



JT050N065WED

主要参数 MAIN CHARACTERISTICS

I _c	50 A
V _{CEs}	650V
V _{cesat-typ} (V _{ge} =15V)	1.6V

用途

- 逆变器
- UPS 电源
- 电机控制

APPLICATIONS

- General purpose inverters
- UPS
- Motor control

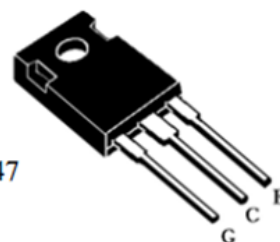
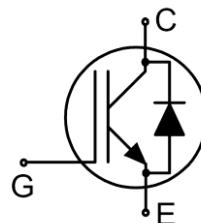
产品特性

- 低栅极电荷
- Trench FS 技术
- RoHS 产品

FEATURES

- Low gate charge
- Trench FS Technology
- RoHS product

封装 Package



TO-247

订货信息 ORDER MESSAGE

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	有卤-编带 Halogen-Reel	无卤-编带 Halogen-Free-Reel		
JT050N065WED-GE-B	JT050N065WED-GE-BR	N/A	N/A	JT050N065WED	TO-247



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
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	$I_c \quad T=25^\circ\text{C}$	100	A
	$I_c \quad T=100^\circ\text{C}$	50	A
最大脉冲集电极极电流 (注 1) Collector Current – pulse (note 1)	I_{CM}	200	A
二极管正向电流 Diode forward current	$I_F \quad T=25^\circ\text{C}$	100	A
	$I_F \quad T=100^\circ\text{C}$	50	A
二极管正向脉冲电流 Diode pulse current	I_{FSM}	200	A
最高栅极发射极电压 Gate-Emmitter Voltage	V_{GES}	± 20	V
瞬态栅极发射极电压 Transient Gate-emitter voltage($t_p \leq 10\mu\text{s}$, $D < 0.010$)	V_{GES}	± 30	V
安全工作区 Turn-off safe area	-	200	A
耗散功率 Power Dissipation	$P_D \quad T_c=25^\circ\text{C}$	437	W
工作结温 Operating Junction Temperature Range	T_{VJ}	$-40 \sim +175$	$^\circ\text{C}$
存储温度 Storage Temperature	T_{STG}	$-55 \sim +150$	$^\circ\text{C}$
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T_L	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

注释:

1: 脉冲宽度由最高结温限制

Notes:

1: Pulse width 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}	$I_C=250\mu A, V_{GE}=0V$	650	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{CES}/\Delta T_J$	$I_C=0.5mA$, referenced to $25^\circ C$	-	0.6	-	$V/^\circ C$
零栅压下集电极漏电流 Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=650V, V_{GE}=0V, T_C=25^\circ C$	-	-	40	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-Emmitter saturation Voltage	V_{CESAT}	$V_{GE}=15V, I_C=50A, T_C=25^\circ C$	-	1.6	2.2	V
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V, f=1.0MHz$	-	3435	-	pF
输出电容 Output capacitance	C_{oes}		-	283	-	pF
反向传输电容 Reverse transfer capacitance	C_{res}		-	79.8	-	pF
栅极电荷总量 Total Gate Charge	Q_g	$V_{CC}=520V, I_C=50A, V_{GE}=15V, T_C=25^\circ C$	-	121.0	-	nC
栅极-反射极 Gate to emitter charge	Q_{ge}		-	31.6	-	
栅极-集电极 Gate to collector charge	Q_{gc}		-	51.3	-	
栅极电阻-Gate resistance	R_g	$f=1MHz$, open collector	-	2.0	-	Ω
短路电流-short current	I_{sc}	$V_{GE}=15V, V_{CE}=300V, t_{sc}\leq 10\mu s$	-	255	-	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	$t_{d(on)}$	$V_{CC}=400V, I_c=50A, R_G=10\Omega$ $V_{GE}=15V$, Parasitic ductance=75nH $T_C=25^\circ C$	-	35	-	ns
上升时间 Turn-On rise time	t_r		-	100	-	ns
关断延迟时间 Turn-Off delay time	$t_{d(off)}$		-	134	-	ns
下降时间 Turn-Off Fall time	t_f		-	75	-	ns
开通损耗 Turn-On energy	Eon		-	1.55	-	mJ
关断损耗 Turn-off energy	Eoff		-	1.15	-	mJ
总开关损耗 Total switching energy	Etot		-	2.7	-	mJ
开启延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{CC}=400V, I_c=50A, R_G=10\Omega$ $V_{GE}=15V$, Parasitic ductance=75nH $T_C=175^\circ C$	-	32	-	ns
上升时间 Turn-On rise time	t_r		-	93	-	ns
关断延迟时间 Turn-Off delay time	$t_{d(off)}$		-	161	-	ns
下降时间 Turn-Off Fall time	t_f		-	159	-	ns
开通损耗 Turn-On energy	Eon		-	1.58	-	mJ
关断损耗 Turn-off energy	Eoff		-	1.8	-	mJ
总开关损耗 Total switching energy	Etot		-	3.38	-	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	$V_{GE}=0V, I_F=50A, T_C=25^\circ C$	-	1.95	2.4	V
		$V_{GE}=0V, I_F=50A, T_C=175^\circ C$	-	1.75	-	V
反向恢复时间 Diode Reverse recovery time	t_{rr}	$V_{GE}=0V, V_R=400V, I_F=50A$ $dl_F/dt=200A/\mu s$ $T_C=25^\circ C$	-	20.2	-	ns
反向恢复电荷 Diode Reverse recovery charge	Qrr		-	13.9	-	nC
反向恢复电流 Diode Reverse recovery Current	I_{RRM}		-	1.26	-	A
反向恢复时间 Diode Reverse recovery time	t_{rr}		$V_{GE}=0V, V_R=400V, I_F=50A$ $dl_F/dt=200A/\mu s$ $T_C=175^\circ C$	-	128	-
反向恢复电荷 Diode Reverse recovery charge	Qrr	-		380	-	nC
反向恢复电流 Diode Reverse recovery Current	I_{RRM}	-		5.94	-	A

电特性 ELECTRICAL CHARACTERISTICS

项 目 Parameter	符 号 Symbol	MAX	单 位 Unit
结到管壳的热阻 Junction to Case IGBT	$R_{th(j-c)}$	0.343	$^\circ C/W$
结到管壳的热阻 Junction to Case diode	$R_{th(j-c)}$	0.47	$^\circ C/W$
结到环境的热阻 Junction to Ambient	$R_{th(j-A)}$	40	$^\circ C/W$

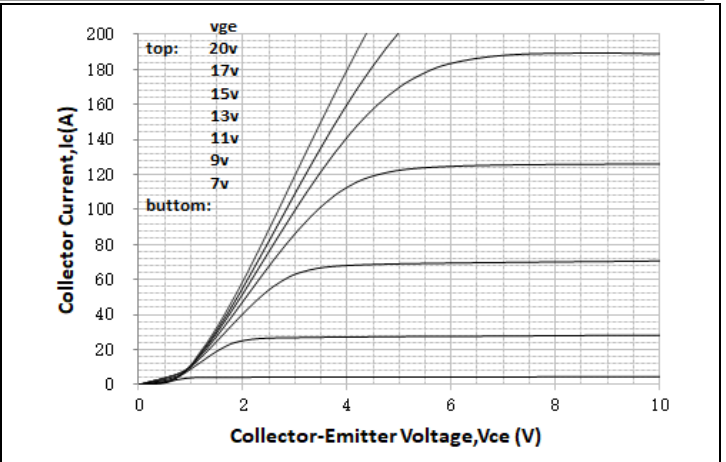
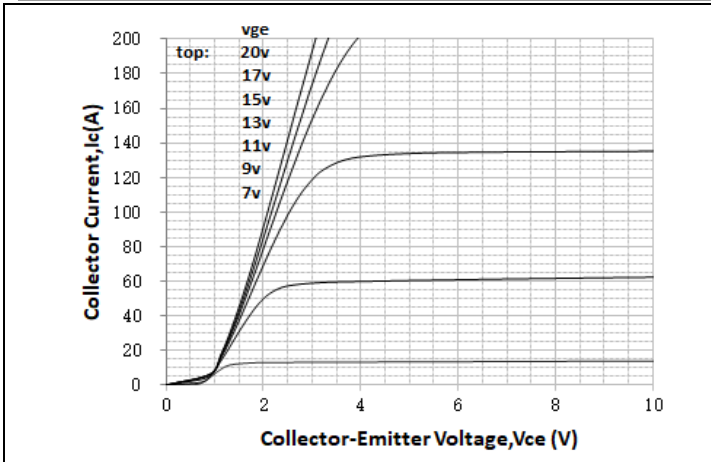




Output Characteristics (25°C)

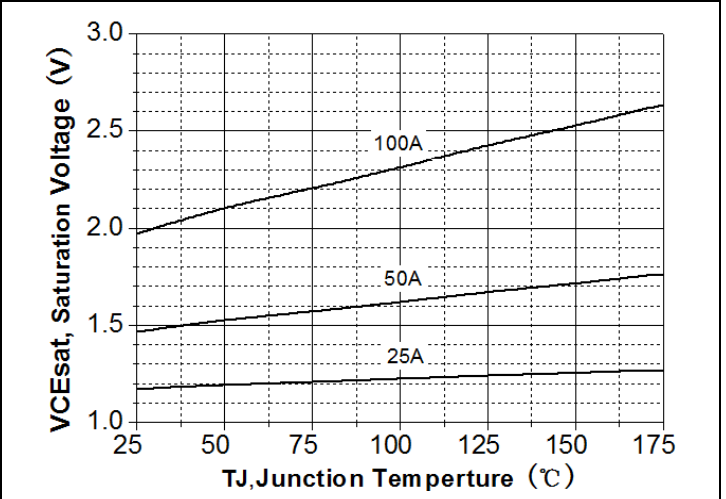
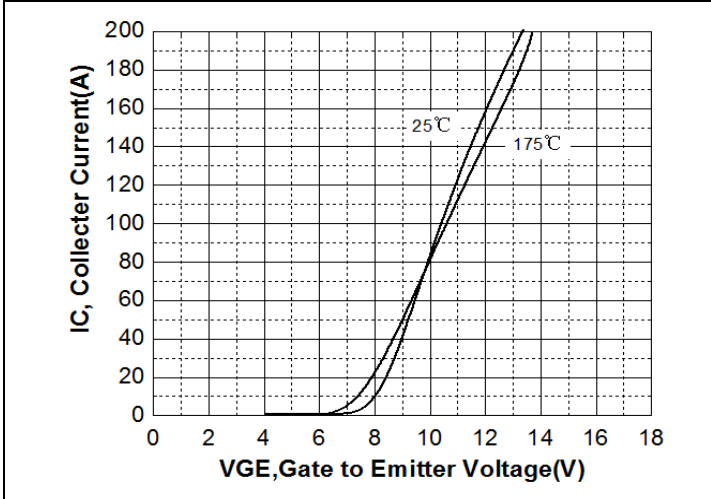
Output Characteristics (175°C)

特征曲线 ELECTRICAL CHARACTERISTICS (curves)



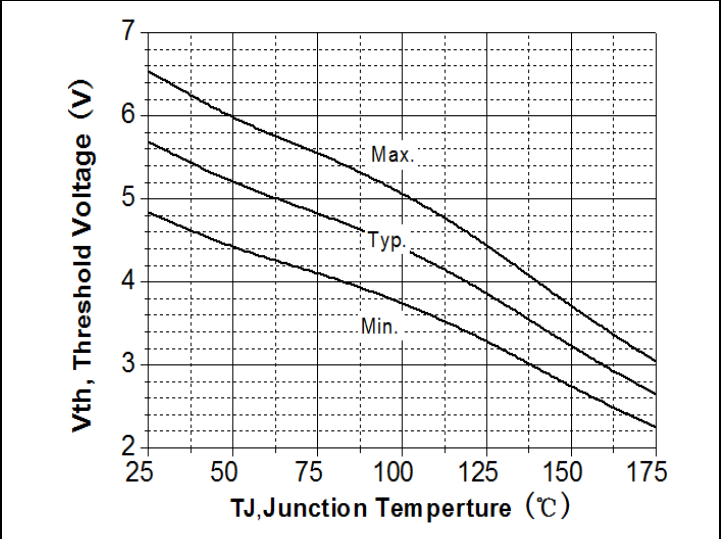
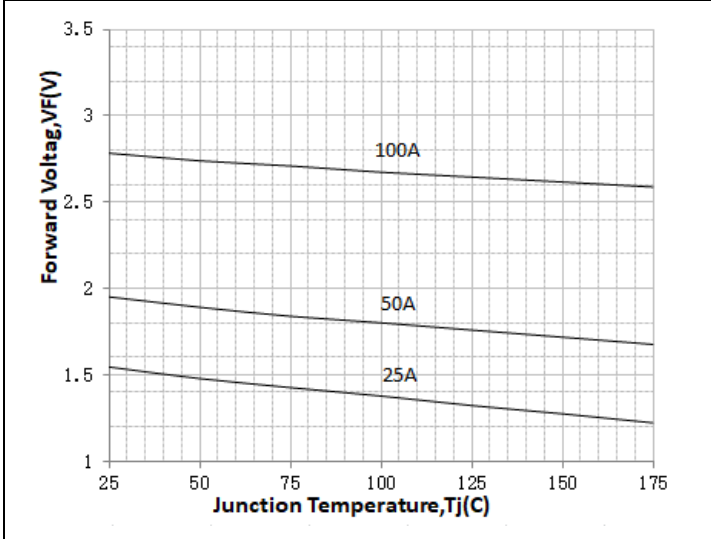
Transfer Characteristics

Vcesat vs. Tj



VF vs. Tj

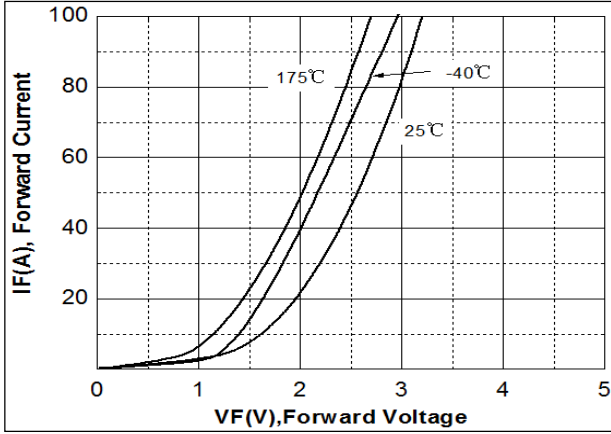
VTH vs. Tj



Diode Characteristic

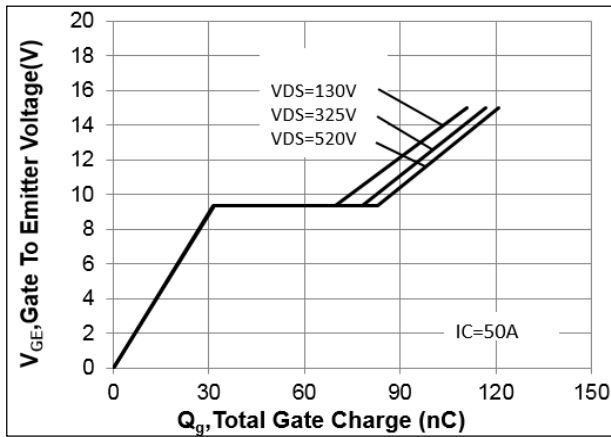
Collector current vs. case temperature

$V_{GE} \geq 15V, T_j \leq 175^\circ C$



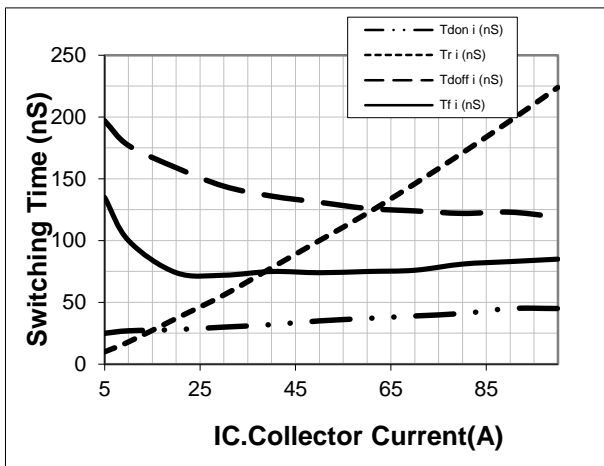
Gate Charge Characteristics

$V_{GE}=15V, I_C=50A$



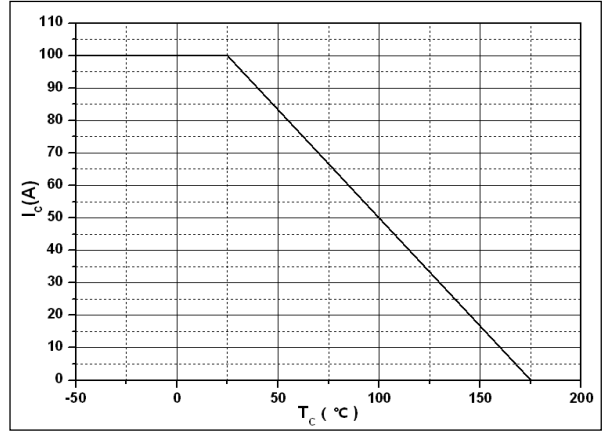
Switching Time vs. I_C (25°C)

$V_{CE}=400V, V_{GE}=15V, R_G=10\Omega$



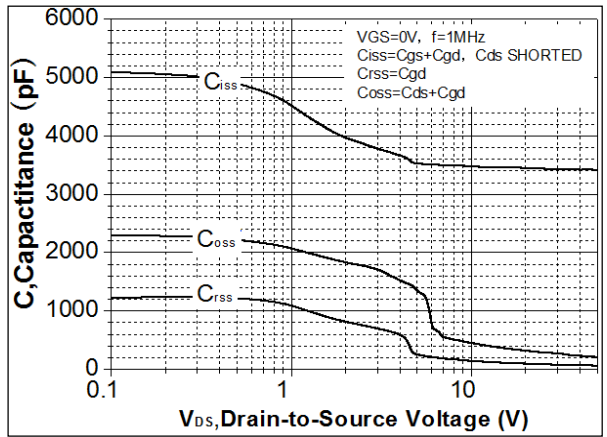
Switching Time vs. R_g (25°C)

$V_{GE}=15V, V_{CE}=400V, I_C=50A$



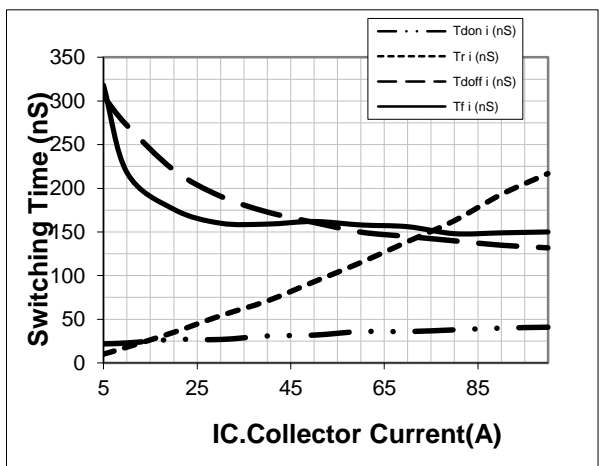
Capacitance Characteristic

$V_{GE}=0V, f=1.0MHz$



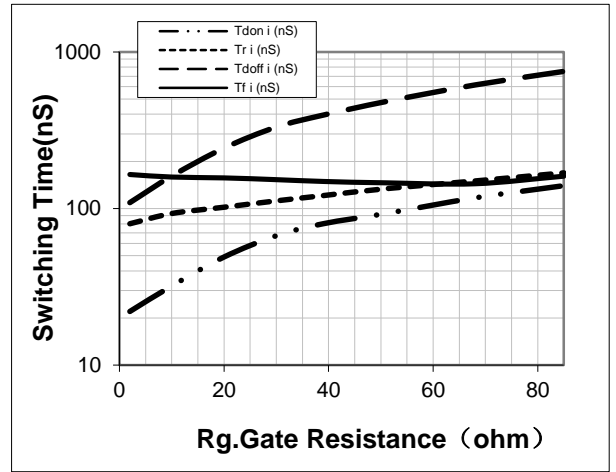
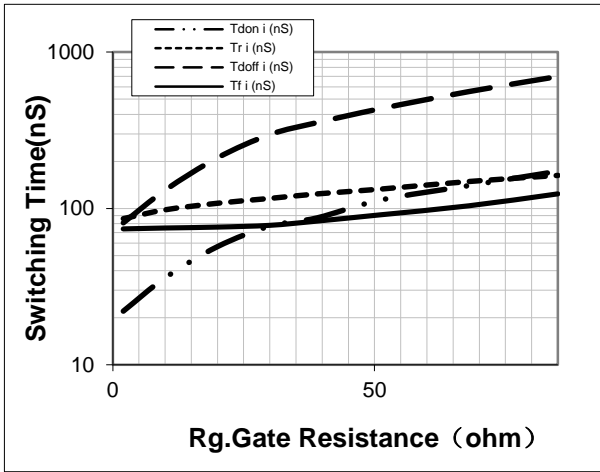
Switching Time vs. I_C (175°C)

$V_{CE}=400V, V_{GE}=15V, R_G=10\Omega$



Switching Time vs. R_g (175°C)

$V_{GE}=15V, V_{CE}=400V, I_C=50A$

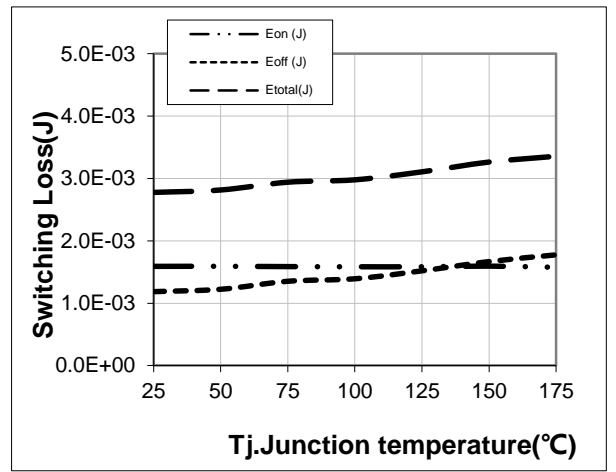
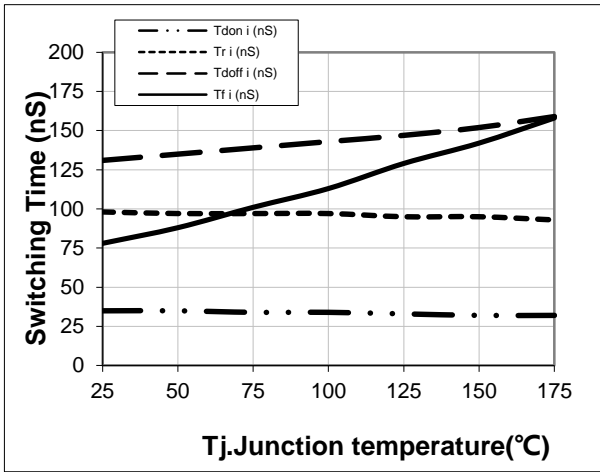


Switching Time vs.Tj

VGE=15V, VCE=400V, IC=50A, Rg=10Ω

Switching Loss vs. Tj

VGE=15V, VCE=400V, IC=50A, Rg=10Ω

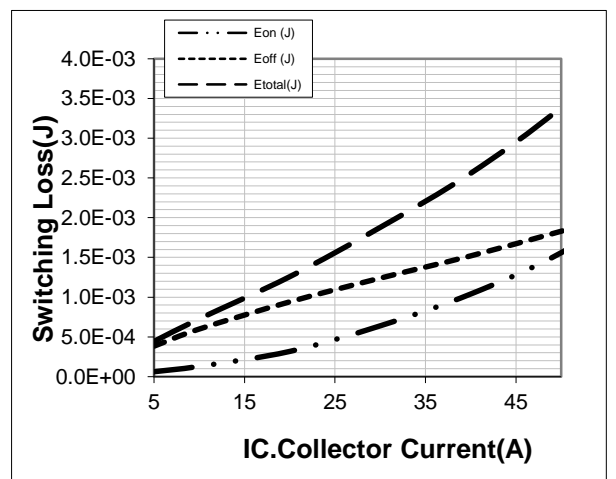
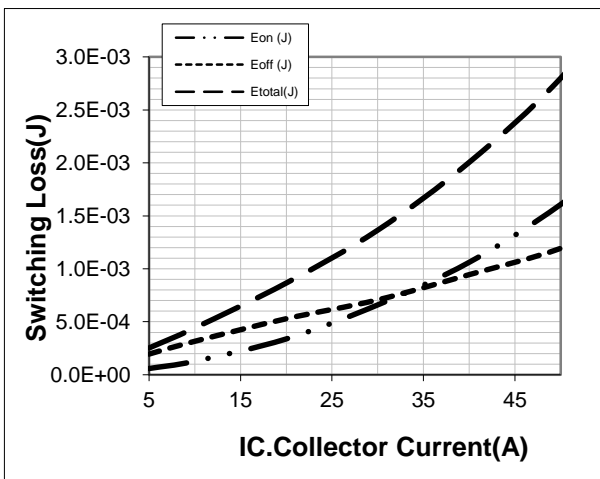


Switching Loss vs. IC(25°C)

VGE=15V, VCE=400V, Rg=10Ω

Switching Loss vs. IC(175°C)

VGE=15V, VCE=400V, Rg=10Ω

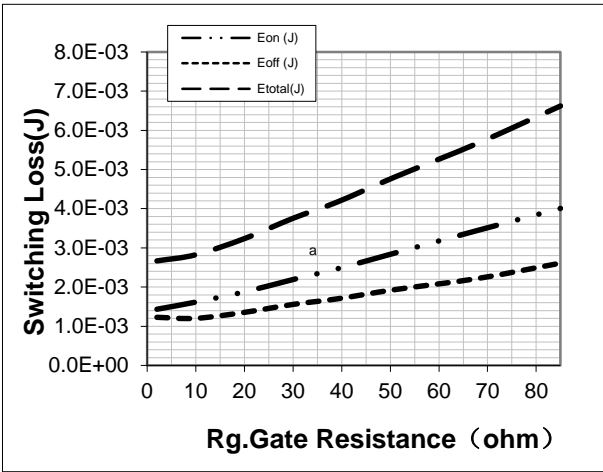


Switching Loss vs. Rg(25°C)

VGE=15V, VCE=400V, IC=50A

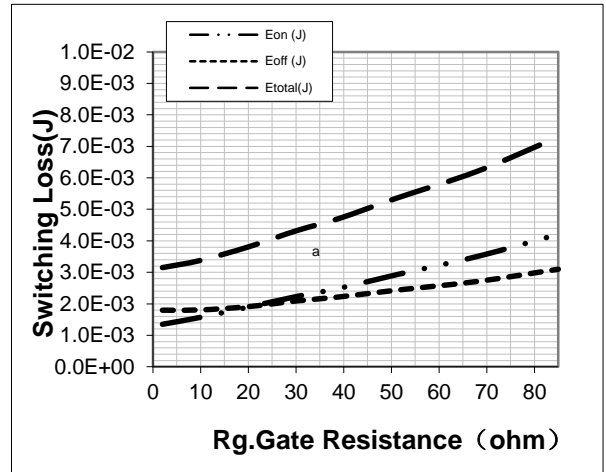
Switching Loss vs. Rg(175°C)

VGE=15V, VCE=400V, IC=50A



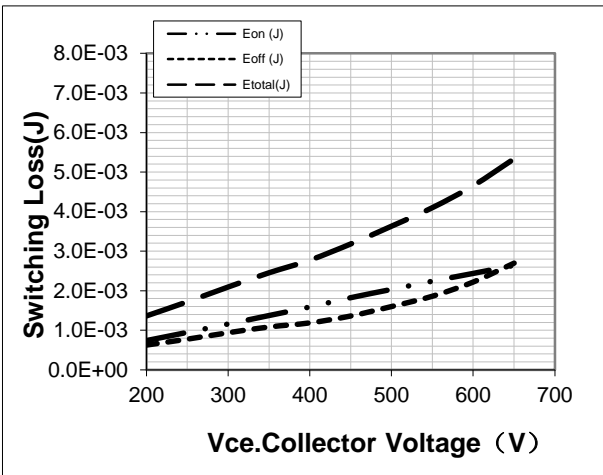
Switching Loss vs. VCE(25°C)

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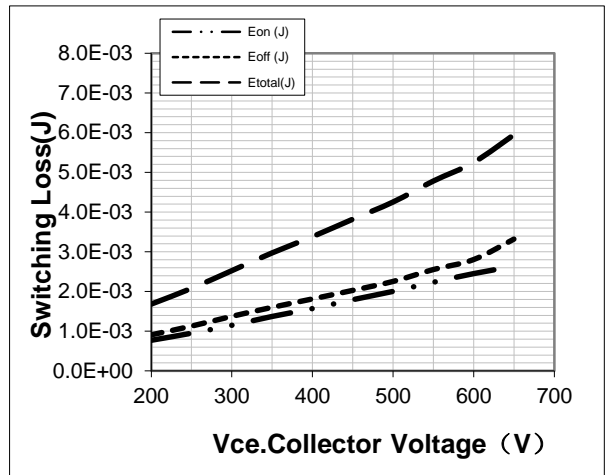


Switching Loss vs. VCE(175°C)

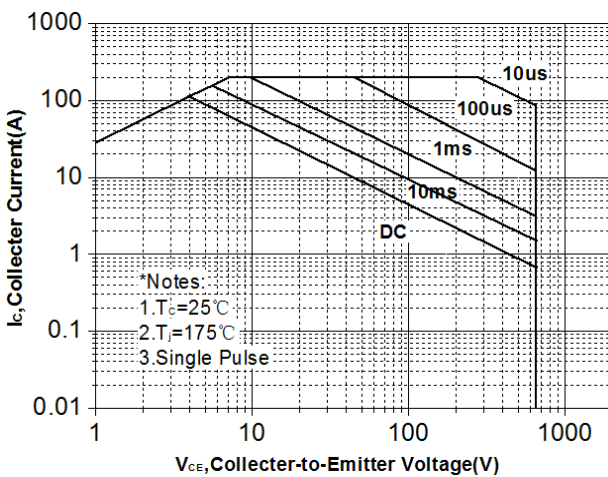
VGE=15V, IC=50A, Rg=10Ω



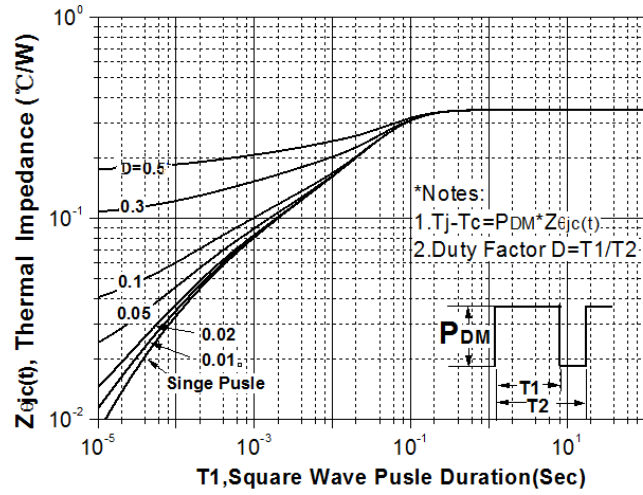
Forward Bias SOA



Normalized Maximum Transient Thermal Impedance for FRD(RJC)



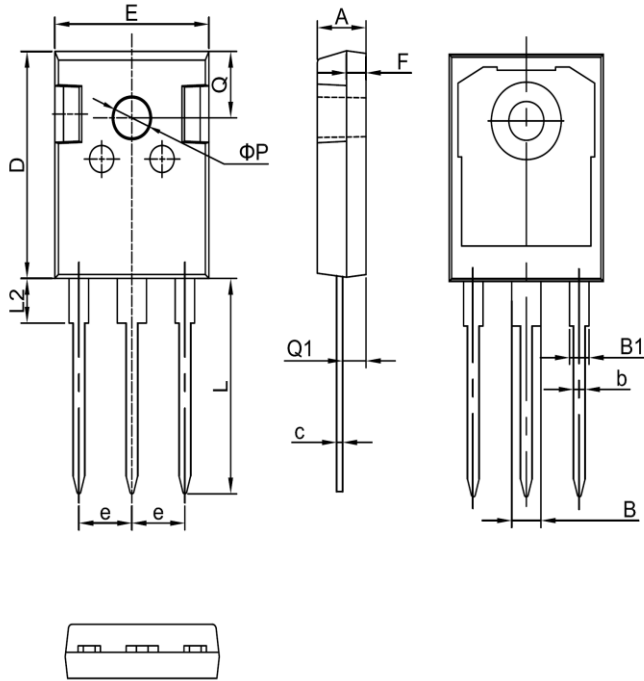
Normalized Maximum Transient Thermal Impedance for IGBT(RJC)





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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