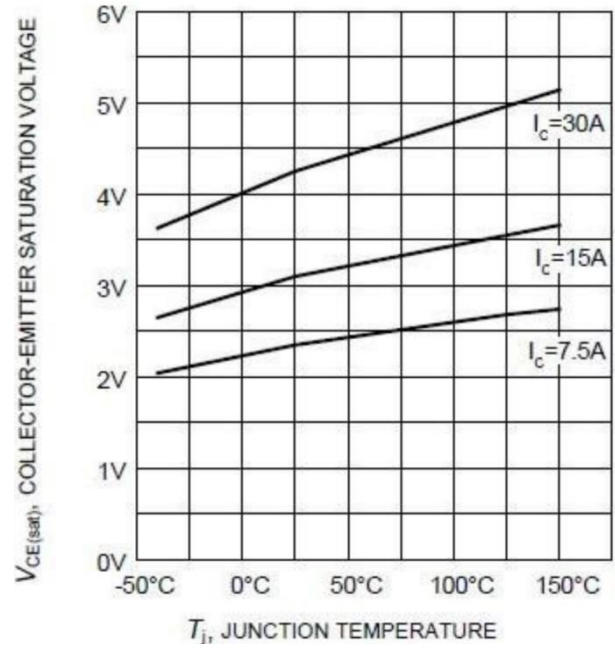
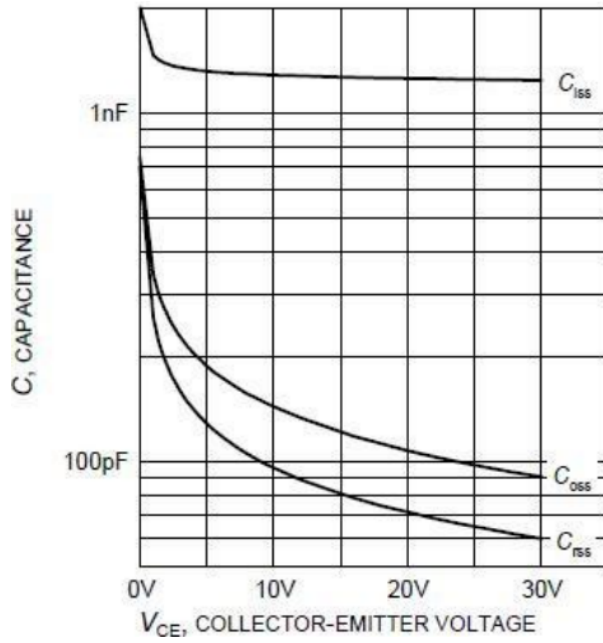
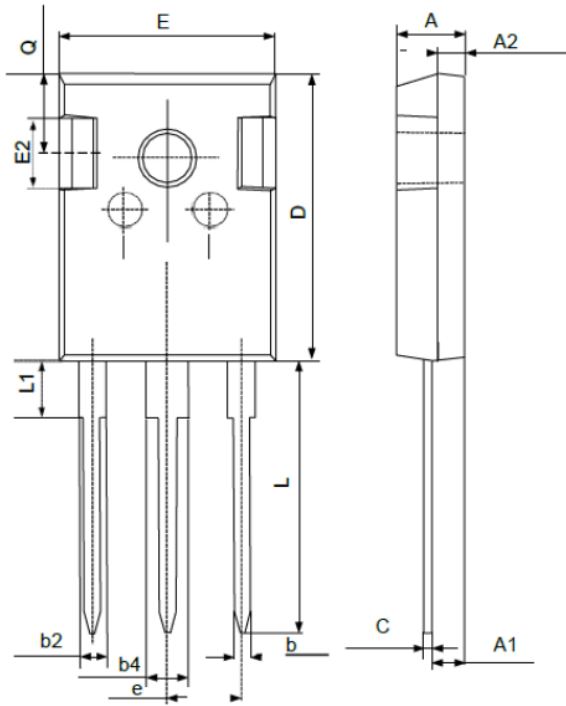


Fig. 4 Safe Operation Area



Package Information

TO-247



SYMBOL	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.59
A2	1.85	2.00	2.15
b	1.11	---	1.36
b2	1.91	---	2.25
b4	2.91	---	3.25
c	0.51	---	0.75
D	20.80	21.00	21.30
E	15.50	15.80	16.10
E2	4.40	5.00	5.20
e	5.44 BSC		
L	19.72	19.92	20.22
L1	---	---	4.30
Q	5.60	5.80	6.00