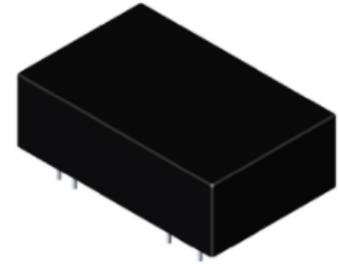


Features

- 2 Watts output power
- 1:1 input voltage range
- 1KVDC/2KVDC isolation
- -40°C to +100°C operating temperature
- DIP14 Package
- EMC-EN55022
- 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.)	
MDH-3.33.3J	3.3VDC (± 10%)	3.3 VDC	606 mA	77%	1500uF	
MDH-3.305J		5 VDC	400 mA	78%	1500uF	
MDH-3.309J		9 VDC	223 mA	82%	680uF	
MDH-3.312J		12 VDC	167 mA	84%	330uF	
MDH-3.315J		15 VDC	134 mA	88%	330uF	
MDH-3.324J		24 VDC	84 mA	84%	220uF	
MDH-3.33.3DJ		±3.3 VDC	±303 mA	77%	680uF	
MDH-3.305DJ		±5 VDC	±200 mA	81%	680uF	
MDH-3.309DJ		±9 VDC	±112 mA	78%	330uF	
MDH-3.312DJ		±12 VDC	±84 mA	81%	220uF	
MDH-3.315DJ		±15 VDC	±67 mA	85%	220uF	
MDH-3.324DJ		±24 VDC	±42 mA	85%	100uF	
MDH-053.3J		5VDC (± 10%)	3.3 VDC	606 mA	78%	1500uF
MDH-0505J			5 VDC	400 mA	81%	1500uF
MDH-0509J			9 VDC	223 mA	85%	680uF
MDH-0512J	12 VDC		167 mA	86%	330uF	
MDH-0515J	15 VDC		134 mA	86%	330uF	
MDH-0524J	24 VDC		84 mA	85%	220uF	
MDH-053.3DJ	±3.3 VDC		±303 mA	80%	680uF	
MDH-0505DJ	±5 VDC		±200 mA	83%	680uF	
MDH-0509DJ	±9 VDC		±112 mA	84%	330uF	
MDH-0512DJ	±12 VDC		±84 mA	84%	220uF	
MDH-0515DJ	±15 VDC		±67 mA	86%	220uF	
MDH-0524DJ	±24 VDC		±42 mA	84%	100uF	
MDH-123.3J	12VDC (± 10%)		3.3 VDC	606 mA	79%	1500uF
MDH-1205J			5 VDC	400 mA	83%	1500uF
MDH-1209J			9 VDC	223 mA	85%	680uF
MDH-1212J		12 VDC	167 mA	82%	330uF	
MDH-1215J		15 VDC	134 mA	85%	330uF	
MDH-1224J		24 VDC	84 mA	86%	220uF	
MDH-123.3DJ		±3.3 VDC	±303 mA	82%	680uF	
MDH-1205DJ		±5 VDC	±200 mA	84%	680uF	
MDH-1209DJ		±9 VDC	±112 mA	82%	330uF	
MDH-1212DJ		±12 VDC	±84 mA	84%	220uF	
MDH-1215DJ		±15 VDC	±67 mA	82%	220uF	
MDH-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.)
MDH-153.3J	15VDC (±10%)	3.3 VDC	606 mA	80%	1500uF
MDH-1505J		5 VDC	400 mA	81%	1500uF
MDH-1509J		9 VDC	223 mA	84%	680uF
MDH-1512J		12 VDC	167 mA	88%	330uF
MDH-1515J		15 VDC	134 mA	85%	330uF
MDH-1524J		24 VDC	84 mA	87%	220uF
MDH-153.3DJ		±3.3 VDC	±303 mA	83%	680uF
MDH-1505DJ		±5 VDC	±200 mA	85%	680uF
MDH-1509DJ		±9 VDC	±112 mA	82%	330uF
MDH-1512DJ		±12 VDC	±84 mA	85%	220uF
MDH-1515DJ		±15 VDC	±67 mA	86%	220uF
MDH-1524DJ		±24 VDC	±42 mA	87%	100uF
MDH-243.3J		24VDC (±10%)	3.3 VDC	606 mA	81%
MDH-2405J	5 VDC		400 mA	83%	1500uF
MDH-2409J	9 VDC		223 mA	85%	680uF
MDH-2412J	12 VDC		167 mA	87%	330uF
MDH-2415J	15 VDC		134 mA	88%	330uF
MDH-2424J	24 VDC		84 mA	87%	220uF
MDH-243.3DJ	±3.3 VDC		±303 mA	83%	680uF
MDH-2405DJ	±5 VDC		±200 mA	83%	680uF
MDH-2409DJ	±9 VDC		±112 mA	83%	330uF
MDH-2412DJ	±12 VDC		±84 mA	85%	220uF
MDH-2415DJ	±15 VDC		±67 mA	83%	220uF
MDH-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

M D H - 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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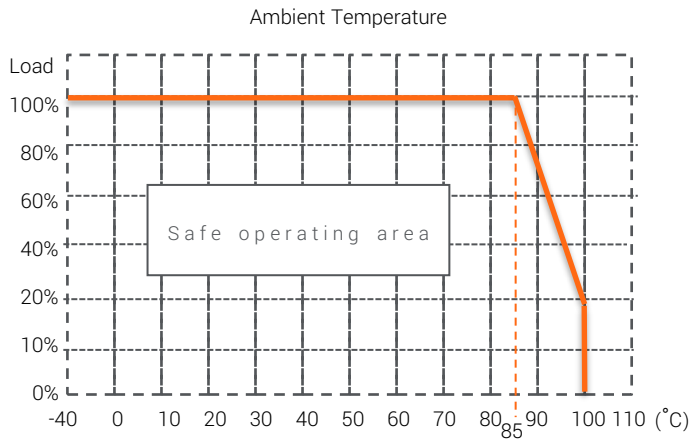
	Parameter	Conditions	Min.	Typ.	Max.	Unit
Environment	Operating temperature		-40		100	°C
	Storage temperature		-55		125	°C
	Relative humidity		5		95	%RH
Function	Isolation voltage	1 sec., Input to output	1000			VDC
		Add suffix "H"	2000			VDC
	Isolation resistance		10			GΩ
	Isolation capacitance				120	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			19.90x10.00x7.10 mm		
	Weight			2.8		g
EMC	EMI	EN 55022		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. "EMC filtering suggestion" is as following.
2. In this datasheet, all test methods are based on our corporate standards.
3. The product information and specifications are subject to change without prior notice.
4. All specifications valid at nominal input voltage, full load and 25°C unless otherwise stated.
5. All characteristics are for listed models, and non-standard models may perform differently. Please contact our technical support for more detail.

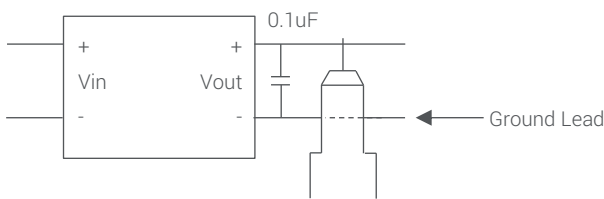
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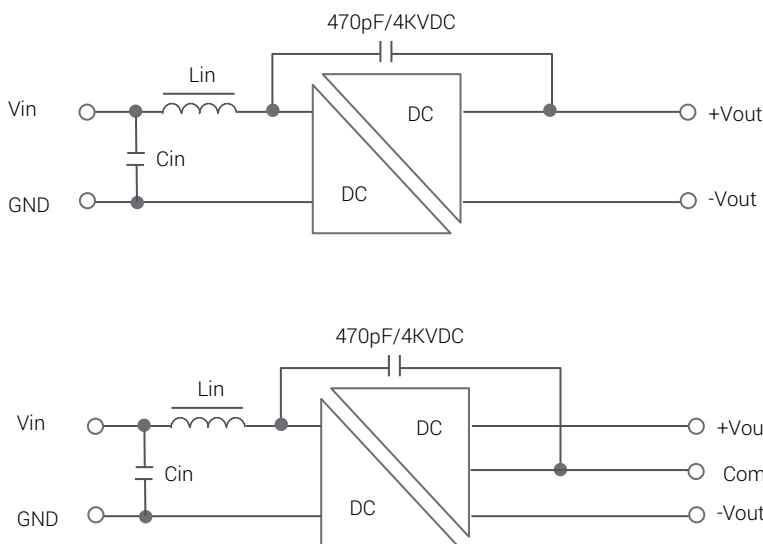
Derating Curve



Ripple & Noise Measure Method



EMC Filtering-Suggestion For Class B



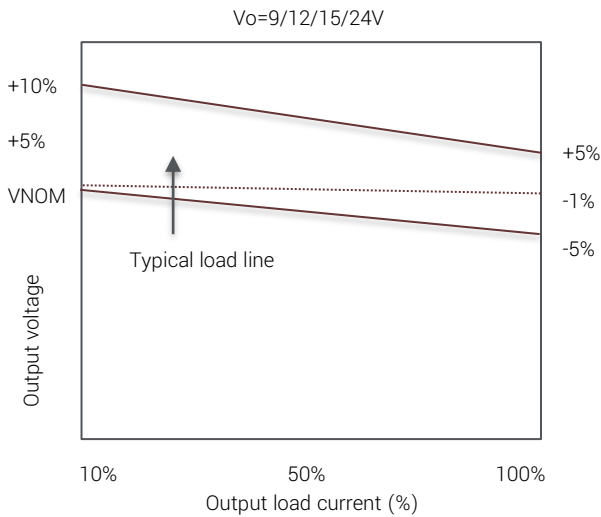
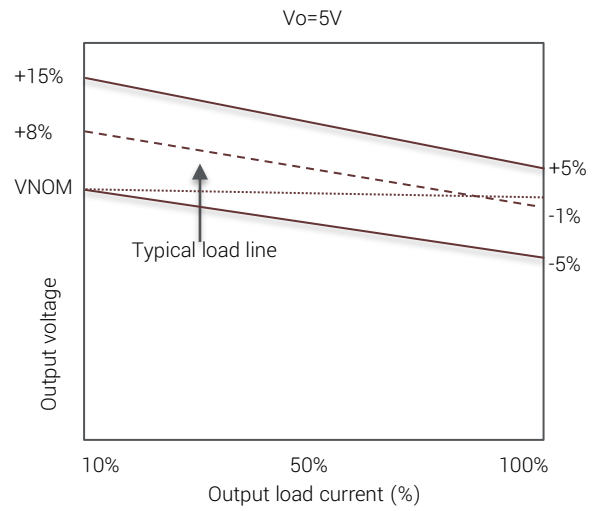
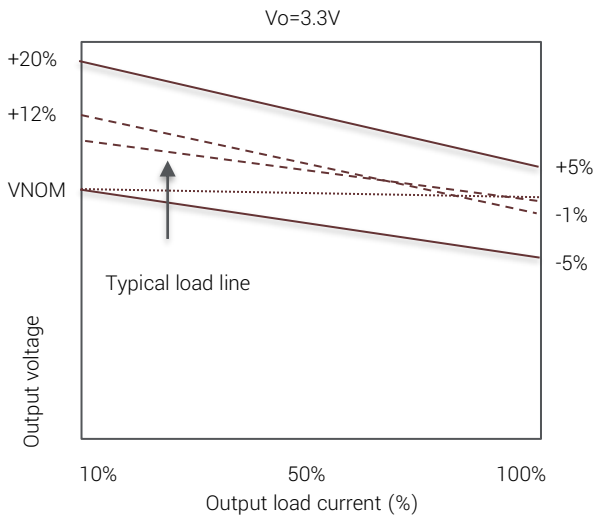
Part No.	Input voltage	Inductance/Capacitance (Lin/Cin)
MDH (Single output)	3.3 V	3.3µH/22µF
	5 V	4.7µH/10µF
	12 V	22µH/4.7µF
	15 V	22µH/4.7µF
	24 V	47µH/2.2µF
MDH-D (Dual output)	3.3 V	3.3µH/22µF
	5 V	4.7µH/10µF
	12 V	22µH/4.7µF
	15 V	22µH/4.7µF
	24 V	47µH/2.2µF

The external filter for meet EN55022 class B.

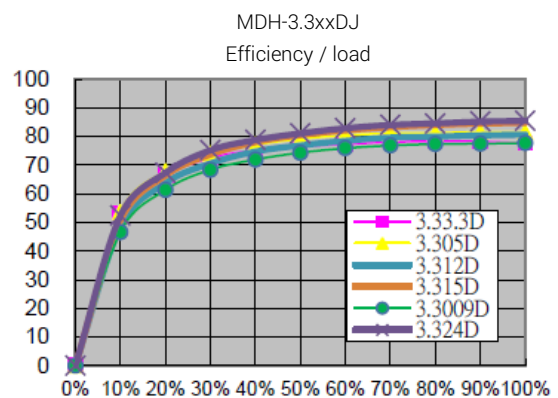
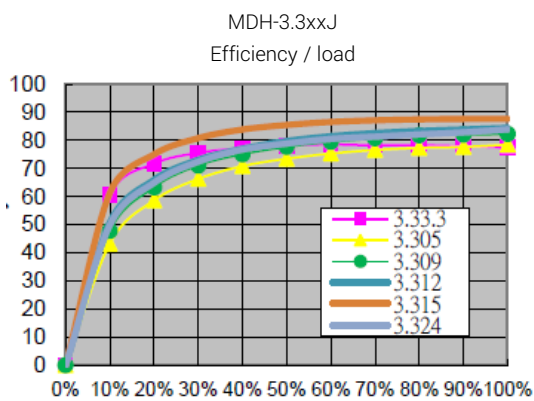
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Tolerance Envelope

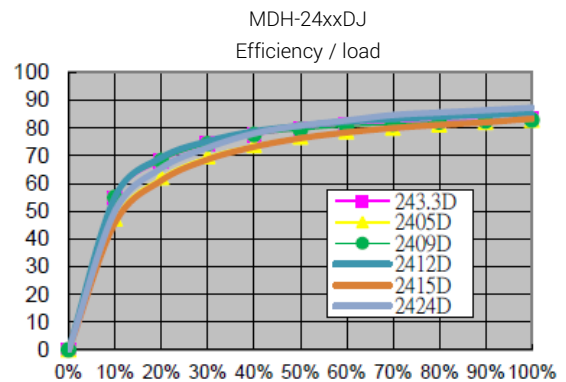
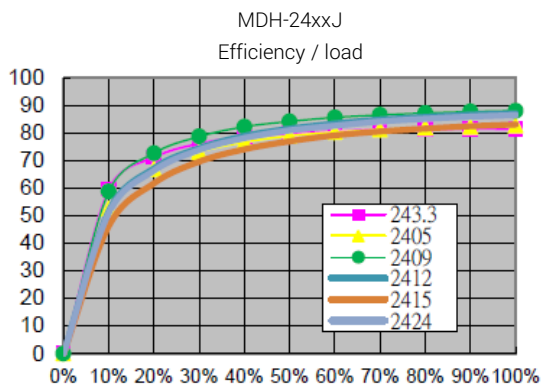
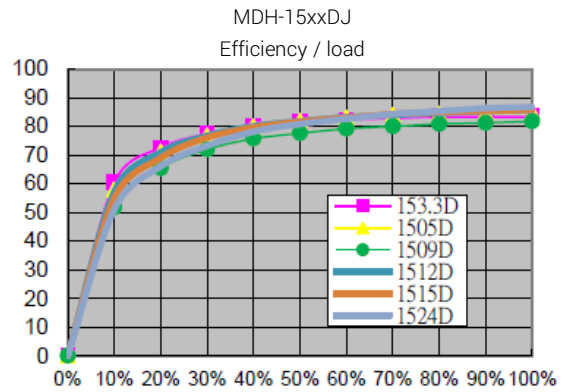
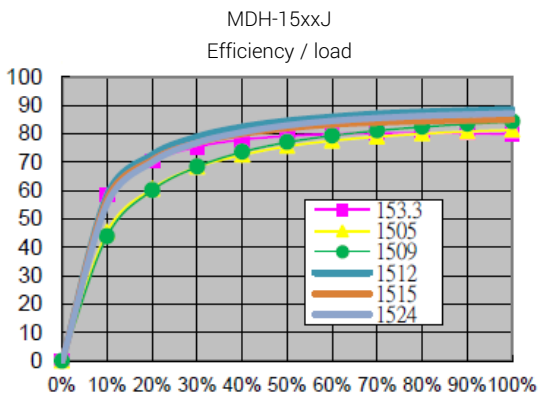
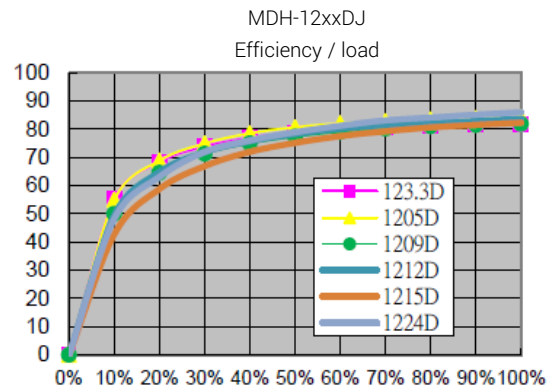
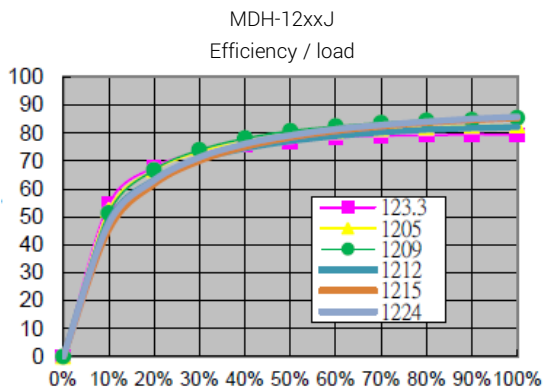
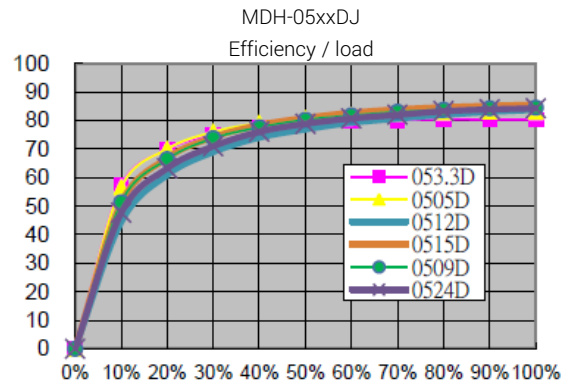
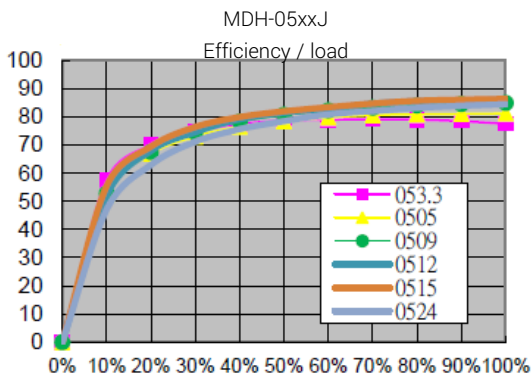


Efficiency Curve



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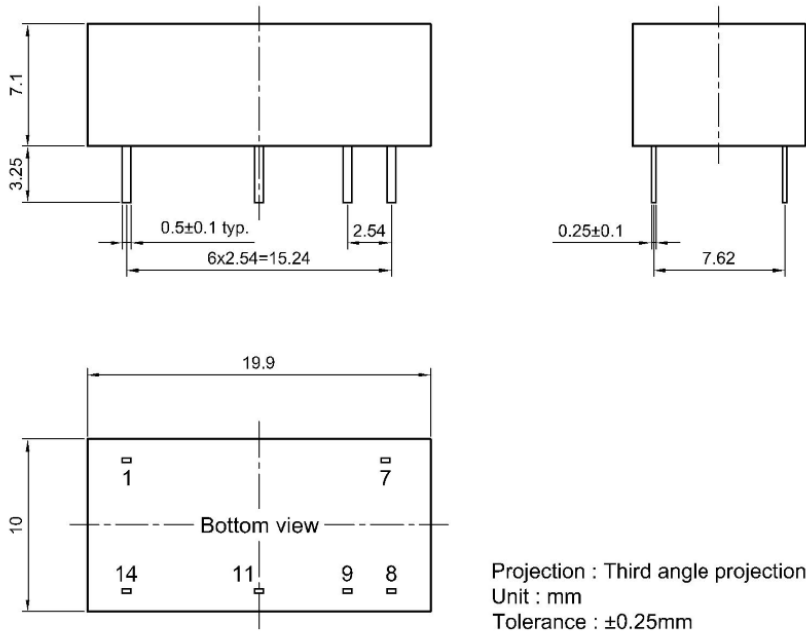
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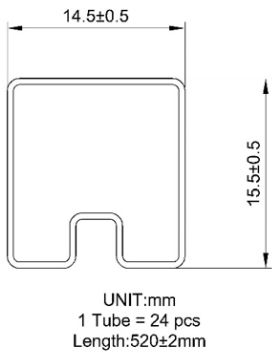
Mechanical Dimension & Pinning



Pin	Single	Dual
1	-Vin	-Vin
7	NC	NC
8	-Vout	Com
9	+Vout	+Vout
11	NC	-Vout
14	+Vin	+Vin

NC= No Connection

Package



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