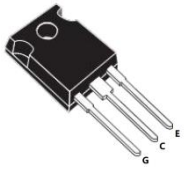
Features

- Low gate charge.
- Trench FS Technology
- Saturation Voltage:
  VCE(sat) = 1.8V @ IC = 40 A
- RoHS Complaint



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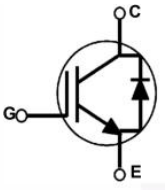
Applications

- General purpose inverters
- UPS



Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Collector to Emitter Voltage		V_{CES}	1200	V
Gate to Emitter Voltage		V_{GES}	±20	
Turn-off safe area		-	160	A
Collector Current	T_C=25℃	I_C	80	A
	T_C=100℃		40	
Pulsed Collector Current TC=25℃		I_{CM}	160	
Diode forward current @ TC= 100°C		I_F	40	
Maximum Power Dissipation TC=25℃		P_D	718	W
Operating Junction Temperature		T_J	-55 to 175	℃
Storage Temperature Range		T_{stg}	-55 to 150	
Maximum Lead Temp. for soldering Purposes, 1/8" from case for 5 seconds		T_L	300	

*Collector current limited by maximum junction temperature

Notes: 1：Pulse width limited by maximum junction temperature

Thermal Characteristics

Parameter	Symbol	Typ	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.209	℃/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	34.09	

Electrical Characteristics T_C = 25°C unless otherwise noted

Parameter	Symbol		Test Conditions	Min	Type	Max	Unit
On/off Characteristics							
Collector to Emitter Breakdown Voltage	BV_{CES}	V_{GE} = 0V, I_C = 250μ		1200	-	-	V
Breakdown Voltage Temperature Coefficient	ΔBVCES/ ΔTJ	IC=0.5mA, referenced to 25℃		-	0.6	-	V/℃
Zero Gate Voltage Collector Current	I_{CES}	VCE=1200V, VGE=0V, TC=25℃		-	-	0.2	mA
		VCE=1200V, VGE=0V, TC=175℃		-	-	2	
Gate-body leakage current, forward	I_{GESF}	VCE=0V, VGE =20V		-	-	200	nA
Gate-body leakage current, reverse	I_{GESR}	VCE=0V, VGE =-20V		-	-	-200	nA
On-Characteristics							
Gate Threshold Voltage	V_{TH}	VCE =VGE , IC=250μA		4.5	-	6.5	V
Collector-Emmiter saturation Voltage	V_{CESAT}	V_{GE}=15V I_C=40A Tc=25℃		-	1.8	2.0	V
		V_{GE}=15V I_C=40A Tc=175℃		-	2.4	-	V
Dynamic Characteristics							
Input Capacitance	Cies	VCE = 25V, VGE = 0V f = 1MHz		-	4604	-	pF
Output Capacitance	Coes			-	200	-	
Reverse Transfer Capacitance	Cres			-	49	-	
Switching Characteristics							
Turn-On Delay Time	td(on）	VCC = 600V, IC = 40A, RG = 12Ω, VGE = 15V, Parasitic ductance = 75nH TC=25℃		-	56	-	nS
Rise Tim	tr			-	98	-	
Turn-Off Delay Tim	td(off)			-	208	-	
Fall Time	tf			-	176	-	
Turn-On energy	Eon			-	2.10	-	
Turn-off energy	Eoff			-	2.28	-	
Total switching energy	Etot			-	4.38	-	
Turn-On Delay Time	td(on）	VCC = 600V, IC = 40A, RG = 12Ω, VGE = 15V, Parasitic ductance =		-	50	-	
Rise Tim	tr			-	98	-	
Turn-Off Delay Tim	td(off)			-	252	-	

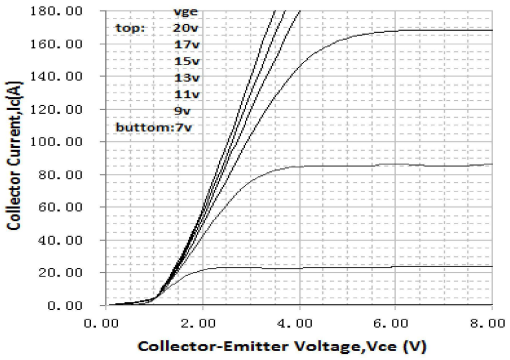
Fall Time	tf	75nH TC=175℃	-	322	-	
Turn-On energy	Eon		-	2.24	-	
Turn-off energy	Eoff		-	3.48	-	
Total switching energy	Etot		-	5.72	-	
Total Gate Charge	Qg	VCC = 960V, IC = 40A, VGE = 15V	-	165	-	nC
Gate to Emitter Charge	Qge		-	46	-	
Gate to Collector Charge	Qgc		-	69	-	

Electrical Characteristics of the Diode T_C = 25°C unless otherwise noted

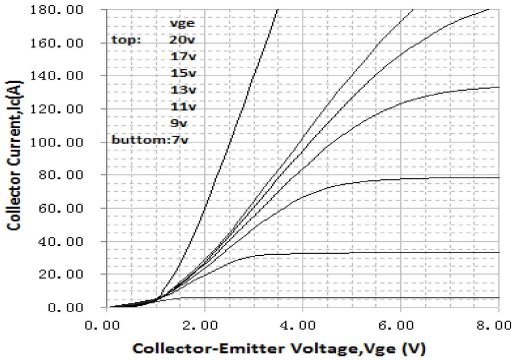
Parameter	Symbol	Test Conditions		Min	Type	Max	Unit
Diode Forward Voltage	V_{FM}	I_F = 40A		-	2.3	3.0	V
Diode Reverse Recovery Time	t_{rr}	I_F =40A, di_F/dt = 200A/μs	T_C=25℃	-	376	-	ns
			T_C=125℃	-	618	-	
Diode Peak Reverse Recovery Cyrrent	I_{rr}		T_C=25℃	-	6.5	-	A
			T_C=125℃	-	13.3	-	
Diode Reverse Recovery Charge	Q_{rr}		T_C=25℃	-	1311	-	nC
			T_C=125℃	-	4283	-	

Typical Performance Characteristics

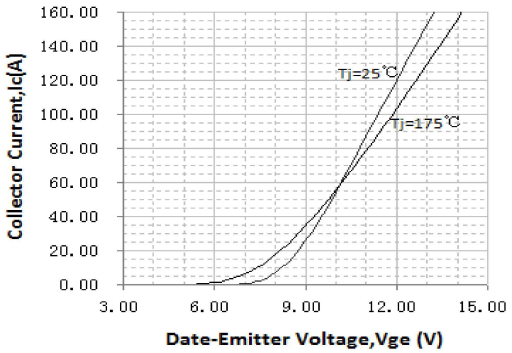
Output Characteristics（25℃）



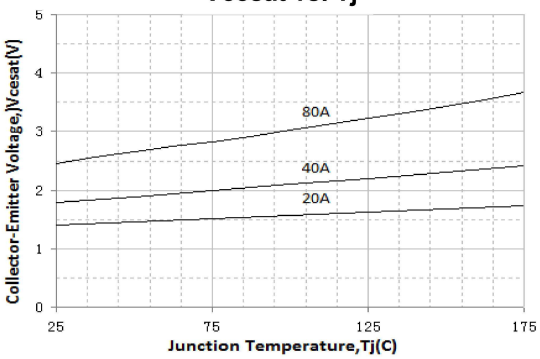
Output Characteristics（175℃）



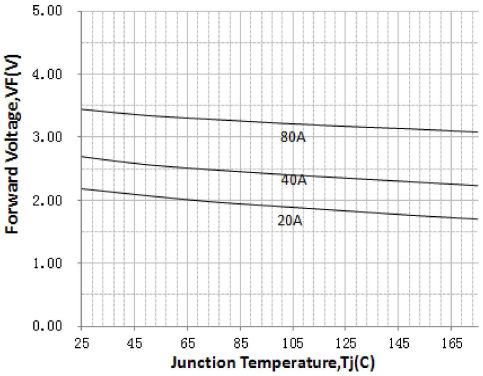
Transfer Characteristics



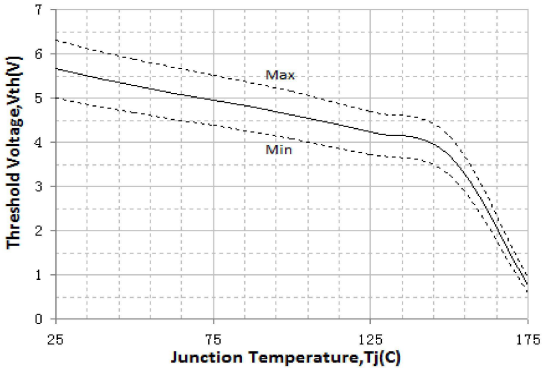
Vcesat vs. Tj



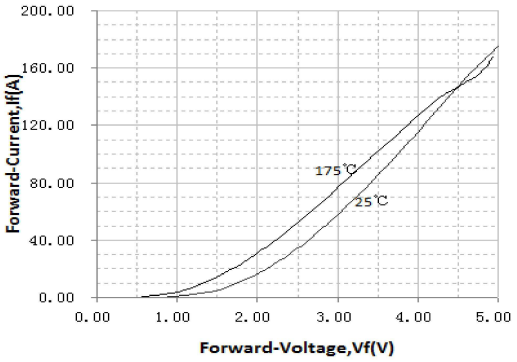
VF vs. Tj



VTH vs. Tj

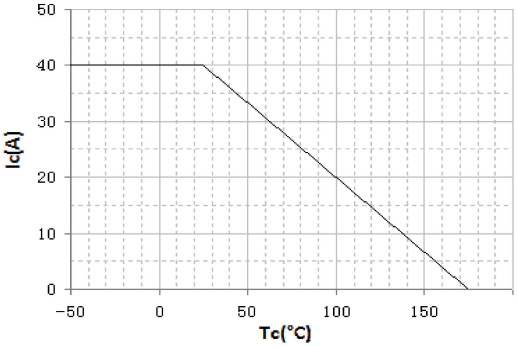


Diode Characteristic



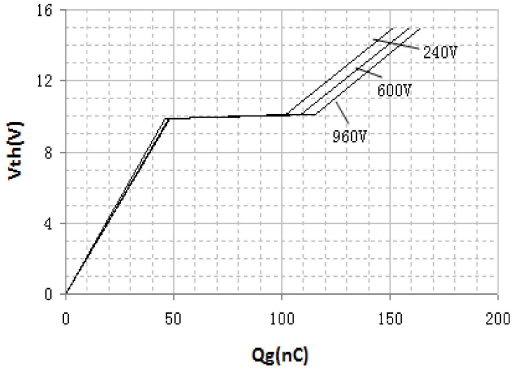
Colletcor current vs.case temperature

VGE≥15V，Tj≤175℃



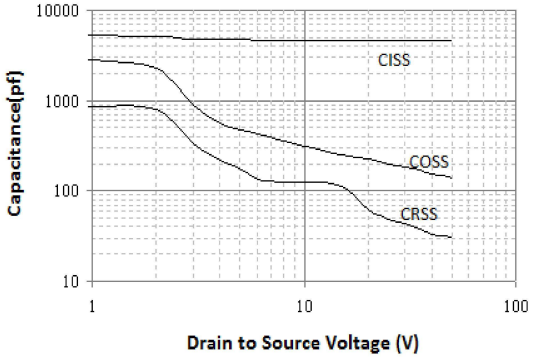
Gate Charge Characteristics

VGE=15V, IC=40A

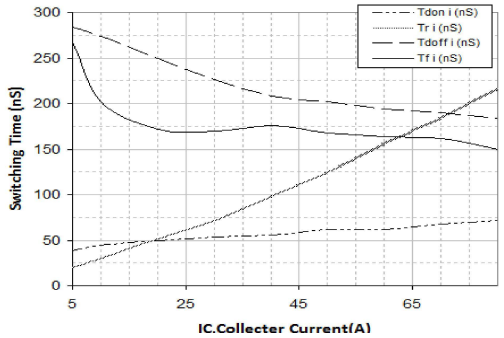


Capacitance Characteristic

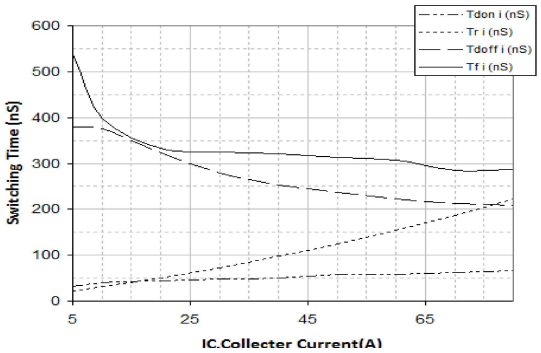
Vce=25V,VGE =0V,f=1.0MHZ



Switching Time vs. IC(25℃)

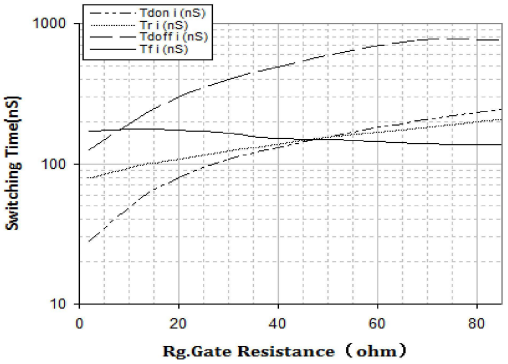


Switching Time vs. IC(175℃)



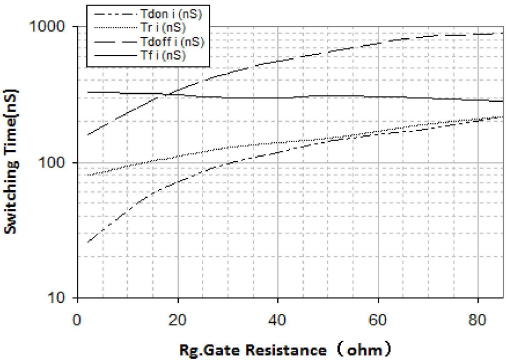
Switching Time vs. Rg(25℃)

VGE=15V,VCE=600V, IC=40A



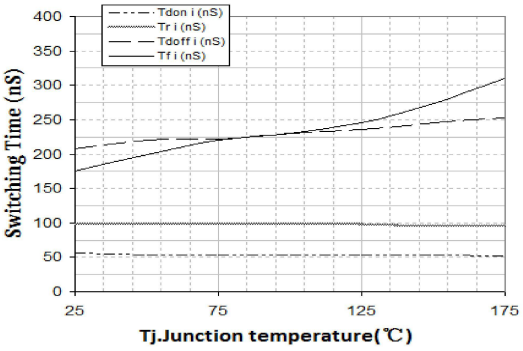
Switching Time vs. Rg(175℃)

VGE=15V,VCE=600V, IC=40A



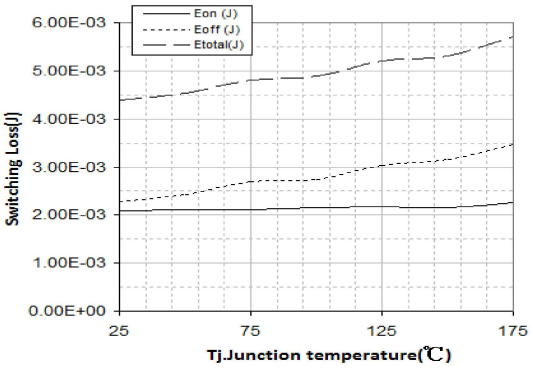
Switching Time vs.Tj

VGE=15V，VCE=600V，IC=40A，Rg=12Ω



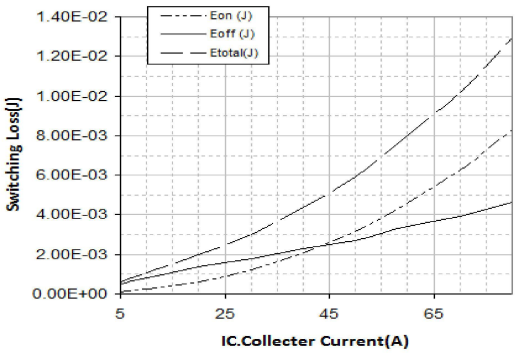
Switching Loss vs. Tj

VGE=15V，VCE=600V，IC=40A，Rg=12Ω



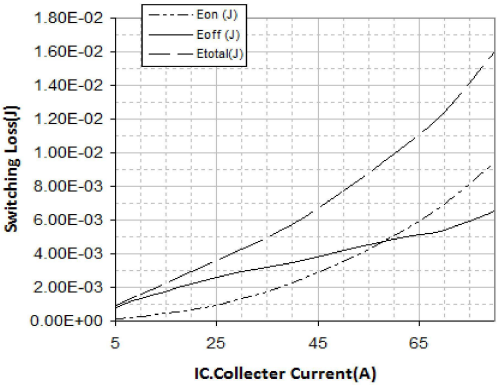
Switching Loss vs. IC(25℃)

VGE=15V,VCE=600V,Rg=12Ω



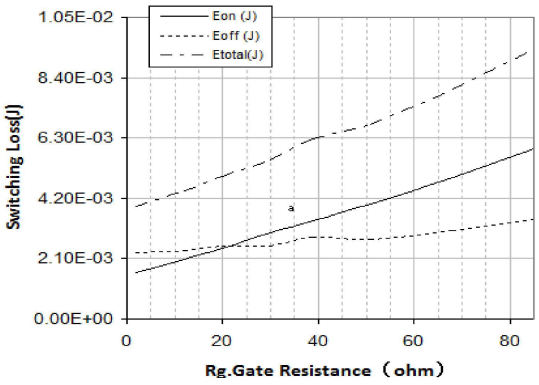
Switching Loss vs. IC(175℃)

VGE=15V,VCE=600V,Rg=12Ω



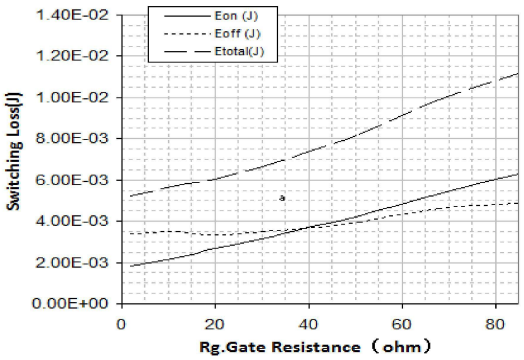
Switching Loss vs. Rg(25℃)

VGE=15V,VCE=600V, IC=40A



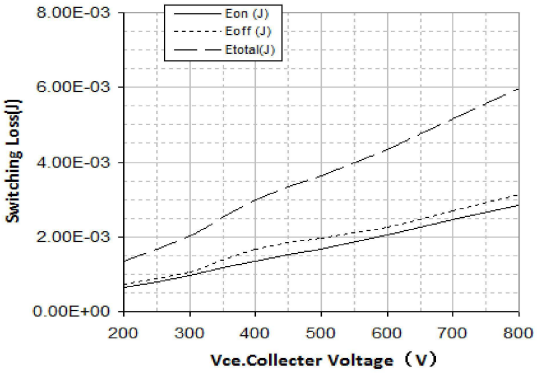
Switching Loss vs. Rg(175℃)

VGE=15V,VCE=600V, IC=40A



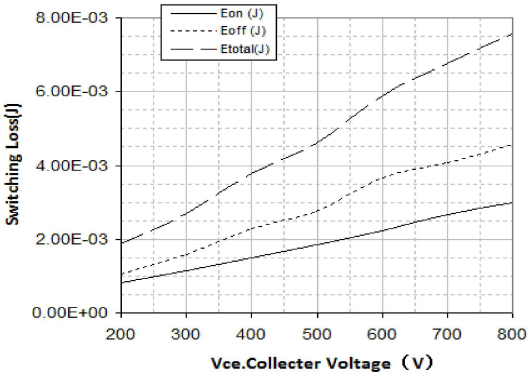
Switching Loss vs. VCE(25℃)

VGE=15V，IC=40A，Rg=12Ω



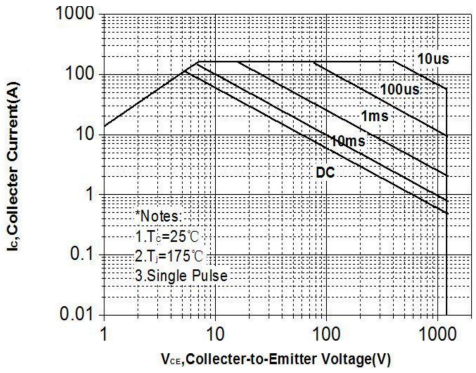
Switching Loss vs. VCE(175℃)

VGE=15V，IC=40A，Rg=12Ω

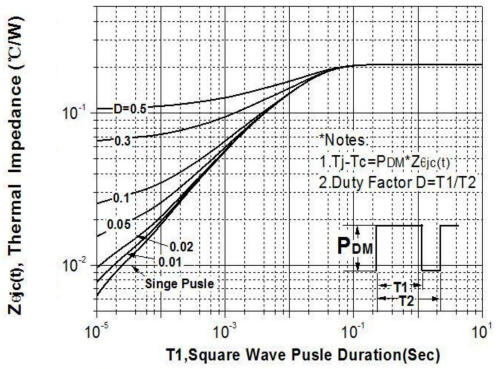


Forward Bias SOA

Tc=25°C, VGE=15V, Tj≤175℃



Normalized Maximum Transient Thermal Impedance for IGBT(RJA)



Package outline dimension