FEATURES

- Low Cost
- RoHS Compliant
- Efficiency up to 81%
- 3000VDC I/O Isolation
- Single and Dual Outputs
- MTBF > 2,000,000 Hours
- Internal SMT Construction
- UL94V-0 Packing Material
- Operating Temperature: -25°C to +75°C
- 5, 12, and 24VDC Input Voltages Available

DESCRIPTION

The MSLUH series power modules are 1W DC/DC converters that are specially designed to provide high levels of isolation (3000VDC) in a miniature "gull-wing" SMT package. These converters operate over input voltage ranges of 4.5~5.5VDC, 10.8~13.2VDC, and 21.6~26.4VDC. This series also has single and dual output voltages of 3.3, 5, 12, 15, ±5, ±12, and ±15VDC. These converters impressive efficiencies enable them to deliver their fully rated output power from –25°C to +75°C without a heat sink or forced-air cooling. These converters are useful for a variety of applications including distributed power systems, data communication equipment, telecommunication equipment, and industrial robot systems.

SPECIFICATIONS: *MSLUH Series*

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	Nom	Max	Unit
INPUT (V_{in})					
Input Voltage Range	5V nominal input models	4.5	5	5.5	VDC
	12V nominal input models	10.8	12	13.2	
	24V nominal input models	21.6	24	26.4	
Reverse Polarity Input Current	All models			0.3	A
Input Surge Voltage (1000ms)	5V nominal input models	-0.7		9	VDC
	12V nominal input models	-0.7		18	
	24V nominal input models	-0.7		30	
Input Filter	All models	Internal Capacitor			
OUTPUT (V_o)					
Output Voltage		See Model Selection Table			
Output Voltage Balance	Dual Output, Balanced Loads		±0.1	±1.0	%
Load Regulation	Io = 20% to 100%	See Model Selection Table			
Line Regulation	For Vin Change of 1%		±1.2	±1.5	%
Output Power				1	W
Output Current		See Model Selection Table			
Ripple & Noise (20MHz)			75	100	mV_{pk-pk}
Ripple & Noise (20MHz)	Over Line, Over Load, and Over Temperature			150	mV_{pk-pk}
Ripple & Noise (20MHz)				15	mVrms
PROTECTION					
Short Circuit Protection		0.5 seconds max.			
Input Fuse Recommendation	5V nominal input models	500mA slow-blow type			
	12V nominal input models	200mA slow-blow type			
	24V nominal input models	100mA slow-blow type			
GENERAL					
Efficiency		See Model Selection Table			
Switching Frequency		50	100	150	KHz
Isolation Voltage Rated *(See Note 6)*	60 seconds	3000			VDC
Isolation Voltage Test	Flash Test for 1 second	3300			VDC
Isolation Resistance	500VDC	10			GΩ
Isolation Capacitance	100KHz, 1V		60	100	pF
Internal Power Dissipation				550	mW
Max. Capacitive Load		See Model Selection Table			
ENVIRONMENTAL					
Operating Temperature (Ambient)	Ambient	-25		+75	°C
Operating Temperature (Case)	Case	-25		+90	°C
Storage Temperature		-25		+125	°C
Lead Temperature	1.5mm from case for 10 seconds			300	°C
Humidity				95	%
Cooling		Free air convection			
Temperature Coefficient			±0.01	±0.02	%/°C
MTBF	MIL-HDBK-217F @ 25°C, Ground Benign	2,000,000 hours			
PHYSICAL					
Weight		0.07oz (2g)			
Dimensions (L x W x H)		0.64 x 0.31 x 0.30 inches 16.3 x 8.0 x 7.67 mm			
Case Material		Non-conductive black plastic			
Flammability		UL94V-0			

MODEL SELECTION TABLES

SINGLE OUTPUT MODELS									
Model Number	Input Voltage	Output Voltage	Output Current[1]		Input Current		Max. Load Regulation	Efficiency[2]	Maximum Capacitive Load
			Min	Max	No Load	Max Load			
MSLU5S33-260H	5 VDC (4.5 ~ 5.5 VDC)	3.3 VDC	5mA	260mA	30mA	238mA	10%	72%	33µF
MSLU5S05-200H		5 VDC	4mA	200mA		267mA	10%	75%	33µF
MSLU5S12-84H		12 VDC	2mA	84mA		255mA	7%	79%	4.7µF
MSLU5S15-67H		15 VDC	1.5mA	67mA		251mA	7%	80%	4.7µF
MSLU12S33-260H	12 VDC (10.8 ~ 13.2 VDC)	3.3 VDC	5mA	260mA	15mA	98mA	10%	73%	33µF
MSLU12S05-200H		5 VDC	4mA	200mA		110mA	8%	76%	33µF
MSLU12S12-84H		12 VDC	2mA	84mA		105mA	5%	80%	4.7µF
MSLU12S15-67H		15 VDC	1.5mA	67mA		103mA	5%	81%	4.7µF
MSLU24S33-260H	24 VDC (21.6 ~ 26.4 VDC)	3.3 VDC	5mA	260mA	8mA	51mA	10%	70%	33µF
MSLU24S05-200H		5 VDC	4mA	200mA		57mA	8%	73%	33µF
MSLU24S12-84H		12 VDC	2mA	84mA		53mA	5%	79%	4.7µF
MSLU24S15-67H		15 VDC	1.5mA	67mA		53mA	5%	79%	4.7µF

DUAL OUTPUT MODELS									
Model Number	Input Voltage	Output Voltage	Output Current[1]		Input Current		Max. Load Regulation	Efficiency[2]	Maximum Capacitive Load
			Min	Max	No Load	Max Load			
MSLU5D05-100H	5 VDC (4.5 ~ 5.5 VDC)	±5 VDC	±2	±100	30mA	267mA	10%	75%	10µF
MSLU5D12-42H		±12 VDC	±0.8	±42		255mA	7%	79%	2.2µF
MSLU5D15-34H		±15 VDC	±0.7	±34		255mA	7%	80%	2.2µF
MSLU12D05-100H	12 VDC (10.8 ~ 13.2 VDC)	±5 VDC	±2	±100	15mA	110mA	8%	76%	10µF
MSLU12D12-42H		±12 VDC	±0.8	±42		105mA	5%	80%	2.2µF
MSLU12D15-34H		±15 VDC	±0.7	±34		106mA	5%	80%	2.2µF
MSLU24D05-100H	24 VDC (21.6 ~ 26.4 VDC)	±5 VDC	±2	±100	8mA	57mA	8%	73%	10µF
MSLU24D12-42H		±12 VDC	±0.8	±42		53mA	5%	79%	2.2µF
MSLU24D15-34H		±15 VDC	±0.7	±34		54mA	5%	79%	2.2µF

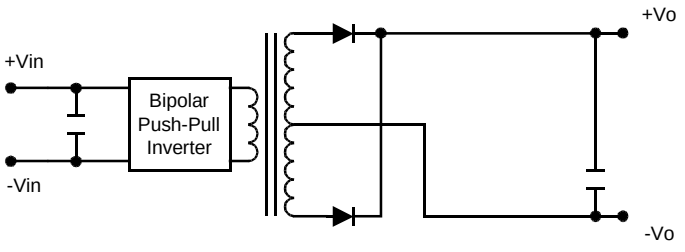
NOTES

1. The MSLUH series requires a minimum output loading to maintain specified regulations. Operation under no-load conditions will not damage these devices; however they may not meet all listed specifications.
2. Efficiency: typical value measured at full load.
3. All DC/DC converters should be externally fused at the front end for protection.
4. Other input and output voltages may be available, please contact factory.
5. It is not recommended to use water-washing processes on surface mount units.
6. For 1500VDC I/O isolation voltage see the MSLU series.

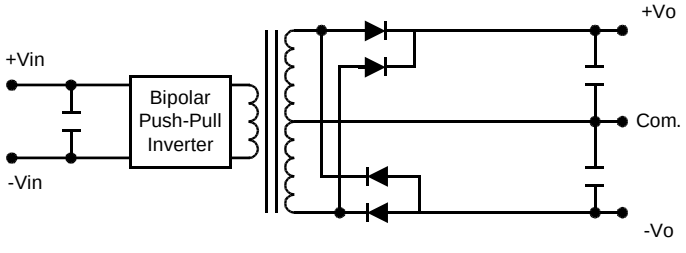
**Due to advances in technology, specifications are subject to change without notice.*

BLOCK DIAGRAMS

Single Output

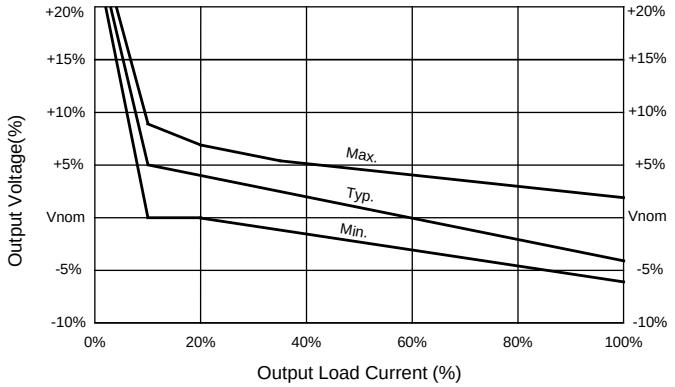


Dual Output



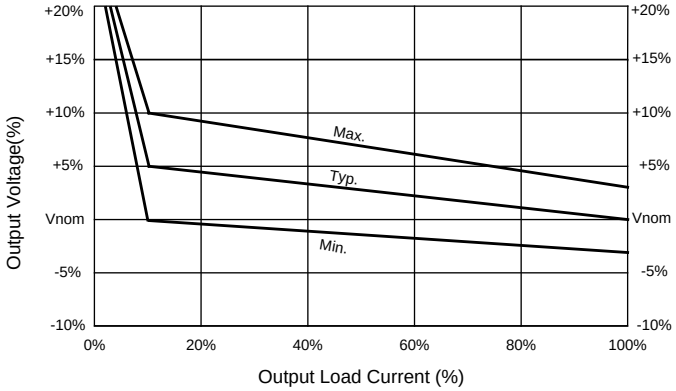
Tolerance Envelope Graph (3.3V & 5V Outputs)

3.3V & 5V output types.



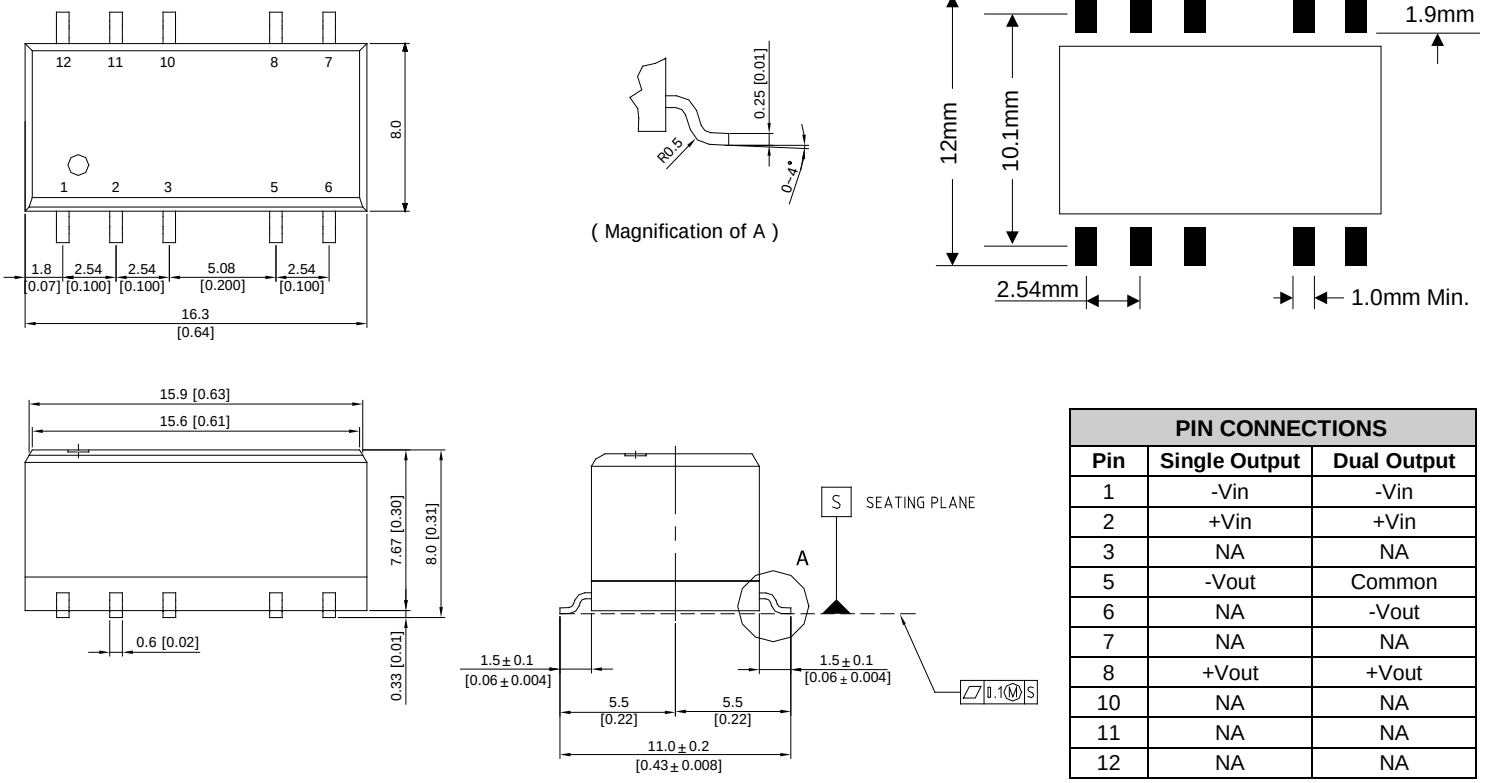
Tolerance Envelope Graph (All Other Outputs)

All other types.



MECHANICAL DRAWING

Unit: mm [inches]



PIN CONNECTIONS		
Pin	**Single Output**	**Dual Output**
1	-Vin	-Vin
2	+Vin	+Vin
3	NA	NA
5	-Vout	Common
6	NA	-Vout
7	NA	NA
8	+Vout	+Vout
10	NA	NA
11	NA	NA
12	NA	NA

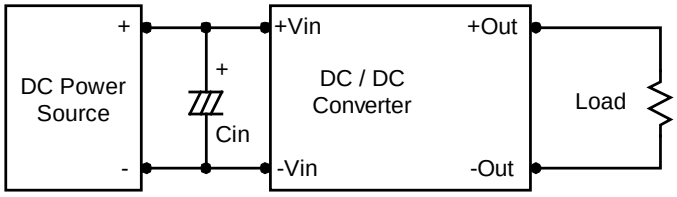
NA: Not available for electrical connection

1. Tolerance: X.X±0.25 [X.XX±0.01]
   X.XX±0.13 [X.XXX±0.005]
2. Pin: ±0.05 [±0.002]

DESIGN & FEATURE CONSIDERATONS

Input Source Impedance

The power module should be connected to a low ac-impedance input source. Highly inductive source impedances can affect the stability of the power module. In applications where power is supplied over long lines and output loading is high, it may be necessary to use a capacitor at the input to ensure startup. A capacitor mounted close to the power module helps ensure stability of the unit, it is recommended to use a good quality low Equivalent Series Resistance (ESR < 1.0Ω at 100KHz) capacitor of 2.2µF for the 5V input models, a 1.0µF for the 12V input models, and a 0.47µF for the 24V input models.



Maximum Capacitive Load

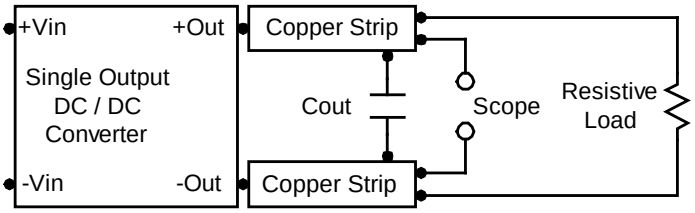
The MSLUH series has a limit of maximum connected capacitance at the output. The power module may be operated in current limiting mode during start-up, affecting the ramp-up and the startup time. The maximum capacitance can be found in the Model Selection Table.

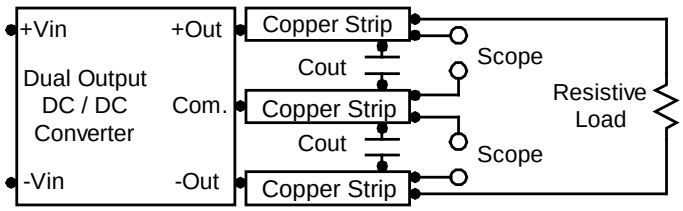
TEST CONFIGURATIONS

Peak-to-Peak Output Noise Measurement Test

Use a Cout 0.33µF ceramic capacitor.

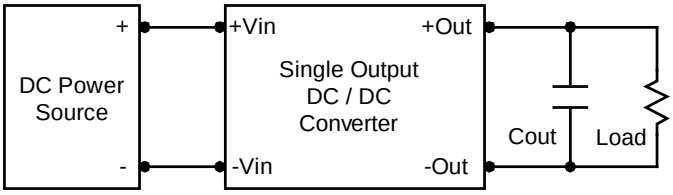
Scope measurement should be made by using a BNC socket; measurement bandwidth is 0 ~ 20MHz. Position the load between 50mm and 75mm from the DC/DC Converter.

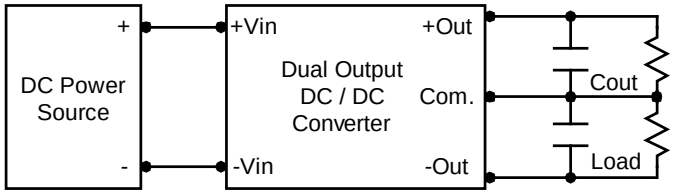




Output Ripple Reduction

A good quality low ESR capacitor placed as close as possible across the load will give the best ripple and noise performance. To reduce output ripple, it is recommended to use 1.0µF capacitors at the output.





Thermal Considerations

Many conditions affect the thermal performance of the power module, such as orientation, airflow over the module, and board spacing. To avoid exceeding the maximum temperature rating of the components inside the power module, the case temperature must be kept below 90°C. The derating curves are determined from measurements obtained in an experimental apparatus.

COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 40 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on time and on budget. Our ISO9001-2008 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.

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