

**APPLICATIONS**

General purpose inverters

Induction heating(IH)

UPS

FEATURES

Low gate charge

FS Technology

saturation voltage:

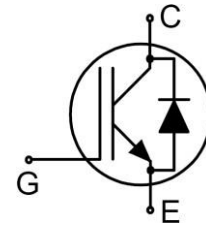
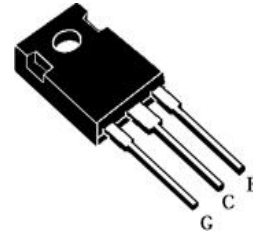
VCE(sat), typ = 1.85V

@ IC = 35A and TC = 25°C

RoHS product



TO-247



Parameter	Symbol	Value	Unit
Collector-Emmitter Voltage	V_{CES}	1200	V
Collector Current-continuous	I_C T=25°C T=100°C	70	A
		35	A
Collector Current – pulse (note 1)	I_{CM}	120	A
Gate-Emmitter Voltage	V_{GES}	±30	V
Turn-off safe area	-	120	A
Power Dissipation	P_D T _C =25°C	685	W
Operating and Storage Temperature Range	T _J , T _{STG}	-40~+175	°C
Maximum Lead Temperature for Soldering Purposes	T _L	290	°C

*Collector current limited by maximum junction temperature

**ELECTRICAL CHARACTERISTICS**

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off –Characteristics						
Collector-Emmitter Voltage	BV_{CES}	$I_C=500\mu A, V_{GE}=0V$	1200	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{CES}/\Delta T_J$	$I_C=1mA$, referenced to $25^\circ C$	-	0.6	-	$V/^\circ C$
Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=1200V, V_{GE}=0V,$ $T_C=25^\circ C$	-	-	0.1	mA
Gate-body leakage current, forward	I_{GESF}	$V_{CE}=0V, V_{GE}=20V$	-	-	300	nA
Gate-body leakage current, reverse	I_{GESR}	$V_{CE}=0V, V_{GE}=-20V$	-	-	-300	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}, I_C=250\mu A$	5.2	-	6.2	V
Collector-Emmitter saturation Voltage	V_{CESAT}	$V_{GE}=15V, I_C=15A$ $T_C=25^\circ C$	-	1.85	2.2	V
Dynamic Characteristics						
Input capacitance	C_{ies}	$V_{CE}=25V,$ $V_{GE}=0V,$ $f=1.0MHz$	-	3230	3630	pF
Output capacitance	C_{oes}		-	206	258	pF
Reverse transfer capacitance	C_{res}		-	76	103	pF

**ELECTRICAL CHARACTERISTICS**

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Switching Characteristics						
Turn-On delay time	$t_{d(on)}$	$V_{CE}=600V, I_C=35A, R_G=10\Omega$ $T_C=25^\circ C$ Inductive Load	-	55		ns
Turn-On rise time	t_r		-	115		ns
Turn-Off delay time	$t_{d(off)}$		-	190		ns
Turn-Off Fall time	t_f		-	173		ns
Turn-on energy	E_{on}			2.05		mJ
Turn-off energy	E_{off}			2.2		mJ
Total switching energy	E_{total}			4.25		mJ
Total Gate Charge	Q_g	$V_{CE}=600V,$ $I_C=35A$ $V_{GE}=15V$ (note 3, 4)	-	153		nC
Anti-Parallel Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_F	$V_{GE}=0V, I_F=35A$	-	1.5	2.65	V
Diode Reverse recovery time	t_{rr}	$V_{GE}=0V, V_R=800V I_F=35A$ $di_F/dt=750A/\mu s$ (note 4)	-	987	-	ns
Reverse recovery charge	Q_{rr}		-	0.4	-	μC

THERMAL CHARACTERISTIC

Parameter	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.26	$^\circ C/W$
Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	38	$^\circ C/W$

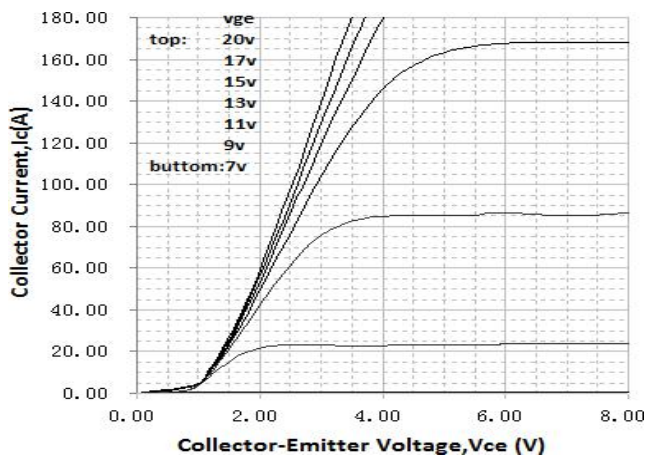
Notes:

- 1: Pulse width limited by maximum junction temperature
- 2: Allowed number of short circuits: <1000; time between short circuits: >1s.
- 3: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- 4: Essentially independent of operating temperature

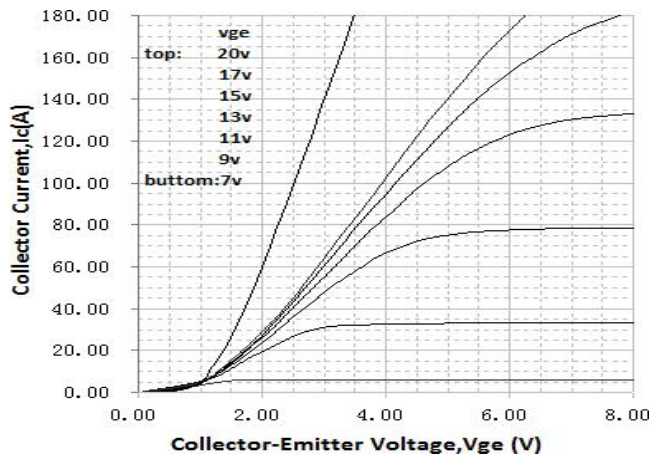


ELECTRICAL CHARACTERISTICS (curves)

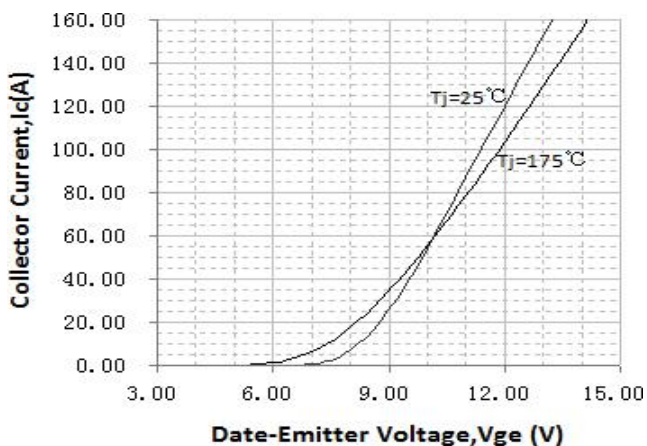
Output Characteristics (25°C)



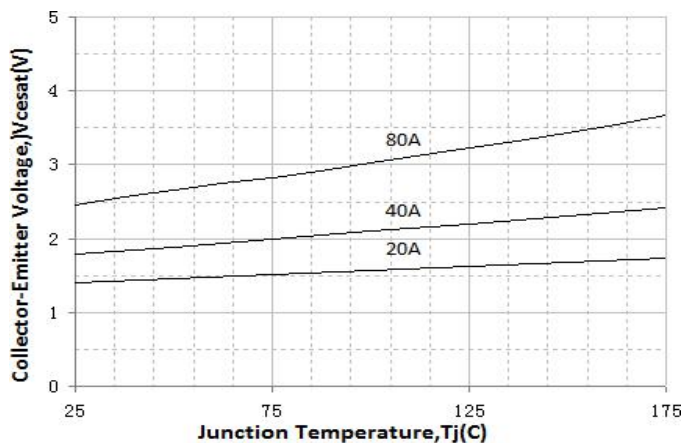
Output Characteristics (175°C)



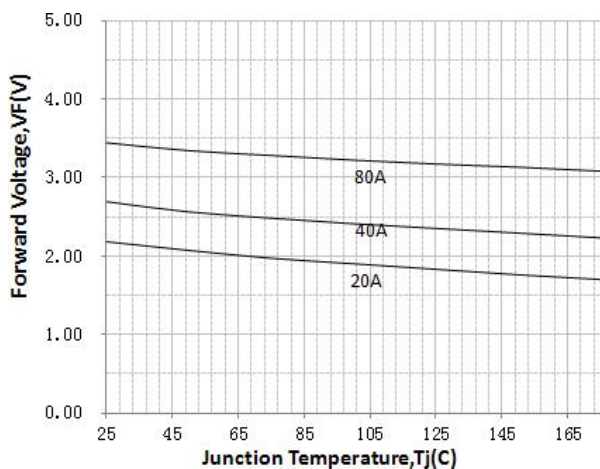
Transfer Characteristics



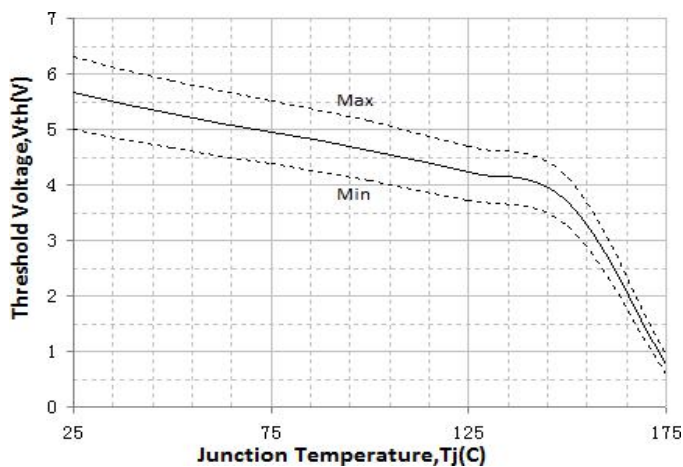
Vcesat vs. Tj



VF vs. Tj

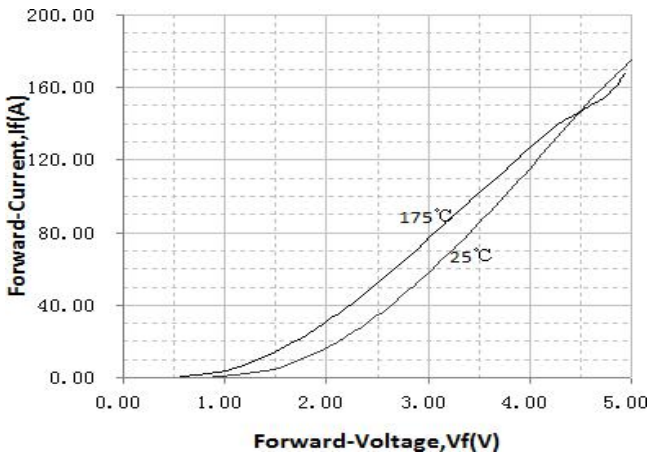


VTH vs. Tj



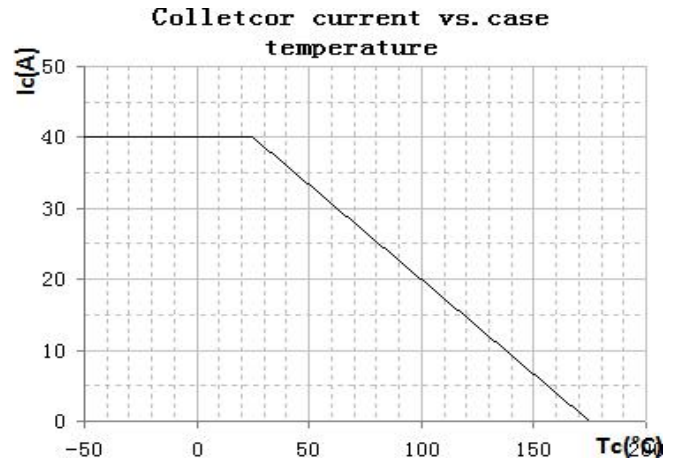


Diode Characteristic



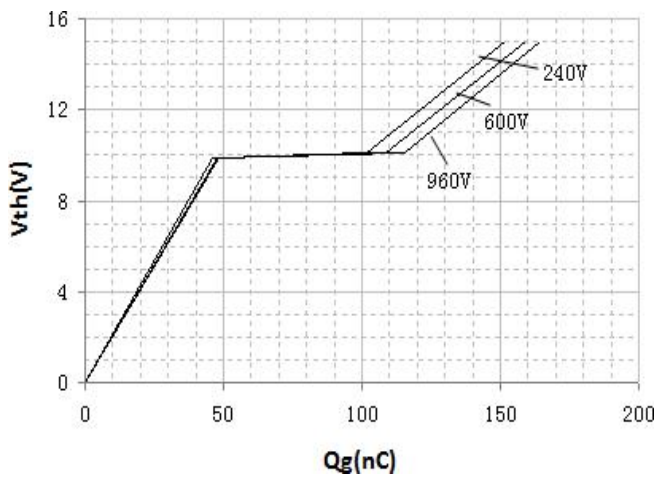
Collector current vs. case temperature

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



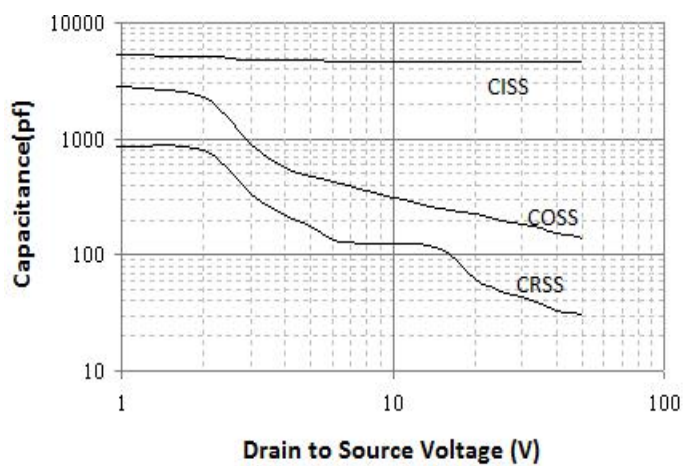
Gate Charge Characteristics

$V_{GE}=15V, I_C=35A$

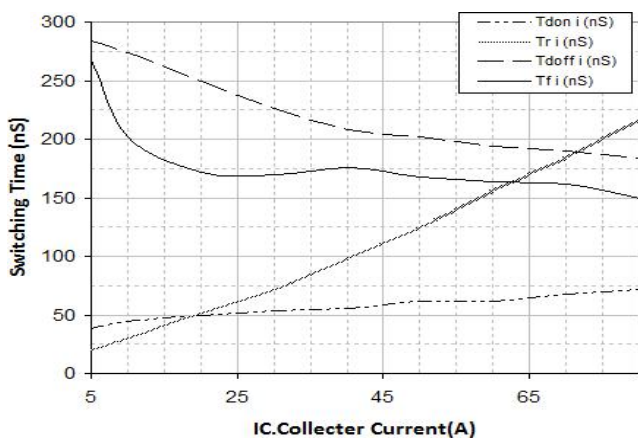


Capacitance Characteristic

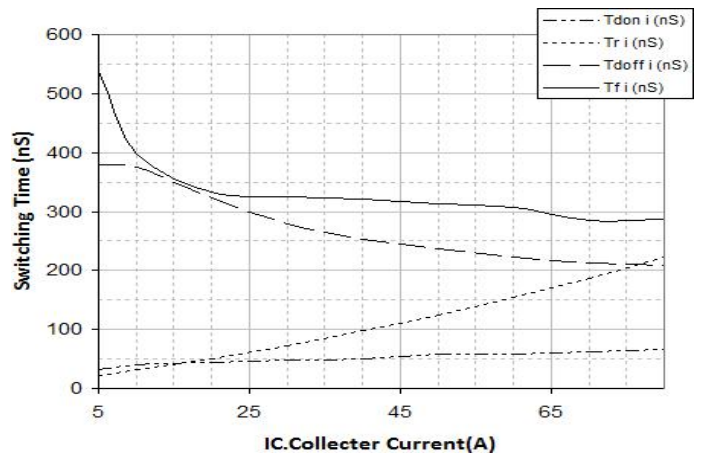
$V_{ce}=25V, V_{GE}=0V, f=1.0MHz$



Switching Time vs. I_C (25°C)



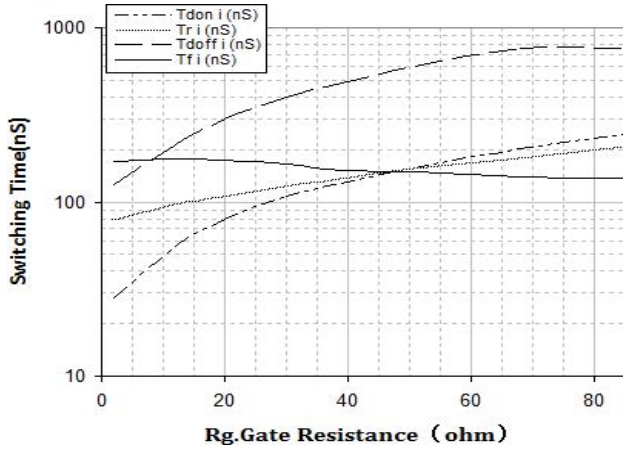
Switching Time vs. I_C (175°C)





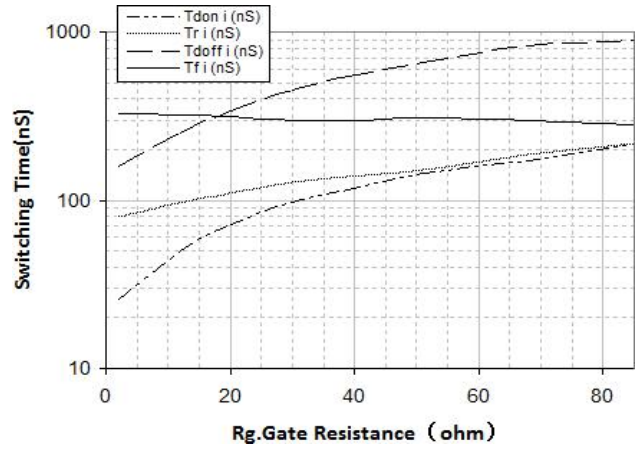
Switching Time vs. Rg(25°C)

VGE=15V,VCE=600V, IC=35A



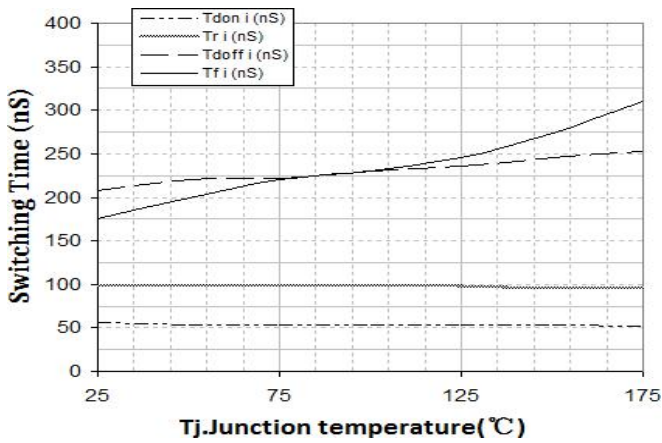
Switching Time vs. Rg(175°C)

VGE=15V,VCE=600V, IC=35A



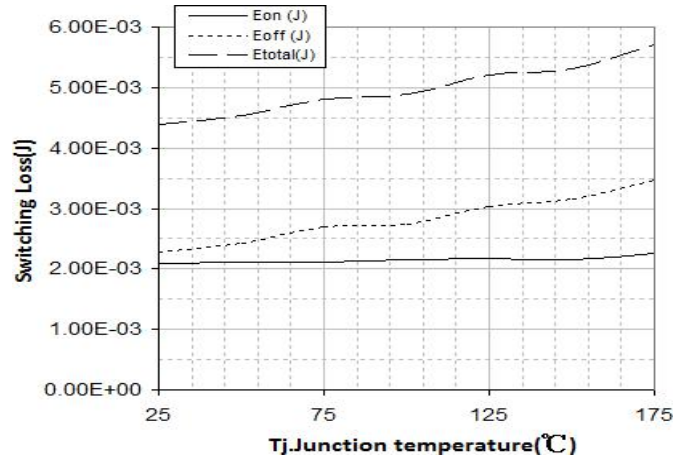
Switching Time vs. Tj

VGE=15V, VCE=600V, IC=35A, Rg=10Ω



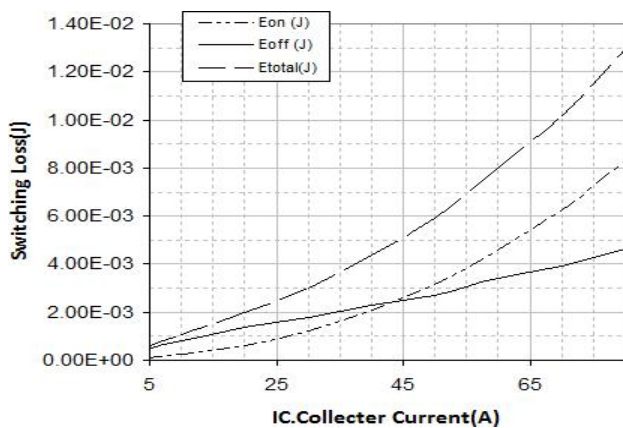
Switching Loss vs. Tj

VGE=15V, VCE=600V, IC=35A, Rg=10Ω



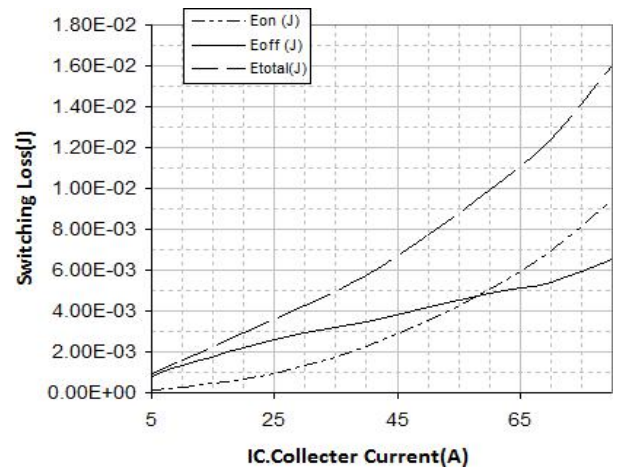
Switching Loss vs. IC(25°C)

VGE=15V,VCE=600V,Rg=10Ω



Switching Loss vs. IC(175°C)

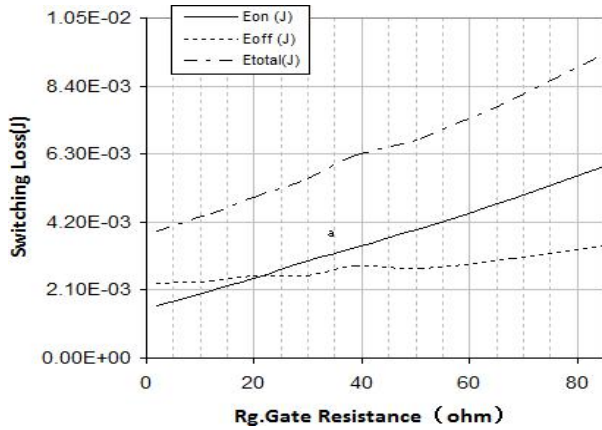
VGE=15V,VCE=600V,Rg=10Ω





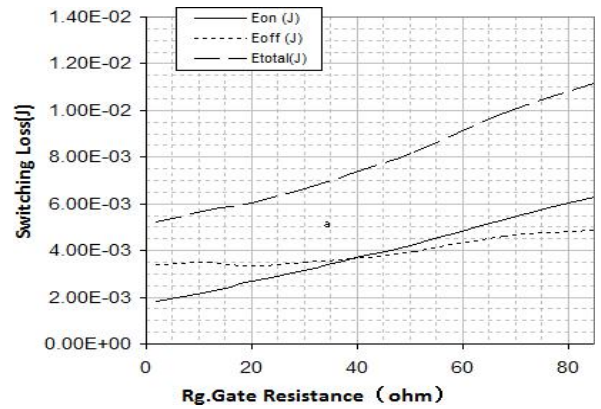
Switching Loss vs. Rg(25°C)

VGE=15V, VCE=600V, IC=35A



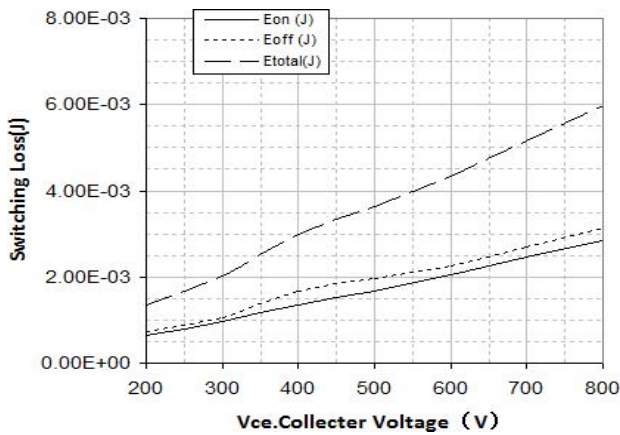
Switching Loss vs. Rg(175°C)

VGE=15V, VCE=600V, IC=35A



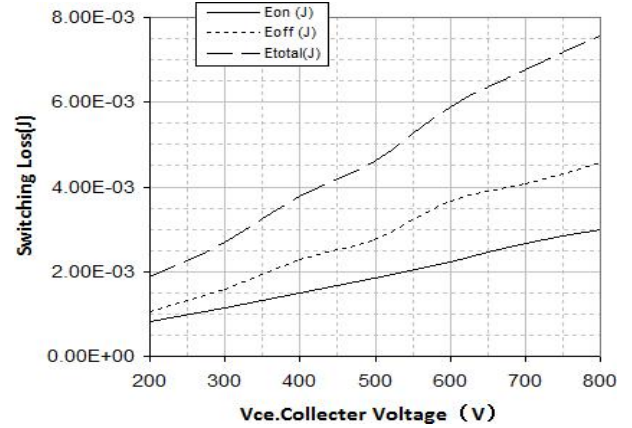
Switching Loss vs. VCE(25°C)

VGE=15V, IC=35A, Rg=10Ω



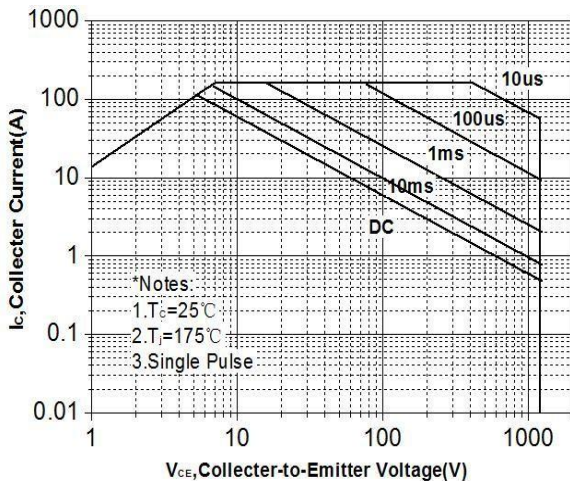
Switching Loss vs. VCE(175°C)

VGE=15V, IC=35A, Rg=10Ω

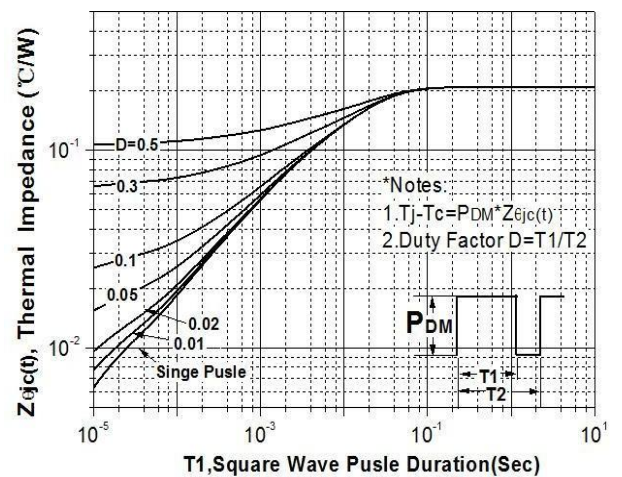


Forward Bias SOA

Tc=25°C, VGE=15V, Tj ≤ 175°C



Normalized Maximum Transient Thermal Impedance for IGBT(RJA)

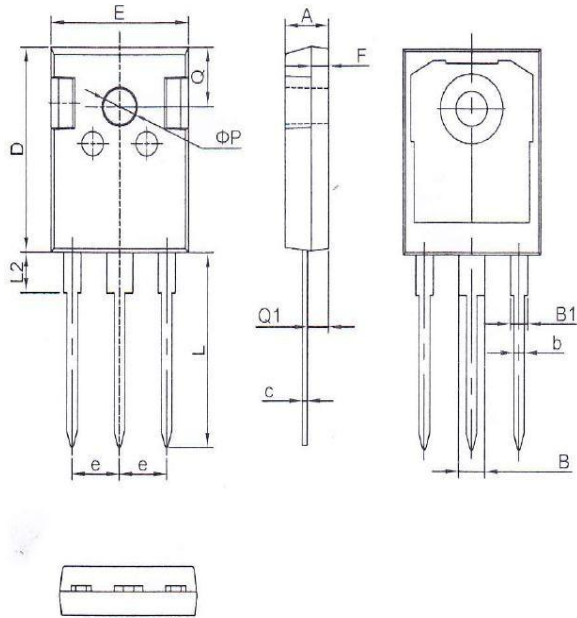




PACKAGE MECHANICAL DATA

TO-247

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
Q1	2.30	2.50
P	3.50	3.70

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