

승 인 원

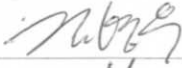


(APPROVAL SHEET)

품 목	S.M.P.S
품 명	ESF850~1500-S
Rev. No.	A

승 인 (APPROVED)	검 토 Inspected by :
	심 사 Checked by :
	승 인 Approved by :
	날 짜 Date :

상기와 같이 승인원을 제출하오니 검토하시어 승인하여 주시기 바랍니다.

2007 년 10월 08 일

작 성 :	주 임	김 병 우	
검 토 :	선 임	이 동 찬	
승 인 :	상 무	장 재 하	



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승인원 변경이력

Product.	S.M.P.S	Date.	2007.10.08.
Model.	ESF850~1500-S	Rev.	A
Customer.	STANDARD	Page.	1

DWG	주 임 김병우	<i>김병우</i>
CHK	선 임 이동찬	<i>이동찬</i>
APPD	상 무 장재하	<i>장재하</i>

No.	Date.	변경내용	변경사유	변경항목	Rev.
1	2007.10.05.	-승인원 신규발행	신규발행	전체(All Page)	A

(Specifications)

Product.	SMPS	Date.	2007.10.08.
Model.	ESF850-S	Rev.	A
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MODEL/CHANNEL		Unit.	3R3	05	09	12
INPUT	Voltage , Frequency	[V]	AC100-120V/200-240V(AC90 132V/180 264V or DC240 370V) ,50/60Hz(47 440Hz or DC)			
	Current	110V	14.0	18.0	18.0	18.0
	Typ.	220V	7.0	9.0	9.0	9.0
	Efficiency	110V	70	78	80	81
	Typ.	220V	70	78	80	81
	Power factor	110V	-	-		
	Typ.	220V	-	-		
Inrush Current	110V	[A]	30 (Ta=25 , Io=100% at cold Start)			
Typ.	220V		60 (Ta=25 , Io=100% at cold Start)			
Leakage Current	110V	[mA]	3.5			
Max.	220V		3.5			
OUTPUT	Norminal Voltage	[V]	3.3	5	9	12
	Setting Voltage Range	[V]	3.26 3.33	4.95 5.05	8.91 9.09	11.88 12.12
	current	[A]	170	170	95.0	71.0
	Line Regulations	[mV]	25	25	45	60
	Load Regulations	[mV]	50	50	90	120
	Cross Regulations	[mV]	-	-	-	-
	Temperature Drift	[mV]	75	75	135	180
	Ripple Max.	[mV]	50	50	90	120
	Ripple & Noise Max.	[mV]	100	100	140	170
	Turn -on Time Typ.	[ms]	800 (AC IN 110V/220V, Io=100%)			
	Hold -up Time Typ.	[ms]	17 (AC IN 110V/220V, Io=100%)			
Function	Over Voltage Protection	[V]	3.8 5.3	5.8 7.0	10.4 12.6	13.8 16.8
	Over Current Protection	[A]	187 246.5	187 246.5	104.5 137.8	78.1 103
	Remote ON.OFF	-	-	-	-	-
	Remote Sensing	-	-	-	-	-
	Power Fail Signal	-	-	-	-	-
	Parallel/Series Operation	-	Series operations is possible			
	Cooling / O.T.P	-	Fan / Possible			
Electrical Isolation	(1) Input - Output	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(2) Input - F.G	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(3) Output - F.G	-	AC 0.5KV 1min, cut-off:100mA / DC 500V 100MΩ			
Environment	Operating temp. & Humidity	-	-10 +50 , 20 90% RH (Non Condensing)			
	Storage temp. & Humidity	-	-20 +75 , 20 90% RH (Non Condensing)			
	Vibration	-	10 55Hz at 1G 3minutes period, 30minutes along X,Y and Z axis			
Dimension	Size(WxHxD) / Weight	mm / g	200 x 97 x 345		/	6700
Safety	-	-	-			
Emission	Conducted Emission	-	-			
PFHC	-	-	-			

(Specifications)

Product.	SMPS	Date.	2007.10.08.
Model.	ESF850-S	Rev.	A
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MODEL/CHANNEL		Unit.	15	20	24	30
INPUT	Voltage , Frequency	[V]	AC100-120V/200-240V(AC90 132V/180 264V or DC240 370V),50/60Hz(47 440Hz or DC)			
	Current	110V [A]	18.0	18.0	18.0	18.0
	Typ.	220V	9.0	9.0	9.0	9.0
	Efficiency	110V [%]	81	81	83	84
	Typ.	220V	81	81	83	84
	Power factor	110V -	-			
	Typ.	220V	-			
Inrush Current	110V [A]	30 (Ta=25 , Io=100% at cold Start)				
Typ.	220V	60 (Ta=25 , Io=100% at cold Start)				
Leakage Current	110V [mA]	3.5				
Max.	220V	3.5				
OUTPUT	Norminal Voltage	[V]	15	20	24	30
	Setting Voltage Range	[V]	14.85 15.15	19.8 20.2	23.76 24.24	29.7 30.3
	current	[A]	57.0	42.5	35.5	28.5
	Line Regulations	[mV]	75	100	120	150
	Load Regulations	[mV]	150	200	240	300
	Cross Regulations	[mV]	-	-	-	-
	Temperature Drift	[mV]	225	300	360	450
	Ripple Max.	[mV]	150	200	240	300
	Ripple & Noise Max.	[mV]	200	250	290	350
	Turn -on Time Typ.	[ms]	800 (AC IN 110V/220V, Io=100%)			
	Hold -up Time Typ.	[ms]	17 (AC IN 110V/220V, Io=100%)			
Function	Over Voltage Protection	[V]	17.3 21.0	23.0 28.0	27.6 33.6	34.5 42.0
	Over Current Protection	[A]	62.7 82.7	46.8 61.6	39.1 51.5	31.4 41.3
	Remote ON.OFF	-	-	-	-	-
	Remote Sensing	-	-	-	-	-
	Power Fail Signal	-	-	-	-	-
	Parallel/Series Operation	-	Series operations is possible			
	Cooling / O.T.P	-	Fan / Possible			
Electrical Isolation	(1) Input - Output	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(2) Input - F.G	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(3) Output - F.G	-	AC 0.5KV 1min, cut-off:100mA / DC 500V 100MΩ			
Environment	Operating temp. & Humidity	-	-10 +50 , 20 90% RH (Non Condensing)			
	Storage temp. & Humidity	-	-20 +75 , 20 90% RH (Non Condensing)			
	Vibration	-	10 55Hz at 1G 3minutes period, 30minutes along X,Y and Z axis			
Dimension	Size(WxHxD) / Weight	mm / g	200 x 97 x 345		/	6700
Safety	-	-	-			
Emission	Conducted Emission	-	-			
PFHC	-	-	-			

(Specifications)

Product.	SMPS	Date.	2007.10.08.
Model.	ESF850-S	Rev.	A
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MODEL/CHANNEL		Unit.	48	-	-	-
INPUT	Voltage , Frequency	[V]	AC100-120V/200-240V(AC90 132V/180 264V or DC240 370V),50/60Hz(47 440Hz or DC)			
	Current	110V	18.0	-	-	-
	Typ.	220V	9.0	-	-	-
	Efficiency	110V	85	-	-	-
	Typ.	220V	85	-	-	-
	Power factor	110V	-	-		
	Typ.	220V	-	-		
Inrush Current	110V	[A]	30 (Ta=25 , Io=100% at cold Start)			
Typ.	220V		60 (Ta=25 , Io=100% at cold Start)			
Leakage Current	110V	[mA]	3.5			
Max.	220V		3.5			
OUTPUT	Norminal Voltage	[V]	48	-	-	-
	Setting Voltage Range	[V]	47.52 48.48	-	-	-
	current	[A]	18.0	-	-	-
	Line Regulations	[mV]	240	-	-	-
	Load Regulations	[mV]	480	-	-	-
	Cross Regulations	[mV]	-	-	-	-
	Temperature Drift	[mV]	780	-	-	-
	Ripple Max.	[mV]	480	-	-	-
	Ripple & Noise Max.	[mV]	530	-	-	-
	Turn -on Time Typ.	[ms]	800 (AC IN 110V/220V, Io=100%)			
	Hold -up Time Typ.	[ms]	17 (AC IN 110V/220V, Io=100%)			
Function	Over Voltage Protection	[V]	55.2 67.2	-	-	-
	Over Current Protection	[A]	19.8 26.1	-	-	-
	Remote ON.OFF	-	-	-	-	-
	Remote Sensing	-	-	-	-	-
	Power Fail Signal	-	-	-	-	-
	Parallel/Series Operation	-	Series operations is possible			
	Cooling / O.T.P	-	Fan / Possible			
Electrical Isolation	(1) Input - Output	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(2) Input - F.G	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(3) Output - F.G	-	AC 0.5KV 1min, cut-off:100mA / DC 500V 100MΩ			
Environment	Operating temp. & Humidity	-	-10 +50 , 20 90% RH (Non Condensing)			
	Storage temp. & Humidity	-	-20 +75 , 20 90% RH (Non Condensing)			
	Vibration	-	10 55Hz at 1G 3minutes period, 30minutes along X,Y and Z axis			
Dimension	Size(WxHxD) / Weight	mm / g	200 x 97 x 345		/	6700
Safety	-	-	-			
Emission	Conducted Emission	-	-			
PFHC	-	-	-			

(Specifications)

Product.	SMPS	Date.	2007.10.08.
Model.	ESF1000-S	Rev.	A
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MODEL/CHANNEL		Unit.	3R3	05	06	07
INPUT	Voltage , Frequency	[V]	AC100-120V/200-240V(AC90 132V/180 264V or DC240 370V),50/60Hz(47 440Hz or DC)			
	Current	110V	16.0	22.0	22.0	22.0
	Typ.	220V	8.0	11.0	11.0	11.0
	Efficiency	110V	70	78	75	80
	Typ.	220V	70	78	75	80
	Power factor	110V	-	-		
	Typ.	220V	-	-		
Inrush Current	110V	[A]	30 (Ta=25 , Io=100% at cold Start)			
Typ.	220V		60 (Ta=25 , Io=100% at cold Start)			
Leakage Current	110V	[mA]	3.5			
Max.	220V		3.5			
OUTPUT	Norminal Voltage	[V]	3.3	5.0	6.0	7.0
	Setting Voltage Range	[V]	3.27 3.33	4.95 5.05	5.94 6.06	6.93 7.07
	current	[A]	200	200	167	143
	Line Regulations	[mV]	25	25	30	35
	Load Regulations	[mV]	50	50	60	70
	Cross Regulations	[mV]	-	-	-	-
	Temperature Drift	[mV]	75	75	90	105
	Ripple Max.	[mV]	50	50	60	70
	Ripple & Noise Max.	[mV]	100	100	110	120
	Turn -on Time Typ.	[ms]	800 (AC IN 110V/220V, Io=100%)			
	Hold -up Time Typ.	[ms]	17 (AC IN 110V/220V, Io=100%)			
Function	Over Voltage Protection	[V]	3.8 5.3	5.8 7.0	6.9 8.4	8.1 9.8
	Over Current Protection	[A]	220 290	220 290	183.7 242.2	157.3 207.4
	Remote ON.OFF	-	-	-	-	-
	Remote Sensing	-	-	-	-	-
	Power Fail Signal	-	-	-	-	-
	Parallel/Series Operation	-	Series operations is possible			
	Cooling / O.T.P	-	Fan / Possible			
Electrical Isolation	(1) Input - Output	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(2) Input - F.G	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(3) Output - F.G	-	AC 0.5KV 1min, cut-off:100mA / DC 500V 100MΩ			
Environment	Operating temp. & Humidity	-	-10 +50 , 20 90% RH (Non Condensing)			
	Storage temp. & Humidity	-	-20 +75 , 20 90% RH (Non Condensing)			
	Vibration	-	10 55Hz at 1G 3minutes period, 30minutes along X,Y and Z axis			
Dimension	Size(WxHxD) / Weight	mm / g	200 x 97 x 345		/	6700
Safety	-	-	-			
Emission	Conducted Emission	-	-			
PFHC	-	-	-			

(Specifications)

Product.	SMPS	Date.	2007.10.08.
Model.	ESF1000-S	Rev.	A
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MODEL/CHANNEL		Unit.	7R5	09	10	12
INPUT	Voltage , Frequency	[V]	AC100-120V/200-240V(AC90 132V/180 264V or DC240 370V),50/60Hz(47 440Hz or DC)			
	Current	110V	22.0	22.0	22.0	22.0
	Typ.	220V	11.0	11.0	11.0	11.0
	Efficiency	110V	75	80	80	81
	Typ.	220V	75	80	80	81
	Power factor	110V	-	-		
	Typ.	220V	-	-		
Inrush Current	110V	[A]	30 (Ta=25 , Io=100% at cold Start)			
Typ.	220V		60 (Ta=25 , Io=100% at cold Start)			
Leakage Current	110V	[mA]	3.5			
Max.	220V		3.5			
OUTPUT	Norminal Voltage	[V]	7.5	9.0	10	12
	Setting Voltage Range	[V]	7.43 7.58	8.91 9.09	9.9 10.1	11.88 12.12
	current	[A]	134	111	100	83.0
	Line Regulations	[mV]	37	45	50	60
	Load Regulations	[mV]	75	90	100	120
	Cross Regulations	[mV]	-	-	-	-
	Temperature Drift	[mV]	112	135	150	180
	Ripple Max.	[mV]	75	90	100	120
	Ripple & Noise Max.	[mV]	125	140	150	170
	Turn -on Time Typ.	[ms]	800 (AC IN 110V/220V, Io=100%)			
	Hold -up Time Typ.	[ms]	17 (AC IN 110V/220V, Io=100%)			
Function	Over Voltage Protection	[V]	8.6 10.5	10.4 12.6	11.5 14.0	13.8 16.8
	Over Current Protection	[A]	147.4 194.3	122.1 161.0	110.0 145.0	91.3 120.4
	Remote ON.OFF	-	-	-	-	-
	Remote Sensing	-	-	-	-	-
	Power Fail Signal	-	-	-	-	-
	Parallel/Series Operation	-	Series operations is possible			
	Cooling / O.T.P	-	Fan / Possible			
Electrical Isolation	(1) Input - Output	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(2) Input - F.G	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(3) Output - F.G	-	AC 0.5KV 1min, cut-off:100mA / DC 500V 100MΩ			
Environment	Operating temp. & Humidity	-	-10 +50 , 20 90% RH (Non Condensing)			
	Storage temp. & Humidity	-	-20 +75 , 20 90% RH (Non Condensing)			
	Vibration	-	10 55Hz at 1G 3minutes period, 30minutes along X,Y and Z axis			
Dimension	Size(WxHxD) / Weight	mm / g	200 x 97 x 345		/	6700
Safety	-	-	-			
Emission	Conducted Emission	-	-			
PFHC	-	-	-			

(Specifications)

Product.	SMPS	Date.	2007.10.08.
Model.	ESF1000-S	Rev.	A
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MODEL/CHANNEL		Unit.	15	20	24	28
INPUT	Voltage , Frequency	[V]	AC100-120V/200-240V(AC90 132V/180 264V or DC240 370V) ,50/60Hz(47 440Hz or DC)			
	Current	110V	22.0	22.0	22.0	22.0
	Typ.	220V	110	11.0	11.0	11.0
	Efficiency	110V	81	80	83	83
	Typ.	220V	81	80	83	83
	Power factor	110V	-	-		
	Typ.	220V	-	-		
Inrush Current	110V	[A]	30 (Ta=25 , Io=100% at cold Start)			
Typ.	220V		60 (Ta=25 , Io=100% at cold Start)			
Leakage Current	110V	[mA]	3.5			
Max.	220V		3.5			
OUTPUT	Norminal Voltage	[V]	15	20	24	28
	Setting Voltage Range	[V]	14.85 15.15	19.8 20.2	23.76 24.24	27.72 28.28
	current	[A]	67.0	50.0	42.0	36.0
	Line Regulations	[mV]	75	100	120	140
	Load Regulations	[mV]	150	200	240	280
	Cross Regulations	[mV]	-	-	-	-
	Temperature Drift	[mV]	225	300	360	420
	Ripple Max.	[mV]	150	200	240	280
	Ripple & Noise Max.	[mV]	200	250	290	330
	Turn -on Time Typ.	[ms]	800 (AC IN 110V/220V, Io=100%)			
	Hold -up Time Typ.	[ms]	17 (AC IN 110V/220V, Io=100%)			
Function	Over Voltage Protection	[V]	17.3 21.0	23.0 28.0	27.6 33.6	32.2 39.2
	Over Current Protection	[A]	73.7 97.2	55.0 72.5	46.2 60.9	39.6 52.2
	Remote ON.OFF	-	-	-	-	-
	Remote Sensing	-	-	-	-	-
	Power Fail Signal	-	-	-	-	-
	Parallel/Series Operation	-	Series operations is possible			
	Cooling / O.T.P	-	Fan / Possible			
Electrical Isolation	(1) Input - Output	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(2) Input - F.G	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(3) Output - F.G	-	AC 0.5KV 1min, cut-off:100mA / DC 500V 100MΩ			
Environment	Operating temp. & Humidity	-	-10 +50 , 20 90% RH (Non Condensing)			
	Storage temp. & Humidity	-	-20 +75 , 20 90% RH (Non Condensing)			
	Vibration	-	10 55Hz at 1G 3minutes period, 30minutes along X,Y and Z axis			
Dimension	Size(WxHxD) / Weight	mm / g	200 x 97 x 345		/	6700
Safety	-	-	-			
Emission	Conducted Emission	-	-			
PFHC	-	-	-			

(Specifications)

Product.	SMPS	Date.	2007.10.08.
Model.	ESF1000-S	Rev.	A
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MODEL/CHANNEL		Unit.	48	60	-	-
INPUT	Voltage , Frequency	[V]	AC100-120V/200-240V(AC90 132V/180 264V or DC240 370V),50/60Hz(47 440Hz or DC)			
	Current	110V	22.0	22.0	-	-
	Typ.	220V	11.0	11.0	-	-
	Efficiency	110V	85	85	-	-
	Typ.	220V	85	85	-	-
	Power factor	110V	-	-		
	Typ.	220V	-	-		
Inrush Current	110V	[A]	30 (Ta=25 , Io=100% at cold Start)			
Typ.	220V		60 (Ta=25 , Io=100% at cold Start)			
Leakage Current	110V	[mA]	3.5			
Max.	220V		3.5			
OUTPUT	Norminal Voltage	[V]	48	60	-	-
	Setting Voltage Range	[V]	47.52 48.48	59.4 60.6	-	-
	current	[A]	21.0	16.7	-	-
	Line Regulations	[mV]	240	300	-	-
	Load Regulations	[mV]	480	600	-	-
	Cross Regulations	[mV]	-	-	-	-
	Temperature Drift	[mV]	720	900	-	-
	Ripple Max.	[mV]	480	600	-	-
	Ripple & Noise Max.	[mV]	530	650	-	-
	Turn -on Time Typ.	[ms]	800 (AC IN 110V/220V, Io=100%)			
	Hold -up Time Typ.	[ms]	17 (AC IN 110V/220V, Io=100%)			
Function	Over Voltage Protection	[V]	55.2 67.2	69.0 84.0	-	-
	Over Current Protection	[A]	23.1 30.5	18.4 24.2	-	-
	Remote ON.OFF	-	-	-	-	-
	Remote Sensing	-	-	-	-	-
	Power Fail Signal	-	-	-	-	-
	Parallel/Series Operation	-	Series operations is possible			
	Cooling / O.T.P	-	Fan / Possible			
Electrical Isolation	(1) Input - Output	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(2) Input - F.G	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(3) Output - F.G	-	AC 0.5KV 1min, cut-off:100mA / DC 500V 100MΩ			
Environment	Operating temp. & Humidity	-	-10 +50 , 20 90% RH (Non Condensing)			
	Storage temp. & Humidity	-	-20 +75 , 20 90% RH (Non Condensing)			
	Vibration	-	10 55Hz at 1G 3minutes period, 30minutes along X,Y and Z axis			
Dimension	Size(WxHxD) / Weight	mm / g	200 x 97 x 345		/	6700
Safety	-	-	-			
Emission	Conducted Emission	-	-			
PFHC	-	-	-			

(Specifications)

Product.	SMPS	Date.	2007.10.08.
Model.	ESF1250-S	Rev.	A
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MODEL/CHANNEL		Unit.	3R3	05	09	12
INPUT	Voltage , Frequency	[V]	AC100-120V/200-240V(AC90 132V/180 264V or DC240 370V) ,50/60Hz(47 440Hz or DC)			
	Current	110V	20.0	27.0	27.0	27.0
	Typ.	220V	10.0	13.5	13.5	13.5
	Efficiency	110V	70	78	80	81
	Typ.	220V	70	78	80	81
	Power factor	110V	-	-		
	Typ.	220V	-	-		
Inrush Current	110V	[A]	30 (Ta=25 , Io=100% at cold Start)			
Typ.	220V		60 (Ta=25 , Io=100% at cold Start)			
Leakage Current	110V	[mA]	3.5			
Max.	220V		3.5			
OUTPUT	Norminal Voltage	[V]	3.3	5.0	9.0	12
	Setting Voltage Range	[V]	3.27 3.33	4.95 5.05	8.91 9.09	11.88 12.12
	current	[A]	250	250	139	104
	Line Regulations	[mV]	25	25	45	60
	Load Regulations	[mV]	50	50	90	120
	Cross Regulations	[mV]	-	-	-	-
	Temperature Drift	[mV]	75	75	135	180
	Ripple Max.	[mV]	50	50	90	120
	Ripple & Noise Max.	[mV]	100	100	140	170
	Turn -on Time Typ.	[ms]	800 (AC IN 110V/220V, Io=100%)			
	Hold -up Time Typ.	[ms]	17 (AC IN 110V/220V, Io=100%)			
Function	Over Voltage Protection	[V]	3.8 5.3	5.8 7.0	10.4 12.6	13.8 16.8
	Over Current Protection	[A]	275 362.5	275 362.5	152.9 201.6	114.4 150.8
	Remote ON.OFF	-	-	-	-	-
	Remote Sensing	-	-	-	-	-
	Power Fail Signal	-	-	-	-	-
	Parallel/Series Operation	-	Series operations is possible			
	Cooling / O.T.P	-	Fan / Possible			
Electrical Isolation	(1) Input - Output	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(2) Input - F.G	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(3) Output - F.G	-	AC 0.5KV 1min, cut-off:100mA / DC 500V 100MΩ			
Environment	Operating temp. & Humidity	-	-10 +50 , 20 90% RH (Non Condensing)			
	Storage temp. & Humidity	-	-20 +75 , 20 90% RH (Non Condensing)			
	Vibration	-	10 55Hz at 1G 3minutes period, 30minutes along X,Y and Z axis			
Dimension	Size(WxHxD) / Weight	mm / g	200 x 97 x 345		/	6800
Safety	-	-	-			
Emission	Conducted Emission	-	-			
PFHC	-	-	-			

(Specifications)

Product.	SMPS	Date.	2007.10.08.
Model.	ESF1250-S	Rev.	A
Customer.		Page.	2 / 3

MODEL/CHANNEL		Unit.	15	20	24	28
INPUT	Voltage , Frequency	[V]	AC100-120V/200-240V(AC90 132V/180 264V or DC240 370V) ,50/60Hz(47 440Hz or DC)			
	Current	110V	27.0	27.0	27.0	27.0
	Typ.	220V	13.5	13.5	13.5	13.5
	Efficiency	110V	81	80	83	83
	Typ.	220V	81	80	83	83
	Power factor	110V	-	-		
	Typ.	220V	-	-		
Inrush Current	110V	[A]	30 (Ta=25 , Io=100% at cold Start)			
Typ.	220V		60 (Ta=25 , Io=100% at cold Start)			
Leakage Current	110V	[mA]	3.5			
Max.	220V		3.5			
OUTPUT	Norminal Voltage	[V]	15	20	24	28
	Setting Voltage Range	[V]	14.85 15.15	19.8 20.2	23.76 24.24	27.72 28.28
	current	[A]	83.0	62.5	52.0	45.0
	Line Regulations	[mV]	75	100	120	140
	Load Regulations	[mV]	150	200	240	280
	Cross Regulations	[mV]	-	-	-	-
	Temperature Drift	[mV]	225	300	360	420
	Ripple Max.	[mV]	150	200	240	280
	Ripple & Noise Max.	[mV]	200	250	290	330
	Turn -on Time Typ.	[ms]	800 (AC IN 110V/220V, Io=100%)			
	Hold -up Time Typ.	[ms]	17 (AC IN 110V/220V, Io=100%)			
Function	Over Voltage Protection	[V]	17.3 21.0	23.0 28.0	27.6 33.6	32.2 39.2
	Over Current Protection	[A]	91.3 120.4	68.8 90.6	57.2 75.4	49.5 65.3
	Remote ON.OFF	-	-	-	-	-
	Remote Sensing	-	-	-	-	-
	Power Fail Signal	-	-	-	-	-
	Parallel/Series Operation	-	Series operations is possible			
	Cooling / O.T.P	-	Fan / Possible			
Electrical Isolation	(1) Input - Output	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(2) Input - F.G	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(3) Output - F.G	-	AC 0.5KV 1min, cut-off:100mA / DC 500V 100MΩ			
Environment	Operating temp. & Humidity	-	-10 +50 , 20 90% RH (Non Condensing)			
	Storage temp. & Humidity	-	-20 +75 , 20 90% RH (Non Condensing)			
	Vibration	-	10 55Hz at 1G 3minutes period, 30minutes along X,Y and Z axis			
Dimension	Size(WxHxD) / Weight	mm / g	200 x 97 x 345		/	6800
Safety	-	-	-			
Emission	Conducted Emission	-	-			
PFHC	-	-	-			

(Specifications)

Product.	SMPS	Date.	2007.10.08.
Model.	ESF1250-S	Rev.	A
Customer.		Page.	3 / 3

MODEL/CHANNEL		Unit.	48	-	-	-
INPUT	Voltage , Frequency	[V]	AC100-120V/200-240V(AC90 132V/180 264V or DC240 370V),50/60Hz(47 440Hz or DC)			
	Current	110V	27.0	-	-	-
	Typ.	220V	13.5	-	-	-
	Efficiency	110V	85	-	-	-
	Typ.	220V	85	-	-	-
	Power factor	110V	-	-		
	Typ.	220V	-	-		
Inrush Current	110V	[A]	30 (Ta=25 , Io=100% at cold Start)			
Typ.	220V		60 (Ta=25 , Io=100% at cold Start)			
Leakage Current	110V	[mA]	3.5			
Max.	220V		3.5			
OUTPUT	Norminal Voltage	[V]	48	-	-	-
	Setting Voltage Range	[V]	47.52 48.48	-	-	-
	current	[A]	26.0	-	-	-
	Line Regulations	[mV]	240	-	-	-
	Load Regulations	[mV]	480	-	-	-
	Cross Regulations	[mV]	-	-	-	-
	Temperature Drift	[mV]	720	-	-	-
	Ripple Max.	[mV]	480	-	-	-
	Ripple & Noise Max.	[mV]	530	-	-	-
	Turn -on Time Typ.	[ms]	800 (AC IN 110V/220V, Io=100%)			
	Hold -up Time Typ.	[ms]	17 (AC IN 110V/220V, Io=100%)			
Function	Over Voltage Protection	[V]	55.2 67.2	-	-	-
	Over Current Protection	[A]	28.6 37.7	-	-	-
	Remote ON.OFF	-	-	-	-	-
	Remote Sensing	-	-	-	-	-
	Power Fail Signal	-	-	-	-	-
	Parallel/Series Operation	-	Series operations is possible			
	Cooling / O.T.P	-	Fan / Possible			
Electrical Isolation	(1) Input - Output	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(2) Input - F.G	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(3) Output - F.G	-	AC 0.5KV 1min, cut-off:100mA / DC 500V 100MΩ			
Environment	Operating temp. & Humidity	-	-10 +50 , 20 90% RH (Non Condensing)			
	Storage temp. & Humidity	-	-20 +75 , 20 90% RH (Non Condensing)			
	Vibration	-	10 55Hz at 1G 3minutes period, 30minutes along X,Y and Z axis			
Dimension	Size(WxHxD) / Weight	mm / g	200 x 97 x 345	/	6800	
Safety	-	-	-			
Emission	Conducted Emission	-	-			
PFHC	-	-	-			

(Specifications)

Product.	SMPS	Date.	2007.10.08.
Model.	ESF1500-S	Rev.	A
Customer.		Page.	1 / 5

MODEL/CHANNEL		Unit.	3R3	05	06	07
INPUT	Voltage , Frequency	[V]	AC100-120V/200-240V(AC90 132V/180 264V or DC240 370V) ,50/60Hz(47 440Hz or DC)			
	Current	110V [A]	24.0	32.0	32.0	32.0
	Typ.	220V	12.0	16.0	16.0	16.0
	Efficiency	110V [%]	70	78	78	78
	Typ.	220V	70	78	78	78
	Power factor	110V -	-	-	-	-
	Typ.	220V	-	-	-	-
Inrush Current	110V [A]	30 (Ta=25 , Io=100% at cold Start)				
Typ.	220V	60 (Ta=25 , Io=100% at cold Start)				
Leakage Current	110V [mA]	3.5				
Max.	220V	3.5				
OUTPUT	Norminal Voltage	[V]	3.3	5.0	6.0	7.0
	Setting Voltage Range	[V]	3.27 3.33	4.95 5.05	5.94 6.06	6.93 7.07
	current	[A]	300	300	250	214
	Line Regulations	[mV]	25	25	30	35
	Load Regulations	[mV]	50	50	60	70
	Cross Regulations	[mV]	-	-	-	-
	Temperature Drift	[mV]	75	75	90	105
	Ripple Max.	[mV]	50	50	60	70
	Ripple & Noise Max.	[mV]	100	100	110	120
	Turn -on Time Typ.	[ms]	800 (AC IN 110V/220V, Io=100%)			
	Hold -up Time Typ.	[ms]	17 (AC IN 110V/220V, Io=100%)			
Function	Over Voltage Protection	[V]	3.8 4.6	5.8 7.0	6.9 8.4	8.1 9.8
	Over Current Protection	[A]	330 435	330 435	275 362.5	235.4 310.3
	Remote ON.OFF	-	-	-	-	-
	Remote Sensing	-	-	-	-	-
	Power Fail Signal	-	-	-	-	-
	Parallel/Series Operation	-	Series operations is possible			
	Cooling / O.T.P	-	Fan / Possible			
Electrical Isolation	(1) Input - Output	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(2) Input - F.G	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(3) Output - F.G	-	AC 0.5KV 1min, cut-off:100mA / DC 500V 100MΩ			
Environment	Operating temp. & Humidity	-	-10 +50 , 20 90% RH (Non Condensing)			
	Storage temp. & Humidity	-	-20 +75 , 20 90% RH (Non Condensing)			
	Vibration	-	10 55Hz at 1G 3minutes period, 30minutes along X,Y and Z axis			
Dimension	Size(WxHxD) / Weight	mm / g	200 x 97 x 345		/	6800
Safety	-	-	-			
Emission	Conducted Emission	-	-			
PFHC	-	-	-			

(Specifications)

Product.	SMPS	Date.	2007.10.08.
Model.	ESF1500-S	Rev.	A
Customer.		Page.	2 / 5

MODEL/CHANNEL		Unit.	08	09	12	13R5
INPUT	Voltage , Frequency	[V]	AC100-120V/200-240V(AC90 132V/180 264V or DC240 370V) ,50/60Hz(47 440Hz or DC)			
	Current	110V [A]	32.0	32.0	32.0	32.0
	Typ.	220V	16.0	16.0	16.0	16.0
	Efficiency	110V [%]	80	80	81	81
	Typ.	220V	80	80	81	81
	Power factor	110V -	-			
	Typ.	220V	-			
Inrush Current	110V [A]	30 (Ta=25 , Io=100% at cold Start)				
Typ.	220V	60 (Ta=25 , Io=100% at cold Start)				
Leakage Current	110V [mA]	3.5				
Max.	220V	3.5				
OUTPUT	Norminal Voltage	[V]	8.0	9.0	12	13.5
	Setting Voltage Range	[V]	7.92 8.08	8.91 9.09	11.88 12.12	13.37 13.64
	current	[A]	187	167	125	110
	Line Regulations	[mV]	40	45	60	67
	Load Regulations	[mV]	80	90	120	135
	Cross Regulations	[mV]	-	-	-	-
	Temperature Drift	[mV]	120	135	180	202
	Ripple Max.	[mV]	80	90	120	135
	Ripple & Noise Max.	[mV]	130	140	170	180
	Turn -on Time Typ.	[ms]	800 (AC IN 110V/220V, Io=100%)			
	Hold -up Time Typ.	[ms]	17 (AC IN 110V/220V, Io=100%)			
Function	Over Voltage Protection	[V]	9.2 11.2	10.4 12.6	13.8 16.8	15.5 18.9
	Over Current Protection	[A]	205.7 271.2	183.7 242.2	137.5 181.3	121.0 159.5
	Remote ON.OFF	-	-	-	-	-
	Remote Sensing	-	-	-	-	-
	Power Fail Signal	-	-	-	-	-
	Parallel/Series Operation	-	Series operations is possible			
	Cooling / O.T.P	-	Fan / Possible			
Electrical Isolation	(1) Input - Output	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(2) Input - F.G	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(3) Output - F.G	-	AC 0.5KV 1min, cut-off:100mA / DC 500V 100MΩ			
Environment	Operating temp. & Humidity	-	-10 +50 , 20 90% RH (Non Condensing)			
	Storage temp. & Humidity	-	-20 +75 , 20 90% RH (Non Condensing)			
	Vibration	-	10 55Hz at 1G 3minutes period, 30minutes along X,Y and Z axis			
Dimension	Size(WxHxD) / Weight	mm / g	200 x 97 x 345		/	6800
Safety	-	-	-			
Emission	Conducted Emission	-	-			
PFHC	-	-	-			

(Specifications)

Product.	SMPS	Date.	2007.10.08.
Model.	ESF1500-S	Rev.	A
Customer.		Page.	3 / 5

MODEL/CHANNEL		Unit.	15	20	24	28	
INPUT	Voltage , Frequency	[V]	AC100-120V/200-240V(AC90 132V/180 264V or DC240 370V),50/60Hz(47 440Hz or DC)				
	Current	110V	32.0	32.0	32.0	32.0	
	Typ.	220V	16.0	16.0	16.0	16.0	
	Efficiency	110V	81	82	83	83	
	Typ.	220V	81	82	83	83	
	Power factor	110V	-	-			
	Typ.	220V	-	-			
Inrush Current	110V	[A]	30 (Ta=25 , Io=100% at cold Start)				
Typ.	220V		60 (Ta=25 , Io=100% at cold Start)				
Leakage Current	110V	[mA]	3.5				
Max.	220V		3.5				
OUTPUT	Norminal Voltage	[V]	15	20	24	28	
	Setting Voltage Range	[V]	14.85 15.15	19.8 20.2	23.76 24.24	27.72 28.28	
	current	[A]	100	75.0	63.0	54.0	
	Line Regulations	[mV]	75	100	120	140	
	Load Regulations	[mV]	150	200	240	280	
	Cross Regulations	[mV]	-	-	-	-	
	Temperature Drift	[mV]	225	300	360	420	
	Ripple Max.	[mV]	150	200	240	280	
	Ripple & Noise Max.	[mV]	200	250	290	330	
	Turn -on Time Typ.	[ms]	800 (AC IN 110V/220V, Io=100%)				
	Hold -up Time Typ.	[ms]	17 (AC IN 110V/220V, Io=100%)				
Function	Over Voltage Protection	[V]	17.3 21.0	23.0 28.0	27.6 33.6	32.2 39.2	
	Over Current Protection	[A]	110.0 145.0	82.5 108.8	69.3 91.4	59.4 78.3	
	Remote ON.OFF	-	-	-	-	-	
	Remote Sensing	-	-	-	-	-	
	Power Fail Signal	-	-	-	-	-	
	Parallel/Series Operation	-	Series operations is possible				
	Cooling / O.T.P	-	Fan / Possible				
Electrical Isolation	(1) Input - Output	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ				
	(2) Input - F.G	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ				
	(3) Output - F.G	-	AC 0.5KV 1min, cut-off:100mA / DC 500V 100MΩ				
Environment	Operating temp. & Humidity	-	-10 +50 , 20 90% RH (Non Condensing)				
	Storage temp. & Humidity	-	-20 +75 , 20 90% RH (Non Condensing)				
	Vibration	-	10 55Hz at 1G 3minutes period, 30minutes along X,Y and Z axis				
Dimension	Size(WxHxD) / Weight	mm / g	200 x 97 x 345		/	6800	
Safety	-	-	-				
Emission	Conducted Emission	-	-				
PFHC	-	-	-				

(Specifications)

Product.	SMPS	Date.	2007.10.08.
Model.	ESF1500-S	Rev.	A
Customer.		Page.	4 / 5

MODEL/CHANNEL		Unit.	30	32	36	48
INPUT	Voltage , Frequency	[V]	AC100-120V/200-240V(AC90 132V/180 264V or DC240 370V),50/60Hz(47 440Hz or DC)			
	Current	110V [A]	32.0	32.0	32.0	32.0
	Typ.	220V	16.0	16.0	16.0	16.0
	Efficiency	110V [%]	83	84	84	85
	Typ.	220V	83	84	84	85
	Power factor	110V -	-			
	Typ.	220V	-			
Inrush Current	110V [A]	30 (Ta=25 , Io=100% at cold Start)				
Typ.	220V	60 (Ta=25 , Io=100% at cold Start)				
Leakage Current	110V [mA]	3.5				
Max.	220V	3.5				
OUTPUT	Norminal Voltage	[V]	30	32	36	48
	Setting Voltage Range	[V]	29.7 30.3	31.68 32.32	35.64 36.36	47.52 48.48
	current	[A]	50.0	47.0	41.5	32.0
	Line Regulations	[mV]	150	160	180	240
	Load Regulations	[mV]	300	320	360	480
	Cross Regulations	[mV]	-	-	-	-
	Temperature Drift	[mV]	450	480	540	720
	Ripple Max.	[mV]	300	320	360	480
	Ripple & Noise Max.	[mV]	350	370	410	530
	Turn -on Time Typ.	[ms]	800 (AC IN 110V/220V, Io=100%)			
	Hold -up Time Typ.	[ms]	17 (AC IN 110V/220V, Io=100%)			
Function	Over Voltage Protection	[V]	34.5 42.0	36.8 44.8	41.4 50.4	55.2 67.2
	Over Current Protection	[A]	55.0 72.5	51.7 68.2	45.7 60.2	35.2 46.4
	Remote ON.OFF	-	-	-	-	-
	Remote Sensing	-	-	-	-	-
	Power Fail Signal	-	-	-	-	-
	Parallel/Series Operation	-	Series operations is possible			
	Cooling / O.T.P	-	Fan / Possible			
Electrical Isolation	(1) Input - Output	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(2) Input - F.G	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(3) Output - F.G	-	AC 0.5KV 1min, cut-off:100mA / DC 500V 100MΩ			
Environment	Operating temp. & Humidity	-	-10 +50 , 20 90% RH (Non Condensing)			
	Storage temp. & Humidity	-	-20 +75 , 20 90% RH (Non Condensing)			
	Vibration	-	10 55Hz at 1G 3minutes period, 30minutes along X,Y and Z axis			
Dimension	Size(WxHxD) / Weight	mm / g	200 x 97 x 345		/	6800
Safety	-	-	-			
Emission	Conducted Emission	-	-			
PFHC	-	-	-			

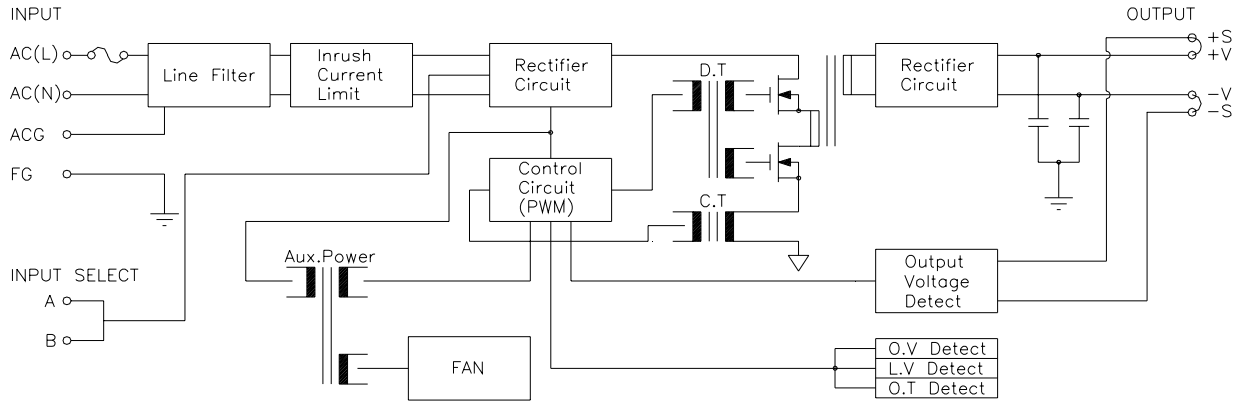
(Specifications)

Product.	SMPS	Date.	2007.10.08.
Model.	ESF1500-S	Rev.	A
Customer.		Page.	5 / 5

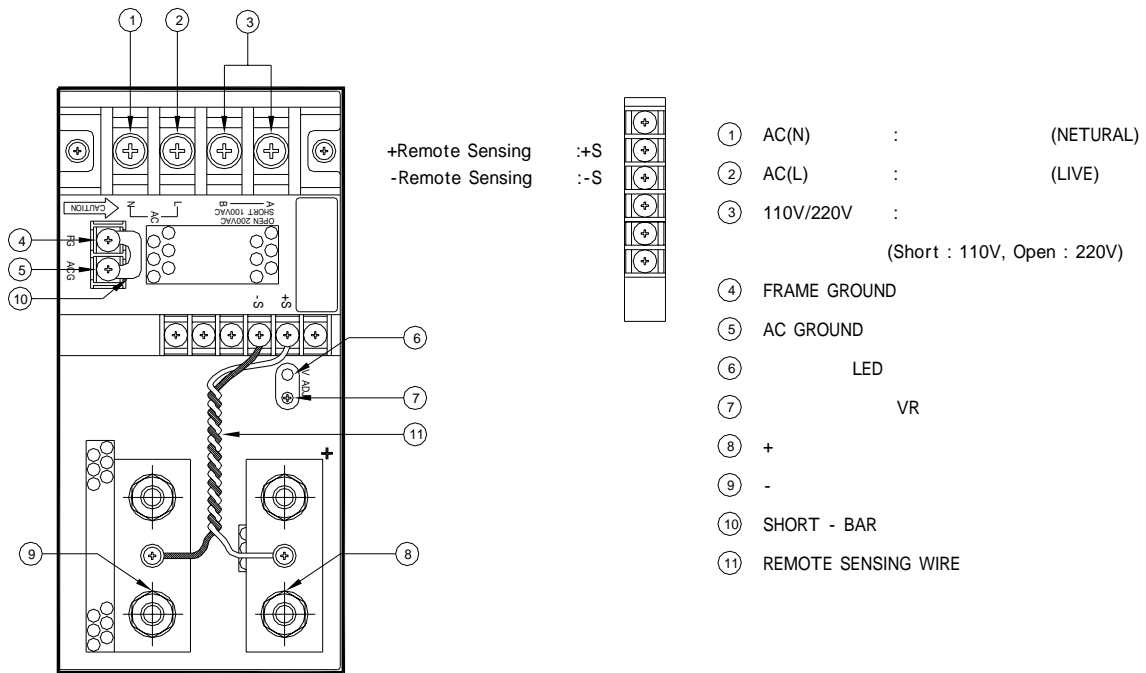
MODEL/CHANNEL		Unit.	60	-	-	-
INPUT	Voltage , Frequency	[V]	AC100-120V/200-240V(AC90 132V/180 264V or DC240 370V),50/60Hz(47 440Hz or DC)			
	Current	110V	32.0	-	-	-
	Typ.	220V	16.0	-	-	-
	Efficiency	110V	85	-	-	-
	Typ.	220V	85	-	-	-
	Power factor	110V	-	-		
	Typ.	220V	-	-		
Inrush Current	110V	[A]	30 (Ta=25 , Io=100% at cold Start)			
Typ.	220V		60 (Ta=25 , Io=100% at cold Start)			
Leakage Current	110V	[mA]	3.5			
Max.	220V		3.5			
OUTPUT	Norminal Voltage	[V]	60	-	-	-
	Setting Voltage Range	[V]	59.4 60.6	-	-	-
	current	[A]	25.0	-	-	-
	Line Regulations	[mV]	300	-	-	-
	Load Regulations	[mV]	600	-	-	-
	Cross Regulations	[mV]	-	-	-	-
	Temperature Drift	[mV]	900	-	-	-
	Ripple Max.	[mV]	600	-	-	-
	Ripple & Noise Max.	[mV]	650	-	-	-
	Turn -on Time Typ.	[ms]	800 (AC IN 110V/220V, Io=100%)			
	Hold -up Time Typ.	[ms]	17 (AC IN 110V/220V, Io=100%)			
Function	Over Voltage Protection	[V]	69.0 84.0	-	-	-
	Over Current Protection	[A]	27.5 36.3	-	-	-
	Remote ON.OFF	-	-	-	-	-
	Remote Sensing	-	-	-	-	-
	Power Fail Signal	-	-	-	-	-
	Parallel/Series Operation	-	Series operations is possible			
	Cooling / O.T.P	-	Fan / Possible			
Electrical Isolation	(1) Input - Output	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(2) Input - F.G	-	AC 1.5KV 1min, cut-off: 20mA / DC 500V 100MΩ			
	(3) Output - F.G	-	AC 0.5KV 1min, cut-off:100mA / DC 500V 100MΩ			
Environment	Operating temp. & Humidity	-	-10 +50 , 20 90% RH (Non Condensing)			
	Storage temp. & Humidity	-	-20 +75 , 20 90% RH (Non Condensing)			
	Vibration	-	10 55Hz at 1G 3minutes period, 30minutes along X,Y and Z axis			
Dimension	Size(WxHxD) / Weight	mm / g	200 x 97 x 345		/	6800
Safety	-	-	-			
Emission	Conducted Emission	-	-			
PFHC	-	-	-			

User's guide

1. BLOCK DIAGRAM



2. Terminal Connection



3. Function

3-1. (Adjustable output voltage range)

o 가 5%

User's guide

3-2. (O.C.P : Over Current Protection)

- SMPS 가 110%
- short 가
- short AC 3 .)

3-3. (O.V.P : Over Voltage Protection)

- 115% 가 SMPS
- AC 3 A/S

4. / (Series operation / Parallel operation)

4-1. A (Fig 1.) B (Fig 2.)

4-2. 가 가 , , SMPS (Fig 4.) 가

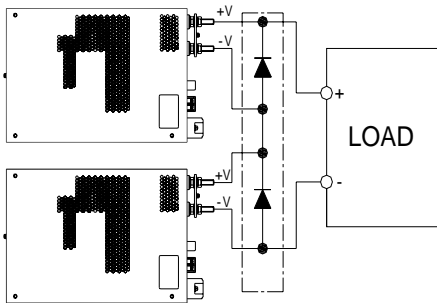


Fig 1. A

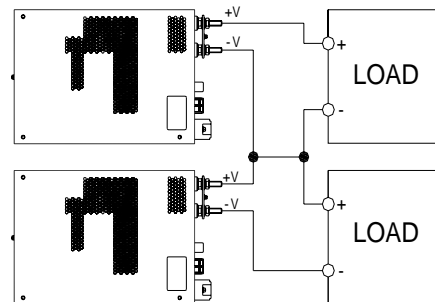


Fig 2. B

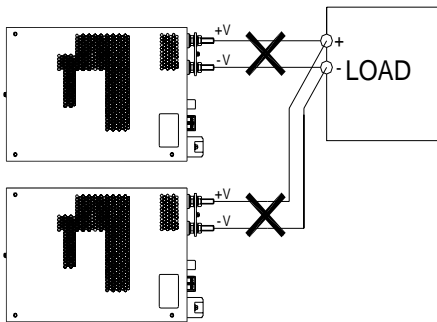


Fig 3. A(가)

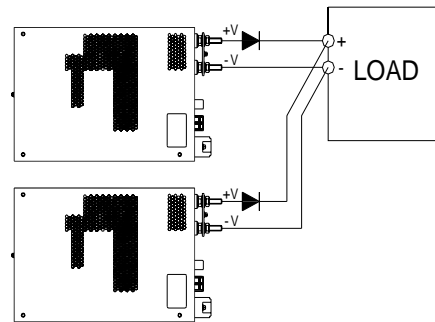


Fig 4. (Back up)

SMPS

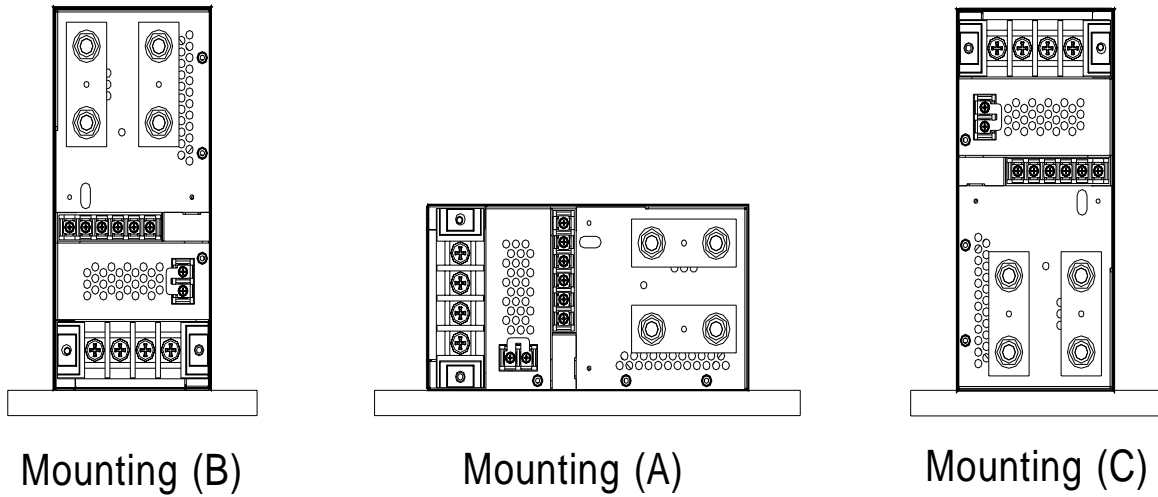
User's guide

5. (Mounting method)

5-1.

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Mounting (B)

Mounting (A)

Mounting (C)

Fig 5.

SMPS

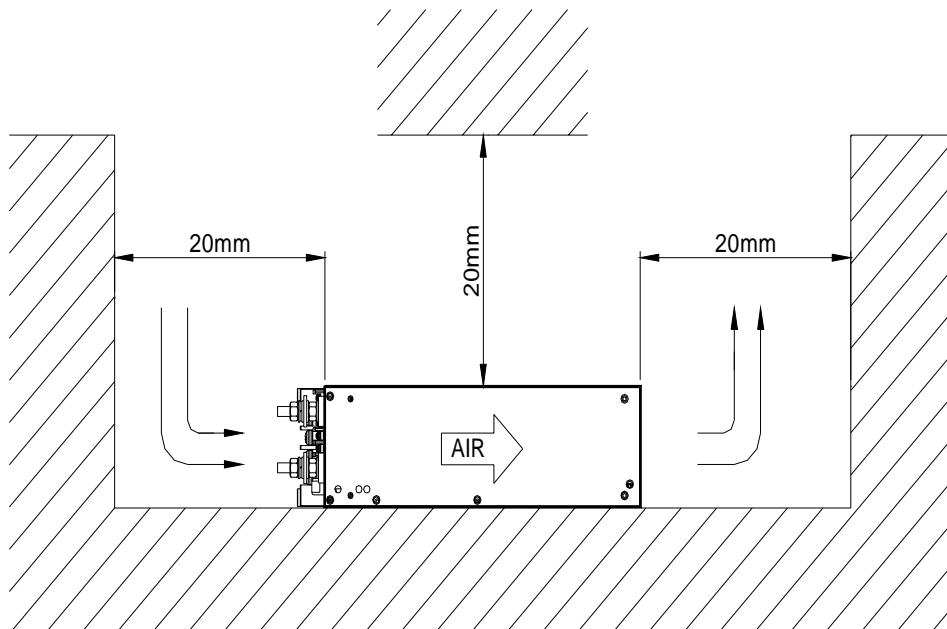
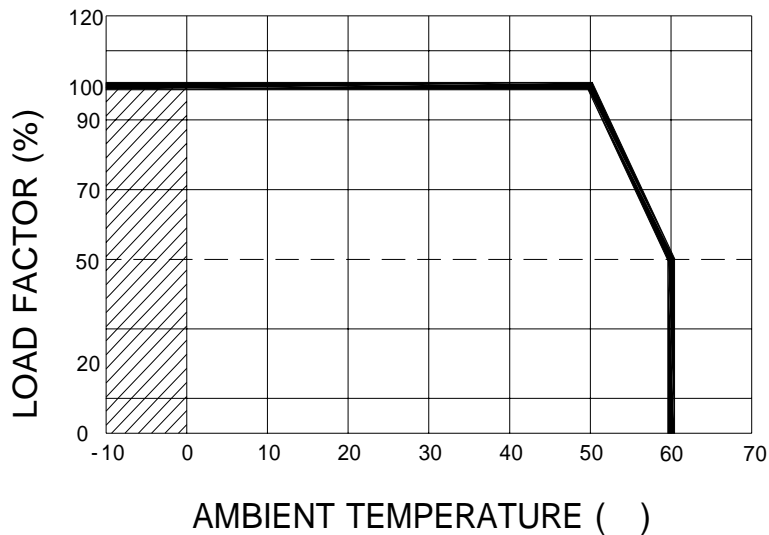


Fig 6.

User's guide

6. Output derating curve



7.

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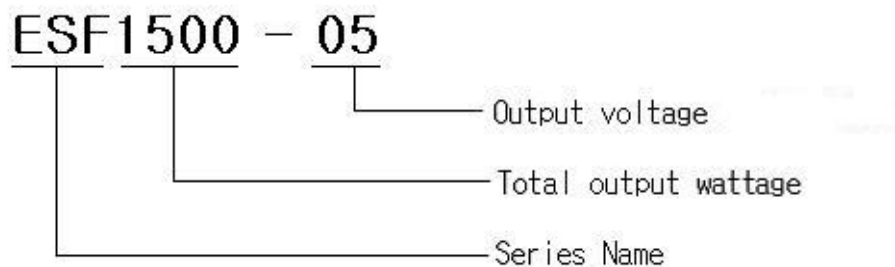
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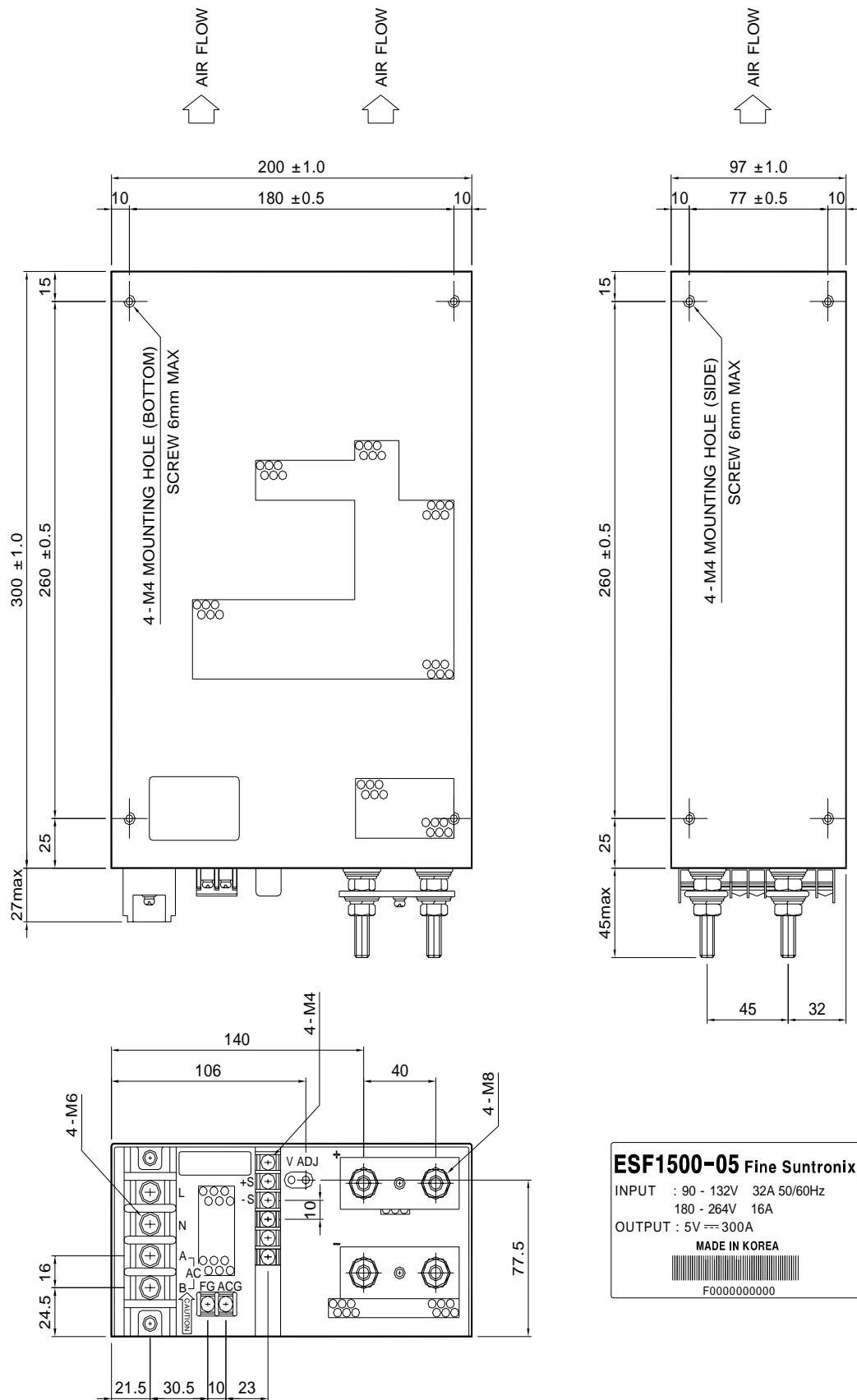
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User's guide

9. ORDERING NUMBER SYSTEM



Dimension



ESF1500-05 Fine Suntronix
 INPUT : 90 - 132V 32A 50/60Hz
 180 - 264V 16A
 OUTPUT : 5V ---300A
 MADE IN KOREA
 F000000000

INPUT ()

- o Input Voltage () : AC() (110VAC, 220VAC) DC()
(5VDC, 12VDC)
- o Input Current () : 가
- o Input Wattage () : SMPS
- o Input Frequency () : AC() 50Hz, 60Hz(60Hz)
- o Input Efficiency () :
- o Inrush Current () :
- o Leakage Current () : 1 Capacitor
- o Power Factor () :

OUTPUT ()

- o Output Voltage () : DC()
- o Output Current () : DC()
- o Output Wattage () : SMPS가 DC (X)
- o Line Regulation () : (AC DC)
DC()
- o Load Regulation () : min~100% DC()
- o Cross Regulation () : SMPS min~100%
DC()
- o Temperature Drift () : SMPS DC()
- o Ripple & Noise () : DC()
- o Turn on Time () : DC() 90%
- o Hold up Time () : DC() 90%

FUNCTION ()

- o Over Current Protection (OCP,) : 가 SMPS
SMPS
- o Over Voltage Protection (OVP,) : SMPS가 DC()
SMPS가 DC()
- o Over Temperature Protection (OTP,) : SMPS 가
- o Remote ON/OFF (RC or CNT,) : SMPS ON/OFF
- o Remote Sensing (+S, -S,) : SMPS 가
- o Load Detect (LD,) :
- o Adjustable Output Voltage (VR,) : SMPS
가 TRM
- o Power Fail Signal (P.F,)
 - 1) P.F : 가
 - 2) P.F : SMPS
- o Low Voltage alarm (LV alarm,) : SMPS
- o Power alarm (PR alarm,) : SMPS AC , FAN
(P.F, LV alarm, FAN alarm)
- o Parallel / Series Operation (/) : SMPS
가
- o Voltage Balance (VB,) : 가
- o Current Balance (CB,) : 가
가
- o Frame Gnd(FG), AC Gnd(ACG) : Frame Ground, AC Ground

ELECTRICAL ISOLATION ()

o Electrically Isolated Input-Output (-) : AC()
DC() .

o Electrically Isolated Input-Case, FG (- ,) : AC()
,

o Electrically Isolated Output-Case, FG (- ,) : DC()
.

ENVIRONMENT ()

o Operating Temp and Humidity (&) : SMPS
.

o Storage Temp and Humidity (&) : SMPS ,
.

o Vibration () : SMPS가 .

ETC ()

o Safety () :

o Safety Regulation () :

o Line Conducted RF Voltage () : .