

# AM50QB-11024S-NZ-K Datasheet

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DiGi Electronics Part Number	AM50QB-11024S-NZ-K-DG
Manufacturer	<a href="#">aimtec</a>
Manufacturer Product Number	AM50QB-11024S-NZ-K
Description	DC DC CONVERTER 24V 50W
Detailed Description	Isolated Module DC DC Converter 1 Output 24V 2.08 3A 66V - 160V Input

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## Purchase and inquiry

Manufacturer Product Number:

AM50QB-110245-NZ-K

Series:

AM50QB-NZ (50W)

Type:

Isolated Module

Voltage - Input (Min):

66V

Voltage - Output 1:

24V

Voltage - Output 3:

-

Current - Output (Max):

2.083A

Voltage - Isolation:

3 kV

Features:

Heat Sink, Remote On/Off, Remote Sense

Efficiency:

90%

Package / Case:

Quarter Brick

Supplier Device Package:

Quarter Brick

Approval Agency:

CE

Manufacturer:

aimtec

Product Status:

Active

Number of Outputs:

1

Voltage - Input (Max):

160V

Voltage - Output 2:

-

Voltage - Output 4:

-

Power (Watts):

50 W

Applications:

ITE (Commercial)

Operating Temperature:

-40°C ~ 100°C (With Derating)

Mounting Type:

Through Hole

Size / Dimension:

2.44" L x 1.54" W x 1.21" H (62.0mm x 39.2mm x 30.8mm)

Control Features:

-

Base Product Number:

AM50QB

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

ECCN:

EAR99

Moisture Sensitivity Level (MSL):

1 (Unlimited)

HTSUS:

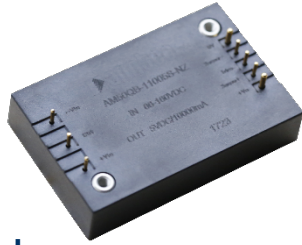
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**Not Recommended For New Design**  
For new design, please refer to AM50QB-JZ series

**Series AM50QB-NZ**  
50 Watt | DC-DC Converter

**FEATURES:**

- Ultra-wide Input range 66-160VDC
- Efficiency up to 90%
- Input under voltage lockout
- Continued short circuit protection
- Input / Output Isolation 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   NL (mA)	Output Voltage (V)	Output Current max (A)	Isolation (VDC)	Max Capacitive Load (uF)	Efficiency (%)
AM50QB-11005S-NZ	66-160	528   15	5	10	3000	7500	88
AM50QB-11012S-NZ	66-160	528   15	12	4.167	3000	6000	88
AM50QB-11024S-NZ	66-160	516   15	24	2.083	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.

## Input Specifications

Parameters	Nominal	Typical	Maximum	Units
Voltage range	110	66-160		VDC
Filter	π(Pi) Network			
Startup time		25		ms
Absolute Maximum Rating			-0.7 - 180	VDC
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 2mA			
Under voltage lockout		58		VDC
Input reflected current		50		mA

## Isolation Specifications

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

## Output Specifications

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy		±2	±3	%
Line voltage regulation	Vin LL to HL		±0.3	% of Vin
Load voltage regulation	10 – 100% load		±0.5	%
Temperature coefficient			±0.03	%/°C
Ripple & Noise	20MHz Bandwidth	100	300	mV p-p
Voltage adjustment range			-5 to 10	%
Output voltage Sense compensation*			5	%
Over voltage protection			110 - 140	% of Vout
Over current protection		130	180	% of Iout
Short Circuit protection	Continuous, Auto-recovery			
Short circuit restart				
Thermal shutdown	Base plate temperature		115	°C
Transient recovery time	25% load step change	300	500	µs
Transient recovery deviation	25% load step change	±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	220		KHz
Base plate temperature	See derating curves	-40 to +100		°C
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	Black heat resistant plastic (UL94-V0)			
Weight	Without heatsink	46		g
	With heatsink	76		
Dimensions (L x W x H)	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
Dry heat	EN60068-2-2
Damp heat	EN60068-2-30
Shock and Vibrations	IEC/EN61373

## Safety Specifications

Parameters	Conditions
Standards	EN 55022, Class B, with external filter & EN 55024: 2010 IEC 61000-4-2, Contact ±6KV, Air ±8KV, Criteria B IEC 61000-4-3, 10V/m, Criteria A IEC 61000-4-4, ±2KV, Criteria B, with external filter IEC 61000-4-5, ±2KV, Criteria B; EN50155, ±1.8KV; with external filter IEC 61000-4-6, 10Vrms, Criteria A EN50155 100%0%, 10ms, with external filter

## Pin Out Specifications

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



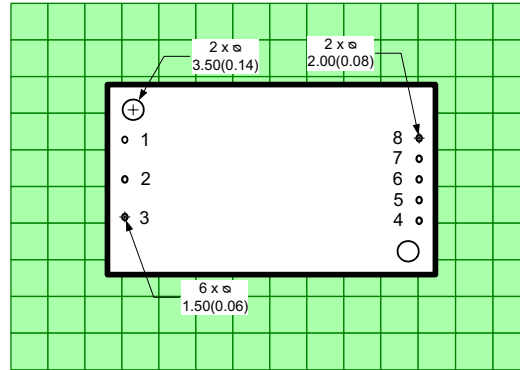
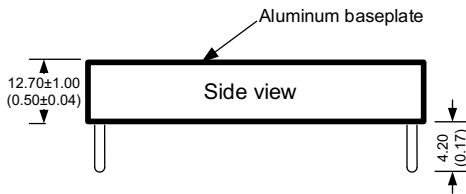
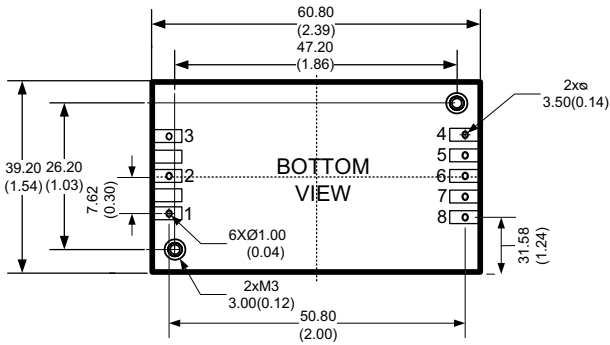
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For new design, please refer to AM50QB-JZ series

Series AM50QB-NZ

50 Watt | DC-DC Converter

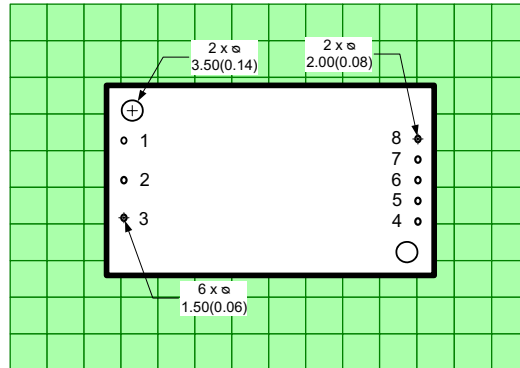
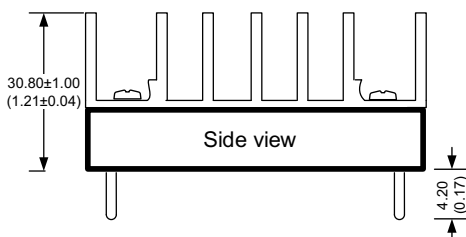
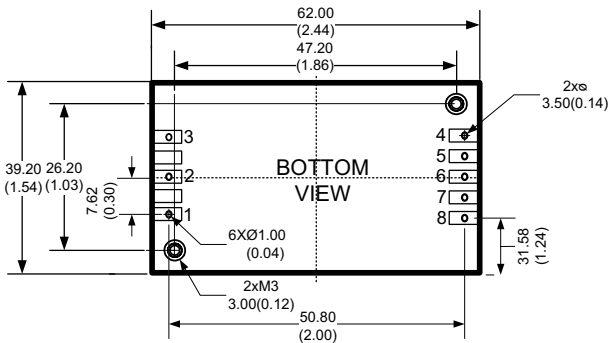
Dimensions



DIV: 2.54 x 2.54

Dimensions: mm (inch)  
Case Tolerance:  $\pm 0.50$  (0.02)  
Pin Tolerance:  $\pm 1.50$  (0.06)  
Pin diameter Tolerance:  $\pm 0.10$  (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

With optional heatsink

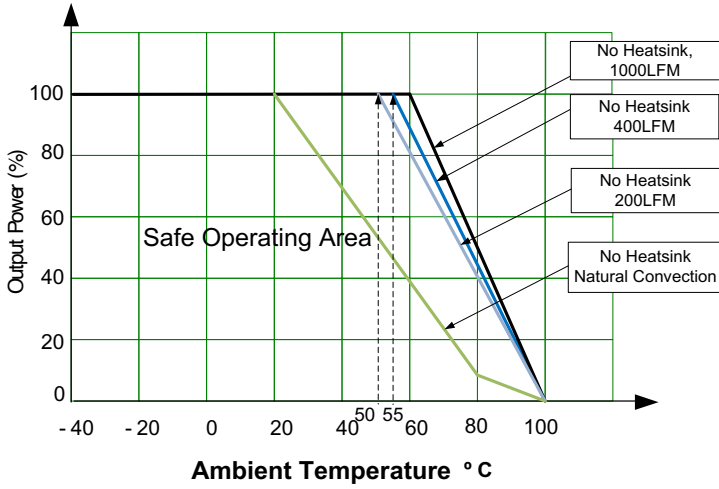


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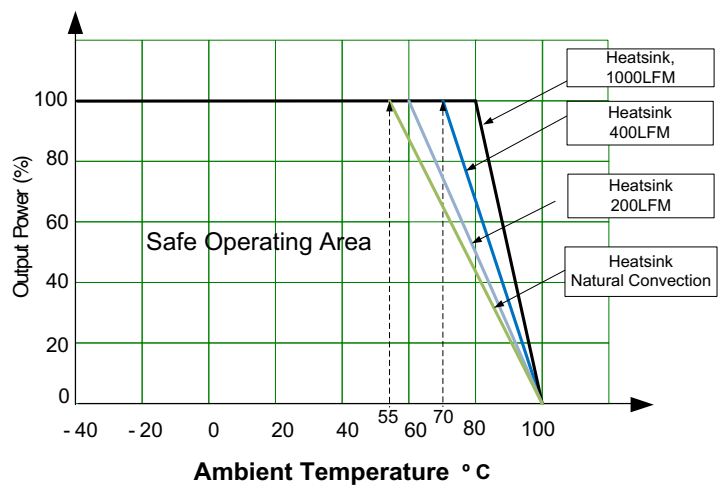
Dimensions: mm (inch)  
Case Tolerance:  $\pm 0.50$  (0.02)  
Pin Tolerance:  $\pm 1.50$  (0.06)  
Pin diameter Tolerance:  $\pm 0.10$  (0.004)  
Pin 1, 2, 3, 5, 6 & 7 diameter: 1.00 (0.04)  
Pin 4 & 8 diameter: 1.50 (0.06)  
Mounting hole screw torque: max 0.4 N m

Derating

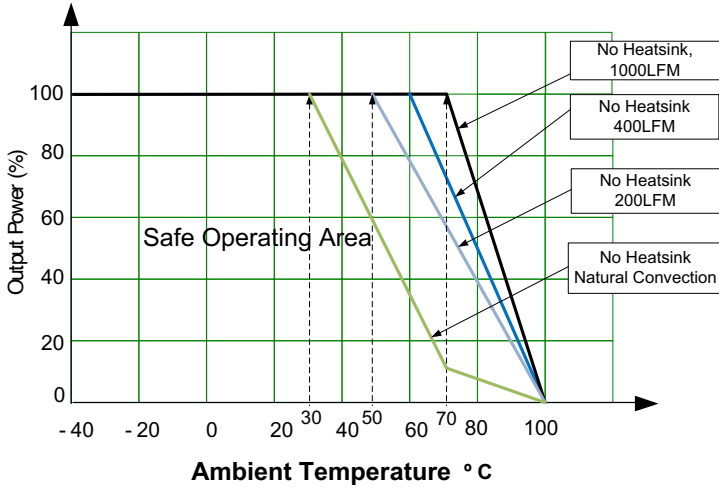
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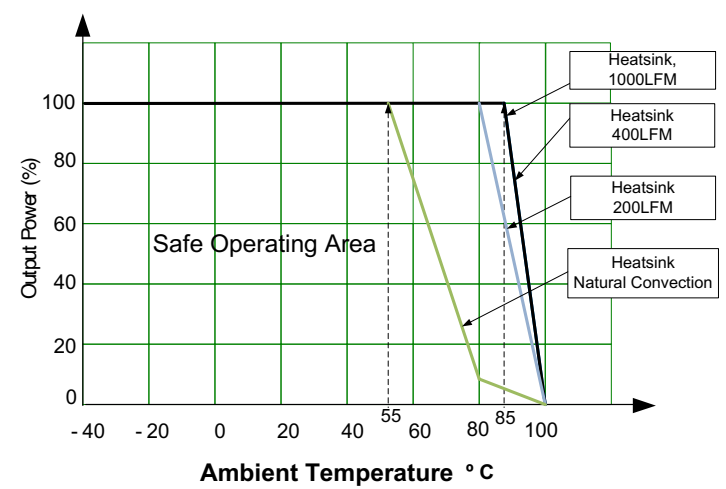
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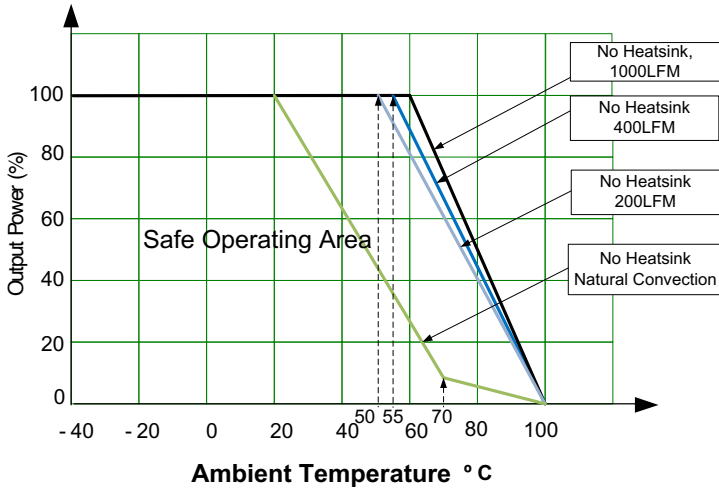
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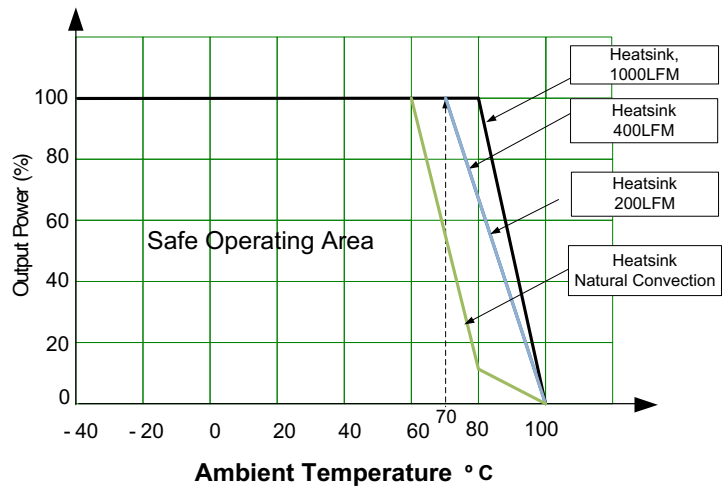
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AM50QB-11024S-NZ



AM50QB-11024S-NZ-K



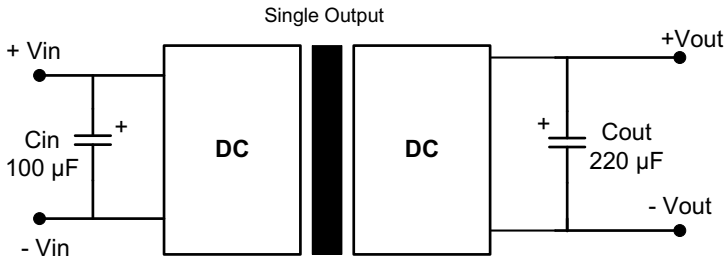


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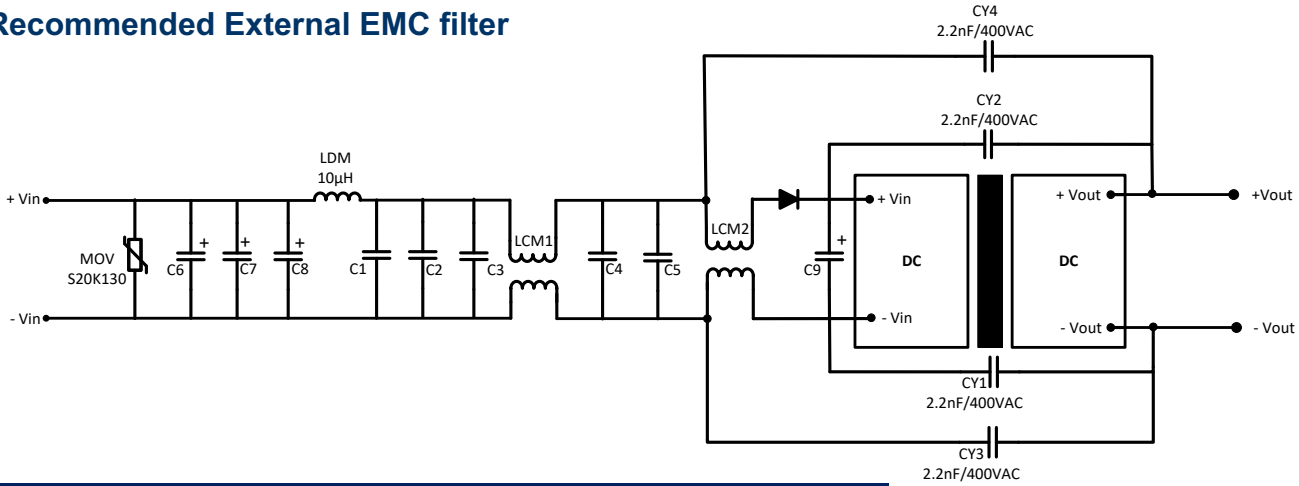
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Series AM50QB-NZ  
50 Watt | DC-DC Converter

### Typical application circuit



### Recommended External EMC filter



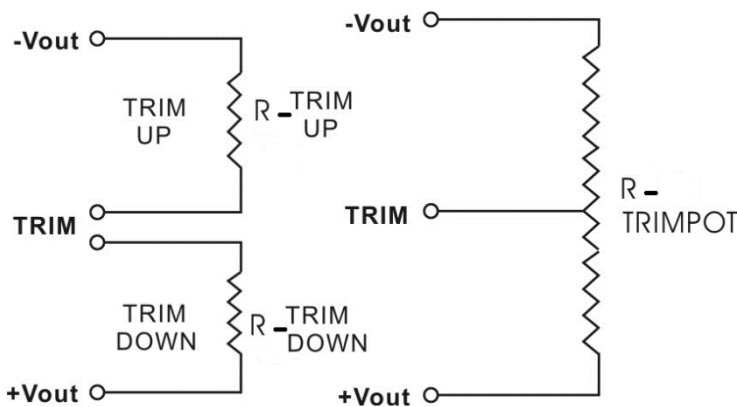
C1, C2, C3, C4 & C5	C6, C7, C8 & C9 (EC type)	LCM1	LCM2	D1
2.2 µF / 250V	100 µF / 400V	2200 µH *2	4700 µH *2	SF306

### Trimming

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

#### Fixed Resistor

#### Variable Potentiometer



Leave open if not used.

## AM50QB-11005S-NZ

Trim down %	1	2	3	4	5					
Vout (VDC)	4.95	4.9	4.85	4.8	4.75					
Rt down (K $\Omega$ )	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 (K $\Omega$ )	-679.667	178.344	72.562	42.868	28.884	20.75	15.43	11.68	8.893	6.742

## AM50QB-11012S-NZ

Trim down %	1	2	3	4	5					
Vout (VDC)	11.88	11.76	11.64	11.52	11.4					
Rt down (K $\Omega$ )	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 (K $\Omega$ )	706.435	158.92	83.879	54.075	38.077	28.095	21.274	16.317	12.552	9.595

## AM50QB-11015S-NZ

Trim down %	1	2	3	4	5					
Vout (VDC)	14.85	14.7	14.55	14.4	14.25					
Rt down (K $\Omega$ )	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 (K $\Omega$ )	1276.5	188.456	95.426	60.777	42.679	31.559	24.034	18.602	14.498	11.287

## AM50QB-11024S-NZ

Trim down %	1	2	3	4	5					
Vout (VDC)	23.76	23.52	23.28	23.04	22.8					
Rt down (K $\Omega$ )	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 (K $\Omega$ )	795.55	176.609	91.778	58.086	40.001	28.717	21.006	15.402	11.146	7.803

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