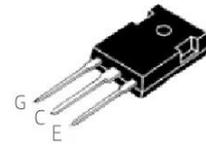
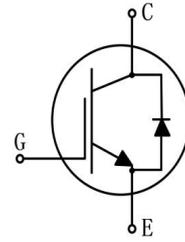


MAIN CHARACTERISTICS

I_C @TC=100°C	60A
V_{CE}	650V
$V_{CE(sat)}$ -typ	1.75V



TO-247

FEATURES

- Positive temperature coefficient in $V_{CE(sat)}$
- Fast Switching
- Low $V_{CE(sat)}$
- Reliable and Rugged
- Halogen Free; RoHS compliant

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°C maximum, 10s per JESD 22-B106

Product specification classification

Part Number	Package	Mode Name	Pack
LGT60N65HB	TO-247	LGT60N65HB	Tube

Maximum Ratings

Characteristics	Symbol	Value	Unit
Collector-emitter voltage	V_{CES}	650	V
Gate-emitter voltage	V_{GES}	± 30	V
Continuous collector current (TC=25°C)	I_c	120	A
Continuous collector current (TC=100°C)		60	A
Pulsed collector current, tp limited by Tvjmax	I_{CM}	240	A
Diode continuous forward current (TC=25°C)	I_F	120	A
Diode continuous forward current (TC=100°C)		60	A
Diode maximum current, tp limited by Tvjmax	I_{FM}	240	A
Short Circuit with Stand Time $V_{GE}=15V, V_{CC} \leq 400V$, Allowed Number of Short Circuits < 1000, Times Between Short Circuits $\geq 1.0s$, $T_J \leq 175^\circ C$	tsc	8	μS
Power dissipation (TC=25°C)	P_{tot}	341	W
Operating junction temperature range	T_{Jmax}, T_{Stg}	-55 to +175	°C
Maximum Temperature for Soldering	T_L	260	°C

Thermal characteristics

Characteristics	Symbol	Values		Unit
		Typ	Max.	
Thermal resistance, junction to case for IGBT	$R_{th(j-c)}$	-	0.44	K/ W
Thermal resistance, junction to case for Diode	$R_{th(j-c)}$	-	0.49	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 $T_{vj}=25^\circ C$ unless otherwise specified

Static characteristics

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Collector-emitter breakdown voltage	$V_{GE}=0V, I_c=250\mu A$	BV_{CES}	650	-	-	V
Collector-emitter leakage current	$V_{CE}=650V, V_{GE}=0V$	I_{CES}	-	-	10	μA
Gate leakage current, forward	$V_{GE}=\pm 20V, V_{CE}=0V$	I_{GES}	-	-	± 200	nA
Gate-emitter threshold voltage	$V_{GE}=V_{CE}, I_c=1mA$	$V_{GE(th)}$	4.3	5.3	6.3	V
Collector-emitter saturation voltage	$V_{GE}=15V, I_c=60A, T_{vj}=25^\circ C$	$V_{CE(sat)}$	-	1.75	2.05	V
	$V_{GE}=15V, I_c=60A, T_{vj}=125^\circ C$		-	1.92	-	V
	$V_{GE}=15V, I_c=60A, T_{vj}=175^\circ C$		-	2.08	-	V
Diode forward voltage	$I_F=60A, T_{vj}=25^\circ C$	V_F	-	1.4	1.95	V
	$I_F=60A, T_{vj}=125^\circ C$		-	1.22	-	V
	$I_F=60A, T_{vj}=175^\circ C$		-	1.16	-	V

Electrical characteristics of IGBT at $T_{vj}=25^{\circ}\text{C}$ unless otherwise specified

Dynamic characteristics

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Input capacitance	$V_{CE}=25\text{V}$	C_{ies}	-	3360	-	pF
Output capacitance	$V_{GE}=0\text{V}$	C_{oes}	-	213	-	pF
Reverse transfer capacitance	$f=1\text{MHz}$	C_{res}	-	90	-	pF
Total gate charge	$V_{CC}=520\text{V}$ $V_{GE}=15\text{V}$ $I_C=60\text{A}$	Q_g	-	188	-	nC
Gate-Emitter Charge		Q_{ge}	-	29	-	nC
Gate-Collector Charge		Q_{gc}	-	94	-	nC

Switching characteristics

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit	
Turn-on delay time	$V_{CC}=400\text{V}$ $V_{GE}=15\text{V}$ $I_C=60\text{A}$ $R_G=5\Omega$ Inductive load	$t_{d(on)}$	-	24	-	ns	
Rise time		t_r	-	111	-	ns	
Turn-off delay time		$t_{d(off)}$	-	126	-	ns	
Fall time		t_f	-	85	-	ns	
Turn-on energy		E_{on}	-	2.07	-	mJ	
Turn-off energy		E_{off}	-	1.54	-	mJ	
Total switching energy		E_{ts}	-	3.61	-	mJ	
Turn-on delay time		$V_{CC}=400\text{V}$ $V_{GE}=15\text{V}$ $I_C=60\text{A}$ $R_G=5\Omega$ Inductive load $T_{vj}=175^{\circ}\text{C}$	$t_{d(on)}$	-	26	-	ns
Rise time			t_r	-	118	-	ns
Turn-off delay time	$t_{d(off)}$		-	156	-	ns	
Fall time	t_f		-	79	-	ns	
Turn-on energy	E_{on}		-	2.23	-	mJ	
Turn-off energy	E_{off}		-	1.76	-	mJ	
Total switching energy	E_{ts}		-	3.99	-	mJ	

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Diode reverse recovery time	$V_R=400\text{V}$	t_{rr}	-	142	-	ns
Diode peak reverse recovery current	$I_F=60\text{A}$	I_{rrm}	-	7.2	-	A
Diode reverse recovery charge	$diF/dt=-200\text{A}/\mu\text{s}$	Q_{rr}	-	363	-	nC
Diode reverse recovery time	$V_R=400\text{V}$	t_{rr}	-	191	-	ns
Diode peak reverse recovery current	$I_F=60\text{A}$	I_{rrm}	-	8.2	-	A
Diode reverse recovery charge	$diF/dt=-200\text{A}/\mu\text{s}$ $T_{vj}=175^{\circ}\text{C}$	Q_{rr}	-	585	-	nC

RATINGS AND CHARACTERISTIC CURVES

Figure 1: Power Dissipation

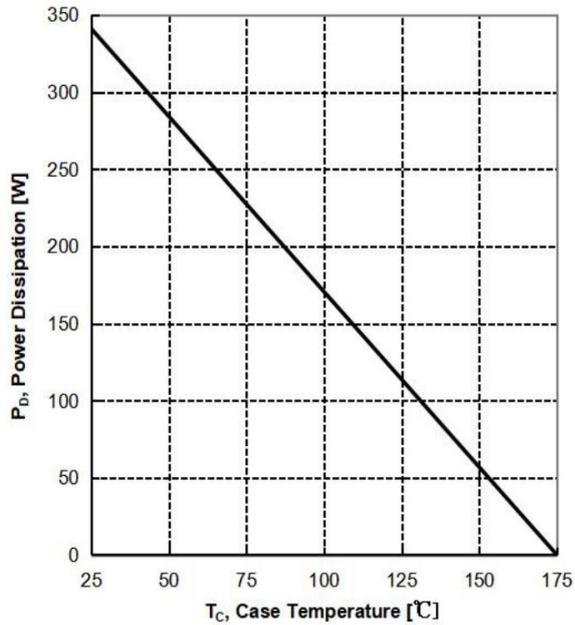


Figure 2: Collector Current vs. Case Temperature

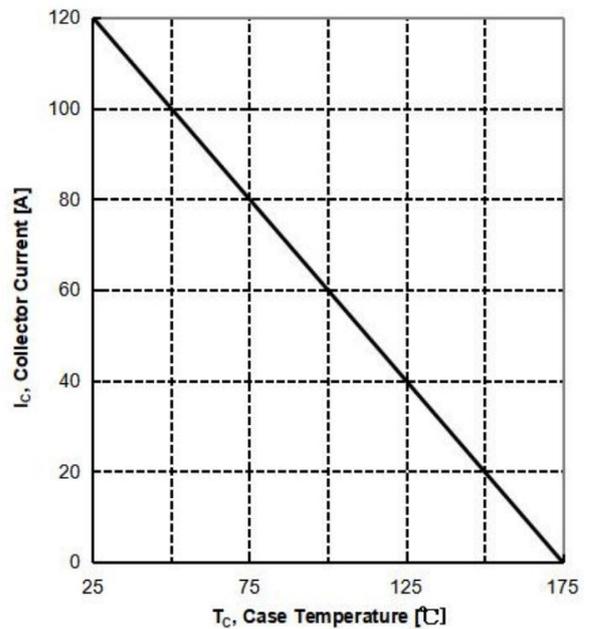


Figure 3: Safe Operation Area

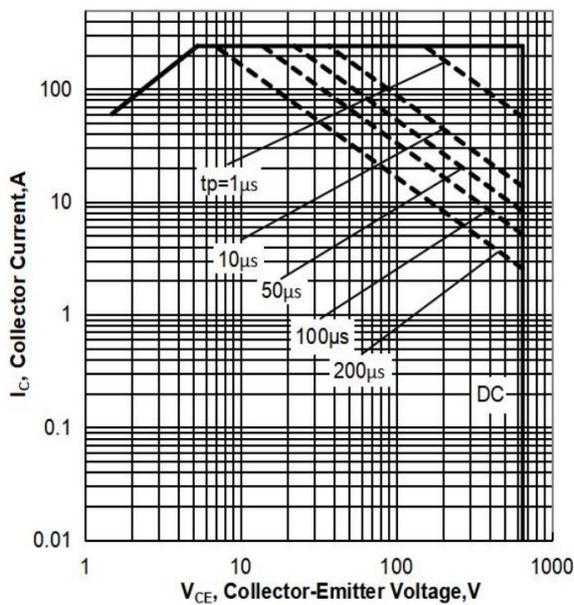
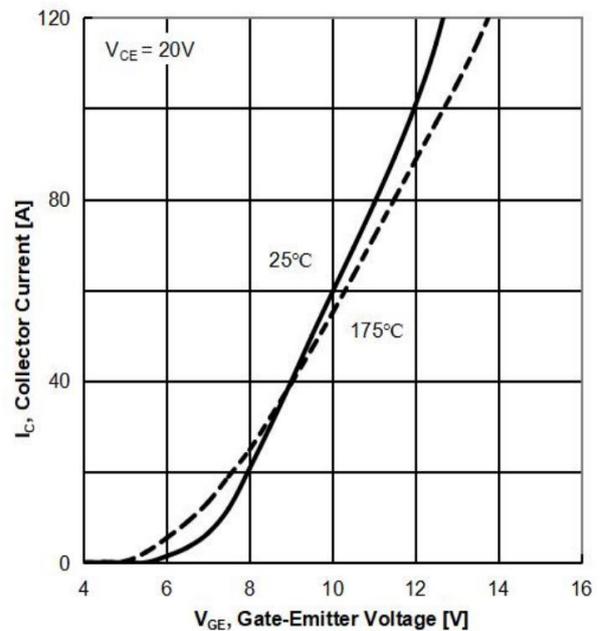


Figure 4: Typical Transfer Characteristics



RATINGS AND CHARACTERISTIC CURVES

Figure 5: Typical Output Characteristics

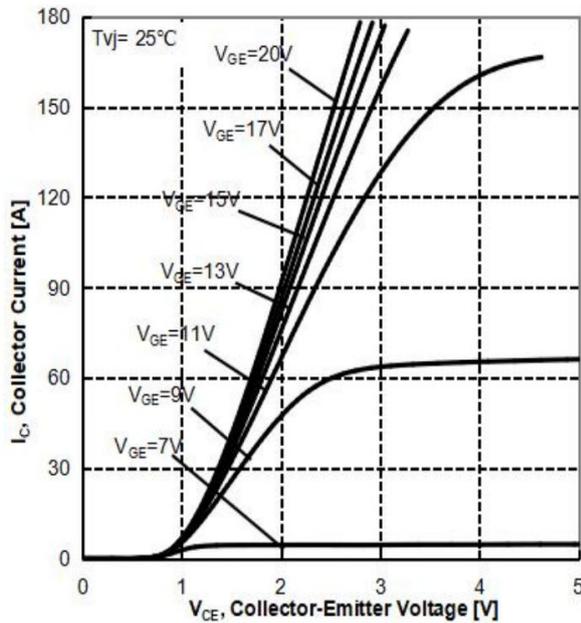


Figure 6: Typical Output Characteristics

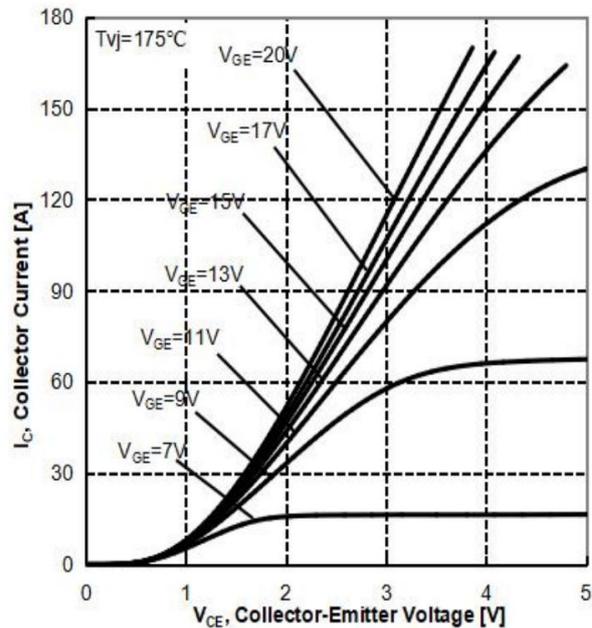


Figure 7: Typical Collector-Emitter Saturation Voltage vs. Junction Temperature

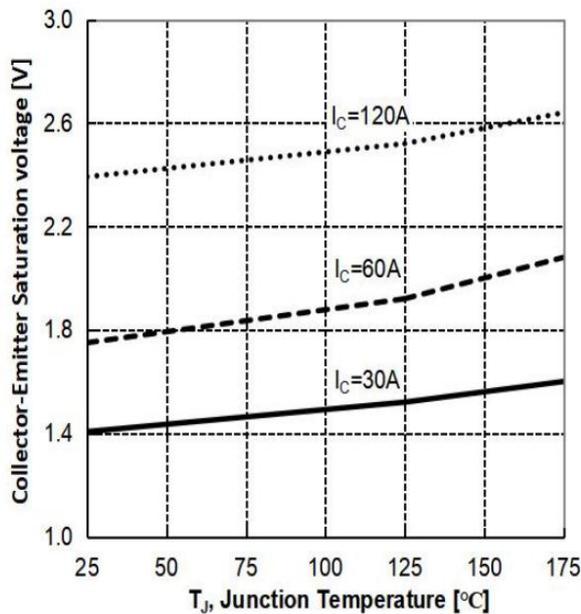
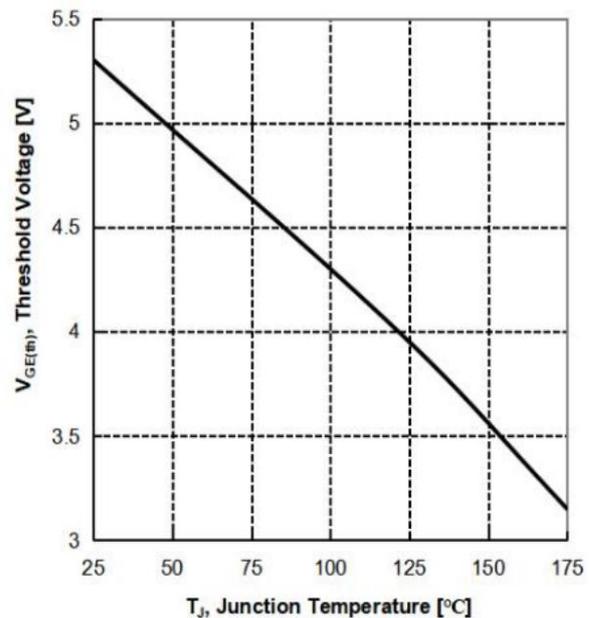


Figure 8: Typical Gate-Emitter Threshold Voltage vs. Junction Temperature



RATINGS AND CHARACTERISTIC CURVES

Figure 9: Typical Switching Times vs. Gate Resistor ($T_J=25^\circ\text{C}$, $V_{CE}=400\text{V}$, $V_{GE}=15\text{V}$, $I_C=60\text{A}$)

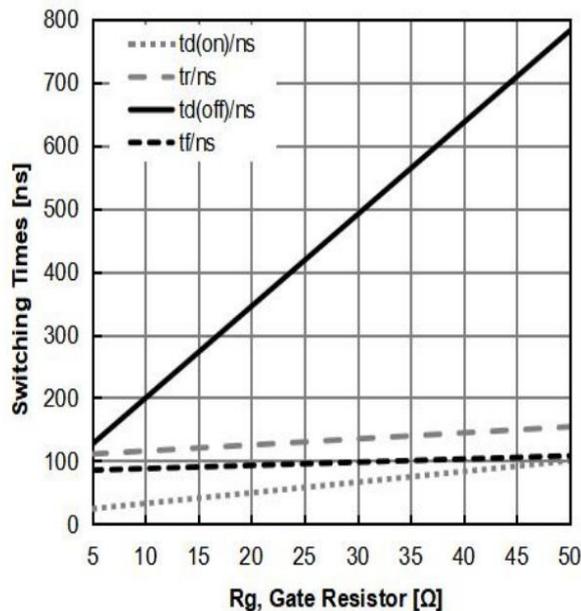


Figure 10: Typical Switching Energy vs. Gate Resistor ($T_J=25^\circ\text{C}$, $V_{CE}=400\text{V}$, $V_{GE}=15\text{V}$, $I_C=60\text{A}$)

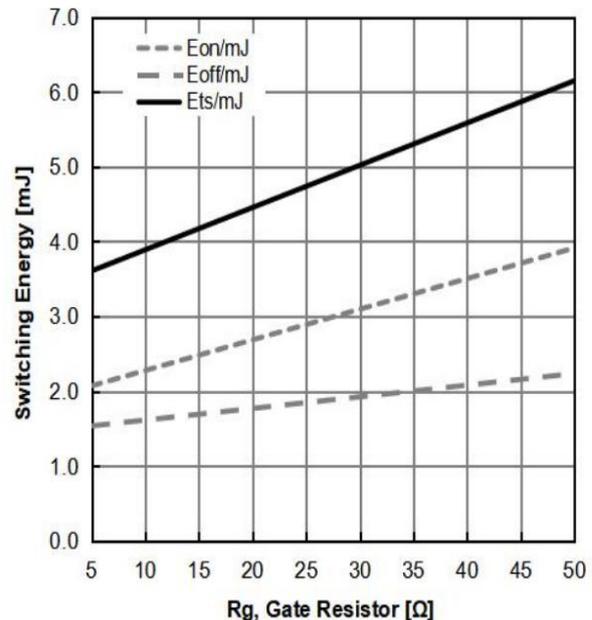


Figure 11: Typical Switching Times vs. Junction Temperature ($V_{CE}=400\text{V}$, $V_{GE}=15\text{V}$, $I_C=60\text{A}$, $R_g=5\Omega$)

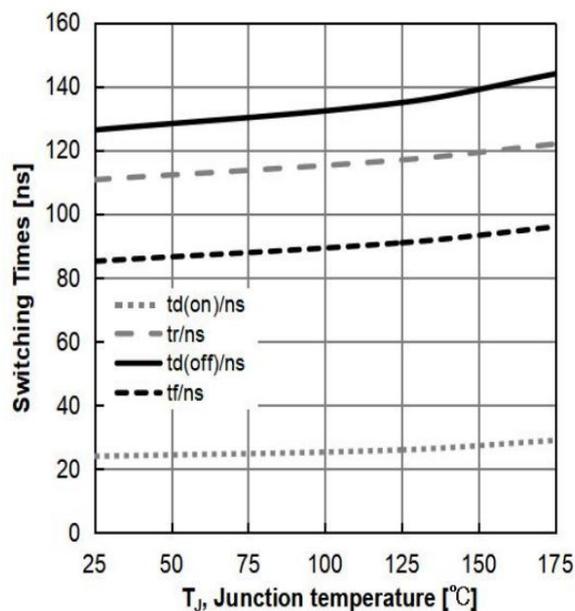
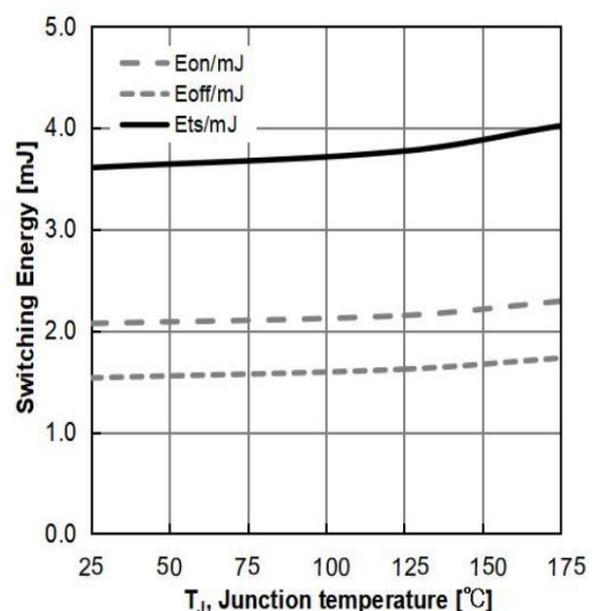


Figure 12: Typical Switching Energy vs. Junction Temperature ($V_{CE}=400\text{V}$, $V_{GE}=15\text{V}$, $I_C=60\text{A}$, $R_g=5\Omega$)



RATINGS AND CHARACTERISTIC CURVES

Figure 13: Typical Switching Times vs. Collector Current ($T_J=25^\circ\text{C}$, $V_{CE}=400\text{V}$, $V_{GE}=15\text{V}$, $R_g=5\Omega$)

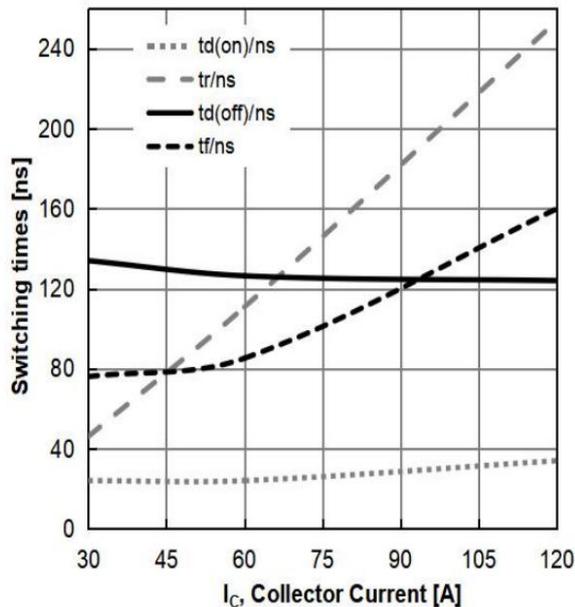


Figure 14: Typical Switching Energy vs. Collector Current ($T_J=25^\circ\text{C}$, $V_{CE}=400\text{V}$, $V_{GE}=15\text{V}$, $R_g=5\Omega$)

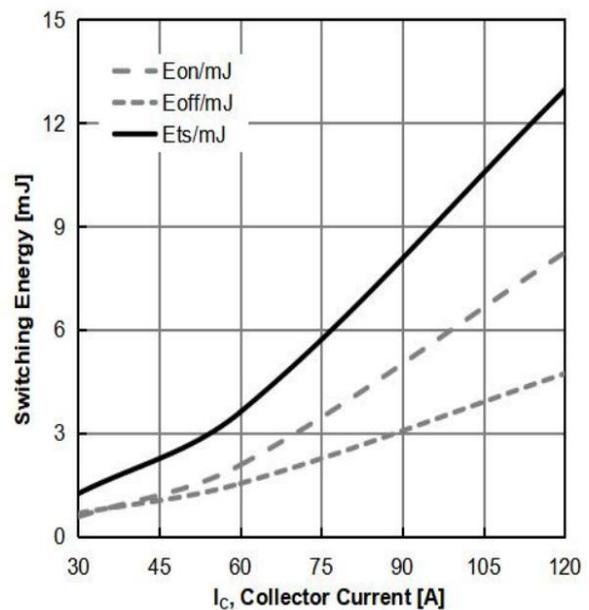


Figure 15: Typical Switching Times vs. VCE ($T_J=25^\circ\text{C}$, $V_{GE}=15\text{V}$, $I_C=60\text{A}$, $R_g=5\Omega$)

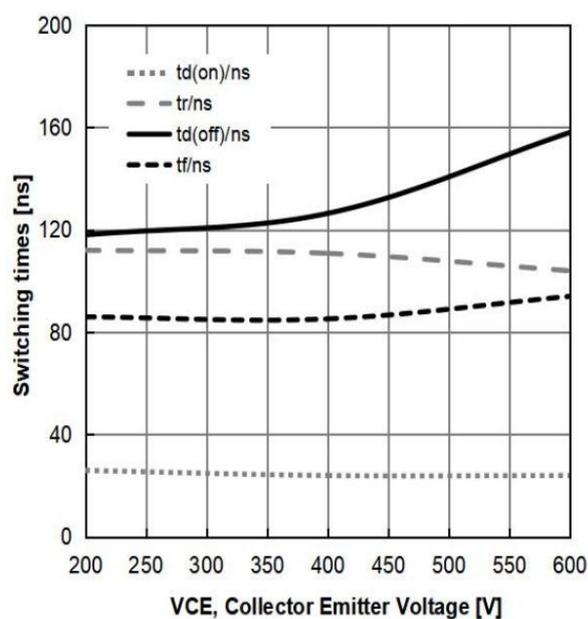
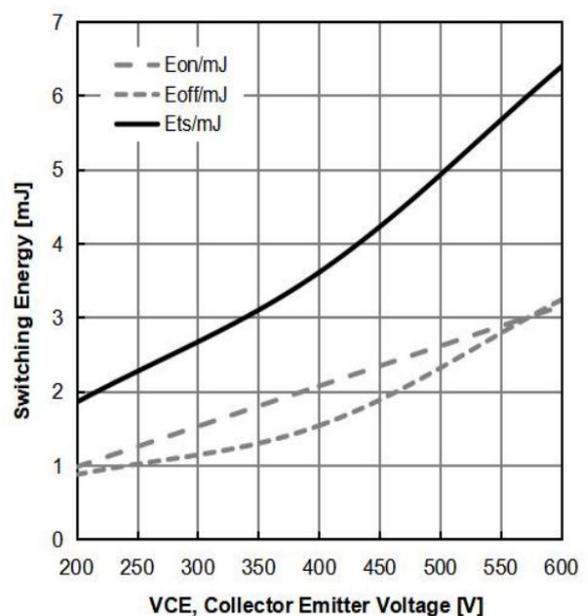


Figure 16: Typical Switching Energy vs. VCE ($T_J=25^\circ\text{C}$, $V_{GE}=15\text{V}$, $I_C=60\text{A}$, $R_g=5\Omega$)



RATINGS AND CHARACTERISTIC CURVES

Figure 17: Typical Capacitance vs. Collector-Emitter Voltage

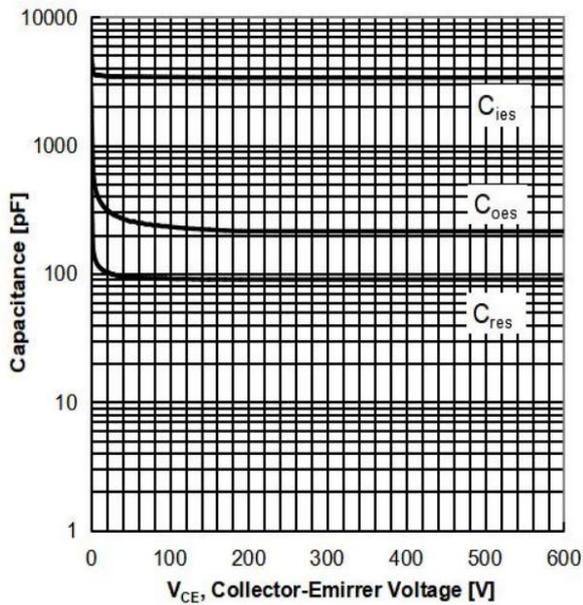


Figure 18: Typical Gate Charge

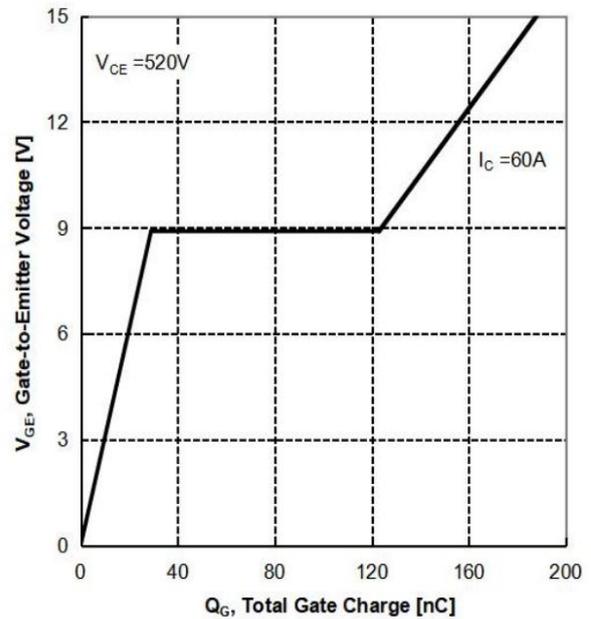


Figure 19: IGBT Transient Thermal Impedance vs. Pulse Width

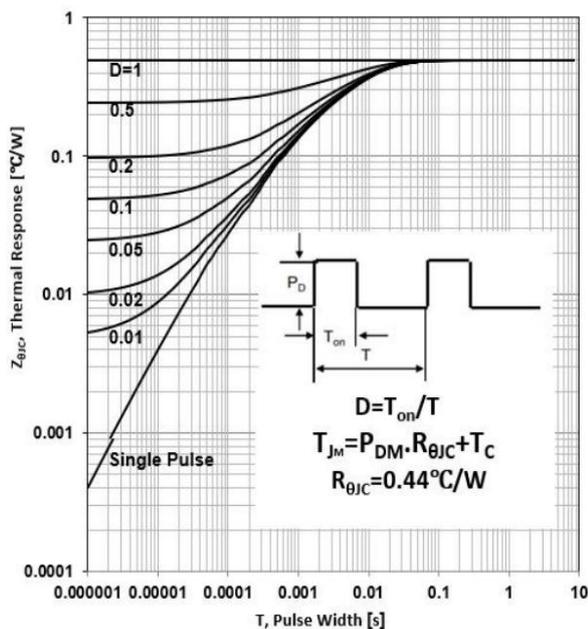


Figure 20: Diode Transient Thermal Impedance vs. Pulse Width

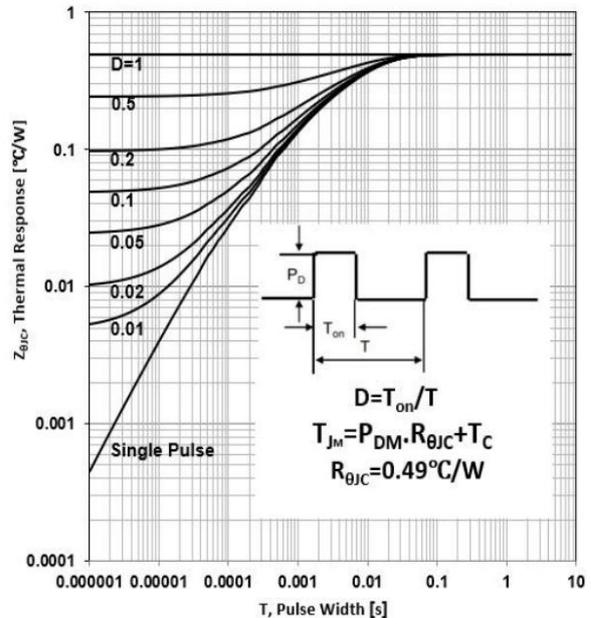
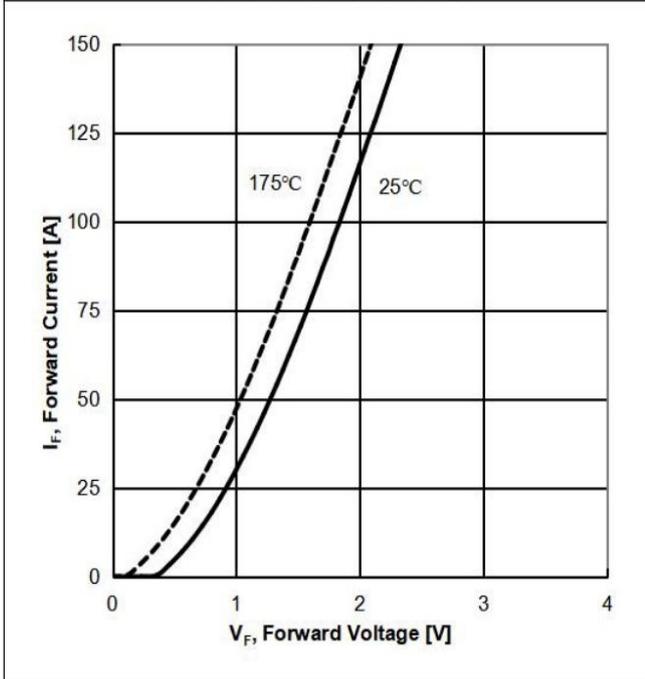
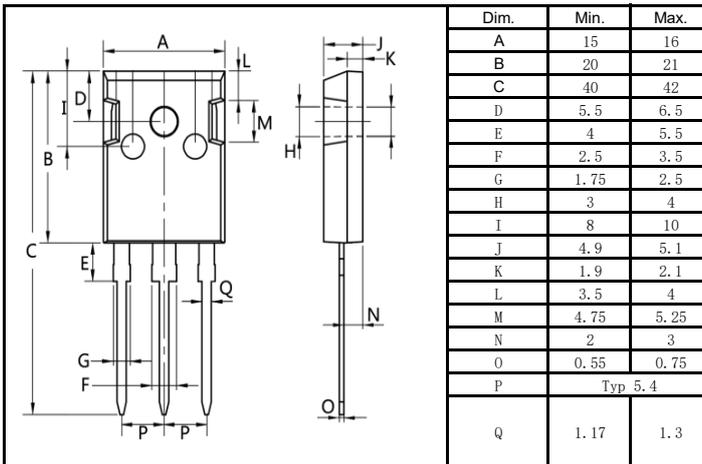


Figure 21: Typical Diode Forward Current vs. Forward Voltage

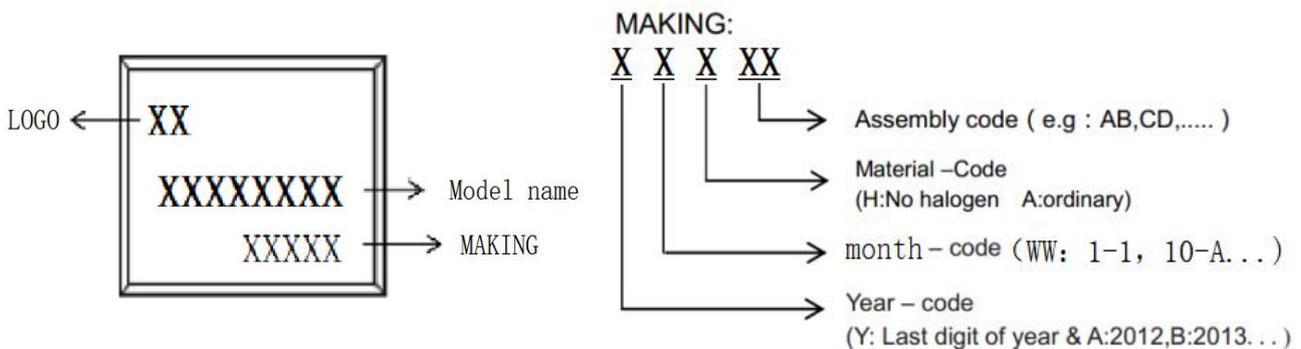


Package Outline Dimensions millimeters

T0-247



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