



Supplemental test data
(参考資料)

Date of issue: Sep. 1, 2011

Test Data

Model Number: GPSA-360-12

Model Name: DC POWER SUPPLY

INPUT: 85V - 264V AC, 50 / 60 Hz

OUTPUT: 12 V 30.0A (40.0 A_{peak})
12VSB 0.3A

Minimum load : 0W
Rated load : 363.6W
Peak output power: 483.6W

Approved by : Masato Urasue (QA manager)
Designed by : Akiko Tatsami (R&D engineer)
Tested by : Kohei Sawada (Evaluation test engineer)

Nipron Co., Ltd.

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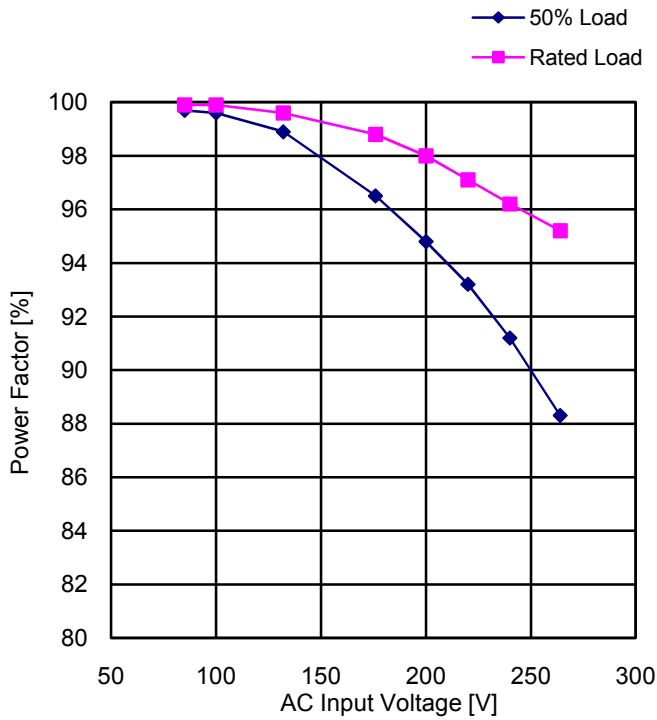
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Model	GPSA-360-12	Temperature: 25°C																																					
Item	Input Current (by Load Power)																																						
		<table border="1"> <thead> <tr> <th rowspan="2">Load Power [W]</th> <th colspan="4">Input Current [A rms]</th> </tr> <tr> <th>Input Voltage 85V AC</th> <th>Input Voltage 100V AC</th> <th>Input Voltage 240V AC</th> <th>Input Voltage 264V AC</th> </tr> </thead> <tbody> <tr> <td>0.0</td> <td>0.21</td> <td>0.20</td> <td>0.20</td> <td>0.20</td> </tr> <tr> <td>90.9</td> <td>1.45</td> <td>1.23</td> <td>0.59</td> <td>0.57</td> </tr> <tr> <td>181.8</td> <td>2.71</td> <td>2.27</td> <td>0.99</td> <td>0.93</td> </tr> <tr> <td>272.7</td> <td>4.02</td> <td>3.36</td> <td>1.41</td> <td>1.29</td> </tr> <tr> <td>363.6</td> <td>5.45</td> <td>4.52</td> <td>1.85</td> <td>1.70</td> </tr> </tbody> </table>				Load Power [W]	Input Current [A rms]				Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC	0.0	0.21	0.20	0.20	0.20	90.9	1.45	1.23	0.59	0.57	181.8	2.71	2.27	0.99	0.93	272.7	4.02	3.36	1.41	1.29	363.6	5.45	4.52	1.85	1.70
Load Power [W]	Input Current [A rms]																																						
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC																																			
0.0	0.21	0.20	0.20	0.20																																			
90.9	1.45	1.23	0.59	0.57																																			
181.8	2.71	2.27	0.99	0.93																																			
272.7	4.02	3.36	1.41	1.29																																			
363.6	5.45	4.52	1.85	1.70																																			

Model	GPSA-360-12	Temperature: 25°C																														
Item	Efficiency																															
<p>■ Efficiency(by Input Voltage)</p> <table border="1"> <thead> <tr> <th>AC Input Voltage [V]</th> <th>50% Load</th> <th>Rated Load</th> </tr> </thead> <tbody> <tr><td>85</td><td>78.99</td><td>78.13</td></tr> <tr><td>100</td><td>80.03</td><td>80.03</td></tr> <tr><td>132</td><td>81.25</td><td>82.21</td></tr> <tr><td>176</td><td>82.27</td><td>83.58</td></tr> <tr><td>200</td><td>82.80</td><td>84.04</td></tr> <tr><td>220</td><td>83.14</td><td>84.37</td></tr> <tr><td>240</td><td>84.13</td><td>84.65</td></tr> <tr><td>264</td><td>83.51</td><td>84.93</td></tr> </tbody> </table>				AC Input Voltage [V]	50% Load	Rated Load	85	78.99	78.13	100	80.03	80.03	132	81.25	82.21	176	82.27	83.58	200	82.80	84.04	220	83.14	84.37	240	84.13	84.65	264	83.51	84.93		
AC Input Voltage [V]	50% Load	Rated Load																														
85	78.99	78.13																														
100	80.03	80.03																														
132	81.25	82.21																														
176	82.27	83.58																														
200	82.80	84.04																														
220	83.14	84.37																														
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264	83.51	84.93																														
<p>■ Efficiency(by Load Power)</p> <table border="1"> <thead> <tr> <th rowspan="2">Load Power [W]</th> <th colspan="4">Efficiency [%]</th> </tr> <tr> <th>Input Voltage 85V AC</th> <th>Input Voltage 100V AC</th> <th>Input Voltage 240V AC</th> <th>Input Voltage 264V AC</th> </tr> </thead> <tbody> <tr><td>90.9</td><td>73.96</td><td>74.51</td><td>76.98</td><td>77.76</td></tr> <tr><td>181.8</td><td>78.99</td><td>80.03</td><td>84.13</td><td>83.51</td></tr> <tr><td>272.7</td><td>79.40</td><td>80.85</td><td>84.75</td><td>85.63</td></tr> <tr><td>363.6</td><td>78.13</td><td>80.03</td><td>84.65</td><td>84.93</td></tr> </tbody> </table>				Load Power [W]	Efficiency [%]				Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC	90.9	73.96	74.51	76.98	77.76	181.8	78.99	80.03	84.13	83.51	272.7	79.40	80.85	84.75	85.63	363.6	78.13	80.03	84.65	84.93
Load Power [W]	Efficiency [%]																															
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC																												
90.9	73.96	74.51	76.98	77.76																												
181.8	78.99	80.03	84.13	83.51																												
272.7	79.40	80.85	84.75	85.63																												
363.6	78.13	80.03	84.65	84.93																												

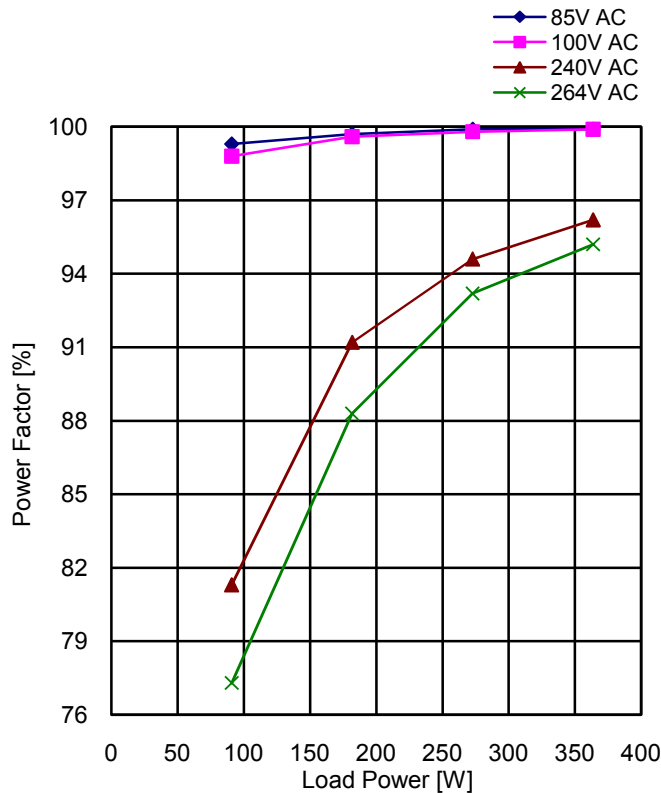
Model	GPSA-360-12	Temperature: 25°C
Item	Power Factor	

■ Power Factor (by Input Voltage)



AC Input Voltage [V]	Power Factor [%]	
	50% Load	Rated Load
85	99.7	99.9
100	99.6	99.9
132	98.9	99.6
176	96.5	98.8
200	94.8	98.0
220	93.2	97.1
240	91.2	96.2
264	88.3	95.2

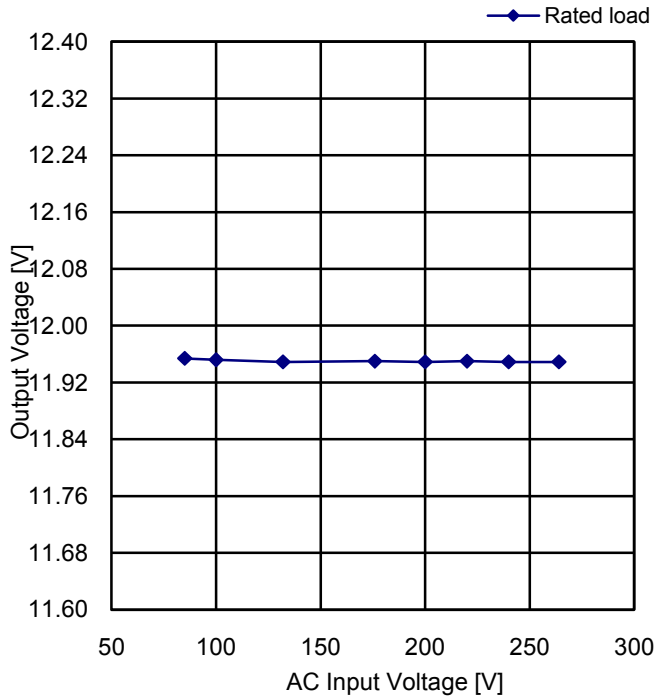
■ Power Factor (by Load Power)



Load Power [W]	Power Factor [%]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
90.9	99.3	98.8	81.3	77.3
181.8	99.7	99.6	91.2	88.3
272.7	99.9	99.8	94.6	93.2
363.6	99.9	99.9	96.2	95.2

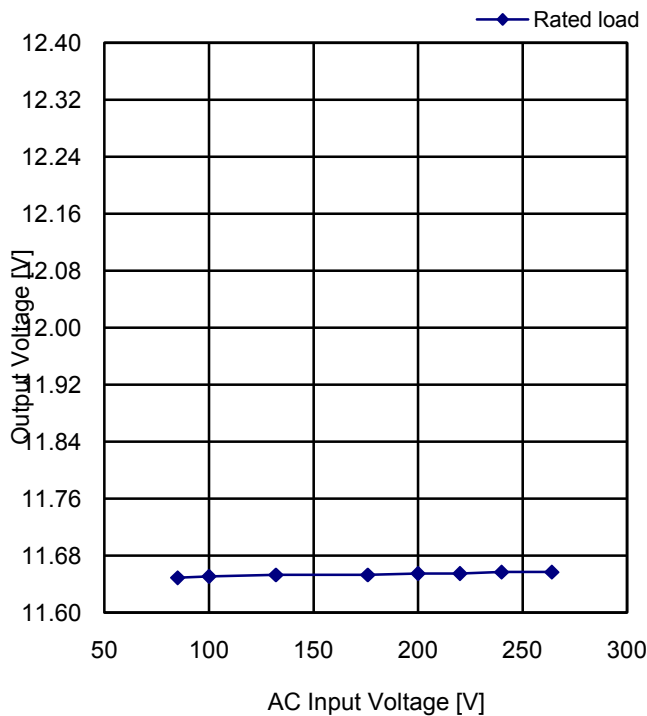
Model	GPSA-360-12	Temperature: 25°C
Item	Line Regulation	

12V/30A



AC Input Voltage [V]	Output Voltage [V]
85	11.954
100	11.952
132	11.949
176	11.950
200	11.949
220	11.950
240	11.949
264	11.949

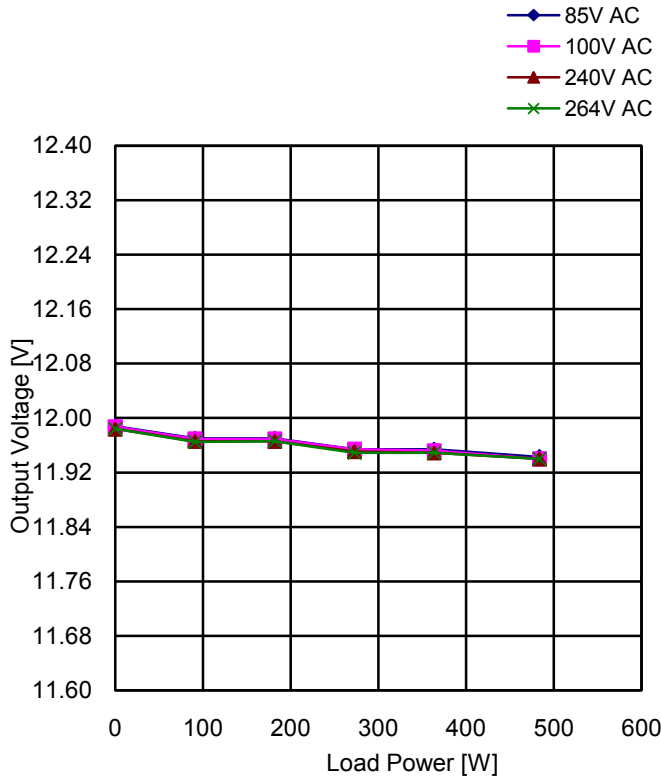
12VSB/0.3A



AC Input Voltage [V]	Output Voltage [V]
85	11.649
100	11.651
132	11.653
176	11.653
200	11.655
220	11.655
240	11.657
264	11.657

Model	GPSA-360-12	Temperature: 25°C
Item	Load Regulation	

12V

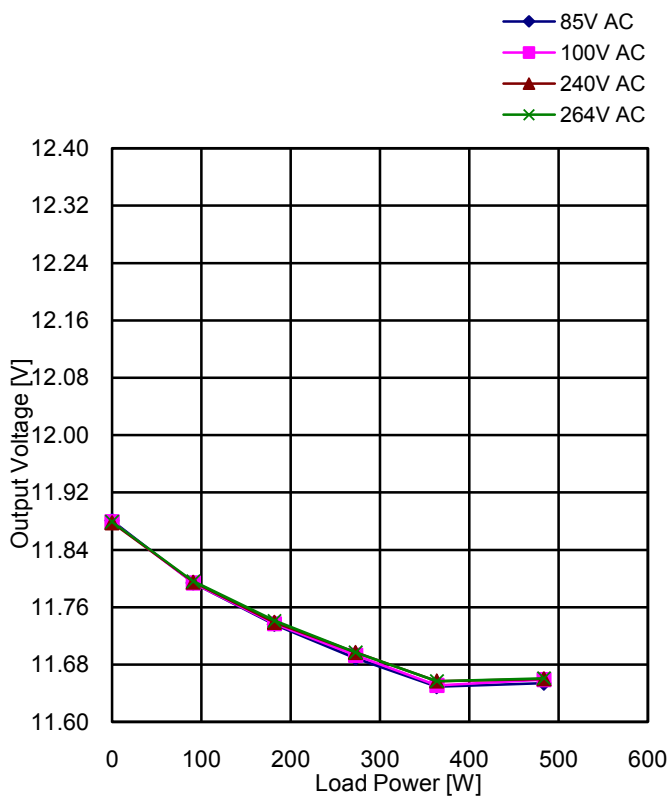


Load Power [W]	Output Voltage [V]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
0.0	11.988	11.987	11.984	11.984
90.9	11.970	11.969	11.966	11.965
181.8	11.970	11.969	11.966	11.966
272.7	11.954	11.954	11.951	11.949
363.6	11.954	11.952	11.949	11.949
483.6	11.943	11.940	11.940	11.940
-	-	-	-	-

Load Condition

Load Power [W]	Load Current [A]
	12V
0.0	0.00
90.9	7.50
181.8	15.00
272.7	22.50
363.6	30.00
483.6	40.00
-	-

12VSB



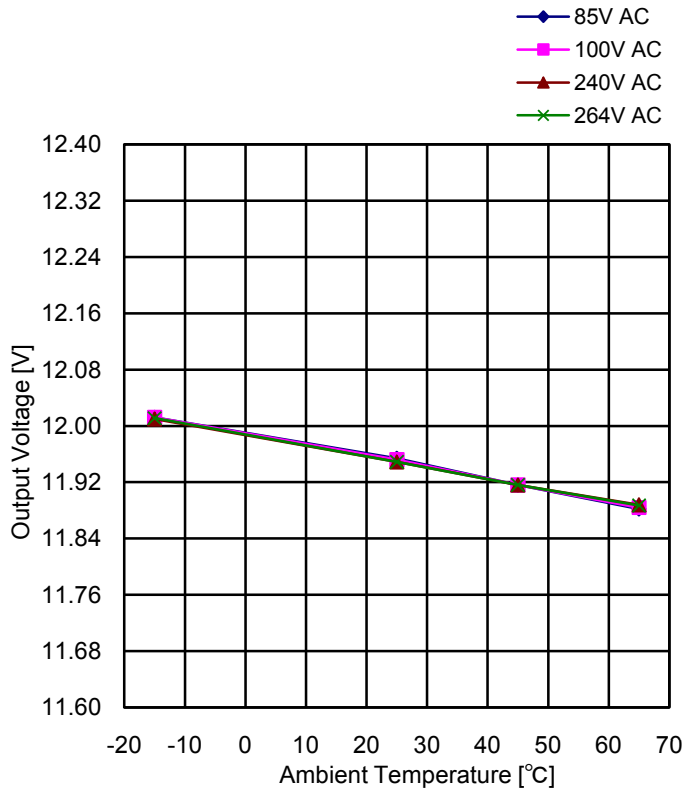
Load Power [W]	Output Voltage [V]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
0.0	11.881	11.879	11.878	11.879
90.9	11.794	11.794	11.795	11.796
181.8	11.736	11.737	11.739	11.741
272.7	11.689	11.693	11.697	11.697
363.6	11.649	11.651	11.657	11.657
483.6	11.654	11.659	11.660	11.661
-	-	-	-	-

Load Condition

Load Power [W]	Load Current [A]
	12VSB
0.0	0.00
90.9	0.075
181.8	0.15
272.7	0.225
363.6	0.30
483.6	0.30
-	-

Model	GPSA-360-12
Item	Ambient Temperature Drift

12V

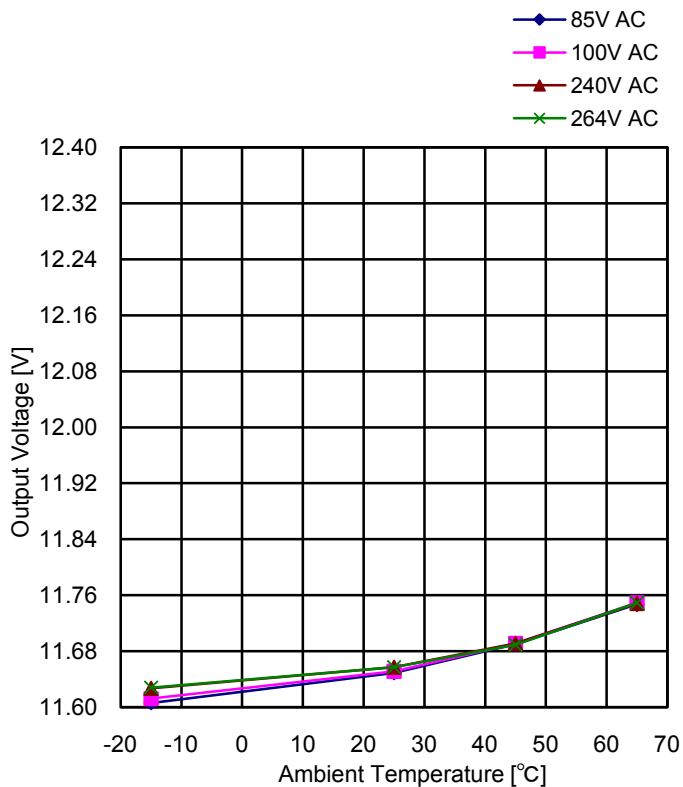


Ambient Temp. (°C)	Output Voltage [V]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
-15	12.012	12.012	12.010	12.011
25	11.954	11.952	11.949	11.949
45	11.916	11.916	11.916	11.916
65	11.882	11.884	11.888	11.887

Load Condition

Ambient Temp. (°C)	Load Current [A]
	12V
-15	30.00
25	30.00
45	30.00
65	18.00

12VSB



Ambient Temp. (°C)	Output Voltage [V]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
-15	11.606	11.612	11.627	11.628
25	11.649	11.651	11.657	11.657
45	11.690	11.691	11.691	11.689
65	11.747	11.749	11.748	11.749

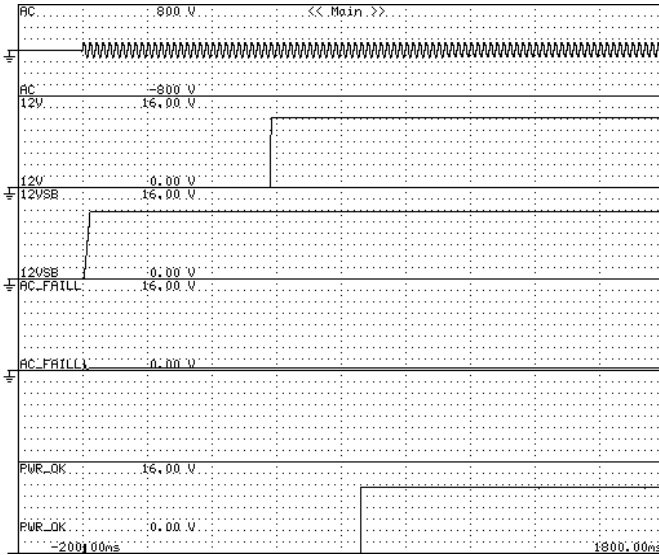
Load Condition

Ambient Temp. (°C)	Load Current [A]
	12VSB
-15	0.30
25	0.30
45	0.30
65	0.18

Model	GPSA-360-12	Temperature: 25°C
Item	Output Rise Characteristics (at AC Power ON)	

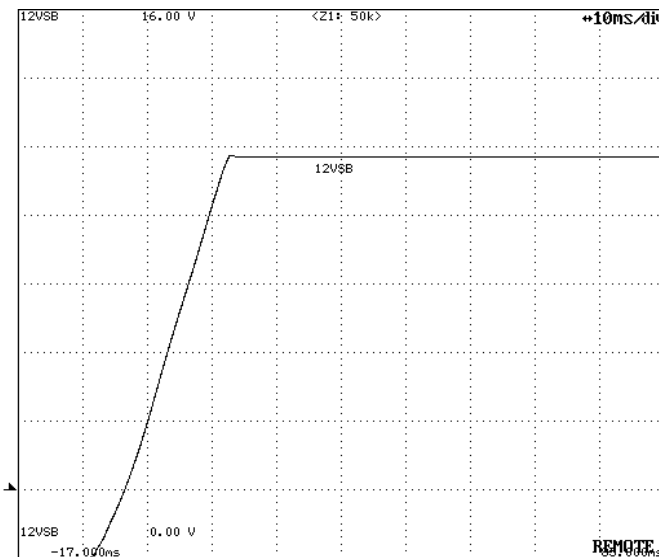
Input: 100V AC
Load: Rated Load

Timebase Range: 200ms/div



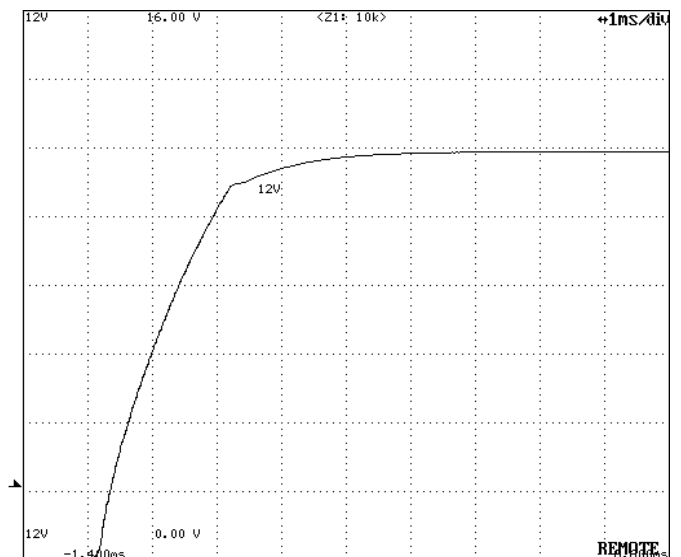
All Output Start-up Sequence

**Vertical Sensitivity: 2V/div
Timebase Range: 10ms/div**



12VSB DC Output Rise Characteristics

**Vertical Sensitivity: 2V/div
Timebase Range: 1ms/div**

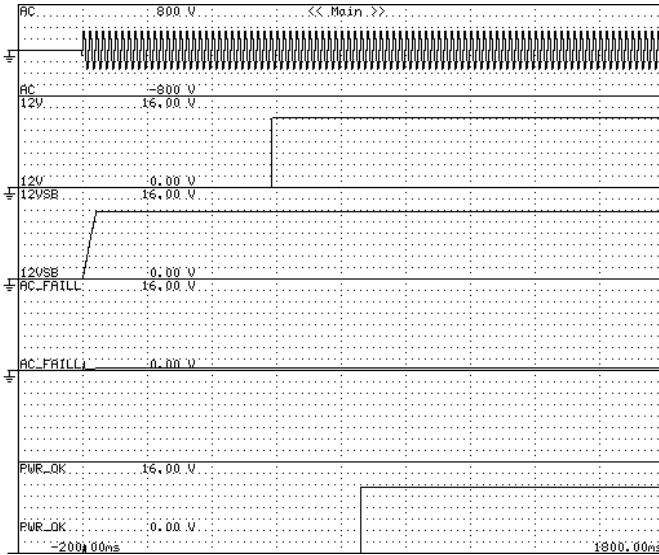


12V DC Output Rise Characteristics

Model	GPSA-360-12	Temperature: 25°C
Item	Output Rise Characteristics (at AC Power ON)	

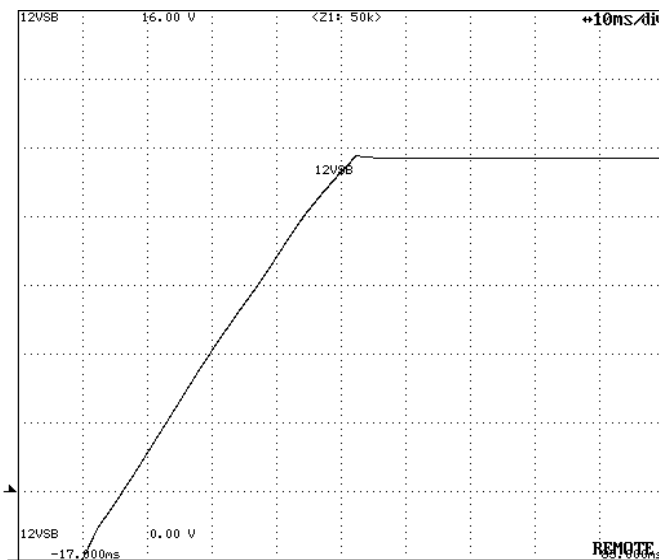
Input: 240V AC
Load: Rated Load

Timebase Range: 200ms/div



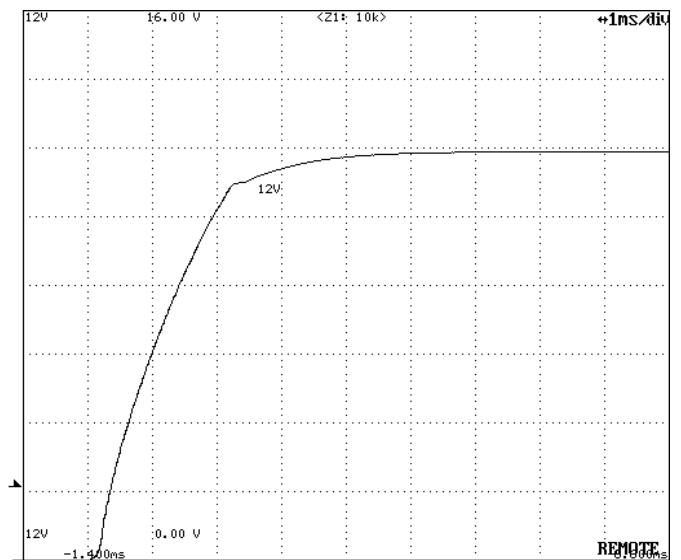
All Output Start-up Sequence

**Vertical Sensitivity: 2V/div
Timebase Range: 10ms/div**



12VSB DC Output Rise Characteristics

**Vertical Sensitivity: 2V/div
Timebase Range: 1ms/div**



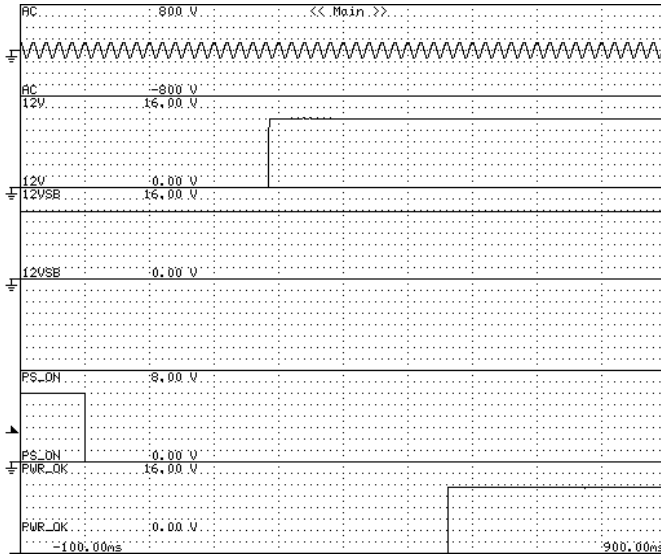
12V DC Output Rise Characteristics

Model	GPSA-360-12	Temperature: 25°C
Item	Output Rise Characteristics (at Remote ON)	

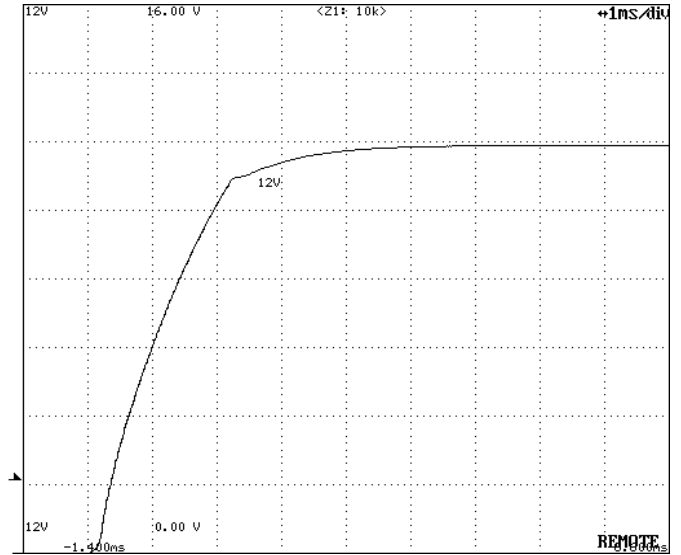
Input: 100V AC
Load: Rated Load

Timebase Range: 100ms/div

Vertical Sensitivity: 2V/div
Timebase Range: 1ms/div



All Output Start-up Sequence

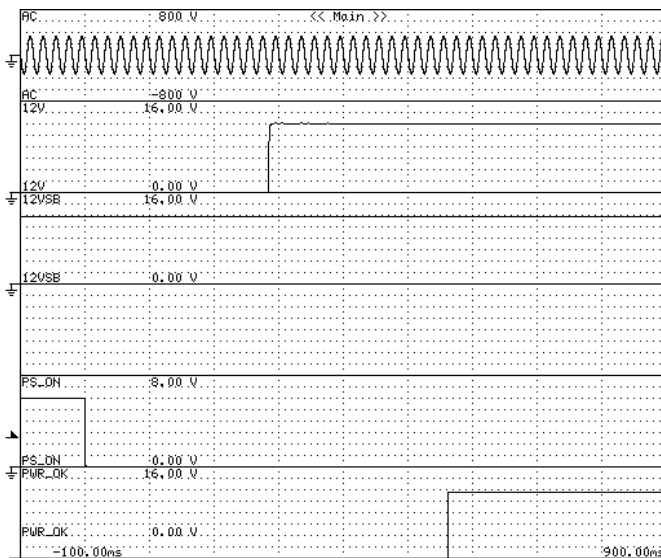


12V DC Output Rise Characteristics

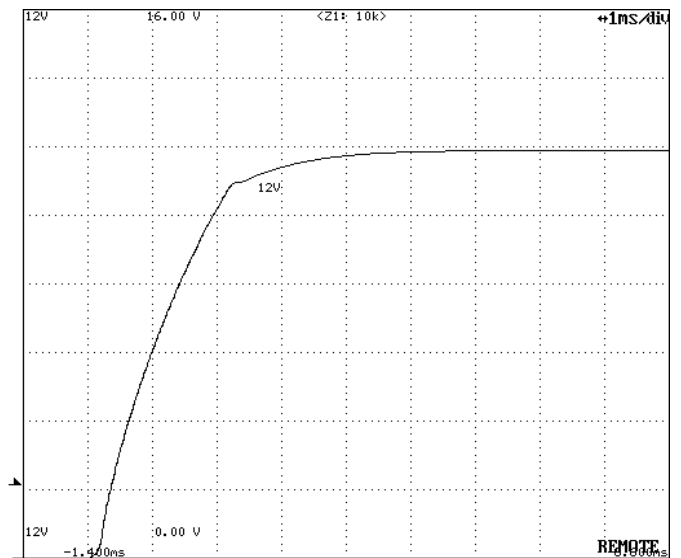
Input: 240V AC
Load: Rated Load

Timebase Range: 100ms/div

Vertical Sensitivity: 2V/div
Timebase Range: 1ms/div



All Output Start-up Sequence

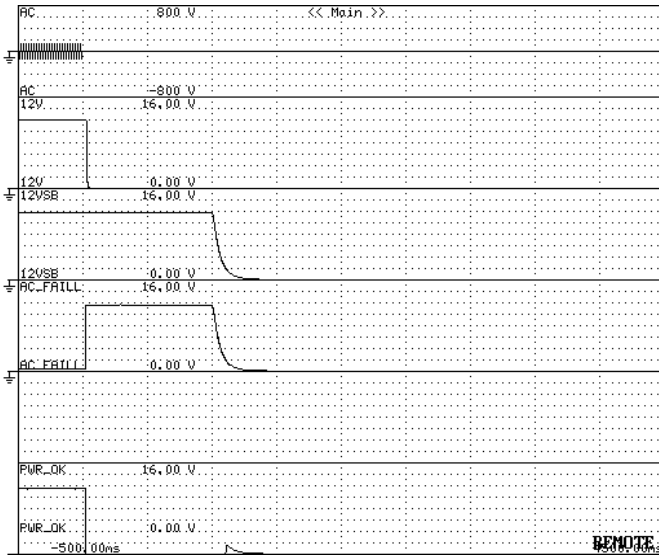


12V DC Output Rise Characteristics

Model	GPSA-360-12	Temperature: 25°C
Item	Output Fall Characteristics (at AC Power OFF)	

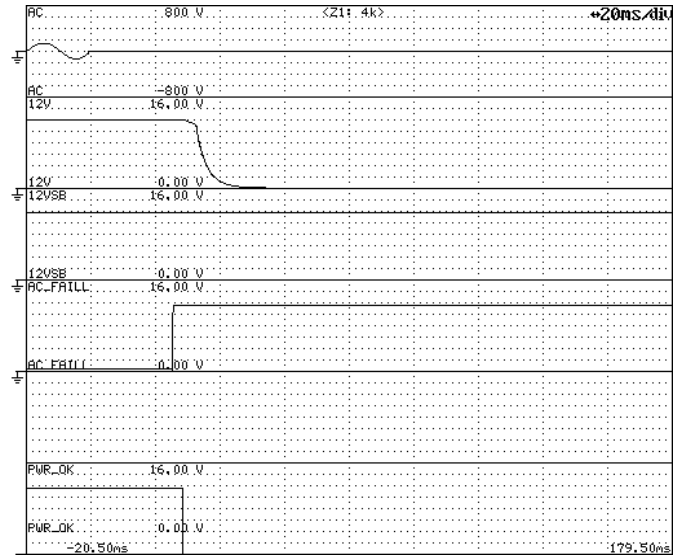
Input: 100V AC
Load: Rated Load

Timebase Range: 500ms/div



Output Fall Characteristics

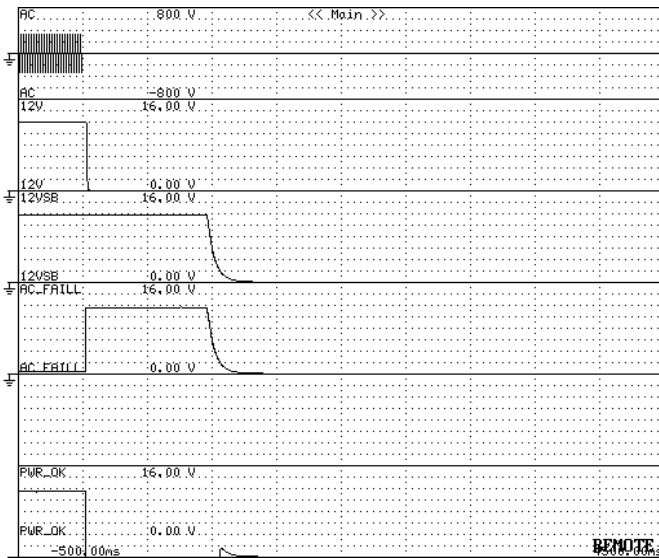
Timebase Range: 20ms/div



Output Fall Characteristics (magnification)

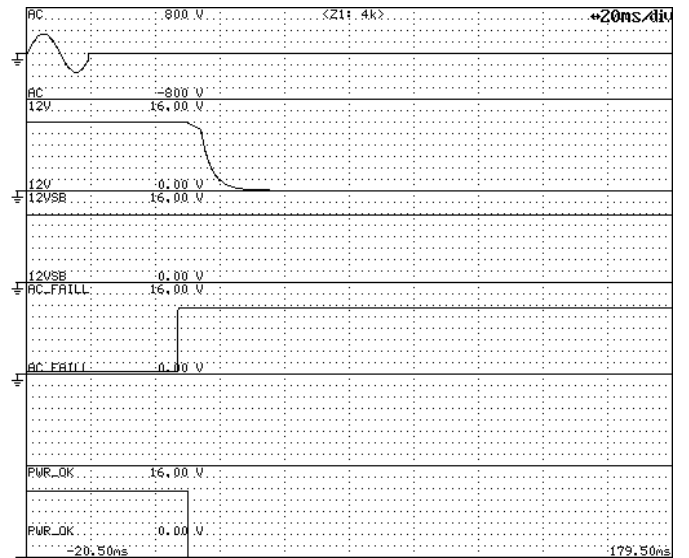
Input: 240V AC
Load: Rated Load

Timebase Range: 500ms/div



Output Fall Characteristics

Timebase Range: 20ms/div

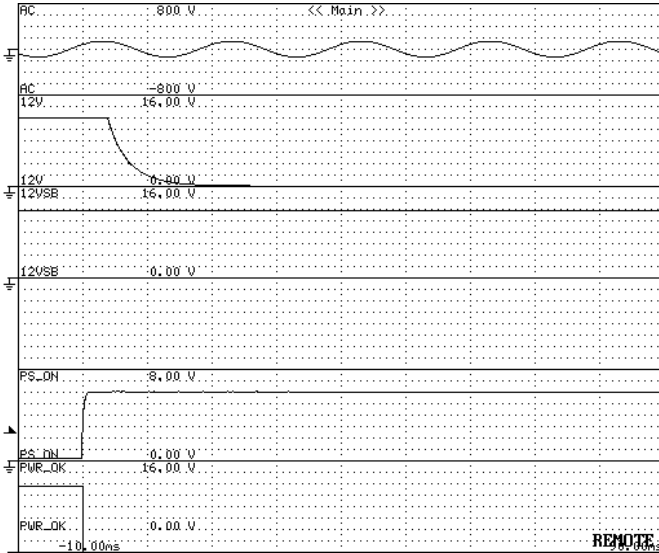


Output Fall Characteristics (magnification)

Model	GPSA-360-12	Temperature: 25°C
Item	Output Fall Characteristics (at Remote OFF)	

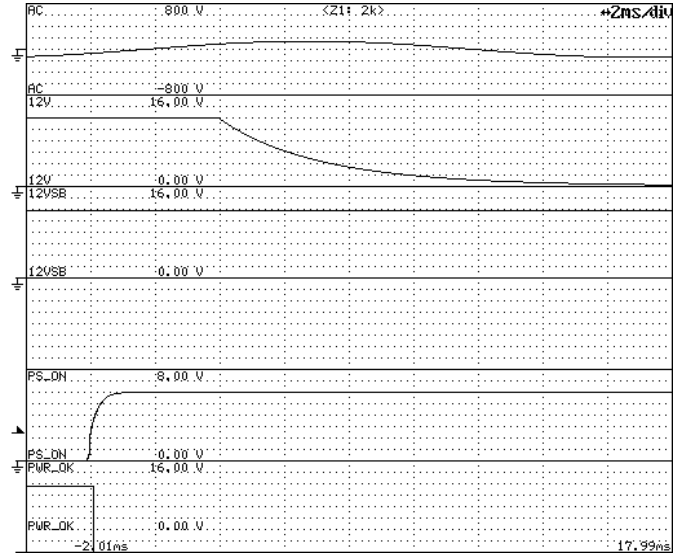
Input: 100V AC
Load: Rated Load

Timebase Range: 10ms/div



Output Fall Characteristics

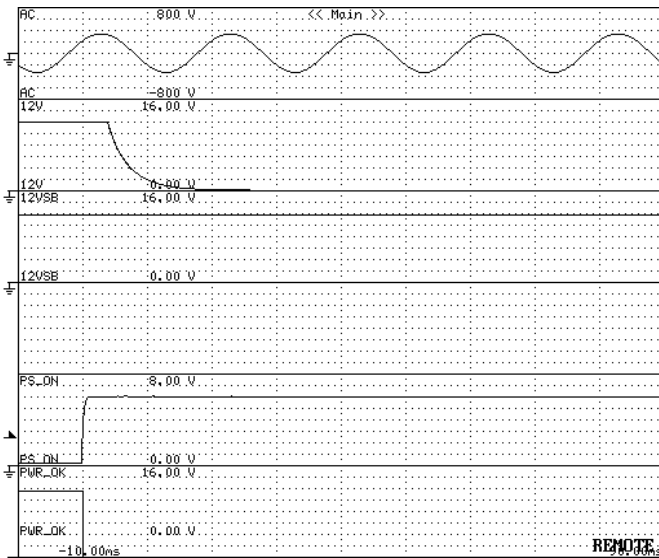
Timebase Range: 2ms/div



Output Fall Characteristics (magnification)

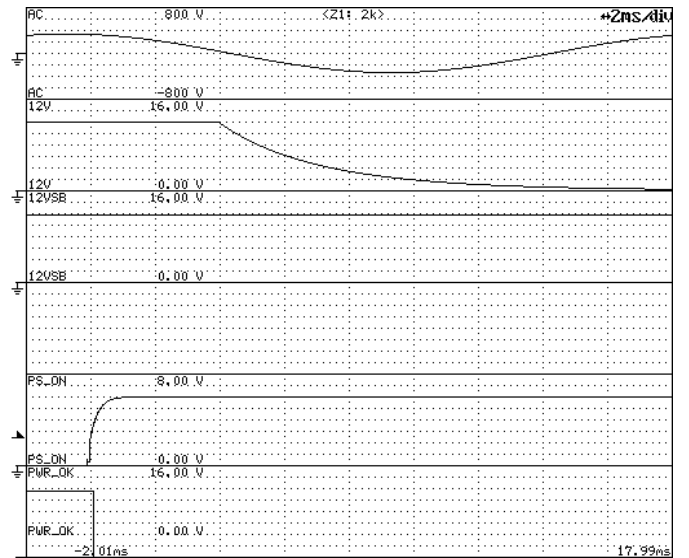
Input: 240V AC
Load: Rated Load

Timebase Range: 10ms/div



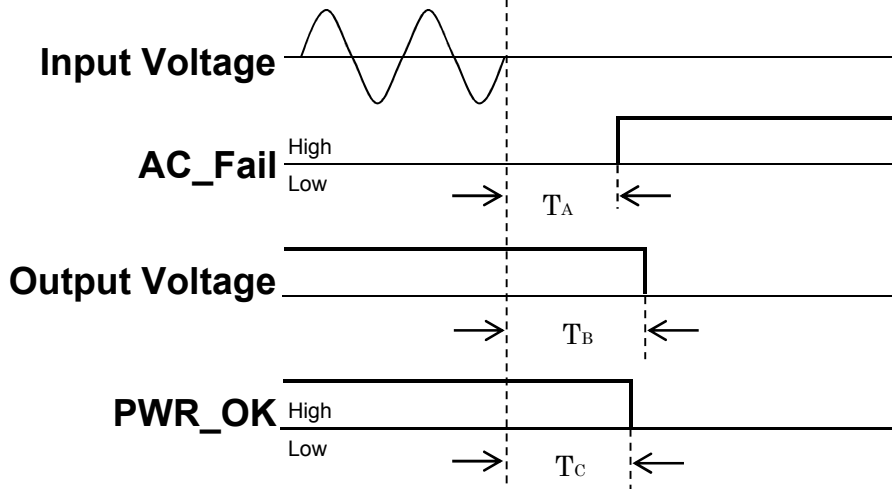
Output Fall Characteristics

Timebase Range: 2ms/div

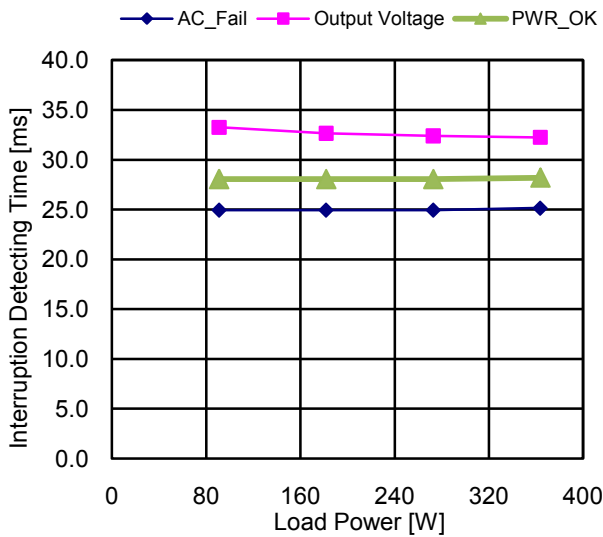


Output Fall Characteristics (magnification)

Model	GPSA-360-12	Temperature: 25°C
Item	Instantaneous Interruption Compensation (by Load Power)	

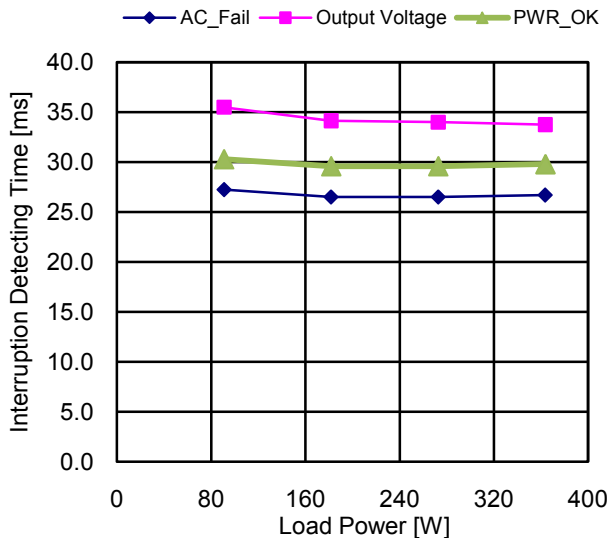


Input Voltage: 100V AC



Load Power [W]	Interruption Detecting Time [ms]		
	AC_Fail	Output Voltage	PWR_OK
	T _A	T _B	T _C
90.9	25.0	33.3	28.1
181.8	25.0	32.7	28.1
272.7	25.0	32.4	28.1
363.6	25.2	32.3	28.2

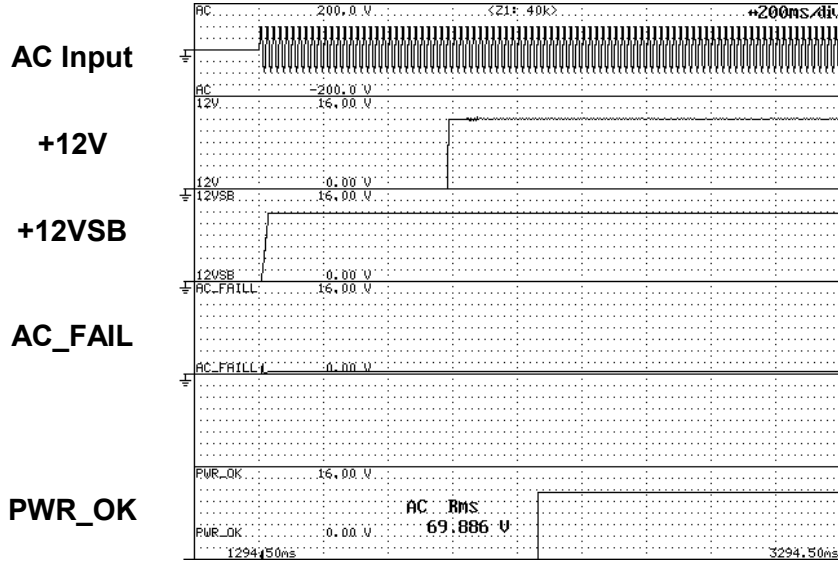
Input Voltage: 240V AC



Load Power [W]	Interruption Detecting Time [ms]		
	AC_Fail	Output Voltage	PWR_OK
	T _A	T _B	T _C
90.9	27.3	35.5	30.3
181.8	26.5	34.2	29.6
272.7	26.5	34.0	29.6
363.6	26.7	33.8	29.8

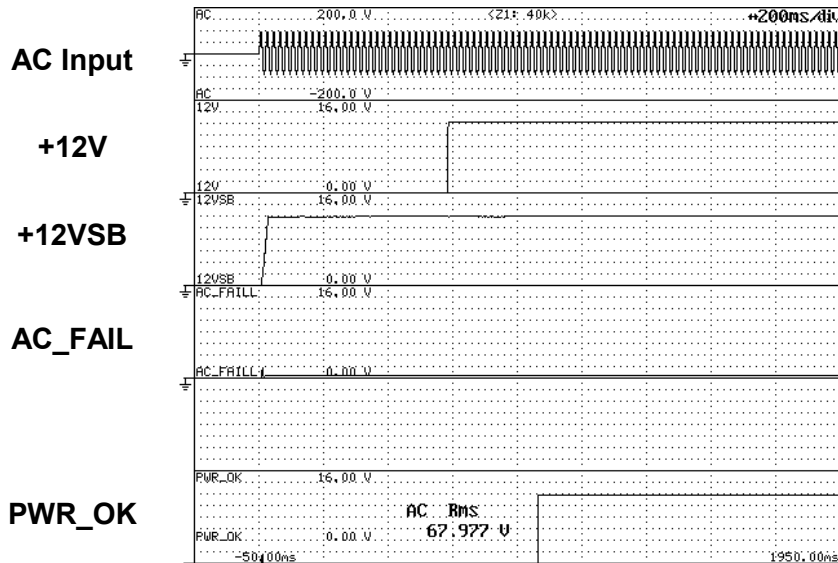
Model	GPSA-360-12	Temperature: 25°C
Item	Start-Up Voltage	

**Timebase Range: 200ms/div
Load: Rated Load**



Start-up Voltage: 69.9V AC

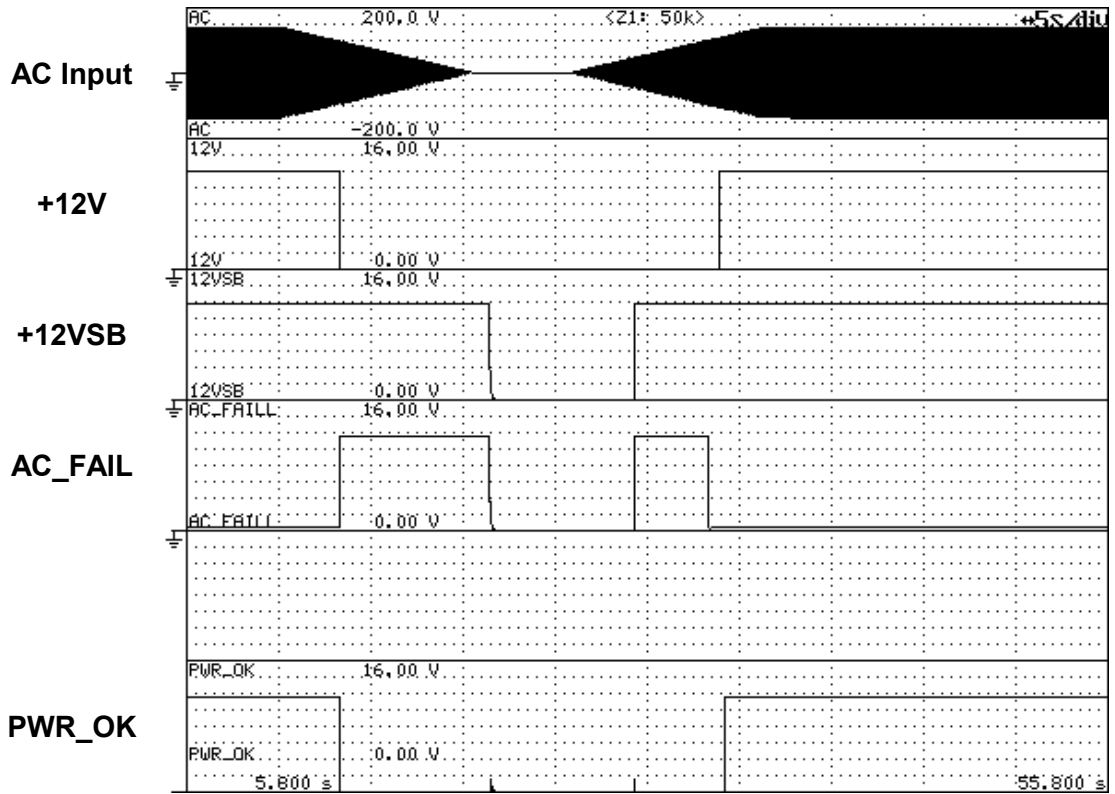
**Timebase Range: 200ms/div
Load: Minimum Load**



Start-up Voltage: 68.0V AC

Model	GPSA-360-12	Temperature: 25°C
Item	Input Voltage Sweep Up/Down	

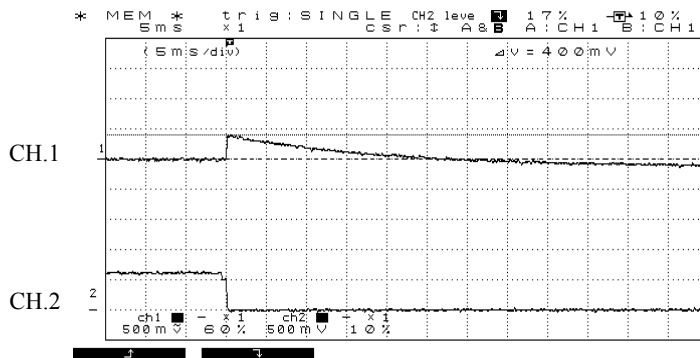
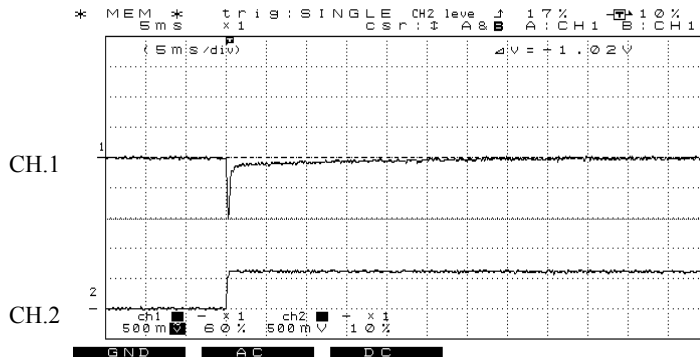
Timebase Range: 5s/div
Load: Rated Load



Sweep Rate: 10Vave/sec

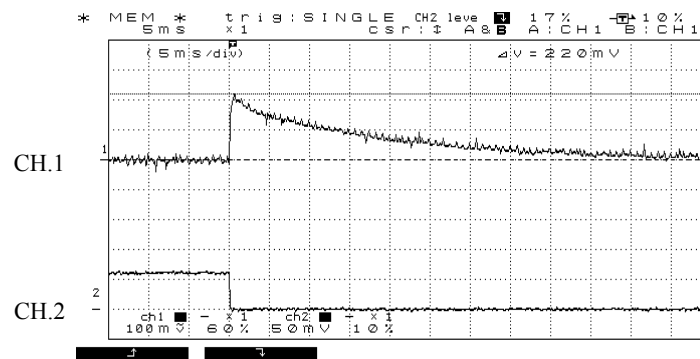
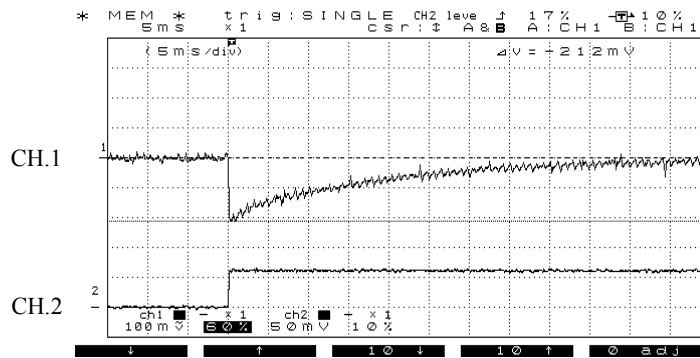
Model	GPSA-360-12	Temperature: 25°C
Item	Dynamic Load Response	

+12V DC Output Transient Response Waveforms



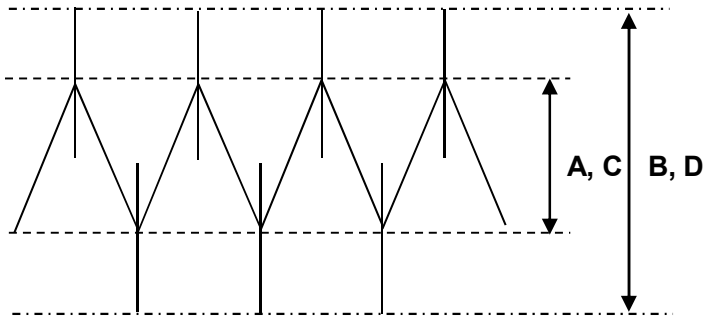
Waveform 1	
CH1	Measuring Point: DC Output Voltage
	Vertical Sensitivity: 500mV/div
CH2	Measuring Point: DC Output Current
	Vertical Sensitivity: 25A/div
Timebase Range	5ms/div
Condition	Input: 100V AC Load: Rated Load (Other output)
Note: Rated Load(30A) \Rightarrow Minimum load(0A)	

12VSB Output Transient Response Waveforms



Waveform 2	
CH1	Measuring Point: DC Output Voltage
	Vertical Sensitivity: 100mV/div
CH2	Measuring Point: DC Output Current
	Vertical Sensitivity: 0.25A/div
Timebase Range	5ms/div
Condition	Input: 100V AC Load: Rated Load (Other output)
Note: Rated Load(0.3A) \Rightarrow Minimum load(0A)	

Model	GPSA-360-12	Load: Rated Load
Item	Ripple / Noise Voltage	



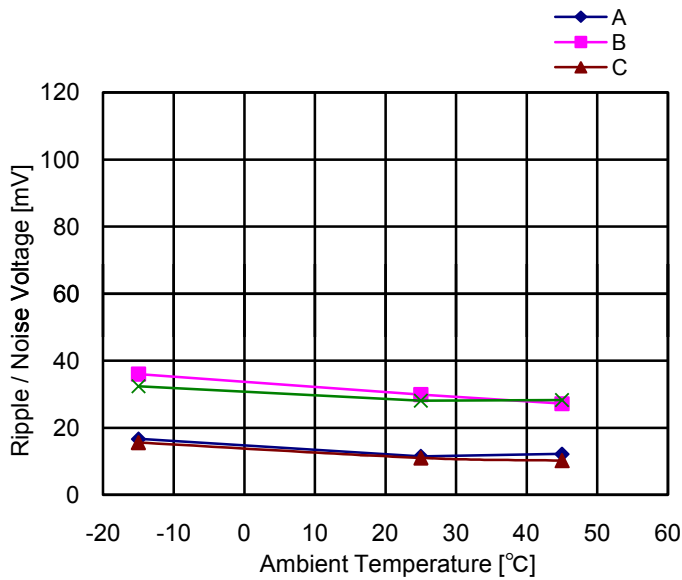
at 100V AC

A: Ripple Voltage (mV_{P-P})
B: Noise Voltage (mV_{P-P})

at 240V AC

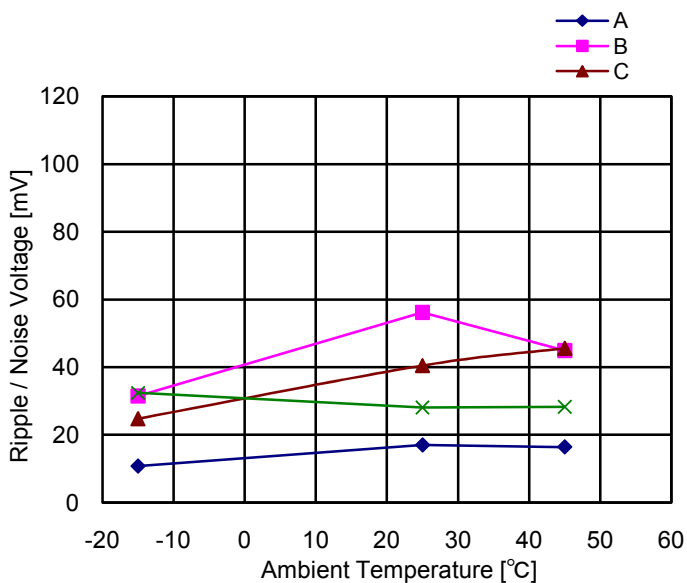
C: Ripple Voltage (mV_{P-P})
D: Noise Voltage (mV_{P-P})

12V



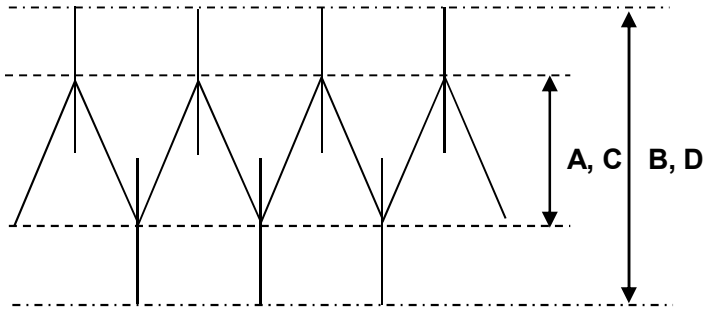
Ambient Temp. [°C]	Ripple / Noise Voltage [mV]			
	A	B	C	D
-15	16.7	36.0	15.6	32.4
25	11.5	29.9	11.0	28.1
45	12.2	27.2	10.2	28.3

12VSB



Ambient Temp. [°C]	Ripple / Noise Voltage [mV]			
	A	B	C	D
-15	10.8	31.5	10.1	24.8
25	17.0	56.2	17.1	40.5
45	16.4	44.9	15.8	45.6

Model	GPSA-360-12	Temperature : 25°C
Item	Ripple / Noise Voltage	



at 100V AC

A: Ripple Voltage (mV_{P-P})

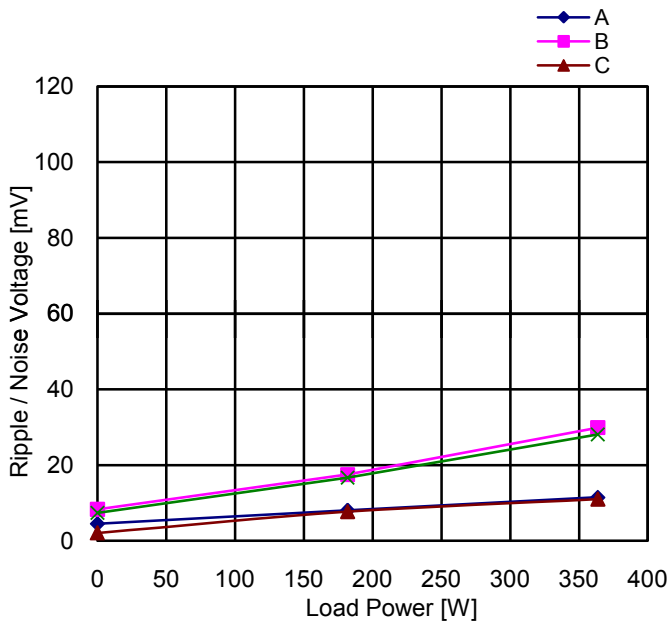
B: Noise Voltage (mV_{P-P})

at 240V AC

C: Ripple Voltage (mV_{P-P})

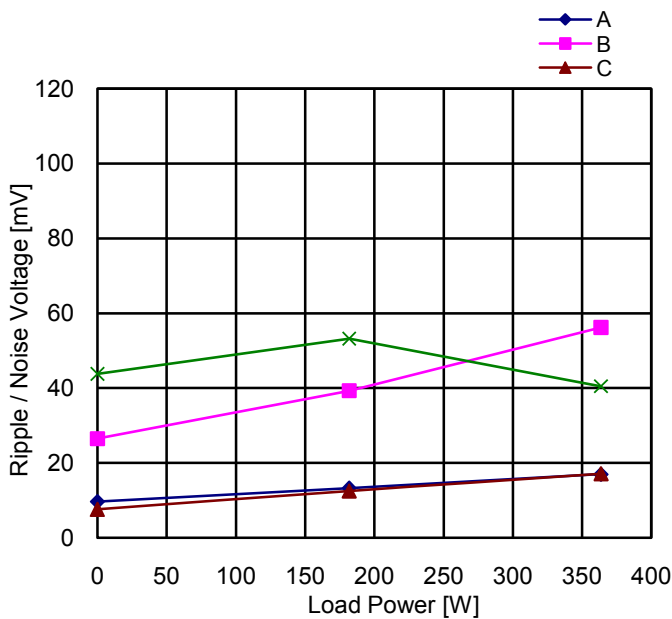
D: Noise Voltage (mV_{P-P})

12V



Load Power [W]	Ripple / Noise Voltage [mV]			
	A	B	C	D
0	4.5	8.3	2.1	7.4
181.8	8.1	17.5	7.7	16.7
363.6	11.5	29.9	11.0	28.1

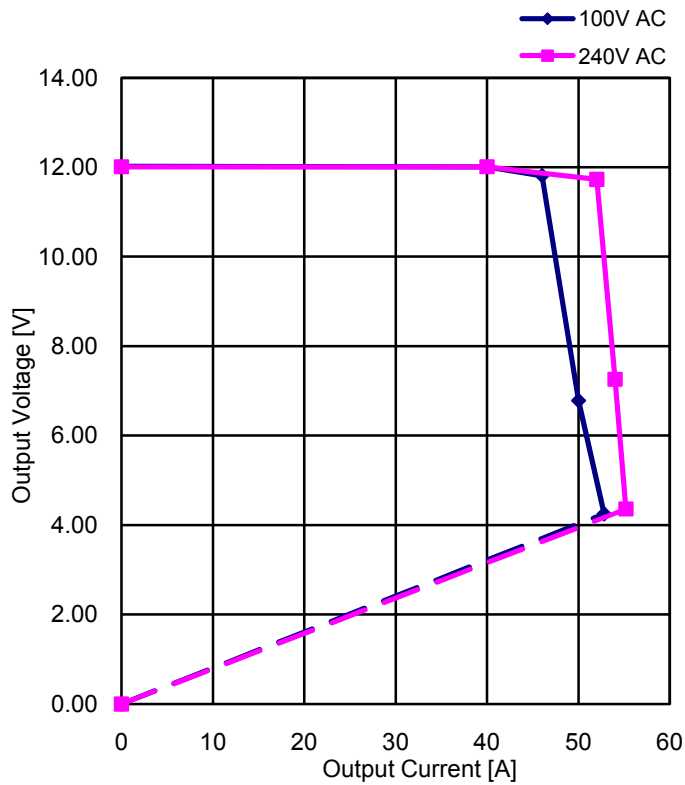
12VSB



Load Power [W]	Ripple / Noise Voltage [mV]			
	A	B	C	D
0	9.7	26.5	7.6	43.8
181.8	13.3	39.3	12.5	53.2
363.6	17.0	56.2	17.1	40.5

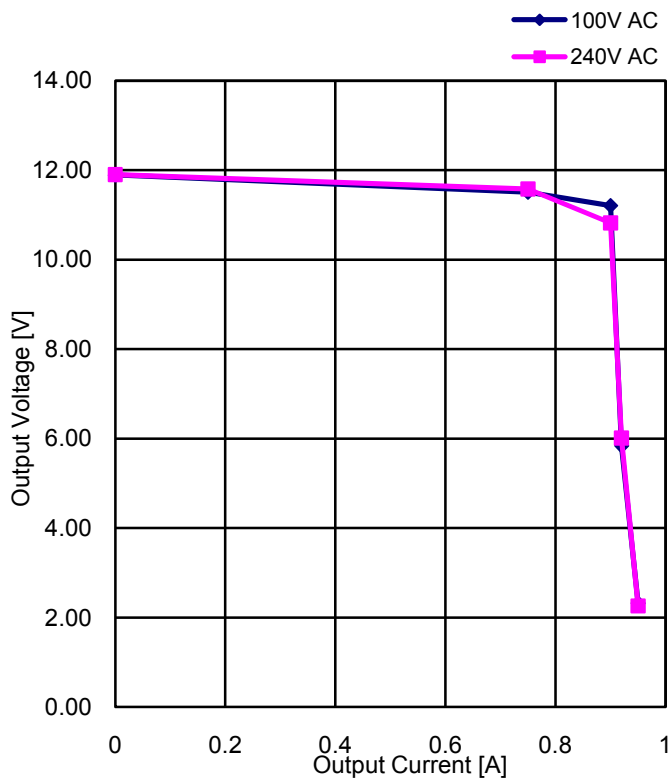
Model	GPSA-360-12	Temperature: 25°C
Item	Over-Current Protection	

V-I Characteristics of 12V O.C.P



Input Voltage: 100V AC		Input Voltage: 240V AC	
Output Current [A]	Output Voltage [V]	Output Current [A]	Output Voltage [V]
0.00	12.02	0.00	12.01
40.00	12.01	40.00	12.01
46.00	11.81	52.00	11.73
50.00	6.78	54.00	7.26
52.80	4.25	55.20	4.36

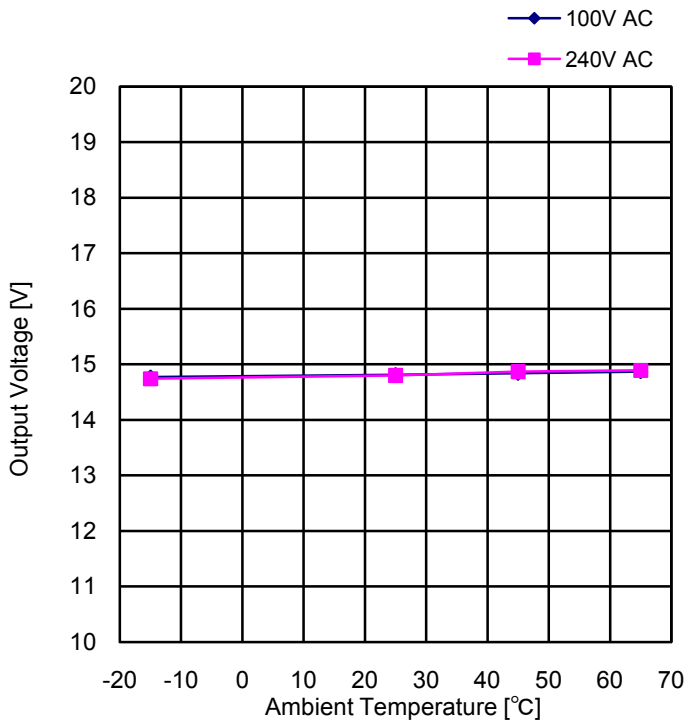
V-I Characteristics of 12VSB O.C.P



Input Voltage: 100V AC		Input Voltage: 240V AC	
Output Current [A]	Output Voltage [V]	Output Current [A]	Output Voltage [V]
0.00	11.89	0.00	11.90
0.75	11.51	0.75	11.58
0.90	11.21	0.90	10.82
0.92	5.84	0.92	6.01
0.95	2.32	0.95	2.26
0.95	2.32	0.95	2.26

Model	GPSA-360-12	Load: Minimum Load
Item	Over-Voltage Protection	

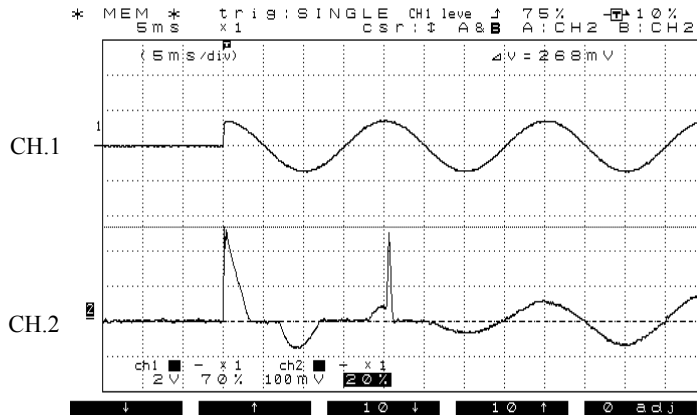
12V



Ambient Temp. [°C]	Output Voltage[V]	
	Input Voltage 100V AC	Input Voltage 240V AC
-15	14.77	14.74
25	14.81	14.80
45	14.84	14.87
65	14.87	14.89

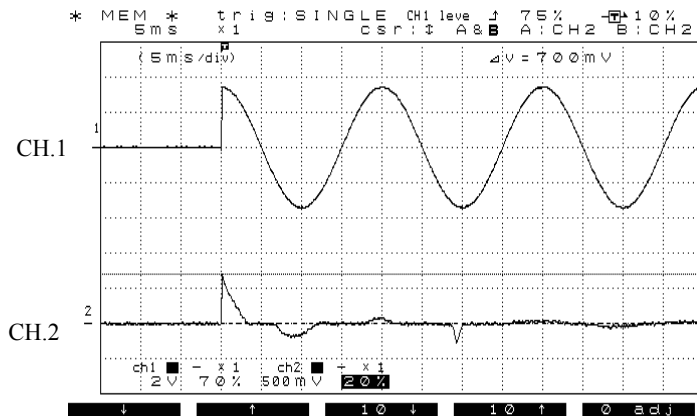
Model	GPSA-360-12	Temperature: 25°C
Item	Inrush Current	Load: Rated Load

Inrush Current Waveforms



Waveform 1

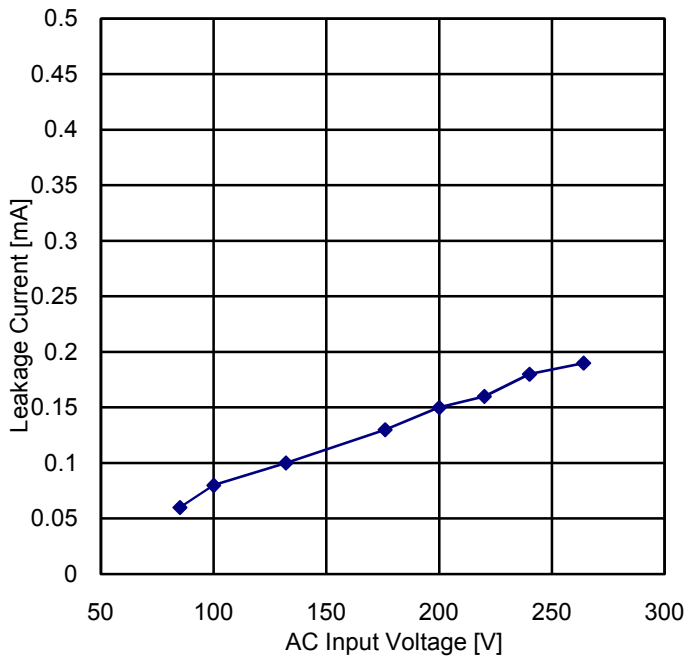
CH1	Measuring Point:	AC Input Voltage
	Range:	200V/div
CH2	Measuring Point:	AC Input Current
	Range:	5A/div
Timebase Range	5ms/div	
Conditions	Input: 100V AC Load: Rated Load	
Note: Inrush Current: 13.4A		



Waveform 2

CH1	Measuring Point:	AC Input Voltage
	Range:	200V/div
CH2	Measuring Point:	AC Input Current
	Range:	25A/div
Timebase Range	5ms/div	
Conditions	Input: 240V AC Load: Rated Load	
Note: Inrush Current: 35.0A		

Model	GPSA-360-12	Load: Rated Load
Item	Leakage Current	Temperature: 25°C



AC Input Voltage [V]	Leakage Current [mA]
85	0.06
100	0.08
132	0.10
176	0.13
200	0.15
220	0.16
240	0.18
264	0.19