

FEATURES

20(25)W,AC-DC Converter

- ◆ Universal Input:85-305V_{AC}/100-430V_{DC}
- ◆ Regulated output,low ripple/noise
- ◆ High efficiency up to 90%
- ◆ Output shortcircuit,over-current,over-voltage, protection
- ◆ Plastic case,meets UL94V-0
- ◆ IEC60950,UL60950,EN60950 approval
- ◆ Mounting:PCBmounting,Chassismounting, DIN-Rail mounting available
- ◆ Three year warranty



Selection Guide

Certification	Part No.*	Output Power	Nominal Output Voltage and Current		Efficiency (230VAC,%/Typ.)	Max.Capacitive Load(μF)	
			(Vo1/Io1)	(Vo2/Io2)		Vo1	Vo2
	CFAE20S3V3	13.53W	3.3V/4100mA	--	80	48000	--
	CFAE20S05	17.5W	5V/3500mA	--	85	12240	--
	CFAE20S09		9V/2100mA	--	86	7200	--
	CFAE20S12		12V/1600mA	--	88	5400	--
	CFAE20S15		15V/1300mA	--	88	2720	--
	CFAE20S24		24V/850mA	--	90	1840	--
	CFAE20D05	20W	+5V/2000mA	-5V/2000mA	83	8000	8000
	CFAE20D12		+12V/830mA	-12V/830mA	88	960	960
	CFAE20D15		+15V/650mA	-15V/650mA	89	880	880
	CFAE20T05H05I-05		5V/2500mA	±5V/500mA	74	11200	4480
	CFAE20T05H12I-04		5V/2000mA	±12V/400mA	75	16000	1600
	CFAE20T05H15I-03		5V/2000mA	±15V/300mA	76	13520	370
	CFAE20T05M24I		5V/2000mA	±24V/200mA	77	11200	370
	CFAE20D05H12I-06		5V/2500mA	12V/600mA	75	32400	3250
	CFAE20D05H15I-06		5V/2500mA	15V/500mA	76	28000	1980
	CFAE20D05H24I-06		5V/2500mA	24V/300mA	77	28000	720
	CFA25S3V3	13.53W	3.3V/4100mA	--	80	48000	--
	CFA25S05	20.5W	5V/4100mA	--	85	12240	--
	CFA25S09	25W	9V/2500mA	--	86	5600	--
	CFA25S12		12V/2100mA	--	88	5400	--
	CFA25S15		15V/1600mA	--	88	2400	--
	CFA25S24		24V/1100mA	--	90	1440	--
	CFA25S48		48V/500mA	--	90	500	--

Note: *About CFAE20DXX, use both positive and negative output as sampling feedback; and all others use Vo1 as sampling feedback.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	--	305	V _{AC}
	DC input	100	--	430	V _{DC}
Input frequency		47	--	63	Hz
Input current	115V _{AC}	--	--	0.6	A
	230V _{AC}	--	--	0.34	
Inrush current	115V _{AC}	--	16	--	
	230V _{AC}	--	30	--	
Leakage current		0.3mA RMStyp./230V _{AC} /50Hz			
Recommended External Input Fuse(Chassismounting,DIN-Railmounting package seriesinclude fuse)		3.15A/250V,slow fusing,necessary			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage	Main circuit		--	±2	--	
Line Regulation	Full load	Main circuit	--	±0.5	--	
		Auxiliary circuit	--	±1.5	--	
Load Regulation	0%-100% load	Single output	--	±1	--	%
	10%-100% load	Dual output(balanced load)	--	±2	--	
		Isolated triple output (balanced load)	Main circuit Vo1	--	±3	
			Auxiliary circuit ±Vo2	--	±5	
		Isolated and separated twin output (balanced load)	Main circuit Vo1	--	±3	
			Auxiliary circuit Vo2	--	±5	
Ripple/Noise*	Main circuit	20MHz bandwidth(peak-peak value)	--	50	100	mV
Temperature Coefficient	Main circuit		--	±0.02	--	%/°C
Short Circuit Protection			Continuous,self-recovery			
Over-current Protection			≥110%Io self-recovery			
Over-voltage Protection	Main circuit	3.3/5V _{DC} Output	≤7.5V _{DC}			
		9V _{DC} Output	≤13V _{DC}			
		12 /15V _{DC} Output	≤20V _{DC}			
		24V _{DC} Output	≤30V _{DC}			
		48V _{DC} Output	≤60V _{DC}			
Min.Load	Single output models		0	--	--	%
	Dual output models(balanced load)		10	--	--	
	Isolated and separated twin output(balanced load)		10	--	--	
	Isolated triple output(balanced load)		10	--	--	
Hold-up Time	115V _{AC} input		--	15	--	ms
	230V _{AC} input		--	80	--	

Note:*Ripple and noise are measured by"parallel cable"method,please see AC-DC Converter Application Notes for specific operation.

General Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output	Testtime:1 min	3000	--	--	V _{AC}
	Input- 		2000	--	--	
Operating Temperature			-25	--	+55	°C
Storage Temperature			-40	--	+105	
Storage Humidity			--	--	95	%RH

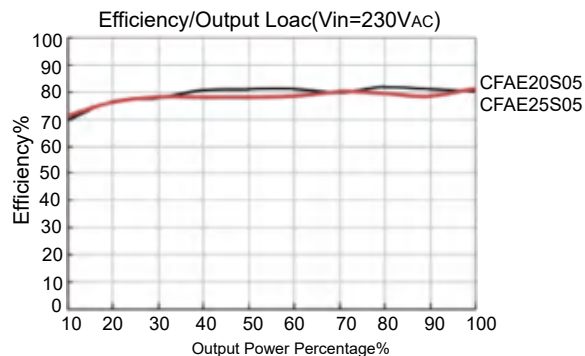
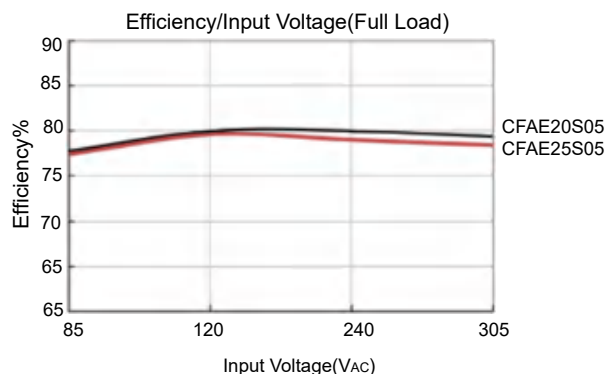
Welding Temperature	Wave-soldering	260±5℃;time:5-10s			
	Manual-welding	360±10℃;time:3-5s			
Switching Frequency		--	65	--	kHz
Power Derating	-25℃to-40℃	2.0	--	--	% /℃
	+55℃to+70℃	3.0	--	--	
		4.0	--	--	
Safety Standard		IEC60950/EN60950/UL60950			
Safety Certification		IEC60950/EN60950/UL60950			
Safety Class		CLASSI			
MTBF		MIL-HDBK-217F@25℃>300,000h			

Physical Specifications		
Casing Material		Black flame-retardant and heat-resistant plastic(UL94V-0)
Dimension	Horizontal package	70.0*48.0*23.5mm
	Din-Rail mounting(Adapter base)	96.1*54.0*36.6mm
Weight	Horizontal package/Adapter baseDin-Railmounting	120g/210g(Typ.)
Cooling method		Free air convection

EMC Specifications			
EMI	CE	CISPR22/EN55022 CLASS B	
	RE	CISPR22/EN55022 CLASS B	
EMS	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV Perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m perf. Criteria A
	EFT	IEC/EN61000-4-4	±2KV perf. Criteria B
		IEC/EN61000-4-4	±4KV(See Fig.5for recommended circuit) perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±1KV/line to ground ±2KV perf. Criteria B
		IEC/EN61000-4-5	line to line ±2KV/line to ground ±4KV (See Fig.5 for recommended circuit) perf. Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s perf. Criteria A
	PFM	IEC/EN61000-4-8	10A/m perf. Criteria A
	Voltage dips,short interruptions and voltage variations immunity	IEC/EN61000-4-11	0%,70% perf. Criteria B



Note:①When input 85-100VAc/240-305VAc/100-120Vdc/340-430Vdc,it need to be voltage derated on basis of temperature derating;
②Thisprod uct is suitable for use in natural air cooling environments,if in a closed environment,please contact our company's FAE.



Design Reference

1. Typical application circuit

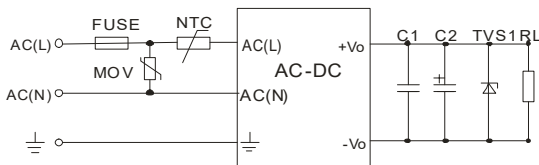


Fig.1:Single way series(Single Output)Typical application circuit

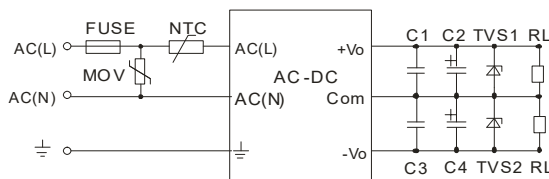


Fig.2:Two way series(Dual Output) typical application circuit

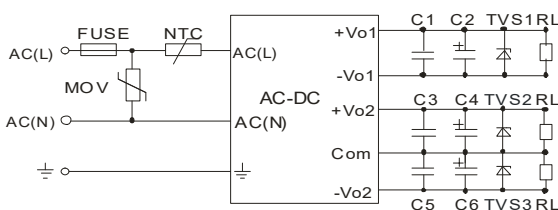


Fig.3:Three way series(Triple Output)typical application circuit

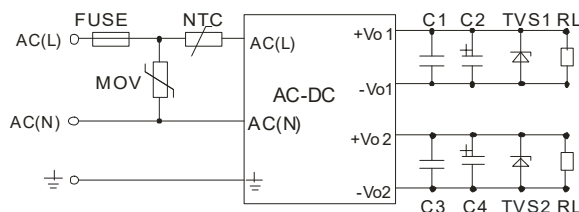


Fig.4:Two way isolation series(Isolate Twin Output)typical application circuit

Model	C2(μF)	C4(μF)	C6(μF)	TVS1	TVS2	TVS3
CFAE20S3V3	330	--	--	SMBJ7.0A	--	--
CFAE20S05	330	--	--	SMBJ7.0A	--	--
CFAE20S09	220	--	--	SMBJ12A	--	--
CFAE20S12	220	--	--	SMBJ20A	--	--
CFAE20S15	220	--	--	SMBJ20A	--	--
CFAE20S24	220	--	--	SMBJ30A	--	--
CFAE20D05	470	470	--	SMBJ7.0A	SMBJ7.0A	--
CFAE20D12	120	120	--	SMBJ20A	SMBJ20A	--
CFAE20D15	68	68	--	SMBJ20A	SMBJ20A	--
CFAE20T05H05I-05	330	120	120	SMBJ7.0A	SMBJ7.0A	SMBJ7.0A
CFAE20T05H12I-04	330	120	120	SMBJ7.0A	SMBJ20A	SMBJ20A
CFAE20T05H15I-03	330	120	120	SMBJ7.0A	SMBJ20A	SMBJ20A
CFAE20T05M24I	330	47	47	SMBJ7.0A	SMBJ30A	SMBJ30A
CFAE20D05H12I-06	330	220	--	SMBJ7.0A	SMBJ20A	--
CFAE20D05H15I-06	330	220	--	SMBJ7.0A	SMBJ20A	--
CFAE20D05H24I-06	330	120	--	SMBJ7.0A	SMBJ30A	--
CFAE25S3V3	330	--	--	SMBJ7.0A	--	--
CFAE25S05	330	--	--	SMBJ7.0A	--	--
CFAE25S09	330	--	--	SMBJ12A	--	--
CFAE25S12	330	--	--	SMBJ20A	--	--
CFAE25S15	330	--	--	SMBJ20A	--	--
CFAE25S24	120	--	--	SMBJ30A	--	--
CFAE25S48	68	--	--	SMBJ64A	--	--

Note:

Output filtering capacitors C2,C4,C6 are electrolytic capacitors,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 voltage reduced to at least 80%.C1,C3,C5 are ceramic capacitors,which is used to filter high-frequency noise.TVS is a recommended component to protect post-circuits if converter fails.External input NTC is recommended to use 5D-9.External input MOV model is recommended to use S14K300.

2. EMC solution-recommended circuit

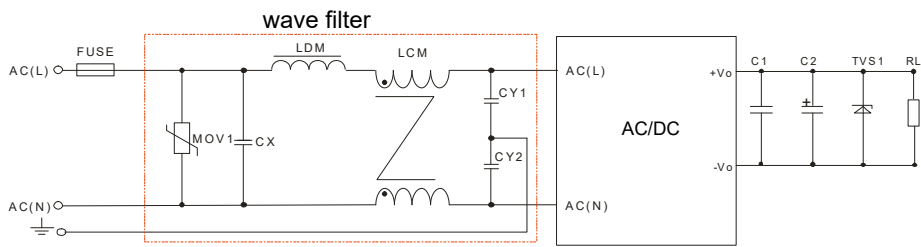
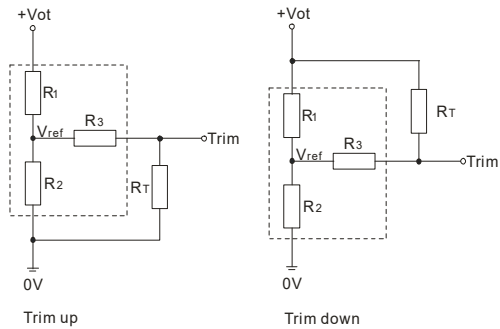


Fig.5:EMC Recommended circuit with higher requirements

Element model	Recommended value
MOV1	S14K300
CY1,CY2	1000pF/400VAc
CX	0.1μF/275VAc
LCM	10mH,recommended Our filter
LDM	4.7μH/2A
Wave filter	2KV/4KV EMC filter
FUSE	3.15A/250V slow fusing,necessary

3. Application of Trimand calculation of Trimresistance



Calculation formula of Trimresistance:

$$\begin{aligned} \text{up: } R_T &= \frac{aR_2}{R_2 - a} - R_3 & a &= \frac{V_{ref}}{V_{ot} - V_{ref}} \cdot R_1 \\ \text{down: } R_T &= \frac{aR_1}{R_1 - a} - R_3 & a &= \frac{V_{ot} - V_{ref}}{V_{ref}} \cdot R_2 \end{aligned}$$

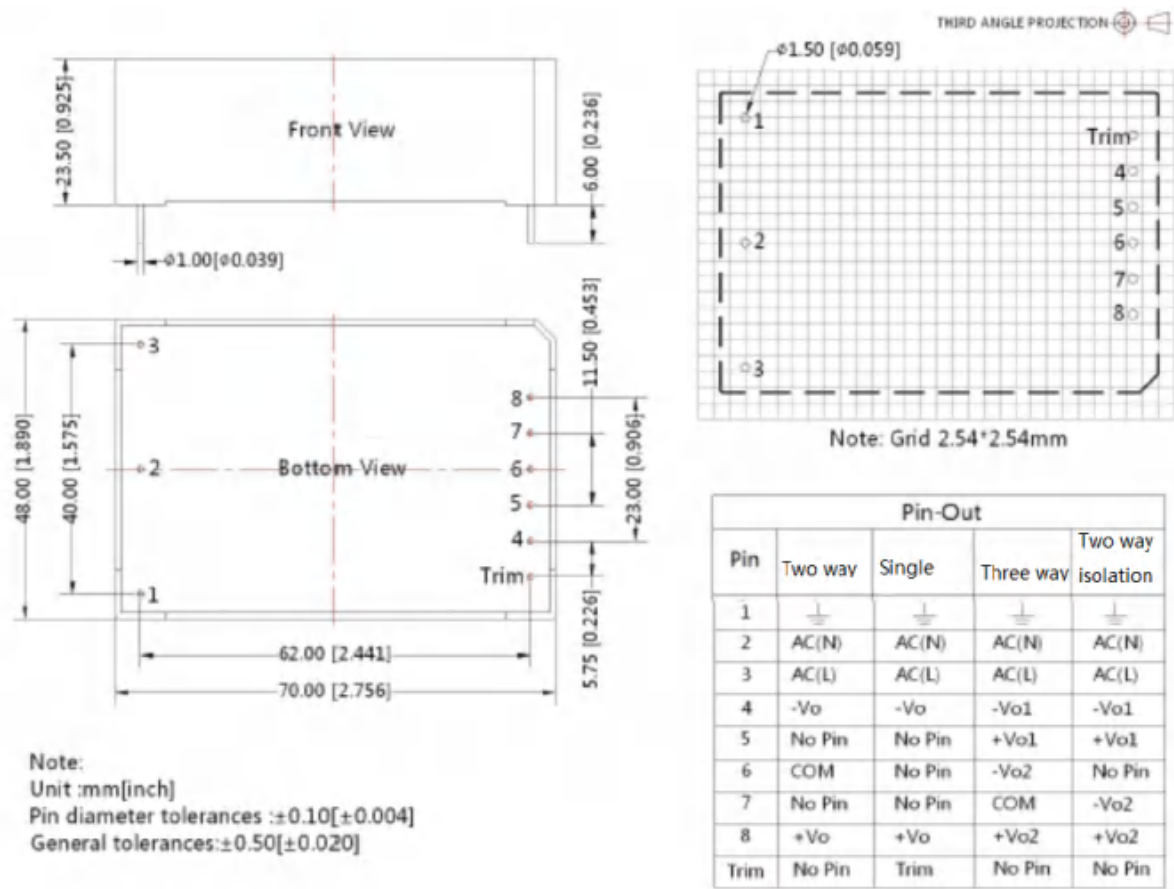
R_T is Trimresistance
 a is a self-defined parameter, with no real meaning.

Applied circuits of Trim(Part in broken line is the interior of models):

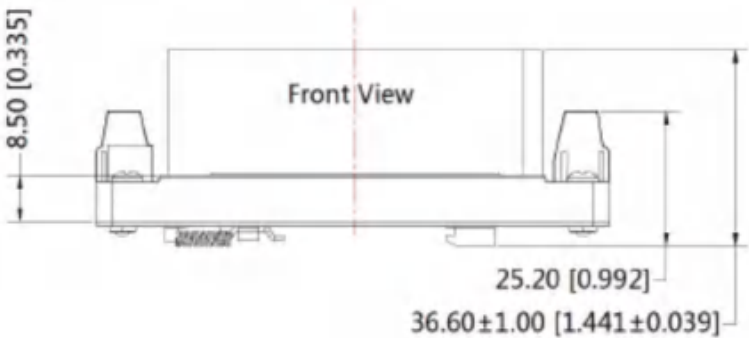
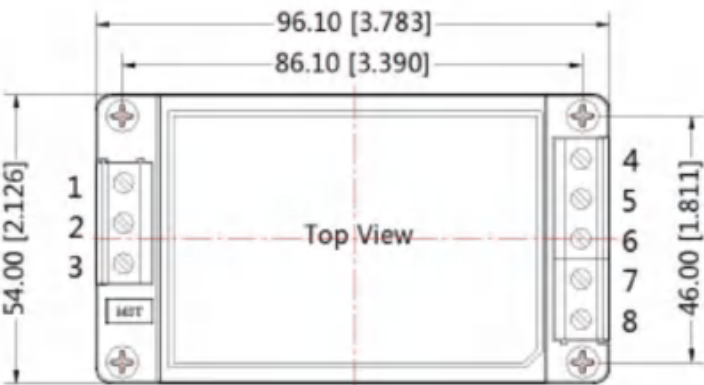
Vout	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)	Vot(V)
3.3V	3.3	1.98	1	1.24	Output voltage after regulation, variation≤±10%+
5V	3.3	3.3	1	2.5	
9V	7.5	2.87	1	2.5	
12V	3.83	1	1	2.5	
15V	7.5	1.5	1	2.5	
24V	8.66	1	1	2.5	
48V	68	3.73	1	2.5	

4. Formore information, Please find the application note on www.chewins.net

Dimensions and Recommended Layout



Adapter base Dimensions



THIRD ANGLE PROJECTION

Pin-Out				
Pin	Two way	Single	Three way	Two way isolation
1	⏏	⏏	⏏	⏏
2	AC(N)	AC(N)	AC(N)	AC(N)
3	AC(L)	AC(L)	AC(L)	AC(L)
4	-Vo	-Vo	-Vo1	-Vo1
5	NC	NC	+Vo1	+Vo1
6	COM	Trim	-Vo2	NC
7	NC	NC	COM	-Vo2
8	+Vo	+Vo	+Vo2	+Vo2

Note:
Unit: mm[inch]
Mounting rail: TS35, rail needs to connect safety ground
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ±0.50[±0.020]

Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from www.chewins.net Packing bag number of Horizontal package:58220006,the Packing bag number of A2/A3/A4 package:58220010;
2. If the product is not operated within the required load range,the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. Unless otherwise specified,parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$,humidity<75% with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on our Company's corporate standards;
5. We can provide product customization service,please contact our technicians directly for specific information;
6. Specifications are subject to change without prior notice.



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