



JT05N065RED/SED/FED/CED

主要参数 MAIN CHARACTERISTICS

I_C	6 A
V_{CE}	650V
$V_{cesat} (V_{ge}=15V)$	1.6V

用途

- 逆变器
- UPS 电源

APPLICATIONS

- General purpose inverters
- UPS

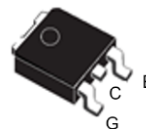
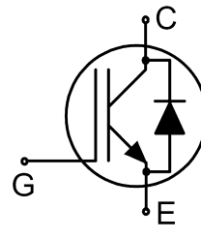
产品特性

- 低栅极电荷
- Trench FS 技术
- 通态压降
- RoHS 产品

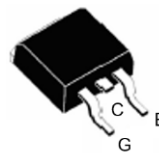
FEATURES

- Low gate charge
- Trench FS Technology
- Saturation voltage
- RoHS product

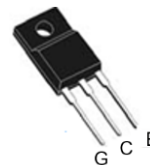
封装 Package



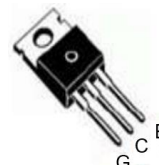
DPAK



TO-263



TO-220MF



TO-220C

订货信息 ORDER MESSAGE

订货型号 Order codes		印记 Marking	封装 Package
无卤-条管 Non halogen-Tube	无卤-编带 Non halogen-Reel		
JT05N065RED-R-BR	JT05N065RED-R-AR	JT05N065RED	DPAK
JT05N065SED-S-BR	JT05N065SED-S-AR	JT05N065SED	TO-263
JT05N065FED-F-BR	N/A	JT05N065FED	TO-220MF
JT05N065CED-C-BR	N/A	JT05N065CED	TO-220C



绝对最大额定值 ABSOLUTE RATINGS ($T_C=25^\circ\text{C}$)

项 目 Parameter	符 号 Symbol	数 值 Value			单 位 Unit
		JT05N065RED	JT05N065SED /CED	JT05N065FED	
最高集电极—发射极直流 电压 Collector-Emitter Voltage	V_{CE}	650	650	650	V
*连续集电极电流 Collector Current-continuous	I_C $T=25^\circ\text{C}$ $T=100^\circ\text{C}$	12	12	12	A
		6	6	6	A
最大脉冲集电极极电流(注 1) Collector Current – pulse (note 1)	I_{CM}	20	20	20	A
最高栅极发射极电压 Gate-Emitter Voltage	V_{GE}	± 30	± 30	± 30	V
安全工作区 Turn-off safe area	-	20	20	20	A
耗散功率 Power Dissipation	P_D $T_C=25^\circ\text{C}$	56.8	96.2	25	W
最高结温及存储温度 Operating and Storage Temperature Range	T_{VJ} , T_{STG}	-55~+150	-55~+150	-55~+150	$^\circ\text{C}$
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T_L	300	300	300	$^\circ\text{C}$

*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-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°C	-	0.5	-	V/°C
零栅压下集电极漏电流 Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=650V, V_{GE}=0V, T_C=25^\circ C$	-	-	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	$V_{GE(th)}$	$V_{CE} = V_{GE}, I_C=250\mu A$	4.5	-	6.5	V
饱和压降 Collector-Emitter saturation Voltage	V_{CESAT}	$V_{GE}=15V, I_C=5A, T_C=25^\circ C$	-	1.5	1.8	V
		$V_{GE}=15V, I_C=6A, T_C=25^\circ C$	-	1.6	1.9	V
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C_{ies}	$V_{CE}=25V,$ $V_{GE}=0V,$	-	259	-	pF
输出电容 Output capacitance	C_{oes}	$f=1.0MHz$	-	31.3	-	pF
反向传输电容 Reverse transfer capacitance	C_{res}		-	10.3	-	pF
栅极电荷总量-Total Gate Charge	Q_g		-	13.7	-	nC
栅极-发射极电荷 Gate to emitter charge	Q_{ge}		-	2.3	-	
栅极-集电极电荷 Gate to collector charge	Q_{gc}	$V_{CC}=480V, I_C=5A, V_{GE}=15V$ $T_C=25^\circ C$ (note 2)	-	5.8	-	
栅极电荷总量-Total Gate Charge	Q_g		-	16.8	-	nC
栅极-发射极电荷 Gate to emitter charge	Q_{ge}		-	6.3	-	
栅极-集电极电荷 Gate to collector charge	Q_{gc}	$V_{CC}=480V, I_C=6A, V_{GE}=15V$ $T_C=25^\circ C$ (note 2)	-	2.8	-	
栅极电阻-Gate resistance	R_g	$f=1 MHz$, open collector	-	2.0	-	Ω
短路电流-Short current	I_{sc}	$V_{GE}=15V, V_{CE}=360V$ $T_{Jstart} \leq 150^\circ C, t_{sc} \leq 10\mu s$	-	40	-	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	$t_{d(on)}$	$V_{CC}=400V, I_c=5A, R_G=60\Omega$ $V_{GE}=15V$ $T_j=25^\circ C$ (note 3)	-	22	-	ns
上升时间 Turn-On rise time	t_r		-	15	-	ns
关断延迟时间 Turn-Off delay time	$t_{d(off)}$		-	104	-	ns
下降时间 Turn-Off Fall time	t_f		-	32	-	ns
开通损耗 Turn-On energy	Eon		-	132	-	μJ
关断损耗 Turn-off energy	Eoff		-	65	-	μJ
总开关损耗 Total switching energy	Etot		-	197	-	μJ
开启延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{CC}=400V, I_c=6A, R_G=60\Omega$ $V_{GE}=15V$ $T_j=25^\circ C$ (note 3)	-	23	-	ns
上升时间 Turn-On rise time	t_r		-	17	-	ns
关断延迟时间 Turn-Off delay time	$t_{d(off)}$		-	101	-	ns
下降时间 Turn-Off Fall time	t_f		-	31	-	ns
开通损耗 Turn-On energy	Eon		-	140	-	μJ
关断损耗 Turn-off energy	Eoff		-	69	-	μJ
总开关损耗 Total switching energy	Etot		-	209	-	μJ
开启延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{CC}=400V, I_c=5A, R_G=60\Omega$ $V_{GE}=15V$ $T_j=150^\circ C$ (note 3)	-	25	-	ns
上升时间 Turn-On rise time	t_r		-	19	-	ns
关断延迟时间 Turn-Off delay time	$t_{d(off)}$		-	110	-	ns
下降时间 Turn-Off Fall time	t_f		-	35	-	ns
开通损耗 Turn-On energy	Eon		-	145	-	μJ
关断损耗 Turn-off energy	Eoff		-	73	-	μJ
总开关损耗 Total switching energy	Etot		-	218	-	μJ
开启延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{CC}=400V, I_c=6A, R_G=60\Omega$ $V_{GE}=15V$ $T_j=150^\circ C$ (note 3)	-	27	-	ns
上升时间 Turn-On rise time	t_r		-	23	-	ns
关断延迟时间 Turn-Off delay time	$t_{d(off)}$		-	107	-	ns
下降时间 Turn-Off Fall time	t_f		-	34	-	ns
开通损耗 Turn-On energy	Eon		-	149	-	μJ
关断损耗 Turn-off energy	Eoff		-	78	-	μJ
总开关损耗 Total switching energy	Etot		-	227	-	μJ



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	$V_{GE}=0V, I_F=2.5A, T_j=25^\circ C$	-	1.5	1.8	V
正向压降 Diode Forward Voltage	V_F	$V_{GE}=0V, I_F=3.0A, T_j=25^\circ C$	-	1.6	1.9	V
反向恢复时间 Diode Reverse recovery time	t_{rr}	$V_{GE}=0V, V_R=400V, I_F=5A$ $di_F/dt=200A/\mu s, T_j=25^\circ C$	-	70	-	ns
反向恢复电荷 Diode Reverse recovery charge	Q_{rr}		-	145	-	nC
反向恢复电流 Diode Reverse recovery Current	I_{rrm}		-	4.0	-	A
反向恢复时间 Diode Reverse recovery time	t_{rr}	$V_{GE}=0V, V_R=400V, I_F=6A$ $di_F/dt=200A/\mu s$	-	76	-	ns
反向恢复电荷 Diode Reverse recovery charge	Q_{rr}		-	156	-	nC
反向恢复电流 Diode Reverse recovery Current	I_{rrm}		-	4.4	-	A

项 目 Parameter	符 号 Symbol	最大值 MAX			单 位 Unit
		JT05N065RED	JT05N065SED/CED	JT05N065FED	
结到管壳的热阻-IGBT Thermal Resistance, Junction to Case	$R_{th(j-c)}$	2.2	1.8	5	$^\circ C/W$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	110	62	65	$^\circ C/W$

注释:

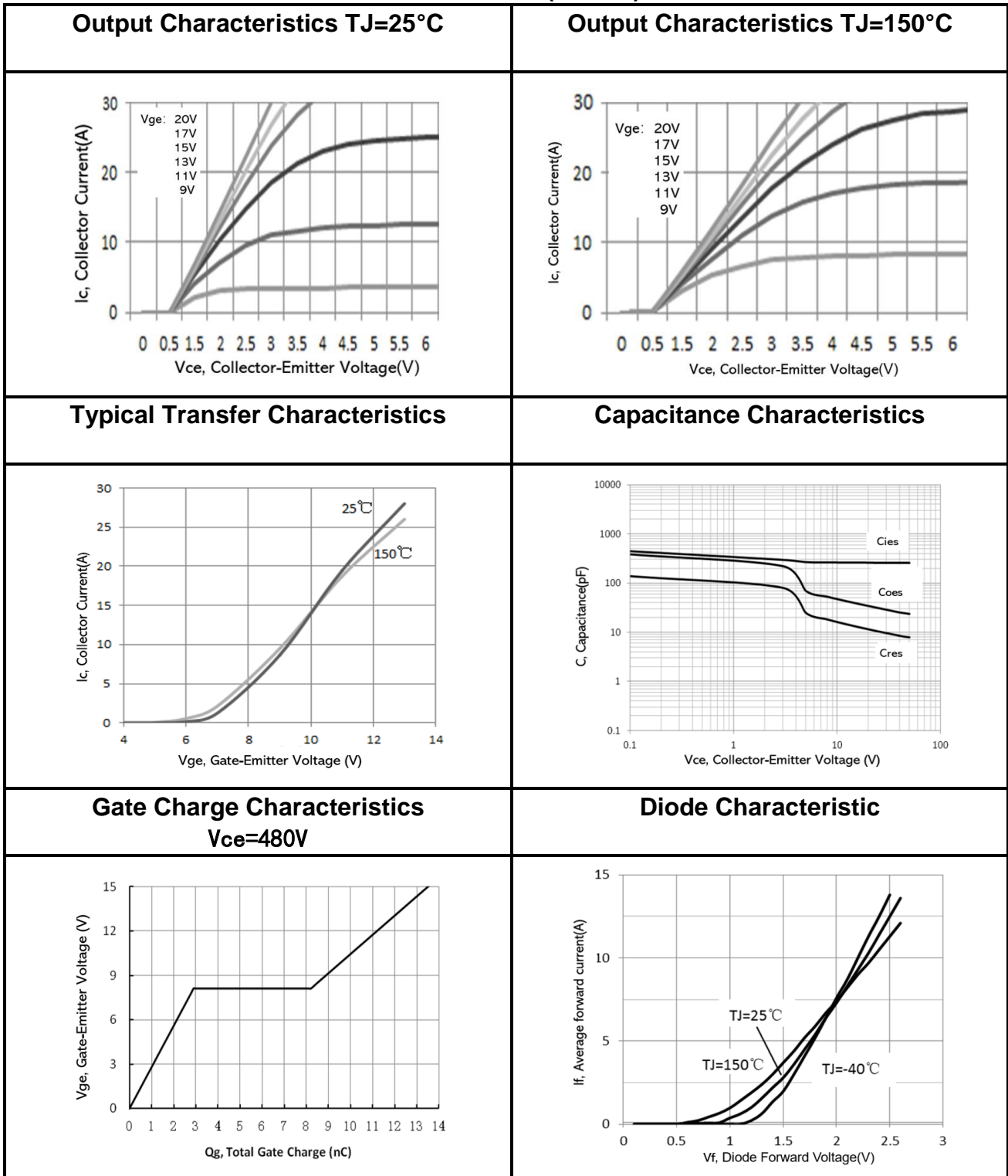
- 1: 脉冲宽度由最高结温限制
- 2: 基本与工作温度无关
- 3: 脉冲测试: 脉冲宽度 $\leq 300\mu s$, 占空比 $\leq 2\%$

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 Cycles $\leq 2\%$

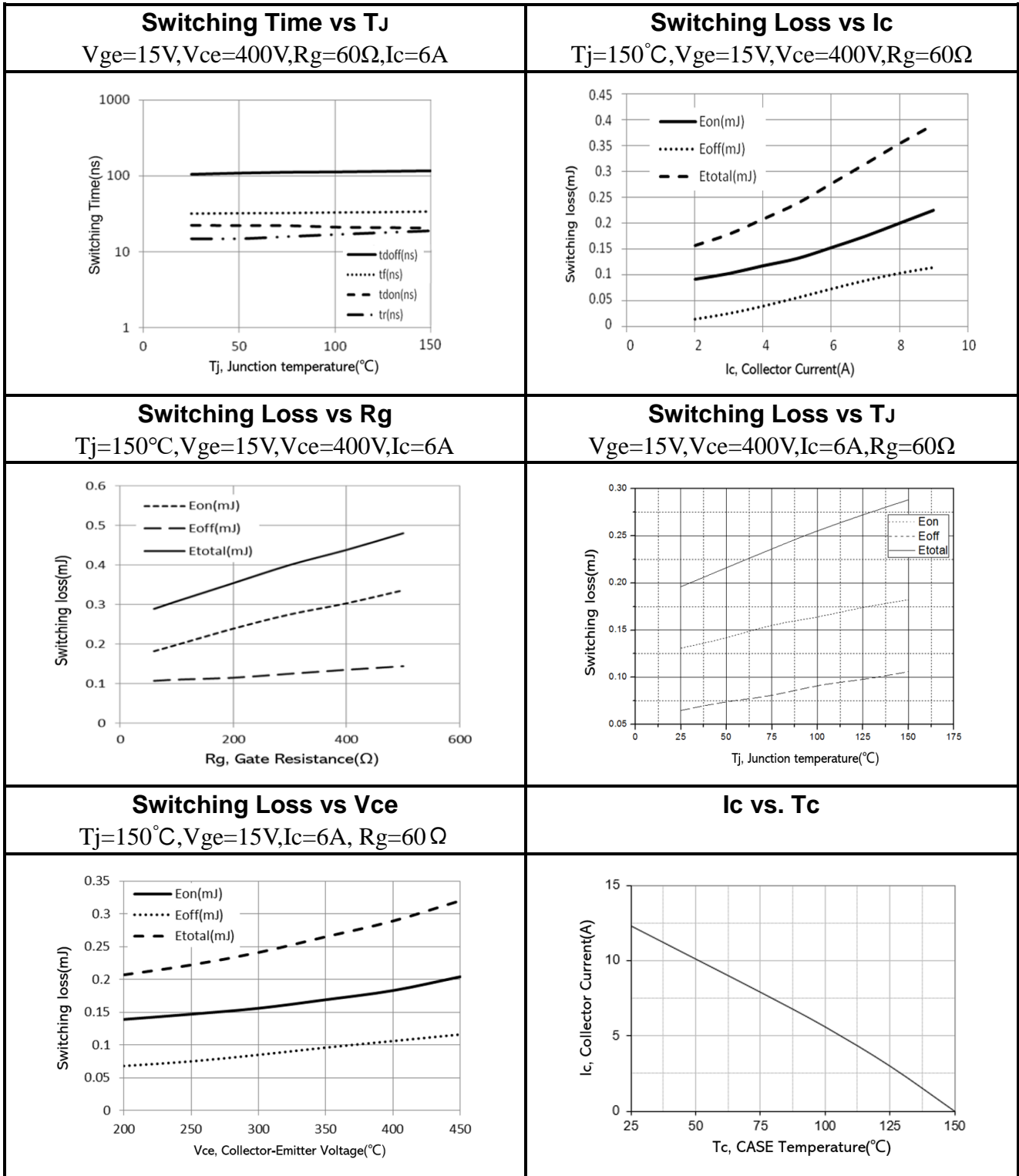


特征曲线 ELECTRICAL CHARACTERISTICS (curves)



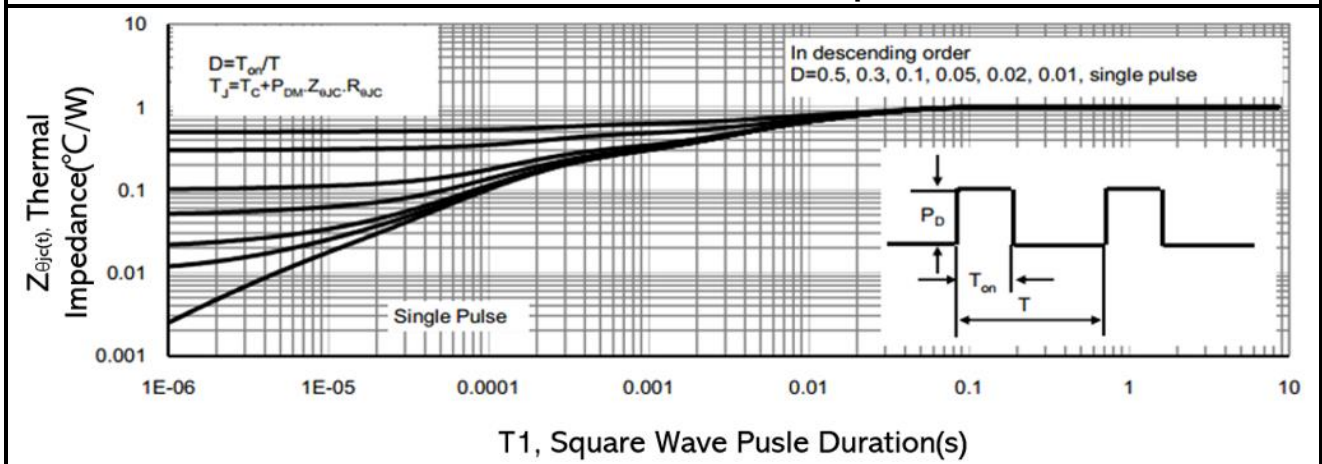


<p>SOA Characteristics For DPAK</p>	<p>SOA Characteristics For TO-263</p>
<p>SOA Characteristics For TO-220MF</p>	<p>Vcesat vs Tj</p>
<p>Switching Time vs Ic Tj=150°C, Vge=15V, Vce=400V, Rg=60Ω</p>	<p>Switching Time vs Rg Tj=150°C, Vge=15V, Vce=400V, Ic=6A</p>

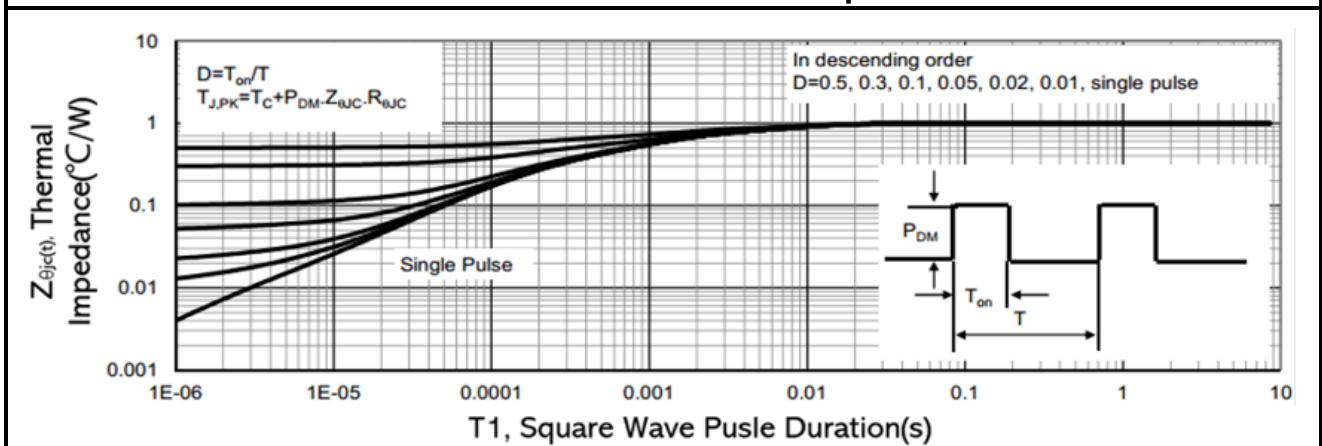




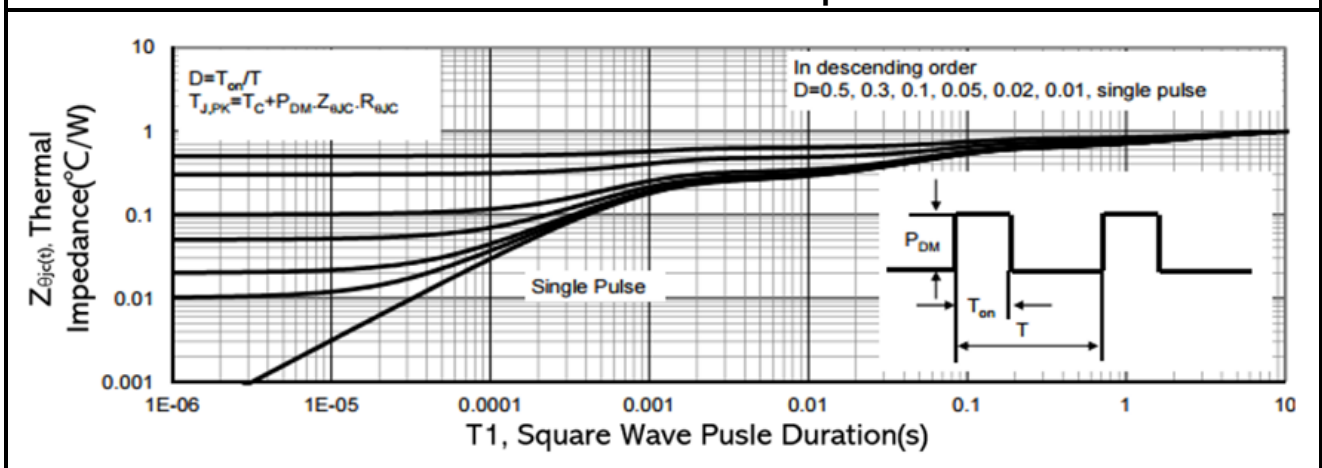
Normalized Maximum Transient Thermal Impedance for DPAK



Normalized Maximum Transient Thermal Impedance for TO-263



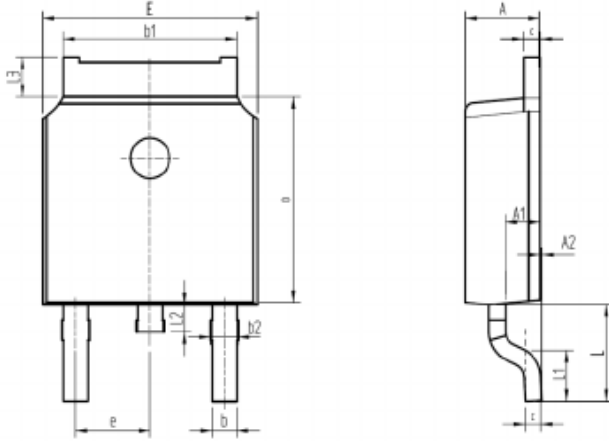
Normalized Maximum Transient Thermal Impedance for TO-220MF



外形尺寸 PACKAGE MECHANICAL DATA

DPAK

单位 Unit: mm

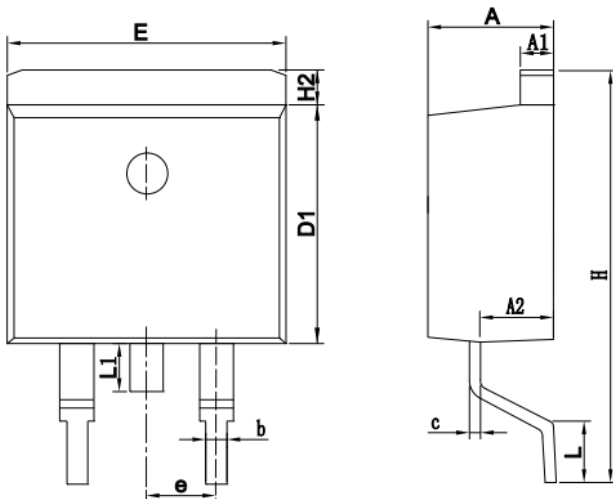


SYMBOL	mm	
	MIN	MAX
A	2.16	2.41
A1	0.97	1.17
A2	0.00	0.15
b	0.63	0.93
b1	5.13	5.53
b2	0.66	0.96
c	0.40	0.60
D	5.80	6.40
E	6.30	6.90
e	2.286BSC	
L	2.50	3.30
L1	1.20	1.80
L2	0.60	1.00
L3	0.85	1.30

外形尺寸 PACKAGE MECHANICAL DATA

TO-263

单位 Unit: mm

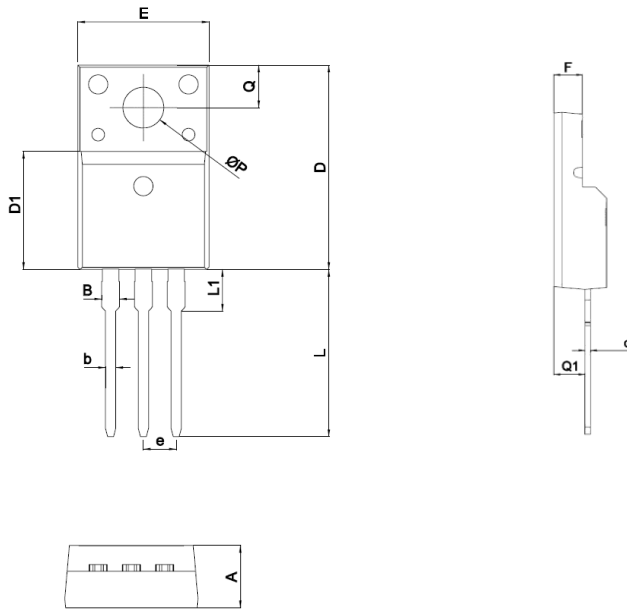


SYMBOL	MM	
	MIN	MAX
A	4.30	4.80
A1	1.12	1.42
A2	2.54	2.84
b	0.67	1.00
c	0.29	0.52
D1	8.40	9.00
E	9.80	10.46
e	2.54BSC	
H	14.00	16.00
H2	1.12	1.45
L	1.50	3.10
L1	1.45	1.70



TO-220MF

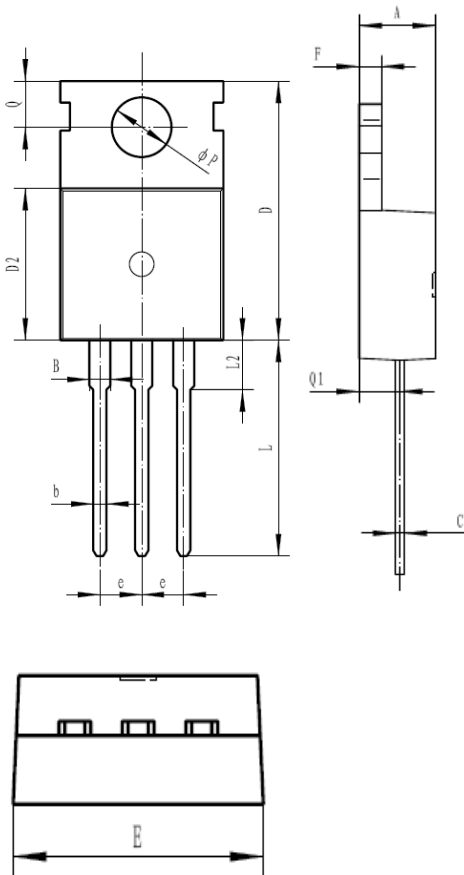
单位 Unit: mm



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

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



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3. Please do not exceed the absolute maximum ratings of the device when circuit designing.
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