

# DIODE MODULE

# DWF(R)40A30/40

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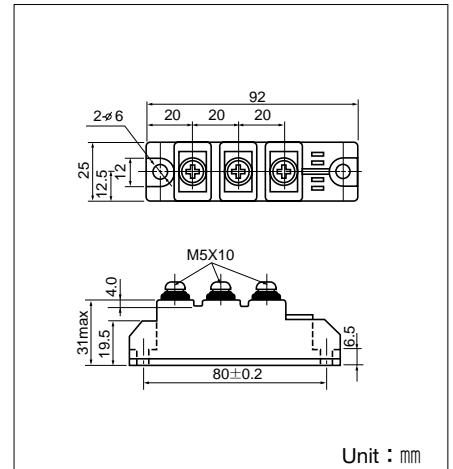
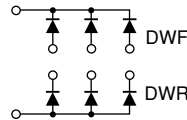


DWF(R)40A is a non-isolated diode module designed for 3 phase rectification.

- $I_{F(AV)}=40A$ ,  $V_{RRM}=400V$
- Easy Construction with Joint-Cathode (F) Type and Joint-Anode (R) type.
- Non-isolated. (Mounting Base as terminals.)
- High Surge Capability

**(Applications)**

- Welding Power Supply
- 3 Phase Rectifier



**Maximum Ratings**

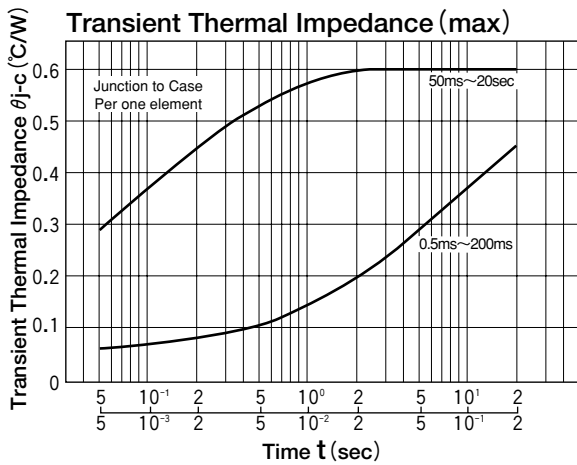
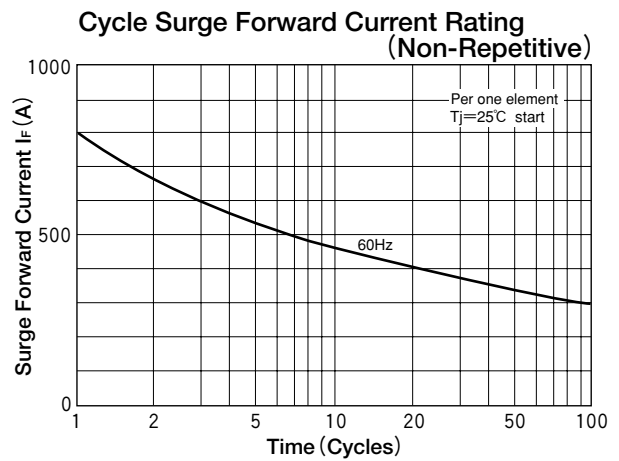
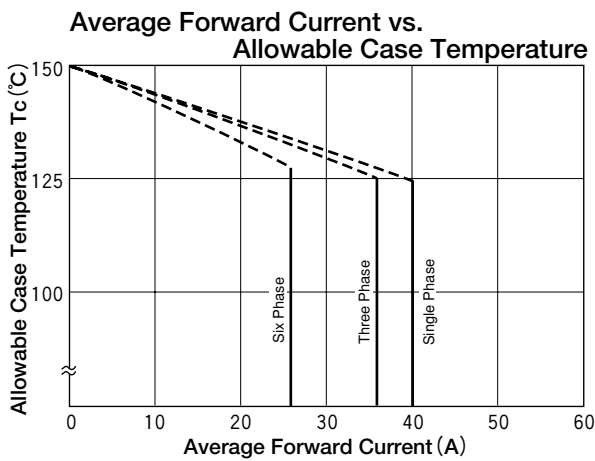
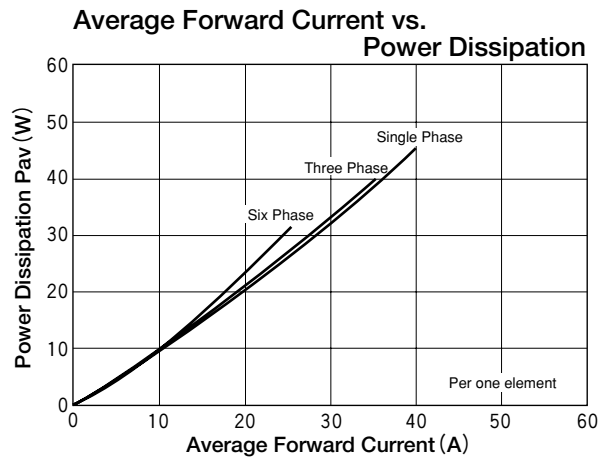
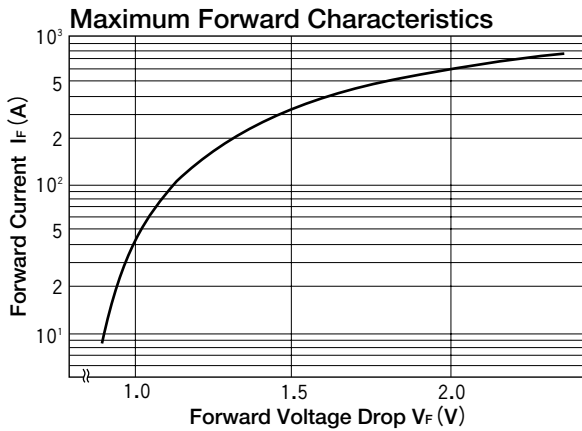
( $T_j=25^\circ C$  unless otherwise specified)

Symbol	Item	Ratings		Unit
		DWF(R)40A30	DWF(R)40A40	
$V_{RRM}$	Repetitive Peak Reverse Voltage	300	400	V
$V_{RSM}$	Non-Repetitive Peak Reverse Voltage	360	480	V
$V_{R(DC)}$	D.C. Reverse Voltage	240	320	V

Symbol	Item	Conditions	Ratings	Unit	
$I_{F(AV)}$	Average Forward Current	Single phase, half wave, $180^\circ$ conduction, $T_c : 122^\circ C$	40	A	
$I_{F(RMS)}$	R.M.S. Forward Current	Single phase, half wave, $180^\circ$ conduction, $T_c : 122^\circ C$	62	A	
$I_{FSM}$	Surge Forward Current	$\frac{1}{2}$ cycle, 60Hz, peak value, non-repetitive	800	A	
$I^2t$	$I^2t$	Value for one cycle of surge current	2700	$A^2S$	
$T_j$	Operating Junction Temperature		-30 to +150	$^\circ C$	
$T_{stg}$	Storage Temperature		-30 to +125	$^\circ C$	
	Mounting Torque	Mounting (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass			170	g

**Electrical Characteristics**

Symbol	Item	Conditions	Ratings	Unit
$I_{RRM}$	Repetitive Peak Reverse Current, max.	at $V_{DRM}$ , single phase, half wave, $T_j=150^\circ C$	8	mA
$V_{FM}$	Forward Voltage Drop, max.	Forward current 120A, $T_j=25^\circ C$ , Inst. measurement	1.15	V
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to case	0.60	$^\circ C/W$



# DIODE MODULE

# DWF(R)50A30/40

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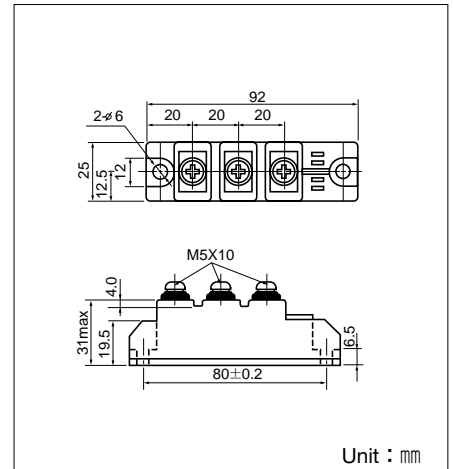
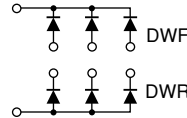


DWF(R)50A is a non-isolated diode module designed for 3 phase rectification.

- $I_{F(AV)}=50A$ ,  $V_{RRM}=400V$
- Easy Construction with Joint-Cathode (F) Type and Joint-Anode (R) type.
- Non-isolated. (Mounting Base as terminals.)
- High Surge Capability

**(Applications)**

- Welding Power Supply
- 3 Phase Rectifier



**Maximum Ratings**

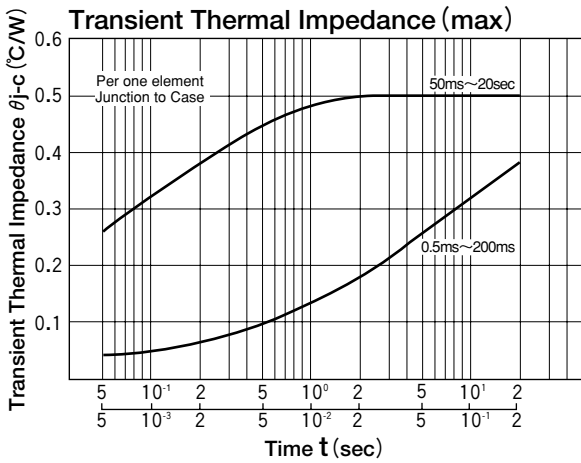
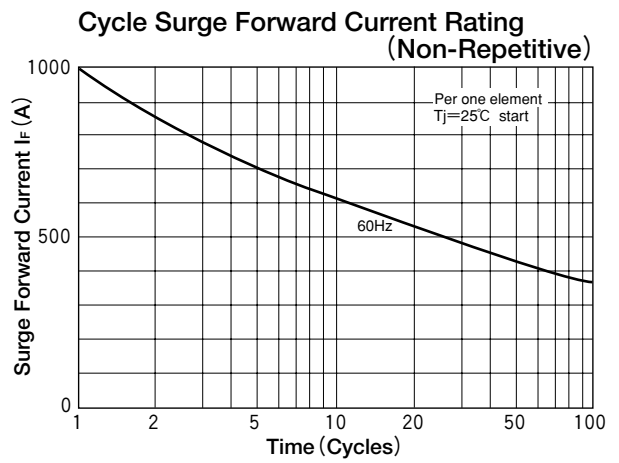
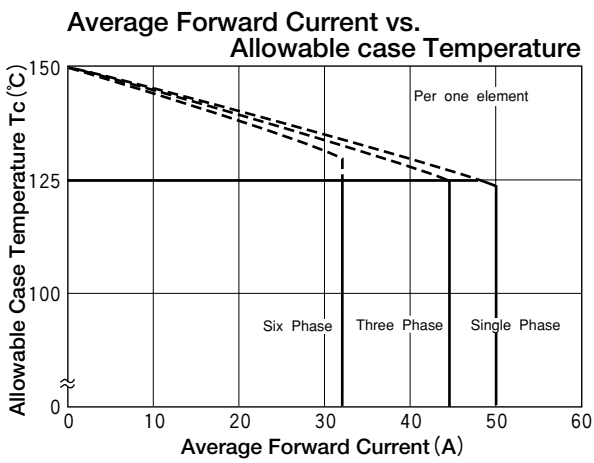
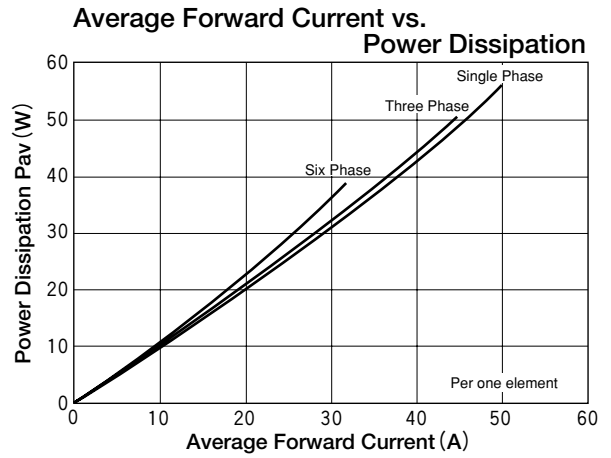
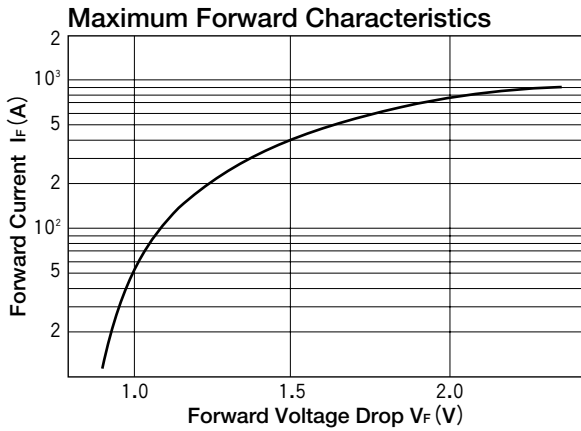
( $T_j=25^\circ C$  unless otherwise specified)

Symbol	Item	Ratings		Unit
		DWF(R)50A30	DWF(R)50A40	
$V_{RRM}$	Repetitive Peak Reverse Voltage	300	400	V
$V_{RSM}$	Non-Repetitive Peak Reverse Voltage	360	480	V
$V_{R(DC)}$	D.C. Reverse Voltage	240	320	V

Symbol	Item	Conditions	Ratings	Unit	
$I_{F(AV)}$	Average Forward Current	Single phase, half wave, $180^\circ$ conduction, $T_c : 122^\circ C$	50	A	
$I_{F(RMS)}$	R.M.S. Forward Current	Single phase, half wave, $180^\circ$ conduction, $T_c : 122^\circ C$	78	A	
$I_{FSM}$	Surge Forward Current	$\frac{1}{2}$ cycle, 60Hz, peak value, non-repetitive	1000	A	
$I^2t$	$I^2t$	Value for one cycle of surge current	4150	$A^2S$	
$T_j$	Operating Junction Temperature		-30 to +150	$^\circ C$	
$T_{stg}$	Storage Temperature		-30 to +125	$^\circ C$	
	Mounting Torque	Mounting (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass			170	g

**Electrical Characteristics**

Symbol	Item	Conditions	Ratings	Unit
$I_{RRM}$	Repetitive Peak Reverse Current, max.	at $V_{DRM}$ , single phase, half wave, $T_j=150^\circ C$	10	mA
$V_{FM}$	Forward Voltage Drop, max.	Forward current 150A, $T_j=25^\circ C$ , Inst. measurement	1.15	V
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to case	0.50	$^\circ C/W$



# DIODE MODULE

# DWF(R)70A30/40

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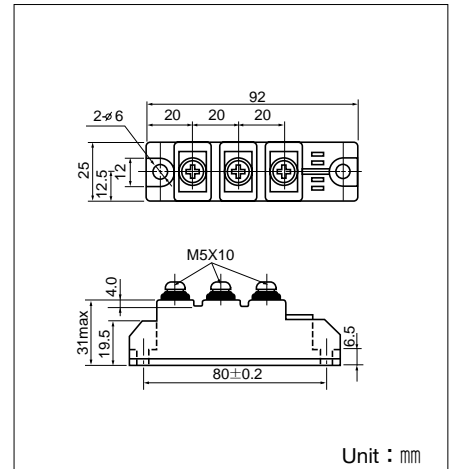
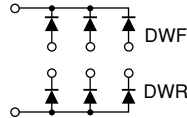


DWF(R)70A is a non-isolated diode module designed for 3 phase rectification.

- $I_{F(AV)} = 70A$ ,  $V_{RRM} = 400V$
- Easy Construction with Joint-Cathode (F) Type and Joint-Anode (R) type.
- Non-isolated. (Mounting Base as terminals.)
- High Surge Capability

**(Applications)**

- Welding Power Supply
- 3 Phase Rectifier



Unit : mm

**Maximum Ratings**

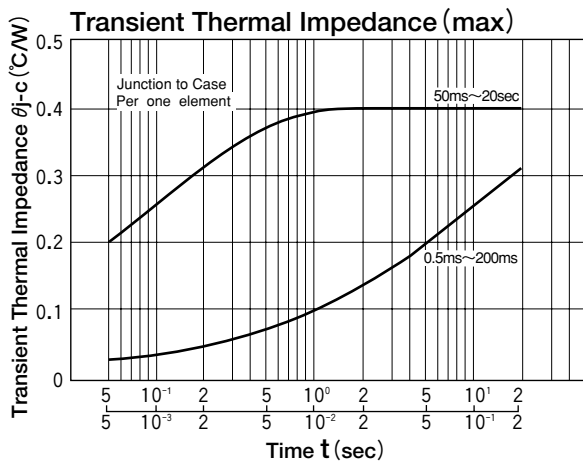
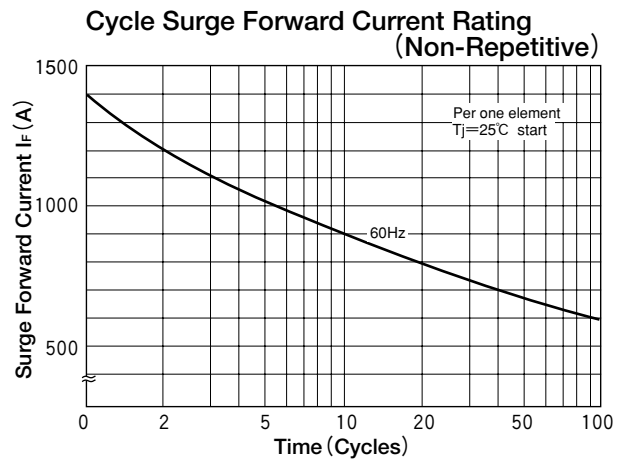
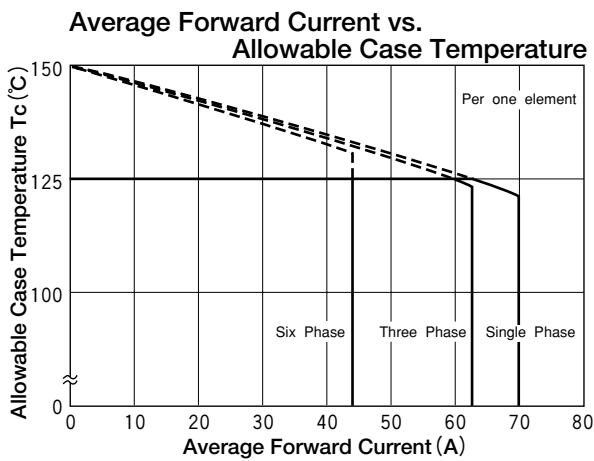
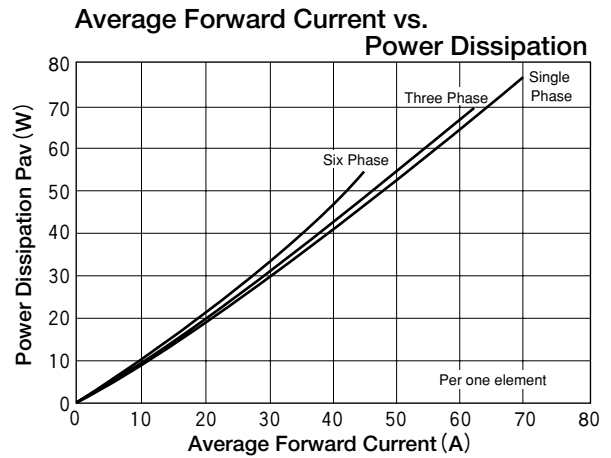
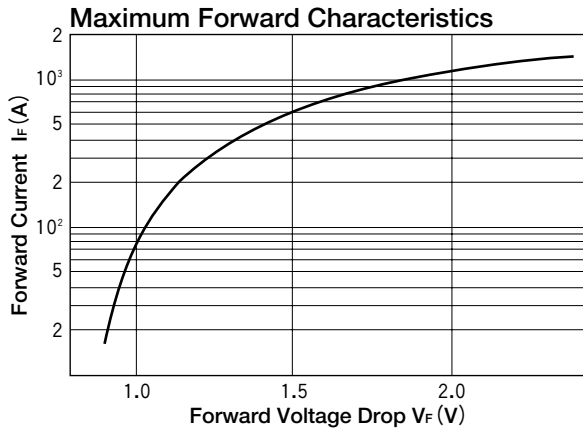
( $T_j = 25^\circ C$  unless otherwise specified)

Symbol	Item	Ratings		Unit
		DWF(R)70A30	DWF(R)70A40	
$V_{RRM}$	Repetitive Peak Reverse Voltage	300	400	V
$V_{RSM}$	Non-Repetitive Peak Reverse Voltage	360	480	V
$V_{R(DC)}$	D.C. Reverse Voltage	240	320	V

Symbol	Item	Conditions	Ratings	Unit	
$I_{F(AV)}$	Average Forward Current	Single phase, half wave, $180^\circ$ conduction, $T_c : 119^\circ C$	70	A	
$I_{F(RMS)}$	R.M.S. Forward Current	Single phase, half wave, $180^\circ$ conduction, $T_c : 119^\circ C$	110	A	
$I_{FSM}$	Surge Forward Current	$\frac{1}{2}$ cycle, 60Hz, peak value, non-repetitive	1400	A	
$I^2t$	$I^2t$	Value for one cycle of surge current	8100	$A^2S$	
$T_j$	Operating Junction Temperature		$-30$ to $+150$	$^\circ C$	
$T_{stg}$	Storage Temperature		$-30$ to $+125$	$^\circ C$	
	Mounting Torque	Mounting (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (48)	N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (48)	
	Mass			170	g

**Electrical Characteristics**

Symbol	Item	Conditions	Ratings	Unit
$I_{RRM}$	Repetitive Peak Reverse Current, max.	at $V_{DRM}$ , single phase, half wave, $T_j = 150^\circ C$	12	mA
$V_{FM}$	Forward Voltage Drop, max.	Forward current 220A, $T_j = 25^\circ C$ , Inst. measurement	1.15	V
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to case	0.40	$^\circ C/W$



# DIODE MODULE

## DWF(R)70BB30/40

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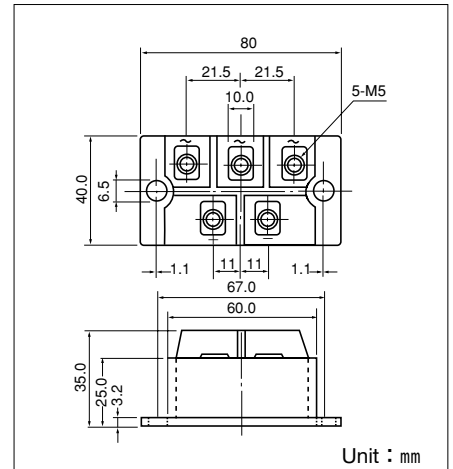
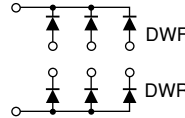


Power Diode Module **DWF(W)70BB** is designed for three phase half wave rectification, which has three diodes connected in a three phase bridge configuration. The mounting base of the module is electrically isolated from semiconductor elements for simple heatsink construction. Output DC current is 70Amp ( $T_c=106^\circ\text{C}$ ) Repetitive peak reverse voltage is up to 400V.

- $T_{j\text{Max}}=150^\circ\text{C}$
- Isolated mounting Base
- High reliability by unique glass passivation

### (Applications)

AC, DC Motor Drive/AVR/Switching  
-for three phase rectification



### Maximum Ratings

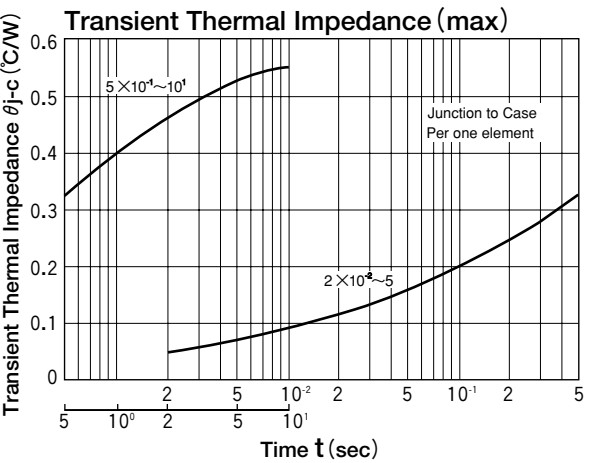
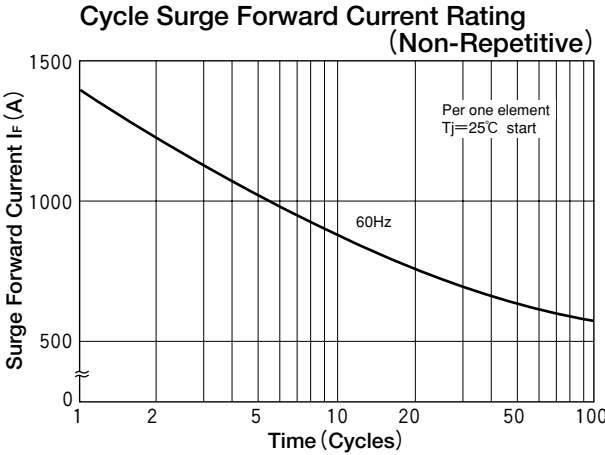
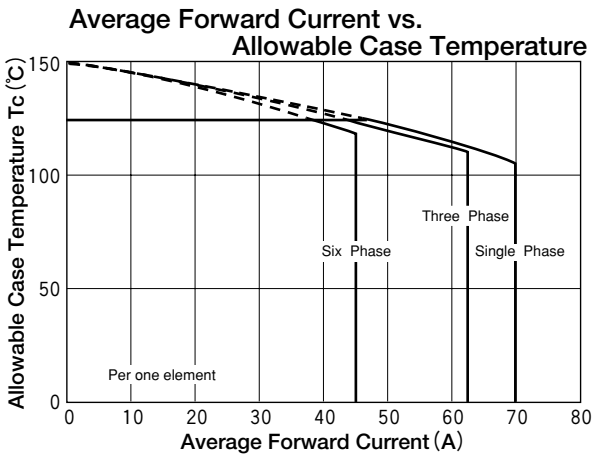
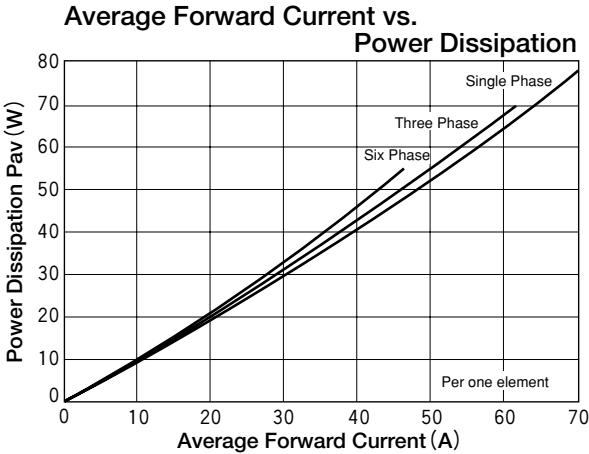
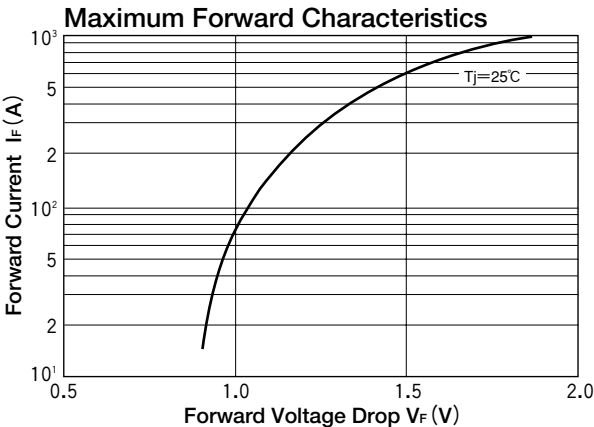
( $T_j=25^\circ\text{C}$  unless otherwise specified)

Symbol	Item	Ratings		Unit
		DWF(R)70BB30	DWF(R)70BB40	
$V_{RRM}$	Repetitive Peak Reverse Voltage	300	400	V
$V_{RSM}$	Non-Repetitive Peak Reverse Voltage	360	480	V

Symbol	Item	Conditions	Ratings	Unit	
$I_D$	Average Forward Current (D.C.)	D.C. $T_c : 106^\circ\text{C}$	70	A	
$I_{FSM}$	Surge Forward Current	1 cycle, 60Hz, peak value, non-repetitive	1400	A	
$I^2t$	$I^2t$	Value for one cycle of surge current	8100	$\text{A}^2\text{S}$	
$T_j$	Operating Junction Temperature		-40 to +150	$^\circ\text{C}$	
$T_{stg}$	Storage Temperature		-40 to +125	$^\circ\text{C}$	
$V_{ISO}$	Isolation Breakdown Voltage (R.M.S.)	A.C. 1 minute	2500	V	
	Mounting Torque	Mounting (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass	Typical Value	200	g	

### Electrical Characteristics

Symbol	Item	Conditions	Ratings			Unit
			Min.	Typ.	Max.	
$I_{RRM}$	Repetitive Peak Reverse Current	$T_j=150^\circ\text{C}$ at $V_{RRM}$			12	mA
$V_{FM}$	Forward Voltage Drop	$T_j=25^\circ\text{C}$ , $I_{FM}=220\text{A}$ , Inst. measurement			1.15	V
$R_{th(j-c)}$	Thermal Impedance	Junction to case ( $\frac{1}{3}$ MODULE)			0.55	$^\circ\text{C}/\text{W}$





# DIODE MODULE

# DWF(R)100A30/40

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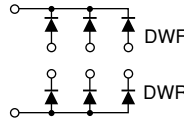
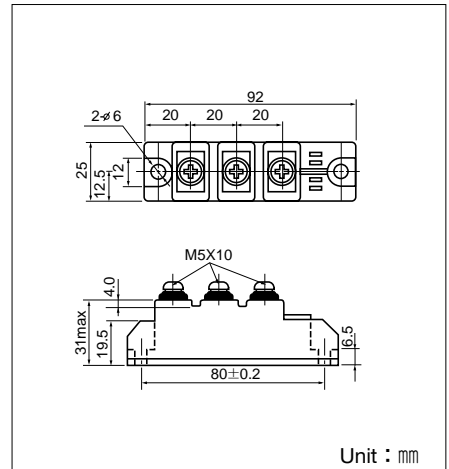


DWF(R)100A is a non-isolated diode module designed for 3 phase rectification.

- $I_{F(AV)} = 100A$ ,  $V_{RRM} = 400V$
- Easy Construction with Joint-Cathode (F) Type and Joint-Anode (R) type.
- Non-isolated. (Mounting Base as terminals.)
- High Surge Capability

**(Applications)**

- Welding Power Supply
- 3 Phase Rectifier



**Maximum Ratings**

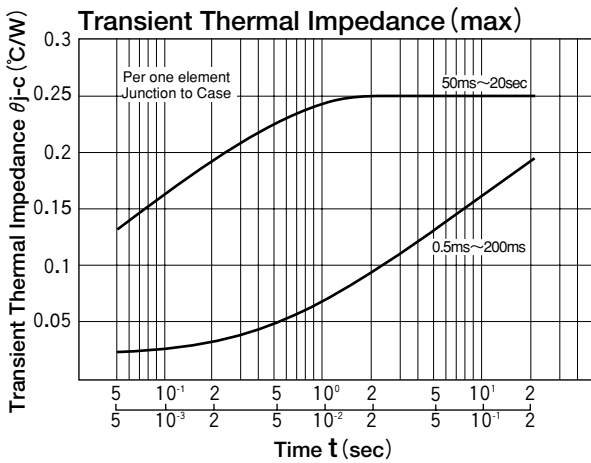
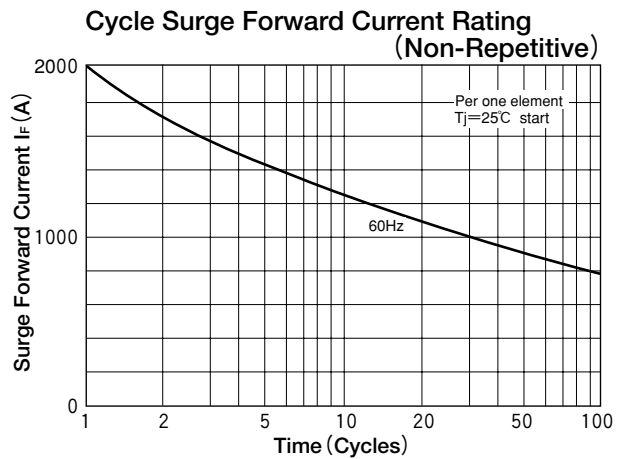
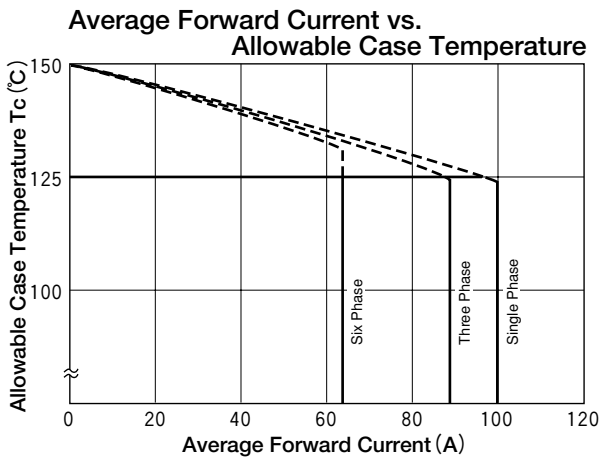
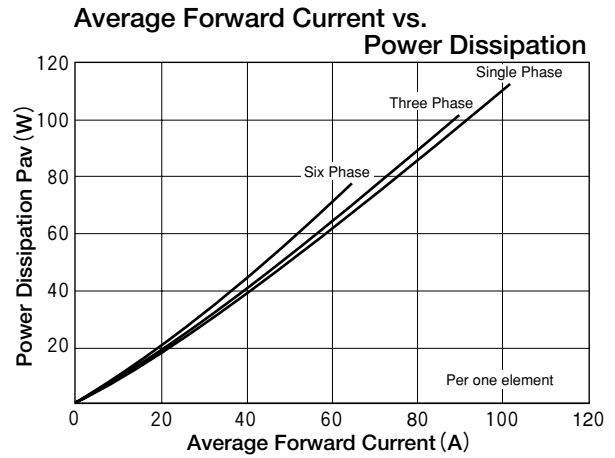
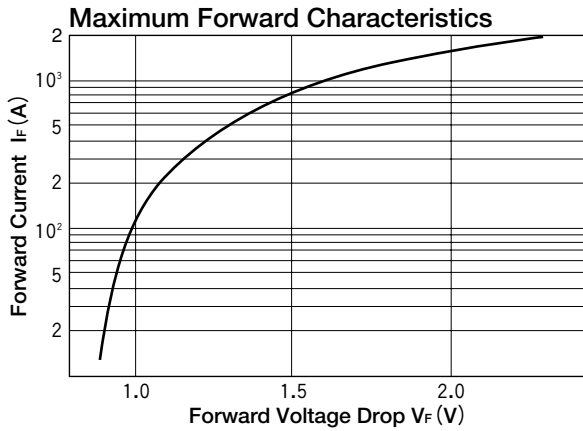
( $T_j = 25^\circ C$  unless otherwise specified)

Symbol	Item	Ratings		Unit
		DWF(R)100A30	DWF(R)100A40	
$V_{RRM}$	Repetitive Peak Reverse Voltage	300	400	V
$V_{RSM}$	Non-Repetitive Peak Reverse Voltage	360	480	V
$V_{R(DC)}$	D.C. Reverse Voltage	240	320	V

Symbol	Item	Conditions	Ratings	Unit	
$I_{F(AV)}$	Average Forward Current	Single phase, half wave, $180^\circ$ conduction, $T_c : 122^\circ C$	100	A	
$I_{F(RMS)}$	R.M.S. Forward Current	Single phase, half wave, $180^\circ$ conduction, $T_c : 122^\circ C$	160	A	
$I_{FSM}$	Surge Forward Current	$\frac{1}{2}$ cycle, 60Hz, peak value, non-repetitive	2000	A	
$I^2t$	$I^2t$	Value for one cycle of surge current	16600	A <sup>2</sup> S	
$T_j$	Operating Junction Temperature		-30 to +150	$^\circ C$	
$T_{stg}$	Storage Temperature		-30 to +125	$^\circ C$	
	Mounting Torque	Mounting (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass			170	g

**Electrical Characteristics**

Symbol	Item	Conditions	Ratings	Unit
$I_{RRM}$	Repetitive Peak Reverse Current, max.	at $V_{DRM}$ , single phase, half wave, $T_j = 150^\circ C$	15	mA
$V_{FM}$	Forward Voltage Drop, max.	Forward current 300A, $T_j = 25^\circ C$ , Inst. measurement	1.15	V
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to case	0.25	$^\circ C/W$



# THREE PHASE DIODE+THYRISTOR

## DFA50BA80/160

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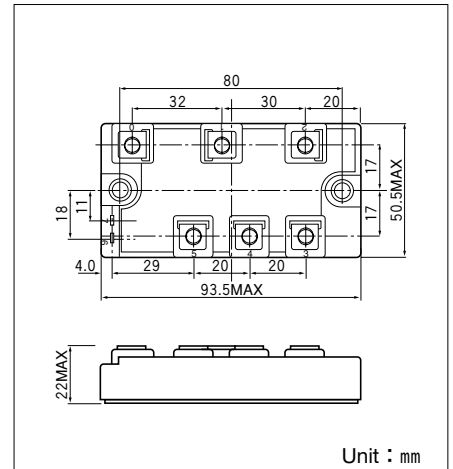
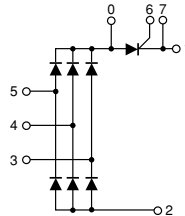
**SanRex** Power Module, DFA50BA, is complex isolated module which is designed for rash current circuit.

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
		DFA50BA80	DFA50BA160	
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> =117°C	50	A	
I <sub>FSM</sub>	Surge forward current	1cycle, 50/60Hz, peak value, non-repetitive	730/800	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. 1minute	2500	V	
	Mounting Torque	Mounting (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass	Typical Value	150	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>	8	mA
V <sub>FM</sub>	Forward Voltage Drop,max.	T <sub>j</sub> =25°C, I <sub>F</sub> =50A Inst. measurement	1.30	V
R <sub>th(j-c)</sub>	Thermal Impedance, max.	Junction to Case (TOTAL)	0.25	°C/W
R <sub>th(c-f)</sub>	Thermal Impedance, max.	Case to Fin	0.10	°C/W

## ● THYRISTOR

### ■ Maximum Ratings

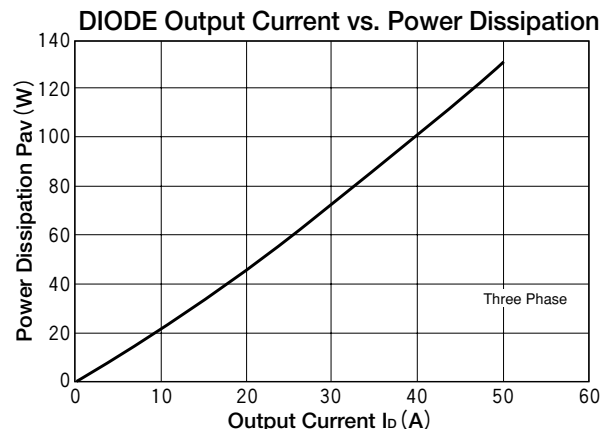
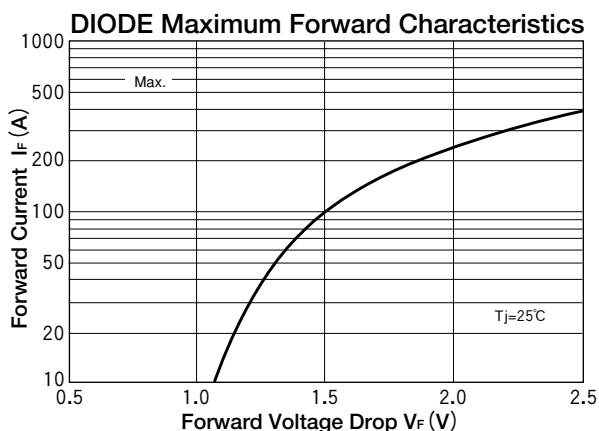
(T<sub>j</sub>=25°C unless otherwise specified)

Symbol	Item	Ratings		Unit
		DFA50BA80	DFA50BA160	
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

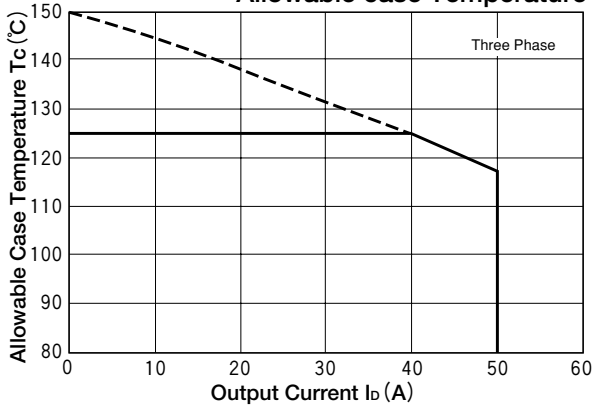
Symbol	Item	Conditions	Ratings	Unit	
I <sub>T(AV)</sub>	Average On-State Current	Singl phase half wave. 180° conduction, T <sub>c</sub> =85°C	50	A	
I <sub>TSM</sub>	Surge On-State Current	1 cycle, 50/60Hz, peak value, non-repetitive	730/800	A	
I <sup>2</sup> t	I <sup>2</sup> t		2660	A <sup>2</sup> S	
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)	2.7 (28)	N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass	Typical Value		150	g

### ■ Electrical Characteristics

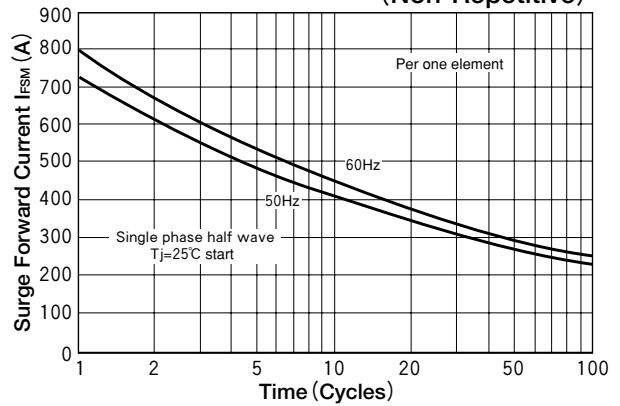
Symbol	Item	Conditions	Ratings	Unit
I <sub>DRM</sub>	Repetitive Peak Off-State Current,max.	T <sub>j</sub> =135°C, V <sub>D</sub> =V <sub>DRM</sub>	50	mA
I <sub>RRM</sub>	Repetitive Peak Reverse Current,max.	T <sub>j</sub> =135°C, V <sub>D</sub> =V <sub>RRM</sub>	50	mA
V <sub>TM</sub>	Peak On-State Voltage,max.	T <sub>j</sub> =25°C, I <sub>TM</sub> =50A, Inst. measurement	1.25	V
I <sub>GT</sub>	Gate Trigger Current,max.	V <sub>D</sub> =6V, I <sub>T</sub> =1A	70	mA
V <sub>GT</sub>	Gate Trigger Voltage,max.	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	0.80	°C/W
R <sub>th(c-f)</sub>	Thermal Impedance, max.	Case to Fin	0.10	°C/W



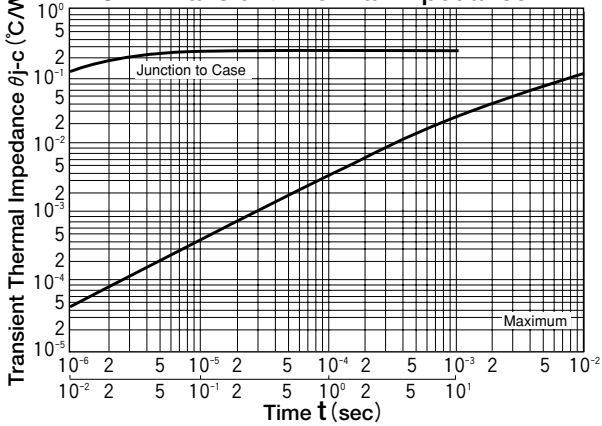
**DIODE Output Current vs. Allowable case Temperature**



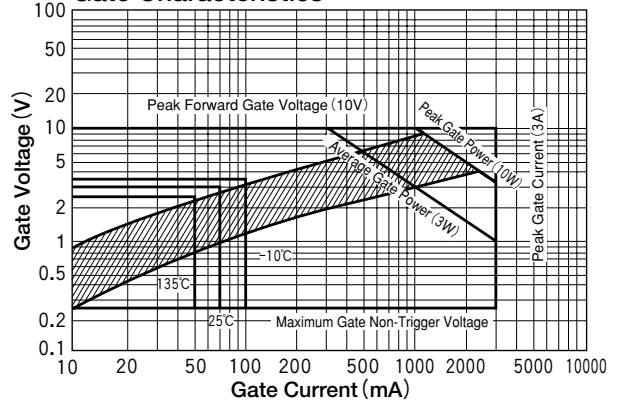
**Surge Forward Current Rating (Non-Repetitive)**



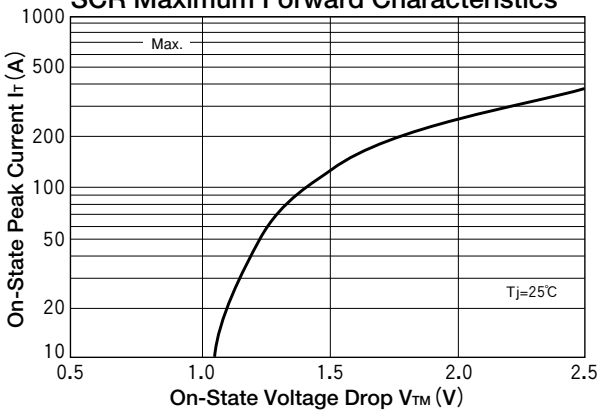
**DIODE Transient Thermal Impedance**



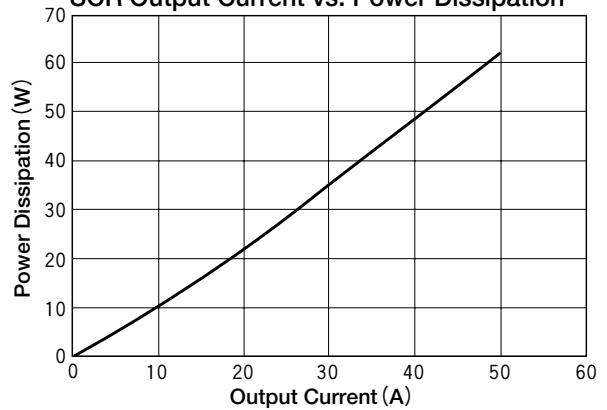
**Gate Characteristics**



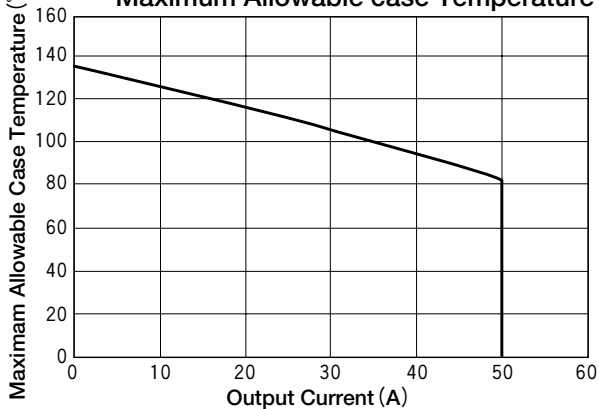
**SCR Maximum Forward Characteristics**



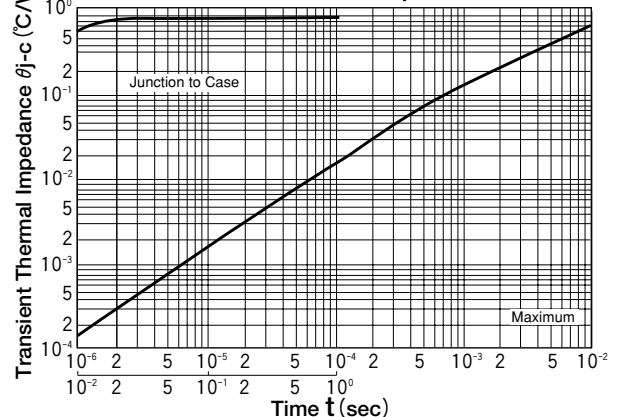
**SCR Output Current vs. Power Dissipation**



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



**SCR Transient Thermal Impedance**



# THREE PHASE DIODE+THYRISTOR

## DFA75BA80/160

TOP



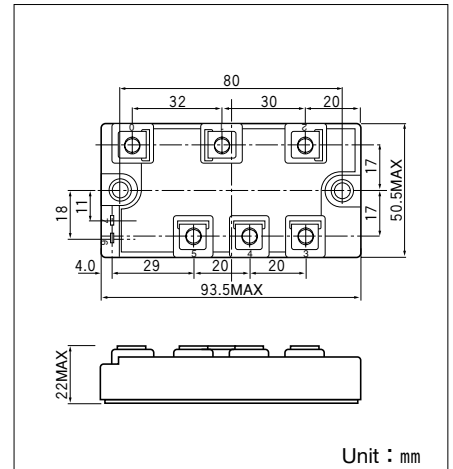
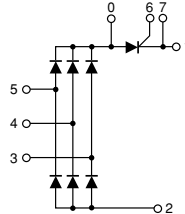
**SanRex** Power Module, **DFA75BA**, is complex isolated module which is designed for rash current circuit.

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
		DFA75BA80	DFA75BA160	
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> =101°C	75	A	
I <sub>FSM</sub>	Surge forward current	1cycle, 50/60Hz, peak value, non-repetitive	910/1000	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. 1minute	2500	V	
	Mounting Torque	Mounting (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass	Typical Value	150	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>	8	mA
V <sub>FM</sub>	Forward Voltage Drop,max.	T <sub>j</sub> =25°C, I <sub>F</sub> =75A, Inst. measurement	1.30	V
R <sub>th(j-c)</sub>	Thermal Impedance, max.	Junction to Case (TOTAL)	0.25	°C/W
R <sub>th(c-f)</sub>	Thermal Impedance, max.		0.10	°C/W

## ● THYRISTOR

### ■ Maximum Ratings

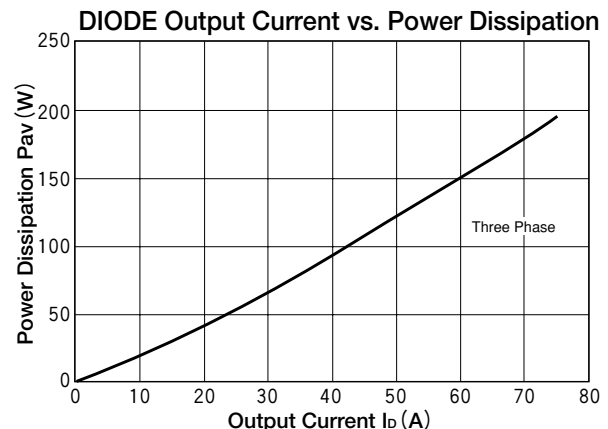
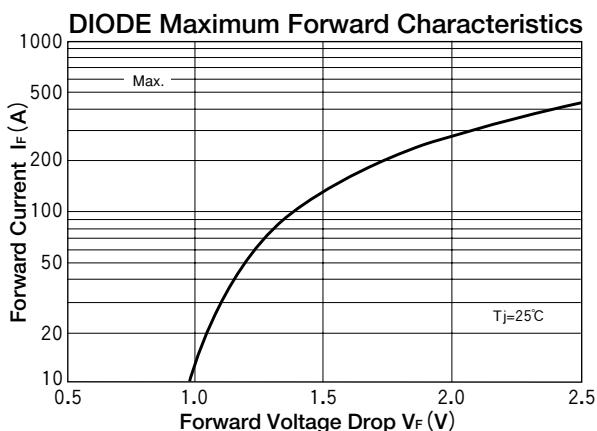
(T<sub>j</sub>=25°C unless otherwise specified)

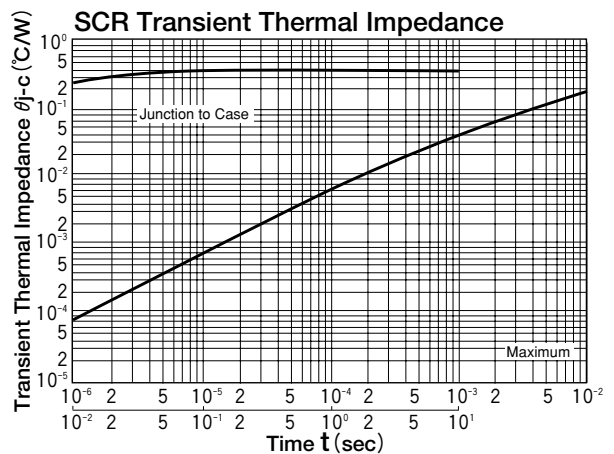
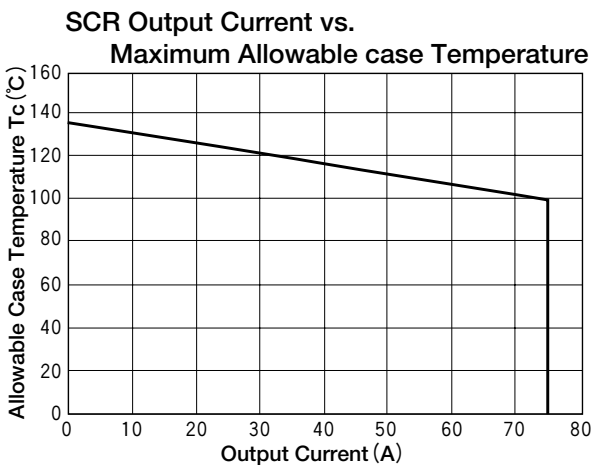
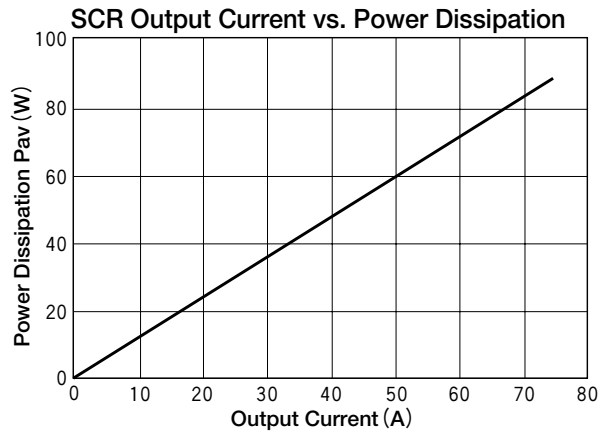
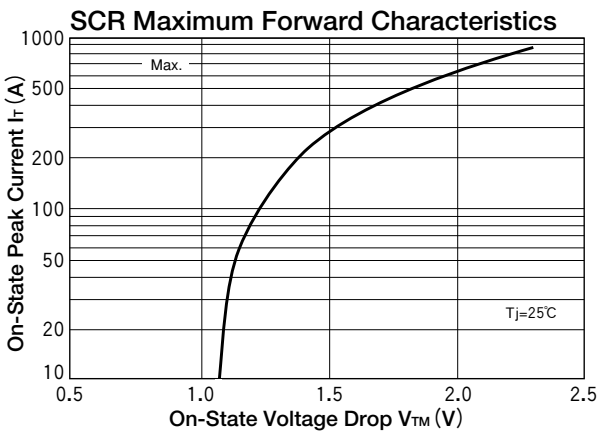
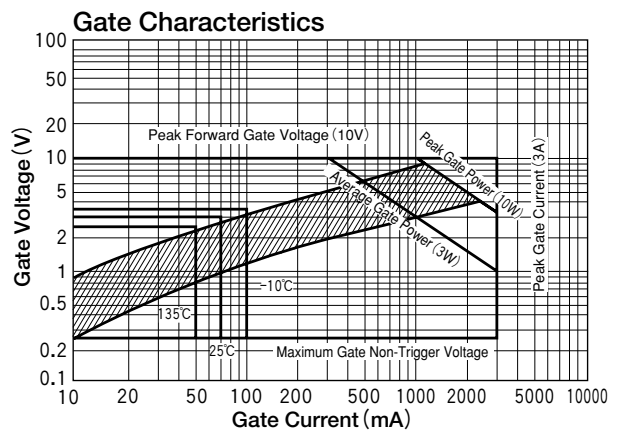
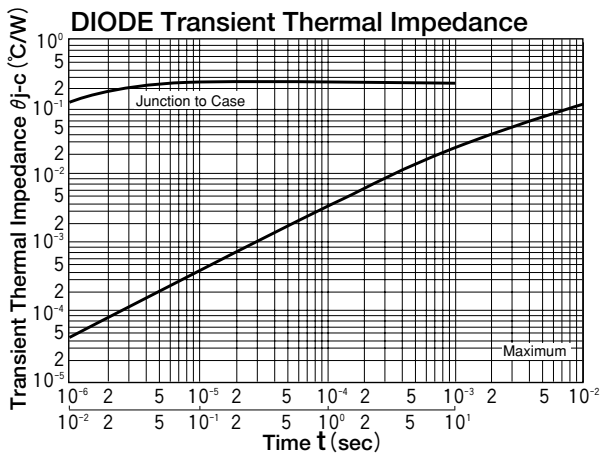
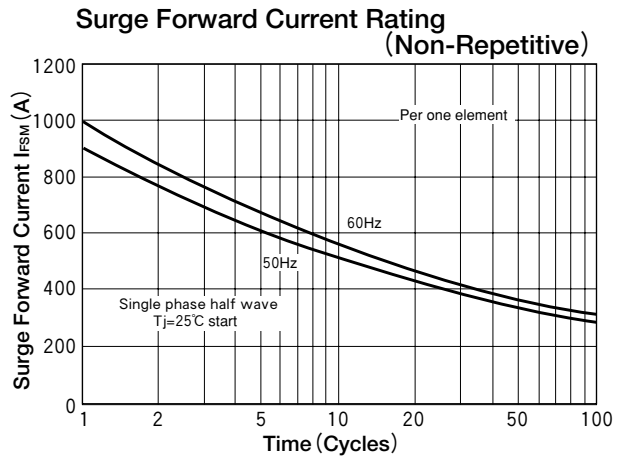
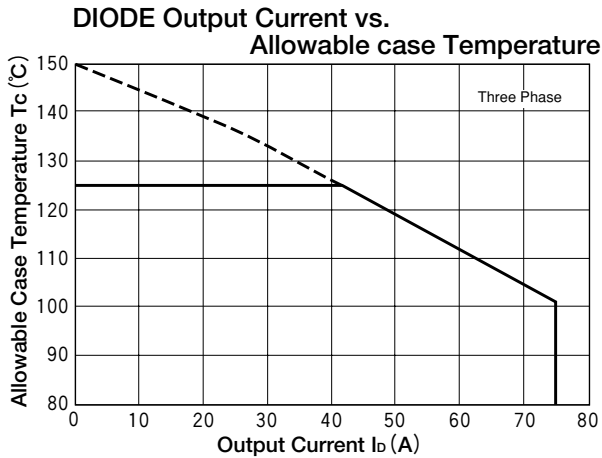
Symbol	Item	Ratings		Unit
		DFA75BA80	DFA75BA160	
V <sub>RRM</sub>	Repetitive Peak Reverse Voltage	800	1600	V
V <sub>RSM</sub>	Non-Repetitive Peak Reverse Voltage	960	1700	V
V <sub>DRM</sub>	Repetitive Peak off-State Voltage	800	1600	V

Symbol	Item	Conditions	Ratings	Unit	
I <sub>T(AV)</sub>	Average On-State Current	Singl phase halfwave. 180° conduction, T <sub>c</sub> =99°C	75	A	
I <sub>TSM</sub>	Surge On-State Current	1 cycle, 50/60Hz, peak value, non-repetitive	910/1000	A	
I <sup>2</sup> t	I <sup>2</sup> t		4150	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)	2.7 (28)	N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass	Typical Value		150	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>	60	mA
I <sub>RRM</sub>	Repetitive Peak Reverse Current,max.	T <sub>j</sub> =135°C, V <sub>D</sub> =V <sub>RRM</sub>	60	mA
V <sub>TM</sub>	Peak On-State Voltage,max.	T <sub>j</sub> =25°C, I <sub>TM</sub> =75A, Inst. measurement	1.20	V
I <sub>GT</sub>	Gate Trigger Current,max.	V <sub>D</sub> =6V, I <sub>T</sub> =1A	70	mA
V <sub>GT</sub>	Gate Trigger Voltage,max.	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	0.40	°C/W
R <sub>th(c-f)</sub>	Thermal Impedance, max.	Case to Fin	0.10	°C/W







# THREE PHASE DIODE+THYRISTOR

## DFA100BA80/160

TOP



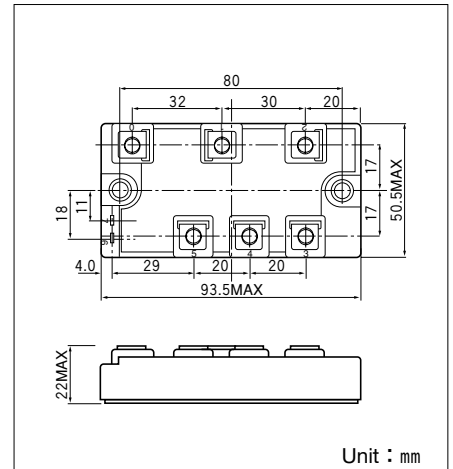
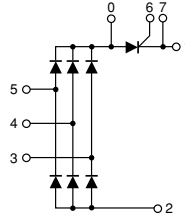
**SanRex** Power Module, DFA100BA, is complex isolated module which is designed for rash current circuit.

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
		DFA100BA80	DFA100BA160	
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> =98°C	100	A	
I <sub>FSM</sub>	Surge forward current	1 cycle, 50/60Hz, peak value, non-repetitive	1186/1300	A	
T <sub>j</sub>	Operating Junction Temperature <sup>a</sup>		-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)	2.7 (28)	N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass	Typical Value	150	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>	12	mA
V <sub>FM</sub>	Forward Voltage Drop,max.	T <sub>j</sub> =25°C, I <sub>F</sub> =100A, Inst. measurement	1.30	V
R <sub>th(j-c)</sub>	Thermal Impedance, max.	Junction to Case (TOTAL)	0.20	°C/W
R <sub>th(c-f)</sub>	Thermal Impedance, max.	Case to Fin	0.10	°C/W

● **THYRISTOR**

■ **Maximum Ratings**

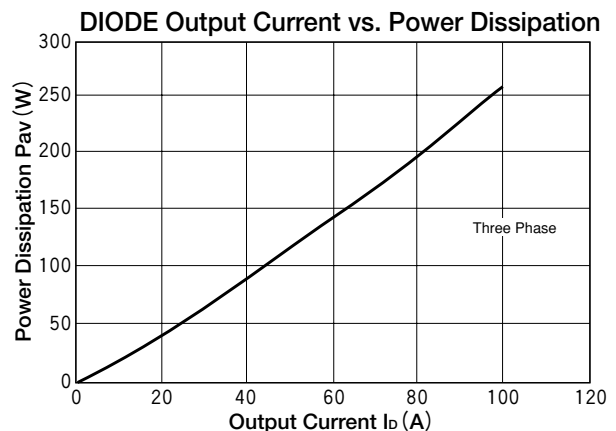
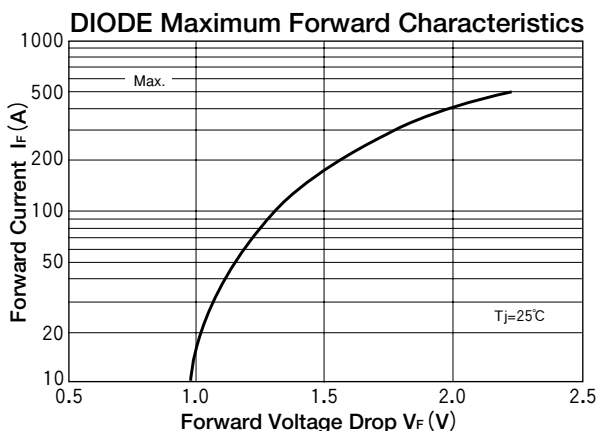
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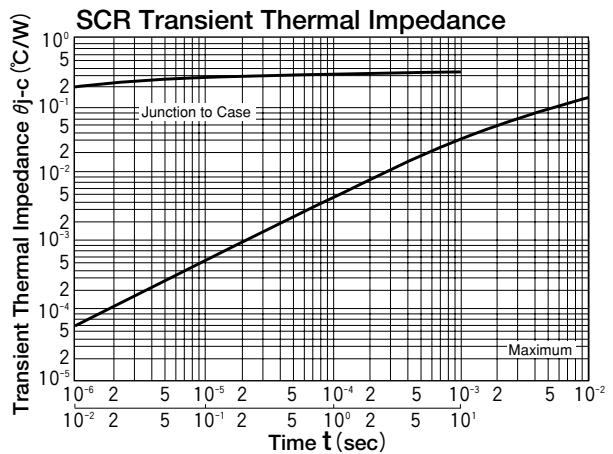
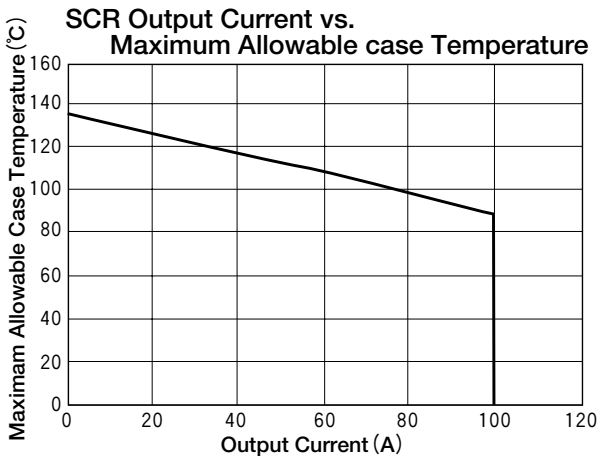
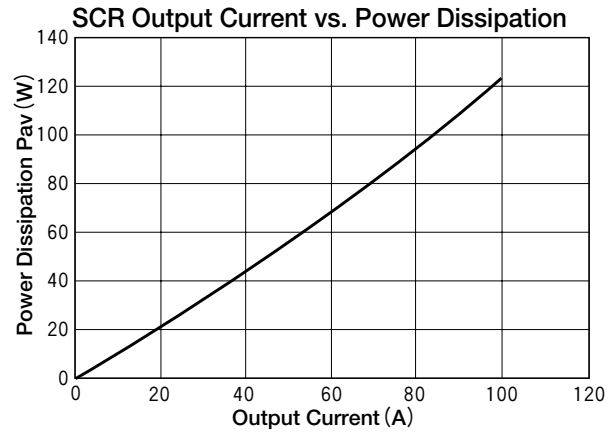
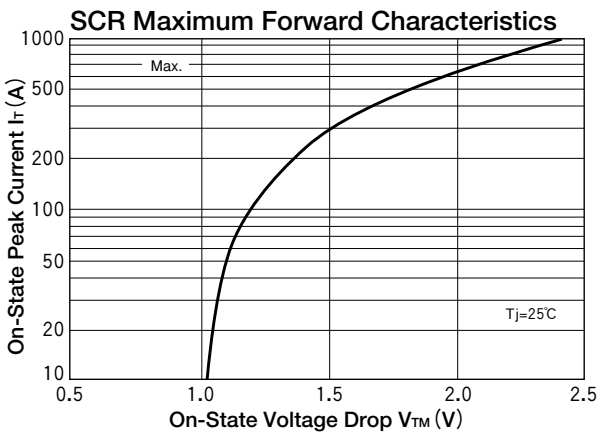
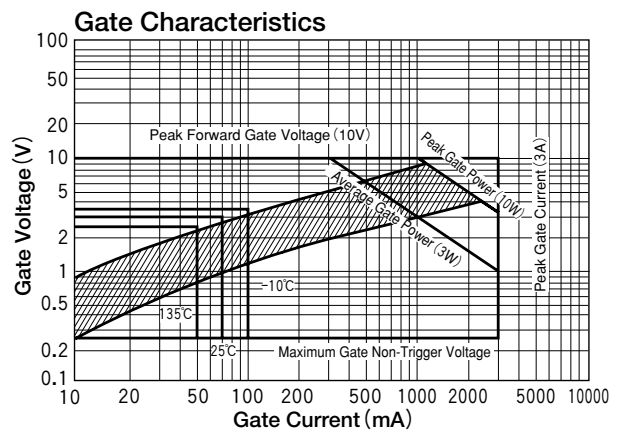
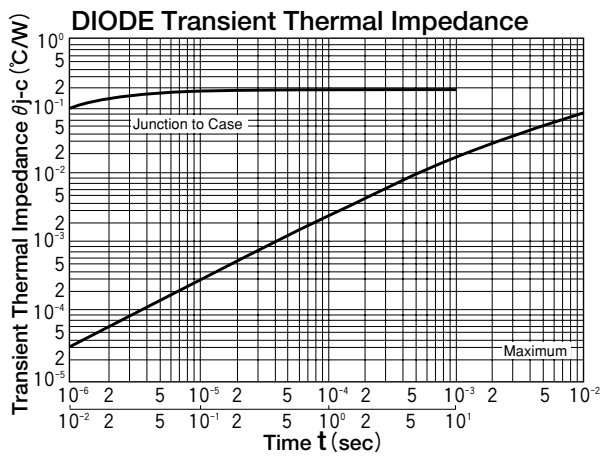
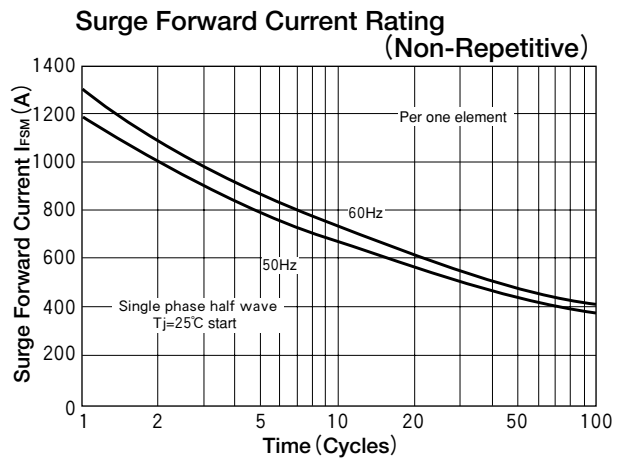
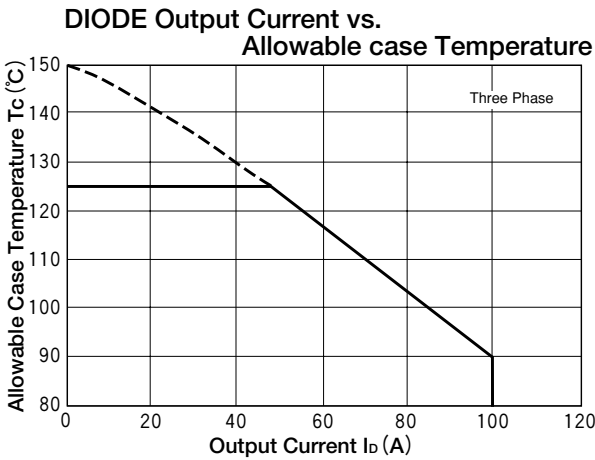
Symbol	Item	Ratings		Unit
		DFA100BA80	DFA100BA160	
V <sub>RRM</sub>	Repetitive Peak Reverse Voltage	800	1600	V
V <sub>RSM</sub>	Non-Repetitive Peak Reverse Voltage	960	1700	V
V <sub>DRM</sub>	Repetitive Peak off-State Voltage	800	1600	V

Symbol	Item	Conditions	Ratings	Unit	
I <sub>T(AV)</sub>	Average On-State Current	Singl phase half wave. 180° conduction, T <sub>c</sub> =92°C	100	A	
I <sub>TSM</sub>	Surge On-State Current	1 cycle, 50/60Hz, peak value, non-repetitive	1186/1300	A	
I <sup>2</sup> t	I <sup>2</sup> t		7030	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)	2.7 (28)	N·m (kgf·cm)
		Terminals (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass	Typical Value	150	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>	70	mA
I <sub>RRM</sub>	Repetitive Peak Reverse Current,max.	T <sub>j</sub> =135°C, V <sub>D</sub> =V <sub>RRM</sub>	70	mA
V <sub>TM</sub>	Peak On-State Voltage,max.	T <sub>j</sub> =25°C, I <sub>TM</sub> =100A, Inst. measurement	1.20	V
I <sub>GT</sub>	Gate Trigger Current,max.	V <sub>D</sub> =6V, I <sub>T</sub> =1A	70	mA
V <sub>GT</sub>	Gate Trigger Voltage,max.	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	0.36	°C/W
R <sub>th(c-f)</sub>	Thermal Impedance, max.	Case to Fin	0.10	°C/W





# THREE PHASE DIODE+THYRISTOR

## DFA150AA80/160



UL;E76102 (M)

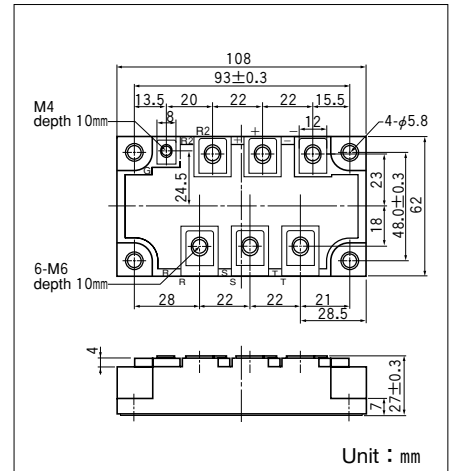
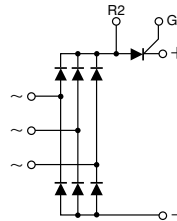
**SanRex** Power Module, DFA150AA, is complex isolated module which is designed for rash current circuit.

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.



Unit : mm

### ● 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. 1minute	2500	V
	Mounting Torque	Mounting (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)
		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	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

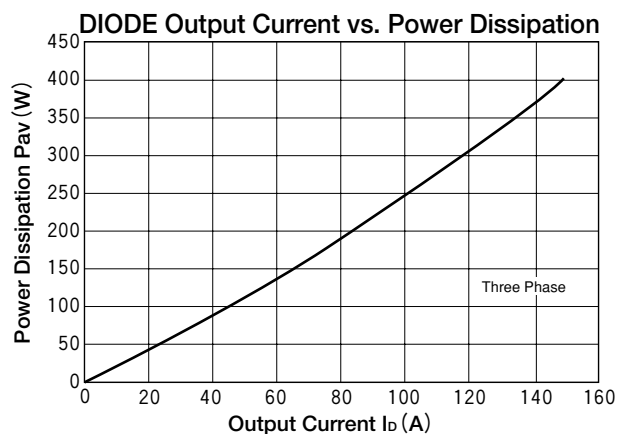
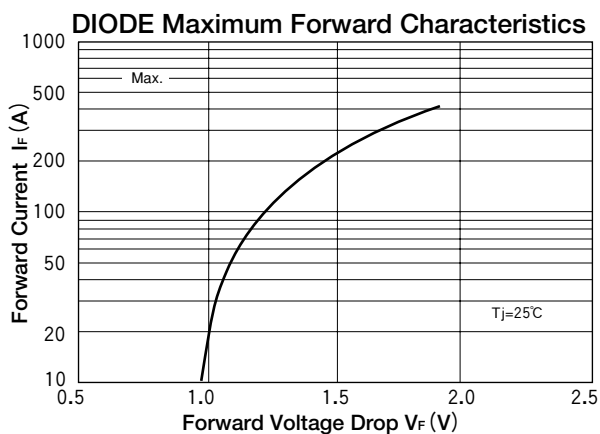
(T<sub>j</sub>=25°C unless otherwise specified)

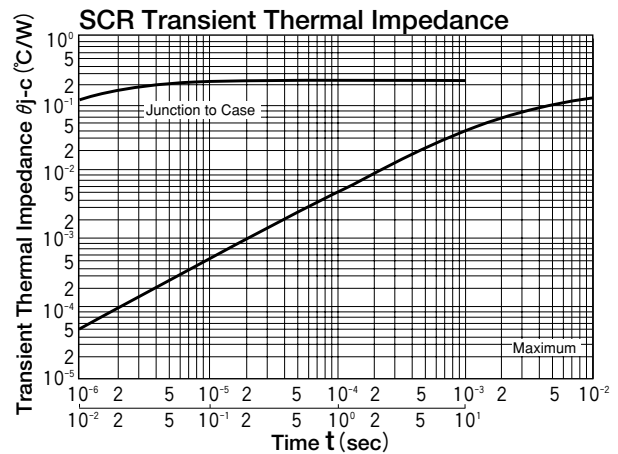
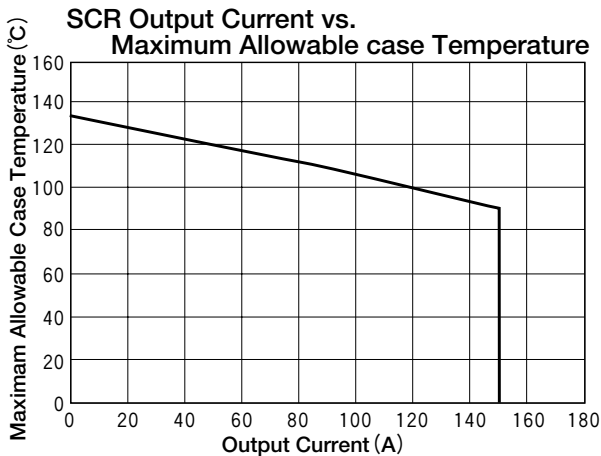
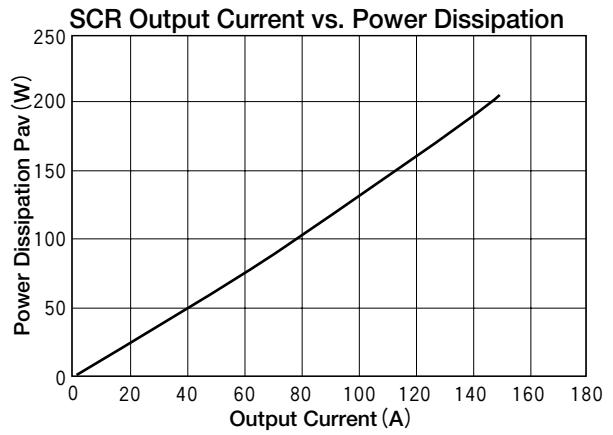
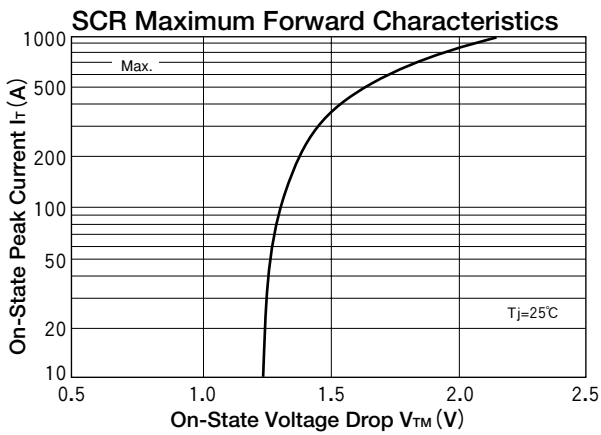
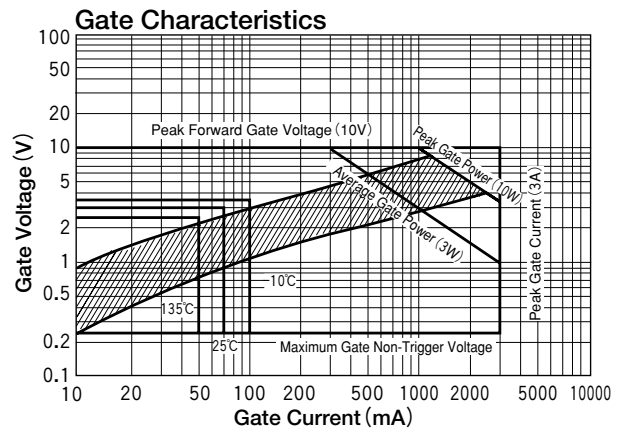
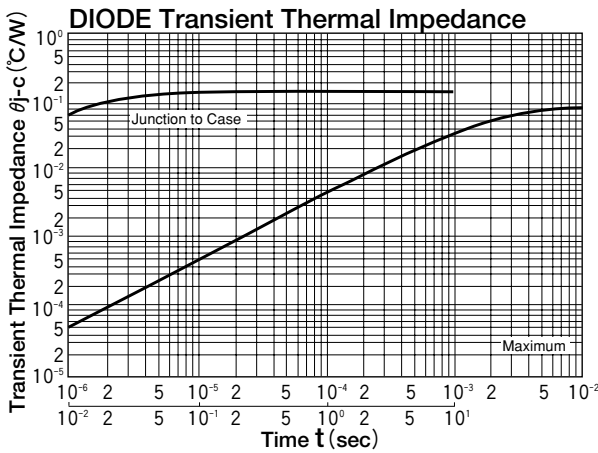
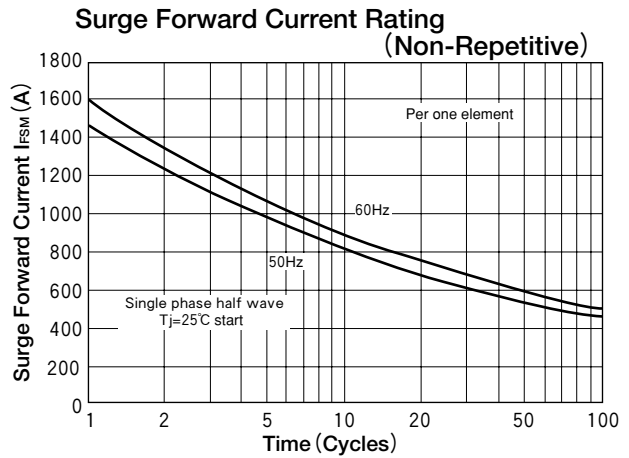
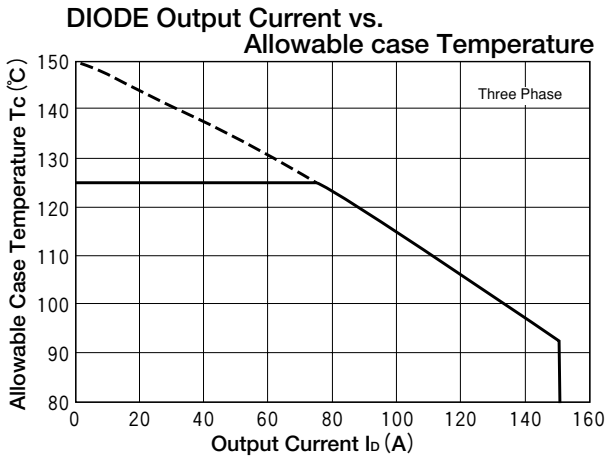
Symbol	Item	Ratings		Unit
		DFA150AA80	DFA150AA160	
V <sub>RRM</sub>	Repetitive Peak Reverse Voltage	800	1600	V
V <sub>RSM</sub>	Non-Repetitive Peak Reverse Voltage	960	1700	V
V <sub>DRM</sub>	Repetitive Peak off-State Voltage	800	1600	V

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)	2.7 (28)	N·m (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	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





# THREE PHASE DIODE+THYRISTOR

# DFA200AA80/160



UL;E76102 (M)

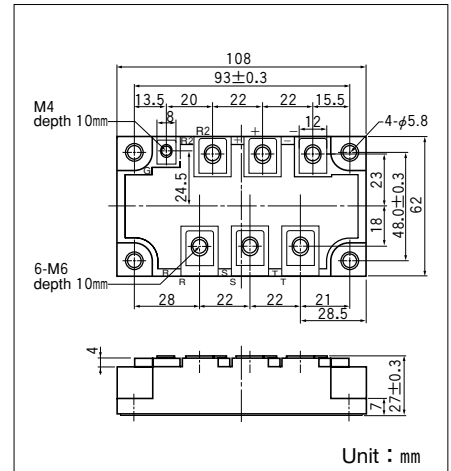
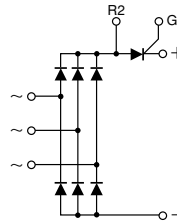
**SanRex** Power Module, DFA200AA, is complex isolated module which is designed for rash current circuit.

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**

■ **Mximum Ratings**

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

Symbol	Item	Ratings		Unit
		DFA200AA80	DFA200AA160	
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> =96°C	200	A
I <sub>FSM</sub>	Surge forward current	1 cycle, 50/60Hz, peak value, non-repetitive	1850/2000	kA
T <sub>j</sub>	Operating Junction Temperature		-30 to +150	°C
T <sub>stg</sub>	Storage Temperature		-30 to +135	°C
V <sub>ISO</sub>	Isolation Breakdown Voltage (R.M.S.)	A.C. 1minute	2500	V
	Mounting Torque	Mounting (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)
		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	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>	20	mA
V <sub>FM</sub>	Forward Voltage Drop,max.	I <sub>F</sub> =200A Inst. measurement	1.35	V
R <sub>th(j-c)</sub>	Thermal Impedance, max.	Junction to Case (TOTAL)	0.10	°C/W

● **THYRISTOR**

■ **Maximum Ratings**

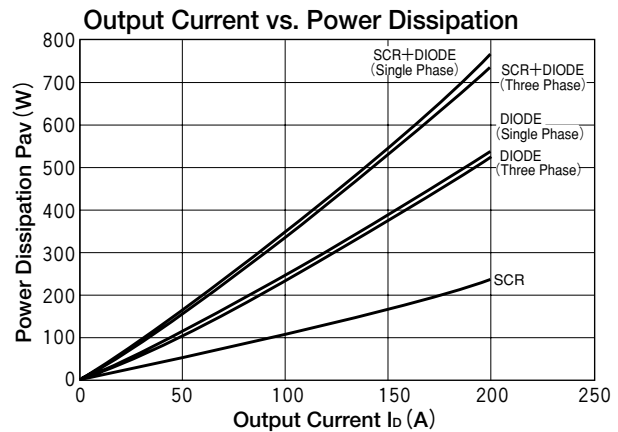
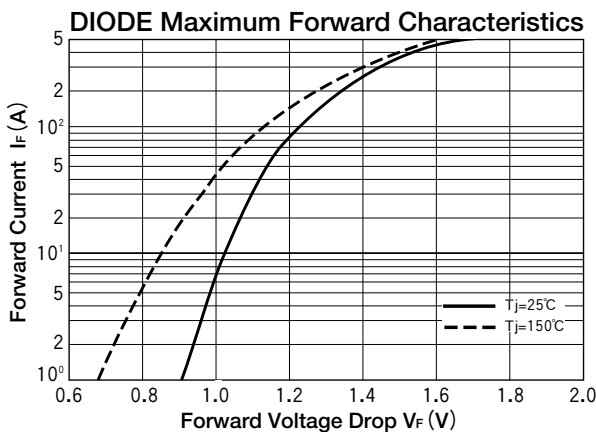
(T<sub>j</sub>=25°C unless otherwise specified)

Symbol	Item	Ratings		Unit
		DFA200AA80	DFA200AA160	
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	200	A
I <sub>TSM</sub>	Surge On-State Current	½ cycle, 50/60Hz, peak value, non-repetitive	1850/2000	A
I <sup>2</sup> t	I <sup>2</sup> t (for fusing)	Value for one of surge current	17000	A <sup>2</sup> S
di/dt	Critical Rate of Rise of On-State Current	I <sub>G</sub> =100mA, V <sub>D</sub> =½V <sub>DRM</sub> , di <sub>G</sub> /dt=0.1A/μs	200	A/μs
V <sub>ISO</sub>	Isolation Breakdown Voltage (R.M.S.)	A.C. 1minute	2500	V
T <sub>j</sub>	Operating Junction Temperature	T <sub>j</sub> =125°C~135°C	-30 to +135	°C
T <sub>stg</sub>	Storage Temperature		-30 to +135	°C
	Mounting Torque	Mounting (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)
		Terminal (M6)	Recommended Value 2.5-3.9 (15-25)	4.7 (48)
		Terminal (M4)	Recommended Value 1.0-1.4 (15-25)	1.5 (15)
	Mass	Typical Value	460	g

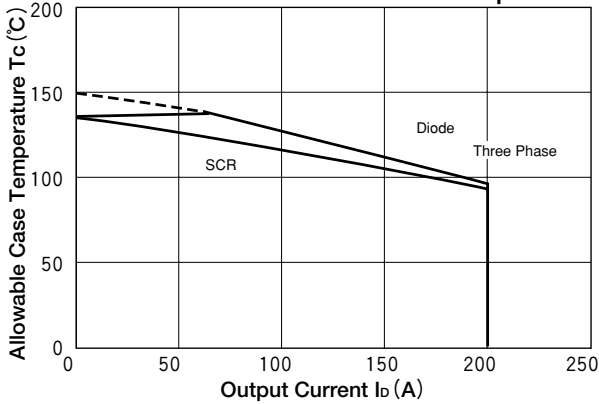
■ **Electrical Characteristics**

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>	50	mA
I <sub>RRM</sub>	Repetitive Peak Reverse Current,max.	T <sub>j</sub> =135°C, V <sub>D</sub> =V <sub>DRM</sub>	50	mA
V <sub>TM</sub>	Peak on-State Voltagea,max.	I <sub>T</sub> =200A Inst. measurement	1.15	V
I <sub>GT</sub>	Gate Trigger Current,max.	V <sub>D</sub> =6V, I <sub>T</sub> =1A	100	mA
V <sub>GT</sub>	Gate Trigger Voltage,max.	V <sub>D</sub> =6V, I <sub>T</sub> =1A	3	V
dv/dt	Critical Rate of off-State Voltage,min.	T <sub>j</sub> =125°C, V <sub>D</sub> =⅔V <sub>DRM</sub>	500	V/μs
R <sub>th(j-c)</sub>	Thermal Impedance, max.	Junction to Case	0.18	°C/W

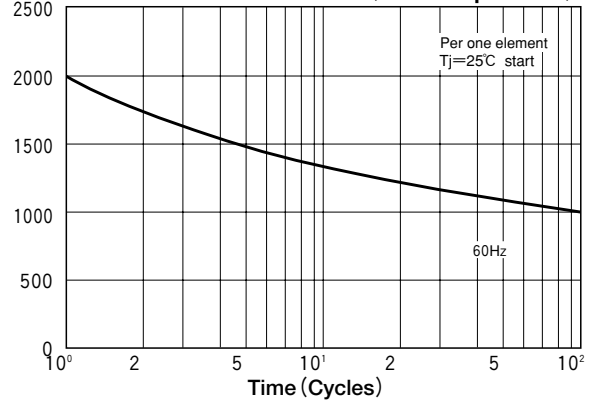




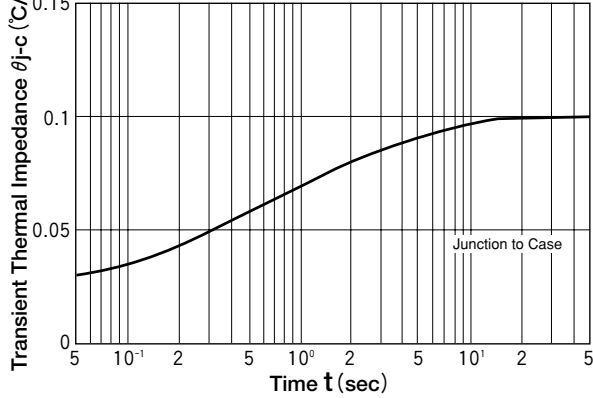
**Output Current vs. Allowable case Temperature**



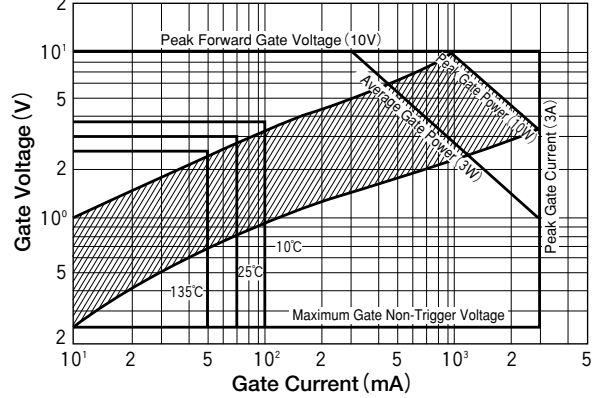
**DIODE Surge Forward Current Rating (Non-Repetitive)**



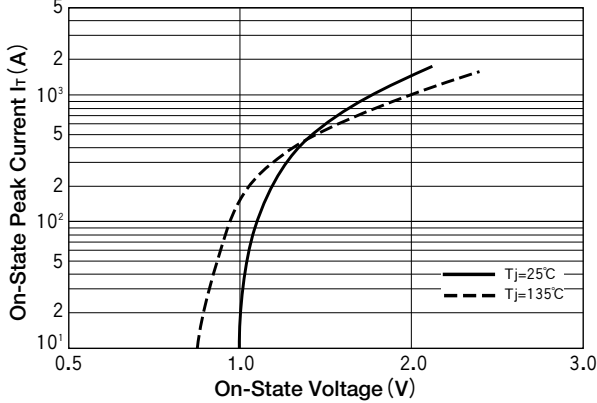
**DIODE Transient Thermal Impedance**



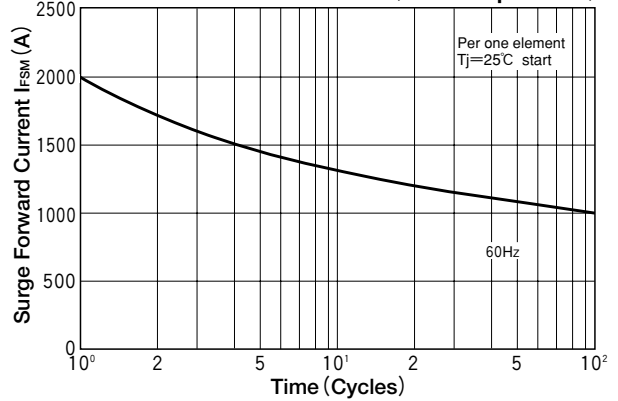
**Gate Characteristics**



**SCR On-State Characteristics**



**Surge On-State Current Rating (Non-Repetitive)**



**SCR Transient Thermal Impedance**

