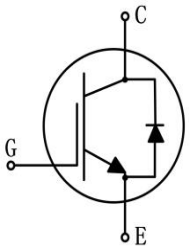
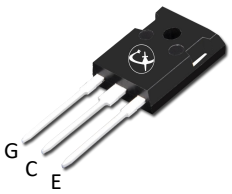
LGT50N65HB

N-Channel Enhancement Mode Power IGBT

MAIN CHARACTERISTICS

$I_{C\ @TC=100℃}$	50A
V_{CE}	650V
VCE(sat)-typ	1.65V





TO-247

FEATURES

- Positive temperature coefficient
- Fast Switching
- Low VCE(sat)
- Reliable and Rugged
- Halogen Free and Green Devices Available

APPLICATIONS

- UPS
- Motor drives
- Boost
- Portable power station

MECHANICAL DATA

- Case: Molded plastic
- Mounting Position: Any
- Molded Plastic: UL Flammability Classification Rating 94V-0
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Solder bath temperature 275℃ maximum,10s per JESD 22-B106

Product specification classification

Part Number	Package	Mode Name	Pack
LGT50N65HB	TO-247	LGT50N65HB	Tube

LGT50N65HB

N-Channel Enhancement Mode Power IGBT

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CES}	650	V
Gate-emitter voltage	V_{GES}	±20	V
Continuous collector current (TC=25℃)	I_C	100	A
Continuous collector current (TC=100℃)		50	A
Pulsed collector current, tp limited by Tvjmax	I_{CM}	200	A
Diode continuous forward current (TC=25℃)	I_F	100	A
Diode continuous forward current (TC=100℃)		50	A
Diode maximum current, tp limited by Tvjmax	I_{FM}	200	A
Power Dissipation @TC=25°C	P_D	250	W
Short circuit withstand time VGE=15V, VCC≤ 600V,allowed number of short circuits<1000,times between short circuits≥1.0s,TJ≤175°C	tSC	8	μs
Operating junction temperature range	T_{vj}	-55 to +175	°C
Storage temperature range	T_{stg}	-55 to +175	°C

Thermal characteristics

Parameter	Symbol	Values	Unit
Thermal resistance, junction to case for IGBT	$R_{th(j-c)}$	0.60	℃/W
Thermal resistance, junction to case for Diode	$R_{th(j-c)}$	0.55	℃/W
Thermal resistance, junction to ambient	$R_{th(j-a)}$	40	℃/W

Note1:Pulse test: 300 μs pulse width, 2 % duty cycle

Electrical characteristics of IGBT at Tvj=25℃ unless otherwise specified

Static characteristics

Parameter	Test Condition	Symbol	Min	Typ	Max	Unit
Collector-emitter breakdown voltage	V_{GE}=0V, I_C=250μA	B_{VCES}	650	-	-	V
Collector-emitter leakage current	V_{CE}=650V, V_{GE}=0V	I_{CES}	-	-	10	μA
Gate leakage current, forward	V_{GE}=±20V, V_{CE}=0V	I_{GES}	-	-	±200	nA
Gate-emitter threshold voltage	V_{GE}=VCE, I_C=1mA	$V_{GE(th)}$	4.3	5.3	6.3	V
Collector-emitter saturation voltage	V_{GE}=15 V, I_C=50A, Tvj=25℃	$V_{CE(sat)}$	-	1.65	2	V
	V_{GE}=15V, I_C=50A, T_{vj}=125℃		-	1.85	-	V
	V_{GE}=15V, I_C=50A, T_{vj}=175℃		-	2	-	V

Dynamic characteristics

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Input capacitance	V_{CE}=25V V_{GE}=0V f =1MHz	C_{ies}	-	3356	-	pF
Output capacitance		C_{oes}	-	179	-	pF
Reverse transfer capacitance		C_{res}	-	93	-	pF
Total gate charge	V_{CC}=520V V_{GE}=15V I_C=50A	Q_g	-	183	-	nC
Gate- Emitter Charge		Qge	-	26	-	nC
Gate- Collector Charge		Qgc	-	83	-	nC

Electrical characteristics of IGBT at Tvj=25℃ unless otherwise specified

Switching characteristics

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Turn-on delay time	V_{CC}=400V V_{GE}=15V I_C=50A R_G=5Ω Inductive load	td(on)	-	24	-	ns
Rise time		tr	-	88	-	ns
Turn-off delay time		td(off)	-	124	-	ns
Fall time		tf	-	73	-	ns
Turn-on energy		Eon	-	1.4	-	mJ
Turn-off energy		Eoff	-	1.2	-	mJ
Total switching energy		Ets	-	2.6	-	mJ
Turn-on delay time	V_{CC}=400V V_{GE}=15V I_C=50A R_G=5Ω Inductive load Tvj=175℃	td(on)	-	30	-	ns
Rise time		tr	-	95	-	ns
Turn-off delay time		td(off)	-	152	-	ns
Fall time		tf	-	67	-	ns
Turn-on energy		Eon	-	1.62	-	mJ
Turn-off energy		Eoff	-	1.5	-	mJ
Total switching energy		Ets	-	3.12	-	mJ

Electrical characteristics of Diode at Tvj=25℃ unless otherwise specified

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Diode forward voltage	I_F=50A Tvj=25℃	VF	-	1.65	2.05	V
	I_F=50A Tvj=125℃		-	1.57	-	V
	I_F=50A Tvj=175℃		-	1.47	-	V
Diode reverse recovery time	I_F=50A V_{CC}=400V diF/dt=200A/μs	trr	-	136	-	ns
Diode peak reverse recovery current		Qrr	-	350	-	nC
Diode reverse recovery charge		Irrm	-	6.9	-	A
Diode reverse recovery time	I_F=50A V_{CC}=400V diF/dt=200A/μs Tvj=175℃	trr	-	183	-	ns
Diode peak reverse recovery current		Qrr	-	560	-	nC
Diode reverse recovery charge		Irrm	-	7.8	-	A

RATINGS AND CHARACTERISTIC CURVES

Figure 1: Power Dissipation

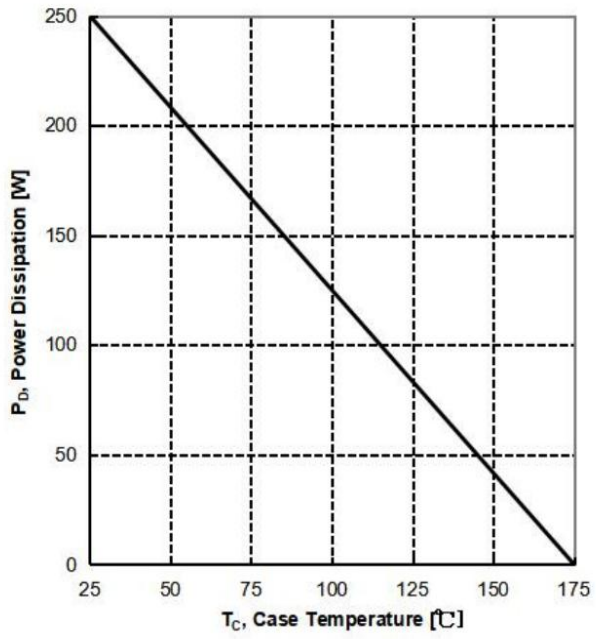


Figure 2: Collector Current vs. Case Temperature

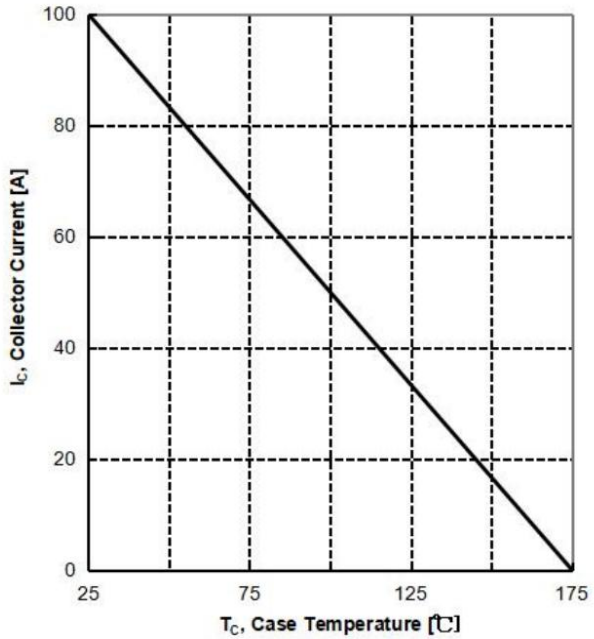


Figure 3: Safe Operation Area

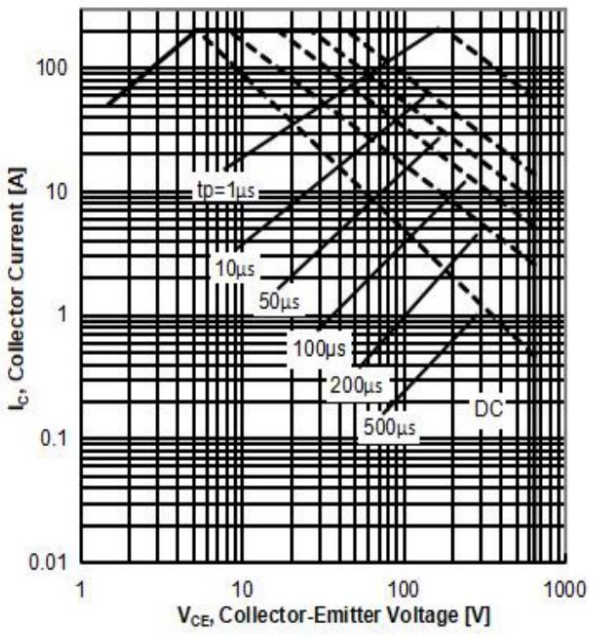


Figure 4: Typical Transfer Characteristics

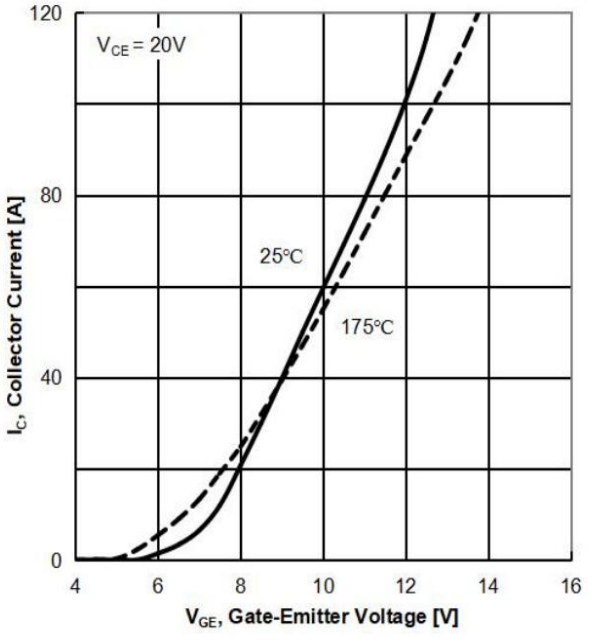


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Figure 5: Typical Output Characteristics

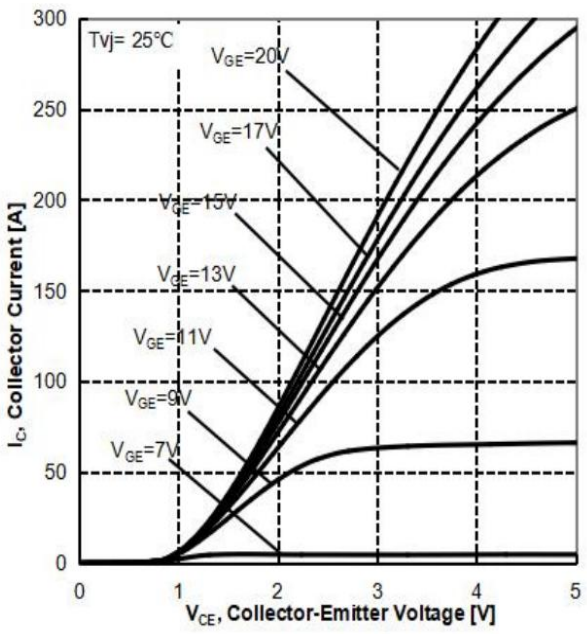

Figure 6: Typical Output Characteristics

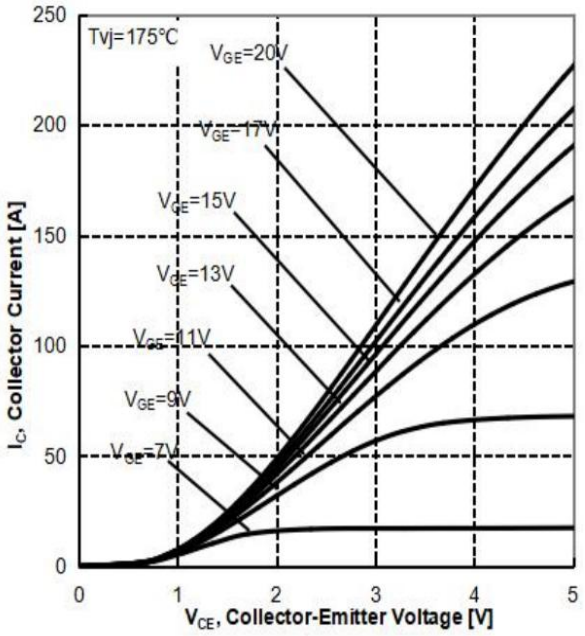

Figure 7: Typical Collector-Emitter Saturation Voltage vs. Junction Temperature

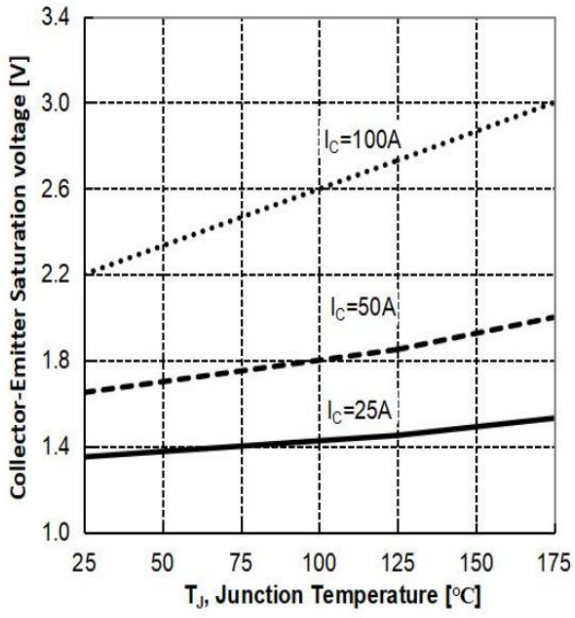

Figure 8: Typical Gate-Emitter Threshold Voltage vs. Junction Temperature

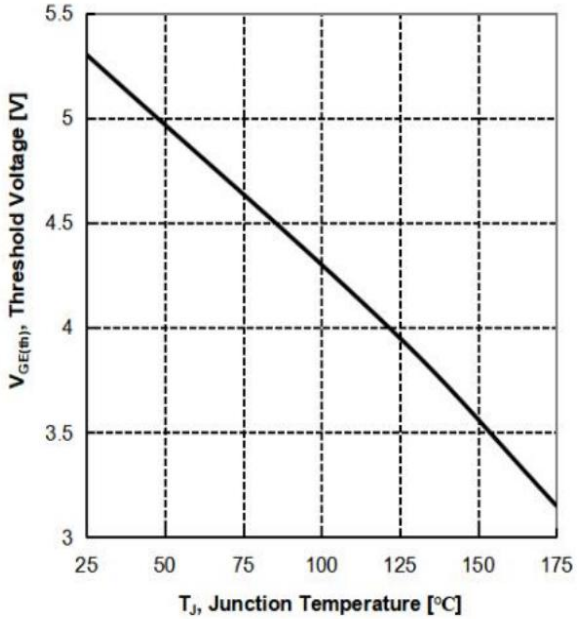

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Figure 9: Typical Switching Times vs. Gate Resistor (T_J=25℃, V_{CE}=400V, V_{GE}=15V, I_C=50A)

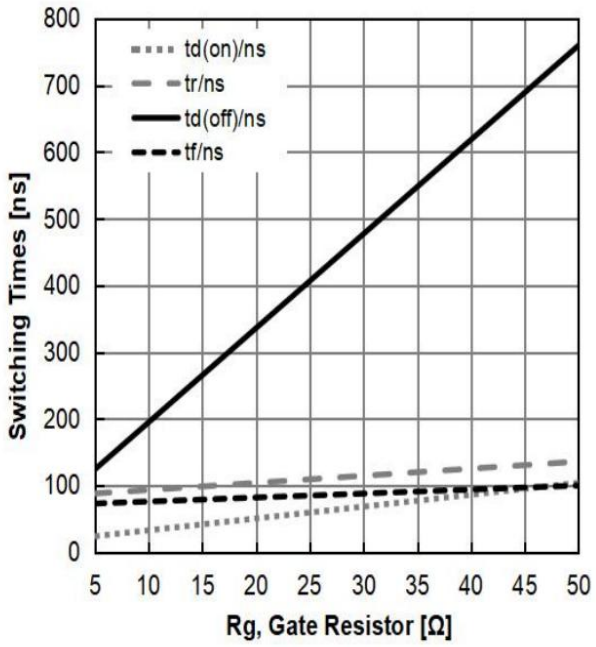

Figure 10: Typical Switching Energy vs. Gate Resistor (T_J=25℃, V_{CE}=400V, V_{GE}=15V, I_C=50A)

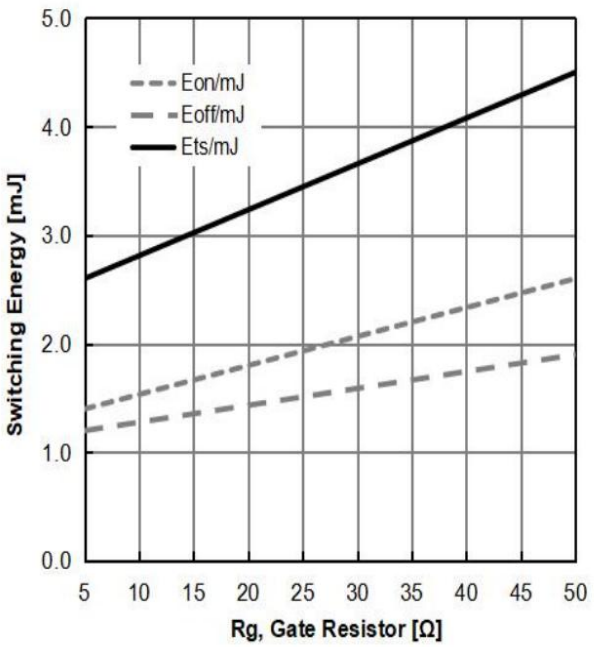

Figure 11: Typical Switching Times vs. Junction Temperature (V_{CE}=400V, V_{GE}=15V, I_C=50A,Rg=5Ω)

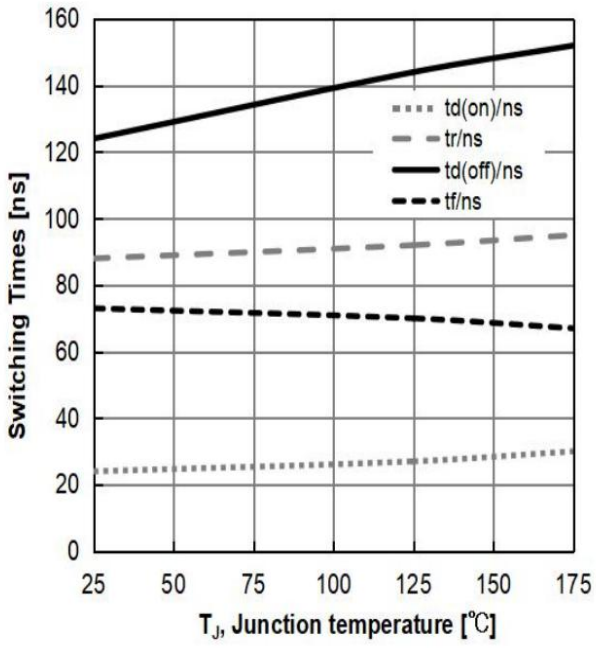

Figure 12: Typical Switching Energy vs. Junction Temperature (V_{CE}=400V, V_{GE}=15V, I_C=50A,Rg=5Ω)

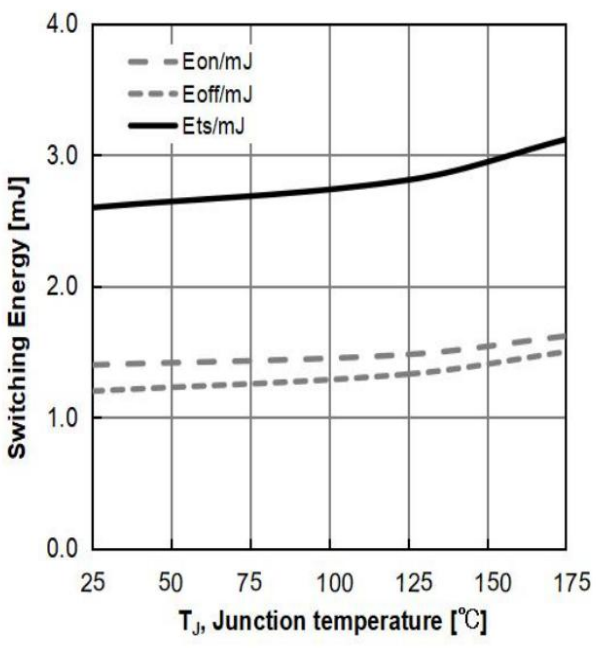

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Figure 13: Typical Switching Times vs. Collector Current (T_J=25℃, V_{CE}=400V, V_{GE}=15V,Rg=5Ω)

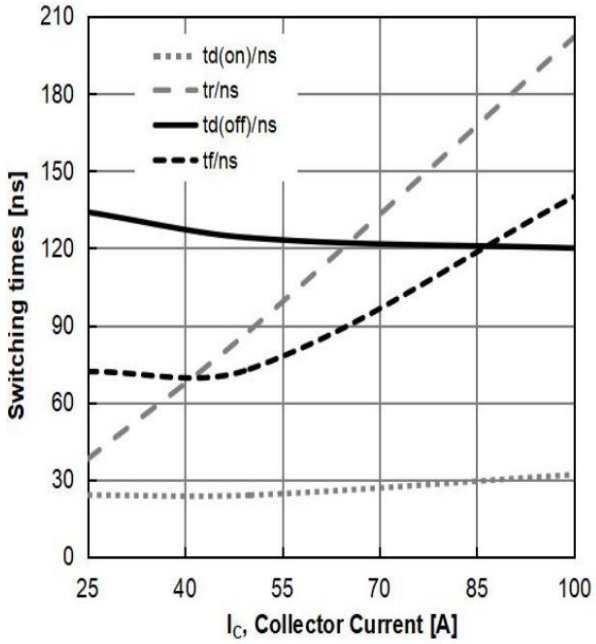


Figure 14: Typical Switching Energy vs. Collector Current (T_J=25℃, V_{CE}=400V, V_{GE}=15V,Rg=5Ω)

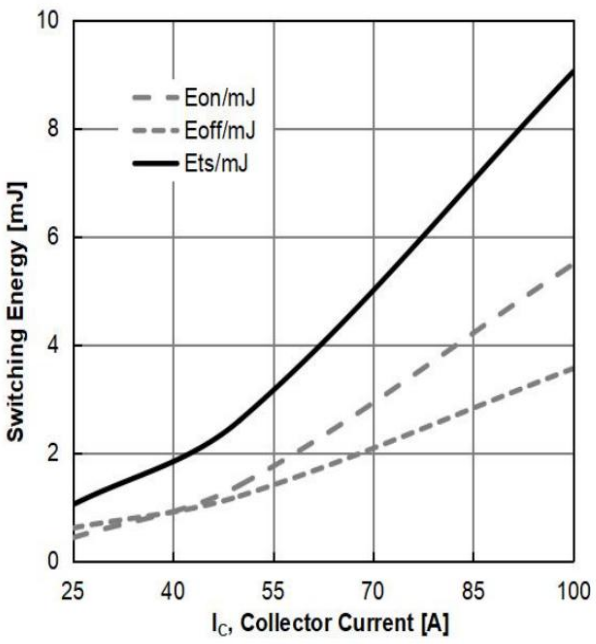


Figure 15: Typical Switching Times vs. VCE (T_J=25℃, V_{GE}=15V, I_C=50A,Rg=5Ω)

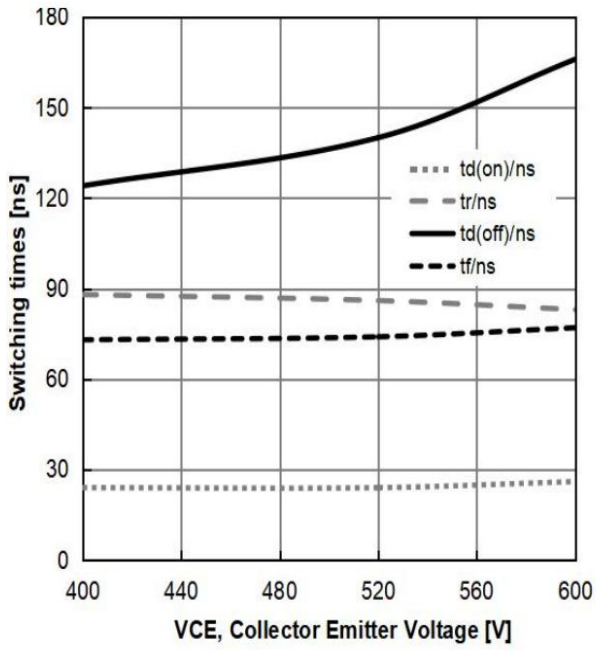
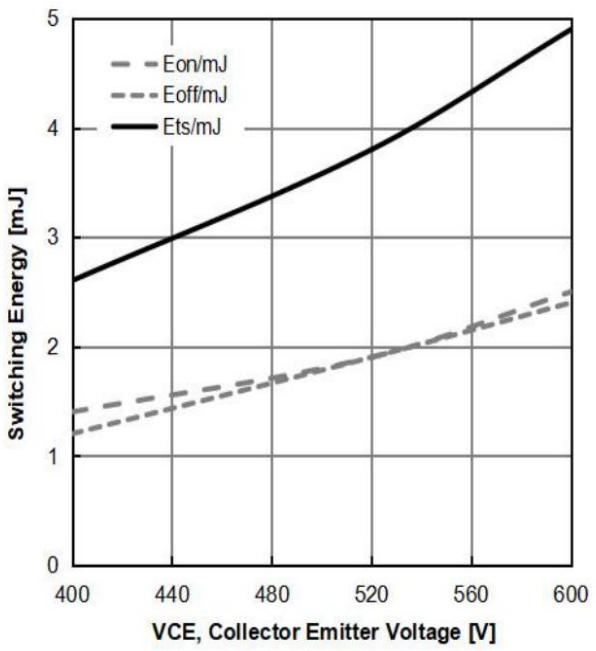


Figure 16: Typical Switching Energy vs. VCE (T_J=25℃, V_{GE}=15V, I_C=50A,Rg=5Ω)



RATINGS AND CHARACTERISTIC CURVES

Figure 17: Typical Capacitance vs. Collector- Emitter Voltage

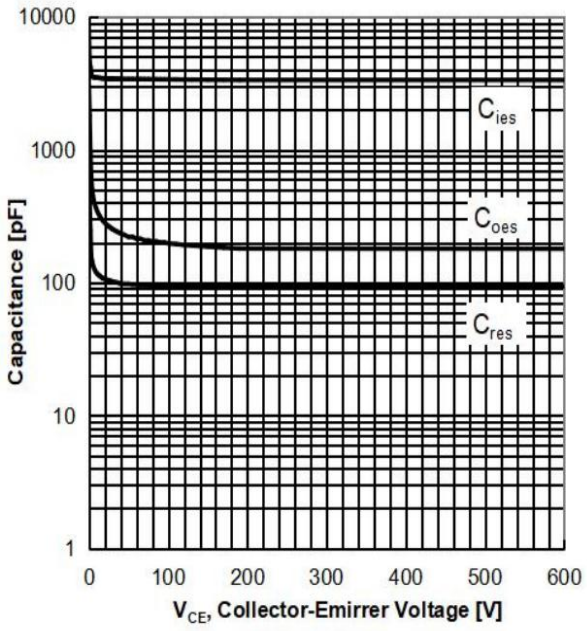


Figure 18: Typical Gate Charge

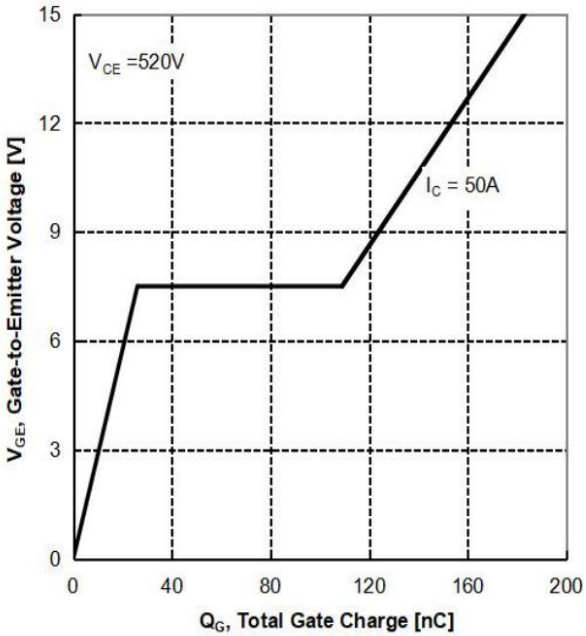


Figure 19: IGBT Transient Thermal Impedance vs. Pulse Width

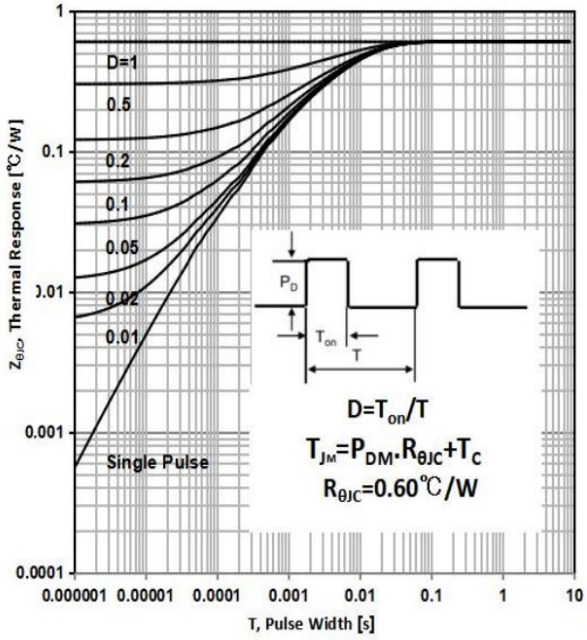


Figure 20: Diode Transient Thermal Impedance vs. Pulse Width

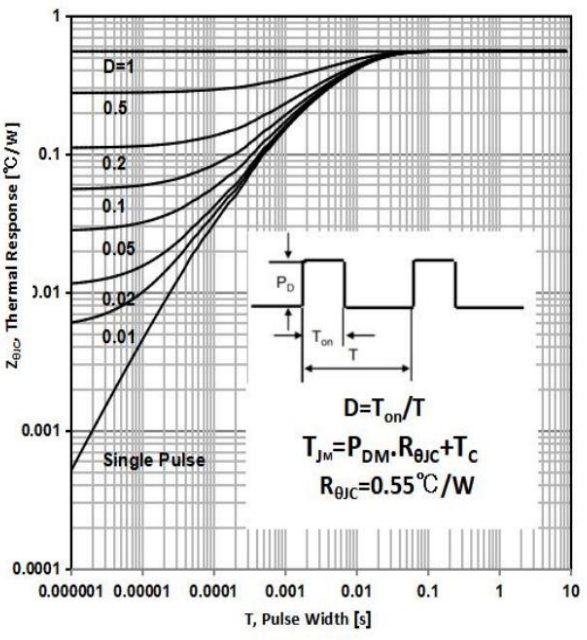


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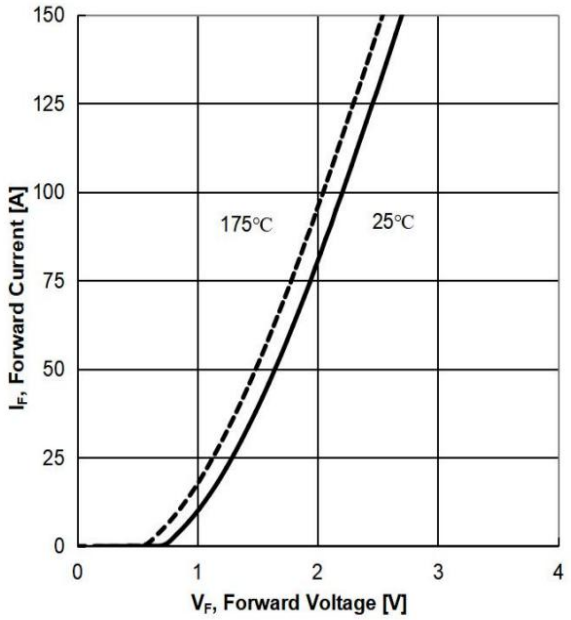
Figure 21: Typical Diode Forward Current vs. Forward Voltage



Package Outline Dimensions millimeters

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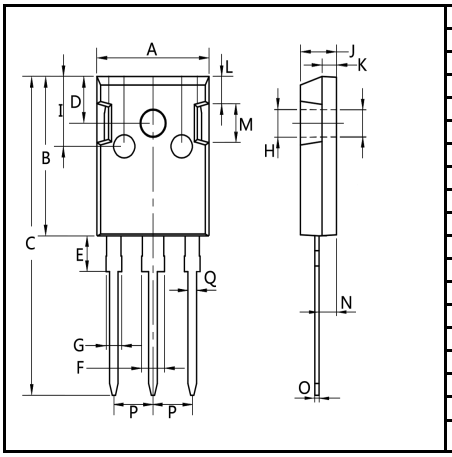
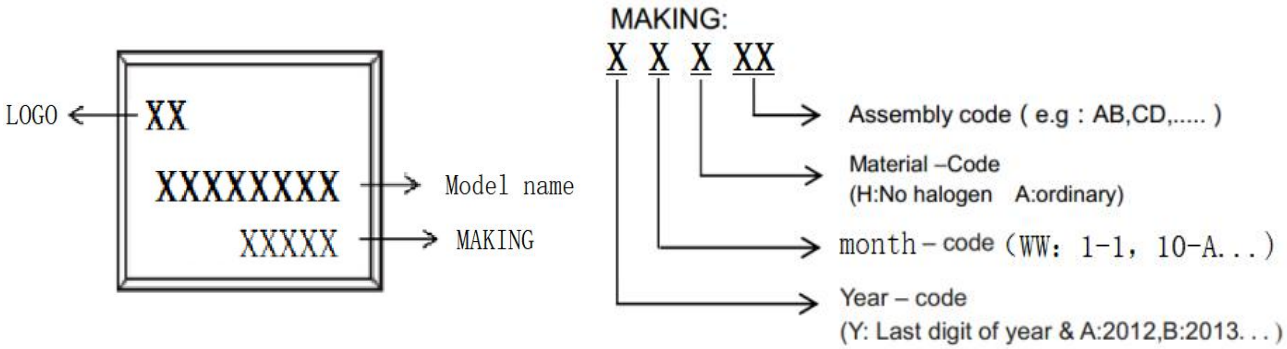
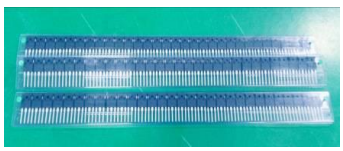


Dim.	Min.	Max.
A	15	16
B	20	21
C	40	42
D	5.5	6.5
E	4	5.5
F	2.5	3.5
G	1.75	2.5
H	3	4
I	8	10
J	4.9	5.1
K	1.9	2.1
L	3	4
M	4.75	5.25
N	2	3
O	0.55	0.65
P	Typ 5.4	
Q	1.17	1.3
All Dimensions in millimeter		

Marking on the body



packing instruction

PKG	Minimal Package	Mini Box	Box
TO-247			
	30pcs/pdpe	600pcs/box	3000pcs/box

Notice

All product,product specifications and data are subject to change without notice to improve.The right to explain is owned by LINGXUN electronics company.

Confirm that operation temperature is within the specified range described in the product specification. Avoid applying poer exceeding normal rated

poer; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.

LINGXUN electronics shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.

http://www.lxmicro.com

Revision History

Rev	Changes	Date
1.0	First version	2025-8-16