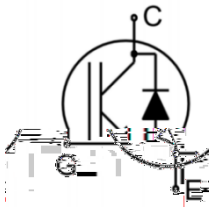
Main Product Characteristics:

TO - 247



Schematic Diagram

Features and Benefits:

- Trench FS technology offering
-
-
- High ruggedness, temperature stable behavior
-

Applications:

-
- 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	120	A
	Collector Current @T_C = 100 °C	60	
I_{Cpuls}	Pulsed Collector Current t_p limited by T_{jmax}	240	
-	Turn off safe operating area V_{CE}=650V T_J=175°C	240	
I_F	Diode Continuous Forward Current @T_C = 25 °C	120	A
	Diode Continuous Forward Current @T_C = 100 °C	60	
I_{FM}	Diode Maximum Forward Current	240	
P_D	Power Dissipation @ T_C = 25°C	319	W
	Power Dissipation @ T_C = 100°C	159	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
	Thermal Resistance,Junction-to-case for IGBT			°C
	Thermal Resistance,Junction-to-case for Diode			°C
	Thermal Resistance,Junction-to-ambient			°C

Electrical Characteristics °C

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		1.9	2.2	V	I_C=60A ,V_{GE}=15V @T_J=25°C
$V_{GE(th)}$	Gate Threshold Voltage	4		6	V	I_C=250 A,V_{CE}=V_{GE}
I_{CES}	Collector-Emitter Leakage Current			1	A	V_{GE} =0V,V_{CE}=700V
I_{GES}	Gate to Emitter Reverse Leakage			100	nA	V_{GE}=25V,V_{CE} =0V
				-100		V_{GE}=-25V,V_{CE} =0V
C_{ies}	Input capacitance		2765		pF	V_{GS} = 0V V_{DS} = 25V 1MHz
C_{oes}	Output capacitance		125			
C_{res}	Reverse transfer capacitance		75			
$t_{d(on)}$	Turn-on delay time				ns	V_{CC}=400V,I_C=60A, V_{GE}=0/15V, R_g=10
t_r	Rise time					
$t_{d(off)}$	Turn-Off delay time					
t_f	Fall time					
E_{on}	Turn-On Switching Loss				mJ	V_{CC}=400V,I_C=60A, V_{GE}=0/15V, R_g=10
E_{off}	Turn-Off Switching Loss					
E_{ts}	Total Switching Loss					
Q_g	Total Gate Charge				nC	V_{CC}=480V, I_C=60A, V_{GE}=15V
Q_{ge}	Gate to Emitter Charge					
Q_{gc}	Gate to Collector Charge					
$I_{C(SC)}$	Short circuit collector current Max.1000 short circuits				A	V_{GE}=15V,V_{CC} ≤ 400V, t_{sc} ≤ 5 s

Electrical Characteristics of the Diode °C

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V_{FM}	Diode Forward Voltage		1.85	2.5	V	I_F=60A
t_{rr}	Reverse Recovery Time		91		ns	T_J = 25°C, I_F =60A, di/dt = 200
Q_{rr}	Reverse Recovery Charge		0.8			
I_{RRM}	Diode Peak Reverse Recovery Current		17.6		A	

Typical Electrical and Thermal Characteristics

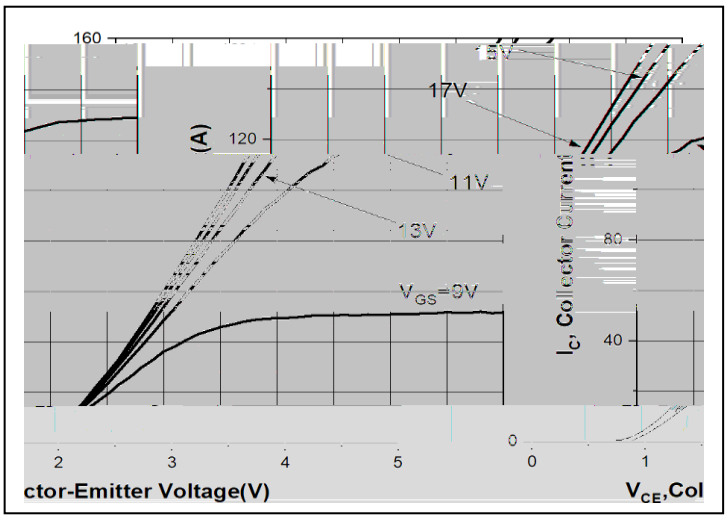


Figure1. Typical Output Characteristics

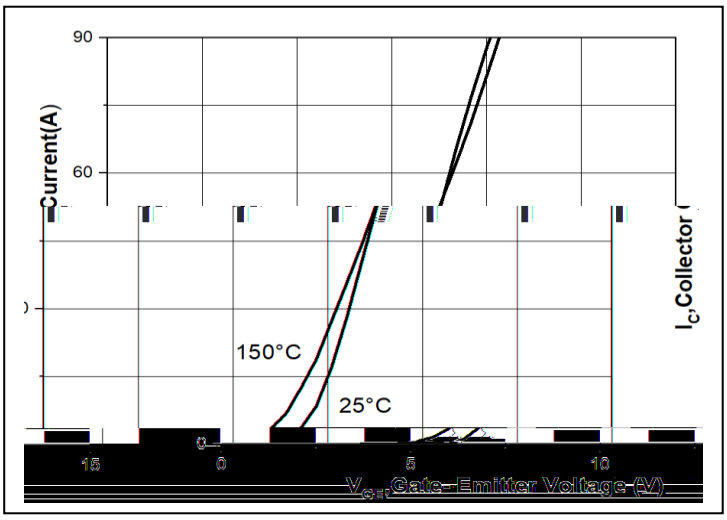


Figure2. Typical Transfer Characteristics

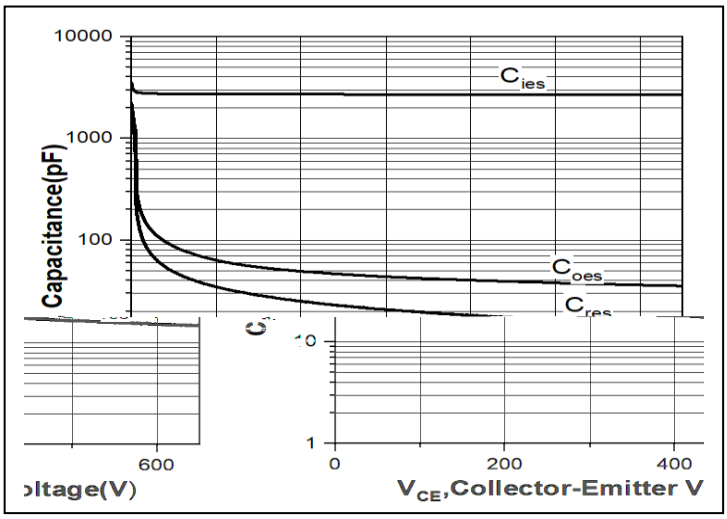


Figure3.Typical Capacitance

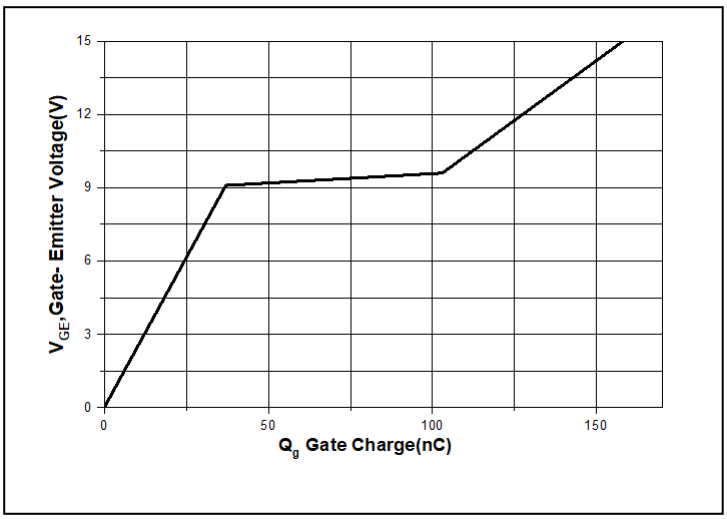


Figure4. Typical Gate Charge

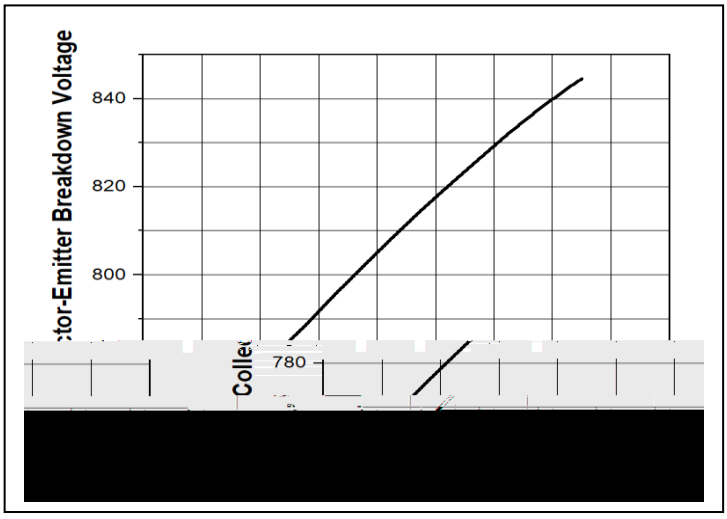


Figure5.

Typical Electrical and Thermal Characteristics

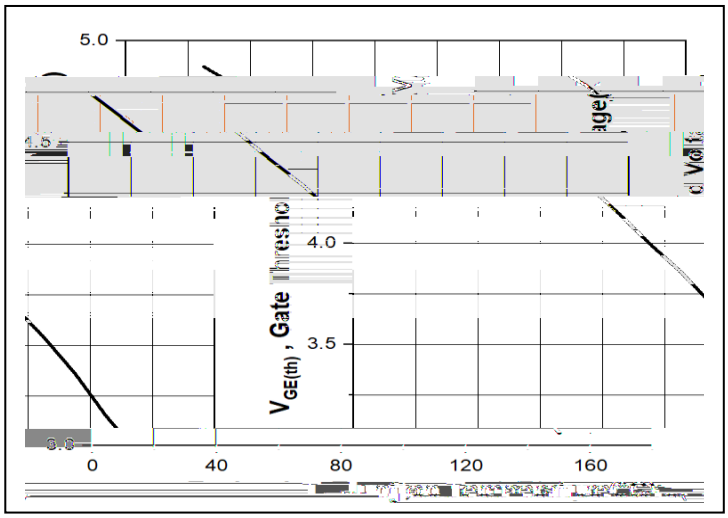


Figure7.Gate Threshold Voltage vs. Temperature

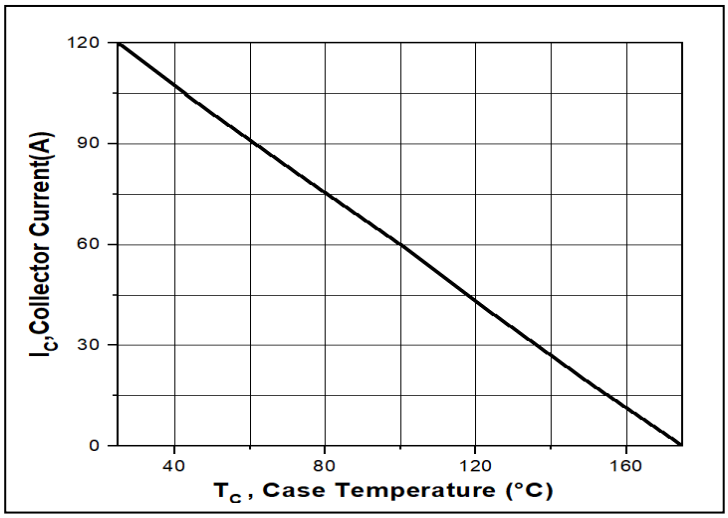


Figure8.Collector Current vs. Temperature

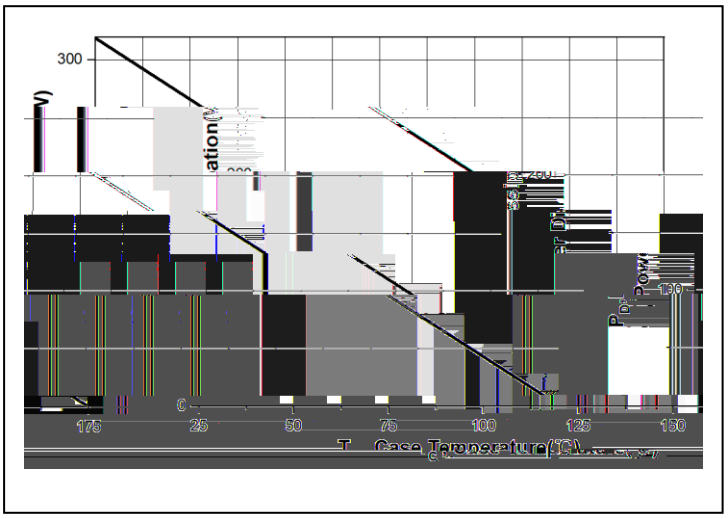
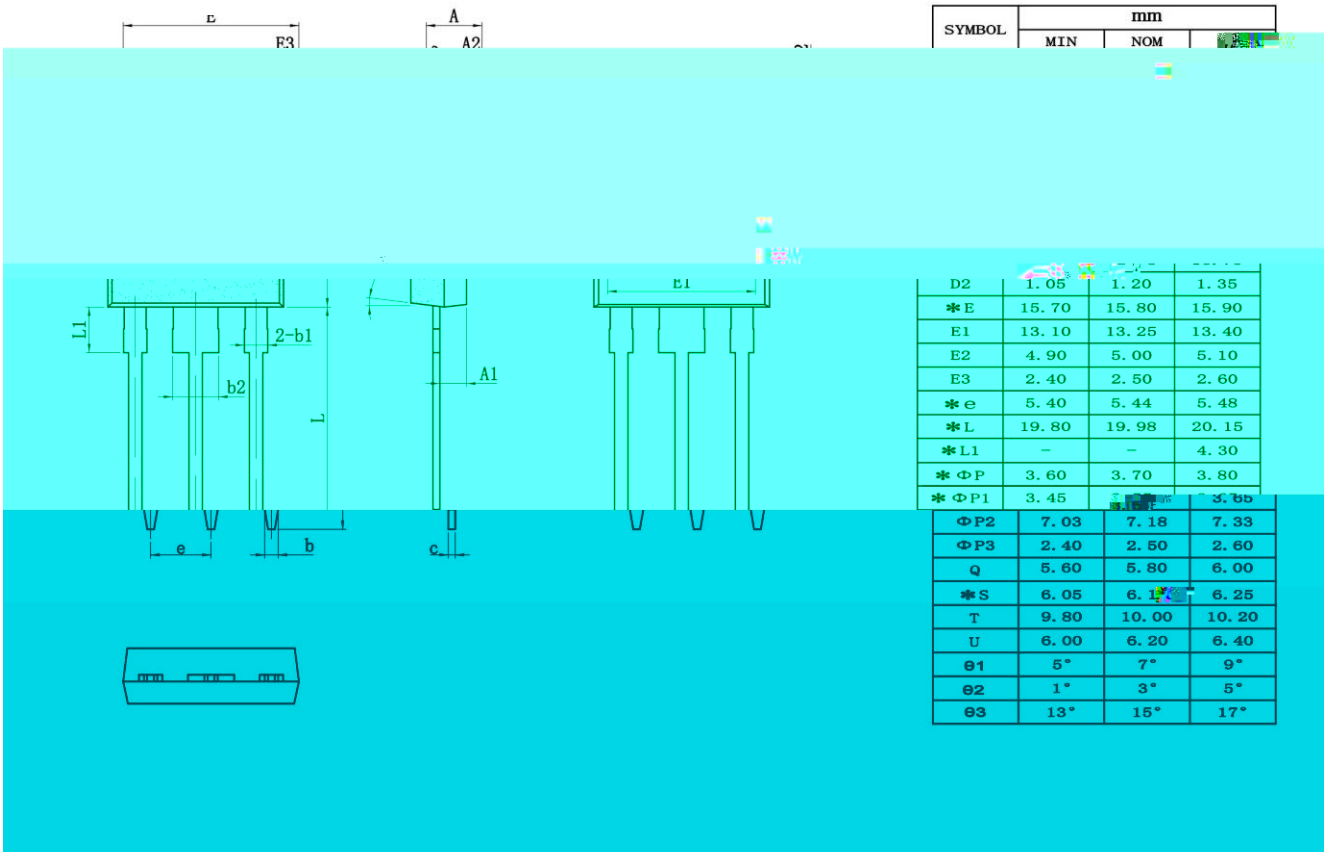


Figure9. Power Dissipation vs. Case Temperature

Mechanical Data

Option1:

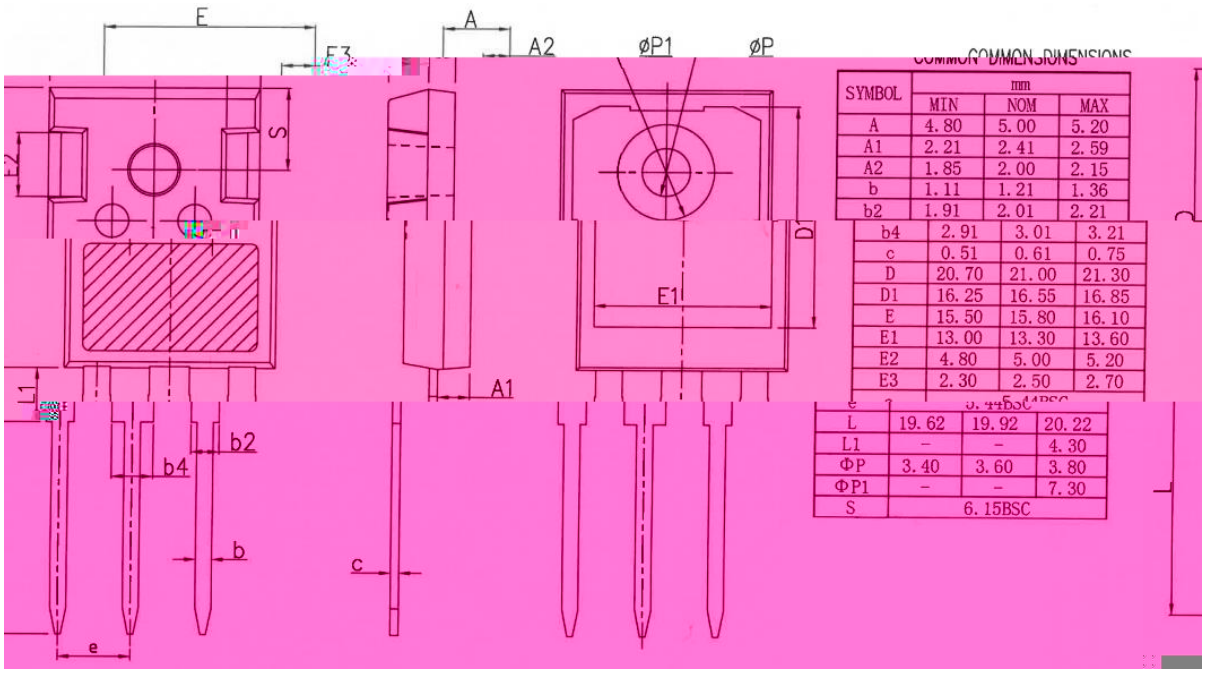
Unit:mm



SYMBOL	mm		
	MIN	NOM	MAX
D2	1.05	1.20	1.35
*E	15.70	15.80	15.90
E1	13.10	13.25	13.40
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
*e	5.40	5.44	5.48
*L	19.80	19.98	20.15
*L1	–	–	4.30
*ΦP	3.60	3.70	3.80
*ΦP1	3.45	[illegible]	3.65
ΦP2	7.03	7.18	7.33
ΦP3	2.40	2.50	2.60
Q	5.60	5.80	6.00
*S	6.05	6.[illegible]	6.25
T	9.80	10.00	10.20
U	6.00	6.20	6.40
θ1	5°	7°	9°
θ2	1°	3°	5°
θ3	13°	15°	17°

Option2:

Option3:



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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