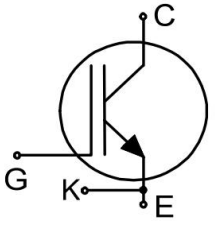
Main Product Characteristics:

V_{CES}	1250 V
I_C	100 A
$V_{CE(sat)}$	1.75 V

TO-247PLUS-4L



Schematic Diagram

G:Gate
E:Emitter
K:Kelvin Emitter
C:Collector

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

RoHS Compliant

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	200	A
	Collector Current @T_C = 100 °C	100	
I_{Cpuls}	Pulsed Collector Current，t_p limited by T_{jmax}	400	
-	Turn off safe operating area，V_{CE}=1200V，T_J=175°C	400	
I_F	Diode Continuous Forward Current @T_C = 100 °C	100	
I_{FM}	Diode Maximum Forward Current	400	
P_D	Power Dissipation @ T_C = 25°C	750	W
	Power Dissipation @ T_C = 100°C	376	W
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	°C
T_L	Maximum Temperature for Soldering	260	°C

Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Thermal Resistance,Junction-to-case for IGBT	—	0.2	°C/W
	Thermal Resistance,Junction-to-case for Diode	—	1.4	°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	1250	—	—	V	V_{GE}=0V,I_{CE}=1mA
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	—	1.75	2.2	V	I_C=100A ,V_{GE}=15V @T_J=25°C
		—	2.45	—		I_C=100A ,V_{GE}=15V@T_J=175°C
$V_{GE(th)}$	Gate Threshold Voltage	4.5	4.8	6.5	V	I_C=250uA,V_{CE}=V_{GE}
I_{CES}	Collector-Emitter Leakage Current	—	—	10	μA	V_{GE} =0V,V_{CE}=1200V
I_{GES}	Gate to Emitter Reverse Leakage	—	—	100	nA	V_{GE}=30V,V_{CE} =0V
		—	—	-100		V_{GE}=-30V,V_{CE} =0V
C_{ies}	Input capacitance	—	12.18	—	nF	V_{GS} = 0V
C_{oes}	Output capacitance	—	166	—	pF	V_{DS} = 100V
C_{res}	Reverse transfer capacitance	—	108	—		f = 1MHz
$t_{d(on)}$	Turn-on delay time	—	86	—	ns	V_{CC}=600V, V_{GE}=0.0/15.0V, R_G=10.0Ω, I_C=90A
t_r	Rise time	—	50	—		
$t_{d(off)}$	Turn-Off delay time	—	850	—		
t_f	Fall time	—	52	—		
E_{on}	Turn-On Switching Loss	—	10.7	—	mJ	V_{CC}=600V, V_{GE}=0.0/15.0V, R_G=10.0Ω, I_C=90A
E_{off}	Turn-Off Switching Loss	—	7.3	—		
E_{ts}	Total Switching Loss	—	18	—		
Q_g	Total Gate Charge	—	669	—	nC	V_{CC}=960V, I_C=100A, V_{GE}=15V
Q_{ge}	Gate to Emitter Charge	—	107	—		
Q_{gc}	Gate to Collector Charge	—	258	—		

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	4	V	I_F=100A,V_{GE}=0V
t_{rr}	Reverse Recovery Time	—	85	—	ns	T_J = 25°C, I_F =100A, VR=600V, VGE=0.0/15.0V
Q_{rr}	Reverse Recovery Charge	—	2.2	—	μC	
I_{RRM}	Diode Peak Reverse Recovery Current	—	48	—	A	

Typical Electrical and Thermal Characteristics

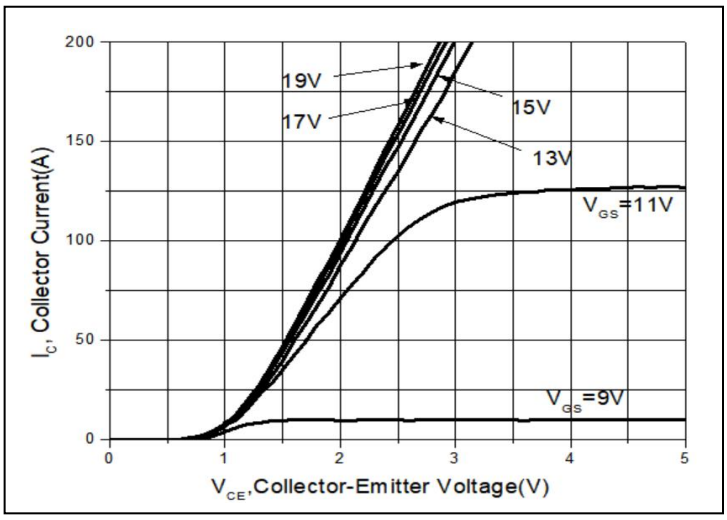


Figure1. Typical Output Characteristics

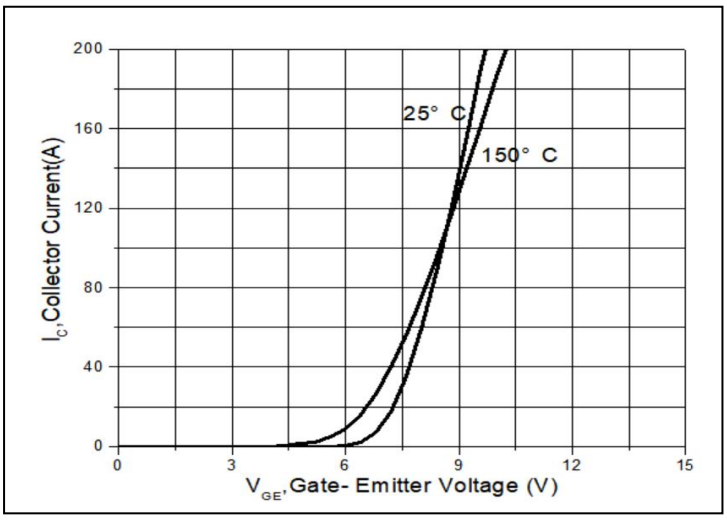


Figure2. Typical Transfer Characteristics

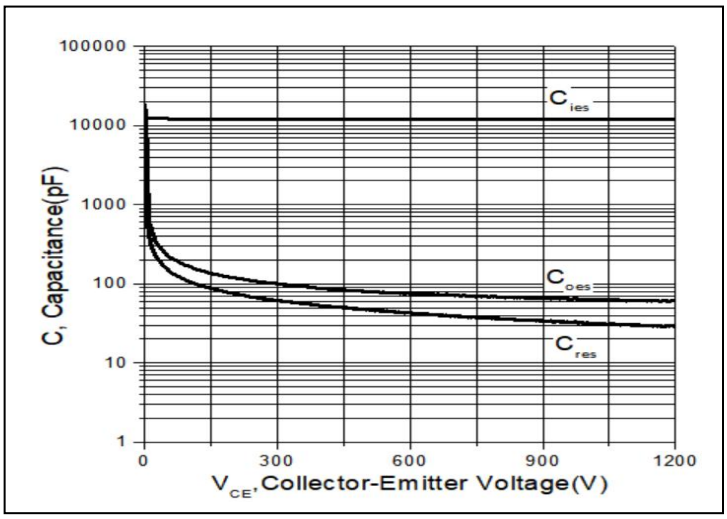


Figure3.Typical Capacitance

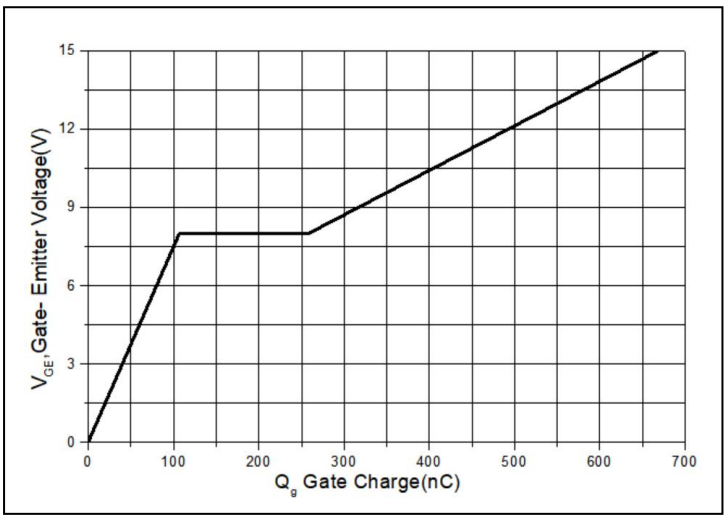


Figure4. Typical Gate Charge

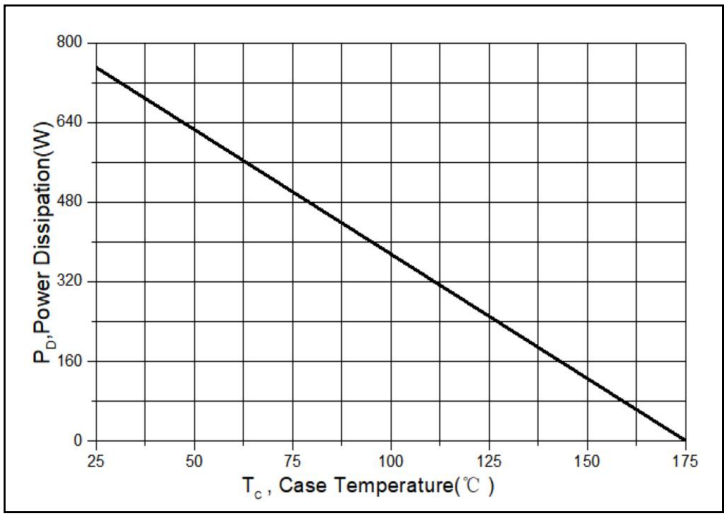


Figure5. Power Dissipation vs. Case Temperature

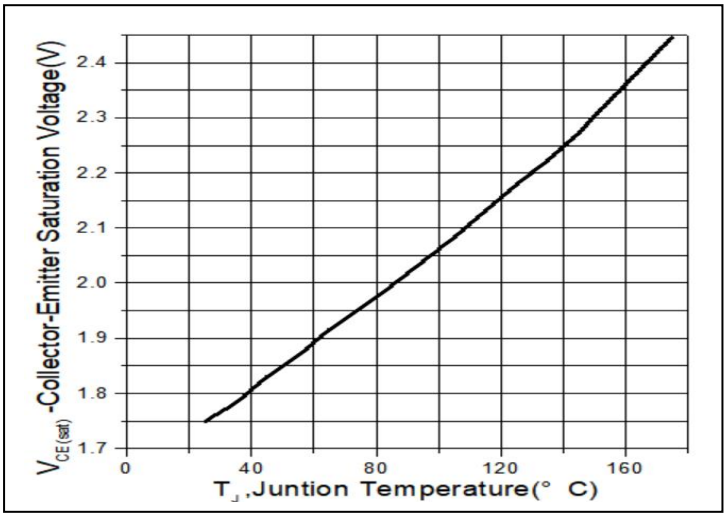


Figure6. Collector-Emitter Saturation Voltage vs. Temperature

Typical Electrical and Thermal Characteristics

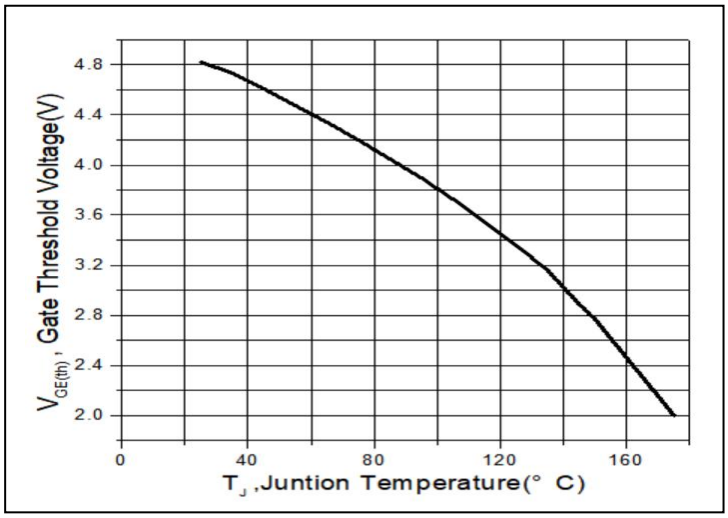


Figure7. Gate Threshold Voltage vs. Temperature

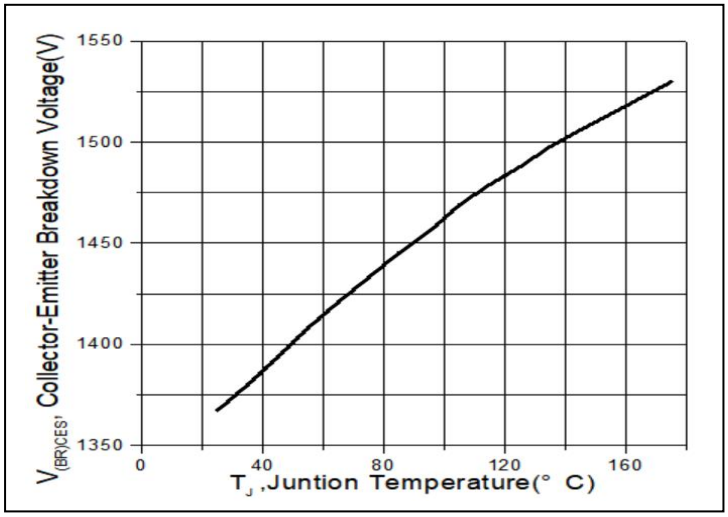
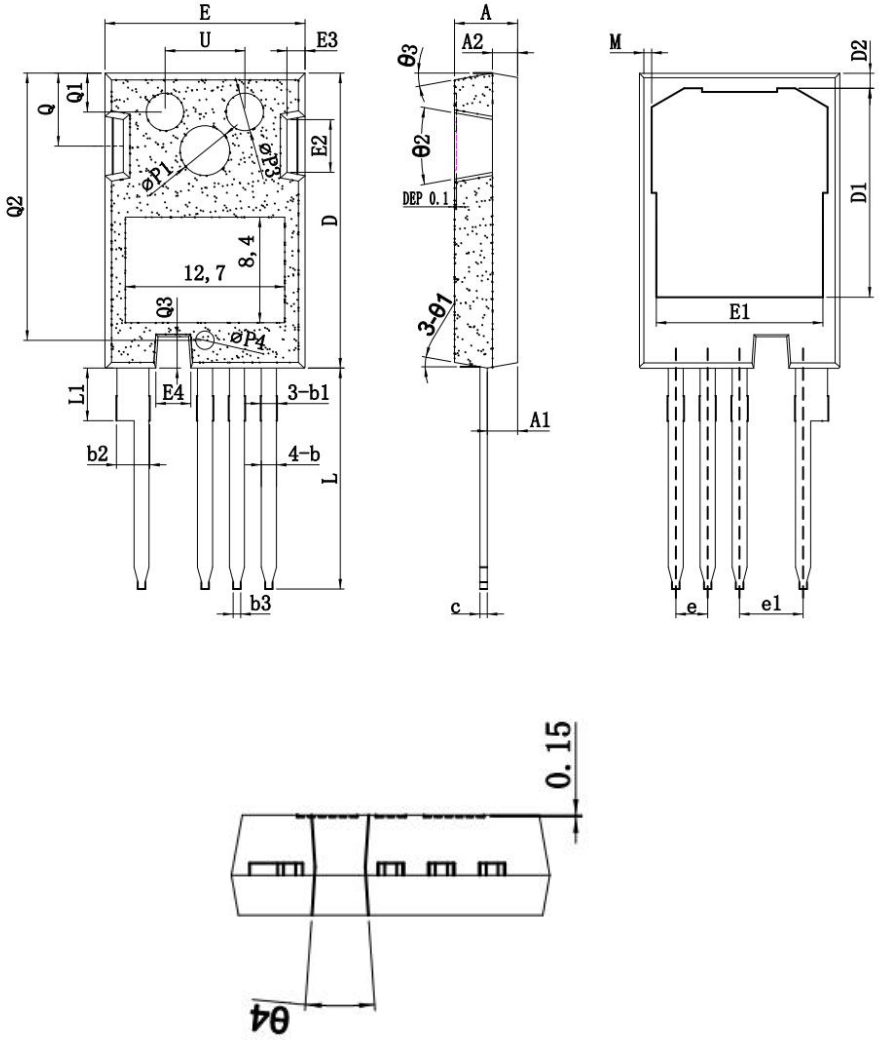


Figure8. Collector-Emitter Breakdown Voltage vs. Temperature

Mechanical Data：



SYMBOL	mm		
	MIN	NOM	MAX
✱A	4. 83	5. 02	5. 21
✱A1	2. 29	2. 42	2. 54
A2	1. 91	2. 00	2. 16
✱b	1. 07	1. 20	1. 33
✱b1	1. 15	1. 30	1. 45
✱b2	2. 39	2. 67	2. 94
b3	0. 45	0. 60	0. 75
✱c	0. 55	0. 60	0. 68
✱D	23. 30	23. 45	23. 60
D1	16. 35	16. 65	16. 95
D2	0. 95	1. 19	1. 25
✱E	15. 75	15. 94	16. 13
E1	13. 05	13. 25	13. 45
E2	4. 00	4. 40	4. 80
E3	1. 00	1. 45	1. 90
E4	2. 40	2. 80	3. 20
✱e	2. 50	2. 54	2. 58
✱e1	5. 03	5. 08	5. 13
✱L	17. 31	17. 57	17. 82
✱L1	—	—	4. 37
M	0. 40	0. 60	0. 80
ΦP1	3. 80	4. 00	4. 20
ΦP3	2. 80	3. 00	3. 20
ΦP4	1. 30	1. 50	1. 70
Q	5. 49	5. 79	6. 00
Q1	2. 80	3. 10	3. 40
Q2	19. 95	21. 25	21. 55
Q3	2. 35	2. 50	2. 65
U	6. 05	6. 35	6. 55
θ1	6°	10°	13°
θ2	16°	20°	24°
θ3	6°	10°	13°
θ4	5°	8°	11°

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