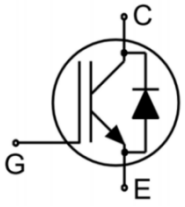
Main Product Characteristics:

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 °C	80	
I_{Cpuls}	Pulsed Collector Current，t_p limited by Tjmax	320	
-	Turn off safe operating area，V_{CE}=650V，T_J=175°C	320	
I_F	Diode Continuous Forward Current @T_C = 25 °C	160	A
	Diode Continuous Forward Current @T_C = 100 °C	80	
I_{FM}	Diode Maximum Forward Current	320	
P_D	Power Dissipation @ T_C = 25°C	483	W
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	°C
T_L	Maximum Teprature for Soldering	260	°C

Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Thermal Resistance,Junction-to-case for IGBT	—	0.31	°C/W
	Thermal Resistance,Junction-to-case for Diode	—	0.51	°C/W
$R_{\theta JA}$	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 V_{DS} = 25V f = 1MHz
C_{oes}	Output capacitance	—	250	—		
C_{res}	Reverse transfer capacitance	—	149	—		
$t_{d(on)}$	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 VGE=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

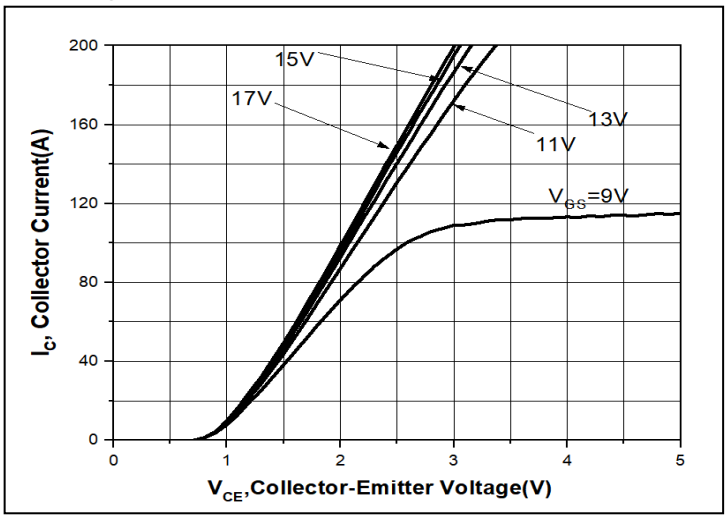


Figure1. Typical Output Characteristics

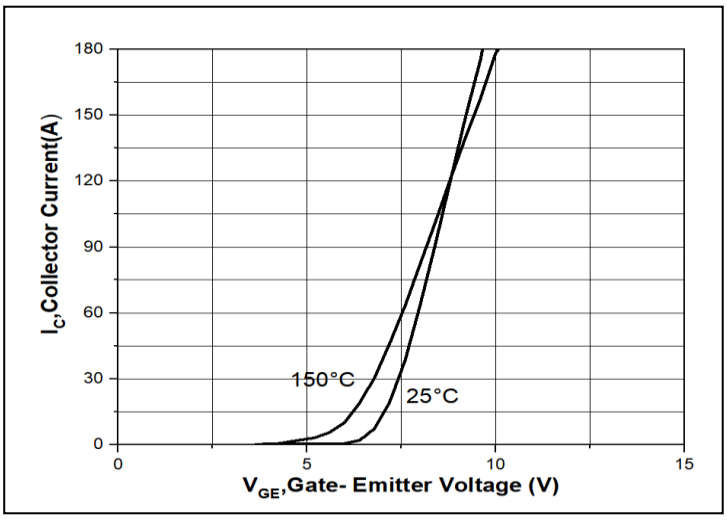


Figure2. Typical Transfer Characteristics

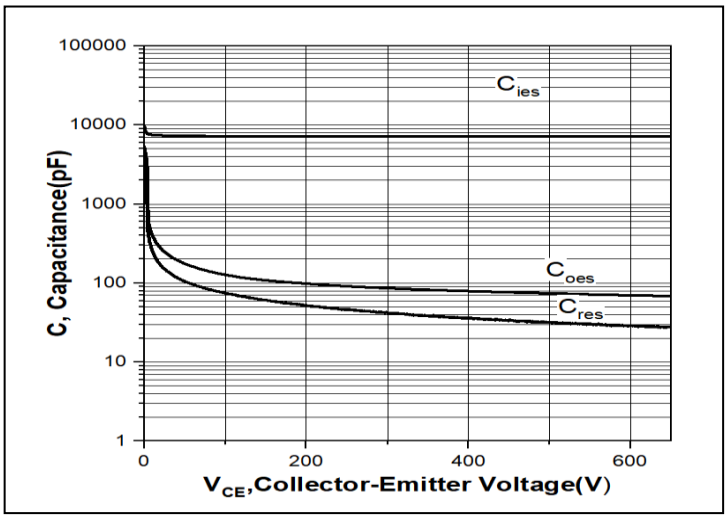


Figure3.Typical Capacitance

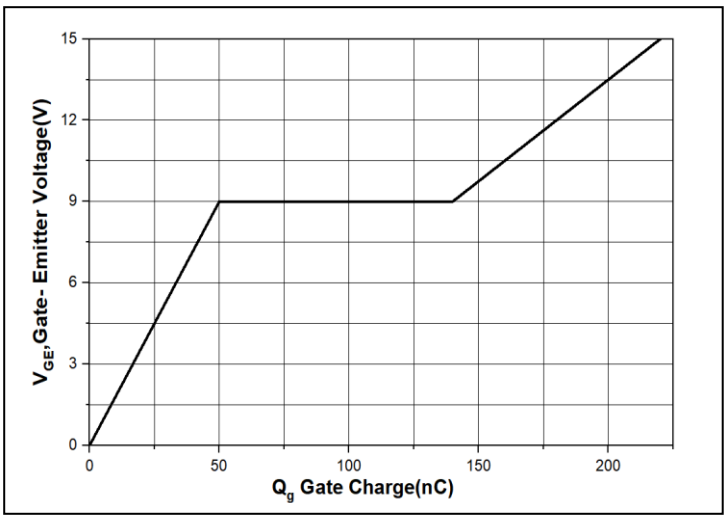


Figure4. Typical Gate Charge

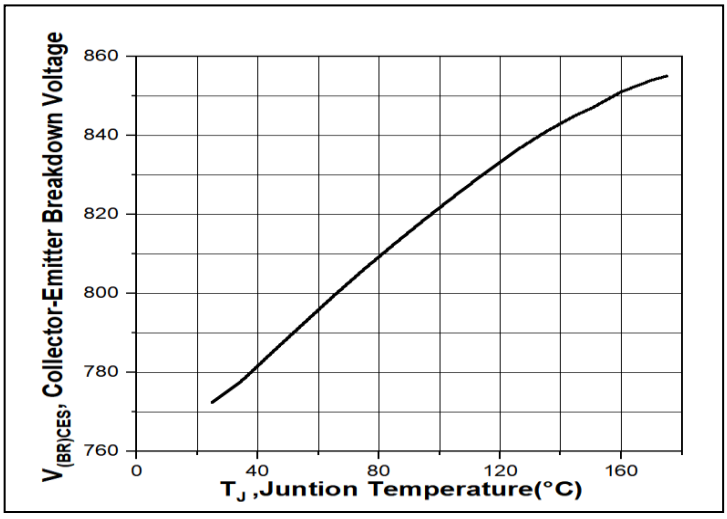


Figure5.Collector-Emitter Breakdown Voltage vs. Temperature

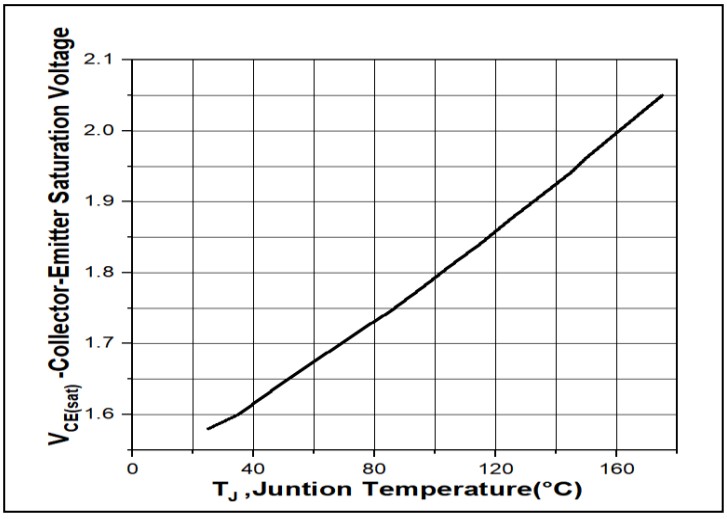


Figure6. Collector-Emitter Saturation Voltage vs. Temperature

Typical Electrical and Thermal Characteristics

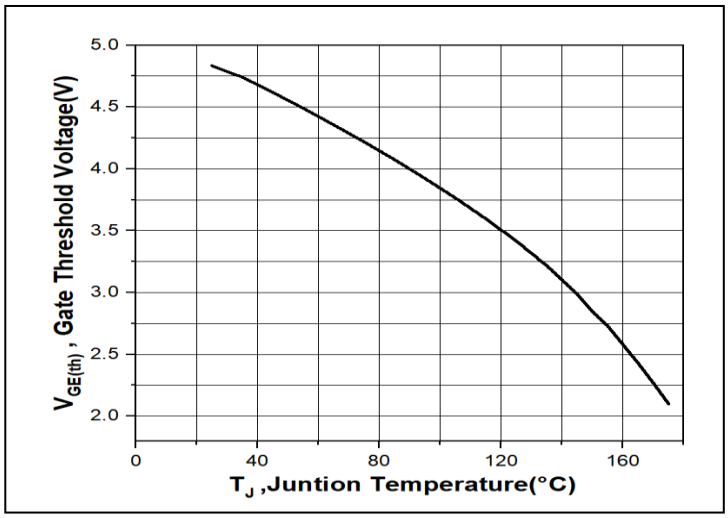


Figure7.Gate Threshold Voltage vs. Temperature

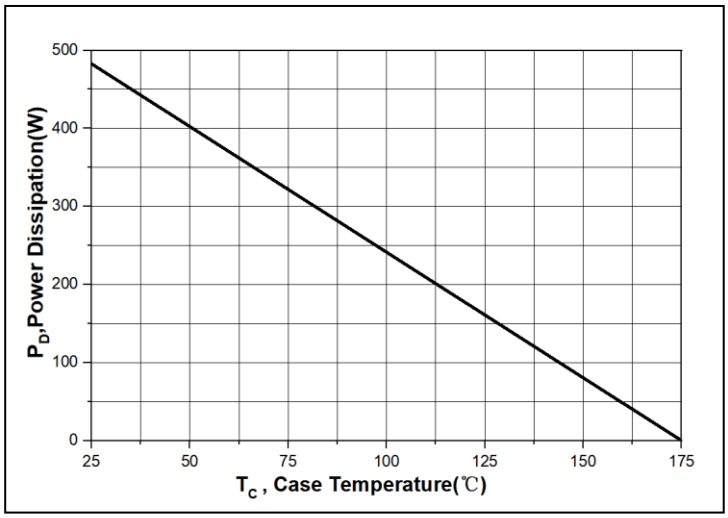


Figure8. Power Dissipation vs. Case Temperature

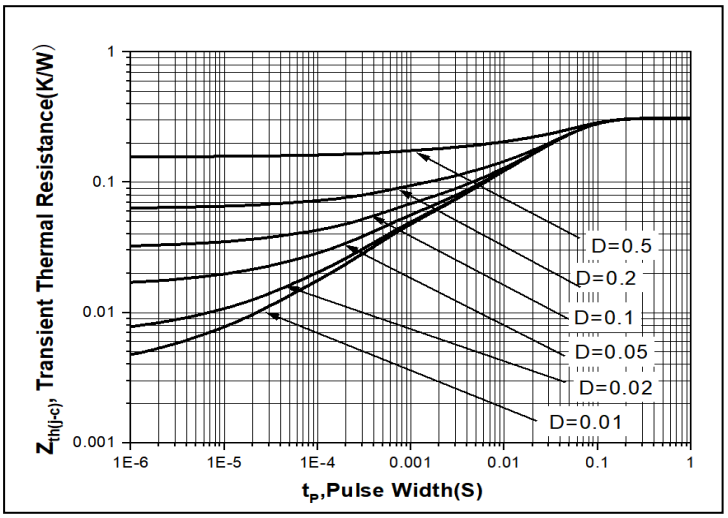


Figure9. IGBT transient thermal resistance (D= t_p/T)

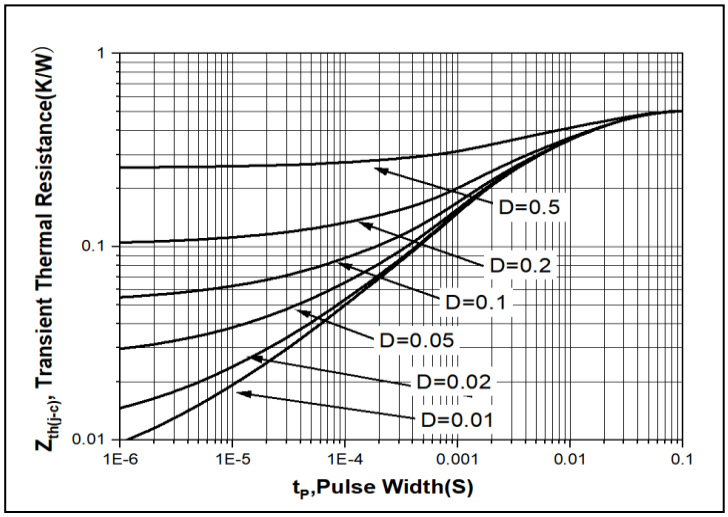
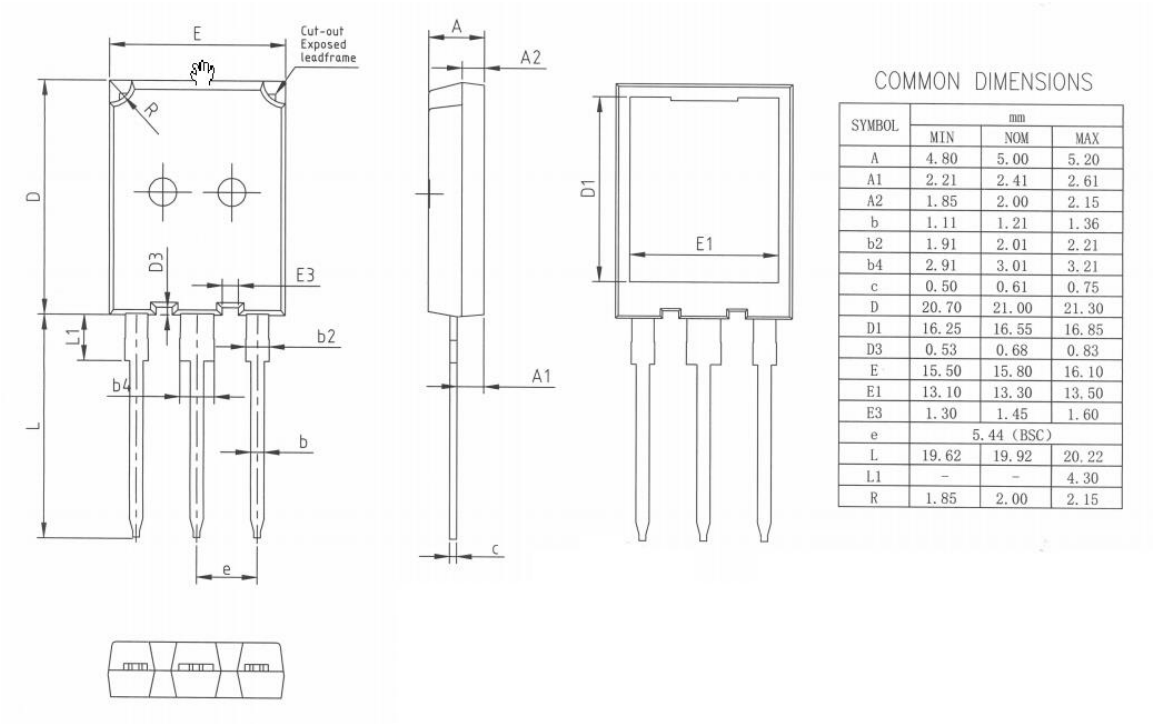


Figure10. Diode transient thermal impedance as a function of pulse width（D=t_p/T）

Mechanical Data：

Option1:

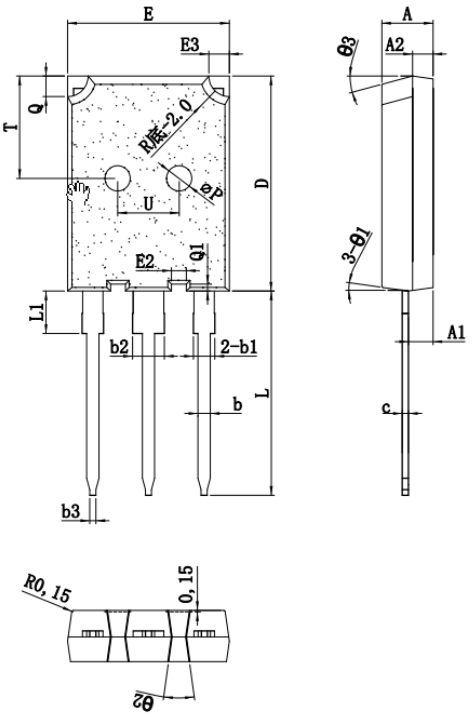
Unit:mm



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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