

MFS-1500-U series

1500W Constant Voltage Enclosed Switching Power Supply with PFC function



■ Features:

- Universal AC input / Full range: 85÷264VAC or 120÷370VDC
 - Built-in active PFC function
- Protections: Over current / Short circuit / Over Voltage / Over temperature
 - Support 3+1 parallel redundancy, current sharing
 - Wide range of adjustable output voltage
- Wide range of operating temperature range: -40°C to +70°C
 - Operating altitude up to 5000m
 - Fan speed automatic adjustable



MODEL NUMBERING

MFS	-	1500	-	X	-	U
SERIES		RATED OUTPUT POWER		RATED OUTPUT VOLTAGE		INPUT VOLTAGE RANGE
ENCLOSED TYPE SWITCHING POWER SUPPLY, 1U PROFILE, CONSTANT VOLTAGE DESIGN, PFC FUNCTION		1500 means 1500W		X = 12	12V	U means 86~264VAC / 120~370VDC
			X = 15	15V		
			X = 24	24V		
			X = 27	27V		
			X = 36	36V		
			X = 48	48V		
			X = 54	54V		

ELECTRICAL SPECIFICATION

MODEL	MFS-1500-12-U	MFS-1500-15-U	MFS-1500-24-U	MFS-1500-27-U	MFS-1500-36-U	MFS-1500-48-U	MFS-1500-54-U
MAIN OUTPUT							
RATED VOLTAGE	12V	15V	24V	27V	36V	48V	54V
ADJUSTABLE VOLTAGE RANGE (MIN.)	12V ÷ 14.4V	15V ÷ 18V	24V ÷ 28.8V	27V ÷ 32.4V	36V ÷ 43.2V	48V ÷ 56V	54V ÷ 58V
RATED CURRENT	125A	100A	62.5A	56A	42A	32A	28A
RATED POWER	1510W	1510W	1510W	1522W	1522W	1546W	1522W
LINE REGULATION (TYP.)	± 0.5%						
LOAD REGULATION (TYP.)	± 0.5%						
VOLTAGE ACCURACY (TYP.)	± 1%						
RIPPLE & NOISE (MAX.) [2]	150mV _{p-p}	150mV _{p-p}	150mV _{p-p}	150mV _{p-p}	200mV _{p-p}	200mV _{p-p}	250mV _{p-p}
HOLD UP TIME (TYP.)	12ms / 230VAC at full load						
EFFICIENCY (TYP.)	92%	92%	94%	94%	94%	94%	94%
MINIMUM LOAD	0%						
DYNAMIC MINIMUM LOAD	10%						

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AUXILIARY OUTPUT

RATED VOLTAGE	5V	5V	5V	5V	5V	5V	5V
RATED CURRENT	2A	2A	2A	2A	2A	2A	2A
RATED POWER	10W	10W	10W	10W	10W	10W	10W
LINE REGULATION (TYP.)	± 1%						
LOAD REGULATION (TYP.)	± 3%						
VOLTAGE ACCURACY (TYP.)	± 2%						
RIPPLE & NOISE (MAX.) [2]	100mV _{p-p}	100mV _{p-p}	100mV _{p-p}	100mV _{p-p}	100mV _{p-p}	100mV _{p-p}	100mV _{p-p}

INPUT

<u>PARAMETER</u>	<u>OPERATING CONDITIONS</u>	<u>MIN.</u>	<u>TYP.</u>	<u>MAX.</u>	<u>UNIT</u>
VOLTAGE RANGE	AC INPUT	85	-	264	VAC
	DC INPUT	120	-	370	VAC
FREQUENCY RANGE		47	-	63	Hz
AC CURRENT	115VAC	-	-	15.5	A
	230VAC	-	-	8	
INRUSH CURRENT	115VAC	COLD START	16	20	A
	230VAC		32	40	
POWER FACTOR	115VAC	ROOM TEMPERATURE, FULL LOAD	PF ≥ 0.99		
	230VAC		PF ≥ 0.95		
CONTACT LEAKAGE CURRENT	240VAC	EARTH LEAKAGE CURRENT	< 0.5		mA
		TOUCH CURRENT	< 0.5		

PROTECTIONS

OVER CURRENT	Type: Constant current limit, output voltage turns off after 5s, auto-recovery						
SHORT CIRCUIT	Type: hiccup mode, auto-recovery after < 5s since fault is removed						
OVER VOLTAGE	≤ 16.5VDC	≤ 25VDC	≤ 33VDC	≤ 35VDC	≤ 48VDC	≤ 60VDC	≤ 63VDC
	Type: shut down output voltage. Re-power on to recovery and PS_ON for recovery.						
OVER TEMPERATURE	Activation: max. 70°C; Deactivation: min. 50°C						

WORKING ENVIRONMENT

WORKING TEMPERATURE	-40°C ÷ +70°C (Refer to Temperature Derating Curve)						
WORKING HUMIDITY	20 ÷ 90% RH non-condensing						
STORAGE TEMPERATURE AND HUMIDITY	-40°C ÷ 85°C, 10 ÷ 95% RH non-condensing						

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SAFETY REGULATIONS

	<u>PARAMETER</u>	<u>MIN.</u>	<u>TYP.</u>	<u>MAX.</u>	<u>UNIT</u>	<u>CONDITIONS</u>
<i>WITHSTAND VOLTAGE</i>	<i>IN/OUT</i>	4000	-	-		
	<i>IN/GND</i>	2000	-	-	VAC	<10mA, 1min
	<i>OUT/GND</i>	1250	-	-		
<i>ISOLATION RESISTANCE</i>	<i>IN/OUT</i>	100	-	-		Environment temperature: 25±5°C
	<i>IN/GND</i>	100	-	-	MΩ	Relative humidity: <95% RH, non-condensing
	<i>OUT/GND</i>	100	-	-		Testing voltage: 500VDC
<i>SAFETY STANDARDS</i>	Compliance to EN62368-1, designed to meet EN60601-1, EN60335-1					
<i>SAFETY CLASS</i>	Class I					

EMC REGULATIONS

<i>EMISSIONS</i>	<i>CE</i>	CISPR32/EN55032 Class B			
	<i>RE</i>	CISPR32/EN55032 Class B			
	<i>HARMONIC CURRENT</i>	EN61000-3-2 Class A			
	<i>FLICKER</i>	EN61000-3-3			
<i>IMMUNITY</i>	<i>ESD</i>	EN61000-4-2	Contact ±8kV / Air ±15kV		Perf. Criteria B
	<i>RS</i>	EN61000-4-3	10V/m		Perf. Criteria A
	<i>EFT</i>	EN61000-4-4	±4kV		Perf. Criteria B
	<i>SURGE</i>	EN61000-4-5	Line to line ±2kV / Line to ground ±4kV		Perf. Criteria B
	<i>CS</i>	EN61000-4-6	10Vrms		Perf. Criteria A
	<i>VOLTAGE DIPS, SHORT INTERRUPTIONS AND VOLTAGE VARIATIONS</i>	EN61000-4-11	0%, 70%		Perf. Criteria B

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FUNCTIONAL SPECIFICATIONS

PARAMETER	OPERATING CONDITIONS	MIN.	TYP.	MAX.	UNIT
REMOTE CONTROL SWITCH	POWER ON ALL INPUT VOLTAGE RANGE ALL LOAD RANGE	PS_ON (CN7 PIN6) and GND (CN7 PIN7/14) are shorted			/
	POWER OFF	PS_ON (CN7 PIN6) and GND (CN7 PIN7/14) are open			
DC_OK SIGNAL	POWER ON ALL INPUT VOLTAGE RANGE	2.5	-	5	V
	POWER OFF ALL LOAD RANGE	-	-	0.5	
ORING		Support direct parallel use, achieve 3+1 parallel redundancy			
CURRENT SHARING ACCURACY	$I_o > 50\% I_{o1}$	-	±5	-	%
LED SIGNAL*	NORMAL OUTPUT	Green on			/
	MAIN OUTPUT STATUS INDICATION	ABNORMAL OUTPUT, PROTECTED Red on			
	POWER OFF (AC WITHOUT INPUT)	Light off			
REMOTE SENSE	TOTAL COMPENSATE VOLTAGE V_{s+}/V_{s-} (CN7 PIN1/8 SHORTED TO V_{o+}/V_{o-} RESPECTIVELY)	-	200	-	mV
SDA, SCL FOR I2C		Internal 2.4kΩ pull-up resistor to internal 3.3V			

Note:
1. If the product is used in a medical equipment, the terminal system should shield the LED signal light to meet the medical certification requirements that operators should not see the indicator light after the product is installed.

OTHERS

MTBF (MIN.)	250 000h / 25°C per MIL-HDBK-217F
DIMENSIONS AND CASE MATERIAL	250 x 127 x 40.5mm (L x W x H); SUS 304
NET WEIGHT	1.8kg
COOLING METHOD	Forced cooling (25CFM), the fan speed is determined by the output power and linearly adjusted

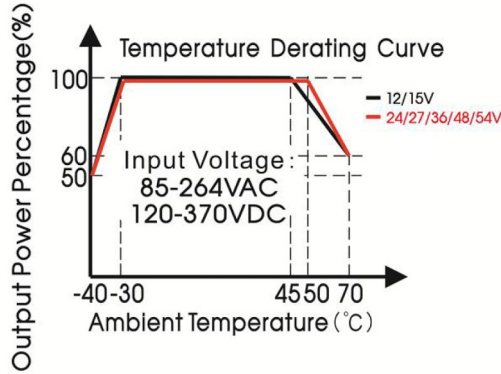
- For all applications, please refer to MFS-1500-U series Power Supply Application Notes.
- All parameters NOT specially mentioned are measured at 230VAC input, rated load, 25°C of ambient temperature and humidity <75% RH.
- Ripple & noise is measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1μF i 47μF parallel capacitor.
- In order to improve the efficiency at high input voltage, there will be audible noise generated, but it does not affect product performance and reliability.
- Case needs to be connected to the earth (⊕) of the system when the terminal equipment in operating.
- The room temperature derating of 5°C / 1000m is needed for operating altitude greater than 2000m.
- In the appearance dimension drawing ±Vo represents the main output ±S represents the auxiliary output and the auxiliary output can be selected by the customized, which has no effect on the main output.
- Power supply is considered as component not indented to apply by end-user. Power supply meets safety and EMC standards however the final equipment with power supply must be re-quality to comply with EMC Directives.

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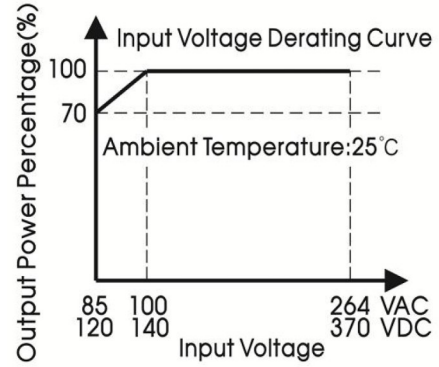
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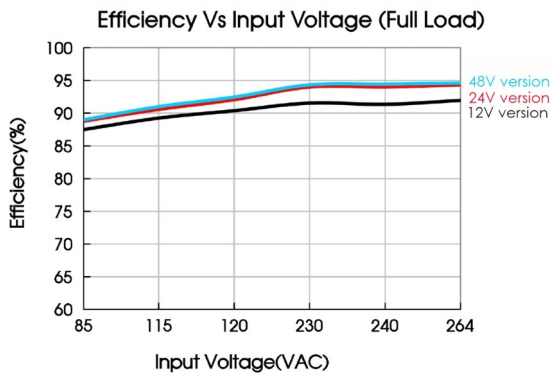
DERATING CURVE



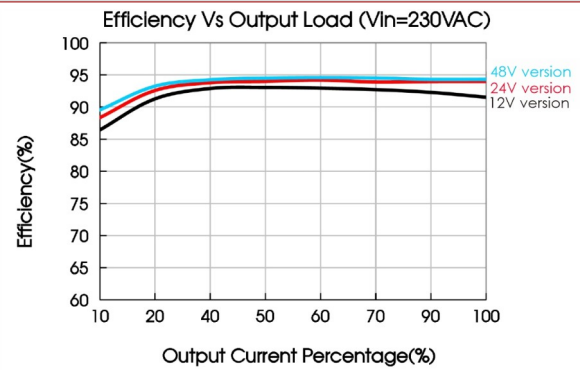
STATIC CHARACTERISTIC



EFFICIENCY vs INPUT VOLTAGE CURVE



EFFICIENCY vs LOAD CURVE

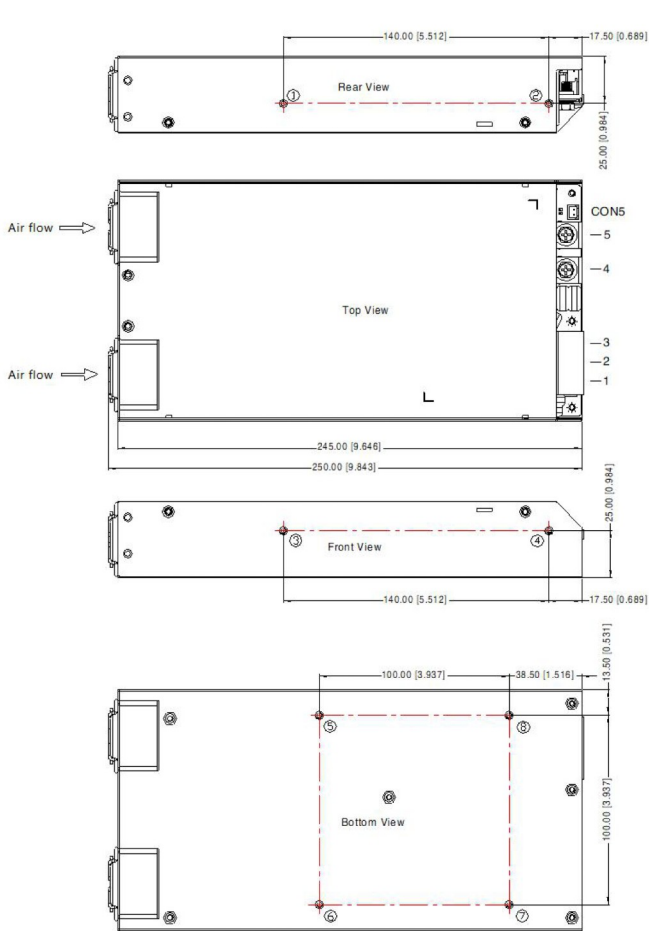


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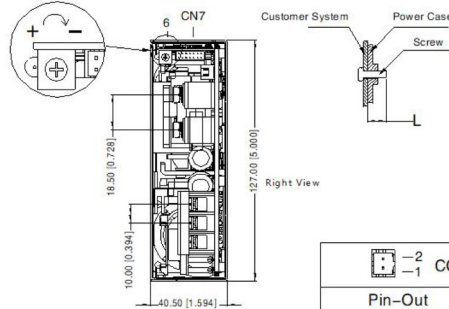
MECHANICAL SPECIFICATION



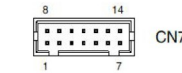
THIRD ANGLE PROJECTION

Position	Screw Spec.	L(Recommend)	Torque(max)
① - ⑥	M3	3mm	0.8N · m

Pin-Out	
Pin	Mark
1	AC(L)
2	AC(N)
3	⊕
4	-Vo Main output
5	+Vo Main output
6	ADJ Output adjustable resistor



Pin-Out		Customer Connector
Pin	Mark	Connector: XHS2.5-2Y (KANGDAO) or equivalent Terminal: XH2.5-TE (KANGDAO) or equivalent
1	-S	
2	+S	



Pin-Out				Customer Connector
Pin	Mark	Pin	Mark	
1	VS+	8	VS-	Connector: JST PHDR-14VS or equivalent Terminal: JST SPHD-002T-P0.5 or equivalent
2	CURRENT SHARE	9	ADDRESS0	
3	DC_OK	10	ADDRESS1	
4	SCL	11	ADDRESS2	
5	SDA	12	RXD	
6	PS_ON	13	TXD	
7	GND	14	GND	

Note:

Unit: mm[inch]

Pin1, 2, 3 wire range: 22-12AWG

Pin1, 2, 3 connector tightening torque: M4, 1.2N · m(max)

Pin4, 5 connector tightening torque: M5, 2.3N · m(max)

General tolerances: ±1.00[±0.039]