

Typical Features

- ◆ Wide input voltage range 85-305VAC/120-430VDC
- ◆ No load power consumption $\leq 0.2W@220VAC$
- ◆ Efficiency up to 87% (Typ.)
- ◆ Operating temperature from $-40^{\circ}C$ to $+75^{\circ}C$
- ◆ Switching frequency 65KHz
- ◆ Short circuit & over current protections
- ◆ Isolation voltage 4000VAC
- ◆ Conform to CE regulations
- ◆ Compliant with IEC/EN62368/UL62368
- ◆ Safety Class II



Application Field

FA15-C4SXXYH Series ----- Compact size, high efficiency modular power supplies with global adapted input voltage range (both AC & DC available), low ripple, low temperature rise, low standby power consumption, high efficiency, high reliability, safety isolated and good EMC performance. This series of products can be widely used in the fields of Industry, Office devices, Electric power and Household devices, etc. The additional circuit diagram for EMC is recommended for the application with high EMC requirement.

Typical Product List

Certificate	Part No.	Output Specification			Max Capacitive Load @220VAC uF	Ripple & Noise 20MHz (Max) mVp-p	Efficiency @Full Load 220VAC % (Typ.)
		Power	Voltage	Current			
		(W)	Vo (V)	Io (mA)			
-	FA15-C4S05YH	15	5	3000	5000	80 (*)	82
-	FA15-C4S12YH	15	12	1250	2000	200	86
-	FA15-C4S12V5YH	15	12.5	1200	2000	200	86
-	FA15-C4S12V8YH	15	12.8	1172	2000	200	86
-	FA15-C4S15YH	15	15	1000	1000	200	87
-	FA15-C4S24YH	15	24	625	600	240	86

- Note 1: The typical value of efficiency is based on the product tested after half an hour burn-in at full load.
- Note 2: The minimum efficiency should be at -2% of the typical values in this table.
- Note 3: The Ripple and Noise is tested by the twisted pair method according to the following test instruction.
- Note 4: The * marked Ripple & noise value of FA15-C4S05YH has been tested with the recommended circuit 2.
- Note 5: The suffix -T is for the chassis package, -TS is for the package of DIN Rail which width is 35mm.

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	AC Input	85	220	305	VAC
	DC Input	120	310	430	VDC
Input Frequency	-	47	50	63	Hz
Input Current	Input 115VAC	-	-	0.3	A
	Input 220VAC	-	-	0.2	
Surge Current	Input 115VAC	-	-	16	
	Input 220VAC	-	-	30	
No Load Power Consumption	Input 115VAC	-	-	0.2	W
	Input 220VAC	-	-		
Leakage Current	-	0.5mA TYP/230VAC/50Hz			
External Fuse Recommended	-	2A/300VAC Time-delay fuse			
Hot Plug	-	Unavailable			
ON/OFF Control	-	Unavailable			

Output Specifications

Item		Operating Condition	Min.	Typ.	Max.	Unit
Voltage Accuracy		Full input voltage range, any load	-	±2.0	±3.0	%
Line Regulation		Nominal Load	-	-	±0.5	%
Load Regulation		Nominal input voltage, 20%~100% load	-	-	±5.0	%
Minimum Load		Single Output	0	-	-	%
Turn-on Delay Time		Input 115VAC (full load)	-	1000	-	mS
		Input 220VAC (full load)				
Power-off Hold up Time		Input 115VAC (full load)	-	100	-	mS
		Input 220VAC (full load)	-		-	
Dynamic Response	Overshoot range	25%~50%~25%	-5.0	-	+5.0	%
	Recovery time	50%~75%~50%	-	-	+5.0	mS
Output Over-shoot		Full input voltage range	≤10%Vo			%
Short circuit protection			Continuous, Self-recovery			Hiccup
Over Current Protection		Input 220VAC	≥130% Io, Self-recovery			Hiccup
Drift Coefficient		-	-	±0.03%	-	%/°C
Ripple & Noise		-	-	150	240	mV

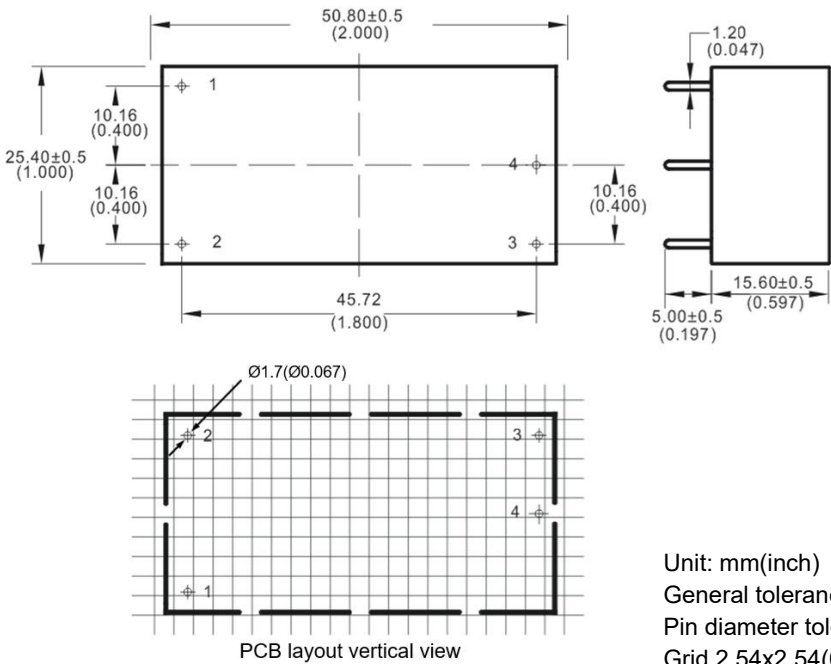
General Specifications

Items	Operating Conditions	Min.	Typ.	Max.	Unit
Switching Frequency	-	61	65	73	KHz
Operating Temperature	Refer to the temperature derating graph	-40	-	+75	℃
Storage Temperature	-	-40	-	+85	
Soldering Temperature	Wave-soldering	260±4℃, timing 5-10S			
	Manual-soldering	360±8℃, timing 4-7S			
Relative Humidity	-	10	-	90	%RH
Isolation Voltage	I/P-O/P, Test 1min, leakage current ≤5mA	4000	-	-	VAC
Insulation Resistance	I/P-O/P @DC500V	100	-	-	MΩ
Vibration	-	10-55Hz, 10G, 30Min, along X, Y, Z			
MTBF	-	MIL-HDBK-217F@25℃ >300,000H			
Unit Weight	Part No.	Weight (Typ.)			
	FA15-C4SXXYH	35g			
	FA15-C4SXXYH-T	55g			
	FA15-C4SXXYH-TS	70g			

EMC Performance

Total Item		Sub Item	Test Standard	Performance/Class
EMC	EMI	CE	CISPR32/EN55032	CLASS B (with the Recommended Circuit 1)
		RE	CISPR32/EN55032	CLASS B (with the Recommended Circuit 1)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria A
		CS	IEC/EN61000-4-6	10Vr.m.s Perf.Criteria A
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	±1KV Perf.Criteria B
				Line to line ±2KV / line to ground ±4KV Perf.Criteria B (with the Recommended Circuit 1)
		EFT	IEC/EN61000-4-4	±1KV Perf.Criteria B
				±2KV Perf.Criteria B (with the Recommended Circuit 1)
		Voltage dips and interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B
		PFMF	IEC/EN61000-4-8	10A/m Perf.Criteria A

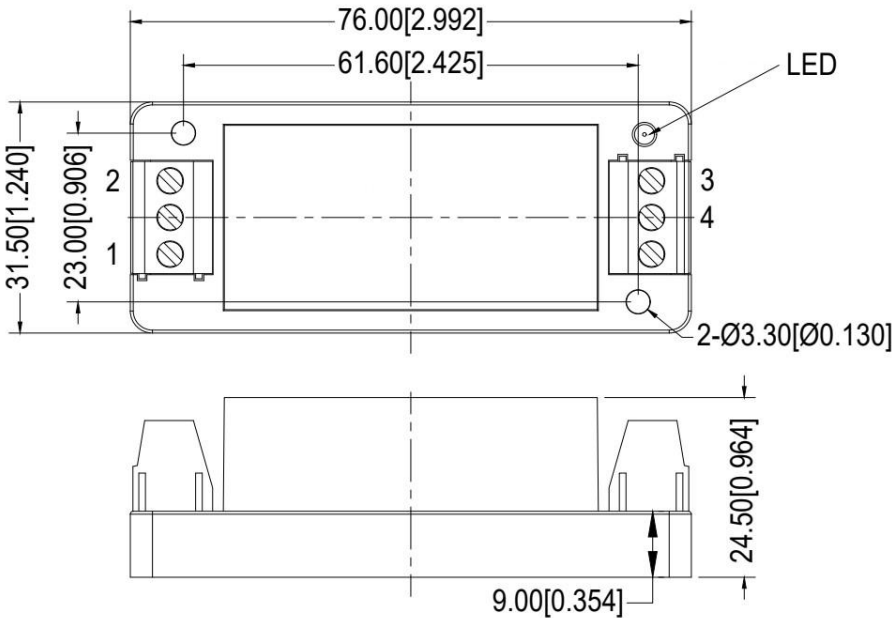
Y2 Package Mechanical Dimensions



Pin No.	Function
1	AC(N)
2	AC(L)
3	+Vo
4	-Vo

Unit: mm(inch)
General tolerance: ±0.50(±0.020)
Pin diameter tolerance: ±0.10(±0.004)
Grid 2.54x2.54(0.10x0.10)

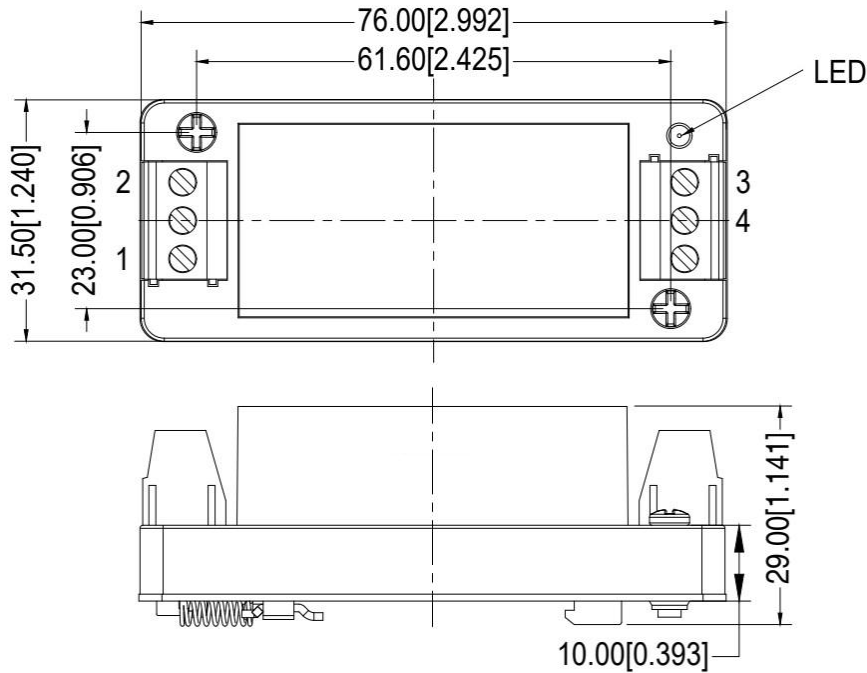
Y2-T Package Mechanical Dimensions



Terminal No.	Function
1	AC(N)
2	AC(L)
3	+Vo
4	-Vo

Unit: mm[inch]
Lead wires gauge: 24-12AWG
Screwing torque: 0.4N.m Max
General tolerance: ±1.00[±0.039]

Y2-TS Package Mechanical Dimensions



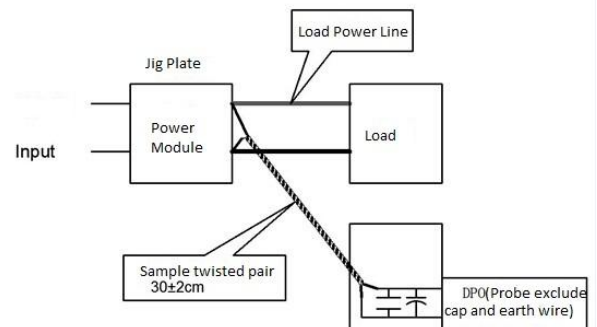
Terminal No.	Function
1	AC(N)
2	AC(L)
3	+Vo
4	-Vo

Unit: mm[inch]
 Lead wires gauge: 24-12AWG
 Screwing torque: 0.4N.m Max
 General tolerance: $\pm 1.00[\pm 0.039]$

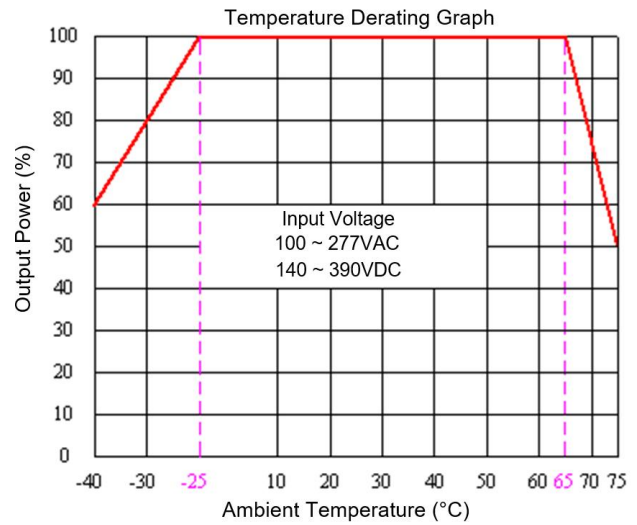
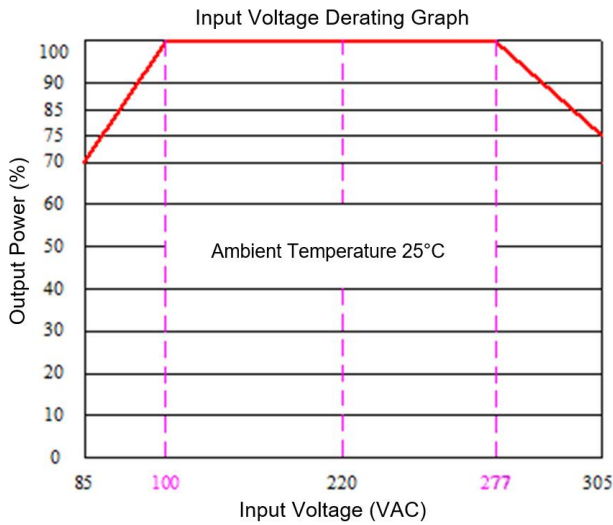
Package Code	Dimensions L x W x H	
Y2	50.80X25.40X15.60 mm	2.000X1.000X0.597 inch
Y2-T	76.00X31.50X24.50 mm	2.992X1.240X0.964 inch
Y2-TS	76.00X31.50X29.00 mm	2.992X1.240X1.141 inch

Ripple & Noise Test Instruction (Twisted Pair Method, 20MHZ bandwidth)

1) The Ripple & noise test needs 12# twisted pair cables, an oscilloscope which bandwidth should be set to 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the Sample Mode.
 2) The test diagram is shown on the right. The converter output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The twisted pair (length 30cm $\pm$ 2 cm) should be connected in parallel with the load, the location is as close as possible to the output pins or terminals. The test can be start after input power on.



Product Characteristic Graphs



Note 1: The output power should be derated based on the input voltage derating graph at 85~100VAC/277~305VAC & 120~140VDC/390~430VDC.

Note 2: This product should operate at the natural air condition, please contact us if it need be used at a closed space.

Recommended Circuits for Application

EMC solution & recommended circuit diagram

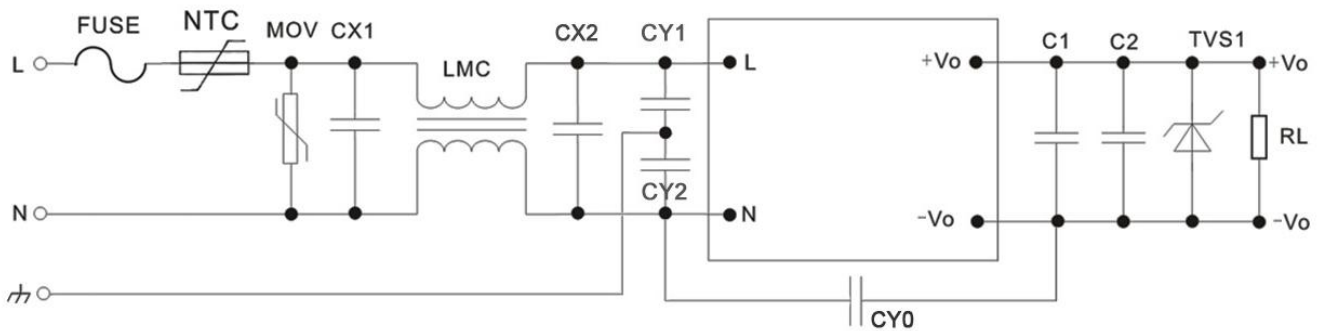


Figure – Circuit 1

Note:

- 1) 2A/300Vac Time-delay fuse is recommended for FUSE.
- 2) 10D561K/3500A varistor is recommended for MOV.
- 3) 10D-11 NTC is recommended to protect the converter against the lighting surge.
- 4) Common mode choke 30mH/0.5A is recommended for LMC.
- 5) X2/224K/310VAC capacitor is recommended for CX1; X2/104K/310VAC capacitor is recommended for CX2.
- 6) Y1/102M/400VAC capacitor is recommended for CY0, CY1 & CY2.
- 7) A high frequency low impedance electrolytic capacitor is recommended for C1 which capacitance should be less than the Max capacitive load and withstand voltage more than 1.5x of the output voltage.
- 8) 0.1uF ceramic SMD capacitor is recommended for C2 which withstand voltage be more than 1.5x of the output voltage.
- 9) TVS1: SMBJ7.0A for 5V output; SMBJ12.0A for 9V output; SMBJ20A for 12V, 12.5V, 12.8V & 15V outputs; SMBJ30.0A for 24V output; SMBJ64A for 48V output.

Low Ripple & Noise circuit diagram for FA15-C4S05YH

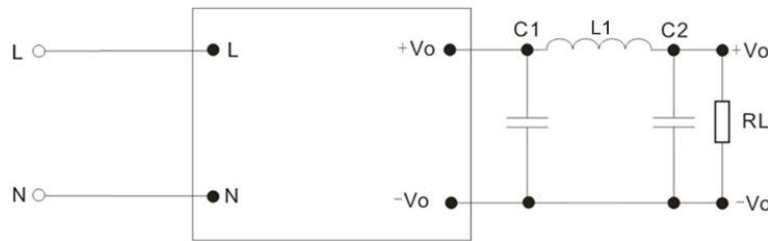


Figure – Circuit 2

Note:

- 1) Electrolytic capacitor 330uF/10V is recommended for C1 and 220uF/10V for C2.
- 2) Drum choke (2.2uH, wound-wire diameter >Ø0.7mm) is recommended for L1.

Application Notice

1. The products should be used according to the specifications in this datasheet, otherwise it could be permanently damaged.
2. A fuse should be connected at input.
3. The product performance in this datasheet cannot be guaranteed if it works at a lower load than the minimum load defined.
4. The product performance in this datasheet cannot be guaranteed if it works at over-load condition.
5. Unless otherwise specified, all values or indicators in this datasheet are tested at Ta=25°C, humidity<75%RH, nominal input voltage and rated load (pure resistance load).
6. All values or indicators in this datasheet had been tested based on Aipupower test specifications.
7. The specifications are specially for the parts listed in this datasheet, any other non-standard model performances could be out of the specifications. Please contact our technician for specific requirements.
8. Aipupower can provide customization service.

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