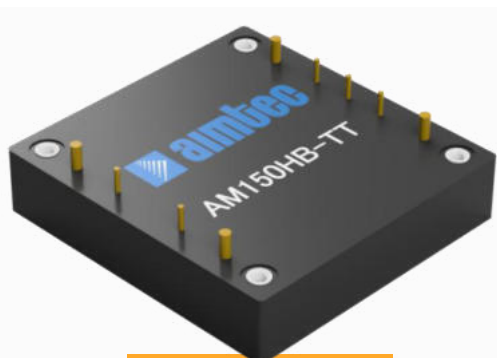


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AM150HB-TT



½ brick

The AM150HB-TT series is a high-performance half brick DC/DC converter specifically designed for a variety of railway application. It features 150W of output power with no requirement for minimum load, a wide input voltage of 9-75VDC, operating temperatures up to 105°C and reinforced I/O isolation of 3000VDC.

Additionally, this series includes input under-voltage protection, output over-voltage, short-circuit, over-current and over-temperature protection, remote On/Off control, remote sense compensation and output voltage trim adjustment.

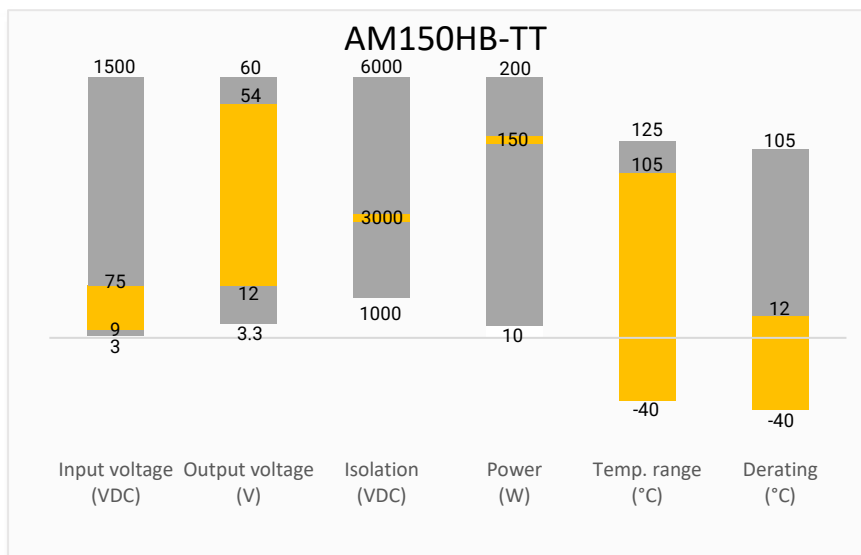
The AM150HB-TT series meets EN50155 railway standards and are widely used in the industrial control, electric power, battery management system, automation power application and datacom application.

Features

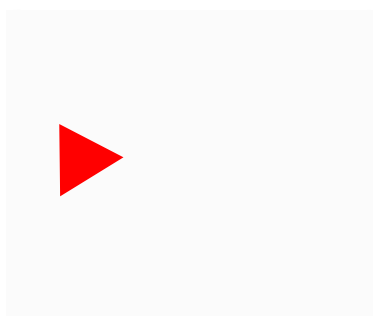
- Operating Temp: -40 °C to +105 °C
- Isolation voltage: 3000VDC
- High efficiency: Up to 89.5% typ.
- Regulated single output
- Output short circuit, over-current, over-voltage, input under-voltage, over temperature protection
- Standard ½ brick package
- Design to meet IEC/EN/UL 62368, EN50155



Summary



Training



Product Training Video
(click to open)



Press Release

Coming Soon!

Application Notes

Applications



Power Grid



Industrial



Telecom



Instrumentation

Models & Specifications

Single Output

Model	Input Voltage (VDC)	Output Voltage (VDC)	Nominal Vin Input Current		Output Current Max (A)	Maximum Capacitive Load (μF)	Efficiency Full Load Typ. (%)
			No Load Max (mA)	Full Load Typ. (A)			
AM150HB-4812SH30TT	48 (9 ~ 75)	12	35	3.49	12.5	5000	89.5
AM150HB-4824SH30TT	48 (9 ~ 75)	24	35	3.53	6.25	2000	88.5
AM150HB-4828SH30TT	48 (9 ~ 75)	28	35	3.51	5.35	1500	89.0
AM150HB-4848SH30TT	48 (9 ~ 75)	48	75	3.53	3.12	1000	88.5
AM150HB-4854SH30TT	48 (9 ~ 75)	54	75	3.51	2.77	1000	89.0

Input Specification

Parameters	Conditions	Typical	Maximum	Units
Input voltage	Nominal 48V	> 9	75	VDC
Absolute maximum rating	0.1s (Max)	--	100	VDC
Start-up voltage		9	--	VDC
Shut down voltage		8	--	VDC
On/Off control	On	Control pin open or 3-12VDC		
	Off	Control pin short to –Vin or 0-1.2VDC		
Input filter	Pi filter			

Isolation Specification

Parameters	Conditions	Typical	Maximum	Units
Tested isolation voltage	Input / output 60 sec	≥ 3000	--	VDC
Resistance	500VDC	≥ 1000	--	MΩ
Capacitance		--	3500	pF

Output Specification

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy	0% -100% load	--	±1	%
Line regulation	LL – HL 100% load	--	±0.2	%
Load regulation	0% - 100% load	--	±0.5	%
Start-up time	100% load, 48Vin	> 200	400	mS
Short circuit protection	Continues, Auto recovery			
Over current protection		150	--	% Io
Over voltage protection	Shut down, 12V output	13.4	18	VDC
	Shut down, 24V output	26.9	36	VDC
	Shut down, 28V output	31.4	42	VDC
	Shut down, 48V output	53.8	72	VDC
	Shut down, 54V output	60.5	81	VDC
Transient Recovery Time	Nominal input, 25% load step change(75%-100%)	500	--	μs
Ripple & Noise*	20MHz bandwidth, 100% load, 12V output	120	--	mV pk-pk
	20MHz bandwidth, 100% load, others	240	--	mV pk-pk
Trim		--	±10	%

* Tested with the ripple & noise circuit.

General Specifications

Parameters	Conditions	Typical	Maximum	Units
Switching frequency	100% Load	200	--	KHz
Operating temperature	With derating	-40 to +105	--	°C
Storage temperature		-55 to +125	--	°C
Over temperature protection	Case temperature	115	--	°C
Soldering temperature	1.5mm distance, ≤ 10s	--	300	°C
Temperature coefficient	100% Load	--	± 0.05	%/°C
Thermal Resistance	Models without heatsink, 20LFM	≥0.93	--	°C/W
	Models without heatsink, 100LFM	≥0.81	--	°C/W
	Models without heatsink,300LFM	≥0.53	--	°C/W
	Models without heatsink, 500LFM	≥0.42	--	°C/W
Cooling	Force air convection			
Humidity	Non-condensing	≥5	95	% RH
Weight		109	--	g
Dimensions (L x W x H)		2.40 x 2.28 x 0.50 inches (61.0 x 57.9 x 12.7 mm)		
Case material	Black plastic (UL94V-0)			
MTBF	≥ 1 000 000 hrs (MIL-HDBK -217F, t=+25°C)			
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.				

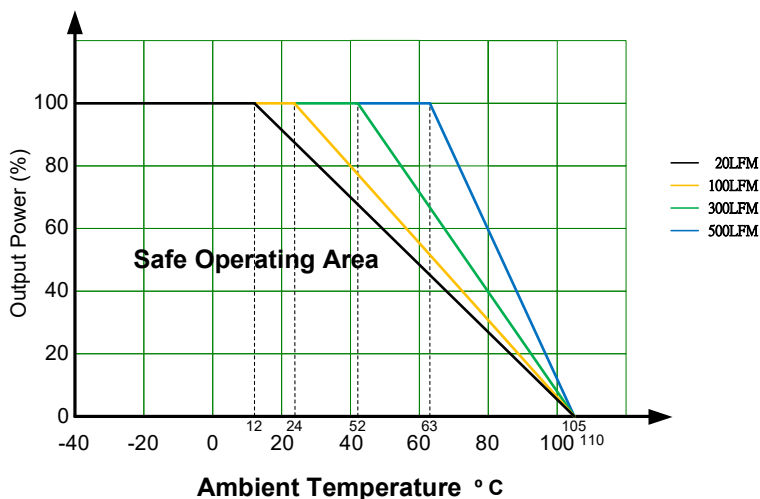
Environment Approval

Parameters	Conditions
Vibration	MIL-STD-202G

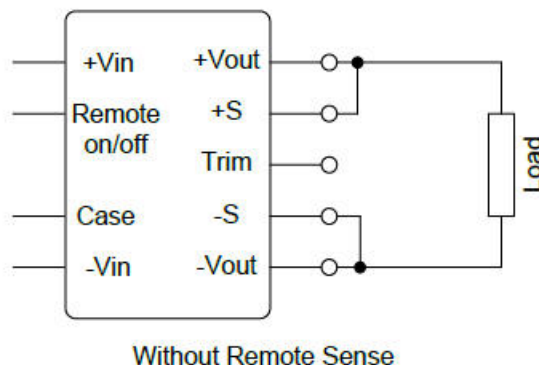
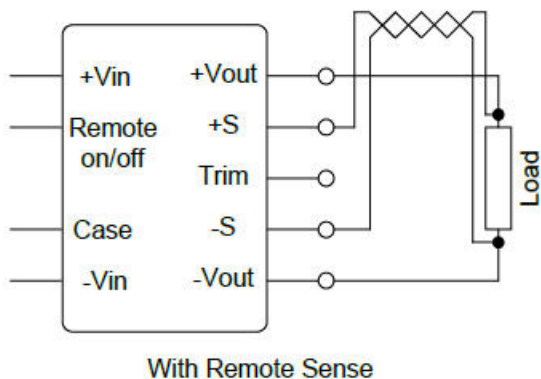
Safety Specifications

Parameters		
Standards	Information technology Equipment	Design to meet IEC/EN/UL 62368, EN50155
	EMI - Conducted and radiated emission	EN55032 Class A, B with the recommended EMI circuit
	Electrostatic Discharge Immunity	EN 61000-4-2, Contact ±6KV, Air ±8KV, Criteria A
	RF, Electromagnetic Field Immunity	EN 61000-4-3, 10V/m, Criteria A
	Electrical Fast Transient Immunity	EN 61000-4-4, ±2KV, Criteria A (External input capacitor required 680μF/ 100V)
	Surge Immunity	EN 61000-4-5, L-L ±2KV, Criteria A (External input capacitor required 680μF/ 100V)
	RF, Conducted Disturbance Immunity	EN 61000-4-6, 10 V/rms, Criteria A
	PFM, Magnetic Field Immunity	EN 61000-4-8, 10 A/m, Criteria A

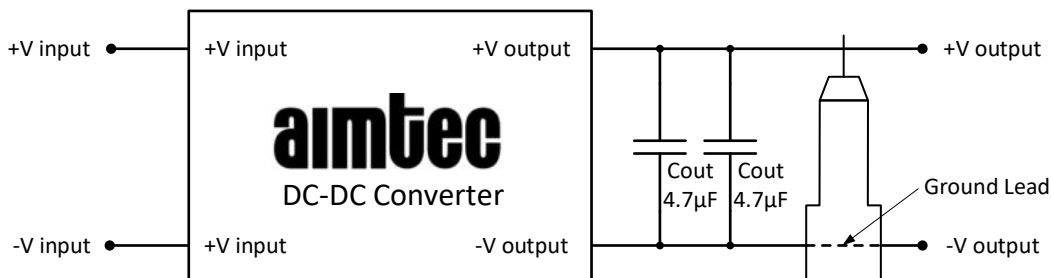
Derating



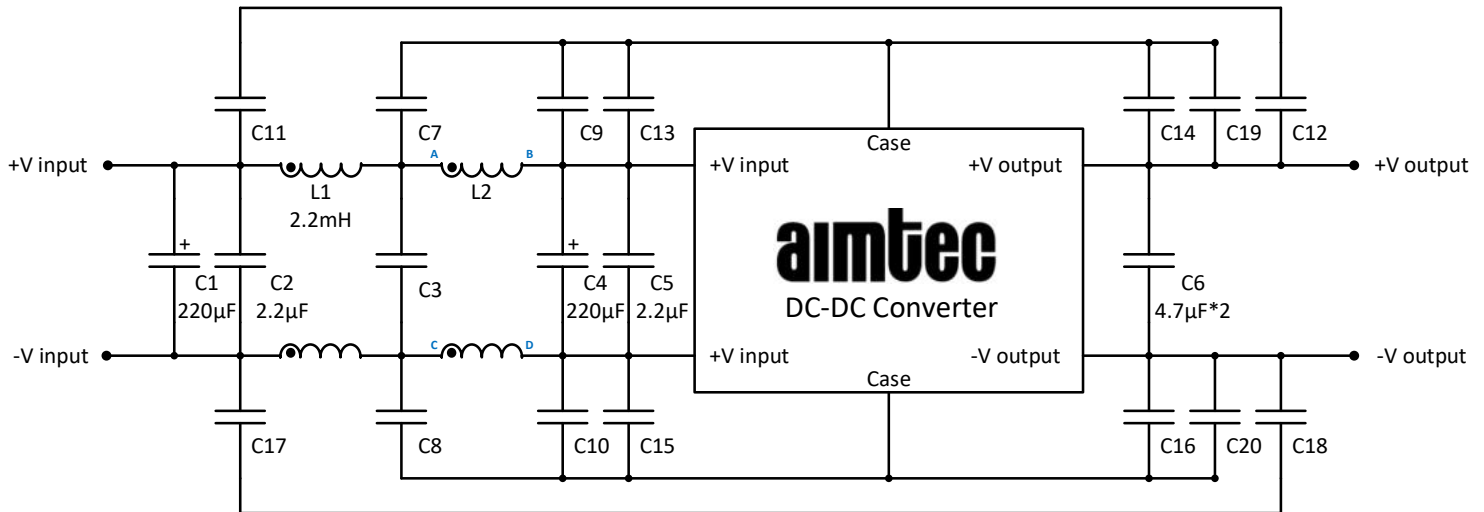
Remotes sense application



Ripple & noise circuit



Recommended EMI circuit



Vout	EMC Level	C3	C7	C8	C9	C10	C11	C12	C13
12V	Class A	Open	Open	Open	4700pF // 2200pF	4700pF // 2200pF	Open	Open	4700pF
	Class B	2.2µF	4700pF*3	4700pF*3	Open	Open	15pF	15pF	4700pF
24V	Class A	Open	Open	Open	4700pF // 2200pF	4700pF // 2200pF	Open	Open	4700pF
	Class B	2.2µF	4700pF*3	4700pF*3	Open	Open	10pF	10pF	4700pF*2
28V	Class A	Open	Open	Open	4700pF // 2200pF	4700pF // 2200pF	Open	Open	4700pF
	Class B	2.2µF	4700pF*3	4700pF*3	Open	Open	10pF	10pF	4700pF*2
48V	Class A	Open	Open	Open	4700pF	4700pF	Open	Open	4700pF
	Class B	2.2µF	4700pF*3	4700pF*3	470pF	470pF	15pF	15pF	4700pF*3
54V	Class A	Open	Open	Open	4700pF	4700pF	Open	Open	4700pF
	Class B	2.2µF	4700pF*3	4700pF*3	Open	Open	15pF	15pF	4700pF*3
Vout	EMC Level	C14	C15	C16	C17	C18	C19	C20	L2
12V	Class A	2200pF	4700pF	2200pF	Open	Open	4700pF // 2200pF	4700pF // 2200pF	A short TO B C short TO D
	Class B	4700pF	4700pF	4700pF	15pF	15pF	4700pF*3	4700pF*3	2.2mH
24V	Class A	2200pF	4700pF	2200pF	Open	Open	4700pF // 2200pF	4700pF // 2200pF	A short TO B C short TO D
	Class B	4700pF	4700pF*2	4700pF	10pF	10pF	4700pF*3	4700pF*3	2.2mH
28V	Class A	2200pF	4700pF	2200pF	Open	Open	4700pF // 2200pF	4700pF // 2200pF	A short TO B C short TO D
	Class B	4700pF	4700pF*2	4700pF	10pF	10pF	4700pF*3	4700pF*3	2.2mH
48V	Class A	3300pF	4700pF	3300pF	Open	Open	4700pF	4700pF	A short TO B C short TO D
	Class B	4700pF	4700pF*3	4700pF	15pF	15pF	4700pF*3	4700pF*3	2.2mH
54V	Class A	3300pF	4700pF	3300pF	Open	Open	4700pF	4700pF	A short TO B C short TO D
	Class B	4700pF	4700pF*3	4700pF	15pF	15pF	4700pF*3	4700pF*3	2.2mH

Technical drawing of a rectangular plate with dimensions and hole specifications. The plate is shown on a green grid background. The overall dimensions are 58.40 (width) and 61.50 (height). The width is also labeled as (2.30). The height is also labeled as (2.42). The plate has several holes of different diameters and positions:

- Top-left corner: $\varnothing 3.50 \pm 0.1$ (positioned at $(\varnothing 0.138 \pm 0.004)$ from the left edge).
- Below the top-left hole: $\varnothing 2.30 \pm 0.1$ (positioned at $(\varnothing 0.091 \pm 0.004)$ from the left edge).
- Below the previous hole: $\varnothing 1.30 \pm 0.1$ (positioned at $(\varnothing 0.051 \pm 0.004)$ from the left edge).
- Bottom-left corner: $\varnothing 1.30 \pm 0.1$ (positioned at $(\varnothing 0.051 \pm 0.004)$ from the left edge).
- Right edge: A vertical row of holes with diameters $\varnothing 3.50 \pm 0.1$, $\varnothing 2.30 \pm 0.1$, and $\varnothing 1.30 \pm 0.1$ from top to bottom.

Pin	Single	Pin	Single
1	+Vin	6	-Sense
2	On/Off Control	7	Trim
3	Case	8	+Sense
4	-Vin	9	+Vout
5	-Vout	--	--

The image contains two circuit diagrams side-by-side, illustrating different methods for trimming a circuit.

Fixed Resistor: This diagram shows a vertical stack of three resistors. The top resistor is labeled "TRIM UP" and has a resistance value of $R_{\text{TRIM UP}}$. The bottom resistor is labeled "TRIM DOWN" and has a resistance value of $R_{\text{TRIM DOWN}}$. The middle section is labeled "TRIM". The input terminals are labeled "-Vout" at the top and "+Vout" at the bottom.

Variable Potentiometer: This diagram shows a single vertical potentiometer. The top terminal is labeled "-Vout" and the bottom terminal is labeled "+Vout". The wiper terminal is labeled "TRIM". The total resistance of the potentiometer is labeled R_{TRIMPOT} .

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	11.880	11.760	11.640	11.520	11.400	11.280	11.160	11.040	10.920	10.800
Rt down (KΩ)	2902.333	1398.167	896.778	646.083	495.667	395.389	323.762	270.042	228.259	194.833
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	12.120	12.240	12.360	12.480	12.600	12.720	12.840	12.960	13.080	13.200
Rt up (KΩ)	723.667	327.833	195.889	129.917	90.333	63.944	45.095	30.958	19.963	11.167

Vout = 24V

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	23.760	23.520	23.280	23.040	22.800	22.560	22.320	22.080	21.840	21.600
Rt down (KΩ)	7541.367	3689.283	2405.256	1763.242	1378.033	1121.228	937.795	800.221	693.219	607.617
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	24.240	24.480	24.720	24.960	25.200	25.440	25.680	25.920	26.160	26.400
Rt up (KΩ)	819.033	371.117	221.811	147.158	102.367	72.506	51.176	35.179	22.737	12.783

Vout = 28V

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	27.720	27.440	27.160	26.880	26.600	26.320	26.040	25.760	25.480	25.200
Rt down (KΩ)	9110.486	4465.843	2917.629	2143.521	1679.057	1369.414	1148.241	982.361	853.343	750.129
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	28.280	28.560	28.840	29.120	29.400	29.680	29.960	30.240	30.520	30.800
Rt up (KΩ)	833.914	378.557	226.771	150.879	105.343	74.986	53.302	37.039	24.390	14.271

Vout = 48V

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	47.520	47.040	46.560	46.080	45.600	45.120	44.640	44.160	43.680	43.200
Rt down (KΩ)	16989.483	8363.442	5488.094	4050.421	3187.817	2612.747	2201.983	1893.910	1654.298	1462.608
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	48.480	48.960	49.440	49.920	50.400	50.880	51.360	51.840	52.320	52.800
Rt up (KΩ)	867.317	393.358	235.372	156.379	108.983	77.386	54.817	37.890	24.724	14.192

Vout = 54V

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	53.460	52.920	52.380	51.840	51.300	50.760	50.220	49.680	49.140	48.600
Rt down (KΩ)	18507.126	9322.129	6167.403	4571.993	3608.892	2964.366	2502.781	2155.928	1885.759	1669.375
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	54.540	55.080	55.620	56.160	56.700	57.240	57.780	58.320	58.860	59.400
Rt up (KΩ)	918.485	406.389	241.041	159.335	110.617	78.264	55.217	37.965	24.567	13.860

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