# ZWS240BP

## SPECIFICATIONS

A253-01-01C

| | ITEMS / MODEL | | | ZWS240BP -24 | ZWS240BP -36 | ZWS240BP -48 |
|---|---|---|---|---|---|---|
| 1 | Nominal Output Voltage | | V | 24 | 36 | 48 |
| 2 | Average Output Current | | A | 10 | 6.7 | 5.0 |
| 3 | Peak Output Current | (*1) | A | 20.0 | 13.4 | 10.0 |
| 4 | Average Output Power | | W | 240.0 | 241.2 | 240.0 |
| 5 | Peak Output Power | (*1) | W | 480.0 | 482.4 | 480.0 |
| 6 | Efficiency (Typ) | 100VAC | % | 88 | | |
| | (*2) | 200VAC | % | 91 | | |
| 7 | Input Voltage Range | (*3)(*13) | - | 85 - 265VAC (47 - 63Hz) or 120 - 370VDC | | |
| 8 | Input Current (Typ) | (*2) | A | 2.8/1.5 | | |
| 9 | Inrush Current (Typ) | (*2)(*4) | - | 15A at 100VAC, 30A at 200VAC, Ta=25°C, Cold Start | | |
| 10 | PFHC | | - | Designed to meet IEC61000-3-2 | | |
| 11 | Power Factor (Typ) | (*2) | - | 0.98/0.93 | | |
| 12 | Output Voltage Range | | V | 21.6 - 27.5 | 32.4 - 39.6 | 39.6 - 52.8 |
| 13 | Maximum Ripple & Noise | 0≤Ta≤70°C | mV | 240 | 360 | 480 |
| | (*5) | -10≤Ta<0°C | mV | 360 | 540 | 720 |
| 14 | Maximum Line Regulation | (*5)(*6) | mV | 96 | 144 | 192 |
| 15 | Maximum Load Regulation | (*5)(*7) | mV | 192 | 288 | 384 |
| 16 | Temperature Coefficient | (*5) | - | Less than 0.02% / °C | | |
| 17 | Over Current Protection | (*8) | A | 20.10 - | 13.47 - | 10.05 - |
| 18 | Over Voltage Protection | (*9) | V | 28.8 - 33.6 | 41.4 - 48.6 | 55.2 - 64.8 |
| 19 | Hold-up Time (Typ) | (*2) | - | 20ms | | |
| 20 | Leakage Current | (*10) | - | Less than 0.5mA. 0.2mA(Typ) at 100VAC / 0.4mA(Typ) at 230VAC | | |
| 21 | Remote Control | | - | Option | | |
| 22 | Parallel Operation | | - | - | | |
| 23 | Series Operation | | - | Possible | | |
| 24 | Operating Temperature | (*11) | - | Convection : -10 - +70°C (-10 - +50°C:100%, +60°C:65%, +70°C:30%) | | |
| 25 | Operating Humidity | | - | 30 - 90%RH (No Condensing) | | |
| 26 | Storage Temperature | | - | -30 - +75°C | | |
| 27 | Storage Humidity | | - | 10 - 90%RH (No Condensing) | | |
| 28 | Cooling | | - | Convection Cooling | | |
| 29 | Withstand Voltage | | - | Input - FG : 2kVAC (10mA), Input - Output : 3kVAC (10mA)<br>Output - FG : 500VAC (20mA) for 1min | | |
| 30 | Isolation Resistance | | - | More than 100MΩ at 25°C and 70%RH Output - FG : 500VDC | | |
| 31 | Vibration | | - | At no operating, 10 - 55Hz (Sweep for 1min)<br>19.6m/s$^2$ Constant, X,Y,Z 1hour each. | | |
| 32 | Shock | | - | Less than 196.1m/s$^2$ | | |
| 33 | Safety | | - | Approved by UL62368-1, CSA62368-1, EN62368-1, UL60950-1, CSA60950-1, EN60950-1 (Expire date of 60950-1 : 20/12/2020), EN50178(OV II)<br>Designed to meet DENAN at 100VAC Only. | | |
| 34 | Conducted Emission | (*12) | - | Designed to meet EN55011/EN55032-B, FCC-B, VCCI-B | | |
| 35 | Radiated Emission | (*12) | - | Designed to meet EN55011/EN55032-B, FCC-B, VCCI-B | | |
| 36 | Immunity | | - | Designed to meet IEC61000-6-2 IEC61000-4-2, -3, -4, -5, -6, -8, -11 | | |
| 37 | Weight (Typ) | | g | 520 | | |
| 38 | Size (W x H x D) | | mm | 84 x 42 x 180 ( Refer to Outline Drawing ) | | |

*Read instruction manual carefully, before using the power supply unit.

=NOTES=

*1. Operating time at peak output is less than 5sec, duty is less than 40%. For details, refer to peak output condition (A253-01-03_). When the peak output more than 5 sec is continued, the output is shut down, manual reset.

*2. At 100VAC/200VAC, Ta=25°C, nominal output voltage and average output power.

*3. For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100 - 240VAC (50-60Hz).

*4. Not applicable for the in-rush current to Noise Filter for less than 0.2ms.

*5. Please refer to Fig. A for measurement of Vo, line & load regulation and ripple voltage.

*6. 90 - 265VAC, constant load.

*7. No load-Average load, constant input voltage.

*8. Constant current limit with automatic recovery. Avoid to operate at over load or short circuit condition.

*9. OVP circuit will shut down output, manual reset (Re power on).

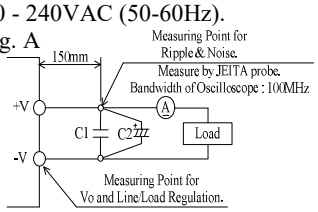
*10. Measured by the each measuring method of UL, CSA, EN and DENAN (at 60Hz), Ta=25°C.

*11. Output Derating - Derating at standard mounting. Refer to output derating curve (A253-01-02_).
- When forced air cooling, refer to forced air cooling specifications (A253-01-04_, A253-01-05_, A253-01-06_).
- Load (%) is percent of average output power or average output current, do not exceed its derating of average load.

*12. At Ta=25°C and average output power.

*13. Output derating needed when input voltage less than 90VAC. Refer to output derating vs. input voltage (A253-01-02_).

Fig. A




C1 : Film Cap. 0.1μF
C2 : Elect. Cap. 100μF

# ZWS240BP

## OUTPUT DERATING

A253-01-02A

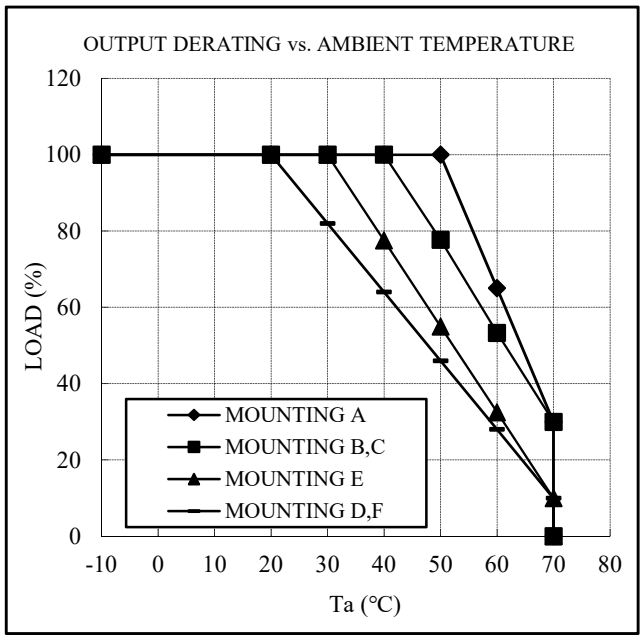
*COOLING : CONVECTION COOLING

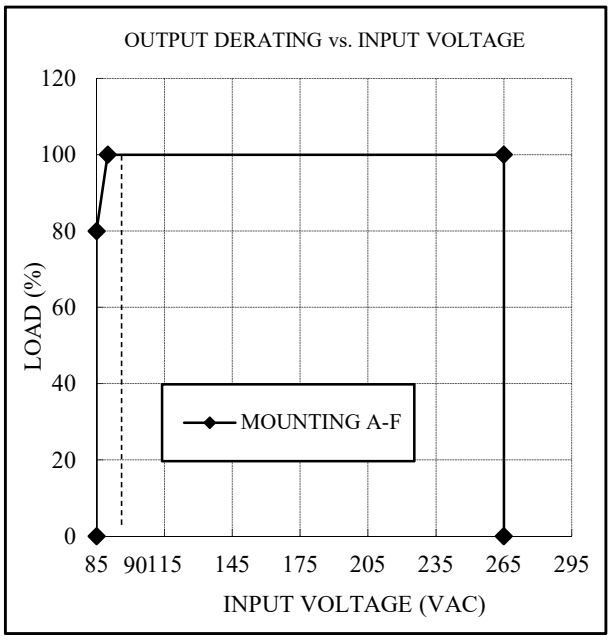
| Ta (°C) | LOAD (%) | |
|---|---|---|
| | MOUNTING A | MOUNTING B,C |
| -10 - +20 | 100 | 100 |
| 30 | 100 | 100 |
| 40 | 100 | 100 |
| 50 | 100 | 77 |
| 60 | 65 | 53 |
| 70 | 30 | 30 |

| Ta (°C) | LOAD (%) | |
|---|---|---|
| | MOUNTING E | MOUNTING D,F |
| -10 - +20 | 100 | 100 |
| 30 | 100 | 82 |
| 40 | 78 | 64 |
| 50 | 55 | 46 |
| 60 | 32 | 28 |
| 70 | 10 | 10 |

*COOLING : CONVECTION / FORCED AIR COOLING

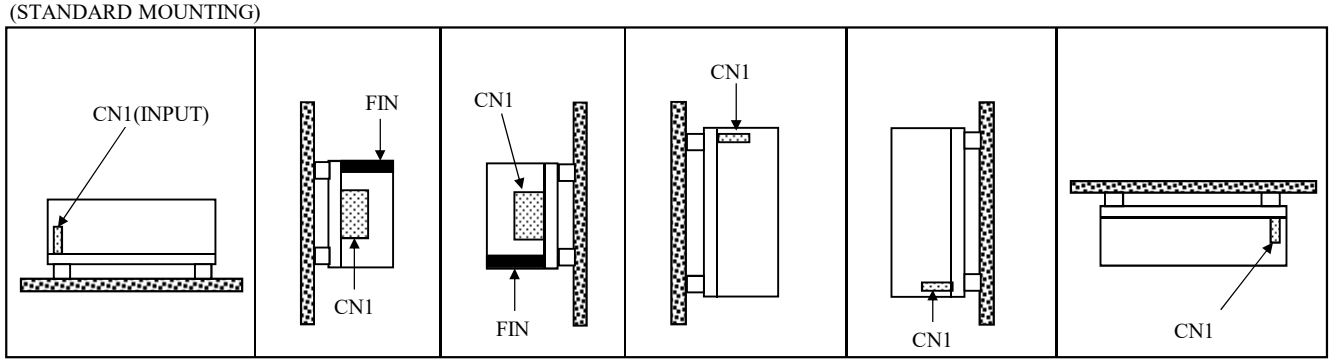
| INPUT VOLTAGE (VAC) | LOAD (%) |
|---|---|
| | MOUNTING A-F |
| 85 | 80 |
| 90 - 265 | 100 |




MOUNTING A | MOUNTING B | MOUNTING C | MOUNTING D | MOUNTING E | MOUNTING F

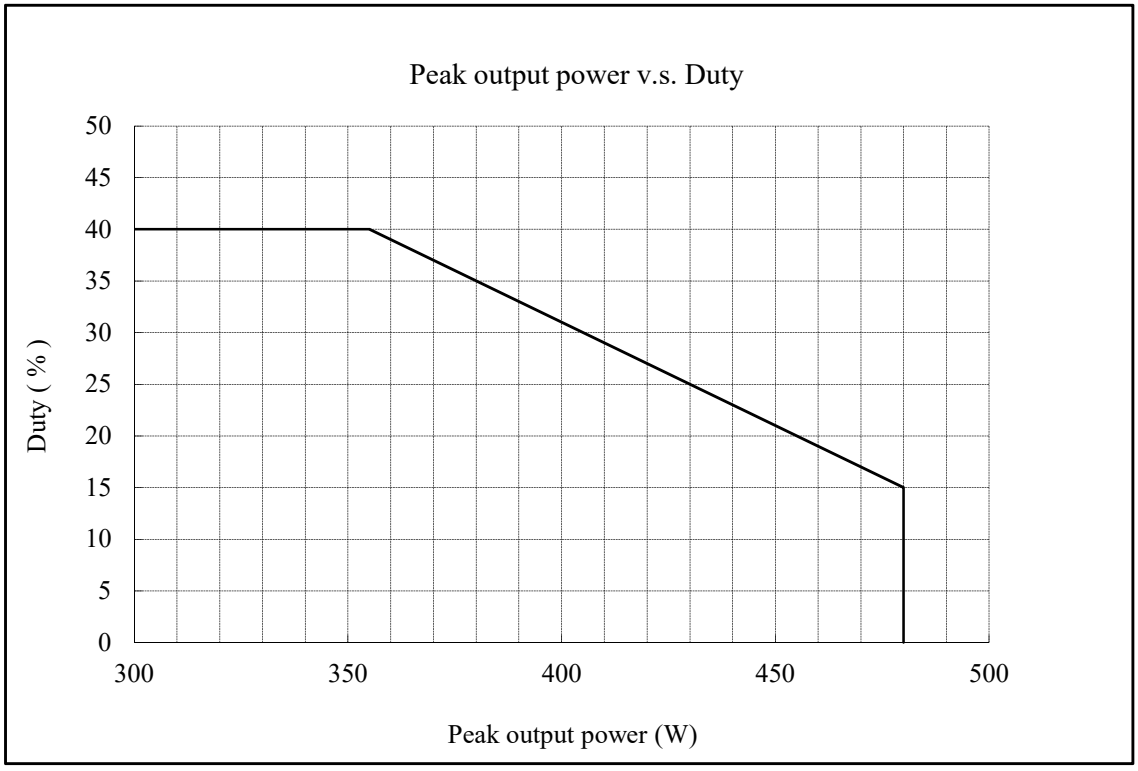
(STANDARD MOUNTING)



# ZWS240BP

PEAK OUTPUT CONDITION

A253-01-03

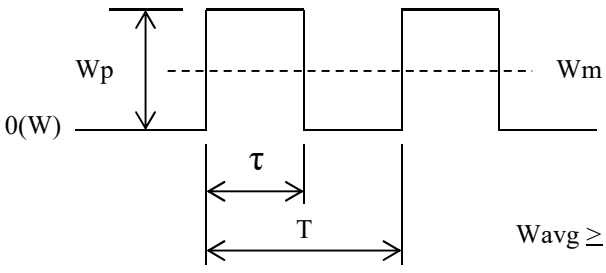



**Peak output power**

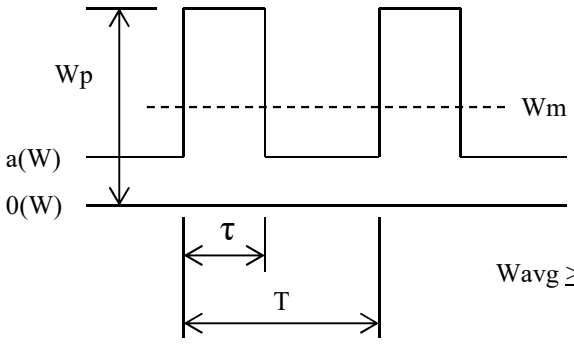
Use this product so that relationship among Duty, average output power (Wm) and peak output power (Wp) satisfy conditions defined by expression below.
This product must be used less than average output power of specification (Wavg).
Also operating duration at peak output power should be less than 5 sec.

$$Duty = \frac{\tau}{T} \times 100 \qquad \tau \leq 5 \text{ (sec)}$$

| | |
|---|---|
| Wp | : Peak output power (W) |
| Wavg | : Average output power of Specification (W) |
| Wm | : Average output power (W) |
| τ | : Pulse width of peak output power (sec) (Operating time at peak output) |
| T | : Period (sec) |
| Duty | : The duty is pulse width of peak output power of one period (%) |




$$Wavg \geq Wm = \frac{Wp \times \tau}{T}$$




$$Wavg \geq Wm = \frac{(Wp-a) \times \tau}{T} + a$$

# ZWS240BP

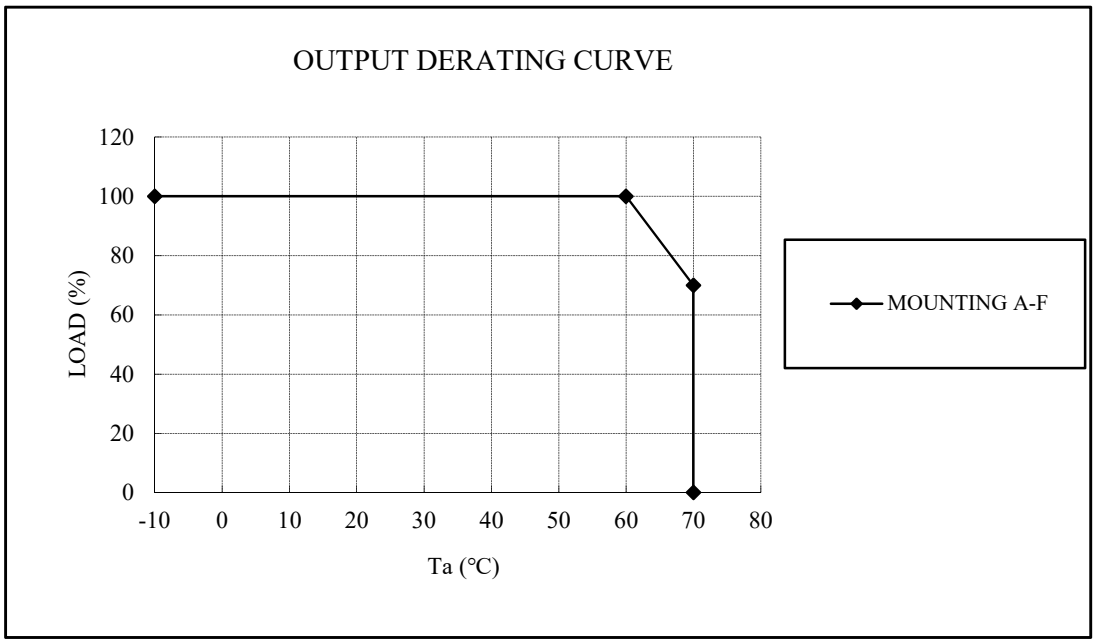
OUTPUT DERATING

A253-01-04

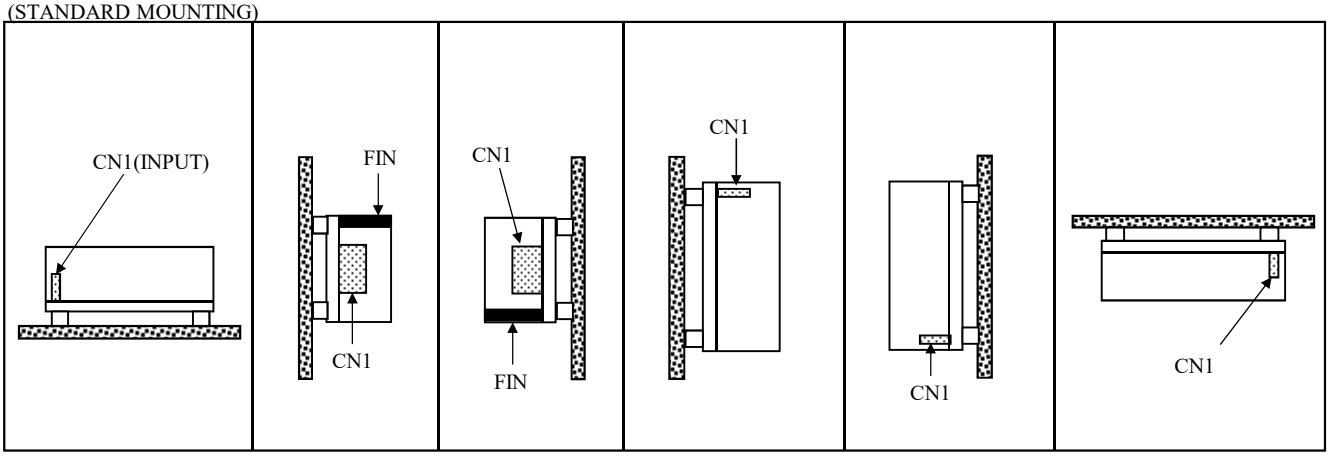
*COOLING : FORCED AIR COOLING

| Ta (°C) | LOAD (%) |
|---|---|
| | MOUNTING A-F |
| -10 - +60 | 100 |
| 70 | 70 |

Air velocity ≧ 0.7m/s : Air must flow through component side.




MOUNTING A (STANDARD MOUNTING) | MOUNTING B | MOUNTING C | MOUNTING D | MOUNTING E | MOUNTING F



# ZWS240BP

SPECIFICATIONS (FORCED AIR COOLING)

A253-01-05A

| | ITEMS / MODEL | | | ZWS240BP -24 | ZWS240BP -36 | ZWS240BP -48 |
|---|---|---|---|---|---|---|
| 1 | Nominal Output Voltage | | V | 24 | 36 | 48 |
| 2 | Average Output Current | | A | 12.5 | 8.4 | 6.3 |
| 3 | Peak Output Current | (*1) | A | 20.0 | 13.4 | 10.0 |
| 4 | Average Output Power | | W | 300.0 | 302.4 | 302.4 |
| 5 | Peak Output Power | (*1) | W | 480.0 | 482.4 | 480.0 |
| 6 | Efficiency (Typ) | 100VAC | % | 88 | | |
| | (*2) | 200VAC | % | 91 | | |
| 7 | Input Voltage Range | (*3)(*4) | - | 85 - 265VAC (47 - 63Hz) or 120 - 370VDC | | |
| 8 | Input Current (Typ) | (*5) | A | 3.6/1.8 | | |
| 9 | Hold-up Time (Typ) | (*5) | - | 16ms(typ) at 100VAC & Rated O/P Power, 20ms(typ) at 100VAC & 75% Load | | |
| 10 | Operating Temperature | (*6) | - | -10 - +70°C (-10 - +60°C:100%, +70°C:70%) | | |
| 11 | Cooling | (*7) | - | Forced Air Cooling | | |
| 12 | Conducted Emission | (*8) | - | Designed to meet EN55011/EN55032-A, FCC-A, VCCI-A | | |
| 13 | Radiated Emission | (*8) | - | Designed to meet EN55011/EN55032-A, FCC-A, VCCI-A | | |

*Read instruction manual carefully, before using the power supply unit.

*For other specification items, refer to specifications(A253-01-01_).

=NOTES=

*1. Operating time at peak output is less than 5sec, duty is less than 40%. For details, refer to peak output condition (A253-01-03_). When the peak output more than 5 sec is continued, the output is shut down, manual reset.

*2. At 100VAC/200VAC, Ta=25°C, nominal output voltage and average output power.

*3. For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100 - 240VAC (50-60Hz).

*4. Output derating needed when input voltage less than 90VAC. Refer to output derating vs. input voltage (A253-01-02_).

*5. At 100VAC/200VAC, Ta=25°C, nominal output voltage and average output power.

*6. Output Derating - Derating at standard mounting. Refer to output derating curve (A253-01-06_).
- Load (%) is percent of average output power or average output current, do not exceed its derating of average load.

*7. Forced air cooling with air velocity more than 1.5m/s (measured at component side of PCB, air must flow through component side)

*8. At Ta=25°C and average output power.

# ZWS240BP

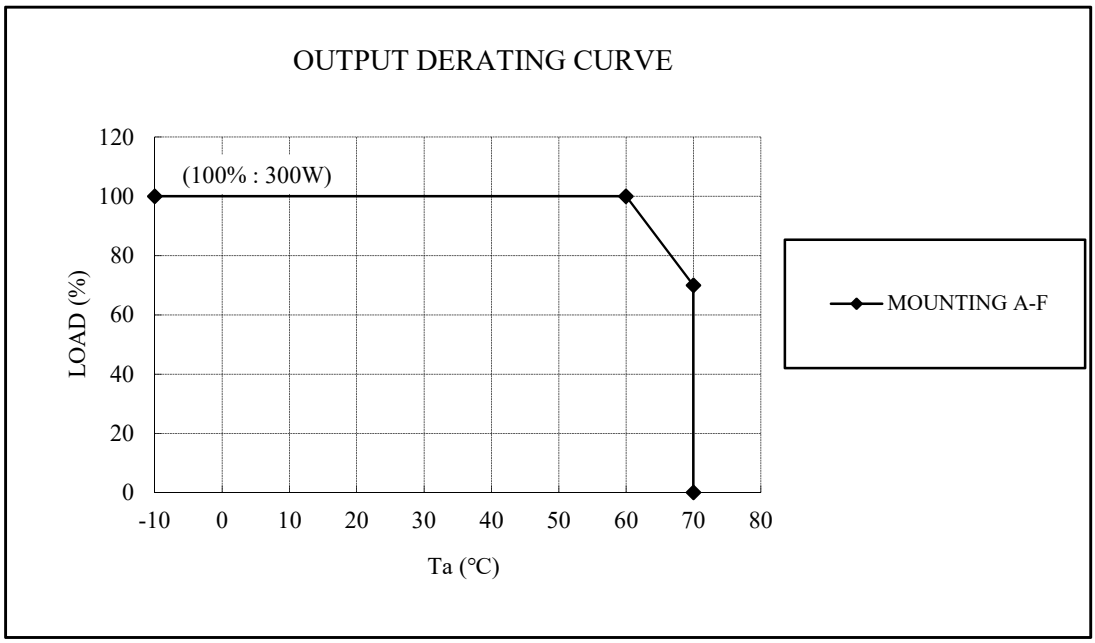
OUTPUT DERATING

A253-01-06

*AVERAGE OUTPUT POWER : 300W
*COOLING : FORCED AIR COOLING

| Ta (°C) | LOAD (%) |
|---|---|
| | MOUNTING A-F |
| -10 - +60 | 100 |
| 70 | 70 |

Air velocity ≧ 1.5m/s : Air must flow through component side.




MOUNTING A (STANDARD MOUNTING) | MOUNTING B | MOUNTING C | MOUNTING D | MOUNTING E | MOUNTING F