



1ACA_3 Series

1W - Single Output AC-DC Converter - Universal Input - Isolated & Regulated

AC-DC Converter

1 Watt

- ⊕ Wide input voltage range: 85~305VAC/120~430VDC
- ⊕ AC and DC dual-use (input from the same terminal)
- ⊕ Small size
- ⊕ Low ripple and noise
- ⊕ EMC meets EN55022, EN55024
- ⊕ Low standby power
- ⊕ High efficiency up to 75%
- ⊕ Over output current protection
- ⊕ Short circuit protection (SCP)
- ⊕ Meet IEC61000, UL60950 and IEC60950 standards
- ⊕ 3 years warranty

The 1ACA_3 series is the compact size power converters series offered by Gaptec. It features compact size and 3000VAC safer isolation. It offers good EMC performance, meets IEC61000, UL60950 and IEC60950 standards, and is widely used in industrial, electricity, instruments and civil applications.

If it is planned to be used in electricity and other higher requirement to EMC applications, one must connect a typical application.



Approval	Model	Package	Power [W]	Output [Vo]	Output [Io]	Ripple and Noise [mV, typ]	Efficiency [%, typ]	Capacitive load [µF, max]
UL/CE	1ACA_03S3	33.7x22.2x18mm	1	3.3V	300mA	100	63	4000
UL/CE	1ACA_05S3	33.7x22.2x18mm	1	5V	200mA	100	68	4000
UL/CE	1ACA_09S3	33.7x22.2x18mm	1	9V	111mA	100	72	2200
UL/CE	1ACA_12S3	33.7x22.2x18mm	1	12V	83mA	100	73	2200
UL/CE	1ACA_15S3	33.7x22.2x18mm	1	15V	67mA	100	74	1000
UL/CE	1ACA_24S3	33.7x22.2x18mm	1	24V	42mA	100	75	680

Input specifications

Input voltage range	85~305VAC, 120~430VDC	
Input frequency	47~63Hz	
Input current	110VAC • 37mA (max)	230VAC • 21mA (max)
Inrush current	110VAC • 7A (typ)	230VAC • 14A (typ)
Leakage current	0.15mA (max)	
Recommended eExternal input fuse (special package series include fuse)	1A/300V	
Hot plug	Unavailable	

Note:

- Models listed with strike-through text have been officially discontinued.
- Unless otherwise specified, all specifications are measured at rated input voltage and rated output load, TA=25°C, humidity < 75%.
- All specifications stated in this datasheet are subject to the above listed models only. For specifications of non-standard models, please contact our technical support team.

Output specifications

Output voltage accuracy	±5% (max) ±6% (max) at 3.3V output
Line regulation (full load)	±2% (typ)
Load regulation (10% to 100%)	±5% (typ)
Ripple & Noise* (p-p)	20MHz Bandwidth: 100mV (typ), 200mV (max)
Temperature coefficient	±0.04%/°C (typ)
Stand-by power consumption	0.2W (max)
Short circuit protection	Continuous, and auto resume
Over current protection	110%~400% IO can auto resume
Hold-up time	230VAC output: 50ms (typ)

* Ripple and Noise are measured by the method of parallel lines, please see AC-DC Converter Application Notes for specific operation methods.

Model selection:

WTC_yyN##

W= Watt; T= Type; C= Case; yy= Vout; N= Numbers of Output;

##= Isolation (kVAC)

Example:

1ACA_05S3

1= 1Watt; AC= AC-DC; A= case style; 5Vout; S= Single Output;

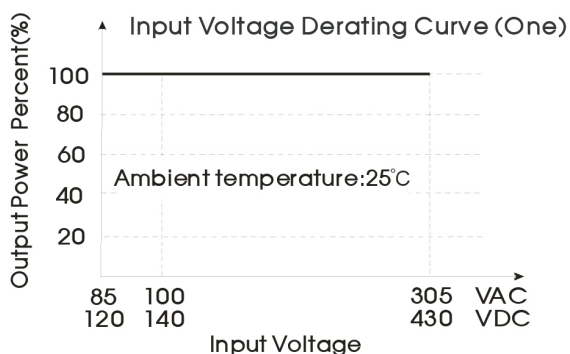
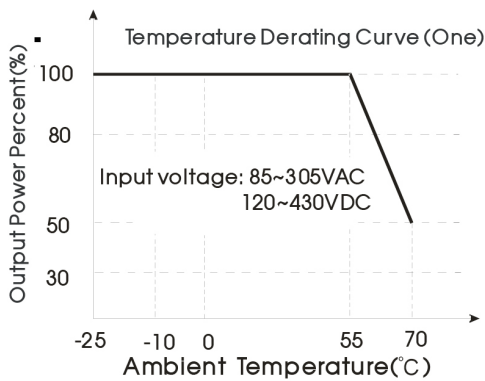
3= 3kVAC

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Common specifications			
Operating temperature range	-25°C ~ +70°C		
Storage temperature range	-25°C ~ +85°C		
Power derating temperature range	-25°C ~ -10°C; 1.33%/°C 55°C ~ 70°C; 3.3%/°C		
Cooling	Free convection		
Storage Humidity	95% RH (max)		
Switching frequency	100kHz (max)		
I/O-isolation voltage	3000VAC/1Min		
EMC / EMI / CE	CISPR22/EN55022, CLASS B		
EMC / EMI / RE	CISPR22/EN55022, CLASS B		
EMC / EMS / ESD	IEC/EN61000-4-2	±4KV / ±8KV	perf. Criteria B
EMC / EMS / RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
EMC / EMS / EFT*	IEC/EN61000-4-4	±2KV (see EMC solution-recommended circuit)	perf. Criteria B
EMC / EMS / Surge Immunity	IEC/EN61000-4-5	±1KV/±2KV (see EMC solution-recommended circuit)	perf. Criteria B
EMC / EMS / CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A
EMC / EMS / PFM	IEC/EN61000-4-8	10A/m	perf. Criteria A
EMC / EMS / Voltage dips, short and interruptions immunity	IEC/EN61000-4-11	0%-70%	perf. Criteria B
Safety certification	EN60950,UL60950		
Safety class	CLASS II		
Case material	UL94V-0		
Install	PCB		
MTBF	MIL-HDBK-217F@25°C >300,000h @25°C		
Weight	20g		

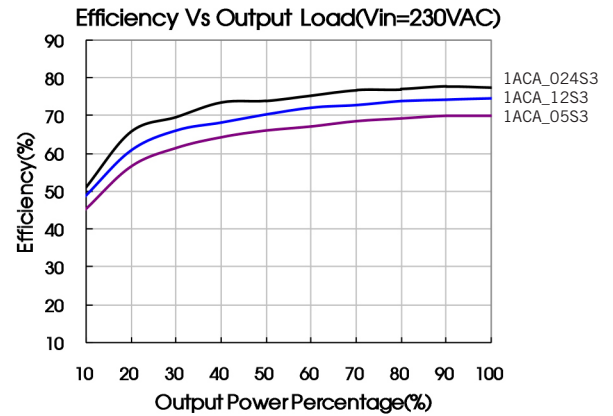
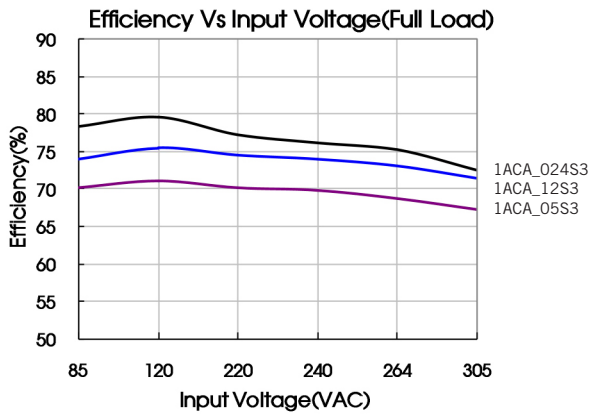
Typical characteristics



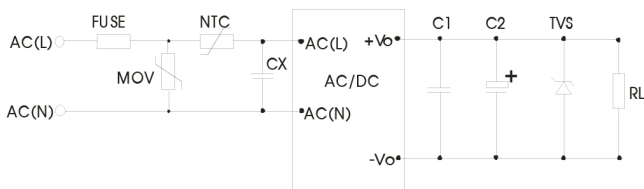
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Typical efficiency curve



Typical application circuit



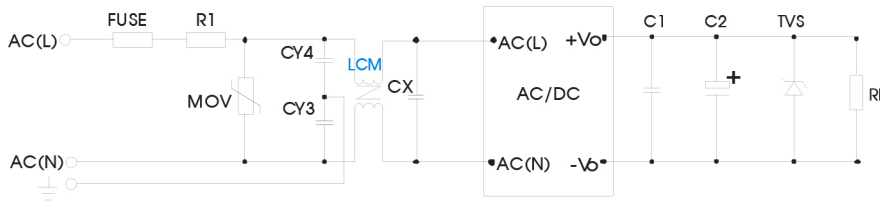
Model	C1(μF)	C2 (μF)	TVS
1ACA_03S3	1	220	SMBJ7.0A
1ACA_05S3	1	220	SMBJ7.0A
1ACA_09S3	1	120	SMBJ12A
1ACA_12S3	1	120	SMBJ20A
1ACA_15S3	1	120	SMBJ20A
1ACA_24S3	1	68	SMBJ30A

Note:
 Output filtering capacitor C2 is electrolytic capacitor, it is recommended to use high frequency and low impedance electrolytic capacitor. For capacitance and current of capacitor please refer to manufacture's datasheet. Capacitor withstand voltage derating should be 80% or above. C1 is ceramic capacitor, which is used to filter high-frequency noise. TVS is a recommended component to protect post-circuits if converter fails. External input FUSE is recommended to use 1A/300V; external input MOV is recommended to use S14K350; external input NTC is recommended to use 10D-11; external input CX is recommended to use 0.47μF/305VAC.

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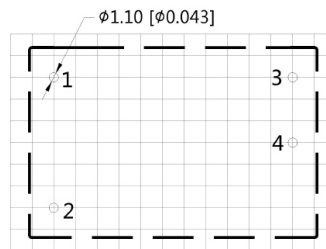
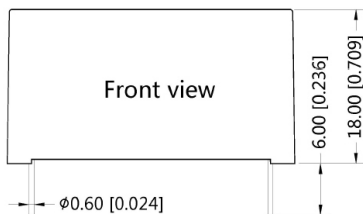
EMC solution-recommended circuit



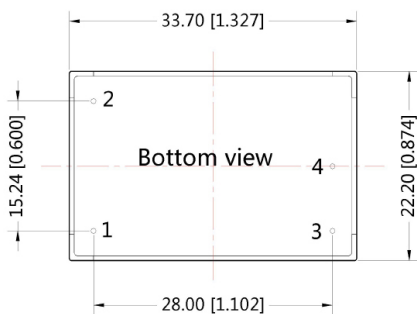
Components	Recommended parameter
MOV	S14K350
CY3	2.2nF/400V
CY4	2.2nF/400V
CX	0.47µF/305VAC
LCM	10 mH
R1	47Ω/3w
FUSE	1A/300V, slow blow, it must be connected to FUSE

Mechanical dimensions

THIRD ANGLE PROJECTION



Note : Grid 2.54*2.54mm



Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	-Vo
4	+Vo

Note:

Unit: mm[inch]

Pin diameter tolerances: ± 0.10mm[± 0.004inch]

General tolerances: ± 0.50mm[± 0.020inch]