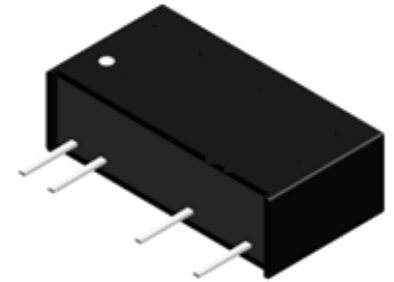


Features

- 2 Watts output power
- 1:1 input voltage range
- 1KVDC/2KVDC isolation
- -40°C to +100°C operating temperature
- DIP7 Package
- EN60950
- EMC-EN55022/55024
- RoHS compliant

Application

- Input voltage range from 3.3V to 24V
- Industry control application
- Tele-communication application



Selection Guide

Part number	Input voltage	Output voltage	Output current @ full load	Efficiency ⁽¹⁾ (typ.)	Capacitive load ⁽²⁾ (max.)	
MSH-3.33.3J	3.3VDC (±10%)	3.3 VDC	606 mA	77%	1500uF	
MSH-3.305J		5 VDC	400 mA	78%	1500uF	
MSH-3.309J		9 VDC	223 mA	82%	680uF	
MSH-3.312J		12 VDC	167 mA	84%	330uF	
MSH-3.315J		15 VDC	134 mA	88%	330uF	
MSH-3.324J		24 VDC	84 mA	84%	220uF	
MSH-3.33.3DJ		±3.3 VDC	±303 mA	77%	680uF	
MSH-3.305DJ		±5 VDC	±200 mA	81%	680uF	
MSH-3.309DJ		±9 VDC	±112 mA	78%	330uF	
MSH-3.312DJ		±12 VDC	±84 mA	81%	220uF	
MSH-3.315DJ		±15 VDC	±67 mA	85%	220uF	
MSH-3.324DJ		±24 VDC	±42 mA	85%	100uF	
MSH-053.3J		5VDC (±10%)	3.3 VDC	606 mA	78%	1500uF
MSH-0505J			5 VDC	400 mA	81%	1500uF
MSH-0509J	9 VDC		223 mA	85%	680uF	
MSH-0512J	12 VDC		167 mA	86%	330uF	
MSH-0515J	15 VDC		134 mA	86%	330uF	
MSH-0524J	24 VDC		84 mA	85%	220uF	
MSH-053.3DJ	±3.3 VDC		±303 mA	80%	680uF	
MSH-0505DJ	±5 VDC		±200 mA	83%	680uF	
MSH-0509DJ	±9 VDC		±112 mA	84%	330uF	
MSH-0512DJ	±12 VDC		±84 mA	84%	220uF	
MSH-0515DJ	±15 VDC		±67 mA	86%	220uF	
MSH-0524DJ	±24 VDC		±42 mA	84%	100uF	
MSH-123.3J	12VDC (±10%)		3.3 VDC	606 mA	79%	1500uF
MSH-1205J			5 VDC	400 mA	83%	1500uF
MSH-1209J		9 VDC	223 mA	85%	680uF	
MSH-1212J		12 VDC	167 mA	82%	330uF	
MSH-1215J		15 VDC	134 mA	85%	330uF	
MSH-1224J		24 VDC	84 mA	86%	220uF	
MSH-123.3DJ		±3.3 VDC	±303 mA	82%	680uF	
MSH-1205DJ		±5 VDC	±200 mA	84%	680uF	
MSH-1209DJ		±9 VDC	±112 mA	82%	330uF	
MSH-1212DJ		±12 VDC	±84 mA	84%	220uF	
MSH-1215DJ		±15 VDC	±67 mA	82%	220uF	
MSH-1224DJ		±24 VDC	±42 mA	86%	100uF	

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Part number	Input voltage	Output voltage	Output current @ full load	Efficiency ⁽¹⁾ (typ.)	Capacitive load ⁽²⁾ (max.)
MSH-153.3J	15VDC (±10%)	3.3 VDC	606 mA	80%	1500uF
MSH-1505J		5 VDC	400 mA	81%	1500uF
MSH-1509J		9 VDC	223 mA	84%	680uF
MSH-1512J		12 VDC	167 mA	88%	330uF
MSH-1515J		15 VDC	134 mA	85%	330uF
MSH-1524J		24 VDC	84 mA	87%	220uF
MSH-153.3DJ		±3.3 VDC	±303 mA	83%	680uF
MSH-1505DJ		±5 VDC	±200 mA	85%	680uF
MSH-1509DJ		±9 VDC	±112 mA	82%	330uF
MSH-1512DJ		±12 VDC	±84 mA	85%	220uF
MSH-1515DJ	±15 VDC	±67 mA	86%	220uF	
MSH-1524DJ	±24 VDC	±42 mA	87%	100uF	
MSH-243.3J	24VDC (±10%)	3.3 VDC	606 mA	81%	1500uF
MSH-2405J		5 VDC	400 mA	83%	1500uF
MSH-2409J		9 VDC	223 mA	85%	680uF
MSH-2412J		12 VDC	167 mA	87%	330uF
MSH-2415J		15 VDC	134 mA	88%	330uF
MSH-2424J		24 VDC	84 mA	87%	220uF
MSH-243.3DJ		±3.3 VDC	±303 mA	83%	680uF
MSH-2405DJ		±5 VDC	±200 mA	83%	680uF
MSH-2409DJ		±9 VDC	±112 mA	83%	330uF
MSH-2412DJ		±12 VDC	±84 mA	85%	220uF
MSH-2415DJ	±15 VDC	±67 mA	83%	220uF	
MSH-2424DJ	±24 VDC	±42 mA	87%	100uF	

1. The efficiency is test by nominal input and max. full load at 25°C.
2. The capacitive load is test by minimum input and constant resistive load.
3. Add "H" after P/N for isolation 2KVDC.
4. Add "P" after P/N for short circuit protection.

Part Number

MSH - 05 05 J

Input voltage Output voltage

Specifications

	Parameter	Conditions	Min.	Typ.	Max.	Unit	
Input	Input filter			Internal capacitors			
	Input voltage range		-10		+10	%	
Output	Voltage accuracy		-5		+5	%	
	Minimum load		0			%	
	Line regulation	LL to HL at 100% load		1.2% typ.@1% of Vin			
	Load regulation		Vo=3.3VDC			20	%
			Vo=5VDC			15	%
		(10% to 100% Load)	Vo=9~24 VDC			10	%
	Ripple & noise	@20MHZ BW (@Nominal Vin)			150	mVp-p	
Operating frequency	100% Load at Nominal Vin		20			KHz	

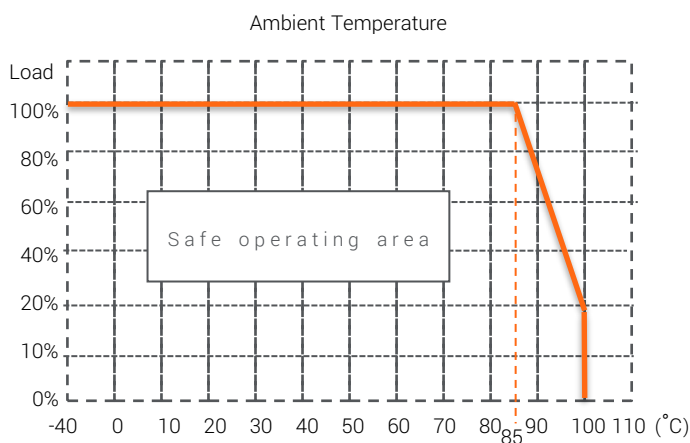
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	Parameter	Conditions	Min.	Typ.	Max.	Unit
Environment	Operating temperature		-40		100	°C
	Storage temperature		-55		125	°C
	Relative humidity		5		95	%RH
Function	Isolation voltage	1 sec., Input to output	1000			VDC
		Add suffix "H"	2000			VDC
	Isolation resistance		10			GΩ
	Isolation capacitance				120	pF
	Short circuit protection	Add suffix "P"		Continuous		
	MTBF	25°C			18.3*10 ⁶	Hours
	Vibration			MIL-STD-202G		
	Safety approvals			EN60950 / EN60601		
Physical	Case material			UL94V-0 black plastic		
	Potting material			Epoxy (UL94V-0)		
	Dimension			19.65x7.05x10.20 mm		
	Weight			2.8		g
EMC	EMI	EN55022		Class A/B		
	ESD	EN61000-4-2, Air±8kV, Contact±6kV		Criteria A		
	Radiated immunity	EN61000-4-3		Criteria A		
	Fast transient	EN61000-4-4, ±1kV		Criteria A		
	Surge	EN61000-4-5, ±0.5kV		Criteria A		
	Conducted immunity	EN61000-4-6		Criteria A		
	Magnetic field immunity	EN61000-4-8		Criteria A		

1. All specifications valid at nominal input voltage, full load and 25°C unless otherwise stated.
2. The product information and specifications are subject to change without prior notice.
3. In this datasheet, all test methods are based on our corporate standards.
4. All characteristics are for listed models, and non-standard models may perform differently. Please contact our technical support for more detail.
5. Please contact our technical support for any specific requirement.
6. "EMC filtering suggestion" is as following.

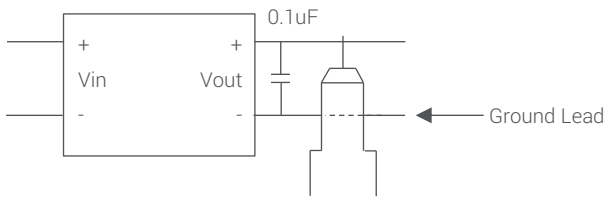
Derating Curve



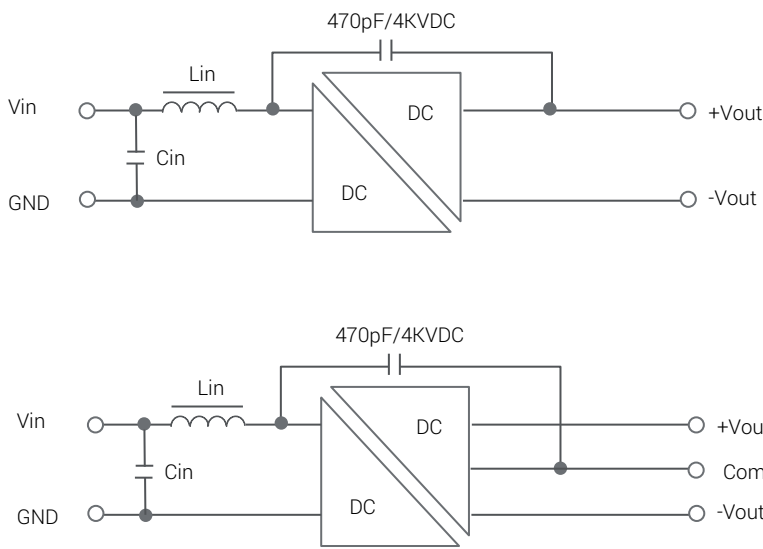
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Ripple & Noise Measure Method



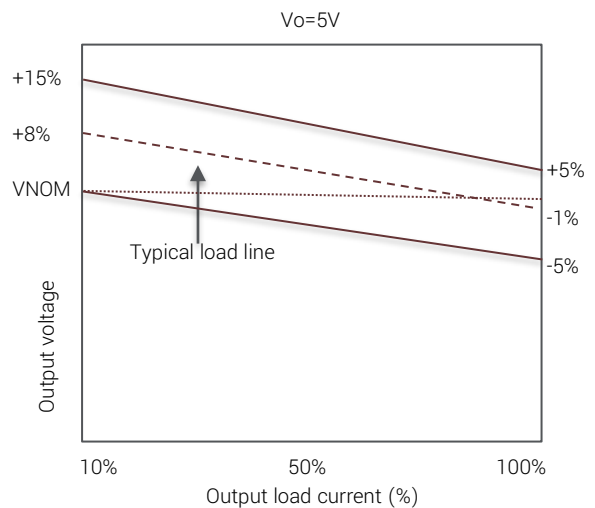
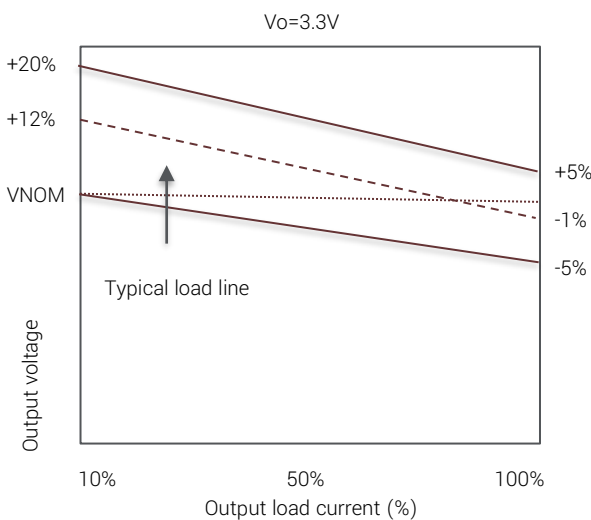
EMC Filtering-Suggestion For Class B



Part No.	Input voltage	Inductance/Capacitance (Lin/Cin)
MSH-J (Single output)	3.3 V	3.3µH/22µF
	5 V	4.7µH/10µF
	12 V	22µH/4.7µF
	15 V	22µH/4.7µF
	24 V	47µH/2.2µF
MSH-DJ (Dual output)	3.3 V	3.3µH/22µF
	5 V	4.7µH/10µF
	12 V	22µH/4.7µF
	15 V	22µH/4.7µF
	24 V	47µH/2.2µF

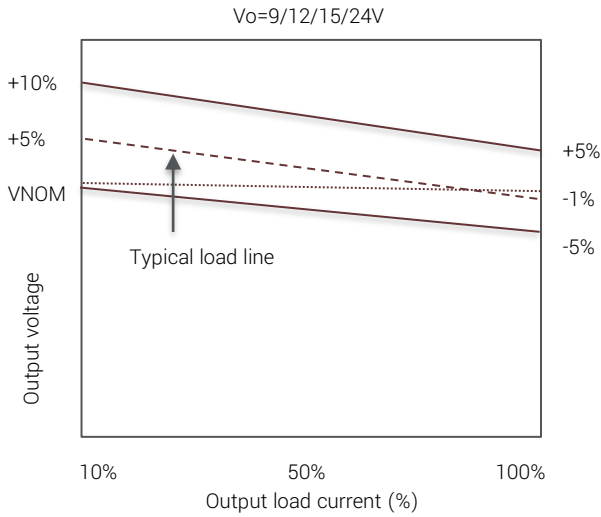
The external filter for EN55022 class B.

Tolerance Envelope

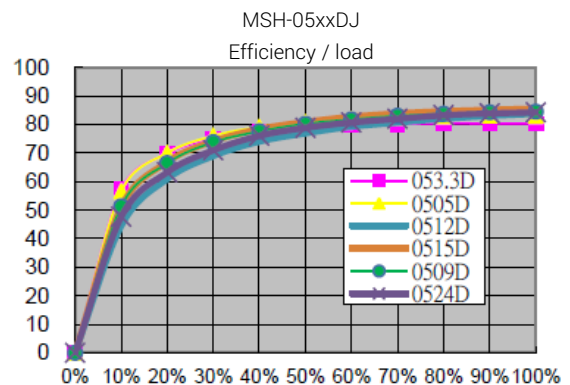
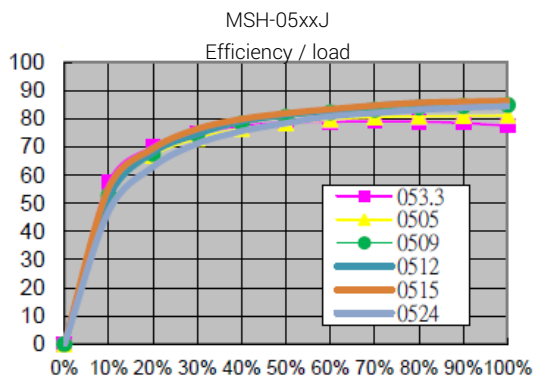
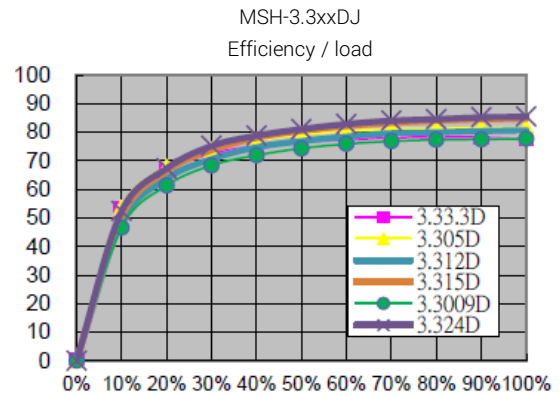
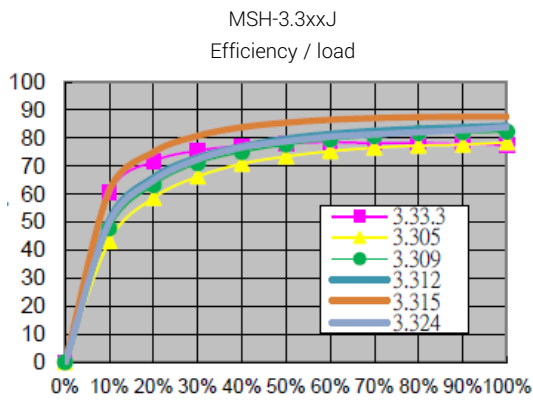


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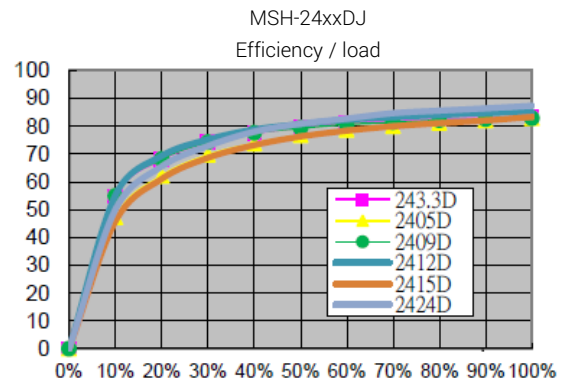
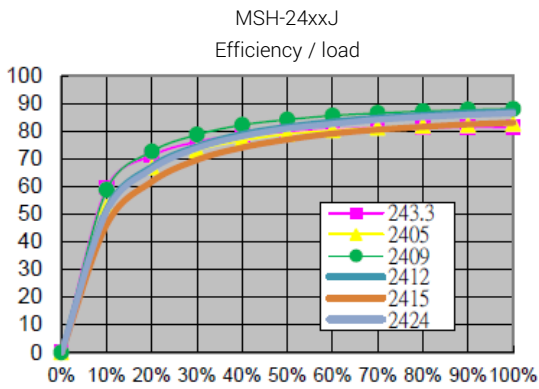
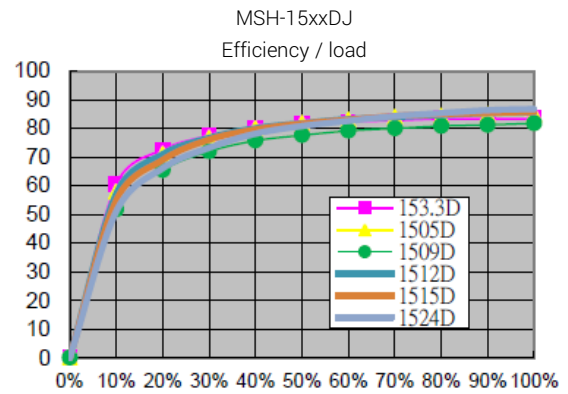
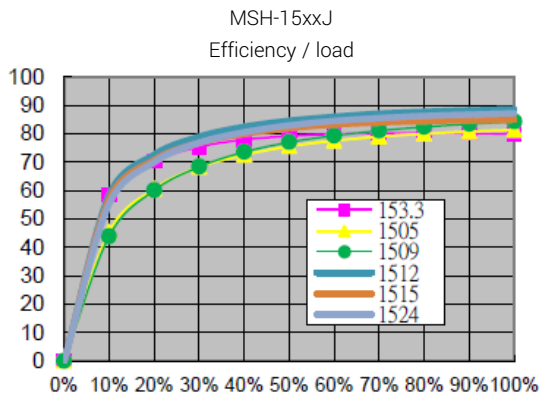
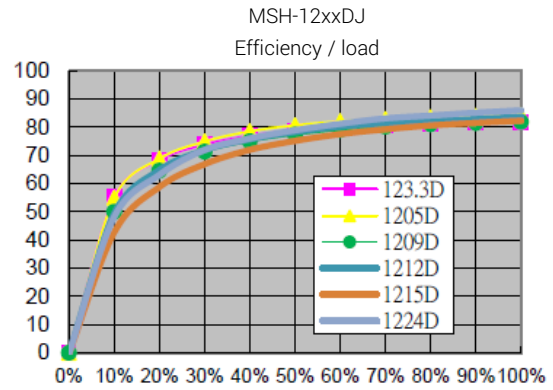
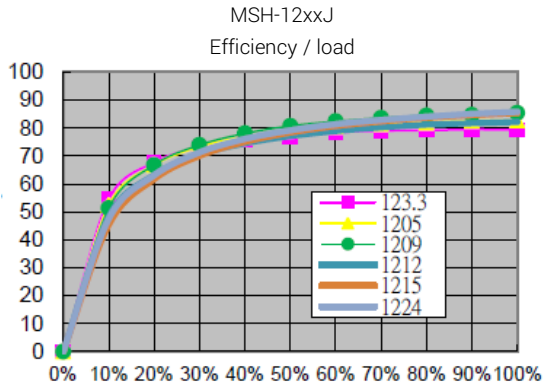


Efficiency Curve



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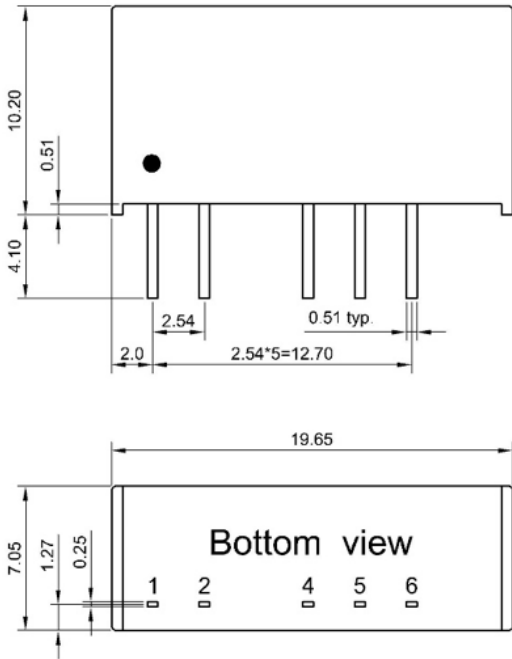
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Mechanical Dimension & Pinning



Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
4	NC	-Vout
5	-Vout	Com.
6	+Vout	+Vout

NC= No Connection

Unit: mm

TOL.: ±0.25mm

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