

1. Description

BLG40T120FUH is obtained by advanced Trench Field Stop (T-FS) technology which reduces the conduction loss, improve switching performance, and enhance the avalanche energy. The IGBT is suitable device for UPS, Welding, and high-speed switching.

KEY CHARACTERISTICS

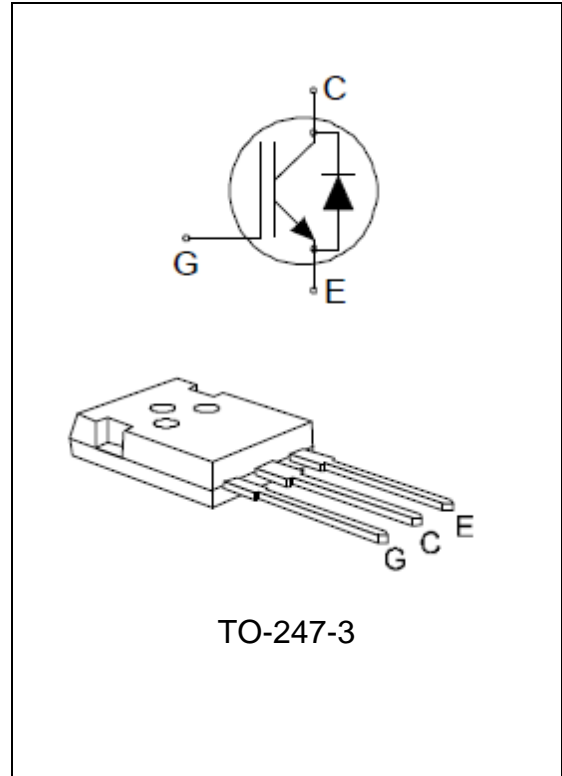
Parameter	Value	Unit
V_{CES}	1200	V
I_C	40	A
$V_{CE(sat).typ}$	1.9	V
$P_D (T_C=25^\circ C)$	367	W

FEATURES

- Fast Switching
- Low $V_{CE(sat)}$
- Positive temperature coefficient
- Very soft, fast recovery anti-parallel diode
- RoHS product

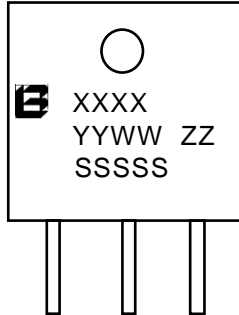
APPLICATIONS

- UPS
- Welding Converters
- Converters with high switching frequency



ORDERING INFORMATION

Ordering Codes	Package	Product Code	Packing
BLG40T120FUH-F	TO-247	G40T120FUH	Tube

<p>BLG40T120FUH-F</p> <div style="border: 1px solid black; padding: 5px; margin-left: 20px;"> (2) Package type (1) Chip name </div> <p>(1) BLG40T120FUH:1200V 40A (2) F:TO-247</p>	 <p>XXXX: Product Code YYWW: Year & Week ZZ: Assembly Code SSSSS: Lot Code</p>
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2. ABSOLUTE RATINGS

at $T_C = 25^\circ\text{C}$, unless otherwise specified

Symbol	Parameter	Rating	Units
V_{CES}	Collector-Emitter Voltage	1200	V
I_C	Collector Current @ $T_C=25^\circ\text{C}$	80	A
	Collector Current @ $T_C=100^\circ\text{C}$	40	A
I_{CM}	Pulsed Collector Current (Note1) @ $T_C=25^\circ\text{C}$	160	A
I_F	Diode Continuous Forward Current @ $T_C=25^\circ\text{C}$	40	A
	Diode Continuous Forward Current @ $T_C=100^\circ\text{C}$	20	A
I_{FM}	Diode Maximum Forward Current @ $T_C=25^\circ\text{C}$	80	A
V_{GES}	Gate-Emitter Voltage	± 20	V
P_D	Power Dissipation @ $T_C=25^\circ\text{C}$	367	W
T_{Jmax}, T_{stg}	Operating Junction and Storage Temperature Range	150, -55 to 150	$^\circ\text{C}$
T_L	Maximum Temperature for Soldering	260	$^\circ\text{C}$

3. Thermal characteristics

Symbol	Parameter	RATINGS	Units
$R_{\theta JC}$	Junction-to-Case (IGBT)	0.34	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Junction-to-Case (Diode)	0.8	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Junction-to-Ambient	40	$^\circ\text{C}/\text{W}$

4. Electrical Characteristics

at $T_C = 25^\circ\text{C}$, unless otherwise specified

OFF Characteristics						
Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
V_{CES}	Collector-Emitter Breakdown Voltage	$V_{GE} = 0\text{V}$, $I_C = 250\mu\text{A}$	1200	--	--	V
I_{CES}	Collector-Emitter Leakage Current	$V_{CE} = 1200\text{V}$, $V_{GE} = 0\text{V}$	--	--	250	μA
$I_{GES(F)}$	Gate-Emitter Leakage Current	$V_{GE} = +20\text{V}$	--	--	600	nA
$I_{GES(R)}$	Gate-Emitter Reverse Leakage	$V_{GE} = -20\text{V}$	--	--	-600	nA

ON Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE} = 15V$, $I_C = 40A$	--	1.9	2.4	V
$V_{GE(TH)}$	Gate Threshold Voltage	$V_{CE} = V_{GE}$, $I_C = 1mA$	5.0	5.8	6.5	V

Pulse width $t_p \leq 300\mu s$, $\delta \leq 2\%$

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	$V_{GE}=0V$ $V_{CE}=25V$ $f = 1.0MHz$	--	3560	--	pF
C_{oss}	Output Capacitance		--	150	--	
C_{rss}	Reverse Transfer Capacitance		--	90	--	
Q_g	Total Gate Charge	$I_C=40A$, $V_{CE}=960V$ $V_{GE}=15V$		245		nC

Switching Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_C = 40A$ $V_{CE} = 600V$ $V_{GE} = 15V$ $R_G = 10\Omega$ $T_J = 25^\circ C$ Inductive Load	--	48	--	ns
t_r	Rise Time		--	90	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	275	--	
t_f	Fall Time		--	55	--	
E_{on}	Turn-On Switching Loss		--	5.8	--	mJ
E_{off}	Turn-Off Switching Loss		--	1.5	--	
E_{ts}	Total Switching Loss		--	7.30	--	

Diode Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
V_F	Diode Forward Voltage	$I_F=20A$	--	2	2.6	V
T_{rr}	Reverse Recovery Time	$I_F=20A$, $di/dt=200A/\mu s$, $T_J=25^\circ C$	--	60	--	ns
Q_{rr}	Reverse Recovery Charge		--	413	--	nC
I_{rrm}	Reverse Recovery Current		--	12.3	--	A

Note1: Pulse width limited by maximum junction temperature

5. Characteristics Curves

Figure 1. Forward Bias Safe Operating Area

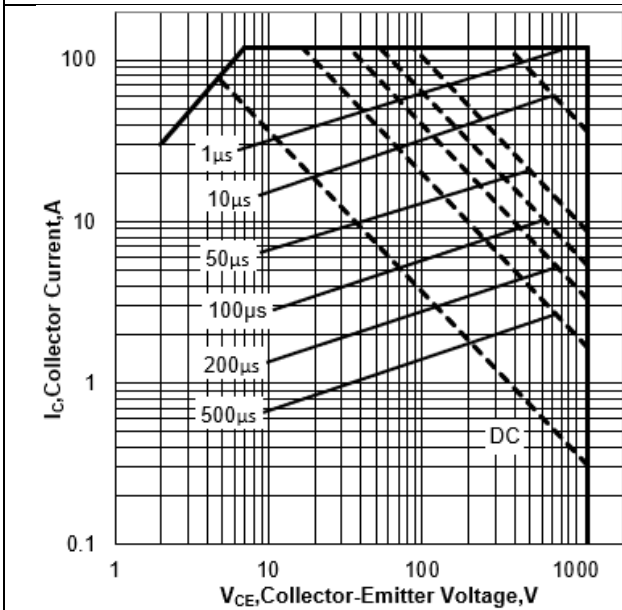


Figure 2. Power Dissipation vs Case Temperature

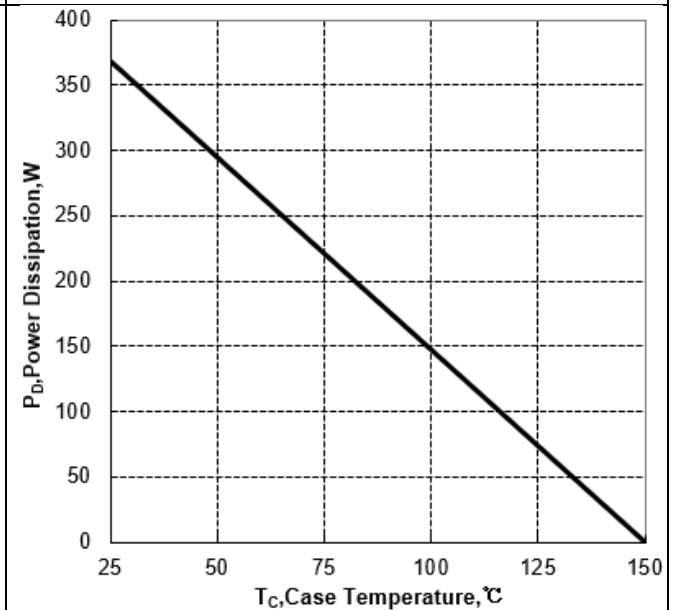


Figure 3. Collector Current vs Case Temperature

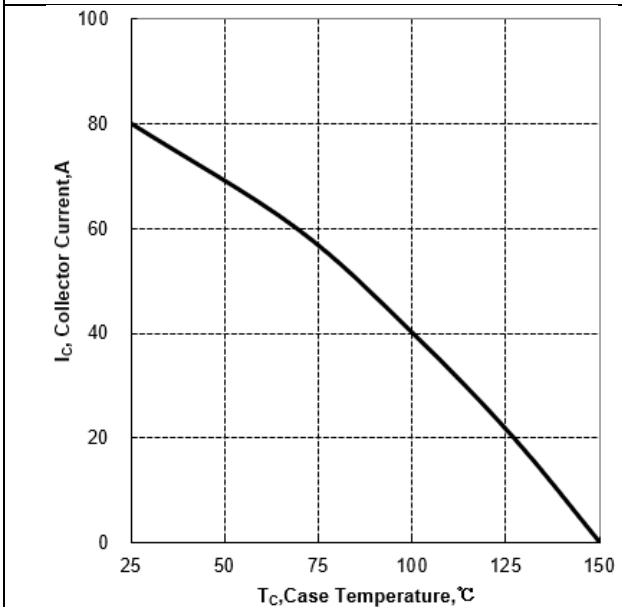


Figure 4. Typical Transfer Characteristics

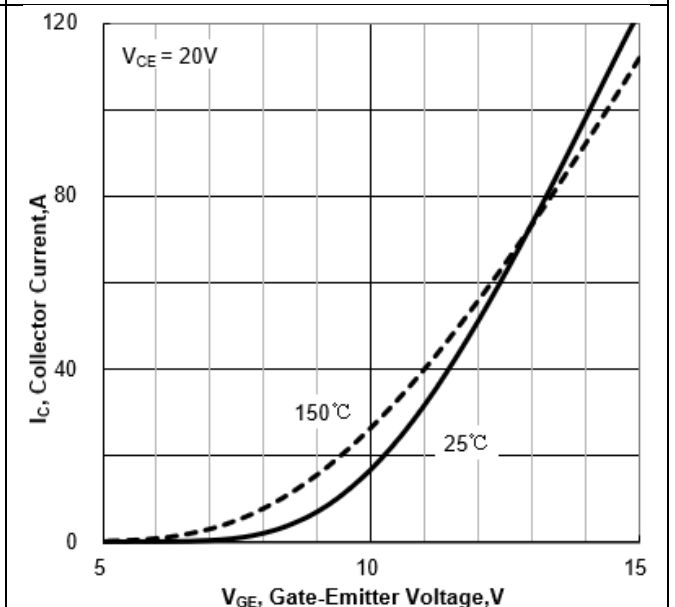


Figure 5. Typical Output Characteristics(T=25°C)

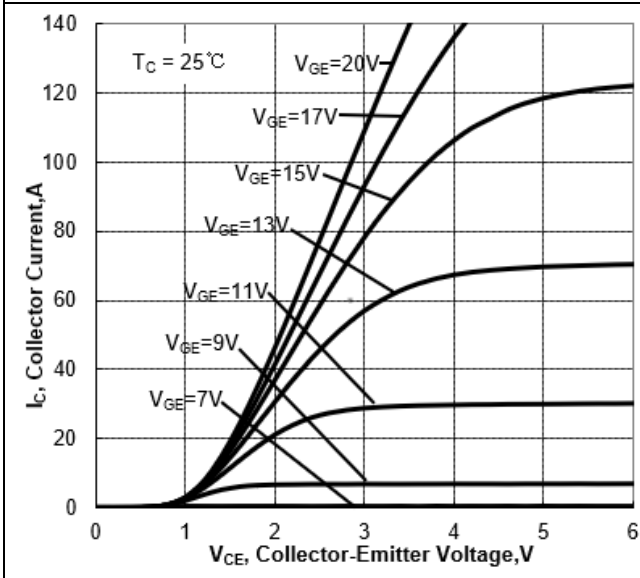


Figure 6. Typical Output Characteristics(T=150°C)

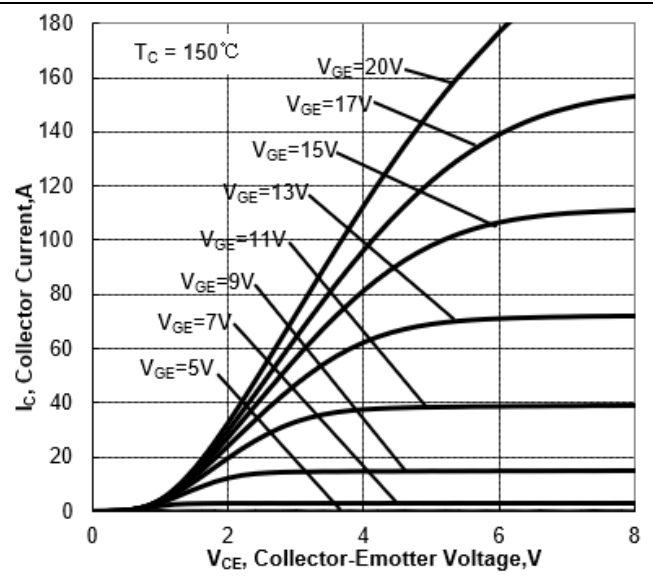


Figure 7. Typical Collector-Emmitter Saturation Voltage vs Junction Temperature

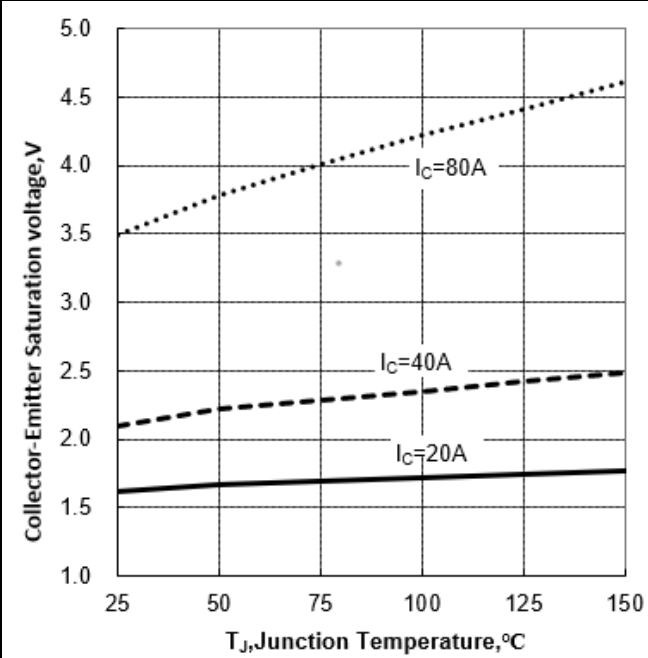


Figure 8. Typical Transfer Characteristics

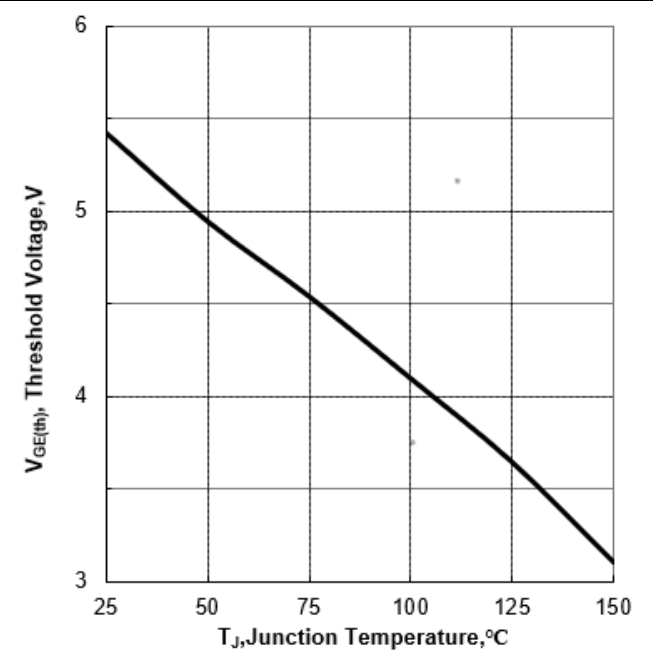


Figure 9. Typical Switching Times vs Gate Resistor
($T_J=25^\circ\text{C}$, $V_{ce}=600\text{V}$, $V_{ge}=15/0\text{V}$, $I_c=40\text{A}$)

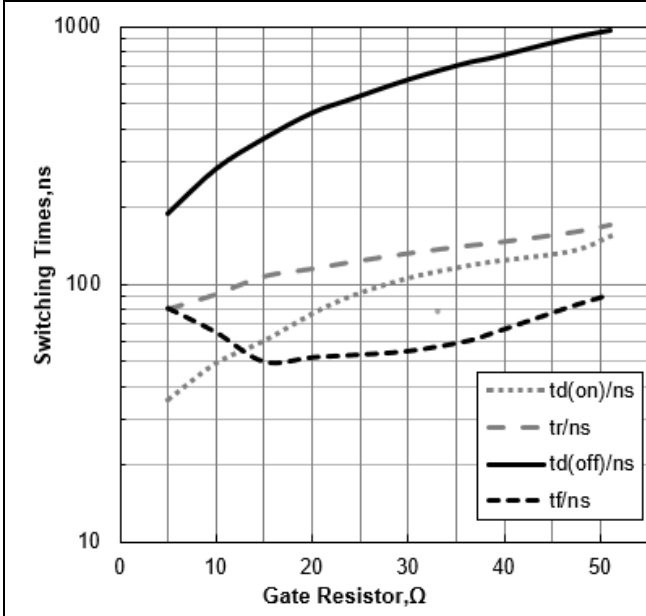


Figure 10. Typical Switching vs Gate Resistor
($T_J=150^\circ\text{C}$, $V_{ce}=600\text{V}$, $V_{ge}=15/0\text{V}$, $I_c=40\text{A}$)

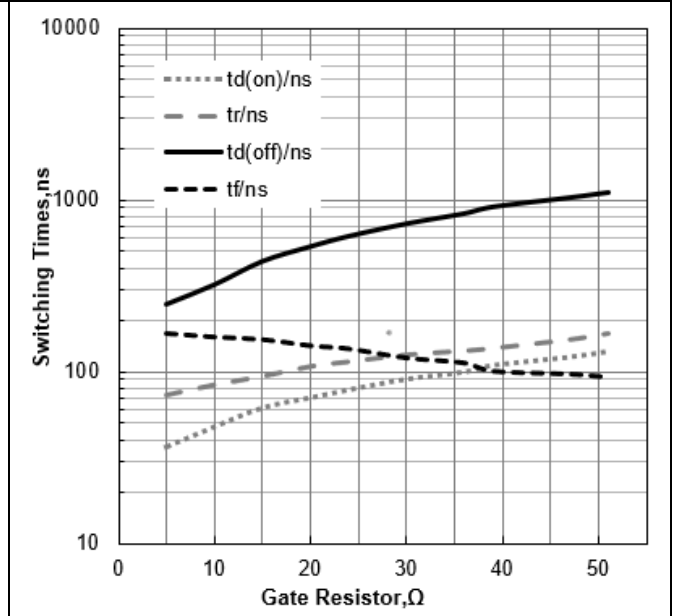


Figure 11. Typical Switching Energy vs Gate Resistor
($V_{ce}=600\text{V}$, $V_{ge}=15/0\text{V}$, $I_c=40\text{A}$)

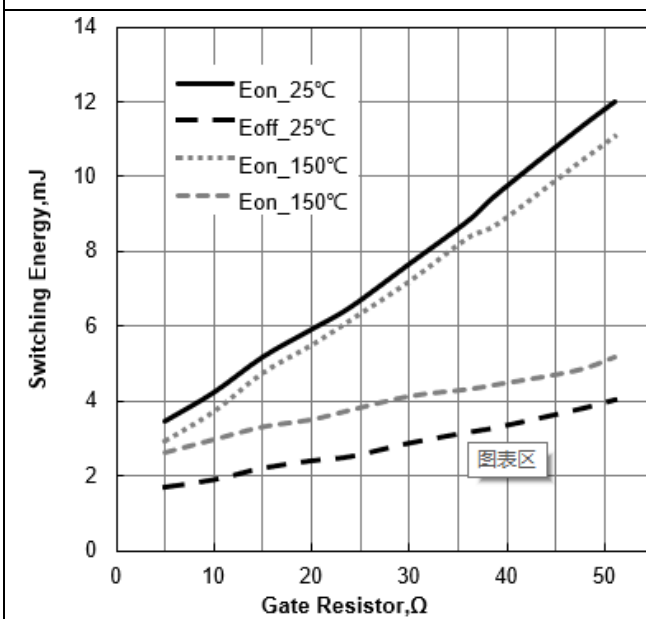


Figure 12. Typical Switching Times vs Junction Temperature
($V_{ce}=600\text{V}$, $V_{ge}=15/0\text{V}$, $I_c=40\text{A}$)

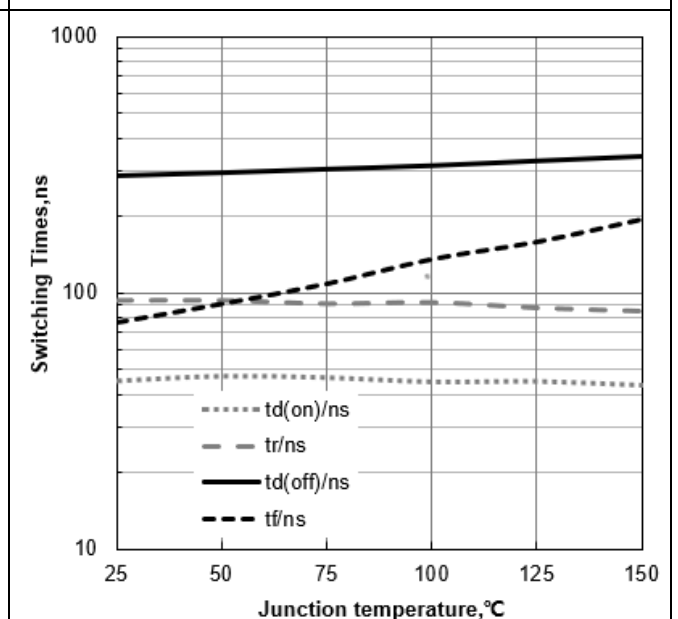


Figure 13. Typical Switching Energy vs Junction Temperature (Vce=600V, Vge=15/0V, Ic=40A)

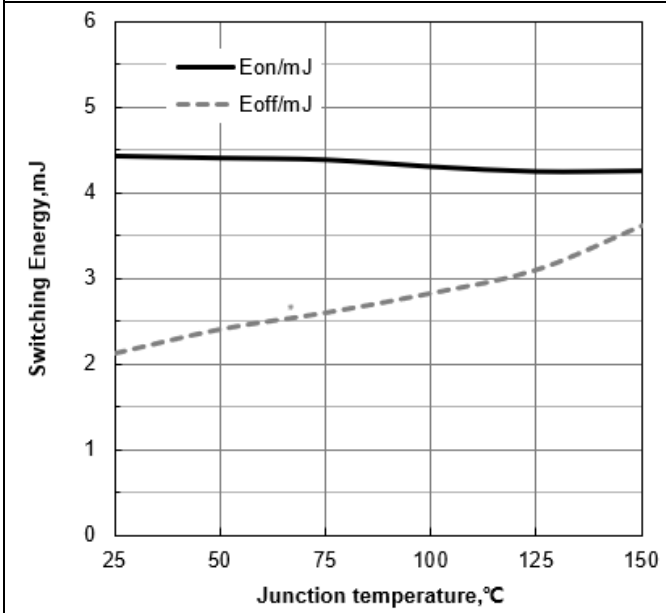


Figure 14. Typical Switching Energy vs Collector Current (Tj=25°C, Vce=600V, Vge=15/0V)

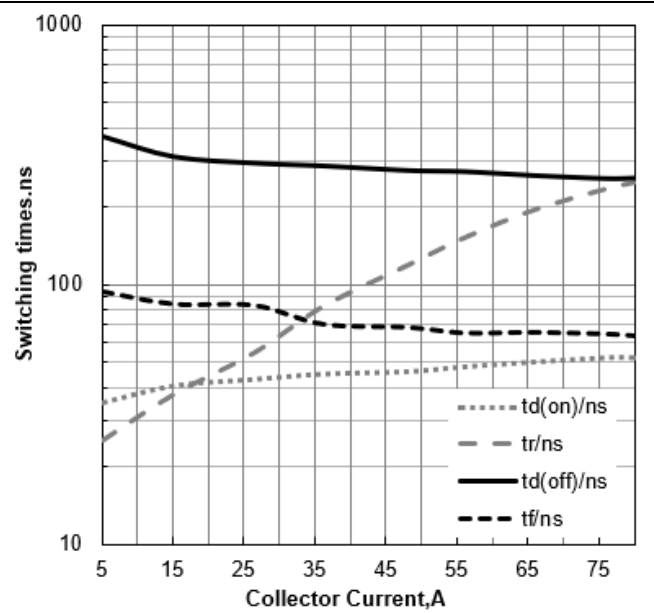


Figure 15. Typical Switching Times vs Collector Current (Tj=150°C, Vce=600V, Vge=15/0V)

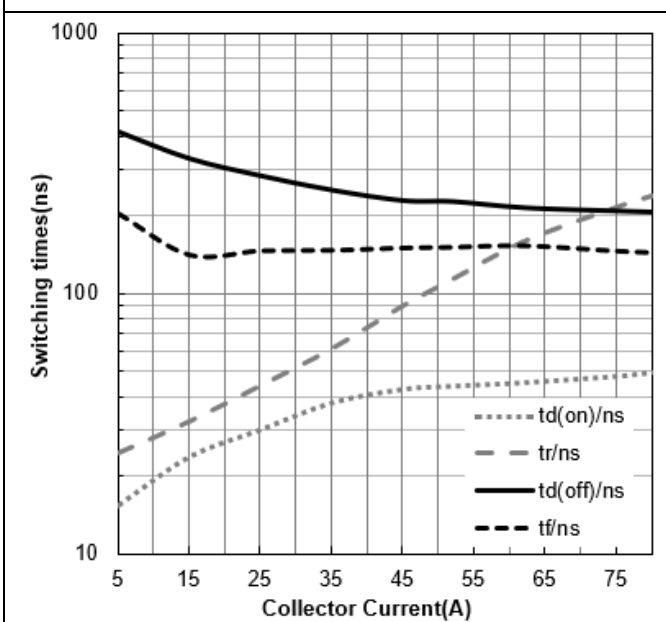


Figure 16. Typical Switching Energy vs Collector Current (Vce=600V, Vge=15/0V, Ic=40A)

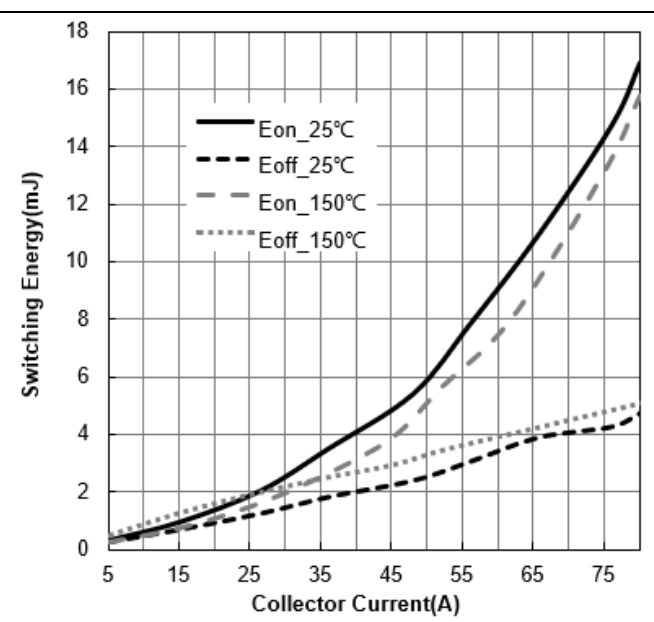


Figure 17. Typical Gate Charge

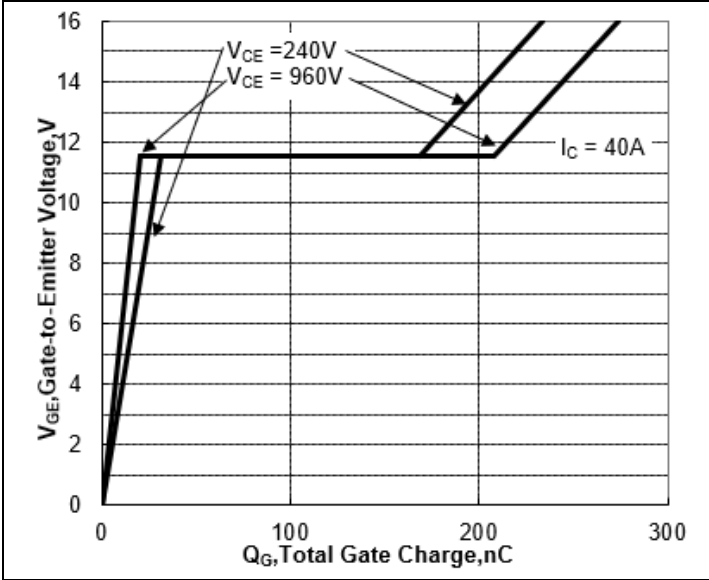


Figure 18. Typical Capacitance vs Collector-Emitter Voltage

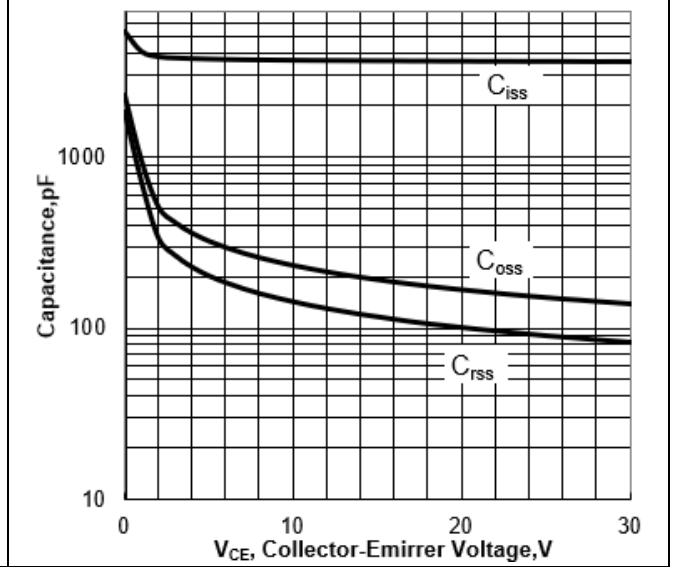


Figure 19. IGBT Transient Thermal Impedance vs Pulse Width

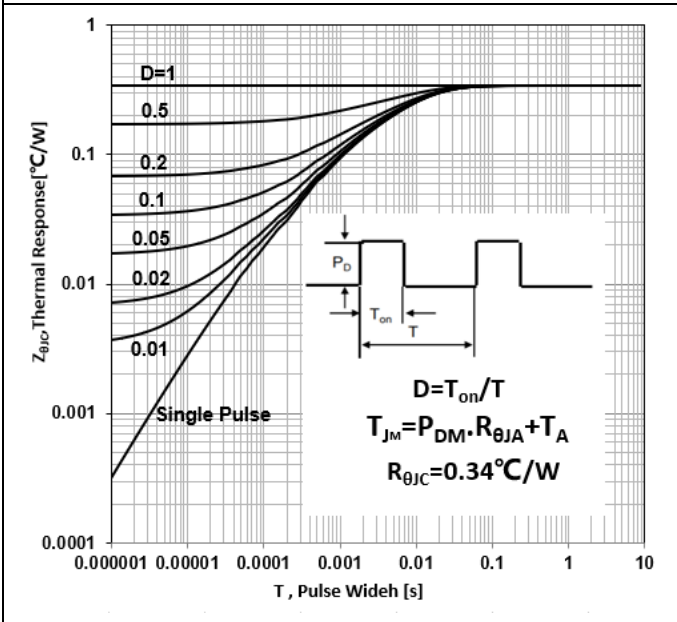


Figure 20. Diode Transient Thermal Impedance vs Pulse Width

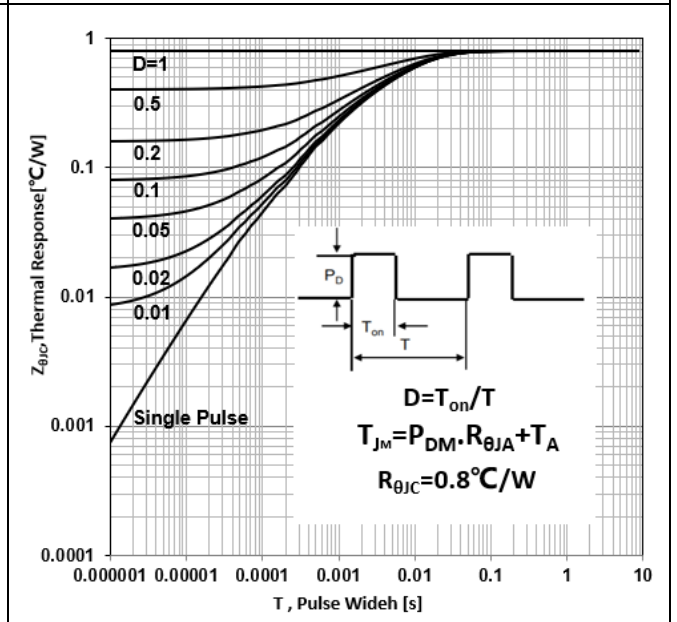
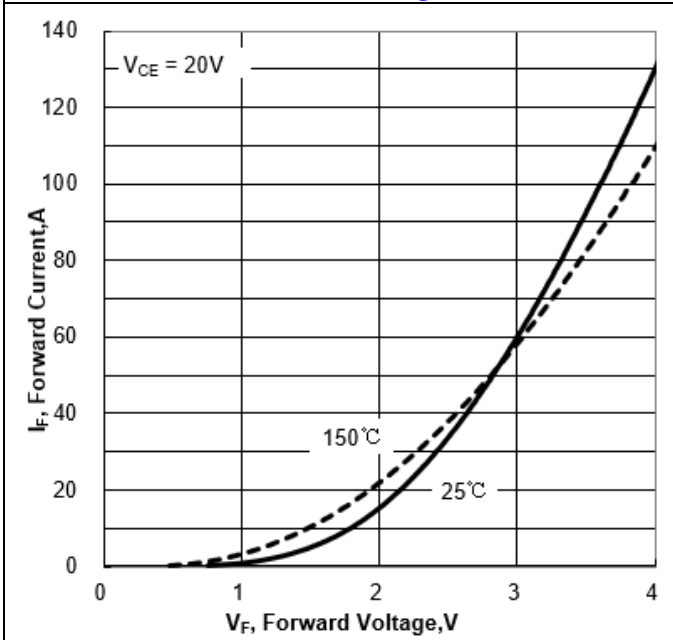
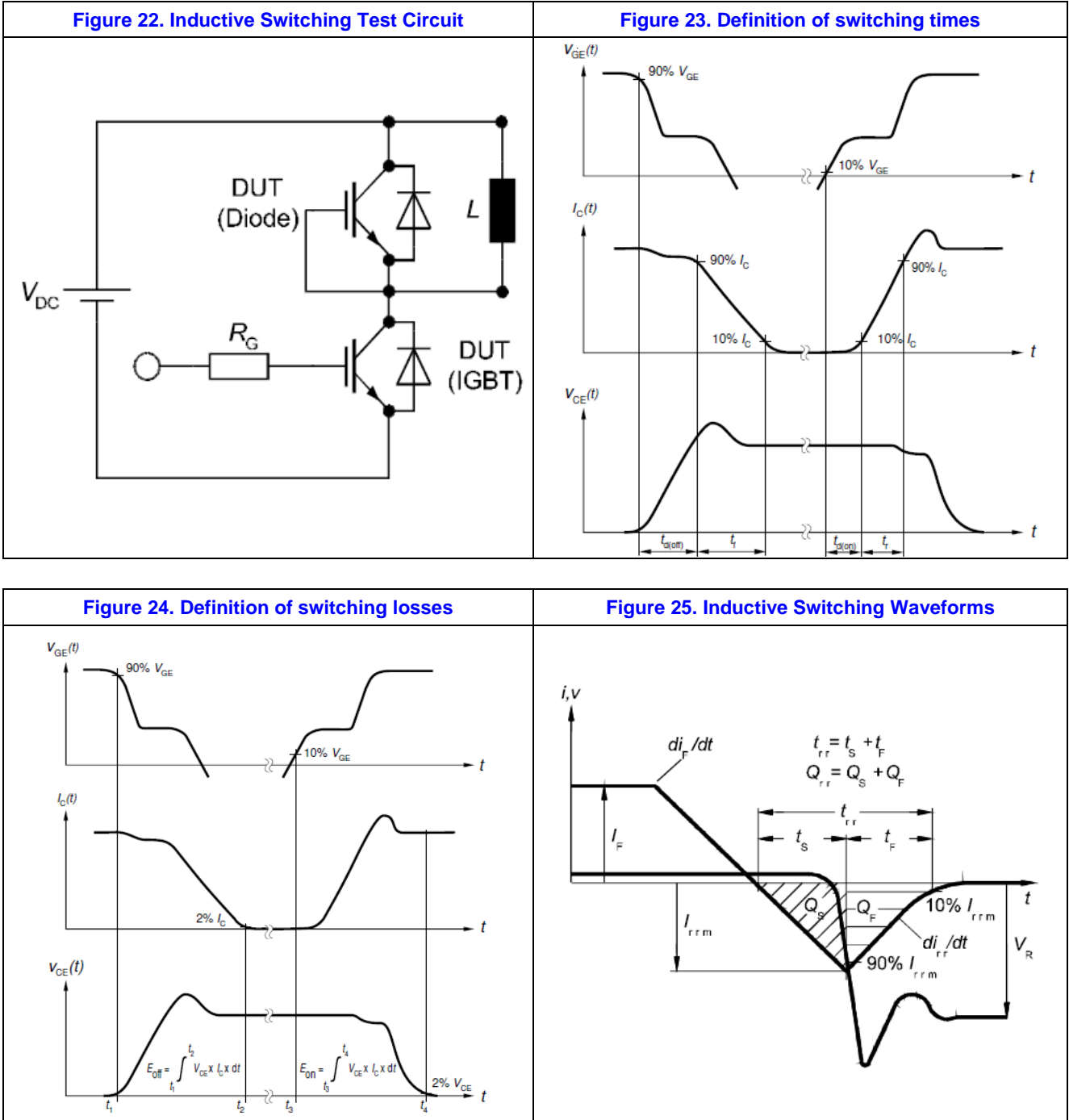


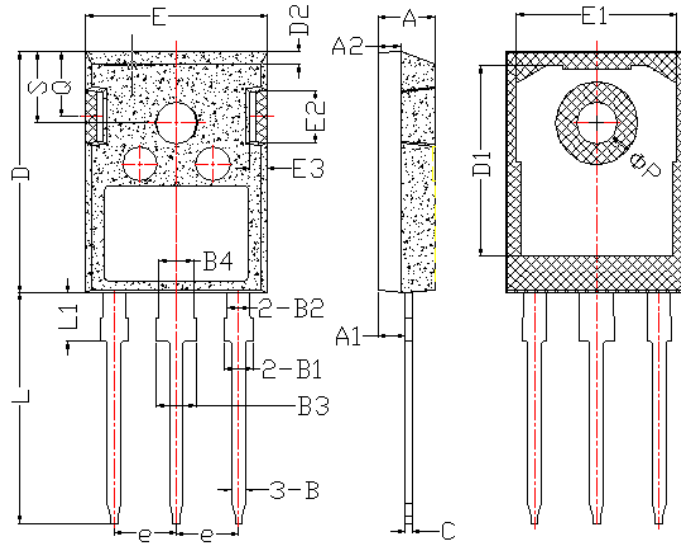
Figure 21. Typical Diode Forward Current vs Forward Voltage



6. Test Circuit and Waveform



7. Package Description



Items	Values(mm)	
	MIN	MAX
A	4.90	5.16
A1	2.27	2.53
A2	1.85	2.11
B	1.07	1.33
B1	1.90	2.41
B2	1.75	2.15
B3	2.87	3.38
B4	2.87	3.13
C	0.55	0.68
D	20.82	21.10
D1	16.25	17.65
D2	1.05	1.35
E	15.70	16.03
E1	13.10	14.15
E2	3.68	5.10
E3	1.68	2.60
e	5.44	
L	19.80	20.31
L1	4.17	4.47
ΦP	3.50	3.70
Q	5.49	6.00
S	6.04	6.30

TO-247 Package

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