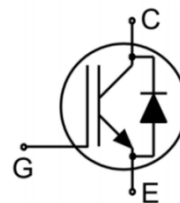


Main Product Characteristics:

V_{CES}	1250V
I_C	40A
$V_{CE(sat)}$	1.75V


TO-247

Schematic Diagram
Features and Benefits:

- Trench FS technology offering
- High speed switching
- Low gate charge and $V_{CE(sat)}$
- High ruggedness, temperature stable behavior
- Maximum junction temperature 175°C


Applications:

- Solar Inverters
- Uninterruptible power supplies
- Motor drives
- Air condition

Absolute Max Rating:

Symbol	Parameter	Value	Units
V_{CES}	Collector-Emitter Voltage	1250	V
V_{GES}	Gate- Emitter Voltage	± 30	V
I_C	Collector Current	80	A
	Collector Current @ $T_c = 100\text{ }^\circ\text{C}$	40	
I_{Cpuls}	Pulsed Collector Current, t_p limited by T_{Jmax}	160	
-	Turn off safe operating area, $V_{CE}=1200V$, $T_J=175^\circ\text{C}$	160	
I_F	Diode Continuous Forward Current @ $T_c = 100\text{ }^\circ\text{C}$	40	
I_{FM}	Diode Maximum Forward Current	160	
P_D	Power Dissipation @ $T_c = 25^\circ\text{C}$	600	W
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	$^\circ\text{C}$
T_L	Maximum Temperature for Soldering	260	$^\circ\text{C}$

Thermal Resistance

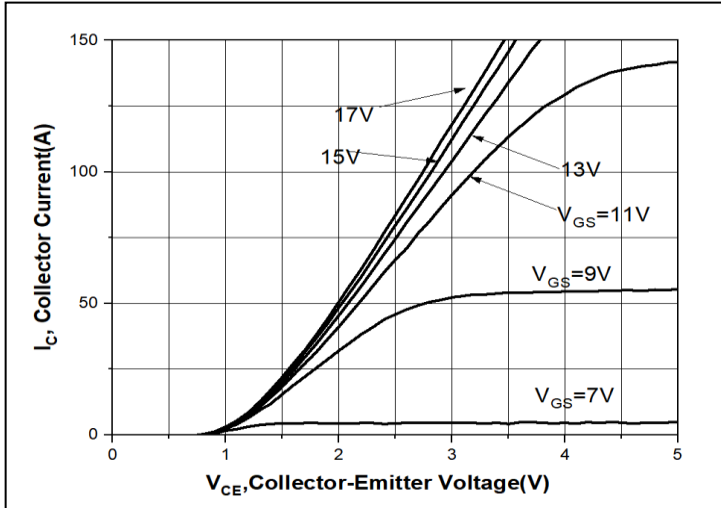
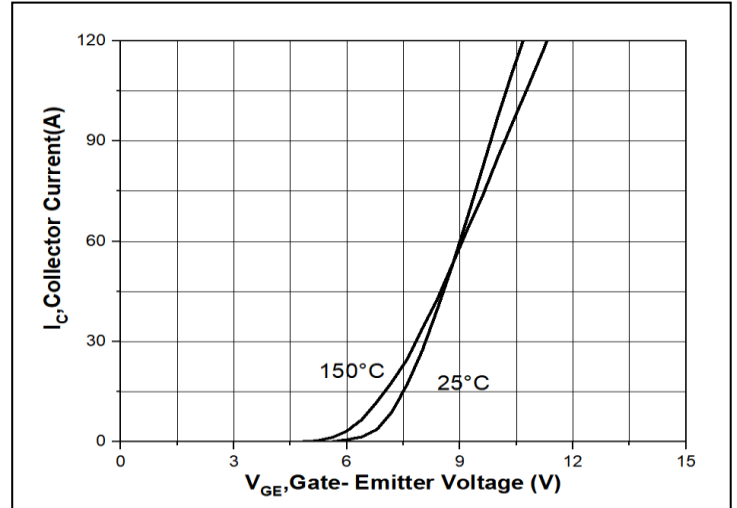
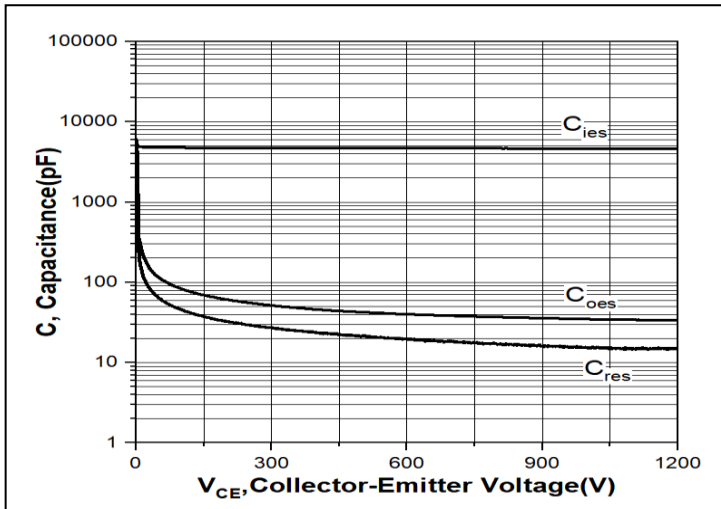
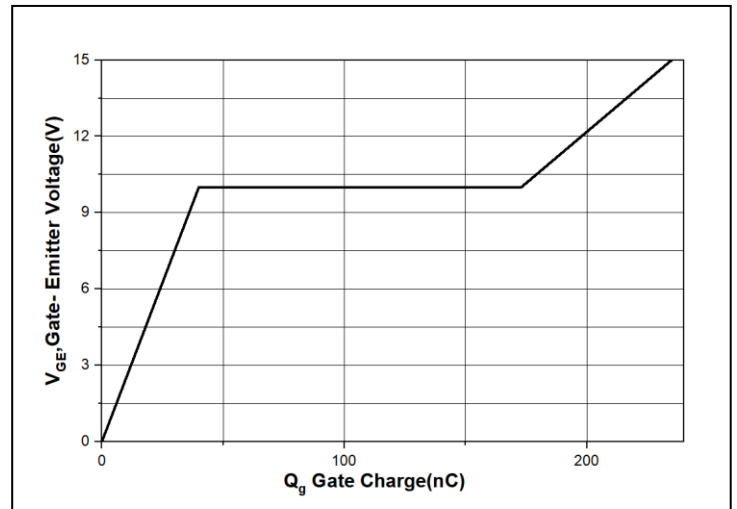
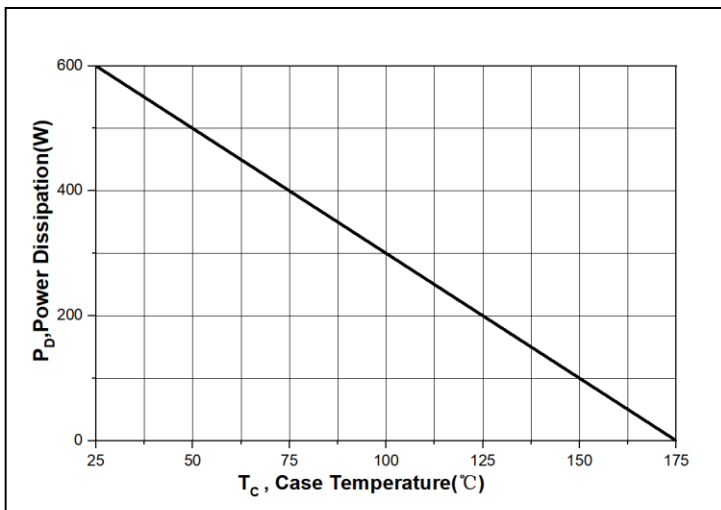
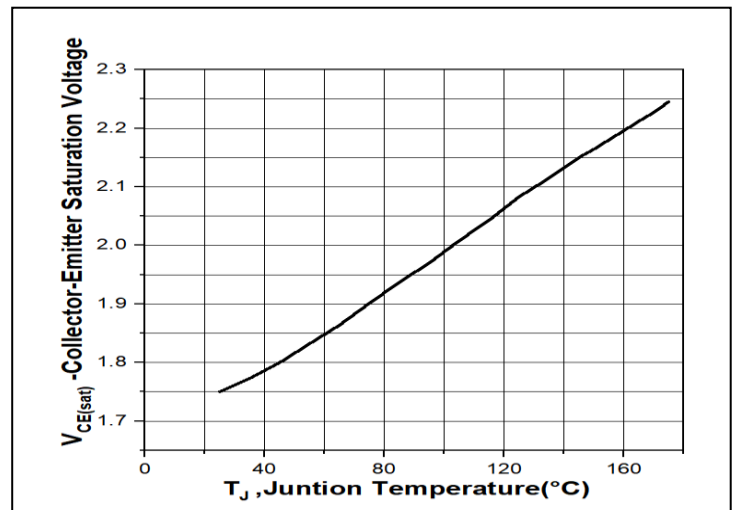
Symbol	Characterizes	Typ.	Max.	Units
R _{θJC}	Thermal Resistance, Junction-to-case for IGBT	—	0.25	°C/W
	Thermal Resistance, Junction-to-case for Diode	—	0.63	°C/W
R _{θJA}	Thermal Resistance, Junction-to-ambient	—	40	°C/W

Electrical Characteristics @T_A=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)CES}	Collector-Emitter Breakdown Voltage	1250	—	—	V	V _{GE} =0V, I _{CE} =1mA
V _{CE(sat)}	Collector-Emitter Saturation Voltage	—	1.75	2	V	I _C =40A, V _{GE} =15V @T _J =25°C
V _{GE(th)}	Gate Threshold Voltage	4.5	—	6.5	V	I _C =1mA, V _{CE} =V _{GE}
I _{CES}	Collector-Emitter Leakage Current	—	—	1	μA	V _{GE} =0V, V _{CE} =1200V
I _{GES}	Gate to Emitter Reverse Leakage	—	—	200	nA	V _{GE} =25V, V _{CE} =0V
		—	—	-200		V _{GE} =-25V, V _{CE} =0V
C _{ies}	Input capacitance	—	4803	—	pF	V _{GS} = 0V V _{DS} = 25V f = 1MHz
C _{oes}	Output capacitance	—	171	—		
C _{res}	Reverse transfer capacitance	—	92	—		
t _{d(on)}	Turn-on delay time	—	40	—	ns	V _{CC} =600V, V _{GE} =0.0/15.0V, R _G =10.0Ω
t _r	Rise time	—	22	—		
t _{d(off)}	Turn-Off delay time	—	358	—		
t _f	Fall time	—	47	—		
E _{on}	Turn-On Switching Loss	—	2.29	—	mJ	V _{CC} =600V, V _{GE} =0.0/15.0V, R _G =10.0Ω
E _{off}	Turn-Off Switching Loss	—	1.74	—		
E _{is}	Total Switching Loss	—	4.03	—		
Q _g	Total Gate Charge	—	235	—	nC	V _{CC} =480V, I _C =40A, V _{GE} =15V
Q _{ge}	Gate to Emitter Charge	—	40	—		
Q _{gc}	Gate to Collector Charge	—	133	—		
I _{C(SC)}	Short circuit collector current Max.1000 short circuits Time between short circuits: ≥1.0s	—	400	—	A	V _{GE} =15V, V _{CC} ≤600V, t _{sc} ≤10μs

Electrical Characteristics of the Diode @T_A=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{FM}	Diode Forward Voltage	—	2.3	3	V	I _F =40A, V _{GE} =0V
t _{rr}	Reverse Recovery Time	—	223	—	ns	T _J = 25°C, I _F =40A, V _{GE} =0.0/15.0V, V _R =600V
Q _{rr}	Reverse Recovery Charge	—	2.99	—	μC	
I _{RRM}	Diode Peak Reverse Recovery Current	—	34.5	—	A	

Typical Electrical and Thermal Characteristics

Figure1. Typical Output Characteristics

Figure2. Typical Transfer Characteristics

Figure3. Typical Capacitance

Figure4. Typical Gate Charge

Figure5. Power Dissipation vs. Case Temperature

Figure6. Collector-Emmitter Saturation Voltage vs. Temperature

Typical Electrical and Thermal Characteristics

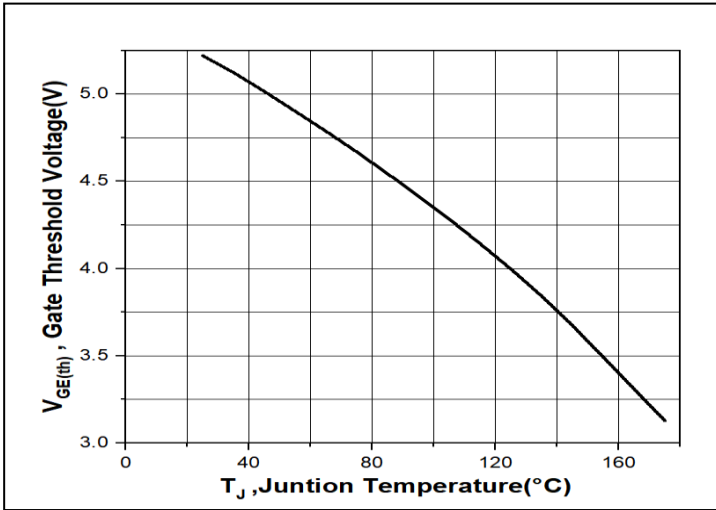


Figure7. Gate Threshold Voltage vs. Temperature

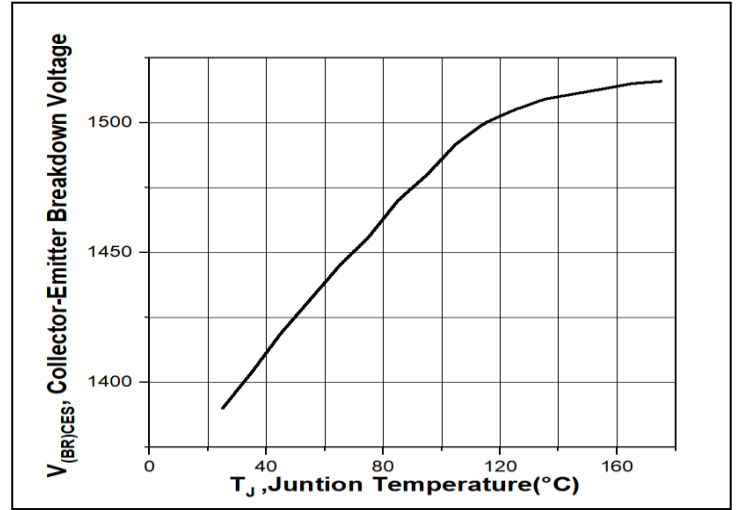


Figure8. Collector-Emitter Breakdown Voltage vs. Temperature

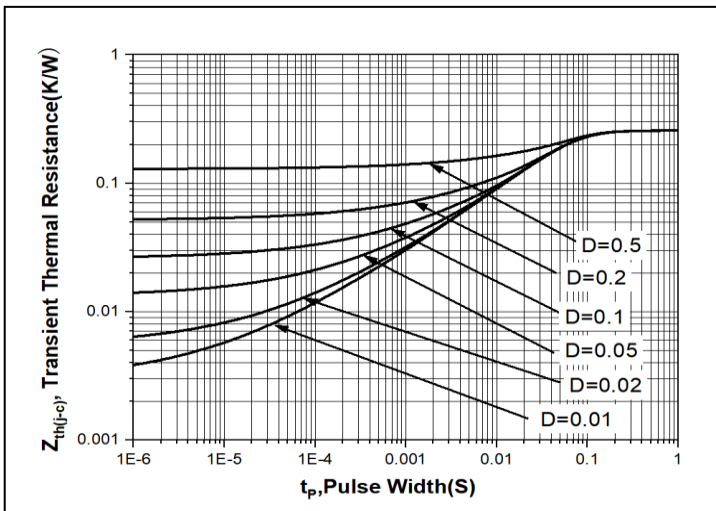


Figure9. IGBT transient thermal resistance (D= t_p/T)

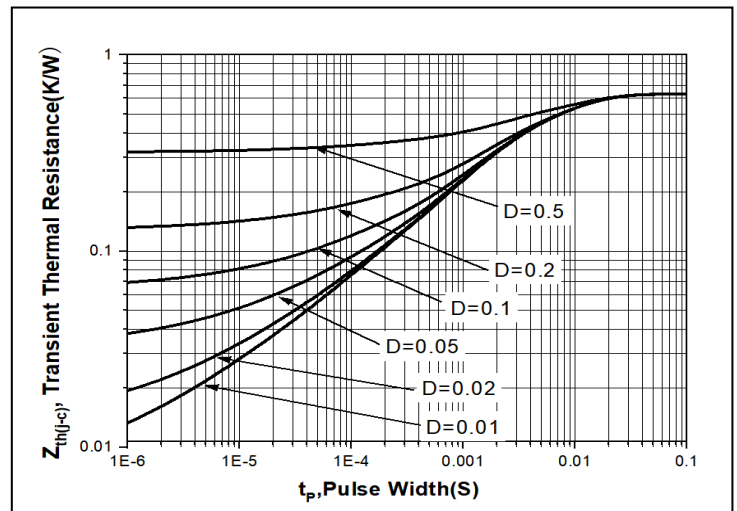
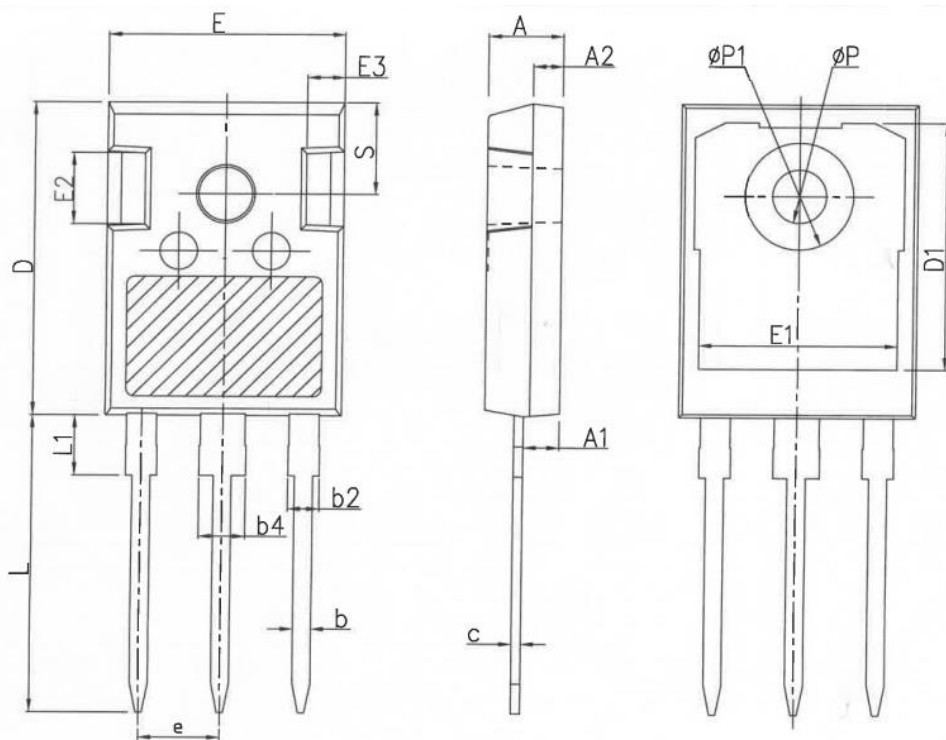


Figure10. Diode transient thermal impedance as a function of pulse width (D=t_p/T)

Mechanical Data:

COMMON DIMENSIONS

SYMBOL	mm		
	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	1.21	1.36
b2	1.91	2.01	2.21
b4	2.91	3.01	3.21
c	0.51	0.61	0.75
D	20.70	21.00	21.30
D1	16.25	16.55	16.85
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
e	5.44BSC		
L	19.62	19.92	20.22
L1	-	-	4.30
ΦP	3.40	3.60	3.80
ΦP1	-	-	7.30
S	6.15BSC		

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