Size: 2.28in x 1.45in x 0.50in
(57.9mm x 36.8mm x 12.7mm)

FEATURES

- Quarter Brick Package
- Wide Input Range
- High Efficiency
- No Minimum Load Requirement
- Remote On/Off
- Over Load, Short Circuit, Over Voltage, and Over Temperature Protection
- UL/cUL 60950-1 recognition (UL certificate), IEC/EN 60950-1 (CB-Report), EN 50155, IEC 60571

DESCRIPTION

The DCMQ75 series of DC/DC railway converters offers 75 watts of output power in a 2.28" x 1.45" x 0.50" quarter brick package. This series consists of single output models with wide input range and high efficiency. Each model in this series has no minimum load requirement, over load, short circuit, over voltage, and over temperature protection as well as remote on/off. This series has UL/cUL 60950-1 recognition (UL certificate), IEC/EN 60950-1 (CB-Report), EN 50155, IEC 60571 safety approvals.

MODEL SELECTION TABLE

Model Number[1]	Input Voltage Range	Output Voltage	Input Current		Max. Output Current	Maximum Capacitive Load	Over Voltage Protection	Efficiency	Reflected Ripple Current	Output Power
			No Load	Max Load						
DCMQ75-72S05	72VDC (43~101VDC)	5VDC	50mA	1170mA	15000mA	25500µF	6.2VDC	89%	35mA	75W
DCMQ75-72S12		12VDC	45mA	1132mA	6250mA	4400µF	15VDC	92%		
DCMQ75-72S15		15VDC	45mA	1132mA	5000mA	2800µF	18VDC	92%		
DCMQ75-72S24		24VDC	55mA	1145mA	3125mA	1100µF	30VDC	91%		
DCMQ75-110S05	110VDC (66~160VDC)	5VDC	40mA	766mA	15000mA	25500µF	6.2VDC	89%	35mA	75W
DCMQ75-110S12		12VDC	35mA	749mA	6250mA	4400µF	15VDC	91%		
DCMQ75-110S15		15VDC	35mA	749mA	5000mA	2800µF	18VDC	91%		
DCMQ75-110S24		24VDC	50mA	758mA	3125mA	1100µF	30VDC	90%		

SPECIFICATIONS

All specifications are based on 25°C, Resistive Load, Nominal Input Voltage, and Rated 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	72V Input Models	43	72	101	VDC
	110V Input Models	66	110	160	
Input Surge Voltage (100ms. Max)	72V Input Models	-0.7		165	VDC
	110V Input Models	-0.7		250	
Start-Up Threshold Voltage	72V Input Models			43	VDC
	110V Input Models			66	
Under Voltage Shutdown	72V Input Models		40		VDC
	110V Input Models		63		
Input Filter		Internal Pi Type			
OUTPUT SPECIFICATIONS					
Output Voltage		See Table			
Voltage Accuracy				±1.0	%Vnom.
Line Regulation	Vin=Min. to Max. @Full Load			±0.2	%
Load Regulation	Io=0% to 100%			±0.3	%
Output Power		See Table			
Output Current		See Table			
Minimum Load		No Minimum Load Requirement			
Maximum Capacitive Load		See Table			
Ripple & Noise (20MHz bandwidth)[2]	24V Output			150	mVp-p
	Others			100	
Transient Recovery Time[3]	25% Load Step Change		250		µsec
Transient Response Deviation	25% Load Step Change		±3	±5	%
Trim Up/Down Range	% of Nominal Output Voltage			±10	%
Start-Up Time	All Models		0.35		S
Temperature Coefficient				±0.02	%/°C

SPECIFICATIONS

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

SPECIFICATION	TEST CONDITIONS	Min	Typ	Max	Unit
REMOTE ON/OFF CONTROL					
Converter On		3.5V~12V or Open Circuit			
Converter Off		0V~1.2V or Short Circuit			
Control Input Current (On)	Vctrl=5.0V		0.5		mA
Control Input Current (Off)	Vctrl=0V		-0.5		mA
Control Common		Referenced to Negative Input			
Standby Input Current	Nominal Vin		2.5		mA
PROTECTION					
Short Circuit Protection	Hiccup Mode 0.3Hz typ.	Automatic Recovery			
Over Load Protection	Hiccup		150		%
Over Temperature Protection	Base Plate			+110	ºC
Over Voltage Protection		See Table			
ENVIRONMENTAL SPECIFICATIONS					
Operating Temperature		Min	Max. Without Heatsink	Max. With Heatsink	Unit
	DCMQ75-75S12, 72S15	-40	56	61	ºC
	DCMQ75-72S24, 110S12, 110S15	-40	49	55	
	DCMQ75-110S24	-40	43	48	
	DCMQ75-72S05, 110S05	-40	36	42	
Storage Temperature		-50		+125	ºC
Thermal Impedance	Natural Convection without Heatsink	7.5			ºC/W
	Natural Convection with Heatsink	6.8			
	100LFM Convection without Heatsink	6.1			
	100LFM Convection with Heatsink	4.1			
	200LFM Convection without Heatsink	5.3			
	200LFM Convection with Heatsink	3.3			
	400LFM Convection without Heatsink	3.9			
	400LFM Convection with Heatsink	2.2			
Operating Humidity	Non-Condensing	5		95	%RH
Base-Plate Temperature Range		-40		+105	ºC
Lead Temperature	1.5mm from case for 10sec.			260	ºC
Cooling		Compliance to IEC/EN60068-2-1			
Dry Heat		Compliance to IEC/EN60068-2-2			
Damp Heat		Compliance to IEC/EN60068-2-30			
Shock & Vibration Test		Compliance to IEC/EN61373			
Fire Protection Test		Compliance to EN45545-2			
MTBF	MIL-HDBK-217F@25ºC Full Load, Ground Benign	143,800 Hours			
GENERAL SPECIFICATIONS					
Typ. Efficiency	@Max. Load	See Table			
Switching Frequency			320		KHz
Isolation Voltage	Input/Output, Reinforced, Rated for 60 Seconds	3000			VACrms
	Input/Output to Case	1500			VDC
Isolation Resistance	500VDC	1000			MΩ
Isolation Capacitance	100KHz, 1V			3000	pF
PHYSICAL SPECIFICATIONS					
Weight		2.15oz (61g)			
Dimensions (L x W x H)		2.28in x 1.45in x 0.50in (57.9mm x 36.8mm x 12.7mm)			
Case Material		Aluminum Frame with Black Anodized Coating			
Base Material	Top Side	Aluminum Plate			
	Bottom Side	Non-Conductive Black Plastic Base Plate			
Potting Material		Epoxy (UL94-V0)			
SAFETY CHARACTERISTICS					
Safety Approvals	UL/cUL 60950-1 recognition (UL certificate)[8], IEC/EN 60950-1 (CB Report), EN 50155, IEC 60571				
EMI	Conduction & Radiation EN55022, EN5501, FCC part 15				Class A
ESD	EN61000-4-2 Air±8kV, Contact ±6kV				A
Radiated Immunity	EN61000-4-3 10V/m				A
Fast Transient[5]	EN61000-4-4 ±2kV				A
Surge[5]	EN61000-4-5 ±2kV				A
Conducted Immunity	EN61000-4-6 10Vrms				A

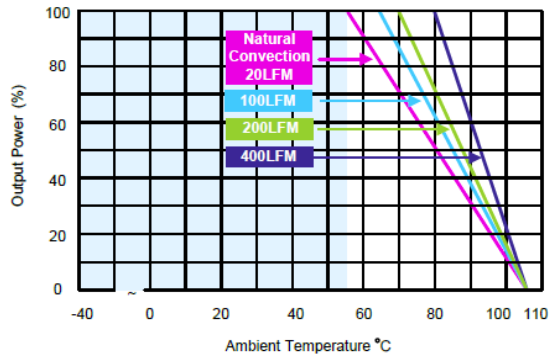
NOTES

1. Heatsink is available for models. To indicate heatsink for model, add -HS to model number.
2. Ripple & Noise measurement with a 1µF MLCC and a 10µF Tantalum Capacitor.
3. Transient recovery time is measured to within 1% error band for a step change in output load of 75% to 100%.
4. Other inputs and outputs may be available, please contact factory.
5. To meet EN61000-4-4 & EN61000-4-5 by adding a capacitor across the input pins. Suggested capacitor: 470µF/200V.
6. Parallel a capacitor across the input pins under specification testing. Suggested capacitor: 68µF/200V.
7. Natural Convection is about 20LFM but is not equal to still air (0 LFM).
8. This product is Listed to applicable standards and requirements by UL.

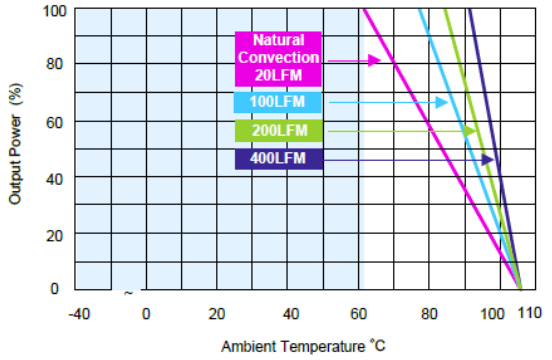
**Due to advances in technology, specifications subject to change without notice.*

DERATING CURVES

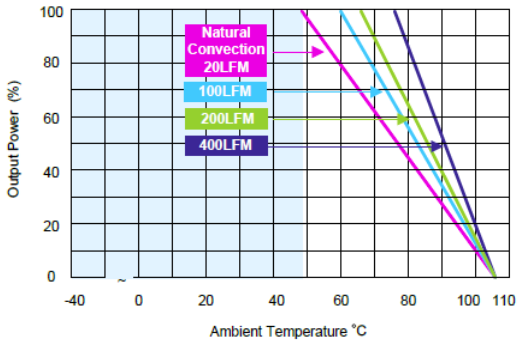
DCMQ75-72S12, 72S15 Derating curve without Heatsink



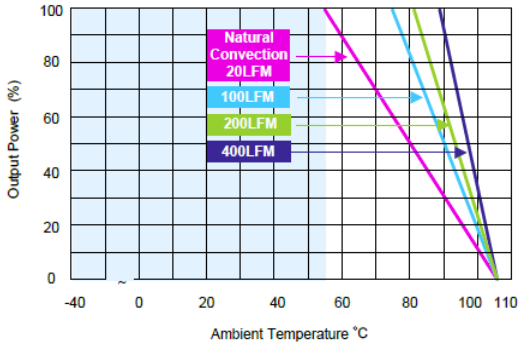
DCMQ75-72S12, 72S15 Derating Curve with Heatsink



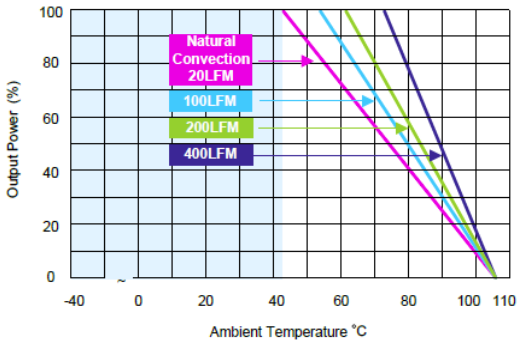
DCMQ75-110S12, 110S15, 72S24 Derating Curve without Heatsink



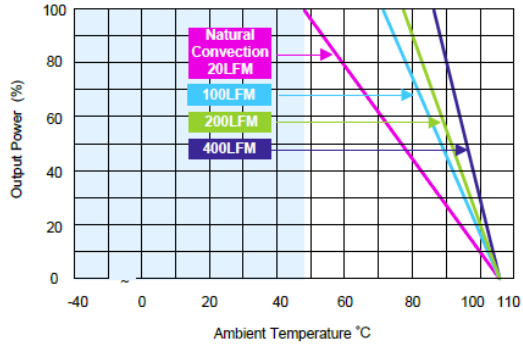
DCMQ75-110S12, 110S15, 72S24 Derating Curve with Heatsink



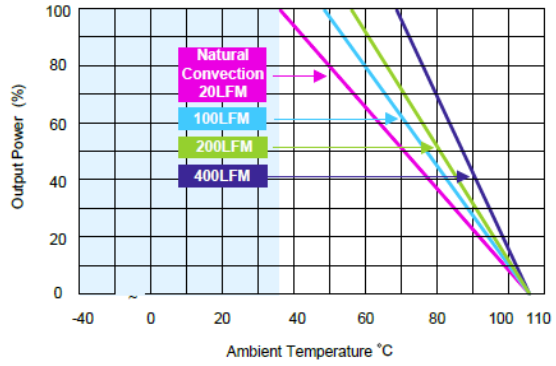
DCMQ75-110S24 Derating Curve Without Heatsink



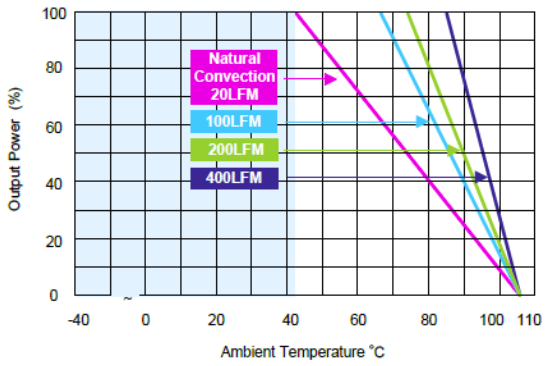
DCMQ75-110S24 Derating Curve with Heatsink



DCMQ75-72S05, 110S05 Derating Curve without Heatsink

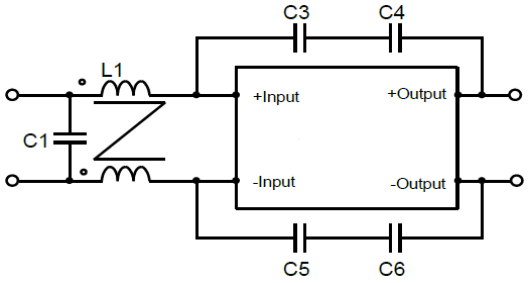


DCMQ75-72S05, 110S05 Derating Curve with Heatsink



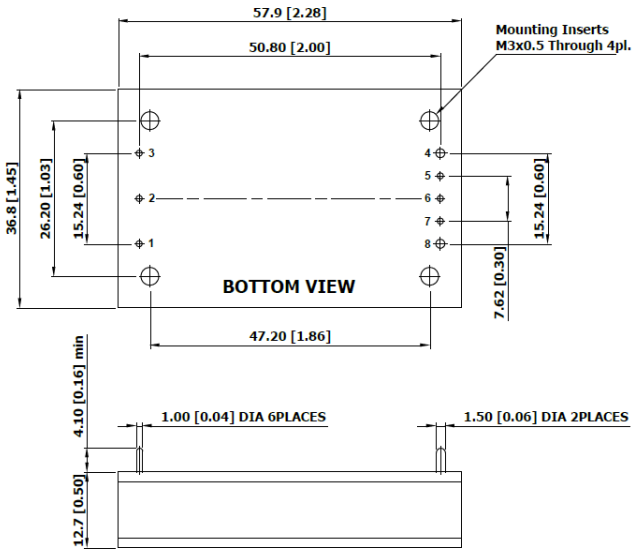
RECOMMENDED FILTER

Recommended Filter for EN 55011&55022, Class A; FCC part 15, Level A Compliance



Model Type	L1	C1	C3	C4	C5	C6
DCMQ75-72SXX	450µH/450µH	CHEMI-CON KXG Series 68µF/200V	2200pF 3KV	2200pF 3KV	2200pF 3KV	2200pF 3KV
DCMQ75-110SXX						

MECHANICAL DRAWINGS



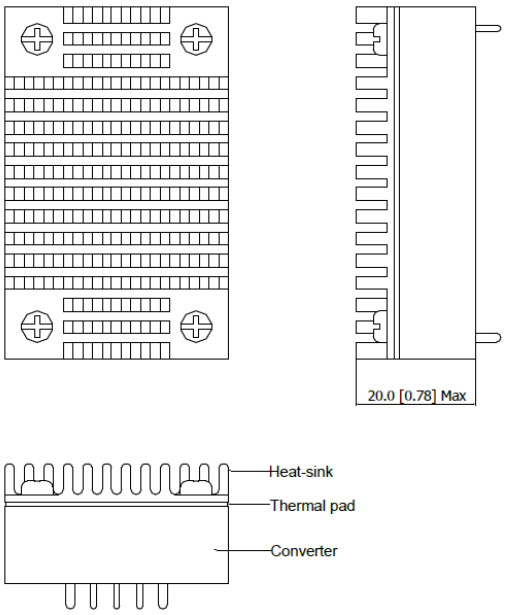
PIN CONNECTIONS

Pin	Function
1	+Vin
2	Remote On/Off
3	-Vin
4	-Vout
5	*-Sense
6	Trim
7	*+Sense
8	+Vout

*If remote sense is not used, the +sense should be connected to +output and –sense should be connected to –output. Maximum output deviation is 10% inclusive of trim.

All dimensions in mm (inches
Tolerance: X.X±0.5 (X.XX±0.02)
X.XX±0.25 (X.XXX±0.01)
Pin Diameter Ø 1.0±0.05 (0.04±0.002)
Pin Diameter Ø 1.5±0.05 (0.06±0.002)

HEATSINK OPTIONS



Heatsink Material: Aluminum
Finish: Black Anodized Coating
Weight: 13g

Advantages of adding heatsink:
Improves heat dissipation and increases the stability and reliability of the DC/DC converters at high operating temperatures.

EXTERNAL OUTPUT TRIMMING

DCMQ75-XXS05 Trim Table

Trim Down	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox0.99	Vox0.98	Vox0.97	Vox0.96	Vox0.95	Vox0.94	Vox0.93	Vox0.92	Vox0.91	Vox0.90	Volts
Rd=	138.88	62.41	36.92	24.18	16.53	11.44	7.79	5.06	2.94	1.24	KOhms
Trim Up	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox1.01	Vox1.02	Vox1.03	Vox1.04	Vox1.05	Vox1.06	Vox1.07	Vox1.08	Vox1.09	Vox1.10	Volts
Ru=	106.87	47.76	28.06	18.21	12.30	8.36	5.55	3.44	1.79	0.48	KOhms

DCMQ75-XXS12 Trim Table

Trim Down	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox0.99	Vox0.98	Vox0.97	Vox0.96	Vox0.95	Vox0.94	Vox0.93	Vox0.92	Vox0.91	Vox0.90	Volts
Rd=	413.55	184.55	108.22	70.05	47.15	31.88	20.89	12.80	6.44	1.35	KOhms
Trim Up	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox1.01	Vox1.02	Vox1.03	Vox1.04	Vox1.05	Vox1.06	Vox1.07	Vox1.08	Vox1.09	Vox1.10	Volts
Ru=	351.00	157.50	93.00	60.75	41.40	28.50	19.29	12.37	7.00	2.70	KOhms

DCMQ75-XXS15 Trim Table

Trim Down	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox0.99	Vox0.98	Vox0.97	Vox0.96	Vox0.95	Vox0.94	Vox0.93	Vox0.92	Vox0.91	Vox0.90	Volts
Rd=	530.73	238.61	141.24	92.56	63.35	43.87	29.96	19.53	11.41	4.92	KOhms
Trim Up	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox1.01	Vox1.02	Vox1.03	Vox1.04	Vox1.05	Vox1.06	Vox1.07	Vox1.08	Vox1.09	Vox1.10	Volts
Ru=	422.77	189.89	112.26	73.44	50.15	34.63	23.54	15.22	8.75	3.58	KOhms

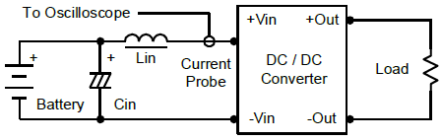
DCMQ75-XXS024 Trim Table

Trim Down	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox0.99	Vox0.98	Vox0.97	Vox0.96	Vox0.95	Vox0.94	Vox0.93	Vox0.92	Vox0.91	Vox0.90	Volts
Rd=	598.66	267.78	157.49	102.34	69.25	47.19	31.44	19.62	10.43	3.08	KOhms
Trim Up	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox1.01	Vox1.02	Vox1.03	Vox1.04	Vox1.05	Vox1.06	Vox1.07	Vox1.08	Vox1.09	Vox1.10	Volts
Ru=	487.14	218.02	128.31	83.46	56.55	38.61	25.79	16.18	8.70	2.72	KOhms

TEST SETUP

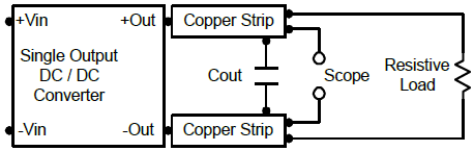
Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor Lin (4.7µH) and Cin (220µF, ESR < 1.0Ω at 100KHz) to simulate source mpedance. Capacitor Cin, offsets possible battery impedance. Current ripple is measured at the input terminals of the module, measurement bandwidth is 0-500KHz.



Peak-to Peak Output Noise Measurement Test

Use a 1µF ceramic capacitor and a 10µF tantalum 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.



APPLICATION NOTES

Remote On/Off

Positive logic remote on/off turns the module on during a logic high voltage on the remote on/off pin, and off during a logic low. To turn the power module on and off, the user must supply a switch to control the votlage between the on/off terminal and the –Vin terminal. The switch can be an open collector or equivalent. A logic low is 0V to 1.2V. A logic high is 3.5V to 12V. the maximum sink current at the on/off terminal (Pin 2) during a logic low is -500µA.

Overcurrent Protection

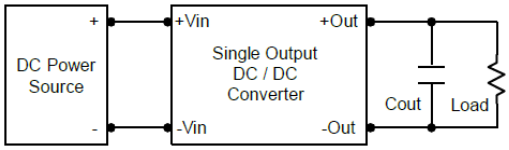
To provide hiccup mode prtection in a fault (output overload) condition, the unit is equipped with internal current limiting circuitry and can endure overload for an unlimited duration.

Overvoltage Protection

The output overvoltage clamp consists of control circuitry, which is independent of the primary regulation loop, that monitors the voltage on the output terminals. The control loop of the clamp has a higher voltage set point than the primary loop. This provides a redundant voltage control that reduces the risk of output overvoltage. The OVP level can be found in the output data.

Output Ripple Reduction

A good quality low ESR cpacitor placed as close as practicable across the load will give the best ripple nad noise performance. To reduce output ripple, it is recommended to use 4.7µF capacitors at the output.

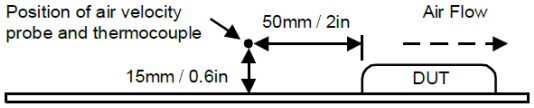


Maximum Capacitive Load

The DCMQ75 series has limitation 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 data sheet.

Thermal Considerations

Many conditions affect the thermal performance of the power module, such as orientation, aiflow 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 105ºC, Tge derating curves are determined from measurements obtained in a test setup.



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 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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