



TT075U065FBC

主要参数 MAIN CHARACTERISTICS

Ic	75A
Vces	650V
Vcesat-typ	1.6V

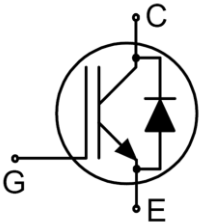
用途

- 充电桩
- UPS 电源
- 光伏
- 储能

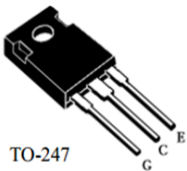
APPLICATIONS

- Charging pile
- UPS
- Solar converters
- Energy Storage

封装 Package



Built in SiC SBD



产品特性

- 低栅极电荷
- Trench FS 技术,
- RoHS 产品
- 快开关速度
- 低开关损耗
- VCE(sat)正温度系数
- 内置 SIC 肖特基二极管

FEATURES

- Low gate charge
- Trench FS Technology,
- RoHS product
- Fast switching speed
- Low switching losses
- VCE(sat) with positive temperature coefficient
- Built in SiC SBD

订货信息 ORDER MESSAGE

订 货 型 号 Order codes				印 记 Marking	封 装 Package
有卤-条管 Halogen-Tube	无卤-条管 Halogen-Free-Tube	有卤-编带 Halogen-Reel	无卤-编带 Halogen-Free-Reel		
TT075U065FBC-GE-B	TT075U065FBC-GE-BR	N/A	N/A	TT075U065FBC	TO-247



绝对最大额定值 ABSOLUTE RATINGS ($T_C=25^{\circ}\text{C}$)

项 目 Parameter	符 号 Symbol	数 值 Value	单 位 Unit
最高集电极—发射极直流电压 Collector-Emmitter Voltage	V_{CES}	650	V
*连续集电极电流 Collector Current-continuous	I_C	150($T_C=25^{\circ}\text{C}$)	A
		75($T_C=100^{\circ}\text{C}$)	A
最大脉冲集电极极电流 (注 1) Collector Current – pulse (note 1)	I_{CM}	300	A
二极管正向测试电流 Diode RMS forward current	I_F	65 ($T_C=25^{\circ}\text{C}$)	A
		48 ($T_C=100^{\circ}\text{C}$)	A
二极管正向不重复峰值电流 (浪涌电流) Surge non repetitive forward current $t_p=10\text{ ms}$ sinusoidal	I_{FSM}	170	A
最高栅极发射极电压 Gate-Emmitter Voltage	V_{GES}	± 20	V
瞬态栅极发射极电压 Transient Gate-emitter voltage($t_p \leq 10\mu\text{s}$, $D < 0.010$)	V_{GES}	± 30	V
安全工作区 Turn-off safe area $V_{CE} \leq 650\text{V}$, $T_{vj} \leq 175^{\circ}\text{C}$, $t_p=1\mu\text{s}$	-	300	A
耗散功率 Power Dissipation	P_D $T_C=25^{\circ}\text{C}$	625	W
工作结温 Operating Junction Temperature Range	T_{VJ}	$-40 \sim +175$	$^{\circ}\text{C}$
存储温度 Storage Temperature	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T_L	260	$^{\circ}\text{C}$

*连续集电极电流由最高结温限制

*Collector current limited by maximum junction temperature

注释:

1: 脉冲宽度由最高结温限制

Notes:

1: Pulse width limited by maximum junction temperature





电特性 ELECTRICAL CHARACTERISTICS

项 目 Parameter	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单位 Units
关态特性 Off –Characteristics						
集电极—发射极击穿电压 Collector-Emmitter Voltage	BV_{CES}	$I_C=250\mu A, V_{GE}=0V$	650	-	-	V
零栅压下集电极漏电流 Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=650V, V_{GE}=0V, T_{vj}=25^{\circ}C$	-	-	500	μA
正向栅极体漏电流 Gate-body leakage current, forward	I_{GESF}	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25^{\circ}C$	-	-	200	nA
反向栅极体漏电流 Gate-body leakage current, reverse	I_{GESR}	$V_{CE}=0V, V_{GE}=-20V, T_{vj}=25^{\circ}C$	-	-	-200	nA
通态特性 On-Characteristics						
阈值电压 Gate Threshold Voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}, I_C=1mA$	3.5	4.5	5.5	V
饱和压降 Collector-Emmitter saturation Voltage	V_{CESAT}	$V_{GE}=15V, I_C=75A$ $T_{vj}=25^{\circ}C$ $T_{vj}=175^{\circ}C$	- -	1.6 2.0	2.1 -	V
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C_{ies}	$V_{CE}=25V$ $V_{GE}=0V$ $f=1.0MHz$	-	2643	-	pF
输出电容 Output capacitance	C_{oes}		-	325	-	pF
反向传输电容 Reverse transfer capacitance	C_{res}		-	58	-	pF
栅极电荷总量 Total Gate Charge	Q_g	$V_{CC}=520V, I_C=75A, V_{GE}=15V$	-	141	-	nC
栅极-反射极 Gate to emitter charge	Q_{ge}		-	28	-	
栅极-集电极 Gate to collector charge	Q_{gc}		-	81	-	



电特性 ELECTRICAL CHARACTERISTICS

开关特性 Switching Characteristics						
项 目 Parameter	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单位 Units
开启延迟时间 Turn-On delay time	t _{d(on)}	V _{CC} =400V,I _c =75A,R _G =5Ω V _{GE} =15 V Tv _j =25℃	-	26	-	ns
上升时间 Turn-On rise time	t _r		-	120	-	ns
关断延迟时间 Turn-Off delay time	t _{d(off)}		-	94	-	ns
下降时间 Turn-Off Fall time	t _f		-	78	-	ns
开通损耗 Turn-On energy	E _{on}		-	1.3	-	mJ
关断损耗 Turn-off energy	E _{off}		-	1.6	-	mJ
总开关损耗 Total switching energy	E _{tot}		-	2.9	-	mJ
开启延迟时间 Turn-On delay time	t _{d(on)}	V _{CC} =400V,I _c =75A,R _G =5Ω V _{GE} =15 V Tv _j =175℃	-	28	-	ns
上升时间 Turn-On rise time	t _r		-	132	-	ns
关断延迟时间 Turn-Off delay time	t _{d(off)}		-	118	-	ns
下降时间 Turn-Off Fall time	t _f		-	126	-	ns
开通损耗 Turn-On energy	E _{on}		-	1.6	-	mJ
关断损耗 Turn-off energy	E _{off}		-	2.5	-	mJ
总开关损耗 Total switching energy	E _{tot}		-	4.1	-	mJ
开启延迟时间 Turn-On delay time	t _{d(on)}	V _{CC} =400V,I _c =37.5A,R _G =5Ω V _{GE} =15 V Tv _j =25℃	-	20	-	ns
上升时间 Turn-On rise time	t _r		-	52	-	ns
关断延迟时间 Turn-Off delay time	t _{d(off)}		-	110	-	ns
下降时间 Turn-Off Fall time	t _f		-	70	-	ns
开通损耗 Turn-On energy	E _{on}		-	0.40	-	mJ
关断损耗 Turn-off energy	E _{off}		-	0.84	-	mJ
总开关损耗 Total switching energy	E _{tot}		-	1.24	-	mJ
开启延迟时间 Turn-On delay time	t _{d(on)}	V _{CC} =400V,I _c =37.5A,R _G =5Ω V _{GE} =15 V Tv _j =175℃	-	22	-	ns
上升时间 Turn-On rise time	t _r		-	50	-	ns
关断延迟时间 Turn-Off delay time	t _{d(off)}		-	142	-	ns
下降时间 Turn-Off Fall time	t _f		-	112	-	ns
开通损耗 Turn-On energy	E _{on}		-	0.45	-	mJ
关断损耗 Turn-off energy	E _{off}		-	1.15	-	mJ
总开关损耗 Total switching energy	E _{tot}		-	1.60	-	mJ
反并联二极管特性及最大额定值 Anti-Parallel Diode Characteristics and Maximum Ratings						
正向压降 Drain-Source Diode Forward Voltage	V _F	I _F =25A, Tv _j =25℃ Tv _j =175℃	- -	1.45 1.8	1.7 -	V
反向恢复电荷 Diode Reverse recovery charge	Q _{rr}	V _R =400V, I _F =25A dI _F /dt=200A/μs Tv _j =25℃	-	42	-	nC





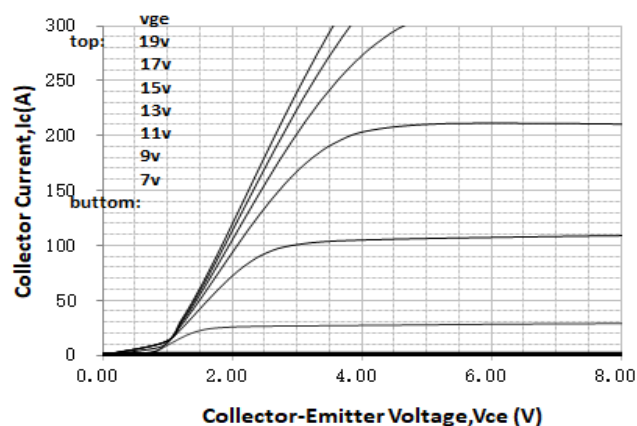
反向恢复时间 Diode Reverse recovery time	trr	V _R =400V, I _F =40A dI _F /dt=100A/μs T _{vj} =25℃ T _{vj} =175℃	- -	45 45	- -	ns
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项 目 Parameter	符 号 Symbol	MAX	单 位 Unit
结到管壳的热阻 Junction to Case IGBT	R _{th(j-c)}	0.24	℃/W
结到管壳的热阻 Junction to Case Diode	R _{th(j-c)}	0.74	℃/W
结到环境的热阻 Junction to Ambient	R _{th(j-A)}	40	℃/W

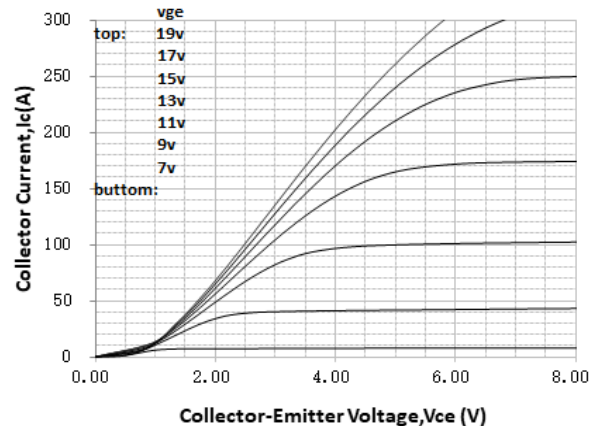


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

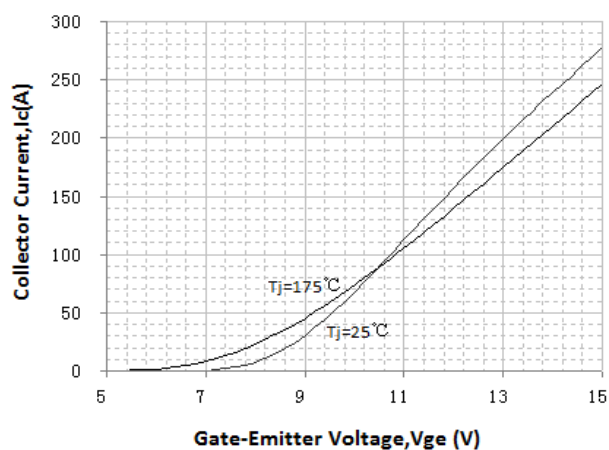
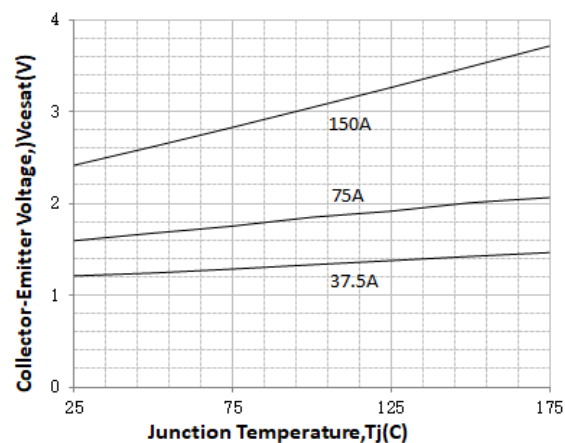
Output Characteristics (25°C)



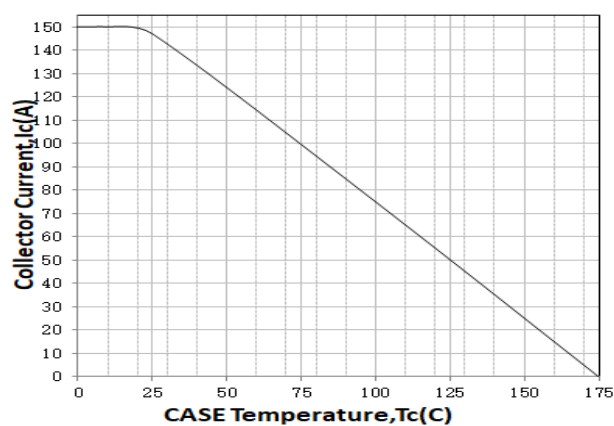
Output Characteristics (175°C)



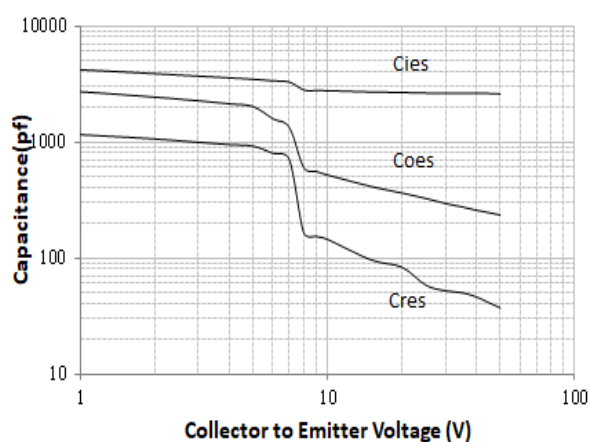
Transfer Characteristics

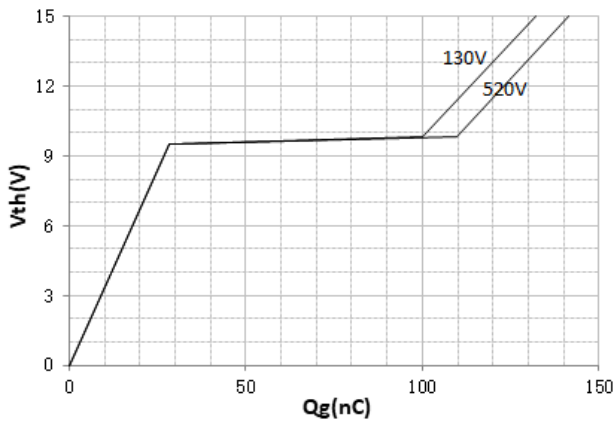
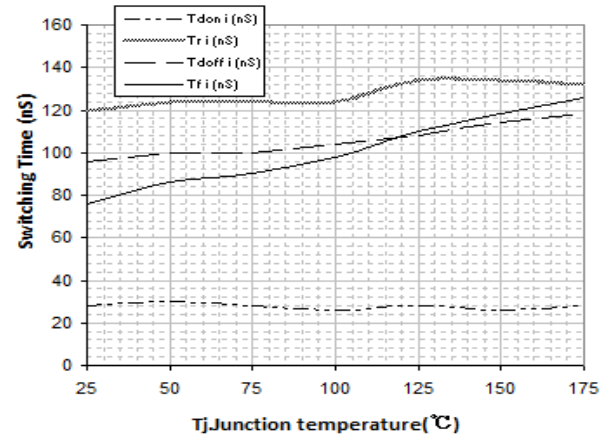
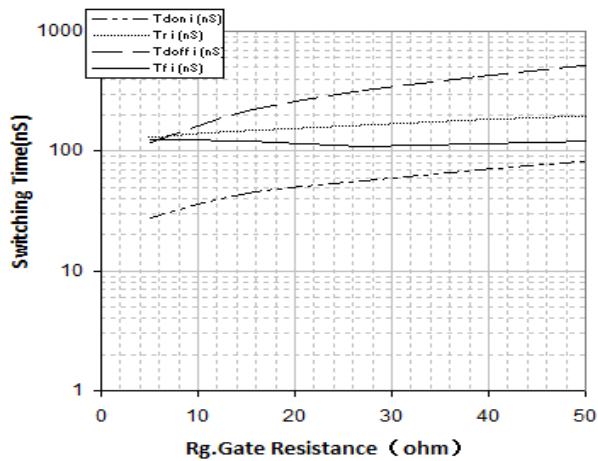
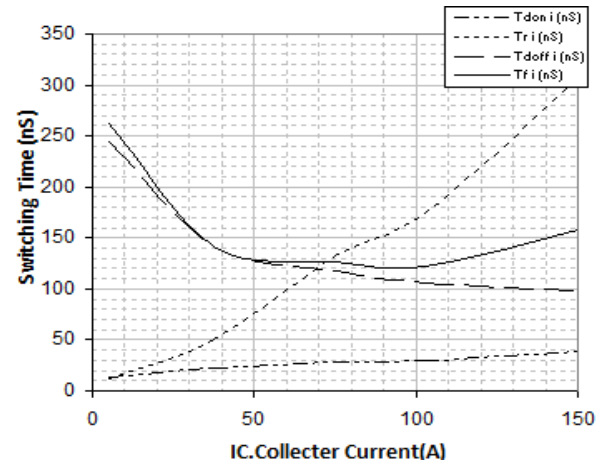
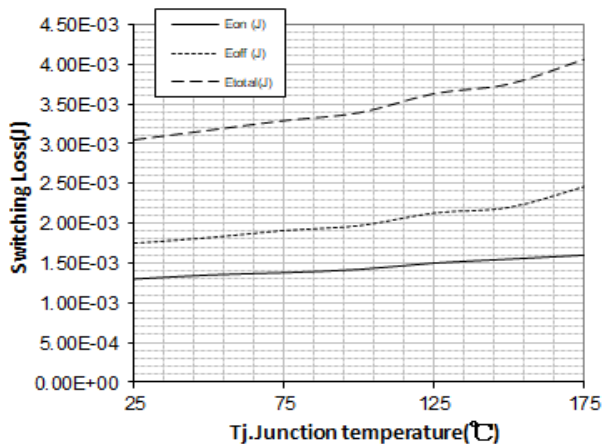
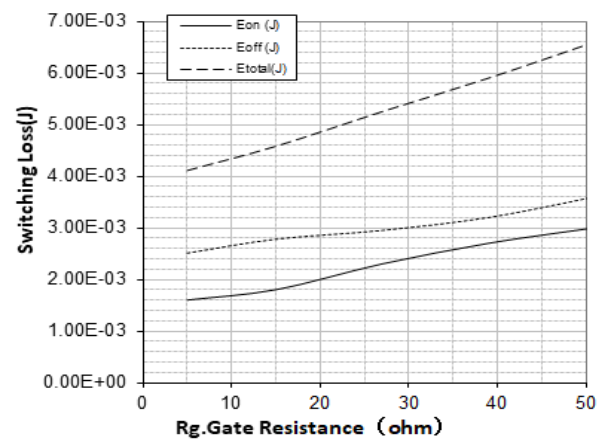
VCESAT vs. T_j 

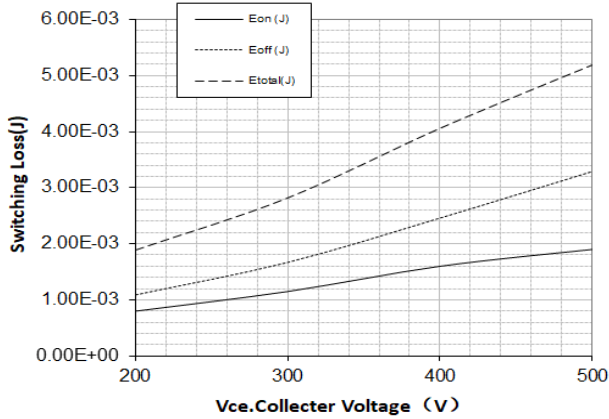
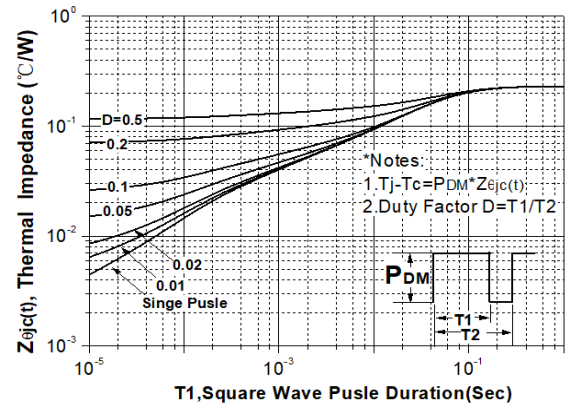
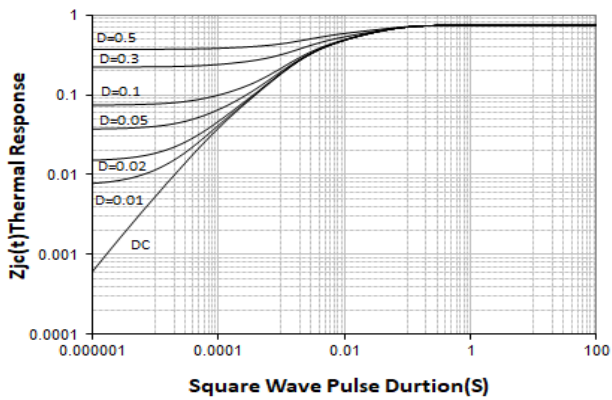
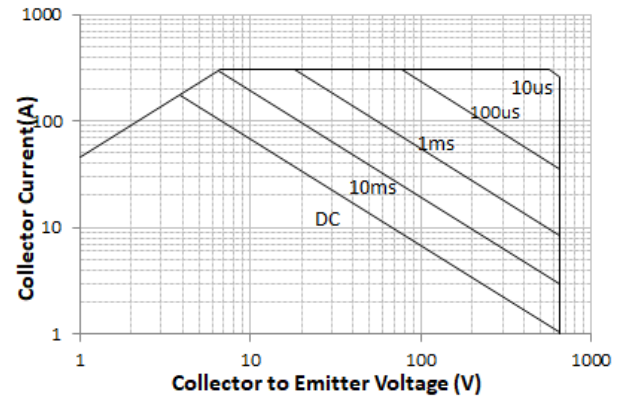
Collector current vs. case temperature

 $V_{ge} \geq 15\text{V}$, $T_j \leq 175^\circ\text{C}$ 

Capacitance Characteristic

 $V_{ge} = 0\text{V}$, $f = 1.0\text{MHz}$ 

**Gate Charge Characteristics** $V_{ge}=15V$, $I_c=75A$ **Switching Time vs. T_j** $V_{ge}=15V$, $V_{ce}=400V$, $I_c=75A$, $R_g=5\Omega$ **Switching Time vs. $R_g(175^\circ C)$** $V_{ge}=15V$, $V_{ce}=400V$, $I_c=75A$ **Switching Time vs. $I_c(175^\circ C)$** $V_{ce}=400V$, $V_{ge}=15V$, $R_g=5\Omega$ **Switching Loss vs. T_j** $V_{ge}=15V$, $V_{ce}=400V$, $I_c=75A$, $R_g=5\Omega$ **Switching Loss vs. $R_g(175^\circ C)$** $V_{ge}=15V$, $V_{ce}=400V$, $I_c=75A$ 

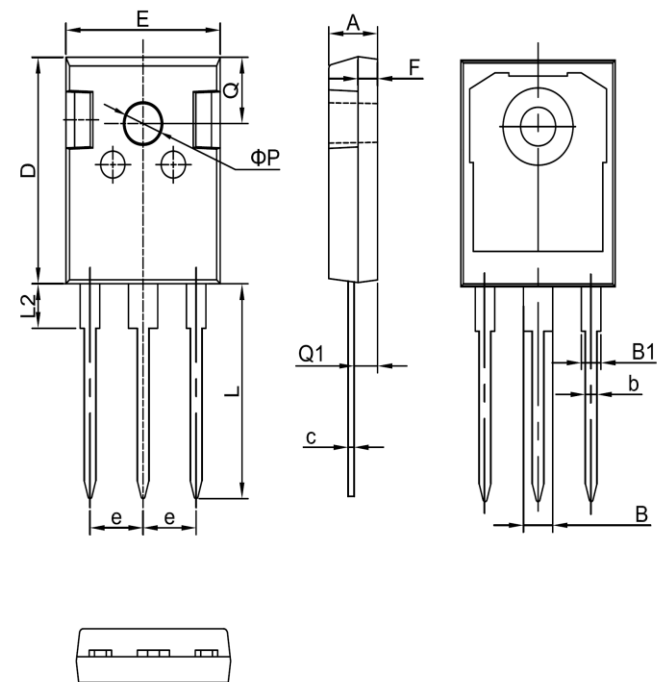
**Switching Loss vs. VCE(175°C)** $V_{ge}=15V$, $I_c=75A$, $R_g=5\Omega$ **Transient Thermal Impedance for IGBT****Transient Thermal Impedance for Diode****Safe Operating Area For TO-247**



外形尺寸 PACKAGE MECHANICAL DATA

TO-247

单位 Unit: mm



符号 symbol	MIN	MAX
A	4.90	5.10
B	2.95	3.35
B1	1.95	2.35
b	1.15	1.35
c	0.50	0.70
D	20.90	21.10
E	15.70	15.90
e	5.34	5.54
F	1.90	2.10
L	19.40	20.40
L2	4.03	4.23
Q	6.00	6.40
Q1	2.30	2.50
P	3.50	3.70



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