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# TRANSISTOR MODULE

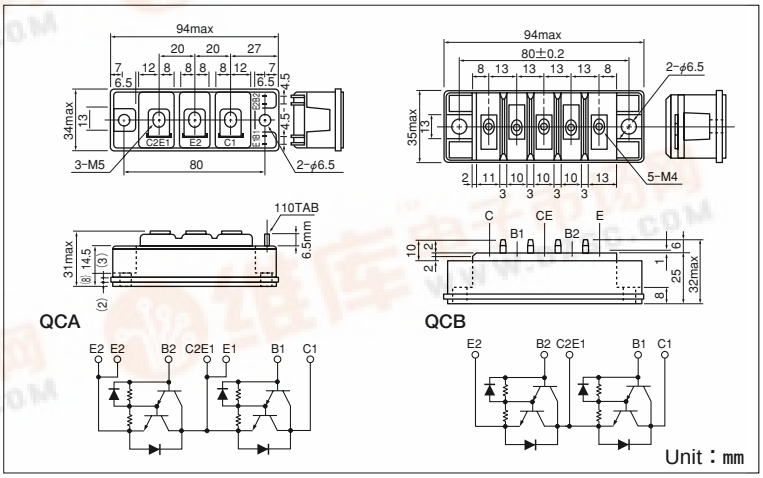
# QCA75A/QCB75A40/60

UL;E76102(M)

**QCA75A** and **QCB75A** are dual Darlington power transistor modules which have series-connected high speed, high power Darlington transistors. Each transistor has a reverse paralleled fast recovery diode.

- $I_C$=75A, $V_{CEX}$=400/600V
- Low saturation voltage for higher efficiency.
- Isolated mounting base
- $V_{EBO}$ 10V for faster switching speed.

(Applications)
Motor Control (VVVF), AC/DC Servo, UPS, Switching Power Supply, Ultrasonic Application




## ■Maximum Ratings

(Tj=25℃ unless otherwise specified)

| Symbol | Item | | | Conditions | Ratings QCA75A40 QCB75A40 | Ratings QCA75A60 QCB75A60 | Unit |
|---|---|---|---|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | | | | 400 | 600 | V |
| $V_{CEX}$ | Collector-Emitter Voltage | | | $V_{BE}$=−2V | 400 | 600 | V |
| $V_{EBO}$ | Emitter-Base Voltage | | | | 10 | | V |
| $I_C$ | Collector Current | | | ( ) pw≦1ms | 75 (150) | | A |
| −$I_C$ | Reverse Collector Current | | | | 75 | | A |
| $I_B$ | Base Current | | | | 4.5 | | A |
| $P_T$ | Total power dissipation | | | $T_C$=25℃ | 350 | | W |
| $T_j$ | Junction Temperature | | | | −40 to +150 | | ℃ |
| Tstg | Storage Temperature | | | | −40 to +125 | | ℃ |
| $V_{ISO}$ | Isolation Voltage | | | A.C.1minute | 2500 | | V |
| | Mounting Torque | QCA75A | Mounting (M6) | Recommended Value 2.5-3.9 (25-40) | 4.7(48) | | N·m kgf·cm |
| | | | Terminal (M5) | Recommended Value 1.5-2.5 (15-25) | 2.7(28) | | |
| | | QCB75A | Mounting (M5) | Recommended Value 1.5-2.5 (15-25) | 2.7(28) | | |
| | | | Terminal (M4) | Recommended Value 1.0-1.4 (10-14) | 1.5(15) | | |
| | Mass | QCA75A/QCB75A | | Typical Value | 240/195 | | g |

## ■Electrical Characteristics

| Symbol | Item | | Conditions | Ratings Min. | Ratings Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{CBO}$ | Collector Cut-off Current | | $V_{CB}$=$V_{CBO}$ | | 1.0 | mA |
| $I_{EBO}$ | Emitter Cut-off Current | | $V_{EB}$=$V_{EBO}$ | | 300 | mA |
| $V_{CEO(SUS)}$ | Collector Emitter Sustaning Voltage | QCA75A40 QCB75A40 | Ic=1A | 300 | | V |
| | | QCA75A60 QCB75A60 | | 450 | | |
| $V_{CEX(SUS)}$ | | QCA75A40 QCB75A40 | Ic=15A, $I_{B2}$=−5A | 400 | | V |
| | | QCA75A60 QCB75A60 | | 600 | | |
| $h_{FE}$ | DC Current Gain | | Ic=75A, $V_{CE}$=2V/5V | 75/100 | | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | | Ic=75A, $I_B$=1A | | 2.0 | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | | Ic=75A, $I_B$=1A | | 2.5 | V |
| ton | Switching Time | On Time | Vcc=300V, Ic=75A $I_{B1}$=1A, $I_{B2}$=−1A | | 2.0 | μs |
| ts | | Storage Time | | | 12.0 | |
| tf | | Fall Time | | | 3.0 | |
| $V_{ECO}$ | Collector-Emitter Reverse Voltage | | −Ic=75A | | 1.4 | V |
| Rth(j-c) | Thermal Impedance (junction to case) | | Transistor part/Diode part | | 0.35/1.3 | ℃/W |

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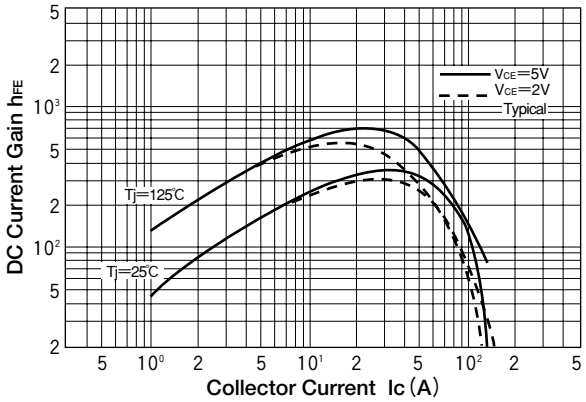
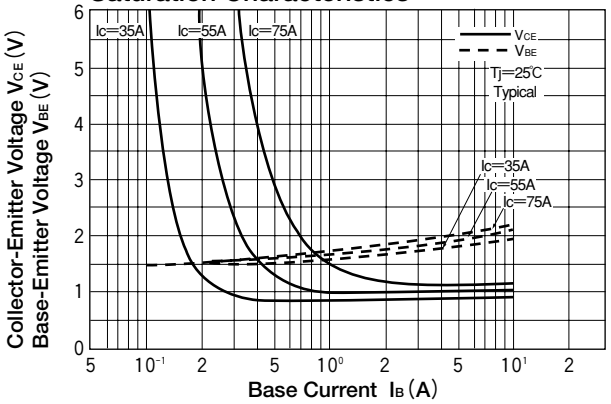
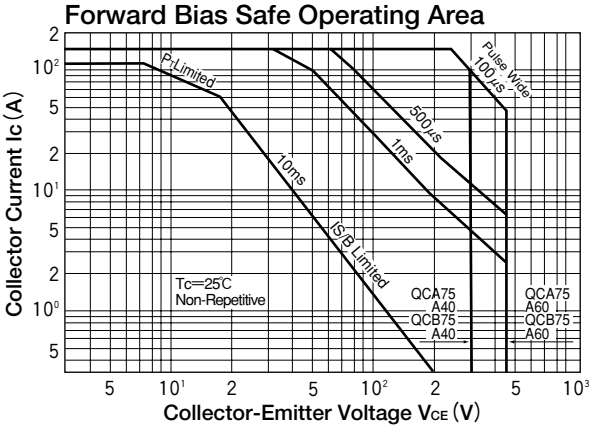
## D.C. Current Gain



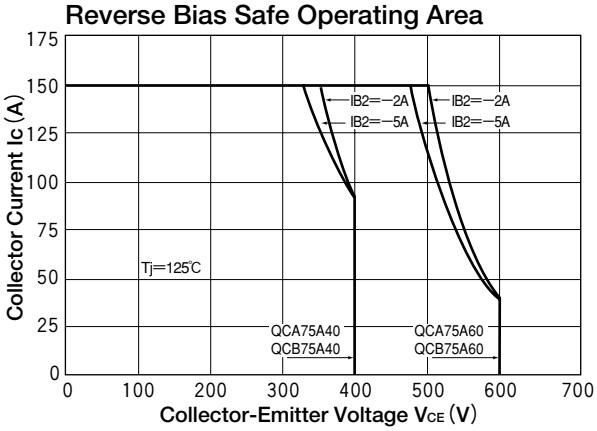

## Saturation Characteristics



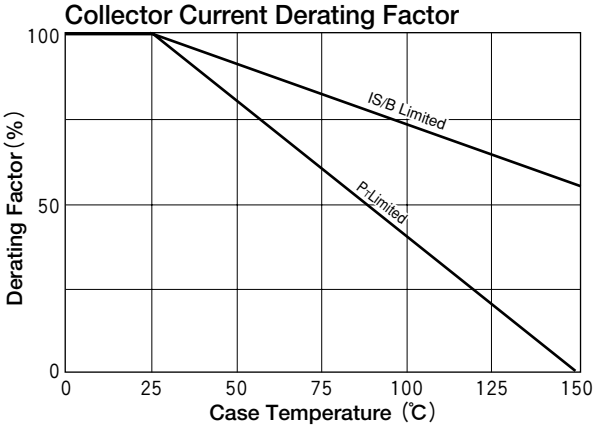

## Forward Bias Safe Operating Area



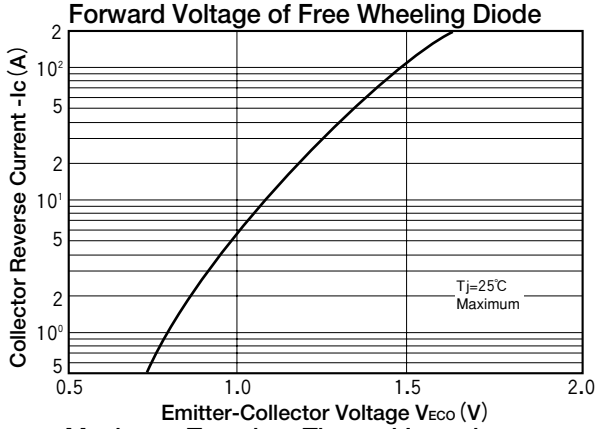

## Reverse Bias Safe Operating Area



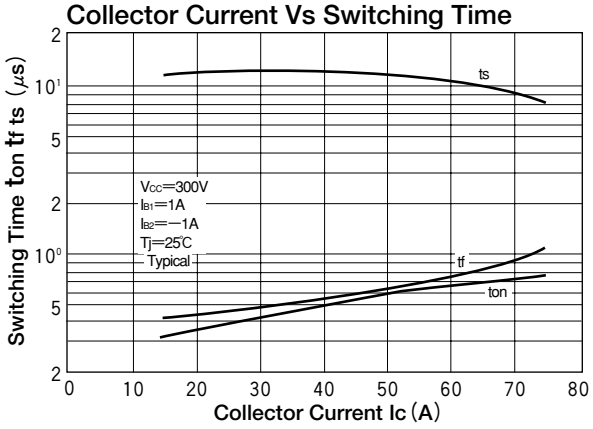

## Collector Current Derating Factor

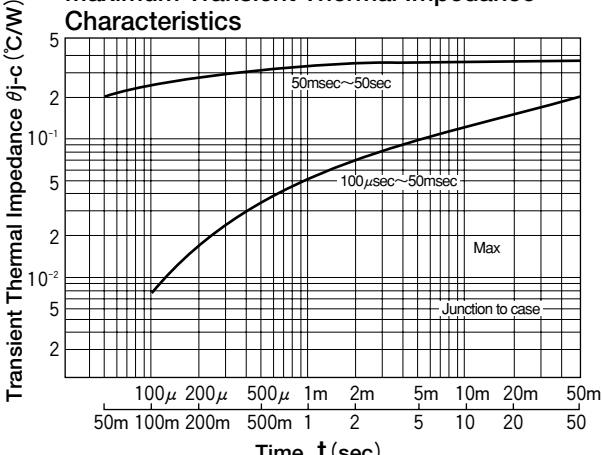



## Forward Voltage of Free Wheeling Diode




## Collector Current Vs Switching Time




## Maximum Transient Thermal Impedance Characteristics