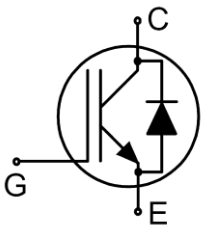
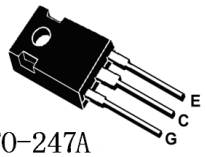
TT030U065GB

主要参数 MAIN CHARACTERISTICS

I_C	30A
V_{CE}	650V
$V_{CEsat-typ}$	1.60V

封装 Package





TO-247A

注：内绝缘产品，背面散热片为铜。

用途 APPLICATIONS

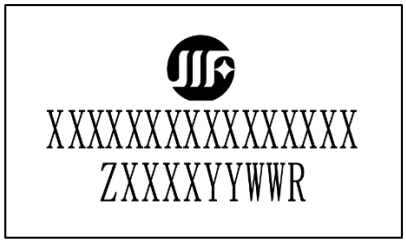
●PFC

●Power factor corrector

产品特性

TT030U065GB 是吉林华微第七代沟槽场截止工艺 IGBT，具有较低的导通损耗和开关损耗，该产品适用于白电 PFC 领域。

印记定义 Mark definition



TO-247A 印章定义：

第一行：商标 Logo

第二行：产品型号说明

T	T	030	U	065	G	B
产品类型(IGBT)	工艺平台(Trench-FS)	电流(A)	频率(高频)	电压(V)	工艺版本(七代)	特殊特性

第三行：ZXXXXYYWWR（其中 Z:封装区别码；XXXX:系统识别码；YY:年份后两位；WW:周代码,以印码日期计,年份同；R：无卤封装，含卤塑封料封装则此字母缺省）

订货信息 ORDER MESSAGE

订 货 型 号 Order codes	印 记 Marking	封 装 Package
无卤-条管 Halogen-Free-Tube		
TT030U065GB-GQ-BR	TT030U065GB	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	60(T_C=25° C)	A
		30(T_C=100° C)	A
最大脉冲集电极极电流（注 1） Collector current - pulse（note 1）	I_{CM}	120	A
*二极管 FRD 正向电流 Diode FRD1 RMS forward current	$I_{F(CE)}$	10 (T_C=25° C)	A
		5 (T_C=100° C)	A
二极管 FRD 正向不重复峰值电流（浪涌电流） Surge non repetitive forward current tp=10ms sinusoidal	$I_{FSM(CE)}$	20	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 VCE≤650V,Tvj≤175℃,t_p=1us	-	120	A
耗散功率 Power dissipation	T_C=25℃ P_D T_C=100℃ P_D	136.4 68.2	W
工作结温（注 2） 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：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：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 60 s 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℃	-	-	30	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=0.3mA	3.5	4.2	5.0	V
饱和压降 Collector-emitter saturation voltage	V_{CESAT}	V_{GE}=15V, I_C=30A Tvj=25℃ Tvj=150℃	- -	1.6 2.1	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	-	1980	-	pF
输出电容 Output capacitance	C_{oes}		-	60	-	pF
反向传输电容 Reverse transfer capacitance	C_{res}		-	9.8	-	pF
栅极电荷总量 Total gate charge	Qg	V_{CC}=520V, I_c=30A, V_{GE}=15V	-	63	-	nC
栅极-发射极 Gate to emitter charge	Qge		-	16.5	-	
栅极-集电极 Gate to collector charge	Qgc		-	20	-	

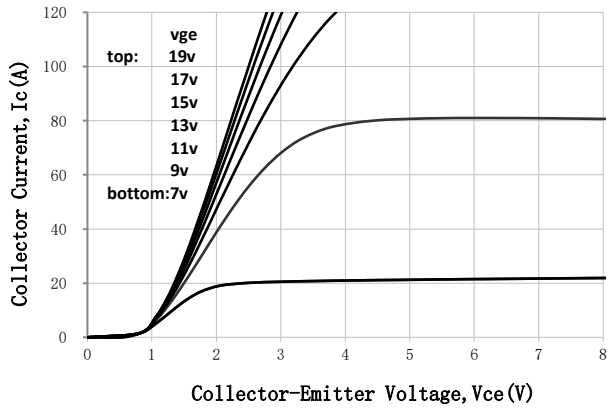
电特性 ELECTRICAL CHARACTERISTICS

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=30A, R_G=10Ω, V_{GE}=15 V Tvj=25℃	-	20	-	ns
上升时间 Turn-on rise time	t_r		-	44	-	ns
关断延迟时间 Turn-off delay time	t_{d}(off)		-	90	-	ns
下降时间 Turn-off fall time	t_f		-	60	-	ns
开通损耗 Turn-on energy	Eon		-	0.45	-	mJ
关断损耗 Turn-off energy	Eoff		-	0.20	-	mJ
总开关损耗 Total switching energy	Etot		-	0.65	-	mJ
开启延迟时间 Turn-on delay time	t_{d}(on)	V_{CC}=400V, I_C=30A, R_G=10Ω, V_{GE}=15 V Tvj =150℃	-	22	-	ns
上升时间 Turn-on rise time	t_r		-	44	-	ns
关断延迟时间 Turn-off delay time	t_{d}(off)		-	114	-	ns
下降时间 Turn-off fall time	t_f		-	80	-	ns
开通损耗 Turn-on energy	Eon		-	0.52	-	mJ
关断损耗 Turn-off energy	Eoff		-	0.35	-	mJ
总开关损耗 Total switching energy	Etot		-	0.87	-	mJ
反并联二极管 FRD1 特性及最大额定值　Anti-Parallel Diode FRD1 Characteristics and Maximum Ratings						
正向压降 Diode forward voltage	V_F	I_F=5A, Tvj =25℃ Tvj =150℃	- -	1.5 1.3	1.8 -	V
反向恢复时间 Reverse recovery time	trr	V_R=400V, I_F=5A dIF/dt=200A/μs Tvj =25℃	-	43	-	ns
反向恢复电荷 Diode reverse recovery charge	Qrr		-	40	-	nC
反向恢复电流 Diode reverse recovery current	Irrm		-	3.0	-	A
反向恢复时间 Diode reverse recovery time	trr	V_R=400V, I_F=5A dIF/dt=200A/μs Tvj =150℃	-	68	-	ns
反向恢复电荷 Diode reverse recovery charge	Qrr		-	98	-	nC
反向恢复电流 Diode reverse recovery current	Irrm		-	5.5	-	A

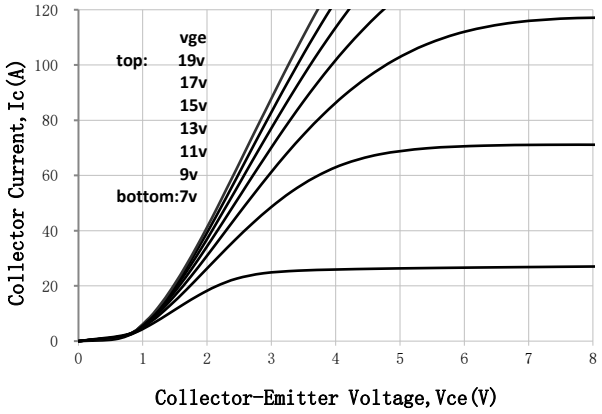
项　　目 Parameter	符　号 Symbol	MAX	单 位 Unit
结到管壳的热阻 Junction to case IGBT	$R_{th(j-c)}$	1.1	℃/W
结到管壳的热阻 Junction to case Diode1	$R_{th(j-c)}$	3.6	℃/W
结到环境的热阻 Junction to ambient	$R_{th(j-a)}$	40	℃/W

特征曲线 ELECTRICAL CHARACTERISTICS (curves)

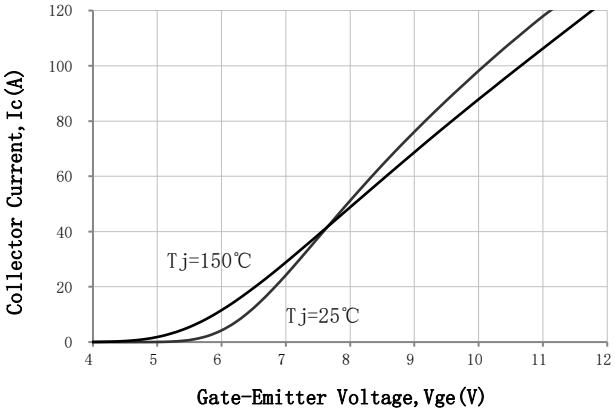
Output Characteristics (25℃)



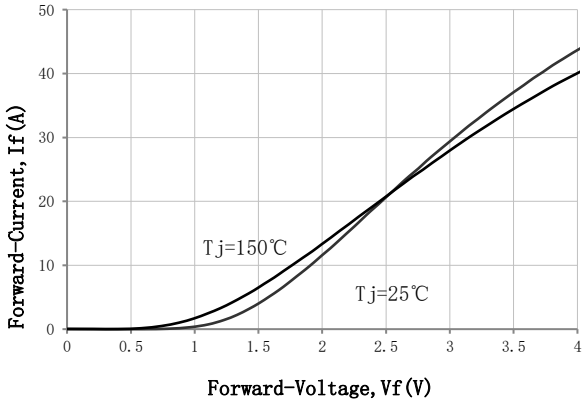
Output Characteristics (150℃)



Transfer Characteristics

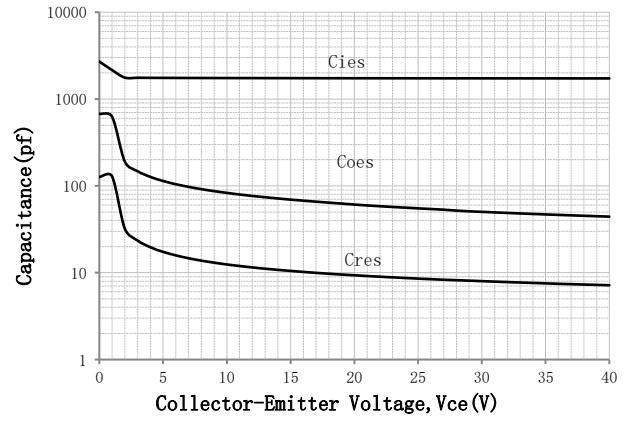


IF vs. VF



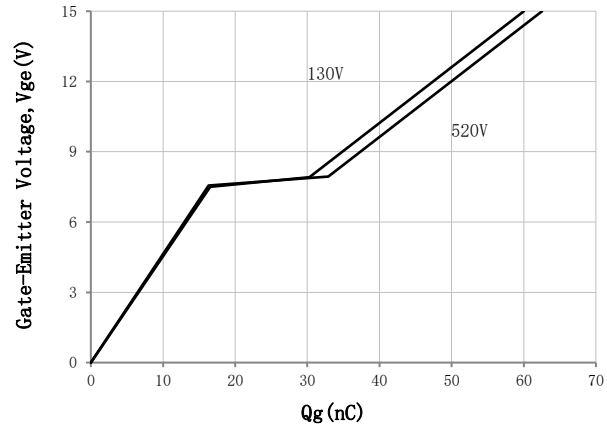
Capacitance Characteristic

VGE =0V, f=1.0MHZ



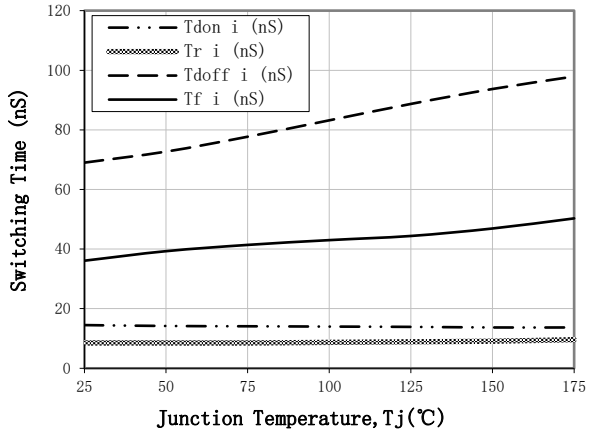
Gate Charge Characteristics

VGE=15V, Ic=30A



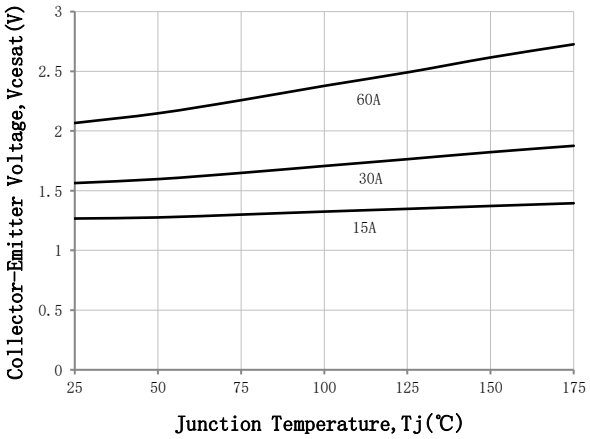
Switching Time vs.Tj

VGE=15V, VCE=400V, Ic=30A, RG=10Ω



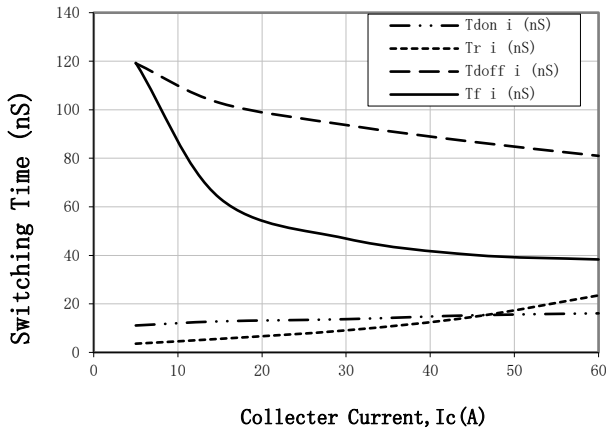
VCEsat vs. Tj

VGE=15V, Ic=15A、30A、60A



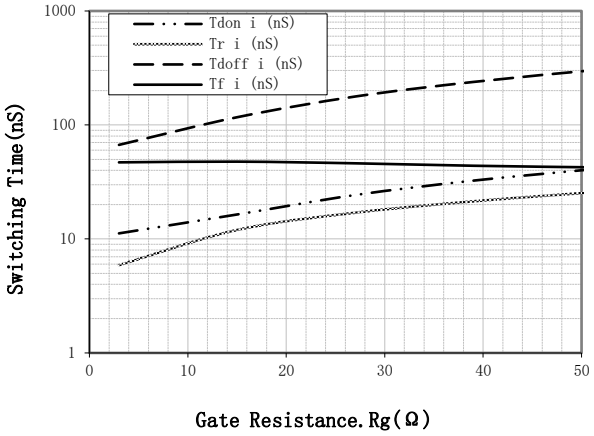
Switching Time vs. Ic(150℃)

VCE=400V, VGE=15V, RG=10Ω



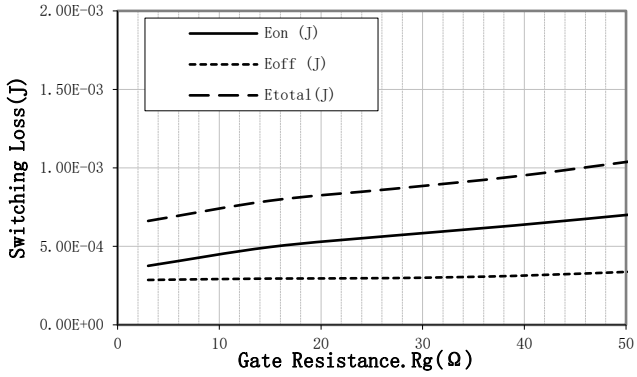
Switching Time vs. Rg(150℃)

VGE=15V, VCE=400V, Ic=30A



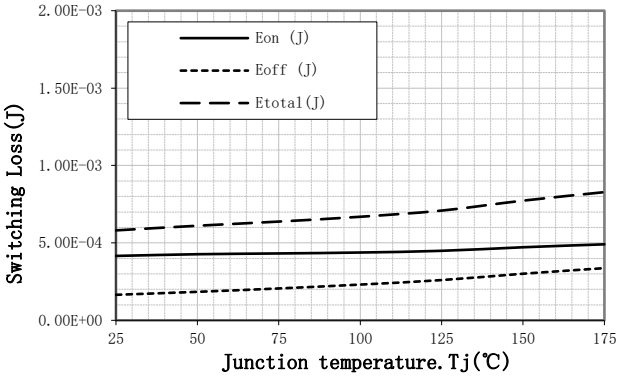
Switching Loss vs. Rg(150℃)

VGE=15V, VCE=400V, Ic=30A

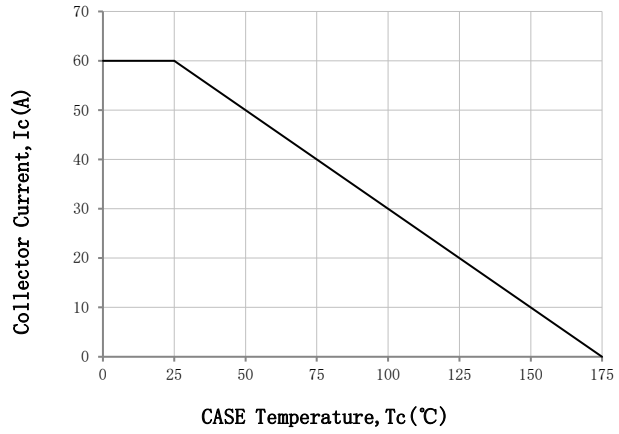


Switching Loss vs. Tj

VGE=15V, VCE=400V, Ic=30A, RG=10Ω

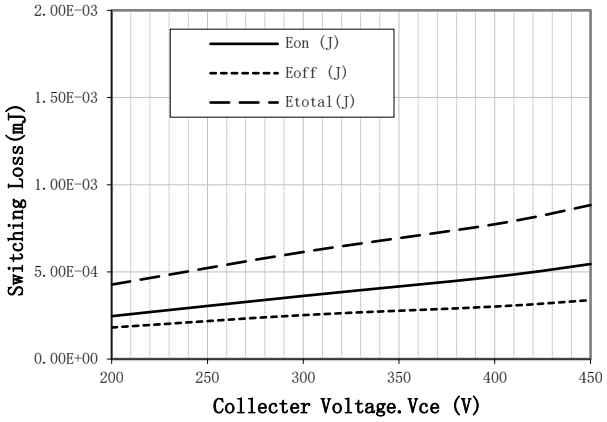


Colletcor Current vs. Case temperature

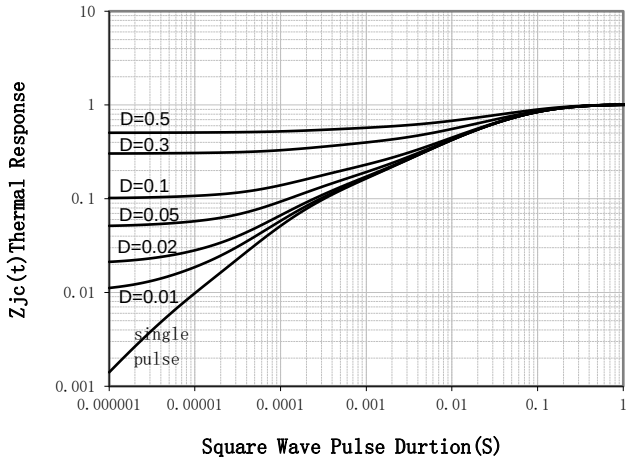


Switching Loss vs. VCE(150℃)

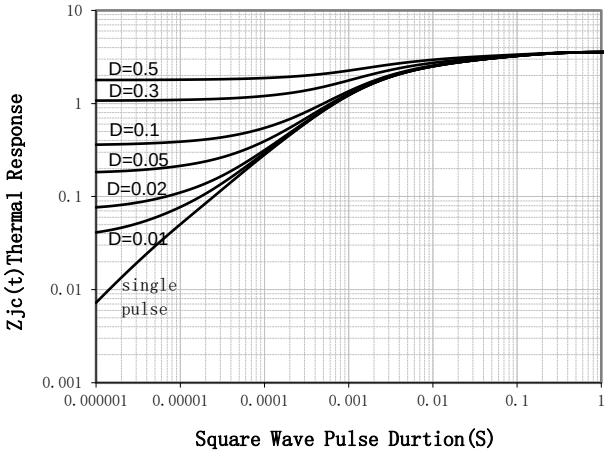
VGE=15V, Ic=30A, RG=10Ω



Transient Thermal Impedance for IGBT

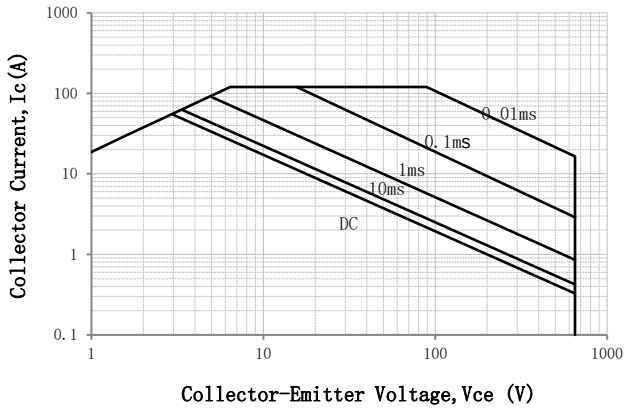


Transient Thermal Impedance for FRD



Safe Operating Area

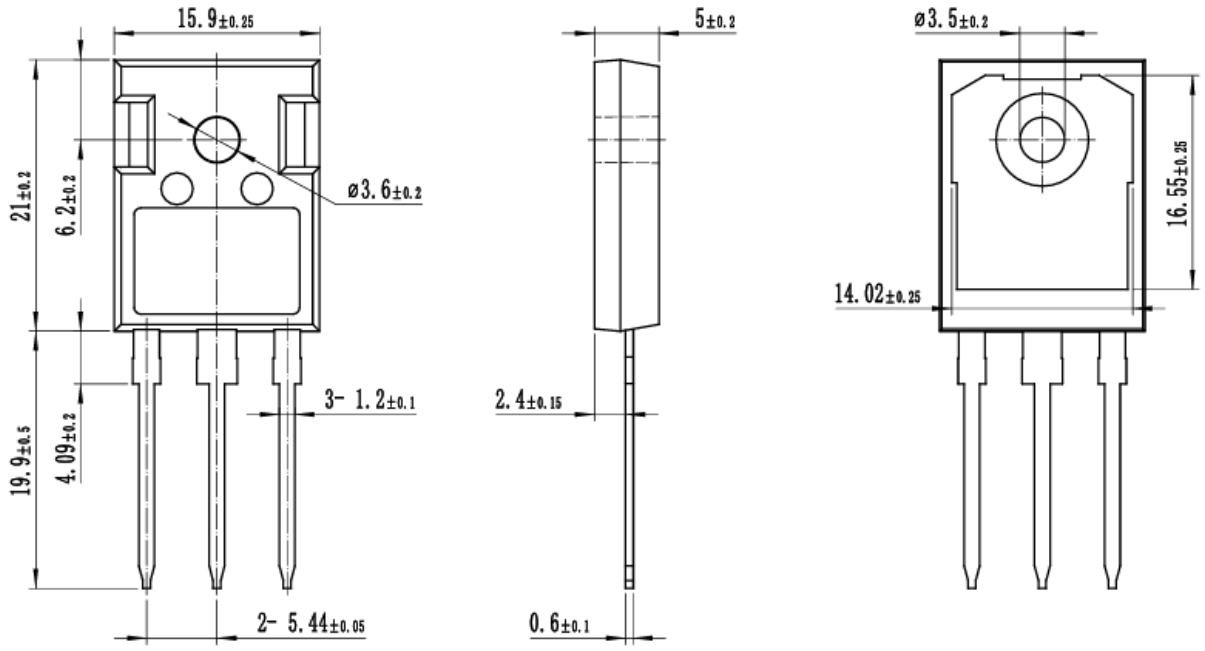
VGE=15V



外形尺寸 PACKAGE MECHANICAL DATA

TO-247A

单位 Unit：mm



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4. 本说明书如有版本变更不另外告知。

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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. Jilin Sino-microelectronics co., Ltd reserves the right to make changes in this. specification sheet and is subject to change without prior notice.

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