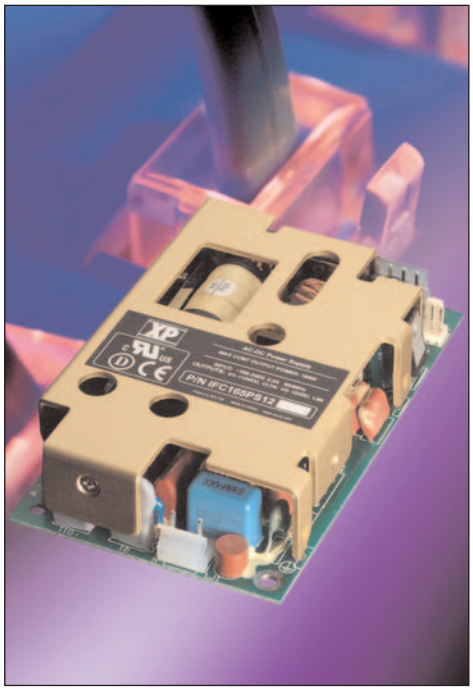
IFC165 Series



- 165 Watt Force Cooled (12 CFM)
- Small Size 3.0” x 5.0” x 1.25”
- Built-In Oring Diodes (Single O/P Models)
- Wide Operating Temperature -25 °C to +70 °C
- Level B Conducted Emissions
- EN61000-3-2, 3 Compliant
- Universal AC Input 90-264 VAC
- Input Frequency 47-63 Hz
- 1-4 Outputs
- Mating Connector & Loom Kits Available

The IFC165 series of multi output AC-DC, 165 Watt power supplies from XP has outputs from 5 VDC to 48 VDC, with single output models offering a 12 V 1A fan supply.

These high density power supplies are available with dual, triple and quad outputs and meet EN55022 Level B EMI/EMC specifications with external filter.

IFC165 power supplies will deliver full power between -25 °C and +50 °C and up to +70 °C with derating and only 12 CFM of cooling. Features include a built in oring diode on single output models.

Comprehensive overvoltage, overload and short circuit protection is built-in, with looms and connector kits available from stock.

Input Characteristics

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage - Operating	90		264	VAC	
Input Frequency	47	50/60	63	Hz	
Input Current - No Load			62	mA	At 90 VAC
Input Current - Full Load			2.25	A	At 90 VAC
Inrush Current			66	A	230 VAC
Input Protection					AC Line Fuse
Earth Leakage Current			<750	µA	240 VAC, 50 Hz

All specifications are at nominal input, full resistive load at 25 ºC unless otherwise stated.

Output Characteristics

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	5		48	VDC	Model-dependent
Initial Set Accuracy				%	See Output Tolerance
Output Voltage Adjustment		N/A		%	Not adjustable by user
Minimum Load	5			W	
Start Up Delay	1.5		15	ms	See graph
Start Up Rise Time			20	ms	See graph
Hold Up Time	22			ms	See graph
Output Tolerance			±5	%	5 W min load on any combination of outputs required. Figure quoted is total line, load and initial set accuracy
Transient Response			5	%	Recovering to within 1% in 500 µs for 25% load change
Ripple & Noise			±1	%	
Overvoltage Protection	113	125	145	%	Recycle input to reset
Overload Protection			150	% Vnom	hiccup mode, auto-recovery

Control and Signalling

Characteristic	Notes & Conditions
Remote Sense	Compensates for 0.5 V (Output 1 only)
AC OK	See timing table
Power Good	See timing table

Reliability & Service Life

Characteristic	Typical	Units	Notes & Conditions
MTBF	200,000	Hours	Calculated mean time between failures, per Bellcore

Isolation

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input to Output Test Voltage	3000			VAC	Test Duration 1 minute
Input to Ground Test Voltage	1500			VAC	Test Duration 1 minute
Output to Ground Test Voltage	500			VAC	Test Duration 1 minute

Other Specifications

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Weight		0.57 / 260		lb / g	
Power Density		8.8		W/in^3	

Environmental Requirements

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-25		+70	ºC	Derate linearly from 100% load at 50 ºC to 50% load at 70 ºC
Storage Temperature	-40		+85	ºC	
Cooling	12			CFM	Required for full power
Humidity			85	%RH	Non-condensing
Operating Altitude			3000	m	
Vibration			2.4	G	5-500 Hz, 3 axis
Shock			15	G pk	

EMC Electromagnetic Compatibility - Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
Harmonic Current	EN61000-3-2	A		
Voltage Flicker	EN61000-3-3	3	B	
EFT	EN61000-4-4	3	B	
Radiated Field	EN61000-4-3	3	B	
Surges	EN61000-4-5	3	B	
Dips & Interruptions	EN61000-4-11	30%, 10 ms 60%, 100 ms 100%, 500 ms	A B B	

EMC Electromagnetic Compatibility - Emmissions

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
Conducted	EN55022/EN60601-1-2	A		Level B with external filter

Standards Compliance List

Standard	Category
EN60950	EN60950-2 : 2001
UL / cUL 60950	UL60950 : 2003 1st Edition
IEC60950	IEC60950 : 2001 1st Edition
CE	LV directive

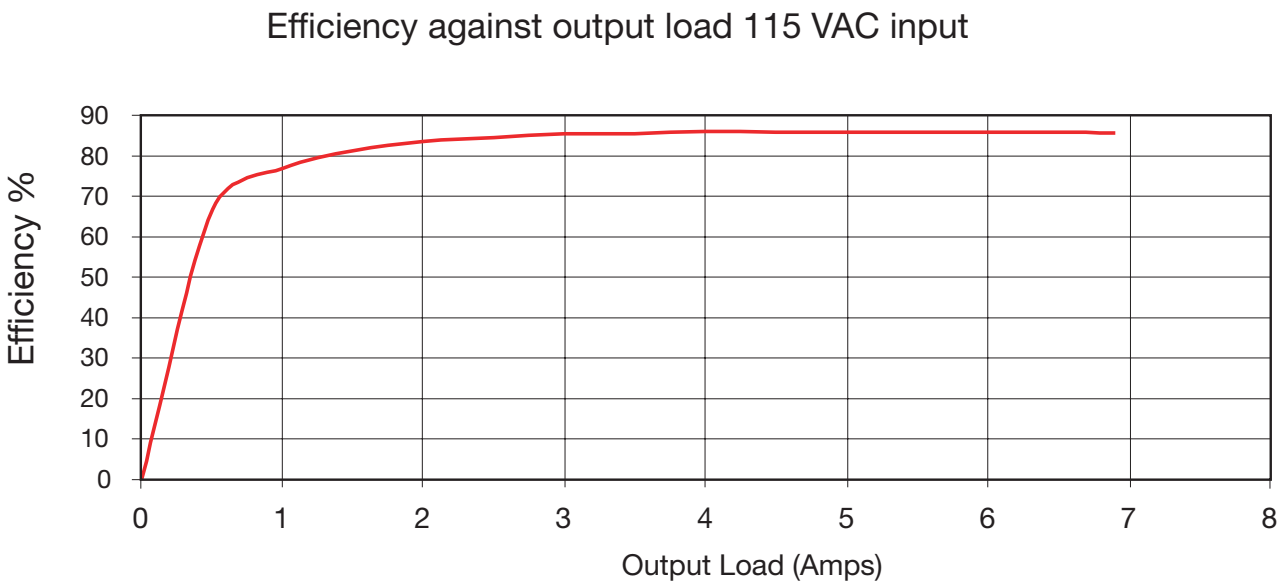
Safety Agency Approvals

Standard	File Number
UL / cUL 60950	E137895
EN60950	

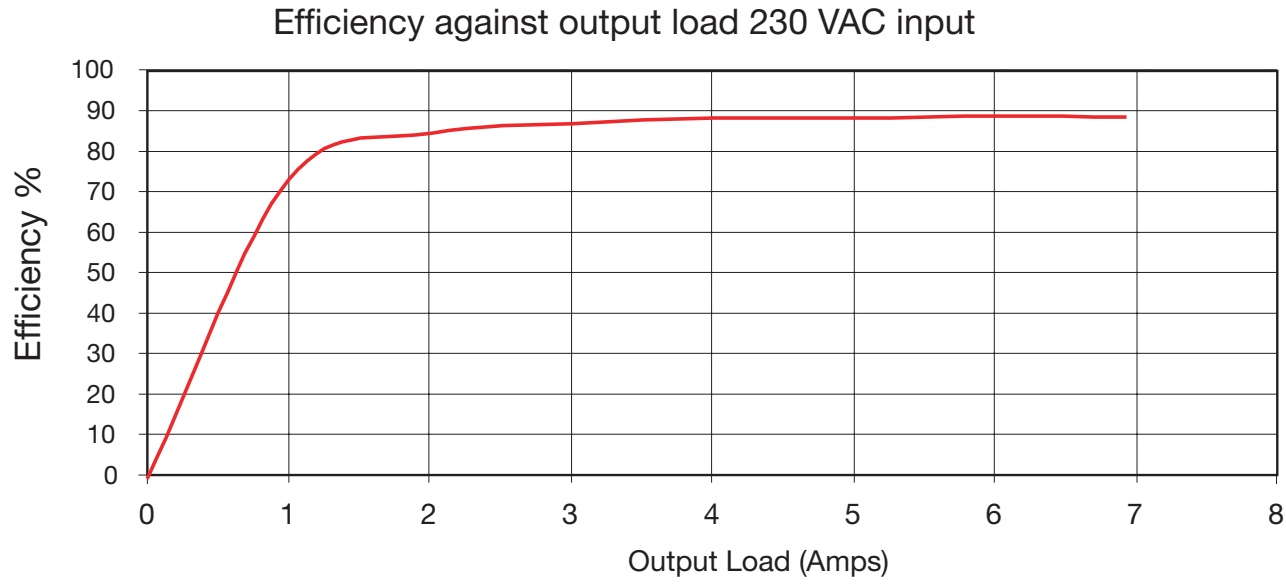
Model Numbers - Outputs

Model Number	Output 1		Output 2		Output 3		Output 4	
	Vnom	Imax	Vnom	Imax	Vnom	Imax	Vnom	Imax
IFC165PS05	+5.0 V	33.0 A	+12.0 V	1.0 A				
IFC165PS12	+12.0 V	13.7 A	+12.0 V	1.0 A				
IFC165PS24	+24.0 V	6.9 A	+12.0 V	1.0 A				
IFC165PS48	+48.0 V	3.4 A	+12.0 V	1.0 A				
IFC165PT31	+5.0 V	21.0 A	+12.0 V	6.0 A	-12.0 V	1.0 A		
IFC165PQ40	+3.3 V	16.0 A	+5.0 V	20.0 A	+12.0 V	6.0 A	-12.0 V	1.0 A

Derating Curves - Efficiency against Output Load

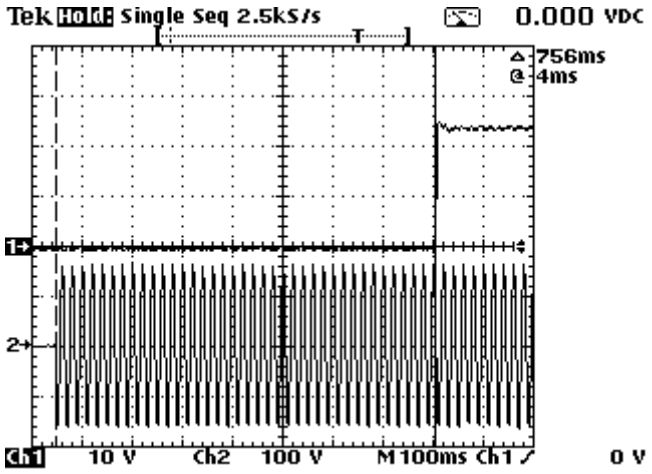


IFC165PS24

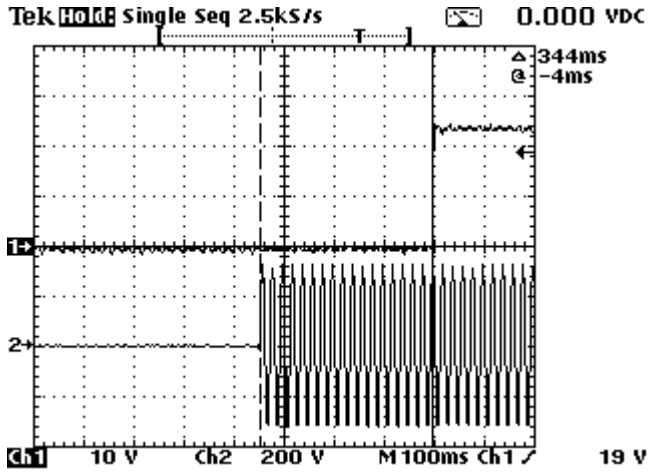


IFC165PS24

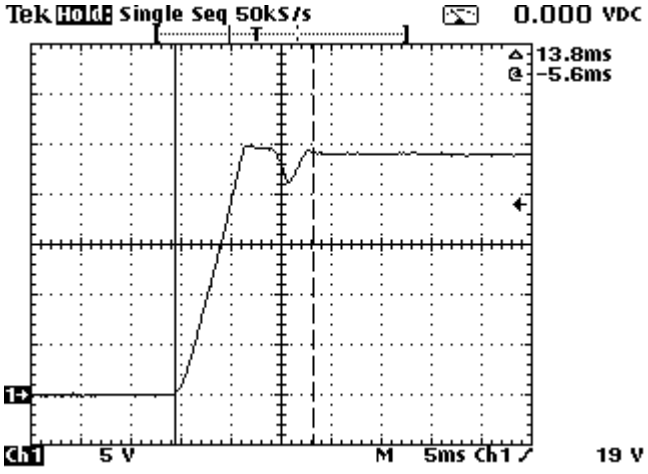
Typical Power Up Characteristics



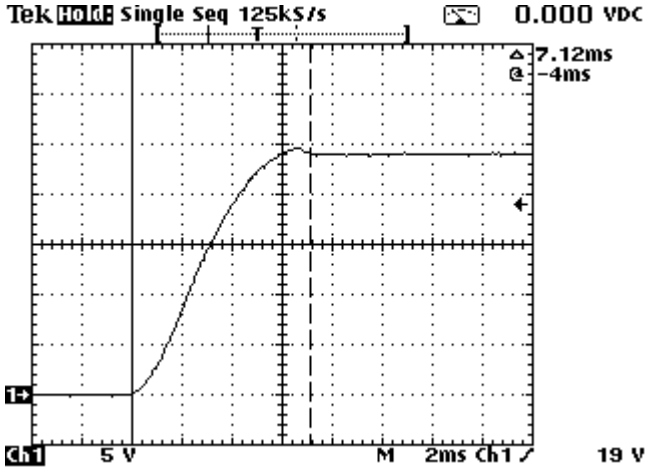
IFC165PS24 Start Up Time 115 VAC



IFC165PS24 Start Up Time 230 VAC

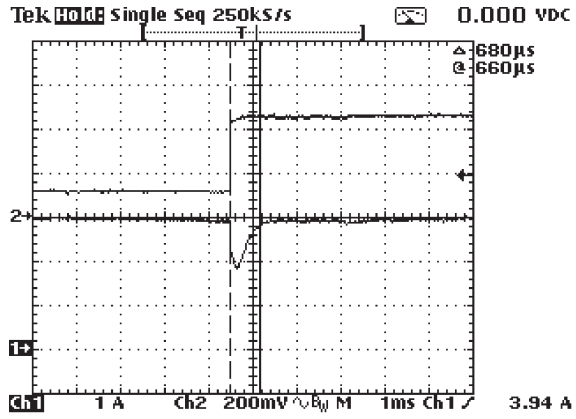


IFC165PS24 Rise Time 115 VAC

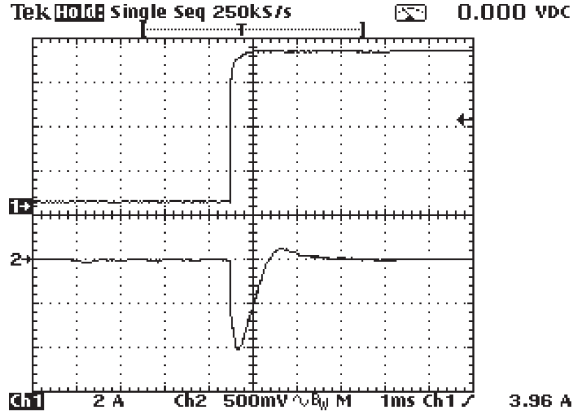


IFC165PS24 Rise Time 230 VAC

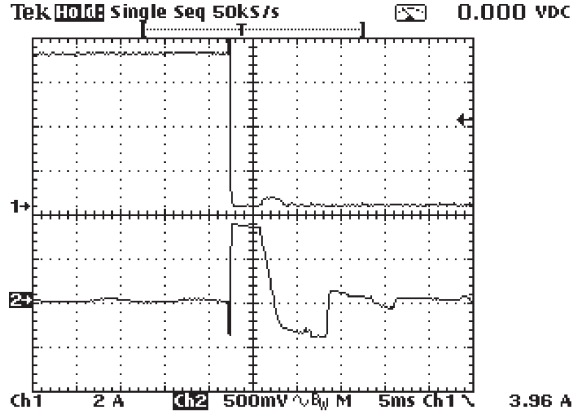
Typical Transient Response



Transient Response - 75-100% load change (24 V Model)

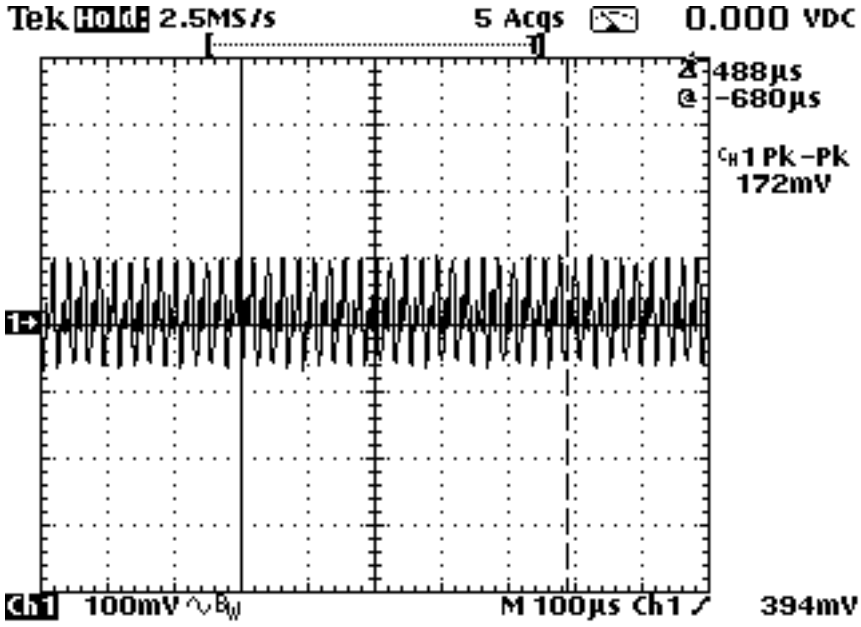


Transient Response - 0-100% load change (24 V Model)



Transient Response - 100-0% load change (24 V Model)

Typical Ripple & Noise



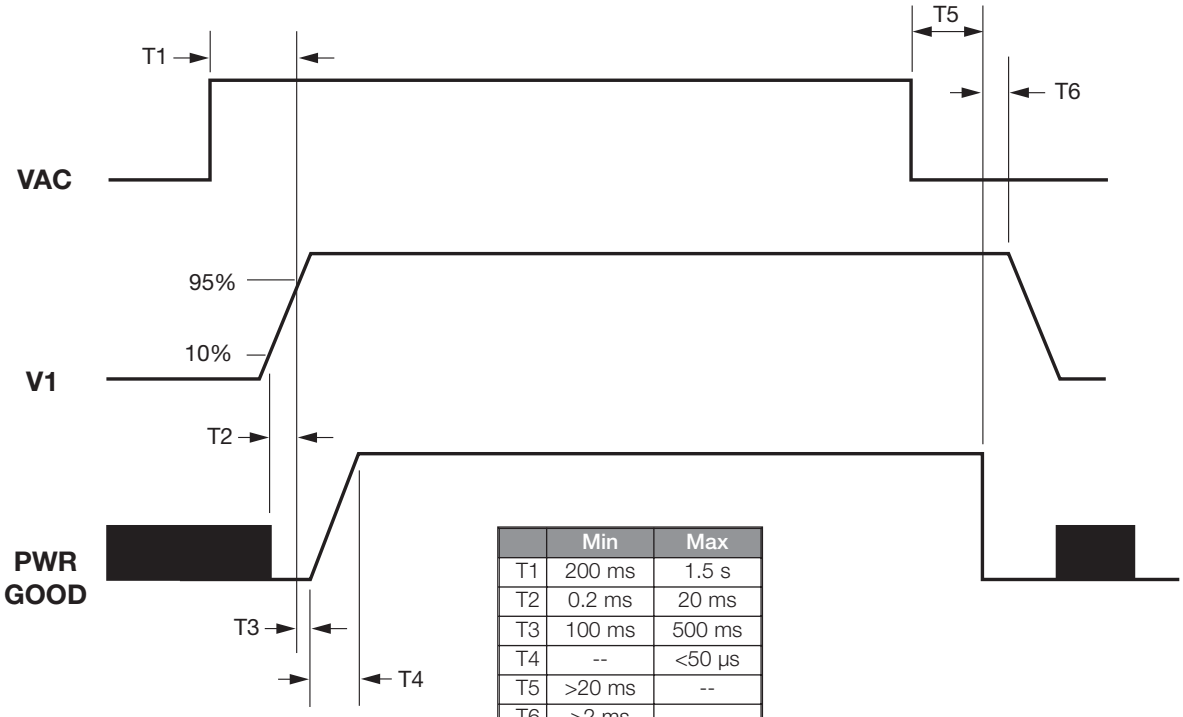
24 V Model

Capacitive Load

The power supply will power up and operate normally with capacitances listed below simultaneously present on the outputs.

Output	Capacitve Load (µF)				
	PT31/ PQ40	PS05	PS12	PS24	PS48
+3.3 V / +2.5 V	6000 µF				
+5 V	10000 µF	10000 µF			
+12 V	1000 µF		4000 µF		
-12 V aux	350 µF	350 µF	350 µF	350 µF	350 µF
15 V					
24 V				2000 µF	
48 V					500 µF

Signal Timing



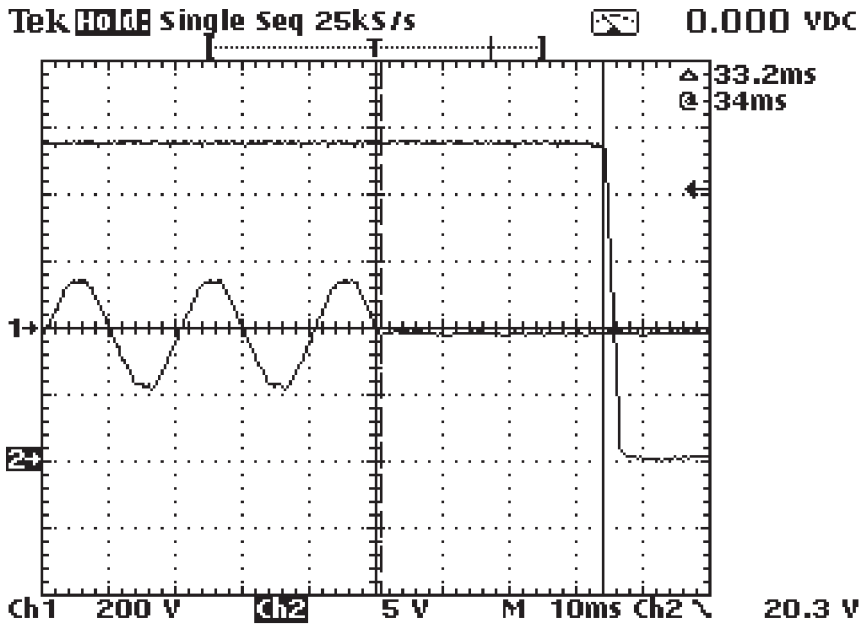
	Min	Max
T1	200 ms	1.5 s
T2	0.2 ms	20 ms
T3	100 ms	500 ms
T4	--	<50 µs
T5	>20 ms	--
T6	>2 ms	--

Power Good Signal / PS_OK Signal

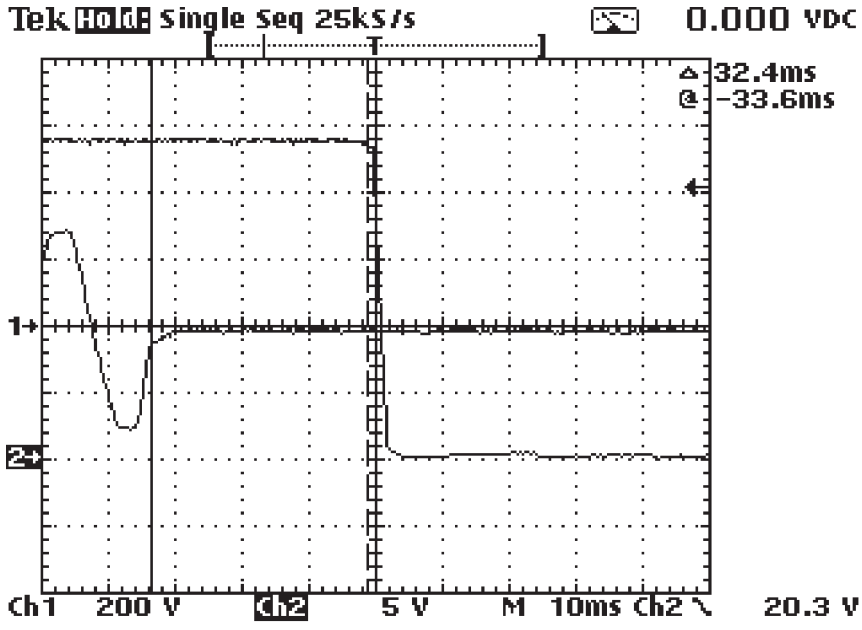
The Power Good Signal provides a high logic level to indicate that sufficient time has expired for the DC outputs to be within their regulation limits and that sufficient mains energy is stored by the power supply to ensure continuous power operation within specification for the duration of the hold-up time. When the AC mains power is removed for a period longer than 20ms, the Power Good Signal transitions to a low logic level. The PS_OK signal is the logical complement of the Power Good Signal and both signals are +5VDC TTL-compatible on all units, with the exception of IFC165PQ40 and IFC165PT31 which have an open-collector output requiring a pull-up resistor for TTL compatiblility. The electrical specifications for the Power Good and PS_OK outputs are described below:

Signal Type	+5 VDC, TTL Compatible
Low Logic Level	<0.4 V when sinking 4 mA
High Logic Level	Open Collector Output (see next)
Power Good Pull-up Resistor	TTL compatible only on PT31 and PQ40 models
Power On Delay	Between 100 and 500 ms after V1 outputs reaches regulation
Power Down Warning	>2 ms before V1 reaches minimum regulated output
Rise Time	<50 µS from 10% to 90% point
PS_OK	Logical complement of Power Good Signal. OPen collector output without a Pull-up resistor

Hold Up Time



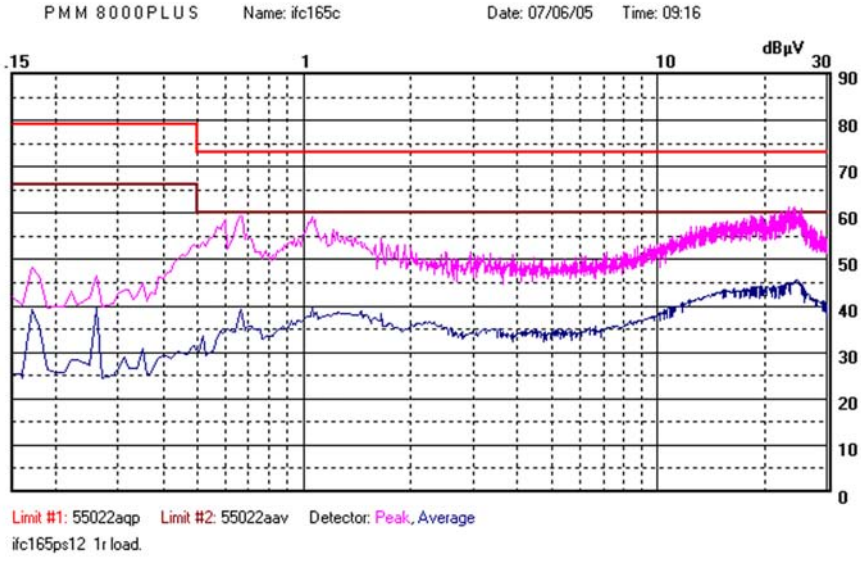
115 VAC



230 VAC

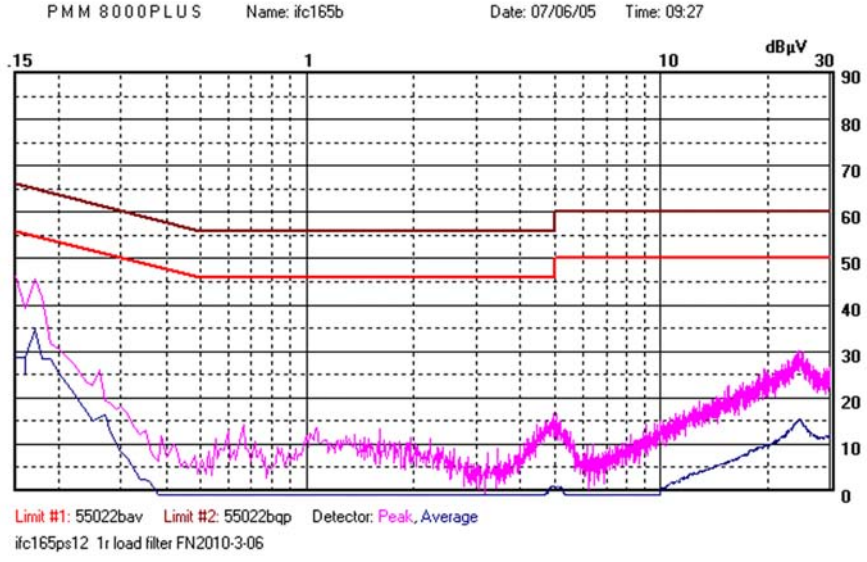
EMC Plots

EN55022 LEVEL A



IFC165PS12 Model

EN55022 LEVEL B



IFC165PS12 Model

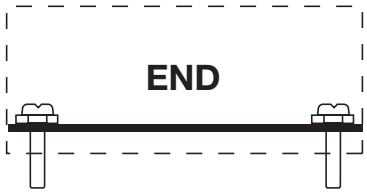
Recommended Filters for EN55022 Level B

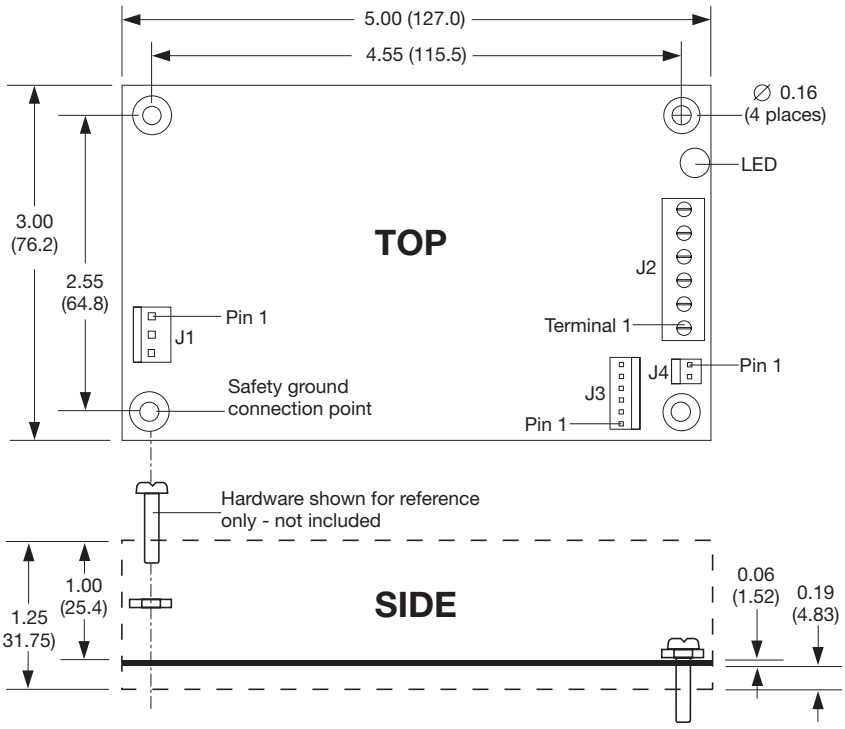
IFC 165 Model Number	IEC Inlet Filter	Chassis Mount Filter
IFC165PS05	FN9222R-3/06	FN2010-3/06
IFC165PS12	FN9222R-3/06	FN2010-3/06
IFC165PS24	FN9222R-3/06	FN2010-3/06
IFC165PS48	FN9222R-3/06	FN2010-3/06
IFC165PT31	FN321-3/05	FN2020-3/06
IFC165PT40	FN321-3/05	FN2020-3/06

Mechanical Drawings

IFC165PS05 Model

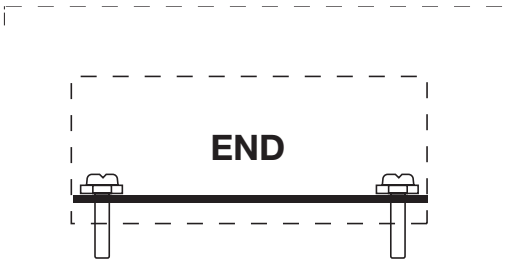
1. All dimensions in inches (mm).
2. Weight 0.57 lb (260 g) approx.
3. The maximum width for the screw head is 0.28 (7.1).
4. #6 or M3 screws recommended.
5. 0.25 inch hex or round stand-offs recommended.

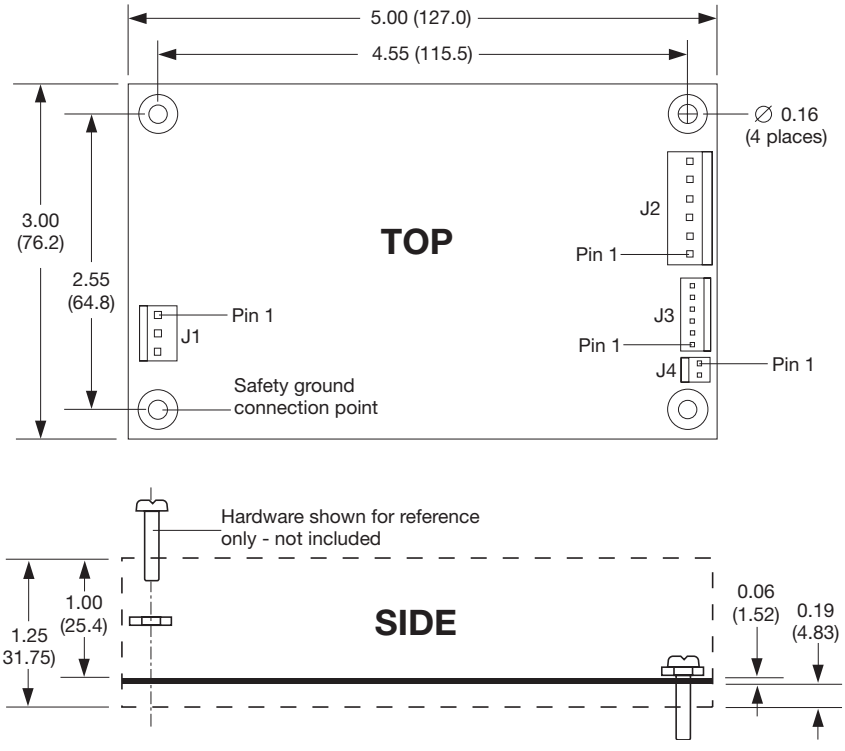




IFC165PS12/24/48 Models

1. All dimensions in inches (mm).
2. Weight 0.57 lb (260 g) approx.
3. The maximum width for the screw head is 0.28 (7.1)
4. #6 or M3 screws recommended.
5. 0.25 inch hex or round stand-offs recommended

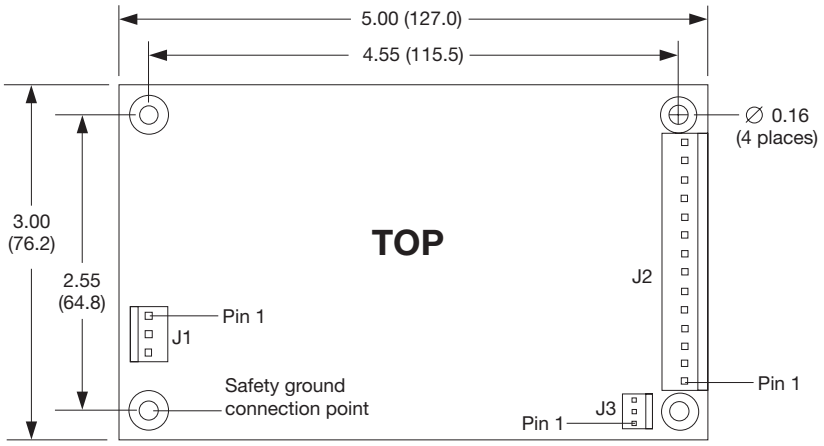


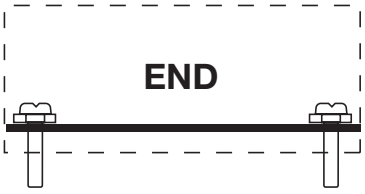


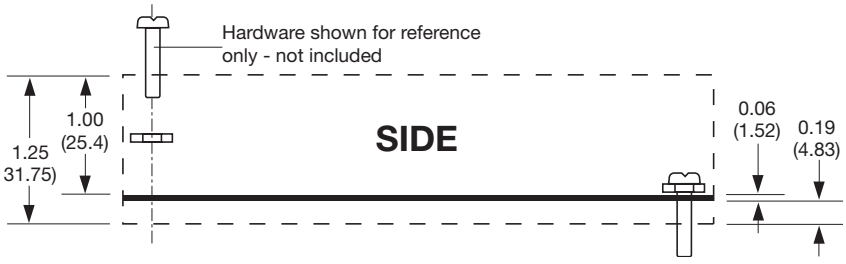
Mechanical Drawings

IFC165PT31/OQ40 Models

1. All dimensions in inches (mm).
2. Weight 0.57 lb (260 g) approx.
3. The maximum width for the screw head is 0.28 (7.1).
4. #6 or M3 screws recommended.
5. 0.25 inch hex or round stand-offs recommended.







Conn	Pin	Connector Pinouts					
		PS05	PS12	PS24	PS48	PT31	PQ40
J1	1	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
	2						
	3	Line	Line	Line	Line	Line	Line
J2	1	+5 VDC	+12 V	+24 V	+48 V	-12 V	-12 V
	2	+5 VDC	+12 V	+24 V	+48 V	+12 V	+12 V
	3	+5 VDC	+12 V	+24 V	+48 V	N/A	+3.3 V
	4	RTN	RTN	RTN	RTN	N/A	+3.3 V
	5	RTN	RTN	RTN	RTN	N/A	+3.3 V
	6	RTN	RTN	RTN	RTN	RTN	RTN
	7					RTN	RTN
	8					RTN	RTN
	9					RTN	RTN
	10					RTN	RTN
	11					+5 V	+5 V
	12					+5 V	+5 V
	13					+5 V	+5 V
	14					+5 V	+5 V
J3	1	N/C	AC OK	AC OK	AC OK	PG	PG
	2	PS OK	PG	PG	PG	N/A	+3.3 V RS
	3	PG	CS	CS	CS	-R Sense	-R Sense
	4	V1 Sense+	+R Sense	+R Sense	+R Sense		
	5	0V Sense-	-R Sense	-R Sense	-R Sense		
	6	CS	RTN	RTN	RTN		
J4	1	+12 V	+12 V	+12 V	+12 V		
	2	RTN	RTN	RTN	RTN		

Conn		Mating Connectors		
		PS05	PS12/24/48	PT31 & PQ40
J1	Mating Connector	09-50-8031	09-50-8031	09-50-8031
	Crimp Pins	08-52-0113	08-52-0113	08-52-0113
J2	Mating Connector	Terminal Block	09-50-8061	09-50-8141
	Crimp Pins	N/A	08-52-0113	08-52-0113
J3	Mating Connector	22-01-3057	22-01-3067	22-01-3037
	Crimp Pins	08-50-0114	08-50-0114	08-50-0114
J4	Mating Connector	22-01-3027	22-01-3027	N/A
	Crimp Pins	08-50-0114	08-50-0114	N/A

Notes

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