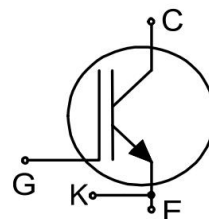


Main Product Characteristics:

V_{CES}	1250 V
I_C	100 A
$V_{CE(sat)}$	1.77 V


TO-247PLUS-4L


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

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	200	A
	Collector Current @ $T_C = 100\text{ }^\circ\text{C}$	100	
I_{Cpuls}	Pulsed Collector Current, t_p limited by T_{jmax}	400	
-	Turn off safe operating area, $V_{CE}=1200\text{V}$, $T_J=175\text{ }^\circ\text{C}$	400	
I_F	Diode Continuous Forward Current @ $T_C = 100\text{ }^\circ\text{C}$	100	
I_{FM}	Diode Maximum Forward Current	400	
P_D	Power Dissipation @ $T_C = 25\text{ }^\circ\text{C}$	750	W
	Power Dissipation @ $T_C = 100\text{ }^\circ\text{C}$	376	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	—	0.2	°C/W
	Thermal Resistance, Junction-to-case for Diode	—	1.4	°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	—	1.77	2.2	V	I _C =100A, V _{GE} =15V @T _J =25°C
		—	2.46	—		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	—	12.17	—	nF	V _{GS} = 0V
C _{oes}	Output capacitance	—	159	—	PF	V _{DS} = 100V f = 1MHz
C _{res}	Reverse transfer capacitance	—	110	—		
t _{d(on)}	Turn-on delay time	—	85	—	ns	V _{CC} =600V, V _{GE} =0.0/15.0V, R _G =10.0Ω, I _C =90A
t _r	Rise time	—	45	—		
t _{d(off)}	Turn-Off delay time	—	840	—		
t _f	Fall time	—	50	—		
E _{on}	Turn-On Switching Loss	—	9.8	—	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	—	17.1	—		
Q _g	Total Gate Charge	—	667	—	nC	V _{CC} =960V, I _C =100A, V _{GE} =15V
Q _{ge}	Gate to Emitter Charge	—	104	—		
Q _{gc}	Gate to Collector Charge	—	255	—		

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

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{FM}	Diode Forward Voltage	—	2.4	4	V	I _F =100A, V _{GE} =0V
t _{rr}	Reverse Recovery Time	—	78	—	ns	T _J = 25°C, I _F =100A, V _R =600V, V _{GE} =0.0/15.0V
Q _{rr}	Reverse Recovery Charge	—	2.12	—	μC	
I _{RRM}	Diode Peak Reverse Recovery Current	—	48	—	A	

Typical Electrical and Thermal Characteristics

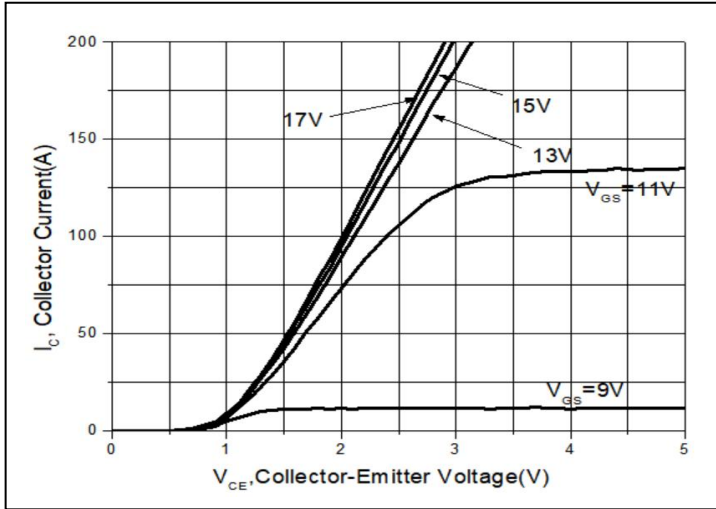


Figure1. Typical Output Characteristics

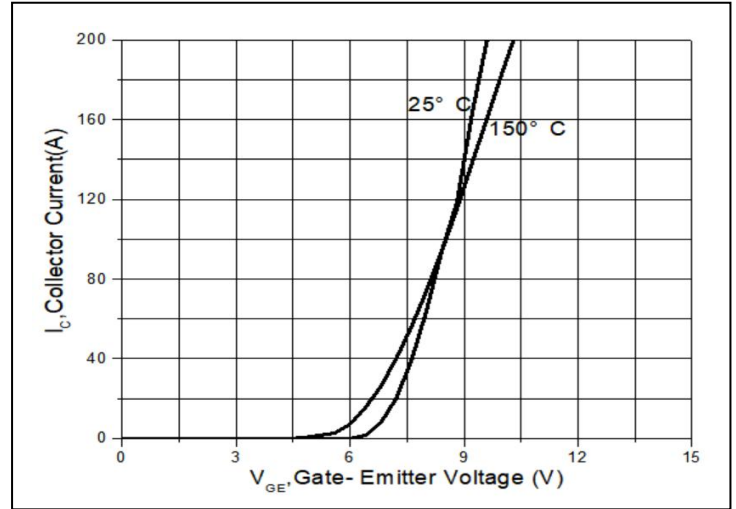


Figure2. Typical Transfer Characteristics

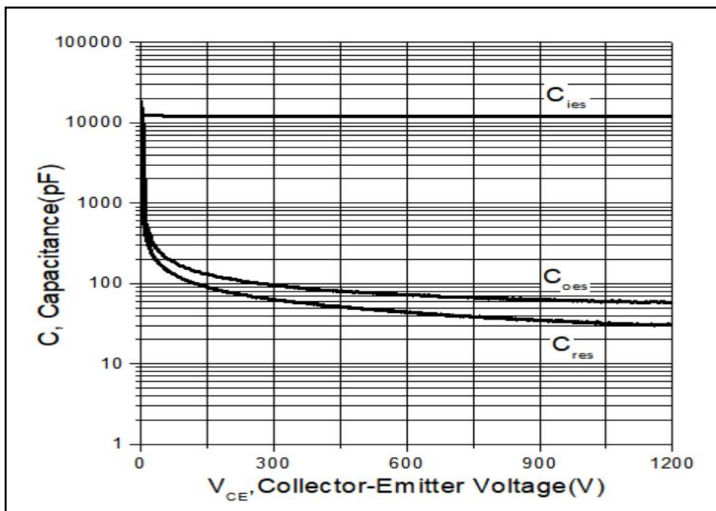


Figure3. Typical Capacitance

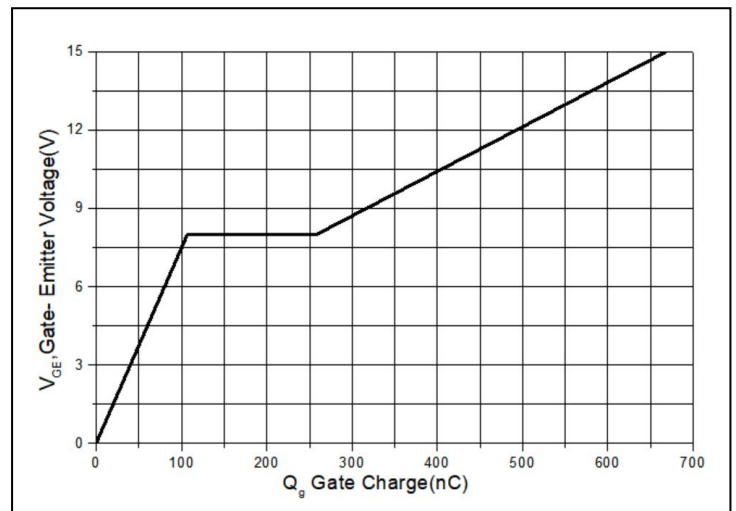


Figure4. Typical Gate Charge

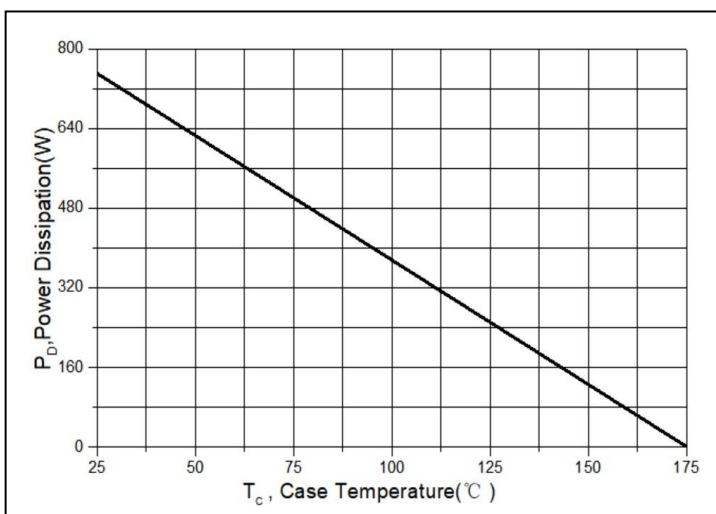


Figure5. Power Dissipation vs. Case Temperature

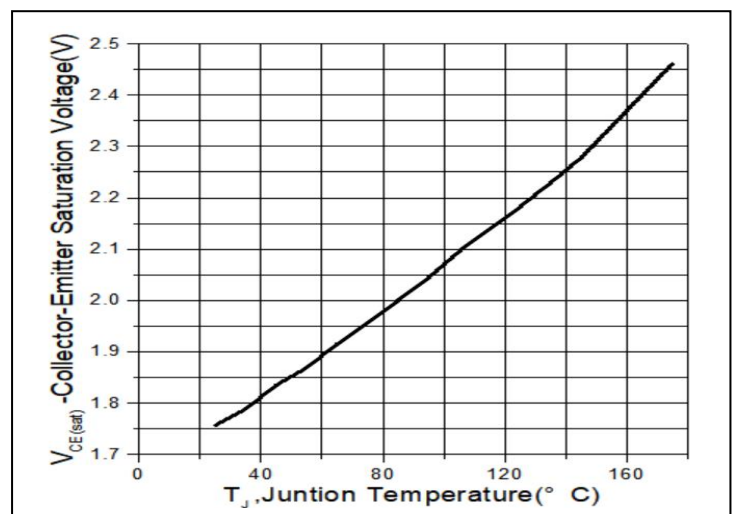


Figure6. Collector-Emitter Saturation Voltage vs. Temperature

Typical Electrical and Thermal Characteristics

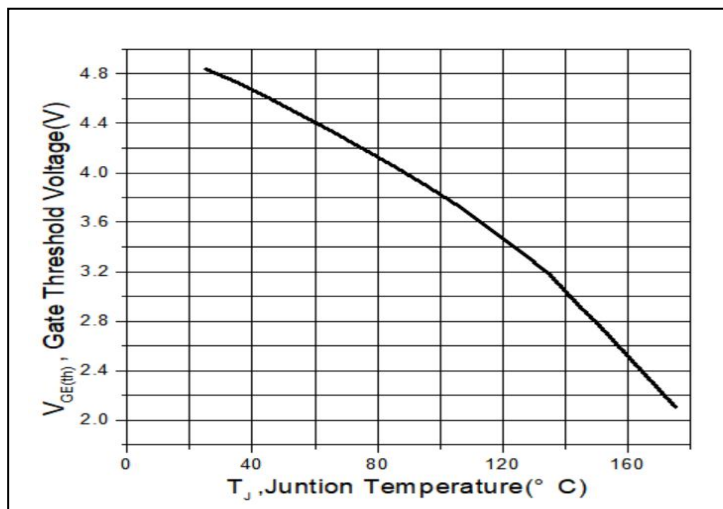


Figure7. Gate Threshold Voltage vs. Temperature

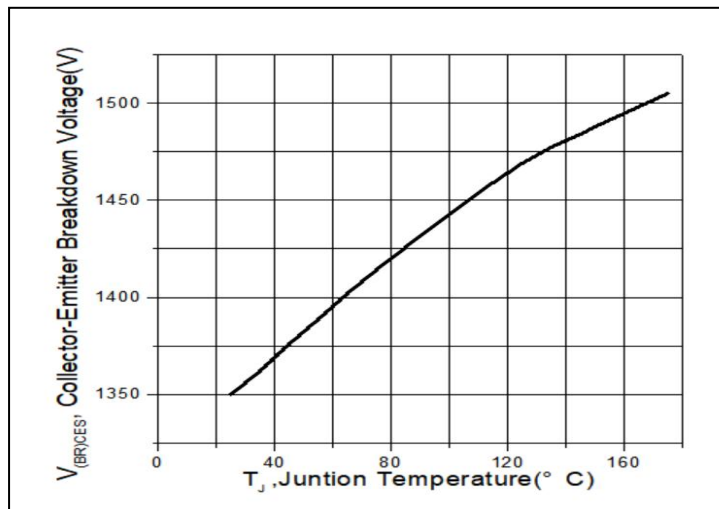
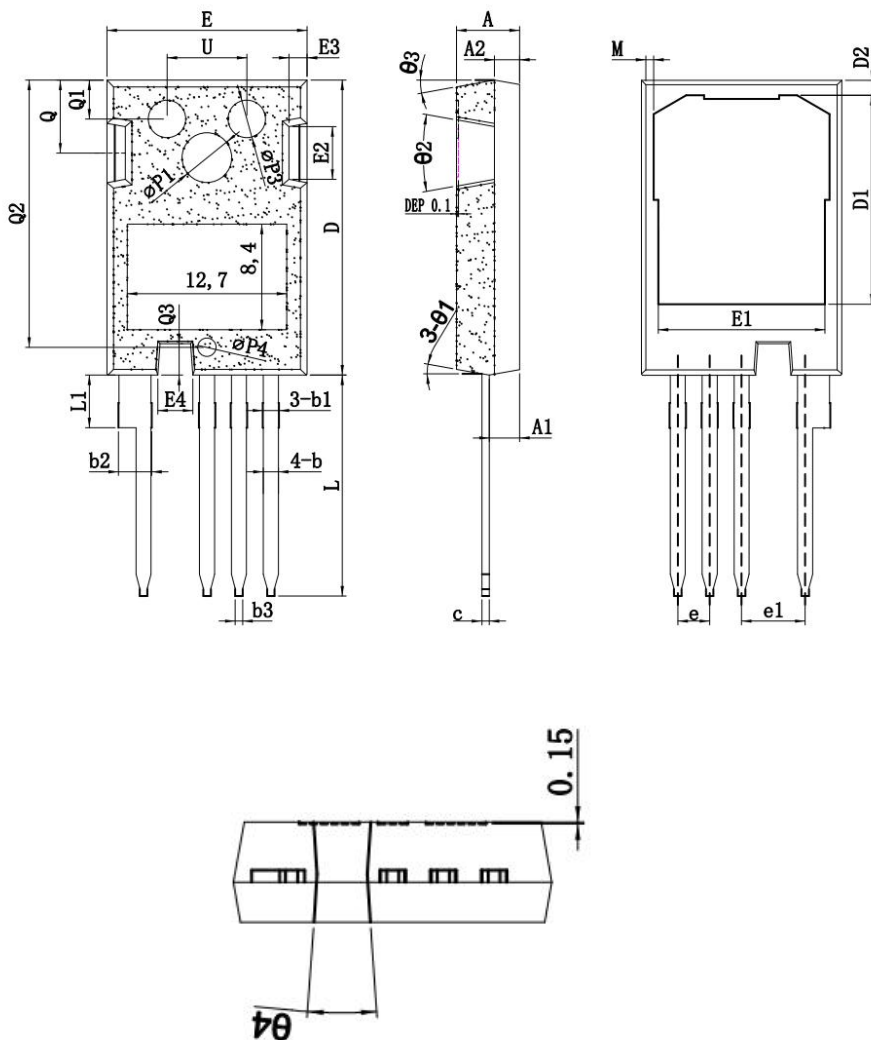


Figure8. Collector-Emitter Breakdown Voltage vs. Temperature

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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