

# THREE PHASE DIODE+THYRISTOR

# DFA150AA80/160

TOP



UL;E76102 (M)

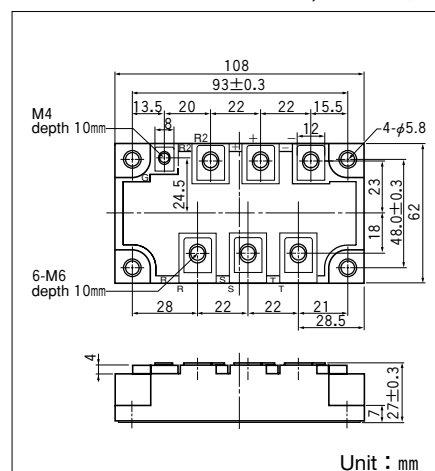
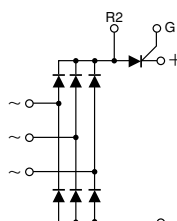
**SanRex** Power Module, DFA150AA, is complex isolated module which is designed for rash current circuit.

It contains six diodes connected in a three phase bridge configuration, and a thyristor connected to a direct current line.

- This Module is designed very compactly. Because diode module and thyristor put together.
- This Module is also isolated type between electorode terminal and mounting base. So you can put this Module and other one together in a same fin.

## (Application)

- Inverter for AC or DC motor control, Current stabilized power supply, Switching power supply.



## ● DIODE

### ■ Maximum Ratings

(T<sub>j</sub>=25°C unless otherwise specified)

| Symbol           | Item                                | Ratings    |             | Unit |
|------------------|-------------------------------------|------------|-------------|------|
|                  |                                     | DFA150AA80 | DFA150AA160 |      |
| V <sub>RRM</sub> | Repetitive Peak Reverse Voltage     | 800        | 1600        | V    |
| V <sub>RSM</sub> | Non-Repetitive Peak Reverse Voltage | 960        | 1700        | V    |

| Symbol           | Item                                 | Conditions                                   | Ratings                           | Unit            |
|------------------|--------------------------------------|----------------------------------------------|-----------------------------------|-----------------|
| I <sub>D</sub>   | Output Current (D.C.)                | Three phase full wave, T <sub>c</sub> =93°C  | 150                               | A               |
| I <sub>FSM</sub> | Surge forward current                | 1 cycle, 50/60Hz, peak value, non-repetitive | 1460/1600                         | A               |
| T <sub>j</sub>   | Operating Junction Temperature       |                                              | -40 to +150                       | °C              |
| T <sub>stg</sub> | Storage Temperature                  |                                              | -40 to +125                       | °C              |
| V <sub>ISO</sub> | Isolation Breakdown Voltage (R.M.S.) | A.C. 1 minute                                | 2500                              | V               |
|                  | Mounting Torque                      | Mounting (M5)                                | Recommended Value 1.5-2.5 (15-25) | N·m<br>(kgf·cm) |
|                  |                                      | Terminal (M6)                                | Recommended Value 2.5-3.9 (25-40) |                 |
|                  |                                      | Terminal (M4)                                | Recommended Value 1.0-1.4 (10-14) |                 |
|                  | Mass                                 | Typical Value                                | 460                               | g               |

### ■ Electrical Characteristics

| Symbol               | Item                                 | Conditions                                              | Ratings | Unit |
|----------------------|--------------------------------------|---------------------------------------------------------|---------|------|
| I <sub>RRM</sub>     | Repetitive Peak Reverse Current,max. | T <sub>j</sub> =150°C, V <sub>R</sub> =V <sub>RRM</sub> | 15      | mA   |
| V <sub>FM</sub>      | Forward Voltage Drop,max.            | I <sub>F</sub> =150A, Inst. measurement                 | 1.35    | V    |
| R <sub>th(j-c)</sub> | Thermal Impedance, max.              | Junction to Case (TOTAL)                                | 0.14    | °C/W |
| R <sub>th(c-f)</sub> | Thermal Impedance, max.              | Case to fin                                             | 0.07    | °C/W |

## ● THYRISTOR

### ■ Maximum Ratings

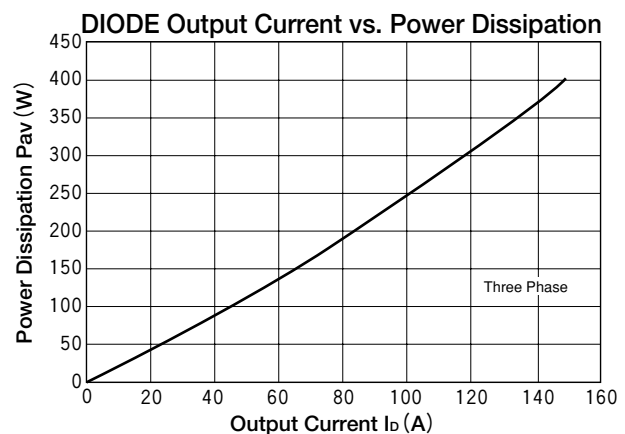
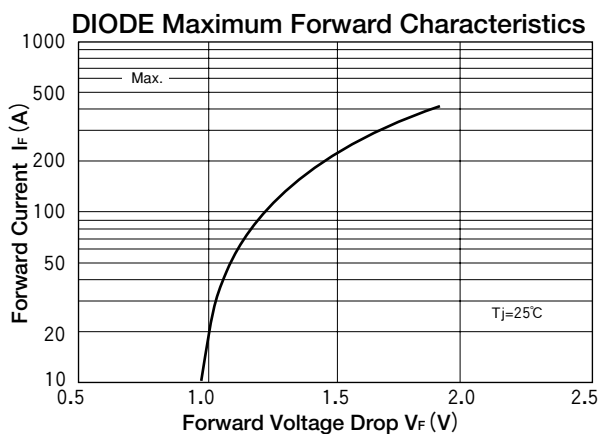
(T<sub>j</sub>=25°C unless otherwise specified)

| Symbol           | Item                                | Ratings    |             | Unit |
|------------------|-------------------------------------|------------|-------------|------|
|                  |                                     | DFA150AA80 | DFA150AA160 |      |
| V <sub>RRM</sub> | Repetitive Peak Reverse Voltage     | 800        | 1600        | V    |
| V <sub>RSM</sub> | Non-Repetitive Peak Reverse Voltage | 960        | 1700        | V    |
| V <sub>DRM</sub> | Repetitive Peak off-State Voltage   | 800        | 1600        | V    |

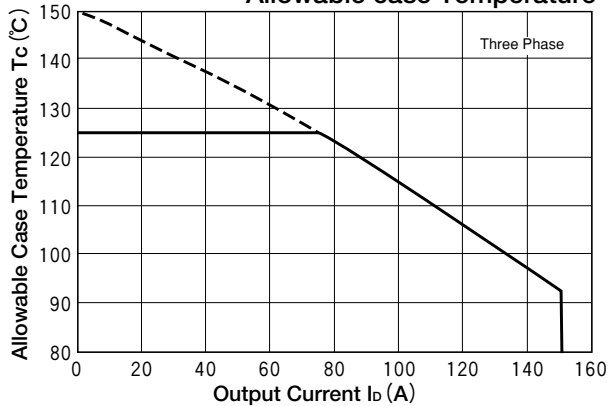
| Symbol             | Item                                      | Conditions                                                                               | Ratings                           | Unit             |
|--------------------|-------------------------------------------|------------------------------------------------------------------------------------------|-----------------------------------|------------------|
| I <sub>T(AV)</sub> | Average On-State Current                  | Singl phase half wave. 180° conduction, T <sub>c</sub> =93°C                             | 150                               | A                |
| I <sub>TSM</sub>   | Surge On-State Current                    | 1 cycle, 50/60Hz, peak value, non-repetitive                                             | 1460/1600                         | A                |
| I <sup>2</sup> t   | I <sup>2</sup> t (for fusing)             |                                                                                          | 10670                             | A <sup>2</sup> s |
| di/dt              | Critical Rate of Rise of On-State Current | I <sub>G</sub> =100mA, V <sub>D</sub> =1/2V <sub>DRM</sub> , di <sub>G</sub> /dt=0.1A/μs | 150                               | A/μs             |
| V <sub>ISO</sub>   | Isolation Breakdown Voltage (R.M.S.)      | A.C. 1minute                                                                             | 2500                              | V                |
| T <sub>j</sub>     | Operating Junction Temperature            |                                                                                          | -40 to +135                       | °C               |
| T <sub>stg</sub>   | Storage Temperature                       |                                                                                          | -40 to +125                       | °C               |
|                    | Mounting Torque                           | Mounting (M5)                                                                            | Recommended Value 1.5-2.5 (15-25) | N·m<br>(kgf·cm)  |
|                    |                                           | Terminal (M6)                                                                            | Recommended Value 2.5-3.9 (25-40) |                  |
|                    |                                           | Terminal (M4)                                                                            | Recommended Value 1.0-1.4 (10-14) |                  |
|                    | Mass                                      | Typical Value                                                                            | 460                               | g                |

### ■ Electrical Characteristics

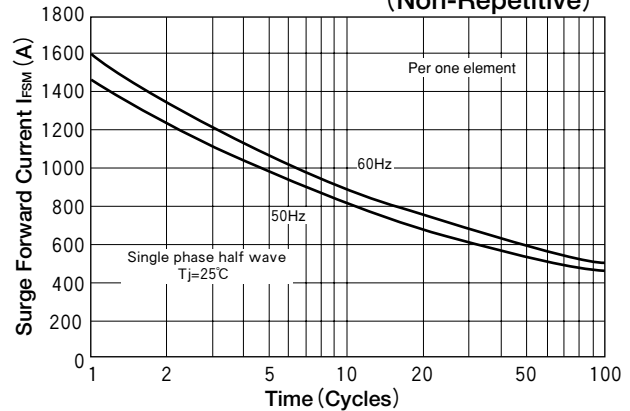
| Symbol               | Item                                            | Conditions                                                       | Ratings | Unit |
|----------------------|-------------------------------------------------|------------------------------------------------------------------|---------|------|
| I <sub>DRM</sub>     | Repetitive Peak Off-State Current,max.          | T <sub>j</sub> =135°C, V <sub>D</sub> =V <sub>DRM</sub>          | 100     | mA   |
| I <sub>RRM</sub>     | Repetitive Peak Reverse Current,max.            | T <sub>j</sub> =135°C, V <sub>D</sub> =V <sub>RRM</sub>          | 100     | mA   |
| V <sub>TM</sub>      | Peak On-State Voltage,max.                      | T <sub>j</sub> =25°C, I <sub>TM</sub> =150A, , Inst. measurement | 1.35    | V    |
| I <sub>GT</sub>      | Gate Trigger Current,max.                       | T <sub>j</sub> =25°C, V <sub>D</sub> =6V, I <sub>T</sub> =1A     | 70      | mA   |
| V <sub>GT</sub>      | Gate Trigger Voltage,max.                       | T <sub>j</sub> =25°C, V <sub>D</sub> =6V, I <sub>T</sub> =1A     | 3       | V    |
| dv/dt                | Critical Rate of Rise of Off-State Voltage,min. | T <sub>j</sub> =125°C, V <sub>D</sub> =2/3V <sub>DRM</sub>       | 500     | V/μs |
| R <sub>th(j-c)</sub> | Thermal Impedance, max.                         | Junction to Case                                                 | 0.21    | °C/W |
| R <sub>th(c-f)</sub> | Thermal Impedance, max.                         | Case to fin                                                      | 0.07    | °C/W |



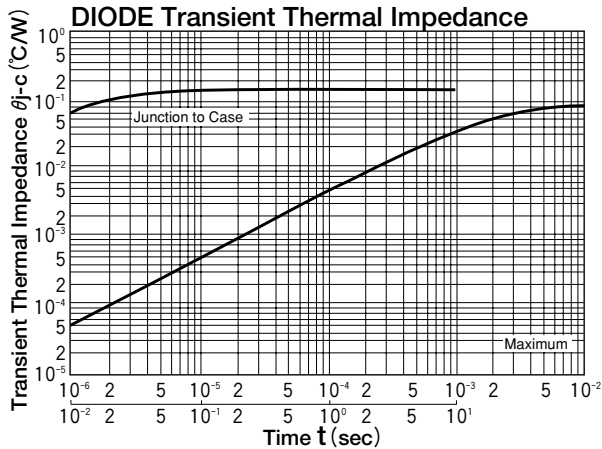
**DIODE Output Current vs. Allowable case Temperature**



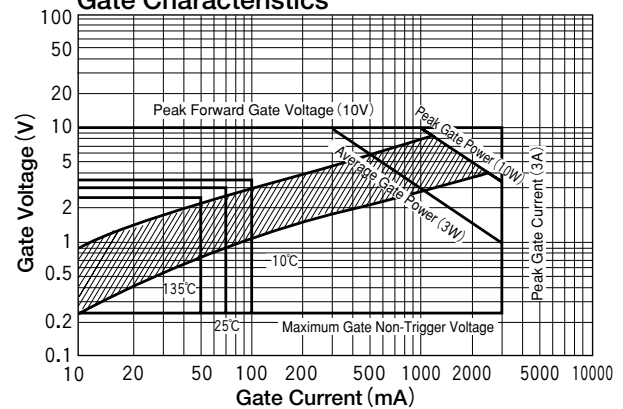
**Surge Forward Current Rating (Non-Repetitive)**



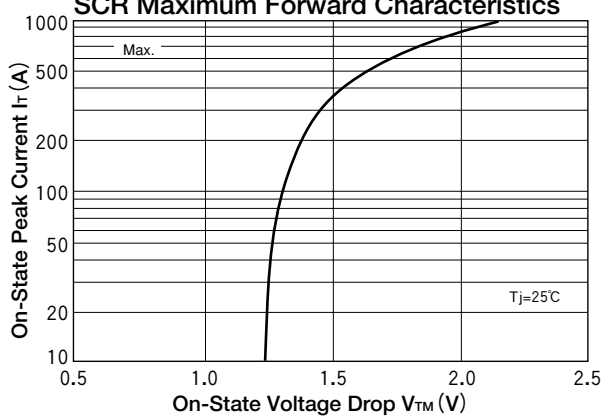
**DIODE Transient Thermal Impedance**



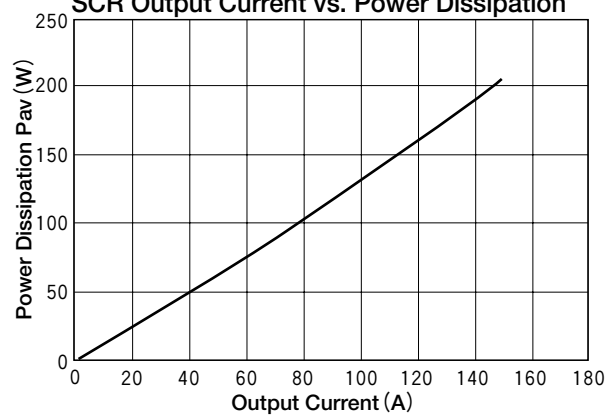
**Gate Characteristics**



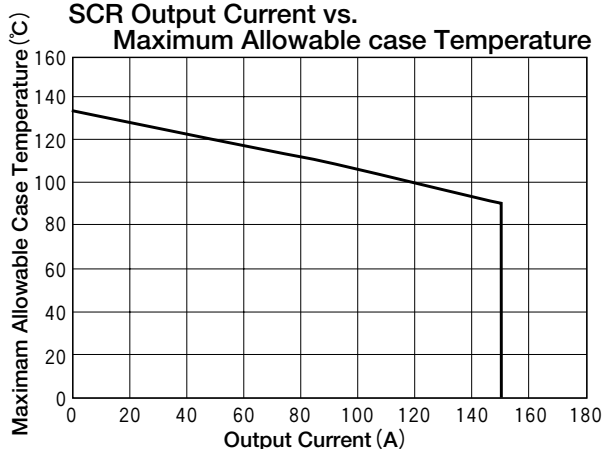
**SCR Maximum Forward Characteristics**



**SCR Output Current vs. Power Dissipation**



**SCR Output Current vs. Maximum Allowable case Temperature**



**SCR Transient Thermal Impedance**

