



JT020N065AED

主要参数 MAIN CHARACTERISTICS

I _c	20A
V _{CEs}	650V
V _{cesat-typ} (V _{ge} =15V)	1.6V

用途

- 逆变器
- UPS 电源
- 空调

APPLICATIONS

- General purpose inverters
- UPS
- Air Condition

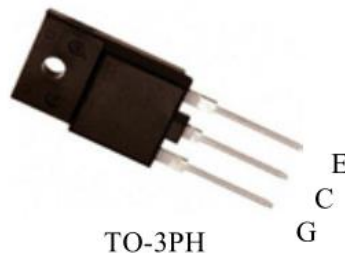
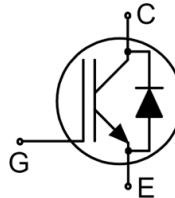
产品特性

- 低栅极电荷
- Trench FS 技术,
- RoHS 产品

FEATURES

- Low gate charge
- Trench FS Technology,
- RoHS product

封装 Package



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		
JT020N065AED-GA-B	JT020N065AED-GA-BR	JT020N065AED	TO-3PH



**绝对最大额定值 ABSOLUTE RATINGS (Tc=25°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	40 (T _C =25°C)	A
		20(T _C =100°C)	A
最大脉冲集电极极电流（注 1） Collector Current – pulse (note 1)	I_{CM}	80	A
二极管正向测试电流 Diode RMS forward current	I_F	40(T _C =25°C)	A
	I_F	20(T _C =100°C)	A
二极管正向不重复峰值电流（浪涌电流） Surge non repetitive forward current tp= 10 ms sinusoidal	I_{FSM}	80	A
最高栅极发射极电压 Gate-Emmitter Voltage	V_{GES}	±20	V
Turn-off safe area	-	80	A
耗散功率 Power Dissipation	P_D	75(T _C =25°C)	W
		37.5(T _C =100°C)	
存储温度 Storage Temperature Range	T_{STG}	-55~+150	°C
结温 Operating Temperature Range	T_J	-55~+175	°C
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T_L	300	°C

*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-Emmitter 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	-	-	40	μ A
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} ,I _C =250μA	4.5	-	6.5	V
饱和压降 Collector-Emmitter saturation Voltage	V _{CESAT}	V _{GE} =15V,I _C =20A, T _c =25°C	-	1.6	2.0	V
		V _{GE} =15V,I _C =20A, T _c =125°C	-	1.75	-	V
		V _{GE} =15V,I _C =20A, T _c =175°C	-	1.9	-	V
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C _{ies}	V _{CE} =25V,V _{GE} =0V, f=1.0MH _Z ,T _C =25°C	-	1500	-	pF
输出电容 Output capacitance	C _{oes}		-	128	-	pF
反向传输电容 Reverse transfer capacitance	C _{res}		-	28	-	pF
栅极电荷总量 Total Gate Charge	Q _g	V _{CC} =400V,I _C =20A,R _G =1 0Ω,V _{GE} =15V,T _C =25°C	-	43	-	nC
栅极-发射极电荷 Gate to emitter charge	Q _{ge}		-	10.0	-	
栅极-集电极电荷 Gate to collector charge	Q _{gc}		-	19	-	





电特性 ELECTRICAL CHARACTERISTICS

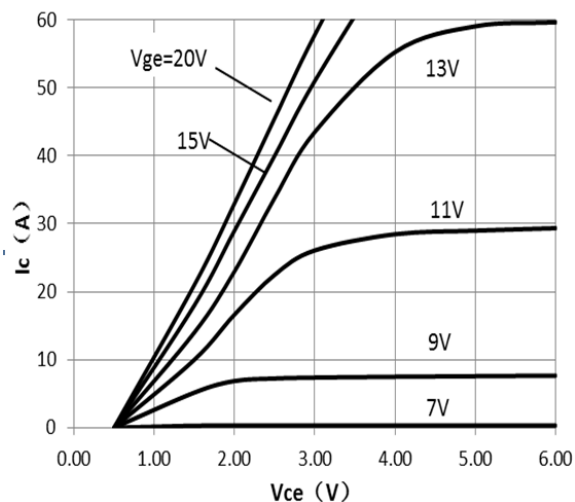
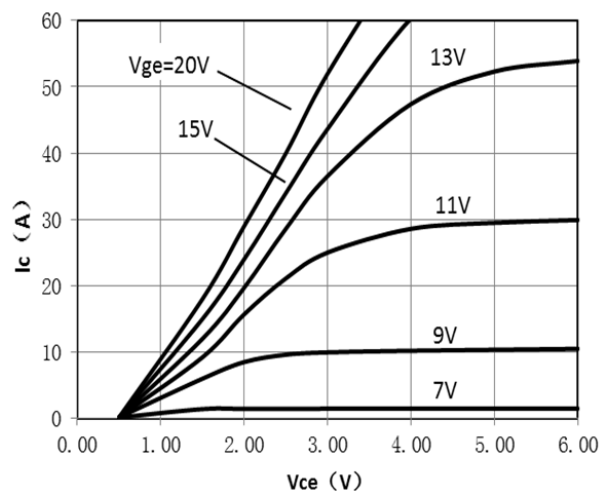
开关特性 Switching Characteristics						
项 目 Parameter	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单位 Units
开启延迟时间 Turn-On delay time	td(on)	V _{CC} =400V,I _{CC} =20A, R _G =10Ω, V _{GE} =15V, T _C =25°C	-	16	-	ns
上升时间 Turn-On rise time	tr		-	56	-	ns
关断延迟时间 Turn-Off delay time	td(off)		-	52	-	ns
下降时间 Turn-Off Fall time	tf		-	82	-	ns
开通损耗 Turn-On energy	Eon		-	0.79	-	mJ
关断损耗 Turn-off energy	Eoff		-	0.3	-	mJ
总开关损耗 Total switching energy	Etot		-	1.09	-	mJ
开启延迟时间 Turn-On delay time	td(on)	V _{CC} =400V,I _C =20A, R _G =10Ω,V _{GE} =15V, T _C =175°C	-	14.0	-	ns
上升时间 Turn-On rise time	tr		-	54.0	-	ns
关断延迟时间 Turn-Off delay time	td(off)		-	76.0	-	ns
下降时间 Turn-Off Fall time	tf		-	146.0	-	ns
开通损耗 Turn-On energy	Eon		-	0.8	-	mJ
关断损耗 Turn-off energy	Eoff		-	0.49	-	mJ
总开关损耗 Total switching energy	Etot		-	1.3	-	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 =20A,T _C =25°C	-	1.6	-	V
		I _F =20A,T _C =175°C	-	1.3	-	V
反向恢复时间 Diode Reverse recovery time	t _{rr}	T _C =25°C,I _F =20A, d _i /d _t =100A/us	-	254	-	ns
反向恢复电荷 Diode Reverse recovery charge	Q _{rr}		-	347	-	nC
反向恢复电流 Diode Reverse recovery Current	I _{rrm}		-	2.7	-	A
反向恢复时间 Diode Reverse recovery time	t _{rr}	T _C =175°C,I _F =20A, d _i /d _t =100A/us	-	429	-	ns
反向恢复电荷 Diode Reverse recovery charge	Q _{rr}		-	1010	-	nC
反向恢复电流 Diode Reverse recovery Current	I _{rrm}		-	4	-	A

项目 Parameter	符号 Symbol	最大 (max)	单位 Unit
结到管壳的热阻 (IGBT) Thermal Resistance, Junction to Case	$R_{th(J-C)}$	2.0	$^\circ C/W$
结到管壳的热阻 (FRD) Thermal Resistance, Junction to Case	$R_{th(J-C)}$	3.9	$^\circ C/W$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(J-A)}$	40	$^\circ C/W$

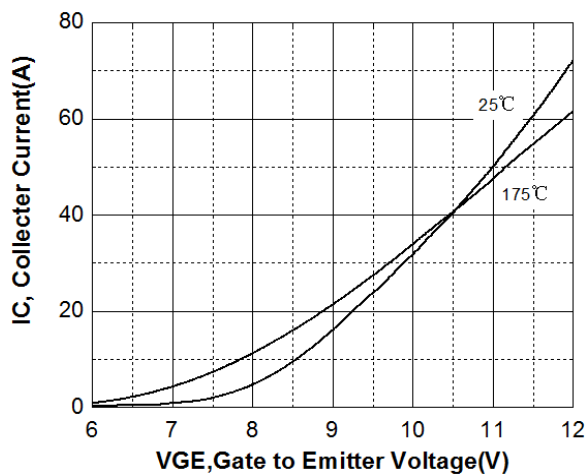
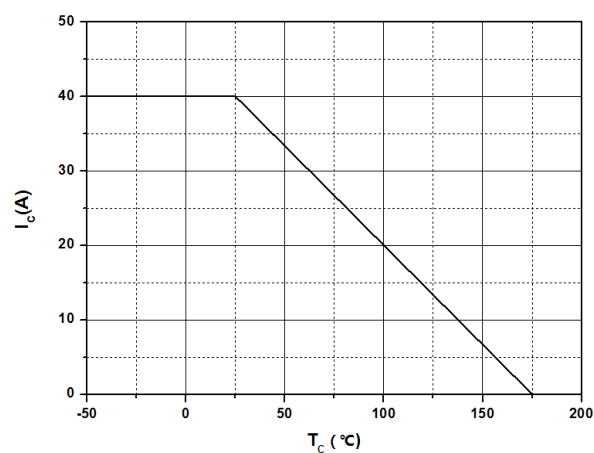
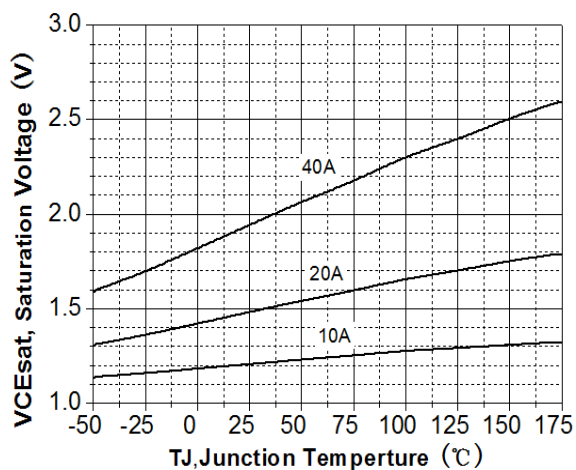
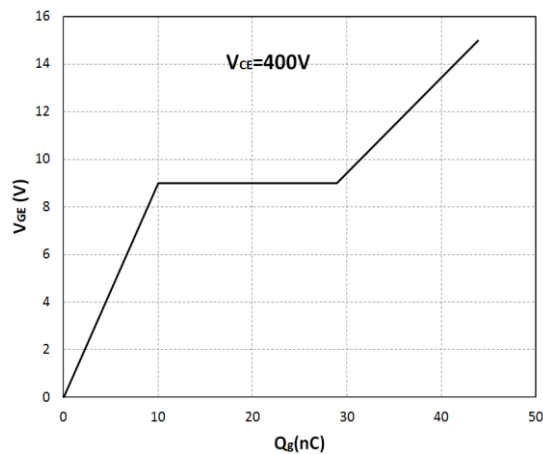


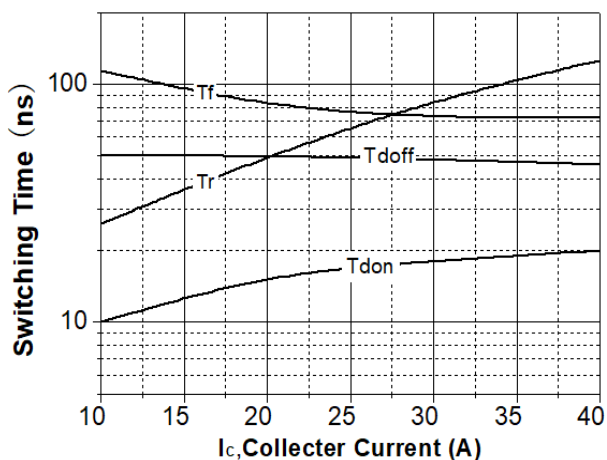
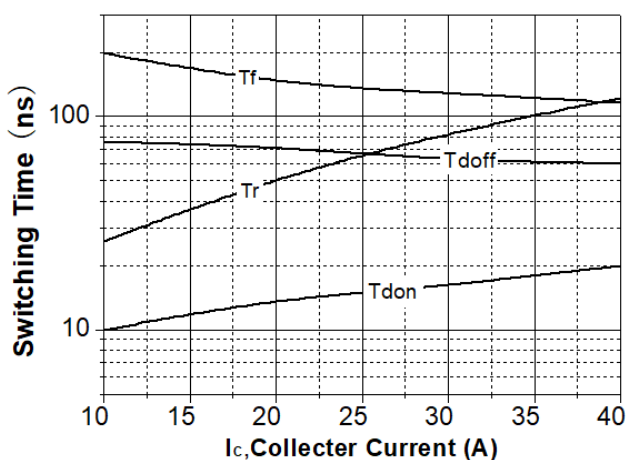
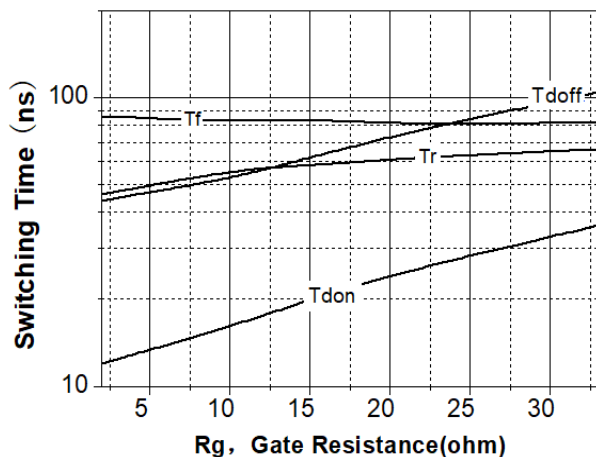
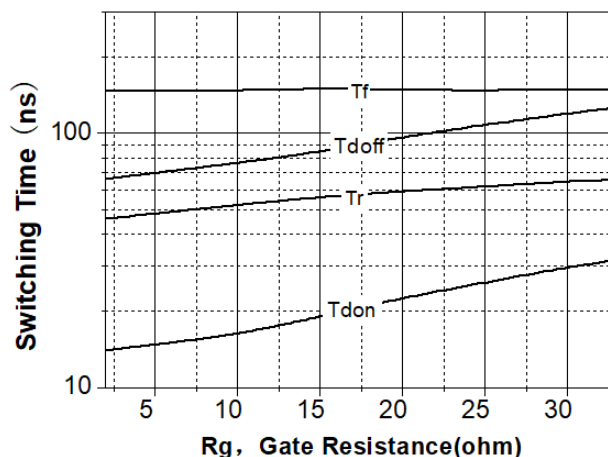
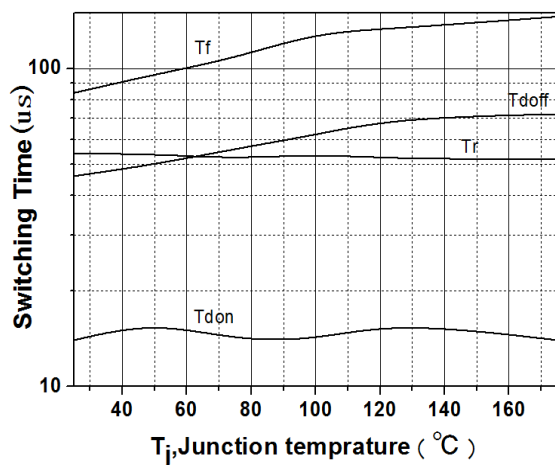
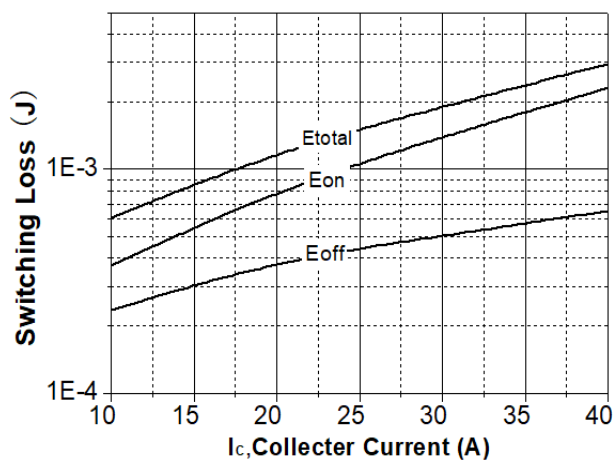


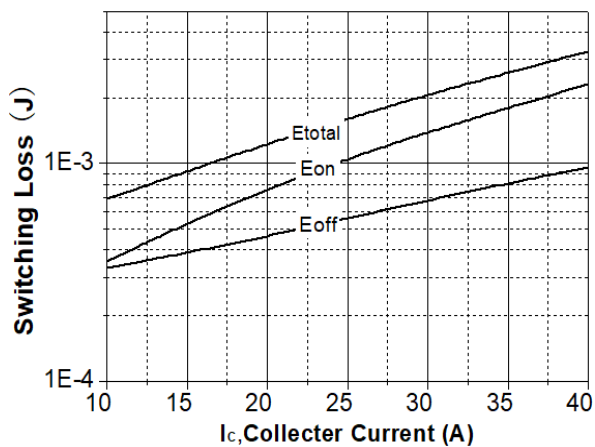
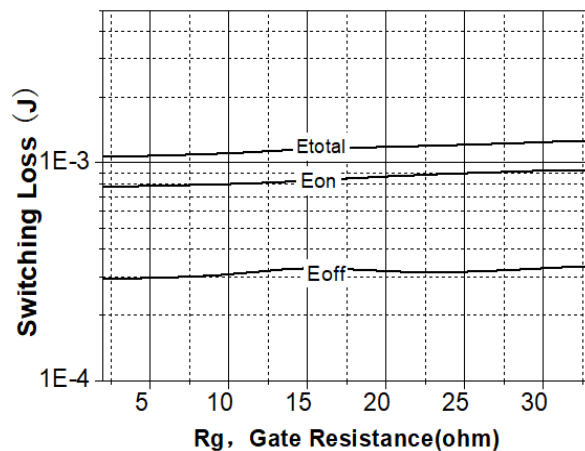
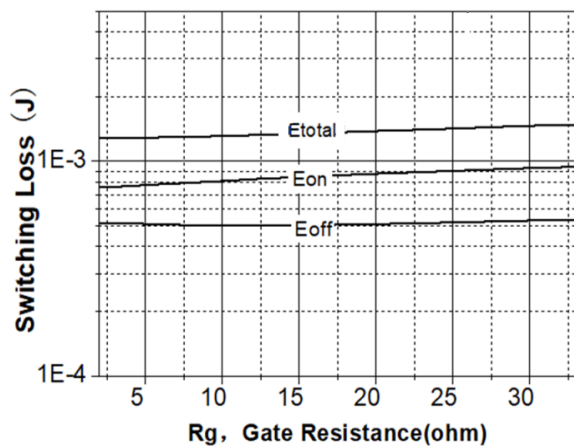
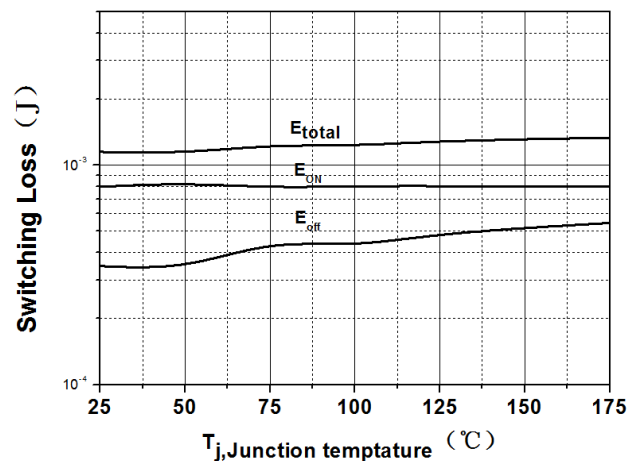
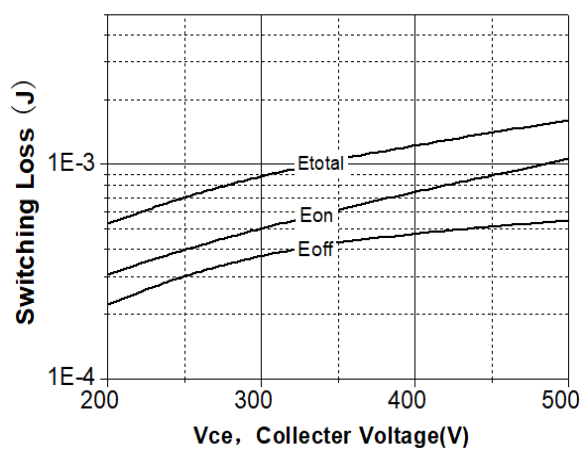
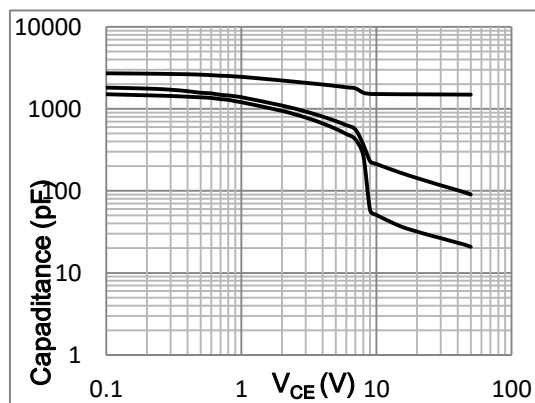
特征曲线 ELECTRICAL CHARACTERISTICS (curves)

Output Characteristics $T_J=25^{\circ}\text{C}$ Output Characteristics $T_J=175^{\circ}\text{C}$ 

Transfer characteristics

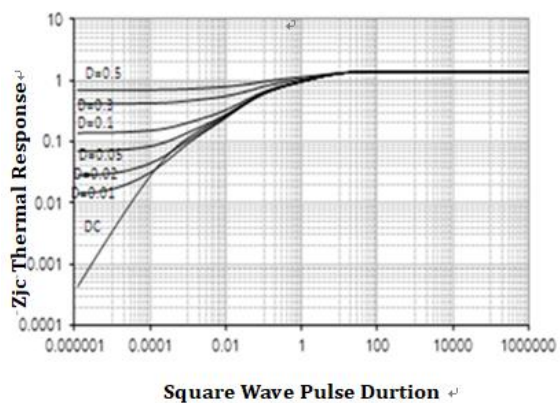
 I_C VS T_C  V_{CESAT} VS T_J  Q_g VS V_{GE} 

SwitchingTime vs. I_C $T_J=25^{\circ}\text{C}, V_{GE}=15\text{V}, V_{CE}=400\text{V}, R_g=10\Omega$ SwitchingTime vs. I_C $T_J=175^{\circ}\text{C}, V_{GE}=15\text{V}, V_{CE}=400\text{V}, R_g=10\Omega$ SwitchingTime vs. R_g $T_J=25^{\circ}\text{C}, V_{GE}=15\text{V}, V_{CE}=400\text{V}, I_C=20\text{A}$ SwitchingTime vs. R_g $T_J=175^{\circ}\text{C}, V_{GE}=15\text{V}, V_{CE}=400\text{V}, I_C=20\text{A}$ Switching Time vs. T_J Switching Loss vs. I_C $T_J=25^{\circ}\text{C}, V_{GE}=15\text{V}, V_{CE}=400\text{V}, R_g=10\Omega$ 

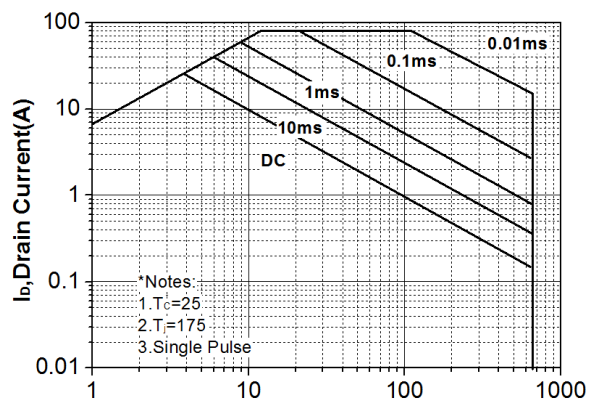
**Switching Loss vs. I_C** $T_J=175^{\circ}\text{C}, V_{GE}=15\text{V}, V_{CE}=400\text{V}, R_g=10\Omega$ **Switching Loss vs. R_g** $T_J=25^{\circ}\text{C}, V_{GE}=15\text{V}, V_{CE}=400\text{V}, I_C=20\text{A}$ **Switching Loss vs. R_g** $T_J=175^{\circ}\text{C}, V_{GE}=15\text{V}, V_{CE}=400\text{V}, I_C=20\text{A}$ **Switching Loss vs. T_J** $V_{GE}=15\text{V}, V_{CE}=400\text{V}, I_C=20\text{A}, R_g=10\Omega$ **Switching Loss vs. V_{CE} (V)** $T_J=175^{\circ}\text{C}, V_{GE}=15\text{V}, I_C=20\text{A}, R_g=10\Omega$ **Capacitance Characteristic** $V_{GE}=0\text{V}, f=1.0\text{MHz}$ 



Transient Thermal Impedance for IGBT



Safe Operating Area

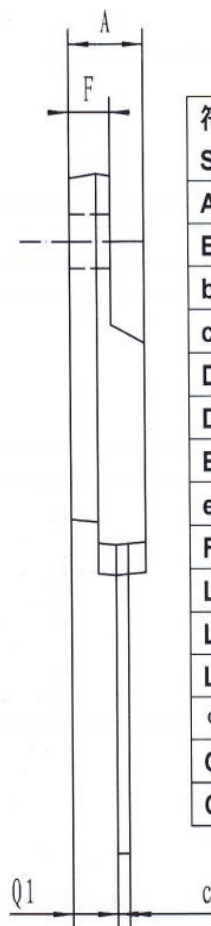
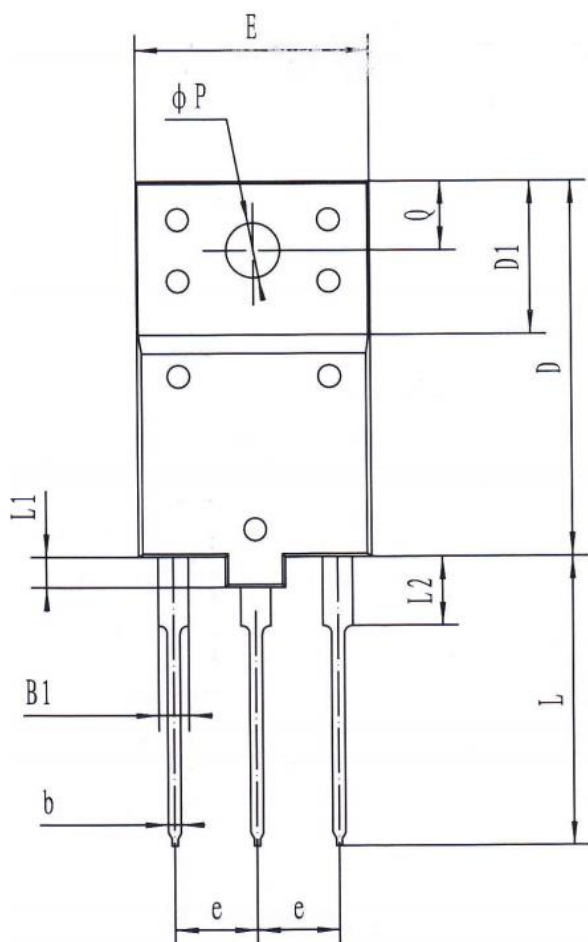




外形尺寸 PACKAGE MECHANICAL DATA

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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