

# CT60AM-18C

## Insulated Gate Bipolar Transistor

REJ03G0287-0100

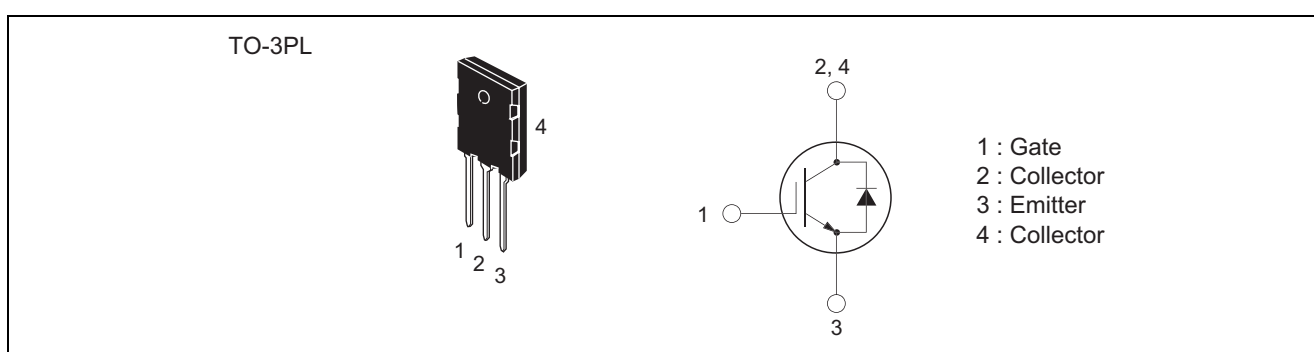
Rev.1.00

Aug.20.2004

### Features

- $V_{CES}$  : 900 V
- $I_C$  : 60 A
- Integrated fast-recovery diode
- For voltage-resonance

### Appearance Figure



### Applications

Voltage-resonance type home appliances (Microwave ovens, IH cooking devices, IH rice-cookers)

### Maximum Ratings

( $T_c = 25^\circ\text{C}$ )

| Parameter                 | Symbol    | Ratings         | Unit             | Conditions               |
|---------------------------|-----------|-----------------|------------------|--------------------------|
| Collector-emitter voltage | $V_{CES}$ | 900             | V                | $V_{GE} = 0 \text{ V}$   |
| Gate-emitter voltage      | $V_{GES}$ | $\pm 20$        | V                | $V_{CE} = 0 \text{ V}$   |
| Peak gate-emitter voltage | $V_{GEM}$ | $\pm 30$        | V                | $V_{CE} = 0 \text{ V}$   |
| Collector current         | $I_C$     | 60              | A                |                          |
| Collector current (Pulse) | $I_{CM}$  | 120             | A                |                          |
| Emitter current           | $I_E$     | 40              | A                |                          |
| Maximum power dissipation | $P_C$     | 200             | W                | $T_c = 25^\circ\text{C}$ |
| Junction temperature      | $T_j$     | $-40$ to $+150$ | $^\circ\text{C}$ |                          |
| Storage temperature       | $T_{stg}$ | $-40$ to $+150$ | $^\circ\text{C}$ |                          |

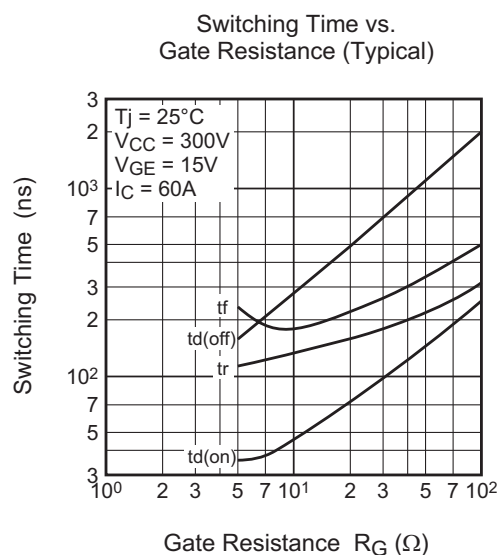
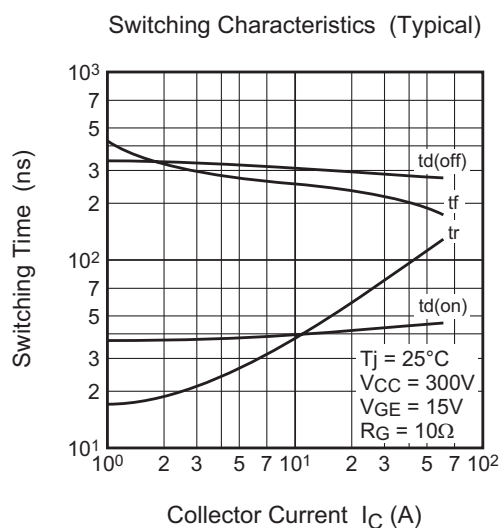
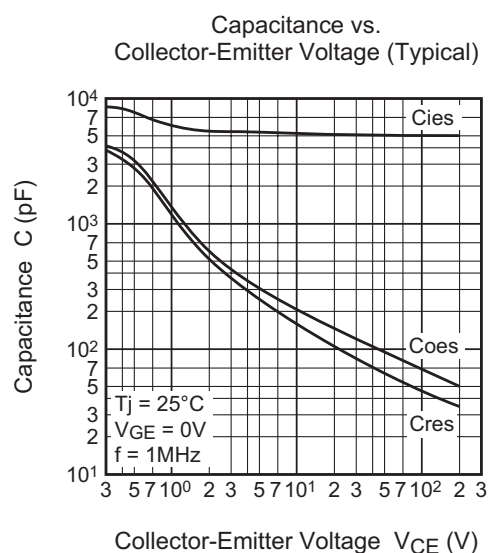
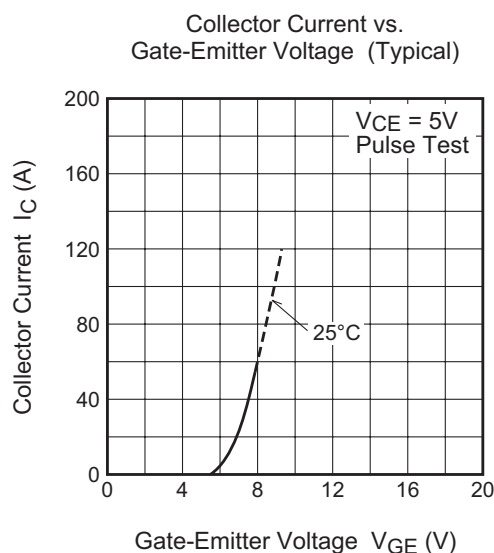
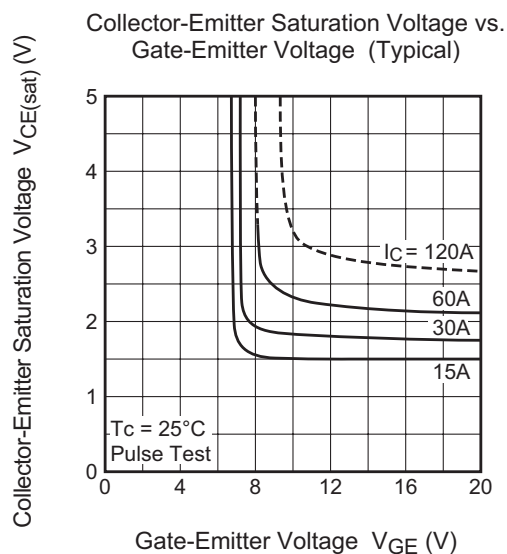
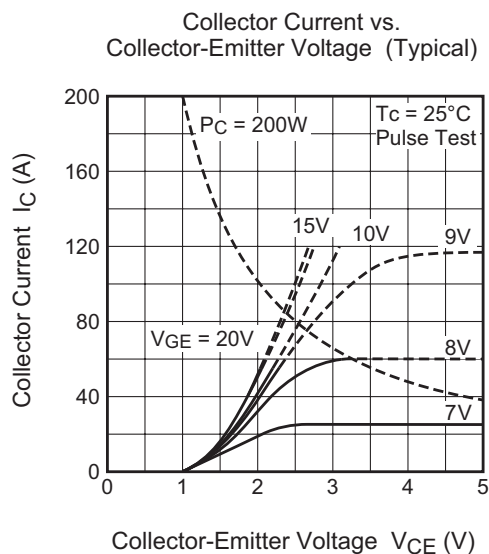
## Electrical Characteristics

(Unless otherwise specified, T<sub>j</sub> = 25°C)

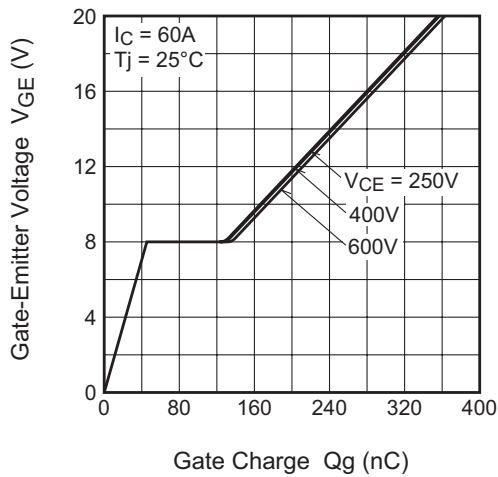
| Parameter                            | Symbol               | Min.                       | Typ. | Max.  | Unit   | Test conditions                                                                                                      |
|--------------------------------------|----------------------|----------------------------|------|-------|--------|----------------------------------------------------------------------------------------------------------------------|
| Collector-emitter breakdown voltage  | V <sub>(BR)CES</sub> | 1000 <sup>not<br/>e1</sup> | —    | —     | V      | I <sub>C</sub> = 1 mA, V <sub>GE</sub> = 0 V                                                                         |
| Collector-emitter leakage current    | I <sub>CES</sub>     | —                          | —    | 1     | mA     | V <sub>CE</sub> = 900 V, V <sub>GE</sub> = 0 V                                                                       |
| Gate-emitter leakage current         | I <sub>GES</sub>     | —                          | —    | ±0.5  | μA     | V <sub>GE</sub> = ±20 V, V <sub>CE</sub> = 0 V                                                                       |
| Gate-emitter threshold voltage       | V <sub>GE(th)</sub>  | 2.0                        | 4.0  | 6.0   | V      | I <sub>C</sub> = 6 mA, V <sub>CE</sub> = 10 V                                                                        |
| Collector-emitter saturation voltage | V <sub>CE(sat)</sub> | —                          | 2.0  | 2.7   | V      | I <sub>C</sub> = 60 A, V <sub>CE</sub> = 15 V                                                                        |
| Input capacitance                    | C <sub>iss</sub>     | —                          | 5000 | —     | pF     | V <sub>CE</sub> = 25 V, V <sub>GE</sub> = 0 V,<br>f = 1MHz                                                           |
| Output capacitance                   | C <sub>oss</sub>     | —                          | 125  | —     | pF     |                                                                                                                      |
| Reverse transfer capacitance         | C <sub>rss</sub>     | —                          | 85   | —     | pF     |                                                                                                                      |
| Turn-on delay time                   | t <sub>d(on)</sub>   | —                          | 0.05 | —     | μs     | I <sub>C</sub> = 60 A, Resistive loads,<br>V <sub>CC</sub> = 300 V, V <sub>GE</sub> = 15 V,<br>R <sub>G</sub> = 10 Ω |
| Rise time                            | t <sub>r</sub>       | —                          | 0.12 | —     | μs     |                                                                                                                      |
| Turn-off delay time                  | t <sub>d(off)</sub>  | —                          | 0.30 | —     | μs     |                                                                                                                      |
| Fall time                            | t <sub>f</sub>       | —                          | 0.25 | —     | μs     |                                                                                                                      |
| Tail loss                            | E <sub>tail</sub>    | —                          | 0.6  | 1.0   | mJ/pls | I <sub>CP</sub> = 60 A, T <sub>j</sub> = 125°C,<br>dv/dt = 200 V/μs,<br>Single-device voltage<br>resonance circuit   |
| Tail current                         | I <sub>tail</sub>    | —                          | 6    | 12    | A      |                                                                                                                      |
| Emitter-collector voltage            | V <sub>EC</sub>      | —                          | —    | 3     | V      | I <sub>E</sub> = 60 A, V <sub>GE</sub> = 0 V                                                                         |
| Diode reverse recovery time          | t <sub>rr</sub>      | —                          | 0.5  | 2     | μs     | I <sub>E</sub> = 60 A, di/dt = 20 A/μs                                                                               |
| Thermal resistance (IGBT)            | R <sub>th(j-c)</sub> | —                          | —    | 0.625 | °C/W   | Junction to case                                                                                                     |
| Thermal resistance (Diode)           | R <sub>th(j-c)</sub> | —                          | —    | 4.0   | °C/W   | Junction to case                                                                                                     |

Notes: 1 Selected value

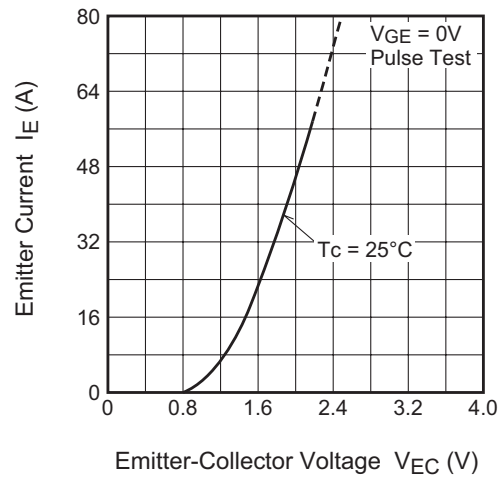
## Performance Curves



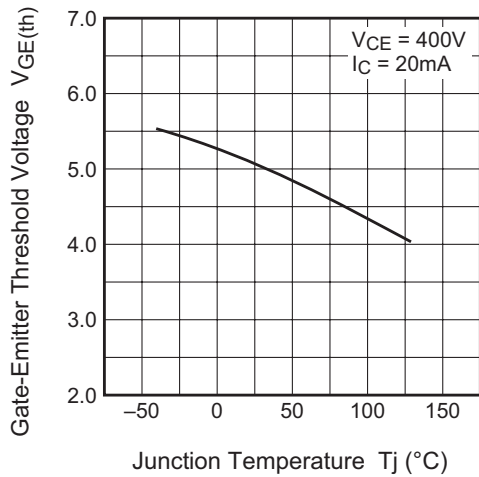
Gate-Emitter Voltage vs.  
Gate Charge Characteristic (Typical)



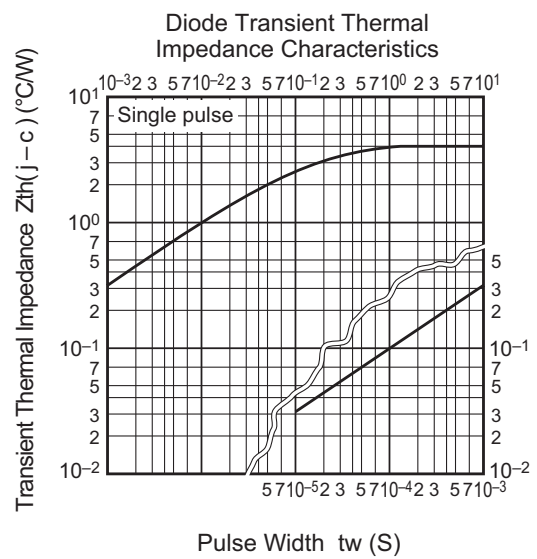
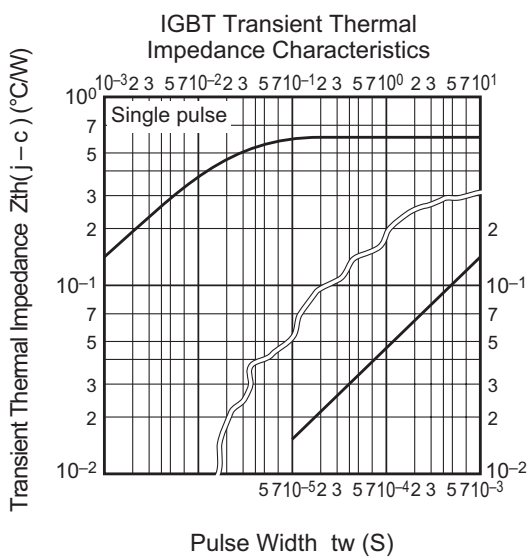
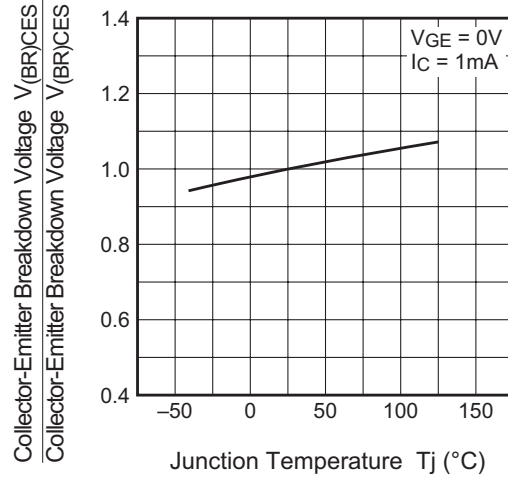
Emitter Current vs.  
Emitter-Collector Voltage (Typical)



Gate-Emitter Threshold Voltage vs.  
Junction Temperature (Typical)



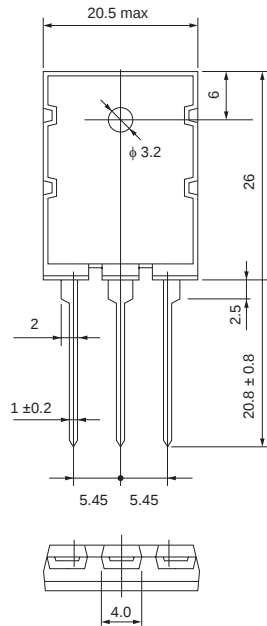
Collector-Emitter Breakdown Voltage vs.  
Junction Temperature (Typical)



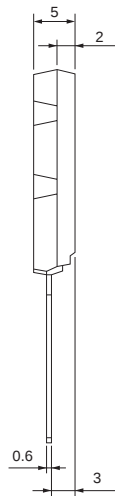
## Package Dimensions

### TO-3PL

| EIAJ Package Code | JEDEC Code | Mass (g) (reference value) | Lead Material |
|-------------------|------------|----------------------------|---------------|
| —                 | —          | 9.8                        | Cu alloy      |



Note 1) The dimensional figures indicate representative values unless otherwise the tolerance is specified.



| Symbol         | Dimension in Millimeters |     |     |
|----------------|--------------------------|-----|-----|
|                | Min                      | Typ | Max |
| A              | —                        | —   | —   |
| A <sub>1</sub> | —                        | —   | —   |
| A <sub>2</sub> | —                        | —   | —   |
| b              | —                        | —   | —   |
| D              | —                        | —   | —   |
| E              | —                        | —   | —   |
| e              | —                        | —   | —   |
| x              | —                        | —   | —   |
| y              | —                        | —   | —   |
| y <sub>1</sub> | —                        | —   | —   |
| ZD             | —                        | —   | —   |
| ZE             | —                        | —   | —   |

## Order Code

| Lead form     | Standard packing        | Quantity | Standard order code           | Standard order code example |
|---------------|-------------------------|----------|-------------------------------|-----------------------------|
| Straight type | Plastic Magazine (Tube) | 25       | Type name                     | CT60AM-18C                  |
| Lead form     | Plastic Magazine (Tube) | 25       | Type name – Lead forming code | CT60AM-18C-AD               |

Note : Please confirm the specification about the shipping in detail.

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