Features

1. Isolation Voltage 5kVAC / 6kVDC, Reinforced Insulation
2. Clearance & Creepage Distance > 5mm
3. Ultra-Low Isolation Capacitance < 12pF
4. Maximum Patient Leakage Current 2 μA
5. Medical level safety certification (level 2 MOPP)
6. Wide operating temperature range: -40℃ to +105℃
7. Up to 85% efficiency
8. Ultra-Compact SIP Package

RoHS CE 3 years Warranty

Selection Guide

Model	Input Voltage (VDC)	Output		Efficiency (%) @ Full Load
	Nominal Range	Output Voltage (VDC)	Output Current (mA) Max./Min.	
AMH0505S-2WR3	5 (4.5-5.5)	5	400/40	77
AMH0509S-2WR3		9	222/22	78
AMH0512S-2WR3		12	167/17	80
AMH0515S-2WR3		15	133/13	83
AMH0524S-2WR3		24	83/8	85
AMG1203S-2WR3	12 (10.8-13.2)	±3.3	±303/±30	69/73
AMG1205S-2WR3		±5	±200/±20	76/80
AMG1209S-2WR3		±9	±111/±11	78/82
AMG1212S-2WR3		±12	±83/±9	79/83
AMG1215S-2WR3		±15	±67/±7	80/84
AMG1224S-2WR3		±24	±42/±5	79/83
AMH1203S-2WR3		3.3	400/40	76/80
AMH1205S-2WR3		5	400/40	76/80
AMH1209S-2WR3		9	222/22	78/82
AMH1212S-2WR3		12	167/17	80/84
AMH1215S-2WR3		15	133/14	80/84
AMH1224S-2WR3		24	84/8	77/81
AMG1505S-2WR3	15 (13.5-16.5)	±5	±200/±20	74/78
AMG1509S-2WR3		±9	±111/±11	76/80
AMG1515S-2WR3		±15	±67/±7	76/80
AMH1505S-2WR3		5	400/40	76/80
AMH1515S-2WR3		15	133/14	79/83
AMG2403S-2WR3	24 (21.6-26.4)	±3.3	±303/±30	69/73
AMG2405S-2WR3		±5	±200/±20	75/79
AMG2409S-2WR3		±9	±111/±11	77/81
AMG2412S-2WR3		±12	±83/±9	78/82

AMG2415S-2WR3	24 (21.6-26.4)	±15	±67/±7	77/81
AMG2424S-2WR3		±24	±42/±5	70/74
AMH2405S-2WR3		5	400/40	75/79
AMH2409S-2WR3		9	222/22	77/81
AMH2412S-2WR3		12	167/17	78/82
AMH2415S-2WR3		15	133/14	80/84
AMH2424S-2WR3		24	84/8	80/84

Input Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Current (full load/no-load)	5V input	- -	530/20	560/--	mA
	12V input	- -	228/15	242/--	
	15V input	- -	167/15	176/--	
	24V input	- -	114/15	121/--	
Surge Voltage (1sec. max.)	5V input	-0.7	--	9	VDC
	12V input	-0.7	--	18	
	15V input	-0.7	--	21	
	24V input	-0.7	--	30	
Reflected ripple current*		- -	200	- -	mA
Input filter		Capacitive filtering			
Hot Plug		Unavailable			
Note: * Refer to DC-DC Converter Application notes for detailed description of reflected ripple current test method.					

Output Characteristic

Parameter	Conditions			Min.	Typ.	Max.	Units
Output voltage accuracy				See output regulation curve(Fig. 1)			
Linear Regulation	Input voltage change: ±1%	5V Intput	5V output	- -	±1.2	±1.5	%
			Other output	- -	- -	±1.2	- -
		Other Input	3.3V output	- -	- -	1.5	
			Other output	- -	- -	1.2	
Load Regulation	10% - 100% load		3.3/5V output	- -	- -	20	%
			Other Output	- -	- -	15	
Ripple & Noise	20MHz bandwidth	5V Intput	5V output	- -	100	150	mVp-p
			Other output	- -	120	180	
		Other Input	3.3V output	- -	100	150	
			Other output	- -	80	120	
Temperature Coefficient	100% load	5V Intput		- -	±0.1	- -	%/℃
		Other Input		- -	±0.02	- -	
Short circuit protection				Continuous, self-recovery			

General Characteristics

Parameter	Conditions		Min.	Typ.	Max.	Units
Isolation voltage	Input-output, Test for 1 minute, the leakage current < 1mA		5000	- -	- -	VAC
			6000	- -	- -	VDC
Patient Leakage Current*	250VAC, 50/60Hz		- -	- -	2	μA
Insulation resistance	IInput-output resistance at 500VDC		1000	- -	- -	MΩ
Isolation capacitance	Input-output capacitance at 100kHz/0.1V		- -	4	- -	pF
Operating Temperature	Derating when operating temperature≥85℃ (see Fig. 2)		-40	- -	+105	℃
Storage Temperature			-55	- -	+125	
Case Temperature Rise	Ta=25℃	5V Input	- -	35	- -	
		Other Input	- -	25	- -	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds		- -	- -	300	
	Wave soldering,10 seconds		255	260	265	
Storage humidity	Non condensing		5	- -	95	%RH
Switching Frequency	100% load, nominal input voltage		- -	200	- -	kHz
MTBF	MIL-HDBK-217F@25℃	5V Input	3500	- -	- -	k hours
		Other Input	19360	- -	- -	
Creepage & Clearance Distance			5	- -	- -	mm

Note: * Leakage current and reinforced insulation is based on 250 VAC, 50/60 Hz system input voltage.

Physical Characteristics

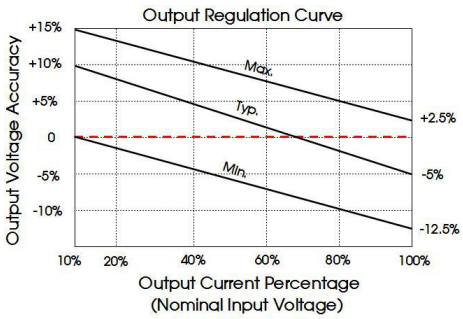
Parameter	Content
Housing material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Overall dimensions	19.50*9.80*12.50 mm
Weight	4.0g(Typ.)
Cooling mode	Natural air cooling

EMC Characteristics

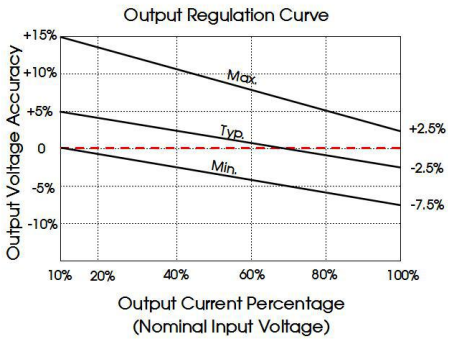
Parameter	Category		Content
EMI	CE	Others	CISPR32/EN55032 CLASS B (see Fig. 4 for recommended circuit) EN60601-1-2/CISPR 11 GROUP1 CLASS B (see Fig. 4 for recommended circuit)
		AMG15_S-2WR3, AMG24_S-2WR3	CISPR32/EN55032 CLASS A (see Fig. 4 for recommended circuit) EN60601-1-2/CISPR 11 GROUP1 CLASS A (see Fig. 4 for recommended circuit)
	RE	Others	CISPR32/EN55032 CLASS B (see Fig. 4 for recommended circuit) EN60601-1-2/CISPR 11 GROUP1 CLASS B (see Fig. 4 for recommended circuit)
		AMG15_S-2WR3, AMG24_S-2WR3	CISPR32/EN55032 CLASS A (see Fig. 4 for recommended circuit) EN60601-1-2/CISPR 11 GROUP1 CLASS A (see Fig. 4 for recommended circuit)
Immunity	ESD		EN60601-1-2 (IEC/EN61000-4-2) Air ±15kV, Contact ±8kV perf. Criteria B

Product Characteristic Curve

3.3VDC output



5VDC input, 12/15/24VDC input 5VDC output



12/15/24VDC input other output

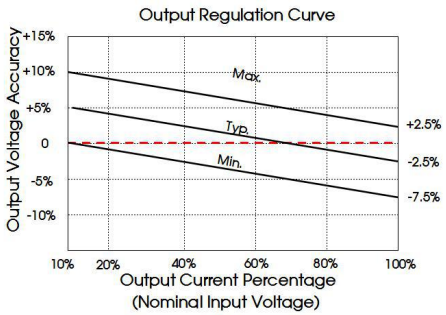


Fig.1

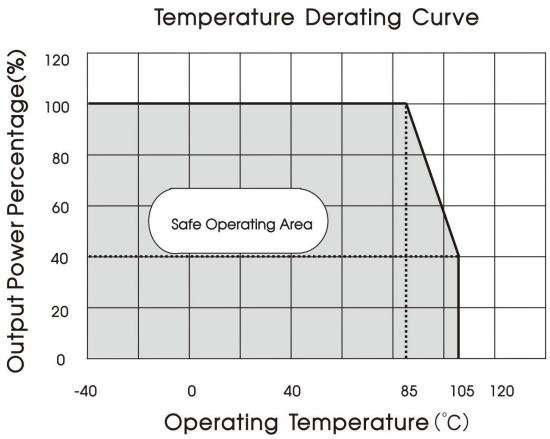


Fig.2

Design Reference

1. Typical application

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig. 3.

Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to Table 1.

The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat

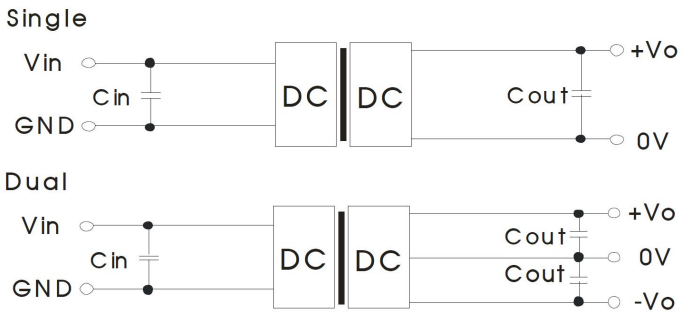


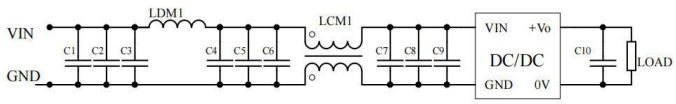
Fig.3

Table 1: Recommended input and output capacitor values

Vin	Cin	Single Vout	Cout	Dual Vout	Cout
5VDC	10μF/25V	3.3/5VDC	10μF/16V	±3.3VDC	4.7μF/16V
12VDC	10μF/25V	9VDC	10μF/16V	±5/±9VDC	4.7μF/16V
15VDC	4.7μF/25V	12VDC	2.2μF/25V	±12/±15VDC	1μF/25V
24VDC	2.2μF/50V	15VDC	1μF/25V	- -	- -
- -	- -	24VDC	0.47μF/50V	- -	- -

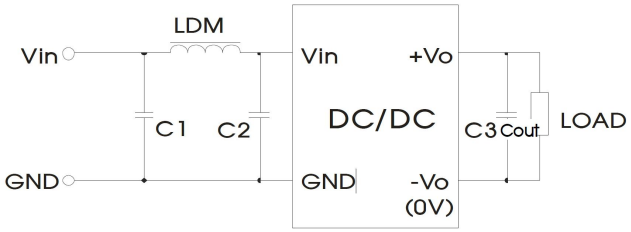
2. EMC compliance circuit

5V input



Input voltage		Single Vout
EMI	C1、C2、C3	22μF /50V
	C4、C5、C6	
	C7、C8、C9	
	C10	Refer to the Cout in table 1
	LDM1	120uH
	LCM1	4.7mH（FL2D-30-472）

AMG15(24)_S-2WR3(CLASS A)



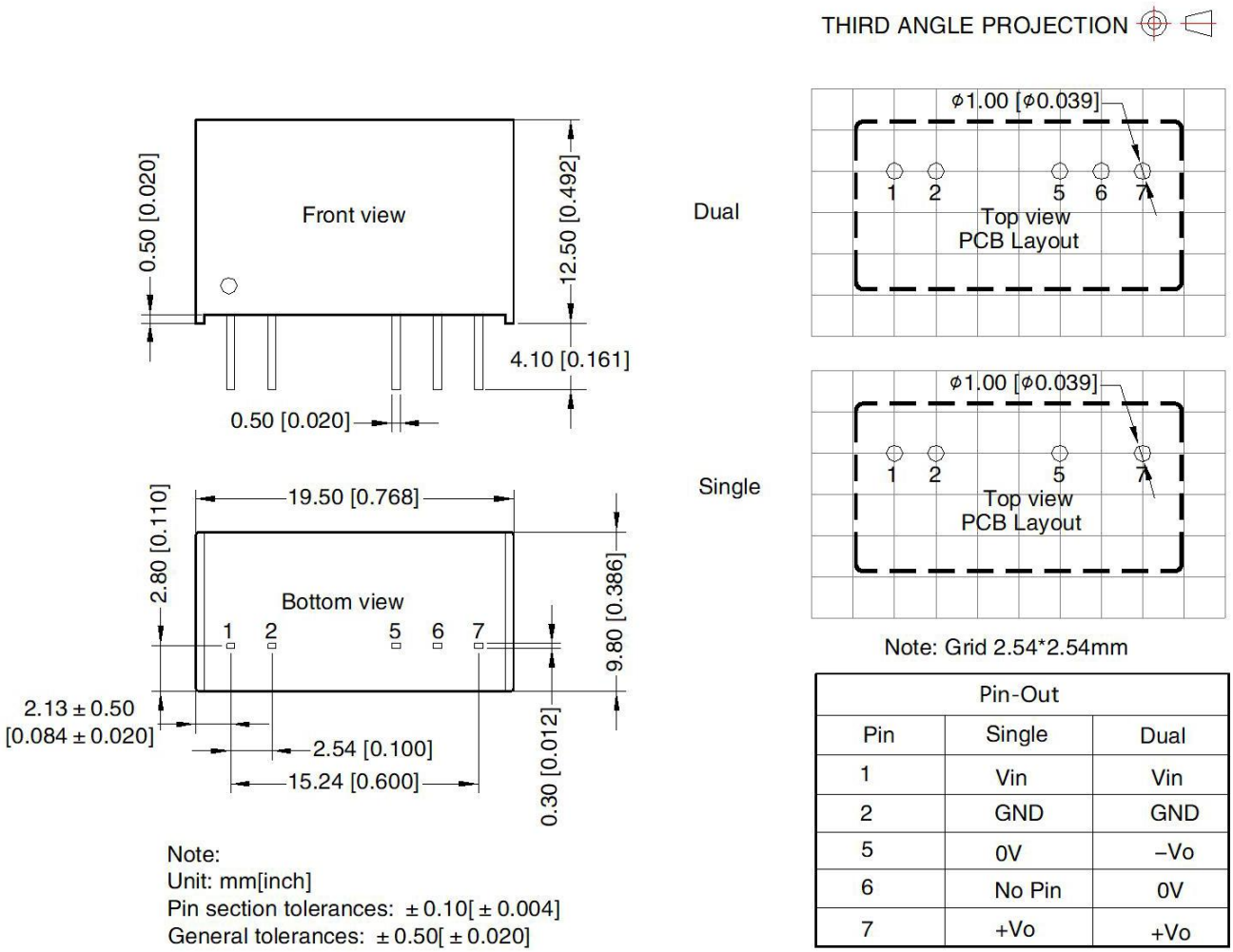
Series		AH12_S-2WR3	AMG12_S-2WR3	100μF /50VAMH15_S-2WR3	AMH24_S-2WR3	
Output voltage(VDC)		- -	- -	- -	others	24V
EMI	C0/C0A	- -				
	C1/C2	4.7μF /50V				
	C3	4.7μF /50V				100μF/50V
	C4	4.7μF /50V				- -
	COUT	Refer to the Cout in table 1				
	LCM	22μH (Nickel zinc inductance)				

Series		AH12_S-2WR3	AMG12_S-2WR3	100μF /50VAMH15_S-2WR3	AMH24_S-2WR3
EMI	C0/C0A	4.7μF /50V			
	C1/C2	4.7μF /50V			
	C3	4.7μF /50V			
	C4	4.7μF /50V			
	COUT	Refer to the Cout in table 1			
	LCM	14μH/0.5A/100mΩ			

3. Minimum Output Load Requirement

For a reliable and efficient operation of the converter, the minimum load should never be less than 10% of the rated output load. If the total
required output power is below 10%, a parallel bleeding resistor is required on the output, ensuring that the sum of the power consumption is
always maintained at 10% minimum.

Dimensions and Recommended Layout



Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.50[± 0.020]

Note: Grid 2.54*2.54mm

Pin-Out		
Pin	Single	Dual
1	Vin	Vin
2	GND	GND
5	0V	–Vo
6	No Pin	0V
7	+Vo	+Vo