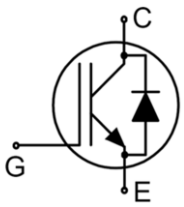
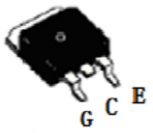
JT020N065SED/CED/WED/FED

主要参数 MAIN CHARACTERISTICS

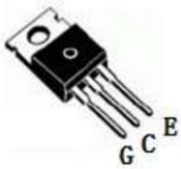
I_C	20 A
BV_{CES}	650V
V_{CESAT}-typ （V_{GE}=15V）	1.6V

封装 **Package**



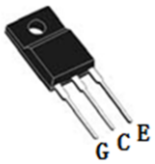


TO-263



TO-220C

TO-247



TO-220MF

用途

- 逆变器
- UPS 电源

APPLICATIONS

- General purpose inverters
- UPS

产品特性

- 低栅极电荷
- Trench FS 技术,
- 通态压降, $V_{CE(sat)}$, typ = 1.6V,I_C =20A and T_C = 25 ℃
- RoHS 产品

FEATURES

- Low gate charge
- Trench FS Technology,
- saturation voltage: $V_{CE(sat)}$, typ = 1.6V,I_C= 20A and T_C = 25°C
- RoHS product

订 货 型 号 Order codes				印 记 Marking	封 装 Package
有卤-条管 Halogen-Tube	无卤-条管 None Halogen-Tube	有卤-编带 Halogen-Reel	无卤-编带 Halogen-Free-Reel		
JT020N065SED-S-B	JT020N065SED-S-BR	JT020N065SED-S-A	JT020N065SED-S-AR	JT020N065SED	TO-263
JT020N065CED-C-B	JT020N065CED-C-BR	N/A	N/A	JT020N065CED	TO-220C
JT020N065WED-GE-B	JT020N065WED-GE-BR	N/A	N/A	JT020N065WED	TO-247
JT020N065FED-F-B	JT020N065FED-F-BR	N/A	N/A	JT020N065FED	TO-220MF

绝对最大额定值 ABSOLUTE RATINGS (Tc=25°C)

项 目 Parameter	符 号 Symbol	数 值 Value			单位 Unit
		JT020N065SED/ JT020N065CED	JT020N065WED	JT020N065FED	
最高集电极－发射极直流电压 Collector-Emmiter Voltage	V_{CES}	650	650	650	V
*连续集电极电流 Collector Current-continuous	I_C	40 (T_C=25°C)	40 (T_C=25°C)	40 (T_C=25°C)	A
		20(T_C=100°C)	20(T_C=100°C)	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	80	80	A
二极管正向测试电流 Diode RMS forward current	I_F	40(T_C=25°C)	40(T_C=25°C)	40(T_C=25°C)	A
	I_F	20(T_C=100°C)	20(T_C=100°C)	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	80	80	A
最高栅极发射极电压 Gate-Emmiter Voltage	V_{GES}	±20	±20	±20	V
Turn-off safe area	-	80	80	80	A
耗散功率 Power Dissipation	P_D T_C=25°C	156	162	35	W
存储温度 Storage Temperature Range	T_{STG}	-55～+150	-55～+150	-55～+150	°C
结温 Operating Temperature Range	T_J	-55～+175	-55～+175	-55～+175	°C
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T_L	300	300	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-Emmiter Voltage	BV_{CES}	I_C=500μA, V_{GE}=0V	650	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{CES}/\Delta T_J$	I_C=1mA, referenced to 25°C	-	0.5	-	V/°C
零栅压下集电极漏电流 Zero Gate Voltage Collector Current	I_{CES}	V_{CE}=650V, V_{GE}=0V, T_C=25°C	-	-	10	μA
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-Emmiter 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	2.15	V
		V_{GE}=15V,I_C=20A, T_c=175°C		1.9	2.3	V
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C_{ies}	V_{CE}=25V,V_{GE}=0V, f=1.0MHz,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}		-	28.7	-	pF
栅极电荷总量 Total Gate Charge	Q_g	V_{CC}=400V,I_C=20A,R_G=10Ω,V_{GE}=15V,T_C=25°C	-	43.9	-	nC
栅极-发射极 Gate to emitter charge	Q_{ge}		-	10.0	-	
栅极-集电极 Gate to collector charge	Q_{gc}		-	18.9	-	
栅极电阻-Gate resistance	R_g	f=1MHz,open collector	-	1.8	-	Ω
短路电流-short current	I_{sc}	V_{GE}=15V,V_{CE}=360V, T_{Jstart}≤150°C,t≤10μs	-	116.7	-	A

电特性 ELECTRICAL CHARACTERISTICS

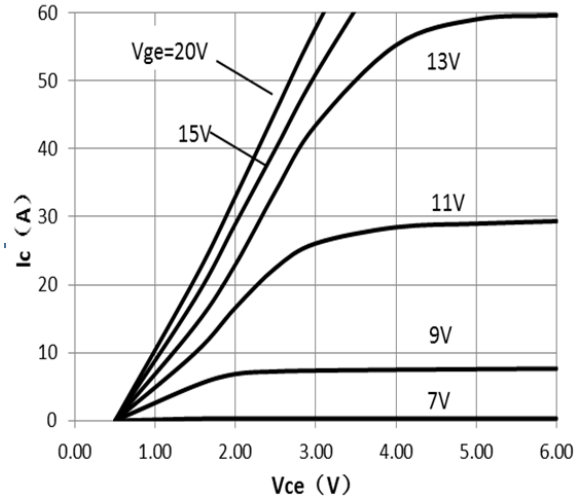
开关特性 Switching Characteristics						
项　　目 Parameter	符　号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单位 Units
开启延迟时间 Turn-On delay time	$t_{d(on)}$	V_{CC}=400V,I_{CC}=20A,	-	16	-	ns
上升时间 Turn-On rise time	t_r	R_G=10Ω, V_{GE}=15V,	-	56	-	ns
关断延迟时间 Turn-Off delay time	$t_{d(off)}$	T_C=25°C	-	52	-	ns
下降时间 Turn-Off Fall time	t_f		-	82	-	ns
开通损耗 Turn-On energy	E_{on}		-	0.79	-	mJ
关断损耗 Turn-off energy	E_{off}		-	0.3	-	mJ
总开关损耗 Total switching energy	E_{tot}		-	1.09	-	mJ
开启延迟时间 Turn-On delay time	$t_{d(on)}$	V_{CC}=400V,I_C=20A,	-	14.0	-	ns
上升时间 Turn-On rise time	t_r	R_G=10Ω,V_{GE}=15V,	-	54.0	-	ns
关断延迟时间 Turn-Off delay time	$t_{d(off)}$	T_C=175°C	-	76.0	-	ns
下降时间 Turn-Off Fall time	t_f		-	146.0	-	ns
开通损耗 Turn-On energy	E_{on}		-	0.8	-	mJ
关断损耗 Turn-off energy	E_{off}		-	0.49	-	mJ
总开关损耗 Total switching energy	E_{tot}		-	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	V_{GE}=0V, I_F=20A,T_C=25°C	-	1.4	-	V
		V_{GE}=0V, I_F=20A,T_C=125°C	-	1.2	-	V
		V_{GE}=0V, I_F=20A,T_C=175°C	-	1.0	-	V
反向恢复时间 Diode Reverse recovery time	t_{rr}	T_C=25°C,I_F=20A, V_{GE}=0V,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, V_{GE}=0V,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

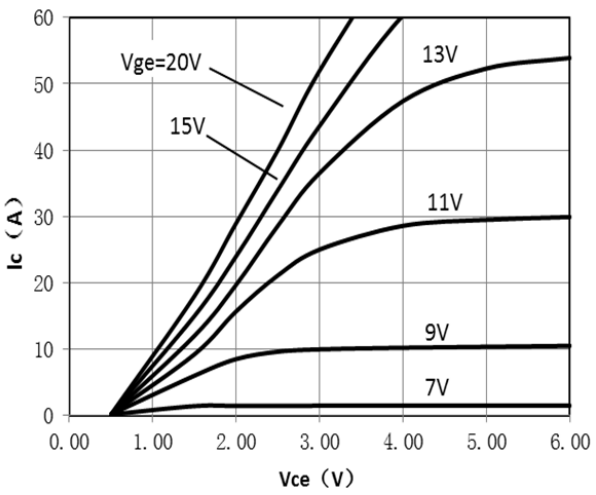
项目 Parameter	符号 Symbol	最大（max）			单位 Unit
		JT020N065SED/ JT020N065CED	JT020N065WED	JT020N065FED	
结到管壳的热阻（IGBT） Thermal Resistance, Junction to Case	$R_{th(J-C)}$	0.8	0.77	3.57	°C/W
结到管壳的热阻（FRD） Thermal Resistance, Junction to Case	$R_{th(J-C)}$	2.13	2.05	7.7	°C/W
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(J-A)}$	62.5	33.8	62.5	°C/W

特征曲线 ELECTRICAL CHARACTERISTICS (curves)

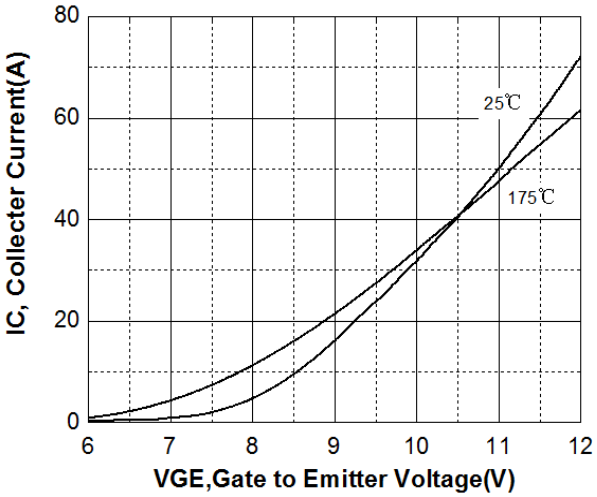
Output Characteristics T_J=25°C



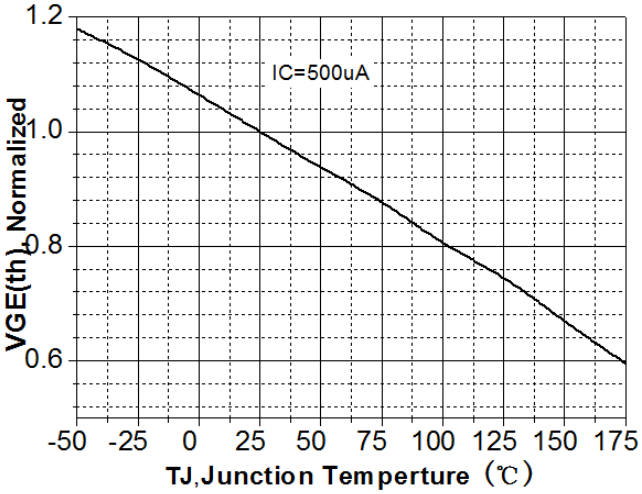
Output Characteristics T_J=175°C



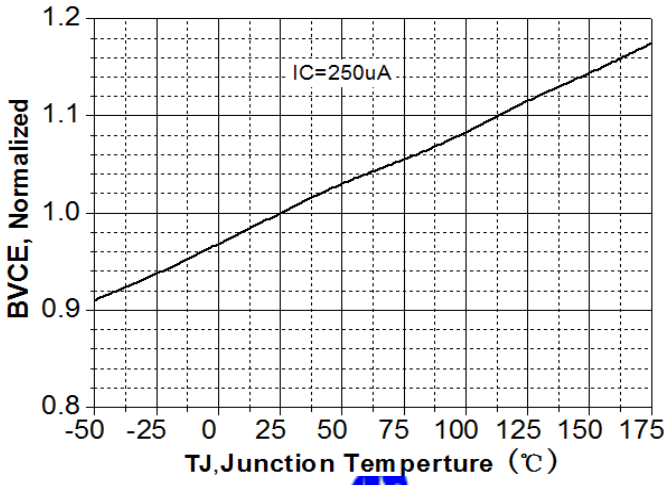
Transfer characteristics V_{CE}=6V



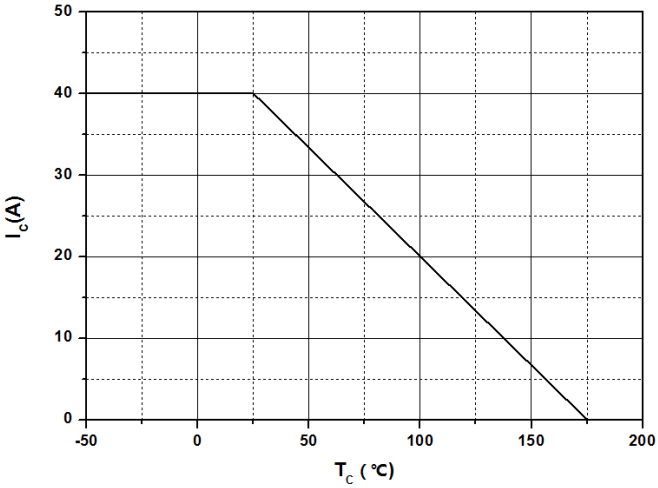
归一化的V_{GE}与T_J关系曲线



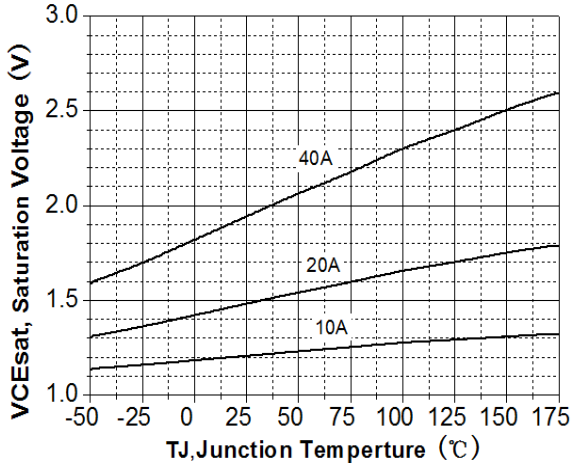
归一化的BV_{CE}与T_J关系曲线



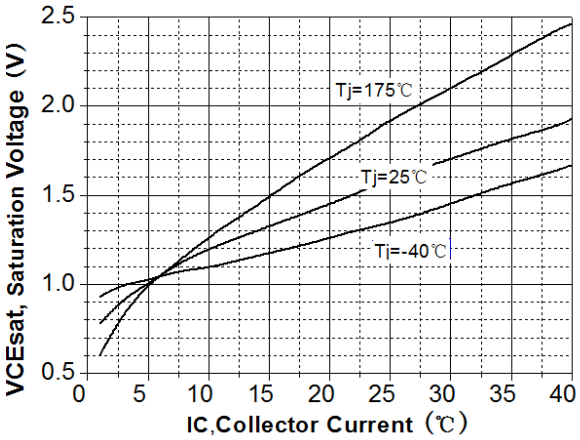
I_C VS T_C



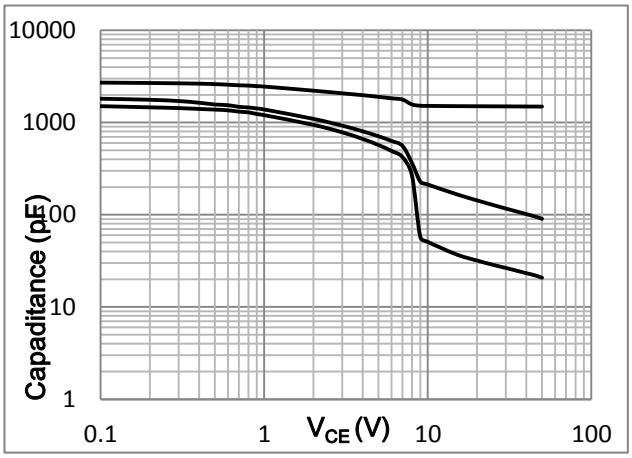
V_{CESAT} vs T_J



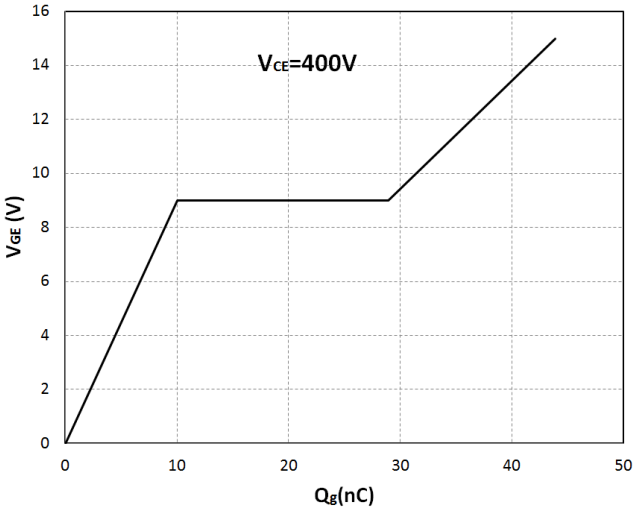
V_{CESAT} vs I_C



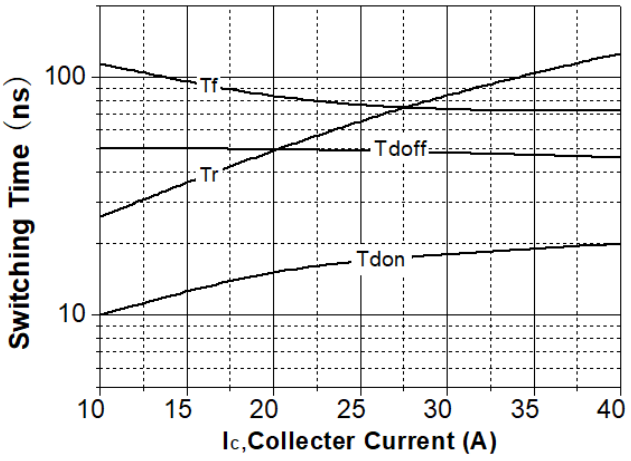
Capacitance Characteristic
V_{GE}=0V,f=1.0MHZ



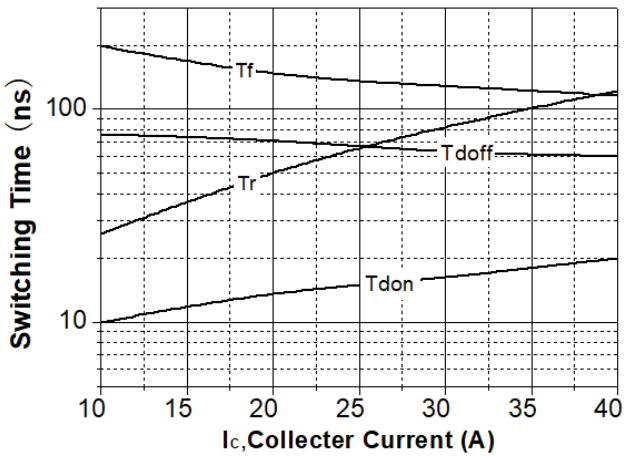
Q_g VS V_{GE}



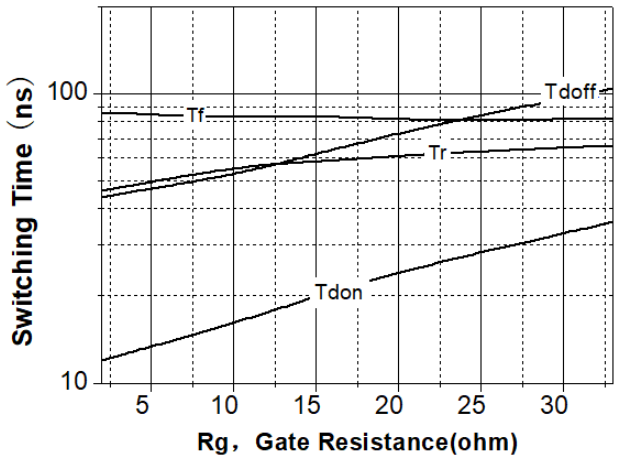
SwitchingTime vs. I_C
T_J=25°C,V_{GE}=15V,V_{CE}=400V,R_g=10Ω



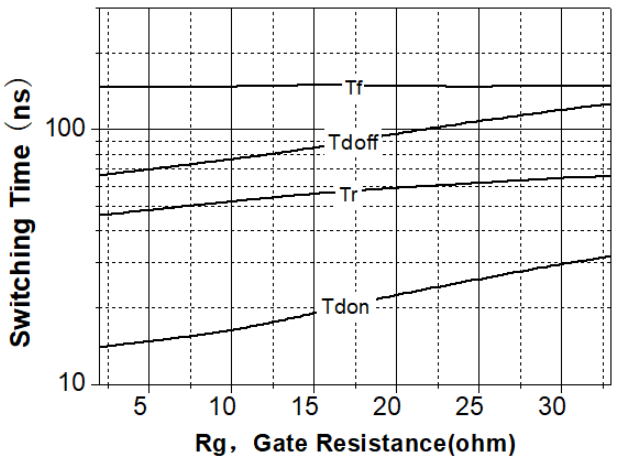
SwitchingTime vs. I_C
T_J=175°C,V_{GE}=15V,V_{CE}=400V,R_g=10Ω



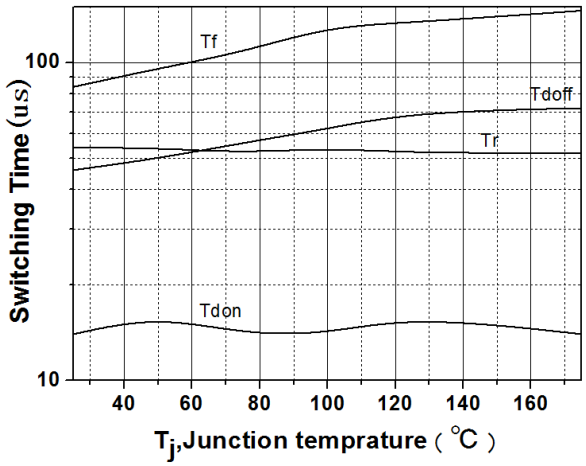
SwitchingTime vs. R_g
T_J=25°C,V_{GE}=15V,V_{CE}=400V,I_C=20A



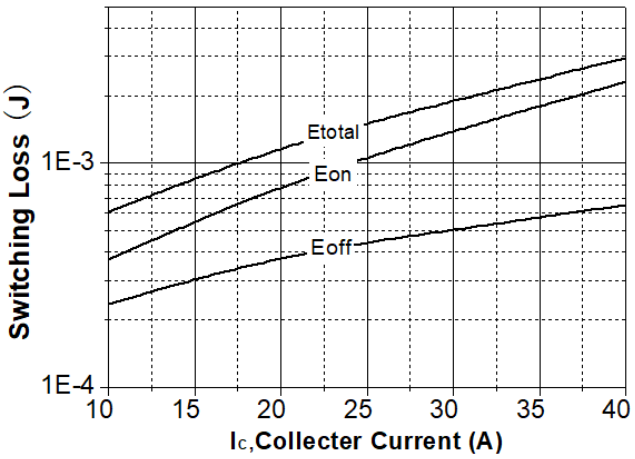
SwitchingTime vs. R_g
T_J=175°C,V_{GE}=15V,V_{CE}=400V,I_C=20A



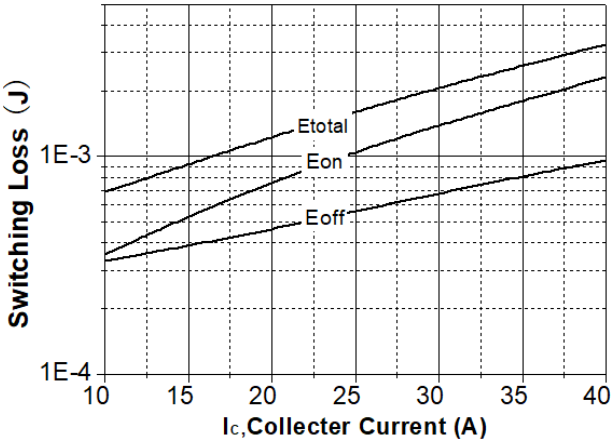
Switching Time vs. T_J



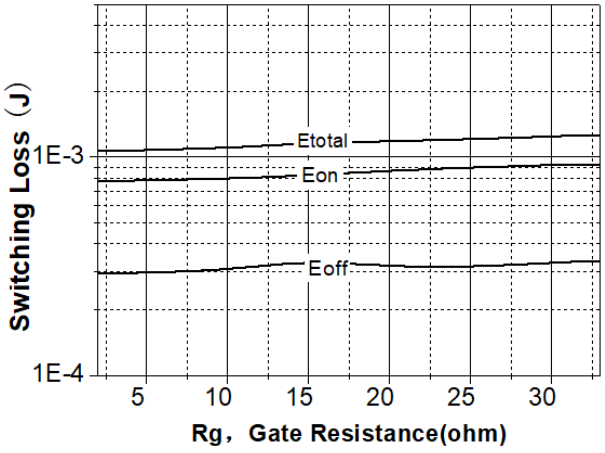
Switching Loss vs. I_C
T_J=25°C,V_{GE}=15V,V_{CE}=400V,R_g=10Ω



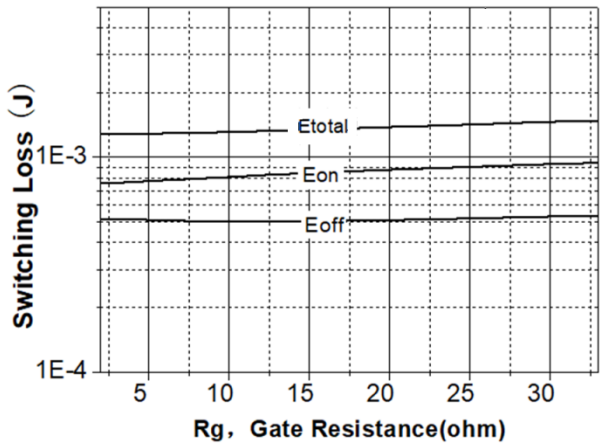
Switching Loss vs. I_C
T_J=175°C,V_{GE}=15V,V_{CE}=400V,R_g=10Ω



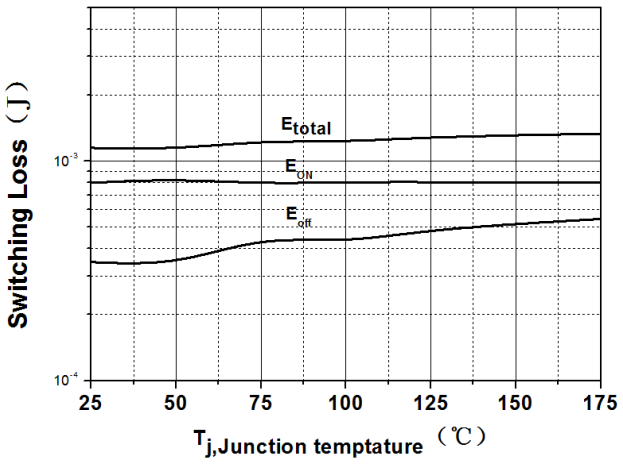
Switching Loss vs. R_g
T_J=25°C,V_{GE}=15V,V_{CE}=400V,I_C=20A



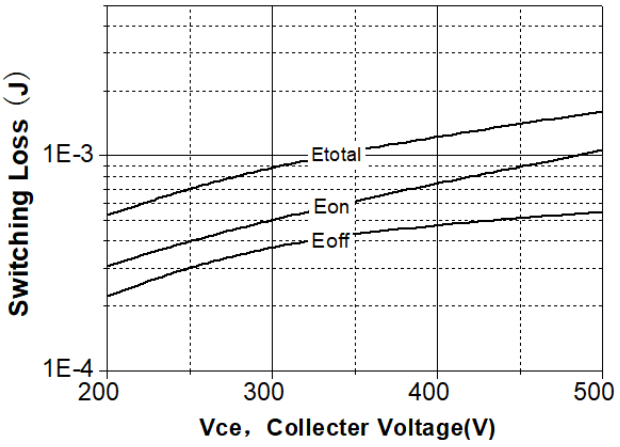
Switching Loss vs. R_g
T_J=175°C,V_{GE}=15V,V_{CE}=400V,I_C=20A



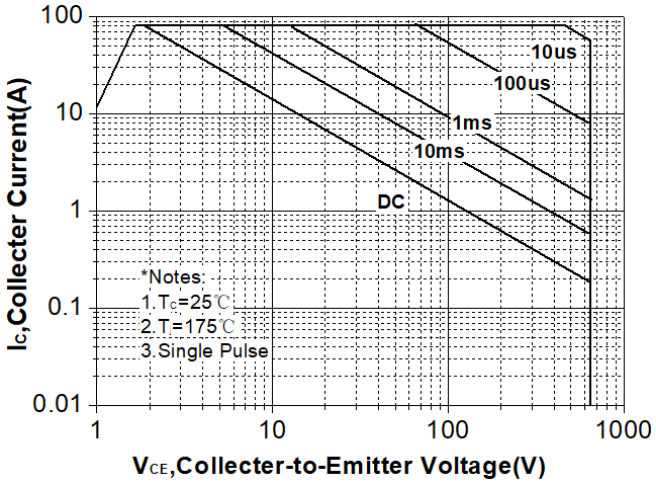
Switching Loss vs. T_J
V_{GE}=15V,V_{CE}=400V,I_C=20A R_g=10Ω



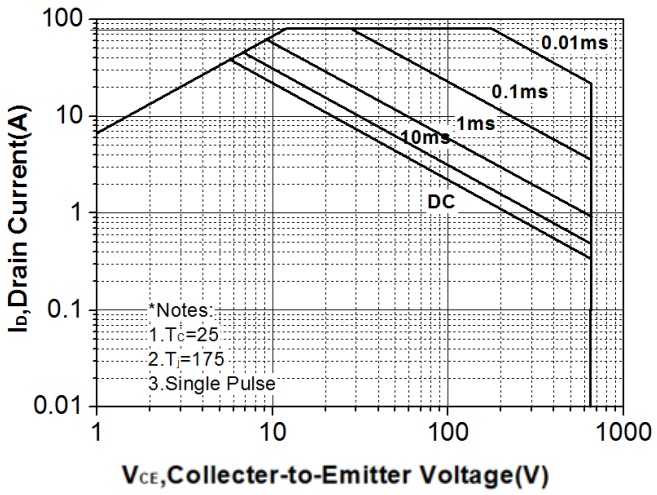
Switching Loss vs. V_{CE}(V)
T_J=175°C,V_{GE}=15V,I_C=20A,R_g=10Ω



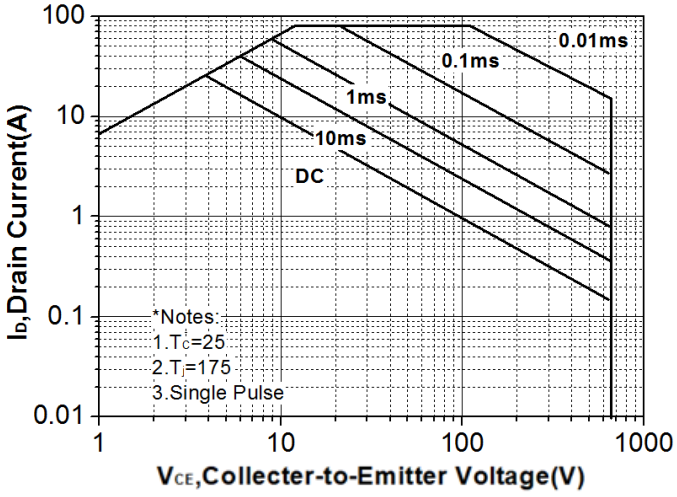
Safe Operating Area TO-247



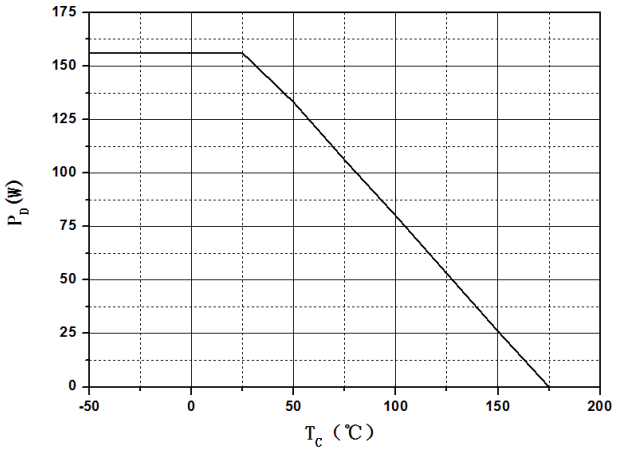
Safe Operating Area TO-263/TO-220C



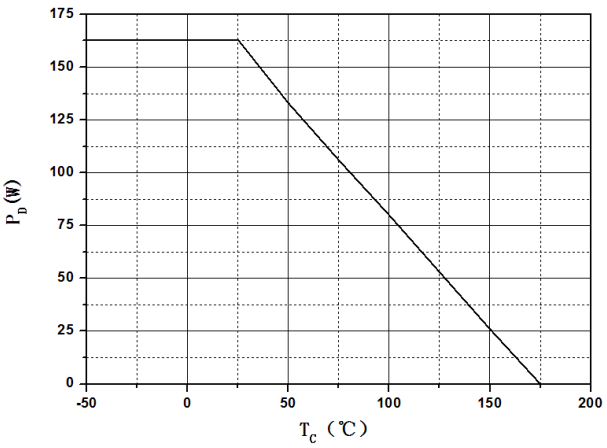
Safe Operating Area TO-220MF



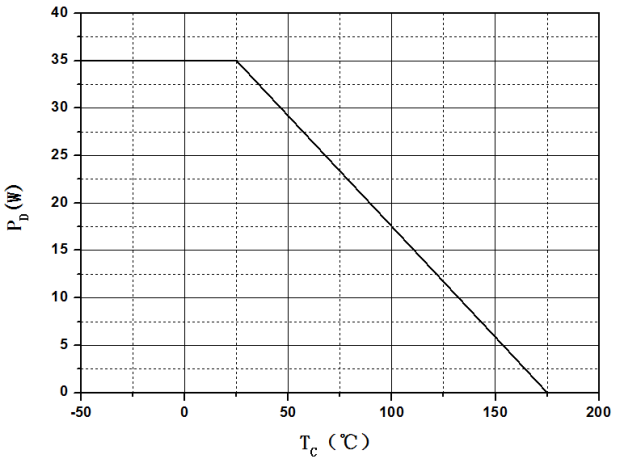
P_D VS temperature（TO-263/TO-220C）



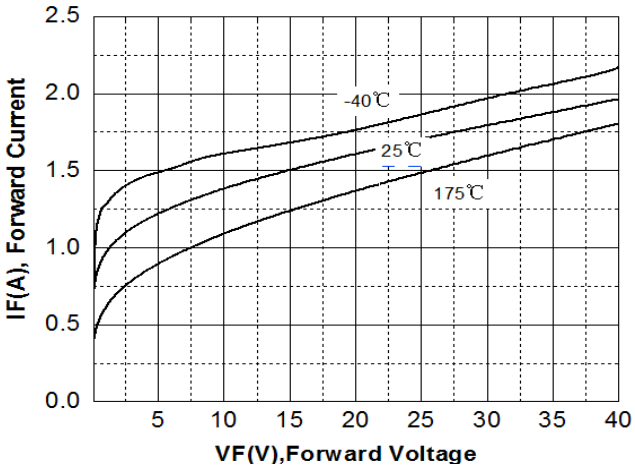
P_D VS temperature（TO-247）



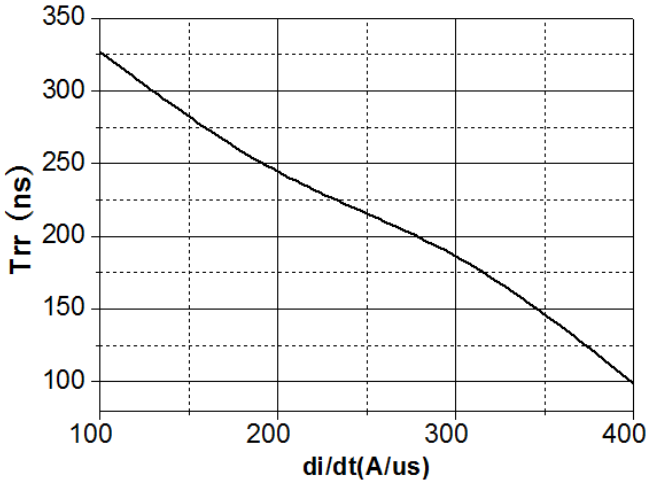
P_D VS temperature（TO-220MF）



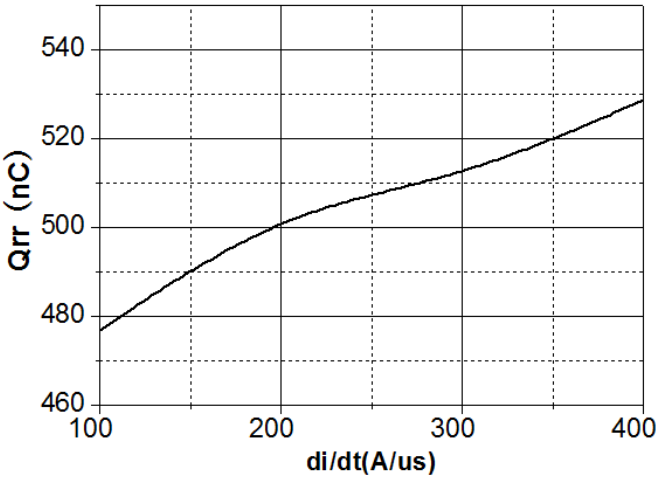
Diode Characteristic



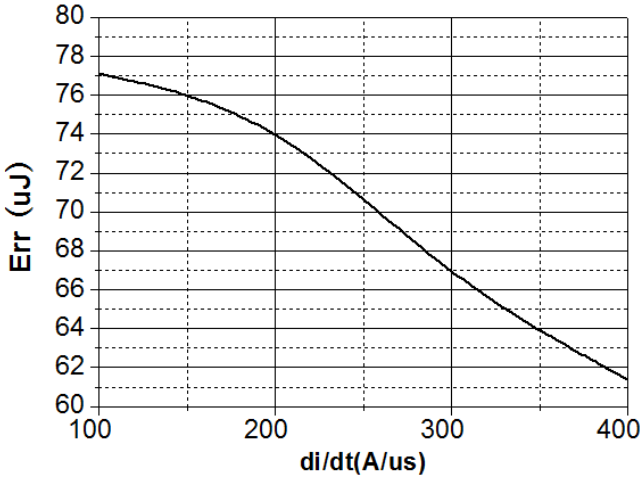
T_{rr}与d_i/d_t关系曲线



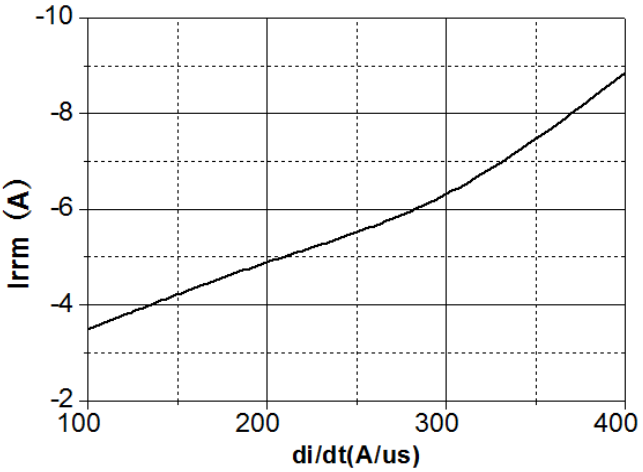
Q_{rr}与d_i/d_t关系曲线



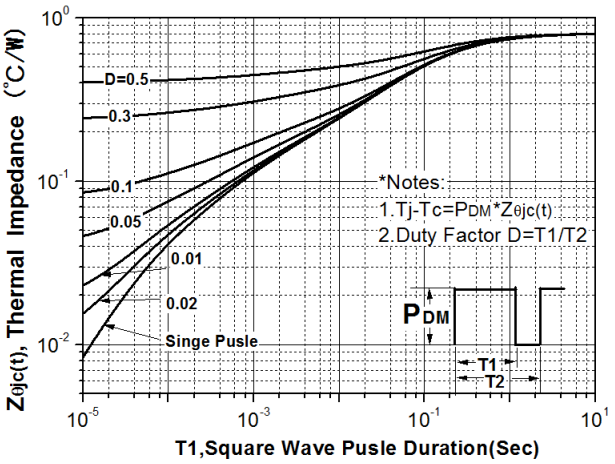
E_{rr}与d_i/d_t关系曲线



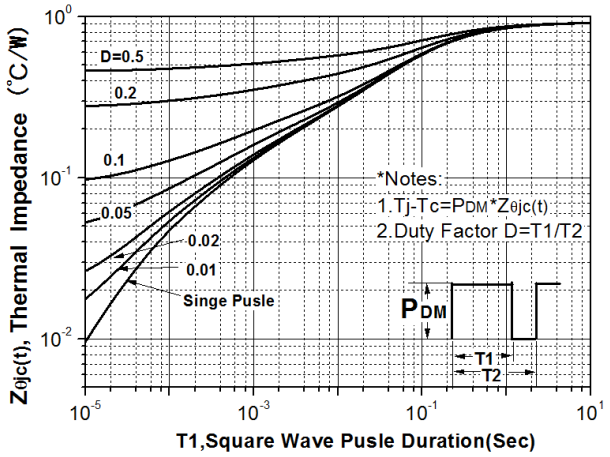
I_{rrm}与d_i/d_t关系曲线



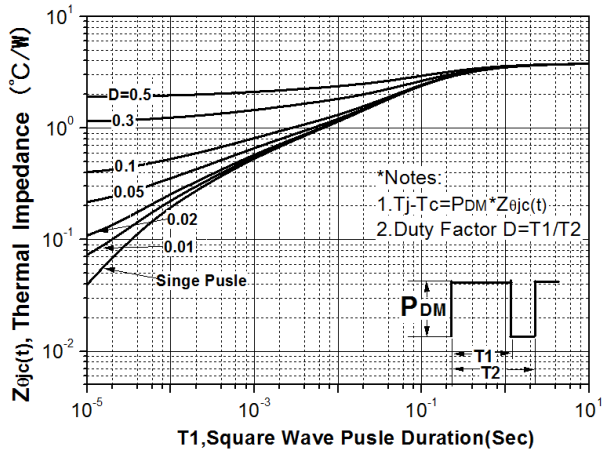
Normalized Maximum Transient Thermal Impedance for IGBT(TO-247)



Normalized Maximum Transient Thermal Impedance for IGBT(TO-263/TO-220C)



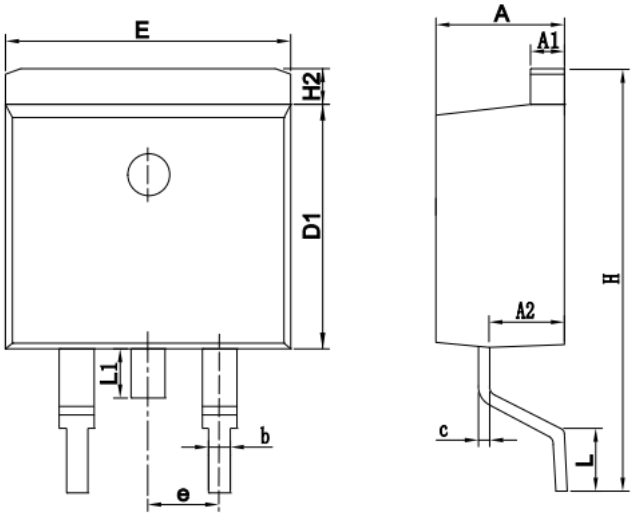
Normalized Maximum Transient Thermal Impedance for IGBT(TO-220MF)



外形尺寸PACKAGE MECHANICAL DATA

TO-263

单位 UNIT:mm

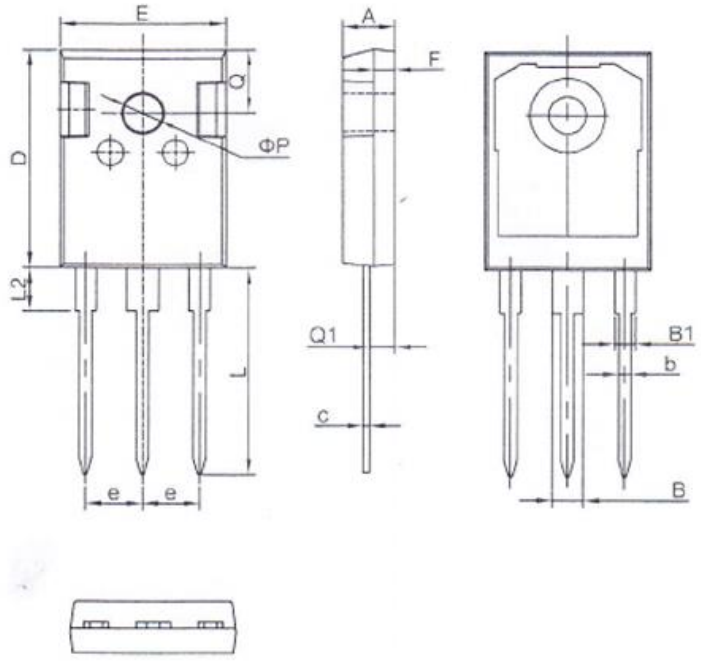


SYMBOL	MM	
	MIN	MAX
A	4.30	4.80
A1	1.12	1.42
A2	2.54	2.84
b	0.67	1.00
c	0.29	0.52
D1	8.40	9.00
E	9.80	10.46
e	2.54BSC	
H	14.00	16.00
H2	1.12	1.45
L	1.50	3.10
L1	1.45	1.70

外形尺寸PACKAGE MECHANICAL DATA

TO-247

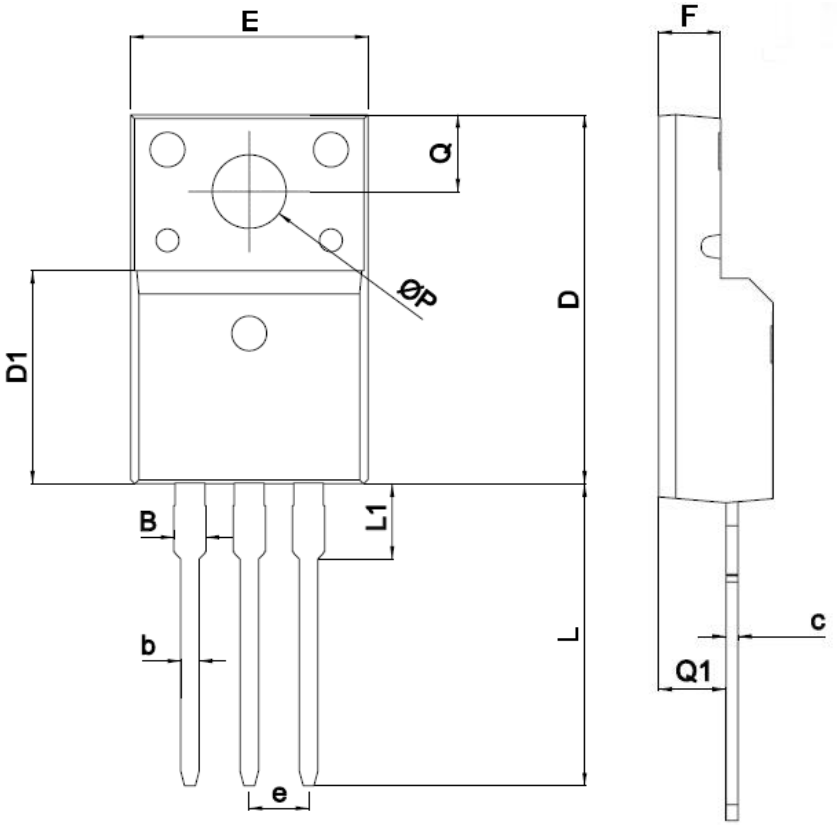
单位 UNIT:mm

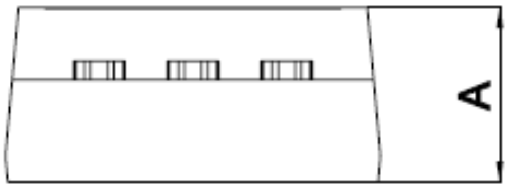


符号 symbol	MIN	MAX
A	4.90	5.10
B	2.95	3.35
B1	1.95	2.35
b	1.15	1.35
c	0.50	0.70
D	20.90	21.10
E	15.70	15.90
e	5.34	5.54
F	1.90	2.10
L	19.40	20.40
L2	4.03	4.23
Q	6.00	6.40
Q1	2.30	2.50
P	3.50	3.70

外形尺寸PACKAGE MECHANICAL DATA

TO-220MF 单位 **UNIT:mm**



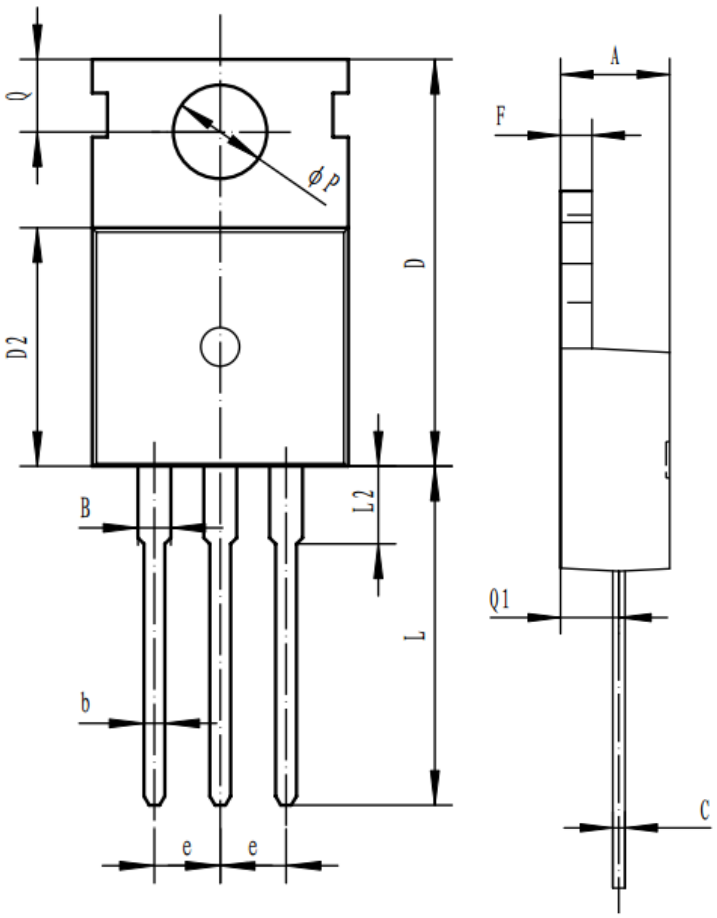


SYMBOL	mm	
	MIN	MAX
A	4.5	4.9
B		1.47
b	0.7	0.9
c	0.45	0.60
D	15.67	16.07
D1	9.04	9.20
e	2.54TYPE	
E	9.96	10.36
F	2.34	2.74
L	12.58	13.38
L1	3.13	3.33
Q	3.2	3.4
Q1	2.56	2.96
ΦP	3.08	3.28

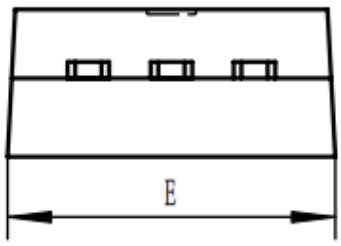
外形尺寸PACKAGE MECHANICAL DATA

TO-220C

单位 UNIT:mm



符号 symbol	MIN	MAX
A	4.30	4.70
B	1.22	1.40
b	0.70	0.95
c	0.40	0.65
D	15.20	16.20
D2	9.00	9.40
E	9.70	10.10
e	2.39	2.69
F	1.25	1.40
L	12.60	13.60
L2	2.80	3.20
Q	2.60	3.00
Q1	2.20	2.60
P	3.50	3.80



注意事项

1.吉林华微电子股份有限公司的产品销售分为直销和销售代理，无论哪种方式，订货时请与公司核实。

2.购买时请认清公司商标，如有疑问请与公司本部联系。

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。

NOTE

1. Jilin Sino-microelectronics co., Ltd sales its product either through direct sales or sales agent , thus, for customers, when ordering , please check with our company.
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.

联系方式

吉林华微电子股份有限公司

公司地址：吉林省吉林市深圳街 99 号

邮编：132013
总机：86-432-64678411
传真：86-432-64665812
网址：www.hwdz.com.cn

市场营销部
地址：吉林省吉林市深圳街 99 号

邮编：132013
电话： 86-432-64675588
64675688
64678411-3098/3099
传真: 86-432-64671533

CONTACT

JILIN SINO-MICROELECTRONICS CO., LTD.

ADD: No.99 Shenzhen Street, Jilin City, Jilin Province, China.
Post Code: 132013
Tel： 86-432-64678411
Fax：86-432-64665812
Web Site：www.hwdz.com.cn

MARKET DEPARTMENT
ADD: No.99 Shenzhen Street, Jilin City, Jilin Province, China.
Post Code: 132013
Tel: 86-432-64675588
64675688
64678411-3098/3099
Fax: 86-432-64671533