



JT010N065SED/CED/FED/WED

主要参数 MAIN CHARACTERISTICS

I_c	10 A
BV_{CES}	650V
$V_{CESAT-typ}$ ($V_{GE}=15V$)	1.5V

用途

- 逆变器
- UPS 电源
- 电机控制

产品特性

- 低栅极电荷
- Trench FS 技术
- RoHS 产品

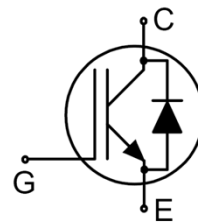
APPLICATIONS

- General purpose inverters
- UPS
- Motor Control

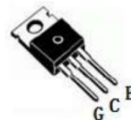
FEATURES

- Low gate charge
- Trench FS Technology
- RoHS product

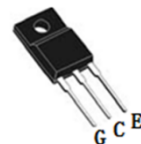
封装 Package



TO-263



TO-220C



TO-220MF



TO-247

订货型号 Order codes		印记 Marking	封装 Package
无卤-条管 None Halogen-Tube	无卤-编带 Halogen-Free-Reel		
JT010N065SED-S-BR	JT010N065SED-S-AR	JT010N065SED	TO-263
JT010N065CED-C-BR	N/A	JT010N065CED	TO-220C
JT010N065FED-F-BR	N/A	JT010N065FED	TO-220MF
JT010N065WED-GE-BR	N/A	JT010N065WED	TO-247

绝对最大额定值 ABSOLUTE RATINGS (T_c=25°C)

项 目 Parameter	符 号 Symbol	数 值 Value			单 位 Unit
		JT010N065SED/ JT010N065CED	JT010N065FED	JT010N065WED	
最高集电极-发射极直流电压 Collector-Emitter Voltage	V _{CES}	650	650	650	V
*连续集电极电流 Collector Current-continuous	I _C	20 (T _C =25°C)	20 (T _C =25°C)	20 (T _C =25°C)	A
		10(T _C =100°C)	10(T _C =100°C)	10(T _C =100°C)	A
最大脉冲集电极极电流 (注1) Collector Current – pulse (note 1)	I _{CM}	40	40	40	A
二极管正向测试电流 Diode RMS forward current	I _F	20(T _C =25°C)	20(T _C =25°C)	20(T _C =25°C)	A
	I _F	10(T _C =100°C)	10(T _C =100°C)	10(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}	40	40	40	A
最高栅极发射极电压 Gate-Emitter Voltage	V _{GES}	±30	±30	±30	V
安全工作区 Turn-off safe area	-	40	40	40	A
耗散功率 Power Dissipation	P _D T _C =25°C	136	37	166	W
存储温度 Storage Temperature Range	T _{STG}	-55~+150	-55~+150	-55~+150	°C
结温 Junction Temperature Range	T _{VJ}	-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.

注 1: 脉冲宽度由最高结温限制。 Note1: The pulse width is limited by the 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}	$I_C=500\mu A, V_{GE}=0V$	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 $25^\circ C$	-	0.5	-	$V/^\circ C$
零栅压下集电极漏电流 Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=650V, V_{GE}=0V,$ $T_C=25^\circ C$	-	-	10	μA
		$V_{CE}=650V, V_{GE}=0V,$ $T_C=175^\circ C$	-	-	2	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	$V_{GE(th)}$	$V_{CE}=V_{GE}, I_C=250\mu A$ $T_C=25^\circ C$	5.5	6	6.5	V
饱和压降 Collector-Emitter saturation Voltage	V_{CESAT}	$V_{GE}=15V, I_C=10A,$ $T_C=25^\circ C$	-	1.5	1.9	V
		$V_{GE}=15V, I_C=10A,$ $T_C=125^\circ C$	-	1.65	2.05	V
		$V_{GE}=15V, I_C=10A,$ $T_C=175^\circ C$	-	1.8	2.2	V
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V,$ $f=1.0MHz, T_C=25^\circ C$	-	800	-	pF
输出电容 Output capacitance	C_{oes}		-	60	-	pF
反向传输电容 Reverse transfer capacitance	C_{res}		-	17	-	pF
栅极电荷总量 Total Gate Charge	Q_g	$V_{CC}=400V, I_C=10A, R_G=1$ $0\Omega, V_{GE}=15V, T_C=25^\circ C$	-	27.4	-	nC
栅极-发射极 Gate to emitter charge	Q_{ge}		-	6.5	-	
栅极-集电极 Gate to collector charge	Q_{gc}		-	11.9	-	
栅极电阻-Gate resistance	R_g	$f=1MHz, open collector$	-	2.1	-	Ω
短路电流-short current	I_{sc}	$V_{GE}=15V, V_{CE}=360V,$ $T_{Jstart} \leq 175^\circ C, t_{sc} \leq 10\mu s$	-	58	-	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	$t_{d(on)}$	$V_{CC}=400V, I_{CC}=10A,$ $R_G=10\Omega, V_{GE}=15V,$ $T_j=25^\circ C$	-	13	-	ns
上升时间 Turn-On rise time	t_r		-	20	-	ns
关断延迟时间 Turn-Off delay time	$t_{d(off)}$		-	47	-	ns
下降时间 Turn-Off Fall time	t_f		-	60	-	ns
开通损耗 Turn-On energy	E_{on}		-	0.35	-	mJ
关断损耗 Turn-Off energy	E_{off}		-	0.1	-	mJ
总开关损耗 Total switching energy	E_{tot}		-	0.45	-	mJ
开启延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{CC}=400V, I_C=10A,$ $R_G=10\Omega, V_{GE}=15V,$ $T_j=175^\circ C$	-	16.0	-	ns
上升时间 Turn-On rise time	t_r		-	20.0	-	ns
关断延迟时间 Turn-Off delay time	$t_{d(off)}$		-	68.0	-	ns
下降时间 Turn-Off Fall time	t_f		-	84.0	-	ns
开通损耗 Turn-On energy	E_{on}		-	0.35	-	mJ
关断损耗 Turn-Off energy	E_{off}		-	0.17	-	mJ
总开关损耗 Total switching energy	E_{tot}		-	0.52	-	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	$V_{GE}=0V, I_F=10A, T_C=25^\circ C$	-	1.75	-	V
		$V_{GE}=0V, I_F=10A, T_C=125^\circ C$	-	1.45	-	V
		$V_{GE}=0V, I_F=10A, T_C=175^\circ C$	-	1.25	-	V
反向恢复时间 Diode Reverse recovery time	t_{rr}	$T_j=25^\circ C, I_F=10A,$ $V_{GE}=0V, d_i/d_t=100A/us$	-	54.6	-	ns
反向恢复电荷 Diode Reverse recovery charge	Q_{rr}		-	34.9	-	nC
反向恢复电流 Diode Reverse recovery Current	I_{rrm}		-	1.13	-	A
反向恢复时间 Diode Reverse recovery time	t_{rr}	$T_j=175^\circ C, I_F=10A,$ $V_{GE}=0V, d_i/d_t=100A/us$	-	80.9	-	ns
反向恢复电荷 Diode Reverse recovery charge	Q_{rr}		-	51.7	-	nC
反向恢复电流 Diode Reverse recovery Current	I_{rrm}		-	1.67	-	A



JT010N065SED CED FED WED

项目 Parameter	符号 Symbol	最大 (max)			单位 Unit
		JT010N065SED/ JT010N065CED	JT010N065FED	JT010N065WED	
结到管壳的热阻 (IGBT) Thermal Resistance, Junction to Case	$R_{th(J-C)}$	1.1	3.1	0.9	°C/W
结到管壳的热阻 (FRD) Thermal Resistance, Junction to Case	$R_{th(J-C)}$	2.2	4.9	2.1	°C/W
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(J-A)}$	62.5	62.5	40	°C/W

注释:

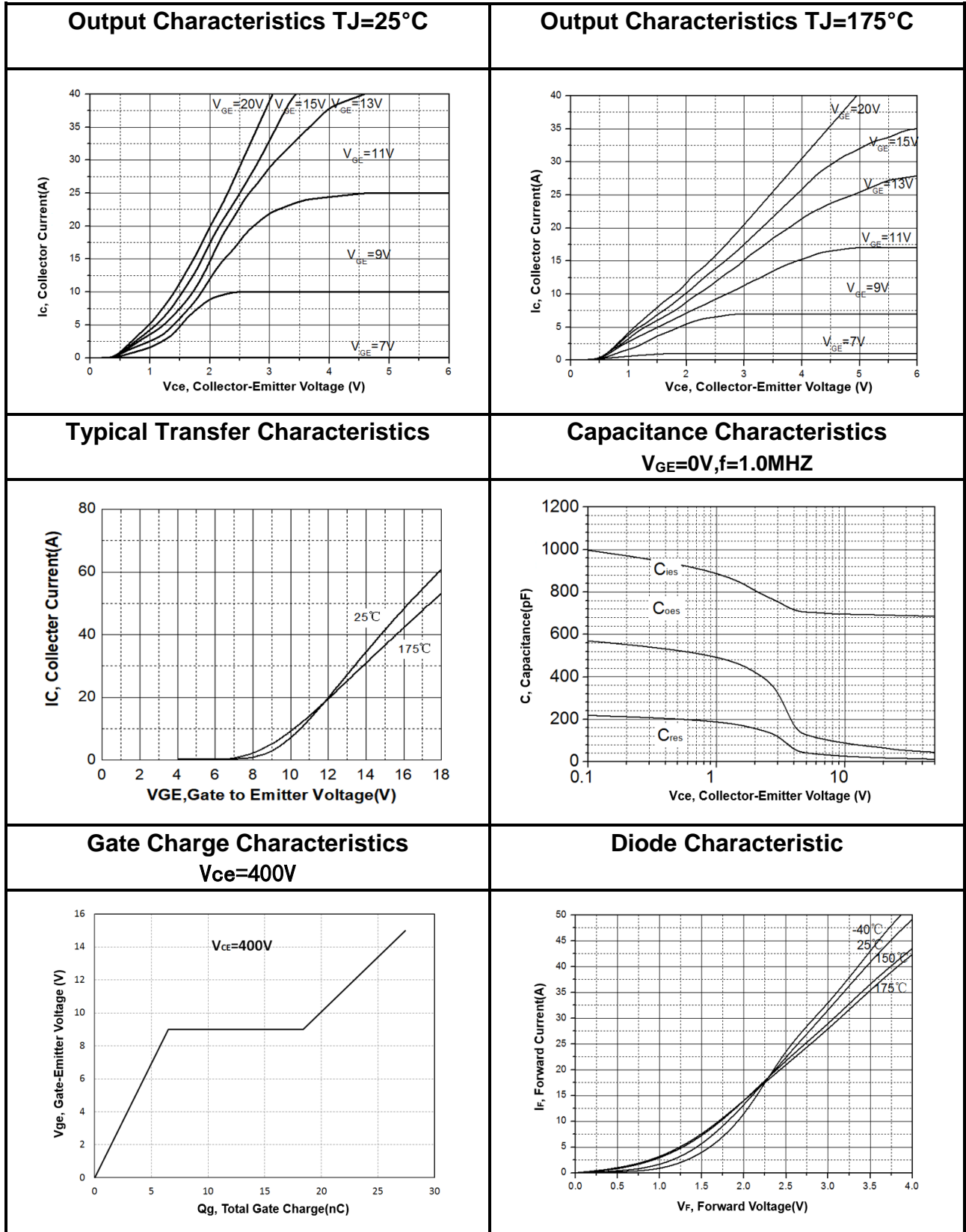
- 1: 脉冲宽度由最高结温限制
- 2: 基本与工作温度无关
- 3: 脉冲测试: 脉冲宽度 $\leq 300\mu s$, 占空比 $\leq 2\%$

Notes:

- 1: Pulse width limited by maximum junction temperature
- 2: Essentially independent of operating temperature
- 3: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

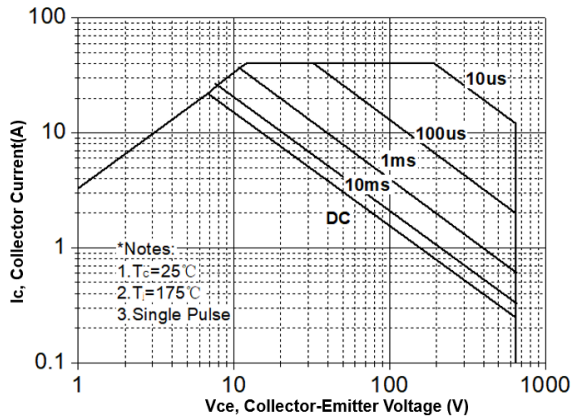


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

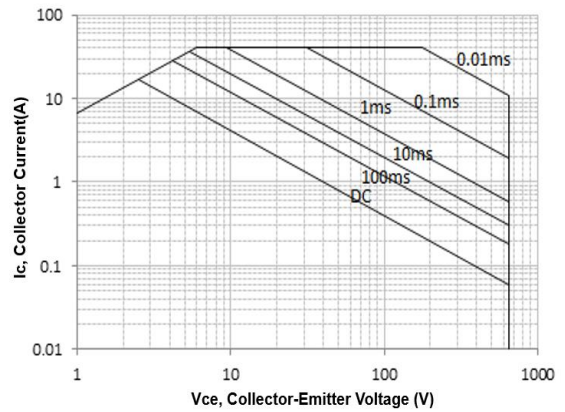




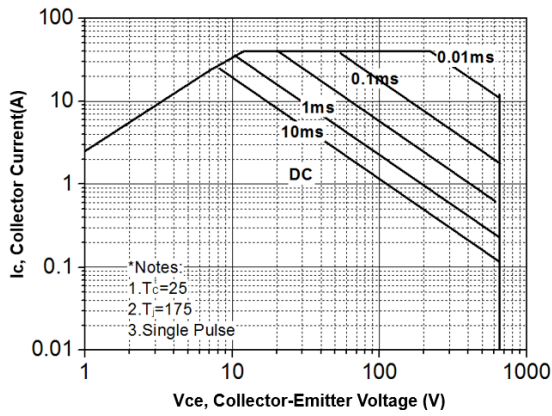
SOA Characteristics For TO-263/TO-220C



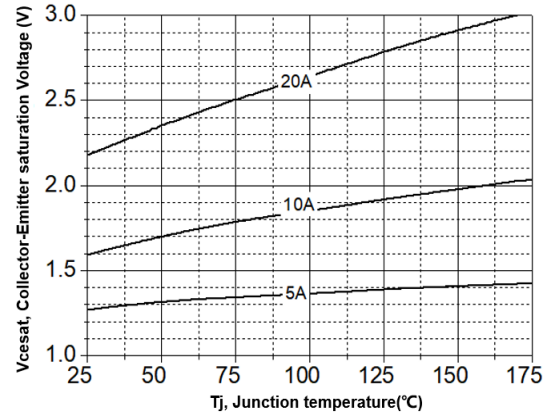
SOA Characteristics For TO-220MF



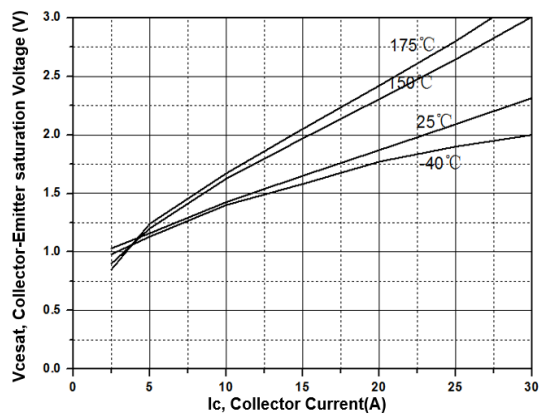
SOA Characteristics For TO-247



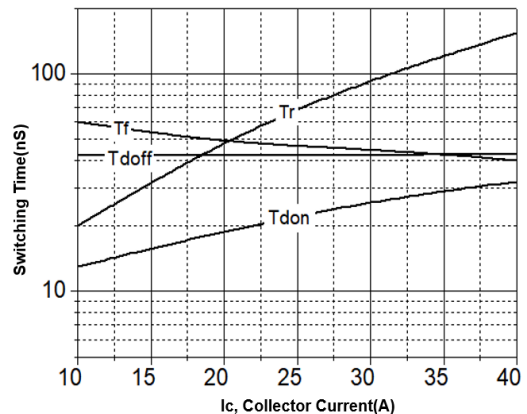
Vcesat vs Tj

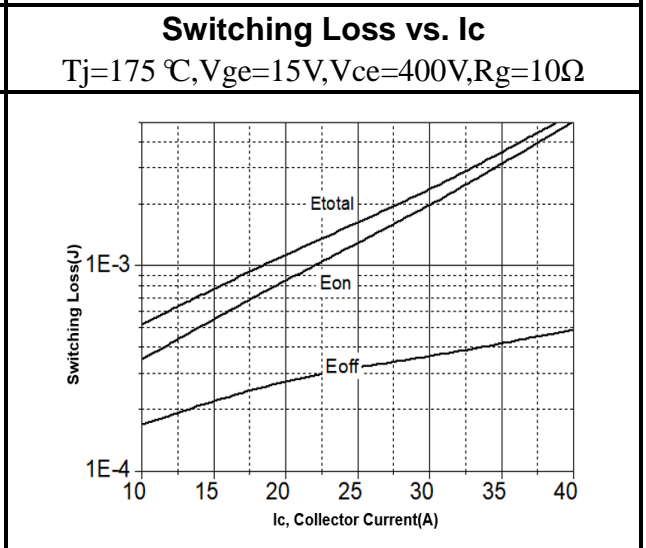
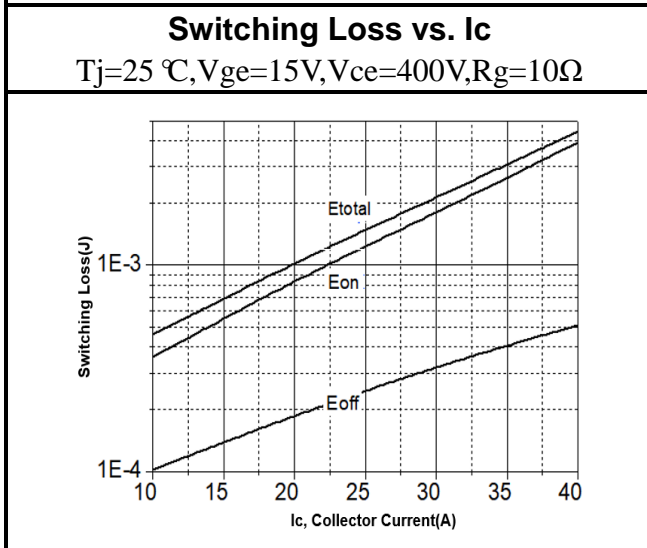
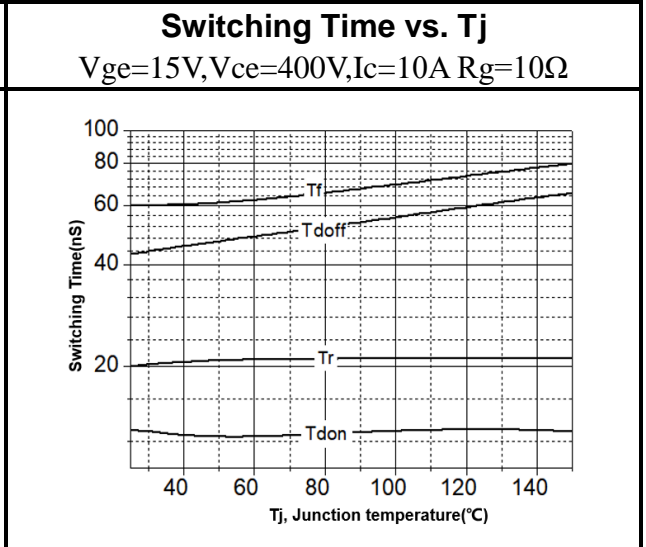
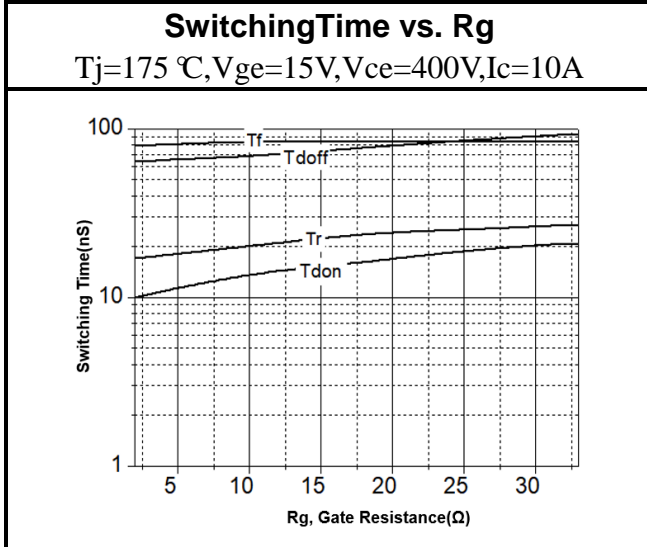
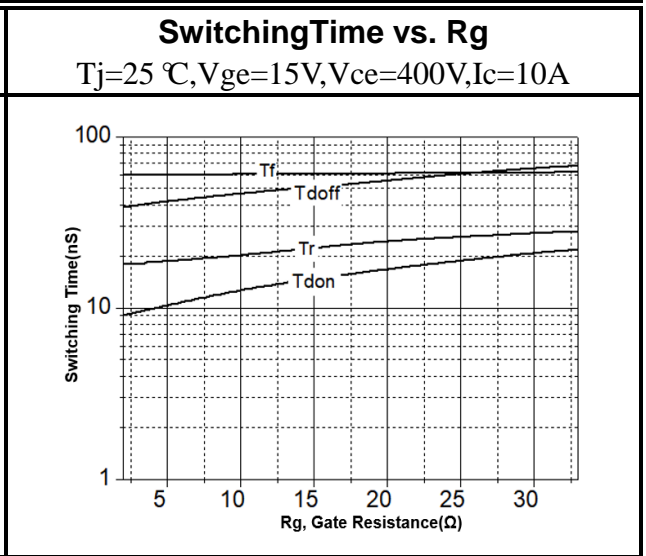
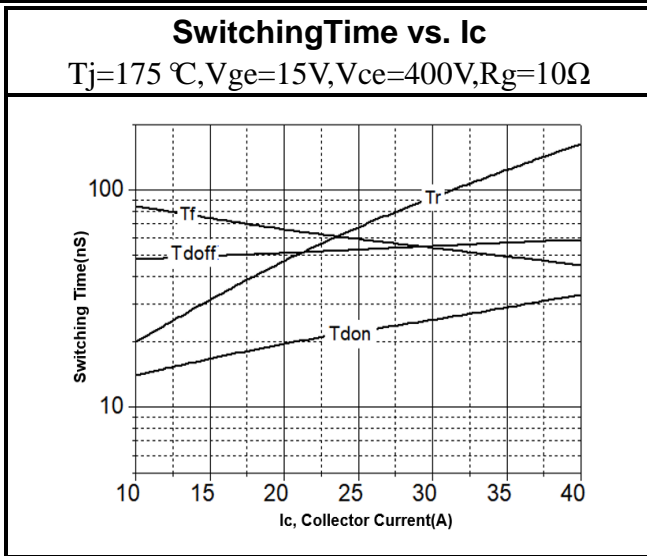


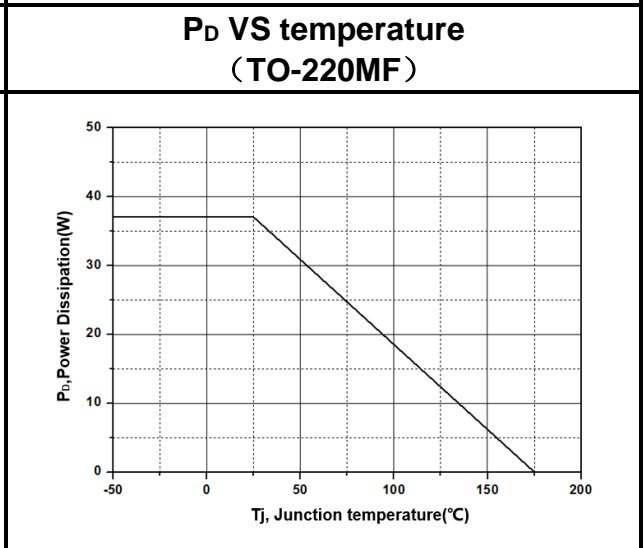
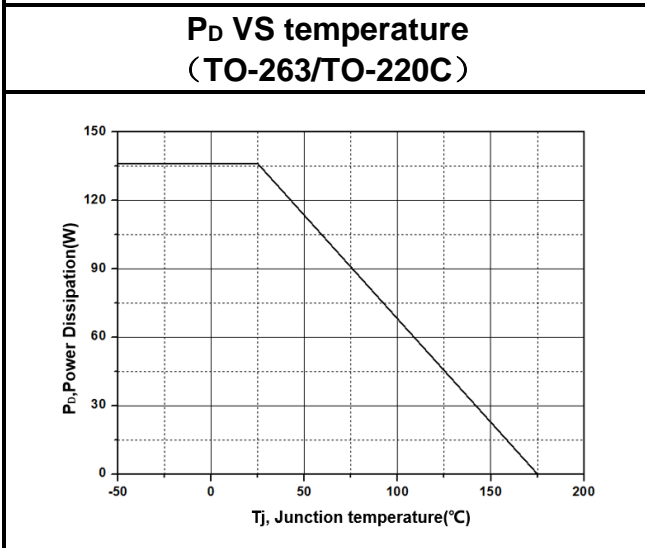
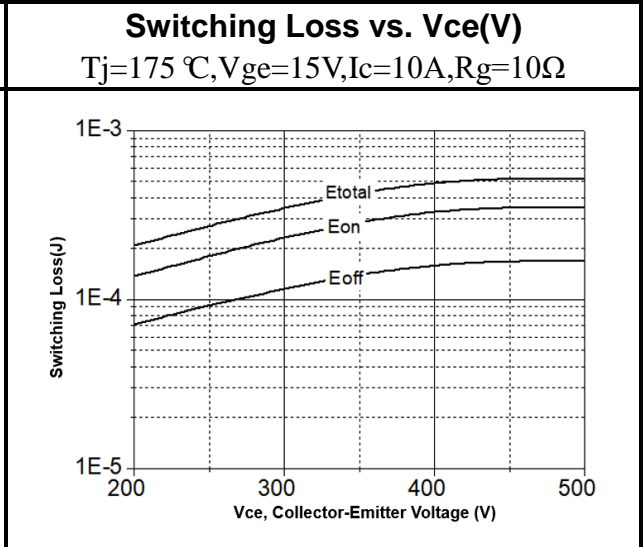
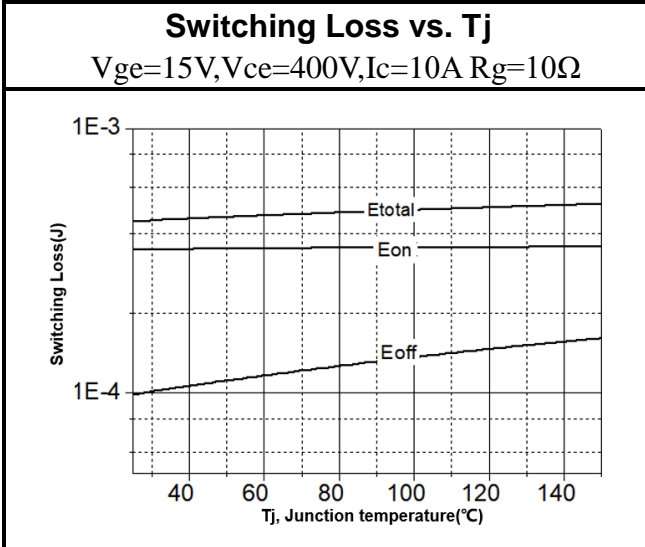
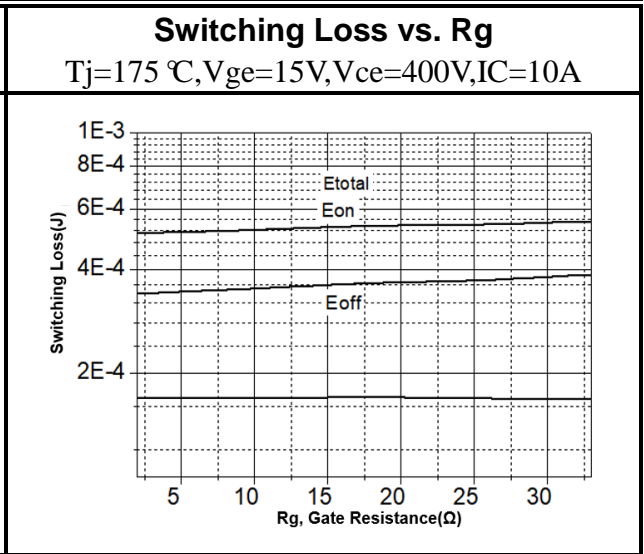
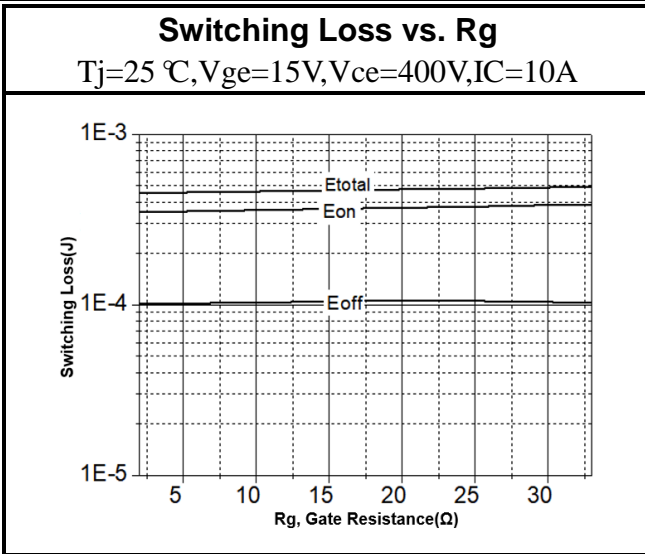
Vcesat vs Ic



Switching Time vs Ic
 $T_j=25^\circ\text{C}, V_{ge}=15\text{V}, V_{CE}=400\text{V}, R_g=10\Omega$

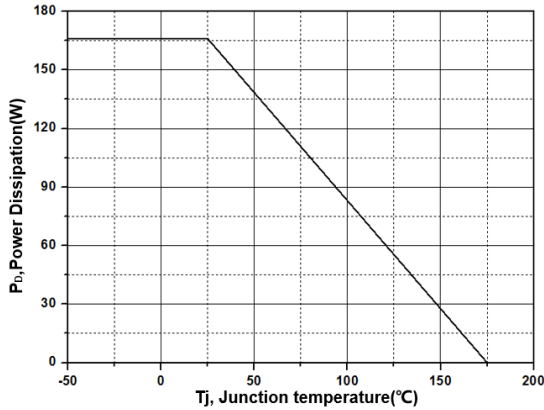




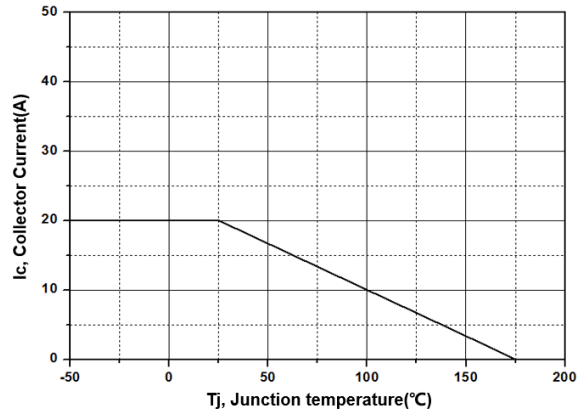




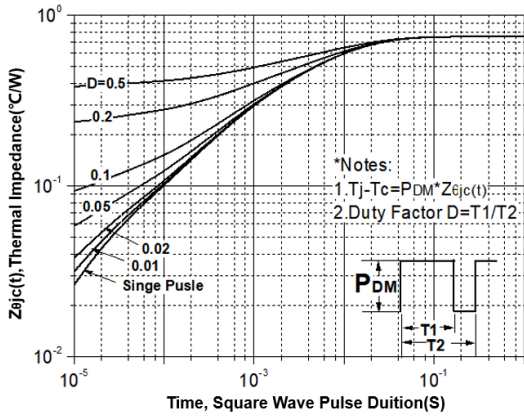
**P_D VS temperature
(TO-247)**



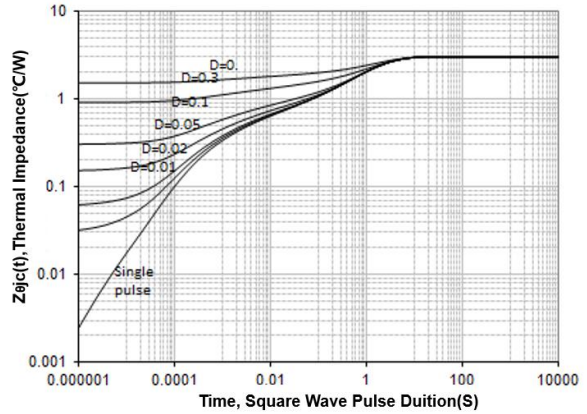
Ic VS temperature



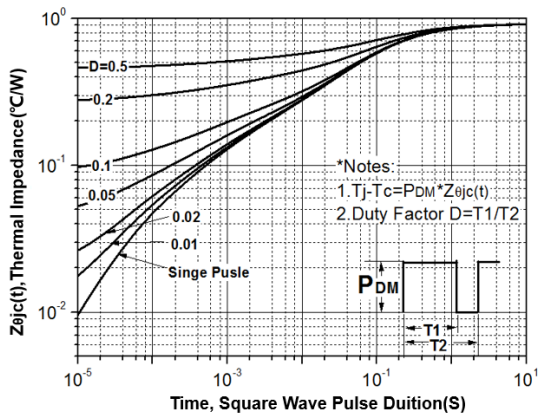
**Normalized Maximum Transient Thermal Impedance for IGBT
(TO-263/TO-220C)**



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



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

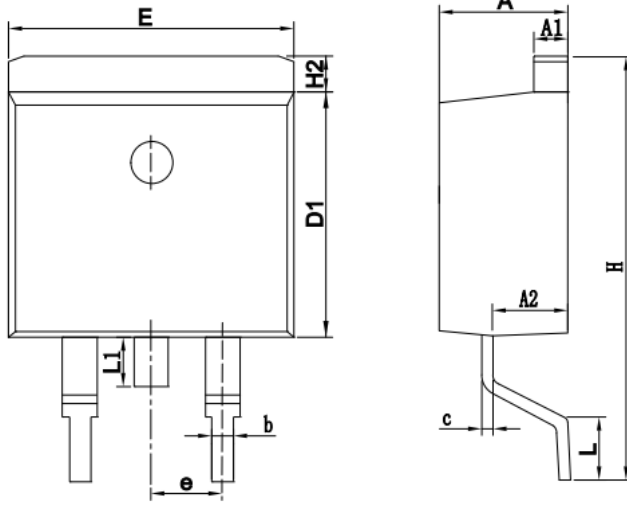




外形尺寸PACKAGE MECHANICAL DATA

TO-263

单位 UNIT:mm



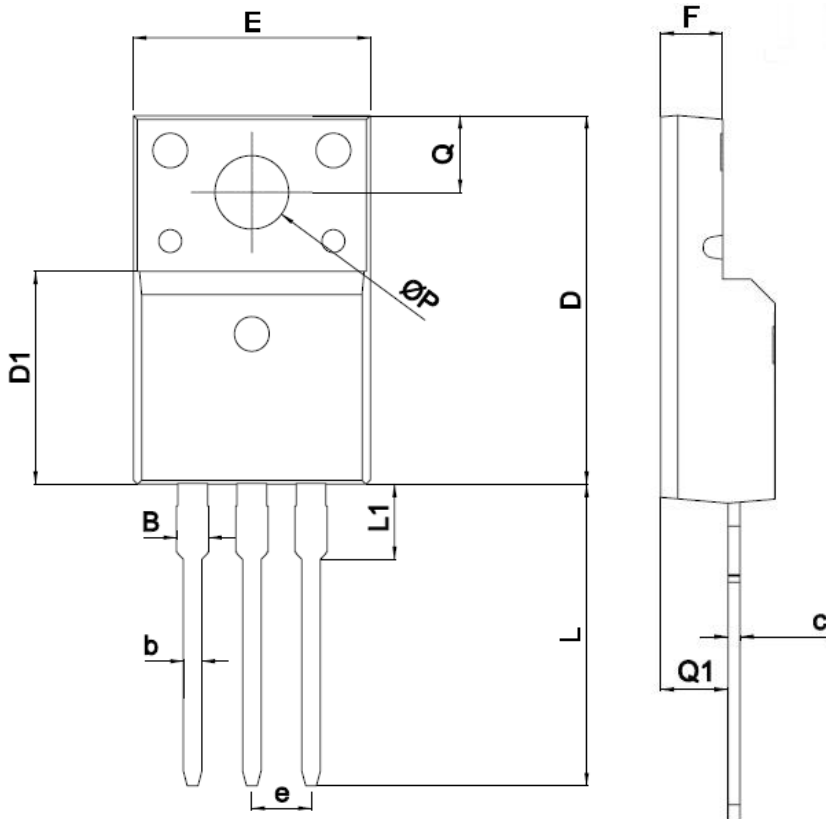
SYMBOL	MIN	MAX
A	4.30	4.80
A1	1.12	1.42
A2	2.54	2.84
b	0.67	1.00
c	0.29	0.52
D1	8.40	9.00
E	9.80	10.46
e	2.54 BSC	
H	14.50	15.50
H2	1.12	1.45
L	1.50	2.80
L1	1.45	1.70



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

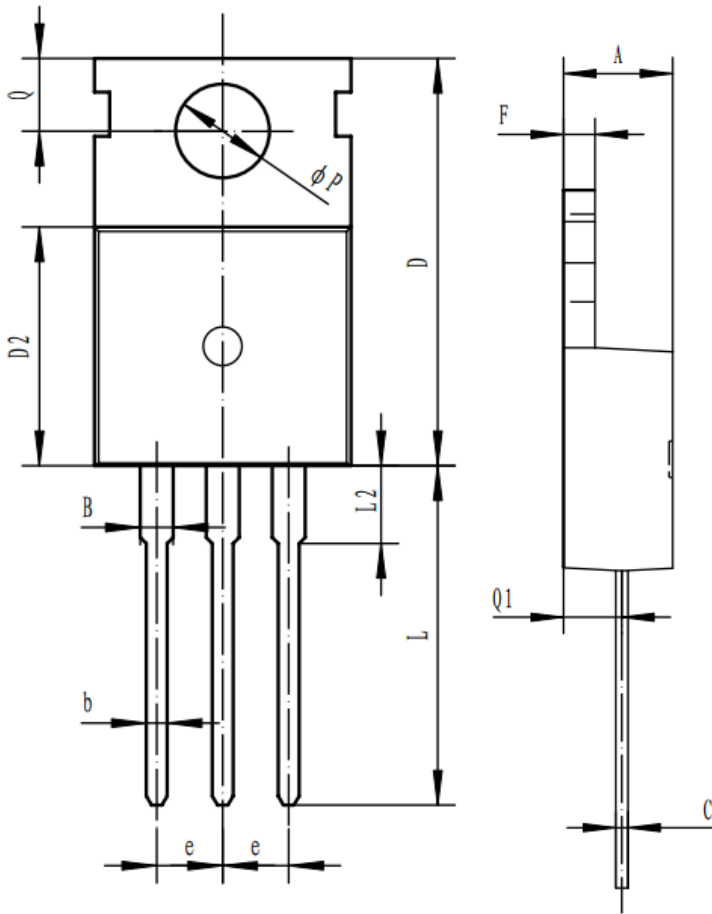




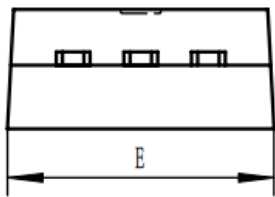
外形尺寸PACKAGE MECHANICAL DATA

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

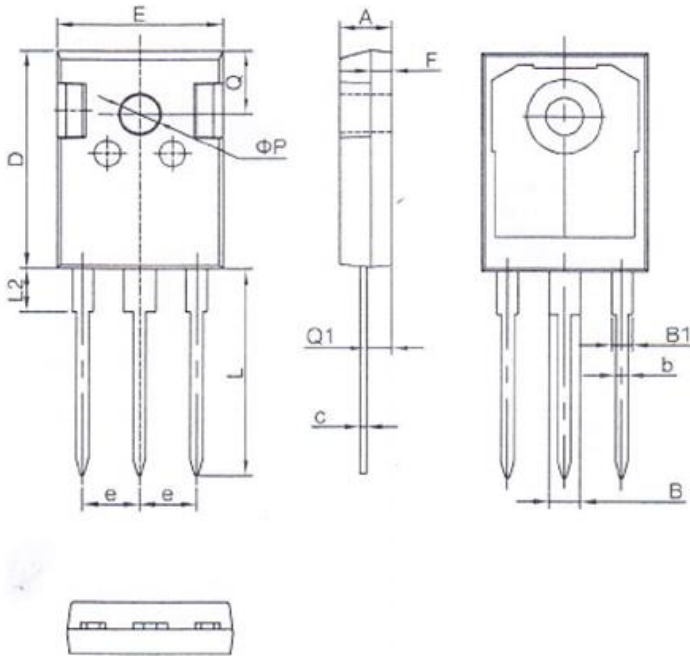




外形尺寸PACKAGE MECHANICAL DATA

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



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