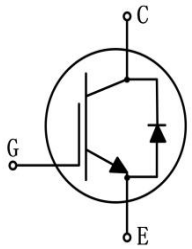
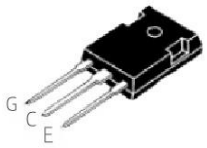
# LGT30N65HB

N-Channel Enhancement Mode Power IGBT

## MAIN CHARACTERISTICS

| | |
|---|---|
| $I_{C\ @TC=100℃}$ | 30A |
| $V_{CE}$ | 650V |
| VCE(sat)-typ | 1.69V |




TO-247

## FEATURES

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

## APPLICATIONS

- Motor drives
- Air Condition
- Inverters

## 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 |
|---|---|---|---|
| LGT30N65HB | TO-247 | LGT30N65HB | Tube |

# LGT30N65HB

N-Channel Enhancement Mode Power IGBT

## 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℃) | $I_C$ | 60 | A |
| Continuous collector current (TC=100℃) | | 30 | A |
| Pulsed collector current, tp limited by Tvjmax | $I_{CM}$ | 90 | A |
| Diode continuous forward current (TC=25℃) | $I_F$ | 60 | A |
| Diode continuous forward current (TC=100℃) | | 30 | A |
| Diode maximum current, tp limited by Tvjmax | $I_{FM}$ | 90 | A |
| Operating junction temperature range | $T_{vj}$ | -55 to +175 | °C |
| Storage temperature range | $T_{stg}$ | -55 to +175 | °C |

## Thermal characteristics

| Characteristics | Symbol | Values | | Unit |
|---|---|---|---|---|
| | | Typ | Max. | |
| Thermal resistance, junction to case for IGBT | $R_{th(j-c)}$ | - | 0.83 | K/ W |
| Thermal resistance, junction to case for Diode | $R_{th(j-c)}$ | - | 0.65 | 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 | $B_{VCES}$ | 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, $I_C$=30A | $V_{CE(sat)}$ | - | 1.69 | 2 | V |
| | $V_{GE}$=15V, $I_C$=30A, $T_{vj}$=125℃ | | - | 1.9 | - | V |
| | $V_{GE}$=15V, $I_C$=30A, $T_{vj}$=175℃ | | - | 2.05 | - | V |

**Dynamic characteristics**

| Characteristics | Test Condition | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Input capacitance | $V_{CE}$=25V<br>$V_{GE}$=0V<br>f =1MHz | $C_{ies}$ | - | 1853 | - | pF |
| Output capacitance | | $C_{oes}$ | - | 72 | - | pF |
| Reverse transfer capacitance | | $C_{res}$ | - | 55 | - | pF |
| Total gate charge | $V_{CC}$=520V $V_{GE}$=15V $I_C$=30A | $Q_g$ | - | 98 | - | nC |
| Gate- Emitter Charge | | Qge | - | 18 | - | nC |
| Gate- Collector Charge | | Qgc | - | 47 | - | nC |
| Short circuit collector current<br>Max.1000 short circuits, times<br>between short circuits: ≥ 1.0s | VGE=15V, VCC≤400V<br>TJ≤175°C | t(SC) | - | 8 | - | μs |

## 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<br>$V_{GE}$=15V<br>$I_C$=30A<br>$R_G$=5Ω<br>Inductive load | td(on) | - | 16 | - | ns |
| Rise time | | tr | - | 46 | - | ns |
| Turn-off delay time | | td(off) | - | 72 | - | ns |
| Fall time | | tf | - | 80 | - | ns |
| Turn-on energy | | Eon | - | 0.52 | - | mJ |
| Turn-off energy | | Eoff | - | 0.77 | - | mJ |
| Total switching energy | | Ets | - | 1.29 | - | mJ |
| Turn-on delay time | $V_{CC}$=400V<br>$V_{GE}$=15V<br>$I_C$=30A<br>$R_G$=5Ω<br>Inductive load<br>Tvj=175℃ | td(on) | - | 18 | - | ns |
| Rise time | | tr | - | 54 | - | ns |
| Turn-off delay time | | td(off) | - | 90 | - | ns |
| Fall time | | tf | - | 75 | - | ns |
| Turn-on energy | | Eon | - | 0.97 | - | mJ |
| Turn-off energy | | Eoff | - | 1.36 | - | mJ |
| Total switching energy | | Ets | - | 2.33 | - | mJ |

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

| Characteristics | Test Condition | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Diode forward voltage | $I_F$=30A | VF | - | 2 | 2.3 | V |
| | $I_F$=30A Tvj=125℃ | | - | 1.7 | - | V |
| | $I_F$=30A Tvj=175℃ | | - | 1.5 | - | V |
| Diode reverse recovery time | $I_F$=30A<br>diF/dt=-200A/μs | trr | - | 48 | - | ns |
| Diode peak reverse recovery current | | Qrr | - | 80 | - | nC |
| Diode reverse recovery charge | | Irrm | - | 5.1 | - | A |
| Diode reverse recovery time | $I_F$=30A<br>diF/dt=-200A/μs Tvj=175℃ | trr | - | 39 | - | ns |
| Diode peak reverse recovery current | | Qrr | - | 127 | - | nC |
| Diode reverse recovery charge | | Irrm | - | 8.5 | - | A |

## RATINGS AND CHARACTERISTIC CURVES

**Figure 1: Power Dissipation**

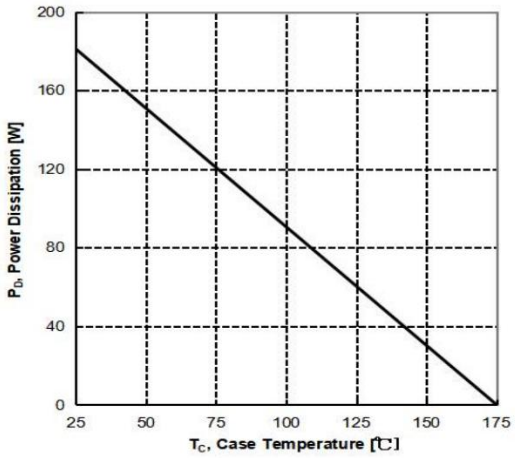



**Figure 2: Collector Current vs. Case Temperature**

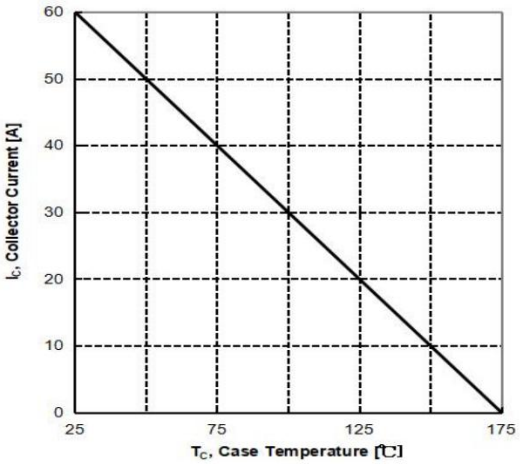



**Figure 3: Safe Operation Area**

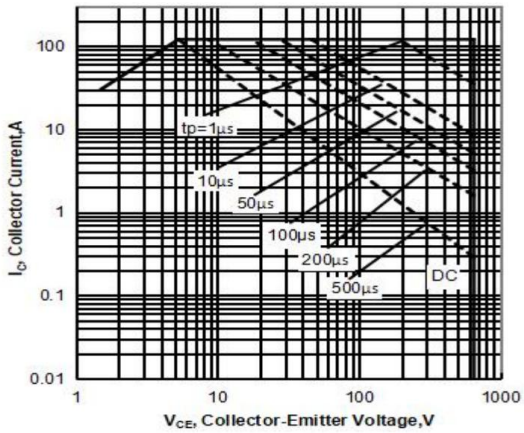



**Figure 4: Typical Transfer Characteristics**

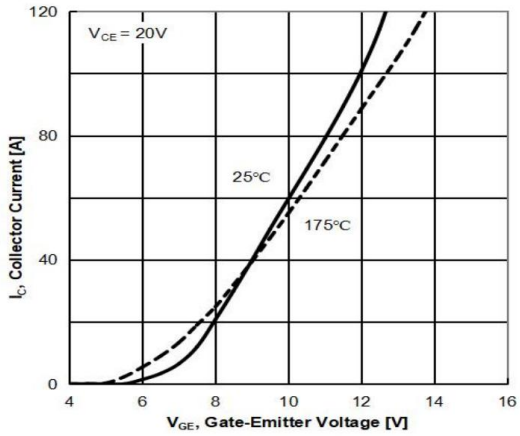



**Figure 5: Typical Output Characteristics**

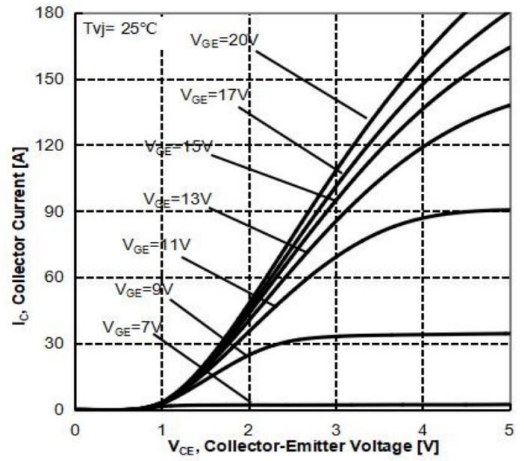
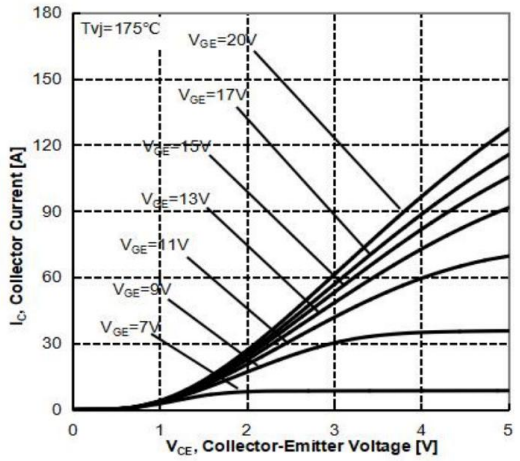



**Figure 6: Typical Output Characteristics**



## RATINGS AND CHARACTERISTIC CURVES

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

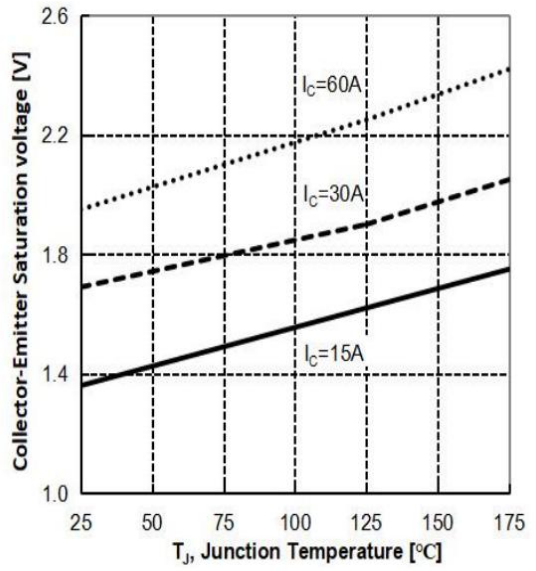



**Figure 8: Typical Gate-Emitter Threshold Voltage vs. Junction Temperature**

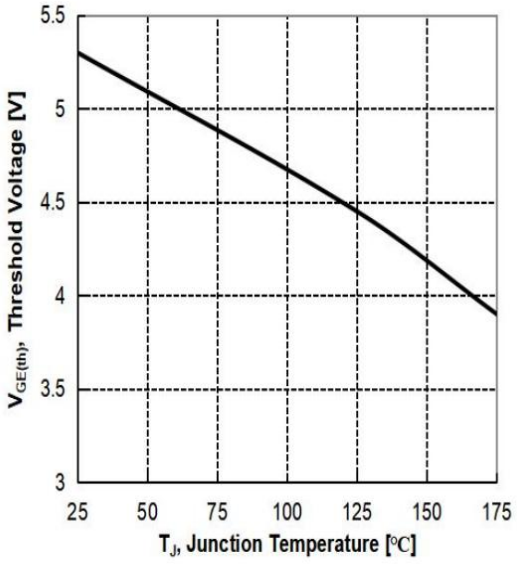



**Figure 9: Typical Switching Times vs. Gate Resistor ($T_J$=25℃, $V_{CE}$=400V, $V_{GE}$=15/0V, $I_C$=30A)**

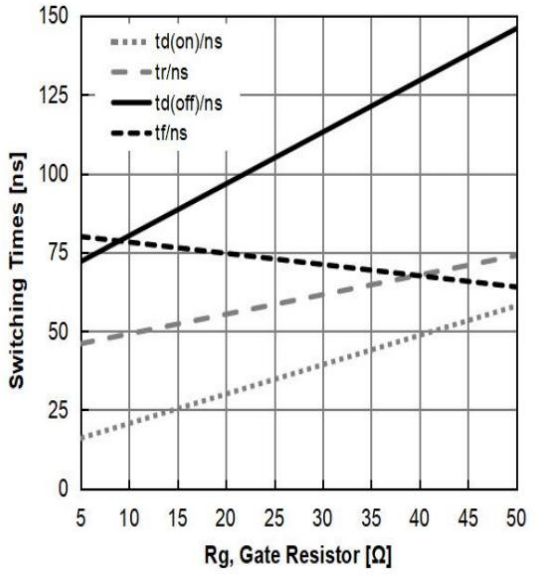
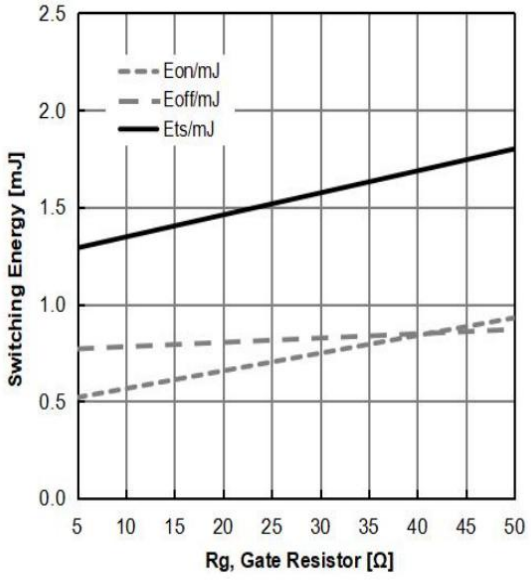



**Figure 10: Typical Switching Energy vs. Gate Resistor ($T_J$=25℃, $V_{CE}$=400V, $V_{GE}$=15/0V, $I_C$=30A)**



## RATINGS AND CHARACTERISTIC CURVES

**Figure 11: Typical Switching Times vs. Junction Temperature ( $V_{CE}$=400V, $V_{GE}$=15/0V, $I_C$=30A)**

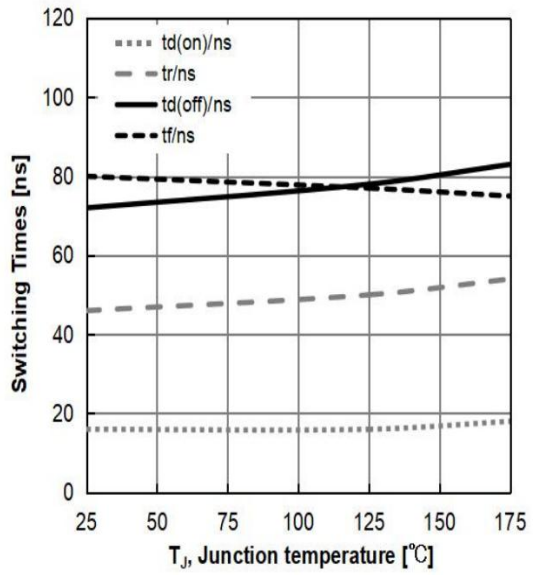



**Figure 12: Typical Switching Energy vs. Junction Temperature ($V_{CE}$=400V, $V_{GE}$=15/0V, $I_C$=30A)**

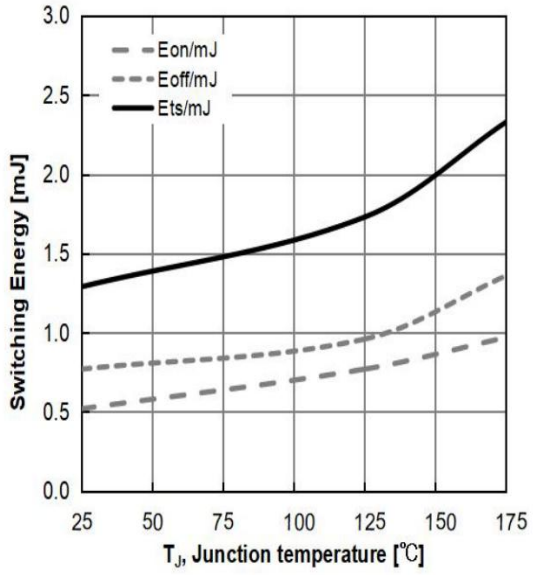



**Figure 13: Typical Switching Times vs. Collector Current ($T_J$=25℃, $V_{CE}$=400V, $V_{GE}$=15/0V)**

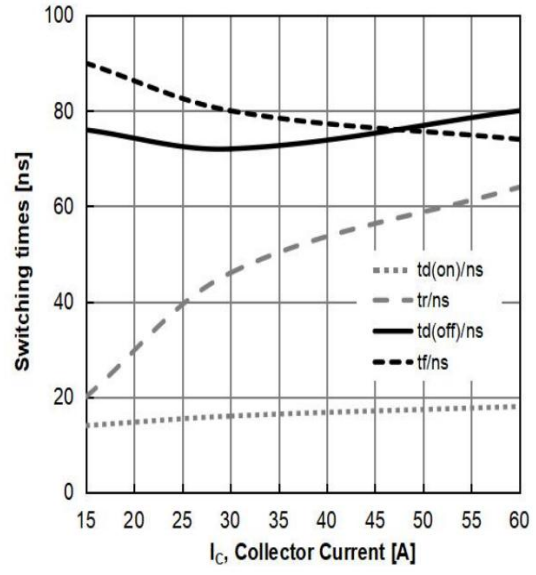
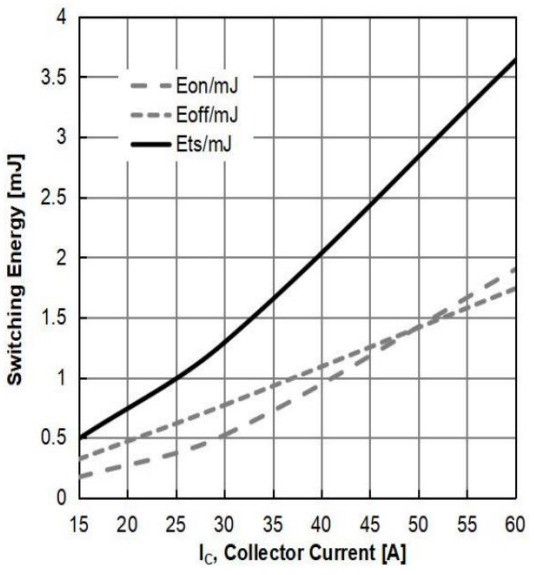



**Figure 14: Typical Switching Energy vs. Collector Current ($T_J$=25℃, $V_{CE}$=400V, $V_{GE}$=15/0V)**



## RATINGS AND CHARACTERISTIC CURVES

**Figure 15: Typical Switching Times vs. VCE ( $T_J$=25℃,$V_{GE}$=15/0V, $I_C$=30A)**

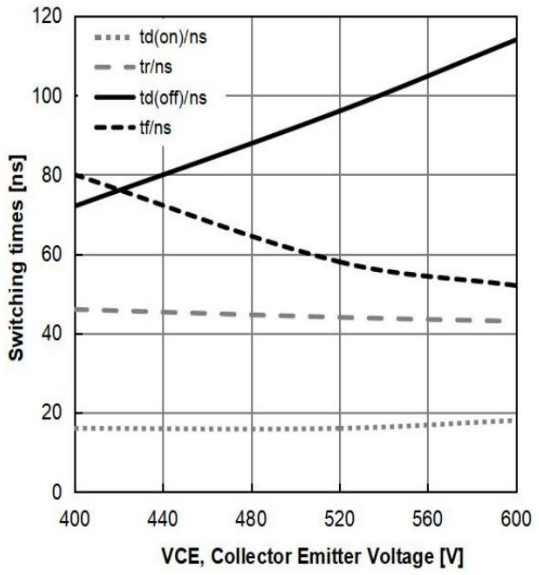



**Figure 16: Typical Switching Energy vs. VCE ( $T_J$=25℃, $V_{GE}$=15/0V, $I_C$=30A)**

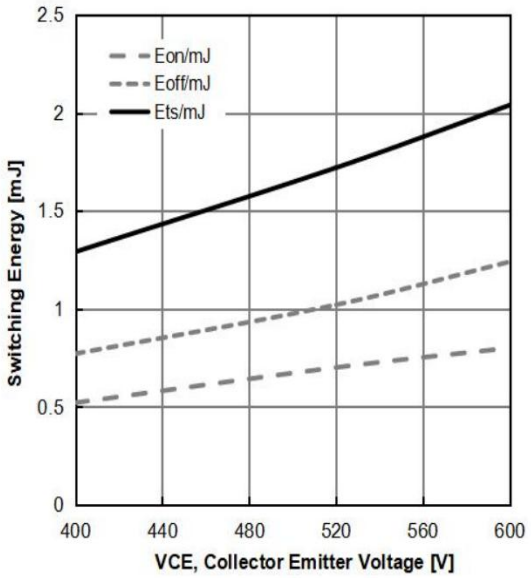



**Figure 17: Typical Gate Charge**

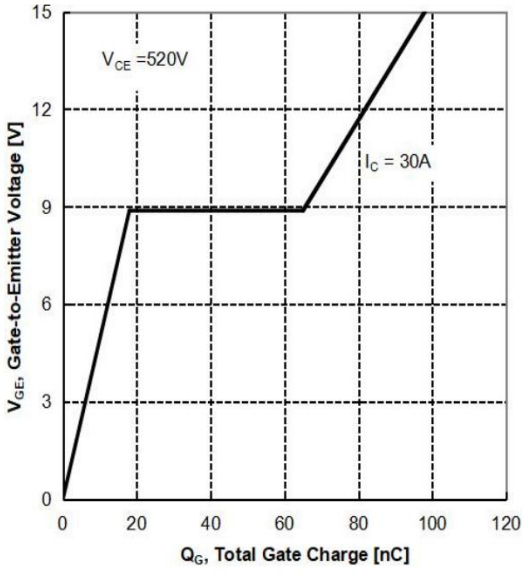
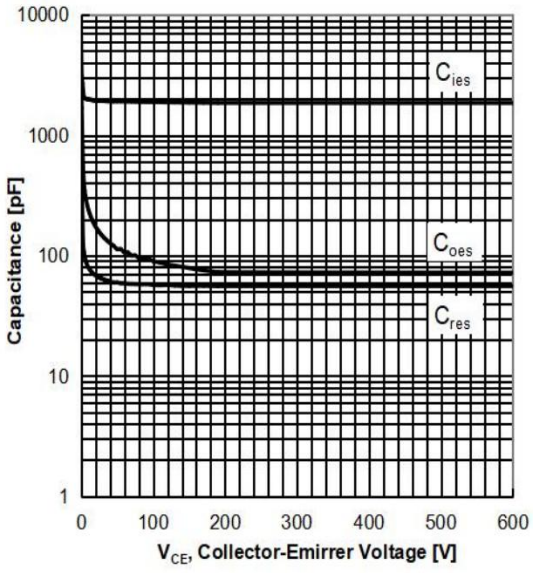



**Figure 18: Typical Capacitance vs. Collector- Emitter Voltage**



## RATINGS AND CHARACTERISTIC CURVES

**Figure 19: IGBT Transient Thermal Impedance vs. Pulse Width**

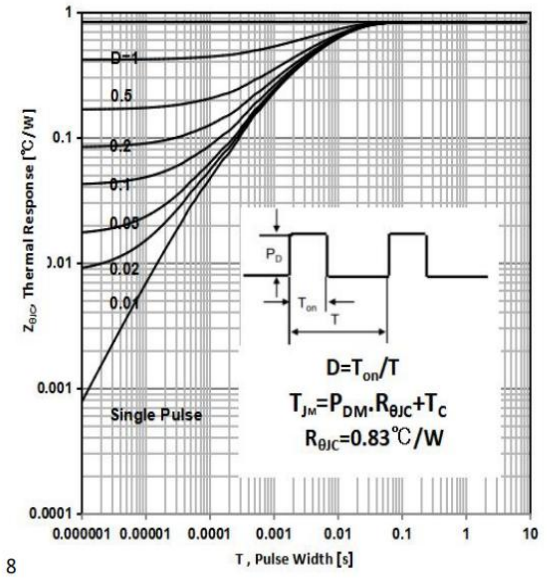



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**Figure 20: Diode Transient Thermal Impedance vs. Pulse Width**

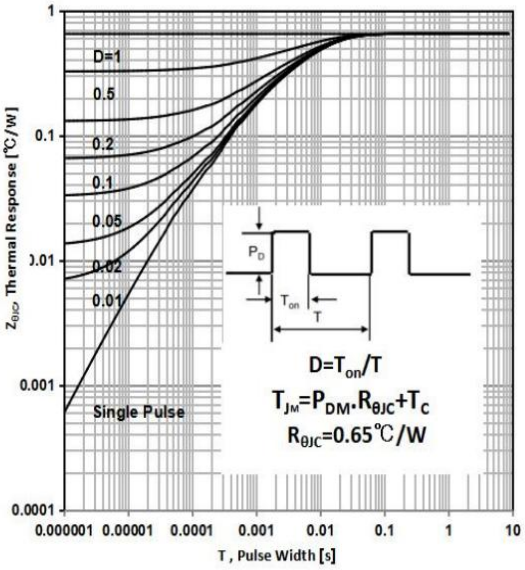
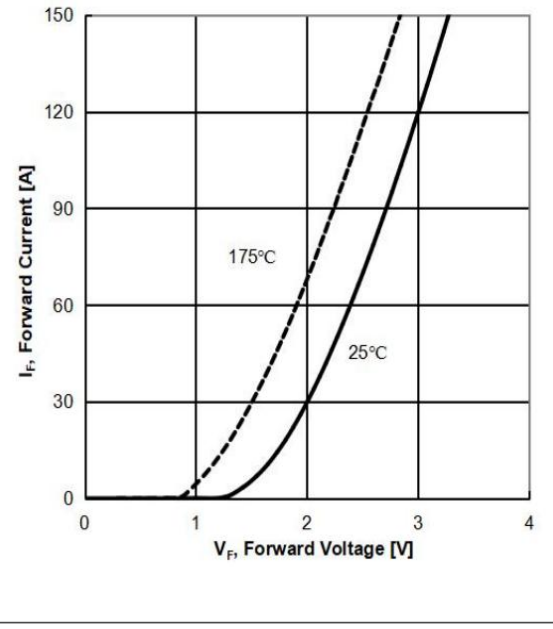



**Figure 21: Typical Diode Forward Current vs. Forward Voltage**

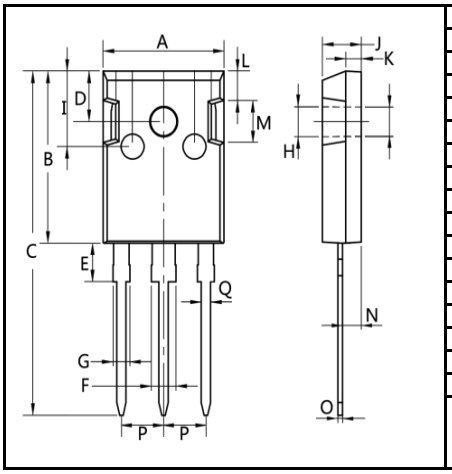


# LGT30N65HB

## N-Channel Enhancement Mode Power IGBT

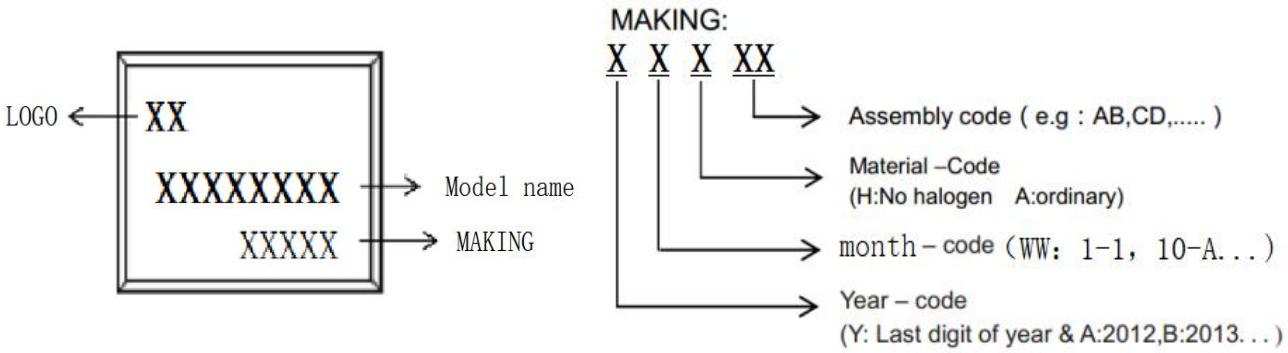
## Package Outline Dimensions millimeters

TO-247

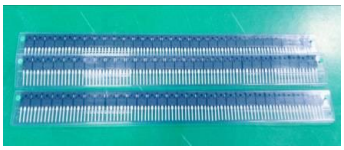



| Dim. | Min. | Max. |
|---|---|---|
| A | 15 | 16 |
| B | 20 | 21 |
| C | 40 | 42 |
| D | 5.5 | 6.5 |
| E | 4 | 5.5 |
| F | 2.5 | 3.5 |
| G | 1.75 | 2.5 |
| H | 3 | 4 |
| I | 8 | 10 |
| J | 4.9 | 5.1 |
| K | 1.9 | 2.1 |
| L | 3.5 | 4 |
| M | 4.75 | 5.25 |
| N | 2 | 3 |
| O | 0.55 | 0.75 |
| P | Typ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