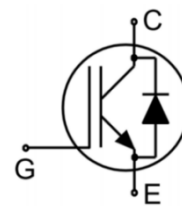


Main Product Characteristics:

V_{CES}	700V
I_C	80A
$V_{CE(sat)}$	1.58V



TO – 247Plus-3L



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	700	V
V_{GES}	Gate- Emitter Voltage	± 30	V
I_C	Collector Current	160	A
	Collector Current @ $T_C = 100\text{ }^\circ\text{C}$	80	
	Pulsed Collector Current, t_p limited by T_{jmax}	320	
-	Turn off safe operating area, $V_{CE}=650\text{V}$, $T_J=175^\circ\text{C}$	320	
I_F	Diode Continuous Forward Current @ $T_C = 25\text{ }^\circ\text{C}$	160	A
	Diode Continuous Forward Current @ $T_C = 100\text{ }^\circ\text{C}$	80	
	Diode Maximum Forward Current	320	
P_D	Power Dissipation @ $T_C = 25^\circ\text{C}$	483	W
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	$^\circ\text{C}$
T_L	Maximum Teprature for Soldering	260	$^\circ\text{C}$

Thermal Resistance

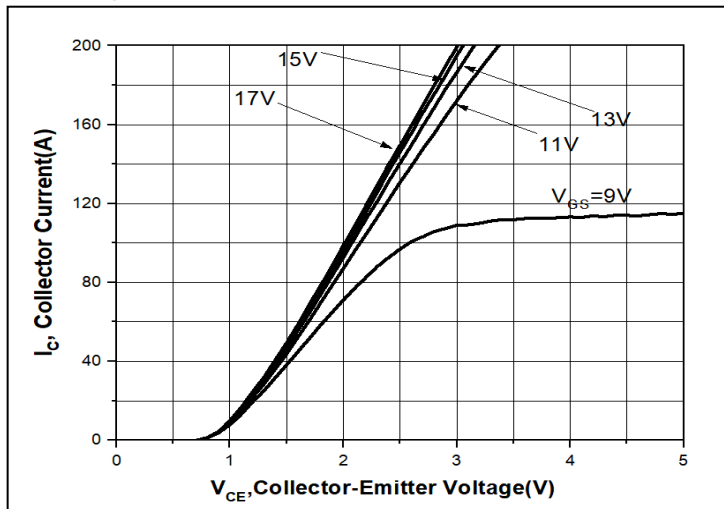
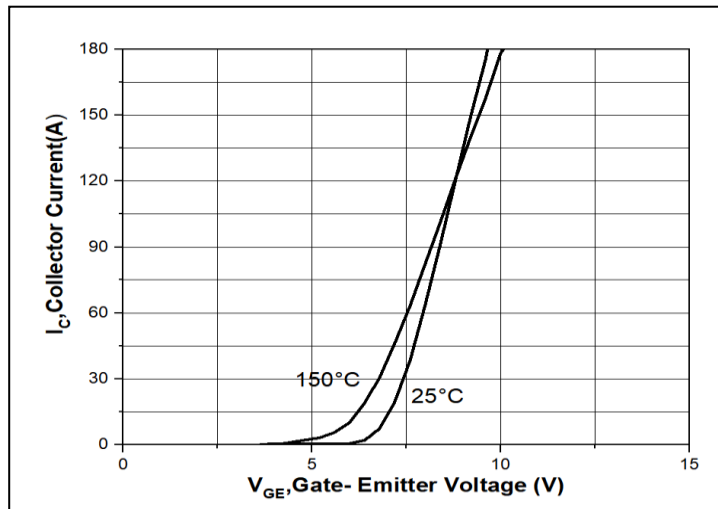
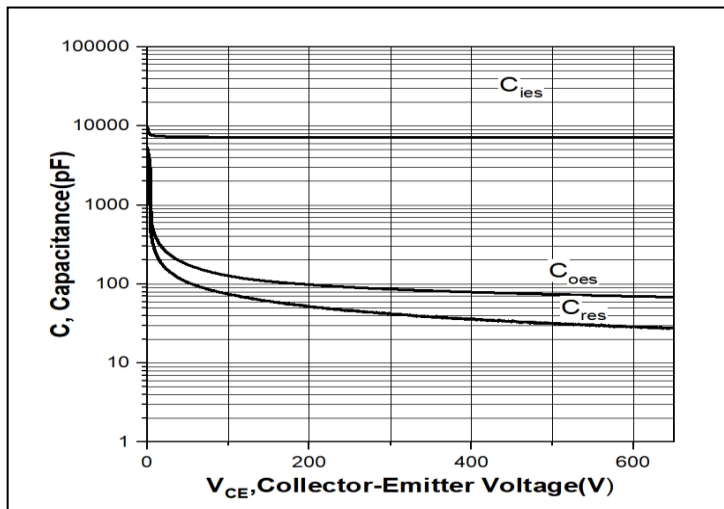
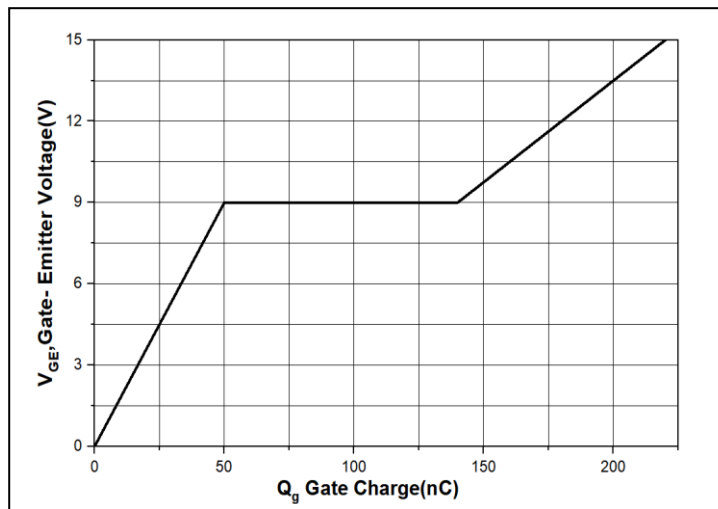
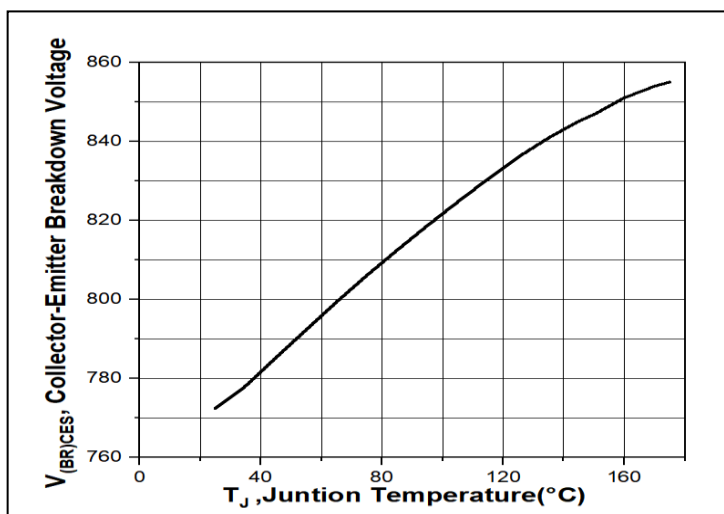
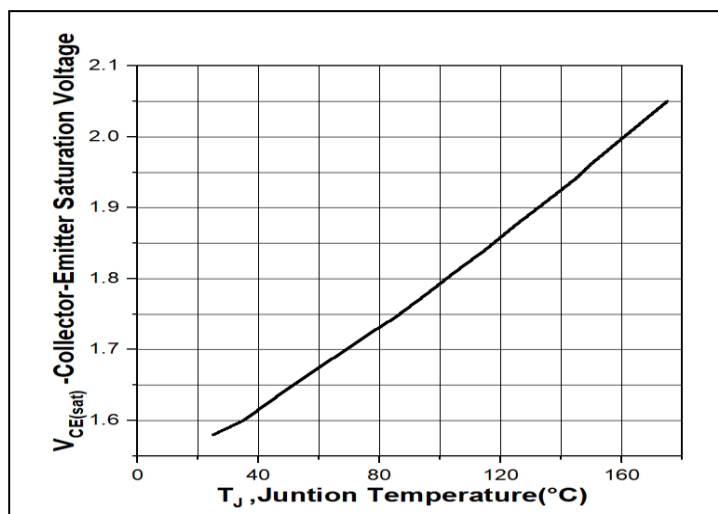
Symbol	Characterizes	Typ.	Max.	Units
R _{θJC}	Thermal Resistance, Junction-to-case for IGBT	—	0.31	°C/W
	Thermal Resistance, Junction-to-case for Diode	—	0.51	°C/W
R _{θJA}	Thermal Resistance, Junction-to-ambient	—	40	°C/W

Electrical Characteristics @T_A=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)CES}	Collector-Emitter Breakdown Voltage	700	—	—	V	V _{GE} =0V, I _{CE} =1mA
V _{CE(sat)}	Collector-Emitter Saturation Voltage	—	1.58	1.85	V	I _C =80A, V _{GE} =15V @ T _J =25°C
V _{GE(th)}	Gate Threshold Voltage	4.5	—	6.5	V	I _C =250μA, V _{CE} =V _{GE}
I _{CES}	Collector-Emitter Leakage Current	—	—	1	μA	V _{GE} =0V, V _{CE} =650V
I _{GES}	Gate to Emitter Reverse Leakage	—	—	100	nA	V _{GE} =20V, V _{CE} =0V
		—	—	-100		V _{GE} =-20V, V _{CE} =0V
C _{ies}	Input capacitance	—	7356	—	pF	V _{GS} = 0V
C _{oes}	Output capacitance	—	250	—		V _{DS} = 25V
C _{res}	Reverse transfer capacitance	—	149	—		f = 1MHz
t _{d(on)}	Turn-on delay time	—	55	—	ns	V _{CC} =400V, I _C =80A, V _{GE} =0/15V, R _g =10Ω,
t _r	Rise time	—	69	—		
t _{d(off)}	Turn-Off delay time	—	328	—		
t _f	Fall time	—	53	—		
E _{on}	Turn-On Switching Loss	—	3.70	—	mJ	V _{CC} =400V, I _C =80A, V _{GE} =0/15V, R _g =10Ω,
E _{off}	Turn-Off Switching Loss	—	1.68	—		
E _{ts}	Total Switching Loss	—	5.38	—		
Q _g	Total Gate Charge	—	220	—	nC	V _{CC} =480V, I _C =80A, V _{GE} =15V
Q _{ge}	Gate to Emitter Charge	—	50	—		
Q _{gc}	Gate to Collector Charge	—	90	—		
I _{C(SC)}	Short circuit collector current Max.1000 short circuits Time between short circuits: ≥1.0s	—	730	—	A	V _{GE} =15V, V _{CC} ≤400V, t _{sc} ≤7μs

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

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{FM}	Diode Forward Voltage	—	1.7	3	V	I _F =80A
t _{rr}	Reverse Recovery Time	—	106	—	ns	T _J = 25°C, I _F =80A, V _R =400V V _{GE} =0/15V
Q _{rr}	Reverse Recovery Charge	—	1.31	—	μC	
I _{RRM}	Diode Peak Reverse Recovery Current	—	24.7	—	A	

Typical Electrical and Thermal Characteristics

Figure1. Typical Output Characteristics

Figure2. Typical Transfer Characteristics

Figure3. Typical Capacitance

Figure4. Typical Gate Charge

Figure5. Collector-Emitter Breakdown Voltage vs. Temperature

Figure6. Collector-Emitter Saturation Voltage vs. Temperature

Typical Electrical and Thermal Characteristics

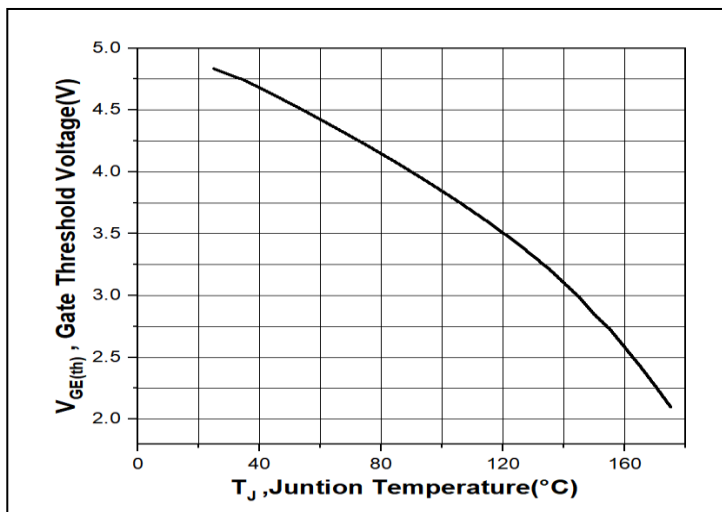


Figure7. Gate Threshold Voltage vs. Temperature

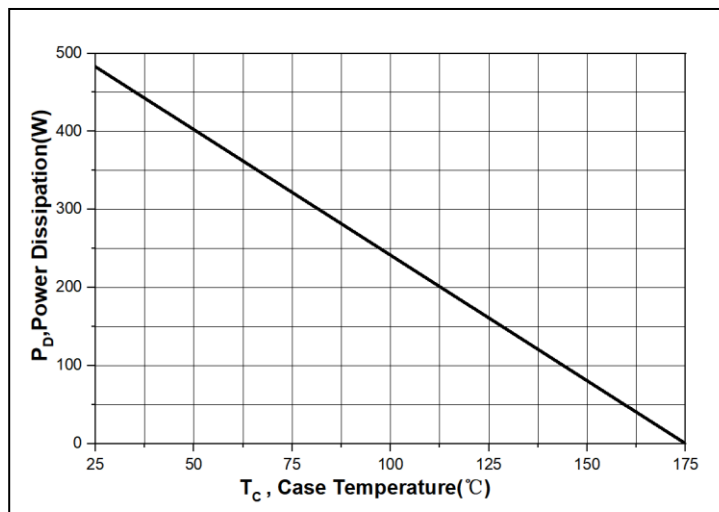


Figure8. Power Dissipation vs. Case Temperature

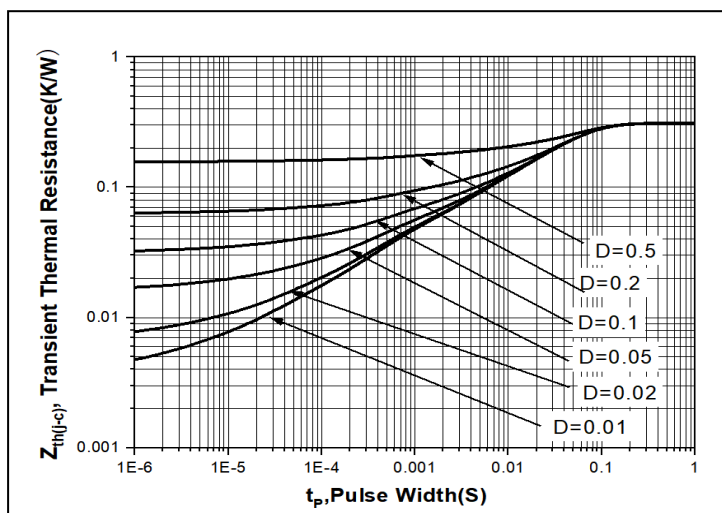


Figure9. IGBT transient thermal resistance ($D = t_p/T$)

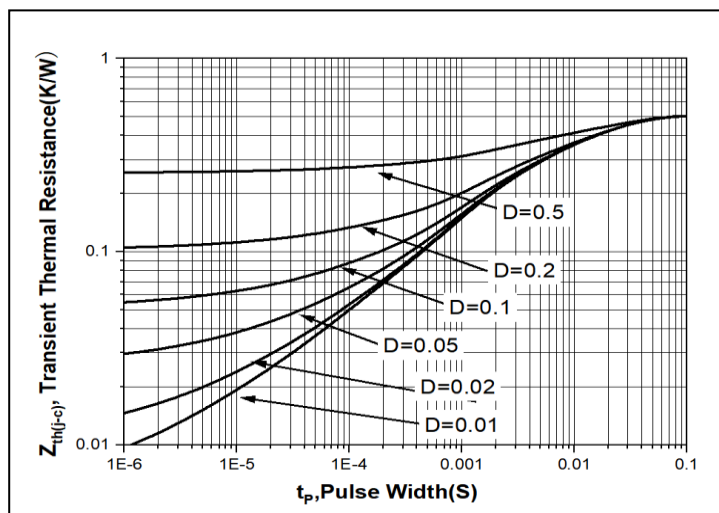
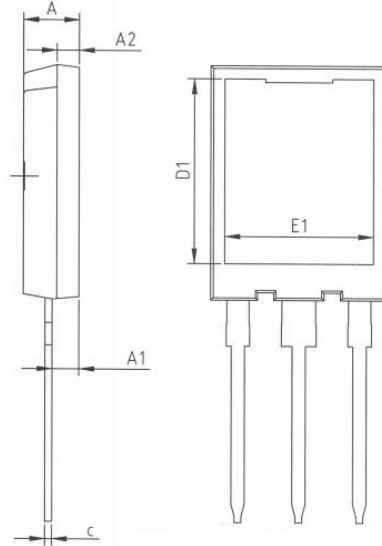
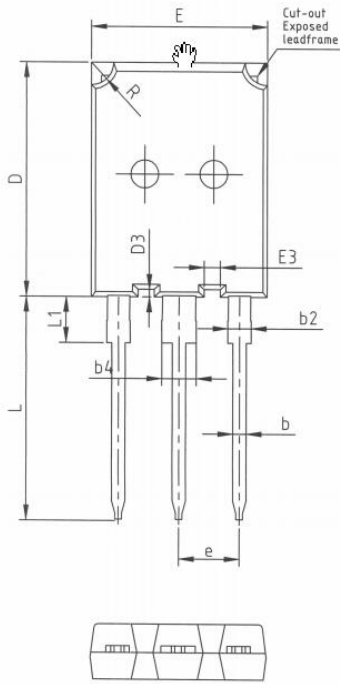


Figure10. Diode transient thermal impedance as a function of pulse width ($D = t_p/T$)

Mechanical Data:

Option1:

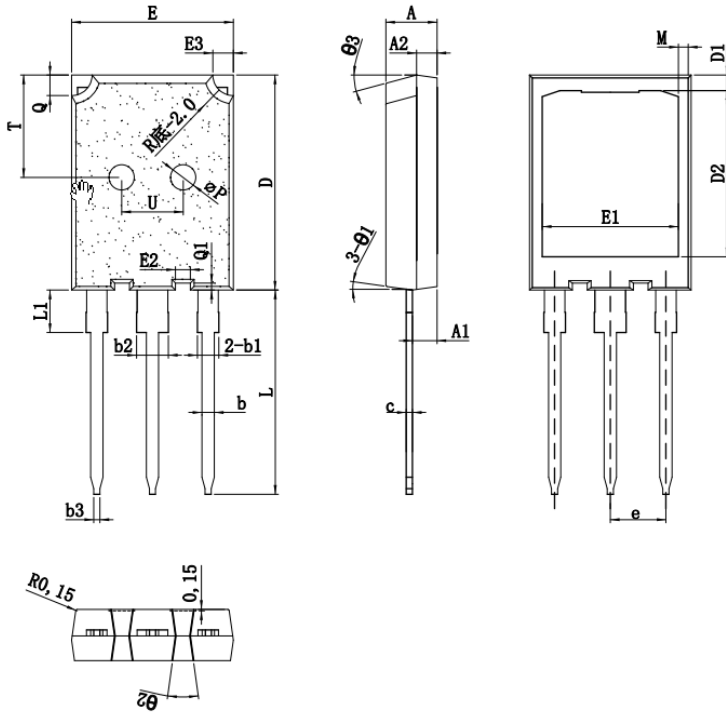
Unit:mm



COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
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	0.50	0.61	0.75
D	20.70	21.00	21.30
D1	16.25	16.55	16.85
D3	0.53	0.68	0.83
E	15.50	15.80	16.10
E1	13.10	13.30	13.50
E3	1.30	1.45	1.60
e	5.44 (BSC)		
L	19.62	19.92	20.22
L1	-	-	4.30
R	1.85	2.00	2.15

Option2:



SYMBOL	mm		
	MIN	NOM	MAX
*A	4.90	5.00	5.10
*A1	2.30	2.40	2.50
A2	1.90	2.00	2.10
*b	1.15	1.20	1.25
*b1	1.95	2.10	2.25
*b2	2.95	3.10	3.25
b3	0.45	0.60	0.75
*c	0.55	0.60	0.68
*D	20.90	21.00	21.10
D1	1.00	1.20	1.40
D2	16.05	16.35	16.65
*E	15.70	15.80	15.90
E1	13.10	13.30	13.50
E2	1.25	1.45	1.65
E3	1.80	2.00	2.20
*e	5.40	5.44	5.48
*L	19.80	19.95	20.10
*L1	-	-	4.30
M	0.50	0.70	0.90
ΦP	2.30	2.50	2.70
Q	1.80	2.00	2.20
Q1	0.50	0.68	0.80
T	9.80	10.00	10.20
U	5.80	6.00	6.20
θ1	5°	7°	9°
θ2	13°	16°	19°
θ3	13°	15°	17°

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