

# TRANSISTOR MODULE

# QCA30B/QCB30A40/60



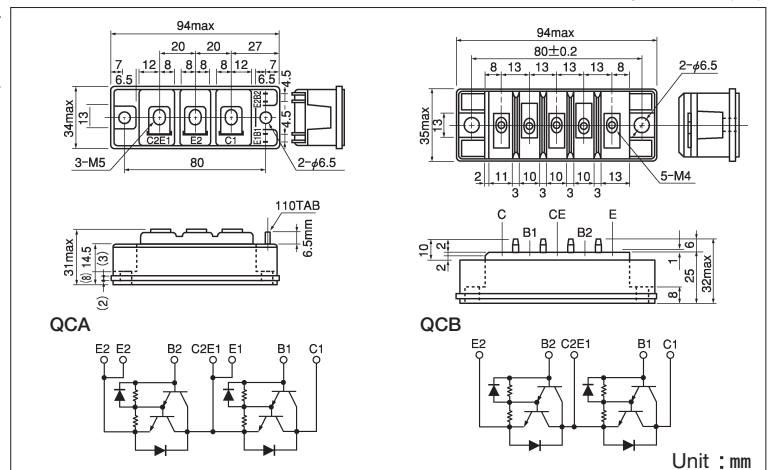
UL;E76102 (M)

QCA30B and QCB30A 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.

- $I_C=30A$ ,  $V_{CEX}=400/600V$
- 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



Unit : mm

### Maximum Ratings

( $T_j=25^\circ C$ )

| Symbol    | Item                       | Conditions          | Ratings              |                                   | Unit       |                 |
|-----------|----------------------------|---------------------|----------------------|-----------------------------------|------------|-----------------|
|           |                            |                     | QCA30B40<br>QCB30A40 | QCA30B60<br>QCB30A60              |            |                 |
| $V_{CBO}$ | Collector-Base Voltage     |                     | 400                  | 600                               | V          |                 |
| $V_{CEX}$ | Collector-Emmitter Voltage | $V_{BE} = -2V$      | 400                  | 600                               | V          |                 |
| $V_{EBO}$ | Emitter-Base Voltage       |                     | 10                   |                                   | V          |                 |
| $I_C$     | Collector Current          | ( ) = $pw \leq 1ms$ | 30 (60)              |                                   | A          |                 |
| $-I_C$    | Reverse Collector Current  |                     | 30                   |                                   | A          |                 |
| $I_B$     | Base Current               |                     | 2                    |                                   | A          |                 |
| $P_T$     | Total power dissipation    | $T_C = 25^\circ C$  | 250                  |                                   | W          |                 |
| $T_j$     | Junction Temperature       |                     | -40 ~ +150           |                                   | $^\circ C$ |                 |
| $T_{stg}$ | Storage Temperature        |                     | -40 ~ +125           |                                   | $^\circ C$ |                 |
| $V_{iso}$ | Isolation Voltage          | A.C.1minute         | 2500                 |                                   | V          |                 |
|           | Mounting Torque            | QCA30B              | Mounting (M6)        | Recommended Value 2.5~3.9 (25~40) | 4.7 (48)   | N·m<br>(kgf·cm) |
|           |                            |                     | Terminal (M5)        | Recommended Value 1.5~2.5 (15~25) | 2.7 (28)   |                 |
|           |                            | QCB30A              | 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      | QCA30B/QCB30A              | Typical Value       | 240/195              |                                   | g          |                 |

### Electrical Characteristics

( $T_j=25^\circ C$ )

| Symbol         | Item                                  | Conditions  | Ratings              |         | Unit         |      |
|----------------|---------------------------------------|---|----------------------|---------|--------------|------|
|                |                                       |   | Min.                 | Max.    |              |      |
| $I_{CBO}$      | 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-Emmitter Sustaning Voltage  | $I_C = 1A$  | QCA30B40<br>QCB30A40 | 300     | V            |      |
| $V_{CEX(SUS)}$ |                                       |   | QCA30B60<br>QCB30A60 | 450     |              |      |
|                |                                       | $I_C = 6A, I_{B2} = -5A$                                      | QCA30B40<br>QCB30A40 | 400     | V            |      |
|                |                                       |   | QCA30B60<br>QCB30A60 | 600     |              |      |
| $h_{FE}$       | DC Current Gain                       | $I_C = 30A, V_{CE} = 2V/5V$                                   | 75/100               |         |              |      |
| $V_{CE(sat)}$  | Collector-Emmitter Saturation Voltage | $I_C = 30A, I_B = 0.4A$                                       |                      | 2.0     | V            |      |
| $V_{BE(sat)}$  | Base-Emmitter Saturation Voltage      | $I_C = 30A, I_B = 0.4A$                                       |                      | 2.5     | V            |      |
| $t_{on}$       | Switching Time                        | $V_{CC} = 300V, I_C = 30A$<br>$I_{B1} = 0.6A, I_{B2} = -0.6A$ |                      | 1.0     | $\mu s$      |      |
| $t_s$          |                                       |   | Storage Time         |         |              | 12.0 |
| $t_f$          |                                       |   | Fall Time            |         |              | 2.0  |
| $V_{ECO}$      | Collector-Emmitter Reverse Voltage    | $-I_C = 30A$  |                      | 1.4     | V            |      |
| $R_{th(j-c)}$  | Thermal Impedance (junction to case)  | Transistor part / Diode part                                  |                      | 0.5/1.6 | $^\circ C/W$ |      |

