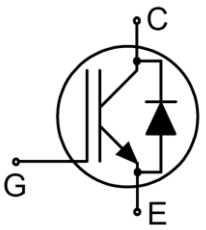
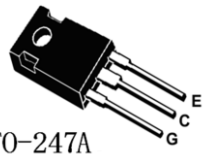
TT050U065FB

主要参数 MAIN CHARACTERISTICS

I_C	50A
V_{CE}	650V
$V_{CEsat-TYP}$	1.9V

封装 **Package**





TO-247A

注：内绝缘产品，背面散热片为铜。

用途 APPLICATIONS

- ●PFC
- ●储能

- ●Power factor corrector (PFC)
- ●Energy storage

产品特性 FEATURES

- ●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
- ●内绝缘产品

- ●Low gate charge
- ●Trench FS Technology
- ●RoHS product
- ●Fast switching speed
- ●Low switching losses
- ●VCE(sat) with positive temperature coefficient
- ●Internal insulation

订货信息 ORDER MESSAGE

订 货 型 号 Order codes 无卤-条管 Halogen-Free-Tube	印 记 Marking	封 装 Package
TT050U065FB-GQ-BR	TT050U065FB	TO-247A

绝对最大额定值 ABSOLUTE RATINGS (Tc=25℃)

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-emitter voltage	V_{CE}	650	V
*连续集电极电流 Collector current-continuous	I_C	100(T_C=25°C)	A
		50(T_C=100°C)	A
最大脉冲集电极极电流（注 1） Collector current – pulse（note 1）	I_{CM}	200	A
*二极管正向测试电流（注 2） Diode RMS forward current	I_F	30 (T_C=25°C)	A
		25(T_C=100°C)	A
二极管正向不重复峰值电流 Surge non repetitive forward current tp= 10 ms sinusoidal	I_{FSM}	100	A
最高栅极发射极电压 Gate-emitter voltage	V_{GE}	±20	V
瞬态栅极发射极电压 Transient gate-emitter voltage (t_p≤10us，D＜0.010)	V_{GE}	±30	V
安全工作区 Turn-off safe area V_{CE} ≤650V，Tvj≤175℃，tp=1us	-	200	A
耗散功率 Power dissipation	P_D T_C=25℃ P_D T_C=100℃	187 93	W
工作结温（注 3） Operating junction temperature range	T_{VJ}	-40～+175	℃
存储温度 Storage temperature	T_{STG}	-55～+150	℃
引线最高焊接温度 Maximum lead temperature for soldering purposes	T_L	260	℃

*连续集电极电流由最高结温限制.

*Collector current limited by maximum junction temperature.

For optimum lifetime and reliability, JSMC recommends operating conditions that do not exceed 80% of the maximum ratings stated in this datasheet

注释：

1：脉冲宽度由最高结温限制.

2：Tc=25°C 电流能力受限于键合线

3：过载工况时，允许在最高结温 Tvjop=175℃下运行，最大占空比＜20%（最多持续 60s）

Notes:

1：Pulse width limited by maximum junction temperature

2：Tc=25°C IF limited by bondwire

3：Under overload condition, it is allowed to operate at the maximum junction temperature Tvjop=175 ℃, and the maximum duty ratio is less than 20% (lasting for 60s at most)

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-emitter voltage	BV_{CES}	I_C=250μA, 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,Tvj=25℃	-	-	50	uA
正向栅极体漏电流 Gate-body leakage current,forward	I_{GESF}	V_{CE}=0V, V_{GE} =20V,Tvj=25℃	-	-	200	nA
反向栅极体漏电流 Gate-body leakage current,reverse	I_{GESR}	V_{CE}=0V, V_{GE} =-20V,Tvj=25℃	-	-	-200	nA
通态特性 On-Characteristics						
阈值电压 Gate threshold voltage	$V_{GE(th)}$	V_{CE} = V_{GE},　I_C=0.5mA	3.5	4.5	5.5	V
饱和压降 Collector-emitter saturation voltage	V_{CESAT}	V_{GE}=15V　I_C=50A Tvj=25℃ Tvj=150℃	 - -	 1.9 2.3	 2.4 -	V
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C_{ies}	V_{CE}=25V V_{GE}=0V f=1.0MHz	-	2770	-	pF
输出电容 Output capacitance	C_{oes}		-	270	-	pF
反向传输电容 Reverse transfer capacitance	C_{res}		-	76	-	pF
栅极电荷总量 Total gate charge	Q_G	V_{CC}=520V,I_c=50A,V_{GE}=15V	-	110	-	nC
栅极-发射极 Gate to emitter charge	Q_{GE}		-	17	-	
栅极-集电极 Gate to collector charge	Q_{GC}		-	62	-	

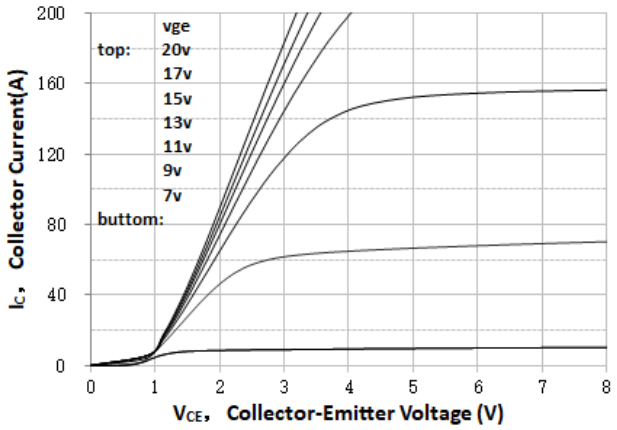
电特性 ELECTRICAL CHARACTERISTICS

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=50A,R_G=5Ω V_{GE}=15 V Tvj=25℃	-	12	-	ns
上升时间 Turn-on rise time	t_r		-	64	-	ns
关断延迟时间 Turn-off delay time	$t_{d(off)}$		-	98	-	ns
下降时间 Turn-off fall time	t_f		-	66	-	ns
开通损耗 Turn-on energy	E_{on}		-	1.07	-	mJ
关断损耗 Turn-off energy	E_{off}		-	1.09	-	mJ
总开关损耗 Total switching energy	E_{tot}		-	2.16	-	mJ
开启延迟时间 Turn-on delay time	$t_{d(on)}$	V_{CC}=400V,I_c=50A,R_G=5Ω V_{GE}=15 V Tvj =150℃	-	16	-	ns
上升时间 Turn-on rise time	t_r		-	66	-	ns
关断延迟时间 Turn-off delay time	$t_{d(off)}$		-	122	-	ns
下降时间 Turn-off fall time	t_f		-	90	-	ns
开通损耗 Turn-on energy	E_{on}		-	1.16	-	mJ
关断损耗 Turn-off energy	E_{off}		-	1.42	-	mJ
总开关损耗 Total switching energy	E_{tot}		-	2.58	-	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 Diode forward voltage	V_F	I_F=25A，Tvj =25℃	-	1.8	2.2	V
反向恢复时间 Diode reverse recovery time	t_{rr}	V_R=400V, I_F=25A dI_F/dt=200A/μs Tvj =25℃	-	57	-	ns
反向恢复电荷 Diode reverse recovery charge	Q_{rr}		-	125	-	nC
反向恢复电流 Diode reverse recovery current	I_{rrm}		-	4.2	-	A
反向恢复时间 Diode reverse recovery time	t_{rr}	V_R=400V, I_F=25A dI_F/dt=200A/μs Tvj =150℃	-	251	-	ns
反向恢复电荷 Diode reverse recovery charge	Q_{rr}		-	979	-	nC
反向恢复电流 Diode reverse recovery current	I_{rrm}		-	7.9	-	A

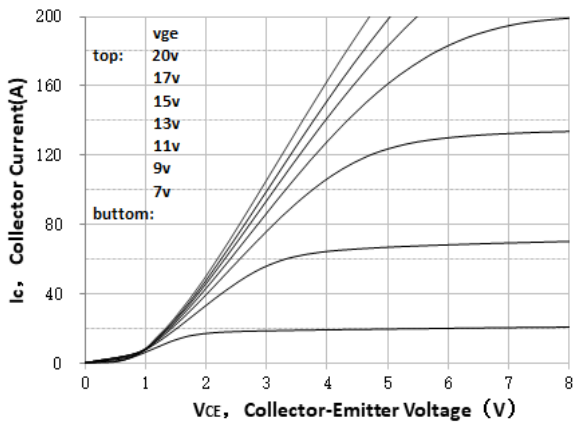
项　　目 Parameter	符　号 Symbol	最大值 Max.	单 位 Unit
结到管壳的热阻 Junction to case IGBT	$R_{th(j-c)}$	0.8	℃/W
结到管壳的热阻 Junction to case Diode	$R_{th(j-c)}$	2.0	℃/W
结到环境的热阻 Junction to ambient	$R_{th(j-a)}$	40	℃/W

特征曲线 ELECTRICAL CHARACTERISTICS (curves)

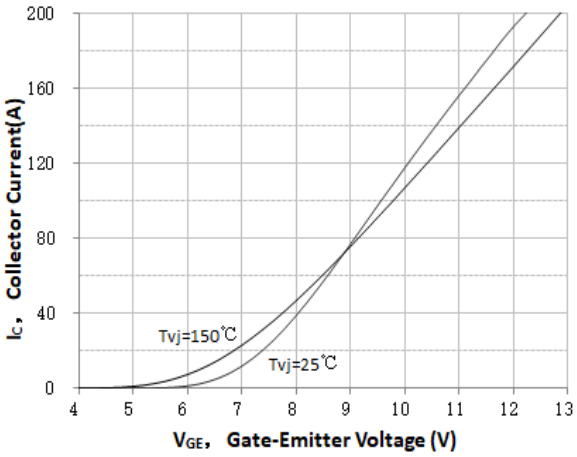
Output Characteristics（25℃）



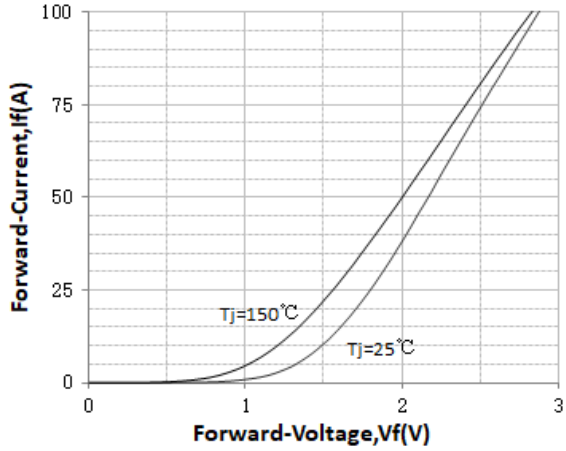
Output Characteristics（150℃）



Transfer Characteristics

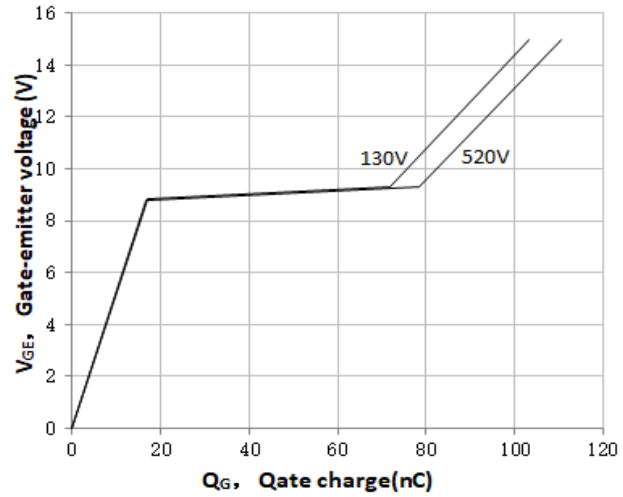


I_F vs. V_F



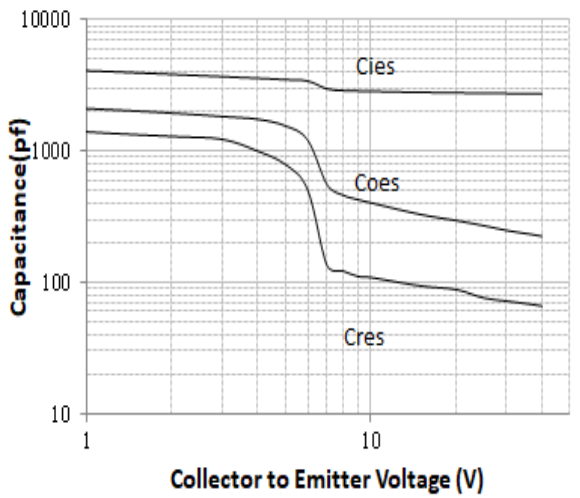
Gate Charge Characteristics

V_{GE}=15V，I_C=50A



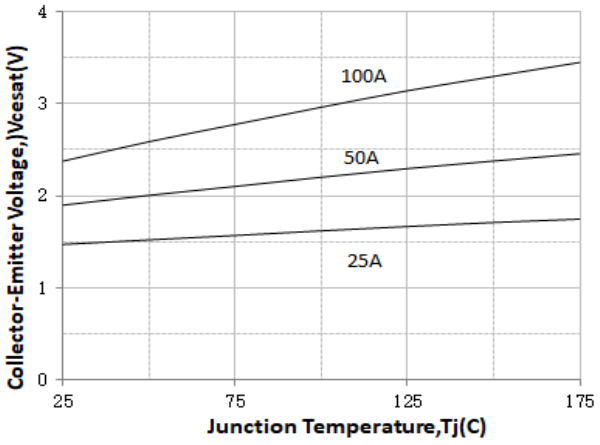
Capacitance Characteristic

V_{GE} =0V，f=1.0MHZ



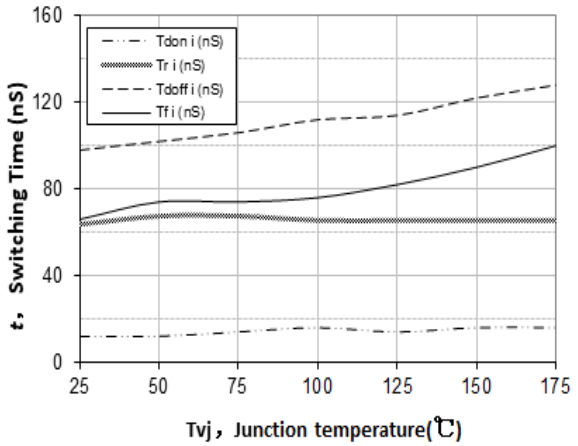
VCEsat vs. Tvj

V_{GE}=15V， I_C=25A、50A、100A



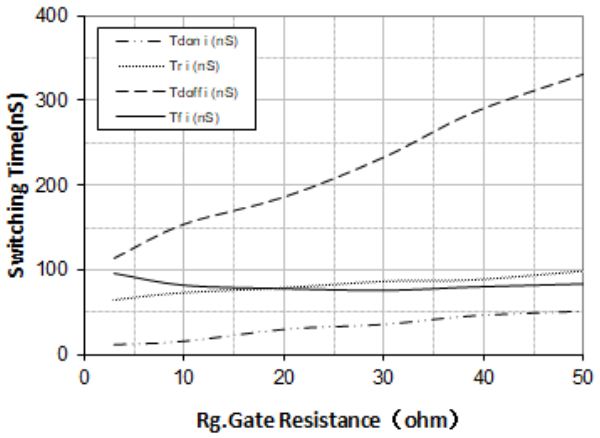
Switching Time vs.Tvj

V_{GE}=15V，V_{CE}=400V，I_C=50A，R_G=5Ω



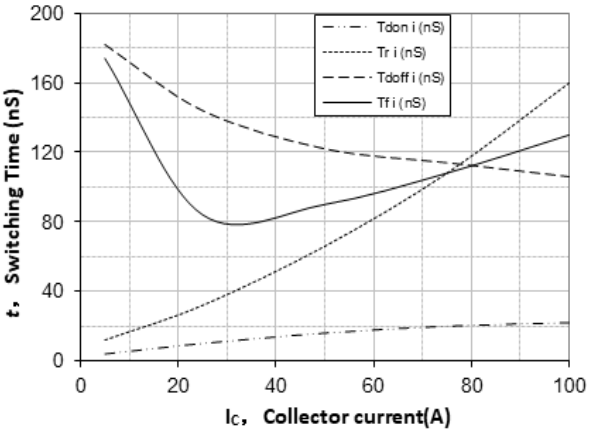
Switching Time vs. R_G(150℃)

V_{GE}=15V，V_{CE}=400V， I_C=50A



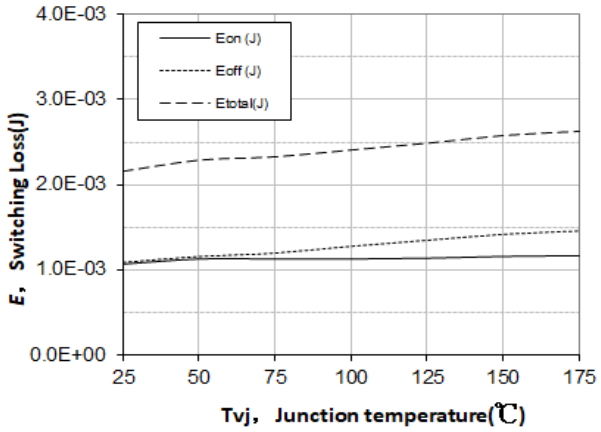
Switching Time vs. I_C(150℃)

V_{CE}=400V，V_{GE}=15V， R_G=5Ω



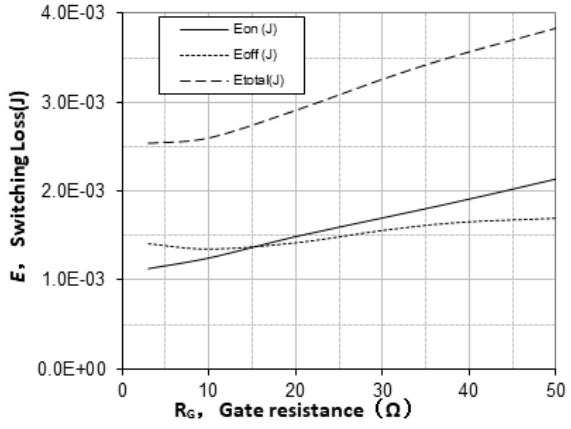
Switching Loss vs. Tvj

V_{GE}=15V，V_{CE}=400V，I_C=50A，R_G=5Ω



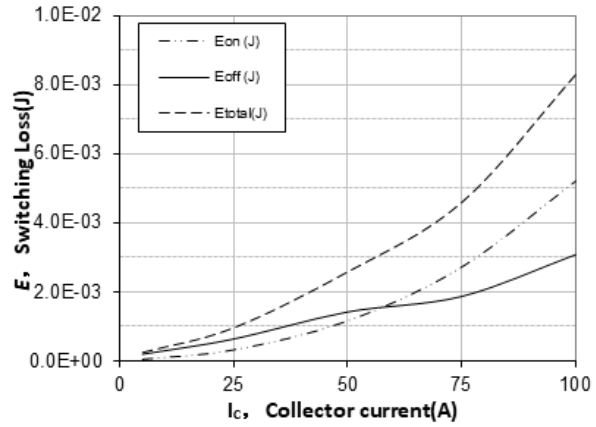
Switching Loss vs. R_G(150℃)

V_{GE}=15V，V_{CE}=400V，I_C=50A

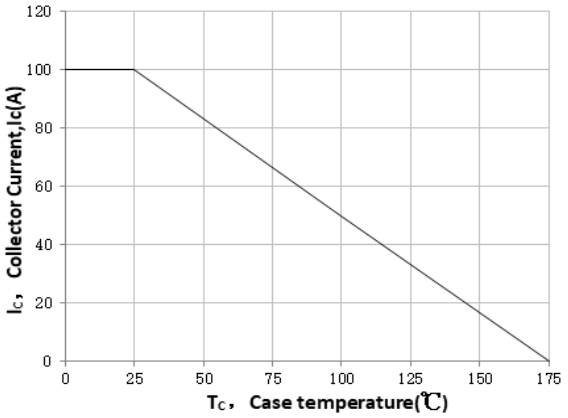


Switching Loss vs. I_C(150℃)

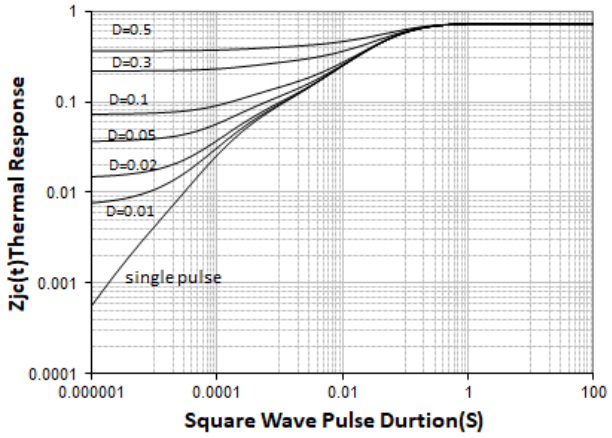
V_{CE}=400V， V_{GE}=15V， R_G=5Ω



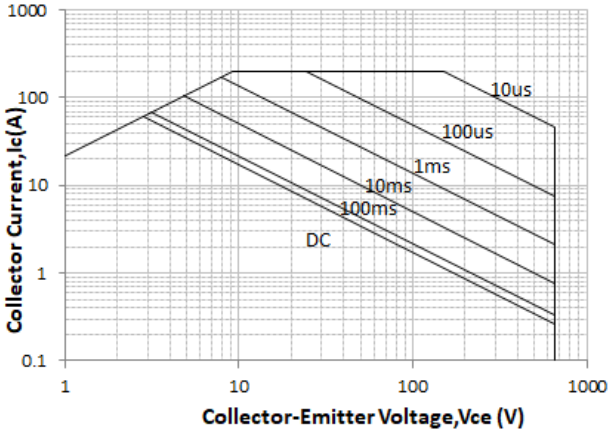
Collector current vs.T_C



Transient Thermal Impedance for IGBT



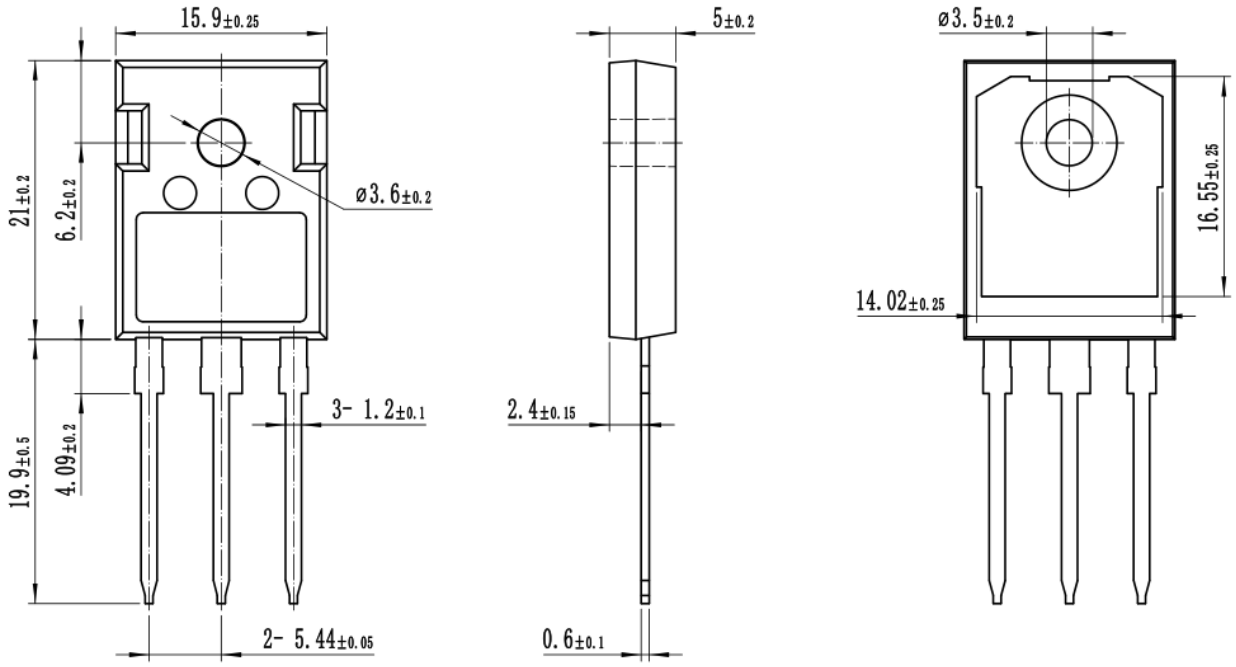
Forward Bias Safe Operating Area



外形尺寸 PACKAGE MECHANICAL DATA

TO-247A

单位 Unit：mm



注意事项

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2. We strongly recommend customers check carefully on the trademark when buying our product, if there is any question, please don’t be hesitate to contact us.
3. Please do not exceed the absolute maximum ratings of the device when circuit designing.
4. This product is an internal insulation product with bare copper cooling fins on the back. The shelf life is 3 months. Prolonged storage may cause discoloration of the cooling fins. Please note.
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