

# IGBT MODULE

## GCA100AA120



UL;E76102 (M)

**SanRex** IGBT Module **GCA100AA120** is designed for high speed, high current switching applications. This Module is electrically isolated and contains two IGBTs connected in series with a fast switching, soft recovery diode ( $t_{rr}=0.1 \mu s$ ) reverse connected across each IGBT.

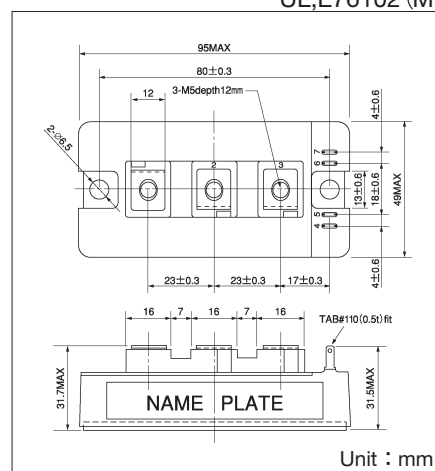
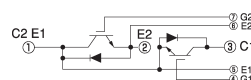
- $I_c=100A$   $V_{CES}=1200V$
- $V_{CE(sat)}=3.0V$  Typ
- $t_f=0.10 \mu s$  Typ
- Soft recovery diode

### (Applications)

Inverter for motor control (VVVF)

UPS, AC servo

DC power supply, Welder



### Maximum Ratings

(Unless otherwise  $T_j=25^\circ C$ )

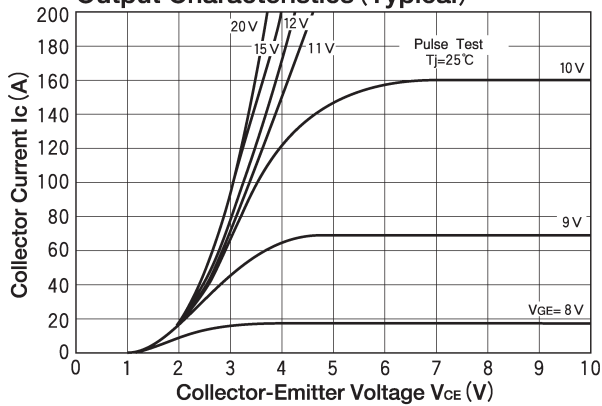
| Symbol    | Item                       |               | Conditions                            | Ratings         | Unit            |
|-----------|----------------------------|---------------|---------------------------------------|-----------------|-----------------|
|           |                            |               |                                       | GCA100AA120     |                 |
| $V_{CES}$ | Collector-Emitter Voltage  |               | with gate terminal shorted to emitter | 1200            | V               |
| $V_{GES}$ | Gate-Emitter Voltage       |               | with collector shorted to emitter     | $\pm 20$        | V               |
| $I_c$     | Collector Current          | DC            |                                       | 100             | A               |
| $I_{CP}$  |                            | Pulse (1 ms)  |                                       | 200             |                 |
| $-I_c$    | Reverse Collector Current  |               |                                       | 100             | A               |
| $P_T$     | Total Power Dissipation    |               | $T_c=25^\circ C$                      | 780             | W               |
| $T_j$     | Junction Temperature       |               |                                       | 150             | $^\circ C$      |
| $T_{stg}$ | Storage Temperature        |               |                                       | $-40 \sim +125$ | $^\circ C$      |
| $V_{ISO}$ | Isolation Voltage (R.M.S.) |               | A.C. 1 minute                         | 2500            | V               |
|           | Mounting Torque            | 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)        |                 |
|           | Mass                       |               | Typical Value                         | 225             | g               |

### Electrical Characteristics

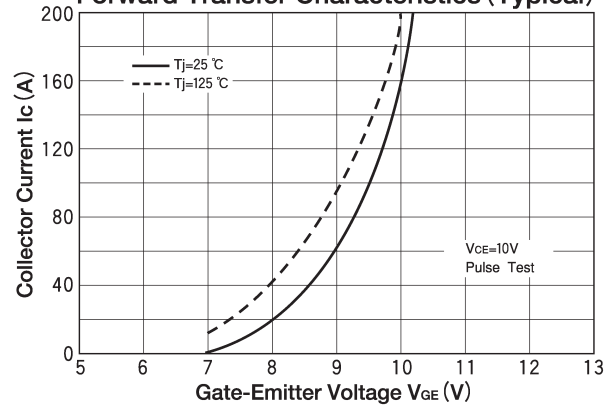
(Unless otherwise  $T_j=25^\circ C$ )

| Symbol        | Item                                 |                     | Conditions                                                        | Ratings |      |           | Unit         |
|---------------|--------------------------------------|---------------------|-------------------------------------------------------------------|---------|------|-----------|--------------|
|               |                                      |                     |                                                                   | Min.    | Typ. | Max.      |              |
| $I_{GES}$     | Gate Leakage Current                 |                     | $V_{GE}=\pm 20V$ , $V_{CE}=0V$                                    |         |      | $\pm 500$ | nA           |
| $I_{CES}$     | Collector Cut-Off Current            |                     | $V_{CE}=1200V$ , $V_{GE}=0V$                                      |         |      | 1.0       | mA           |
| $V_{(BR)CES}$ | Collector-Emitter Breakdown Voltage  |                     | $V_{GE}=0V$ , $I_c=1mA$                                           | 1200    |      |           | V            |
| $V_{GE(th)}$  | Gate Threshold Voltage               |                     | $V_{CE}=10V$ , $I_c=10mA$                                         | 4.5     |      | 7.5       | V            |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage |                     | $I_c=100A$ , $V_{GE}=15V$                                         |         | 3.0  | 3.4       | V            |
| $C_{ies}$     | Input Capacitance                    |                     | $V_{CE}=10V$ , $V_{GE}=0V$ , $f=1MHz$                             |         | 11   | 20        | nF           |
| $t_r$         | Switching Time                       | Rise Time           | $I_c=100A$ , $V_{GE}=+15V/-5V$<br>$V_{CC}=600V$ , $R_G=3.0\Omega$ |         | 0.10 | 0.25      | $\mu s$      |
| $t_d(on)$     |                                      | Turn-on Delay Time  |                                                                   |         | 0.20 | 0.35      |              |
| $t_f$         |                                      | Fall Time           |                                                                   |         | 0.10 | 0.35      |              |
| $t_d(off)$    |                                      | Turn-off Delay Time |                                                                   |         | 0.25 | 0.40      |              |
| $V_{ECS}$     | Emitter-Collector Voltage            |                     | $-I_c=100A$ , $V_{GE}=0V$                                         |         | 2.20 | 3.50      | V            |
| $t_{rr}$      | Reverse Recovery Time                |                     | $-I_c=100A$ , $V_{GE}=-10V$ , $di/dt=200A/\mu s$                  |         | 0.15 | 0.25      | $\mu s$      |
| $R_{th(j-c)}$ | Thermal Resistance                   |                     | IGBT-Case                                                         |         |      | 0.16      | $^\circ C/W$ |
|               |                                      |                     | Diode-Case                                                        |         |      | 0.40      |              |

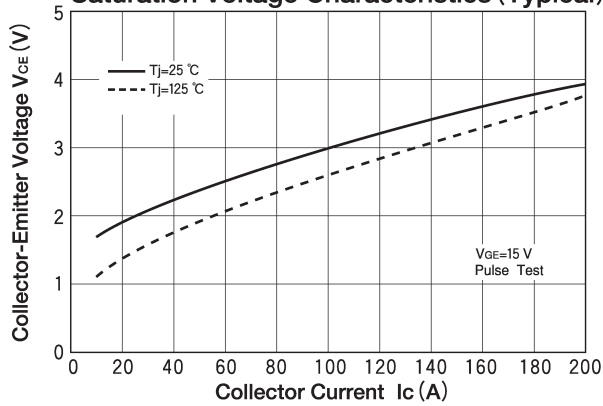
### Output Characteristics (Typical)



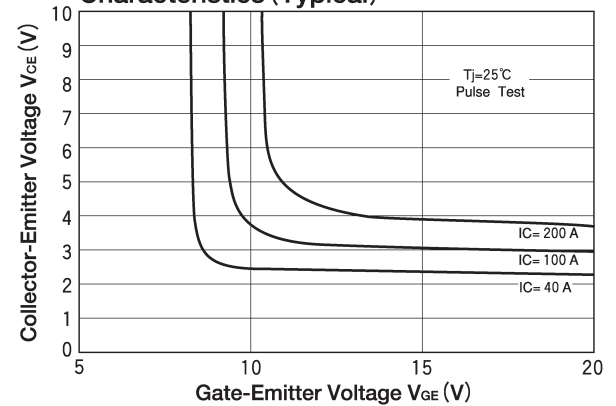
### Forward Transfer Characteristics (Typical)



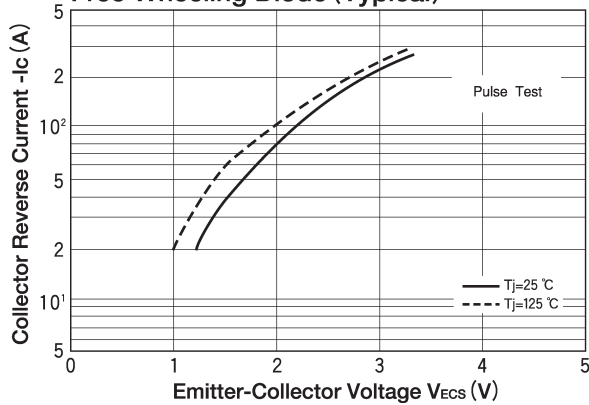
### Saturation Voltage Characteristics (Typical)



### Collector-Emitter Saturation Voltage Characteristics (Typical)



### Forward Voltage of Free Wheeling Diode (Typical)



### Input Capacitance, Output Capacitance, Transfer Capacitance (Typical)

