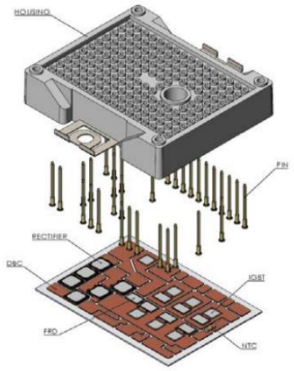
1200V , 25A , PIM

Features

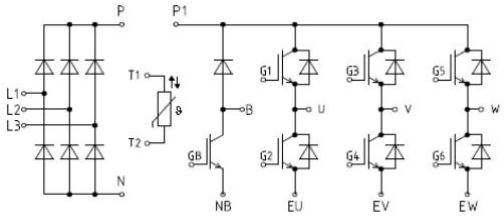
- High frequency operation
- Low stray inductance
- High reliability and Power density
- Low switching loss



sketch map

Applications

- High frequency drivers
- Industry Inverter
- Industry servo
- Air Condition PFC
- AC motor control



Circuit diagram

Key parameter show as below:

Part1: IGBT - Inverter
Part2: Diode- Inverter
Part3: Diode-Rectifier
Part4: IGBT - Break
Part5: Diode- Break

Part1: IGBT - Inverter

Absolute Max Ratings				
Symbol	**Parameter**	**condition**	**Units**	**Maximum**
V_{CES}	Collector-to-Emitter Voltage	T_{VJ}=25 ℃	V	1200
I_C	Continuous DC collector current	TC = 25°C,$T_{VJ\ MAX}$=150 ℃	A	50
		TC = 80°C,$T_{VJ\ MAX}$=150 ℃	A	25
I_{CRM}	Repetitive peak collector current	t_p=1ms	A	75
P_{total}	Total power dissipation	TC = 25°C,$T_{VJ\ MAX}$=150 ℃	°C/W	260
V_{GES}	Gate-Emitter peak voltage		V	+/- 20

IGBT characteristics						
Symbol	**Parameter**	**Test conditions**	**Units**	**Min.**	**Typ.**	**Max.**
$V_{CE(sat)}$	Collector-Emitter Saturation voltage	V_{GE}=15V, I_C=35A,T_{VJ}=25°C	V	—	2.0	2.3
		V_{GE}=15V, I_C=35A,T_{VJ}=125°C	V	—	2.1	—
$V_{GE(th)}$	Gate threshold voltage	V_{GE}= V_{CE}, I_D = 1mA	V	4.0	5.8	6.5
C_{iss}	Input capacitance	V_{GE} = 0V V_{CE}= 25V T_{VJ}=25°C f = 1MHz	pF	—	2280	—
C_{oss}	Output capacitance		pF	—	63	—
C_{rss}	Reverse transfer capacitance		pF	—	45	—
Q_g	Total gate charge	V_{GE} = -15.....+15V	nC	—	192	—
I_{CES}	Collector-Emitter leakage current	V_{CE}=600V, V_{GE} = 0V,T_{VJ}=25°C	mA	-	-	1
I_{GES}	Gate-Emitter leakage current	V_{CE}=0V, V_{GE} =20V,T_{VJ}=25°C	nA	-	-	200
$T_{d(on)}$	Turn-On DelayTime	T_J=25°,Vcc=600V, Ic=25A,Rg=10ohm, V_{GE} =15V	ns	-	46	-
Tr	Rise Time		ns	-	35	-
$T_{d(off)}$	Turn-Off DelayTime		ns	-	190	-
T_f	Turn-Off Fall Time		ns	-	100	-
E_{on}	Turn-on switch loss	T_J=25°,Vcc=400V, Ic=40A,Rg=10ohm, V_{GE} =15V,L=200uH Ls=150nH	uJ	-	1020	-
E_{off}	Turn-off switch loss		uJ	-	930	-

Part2: Diode- Inverter

Absolute Max Ratings				
Symbol	**Parameter**	**condition**	**Units**	**Maximum**
V_{RRM}	Repetitive peak reverse voltage	T_{VJ}=25 °C	V	1200
I_F	Continuous DC forward current		A	25
I_{FRM}	Repetitive peak forward current	T_p=1ms	A	50
I^2t	I^2t Data	V_R=0V,T_p=10ms,T_{VJ}=125 °C	A^2s	240

Diode characteristics						
Symbol	**Parameter**	**Test conditions**	**Units**	**Min.**	**Typ.**	**Max.**
V_F	Forward voltage	I_F=35A,T_{VJ}=25 °C	V	-	2.15	2.4
I_{RM}	Peak reverse recovery current	I_F=35A,diF/dt=20A/us (T_{VJ}=25 °C),V_R=600V, V_{GE}=-15V,T_{VJ}=25 °C	A	-	50	-
Q_r	Recovery charge		uC	-	21	-
T_{rr}	Diode Reverse Recovery Time		nS		120	
E_{rec}	Reverse recovery energy		uJ	-	305	-

Part3: Diode-Rectifier

Absolute Max Ratings				
Symbol	**Parameter**	**condition**	**Units**	**Maximum**
V_{RRM}	Repetitive peak reverse voltage	T_{VJ}=25 °C	V	1600
I_{FRMSM}	Maximum RMS forward current	T_C= 80 °C	A	30
I_{FSM}	Surge forward current	T_p=10ms,T_{VJ}=25 °C	A	360
I^2t	I^2t Data	V_R=0V,T_p=10ms,T_{VJ}=25 °C	A^2s	640

Diode characteristics						
Symbol	**Parameter**	**Test conditions**	**Units**	**Min.**	**Typ.**	**Max.**
V_F	Forward voltage	I_F=30A,T_{VJ}=150 °C	V	-	1.03	1.5
I_R	Reverse Current	V_R=1600A,T_{VJ}=150 °C	mA	-	2.0	-

Part4: IGBT - Break /Chopper

Absolute Max Ratings				
Symbol	**Parameter**	**condition**	**Units**	**Maximum**
V_{CES}	Collector-to-Emitter Voltage	T_{VJ}=25 ℃	V	1200
I_C	Continuous DC collector current	TC = 25°C,$T_{VJ\ MAX}$=150 ℃	A	30
		TC = 80°C,$T_{VJ\ MAX}$=150 ℃	A	15
I_{CRM}	Repetitive peak collector current	t_p=1ms	A	45
P_{total}	Total power dissipation	TC = 25°C,$T_{VJ\ MAX}$=150 ℃	°C/W	150
V_{GES}	Gate-Emitter peak voltage		V	+/- 20

IGBT characteristics						
Symbol	**Parameter**	**Test conditions**	**Units**	**Min.**	**Typ.**	**Max.**
$V_{CE(sat)}$	Collector-Emitter Saturation voltage	V_{GE}=15V, I_C=15A,T_{VJ}=25°C	V	—	2.05	2.3
		V_{GE}=15V, I_C=15A,T_{VJ}=125°C	V	—	2.15	—
$V_{GE(th)}$	Gate threshold voltage	V_{GE}= V_{CE}, I_D = 1mA	V	4.0	5.0	6.5
C_{iss}	Input capacitance	V_{GE} = 0V V_{CE}= 25V T_{VJ}=25°C f = 1MHz	pF	—	1340	—
C_{oss}	Output capacitance		pF	—	130	—
C_{rss}	Reverse transfer capacitance		pF	—	40	—
Q_g	Total gate charge	V_{GE} = -15.....+15V	nC	—	45	—
I_{CES}	Collector-Emitter leakage current	V_{CE}=1200V, V_{GE} = 0V,T_{VJ}=25°C	mA	-	-	1
I_{GES}	Gate-Emitter leakage current	V_{CE}=0V, V_{GE} =20V,T_{VJ}=25°C	nA	-	-	200
$T_{d(on)}$	Turn-On DelayTime	T_J=25°,Vcc=600V, Ic=15A,Rg=10ohm, V_{GE} =15V L=200uH Ls=150nH	ns	-	46	-
Tr	Rise Time		ns	-	35	-
$T_{d(off)}$	Turn-Off DelayTime		ns	-	105	-
T_f	Turn-Off Fall Time		ns	-	44	-
E_{on}	Turn-on switch loss	T_J=25°,Vcc=600V, Ic=15A,Rg=10ohm, V_{GE} =15V,L=200uH Ls=150nH	uJ	-	501	-
E_{off}	Turn-off switch loss		uJ	-	460	-

Part5: Diode-Break

Absolute Max Ratings				
Symbol	**Parameter**	**condition**	**Units**	**Maximum**
V_{RRM}	Repetitive peak reverse voltage	T_{VJ}=25 ℃	V	1200
I_F	Continuous DC forward current	T_{VJ}=25 ℃	A	10
I_{FRM}	Repetitive peak forward current	T_p=1ms	A	20
I^2t	I^2t Data	V_R=0V,T_p=10ms,T_{VJ}=125 ℃	A^2s	120

Diode characteristics						
Symbol	**Parameter**	**Test conditions**	**Units**	**Min.**	**Typ.**	**Max.**
V_F	Forward voltage	I_F=15A,T_{VJ}=25 ℃	V	-	2.0	2.4
I_{RM}	Peak reverse recovery current	I_F=15A,diF/dt=20A/us (T_{VJ}=25 ℃),V_R=1200V, V_{GE}=-15V,T_{VJ}=25 ℃	A	-	30	-
Q_r	Recovery charge		uC	-	21	-
T_{rr}	Diode Reverse Recovery Time		nS		120	
E_{rec}	Reverse recovery energy		uJ	-	305	-

Typical electrical and thermal characteristics：

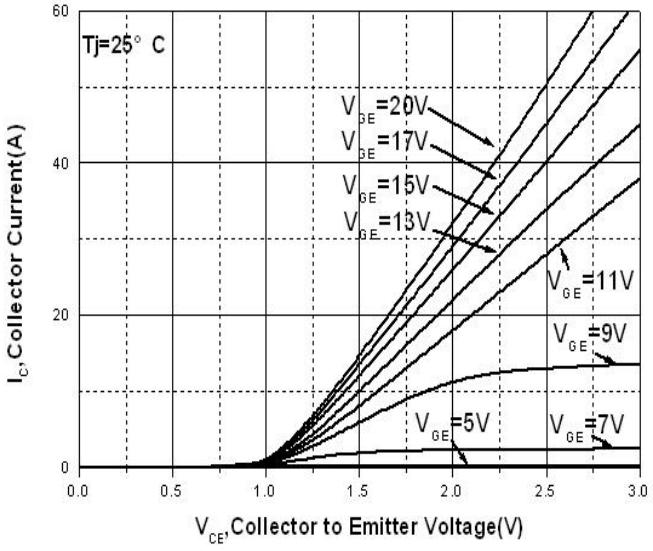


Figure 1: Inverter IGBT Output Characteristics (T_J=25°C)

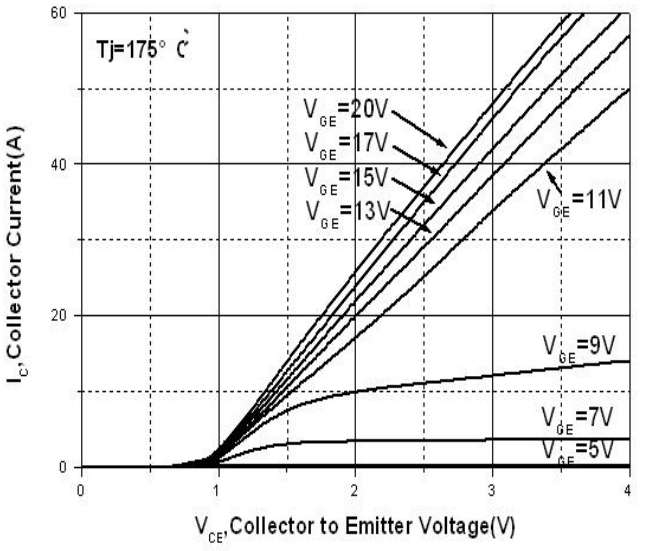


Figure 2: Inverter IGBT I Output Characteristics (T_J=175°C)

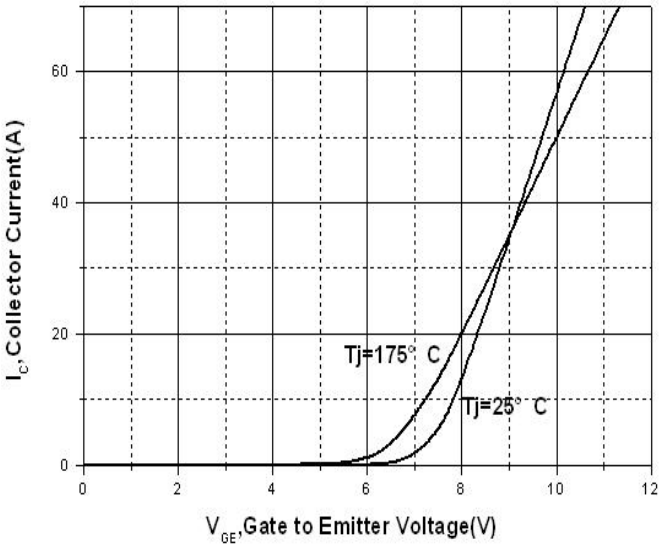


Figure 3: Inverter IGBT Transfer Characteristics

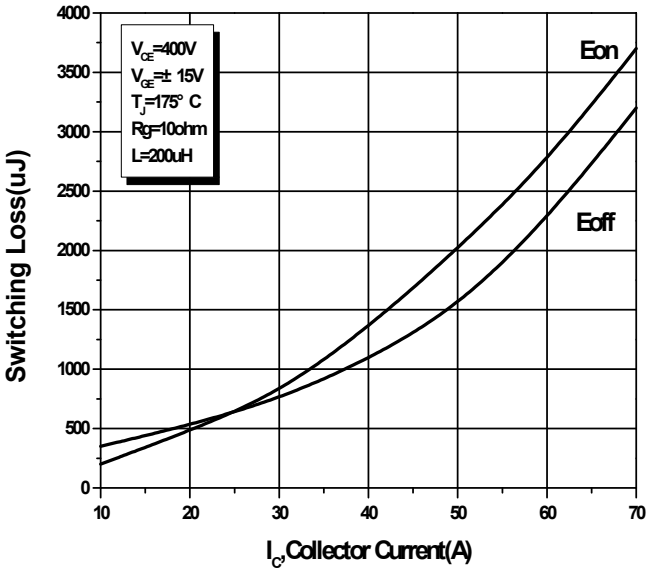


Figure 4: Inverter IGBT Switching loss

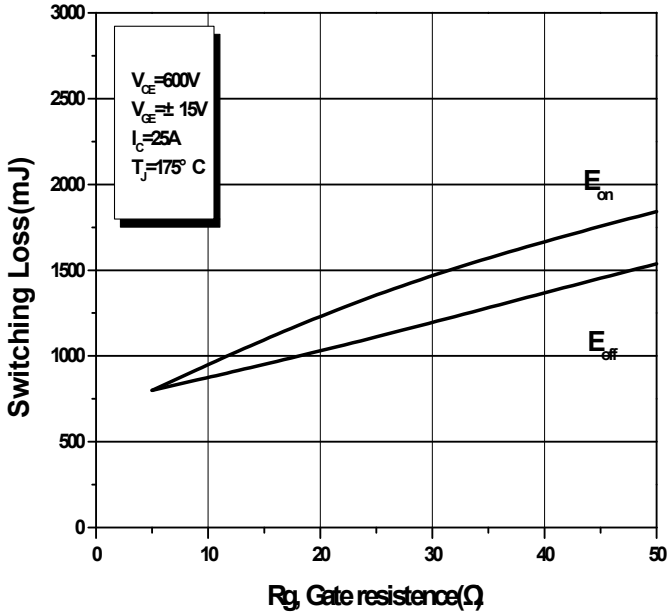


Figure 5: Inverter IGBT Switching loss vs Rg

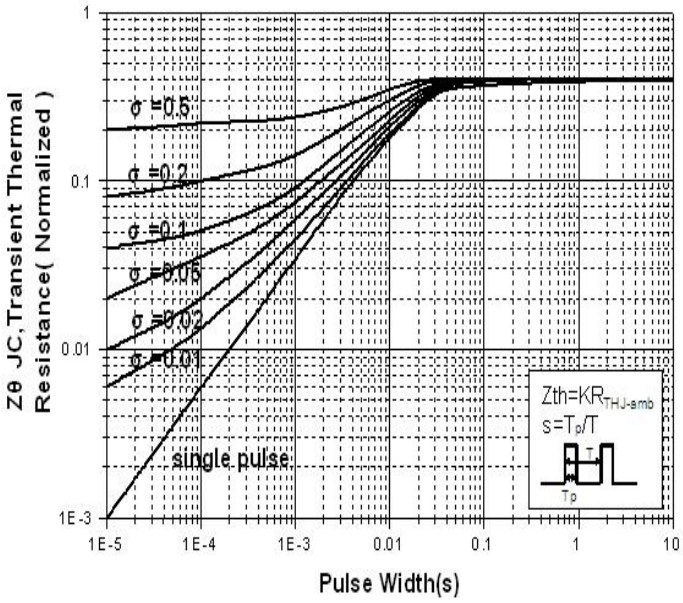


Figure 6: Transient thermal impedance of Inverter IGBT

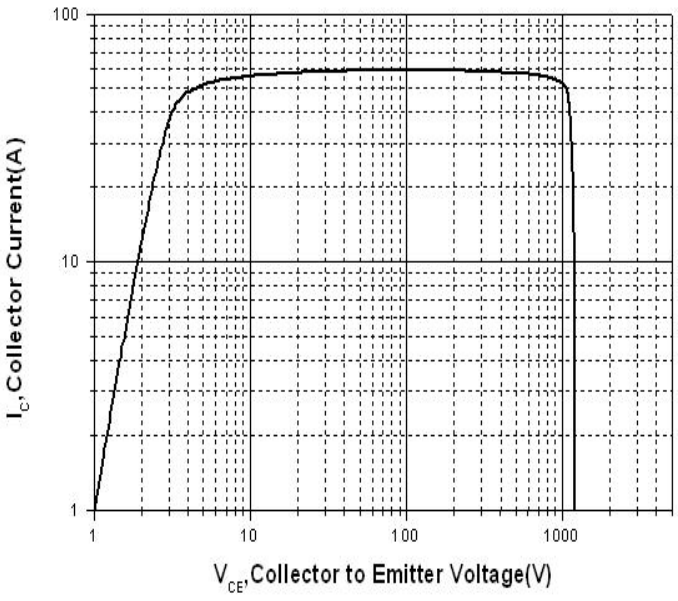


Figure 7: Inverter IGBT RBSOA

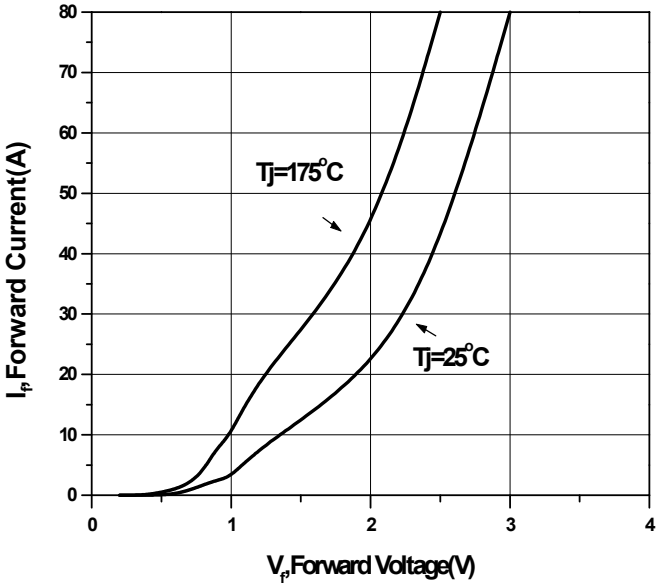


Figure 8: Diode forward characteristic of Inverter

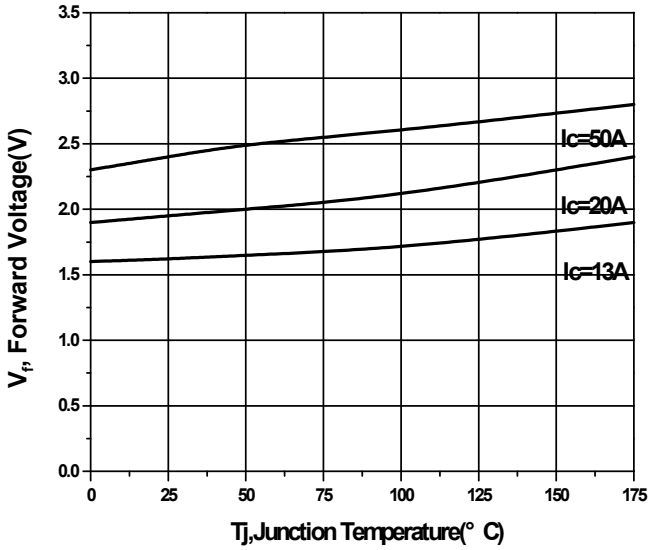


Figure 9: Diode Switching loss of Inverter vs Tj

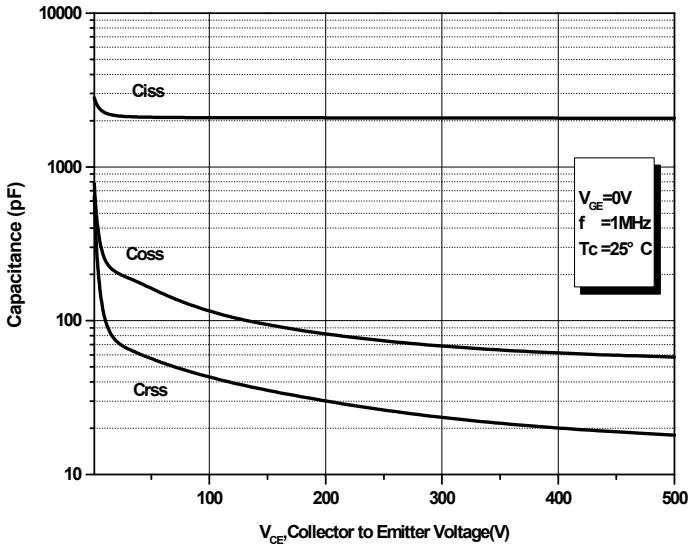
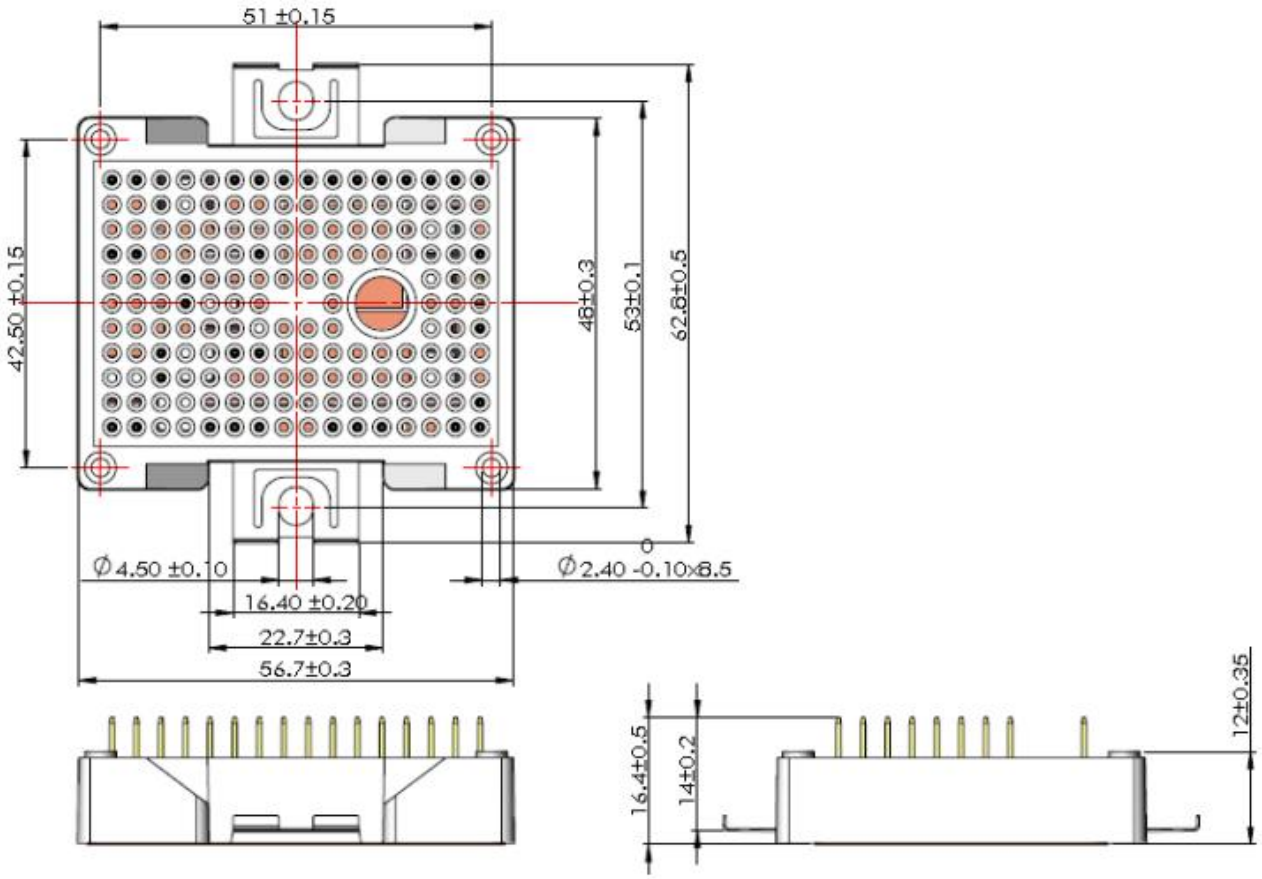
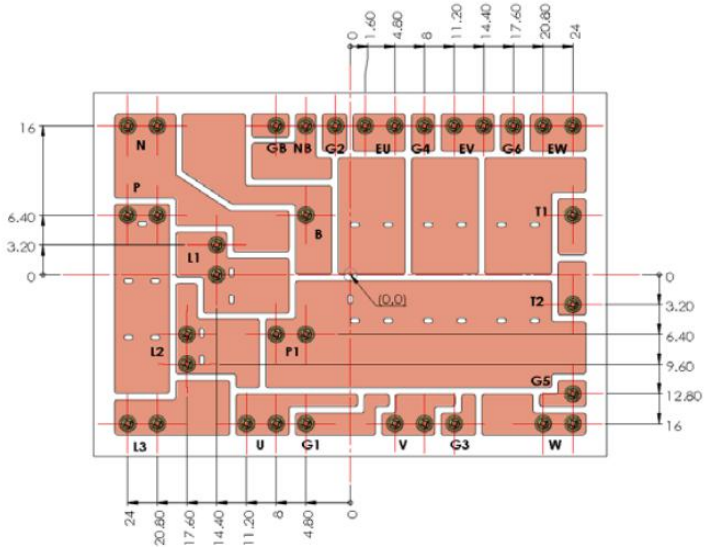
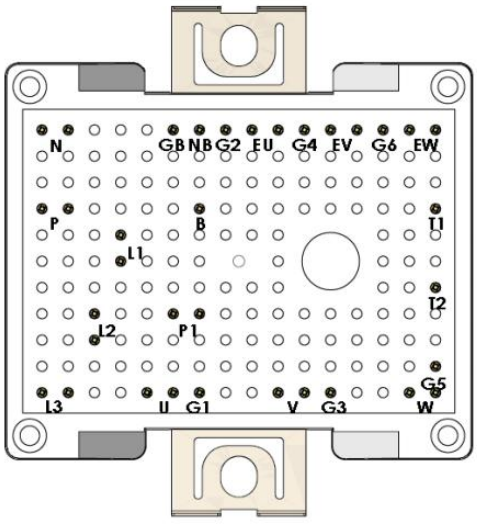


Figure 10: IGBT Capacitance vs. Vce

- **Package Dimensions and Terminal placement**







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