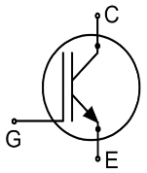
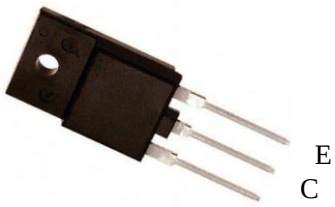
TT030N065EI

主要参数 MAIN CHARACTERISTICS

I_C	30A
V_{CES}	650V
$V_{CE\ (sat)}$ -TYP	1.7V

封装 **Package**





TO-3PH

用途 APPLICATIONS

- 白电领域
- White electricity field

产品特性 FEATURES

- 低栅极电荷
- Trench FS 技术
- RoHS 产品
- 低 VCEsat
- Low gate charge
- Trench FS Technology
- RoHS product
- Low VCEsat

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		
TT030N065EI-GA-BR	TT030N065EI	TO-3PH

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 T_C=25℃ T_C =100℃	I_C	 60 30	A
最大脉冲集电极极电流 Collector current – pulse （pw＜1ms， duty cycle ≤0.01）	I_{CM}	120	A
栅极发射极电压 Gate-emitter voltage 瞬态栅极发射极电压 Transient gate-emitter voltage (pw≤10us， duty cycle ＜0.01)	V_{GE}	 ±20 ±30	V
安全工作区 Turn-off safe area	-	120	A
耗散功率 Power dissipation T_C=25℃ T_C =100℃	P_D	 71 35	W
存储温度 Storage temperature range	T_{STG}	-55～+150	℃
结温 Junction temperature range	T_{VJ}	-40～+175	℃
引线最高焊接温度 Maximum lead temperature for soldering Purposes	T_L	300	℃
绝缘耐压 Isolation voltage	V_{ISO}	1500	V

*连续集电极电流由最高结温限制

*Collector current 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-emitter voltage	BV_{CES}	Ic=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, Tc=25℃	-	-	100	μA
		V_{CE} =650V,　V_{GE} =0V, Tc=175℃	-	1.0	-	mA
正向栅极体漏电流 Gate-body leakage current,forward	I_{GESF}	V_{CE} =0V,　V_{GE} =20V	-	-	200	nA
反向栅极体漏电流 Gate-body leakage current,reverse	I_{GESR}	V_{CE} =0V,　V_{GE} =-20V	-	-	-200	nA
通态特性 On-Characteristics						
阈值电压 Gate threshold voltage	$V_{GE(th)}$	V_{CE} = V_{GE},　Ic=250μA	4.5	-	6.5	V
饱和压降 Collector-emitter saturation voltage	V_{CESAT}	V_{GE} =15V,　Ic=30A,　Tc=25℃	-	1.7	2.1	V
		V_{GE} =15V,　Ic=30A,　Tc=125℃	-	1.8	-	V
		V_{GE} =15V,　Ic=30A,　Tc=175℃	-	2.0	-	V
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	Cies	V_{CE} =25V, V_{GE} =0V, f=1.0MHZ	-	1830	-	pF
输出电容 Output capacitance	Coes		-	160	-	pF
反向传输电容 Reverse transfer capacitance	Cres		-	50.3	-	pF
栅极电荷总量 Total gate charge	Qg	Vcc=520V,Ic=30A,Rg=7.9Ω, V_{GE} =15 V Tc=25℃	-	64.5	-	nC
栅极-反射极 Gate to emitter charge	Qge		-	18.1	-	
栅极-集电极 Gate to collector charge	Qgc		-	23.7	-	
栅极电阻 Gate resistance	Rg	f=1 MHz, open collector	-	1.1	-	Ω
短路电流 Short current	Isc	V_{GE}=15V, V_{CE}=300V, t≤10μs	-	150	-	A

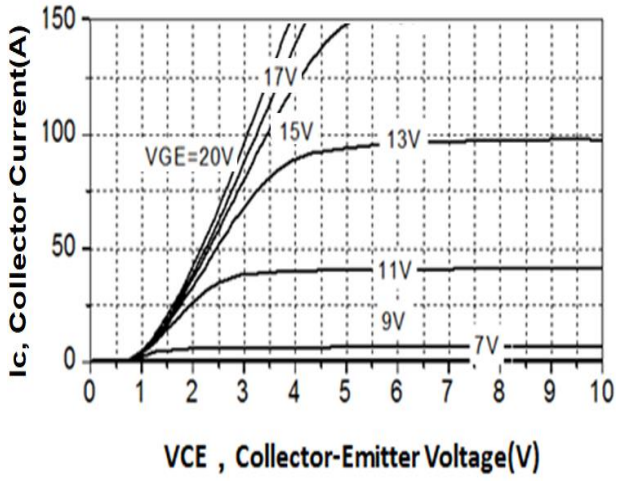
电特性 ELECTRICAL CHARACTERISTICS

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	td(on)	Vcc=400V,Ic=30A,Rg=7.9Ω V_{GE} =15 V Tc=25℃	-	27.0	-	ns
上升时间 Turn-on rise time	tr		-	67.0	-	ns
关断延迟时间 Turn-off delay time	td(off)		-	67.0	-	ns
下降时间 Turn-off fall time	tf		-	44.0	-	ns
开通损耗 Turn-on energy	Eon		-	0.83	-	mJ
关断损耗 Turn-off energy	Eoff		-	0.36	-	mJ
总开关损耗 Total switching energy	Etot		-	1.19	-	mJ
开启延迟时间 Turn-on delay time	td(on)	Vcc=400V,Ic=30A,Rg=7.9Ω V_{GE} =15 V Tc=175℃	-	27.0	-	ns
上升时间 Turn-on rise time	tr		-	68.0	-	ns
关断延迟时间 Turn-off delay time	td(off)		-	90.0	-	ns
下降时间 Turn-off fall time	tf		-	59.0	-	ns
开通损耗 Turn-on energy	Eon			1.09		mJ
关断损耗 Turn-off energy	Eoff			0.58		mJ
总开关损耗 Total switching energy	Etot			1.67		mJ
关断电压变化率 Turn-off dvdt	dv/dt	Vcc=400V,Ic=30A,Rg=10Ω V_{GE} =15 V，Tc=25℃		6140		V/us

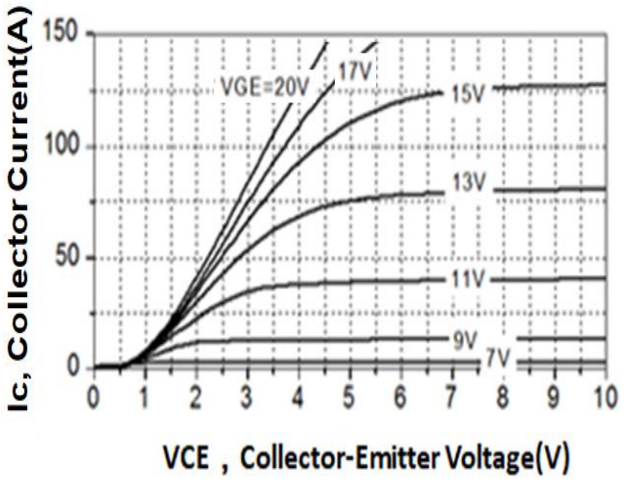
项　　目 Parameter	符　号 Symbol	Typ	Max	单 位 Unit
IGBT 结到管壳的热阻 IGBT thermal resistance, Junction -case	Rth(j-c)	1.86	2.1	℃/W

特征曲线 ELECTRICAL CHARACTERISTICS (curves)

Output Characteristics（25℃）

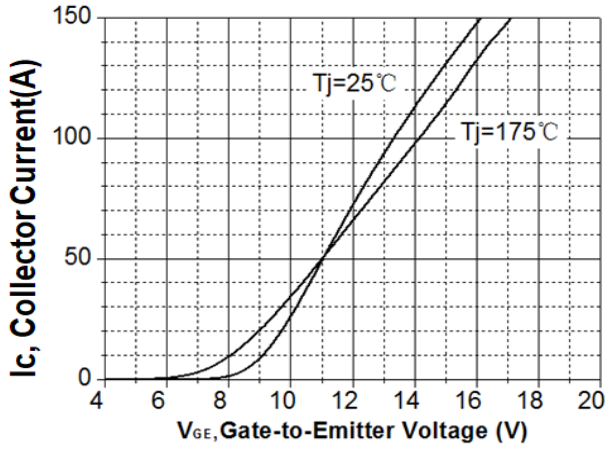


Output Characteristics（175℃）



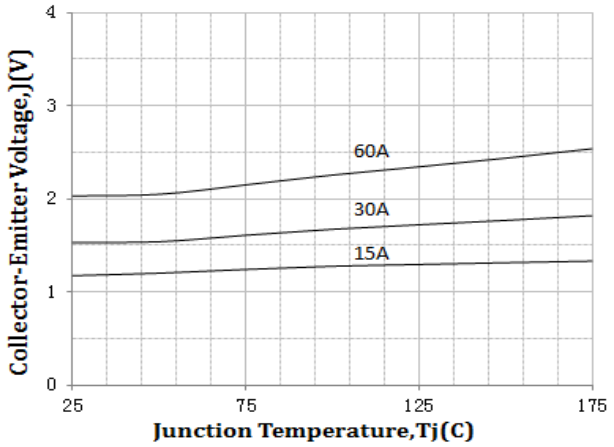
Transfer Characteristics

Vce=20 V



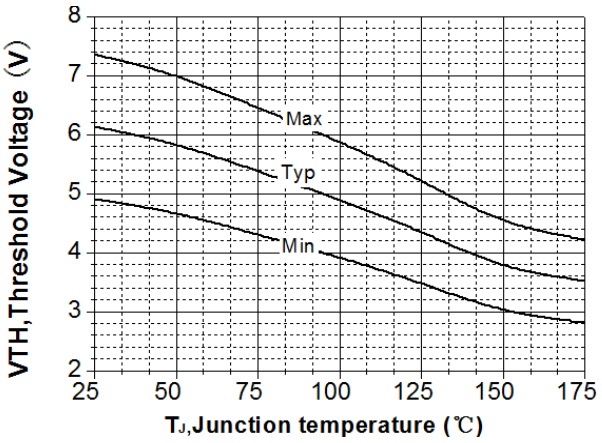
Vcesat vs. Tj

Vge=15V, Ic=15A、30A、60A



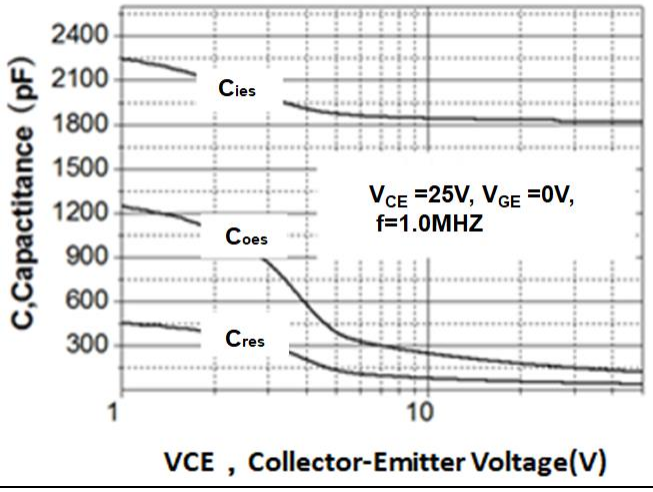
Vth vs. Tj

Ic=250uA



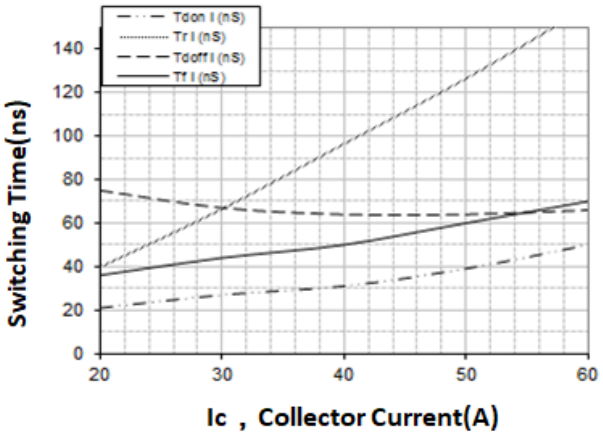
Capacitance Characteristic

VGE =0V,f=1.0MHZ



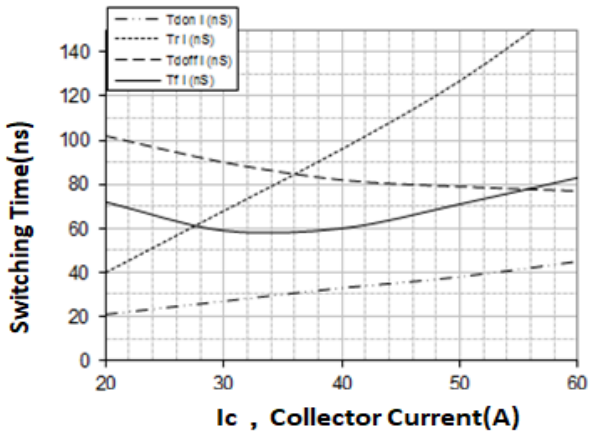
Switching Time vs. Ic(25℃)

VCE=400V,VGE=15V, RG=7.9Ω



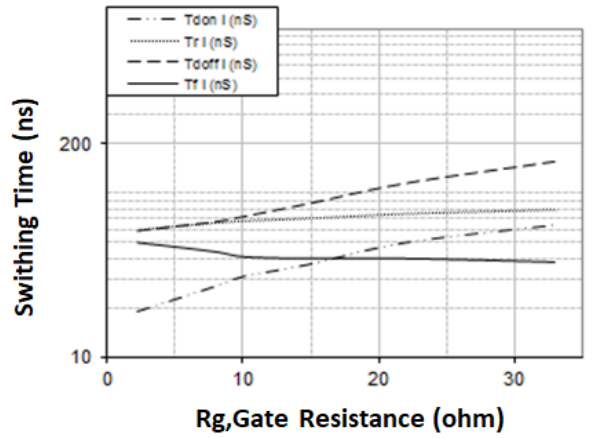
Switching Time vs. Ic(175℃)

VCE=400V,VGE=15V, RG=7.9Ω



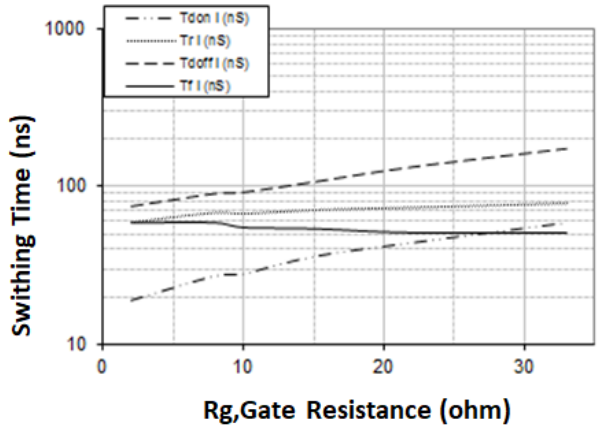
Switching Time vs. Rg(25℃)

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



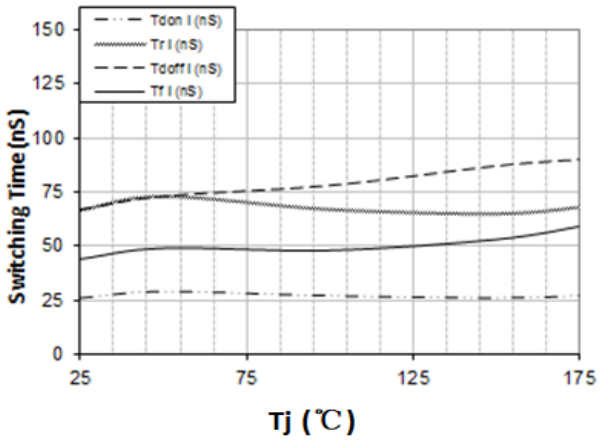
Switching Time vs. Rg(175℃)

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



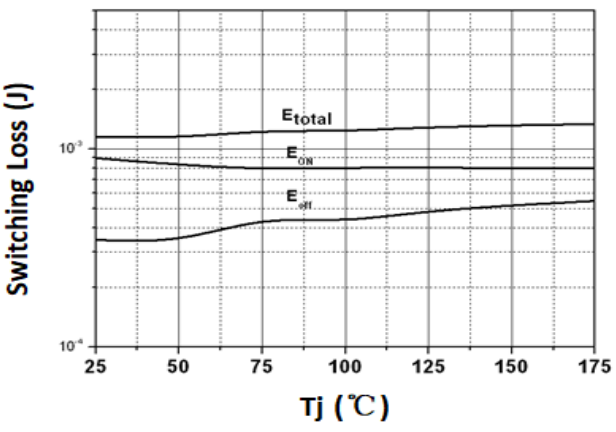
Switching Time vs.Tj

VGE=15V,VCE=400V,IC=30A,RG=7.9Ω



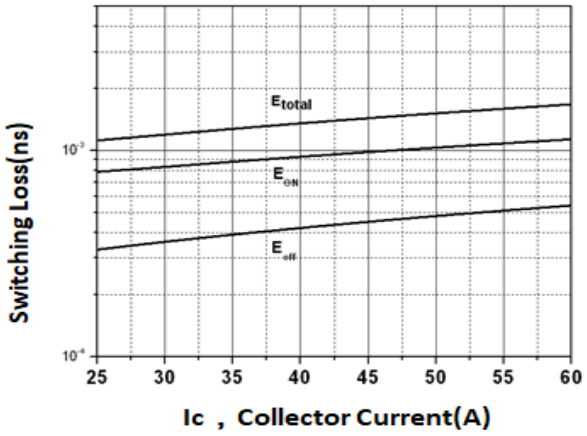
Switching Loss vs. Tj

VGE=15V,VCE=400V,IC=30A ,RG=7.9Ω



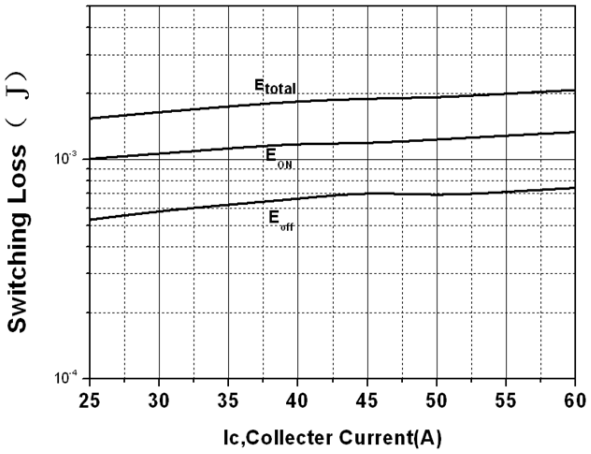
Switching Loss vs. Ic(25℃)

VGE=15V,VCE=400V,RG=7.9Ω



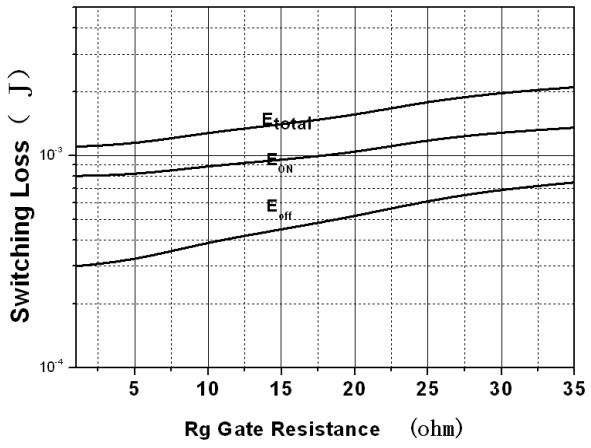
Switching Loss vs. Ic(175℃)

VGE=15V,VCE=400V,RG=7.9Ω



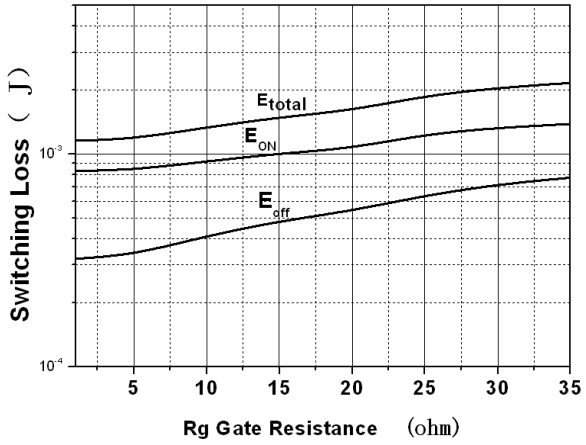
Switching Loss vs. Rg(25℃)

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



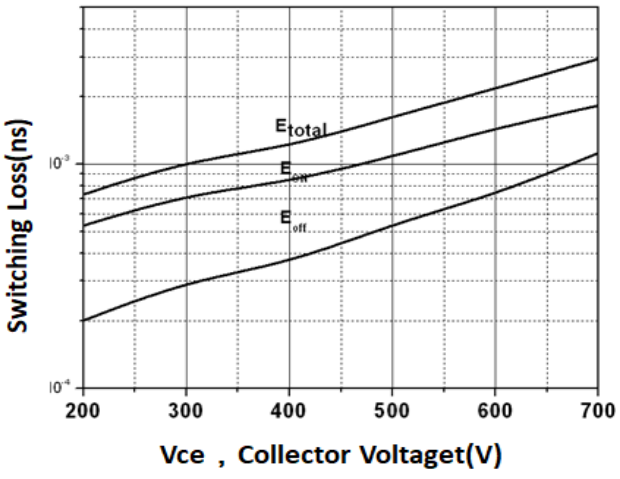
Switching Loss vs. Rg(175℃)

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



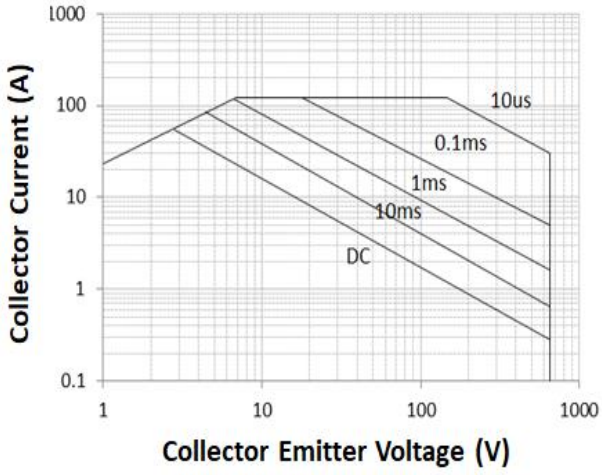
Switching Loss vs. VCE(175℃)

VGE=15V, IC=30A,RG=7.9Ω

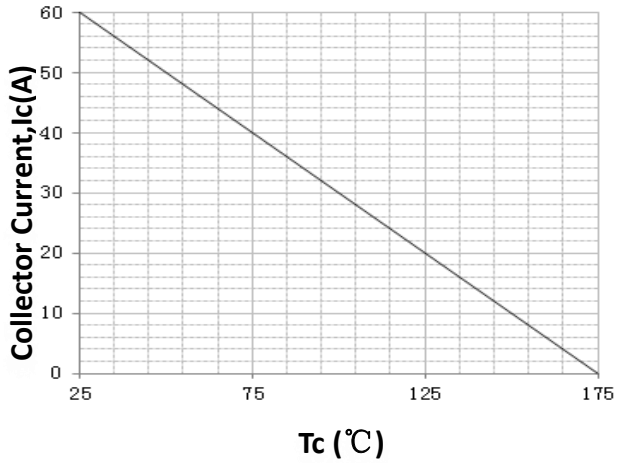


Forward Bias Safe Operating Area

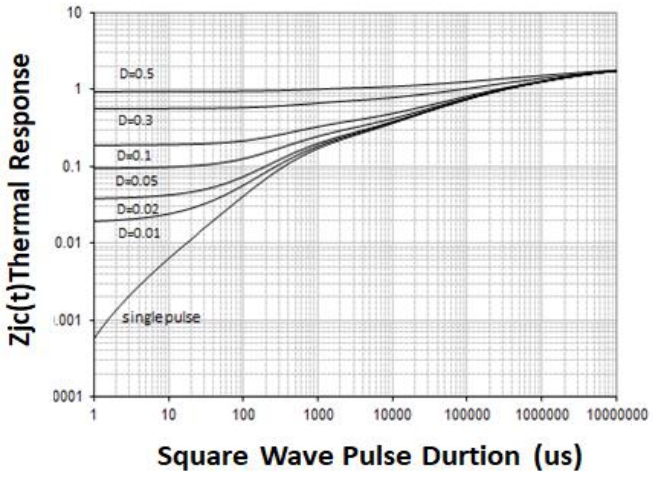
Tc=25 ℃, VGE=15V,Tvj≤150℃



Ic vs.Tc

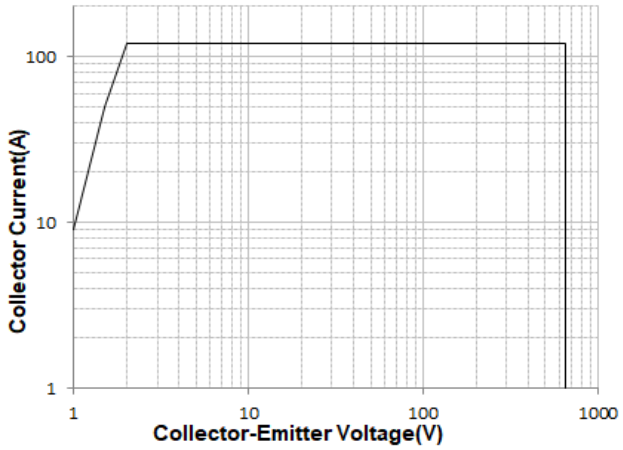


Transient Thermal Impedance

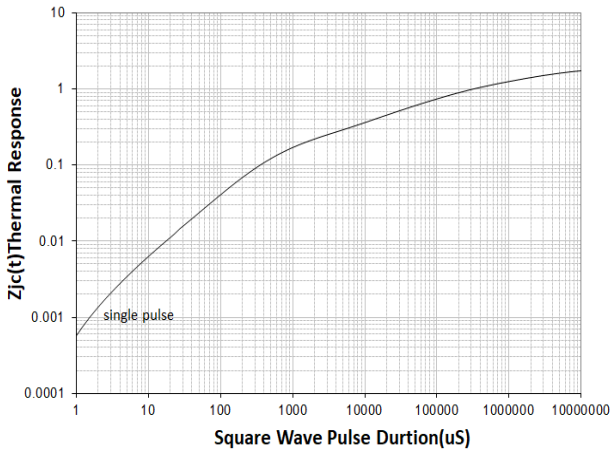


Reverse Bias Safe Operating Area

Tc=25℃,， VGE=±15V， Rg=10Ω， Tvj≤150℃



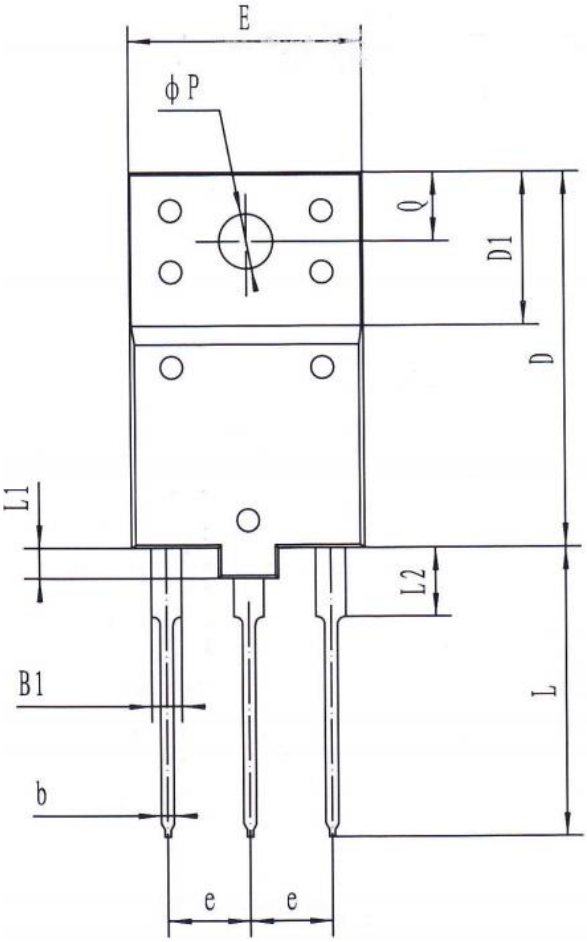
Transient Thermal Impedance

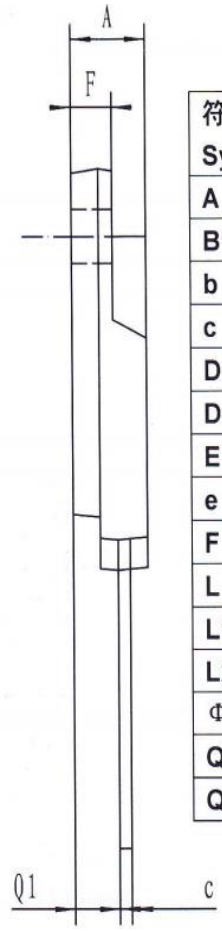


外形尺寸 PACKAGE MECHANICAL DATA

TO-3PH

单位 Unit：mm





符 号 Symbol	Min	Max
A	5.2	5.8
B1	1.8	2.2
b	0.75	1.05
c	0.8	1.1
D	24.0	25.0
D1	9.8	10.2
E	15.0	16.0
e	5.45（typ）	
F	2.7	3.3
L	18.5	19.5
L1	1.8	2.2
L2	4.3	4.7
ΦP	3.4	3.8
Q	4.3	4.7
Q1	3.1	3.5

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3. 在电路设计时请不要超过器件的绝对最大额定值，否则会影响整机的可靠性。
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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