

# TRANSISTOR MODULE

# SQD300AA100

TOP



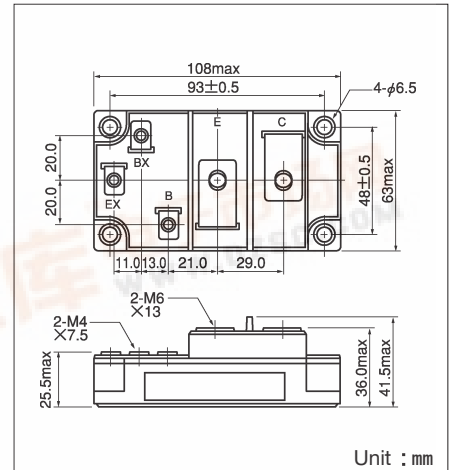
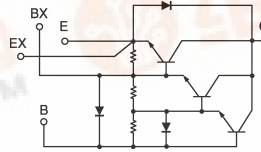
UL;E76102 (M)

SQD300AA100 is a Darlington power transistor module with a high speed, high power Darlington transistor. The transistor has a reverse paralalled fast recovery diode. The mounting base of the module is electrically isolated from semiconductor elements for simple heatsink construction.

- $I_C=300A$ ,  $V_{CEX}=1000V$
- Low saturation voltage for higher efficiency.
- High DC current gain  $h_{FE}$
- Isolated mounting base

(Applications)

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



Unit : mm

### Maximum Ratings

(T<sub>j</sub>=25°C)

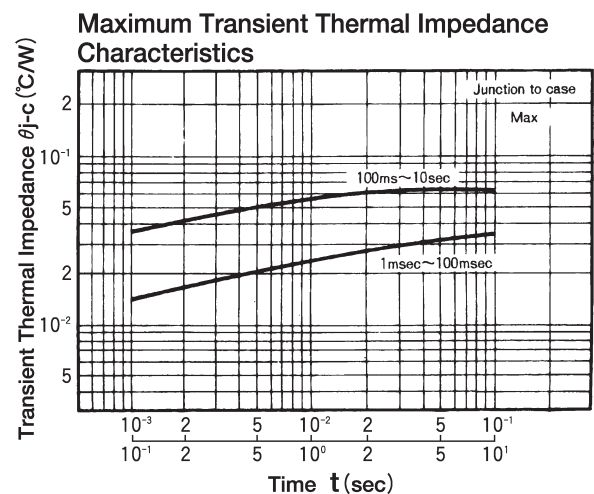
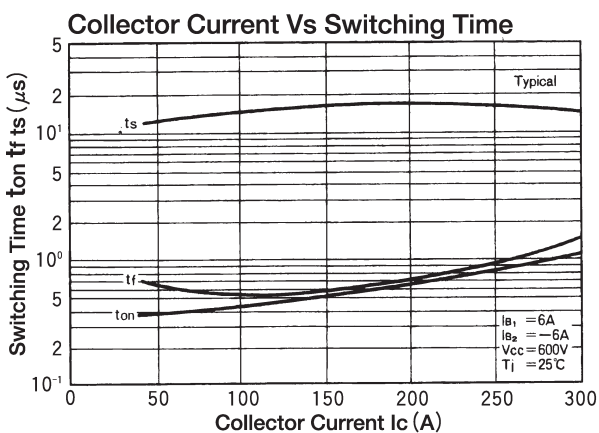
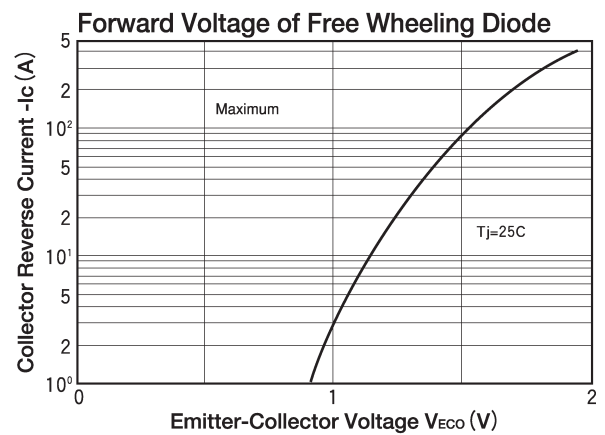
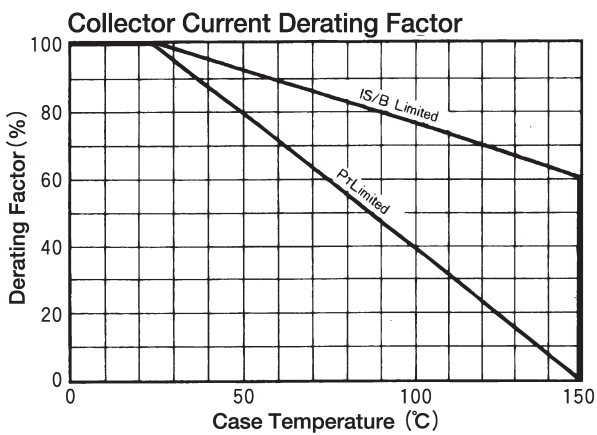
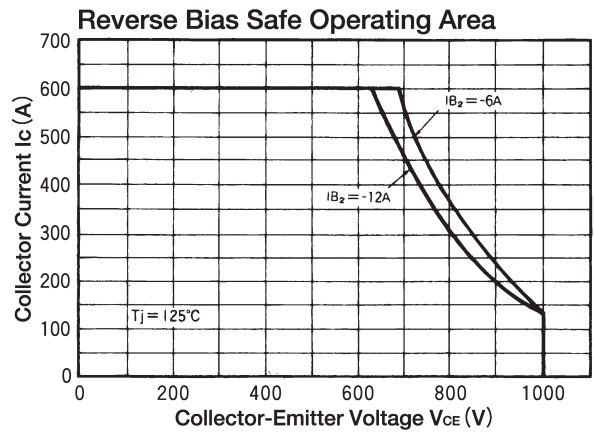
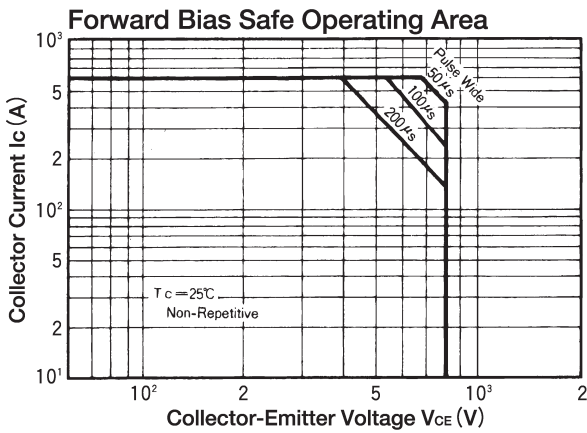
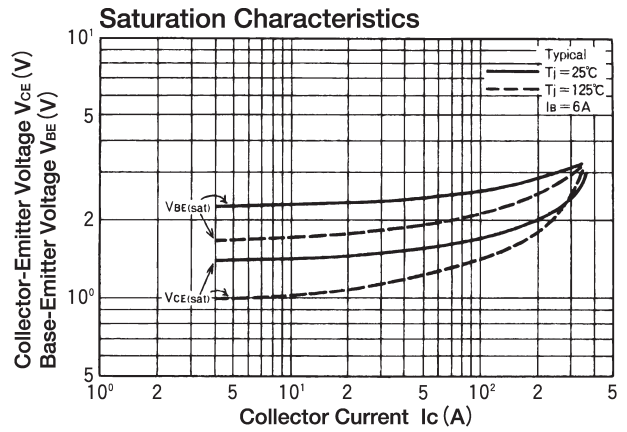
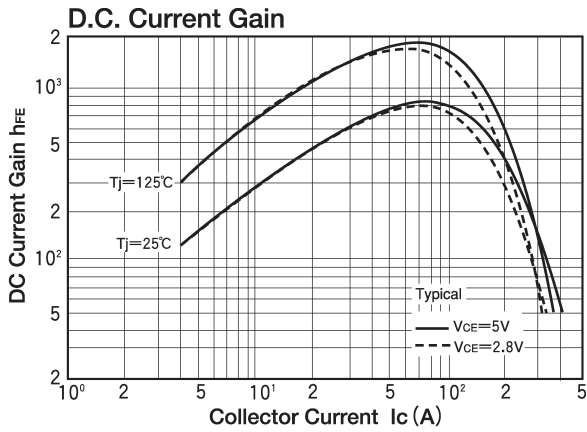
| Symbol           | Item                       | Conditions            | Ratings                           |          | Unit            |
|------------------|----------------------------|-----------------------|-----------------------------------|----------|-----------------|
|                  |                            |                       | SQD300AA100                       |          |                 |
| V <sub>CB0</sub> | Collector-Base Voltage     |                       | 1000                              |          | V               |
| V <sub>CEX</sub> | Collector-Emmitter Voltage | V <sub>BE</sub> = -2V | 1000                              |          | V               |
| V <sub>EBO</sub> | Emitter-Base Voltage       |                       | 7                                 |          | V               |
| I <sub>C</sub>   | Collector Current          |                       | 300                               |          | A               |
| -I <sub>C</sub>  | Reverse Collector Current  |                       | 300                               |          | A               |
| I <sub>B</sub>   | Base Current               |                       | 16                                |          | A               |
| P <sub>T</sub>   | Total power dissipation    | T <sub>C</sub> = 25°C | 2000                              |          | W               |
| T <sub>j</sub>   | Junction Temperature       |                       | -40 ~ +150                        |          | °C              |
| T <sub>stg</sub> | Storage Temperature        |                       | -40 ~ +125                        |          | °C              |
| V <sub>iso</sub> | Isolation Voltage          | A.C.1minute           | 2500                              |          | V               |
|                  | Mounting Torque            | Mounting (M6)         | Recommended Value 2.5~3.9 (25~40) | 4.7 (48) | N·m<br>(kgf·cm) |
|                  |                            | Terminal (M6)         | Recommended Value 2.5~3.9 (25~40) | 4.7 (48) |                 |
|                  |                            | Terminal (M4)         | Recommended Value 1.0~1.4 (10~14) | 1.5 (15) |                 |
|                  | Mass                       | Typical Value         | 520                               |          | g               |

### Electrical Characteristics

(T<sub>j</sub>=25°C)

| Symbol                | Item                                  | Conditions   | Ratings |       | Unit |
|-----------------------|---------------------------------------|--|---------|-------|------|
|                       |                                       |  | Min.    | Max.  |      |
| I <sub>CB0</sub>      | Collector Cut-off Current             | V <sub>CB</sub> = 1000V  |         | 2.0   | mA   |
| I <sub>EBO</sub>      | Emitter Cut-off Current               | V <sub>EB</sub> = 7V   |         | 800   | mA   |
| V <sub>CEX(SUS)</sub> | Collector Emmitter Sustaning Voltage  | I <sub>C</sub> = 60A, I <sub>B2</sub> = -12A   | 1000    |       | V    |
| h <sub>FE</sub>       | DC Current Gain                       | I <sub>C</sub> = 300A, V <sub>CE</sub> = 2.8V  | 75      |       |      |
|                       |                                       | I <sub>C</sub> = 300A, V <sub>CE</sub> = 5V  | 100     |       |      |
| V <sub>CE(sat)</sub>  | Collector-Emmitter Saturation Voltage | I <sub>C</sub> = 300A, I <sub>B</sub> = 6A   |         | 2.5   | V    |
| V <sub>BE(sat)</sub>  | Base-Emmitter Saturation Voltage      | I <sub>C</sub> = 300A, I <sub>B</sub> = 6A   |         | 3.5   | V    |
| ton                   | Switching Time                        | V <sub>CC</sub> = 600V, I <sub>C</sub> = 300A<br>I <sub>B1</sub> = 6A, I <sub>B2</sub> = -6A |         | 3.0   | μs   |
| ts                    |                                       |  |         | 15.0  |      |
| tf                    |                                       |  |         | 3.0   |      |
| V <sub>ECO</sub>      | Collector-Emmitter Reverse Voltage    | I <sub>C</sub> = -300A   |         | 1.8   | V    |
| R <sub>th(j-c)</sub>  | Thermal Impedance (junction to case)  | Transistor part  |         | 0.063 | °C/W |
|                       |                                       | Diode part   |         | 0.3   |      |





# TRANSISTOR MODULE

## SQD300AA120



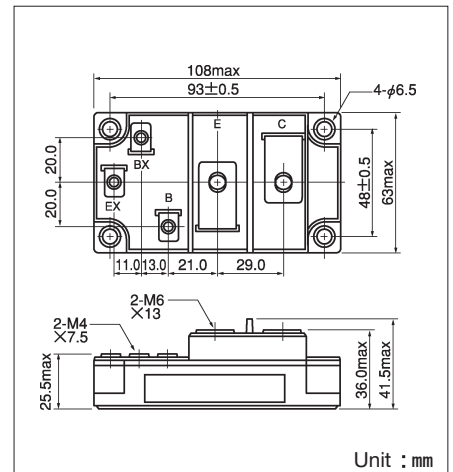
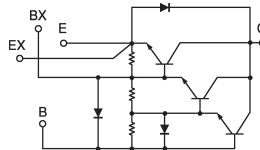
UL;E76102 (M)

SQD300AA120 is a Darlington power transistor module with a high speed, high power Darlington transistor. The transistor has a reverse paralalled fast recovery diode. The mounting base of the module is electrically isolated from semiconductor elements for simple heatsink construction.

- $I_C=300A$ ,  $V_{CEX}=1200V$
- Low saturation voltage for higher efficiency.
- High DC current gain  $h_{FE}$
- Isolated mounting base

### (Applications)

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



### Maximum Ratings

( $T_j=25^\circ C$ )

| Symbol    | Item                      | Conditions       | Ratings                           |            |
|-----------|---------------------------|------------------|-----------------------------------|------------|
|           |                           |                  | SQD300AA120                       | Unit       |
| $V_{CBO}$ | Collector-Base Voltage    |                  | 1200                              | V          |
| $V_{CEX}$ | Collector-Emitter Voltage | $V_{BE} = -2V$   | 1200                              | V          |
| $V_{EBO}$ | Emitter-Base Voltage      |                  | 10                                | V          |
| $I_C$     | Collector Current         |                  | 300                               | A          |
| $-I_C$    | Reverse Collector Current |                  | 300                               | A          |
| $I_B$     | Base Current              |                  | 16                                | A          |
| $P_T$     | Total power dissipation   | $T_C=25^\circ C$ | 2000                              | W          |
| $T_j$     | Junction Temperature      |                  | $-40 \sim +150$                   | $^\circ C$ |
| $T_{stg}$ | Storage Temperature       |                  | $-40 \sim +125$                   | $^\circ C$ |
| $V_{iso}$ | Isolation Voltage         | A.C.1minute      | 2500                              | V          |
|           | Mounting Torque           | (M6)             | Recommended Value 2.5~3.9 (25~40) | 4.7 (48)   |
|           |                           | Terminal (M6)    | Recommended Value 2.5~3.9 (25~40) | 4.7 (48)   |
|           |                           | Terminal (M4)    | Recommended Value 1.0~1.4 (10~14) | 1.5 (15)   |
|           | Mass                      | Typical Value    | 470                               | g          |

### Electrical Characteristics

( $T_j=25^\circ C$ )

| Symbol         | Item                                 | Conditions                | Ratings  |       | Unit         |
|----------------|--------------------------------------|---------------------------|--|-------|--------------|
|                |                                      |                           | Min.   | Max.  |              |
| $I_{CBO}$      | Collector Cut-off Current            | $V_{CB}=1200V$            |  | 4.0   | mA           |
| $I_{EBO}$      | Emitter Cut-off Current              | $V_{EB}=10V$              |  | 1200  | mA           |
| $V_{CEX(SUS)}$ | Collector Emitter Sustaining Voltage | $I_C=60A$ , $I_{B2}=-12A$ | 1200   |       | V            |
| $h_{FE}$       | DC Current Gain                      | $I_C=300A$ , $V_{CE}=5V$  | 75   |       |              |
| $V_{CE(sat)}$  | Collector-Emitter Saturation Voltage | $I_C=300A$ , $I_B=6A$     |  | 3.0   | V            |
| $V_{BE(sat)}$  | Base-Emitter Saturation Voltage      | $I_C=300A$ , $I_B=6A$     |  | 3.5   | V            |
| $t_{on}$       | Switching Time                       | On Time                   |  | 3.0   | $\mu s$      |
| $t_s$          |                                      | Storage Time              | $V_{CC}=600V$ , $I_C=300A$<br>$I_{B1}=6A$ , $I_{B2}=-6A$ | 15.0  |              |
| $t_f$          |                                      | Fall Time                 |  | 3.0   |              |
| $V_{ECO}$      | Collector-Emitter Reverse Voltage    | $I_C=-300A$               |  | 1.8   | V            |
| $R_{th(j-c)}$  | Thermal Impedance (junction to case) | Transistor part           |  | 0.063 | $^\circ C/W$ |
|                |                                      | Diode part                |  | 0.3   |              |

