

THYRISTOR MODULE (NON-ISOLATED TYPE)

PWB60A

TOP

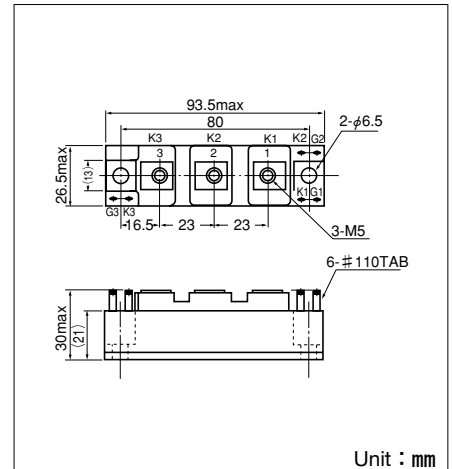
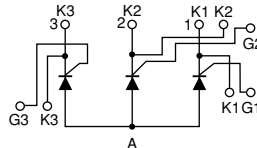


PWB60A is a Thyristor module suitable for low voltage, 3 phase recifier applications.

- $I_{T(AV)}$ 60A (each device)
- High Surge Current 1800 A (60Hz)
- Easy Construction
- Non-isolated. Mounting base as common Anode terminal

(Applications)

Welding power Supply
Various DC power Supply



Unit : mm

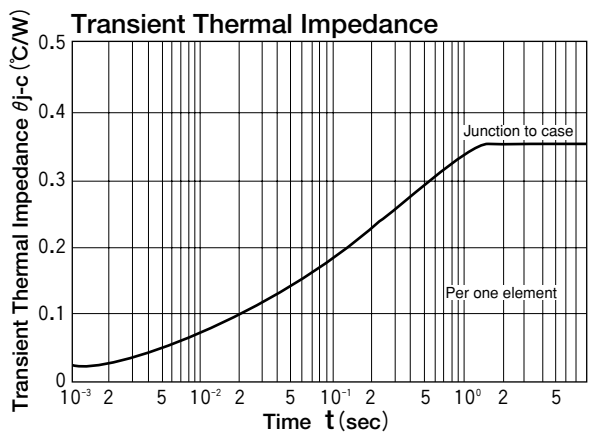
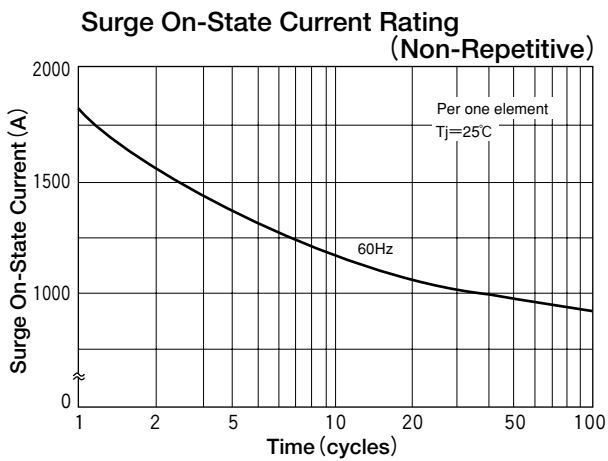
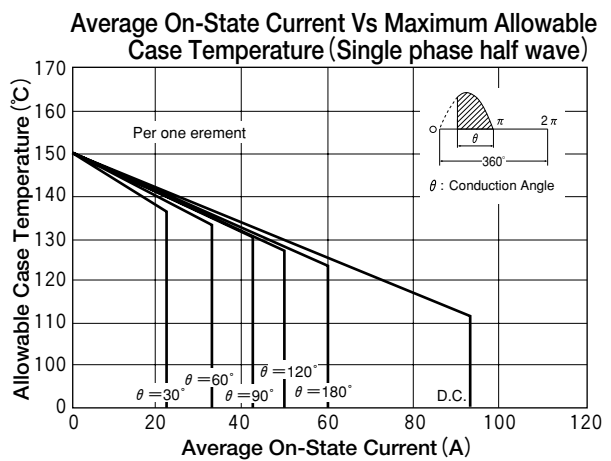
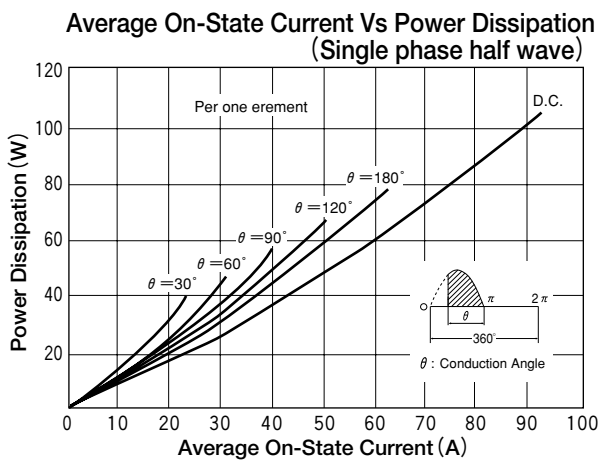
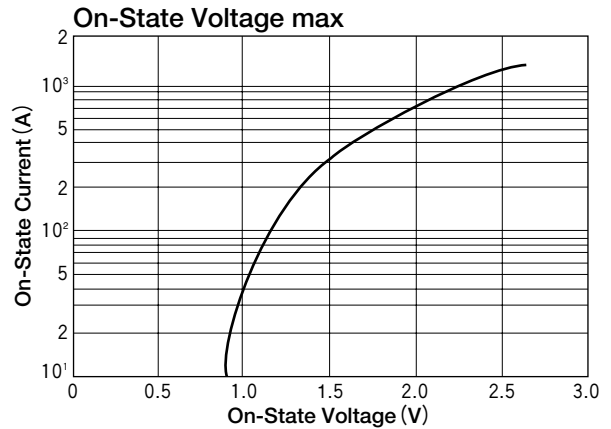
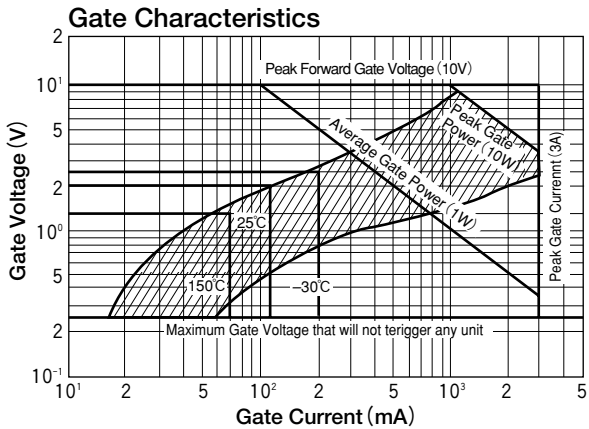
Maximum Ratings

Symbol	Item	Ratings		Unit
		PWB60A30	PWB60A40	
VRRM	Repetitive Peak Reverse Voltage	300	400	V
VRSM	Non-Repetitive Peak Reverse Voltage	360	480	V
VDRM	Repetitive Peak Off-State Voltage	300	400	V

Symbol	Item	Conditions	Ratings	Unit	
$I_{T(AV)}$	Average On-State Current	Single phase, half wave, 180° conduction, $T_c : 123^\circ\text{C}$	60	A	
$I_{T(RMS)}$	R.M.S. On-State Current	Single phase, half wave, 180° conduction, $T_c : 123^\circ\text{C}$	94	A	
I_{TSM}	Surge On-State Current	$\frac{1}{2}$ cycle, 50Hz/60Hz, peak value, non-repetitive	1640/1800	A	
I^2t	I^2t		13,500	A ² S	
P _{GM}	Peak Gate Power Dissipation		10	W	
P _{G(AV)}	Average Gate Power Dissipation		1	W	
I _{FGM}	Peak Gate Current		3	A	
V _{FGM}	Peak Gate Voltage (Forward)		10	V	
V _{RGM}	Peak Gate Voltage (R.M.S.)		5	V	
di/dt	Critical Rate of Rise of On-State Current	$I_G=150\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=1\text{A}/\mu\text{s}$	50	A/ μs	
T _j	Operating Junction Temperature		-30 to +150	°C	
T _{stg}	Storage Temperature		-30 to +125	°C	
	Mounting torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	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 _{DRM}	Repetitive Peak Off-State Current, max.	at V_{DRM} , single phase, half wave, $T_j=150^\circ\text{C}$	10	mA
I _{RRM}	Repetitive Peak Reverse Current, max.	at V_{DRM} , single phase, half wave, $T_j=150^\circ\text{C}$	10	mA
V _{TM}	Peak On-State Voltage, max.	On-State Current 180A, $T_j=25^\circ\text{C}$ Inst. measurement	1.25	V
I _{GT} /V _{GT}	Gate Trigger Current/Voltage, max.	$T_j=25^\circ\text{C}$, $I_T=1\text{A}$, $V_D=6\text{V}$	150/2	mA/V
V _{GD}	Non-Trigger Gate, Voltage. min.	$T_j=150^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$	0.25	V
t _{gt}	Turn On Time, max.	$I_T=60\text{A}$, $I_G=150\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=1\text{A}/\mu\text{s}$	10	μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_j=150^\circ\text{C}$, $V_D=\frac{2}{3}V_{DRM}$, Exponential wave.	50	V/ μs
I _H	Holding Current, typ.	$T_j=25^\circ\text{C}$	100	mA
R _{th(j-c)}	Thermal Impedance, max.	Junction to case ($\frac{1}{3}$ Module)	0.35	°C/W



THYRISTOR MODULE (NON-ISOLATED TYPE)

PWB80A

TOP

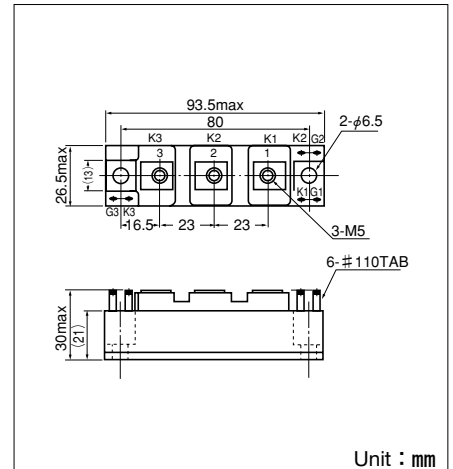
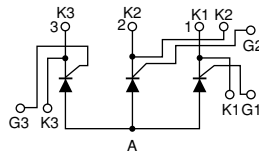


PWB80A is a Thyristor module suitable for low voltage, 3 phase recifier applications.

- $I_{T(AV)}$ 80A (each device)
- High Surge Current 2500 A (60Hz)
- Easy Construction
- Non-isolated. Mounting base as common Anode terminal

(Applications)

Welding power Supply
Various DC power Supply



Unit : mm

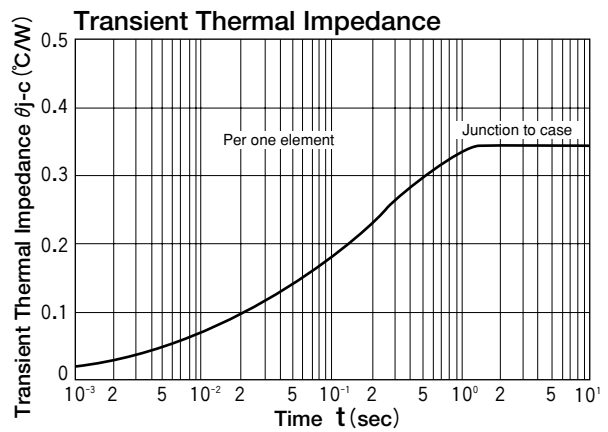
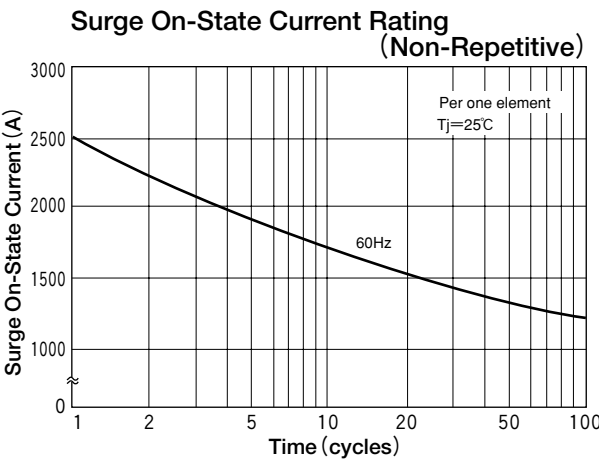
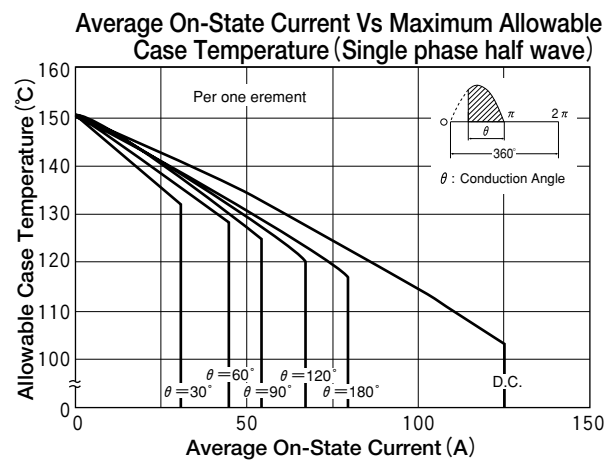
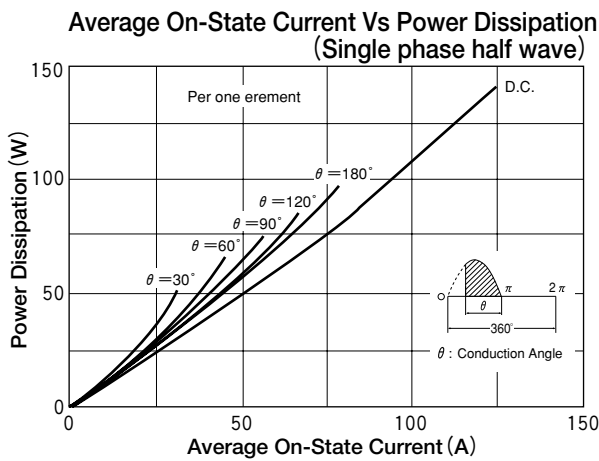
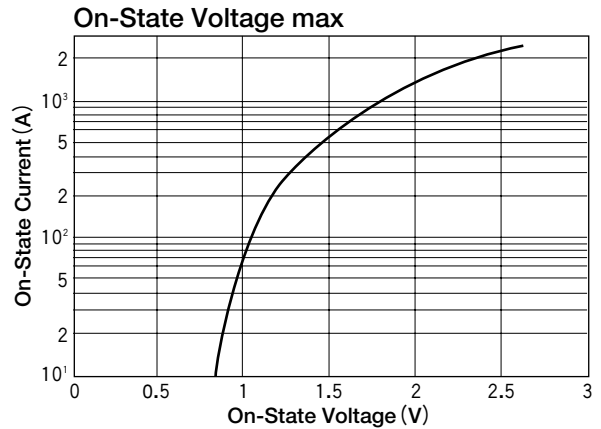
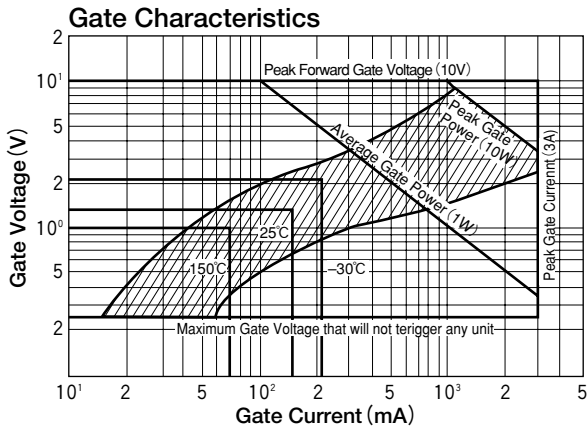
Maximum Ratings

Symbol	Item	Ratings		Unit
		PWB80A30	PWB80A40	
VRRM	Repetitive Peak Reverse Voltage	300	400	V
VRSM	Non-Repetitive Peak Reverse Voltage	360	480	V
VDRM	Repetitive Peak Off-State Voltage	300	400	V

Symbol	Item	Conditions	Ratings	Unit	
$I_{T(AV)}$	Average On-State Current	Single phase, half wave, 180° conduction, $T_c : 116^\circ\text{C}$	80	A	
$I_{T(RMS)}$	R.M.S. On-State Current	Single phase, half wave, 180° conduction, $T_c : 116^\circ\text{C}$	125	A	
I_{TSM}	Surge On-State Current	$\frac{1}{2}$ cycle, 50Hz/60Hz, peak value, non-repetitive	2280/2500	A	
I^2t	I^2t		26000	A ² S	
P_{GM}	Peak Gate Power Dissipation		10	W	
$P_{G(AV)}$	Average Gate Power Dissipation		1	W	
I_{FGM}	Peak Gate Current		3	A	
V_{FGM}	Peak Gate Voltage(Forward)		10	V	
V_{RGM}	Peak Gate Voltage(Reverse)		5	V	
di/dt	Critical Rate of Rise of On-State Current	$I_G=200\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=1\text{A}/\mu\text{s}$	50	A/ μs	
T_j	Operating Junction Temperature		-30 to +150	$^\circ\text{C}$	
T_{stg}	Storage Temperature		-30 to +125	$^\circ\text{C}$	
	Mounting torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	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_{DRM}	Repetitive Peak Off-State Current, max.	at V_{DRM} , single phase, half wave, $T_j=150^\circ\text{C}$	12	mA
I_{RRM}	Repetitive Peak Reverse Current, max.	at V_{DRM} , single phase, half wave, $T_j=150^\circ\text{C}$	12	mA
V_{TM}	Peak On-State Voltage, max	On-State Current 240A, $T_j=25^\circ\text{C}$ Inst. measurement	1.20	V
I_{GT}/V_{GT}	Gate Trigger Current/Voltage, max.	$T_j=25^\circ\text{C}$, $I_T=1\text{A}$, $V_D=6\text{V}$	150/2	mA/V
V_{GD}	Non-Trigger Gate, Voltage. min.	$T_j=150^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$	0.25	V
t_{gt}	Turn On Time, max.	$I_T=80\text{A}$, $I_G=200\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=1\text{A}/\mu\text{s}$	10	μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_j=150^\circ\text{C}$, $V_D=\frac{2}{3}V_{DRM}$, Exponential wave.	50	V/ μs
I_H	Holding Current, typ.	$T_j=25^\circ\text{C}$	100	mA
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to case ($\frac{1}{3}$ Module)	0.35	$^\circ\text{C}/\text{W}$



THYRISTOR MODULE (NON-ISOLATED TYPE)

PWB100A

TOP

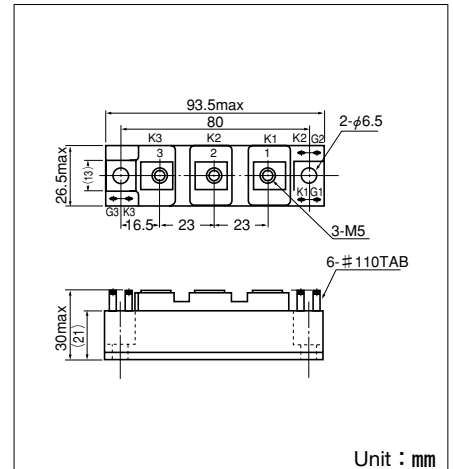
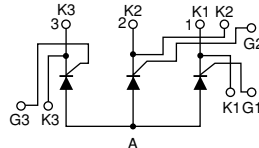


PWB100A is a Thyristor module suitable for low voltage, 3 phase recifier applications.

- $I_{T(AV)}$ 100A (each device)
- High Surge Current 3500 A (60Hz)
- Easy Construction
- Non-isolated. Mounting base as common Anode terminal

(Applications)

Welding power Supply
Various DC power Supply



Unit : mm

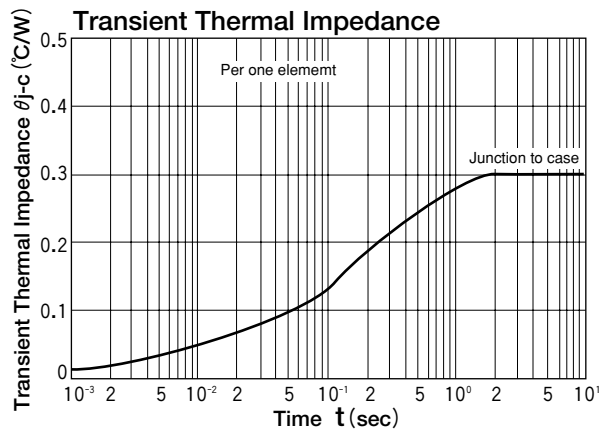
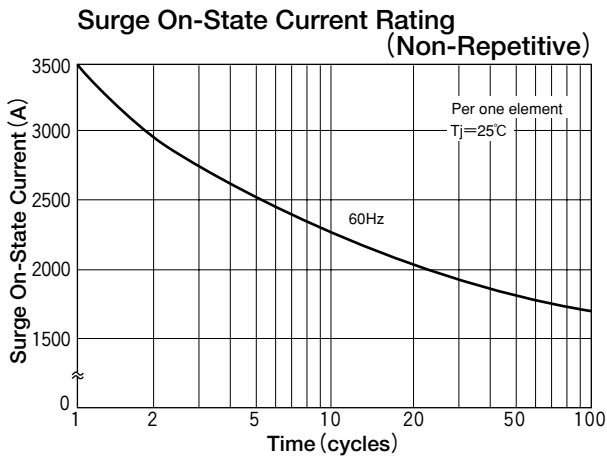
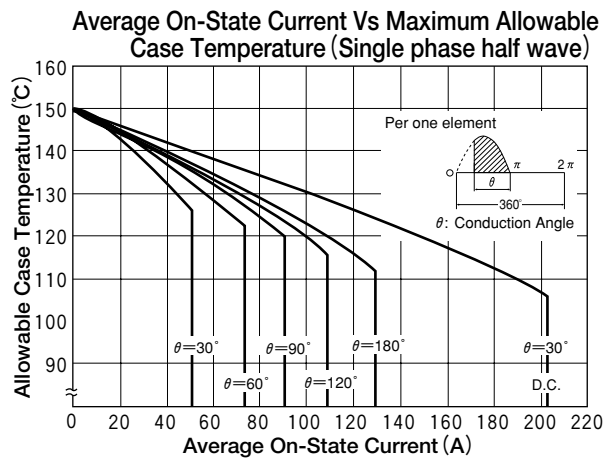
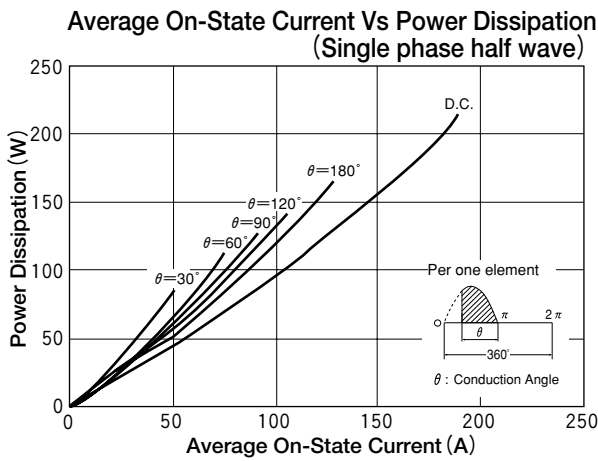
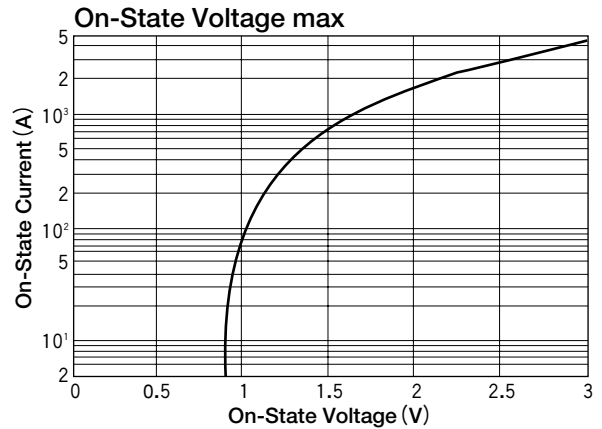
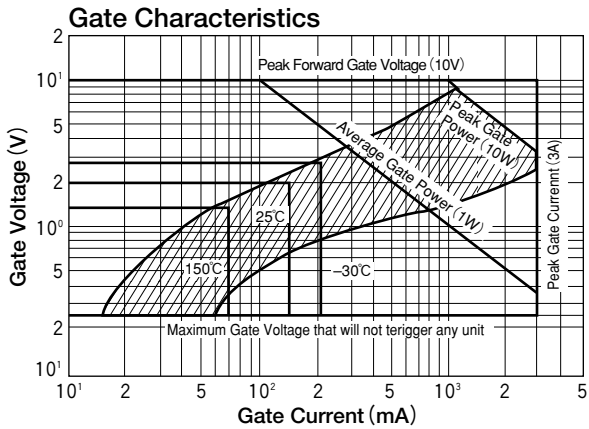
Maximum Ratings

Symbol	Item	Ratings		Unit
		PWB100A30	PWB100A40	
VRRM	Repetitive Peak Reverse Voltage	300	400	V
VRSM	Non-Repetitive Peak Reverse Voltage	360	480	V
VDRM	Repetitive Peak Off-State Voltage	300	400	V

Symbol	Item	Conditions	Ratings	Unit	
$I_{T(AV)}$	Average On-State Current	Single phase, half wave, 180° conduction, $T_c : 114^\circ\text{C}$	100	A	
$I_{T(RMS)}$	R.M.S. On-State Current	Single phase, half wave, 180° conduction, $T_c : 114^\circ\text{C}$	157	A	
I_{TSM}	Surge On-State Current	1/2cycle, 50Hz/60Hz, peak value, non-repetitive	3200/3500	A	
I^2t	I^2t		51000	A ² S	
P_{GM}	Peak Gate Power Dissipation		10	W	
$P_{G(AV)}$	Average Gate Power Dissipation		1	W	
I_{FGM}	Peak Gate Current		3	A	
V_{FGM}	Peak Gate Voltage (Forward)		10	V	
V_{RGM}	Peak Gate Voltage (Reverse)		5	V	
di/dt	Critical Rate of Rise of On-State Current	$I_g=200\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=1/2V_{DRM}$, $dI_G/dt=1\text{A}/\mu\text{s}$	50	A/ μs	
T_j	Operating Junction Temperature		-30 to +150	°C	
T_{stg}	Storage Temperature		-30 to +125	°C	
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	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_{DRM}	Repetitive Peak Off-State Current, max.	at V_{DRM} , single phase, half wave, $T_j=150^\circ\text{C}$	15	mA
I_{RRM}	Repetitive Peak Reverse Current, max.	at V_{DRM} , single phase, half wave, $T_j=150^\circ\text{C}$	15	mA
V_{TM}	Peak On-State Voltage, max.	On-State Current 310A, $T_j=25^\circ\text{C}$ Inst. measurement	1.20	V
I_{GT}/V_{GT}	Gate Trigger Current/Voltage, max.	$T_j=25^\circ\text{C}$, $I_T=1\text{A}$, $V_D=6\text{V}$	150/2	mA/V
V_{GD}	Non-Trigger Gate, Voltage. min.	$T_j=150^\circ\text{C}$, $V_D=1/2V_{DRM}$	0.25	V
t_{gt}	Turn On Time, max.	$I_T=100\text{A}$, $I_g=200\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=1/2V_{DRM}$, $dI_G/dt=1\text{A}/\mu\text{s}$	10	μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_j=150^\circ\text{C}$, $V_D=2/3V_{DRM}$, Exponential wave.	50	V/ μs
I_H	Holding Current, typ.	$T_j=25^\circ\text{C}$	70	mA
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to case (1/3 Module)	0.3	°C/W



THYRISTOR MODULE (NON-ISOLATED TYPE)

PWB130A

TOP

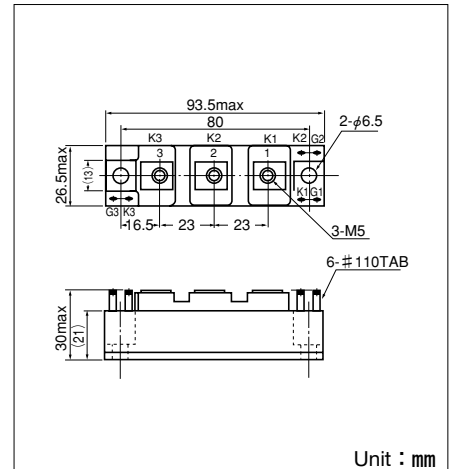
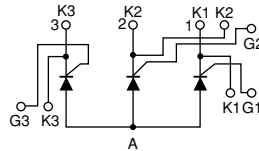


PWB130A is a Thyristor module suitable for low voltage, 3 phase recifier applications.

- $I_{T(AV)}$ 130A (each device)
- high Surge Current 3500 A (50/60Hz)
- Easy Construction
- Non-isolated. Mounting base as common Anode terminal

(Applications)

Welding power Supply
Various DC power Supply



Maximum Ratings

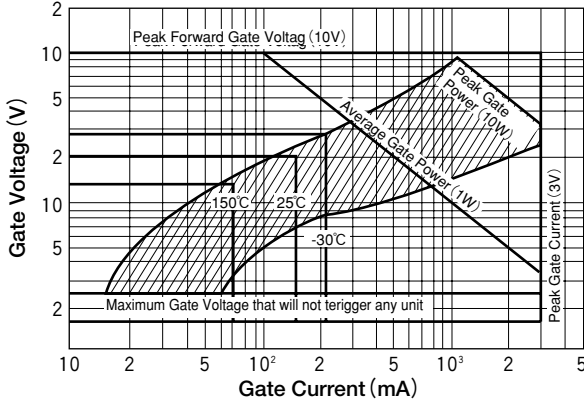
Symbol	Item	Ratings			Unit
		PWB130A20	PWB130A30	PWB130A40	
VRRM	Repetitive Peak Reverse Voltage	200	300	400	V
VRSM	Non-Repetitive Peak Reverse Voltage	240	360	480	V
VDRM	Repetitive Peak Off-State Voltage	200	300	400	V

Symbol	Item	Conditions	Ratings	Unit	
$I_{T(AV)}$	Average On-State Current	Single phase, half wave, 180° conduction, $T_c : 112^\circ\text{C}$	130	A	
$I_{T(RMS)}$	R.M.S. On-State Current	Single phase, half wave, 180° conduction, $T_c : 112^\circ\text{C}$	204	A	
I_{TSM}	Surge On-State Current	1/2cycle, 50Hz/60Hz, peak value, non-repetitive	3200/3500	A	
I^2t	I^2t		51000	A ² S	
P_{GM}	Peak Gate Power Dissipation		10	W	
$P_{G(AV)}$	Average Gate Power Dissipation		1	W	
I_{FGM}	Peak Gate Current		3	A	
V_{FGM}	Peak Gate Voltage (Forward)		10	V	
V_{RGM}	Peak Gate Voltage (Reverse)		5	V	
di/dt	Critical Rate of On-State Current	$I_G=200\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=1/2V_{DRM}$, $dI_G/dt=1\text{A}/\mu\text{s}$	50	A/ μs	
T_j	Operating Junction Temperature		-30 to +150	°C	
T_{stg}	Storage Temperature		-30 to +125	°C	
	Mounting torque	Mounting (M6)	Recommended 2.5-3.9 (25-40)	4.7 (48)	N·m (kgf·cm)
		Terminal (M5)	Recommended 1.5-2.5 (15-25)	2.7 (28)	
	Mass			170	g

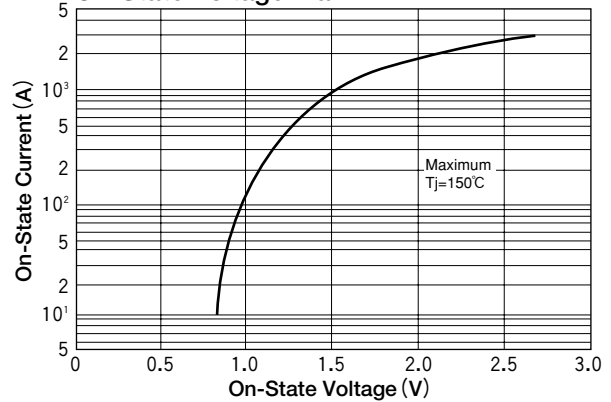
Electrical Characteristics

Symbol	Item	Conditions	Ratings			Unit
			Mix.	Typ.	Min.	
I_{DRM}	Repetitive Peak Off-State Current, max.	at V_{DRM} , single phase, half wave, $T_j=150^\circ\text{C}$			30	mA
I_{RRM}	Repetitive Peak Reverse Current, max.	at V_{DRM} , single phase, half wave, $T_j=150^\circ\text{C}$			30	mA
V_{TM}	Peak On-State Voltage, max.	On-State Current 410A, $T_j=150^\circ\text{C}$ Inst. measurement			1.2	V
I_{GT}	Gate Trigger Current, max.	$T_j=25^\circ\text{C}$, $I_T=1\text{A}$, $V_D=6\text{V}$			150	mA/V
V_{GT}	Gate Trigger Voltage, max.	$T_j=25^\circ\text{C}$, $I_T=1\text{A}$, $V_D=6\text{V}$			2	mA/V
V_{GD}	Non-Trigger Gate, Voltage. min.	$T_j=150^\circ\text{C}$, $V_D=1/2V_{DRM}$	0.25			V
tgt	Turn On Time, max.	$I_T=100\text{A}$, $I_G=200\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=1/2V_{DRM}$, $dI_G/dt=1\text{A}/\mu\text{s}$			10	μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_j=150^\circ\text{C}$, $V_D=2/3V_{DRM}$, Exponential wave.	50			V/ μs
I_H	Holding Current, typ.	$T_j=25^\circ\text{C}$			70	mA
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to case (1/3 Module)			0.2	°C/W

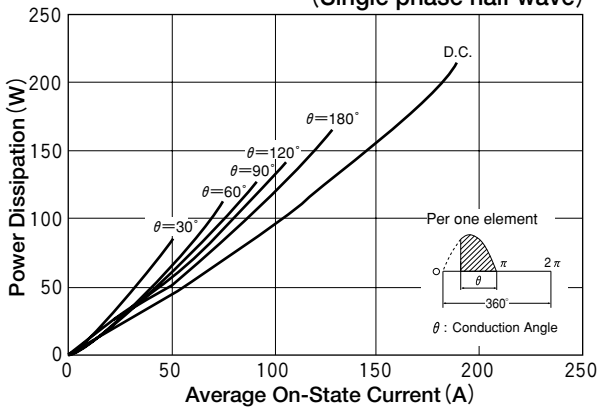
Gate Characteristics



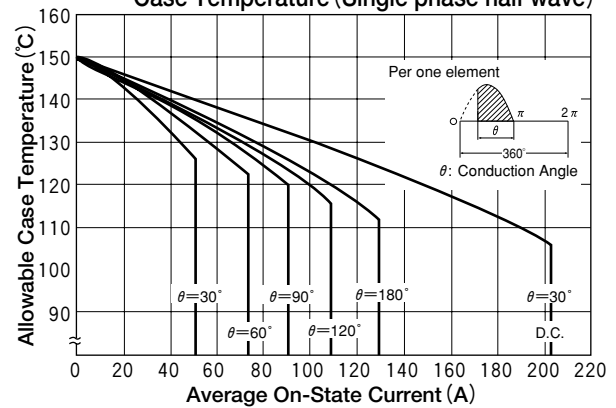
On-State Voltage max



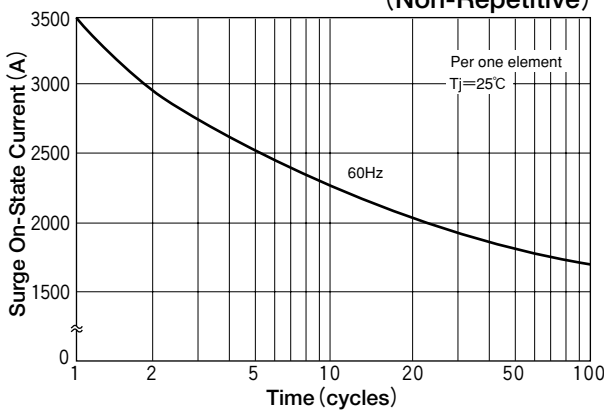
Average On-State Current Vs Power Dissipation (Single phase half wave)



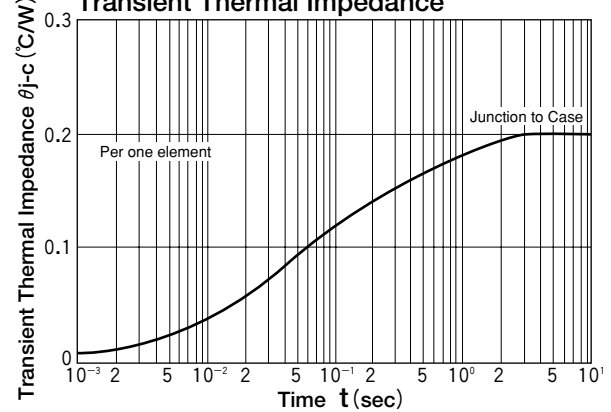
Average On-State Current Vs Maximum Allowable Case Temperature (Single phase half wave)



Surge On-State Current Rating (Non-Repetitive)



Transient Thermal Impedance



THYRISTOR MODULE

PWB200AA

TOP

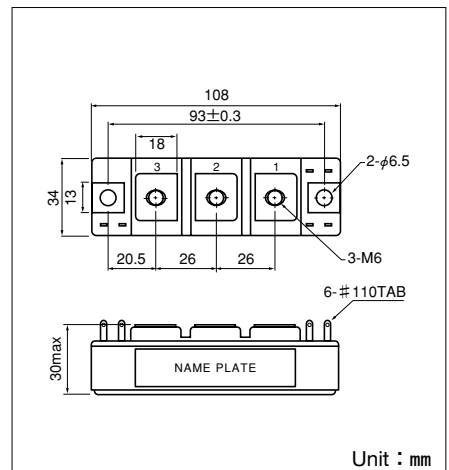
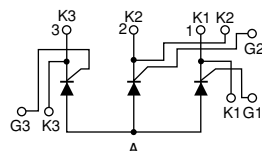


PWB200AA is a Thyristor module suitable for low voltage, 3 phase recifier applications.

- $I_{T(AV)}$ 200A (each device)
- high Surge Current 6000 A (60Hz)
- Easy Construction
- Non-isolated. Mounting base as common Anode terminal

(Applications)

Welding power Supply
Various DC power Supply



Unit : mm

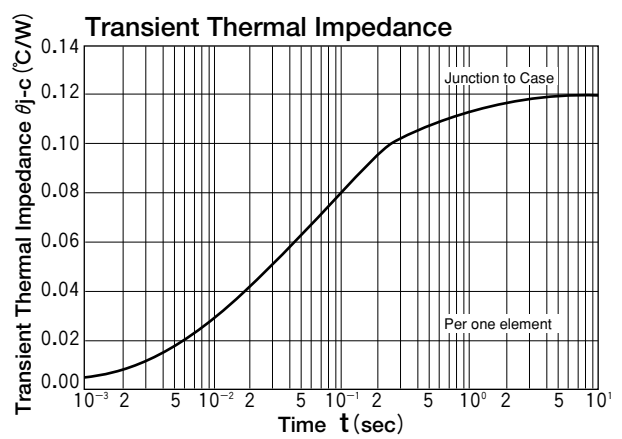
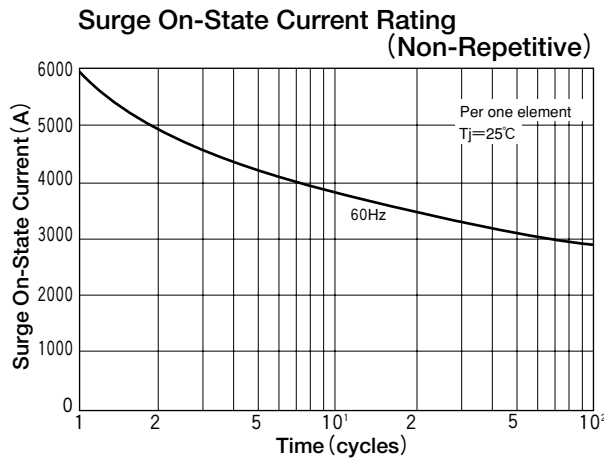
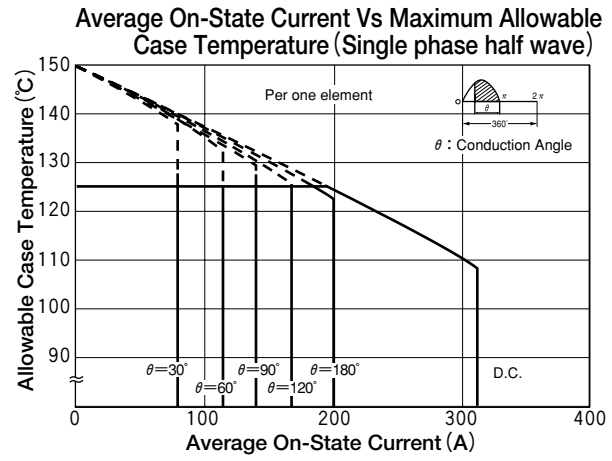
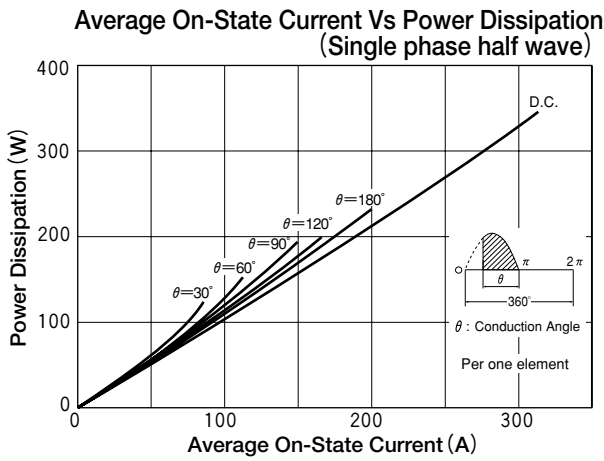
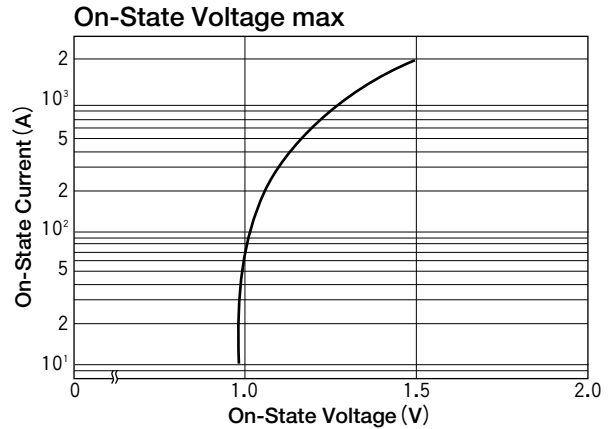
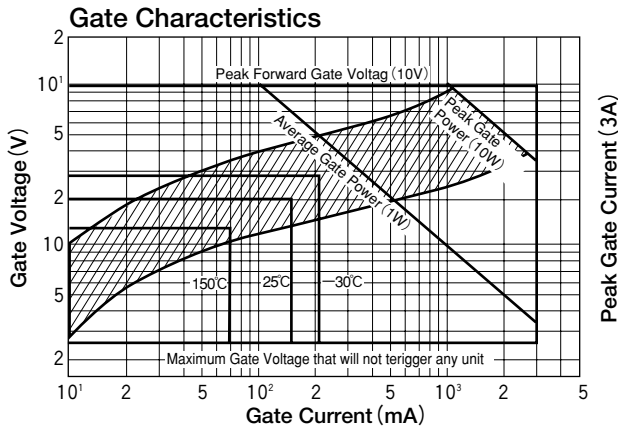
Maximum Ratings

Symbol	Item	Ratings		Unit
		PWB200AA30	PWB200AA40	
V_{RRM}	Repetitive Peak Reverse Voltage	300	400	V
V_{RSM}	Non-Repetitive Peak Reverse Voltage	360	480	V
V_{DRM}	Repetitive Peak Off-State Voltage	300	400	V

Symbol	Item	Conditions	Ratings	Unit	
$I_{T(AV)}$	Average On-State Current	Single phase, half wave, 180° conduction, $T_c : 121^\circ\text{C}$	200	A	
$I_{T(RMS)}$	R.M.S. On-State Current	Single phase, half wave, 180° conduction, $T_c : 121^\circ\text{C}$	314	A	
I_{TSM}	Surge On-State Current	$\frac{1}{2}$ cycle, 50Hz/60Hz, peak value, non-repetitive	5400/6000	A	
I^2t	I^2t		1499400	A^2S	
P_{GM}	Peak Gate Power Dissipation		10	W	
$P_{G(AV)}$	Average Gate Power Dissipation		1	W	
I_{FGM}	Peak Gate Current		3	A	
V_{FGM}	Peak Gate Voltage (Forward)		10	V	
V_{RGM}	Peak Gate Voltage (Reverse)		5	V	
di/dt	Critical Rate of Rise of On-State Current	$I_G=200\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=1\text{A}/\mu\text{s}$	50	$\text{A}/\mu\text{s}$	
T_j	Operating Junction Temperature		-40 to +150	$^\circ\text{C}$	
T_{stg}	Storage Temperature		-40 to +125	$^\circ\text{C}$	
	Mounting torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	N·m (kgf·cm)
		Terminal (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	
	Mass			280	g

Electrical Characteristics

Symbol	Item	Conditions	Ratings	Unit
I_{DRM}	Repetitive Peak Off-State Current, max.	at V_{DRM} , Single phase, half wave, $T_j=150^\circ\text{C}$	60	mA
I_{RRM}	Repetitive Peak Reverse Current, max.	at V_{DRM} , Single phase, half wave, $T_j=150^\circ\text{C}$	60	mA
V_{TM}	Peak On-State Voltage, max.	On-State Current 630A, $T_j=25^\circ\text{C}$ Inst. measurement	1.20	V
I_{GT}	Gate Trigger Current, max.	$T_j=25^\circ\text{C}$, $I_T=1\text{A}$, $V_D=6\text{V}$	150	mA
V_{GT}	Gate Trigger Voltage, max.	$T_j=25^\circ\text{C}$, $I_T=1\text{A}$, $V_D=6\text{V}$	2	V
V_{GD}	Non-Trigger Gate, Voltage. min.	$T_j=150^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$	0.25	V
t_{gt}	Turn On Time, max.	$I_T=200\text{A}$, $I_G=200\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=1\text{A}/\mu\text{s}$	10	μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_j=150^\circ\text{C}$, $V_D=\frac{2}{3}V_{DRM}$, Exponential wave.	200	$\text{V}/\mu\text{s}$
I_H	Holding Current, typ.	$T_j=25^\circ\text{C}$	70	mA
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to case ($\frac{1}{3}$ Module)	0.12	$^\circ\text{C}/\text{W}$



THYRISTOR MODULE

AK25GB40/80



UL;E76102 (M)

Power Thyristor Module **AK25GB** series are designed for various rectifier circuits and power controls. For your circuit application, following internal connections and wide voltage ratings up to 800V are available, and electrically isolated mounting base make your mechanical design easy.

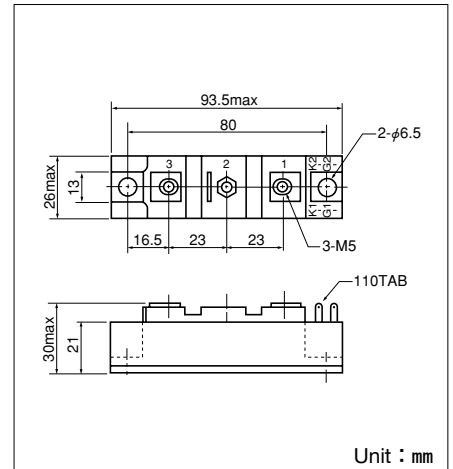
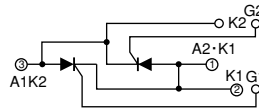
Isolated mounting base

- $I_{T(AV)}$ 25A, $I_{T(RMS)}$ 55A, I_{TSM} 55A
- di/dt 100 A/ μ s
- dv/dt 500V/ μ s

(Applications)

- AC/DC motor drives
- Heater controls
- Light dimmers
- Static switches

Internal Configurations



Maximum Ratings

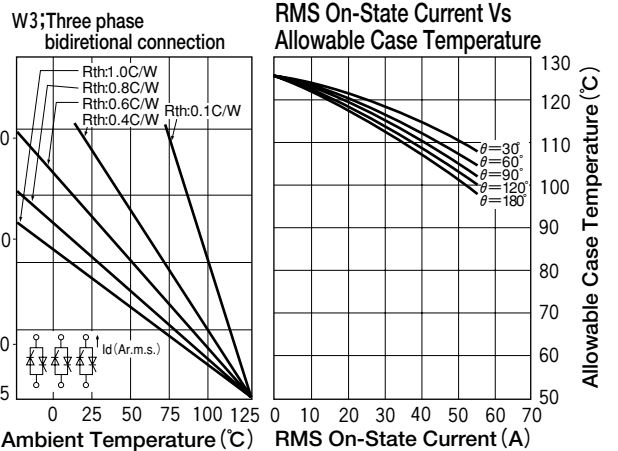
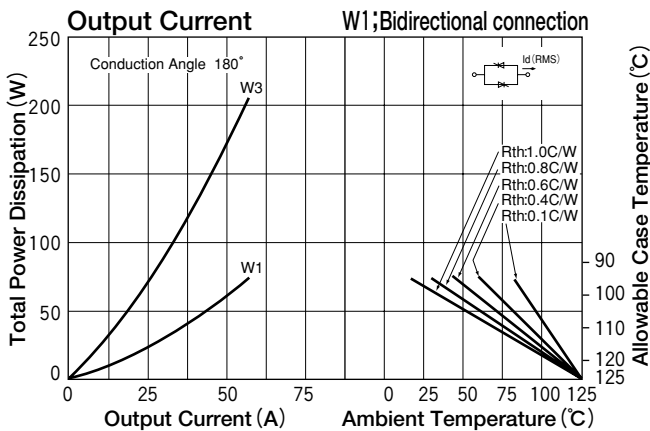
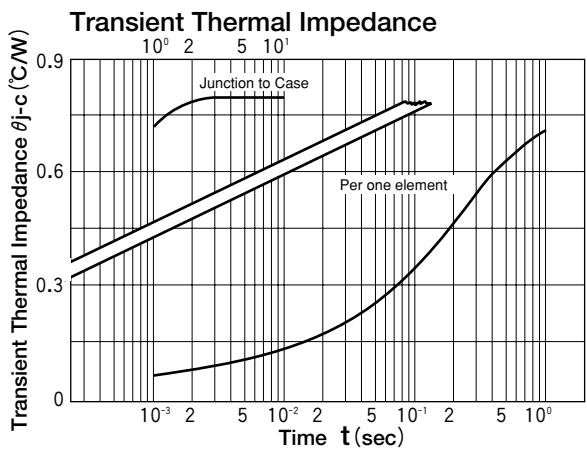
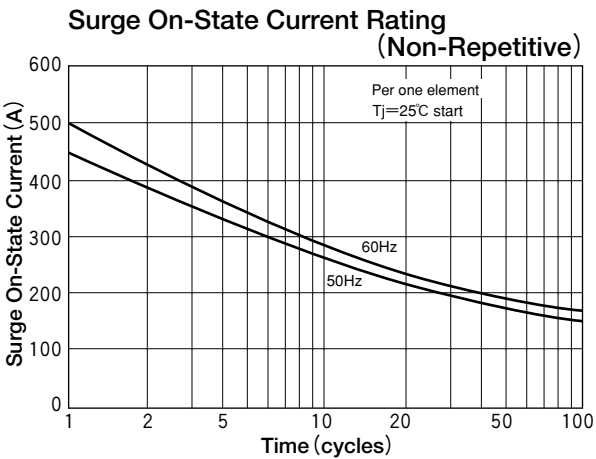
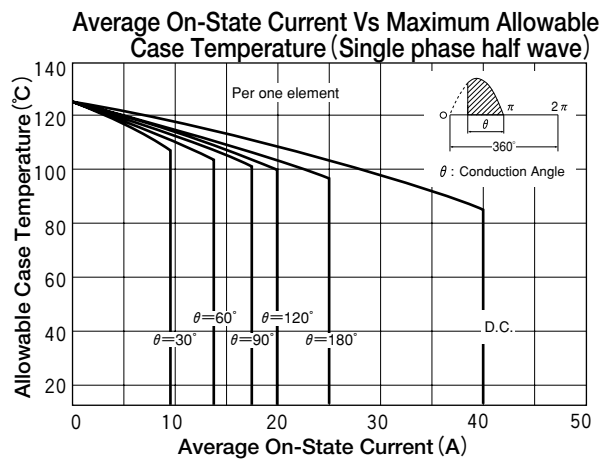
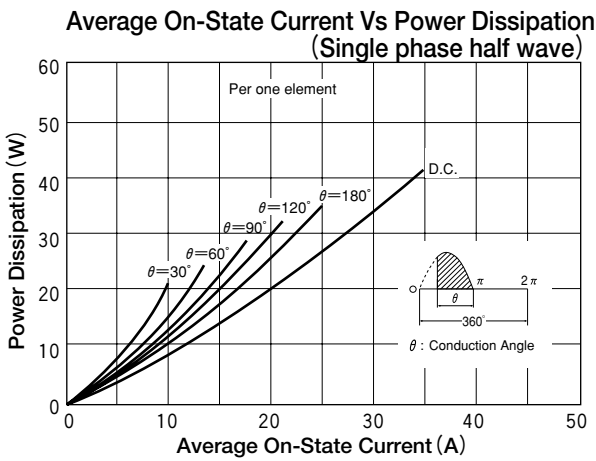
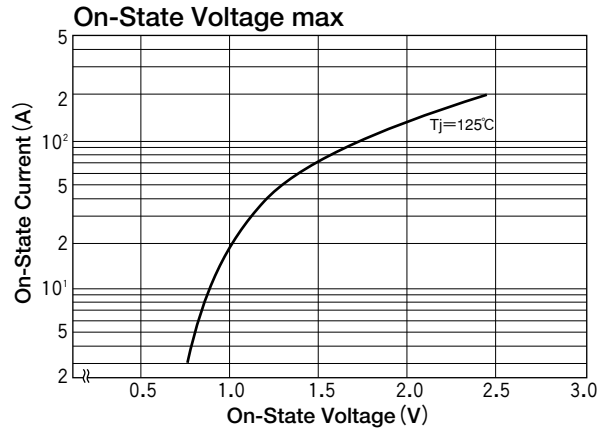
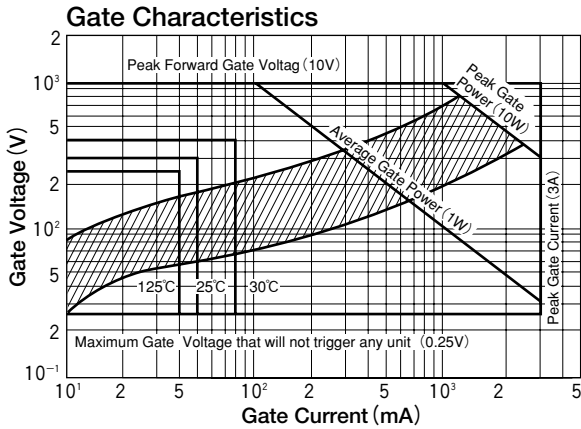
($T_j=25^\circ\text{C}$ unless otherwise specified)

Symbol	Item	Ratings		Unit
		AK25GB40	AK25GB80	
V_{DRM}	Repetitive Peak Off-State Voltage	400	800	V

Symbol	Item	Conditions	Ratings	Unit	
$I_{T(AV)}$	Average On-State Current	Single phase, half wave, 180° conduction, $T_c : 97^\circ\text{C}$	25	A	
$I_{T(RMS)}$	R.M.S. On-State Current	$T_c : 97^\circ\text{C}$	55	A	
I_{TSM}	Surge On-State Current	$\frac{1}{2}$ cycle, 50Hz/60Hz, peak value, non-repetitive	450/500	A	
I^2t	I^2t	Value for one cycle of surge current	1000	A^2S	
P_{GM}	Peak Gate Power Dissipation		10	W	
$P_{G(AV)}$	Average Gate Power Dissipation		1	W	
I_{FGM}	Peak Gate Current		3	A	
V_{FGM}	Peak Gate Voltage (Forward)		10	V	
V_{RGM}	Peak Gate Voltage (Reverse)		5	V	
di/dt	Critical Rate of Rise of On-State Current	$I_G=100\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=0.1\text{A}/\mu\text{s}$	100	$\text{A}/\mu\text{s}$	
V_{ISO}	Isolation Breakdown Voltage (R.M.S.)	A.C. 1 minute	2500	V	
T_j	Operating Junction Temperature		-40 to +125	$^\circ\text{C}$	
T_{stg}	Storage Temperature		-40 to +125	$^\circ\text{C}$	
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	$\text{N}\cdot\text{m}$ ($\text{kgf}\cdot\text{cm}$)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass	Typical Value		170	g

Electrical Characteristics

Symbol	Item	Conditions	Ratings	Unit
I_{DRM}	Repetitive Peak Off-State Current, max.	at V_{DRM} , Single phase, half wave, $T_j=125^\circ\text{C}$	8	mA
V_{TM}	Peak On-State Voltage, max.	On-State Current 75A, $T_j=125^\circ\text{C}$ Inst. measurement	1.50	V
I_{GT}/V_{GT}	Gate Trigger Current/Voltage, max.	$T_j=25^\circ\text{C}$, $I_T=1\text{A}$, $V_D=6\text{V}$	50/3	mA/V
V_{GD}	Non-Trigger Gate, Voltage, min.	$T_j=125^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$	0.25	V
t_{gt}	Turn On Time, max.	$I_T=25\text{A}$, $I_G=100\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=0.1\text{A}/\mu\text{s}$	10	μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_j=125^\circ\text{C}$, $V_D=\frac{2}{3}V_{DRM}$, Exponential wave.	500	$\text{V}/\mu\text{s}$
I_H	Holding Current, typ.	$T_j=25^\circ\text{C}$	50	mA
I_L	Latching Current, typ.	$T_j=25^\circ\text{C}$	100	mA
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to case, per $\frac{1}{2}$ Module	0.80	$^\circ\text{C}/\text{W}$
		Junction to case, per 1 Module	0.40	



THYRISTOR MODULE

AK25HB120/160



UL;E76102 (M)

Power Thyristor Module AK25HB series are designed for various rectifier circuits and power controls. For your circuit application, following internal connections and wide voltage ratings up to 1,600V are available, and electrically isolated mounting base make your mechanical design easy.

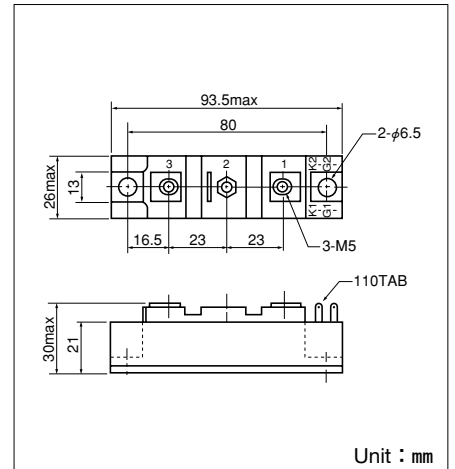
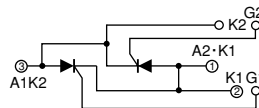
Isolated mounting base

- $I_{T(AV)}$ 25A, $I_{T(RMS)}$ 55A, I_{TSM} 500A
- di/dt 100 A/ μ s
- dv/dt 500V/ μ s

(Applications)

- AC/DC motor drives
- Heater controls
- Light dimmers
- Static switches

Internal Configurations



Maximum Ratings

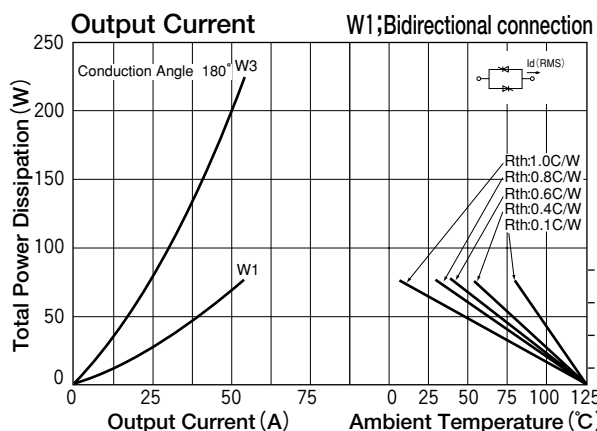
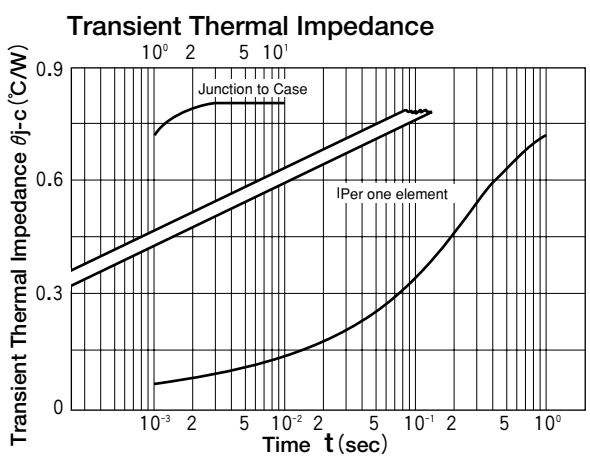
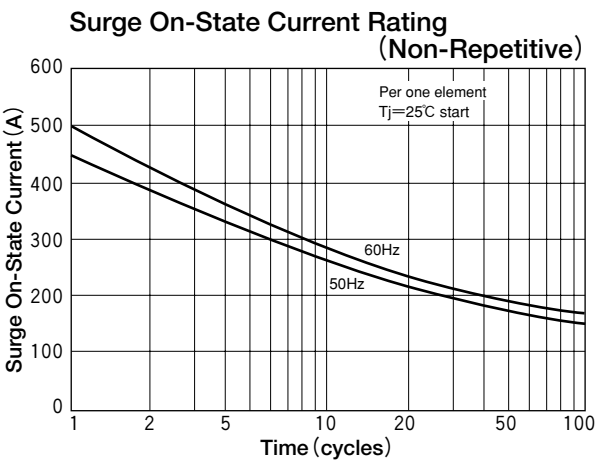
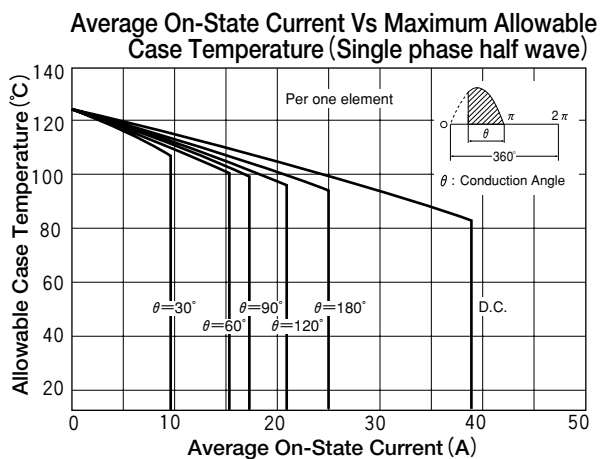
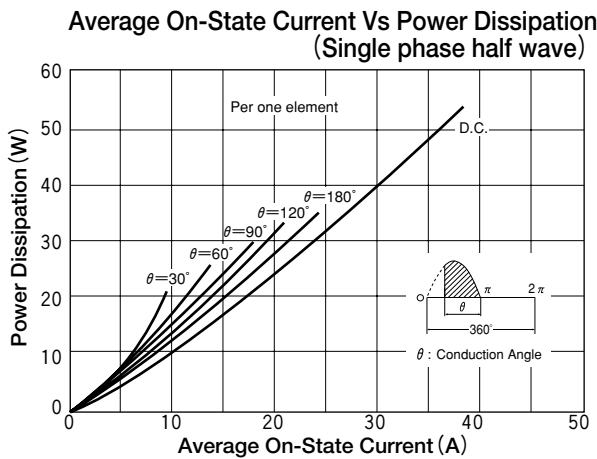
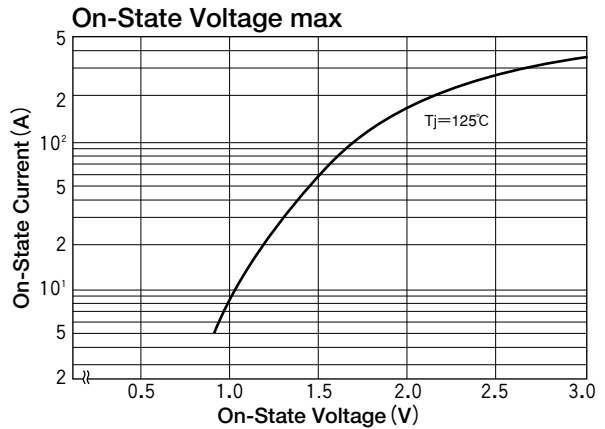
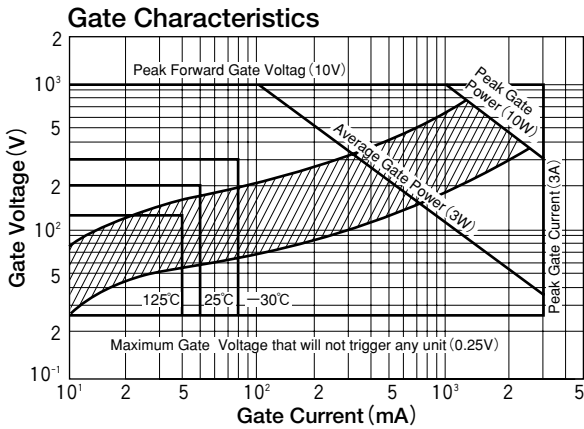
($T_j=25^\circ\text{C}$ unless otherwise specified)

Symbol	Item	Ratings		Unit
		AK25HB120	AK25HB160	
V_{DRM}	Repetitive Peak Off-State Voltage	1200	1600	V

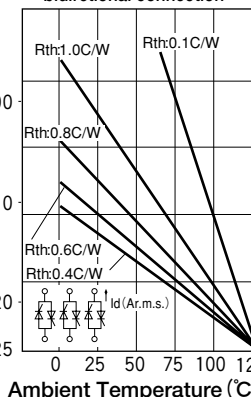
Symbol	Item	Conditions	Ratings	Unit	
$I_{T(AV)}$	Average On-State Current	Single phase, half wave, 180° conduction, $T_c : 94^\circ\text{C}$	25	A	
$I_{T(RMS)}$	R.M.S. On-State Current	$T_c : 94^\circ\text{C}$	55	A	
I_{TSM}	Surge On-State Current	$\frac{1}{2}$ cycle, 50Hz/60Hz, peak value, non-repetitive	450/500	A	
I^2t	I^2t	Value for one cycle of surge current	1000	A^2S	
P_{GM}	Peak Gate Power Dissipation		10	W	
$P_{G(AV)}$	Average Gate Power Dissipation		1	W	
I_{FGM}	Peak Gate Current		3	A	
V_{FGM}	Peak Gate Voltage (Forward)		10	V	
V_{RGM}	Peak Gate Voltage (Reverse)		5	V	
di/dt	Critical Rate of Rise of On-State Current	$I_G=100\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=0.1\text{A}/\mu\text{s}$	100	$\text{A}/\mu\text{s}$	
V_{ISO}	Isolation Breakdown Voltage (R.M.S.)	A.C. 1 minute	2500	V	
T_j	Operating Junction Temperature		-40 to +125	$^\circ\text{C}$	
T_{stg}	Storage Temperature		-40 to +125	$^\circ\text{C}$	
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	$\text{N}\cdot\text{m}$ ($\text{kgf}\cdot\text{cm}$)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass	Typical Value		170	g

Electrical Characteristics

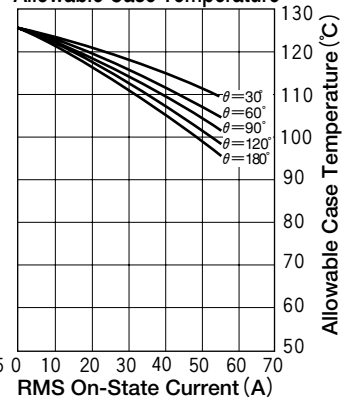
Symbol	Item	Conditions	Ratings	Unit
I_{DRM}	Repetitive Peak Off-State Current, max.	at V_{DRM} , Single phase, half wave, $T_j=125^\circ\text{C}$	8	mA
V_{TM}	Peak On-State Voltage, max.	On-State Current 75A, $T_j=125^\circ\text{C}$ Inst. measurement	1.60	V
I_{GT}/V_{GT}	Gate Trigger Current/Voltage, max.	$T_j=25^\circ\text{C}$, $I_T=1\text{A}$, $V_D=6\text{V}$	50/2	mA/V
V_{GD}	Non-Trigger Gate, Voltage, min.	$T_j=125^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$	0.25	V
t_{gt}	Turn On Time, max.	$I_T=25\text{A}$, $I_G=100\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=0.1\text{A}/\mu\text{s}$	10	μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_j=125^\circ\text{C}$, $V_D=\frac{2}{3}V_{DRM}$, Exponential wave.	500	$\text{V}/\mu\text{s}$
I_H	Holding Current, typ.	$T_j=25^\circ\text{C}$	50	mA
I_L	Latching Current, typ.	$T_j=25^\circ\text{C}$	100	mA
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to case, per $\frac{1}{2}$ Module	0.80	$^\circ\text{C}/\text{W}$
		Junction to case, per 1 Module	0.40	



W3; Three phase bidirectional connection



RMS On-State Current Vs Allowable Case Temperature



THYRISTOR MODULE

AK55GB40/80



UL;E76102 (M)

Power Thyristor Module AK55GB series are designed for various rectifier circuits and power controls. For your circuit application, following internal connections and wide voltage ratings up to 1,600V are available, and electrically isolated mounting base make your mechanical design easy.

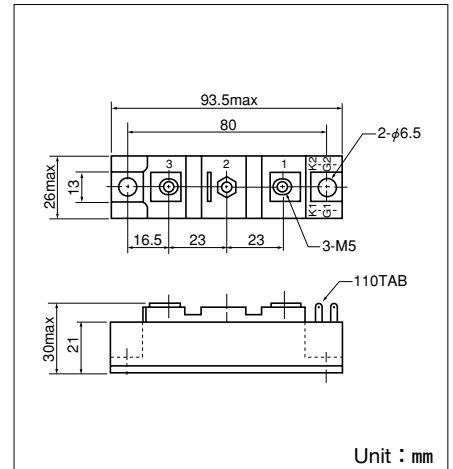
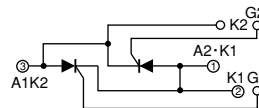
Isolated mounting base

- $I_{T(AV)}$ 55A, $I_{T(RMS)}$ 122A, I_{TSM} 1100A
- di/dt 150 A/ μ s
- dv/dt 500V/ μ s

(Applications)

- AC/DC motor drives
- Heater controls
- Light dimmers
- Static switches

Internal Configurations



Maximum Ratings

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

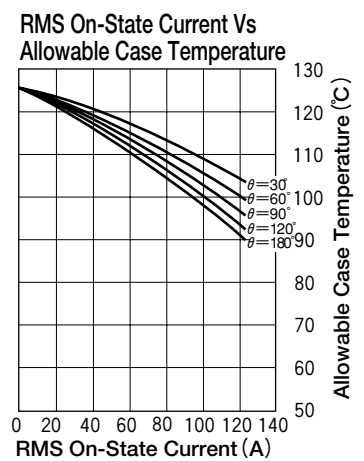
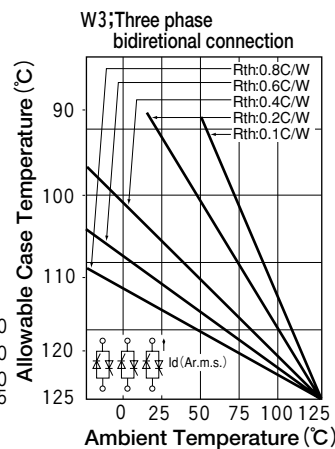
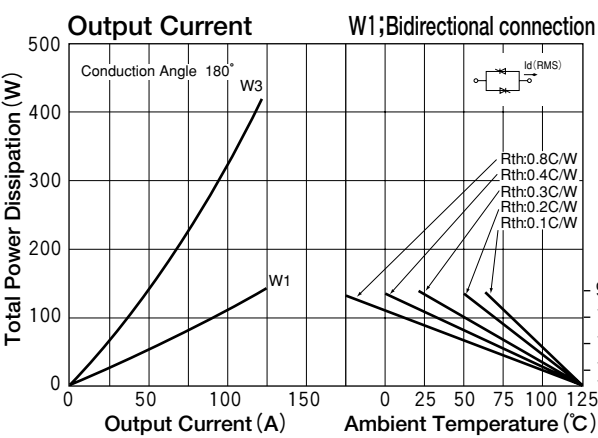
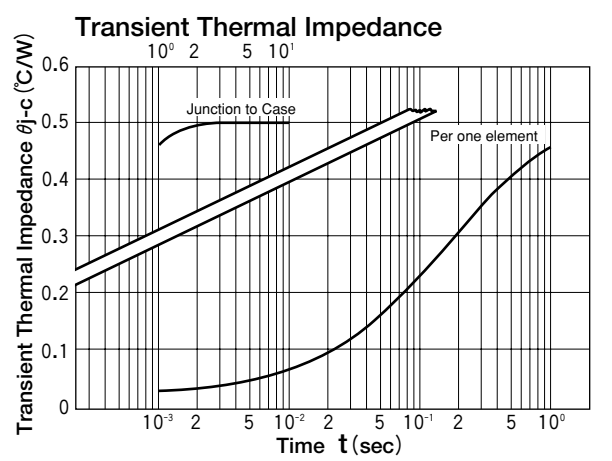
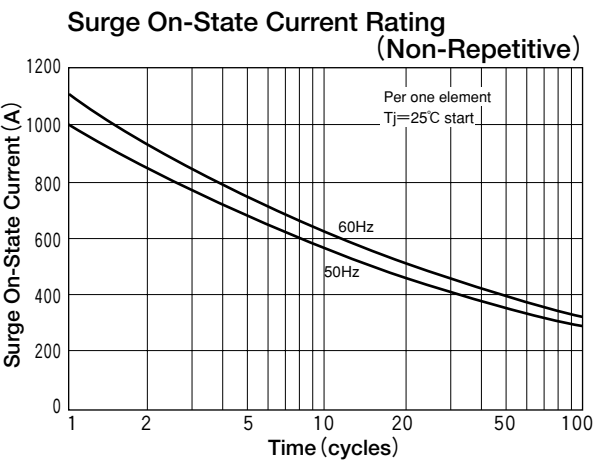
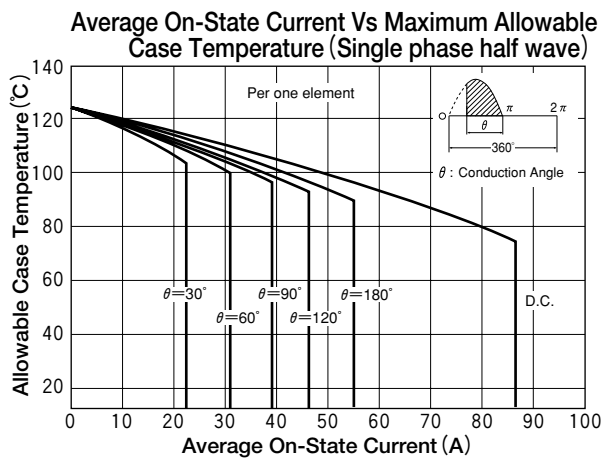
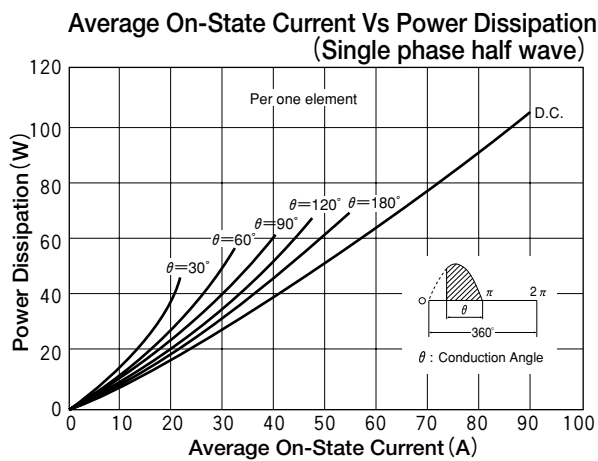
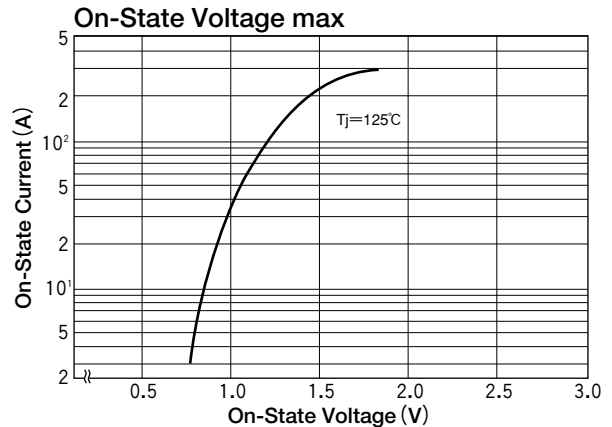
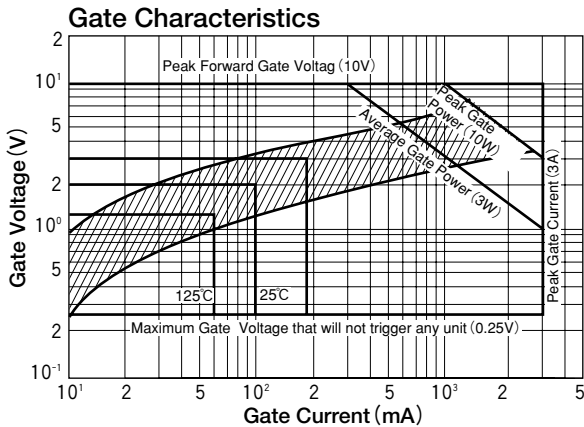
Symbol	Item	Ratings		Unit
		AK55GB40	AK55GB80	
V_{DRM}	Repetitive Peak Off-State Voltage	400	800	V

Symbol	Item	Conditions	Ratings	Unit	
$I_{T(AV)}$	Average On-State Current	Single phase, half wave, 180° conduction, $T_c : 89^\circ\text{C}$	55	A	
$I_{T(RMS)}$	R.M.S. On-State Current	$T_c : 89^\circ\text{C}$	122	A	
I_{TSM}	Surge On-State Current	$\frac{1}{2}$ cycle, 50Hz/60Hz, peak value, non-repetitive	1000/1100	A	
I^2t	I^2t	Value for one cycle of surge current	5000	A^2S	
P_{GM}	Peak Gate Power Dissipation		10	W	
$P_{G(AV)}$	Average Gate Power Dissipation		3	W	
I_{FGM}	Peak Gate Current		3	A	
V_{FGM}	Peak Gate Voltage (Forward)		10	V	
V_{RGM}	Peak Gate Voltage (Reverse)		5	V	
di/dt	Critical Rate of Rise of On-State Current	$I_G=100\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=0.1\text{A}/\mu\text{s}$	150	$\text{A}/\mu\text{s}$	
V_{ISO}	Isolation Breakdown Voltage (R.M.S.)	A.C. 1 minute	2500	V	
T_j	Operating Junction Temperature		-40 to +125	$^\circ\text{C}$	
T_{stg}	Storage Temperature		-40 to +125	$^\circ\text{C}$	
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	$\text{N}\cdot\text{m}$ ($\text{kgf}\cdot\text{cm}$)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass	Typical Value	170	g	

Electrical Characteristics

Symbol	Item	Conditions	Ratings	Unit
I_{DRM}	Repetitive Peak Off-State Current, max.	at V_{DRM} , Single phase, half wave, $T_j=125^\circ\text{C}$	20	mA
V_{TM}	Peak On-State Voltage, max.	On-State Current 165A, $T_j=125^\circ\text{C}$ Inst. measurement	1.35	V
I_{GT}/V_{GT}	Gate Trigger Current/Voltage, max.	$T_j=25^\circ\text{C}$, $I_T=1\text{A}$, $V_D=6\text{V}$	100/3	mA/V
V_{GD}	Non-trigger Gate, Voltage, min	$T_j=125^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$	0.25	V
t_{gt}	Turn On Time, max.	$I_T=55\text{A}$, $I_G=100\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=0.1\text{A}/\mu\text{s}$	10	μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_j=125^\circ\text{C}$, $V_D=\frac{2}{3}V_{DRM}$, Exponential wave.	500	$\text{V}/\mu\text{s}$
I_H	Holding Current, typ	$T_j=25^\circ\text{C}$	50	mA
I_L	Latching Current, typ	$T_j=25^\circ\text{C}$	100	mA
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to case, per $\frac{1}{2}$ Module	0.50	$^\circ\text{C}/\text{W}$
		Junction to case, per 1 Module	0.25	

* mark : Thyristor and Diode part. No mark : Thyristor part



THYRISTOR MODULE

AK55HB120/160



UL;E76102 (M)

Power Thyristor Module AK55HB series are designed for various rectifier circuits and power controls. For your circuit application, following internal connections and wide voltage ratings up to 1600V are available, and electrically isolated mounting base make your mechanical design easy.

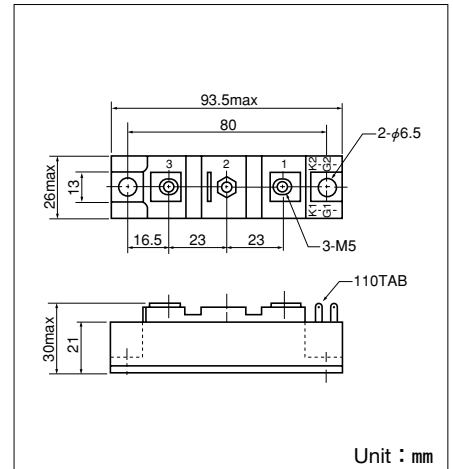
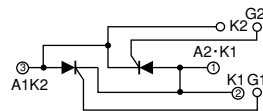
Isolated mounting base

- $I_{T(AV)}$ 55A, $I_{T(RMS)}$ 122A, I_{TSM} 1100A
- di/dt 150 A/ μ s
- dv/dt 500V/ μ s

(Applications)

- AC/DC motor drives
- Heater controls
- Light dimmers
- Static switches

Internal Configurations



Maximum Ratings

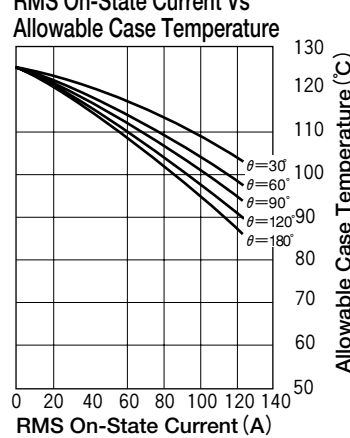
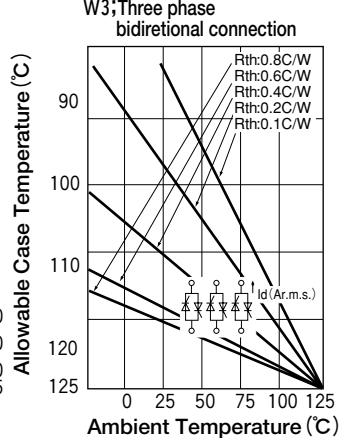
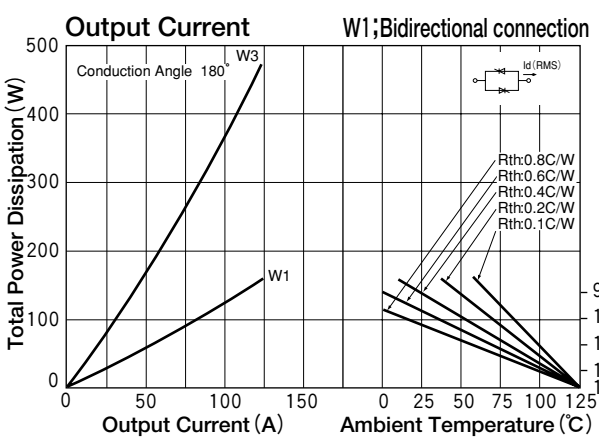
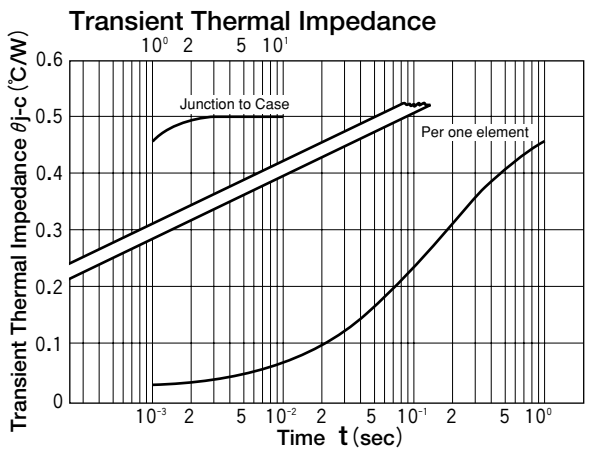
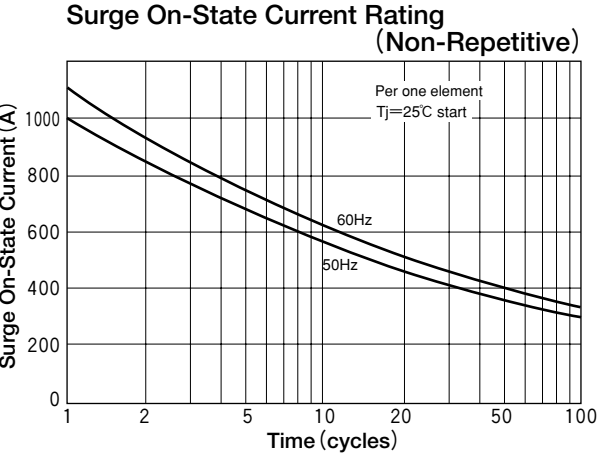
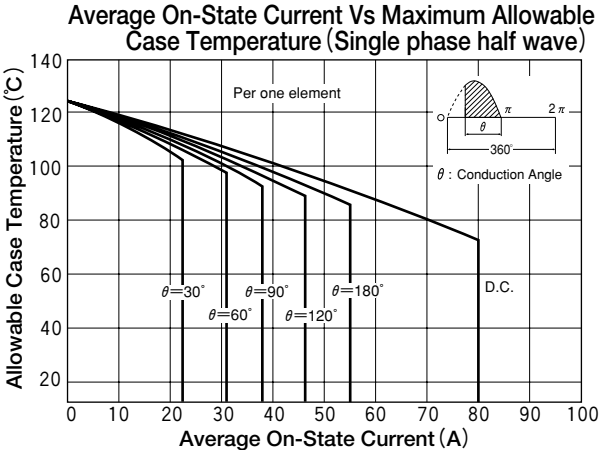
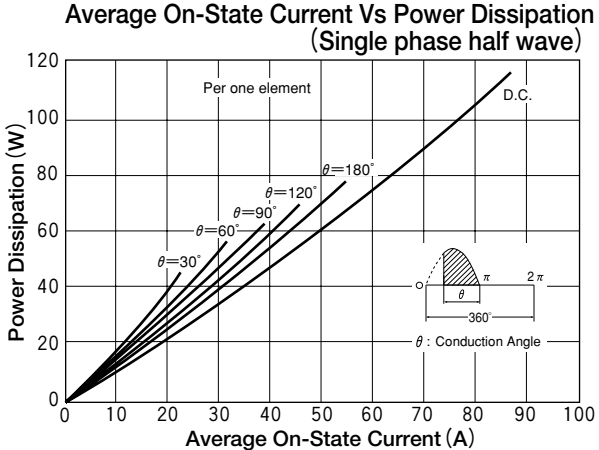
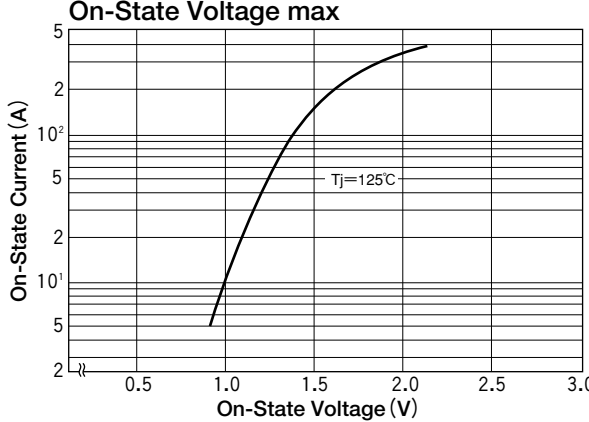
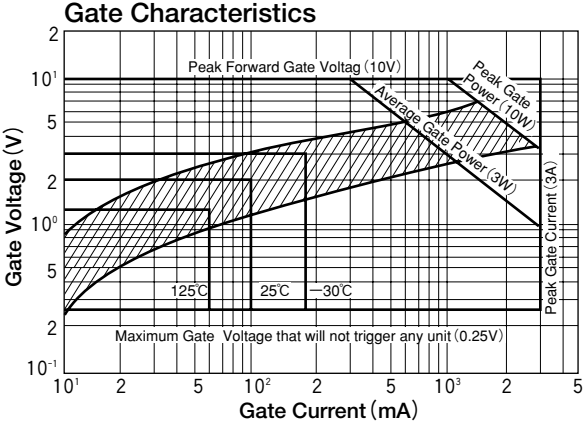
($T_j=25^\circ\text{C}$ unless otherwise specified)

Symbol	Item	Ratings		Unit
		AK55HB120	AK55HB160	
V_{DRM}	Repetitive Peak Off-State Voltage	1200	1600	V

Symbol	Item	Conditions	Ratings	Unit	
$I_{T(AV)}$	Average On-State Current	Single phase, half wave, 180° conduction, $T_c : 85^\circ\text{C}$	55	A	
$I_{T(RMS)}$	R.M.S. On-State Current	$T_c : 85^\circ\text{C}$	122	A	
I_{TSM}	Surge On-State Current	$\frac{1}{2}$ cycle, 50Hz/60Hz, peak value, non-repetitive	1000/1100	A	
I^2t	I^2t	Value for one cycle of surge current	5000	A^2S	
P_{GM}	Peak Gate Power Dissipation		10	W	
$P_{G(AV)}$	Average Gate Power Dissipation		3	W	
I_{FGM}	Peak Gate Current		3	A	
V_{FGM}	Peak Gate Voltage (Forward)		10	V	
V_{RGM}	Peak Gate Voltage (Reverse)		5	V	
di/dt	Critical Rate of Rise of On-State Current	$I_G=100\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=0.1\text{A}/\mu\text{s}$	150	$\text{A}/\mu\text{s}$	
V_{ISO}	Isolation Breakdown Voltage (R.M.S.)	A.C. 1 minute	2500	V	
T_j	Operating Junction Temperature		-40 to +125	$^\circ\text{C}$	
T_{stg}	Storage Temperature		-40 to +125	$^\circ\text{C}$	
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	$\text{N}\cdot\text{m}$ ($\text{kgf}\cdot\text{cm}$)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass	Typical Value	170	g	

Electrical Characteristics

Symbol	Item	Conditions	Ratings	Unit
I_{DRM}	Repetitive Peak Off-State Current, max.	at V_{DRM} , Single phase, half wave, $T_j=125^\circ\text{C}$	20	mA
V_{TM}	Peak On-State Voltage max.	On-State Current 165A, $T_j=125^\circ\text{C}$ Inst. measurement	1.50	V
I_{GT}/V_{GT}	Gate Trigger Current/Voltage, max.	$T_j=25^\circ\text{C}$, $I_T=1\text{A}$, $V_D=6\text{V}$	100/2	mA/V
V_{GD}	Non-Trigger Gate, Voltage, min.	$T_j=125^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$	0.25	V
t_{gt}	Turn On Time, max.	$I_T=55\text{A}$, $I_G=100\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=0.1\text{A}/\mu\text{s}$	10	μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_j=125^\circ\text{C}$, $V_D=\frac{2}{3}V_{DRM}$, Exponential wave.	500	$\text{V}/\mu\text{s}$
I_H	Holding Current, typ.	$T_j=25^\circ\text{C}$	50	mA
I_L	Latching Current, typ.	$T_j=25^\circ\text{C}$	100	mA
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to case, per $\frac{1}{2}$ Module	0.50	$^\circ\text{C}/\text{W}$
		Junction to case, per 1 Module	0.25	



THYRISTOR MODULE

AK90GB40/80



UL;E76102 (M)

Power Thyristor Module AK90GB series are designed for various rectifier circuits and power controls. For your circuit application, following internal connections and wide voltage ratings up to 800V are available, and electrically isolated mounting base make your mechanical design easy.

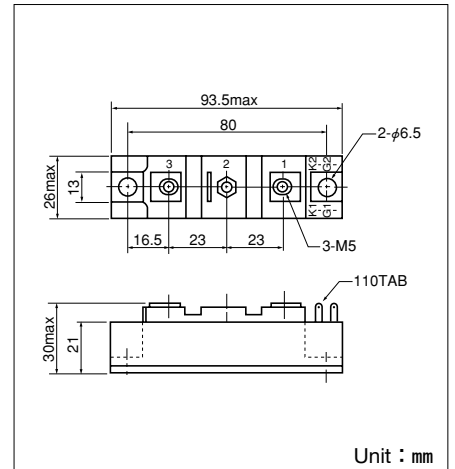
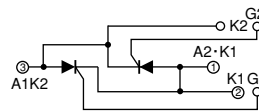
Isolated mounting base

- $I_{T(AV)}$ 90A, $I_{T(RMS)}$ 200A, I_{TSM} 1800A
- di/dt 200 A/ μ s
- dv/dt 500V/ μ s

(Applications)

- AC/DC motor drives
- Heater controls
- Light dimmers
- Static switches

Internal Configurations



Maximum Ratings

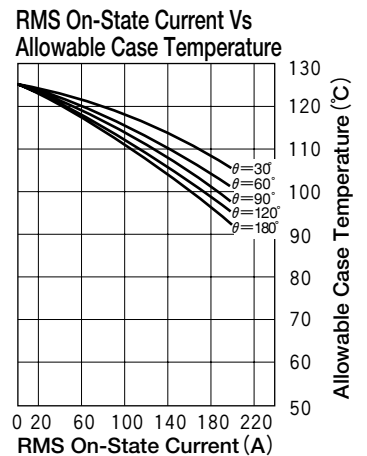
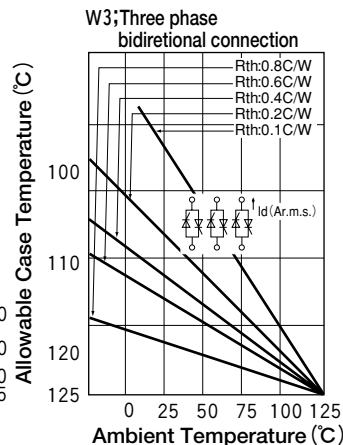
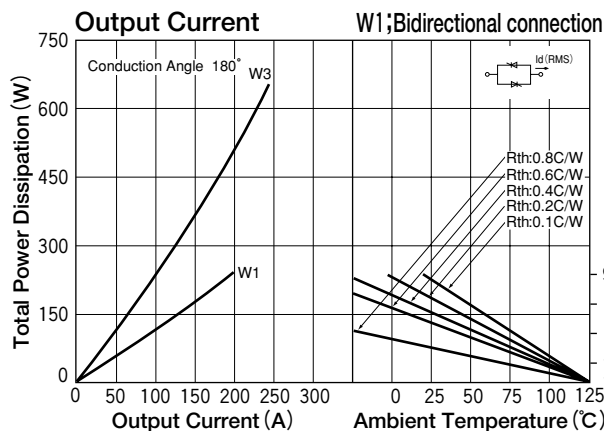
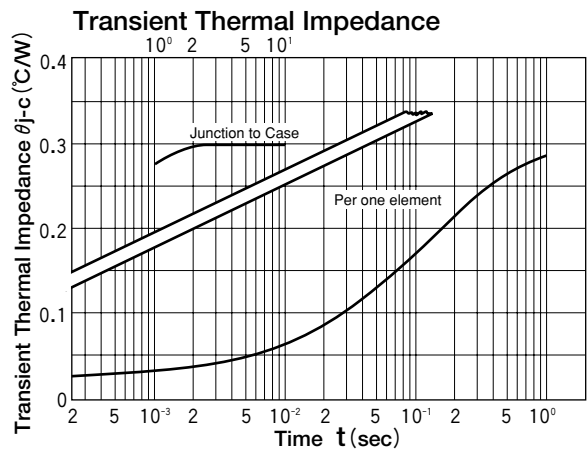
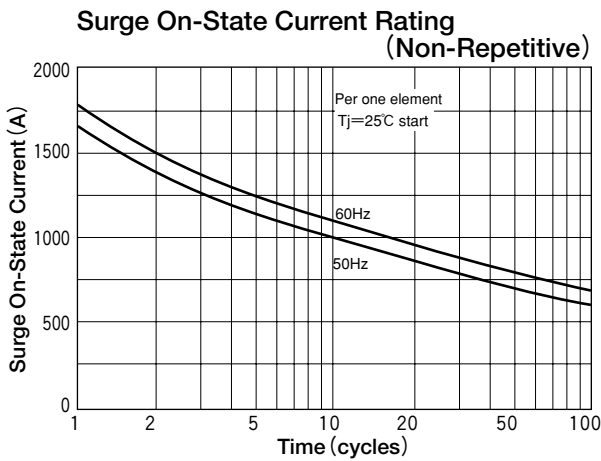
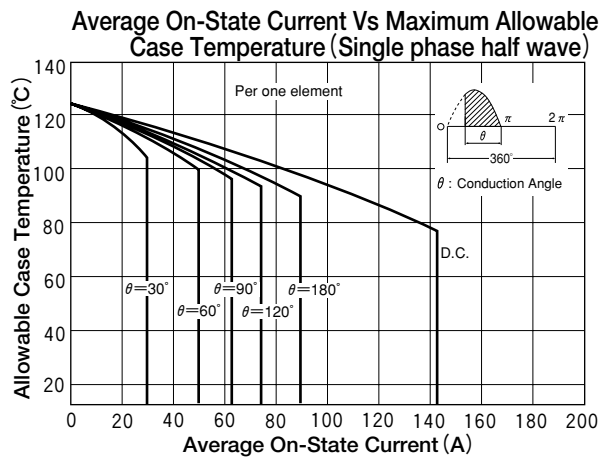
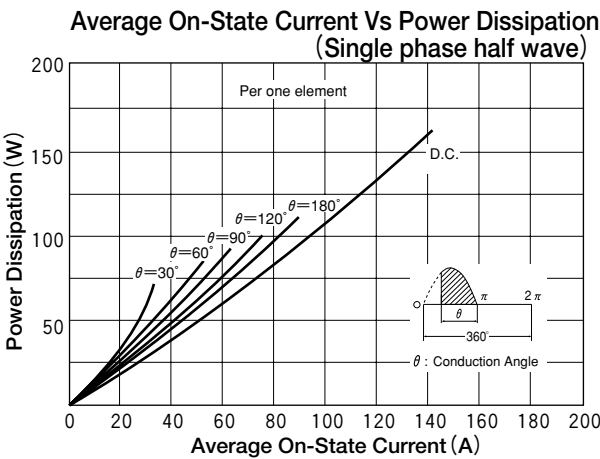
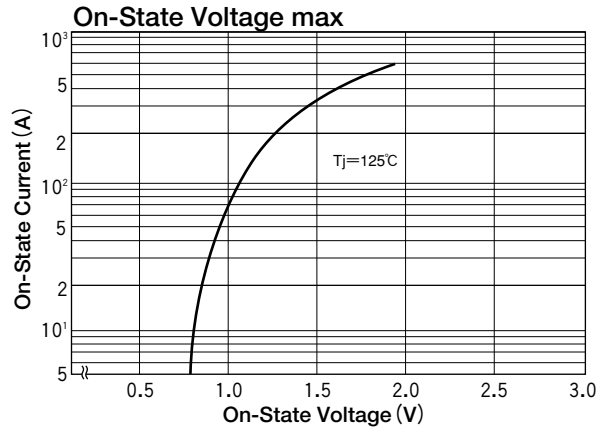
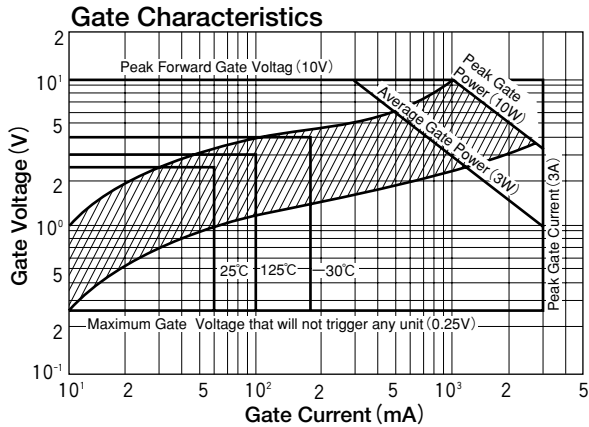
($T_j=25^\circ\text{C}$ unless otherwise specified)

Symbol	Item	Ratings		Unit
		AK90GB40	AK90GB80	
V_{DRM}	Repetitive Peak Off-State Voltage	400	800	V

Symbol	Item	Conditions	Ratings	Unit	
$I_{T(AV)}$	Average On-State Current	Single phase, half wave, 180° conduction, $T_c : 91^\circ\text{C}$	90	A	
$I_{T(RMS)}$	R.M.S. On-State Current	$T_c : 91^\circ\text{C}$	200	A	
I_{TSM}	Surge On-State Current	$\frac{1}{2}$ cycle, 50Hz/60Hz, peak value, non-repetitive	1650/1800	A	
I^2t	I^2t	Value for one cycle of surge current	15000	A^2s	
P_{GM}	Peak Gate Power Dissipation		10	W	
$P_{G(AV)}$	Average Gate Power Dissipation		3	W	
I_{FGM}	Peak Gate Current		3	A	
V_{FGM}	Peak Gate Voltage (Forward)		10	V	
V_{RGM}	Peak Gate Voltage (Reverse)		5	V	
di/dt	Critical Rate of Rise of On-State Current	$I_G=100\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=0.1\text{A}/\mu\text{s}$	200	$\text{A}/\mu\text{s}$	
V_{ISO}	Isolation Breakdown Voltage (R.M.S.)	A.C. 1 minute	2500	V	
T_j	Operating Junction Temperature		-40 to +125	$^\circ\text{C}$	
T_{stg}	Storage Temperature		-40 to +125	$^\circ\text{C}$	
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	$\text{N}\cdot\text{m}$ ($\text{kgf}\cdot\text{cm}$)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass	Typical Value	170	g	

Electrical Characteristics

Symbol	Item	Conditions	Ratings	Unit
I_{DRM}	Repetitive Peak Off-State Current, max.	at V_{DRM} , Single phase, half wave, $T_j=125^\circ\text{C}$	30	mA
V_{TM}	Peak On-State Voltage, max.	On-State Current 270A, $T_j=125^\circ\text{C}$ Inst. measurement	1.30	V
I_{GT}/V_{GT}	Gate Trigger Current/Voltage, max.	$T_j=25^\circ\text{C}$, $I_T=1\text{A}$, $V_D=6\text{V}$	100/3	mA/V
V_{GD}	Non-Trigger Gate, Voltage, min.	$T_j=125^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$	0.25	V
t_{gt}	Turn On Time, max.	$I_T=90\text{A}$, $I_G=100\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=0.1\text{A}/\mu\text{s}$	10	μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_j=125^\circ\text{C}$, $V_D=\frac{2}{3}V_{DRM}$, Exponential wave.	500	$\text{V}/\mu\text{s}$
I_H	Holding Current, typ.	$T_j=25^\circ\text{C}$	50	mA
I_L	Latching Current, typ.	$T_j=25^\circ\text{C}$	100	mA
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to case, per $\frac{1}{2}$ Module	0.30	$^\circ\text{C}/\text{W}$
		Junction to case, per 1 Module	0.15	



THYRISTOR MODULE

AK90HB120/160



UL;E76102 (M)

Power Thyristor Module AK90HB series are designed for various rectifier circuits and power controls. For your circuit application, following internal connections and wide voltage ratings up to 1,600V are available.

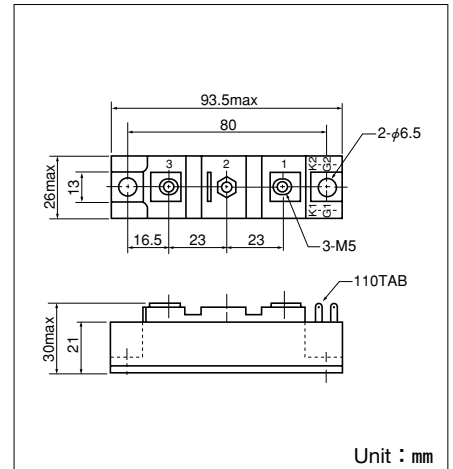
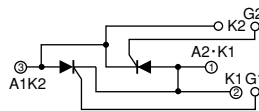
Isolated mounting base

- $I_{T(AV)}$ 90A, $I_{T(RMS)}$ 200A, I_{TSM} 1100A
- di/dt 200 A/ μ s
- dv/dt 500V/ μ s

(Applications)

- AC/DC motor drives
- Heater controls
- Light dimmers
- Static switches

Internal Configurations



Maximum Ratings

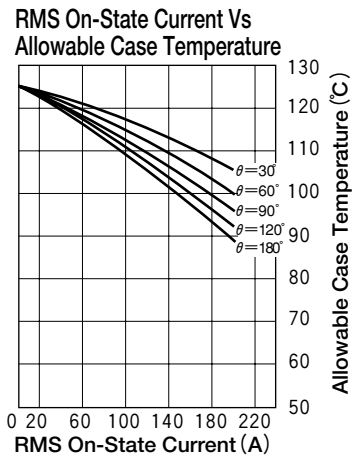
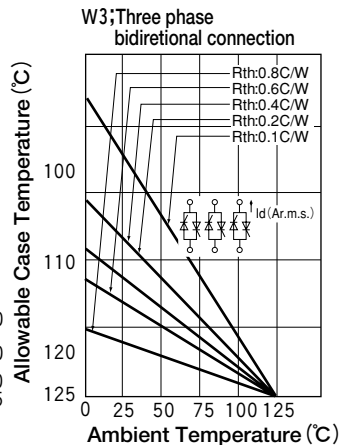
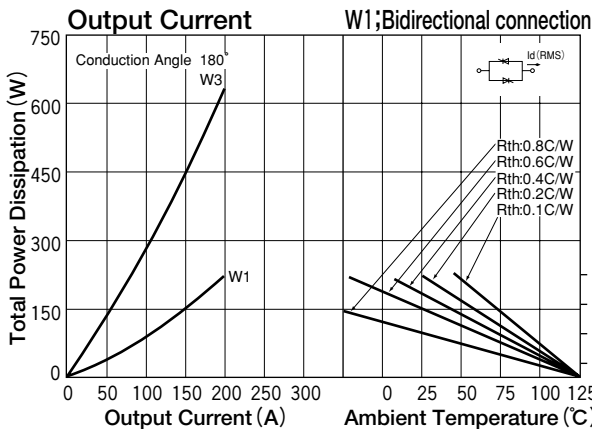
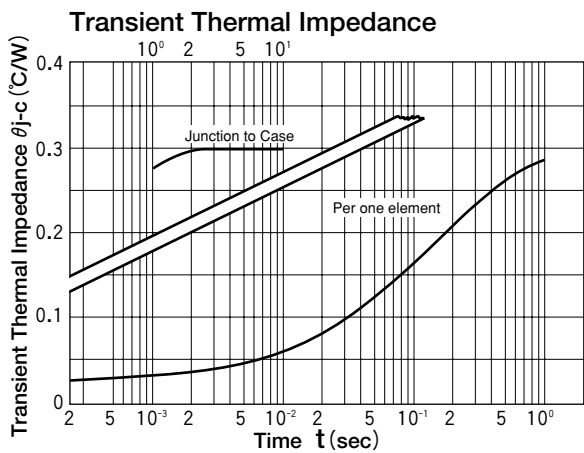
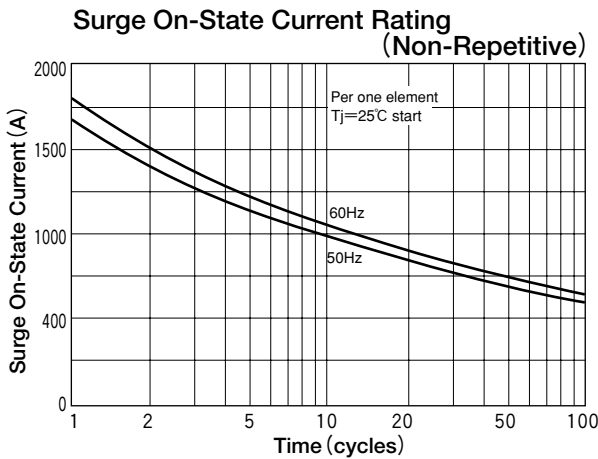
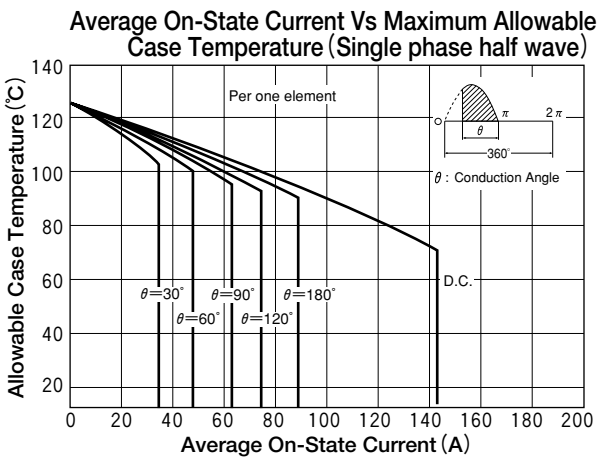
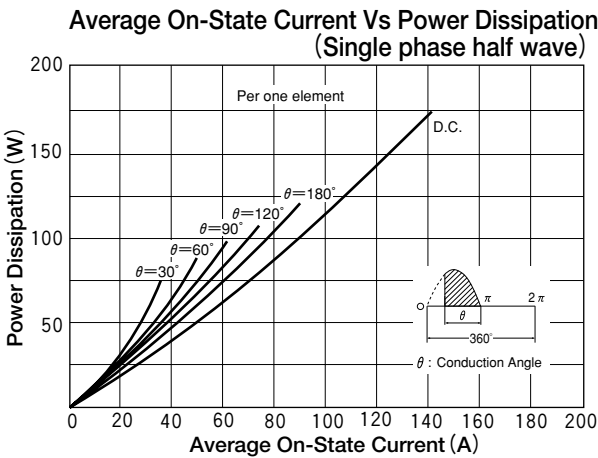
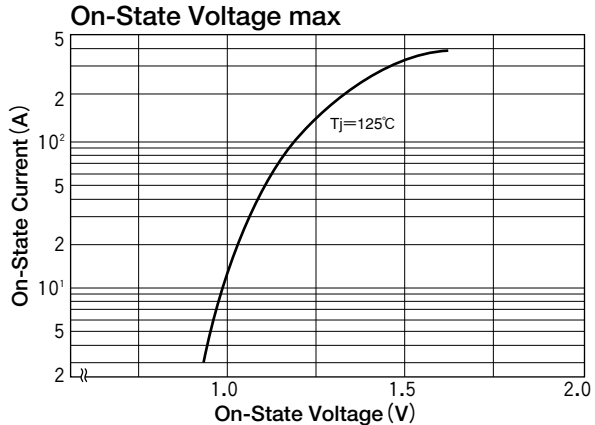
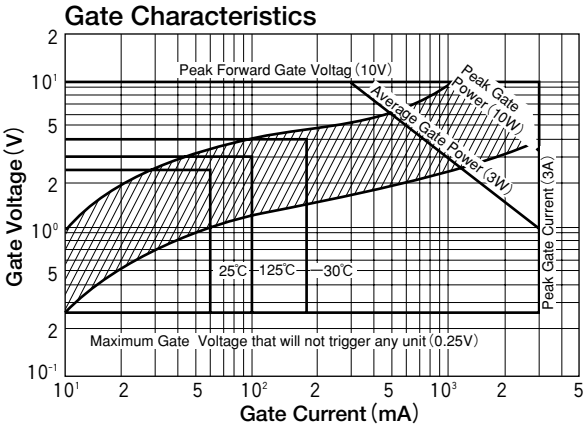
($T_j=25^\circ\text{C}$ unless otherwise specified)

Symbol	Item	Ratings		Unit
		AK90GB120	AK90GB160	
V_{DRM}	Repetitive Peak Off-State Voltage	1200	1600	V

Symbol	Item	Conditions	Ratings	Unit	
$I_{T(AV)}$	Average On-State Current	Single phase, half wave, 180° conduction, $T_c : 88^\circ\text{C}$	90	A	
$I_{T(RMS)}$	R.M.S. On-State Current	$T_c : 88^\circ\text{C}$	200	A	
I_{TSM}	Surge On-State Current	$\frac{1}{2}$ cycle, 50Hz/60Hz, peak value, non-repetitive	1650/1800	A	
I^2t	I^2t	Value for one cycle of surge current	15000	A^2s	
P_{GM}	Peak Gate Power Dissipation		10	W	
$P_{G(AV)}$	Average Gate Power Dissipation		3	W	
I_{FGM}	Peak Gate Current		3	A	
V_{FGM}	Peak Gate Voltage (Forward)		10	V	
V_{RGM}	Peak Gate Voltage (Reverse)		5	V	
di/dt	Critical Rate of Rise of On-State Current	$I_G=100\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=0.1\text{A}/\mu\text{s}$	200	$\text{A}/\mu\text{s}$	
V_{ISO}	Isolation Breakdown Voltage (R.M.S.)	A.C. 1 minute	2500	V	
T_j	Operating Junction Temperature		-40 to +125	$^\circ\text{C}$	
T_{stg}	Storage Temperature		-40 to +125	$^\circ\text{C}$	
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	$\text{N}\cdot\text{m}$ ($\text{kgf}\cdot\text{cm}$)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	
	Mass	Typical Value	170	g	

Electrical Characteristics

Symbol	Item	Conditions	Ratings	Unit
I_{DRM}	Repetitive Peak Off-State Current, max.	at V_{DRM} , Single phase, half wave, $T_j=125^\circ\text{C}$	30	mA
V_{TM}	Peak On-State Voltage, max.	On-State Current 270A, $T_j=125^\circ\text{C}$ Inst. measurement	1.40	V
I_{GT}/V_{GT}	Gate Trigger Current/Voltage, max.	$T_j=25^\circ\text{C}$, $I_T=1\text{A}$, $V_D=6\text{V}$	100/2	mA/V
V_{GD}	Non-Trigger Gate, Voltage, min.	$T_j=125^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$	0.25	V
t_{gt}	Turn On Time, max.	$I_T=90\text{A}$, $I_G=100\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $dI_G/dt=0.1\text{A}/\mu\text{s}$	10	μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_j=125^\circ\text{C}$, $V_D=\frac{2}{3}V_{DRM}$, Exponential wave.	500	$\text{V}/\mu\text{s}$
I_H	Holding Current, typ.	$T_j=25^\circ\text{C}$	50	mA
I_L	Latching Current, typ.	$T_j=25^\circ\text{C}$	100	mA
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to case, per $\frac{1}{2}$ Module	0.30	$^\circ\text{C}/\text{W}$
		Junction to case, per 1 Module	0.15	



THYRISTOR MODULE (THREE PHASES A.C. CONTROL)

PFB15AA



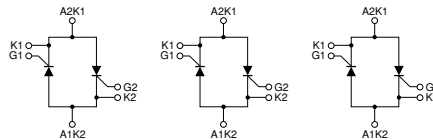
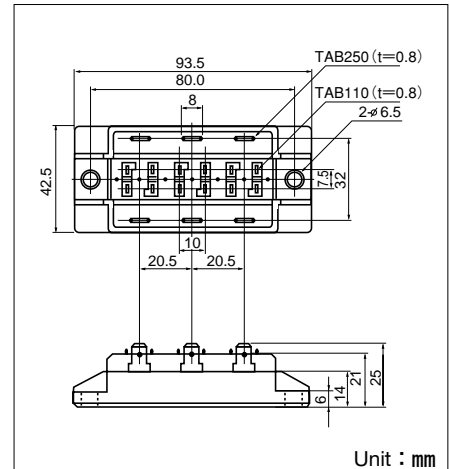
UL:E76102 (M)

PFB15AA is a 6 chip Thyristor module which contains 3 independent back-to-back SCR configurations.

- Easy construction by 3 phase back-to back SCRs in one package.
- high voltage 1600V

(Applications)

SSR
3 Phase Motor Control
Heater Control



Maximum Ratings

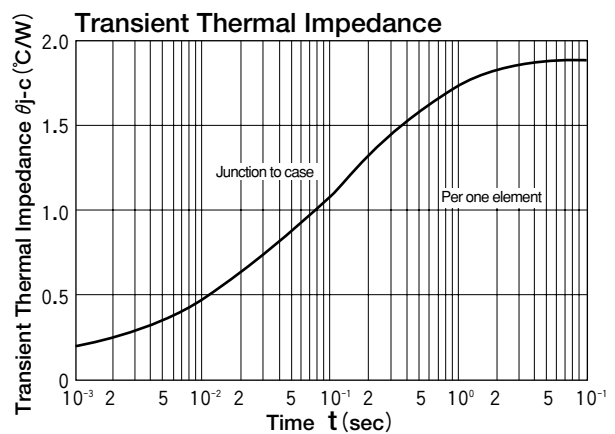
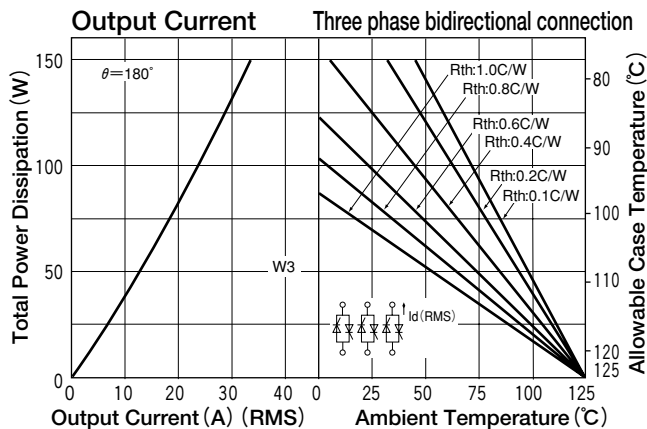
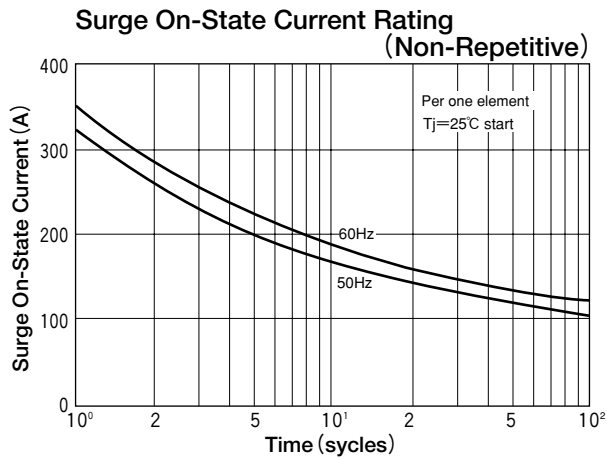
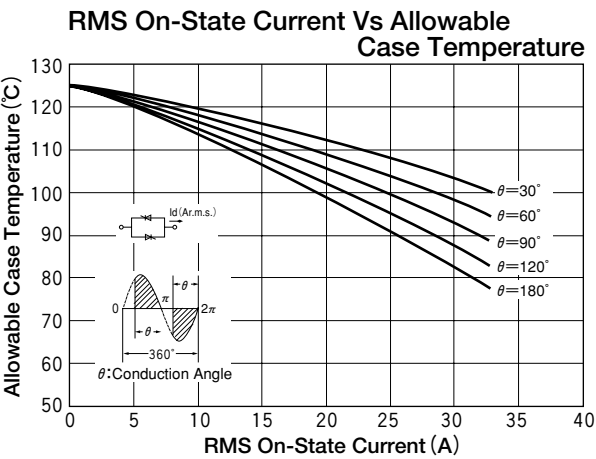
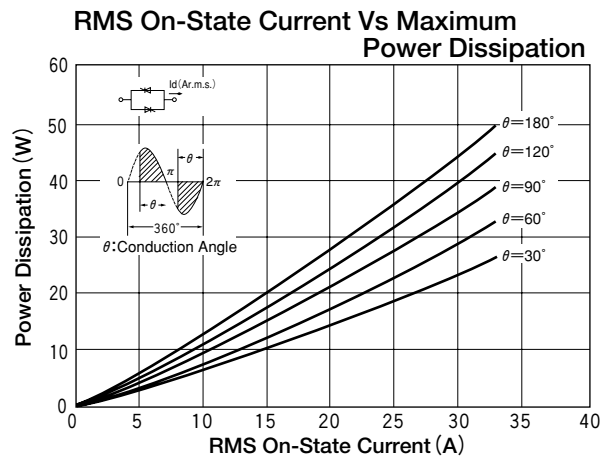
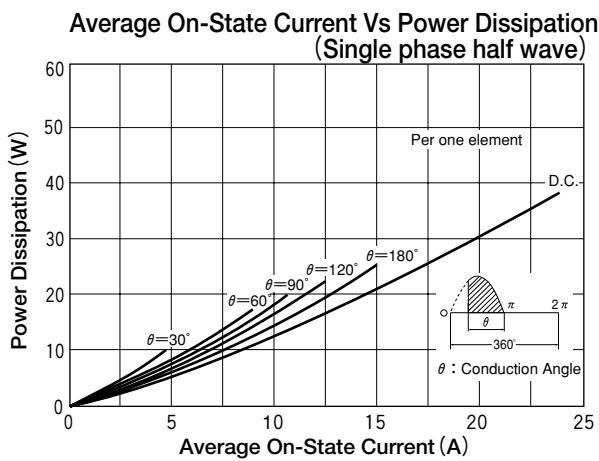
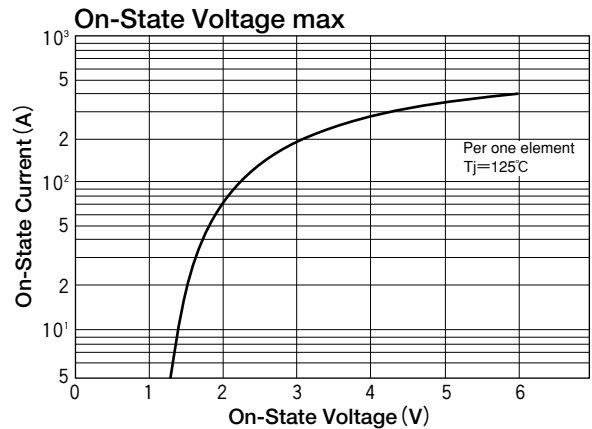
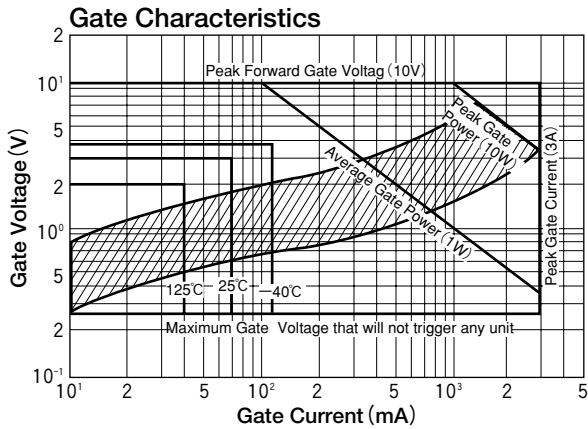
(T_j=25°C unless otherwise specified)

Symbol	Item	Ratings					Unit
		PFB15AA80	PFB15AA100	PFB15AA120	PFB15AA140	PFB15AA160	
V _{DRM}	Repetitive Peak Off-State Voltage	800	1000	1200	1400	1600	V

Symbol	Item	Conditions	Ratings	Unit
I _{T(AV)}	Average On-State Current	Single phase, half wave, 180° conduction, T _c : 77°C	15	A
I _{T(RMS)}	R.M.S. On-State Current	T _c : 77°C	33	A
I _{TSM}	Surge On-State Current	1/2 cycle, 50Hz/60Hz, peak value, non-repetitive	320/350	A
I ² t	I ² t		512	A ² S
P _{GM}	Peak Gate Power Dissipation		10	W
P _{G(AV)}	Average Gate Power Dissipation		1	W
I _{FGM}	Peak Gate Current		3	A
V _{FGM}	Peak Gate Voltage (Forward)		10	V
V _{RGM}	Peak Gate Voltage (Reverse)		5	V
di/dt	Critical Rate of Rise of On-State Current	I _g =100mA, T _j =25°C, V _D =1/2V _{DRM} , di _g /dt=1A/μs	100	A/μs
V _{ISO}	Isolation Breakdown Voltage (R.M.S.)	A.C.1minute	2500	V
T _j	Operating Junction Temperature		-40 to +125	°C
T _{stg}	Storage Temperature		-40 to +125	°C
	Mounting Torque (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)	N·m (kgf·cm)
	Mass		160	g

Electrical Characteristics

Symbol	Item	Conditions	Ratings	Unit
I _{DRM}	Repetitive Peak Off-State Current, max.	at V _{DRM} , single phase, half wave, T _j =125°C	10	mA
V _{TM}	Peak On-State Voltage, max.	On-State Current 45A, T _j =125°C Inst. measurement	1.75	mV
I _{GT} /V _{GT}	Gate Trigger Current/Voltage, max.	T _j =25°C, I _T =1A, V _D =6V	70/3	mA/V
V _{GD}	Non-Trigger Gate, Voltage, min.	T _j =125°C, V _D =1/2V _{DRM}	0.25	V
t _{gt}	Turn On Time, max.	I _T =15A, I _g =100mA, T _j =25°C, V _D =1/2V _{DRM} , di _g /dt=1A/μs	10	μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	T _j =125°C, V _D =2/3V _{DRM} , Exponential wave.	500	V/μs
I _H	Holding Current, typ.	T _j =25°C	50	mA
I _L	Latching Current, typ.	T _j =25°C	100	mA
R _{th(j-c)}	Thermal Impedance, max. (one element)	Junction to case	1.90	°C/W
R _{th(j-c)}	Thermal Impedance, max. (six element)	Junction to case	0.317	°C/W



THYRISTOR MODULE (SINGLE PHASE BRIDGE TYPE)

FSD20A30/60

TOP



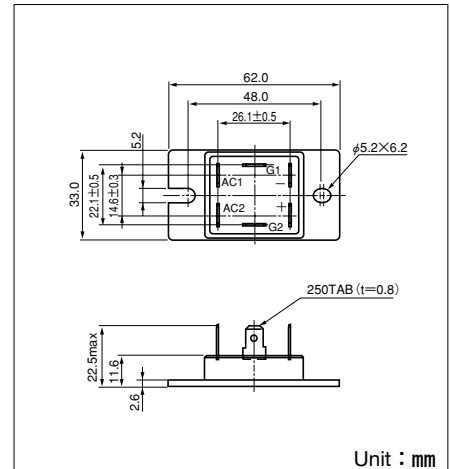
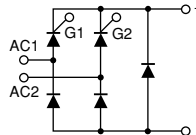
UL:E76102 (M)

FSD20A is a single phase bridge module consist of thyristors and diodes

- $I_D=20A$, $V_{RRM}=600V$
- Easy Construction
- Highly reliable glass passivated chips

(Applications)

Rectification (Bridge)
Motor Drive



Maximum Ratings

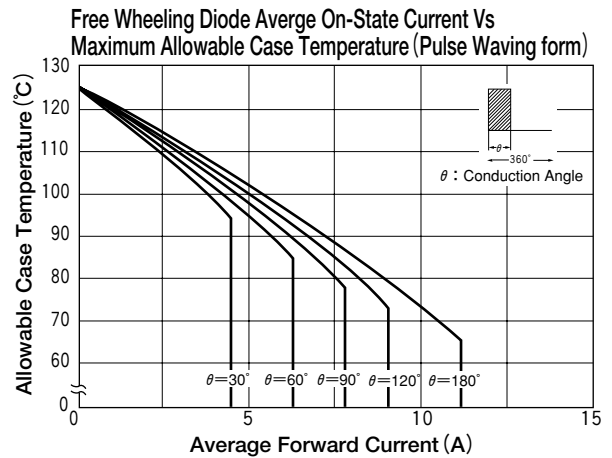
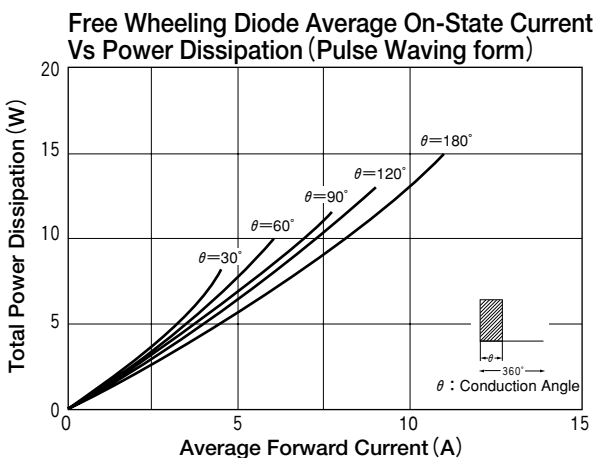
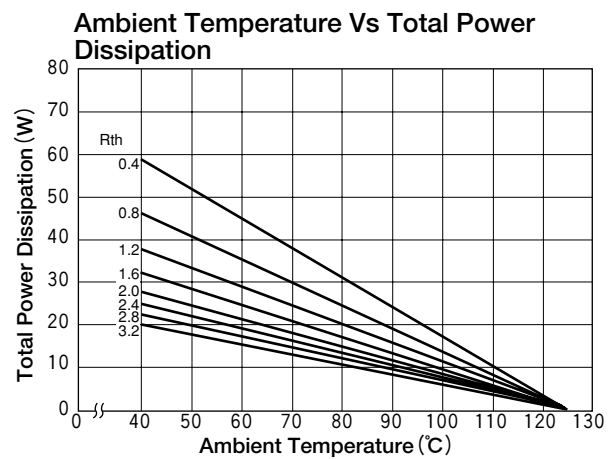
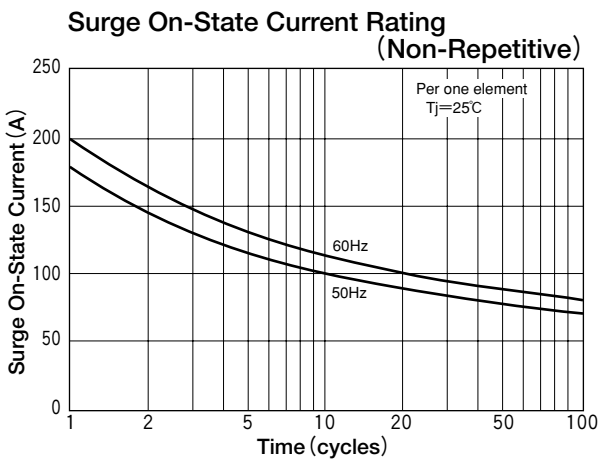
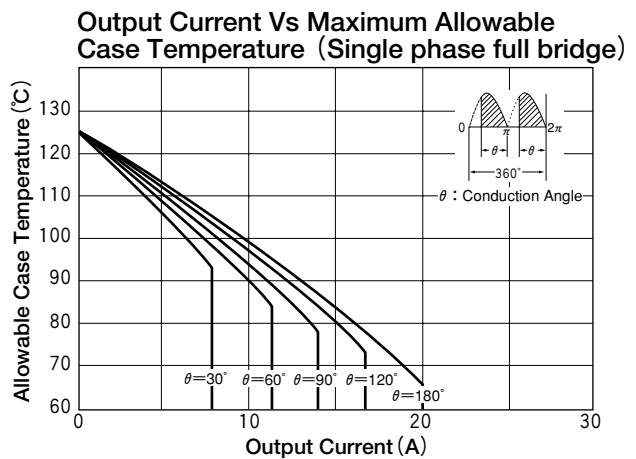
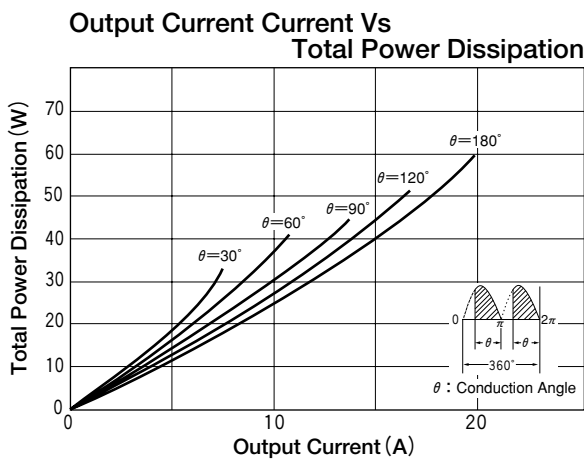
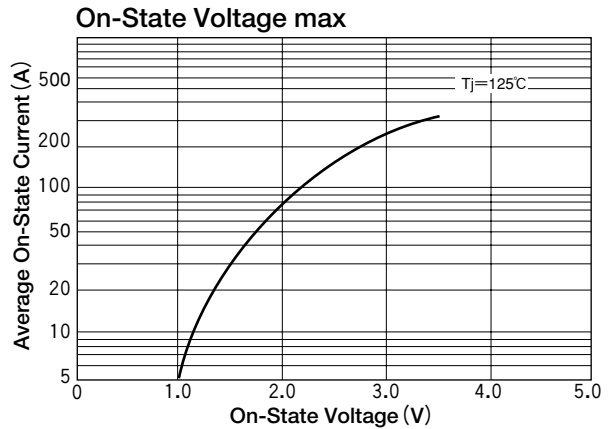
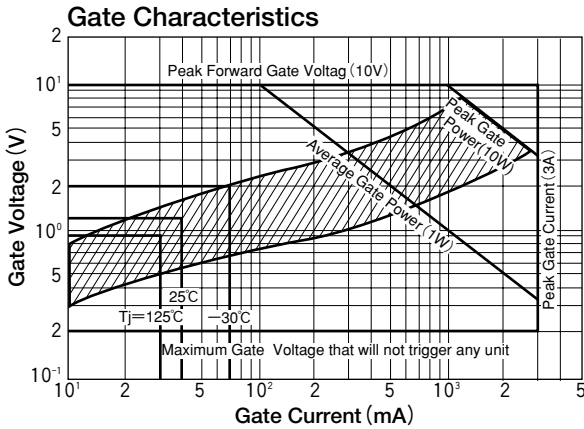
($T_j=25^\circ\text{C}$ unless otherwise specified)

Symbol	Item	Ratings		Unit
		FSD20A30	FSD20A60	
V_{RRM}	Repetitive Peak Reverse Voltage	300	600	V
V_{DRM}	Repetitive Peak Off-State Voltage	300	600	V

Symbol	Item	Conditions	Ratings	Unit
$I_{T(AV)}$	Average On-State Current	Single phase, half wave, 180° conduction, $T_c : 65^\circ\text{C}$	20	A
I_{TSM}	Surge On-State Current	$\frac{1}{2}$ cycle, 50Hz/60Hz, peak value, non-repetitive	180/200	A
I^2t	I^2t		165	A^2S
P_{GM}	Peak Gate Power Dissipation		10	W
$P_{G(AV)}$	Average Gate Power Dissipation		1	W
I_{FGM}	Peak Gate Current		3	A
V_{FGM}	Peak Gate Voltage (Forward)		10	V
V_{RGM}	Peak Gate Voltage (Reverse)		5	V
di/dt	Critical Rate of On-State Current	$I_G=100\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $di_G/dt=1\text{A}/\mu\text{s}$	100	$\text{A}/\mu\text{s}$
V_{ISO}	Isolation Breakdown Voltage (R.M.S.)	A.C.1 minute	2500	V
T_j	Operating Junction Temperature		-30 to +125	$^\circ\text{C}$
T_{stg}	Storage Temperature		-30 to +125	$^\circ\text{C}$
	Mounting Torque (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)	$\text{N}\cdot\text{m}$ ($\text{kgf}\cdot\text{cm}$)
	Mass		66	g

Electrical Characteristics

Symbol	Item	Conditions	Ratings	Unit
I_{DRM}	Repetitive Peak Off-State Current, max.	at V_{DRM} , single phase, half wave, $T_j=125^\circ\text{C}$	5	mA
I_{RRM}	Repetitive Peak Reverse Current, max.	at V_{DRM} , single phase, half wave, $T_j=125^\circ\text{C}$	5	mA
V_{TM}	Peak On-State Voltage, max.	On-State Current 30A, $T_j=25^\circ\text{C}$ Inst. measurement	1.5	V
I_{GT}/V_{GT}	Gate Trigger Current/Voltage, max.	$T_j=25^\circ\text{C}$, $I_T=1\text{A}$, $V_D=6\text{V}$	40/1.2	mA/V
V_{GD}	Non-Trigger Gate, Voltage. min.	$T_j=125^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$	0.2	V
t_{gt}	Turn On Time, max.	$I_T=10\text{A}$, $I_G=100\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=\frac{1}{2}V_{DRM}$, $di_G/dt=1\text{A}/\mu\text{s}$	10	μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_j=125^\circ\text{C}$, $V_D=\frac{2}{3}V_{DRM}$, Exponential wave.	50	$\text{V}/\mu\text{s}$
I_H	Holding Current, typ.	$T_j=25^\circ\text{C}$	30	mA
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to case	1.0	$^\circ\text{C}/\text{W}$



THYRISTOR MODULE (ISOLATED MOLD TYPE)

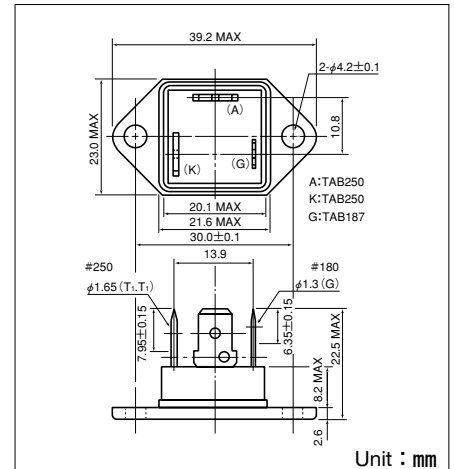
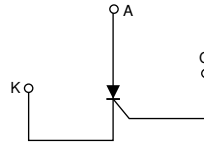
SG16AA



UL:E76102 (M)

SG16AA is an isolated molded thyristor which is suitable for a wide range of industrial and home electronics uses. SG16AA uses highly reliable glass passivation.

- $I_{T(AV)}=16A$
- high Surge Capability
- Tab terminals for easy wiring.



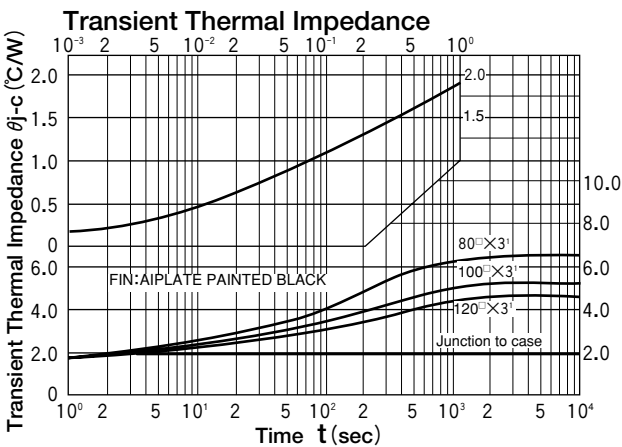
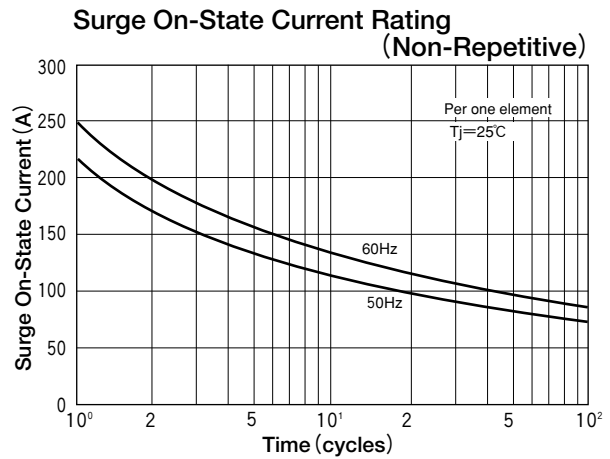
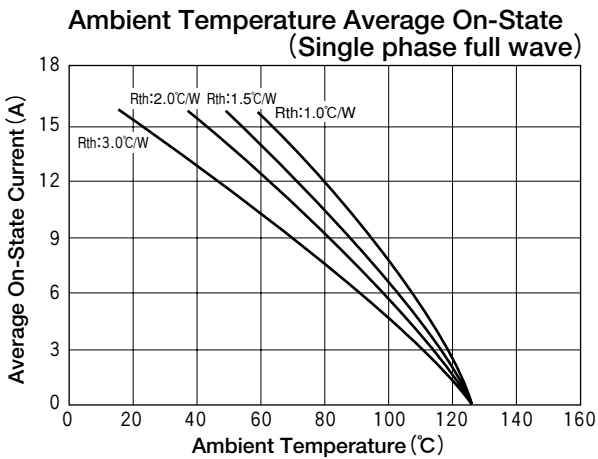
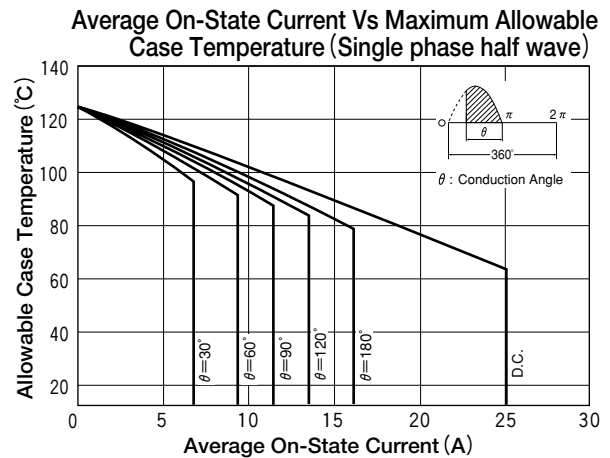
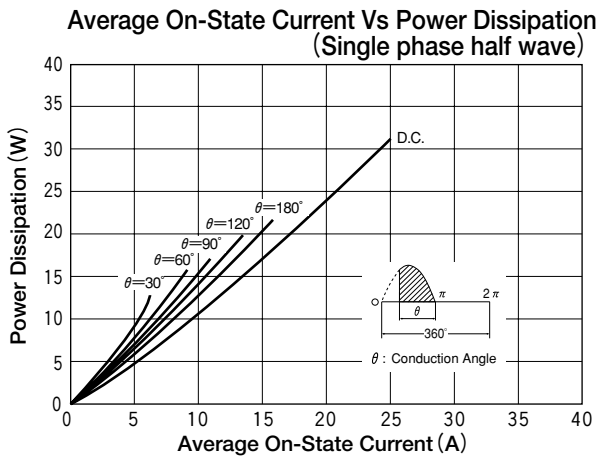
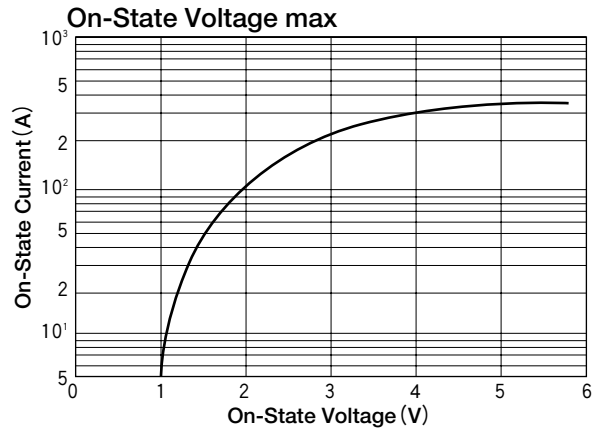
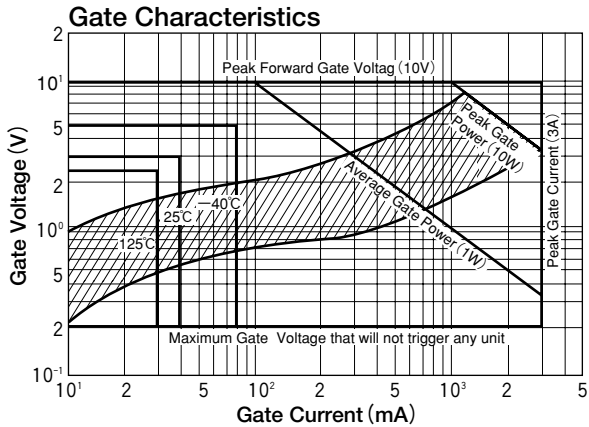
Maximum Ratings

Symbol	Item	Ratings			Unit
		SG16AA20	SG16AA40	SG16AA60	
VRRM	Repetitive Peak Reverse Voltage	200	400	600	V
VRSM	Non-Repetitive Peak Reverse Voltage	240	480	720	V
VDRM	Repetitive Peak Off-State Voltage	200	400	600	V

Symbol	Item	Conditions	Ratings	Unit
$I_{T(AV)}$	Average On-State Current	Single phase, half wave, 180° conduction, $T_c : 80^\circ\text{C}$	16	A
$I_{T(RMS)}$	R.M.S. On-State Current	Single phase, half wave, 180° conduction, $T_c : 80^\circ\text{C}$	25	A
I_{TSM}	Surge On-State Current	1/2 cycle, 50Hz/60Hz, peak value, non-repetitive	220/250	A
I^2t	I^2t	2~10ms	260	A ² S
P _{GM}	Peak Gate Power Dissipation		10	W
P _{G(AV)}	Average Gate Power Dissipation		1	W
I _{FGM}	Peak Gate Current		3	A
V _{FGM}	Peak Gate Voltage(Forward)		10	V
V _{RGM}	Peak Gate Voltage(Reverse)		5	V
di/dt	Critical Rate of Rise of On-State Current	$I_G=100\text{mA}$, $T_J=25^\circ\text{C}$, $V_D=1/2V_{DRM}$, $dI_G/dt=1\text{A}/\mu\text{s}$	100	A/ μs
V _{ISO}	Isolation Breakdown Voltage (R.M.S.)	A.C.1minute	2500	V
T _J	Operating Junction Temperature		-40 to +125	°C
T _{stg}	Storage Temperature		-40 to +125	°C
	Mounting Torque (M4)	Recommended Value 1.0-1.4 (10-14)	1.5 (15)	N·m (kgf·cm)
	Mass		23	g

Electrical Characteristics

Symbol	Item	Conditions	Ratings	Unit
I _{DRM}	Repetitive Peak Off-State Current, max.	at V_{DRM} , single phase, half wave, $T_J=125^\circ\text{C}$	3	mA
I _{RRM}	Repetitive Peak Reverse Current, max.	at V_{DRM} , single phase, half wave, $T_J=125^\circ\text{C}$	3	mA
V _{TM}	Peak On-State Voltage, max.	On-State Current 50A, $T_J=25^\circ\text{C}$ Inst. measurement	1.50	V
I _{GT} /V _{GT}	Gate Trigger Current/Voltage, max.	$T_J=25^\circ\text{C}$, $I_T=1\text{A}$, $V_D=6\text{V}$	40/3	mA/V
V _{GD}	Non-Trigger Gate, Voltage. min.	$T_J=125^\circ\text{C}$, $V_D=1/2V_{DRM}$	0.2	V
t _{gt}	Turn On Time, max.	$I_T=16\text{A}$, $I_G=100\text{mA}$, $T_J=25^\circ\text{C}$, $V_D=1/2V_{DRM}$, $dI_G/dt=1\text{A}/\mu\text{s}$	10	μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_J=125^\circ\text{C}$, $V_D=2/3V_{DRM}$, Exponential wave.	100	V/ μs
I _H	Holding Current, typ.	$T_J=25^\circ\text{C}$	30	mA
R _{th(j-c)}	Thermal Impedance, max.	Junction to case	2.0	°C/W



THYRISTOR MODULE (ISOLATED MOLD TYPE)

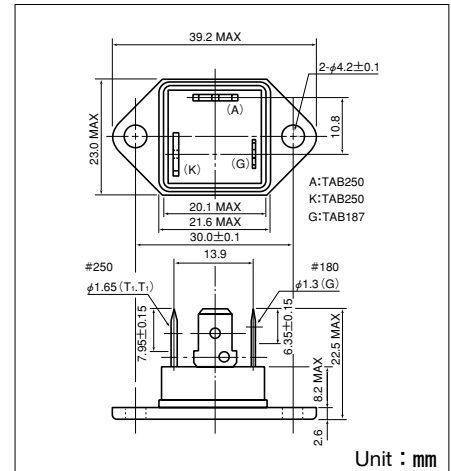
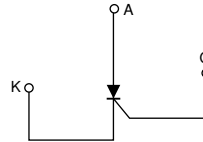
SG25AA



UL:E76102 (M)

SG25AA is an isolated molded thyristor which is suitable for a wide range of industrial and home electronics uses. SG25AA uses highly reliable glass passivation.

- $I_{T(AV)}=25A$
- high Surge Capability
- Tab terminals for easy wiring.



Maximum Ratings

Symbol	Item	Ratings			Unit
		SG25AA20	SG25AA40	SG25AA60	
VRRM	Repetitive Peak Reverse Voltage	200	400	600	V
VRSM	Non-Repetitive Peak Reverse Voltage	240	480	720	V
VDRM	Repetitive Peak Off-State Voltage	200	400	600	V

Symbol	Item	Conditions	Ratings	Unit
$I_{T(AV)}$	Average On-State Current	Single phase, half wave, 180° conduction, $T_c : 70^\circ\text{C}$	25	A
$I_{T(RMS)}$	R.M.S. On-State Current	Single phase, half wave, 180° conduction, $T_c : 70^\circ\text{C}$	39	A
I_{TSM}	Surge On-State Current	1/2 cycle, 50Hz/60Hz, peak value, non-repetitive	450/500	A
I^2t	I^2t	2~10ms	1040	A ² S
P _{GM}	Peak Gate Power Dissipation		10	W
P _{G(AV)}	Average Gate Power Dissipation		1	W
I _{FGM}	Peak Gate Current		3	A
V _{FGM}	Peak Gate Voltage(Forward)		10	V
V _{RGM}	Peak Gate Voltage(Reverse)		5	V
di/dt	Critical Rate of Rise of On-State Current	$I_G=100\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=1/2V_{DRM}$, $dI_G/dt=1A/\mu\text{s}$	100	A/ μs
V _{ISO}	Isolation Breakdown Voltage (R.M.S.)	A.C.1minute	2500	V
T _j	Operating Junction Temperature		-40 to +125	°C
T _{stg}	Storage Temperature		-40 to +125	°C
	Mounting Torque (M4)	Recommended Value 1.0-1.4 (10-14)	1.5 (15)	N·m (kgf·cm)
	Mass		23	g

Electrical Characteristics

Symbol	Item	Conditions	Ratings	Unit
I _{DRM}	Repetitive Peak Off-State Current, max.	at V_{DRM} , single phase, half wave, $T_j=125^\circ\text{C}$	5	mA
I _{RRM}	Repetitive Peak Reverse Current, max.	at V_{DRM} , single phase, half wave, $T_j=125^\circ\text{C}$	5	mA
V _{TM}	Peak On-State Voltage, max.	On-State Current 78A, $T_j=25^\circ\text{C}$ Inst. measurement	1.40	V
I _{GT} /V _{GT}	Gate Trigger Current/Voltage, max.	$T_j=25^\circ\text{C}$, $I_T=1A$, $V_D=6V$	40/3	mA/V
V _{GD}	Non-Trigger Gate, Voltage. min.	$T_j=125^\circ\text{C}$, $V_D=1/2V_{DRM}$	0.2	V
t _{gt}	Turn On Time, max.	$I_T=25A$, $I_G=100\text{mA}$, $T_j=25^\circ\text{C}$, $V_D=1/2V_{DRM}$, $dI_G/dt=1A/\mu\text{s}$	10	μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_j=125^\circ\text{C}$, $V_D=2/3V_{DRM}$, Exponential wave.	100	V/ μs
I _H	Holding Current, typ.	$T_j=25^\circ\text{C}$	30	mA
R _{th(j-c)}	Thermal Impedance, max.	Junction to case	1.6	°C/W

