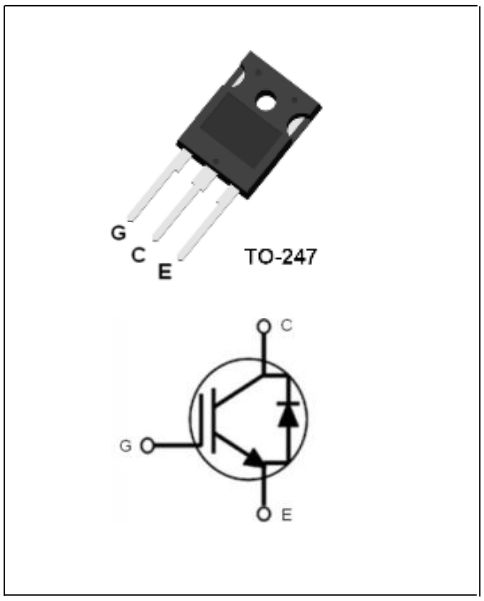
350V 80A IGBT



Description

The device is designed by advanced technology process. This IGBT have excellent quality for applications such as AC/DC square wave welder and other switching .

Features

- $V_{CE(sat)}$=1.33V (typ.) @I_C=80A
- t_{rr}=36ns (typ.)
- High Input Impedance

Applications

- AC/DC square wave welder, Low speed switch

Absolute Maximum Ratings

Symbol	Parameter		Ratings	Unit
V_{CES}	Collector to Emitter Voltage		350	V
V_{GES}	Gate to Emitter Voltage		±20	V
I_C	Collector Current	T_C=25℃	180	A
		T_C=100℃	80	A
I_{CM}	Pulsed Collector Current		240	A
I_F	Diode Continuous Forward Current	T_C=100℃	80	A
I_{FM}	Diode Maximum Forward Current		240	A
P_D	Maximum Power Dissipation	T_C=25℃	415	W
		T_C=100℃	167	W
T_J	Operating Junction Temperature Range		-55~+150	℃
T_{STG}	Storage Temperature Range		-55~+150	℃

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{th\ (J-C)}$ (IGBT)	Thermal Resistance, Junction to case for IGBT	0.30	℃/W
$R_{th\ (J-C)}$ (Diode)	Thermal Resistance, Junction to case for Diode	1.0	℃/W
$R_{th\ (J-A)}$	Thermal Resistance, Junction to Ambient	40	℃/W

Electrical Characteristics of IGBT @T_C=25 ℃ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{CES}	Collector to Emitter Breakdown Voltage	V_{GE}=0V, I_C=250uA	350	-	-	V
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage	I_C=80A, V_{GE}=15V	-	1.33	1.7	V
		I_C=80A, V_{GE}=15V, T_C=125℃	-	1.40	-	V
$V_{GE(th)}$	Gate Threshold Voltage	V_{CE}=V_{GE}, I_C=250uA	-	4.0	-	V
I_{CES}	Zero Gate Voltage Collector Current	V_{CE}=V_{CES}, V_{GE}=0V	-	-	1	mA
I_{GES}	Gate to Emitter Leakage Current	V_{GE}=V_{GES}, V_{CE}=0V	-	-	±250	nA

Electrical Characteristics of Diode @T_C=25 ℃ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Diode Forward Voltage	I_F=30A	-	1.0	2.0	V
		I_F=30A, T_C=125℃	-	0.9	-	V
t_{rr}	Diode Reverse Recovery Time	I_F=30A, di/dt=-200A/us	-	36	-	ns
I_{rr}	Diode Peak Reverse Recovery Current		-	5.0	-	A
Q_{rr}	Diode Reverse Recovery Charge		-	120	-	nC

Switching Characteristics @T_C=25 ℃ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	I_C=80A, V_{CC}=200V, V_{GE}=15V, R_G=7Ω Inductive Load, T_C=25℃	-	0.038	-	us
t_r	Rising Time		-	0.04	-	us
$t_{d(off)}$	Turn-off Delay Time		-	0.83	-	us
t_f	Falling Time		-	1.90	-	us
E_{on}	Turn-on Switching Loss		-	1.20	-	mJ
E_{off}	Turn-off Switching Loss		-	15.3	-	mJ
E_{ts}	Total Switching Loss		-	16.5	-	mJ
$t_{d(on)}$	Turn-on Delay Time	I_C=80A, V_{CC}=200V, V_{GE}=15V, R_G=7Ω Inductive Load, T_C=125℃	-	0.03	-	us
t_r	Rising Time		-	0.06	-	us
$t_{d(off)}$	Turn-off Delay Time		-	1.0	-	us
t_f	Falling Time		-	5.0	-	us
E_{on}	Turn-on Switching Loss		-	1.40	-	mJ
E_{off}	Turn-off Switching Loss		-	21.5	-	mJ
E_{ts}	Total Switching Loss		-	22.9	-	mJ
C_{ies}	Input Capacitance	V_{GE}=0V, V_{CE}=30V, f=1.0MHz	-	5100	-	pF
C_{res}	Reverse Transfer Capacitance		-	215	-	pF
C_{oes}	Output Capacitance		-	93	-	pF
Q_g	Total Gate Charge	I_C=80A, V_{CC}=200V V_{GE}=15V	-	183	-	nC
Q_{ge}	Gate to Emitter Charge		-	28	-	nC
Q_{gc}	Gate to Collector Charge		-	124	-	nC
tsc	Short Circuit Withstand Time	V_{CC}=200V,V_{GE}=15V	5	-	-	us

Typical Performance Characteristics

Fig. 1. Typical Output Characteristics

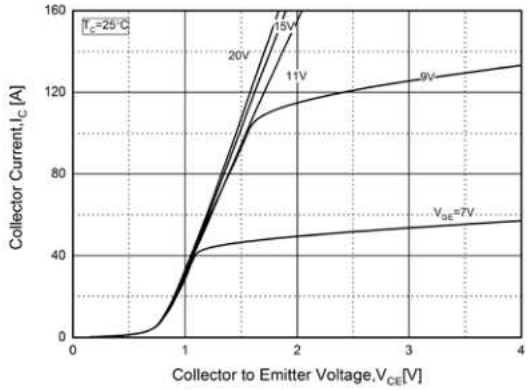


Fig. 2. Typical Saturation Voltage Characteristics

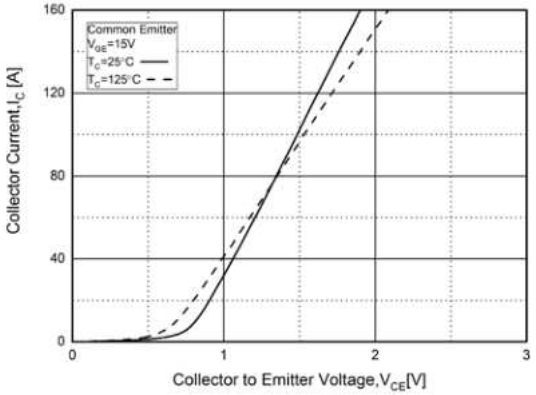


Fig. 3. Typical Saturation Voltage vs. T_C

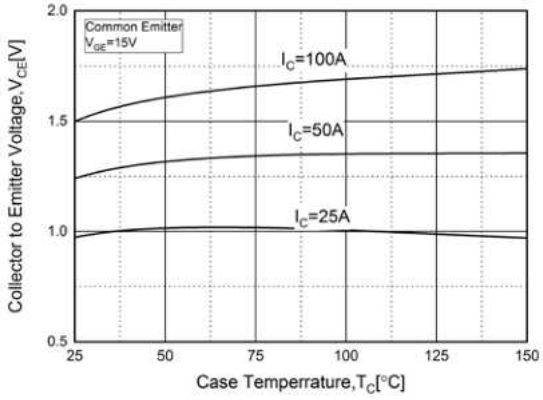


Fig. 4. Diode Forward Characteristics

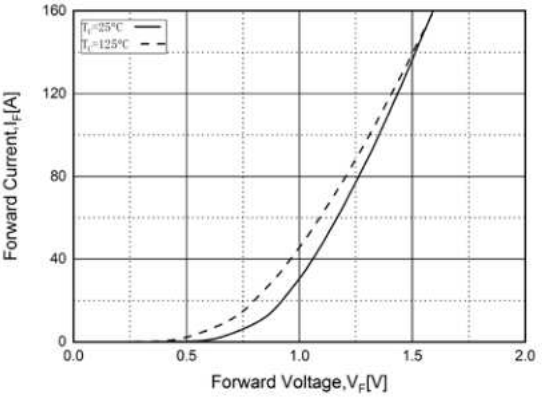


Fig. 5. Typical Capacitance Characteristics

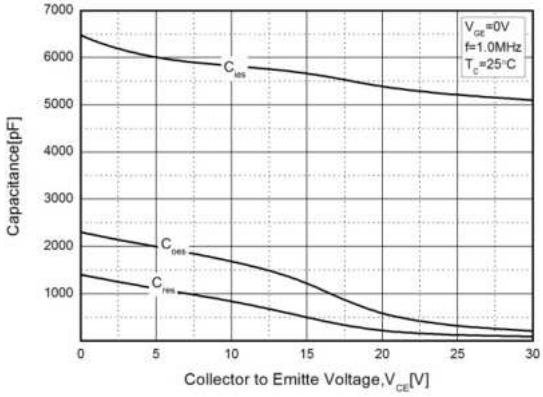
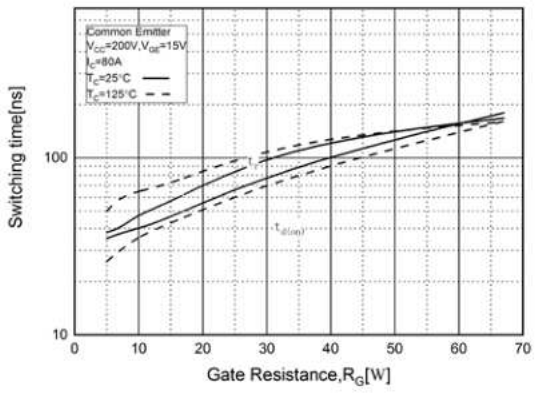


Fig. 6. Turn-on Characteristics vs. R_G



Typical Performance Characteristics

Fig. 7. Turn-off Characteristics vs. R_G

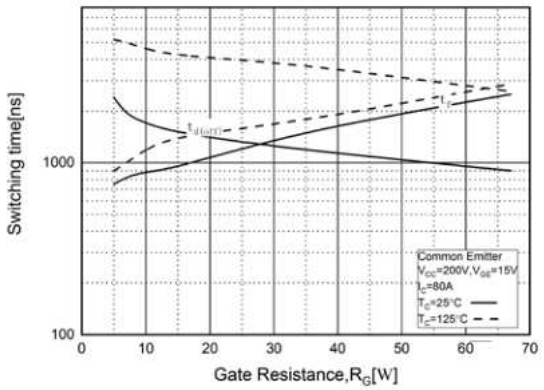


Fig. 8. Switching Loss vs. R_G

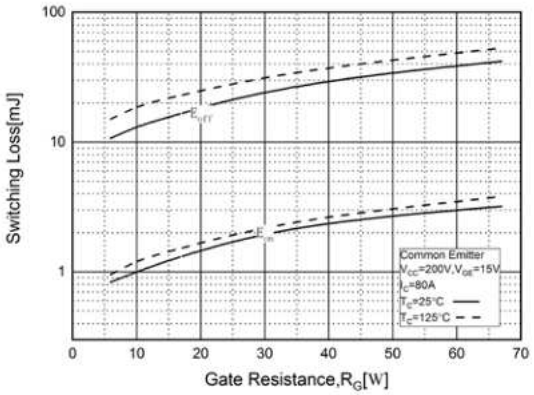


Fig. 9. Turn-on Characteristics vs. I_C

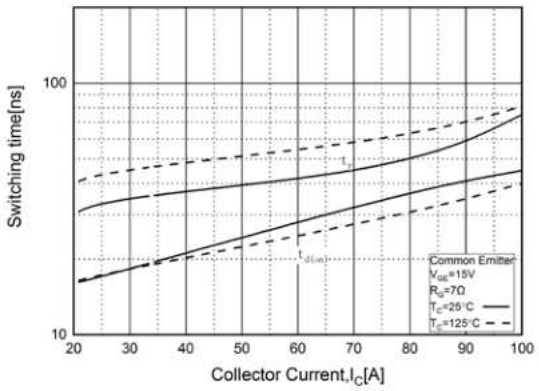


Fig. 10. Turn-off Characteristics vs. I_C

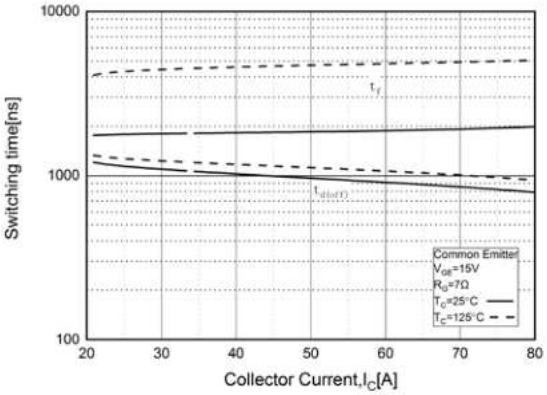
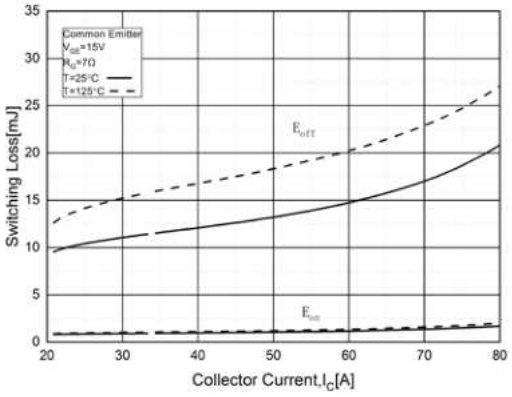


Fig. 11. Switching Loss vs. I_C



Package Dimensions

TO-247

(Dimensions in Millimeters)