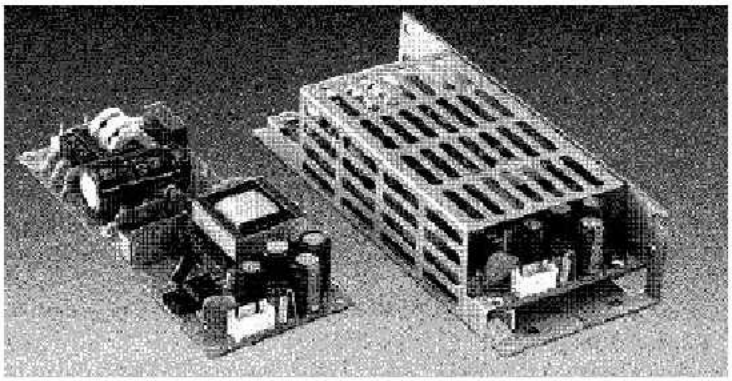

10 WATT
AC-DC CONVERTER
BWS/BWSE-SX SERIES

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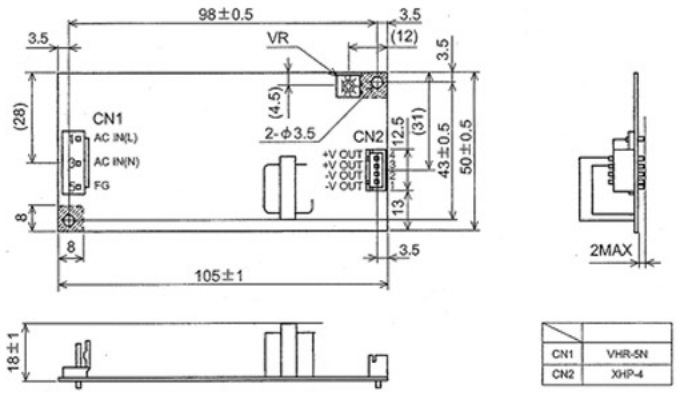
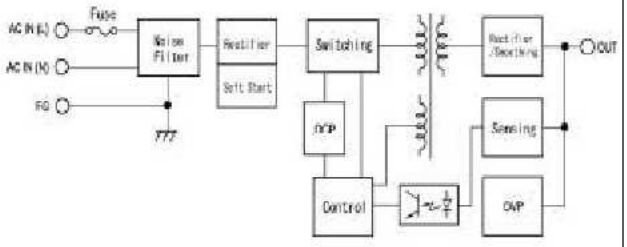
Specifications<AC/DC>	Model				
BWS**SX-U/BWSE**SX 10WATTS/SINGLE	BWS3.3SX-U BWSE3.3SX	BWS05SX-U BWSE05SX	BWS12SX-U BWSE12SX	BWS15SX-U BWSE15SX	BWS24SX-U BWSE24SX
Input Characteristic					
Input Voltage	AC100-230V				
Input Current	0.3A at AC100V/0.15A at AC230V				
Input Range	AC85-264V(DC110-370V)				
Input Frequency	50/60Hz				
Input Frequency Range	47-440Hz				
Phase	Single				
Inrush Current *1	15A(maximum) at AC100V/35A(maximum)at AC230V				
Efficiency [%] (typical) *2	66	74	80	80	81

Dimension (mm)
BWS-SX-U



Block Diagram
BWS-SX-U



ASTRODYNE
Tel: 800-823-8082 Fax: 508-823-8181 e-mail: sales@astrodyne.com

BWS/BWSE Specification

Specifications<AC/DC>	Model				
BWS**SX-U/BWSE**SX 10WATTS/SINGLE	BWS3.3SX-U BWSE3.3SX	BWS05SX-U BWSE05SX	BWS12SX-U BWSE12SX	BWS15SX-U BWSE15SX	BWS24SX-U BWSE24SX
Output Characteristic					
Output Voltage [V]	3.3	5	12	15	24
Output Current [A]	2.0	2.0	0.9	0.7	0.5
Voltage Adjust Range	+/- 10% of Rated Output Voltage(at no load within the input range)				
Ripple and Noise [mVp-p](maximum) *3	83	100	170	200	290
Regulation					
Statistic Line Regulation [mV](maximum)	26.4	40	96	120	192
Statistic Load Regulation [mV](maximum)	29.7	45	108	135	216
Temperature Coefficient *4	0.03%/°C				
Drift[mV](maximum) *5	31.5	40	75	90	135
Dynamic Load Regulation [mV](typical)	not specified				
Recovery Time	not specified				
Rise up time	200mS(maximum) at 25°C and rated input/output				
Hold up time	20mS(typical) at 25°C and rated input/output				
Functions					
Overcurrent Protection *6 >=110% of Rated	Current Limiting with automatic recovery				
Output Current[A]	2.2	2.2	0.99	0.77	0.55
Overvoltage Protection >=115% of	Zener diode clamping				
Rated Output Voltage[V]	3.8	5.75	13.8	17.3	27.6
Remote Sense	not available				
Remote On/Off	not available				
Environmental					
Operating Temperature	open board type:-5 to +50°C/enclosed type:-5 to +40°C				
Operating Humidity	20 to 85%RH(non-condensing)				
Storage Temperature	-20 to +85°C				
Storage Humidity	20 to 85%RH(non-condensing)				
Withstanding Voltage	Primary-Secondary AC3,000V for 1minute				
	Primary-Frame Ground AC2,500V for 1minute				
	Secondary-Frame Ground AC500V for 1minute				
Isolation Resistance	Primary-Secondary-Frame Ground 100MW(minimum) by DC500V insulation tester				
Vibration	5-10Hz:10mm double amplitude,10-55Hz:19.6m/s^2,20minutes' period for 60minutes each along X,Y,Z axes(non-operating)				
Shock	294m/s^2				
Cooling	Convection				
Leakage Current	0.75mA(maximum) at 25°C,rated input/output and rated input frequency				
Line Conducted Noise	Built to meet FCC Part15-B Class B				
	Built to meet VCCI Class B				
	Built to meet EN55022 Class B				
Safety	UL: UL1950(Except BWSE)				
	C-UL: CSA C22.2 No.950(Except BWSE)				
	VDE: EN60950, IEC950, VDE0805(Except BWSE)				
Weight (typical)	open board type:73g/enclosed type:160g				
MTBF [H]	730,000				
Switching Frequency[kHz](typical) *7	80				

Conditions:

*1at cold start

*2 at DC130V input/rated output

*3 measured by a bayonet probe at the end of a pair of 15cm long wires terminated with a 100uF electrolytic capacitor and 0.1uF film capacitor in parallel at a 0 to 100MHz bandwidth

*4 open board type: at -5 to +50°C/enclosed type: at -5 to +40OC

*5 for 7hour period after 1hour warm-up at 25OC and rated input/output

*6 for less than 1minute of overcurrent and short circuit

*7 variable on input voltage and load conditions

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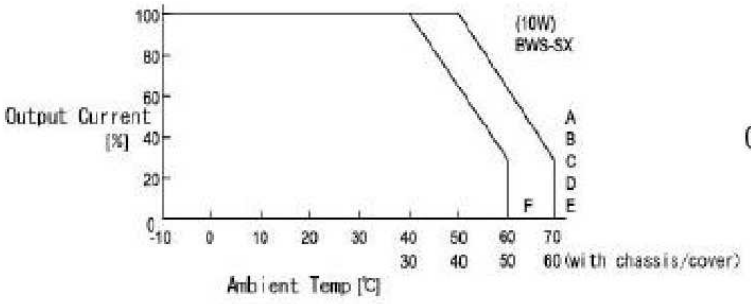
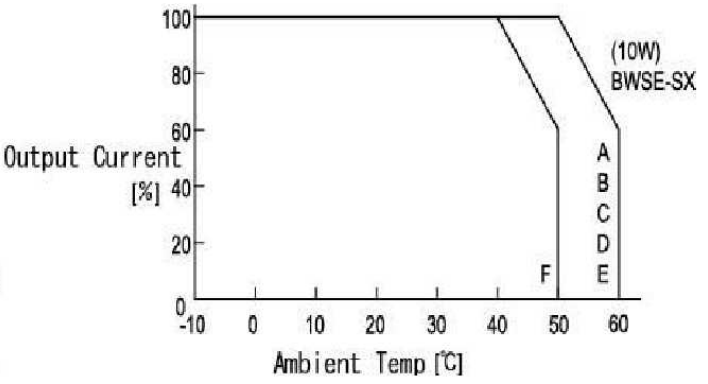
Derating Curve

BWS-SX-U



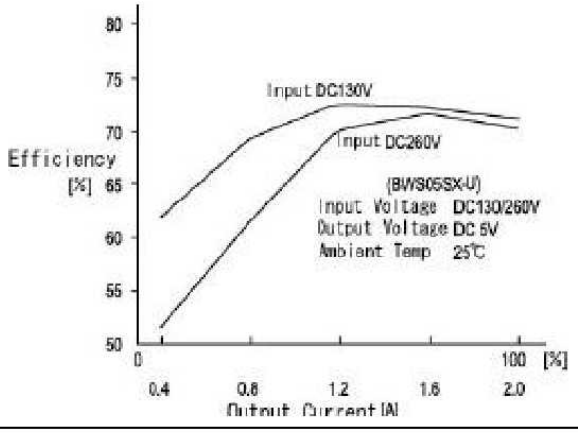
※For safety specification, contact ETA Sales Representative

BWSE-SX-U

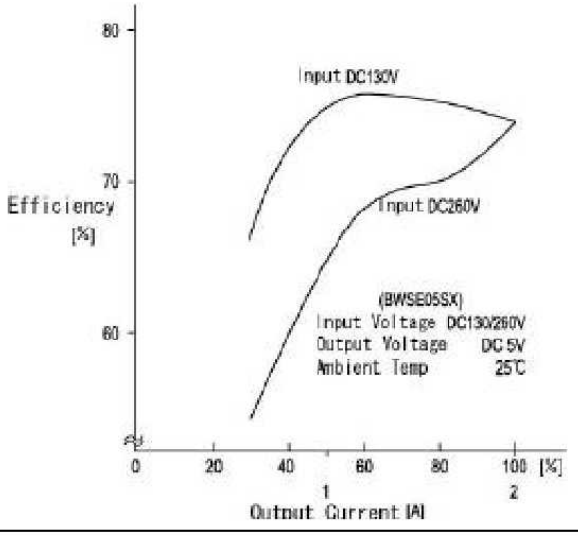


Efficiency Curve

BWS-SX-U

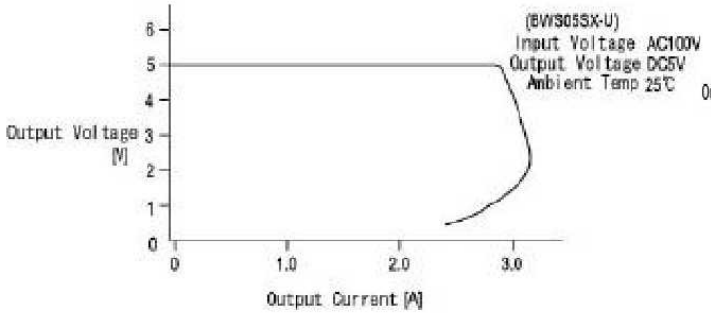


BWSE-SX-U

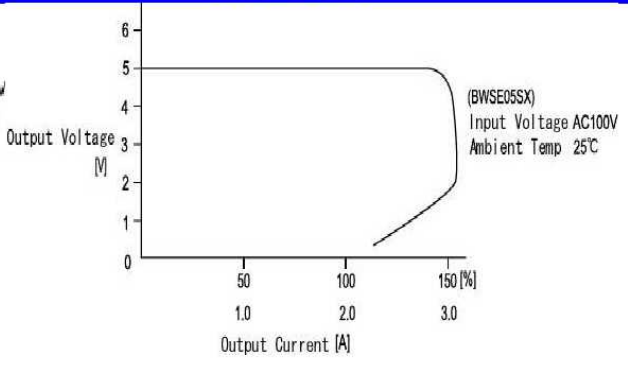


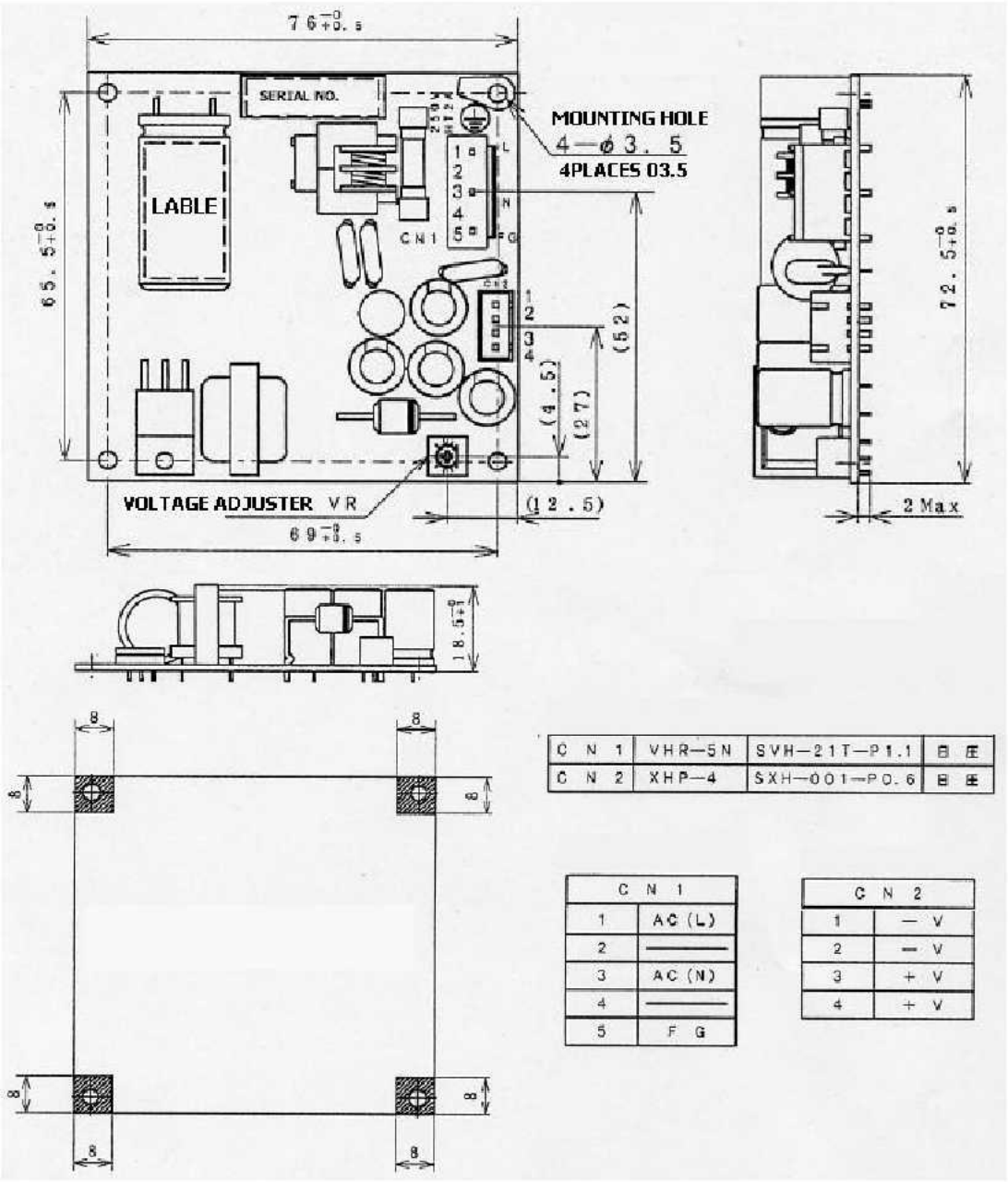
OCP Curve

BWS-SX-U



BWSE-SX-U

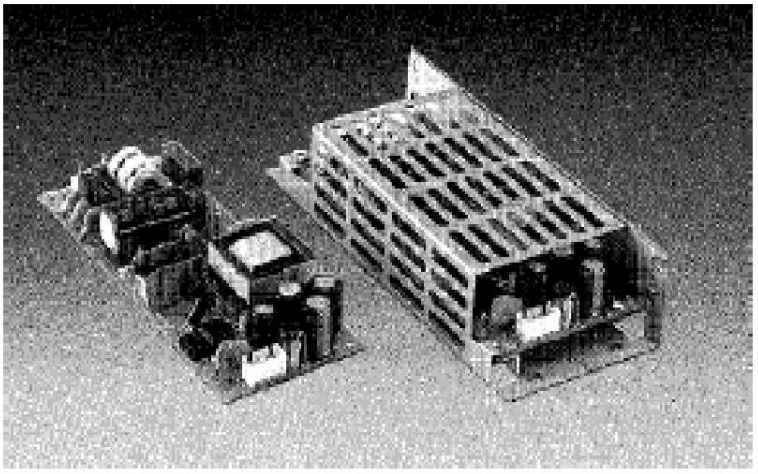




C N 1	VHR—5N	SVH—21T—P1.1	日 圧
C N 2	XHP—4	SXH—001—P0.6	日 圧

C N 1	
1	AC (L)
2	——
3	AC (N)
4	——
5	F G

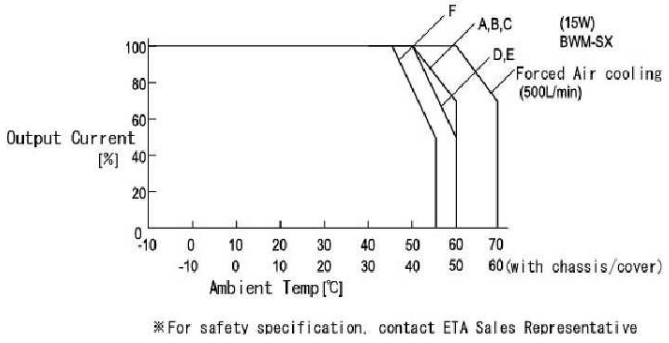
C N 2	
1	— V
2	— V
3	+ V
4	+ V



15 WATT
AC-DC CONVERTER
BWM-SA SERIES

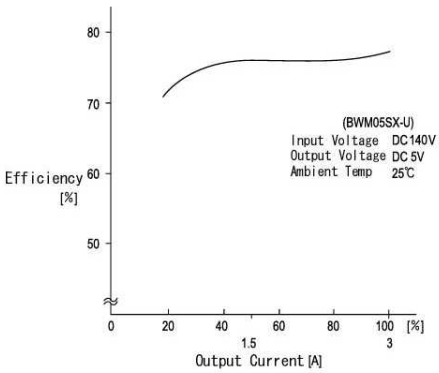
Specifications<AC/DC>	Model				
BWM**SX-U 15WATTS/SINGLE	BWM3.3SX-U	BWM05SX-U	BWM12SX-U	BWM15SX-U	BWM24SX-U
Input Characteristic					
Input Voltage	AC100-230V				
Input Current	0.4A at AC100V/0.2A at AC230V				
Input Range	AC85-264V(DC110-370V)				
Input Frequency	50/60Hz				
Input Frequency Range	47-440Hz				
Phase	Single				
Inrush Current *1	15A(maximum) at AC100V/30A(maximum) at AC200V				
Efficiency [%] (typical) *2	71	76	81	81	83

Derating Curve



※For safety specification, contact ETA Sales Representative

Efficiency Curve



BWM / Specification

Specifications<AC/DC>	Model				
BWM**SX-U 15WATTS/SINGLE	BWM3.3SX-U	BWM05SX-U	BWM12SX-U	BWM15SX-U	BWM24SX-U
Output Characteristic					
Output Voltage [V]	3.3	5	12	15	24
Output Current [A]	3.0	3.0	1.3	1.0	0.7
Voltage Adjust Range	+/- 10% of Rated Output Voltage(at no load within the input range)				
Ripple and Noise [mVp-p](maximum) *3	83	100	170	200	290
Regulation					
Statistic Line Regulation [mV](maximum)	26.4	40	96	120	192
Statistic Load Regulation [mV](maximum)	29.7	45	108	135	216
Temperature Coefficient *4	0.03%/℃				
Drift[mV](maximum) *5	31.5	40	75	90	135
Dynamic Load Regulation [mV](typical) *6	99	150	360	450	720
Recovery Time *6	0.3mS(typical)				
Rise up time	200mS(maximum) at 25℃and rated input/output				
Hold up time	20mS(minimum) at 25℃and rated input/output				
Functions					
Overcurrent Protection *6≧105% of Rated Output	Current Limiting with automatic recovery				
Current[A]	3.15	3.15	1.37	1.05	0.74
Overvoltage Protection≧115% of Rated Output	Zener diode clamping				
Voltage[V]	3.8	5.75	13.8	17.3	27.6
Remote Sense	not available				
Remote On/Off	not available				
Environmental					
Operating Temperature	open board type:-10 to +50℃enclosed type:-10 to +40℃				
Operating Humidity	20 to 90%RH(non-condensing)				
Storage Temperature	-20 to +85℃				
Storage Humidity	20 to 90%RH(non-condensing)				
Withstanding Voltage	Primary-Secondary AC3,000V for 1minute				
	Primary-Frame Ground AC2,500V for 1minute				
	Secondary-Frame Ground AC500V for 1minute				
Isolation Resistance	Primary-Secondary-Frame Ground 50MΩ(minimum) by DC500V insulation tester				
Vibration	5-10Hz:10mm double amplitude,10-55Hz:19.6m/s^2,20minutes' period for 60minutes each along X,Y,Z axes(non-operating)				
Shock	196m/s^2				
Cooling	Convection				
? Leakage Current	1mA(maximum) at 25℃rated input/output and rated input frequency				
? Line Conducted Noise	Built to meet FCC Part15-B Class B				
	Built to meet VCCI Class B				
	Built to meet EN55022 Class B				
? Safety	UL: UL1950				
	C-UL: CSA C22.2 No.950				
	VDE EN60950, IEC950, VDE0805				
Weight (typical)	open board type:95g/enclosed type:220g				
? MTBF [H]	700,000				
? Switching Frequency[kHz](typical) *7	60	50	50	50	50

Conditions:

*1at cold start

*2 at DC130V input/rated output

*3 measured by a bayonet probe at the end of a pair of 20cm long wires terminated with a 47uF electrolytic capacitor and 0.1uF film capacitor in parallel at a 0 to 100MHz bandwidth

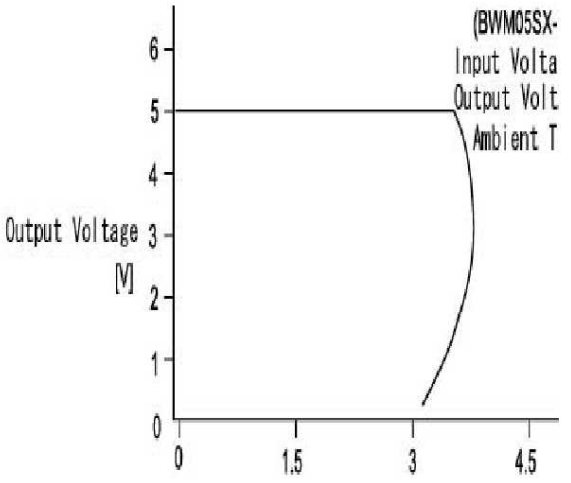
*4 open board type: at -10 to +50℃enclosed type: at -10 to +40℃

*5 for 7hour period after 1hour warm-up at 25℃and rated input/output

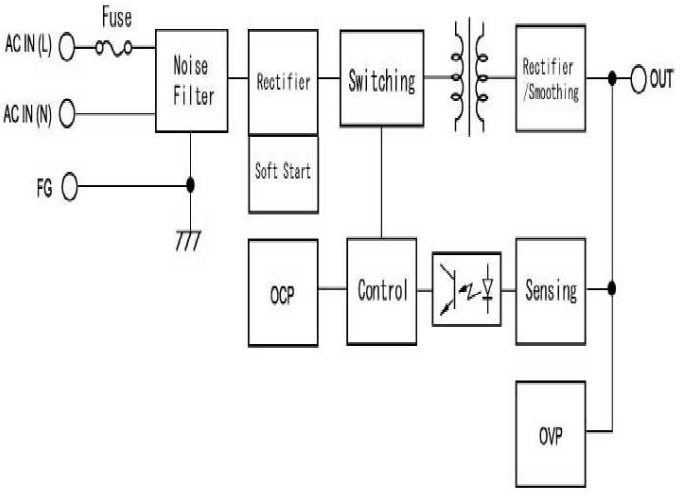
*6 for less than 1minute of overcurrent and short circuit

*7 variable on input voltage and load conditions

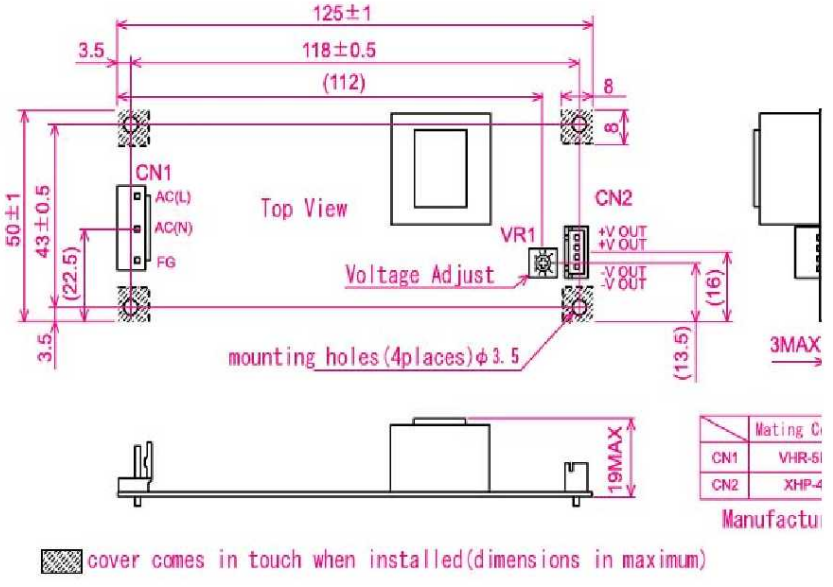
OCP Curve

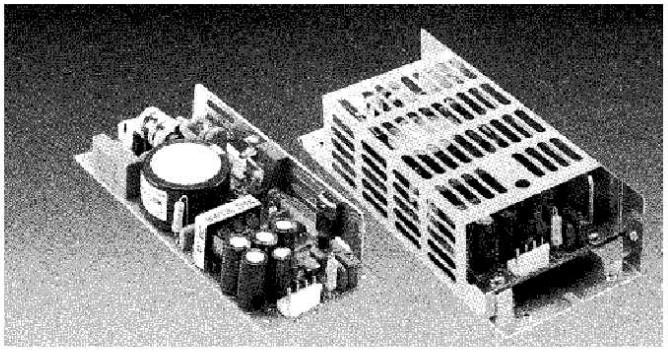


Block Diagram



Dimension (mm)



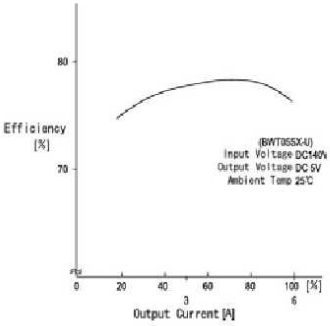


30 WATT
AC-DC CONVERTER

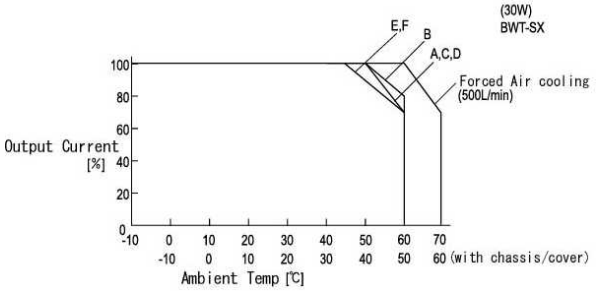
BWT/BWTE-SX SERIES

Specifications<AC/DC>	Model						
BWT/BWTE**SX-U 30WATTS/SINGLE	BWT3.3SX-U BWTE3.3SX	BWT05SX-U BWTE05SX	BWT12SX-U BWTE12SX	BWT15SX-U BWTE15SX	BWT24SX-U BWTE24SX	BWT36SX-U BWTE36SX	BWT48SX-U BWTE48SX
Input Characteristic							
Input Voltage	AC100-230V						
Input Current	0.7A at AC100V/0.4A at AC230V						
Input Range	AC85-264V(DC110-370V)						
Input Frequency	50/60Hz						
Input Frequency Range	47-440Hz						
Phase	Single						
Inrush Current *1	15A(maximum) at AC100V/30A(maximum) at AC230V						
Efficiency [%] (typical) *2	70	75	78	80	81	81	84

Efficiency Curve



Derating Curve



※For safety specification, contact ETA Sales Representative

BWT/BWTE**SX Specification

Specifications<AC/DC>	Model						
BWT/BWTE**SX-U 30WATTS/SINGLE	BWT3.3SX-U BWTE3.3SX	BWT05SX-U BWTE05SX	BWT12SX-U BWTE12SX	BWT15SX-U BWTE15SX	BWT24SX-U BWTE24SX	BWT36SX-U BWTE36SX	BWT48SX-U BWTE48SX
Output Characteristic							
Output Voltage [V]	3.3	5	12	15	24	36	48
Output Current [A]	6.0	6.0	2.5	2.0	1.3	0.9	0.7
Voltage Adjust Range	+/- 10% of Rated Output Voltage(at no load within the input range)						
Ripple and Noise [mVp-p](maximum) *3	83	100	170	200	290	410	530
Regulation							
a.Statistic Line Regulation [mV](maximum)	26.4	40	96	120	192	288	384
b.Statistic Load Regulation [mV](maximum)	29.7	45	108	135	216	324	432
c.Temperature Coefficient *4	0.03%/℃						
d.Drift[mV](maximum) *5	31.5	40	75	90	135	195	255
e.Dynamic Load Regulation [mV](typical) *6	99	150	360	450	720	1080	1440
f.Recovery Time *6	0.3mS(typical)						
Rise up time	200mS(maximum) at 25℃and rated input/output						
Hold up time	20mS(minimum) at 25℃and rated input/output						
Functions							
Overcurrent Protection≧110% of Rated Output Current[A]	Current Limiting with automatic recovery						
	6.6	6.6	2.75	2.2	1.43	0.99	0.77
Overvoltage Protection≧115% of Rated Output Voltage[V]	Zener diode clamping						
	3.8	5.75	13.8	17.3	27.6	41.4	55.2
Remote Sense	not available						
Remote On/Off	not available						
Environmental							
Operating Temperature	open board type:-10 to +50℃/enclosed type:-10 to +40℃						
Operating Humidity	20 to 90%RH(non-condensing)						
Storage Temperature	-20 to +85℃						
Storage Humidity	20 to 90%RH(non-condensing)						
Withstanding Voltage	Primary-Secondary AC3,000V for 1minute						
	Primary-Frame Ground AC2,500V for 1minute						
	Secondary-Frame Ground AC500V for 1minute						
Isolation Resistance	Primary-Secondary-Frame Ground 50MΩ(minimum) by DC500V insulation tester						
Vibration	5-10Hz:10mm double amplitude,10-55Hz:19.6m/s²,20minutes' period for 60minutes each along X,Y,Z axes (non-operating)						
Shock	294m/s²						
Cooling	Convection						
? Leakage Current	1mA(maximum) at 25℃rated input/output and rated input frequency						
? Conducted Line Noise	Built to meet FCC Part15-B Class B						
	Built to meet VCCI Class B						
	Built to meet EN55022 Class B						
? Safety	UL: UL1950(Except BWTE)						
	C-UL: CSA C22.2 No.950(Except BWTE)						
	VDE: EN60950, IEC950, VDE0805(Except BWTE)						
Weight (typical)	open board type:135g /enclosed type:285g						
? MTBF [H]	580,000						
? Switching Frequency[KHz](typical) *7	60	50	50	50	50	50	50

Conditions:

*1 at cold start

*2 at DC130V input/rated output

*3 measured by a bayonet probe at the end of a pair of 20cm long wires terminated with a 47uF electrolytic capacitor and 0.1uF film capacitor in parallel at a 0 to 100MHz bandwidth

*4 open board type: at -10 to +50℃enclosed type: at -10 to +40℃

*5 for 7hour period after 1hour warm-up at 25℃and rated input/output

*6 when output current changed from 25% of rated output current to 75% rapidly at rated input

*7 variable on input voltage and load conditions

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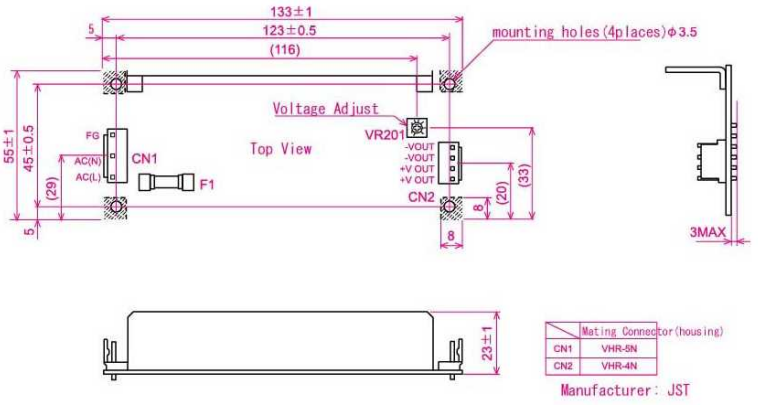
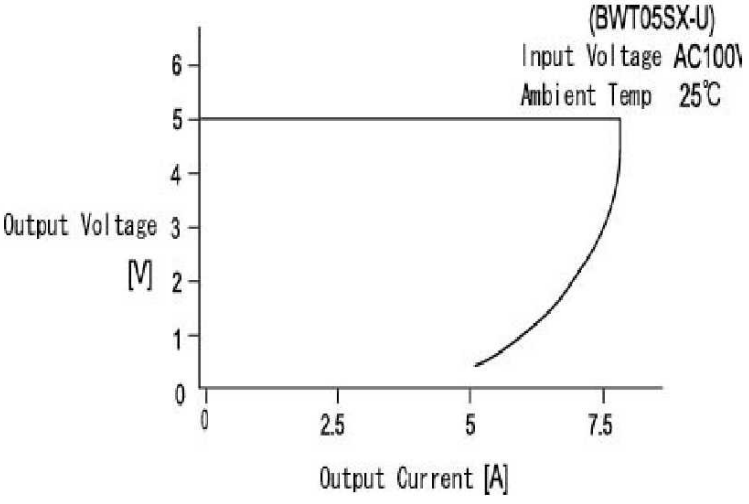
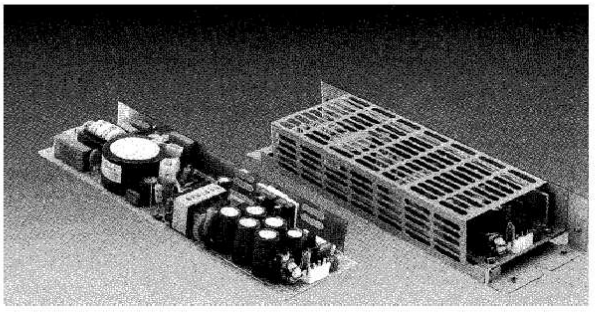
Dimension (mm)



OCP Curve

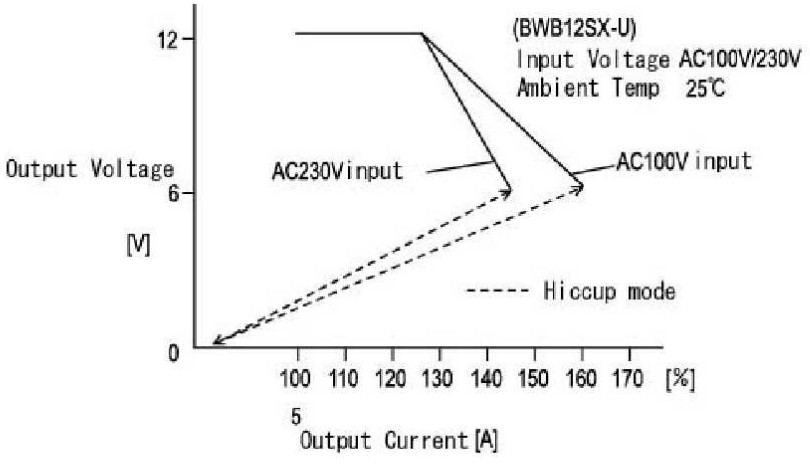




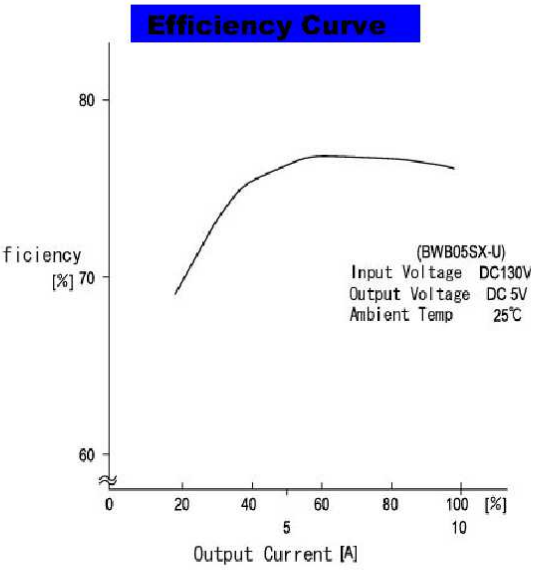
50 WATT
AC-DC CONVERTER
BWB-SX SERIES

Specifications<AC/DC>	Model							
BWB**SX-U 50WATTS/SINGLE	BWB3.3SX-U	BWB05SX-U	BWB12SX-U	BWB15SX-U	BWB24SX-U	BWB30SX-U	BWB36SX-U	BWB48SX-U
Input Characteristic								
Input Voltage	AC100/230V							
Input Current	1.2A at AC100V/0.7A at AC230V							
Input Range	AC85-264V(DC110-350V)							
Input Frequency	50/60Hz							
Input Frequency Range	47-440Hz							
Phase	Single							
Inrush Current *1	20A(maximum) at AC115V/40A(maximum) at AC230V							
Efficiency [%] (typical) *2	71	75	81	82	85	85	86	87

OCP Curve



Efficiency Curve



BWB**SX Specification

Specifications<AC/DC>	Model							
BWB**SX-U 50WATTS/SINGLE	BWB3.3SX-U	BWB05SX-U	BWB12SX-U	BWB15SX-U	BWB24SX-U	BWB30SX-U	BWB36SX-U	BWB48SX-U
Output Characteristic								
Output Voltage [V]	3.3	5	12	15	24	30	36	48
Output Current [A]	10.0	10.0	5.0	4.0	2.5	2.0	1.7	1.3
Voltage Adjust Range	+/- 5% of Rated Output Voltage(at no load within the input range)							
Ripple and Noise [mVp-p](maximum) *3	120	120	170	200	290	350	410	530
Regulation								
Statistic Line Regulation [mV](maximum)	26.4	40	96	120	192	240	288	384
Statistic Load Regulation [mV](maximum)	29.7	45	108	135	216	270	324	432
Temperature Coefficient *4	0.03%/℃							
Drift[mV](maximum) *5	31.5	40	75	90	135	165	195	255
Dynamic Load Regulation [mV](typical) *6	99	150	360	450	720	900	1080	1440
Recovery Time *6	10mS(typical)							
Rise up time	200mS(maximum) at 25℃ and rated input/output							
Hold up time	20mS(typical) at 25℃ and rated input/output							
Functions								
Overcurrent Protection≧115% of Rated Output Current[A]	Current Limiting with automatic recovery							
	11.5	11.5	5.75	4.6	2.88	2.3	1.96	1.5
Overvoltage Protection≧115% of Rated Output Voltage[V]	Output shutdown(to reset,leave 1minute after shut-off)							
	3.8	5.75	13.8	17.3	27.6	34.5	41.4	55.2
Remote Sense	not available							
Remote On/Off	not available							
Environmental								
Operating Temperature	open board type:-10 to +50℃/enclosed type:-10 to +40℃							
Operating Humidity	20 to 85%RH(non-condensing)							
Storage Temperature	-20 to +85℃							
Storage Humidity	20 to 85%RH(non-condensing)							
Withstanding Voltage	Primary-Secondary AC3,000V for 1minute							
	Primary-Frame Ground AC2,500V for 1minute							
	Secondary-Frame Ground AC500V for 1minute							
Isolation Resistance	Primary-Secondary-Frame Ground 50MΩ(minimum) by DC500V insulation tester							
Vibration	5-10Hz:10mm double amplitude,10-55Hz:19.6m/s²,20minutes' period for 60minutes each along X,Y,Z axes(non-operating)							
Shock	196m/s²							
Cooling	Convection							
? Leakage Current	0.6mA(maximum) at 25℃,rated input/output and rated input frequency							
? Line Conducted Noise	Built to meet FCC Part15-B Class B							
	Built to meet VCCI Class B							
	Built to meet with EN55022 Class B							
? Safety	UL:UL1950							
	C-UL:CSA C22.2 No.950							
	VDE:EN60950, IEC950, VDE0805							
? Weight (typical)	open board type:240g/enclosed type:450g							
? MTBF [H]	470,000							
? Switching Frequency[kHz](typical)	55	60	60	60	60	60	60	60

Conditions:

*1 at cold start

*2 at DC260V input/rated output

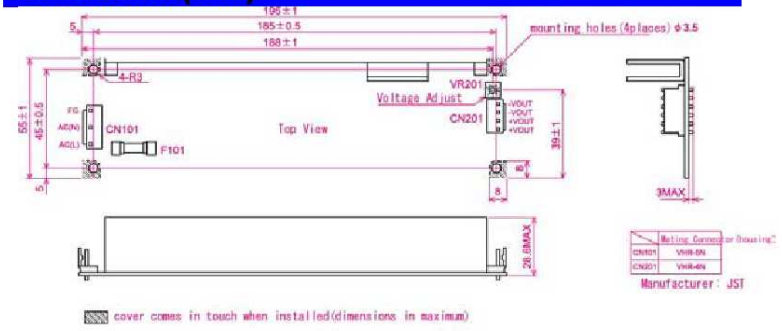
*3 measured by a bayonet probe at the end of a pair of 15cm long wires terminated with a 100uF electrolytic capacitor and 0.1uF film capacitor in parallel at a 0 to 100MHz bandwidth

*4 open board type: at -10 to +50℃/enclosed type: at -10 to +40℃

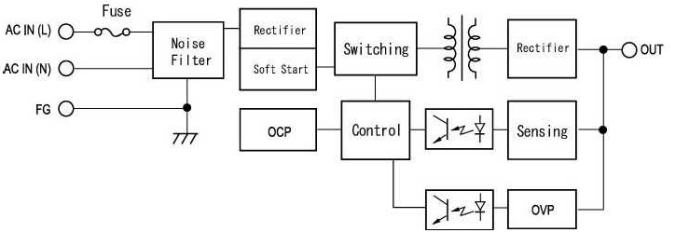
*5 for 7hour period after 1hour warm-up at 25℃ and rated input/output

*6 when output current changed from 25% of rated output current to 75% rapidly at rated input

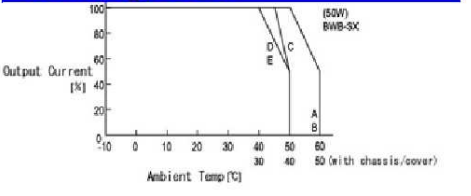
Dimension (mm)



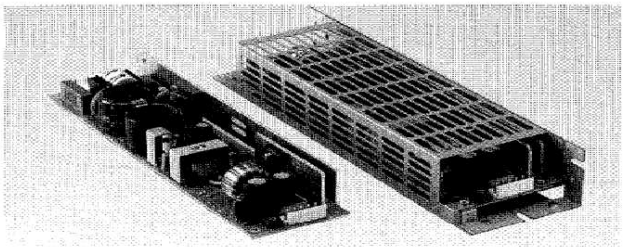
Block Diagram



Derating Curve



※For safety specification, contact ETA Sales Representative



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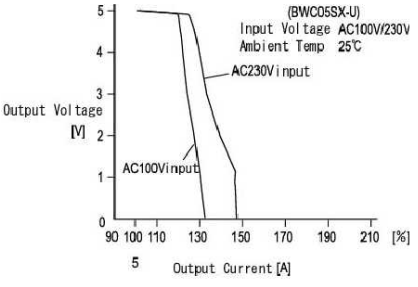
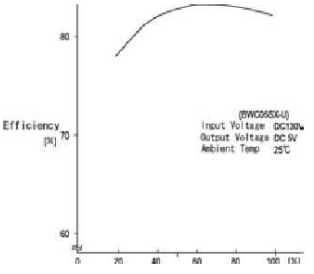
Specifications<AC/DC>	Model							
BWC**SX-U 75WATTS/SINGLE	BWC3.3SX-U	BWC05SX-U	BWC12SX-U	BWC15SX-U	BWC24SX-U	BWC30SX-U	BWC36SX-U	BWC48SX-U
Input Characteristic								
Input Voltage	AC100/230V							
Input Current	1.7A at AC100V/0.9A at 230V							
Input Range	AC85-264V(DC110-350V)							
Input Frequency	50/60Hz							
Input Frequency Range	47-440Hz							
Phase	Single							
Inrush Current *1	20A(maximum) at AC115V/40A(maximum) at AC230V							
Efficiency [%] (typical) *2	77	81	84	84	86	86	88	87

OCP Curve



Efficiency Curve



BWC Specification

Specifications<AC/DC>	Model							
BWC**SX-U 75WATTS/SINGLE	BWC3.3SX-U	BWC05SX-U	BWC12SX-U	BWC15SX-U	BWC24SX-U	BWC30SX-U	BWC36SX-U	BWC48SX-U
Output Characteristic								
Output Voltage [V]	3.3	5	12	15	24	30	36	48
Output Current [A]	15.0	15.0	6.3	5.0	3.2(P4.5)	2.5	2.1	1.6
Voltage Adjust Range	+/- 10% of Rated Output Voltage(at no load within the input range)							
Ripple and Noise [mVp-p](maximum) *3	120	150	220	250	340	400	460	580
Regulation								
Statistic Line Regulation [mV](maximum)	26.4	40	96	120	192	240	288	384
Statistic Load Regulation [mV](maximum)	29.7	45	108	135	216	270	324	432
Temperature Coefficient *4	0.03%/℃							
Drift[mV](maximum) *5	31.5	40	75	90	135	165	195	255
Dynamic Load Regulation [mV](typical) *6	99	150	360	450	720	900	1080	1440
Recovery Time *6	0.5mS(typical)							
Rise up time	300mS(maximum) at 25℃and rated input/output							
Hold up time	20mS(typical) at 25℃and rated input/output							
Functions								
Overcurrent Protection ≧110% of Rated Output Current[A]	Current Limiting with automatic recovery							
	16.5	16.5	6.93	5.5	≧Peak	2.75	2.31	1.76
Over voltage Protection ≧15% of Rated Output Voltage [V]	Output shutdown(to reset,leave 1minute after shut-off)							
	3.8	5.75	13.8	17.3	27.6	34.5	41.4	55.2
Remote Sense	not available							
Remote On/Off	not available							
Environmental								
Operating Temperature	open board type:-10 to +50℃enclosed type:-10 to +40℃							
Operating Humidity	20 to 85%/RH(non-condensing)							
Storage Temperature	-20 to +85℃							
Storage Humidity	20 to 85%/RH(non-condensing)							
Withstanding Voltage	Primary-Secondary AC3,000V for 1minute							
	Primary-Frame Ground AC2,500V for 1minute							
	Secondary-Frame Ground AC500V for 1minute							
Isolation Resistance	Primary-Secondary-Frame Ground 50MΩ(minimum) by DC500V insulation tester							
Vibration	5-10Hz:10mm double amplitude,10-55Hz:19.6m/s^2,20minutes' period for 60minutes each along X,Y,Z axes(non-operating)							
Shock	196m/s^2							
Cooling	Convection							
? Leakage Current	0.75mA(maximum) at 25℃rated input/output and rated input frequency							
? Line Conducted Noise	Built to meet FCC Part15-B Class B							
	Built to meet VCCI Class B							
	Built to meet EN55022 Class B							
? Safety	UL: UL1950							
	C-UL: CSA C22.2 No.950							
	VDE: EN60950, IEC950, VDE0805							
Weight (typical)	open board type:280g/enclosed type:520g							
? MTBF [H]	500,000							
? Switching Frequency[kHz](typical)	140							

Conditions:

*1at cold start

*2 at DC130V input/rated output

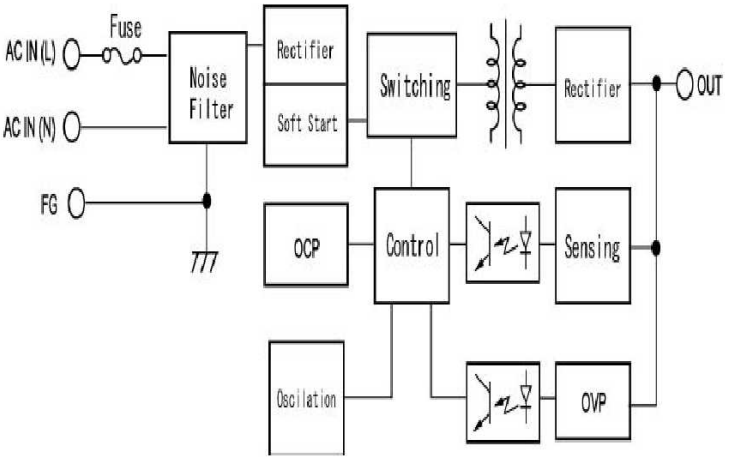
*3 measured by a bayonet probe at the end of a pair of 15cm long wires terminated with a 100uF electrolytic capacitor and 0.1uF film capacitor in parallel at a 0 to 100MHz bandwidth

*4 open board type: at -10 to +50℃enclosed type: at -10 to +40℃

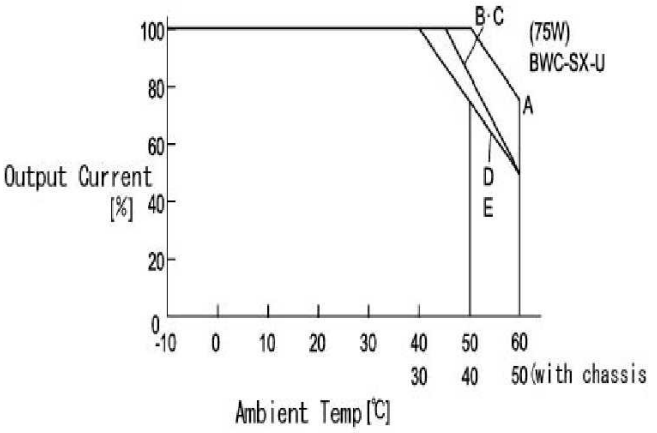
*5 for 7hour period after 1hour warm-up at 25℃and rated input/output

*6 when output current changed from 25% of rated output current to 75% rapidly at rated input

Block Diagram



Derating Curve



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Dimension (mm)