

TRANSISTOR MODULE

SQD400AA100



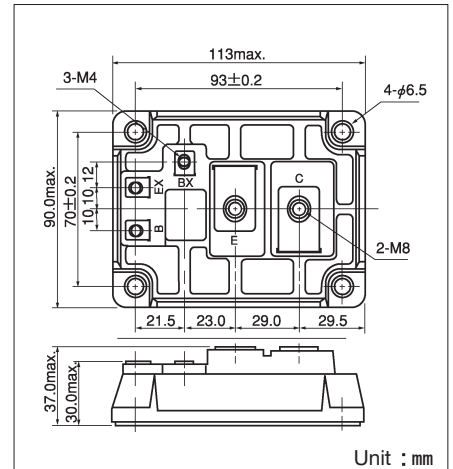
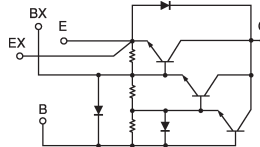
UL;E76102 (M)

SQD400AA100 is a Darlington power transistor module with a high speed, high power Darlington transistor. The transistor has a reverse paralleled fast recovery diode. The mounting base of the module is electrically isolated from Semiconductor elements for simple heatsink construction.

- $I_C=400A$, $V_{CEX}=1000V$
- Low saturation voltage High DC current gain
- Isolated monuting base

(Applications)

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



Maximum Ratings

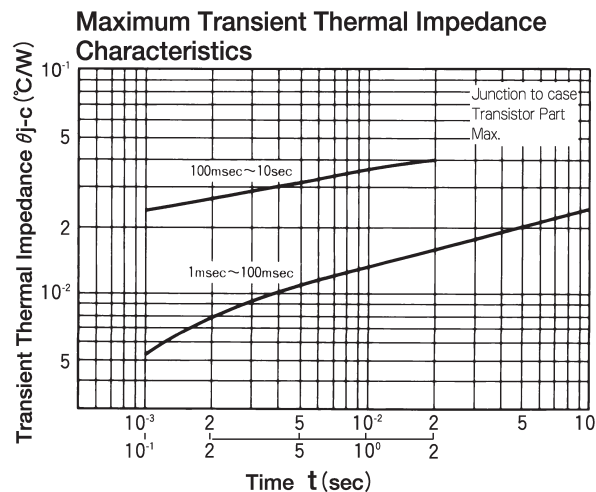
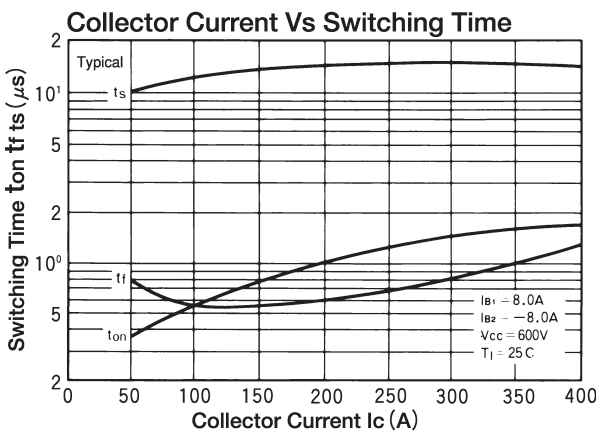
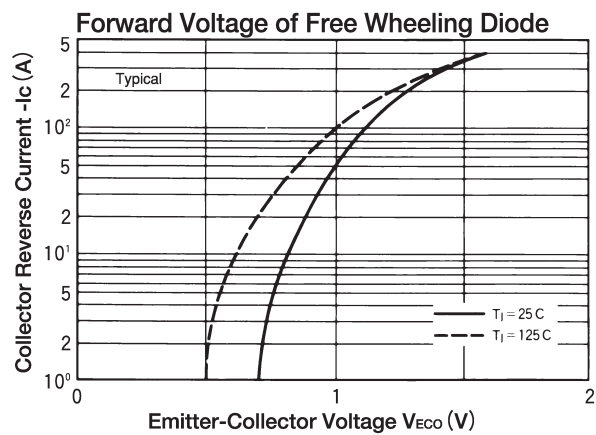
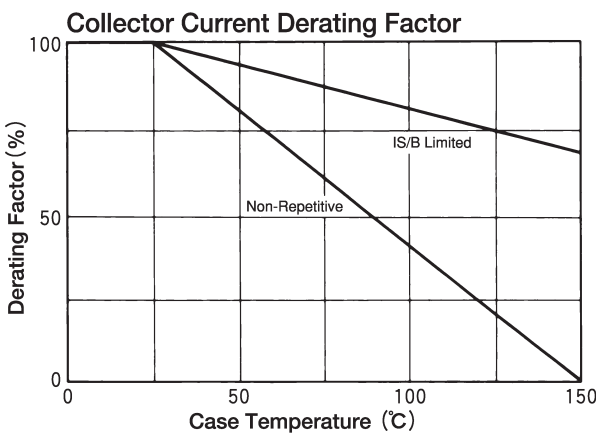
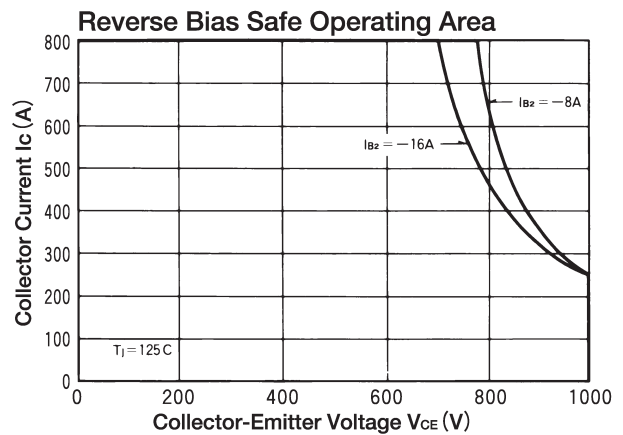
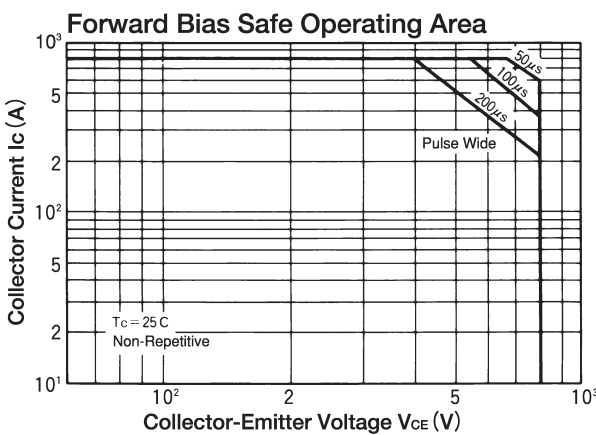
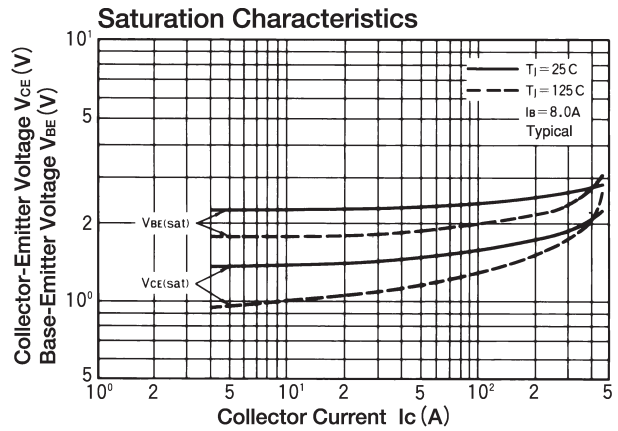
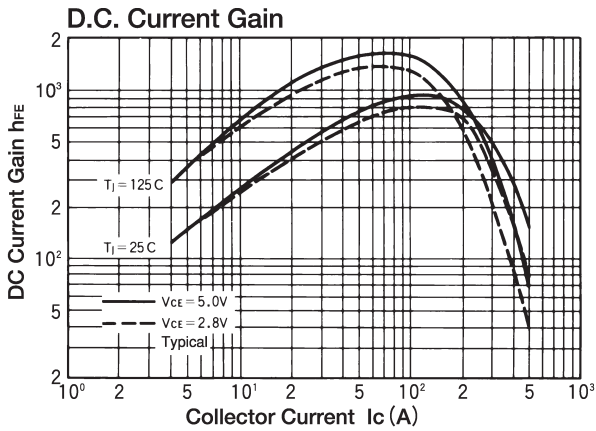
($T_j=25^{\circ}C$)

| Symbol | Item | Conditions | Ratings | | Unit |
|----------------|-------------------------------------|--------------------------|-----------------------------------|----------|-----------------|
| | | | SQD400AA100 | | |
| V_{CBO} | Collector-Base Voltage | | 1000 | | V |
| V_{CEX} | Collector-Emitter Voltage | $V_{BE} = -2V$ | 1200 | | V |
| $V_{CEX(SUS)}$ | Collector-Emitter Sustaning Voltage | $I_C = -80A, I_B = -18A$ | 1000 | | V |
| V_{EBO} | Emitterr-Base Voltage | | 10 | | V |
| I_C | Collector Current | | 400 | | A |
| $-I_C$ | Reverse Collector Current | | 400 | | A |
| I_B | Base Current | | 20 | | A |
| P_T | Total power dissipation | $T_C = 25^{\circ}C$ | 3120 | | 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 | Mouting (M6) | Recommended Value 2.5~3.9 (25~40) | 4.7 (48) | N·m (kgf·cm) |
| | | Terminal (M8) | Recommended Value 8.8~10 (90~105) | 11 (115) | |
| | | Terminal (M4) | Recommended Value 1.0~1.4 (10~14) | 1.5 (15) | |
| | Mass | Typical Value | 670 | | g |

Electrical Characteristics

($T_j=25^{\circ}C$)

| Symbol | Item | Conditions | Ratings | | Unit |
|---------------|--------------------------------------|--|--------------|------|---------------|
| | | | Min. | Max. | |
| I_{CBO} | Collector Cut-off Current | $V_{CB} = 1000V$ | | 3.0 | mA |
| I_{EBO} | Emitter Cut-off Current | $V_{EB} = 10V$ | | 1000 | mA |
| h_{FE} | DC Current Gain | $I_C = 300A, V_{CE} = 2.8V$ | 75 | | |
| | | $I_C = 400A, V_{CE} = 5V$ | 100 | | |
| $V_{CE(sat)}$ | Collector-Emitter Sturation Voltage | $I_C = 400A, I_B = 8A$ | | 2.5 | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C = 400A, I_B = 8A$ | | 3.5 | V |
| t_{on} | Switching Time | $V_{CC} = 600V, I_C = 400A$ $I_{B1} = 8A, I_{B2} = -8A$ | | 3.0 | μs |
| t_s | | | Storage Time | 16.0 | |
| t_f | | | Fall Time | 3.0 | |
| V_{ECO} | $I_C = -400A$ | Collector-Emitter Reverse Voltage | | 1.8 | V |
| $R_{th(j-c)}$ | Thermal Impedance (junction to case) | Transistor part | | 0.04 | $^{\circ}C/W$ |
| | | Diode part | | 0.16 | |



TRANSISTOR MODULE

SQD400AA120



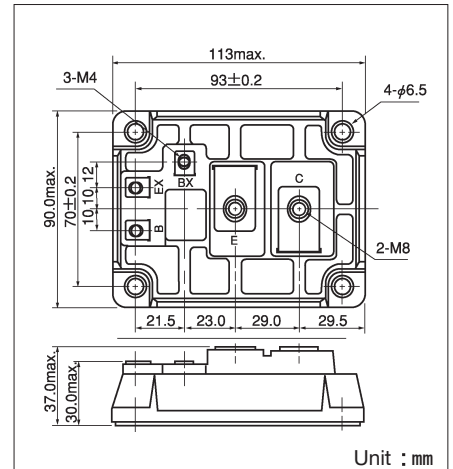
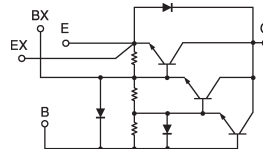
UL;E76102 (M)

SQD400AA120 is a Darlington power transistor module with a high speed, high power Darlington transistor. The transistor has a reverse paralleled fast recovery diode. The mounting base of the module is electrically isolated from Semiconductor elements for simple heatsink construction.

- $I_C=400A$, $V_{CEX}=1200V$
- Low saturation voltage for higher efficiency
- High DC current gain.
- Isolated monuting base

(Applications)

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



Unit : mm

Maximum Ratings

($T_j=25^{\circ}C$)

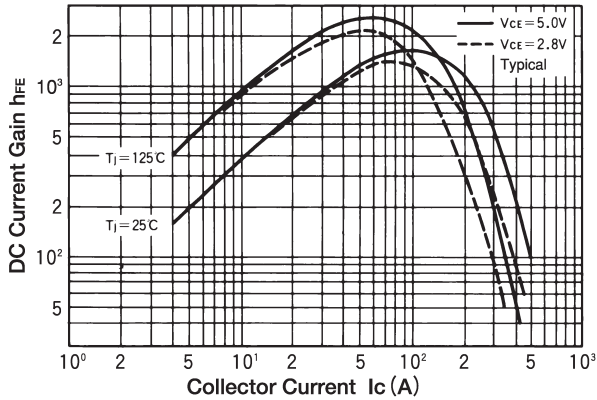
| Symbol | Item | Conditions | Ratings | | Unit |
|----------------|--------------------------------------|----------------------------|-----------------------------------|----------|-----------------|
| | | | SQD400AA120 | | |
| V_{CBO} | Collector-Base Voltage | | 1200 | | V |
| V_{CEX} | Collector-Emitter Voltage | $V_{BE} = -2V$ | 1200 | | V |
| $V_{CEX(SUS)}$ | Collector-Emitter Sustaining Voltage | $I_C = 80A, I_{B2} = -18A$ | 1200 | | V |
| V_{EBO} | Emitterr-Base Voltage | | 10 | | V |
| I_C | Collector Current | | 400 | | A |
| $-I_C$ | Reverse Collector Current | | 400 | | A |
| I_B | Base Current | | 20 | | A |
| P_T | Total power dissipation | $T_C = 25^{\circ}C$ | 3120 | | 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 | Mouting (M6) | Recommended Value 2.5~3.9 (25~40) | 4.7 (48) | N·m (kgf·cm) |
| | | Terminal (M8) | Recommended Value 8.8~10 (90~105) | 11 (115) | |
| | | Terminal (M4) | Recommended Value 1.0~1.4 (10~14) | 1.5 (15) | |
| | Mass | Typical Value | 670 | | g |

Electrical Characteristics

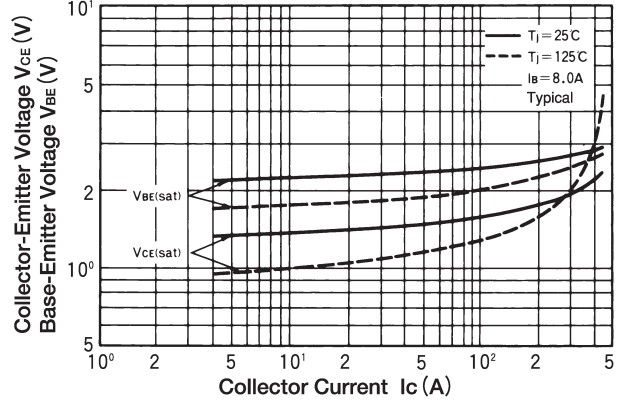
($T_j=25^{\circ}C$)

| Symbol | Item | Conditions | Ratings | | Unit |
|---------------|---|--|---------|------|---------------|
| | | | Min. | Max | |
| I_{CBO} | Collector Cut-off Current | $V_{CB} = 1200V$ | | 5.00 | mA |
| I_{EBO} | Emitter Cut-off Current | $V_{EB} = 10V$ | | 1000 | mA |
| h_{FE} | DC Current Gain | $I_C = 400A, V_{CE} = 2.8V$ | 75 | | |
| | | $I_C = 400A, V_{CE} = 5V$ | 100 | | |
| $V_{CE(sat)}$ | Collector-Emitter Sturation Voltage | $I_C = 400A, I_B = 8A$ | | 3.0 | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C = 400A, I_B = 8A$ | | 3.5 | V |
| t_{on} | Switching Time | $V_{CC} = 600V, I_C = 400A$ $I_{B1} = 8A, I_{B2} = -8A$ | | 3.0 | μs |
| t_s | | | | 17.0 | |
| t_f | | | | 3.0 | |
| V_{ECO} | Collector-Emitter Reverse Voltage | $I_C = -400A$ | | 1.8 | V |
| $R_{th(j-c)}$ | Thermal Impedance (junction to case) | Transistor part | | 0.04 | $^{\circ}C/W$ |
| | | Diode part | | 0.16 | |

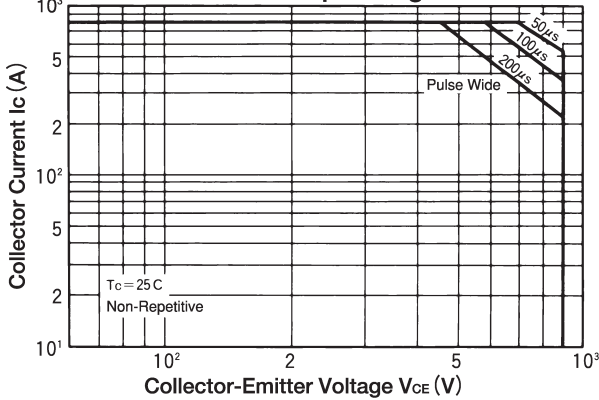
D.C. Current Gain



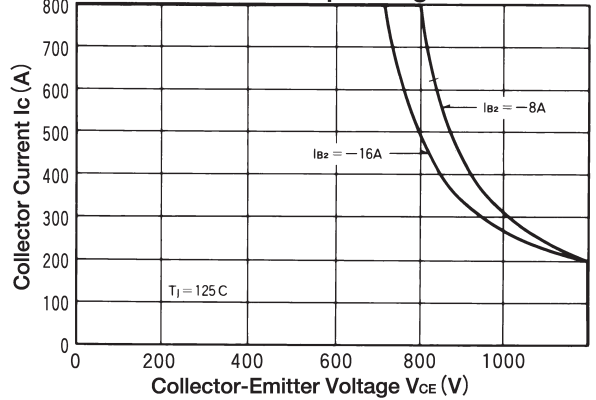
Saturation Characteristics



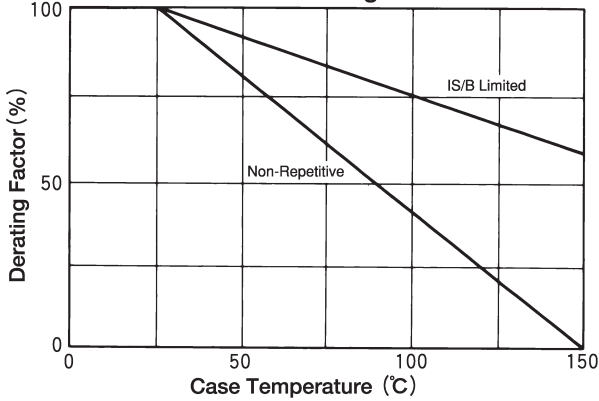
Forward Bias Safe Operating Area



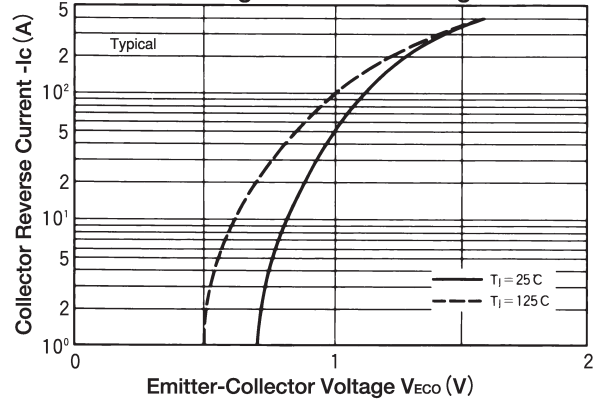
Reverse Bias Safe Operating Area



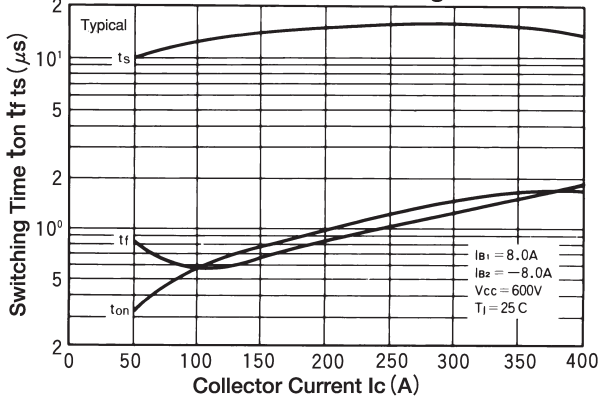
Collector Current Derating Factor



Forward Voltage of Free Wheeling Diode



Collector Current Vs Switching Time



Maximum Transient Thermal Impedance Characteristics

