# **Laptop Power Adapter**



## Single Output 120W Data Sheet

For the latest revision, please visit power.liteon.com

### **Description**

This series is class 1, single-output AC to DC 120W green adapter with C6 inlet type. It can be operated from AC 90V~264V with good efficiency performance for Notebook / AIO / Mini PC / Thin Client /Docking application. It also complies world-wide Safety and EMC regulations.

#### **Features**

- \* Full AC input voltage design with C6 socket
- \* Withstand 300Vac surge voltage for 5 seconds
- \* Full Protections: Short-circuit/ Over-voltage/

Over-current/ Over temperature operating.

- \* Energy efficiency level VI compliance
- \* IEC/EN 62368-1 design compliance
- \* Up to 5000 meters operating altitude (note #4)
- \* High reliability





#### **Electrical Specification**

Electrical Specification	
Model Name	PA-1121-26E1
Output	
Rated power	120W
Rated voltage	19.5V
Rated current	6.15A
Ripple & Noise(max.) (note #2)	380mV
Line & load regulation	±5%
Hold-up time(typ.)	5ms
Timing: AC ON delay / rising (max.)	5 sec / 100ms
Input	
Rated voltage range	100~240Vac
Operated voltage range	90~264Vac, 300Vac for 5 sec
Current range (max.)	1.9A/100Vac
Inrush current	No component damaged ( <i<sup>2*t).</i<sup>
Frequency range	50-60Hz
Leakage current (max.)	50uA at 240Vac
Average efficiency (typ.)	89%

Over voltage (max.)       140% of rated voltage, latch-off protection         Over current (max.)       160% of rated current, latch-off protection         Short circuit at O/P       No damage, latch-off protection         Over temperature       No damage, latch-off protection         Others         MTBF (min.) (note#3)         100K hours @ rated load         Environment         Temperature (note#5)         (operating) 0~35℃ / (storage) -20~85℃         Humidity         (operating) 95% RH non-condensing / (storage) 95% RH         Altitude (max.)         5000 meters         Mechanical         Dimension         136(L)*68(W)*25(H) mm         Vibration         (10°500 Hz, 56 20min./1cycle per axis for all axes (X, Y, Z)         Weight (max.)         Safety         Standard         CB/IEC62368-1,TUV62368-1,UL62368-1,EN62368-1,CCC2688-1         CCC GB4943.1,PSE J62368-1,BSMI CNS15598-1,KC62368-1         Withstand voltage       Input-Output: 4242VDC / Input-FG: 215VDC         Isolation resistance(min.)       Input-Output: 30Mohm @ 500VDC,	Protection Function		
Short circuit at O/P  Over temperature  No damage, latch-off protection  Others  MTBF (min.) (note#3)  100K hours @ rated load  Environment  Temperature (note#5)  (operating) 0"35"C / (storage) -20"85"C  Humidity  Altitude (max.)  5000 meters  Mechanical  Dimension  136(L)*68(W)*25(H) mm  Vibration  10"500 Hz, 5G 20min./1cycle per axis for all axes (X, Y, Z)  Weight (max.)  365g  Safety  Standard  CB/IEC62368-1,TUV62368-1,UL62368-1,EN62368-1, CCC GB4943.1,PSE J62368-1,BSMI CNS15598-1,KC62368-1  Withstand voltage  Input-Output: 4242VDC / Input-FG: 2150VDC  Isolation resistance(min.)  Input-Output: 30Mohm @ 500VDC, 25"C, 70%RH  EMC  ENS5032 (CISPR32)  Conducted EMI: class B / Radiated EMI: class B  FCC  Conducted EMI: class B / Radiated EMI: class B  EN61000-3-2  Harmonic distortion: Class D  EN61000-4-2  ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-3  Radiated RF immunity: 3V/m  EN61000-4-6  EN61000-4-8  Magnetic field immunity: 3A/m	Over voltage (max.)	140% of rated voltage, latch-off protection	
Over temperature No damage, latch-off protection  Others  MTBF (min.) (note#3) 100K hours @ rated load  Environment  Temperature (note#5) (operating) 0°35°C / (storage) -20°85°C Humidity (operating) 95% RH non-condensing / (storage) 95% RH Altitude (max.) 5000 meters  Mechanical  Dimension 136(L)*68(W)*25(H) mm  Vibration 10°500 Hz, 5G 20min./1cycle per axis for all axes (X, Y, Z)  Weight (max.) 365g  Safety  Standard CB/IEC62368-1,TUV62368-1,UL62368-1,EN62368-1, CCC GB4943.1,PSE J62368-1,EN62368-1, CCC GB4943.1,PSE J62368-1,BSMI CNS15598-1,KC62368-1  Withstand voltage Input-Output: 4242VDC / Input-FG: 2150VDC  Isolation resistance(min.) Input-Output: 30Mohm @ 500VDC, 25°C, 70%RH  EMC  ENS5032 (CISPR32) Conducted EMI: class B / Radiated EMI: class B  EN61000-3-2 Harmonic distortion: Class D  EN61000-4-2 ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-3 Radiated RF immunity: 3V/m  EN61000-4-6 Conducted RF immunity: 3V/m  EN61000-4-6 Conducted RF immunity: 3V/m  EN61000-4-8 Magnetic field immunity: 3J/m	Over current (max.)	160% of rated current, latch-off protection	
MTBF (min.) (note#3)  I 00K hours @ rated load  Environment  Temperature (note#5)  (operating) 0°35°C / (storage) -20°85°C  Humidity  (operating) 95% RH non-condensing / (storage) 95% RH  Altitude (max.)  So00 meters  Mechanical  Dimension  136(L)*68(W)*25(H) mm  Vibration  10°500 Hz, 56 20min./1cycle per axis for all axes (X, Y, Z)  Weight (max.)  365g  Safety  Standard  CB/IEC62368-1,TUV62368-1,UL62368-1,EN62368-1, CCC GB4943.1,PSE J62368-1,BSMI CN515598-1,KC62368-1  Withstand voltage  Input-Output: 4242VDC / Input-FG: 2150VDC  Isolation resistance(min.)  Input-Output: 30Mohm @ 500VDC, 25°C, 70%RH  EMC  ENS5032 (CISPR32)  Conducted EMI: class B / Radiated EMI: class B  FCC  Conducted EMI: class B / Radiated EMI: class B  EN61000-3-2  Harmonic distortion: Class D  EN61000-4-2  ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-3  Radiated RF immunity: 3V/m  EN61000-4-6  EN61000-4-6  Conducted RF immunity: 3V/m  EN61000-4-8  Magnetic field immunity: 3V/m	Short circuit at O/P	No damage, latch-off protection	
Temperature (note#s)   100K hours @ rated load	Over temperature	No damage, latch-off protection	
Temperature (note#5) (operating) 0°35°C / (storage) -20°85°C Humidity (operating) 95% RH non-condensing / (storage) 95% RH Altitude (max.) 5000 meters  Mechanical  Dimension 136(L)*68(W)*25(H) mm  Vibration 10°500 Hz, 5G 20min./1cycle per axis for all axes (X, Y, Z)  Weight (max.) 365g  Safety  Standard CB/IEC62368-1,TUV62368-1,UL62368-1,EN62368-1, CCC GB4943.1,PSE J62368-1,BSMI CNS15598-1,KC62368-1  Withstand voltage Input-Output: 4242VDC / Input-FG: 2150VDC  Isolation resistance(min.) Input-Output: 30Mohm @ 500VDC, 25°C, 70%RH  EMC  EN55032 (CISPR32) Conducted EMI: class B / Radiated EMI: class B  FCC Conducted EMI: class B / Radiated EMI: class B  EN61000-3-2 Harmonic distortion: Class D  EN61000-4-2 ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-3 Radiated RF immunity: 3V/m  EN61000-4-5 Surge: ±1KV DM / ±2KV CM  EN61000-4-6 Conducted RF immunity: 3V/m  EN61000-4-8 Magnetic field immunity: 3V/m	Others		
Temperature (note#5) (operating) 0°35°C / (storage) -20°85°C Humidity (operating) 95% RH non-condensing / (storage) 95% RH Altitude (max.) 5000 meters  Mechanical  Dimension 136(L)*68(W)*25(H) mm  Vibration 10°500 Hz, 5G 20min./1cycle per axis for all axes (X, Y, Z) Weight (max.) 365g  Safety  Standard CB/IEC62368-1,TUV62368-1,UL62368-1,EN62368-1, CCC GB4943.1,PSE J62368-1,BSMI CNS15598-1,KC62368-1 Withstand voltage Input-Output: 4242VDC / Input-FG: 2150VDC Isolation resistance(min.) Input-Output: 30Mohm @ 500VDC, 25°C, 70%RH  EMC  ENS5032 (CISPR32) Conducted EMI: class B / Radiated EMI: class B FCC Conducted EMI: class B / Radiated EMI: class B EN61000-3-2 Harmonic distortion: Class D EN61000-4-3 Radiated RF immunity: 3V/m  EN61000-4-4 EFT: ±1KV (AC port) EN61000-4-5 Surge: ±1KV DM / ±2KV CM EN61000-4-6 Conducted RF immunity: 3V/m EN61000-4-8 Magnetic field immunity: 3A/m	MTBF (min.) (note#3)	100K hours @ rated load	
Humidity (operating) 95% RH non-condensing / (storage) 95% RH  Altitude (max.) 5000 meters  Mechanical  Dimension 136(L)*68(W)*25(H) mm  Vibration 10°500 Hz, 5G 20min./1cycle per axis for all axes (X, Y, Z)  Weight (max.) 365g  Safety  Standard CB/IEC62368-1,TUV62368-1,UL62368-1,EN62368-1, CCC GB4943.1,PSE J62368-1,BSMI CNS15598-1,KC62368-1  Withstand voltage Input-Output: 4242VDC / Input-FG: 2150VDC  Isolation resistance(min.) Input-Output: 30Mohm @ 500VDC, 25°C, 70%RH  EMC  EN55032 (CISPR32) Conducted EMI: class B / Radiated EMI: class B  FCC Conducted EMI: class B / Radiated EMI: class B  EN61000-3-2 Harmonic distortion: Class D  EN61000-4-2 ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-3 Radiated RF immunity: 3V/m  EN61000-4-5 Surge: ±1KV DM / ±2KV CM  EN61000-4-6 Conducted RF immunity: 3V/m  EN61000-4-8 Magnetic field immunity: 3A/m	Environment		
Mechanical  Dimension 136(L)*68(W)*25(H) mm  Vibration 10~500 Hz, 5G 20min./1cycle per axis for all axes (X, Y, Z)  Weight (max.) 365g  Safety  Standard CB/IEC62368-1,TUV62368-1,UL62368-1,EN62368-1, CCC GB4943.1,PSE J62368-1,BSMI CNS15598-1,KC62368-1  Withstand voltage Input-Output: 4242VDC / Input-FG: 2150VDC  Isolation resistance(min.) Input-Output: 30Mohm @ 500VDC, 25°C, 70%RH  EMC  EN55032 (CISPR32) Conducted EMI: class B / Radiated EMI: class B  FCC Conducted EMI: class B / Radiated EMI: class B  EN61000-3-2 Harmonic distortion: Class D  EN61000-4-2 ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-3 Radiated RF immunity: 3V/m  EN61000-4-6 Conducted RF immunity: 3V/m  EN61000-4-6 Conducted RF immunity: 3V/m  EN61000-4-8 Magnetic field immunity: 3V/m	Temperature (note#5)	(operating) 0~35°C / (storage) -20~85°C	
MechanicalDimension136(L)*68(W)*25(H) mmVibration10~500 Hz, 5G 20min./1cycle per axis for all axes (X, Y, Z)Weight (max.)365gSafetyStandardCB/IEC62368-1,TUV62368-1,UL62368-1,EN62368-1, CCC GB4943.1,PSE J62368-1,BSMI CNS15598-1,KC62368-1Withstand voltageInput-Output: 4242VDC / Input-FG: 2150VDCIsolation resistance(min.)Input-Output: 30Mohm @ 500VDC, 25°C, 70%RHEMCEN55032 (CISPR32)Conducted EMI: class B / Radiated EMI: class BFCCConducted EMI: class B / Radiated EMI: class BEN61000-3-2Harmonic distortion: Class DEN61000-4-2ESD: ±8KV contact discharge / ±15KV contact dischargeEN61000-4-3Radiated RF immunity: 3V/mEN61000-4-4EFT: ±1KV (AC port)EN61000-4-5Surge: ±1KV DM / ±2KV CMEN61000-4-6Conducted RF immunity: 3V/mEN61000-4-8Magnetic field immunity: 3A/m	Humidity	(operating) 95% RH non-condensing / (storage) 95% RH	
Dimension 136(L)*68(W)*25(H) mm  Vibration 10~500 Hz, 5G 20min./1cycle per axis for all axes (X, Y, Z)  Weight (max.) 365g  Safety  Standard CB/IEC62368-1,TUV62368-1,UL62368-1,EN62368-1, CCC GB4943.1,PSE J62368-1,BSMI CNS15598-1,KC62368-1  Withstand voltage Input-Output: 4242VDC / Input-FG: 2150VDC  Isolation resistance(min.) Input-Output: 30Mohm @ 500VDC, 25°C, 70%RH  EMC  ENS5032 (CISPR32) Conducted EMI: class B / Radiated EMI: class B  FCC Conducted EMI: class B / Radiated EMI: class B  EN61000-3-2 Harmonic distortion: Class D  EN61000-4-2 ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-3 Radiated RF immunity: 3V/m  EN61000-4-4 EFT: ±1KV (AC port)  EN61000-4-5 Surge: ±1KV DM / ±2KV CM  EN61000-4-8 Magnetic field immunity: 3V/m	Altitude (max.)	5000 meters	
Vibration 10~500 Hz, 5G 20min./1cycle per axis for all axes (X, Y, Z)  Weight (max.) 365g  Safety  Standard CB/IEC62368-1,TUV62368-1,UL62368-1,EN62368-1, CCC GB4943.1,PSE J62368-1,BSMI CNS15598-1,KC62368-1  Withstand voltage Input-Output: 4242VDC / Input-FG: 2150VDC  Isolation resistance(min.) Input-Output: 30Mohm @ 500VDC, 25°C, 70%RH  EMC  EN55032 (CISPR32) Conducted EMI: class B / Radiated EMI: class B  FCC Conducted EMI: class B / Radiated EMI: class B  EN61000-3-2 Harmonic distortion: Class D  EN61000-4-3 ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-4 EFT: ±1KV (AC port)  EN61000-4-5 Surge: ±1KV DM / ±2KV CM  EN61000-4-6 Conducted RF immunity: 3V/m  EN61000-4-8 Magnetic field immunity: 3V/m	Mechanical		
Safety  Standard CB/IEC62368-1,TUV62368-1,UL62368-1,EN62368-1, CCC GB4943.1,PSE J62368-1,BMI CNS15598-1,KC62368-1 Withstand voltage Input-Output: 4242VDC / Input-FG: 2150VDC  Isolation resistance(min.) Input-Output: 30Mohm @ 500VDC, 25°C, 70%RH  EMC  EN55032 (CISPR32) Conducted EMI: class B / Radiated EMI: class B  FCC Conducted EMI: class B / Radiated EMI: class B  EN61000-3-2 Harmonic distortion: Class D  EN61000-4-2 ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-3 Radiated RF immunity: 3V/m  EN61000-4-4 EFT: ±1KV (AC port)  EN61000-4-5 Surge: ±1KV DM / ±2KV CM  EN61000-4-8 Magnetic field immunity: 3V/m	Dimension	136(L)*68(W)*25(H) mm	
Safety  Standard CB/IEC62368-1,TUV62368-1,UL62368-1,EN62368-1, CCC GB4943.1,PSE J62368-1,BSMI CNS15598-1,KC62368-1  Withstand voltage Input-Output: 4242VDC / Input-FG: 2150VDC  Isolation resistance(min.) Input-Output: 30Mohm @ 500VDC, 25°C, 70%RH  EMC  EN55032 (CISPR32) Conducted EMI: class B / Radiated EMI: class B  FCC Conducted EMI: class B / Radiated EMI: class B  EN61000-3-2 Harmonic distortion: Class D  EN61000-4-2 ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-3 Radiated RF immunity: 3V/m  EN61000-4-4 EFT: ±1KV (AC port)  EN61000-4-5 Surge: ±1KV DM / ±2KV CM  EN61000-4-6 Conducted RF immunity: 3V/m  EN61000-4-8 Magnetic field immunity: 3A/m	Vibration	10~500 Hz, 5G 20min./1cycle per axis for all axes (X, Y, Z)	
Standard  CB/IEC62368-1,TUV62368-1,UL62368-1,EN62368-1, CCC GB4943.1,PSE J62368-1,BSMI CNS15598-1,KC62368-1  Withstand voltage  Input-Output: 4242VDC / Input-FG: 2150VDC  Isolation resistance(min.)  Input-Output: 30Mohm @ 500VDC, 25°C, 70%RH   EMC  ENS5032 (CISPR32)  Conducted EMI: class B / Radiated EMI: class B  FCC  Conducted EMI: class B / Radiated EMI: class B  EN61000-3-2  Harmonic distortion: Class D  EN61000-4-2  ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-3  Radiated RF immunity: 3V/m  EN61000-4-4  EFT: ±1KV (AC port)  EN61000-4-5  Surge: ±1KV DM / ±2KV CM  EN61000-4-6  Conducted RF immunity: 3V/m  EN61000-4-8  Magnetic field immunity: 3A/m	Weight (max.)	365g	
CCC GB4943.1,PSE J62368-1,BSMI CNS15598-1,KC62368-1  Withstand voltage Input-Output: 4242VDC / Input-FG: 2150VDC  Isolation resistance(min.) Input-Output: 30Mohm @ 500VDC, 25°C, 70%RH  EMC  EN55032 (CISPR32) Conducted EMI: class B / Radiated EMI: class B  FCC Conducted EMI: class B / Radiated EMI: class B  EN61000-3-2 Harmonic distortion: Class D  EN61000-4-2 ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-3 Radiated RF immunity: 3V/m  EN61000-4-4 EFT: ±1KV (AC port)  EN61000-4-5 Surge: ±1KV DM / ±2KV CM  EN61000-4-6 Conducted RF immunity: 3V/m  EN61000-4-8 Magnetic field immunity: 3A/m	Safety		
Isolation resistance(min.)  Input-Output: 30Mohm @ 500VDC, 25°C, 70%RH  EMC  EN55032 (CISPR32)  Conducted EMI: class B / Radiated EMI: class B  FCC  Conducted EMI: class B / Radiated EMI: class B  EN61000-3-2  Harmonic distortion: Class D  EN61000-4-2  ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-3  Radiated RF immunity: 3V/m  EN61000-4-4  EFT: ±1KV (AC port)  EN61000-4-5  Surge: ±1KV DM / ±2KV CM  EN61000-4-6  Conducted RF immunity: 3V/m  EN61000-4-8  Magnetic field immunity: 3A/m	Standard		
EMC  EN55032 (CISPR32) Conducted EMI: class B / Radiated EMI: class B  FCC Conducted EMI: class B / Radiated EMI: class B  EN61000-3-2 Harmonic distortion: Class D  EN61000-4-2 ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-3 Radiated RF immunity: 3V/m  EN61000-4-4 EFT: ±1KV (AC port)  EN61000-4-5 Surge: ±1KV DM / ±2KV CM  EN61000-4-6 Conducted RF immunity: 3V/m  EN61000-4-8 Magnetic field immunity: 3A/m	Withstand voltage	Input-Output: 4242VDC / Input-FG: 2150VDC	
EN55032 (CISPR32)  Conducted EMI: class B / Radiated EMI: class B  FCC  Conducted EMI: class B / Radiated EMI: class B  EN61000-3-2  Harmonic distortion: Class D  EN61000-4-2  ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-3  Radiated RF immunity: 3V/m  EN61000-4-4  EFT: ±1KV (AC port)  EN61000-4-5  Surge: ±1KV DM / ±2KV CM  EN61000-4-6  Conducted RF immunity: 3V/m  EN61000-4-8  Magnetic field immunity: 3A/m	Isolation resistance(min.)	Input-Output: 30Mohm @ 500VDC, 25°C, 70%RH	
FCC Conducted EMI: class B / Radiated EMI: class B  EN61000-3-2 Harmonic distortion: Class D  EN61000-4-2 ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-3 Radiated RF immunity: 3V/m  EN61000-4-4 EFT: ±1KV (AC port)  EN61000-4-5 Surge: ±1KV DM / ±2KV CM  EN61000-4-6 Conducted RF immunity: 3V/m  EN61000-4-8 Magnetic field immunity: 3A/m	EMC		
EN61000-3-2  EN61000-4-2  ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-3  EN61000-4-4  EFT: ±1KV (AC port)  EN61000-4-5  Surge: ±1KV DM / ±2KV CM  EN61000-4-6  Conducted RF immunity: 3V/m  EN61000-4-8  Magnetic field immunity: 3A/m	EN55032 (CISPR32)	Conducted EMI: class B / Radiated EMI: class B	
EN61000-4-2  ESD: ±8KV contact discharge / ±15KV contact discharge  EN61000-4-3  Radiated RF immunity: 3V/m  EN61000-4-4  EFT: ±1KV (AC port)  Surge: ±1KV DM / ±2KV CM  EN61000-4-6  Conducted RF immunity: 3V/m  EN61000-4-8  Magnetic field immunity: 3A/m	FCC	Conducted EMI: class B / Radiated EMI: class B	
EN61000-4-3       Radiated RF immunity: 3V/m         EN61000-4-4       EFT: ±1KV (AC port)         EN61000-4-5       Surge: ±1KV DM / ±2KV CM         EN61000-4-6       Conducted RF immunity: 3V/m         EN61000-4-8       Magnetic field immunity: 3A/m	EN61000-3-2	Harmonic distortion: Class D	
EN61000-4-4       EFT: ±1KV (AC port)         EN61000-4-5       Surge: ±1KV DM / ±2KV CM         EN61000-4-6       Conducted RF immunity: 3V/m         EN61000-4-8       Magnetic field immunity: 3A/m	EN61000-4-2	ESD: ±8KV contact discharge / ±15KV contact discharge	
EN61000-4-5  Surge: ±1KV DM / ±2KV CM  EN61000-4-6  Conducted RF immunity: 3V/m  EN61000-4-8  Magnetic field immunity: 3A/m	EN61000-4-3	Radiated RF immunity: 3V/m	
EN61000-4-6 Conducted RF immunity: 3V/m EN61000-4-8 Magnetic field immunity: 3A/m	EN61000-4-4	EFT: ±1KV (AC port)	
EN61000-4-8 Magnetic field immunity: 3A/m	EN61000-4-5	Surge: ±1KV DM / ±2KV CM	
	EN61000-4-6	Conducted RF immunity: 3V/m	
EN61000-4-11 Voltage dip immunity	EN61000-4-8	Magnetic field immunity: 3A/m	
	EN61000-4-11	Voltage dip immunity	

#### Notes

- #1: All specification defined at 230Vac/50Hz, rated power and 25°C ambient temperature if not mentioned specifically.
- #2: Ripple noise is measured with 0.47uF MLCC & 47uF low ESR capacitor.
- #3: Calculated by Telcordia SR332 at 25  $^{\circ}\text{C}\,$  ambient temperature.
- #4: When operating altitude is higher than 2000m, the environment temperature derating factor is  $0.36^{\circ}\text{C}/100\text{m}$ .

## **Mechanical Specification**

#### PA-1121-26E1

