

## IPU65 series

V2.2

The IPU65 series of AC/DC switching mode power supplies provide 80 Watts of continuous output power. All supplies are UL 94V-1 min compliant. All models meet FCC Part-15 class B and CISPR-22 class B emission limits and are designed to comply with UL/c-UL, TUV/GS, FCC, CB and CE marking conformity assessment. All units are 100% burned in and tested.



**RoHS2**  
2011/65/EU



## 65W / 80W External Power Supply for General Purpose

### FEATURES:

- \* Wide Operating Voltage 80 to 275 VAC, 47 to 63 Hz
- \* IEC-320-C14 Input Inlet
- \* Single to Quad Output
- \* Crowbar Mode Over Voltage Protection
- \* High Altitude of 5000m
- \* DoE VI (except IPU65-101 & IPU65-403)
- \* 3 year warranty

### APPLICATIONS:

- \* POS System
- \* AV Equipment
- \* Industrial PC
- \* Note PC
- \* Charger

### GENERAL SPECIFICATION:

- \* **Short Circuit Protection:** Auto Recovery
- \* **Cooling:** Free Air Convection
- \* **Flammability Rating:** UL94V-1
- \* **Protection Classes:** Class I
- \* **Safety:** UL 60950-1:2nd Edition, CSA C22.2 No.60950-1-07, IEC 60950-1:2005 /A2:2013, EN60950-1:2006 /A2:2013

### APPROVALS:



### Electrical Characteristics: (Single Output)

Symbol	Characteristic	Condition	Min.	Typ.	Max.	Unit
Vins	Safety Approval Input Voltage Range	Safety Approval & Specification in Label	100		240	VAC
Vin	Input Operate Voltage Range	Detail to see Fig.1	80		275	VAC
Fi	Input Frequency	Sine wave	47		63	Hz
Po	Output Power Range	See Rating Chart			80	W
Iil	Low Line Input Current	Full Load, Vin=100VAC		1.9		A
Iih	High Line Input Current	Full Load, Vin=240VAC		0.79		A
Irl	Low Line Input Inrush Current	Full Load, 25°C, Cool start, Vin=100VAC			30	A
Irh	High Line Input Inrush Current	Full Load, 25°C, Cool start, Vin=240VAC			72	A
Ik	Safety Ground Leakage Current	Vin=240VAC, Fi=60Hz			0.75	mA
η	Efficiency	Full Load, Vin=230VAC, Detail to see Rating Chart	See Rating Chart			
ΔVoi	Line Regulation	Full Load, Vin=100~120VAC	0.5		1	%
ΔVoL	Load Regulation	Vin=230VAC, 10~90% Load Change at Condition	3		7	%
OVP	Over Voltage Protection	Over Voltage Protection	112		132	%
OLP	Over Load Protection	Recovers automatically after fault condition is removed	110		150	%
ttr	Time of Transient Response	Io=Full Load to Half Load, Vin=110VAC			4	ms
thu	Hold-Up Time	Full Load, Vin=100VAC	See Rating Chart			
ts	Start-up time	Full Load, Vin=100~240VAC			2	s
Tc	Temperature Coefficient	Full load, Vin=100~240VAC			±0.04	%/°C
HV	Dielectric Withstanding Voltage (P-S)	Primary to Secondary			4242	VDC
Vpg	Dielectric Withstanding Voltage (P-G)	Primary to PE			2121	VDC
EMI	EMC Emission				B	Class

### Environmental: (Single Output)

Symbol	Characteristic	Condition	Min.	Typ.	Max.	Unit
To	Operating Temperature	Detail to see Fig.2 (Derate linearly from 100% load at 40°C to 50% load at 70°C)	-20		70	°C
Ts	Storage Temperature	10 ~ 95% RH	-40		85	°C
Ho	Operating Humidity	non-condensing	0		95%	RH
Hs	Storage Humidity		0		95%	RH
ESDa	Electro Static Discharge	Air Discharge, IEC61000-4-2			8	kV
ESDc	Electro Static Discharge	Contact Discharge, IEC61000-4-2			4	kV
MTBF	Mean Time Between Failure	Operating Temperature at 25°C, Calculated per MIL-HDBK-217F	100k			h
ELEV	Operating Altitude (Elevation)	All condition			5000	m
VBR	Vibration	10 ~ 500Hz, 10min./1cycle, 60min. each along X, Y, Z axes			5	G
Vsl	Surge Voltage	Line-Neutral			1	kV
Vsg	Surge Voltage	Line-PE & Neutral-PE			2	kV

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## 65W / 80W External Power Supply for General Purpose

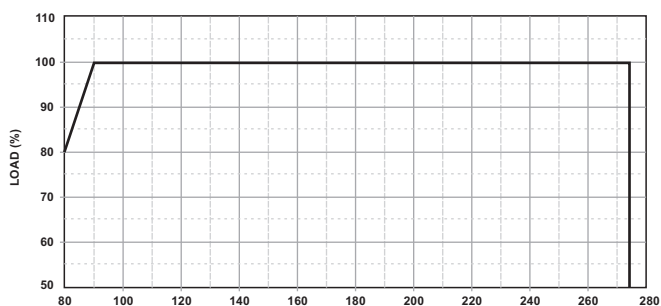
### Electrical Characteristics: (Multi Output)

Symbol	Characteristic	Condition	Min.	Typ.	Max.	Unit
Vins	Safety Approval Input Voltage Range	Safety Approval & Specification in Label	100		240	VAC
Vin	Input Operate Voltage Range	Detail to see Fig.1	80		275	VAC
Fi	Input Frequency	Sine wave	47		63	Hz
Po	Output Power Range	See Rating Chart			65	W
Iil	Low Line Input Current	Full Load, Vin=100VAC		1.65		A
Iih	High Line Input Current	Full Load, Vin=240VAC		0.68		A
IrL	Low Line Input Inrush Current	Full Load, 25°C, Cool start, Vin=100VAC			55	A
IrH	High Line Input Inrush Current	Full Load, 25°C, Cool start, Vin=240VAC			132	A
Ik	Safety Ground Leakage Current	Vin=240VAC, Fi=60Hz			0.75	mA
$\eta$	Efficiency	Full Load, Vin=230VAC, Detail to see Rating Chart	See Rating Chart			
$\Delta V_{oi}$	Line Regulation	Full Load, Vin=100~120VAC	0.5		1	%
$\Delta V_{oL}$	Load Regulation	Vin=230VAC, 10~90% Load Change at Condition	3		7	%
OVP	Over Voltage Protection	Over Voltage Protection	112		132	%
OLP	Over Load Protection	Recovers automatically after fault condition is removed	110		150	%
ttr	Time of Transient Response	Full Load, Vin=110VAC			4	ms
thu	Hold-Up Time	Full Load, Vin=100VAC	See Rating Chart			
ts	Start-up time	Full Load, Vin=100~240VAC			2	s
Tc	Temperature Coefficient	Full load, Vin=100~240VAC			$\pm 0.04$	%/°C
HV	Dielectric Withstanding Voltage (P-S)	Primary to Secondary			4242	VDC
Vpg	Dielectric Withstanding Voltage (P-G)	Primary to PE			2121	VDC
EMI	EMC Emission				B	Class

### Environmental: (Multi Output)

Symbol	Characteristic	Condition	Min.	Typ.	Max.	Unit
To	Operating Temperature	Detail to see Fig.2 (Derate linearly from 100% load at 40°C to 50% load at 70°C)	0		70	°C
Ts	Storage Temperature	10 ~ 95% RH	-40		85	°C
Ho	Operating Humidity	non-condensing	0		95%	RH
Hs	Storage Humidity		0		95%	RH
ESDa	Electro Static Discharge	Air Discharge, IEC61000-4-2			8	kV
ESDc	Electro Static Discharge	Contact Discharge, IEC61000-4-2			4	kV
MTBF	Mean Time Between Failure	Operating Temperature at 25°C, Calculated per MIL-HDBK-217F	100k			h
ELEV	Operating Altitude (Elevation)	All condition			5000	m
VBR	Vibration	10 ~ 500Hz, 10min./1cycle, 60min. each along X, Y, Z axes			5	G
Vsl	Surge Voltage	Line-Neutral			1	kV
Vsg	Surge Voltage	Line-PE & Neutral-PE			2	kV

### Input Voltage Derating Curves :



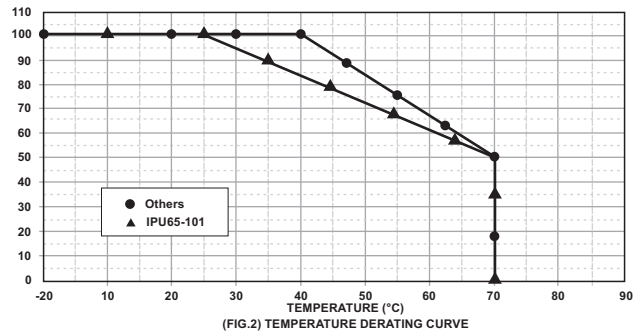
INPUT VOLTAGE (VAC)  
(FIG. 1) INPUT VOLTAGE DERATING CURVE

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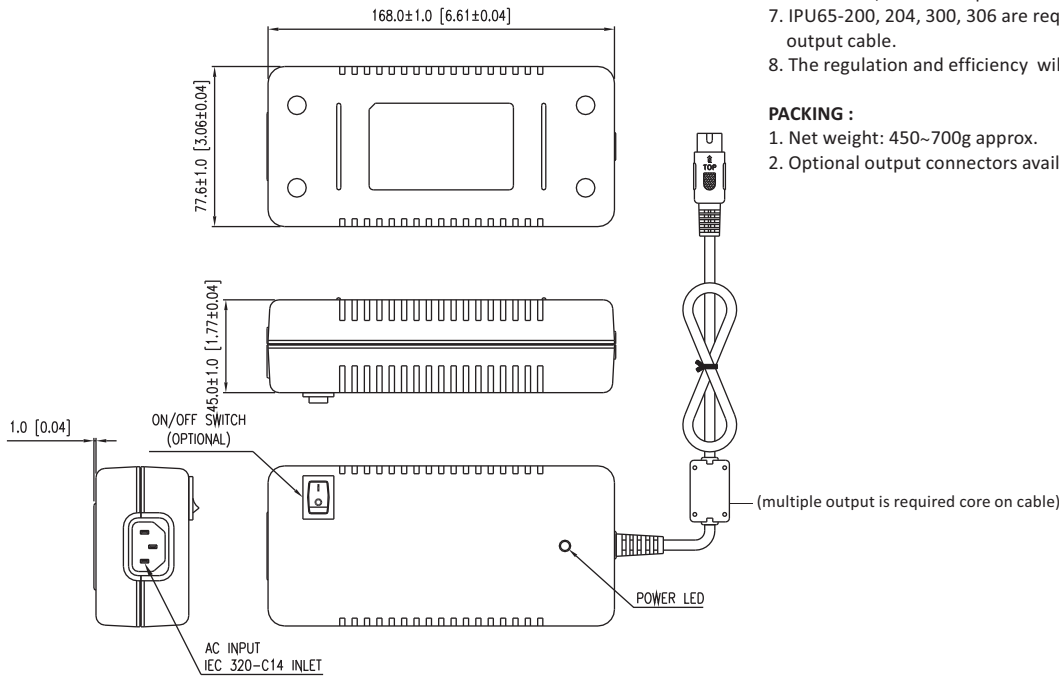
## 65W / 80W External Power Supply for General Purpose

### SPECIFICATION NOTE :

- Output can provide up to peak load when the power supply starts up. Continuous staying in more than rated load is not allowed.
- At factory, in 60% rated load condition, each output is checked to be within voltage accuracy.
- Line regulation is defined by changing  $\pm 10\%$  of input voltage from nominal line at rated load.
- Load regulation is defined by changing  $\pm 40\%$  of measured output load from 60% rated load.
- Ripple & noise is measured by using 20MHz bandwidth limited oscilloscope and terminated each output with a 0.47uF capacitor at rated load and nominal line.
- Hold up time is measured from the end of the last charging pulse to the time which the main output drops down to low limit of main output at rated load and nominal line.
- Efficiency is measured at rated load, and nominal line.



### MECHANICAL DIMENSIONS: ( UNIT: mm )



### OUTPUT CABLE RECOMMEND :

- Selected output connectors and wire, please refer to Appendix.
- IPU65-101~106 are required to use AWG#16X5C/4FT output cable.
- IPU65-107 are required to use AWG#16X2C/4FT output cable.
- IPU65-108~109 are required to use AWG#18X2C/6FT output cable.
- IPU65-110~111 are required to use AWG#20X2C/6FT output cable.
- IPU65-2XX, 3XX are required to use AWG#16X5C/4FT+core output cable.
- IPU65-200, 204, 300, 306 are required to use AWG#16X5C/2FT+core output cable.
- The regulation and efficiency will be changed by modified output cable.

### PACKING :

- Net weight: 450~700g approx.
- Optional output connectors available contact sales for details.

### Rating Chart: (Single Output)

MODEL NO.	Setting Voltage Range (Factory setting, can't be adjusted)		Output Current (Based on the output volt.)		Maximum Output Power (W)	Ripple & Noise (mVp-p)	Total Regulation (%)	Typ. Efficiency (%)	Typ. No Load Consumption (W)	Hold-Up Time (ms)	Protection Mode
	min	max	min	max							
	(VDC)	(VDC)	(A)	(A)							
* IPU65-101	3.0	5.0	10.00	16.60	50	50	±7	65	3	12	Hiccup
IPU65-102	5.0	5.99	10.80	13.00	65	60	±7	87	0.21	12	Hiccup
IPU65-103	6.0	8.0	8.70	11.60	69.6	80	±5	88	0.21	12	Hiccup
IPU65-104	8.0	11.0	6.81	9.37	75	110	±5	88	0.21	12	Hiccup
IPU65-105	11.0	13.0	6.15	6.66	80	130	±5	88	0.21	12	Hiccup
IPU65-106	13.0	16.0	5.00	6.15	80	150	±5	88	0.21	12	Hiccup
IPU65-107	16.0	21.0	3.80	5.00	80	200	±5	88	0.21	12	Hiccup
IPU65-108	21.0	27.0	2.96	3.80	80	200	±5	88	0.21	12	Hiccup
IPU65-109	27.0	33.0	2.42	2.96	80	250	±3	88	0.21	12	Hiccup
IPU65-110	33.0	40.0	2.00	2.42	80	250	±3	88	0.21	12	Hiccup
IPU65-111	40.0	48.0	1.66	2.00	80	300	±3	88	0.21	12	Hiccup

\*IPU65-101 is not in compliance with DoE VI.

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### Rating Chart: (Multi Output)

MODEL NO.	Setting Voltage Range (Factory setting, can't be adjusted)	Output Current (Based on the output volt.)		Maximum Output Power	Ripple & Noise	Total Regulation	Typ. Efficiency	Typ. No Load Consumption	Hold-Up Time	Protection Mode
		min	max							
		(VDC)	(A)							
IPU65-200	+3.3	1.4	7.0	56.1	50	±7	86	0.3	12	Hiccup
	+12.0	0.55	2.75		120	±5				
IPU65-201	+5.0	0.7	7.0	65	50	±5	86	0.3	12	Hiccup
	+12.0	0.7	3.0		120	±5				
IPU65-202	+5.0	1.4	7.0	65	50	±5	86	0.3	12	Hiccup
	+15.0	0.6	3.0		150	±6				
IPU65-203	+5.0	1.4	7.0	65	50	±5	86	0.3	12	Hiccup
	+24.0	0.4	2.0		240	±5				
IPU65-204	+3.3	1.4	7.0	38.1	50	±7	83.4	0.3	12	Hiccup
	+5.0	0.6	3.0		100	±5				
IPU65-215	+5.0	1.4	7.0	59	50	±5	86	0.3	12	Hiccup
	-24.0	0.4	1.0		240	±10				

### Rating Chart: (Multi Output)

MODEL NO.	Setting Voltage Range (Factory setting, can't be adjusted)	Output Current (Based on the output volt.)		Maximum Output Power	Ripple & Noise	Total Regulation	Typ. Efficiency	Typ. No Load Consumption	Hold-Up Time	Protection Mode
		min	max							
		(VDC)	(A)							
IPU65-300	+3.3	1.4	7.0	65	66	±7	86	0.3	12	Hiccup
	+12.0	0.6	3.0		120	±5				
	-12.0	0.16	0.8		120	±5				
IPU65-301	+5.0	0.6	6.0	65	50	±5	86	0.3	12	Hiccup
	+12.0	0.3	3.0		120	±5				
	-5.0	0.0	0.8		50	±5				
IPU65-302	+5.0	0.6	6.0	65	50	±5	86	0.3	12	Hiccup
	+12.0	0.6	3.0		120	±5				
	-12.0	0.0	0.8		120	±5				
IPU65-303	+5.0	0.6	6.0	65	50	±5	86	0.3	12	Hiccup
	+15.0	0.6	3.0		150	±6				
	-15.0	0.0	0.8		150	±5				
IPU65-304	+5.0	0.7	7.0	65	50	±5	86	0.3	12	Hiccup
	+24.0	0.2	2.0		240	±5				
	-24.0	0.0	0.8		240	±5				
IPU65-305	+5.0	0.6	6.0	65	50	±5	86	0.3	12	Hiccup
	+24.0	0.2	2.0		240	±5				
	-12.0	0.0	0.8		120	±5				
IPU65-306	+3.3	0.7	7.0	63.1	66	±7	86	0.3	12	Hiccup
	+12.0	0.6	3.0		120	±5				
	-5.0	0.0	0.8		50	±5				
*IPU65-403	+5.0	0.6	3.5	65	50	±5	86	0.3	12	Hiccup
	+24.0	0.1	1.5		240	±5				
	+12.0	0.0	0.25		120	±5				
	-12.0	0.0	0.15		120	±5				

\*IPU65-403 is not in compliance with DoE VI.