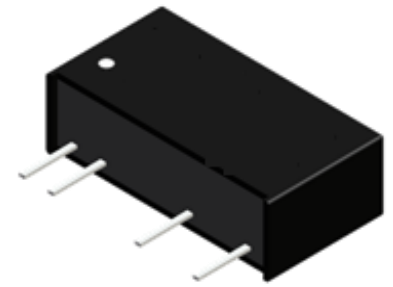


### Features

- 2 Watts output power
- 1:1 input voltage range
- 3KVDC/4KVDC isolation
- -40°C to +100°C operating temperature
- SIP7 Package
- Meet EN60950
- EMC-EN55022/55024
- RoHS compliant

### Application

- Industry control application
- Tele-communication application
- IGBT driver application
- SIC driver application



### Selection Guide

Part number	Input voltage	Output voltage	Output current @ full load	Efficiency <sup>(1)</sup> (min.)	Efficiency <sup>(1)</sup> (typ.)	Capacitive load <sup>(2)</sup> (max.)	
<b>MSVH-3.33.3J</b>	3.3VDC	3.3 VDC	606 mA	74%	77%	1500µF	
<b>MSVH-3.305J</b>		5 VDC	400 mA	75%	78%	1500µF	
<b>MSVH-3.309J</b>		9 VDC	223 mA	79%	82%	680µF	
<b>MSVH-3.312J</b>		12 VDC	167 mA	81%	84%	330µF	
<b>MSVH-3.315J</b>		15 VDC	134 mA	85%	88%	330µF	
<b>MSVH-3.324J</b>		24 VDC	84 mA	81%	84%	220µF	
<b>MSVH-3.33.3DJ</b>		±3.3 VDC	±303 mA	74%	77%	680µF	
<b>MSVH-3.305DJ</b>		±5 VDC	±200 mA	78%	81%	680µF	
<b>MSVH-3.309DJ</b>		±9 VDC	±112 mA	76%	79%	330µF	
<b>MSVH-3.312DJ</b>		±12 VDC	±84 mA	83%	86%	220µF	
<b>MSVH-3.315DJ</b>		±15 VDC	±67 mA	82%	85%	220µF	
<b>MSVH-3.324DJ</b>		±24 VDC	±42 mA	82%	85%	100µF	
<b>MSVH-053.3J</b>		5VDC	3.3 VDC	606 mA	74%	77%	1500µF
<b>MSVH-0505J</b>			5 VDC	400 mA	78%	81%	1500µF
<b>MSVH-0509J</b>	9 VDC		223 mA	82%	85%	680µF	
<b>MSVH-0512J</b>	12 VDC		167 mA	83%	86%	330µF	
<b>MSVH-0515J</b>	15 VDC		134 mA	83%	86%	330µF	
<b>MSVH-0524J</b>	24 VDC		84 mA	82%	85%	220µF	
<b>MSVH-053.3DJ</b>	±3.3 VDC		±303 mA	77%	80%	680µF	
<b>MSVH-0505DJ</b>	±5 VDC		±200 mA	80%	83%	680µF	
<b>MSVH-0509DJ</b>	±9 VDC		±112 mA	82%	85%	330µF	
<b>MSVH-0512DJ</b>	±12 VDC		±84 mA	81%	84%	220µF	
<b>MSVH-0515DJ</b>	±15 VDC		±67 mA	83%	86%	220µF	
<b>MSVH-0524DJ</b>	±24 VDC		±42 mA	81%	84%	100µF	
<b>MSVH-051509J</b>	15/-9 VDC		67/-111 mA	77%	80%	330/470µF	
<b>MSVH-052005J</b>	20/-5 VDC		50/-200 mA +/-80 mA	83% 82%	86% 85%	100/1500µF 100/1500µF	
<b>MSVH-123.3J</b>	12VDC	3.3 VDC	606 mA	76%	79%	1500µF	
<b>MSVH-1205J</b>		5 VDC	400 mA	80%	83%	1500µF	
<b>MSVH-1209J</b>		9 VDC	223 mA	82%	85%	680µF	
<b>MSVH-1212J</b>		12 VDC	167 mA	79%	82%	330µF	
<b>MSVH-1215J</b>		15 VDC	134 mA	82%	85%	330µF	
<b>MSVH-1224J</b>		24 VDC	84 mA	83%	86%	220µF	
<b>MSVH-123.3DJ</b>		±3.3 VDC	±303 mA	79%	82%	680µF	
<b>MSVH-1205DJ</b>		±5 VDC	±200 mA	81%	84%	680µF	
<b>MSVH-1209DJ</b>		±9 VDC	±112 mA	79%	82%	330µF	
<b>MSVH-1212DJ</b>		±12 VDC	±84 mA	81%	84%	220µF	

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Part number	Input voltage	Output voltage	Output current @ full load	Efficiency <sup>(1)</sup> (min.)	Efficiency <sup>(1)</sup> (typ.)	Capacitive load <sup>(2)</sup> (max.)
<b>MSVH-1215DJ</b>	15VDC	±15 VDC	±67 mA	81%	84%	220µF
<b>MSVH-1224DJ</b>		±24 VDC	±42 mA	82%	85%	100µF
<b>MSVH-121503J</b>		15/-3 VDC	67/-334 mA	80%	83%	100/470µF
<b>MSVH-121505J</b>		15/-5 VDC	100/-100 mA	78%	81%	220/680µF
<b>MSVH-121509J</b>		15/-9 VDC	67/-111 mA	80%	83%	330/470µF
<b>MSVH-122005J</b>		20/-5 VDC	50/-200 mA +/-80 mA	83% 83%	86% 86%	100/1500µF 100/1500µF
<b>MSVH-153.3J</b>		3.3 VDC	606 mA	77%	80%	1500µF
<b>MSVH-1505J</b>		5 VDC	400 mA	78%	81%	1500µF
<b>MSVH-1509J</b>		9 VDC	223 mA	81%	84%	680µF
<b>MSVH-1512J</b>		12 VDC	167 mA	85%	88%	330µF
<b>MSVH-1515J</b>		15 VDC	134 mA	82%	85%	330µF
<b>MSVH-1524J</b>		24 VDC	84 mA	84%	87%	220µF
<b>MSVH-153.3DJ</b>		±3.3 VDC	±303 mA	80%	83%	680µF
<b>MSVH-1505DJ</b>		±5 VDC	±200 mA	82%	85%	680µF
<b>MSVH-1509DJ</b>		±9 VDC	±112 mA	80%	83%	330µF
<b>MSVH-1512DJ</b>		±12 VDC	±84 mA	82%	85%	220µF
<b>MSVH-1515DJ</b>		±15 VDC	±67 mA	83%	86%	220µF
<b>MSVH-1524DJ</b>		±24 VDC	±42 mA	84%	87%	100µF
<b>MSVH-151202J</b>		12/-2 VDC	84/-500 mA	79%	82%	220/680µF
<b>MSVH-151504J</b>		15/-4 VDC	67/-250 mA	82%	85%	220/680µF
<b>MSVH-152005J</b>	20/-5 VDC	50/-200 mA +/-80 mA	83% 83%	86% 86%	100/1500µF 100/1500µF	
<b>MSVH-243.3J</b>	24VDC	3.3 VDC	606 mA	78%	81%	1500µF
<b>MSVH-2405J</b>		5 VDC	400 mA	80%	83%	1500µF
<b>MSVH-2409J</b>		9 VDC	223 mA	82%	85%	680µF
<b>MSVH-2412J</b>		12 VDC	167 mA	84%	87%	330µF
<b>MSVH-2415J</b>		15 VDC	134 mA	81%	84%	330µF
<b>MSVH-2424J</b>		24 VDC	84 mA	85%	88%	220µF
<b>MSVH-243.3DJ</b>		±3.3 VDC	±303 mA	79%	82%	680µF
<b>MSVH-2405DJ</b>		±5 VDC	±200 mA	80%	83%	680µF
<b>MSVH-2409DJ</b>		±9 VDC	±112 mA	80%	83%	330µF
<b>MSVH-2412DJ</b>		±12 VDC	±84 mA	82%	85%	220µF
<b>MSVH-2415DJ</b>		±15 VDC	±67 mA	80%	83%	220µF
<b>MSVH-2424DJ</b>		±24 VDC	±42 mA	84%	87%	100µF
<b>MSVH-241509J</b>		15/-9 VDC	67/-111 mA	76%	79%	330/470µF
<b>MSVH-242005J</b>		20/-5 VDC	50/-200 mA +/-80 mA	84% 84%	87% 87%	100/1500µF 100/1500µF

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 4KVDC.
4. Add "P" after P/N for short circuit protection.

## Part Number

**MSVH - 05 1509J**  
 ↓                      ↓                      ↓  
 Model number      Input voltage      Output voltage

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## Specifications

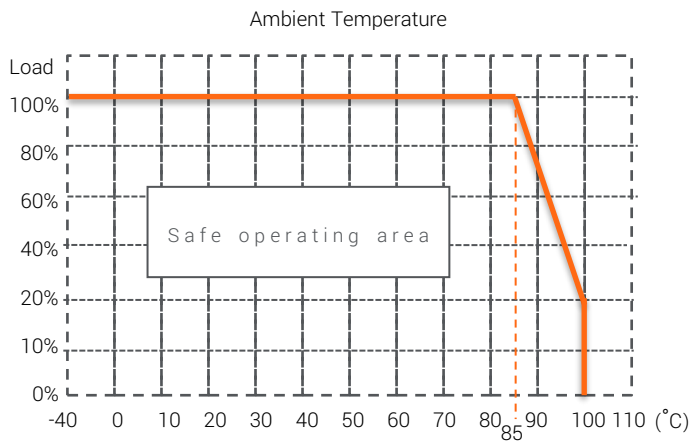
	Parameter	Conditions	Min.	Typ.	Max.	Unit	
Input	Input filter			Internal capacitors			
	Input voltage range		-10		+10	%	
Output	Voltage accuracy		-5		+5	%	
	Minimum load		0			%	
	Line regulation	LL to HL at 100% load		1.2% typ.@1% of Vin			
	Load regulation (10% to 100% load)	Vo= 3.3VDC				20	%
		Vo= 2/ 5VDC				15	%
		Vo= 4/ 9/ 12/ 15/ 20/ 24VDC				10	%
	Ripple & noise	@20MHZ BW (@Nominal Vin)				150	mVp-p
Operating frequency	100% Load at Nominal Vin		20			KHz	
Environment	Operating temperature		-40		100	°C	
	Storage temperature		-55		125	°C	
	Max. case temperature				105	°C	
	Relative Humidity		5		95	%RH	
Function	Isolation voltage	1 sec., Input to output	3			KVDC	
		Add suffix "H"	4			KVDC	
	Isolation resistance		10			GΩ	
	Isolation capacitance				120	pF	
	Short circuit protection	Add suffix "P"			Continuous		
	MTBF	25°C				18.3*10 <sup>6</sup>	Hours
		85°C				8.07*10 <sup>6</sup>	Hours
	Vibration				MIL-STD-202G		
	Safety approvals				Meet 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			

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

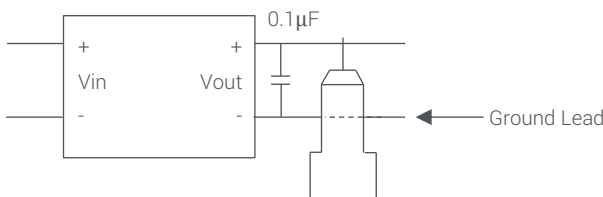
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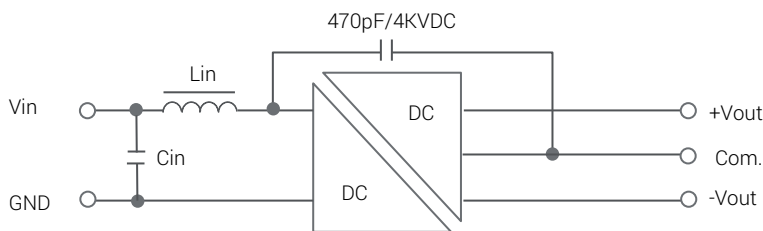
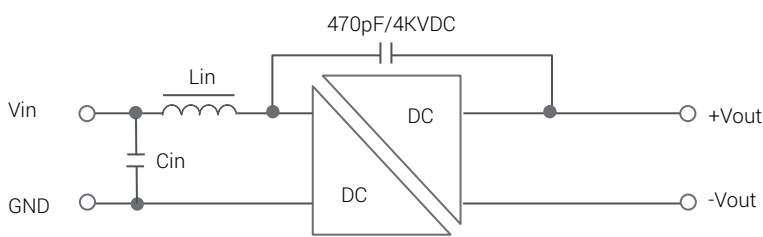
## Derating Curve



## Ripple & Noise Measure Method



## EMC filtering-suggestion for Class B



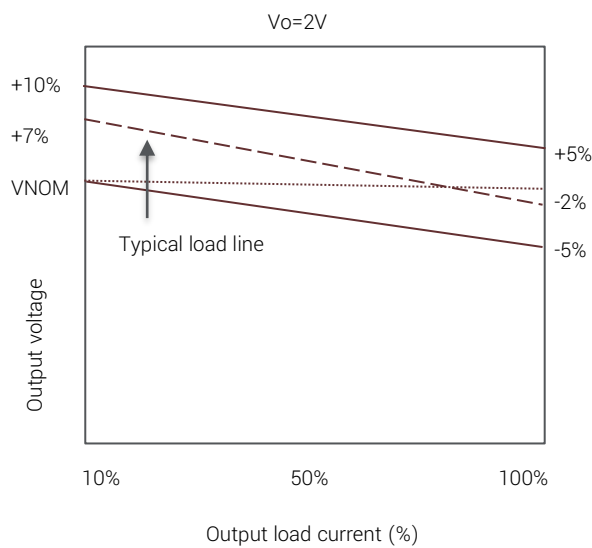
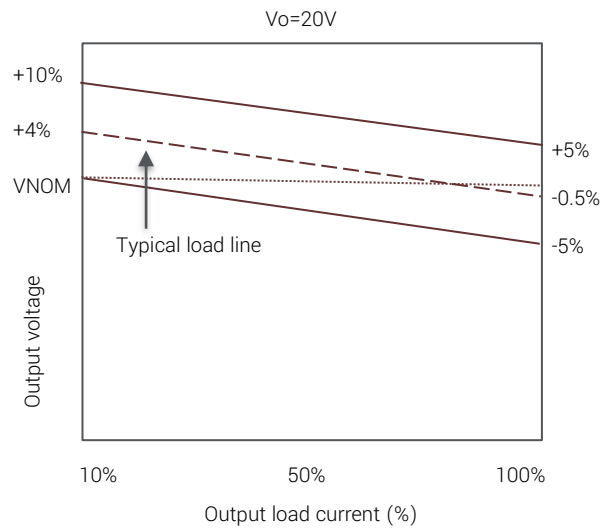
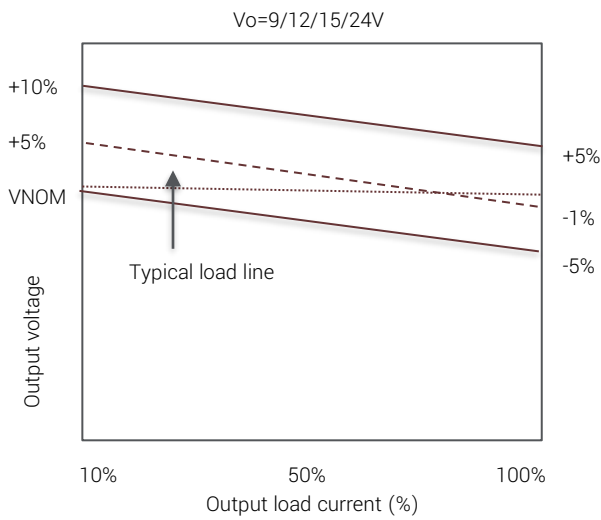
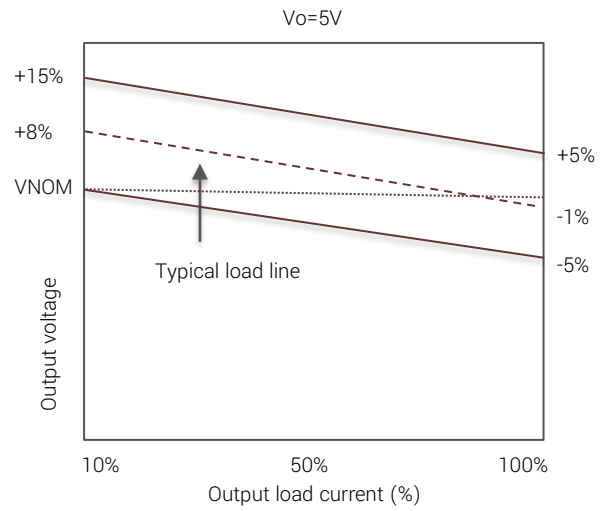
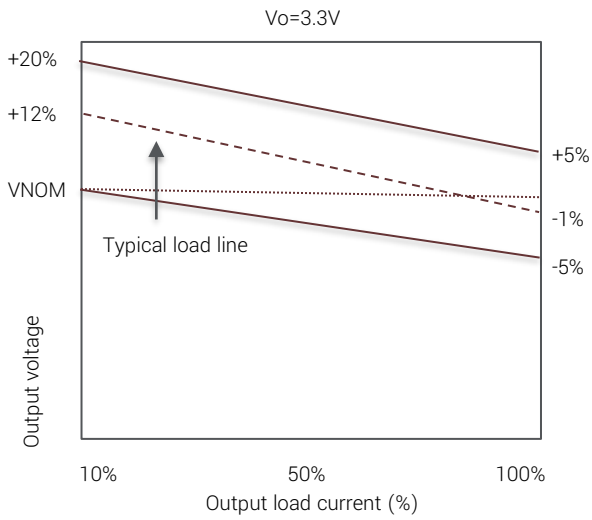
Part No.	Input voltage	Inductance/Capacitance (Lin/Cin)
<b>MSVH-J</b> (Single output)	3.3 V	3.3µH/22µF
	5 V	4.7µH/10µF
	12 V	22µH/4.7µF
	15 V	22µH/4.7µF
	24 V	47µH/2.2µF
<b>MSVH-DJ</b> (Dual output)	3.3 V	3.3µH/22µF
	5 V	4.7µH/10µF
	12 V	22µH/4.7µF
	15 V	22µH/4.7µF
	24 V	47µH/2.2µF

The external filter for EN55022 class B.

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# Tolerance Envelope

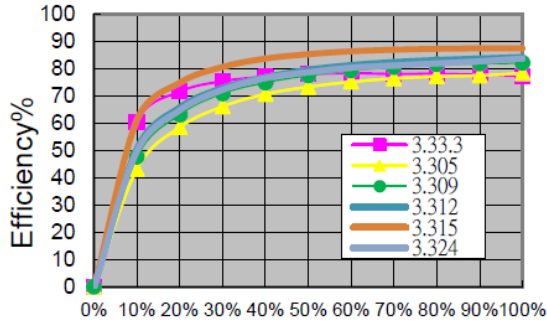


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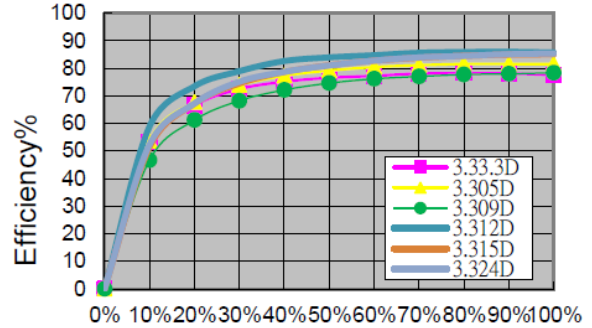
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# Efficiency Curve

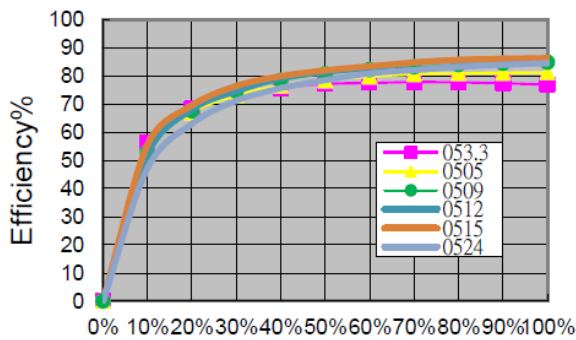
MSVH-3.3xx J  
Efficiency / load



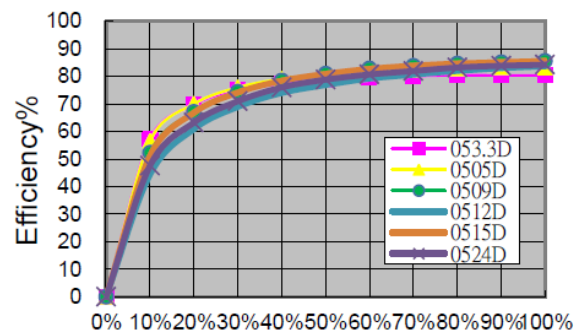
MSVH-3.3xxD J  
Efficiency / load



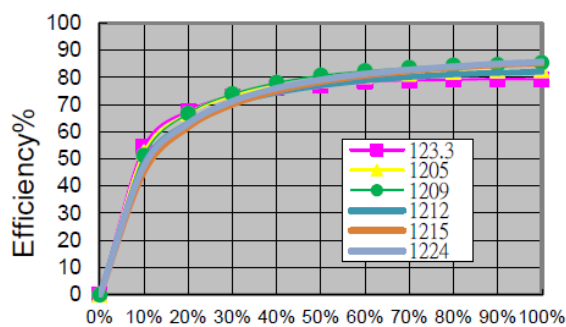
MSVH-05xx J  
Efficiency / load



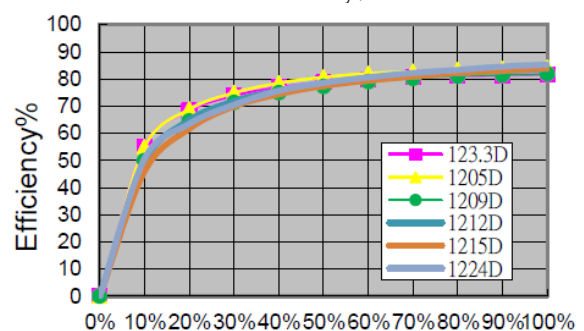
MSVH-05xxD J  
Efficiency / load



MSVH-12xx J  
Efficiency / load

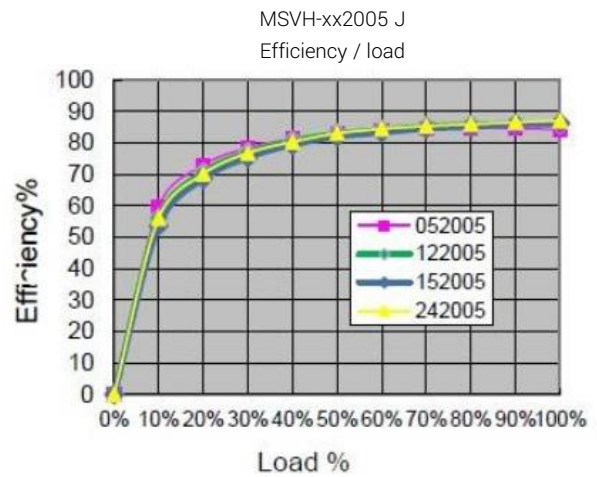
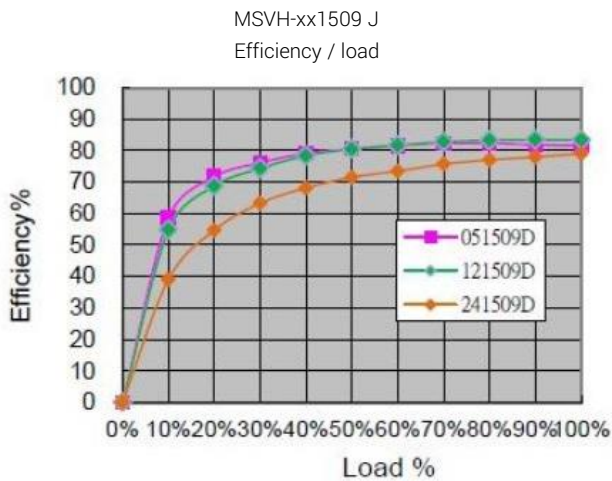
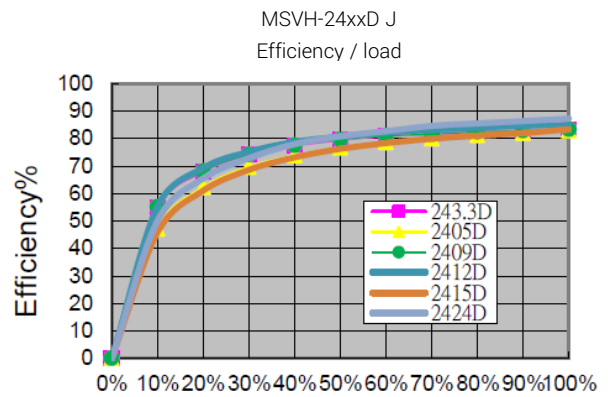
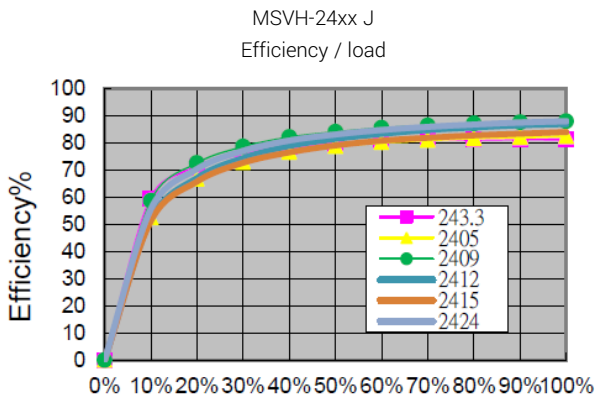
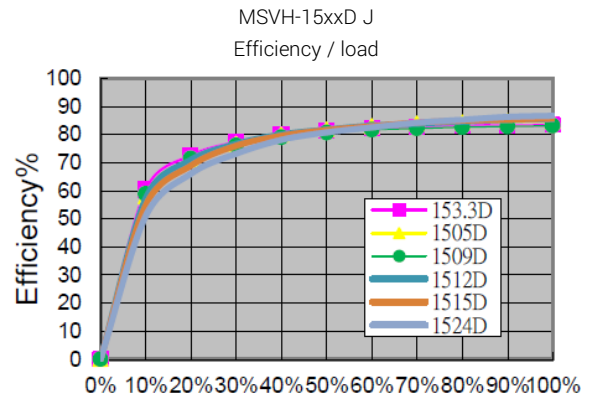
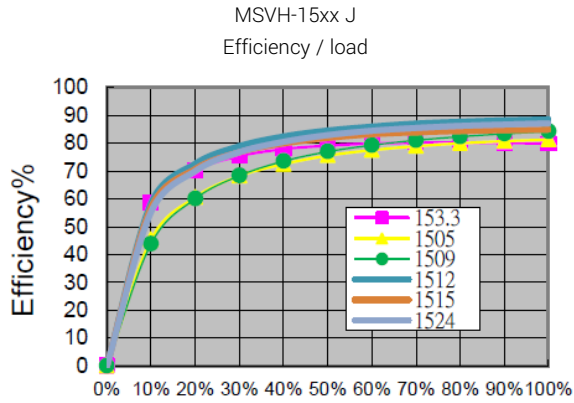


MSVH-12xxD J  
Efficiency / load



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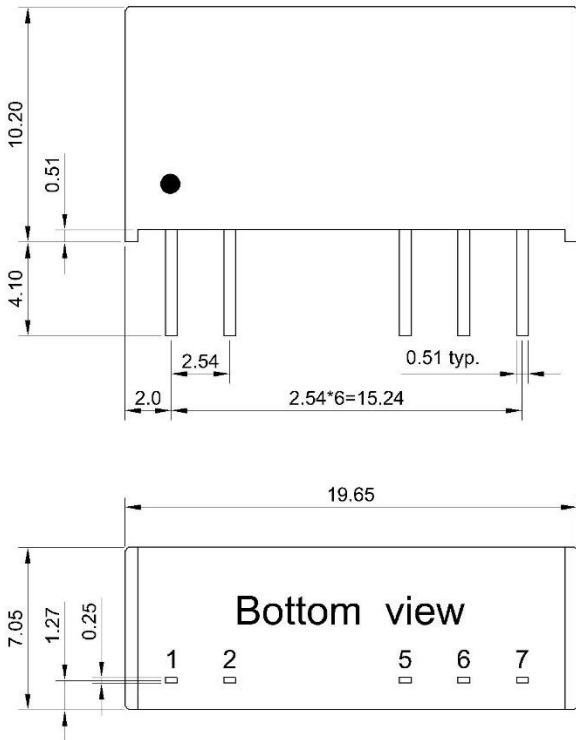
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## Mechanical Dimension & Pinning

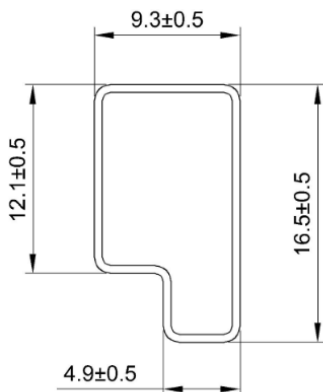


Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
5	-Vout	-Vout
6	No Pin	Com.
7	+Vout	+Vout

Unit: mm

TOL.: ±0.25mm

## Package



UNIT:mm  
 1 Tube = 25 pcs  
 Length:520±2mm

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