Size: 2in x 1in x 0.4in
(50.8mm x 25.4mm x 10.2mm)

OPTIONS

- Positive Remote ON/OFF (Suffix “P”)
- Negative Remote ON/OFF (Suffix “R”)

FEATURES

- 10 Watts Maximum Output Power
- Single and Dual Outputs
- High Efficiency up to 87%
- No Minimum Load Requirement
- 1600VDC I/O Isolation
- Positive or Negative Remote ON/OFF Control Option
- Fixed Switching Frequency
- Over Voltage, Over Load, and Short Circuit Protection
- Extended Operating Temperature Range Available
- Six-Sided Continuous Shielding
- CE Marked
- RoHS & REACH compliant
- UL60950-1, EN60950-1, & IEC60950-1 Safety Approvals
- UL 94V-0 Compliant
- 2:1 Wide Input Voltage Ranges

APPLICATIONS

- Wireless Networks
- Telecom/Datacom
- Industry Control Systems
- Measurement Equipment
- Semiconductor Equipment

DESCRIPTION

The JR series of DC/DC power converters provides 10 watts of output power in a 2.0” x 1.0” x 0.4” industry standard package and footprint. This series has single and dual output models with 2:1 wide input voltage ranges of 9-18VDC, 18-36VDC, and 36-75VDC. Some features include high efficiency up to 87%, 1600VDC I/O isolation, and six-sided shielding. All models are also protected against over voltage, over load, and short circuit conditions. This series is RoHS and UL94V-0 compliant and has UL60950-1, EN60950-1, and IEC60950-1 safety approvals. Please call factory for ordering details.

MODEL SELECTION TABLE

Single Output Models

Model Number[1]	Input Voltage Range	Output Voltage	Output Current		Ripple & Noise[4]	Input Current		Output Power	Maximum Capacitive Load[5]	Efficiency[4]	UL Approval[11]
			Min Load[2]	Max Load[3]		No Load	Full Load				
JR5S5-2000	5VDC (4.5-9VDC)	5VDC	0mA	2000mA	50mVp-p	-	2500mA	10W	7900µF	79%	UL60950-1
JR5S12-830		12VDC	0mA	830mA		-	2350mA	10W	2200µF	82%	UL60950-1
JR5S15-660		15VDC	0mA	670mA		-	2348mA	10W	1470µF	82%	UL60950-1
JR12S33-2000	12VDC (9-18VDC)	3.3VDC	0mA	2000mA	50mVp-p	17mA	724mA	6.6W	6800µF	80%	-
JR12S5-2000		5VDC	0mA	2000mA		21mA	1082mA	10W	4700µF	81%	-
JR12S12-830		12VDC	0mA	830mA		38mA	1037mA	10W	690µF	84%	-
JR12S15-660		15VDC	0mA	670mA		36mA	1046mA	10W	470µF	84%	-
JR24S33-2000	24VDC (18-36VDC)	3.3VDC	0mA	2000mA	50mVp-p	15mA	362mA	6.6W	6800µF	80%	UL60950-1
JR24S5-2000		5VDC	0mA	2000mA		22mA	534mA	10W	4700µF	82%	UL60950-1
JR24S12-830		12VDC	0mA	830mA		18mA	519mA	10W	690µF	84%	UL60950-1
JR24S15-660		15VDC	0mA	670mA		36mA	523mA	10W	470µF	84%	UL60950-1
JR48S33-2000	48VDC (36-75VDC)	3.3VDC	0mA	2000mA	50mVp-p	11mA	181mA	6.6W	6800µF	80%	UL60950-1
JR48S5-2000		5VDC	0mA	2000mA		14mA	260mA	10W	4700µF	84%	UL60950-1
JR48S12-830		12VDC	0mA	830mA		14mA	253mA	10W	690µF	86%	UL60950-1
JR48S15-660		15VDC	0mA	670mA		10mA	252mA	10W	470µF	87%	UL60950-1

MODEL SELECTION TABLE

Dual Output Models

Model Number[1]	Input Voltage Range	Output Voltage	Output Current		Ripple & Noise[4]	Input Current		Output Power	Maximum Capacitive Load[5]	Efficiency[4]	UL Approval[11]
			Min Load[2]	Max Load[3]		No Load	Full Load				
JR5D5-1000	5VDC (4.5-9VDC)	±5VDC	0mA	±1000mA	75mVp-p	-	2461mA	10W	±5060µF	80%	-
JR5D12-420		±12VDC	0mA	±416mA		-	2503mA		±1034µF	80%	-
JR5D15-330		±15VDC	0mA	±333mA		-	2393mA		±660µF	81%	-
JR12D5-1000	12VDC (9-18VDC)	±5VDC	0mA	±1000mA	75mVp-p	39	1042mA	10W	±680µF	84%	UL60950-1
JR12D12-420		±12VDC	0mA	±416mA		47	1053mA		±330µF	83%	UL60950-1
JR12D15-330		±15VDC	0mA	±333mA		45	1041mA		±110µF	84%	UL60950-1
JR24D5-1000	24VDC (18-36VDC)	±5VDC	0mA	±1000mA	75mVp-p	28	527mA	10W	±680µF	83%	UL60950-1
JR24D12-420		±12VDC	0mA	±416mA		24	513mA		±330µF	85%	UL60950-1
JR24D15-330		±15VDC	0mA	±333mA		31	520mA		±110µF	84%	UL60950-1
JR48D5-1000	48VDC (36-75VDC)	±5VDC	0mA	±1000mA	75mVp-p	16	260mA	10W	±680µF	84%	UL60950-1
JR48D12-420		±12VDC	0mA	±416mA		19	254mA		±330µF	86%	UL60950-1
JR48D15-330		±15VDC	0mA	±333mA		16	256mA		±110µF	85%	UL60950-1

SPECIFICATIONS

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
INPUT SPECIFICATIONS						
Input Voltage Range[1]	5VDC nominal input models *(minimum order quantities apply)*		4.5	5	9	VDC
	12VDC nominal input models		9	12	18	
	24VDC nominal input models		18	24	36	
	48VDC nominal input models		36	48	75	
Input Reflected Ripple Current				30		mAp-p
Input Surge Voltage (100ms max)	5VDC nominal input models				15	VDC
	12VDC nominal input models				36	
	24VDC nominal input models				50	
	48VDC nominal input models				100	
Input Filter				Pi Type		
OUTPUT SPECIFICATIONS						
Output Voltage				See Table		
Voltage Accuracy			-1.0		+1.0	%
Line Regulation	Low Line to High Line at Full Load		-0.2		+0.2	%
Load Regulation	No Load to Full Load	Single	-0.5		+0.5	%
		Dual	-1.0		+1.0	
Output Power				See Table		
Output Current				See Table		
Minimum Load			0			A
Maximum Capacitive Load				See Table		
Ripple & Noise	Measured by 20MHz bandwidth	Single		50		mVp-p
		Dual		75		
Transient Response Recovery Time	25% load step change			250		µs
Start-Up Time	Constant resistive load	Power Up		20		ms
Temperature Coefficient			-0.02		+0.02	%/ºC
REMOTE ON/OFF CONTROL[6]						
Positive Logic	DC-DC ON			Open or 3.5~12VDC		
	DC-DC OFF			Short or 0~1.2VDC		
Negative Logic	DC-DC ON			Short or 0~1.2VDC		
	DC-DC OFF			Open or 3.5~12VDC		
Input Current of CTRL Pin			-0.5		+1.0	mA
Remote OFF Input Current				20		mA
PROTECTION						
Short Circuit Protection				Continuous, Automatic recovery		
Over Load Protection	% of Lout Rated				150	%
Over Voltage Protection	Zener diode clamp	3.3V output models		3.9		VDC
		5V output models		6.2		
		12V output models		15		
		15V output models		18		
ENVIRONMENTAL SPECIFICATIONS						
Operating Ambient Temperature[7]	Standard	With derating	-25		+85	ºC
	"T" Version (suffix –I)	Without derating	-40		+85	
Storage Temperature			-55		+125	ºC
Maximum Case Temperature					+105	ºC
Thermal Impedance[8]	Vertical direction by natural convection (20LFM)	Without heat-sink		12		ºC/W
		With heat-sink		10		
Relative Humidity			5		95	% RH
Thermal Shock				MIL-STD-810F		
Vibration				MIL-STD-810F		
MTBF	MIL-HDBK-217F, Full Load			3,342,000 hours		

SPECIFICATIONS

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
GENERAL SPECIFICATIONS						
Efficiency				See Table		
Switching Frequency			270	300	330	kHz
Isolation Voltage	1 minute	Input to Output	1600			VDC
		Input (Output) to Case	1600			
Isolation Resistance	500VDC		1			GΩ
Isolation Capacitance					300	pF
PHYSICAL SPECIFICATIONS						
Weight				0.95oz (27g)		
Dimensions (L x W x H)				2in x 1in x 0.4in (50.8mm x 25.4mm x 10.2mm)		
Case Material				Nickel-Coated Copper		
Base Material				Non-Conductive Black Plastic		
Potting Material				Epoxy (UL94 V-0)		
SAFETY & EMC CHARACTERISTICS						
Safety Approvals		UL60950-1(11) EN60950-1 IEC60950-1				
EMI(9)	EN55022					Class B
ESD	EN6100-4-2	Air ±8kV and Contact ±6kV				Perf. Criteria B
Radiated Immunity	EN6100-4-3	10 V/m				Perf. Criteria A
Fast Transient(10)	EN61000-4-4	±2kV				Perf. Criteria B
Surge(10)	EN61000-4-5	±2kV				Perf. Criteria B
Conducted Immunity	EN61000-4-6	10 Vr.m.s				Perf. Criteria A

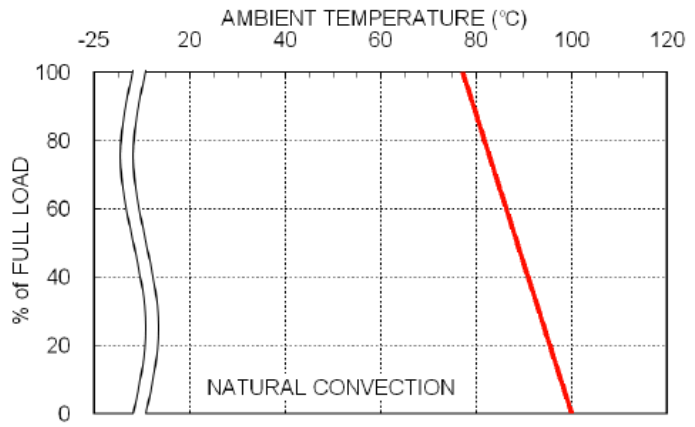
NOTES

(1) Models with a 4.5~9VDC input voltage range require a minimum order.
(2) Typical value at nominal input voltage and full load.
(3) Maximum value at nominal input voltage and full load
(4) Typical value at nominal input voltage and no load
(5) Test by minimum Vin and constant resistive load
(6) The on/off control pin is referenced to –Vin.
To order positive logic remote on/off, add the suffix “P” to the model number (Ex: JR24S15-660P)
To order negative logic remote on/off, add the suffix “R” to the model number (Ex: JR24S15-660R)
(7) “I” type models are more efficient; therefore they can be operated over a more extensive temperature range than the standard version. To order extended operating temperature range, add the suffix “-I” o the model number (EX: JR24S15-660-I)
(8) Heatsink is optional and P/N: 7G-0020C-F.
(9) The JR series can meet EN55022 Class A with external capacitors in parallel connected to the input pins.
Recommended: 12Vin: 4.7µF/25V 1210 MLCC
24Vin: 2.2µF/50V 1812 MLCC
48Vin: 1.5µF/100V 1812 MLCC
(10) An external inputp filter capacitor is required if the module has to meet EN691000-4-4, EN61000-4-5. The filter capacitor suffested is Nippon chemi-con KY series, 220µF/100V, ESR 48mΩ
(11) UL approval can be added to any products not currently listed if required.

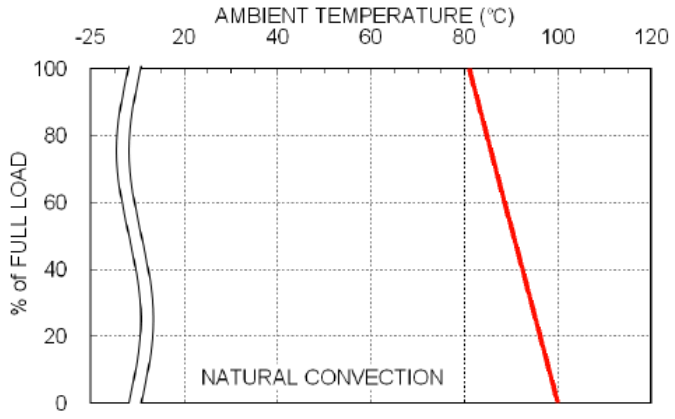
CAUTION: This power module is not internally fused. An input line fuse must always be used.
**Due to advances in technology, specifications subject to change without notice.*

DERATING CURVES

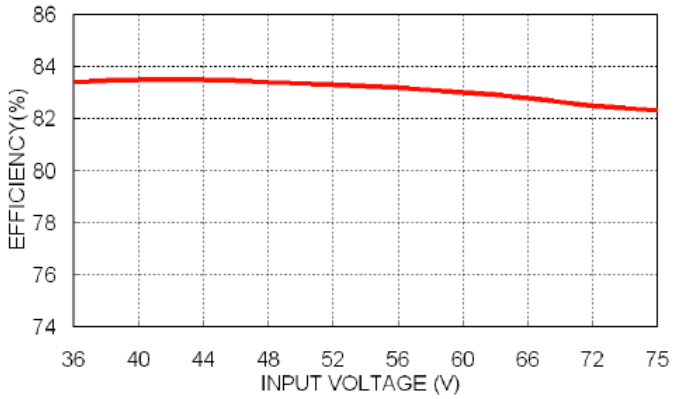
JR48S5-2000 Derating Curve



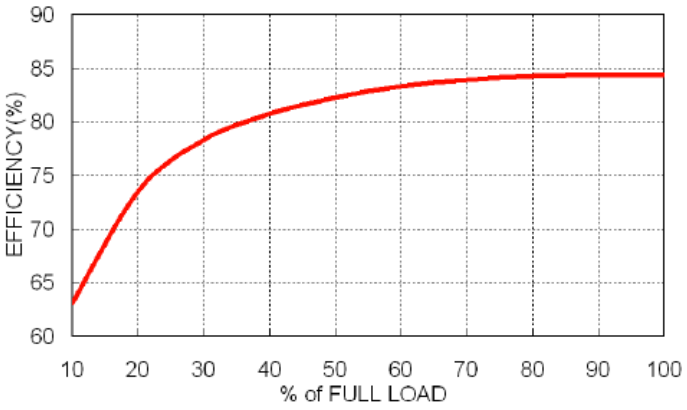
JR48S5-2000 Derating Curve With Heatsink



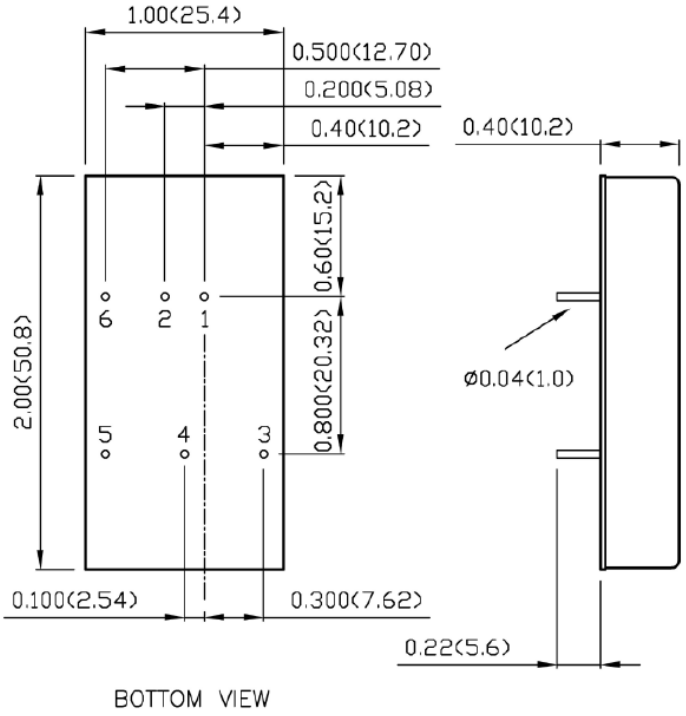
JR48S5-2000 Efficiency vs. Input Voltage



JR48S5-2000 Derating Curve Efficiency vs. Output Load



MECHANICAL DRAWINGS



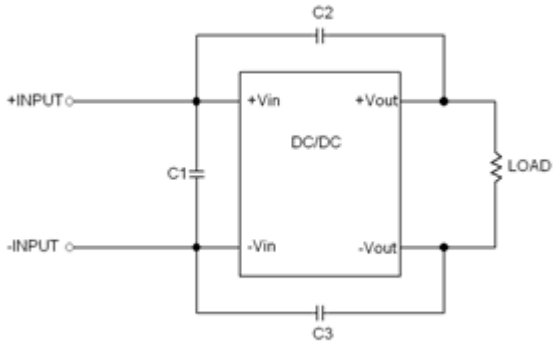
PIN CONNECTION

PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	No Pin	Common
5	-Vout	-Vout
6	Ctrl (Option)	Ctrl (Option)

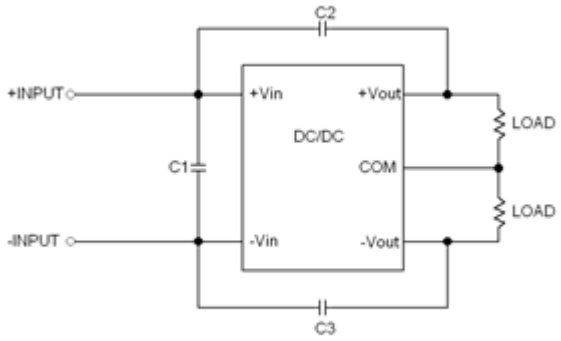
1. All dimensions in inch (mm)
2. Tolerance: x.xx0.02 (x.x±0.5)
   x.xxx±0.01 (x.xx±0.25)
3. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004(0.1)

EMI CONSIDERATIONS

Recommended external EMI filter for EN55022 Class A



Single Output

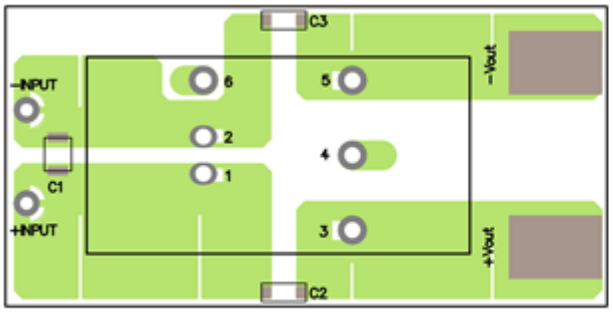


Dual Output

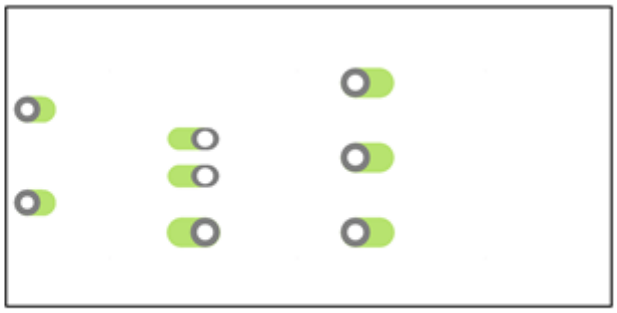
B.O.M. of External EMI Filter

MODEL	Output	C1	C2`C3
JR5S12-830 JR5S15-660 JR5S5-2000	Single Output	N/A	1000pF/2kV 1808 MLCC
JR5D12-420 JR5D15-330 JR5D5-1000	Dual Output	N/A	1000pF/2kV 1808 MLCC

Recommended Layout Pattern for Single Output

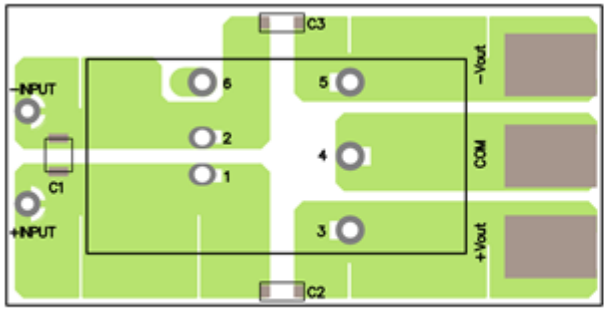


TOP VIEW

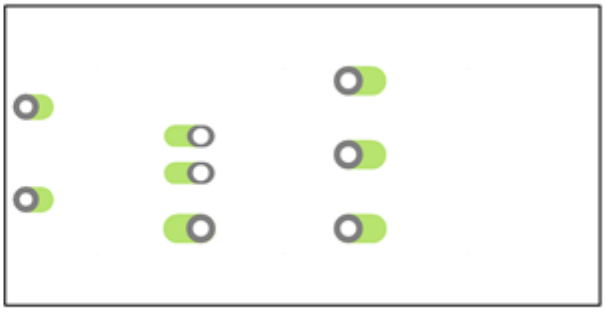


BOTTOM VIEW

Recommended Layout Pattern for Dual Output

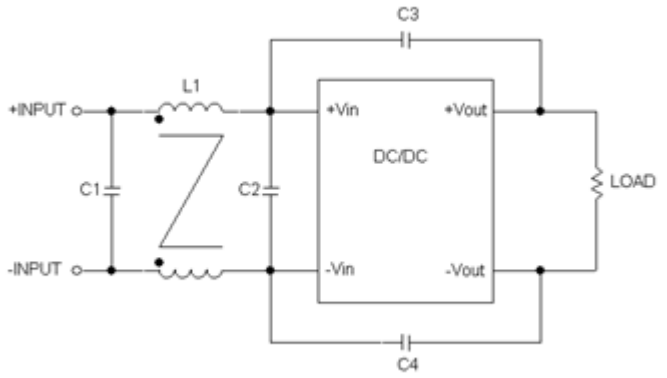


TOP VIEW

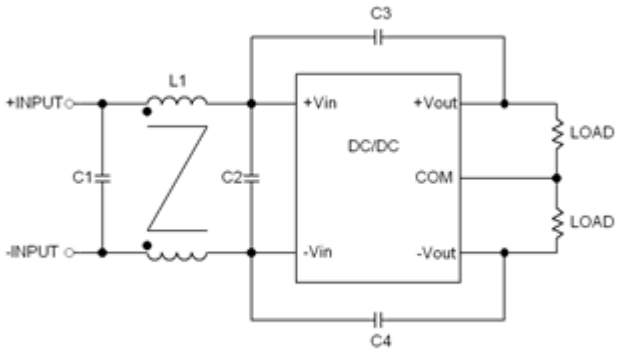


BOTTOM VIEW

Recommended External EMI Filter for EN55022 Class B



Single Output

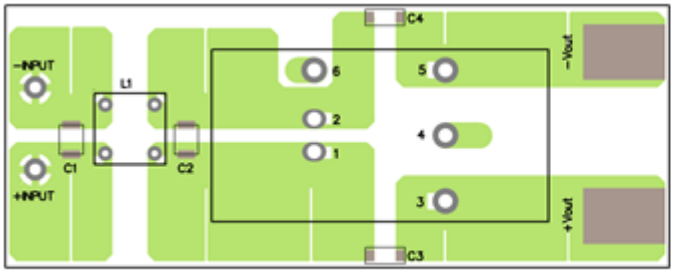


Dual Output

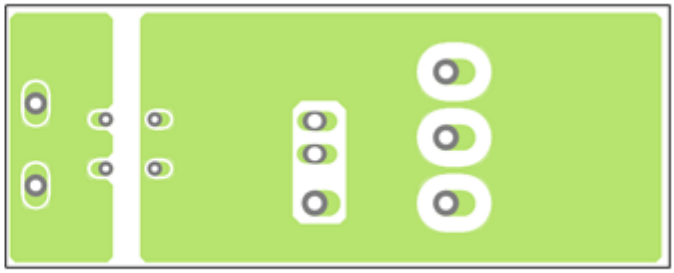
B.O.M of External EMI Filter

MODEL	Output	C1	C2	C3`C4	L1
JR5S12-830 JR5S15-660 JR5S5-2000	Single Output	2.2µF/50V 1210 MLCC	N/A	1000pF/2kV 1808 MLCC	325µH Common Choke, PMT-050
JR5D12-420 JR5D15-330 JR5D5-1000	Dual Output	2.2µF/50V 1210 MLCC	N/A	1000pF/2kV 1808 MLCC	325µH Common Choke, PMT-050

Recommended Layout Pattern for Single Output

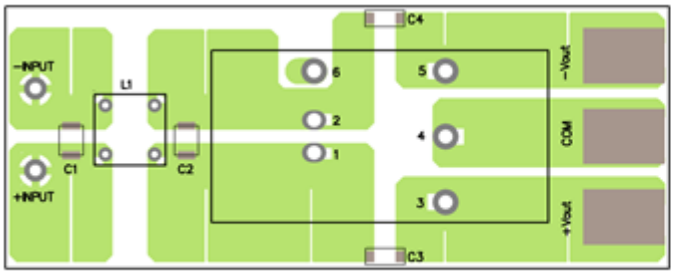


TOP VIEW

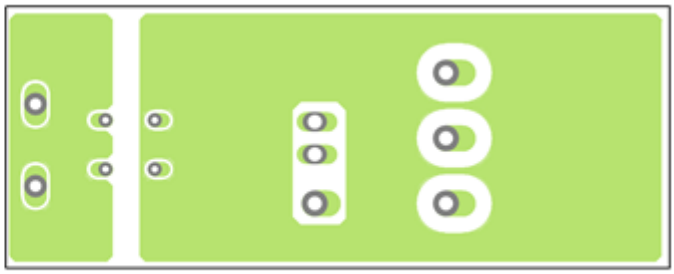


BOTTOM VIEW

Recommended Layout Pattern for Dual Output



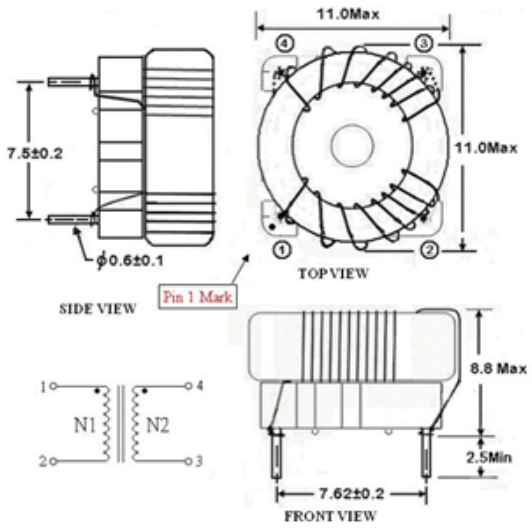
TOP VIEW



BOTTOM VIEW

Specifications of Common Mode Choke and Differential Inductor

Part Number	JR5
Inductance:	Pin 1-2: 325μH±35% (100kHz/100mV)
	Pin 3-4: 325μH±35% (100kHz/100mV)
DCR:	35mΩ, max.
Rated Current:	3.3A, max.
Operating Temperature	-40ºC ~ +105ºC
Recommended Through Hole	ϕ0.8mm



All dimensions in mm

COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001: 2015 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

Contact **Wall Industries** for further information:

Phone: ☎(603)778-2300
Toll Free: ☎(888)597-9255
Fax: ☎(603)778-9797
E-mail: sales@wallindustries.com
Web: www.wallindustries.com
Address: 37 Industrial Drive
Exeter, NH 03833