Series AM75QB-NZ

75 Watt | DC-DC Converter

FEATURES:

- Ultra-wide Input range up to160VDC
- Efficiency up to 93%
- Input under voltage lockout
- Continued short circuit protection
- Input / Output Isolation up to 3000VDC
- Operating Temperature: -40˚C to +100˚C
- OVP, OCP, OTP
- On-Off, Trim and Output Sense controls

Models
Single output

Model	Input Voltage (V)	Max Input Current FL I NL (mA)	Output Voltage (V)	Output Current max (A)	Isolation (VDC)	Max Capacitive Load (uF)	Efficiency (%)
AM75QB-4805SH22-NZ	18-75	1756 I 80	5	15	2250	6000	91
AM75QB-4812SH22-NZ	18-75	1756 I 80	12	6.25	2250	2000	92
AM75QB-4815SH22-NZ	18-75	1756 I 80	15	5	2250	2000	93
AM75QB-4824SH22-NZ	18-75	1756 I 80	24	3.13	2250	1000	92
AM75QB-4848SH22-NZ	18-75	1756 I 80	48	1.56	2250	470	92
AM75QB-11005S-NZ	66-160	793 I 15	5	15	3000	7500	87
AM75QB-11012S-NZ	66-160	783 I 15	12	6.25	3000	6000	88
AM75QB-11024S-NZ	66-160	766 I 15	24	3.125	3000	3000	90

Add suffix “-K” for optional heat sink

NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

*** The models AM75QB-11005S-NZ and AM75QB-11012S-NZ will be discontinued (EOL) by December 30, 2020; for new designs, please refer to AM75QB-11005SA30JZ.**

**** All the models with nominal input 110Vdc are not recommended for new designs; For new design, please refer to AM75QB-JZ series.**

Input Specifications

Parameters	Nominal	Typical	Maximum	Units
Voltage range	48V Vin	18-75		VDC
	110V Vin	66-160		
Filter	π(Pi) Network			
Startup time		25		ms
Absolute Maximum Rating	48V Vin		-0.7 - 90	VDC
	110V Vin		-0.7 - 180	
Peak Input Voltage time			1	s
On/Off control	ON – open or 3.5-12VDC; OFF – short to –Vin or 0-1.2VDC, Idle current 2-10mA			
Under voltage lockout	48V Vin	16.6		VDC
	110V Vin	58		
Input reflected current	48V Vin	30		mA
	110V Vin	50		

Isolation Specifications

Parameters	Conditions	Rated	Maximum	Units
Tested I/O voltage	48V models, 60 sec, 5mA	2250		VDC
	110V models, 60 sec, 1mA	3000		
Tested Input / Case voltage	48V models, 60 sec, 5mA	1500		VDC
	110V models, 60 sec, 1mA	1500		
Tested Output / Case voltage	48V models, 60 sec, 5mA	1500		VDC
	10V models, 60 sec, 1mA	500		
Resistance	At I/O Isolation 500VDC	>100		MOhm
		>1000		
Capacitance	I/O 100KHz/0.1V	2200		pF

Output Specifications

Parameters	Conditions			Typical	Maximum	Units
Voltage accuracy	48V models			±1	±3	%
	110V models			±2	±3	
Line voltage regulation	Vin LL to HL	48V models			±0.5	% of Vin
		110V models			±0.3	
Load voltage regulation	10 – 100% load	48V models			±0.75	%
		110V models			±0.5	
Temperature coefficient					±0.03	%/ºC
Ripple & Noise	20MHz Bandwidth	48V Model	12V/15V Vout	100	200	mV p-p
			Others	150	250	
		110V models		100	300	
Voltage adjustment range					-5 to 10	%
Output voltage Sense compensation*					5	%
Over voltage protection	48V models				110 - 160	% of Vout
	110V models				110 - 140	
Over current protection	48V models			110	190	% of Iout
	110V models			130	180	
Short Circuit protection	Continuous					
Short circuit restart	Auto-recovery					
Thermal shutdown	Base plate temperature	48V models			105	ºC
		110V models			115	
Transient recovery time	25% load step change	48V models		200	500	µs
		110V models		300	500	
Transient recovery deviation	25% load step change	48V Vin, 5VDC Vout		±3	±7.5	%
		Others		±3	±5	

*NOTE: If Output Sense is not used, short +Vout with +Sense and -Vout with -Sense.
Keep the connection track between +Vout with +Sense and -Vout with -Sense as short as possible for stable performance.

General Specifications

Parameters	Conditions		Minimum	Maximum	Units
Switching frequency	100% load	48V models	250		KHz
		110V models	220		
Base plate temperature	See derating curves	48V models	-40 to +85		˚C
		110V models	-40 to +100		
Storage temperature	-55 to +125				˚C
Maximum case temperature				105	˚C
Thermal resistance	Without heatsink – Natural convection		10.7		˚C/W
	Without heatsink – 200LFM convection		6		
	Without heatsink – 400LFM convection		5		
	Without heatsink – 1000LFM convection		4		
	With heatsink – Natural convection		5.1		
	With heatsink – 200LFM convection		2.8		
	With heatsink – 400LFM convection		2.2		
	With heatsink – 1000LFM convection		1.8		
Cooling	Natural convection or forced air				
Humidity	Non-condensing		5	95	% RH
Case material	48V models		Aluminum alloy case (UL94-V0)		
	110V models		Black heat resistant plastic case (UL94-V0)		
Weight	48V models	Without heatsink	83		g
		With heatsink	114		
	110V models	Without heatsink	46		
		With heatsink	76		
Dimensions (L x W x H)	48V models	Without heatsink	2.43 x 1.65 x 0.50 inches	61.8 x 40.2 x 12.7 mm	
		With heatsink	2.43 x 1.65 x 1.09 inches	61.8 x 40.2 x 27.7 mm	
	110V models	Without heatsink	2.39 x 1.54 x 0.50 inches	60.8 x 39.2 x 12.7 mm	
		With heatsink	2.44 x 1.54 x 1.21 inches	62.0 x 39.2 x 30.8 mm	
MTBF	>500,000 hours (MIL-HDBK -217F, Ground Benign, t=+25˚C)				
Maximum soldering temperature	1.5mm from case for 10 sec			300	˚C

Environment Approval

Parameters	Conditions
Cooling	EN60068-2-1, 110V models only
Dry heat	EN60068-2-2, 110V models only
Damp heat	EN60068-2-30, 110V models only
Shock and Vibrations	IEC/EN61373 on both 48V and 110V models

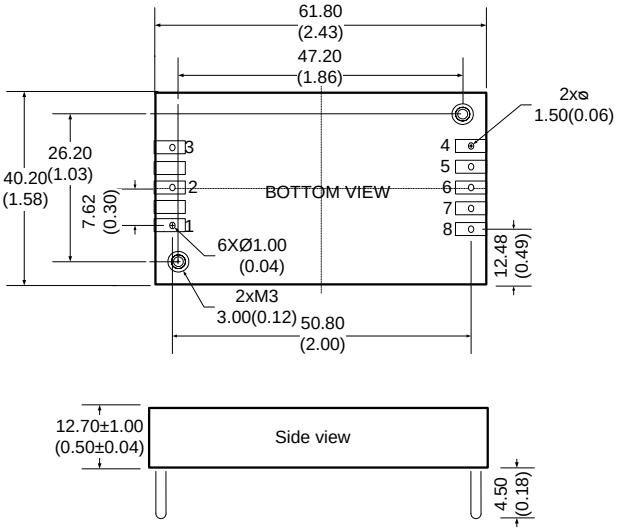
Safety Specifications

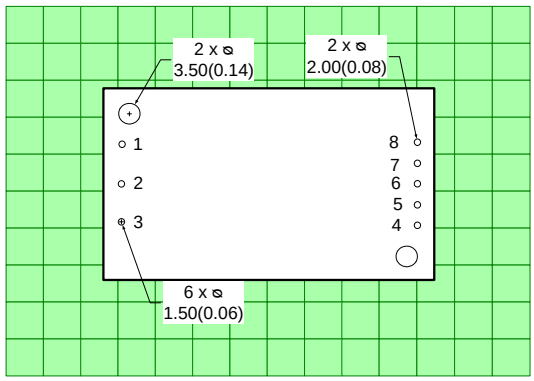
Parameters			
Standards	CISPR32/EN 55032, Class B, with external filter		
	IEC 61000-4-2	48V	Meet EN50121-3-2, Contact ±6KV, Air ±8KV, Criteria B
		110V	Contact ±6KV, Air ±8KV, Criteria B
	IEC 61000-4-3	48V	Meet EN50121-3-2, 10V/m, Criteria A
		110V	10V/m, Criteria A
	IEC 61000-4-4	48V	Meet EN50121-3-2, ±2KV with external filter, Criteria B
		110V	For 110V models, ±2KV with external filter, Criteria B
	EN50121-3-2	48V	differential mode ±1KV, 1.2/50us, source impedance 42Ω with external filter, Criteria B
	IEC 61000-4-5	110V	Meet EN50155, L- L ±2KV, L-G ±4KV with external filter, Criteria B
	IEC 61000-4-6	48V	Meet EN50121-3-2, 10Vrms, Criteria A
		110V	10Vrms, Criteria A
	EN50155	110V	100%0%, 10ms, with external filter, Criteria B

Pin Out Specifications

Pin	Single
1	+Vin
2	On/Off Control
3	-Vin
4	-Vout
5	-Sense
6	Trim
7	+Sense
8	+Vout

48V Model Dimensions

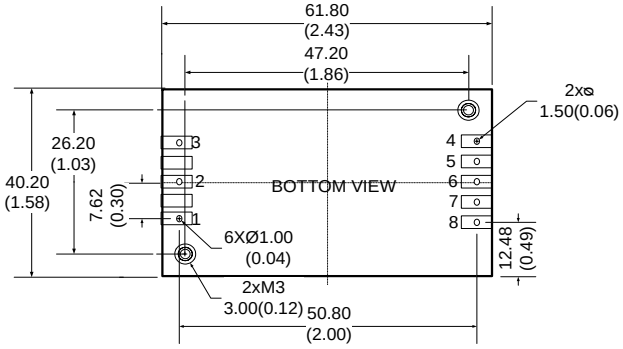


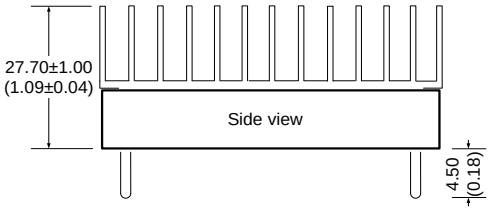


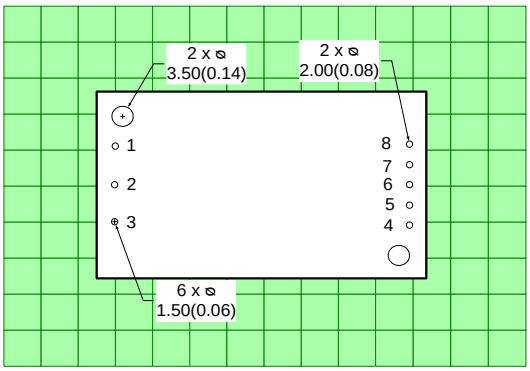
DIV: 2.54 x 2.54

Dimensions: mm (inch)
Case Tolerance: ±0.50 (0.02)
Pin Tolerance: ± 1.50 (0.06)
Pin diameter Tolerance: ±0.10 (0.004)
Pin 1, 2, 3, 5, 6 & 7 diameter: 1.00 (0.04)
Pin 4 & 8 diameter: 1.50 (0.06)
Mounting hole screw torque: max 0.4 N m

48V Models With Optional Heatsink







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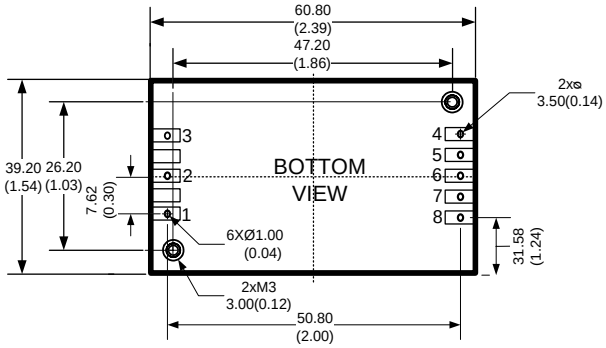
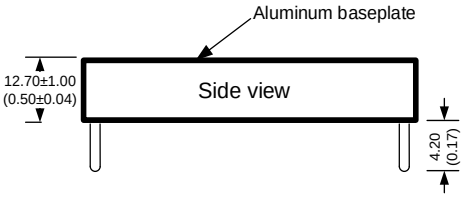
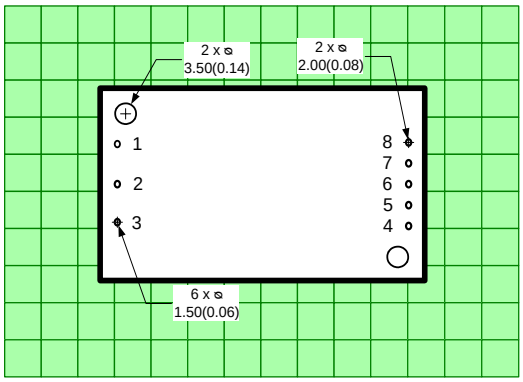
110V Model Dimensions







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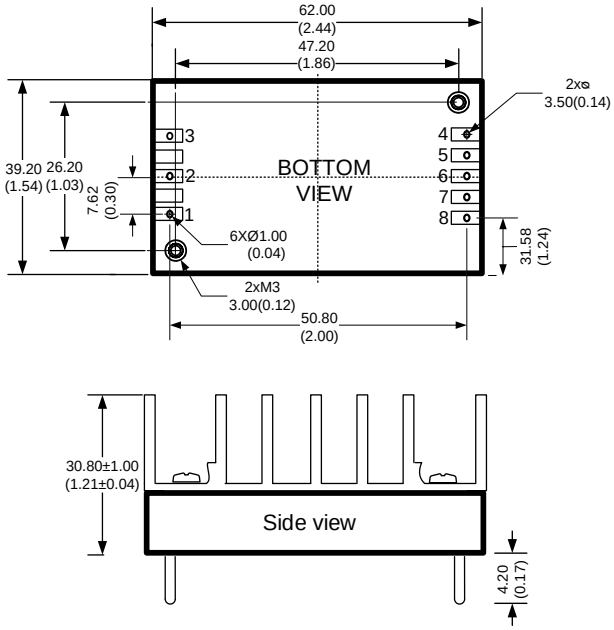
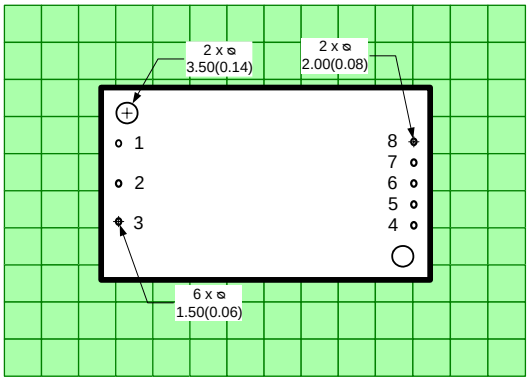
Mounting hole screw torque: max 0.4 N m

110V Models With optional heatsink





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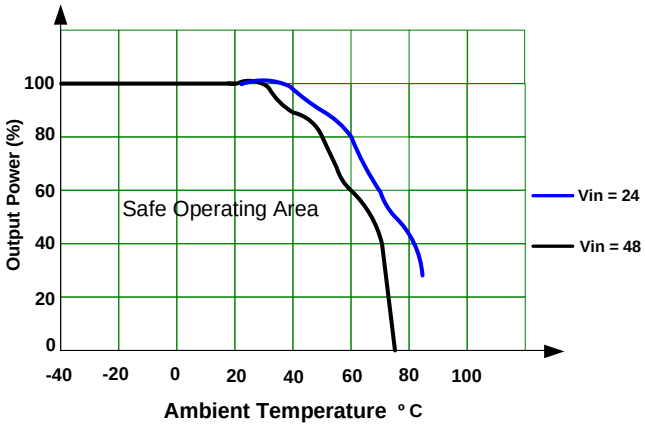
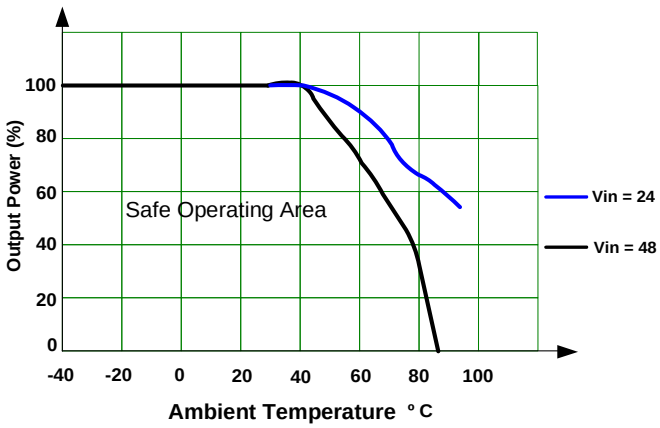
Derating

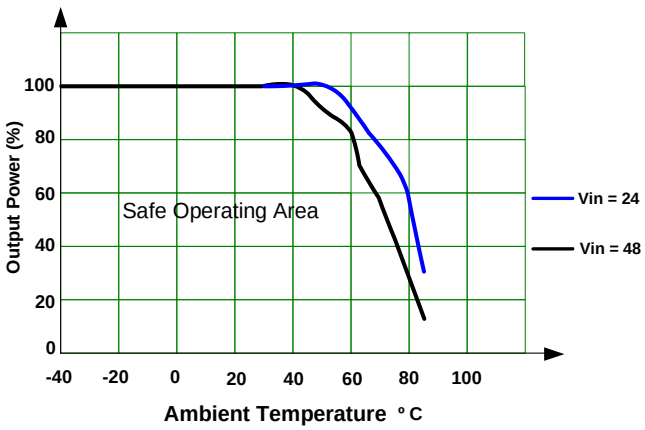
AM75QB-4805S-NZ Without heatsink



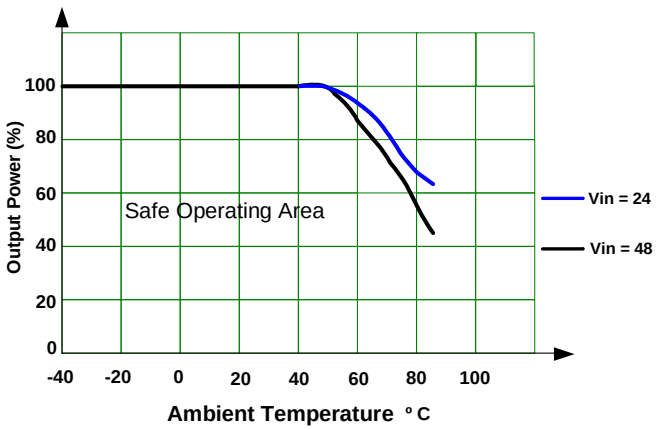
AM75QB-4805S-NZ With heatsink



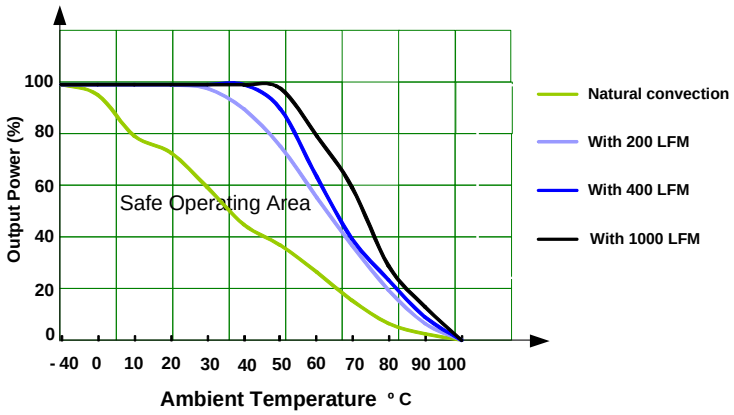
AM75QB-4812/15/24/48S-NZ Without heatsink



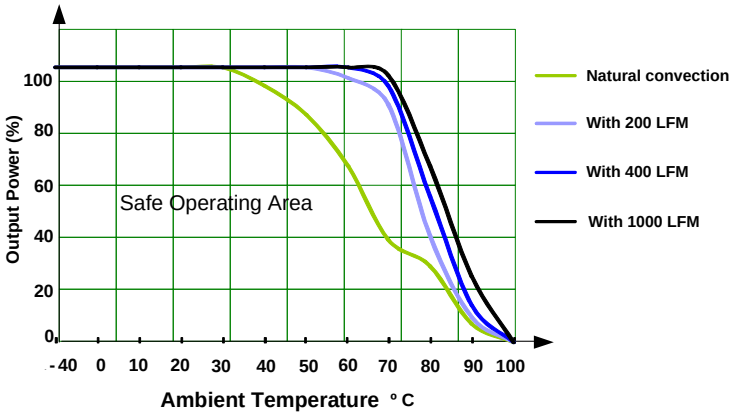
AM75QB-4812/15/24/48S-NZ With heatsink



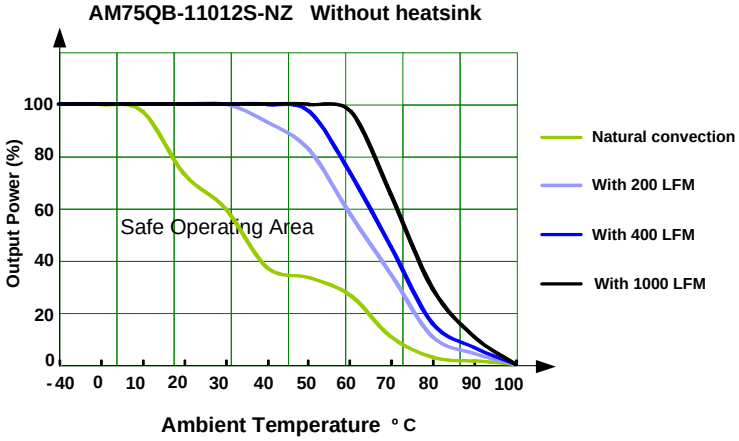
AM75QB-11005S-NZ Without heatsink



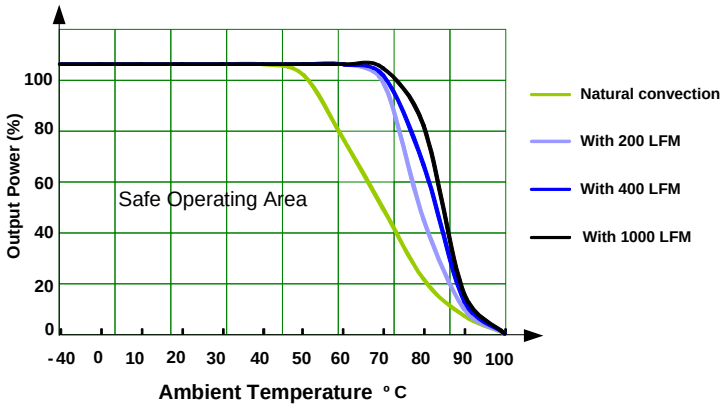
AM75QB-11005S-NZ With heatsink



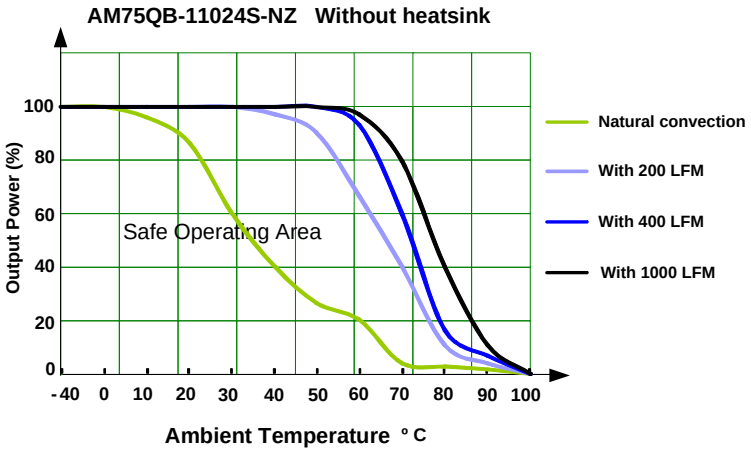
AM75QB-11012S-NZ Without heatsink



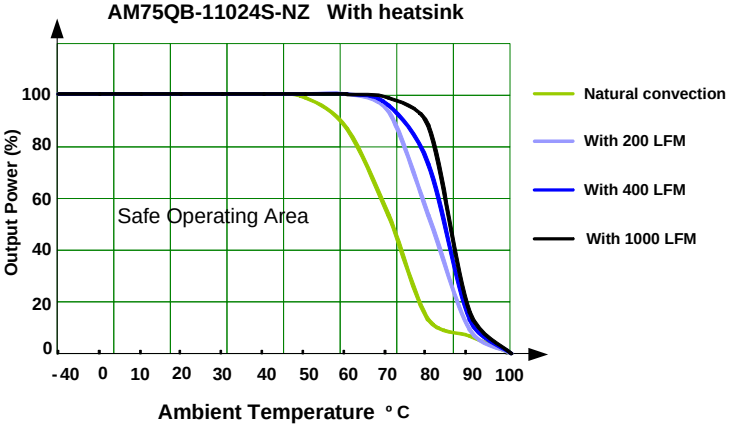
AM75QB-11012S-NZ With heatsink



AM75QB-11024S-NZ Without heatsink

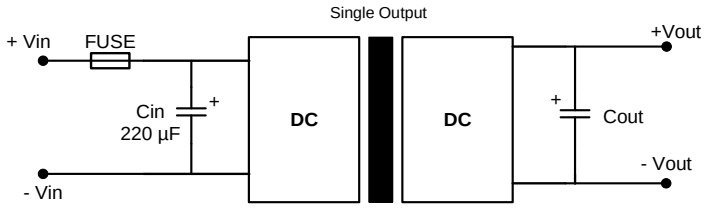


AM75QB-11024S-NZ With heatsink



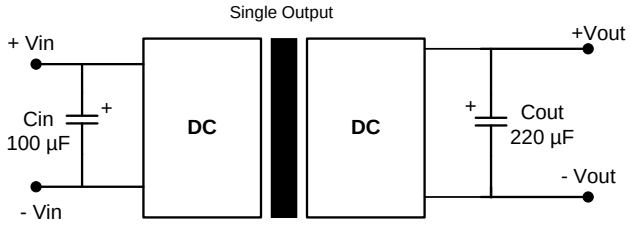
Typical application circuit

48V models



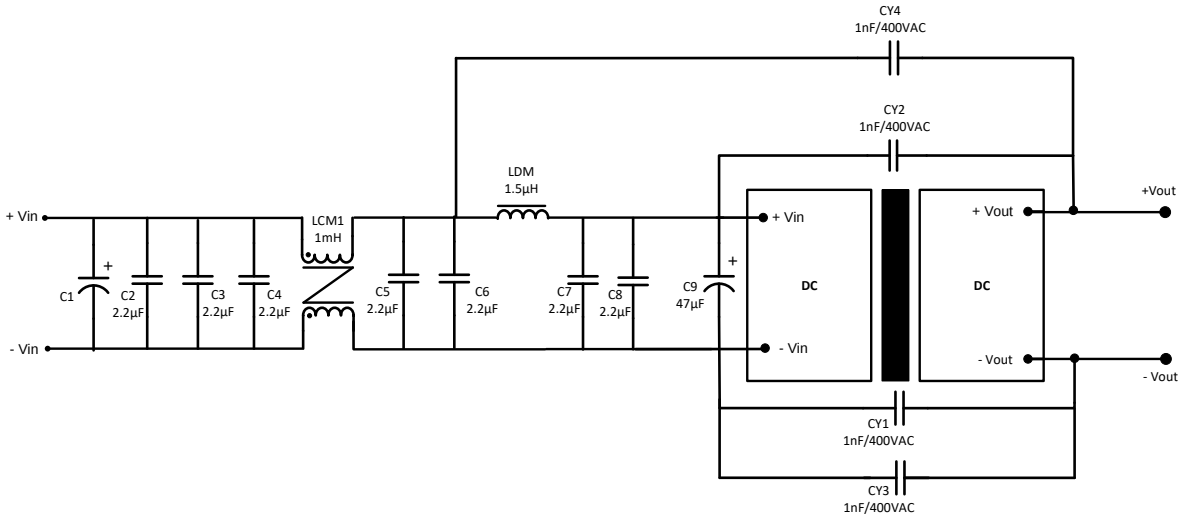
Output	5V	12V/15V	24V	48V
Cout	470 µF	220 µF	100 µF	100 µF

110V Models

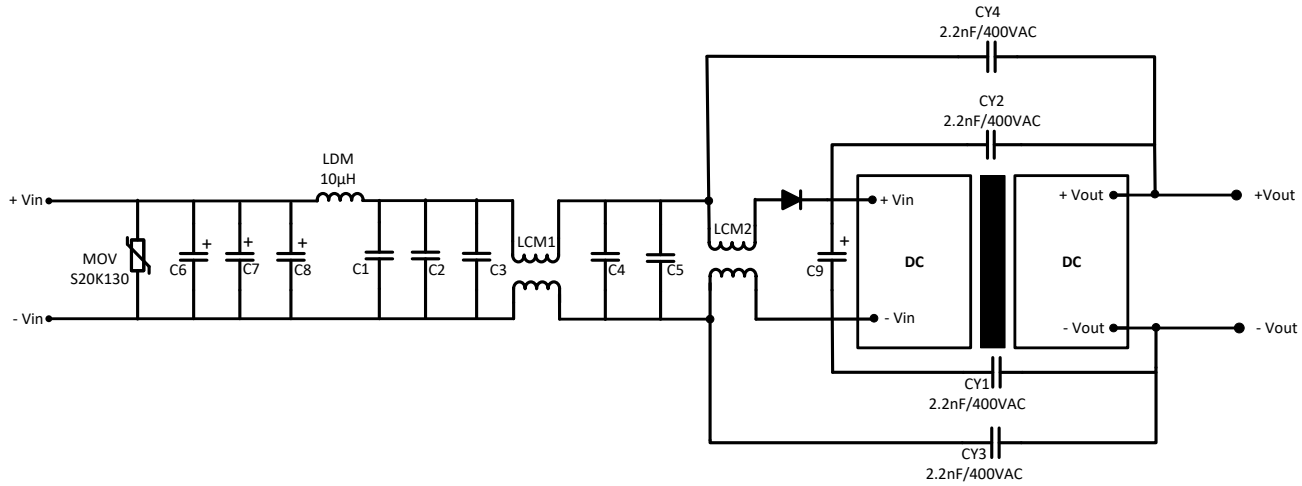


Recommended External EMC filter

48V models



110V Models

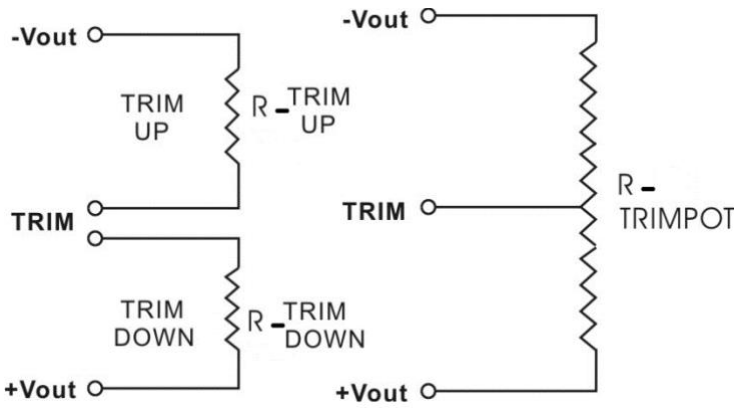


C1, C2, C3, C4 & C5	C6, C7, C8 & C9 (EC type)	LCM1	LCM2	D1
2.2 µF / 250V	100 µF / 400V	2200 µH *2	4700 µH *2	SF306

Trimming

Output voltage can be externally trimmed by utilizing the methods as shown below

Fixed Resistor Variable Potentiometer



Leave open if not used.

AM75QB-xxx05S-NZ
xxx can be 48 or 110

Trim down %	1	2	3	4	5					
Vout (VDC)	4.95	4.9	4.85	4.8	4.75					
Rt down (KΩ)	54.906	33.833	22.748	15.91	11.272					
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	5.05	5.1	5.15	5.2	5.25	5.3	5.35	5.4	5.45	5.5
Rt up (KΩ)	-679.667	178.344	72.562	42.868	28.884	20.75	15.43	11.68	8.893	6.742

AM75QB-xxx12S-NZ
xxx can be 48 or 110

Trim down %	1	2	3	4	5					
Vout (VDC)	11.88	11.76	11.64	11.52	11.4					
Rt down (KΩ)	496.092	301.452	212.527	161.585	128.573					
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	12.12	12.24	12.36	12.48	12.6	12.72	12.84	12.96	13.08	13.2
Rt up (KΩ)	706.435	158.92	83.879	54.075	38.077	28.095	21.274	16.317	12.552	9.595

AM75QB-xxx15S-NZ
xxx can be 48

Trim down %	1	2	3	4	5					
Vout (VDC)	14.85	14.7	14.55	14.4	14.25					
Rt down (KΩ)	643.028	403.954	290.279	223.84	180.26					
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	15.15	15.3	15.45	15.6	15.75	15.9	16.05	16.2	16.35	16.5
Rt up (KΩ)	1276.5	188.456	95.426	60.777	42.679	31.559	24.034	18.602	14.498	11.287

AM75QB-xxx24S-NZ
xxx can be 48 or 110

Trim down %	1	2	3	4	5					
Vout (VDC)	23.76	23.52	23.28	23.04	22.8					
Rt down (KΩ)	1289.521	792.049	564.771	434.571	350.197					
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	24.24	24.48	24.72	24.96	25.2	25.44	25.68	25.92	26.16	26.4
Rt up (KΩ)	795.55	176.609	91.778	58.086	40.001	28.717	21.006	15.402	11.146	7.803

AM75QB-4848S-NZ

Trim down %	1	2	3	4	5					
Vout (VDC)	47.52	47.04	46.56	46.08	45.6					
Rt down (KΩ)	4953.999	2443.889	1606.786	1188.160	936.961					
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	48.48	48.96	49.44	49.92	50.4	50.88	51.36	51.84	52.32	52.8
Rt up (KΩ)	261.328	123.114	77.065	54.045	40.234	31.027	24.451	19.519	15.684	12.615