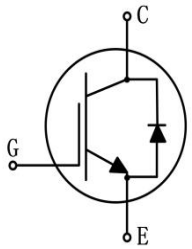
LGT40N120HB

N-Channel Enhancement Mode Power IGBT

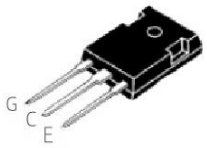
MAIN CHARACTERISTICS

$I_{C\ @TC=100℃}$	40A
V_{CE}	1200V
VCE(sat)-typ	1.9V



FEATURES

- Trench and field-stop technology
- High speed switching
- Low collector to emitter saturation voltage
- Easy parallel switching capability
- Short circuit withstands time 10μs
- High ruggedness performance



TO-247

APPLICATIONS

- Inverter
- Motor driver

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
LGT40N120HB	TO-247	LGT40N120HB	Tube

LGT40N120HB

N-Channel Enhancement Mode Power IGBT

Maximum Ratings

Characteristics	Symbol	Value	Unit
		247	
Collector-emitter voltage	V_{CES}	1200	V
Gate-emitter voltage	V_{GES}	±20	V
Continuous collector current (TC=25℃)	I_C	80	A
Continuous collector current (TC=100℃)		40	A
Pulsed collector current, tp limited by Tvjmax	I_{CM}	160	A
Diode continuous forward current (TC=100℃)	I_F	40	A
Diode maximum current, tp limited by Tvjmax	I_{FM}	160	A
Power dissipation (TC=25℃)	P_{tot}	625	W
Operating junction temperature range	T_{vj}	-40 to +175	°C
Storage temperature range	T_{stg}	-55 to +150	°C

Thermal characteristics

Characteristics	Symbol	Values		Unit
		Typ	Max.	
Thermal resistance, junction to case for IGBT	$R_{th(j-c)}$	-	0.35	K/ W
Thermal resistance, junction to case for Diode	$R_{th(j-c)}$	-	0.70	K/ W
Thermal resistance, junction to ambient	$R_{th(j-a)}$	-	40	K/ W

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

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

Static characteristics

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Collector-emitter breakdown voltage	V_{GE}=0V, I_C=250μA	B_{VCES}	1200	-	-	V
Collector-emitter leakage current	V_{CE}=1200V, V_{GE}=0V	I_{CES}	-	-	100	μA
Gate leakage current, forward	V_{GE}=±20V, V_{CE}=0V	I_{GES}	-	-	±100	nA
Gate-emitter threshold voltage	V_{GE}=VCE, I_C=1mA	$V_{GE(th)}$	5	6	7	V
Collector-emitter saturation voltage	V_{GE}=15 V, I_C=40A	$V_{CE(sat)}$	-	1.9	-	V
	V_{GE}=15V, I_C=40A, T_{vj}=175℃		-	2.3	-	V

Dynamic characteristics

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Input capacitance	V_{CE}=30V V_{GE}=0V f =1MHz	C_{ies}	-	9780	-	pF
Output capacitance		C_{oes}	-	140	-	pF
Reverse transfer capacitance		C_{res}	-	42	-	pF
Total gate charge	V_{CC}=960V V_{GE}=15V I_C=40A	Q_g	-	269	-	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}=600V V_{GE}=15V I_C=40A R_G=10Ω Inductive load	td(on)	-	80	-	ns
Rise time		tr	-	77	-	ns
Turn-off delay time		td(off)	-	308	-	ns
Fall time		tf	-	67	-	ns
Turn-on energy		Eon	-	2.1	-	mJ
Turn-off energy		Eoff	-	1.4	-	mJ
Total switching energy		Ets	-	3.5	-	mJ
Turn-on delay time	V_{CC}=600V V_{GE}=15V I_C=40A R_G=10Ω Inductive load Tvj=175℃	td(on)	-	70	-	ns
Rise time		tr	-	75	-	ns
Turn-off delay time		td(off)	-	352	-	ns
Fall time		tf	-	132	-	ns
Turn-on energy		Eon	-	2.5	-	mJ
Turn-off energy		Eoff	-	2.4	-	mJ
Total switching energy		Ets	-	4.9	-	mJ

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

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Diode forward voltage	I_F=40A	VF	-	3.1	-	V
	I_F=40A Tvj=175℃		-	2.3	-	V
Diode reverse recovery time	V_R=600V I_F=40A diF/dt=-750A/μs	trr	-	170	-	ns
Diode peak reverse recovery current		Irrm	-	17	-	A
Diode reverse recovery charge		Qrr	-	1100	-	nC
Diode reverse recovery time	V_R=600V I_F=40A diF/dt=-750A/μs Tvj=175℃	trr	-	285	-	ns
Diode peak reverse recovery current		Irrm	-	28	-	A
Diode reverse recovery charge		Qrr	-	3300	-	nC

RATINGS AND CHARACTERISTIC CURVES

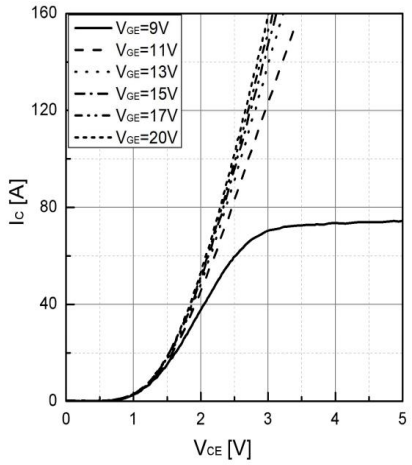


Fig 1. Typical output characteristic (T_{vj}=25℃)

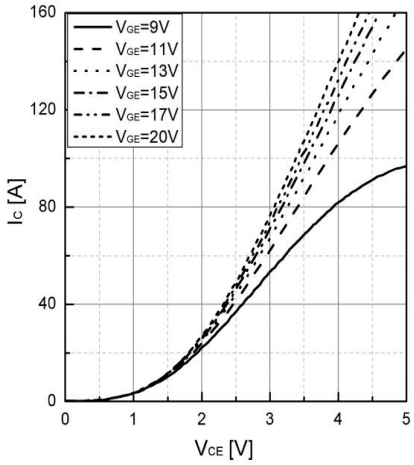


Fig 2. Typical output characteristic(T_{vj}=175℃)

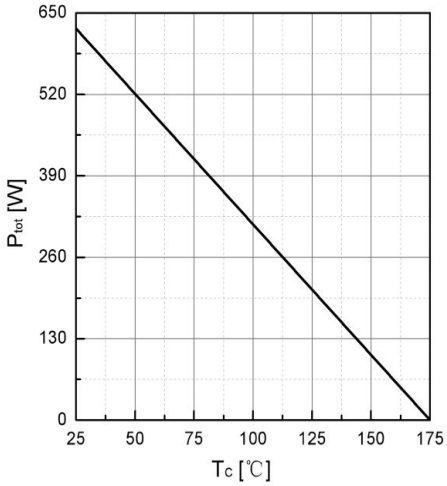


Fig 3. Power dissipation as a function of T_C

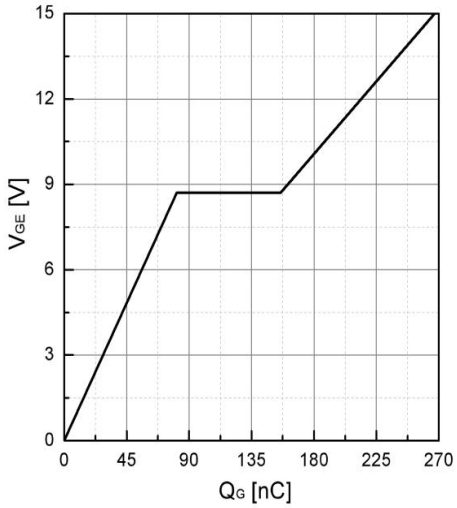


Fig 4. Typical Gate charge

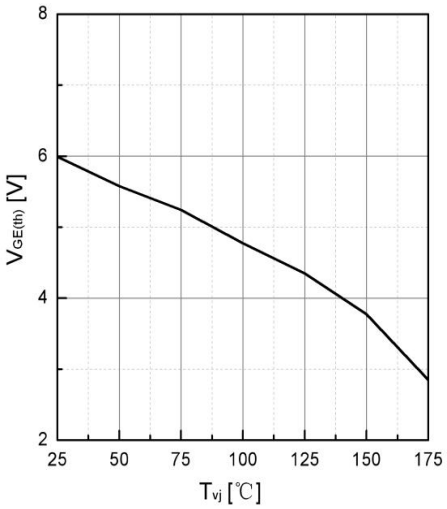


Fig 5. Typical $V_{GE(th)}$ as a function of T_{vj} (I_C=1mA)

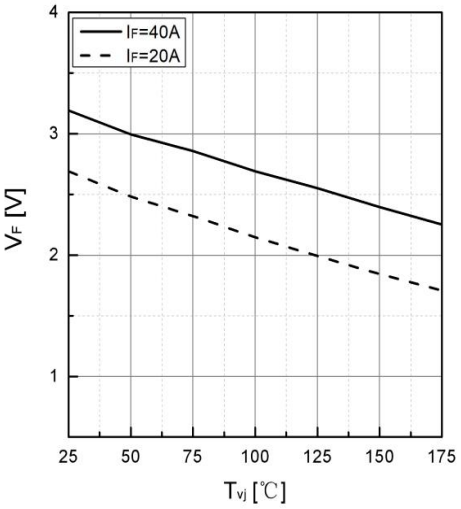


Fig 6. Typical V_F as a function of T_{vj}

RATINGS AND CHARACTERISTIC CURVES

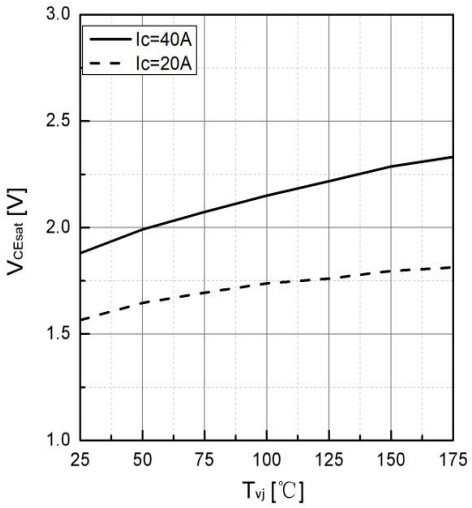


Fig 7. Typical V_{CEsat} as a function of T_{vj}

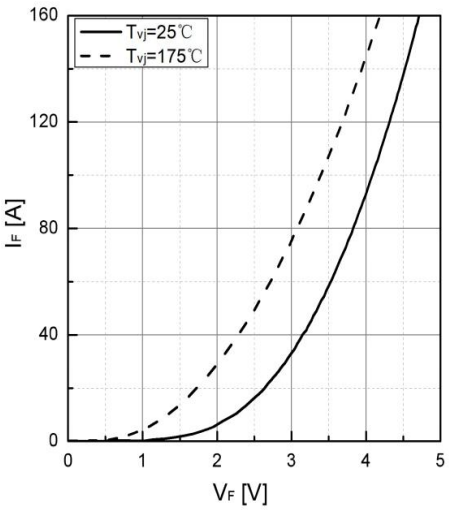


Fig 8. Typical I_F as a function of V_F

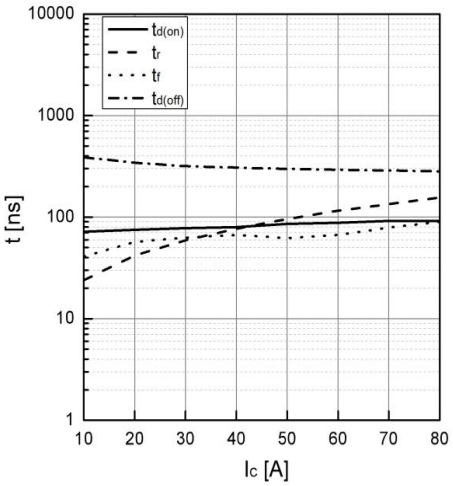


Fig 9. Typical switching time as a function of I_C

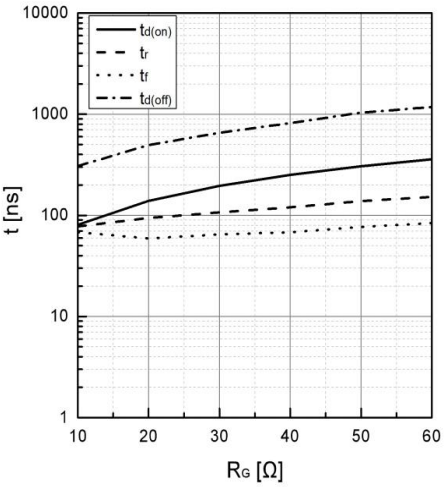


Fig 10. Typical switching times as a function of R_G

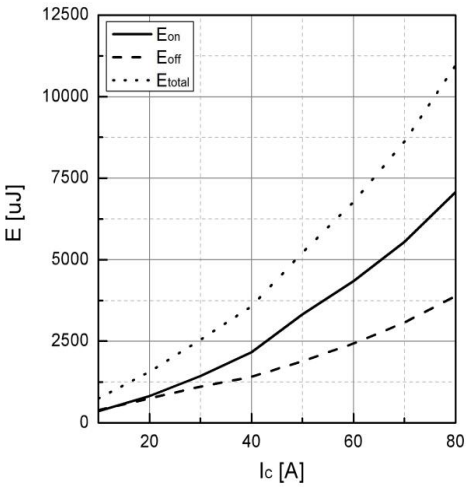


Fig 11. Typical switching energy losses as a function of I_C

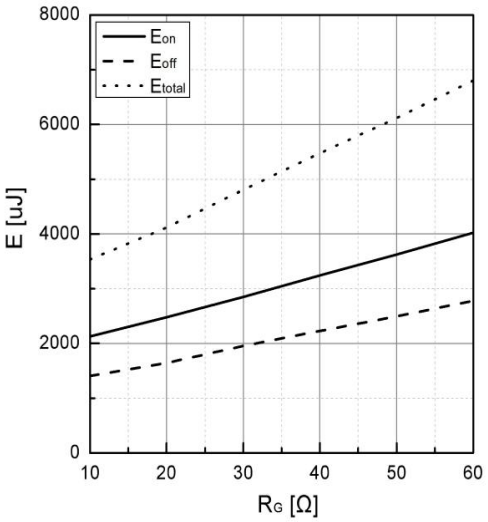


Fig 12. Typical switching energy losses as a function of R_G

RATINGS AND CHARACTERISTIC CURVES

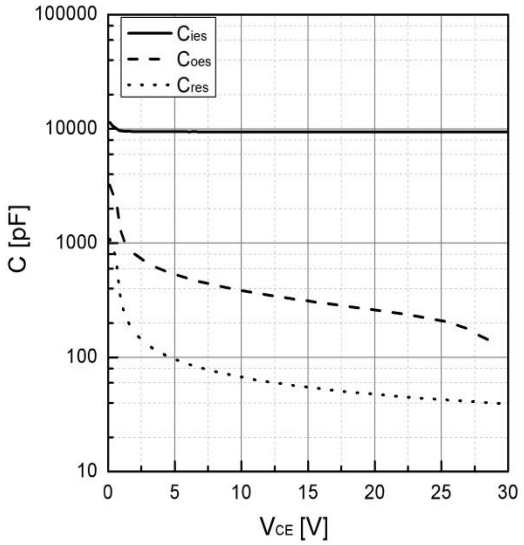


Fig 13. Typical capacitance as a function of V_{CE} (f=1Mhz, V_{GE}=0V)

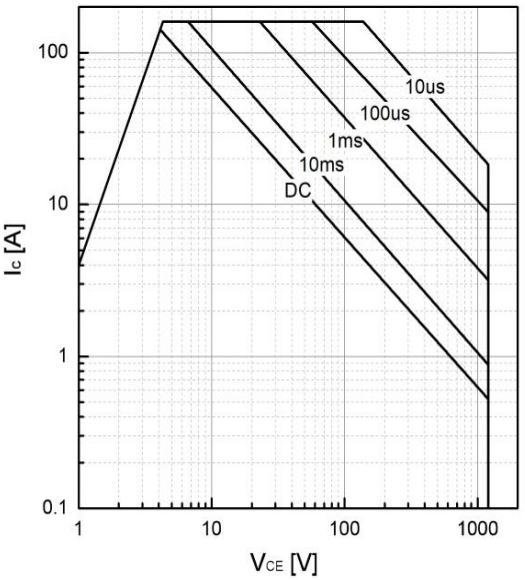


Fig 14. Safe operating area

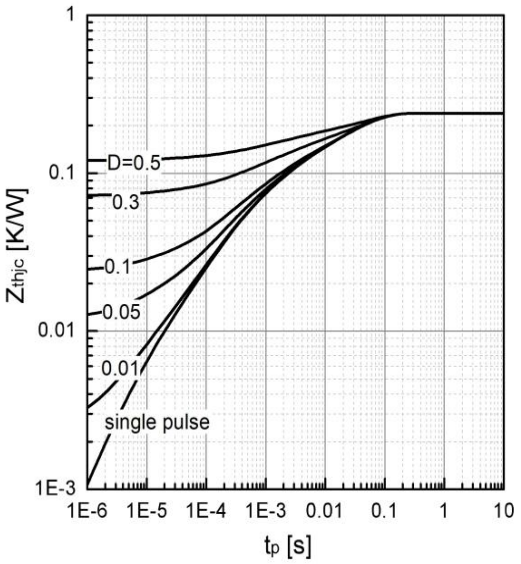


Fig 15. Transient thermal impedance of IGBT

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Package Outline Dimensions millimeters

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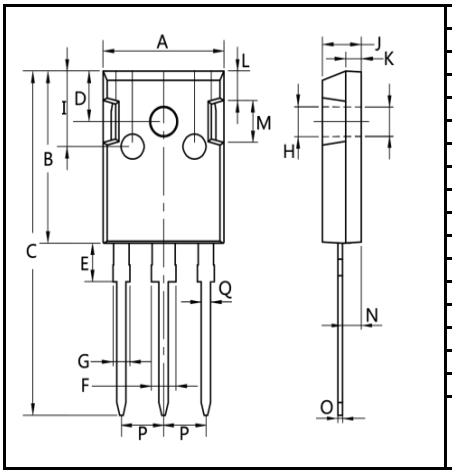
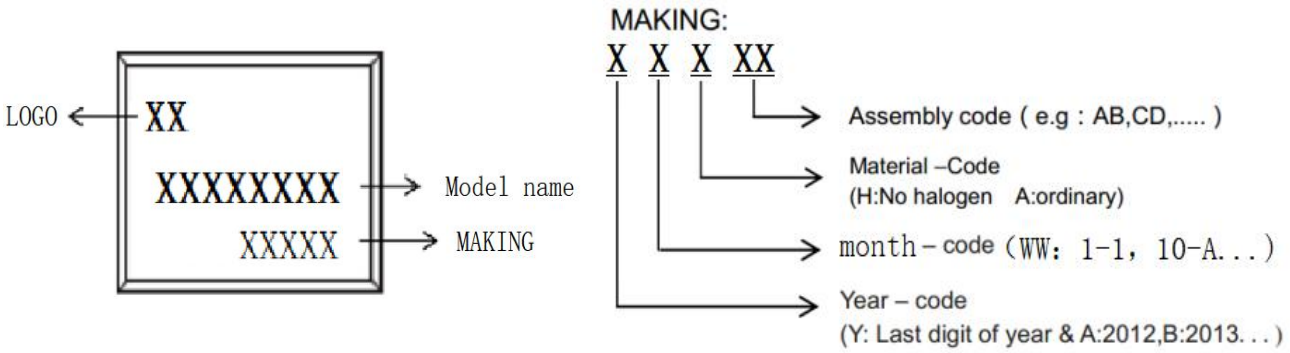
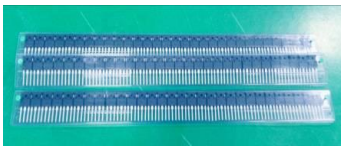


Dim.	Min.	Max.
A	15	16
B	20	21
C	40	42
D	5.5	6.5
E	4	5.5
F	2.5	3.5
G	1.75	2.5
H	3	4
I	8	10
J	4.9	5.1
K	1.9	2.1
L	3.5	4
M	4.75	5.25
N	2	3
O	0.55	0.75
P	Typ 5.4	
Q	1.17	1.3

Marking on the body



packing instruction

PKG	最小包装	内盒	外箱
TO-247			
	30PCS/管	600pcs/盒	3000pcs/箱

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