AM300HB-TT

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1/2 brick

The AM300HB-TT series is a high-performance half brick DC/DC converter specifically designed for a variety of railway applications. It features 300W of output power with no requirement for minimum load, a wide input voltage of 9-36VDC, operating temperature up to 100°C and reinforced I/O isolation of 2000VAC / 3000VDC.

Additionally, this series features include 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 AM300HB-TT meets EN62368-1 standards and are widely used in the centralized lighting, air conditioning and related on-board equipment.

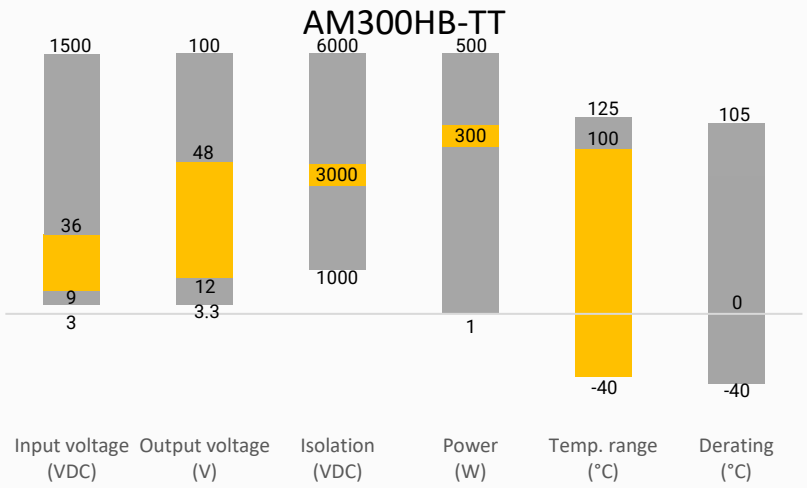
Features

- Operating Temp: -40 °C to +100 °C
- Isolation voltage: 2000VAC / 3000VDC
- High efficiency: Up to 87% typ.
- Wide input voltage 9 ~ 36VDC
- Output short circuit, over-current, over-voltage, input under-voltage, over temperature protection
- Standard 1/2 brick package
- Design to meet EN62368-1

RoHS

3yr Warranty

Summary



Training

Product Training Video (click to open)

Press Release

Coming Soon!

Application Notes

Applications

Railway

Industrial

Models & Specifications

Single Output

Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Current Max (A)	Isolation Voltage (VAC/VDC)	* Ripple & Noise max (mVp-p)	** Maximum Capacitive Load (µF)	Efficiency Full Load Typ (%)
AM300HB-2412SH30TT	24 (9-36)	12	25	2000/3000	120	8800	86.5
AM300HB-2415SH30TT	24 (9-36)	15	20	2000/3000	150	8800	87
AM300HB-2424SH30TT	24 (9-36)	24	12.5	2000/3000	300	4300	86
AM300HB-2448SH30TT	24 (9-36)	48	6.25	2000/3000	480	1500	87

* For the measurement of Ripple and Noise, please refer to Ripple & Noise Circuit.
** The capacitive load is test by minimum input and constant resistive load.

Input Specification

Parameters	Conditions	Typical	Maximum	Units
Input voltage	Nominal 24VDC	≥9	36	VDC
Input surge voltage	1s max.		50	VDC
Start-up voltage	0% - 100% load	9		VDC
Under voltage lockout	0% - 100% load	7		VDC
On/Off control	On	open or 3Vdc< Vr <12Vdc		
	Off	short or 0Vdc< Vr <1.2Vdc		
Input filter	LC type			

Isolation Specification

Parameters	Conditions	Typical	Maximum	Units
Isolation voltage	Input to output 60 sec, ≤ 5mA	≥2000		VAC
	Input to output 60 sec, ≤ 1mA	≥3000		VDC
	Input or output to case, 60 sec, ≤ 5mA	≥1000		VAC
	Input or output to case, 60 sec, ≤ 1mA	≥1600		VDC
Resistance	500VDC	≥1000		MΩ
Capacitance			4700	pF

Output Specification

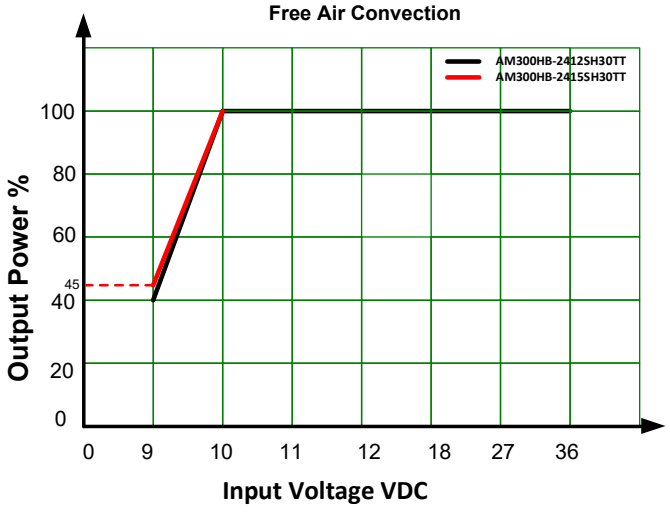
Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy			±1	%
Line regulation	LL – HL 100% load		±0.2	%
Load regulation	0% - 100% load		±0.5	%
Short circuit protection	Continues, Auto recovery			
Over current protection		150		% Io
Over voltage protection	12Vout, Shutdown		19.2	V
	15Vout, Shutdown		24	V
	24Vout, Shutdown		38.4	V
	48Vout, Shutdown		67.2	V
Transient Recovery Time	25% load step change (75% - 100% load)	500		µs
Trim-Voltage adjustability *	12 / 15Vout, Vin = 12 ~36V		±10	%
	24Vout		±10	%
	48Vout, Vin = 12 ~36V		-10, +15	%

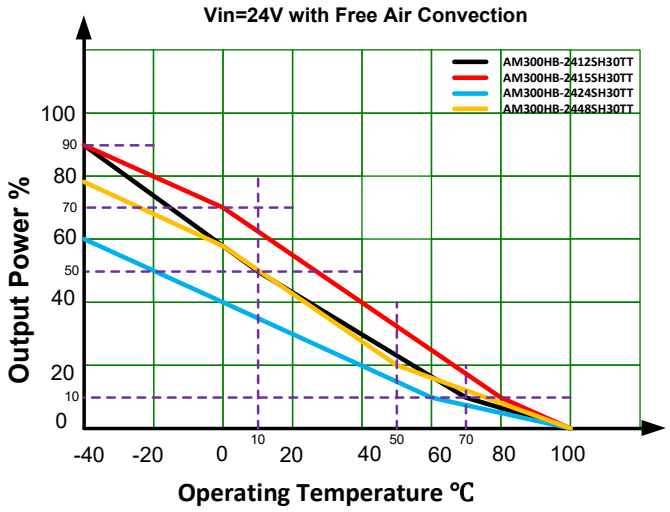
* 0%~100% load at Vin range Pout ≤ max rated power

General Specifications				
Parameters	**Conditions**	**Typical**	**Maximum**	**Units**
Switching frequency	100% Load, Nominal Vin	250		KHz
Operating temperature	With derating, Nominal Vin	-40 to +100		°C
Storage temperature		-55 to +125		°C
Over temperature protection	Tc (Case Temperature)		110	°C
Temperature coefficient			± 0.05	%/ °C
Cooling	Free air convection			
Humidity	Non-condensing	≥5	95	% RH
Weight		120		g
Dimensions (L x W x H)		2.28 x 2.40 x 0.50 inches (57.9 x 61.0 x 12.7 mm)		
Case material	Aluminum Baseplate with Plastic Case			
Potting material	Silicon			
MTBF	≥ 600 000 hrs (MIL-HDBK -217F, t=+25°C)			
Vibration	MIL-STD-202G			
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.				

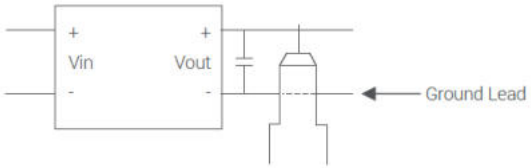
Safety Specifications		
Parameters		
Standards	Design to meet EN62368-1	
	EMI - Conducted and radiated emission	EN 55032 See the recommended EMC circuit for class A
	Electrostatic Discharge Immunity	IEC/EN 61000-4-2, Contact ±6KV, Air ±8KV, Criteria A
	RF, Electromagnetic Field Immunity	IEC/EN 61000-4-3, 10V/m, Criteria A
	Electrical Fast Transient/Burst Immunity *	IEC/EN 61000-4-4, ±2KV, Criteria A
	Surge Immunity *	IEC/EN 61000-4-5, ±2KV, Criteria A
	RF, Conducted Disturbance Immunity	IEC/EN 61000-4-6, 10Vrms, Criteria A
	Magnetic field immunity	IEC/EN 61000-4-8, 10A/m, Criteria A
* External input capacitor required 1000µF/100V		

Derating



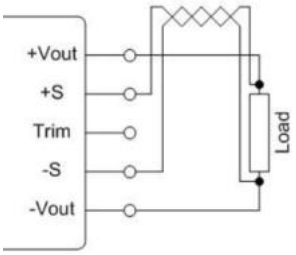


Ripple & Noise Circuit

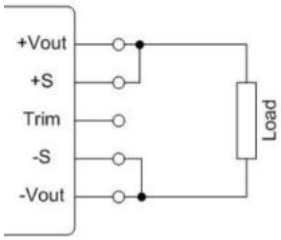


20MHZ BW at nominal with E-cap 47µF/100V + X7R MLCC 0.47µF/100V.

Remote Sense Application



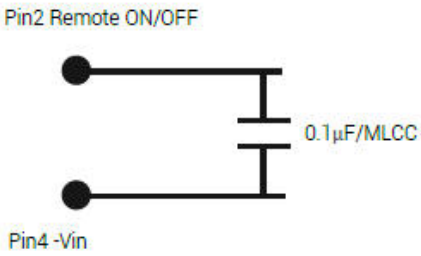
With Remote Sense



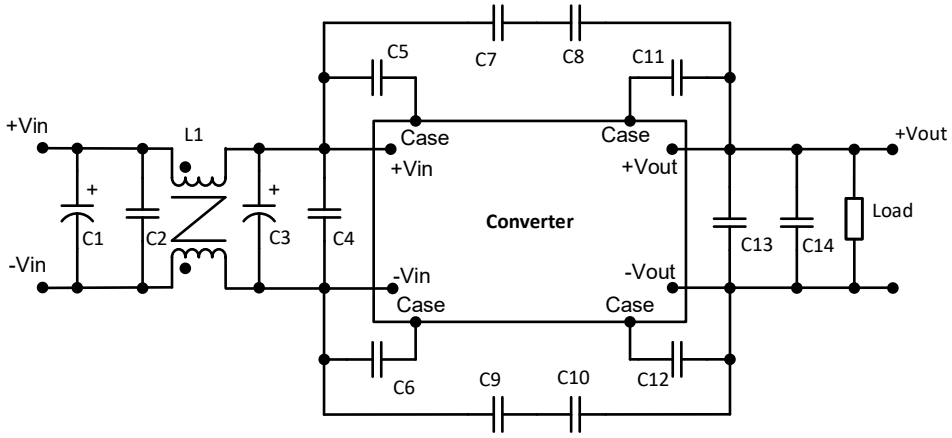
Without Remote Sense

The AM300HB-TT series has Remote Sense feature, it can correct for voltage drops from the converter's output pins to the load. The Sense wire is not the main path of the system and carries very little current. It is recommended to use twisted wires for the +Sense and -Sense wires or shielded cable to avoid noise and unwanted inductance. If no used the Remote Sense feature, please connect +S and -S pin to +Vout and -Vout.

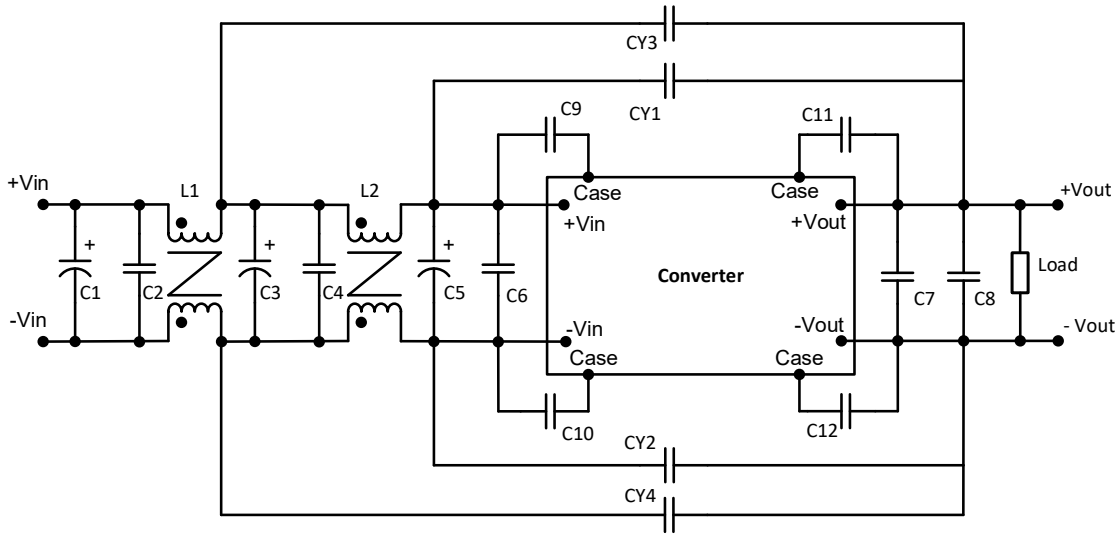
Remote ON/OFF Control



Recommended EMC circuit

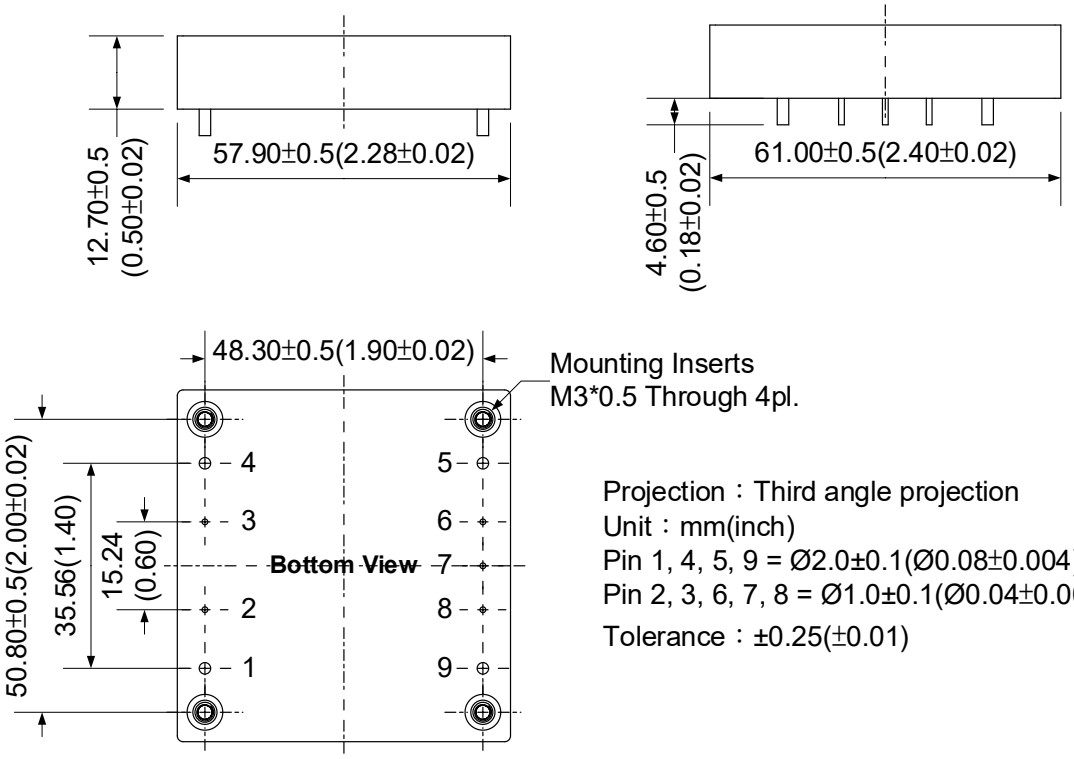


Vout	C1, C3	C2, C4	C5, C6, C11, C12	C7, C8, C9, C10	C13	C14	L1
12V 15V	220uF/100V E-Cap KYA	1uF/50V Ceramic	4700pF/2KV x 4 parallel Ceramic	4700pF/2KV Ceramic	47uF/50V Ceramic	0.1uF/50V Ceramic	A10 T22X14X10 1.3mH
48V	220uF/100V E-Cap KYA	1uF/50V Ceramic	4700pF/2KV x 6 parallel Ceramic	4700pF/2KV Ceramic	4.7uF/100V Ceramic	0.1uF/100V Ceramic	A10 T22X14X10 1.3mH



Vout	C1, C3, C5	C2, C4, C6	C7	C8	C9, C10, C11, C12	CY1, CY2	L1, L2
24V	220uF/100V E-Cap KYA	1uF/50V Ceramic	4.7uF/50V Ceramic	0.1uF/50V Ceramic	2200pF/3KV Ceramic	2200pF/3KV x 5 parallel Ceramic	A10 T22X14X10 1.3mH

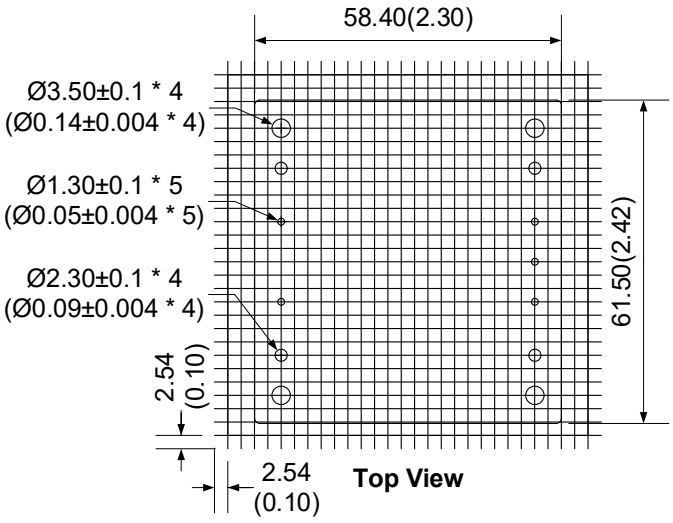
Dimension



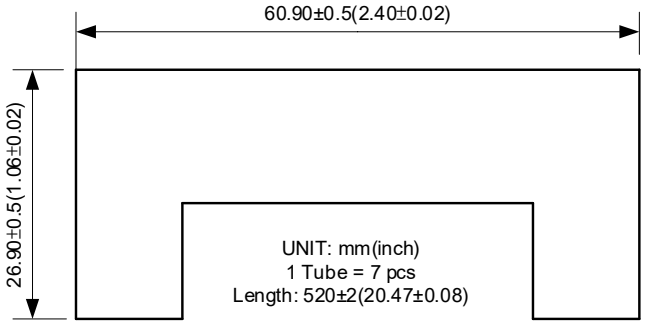
Pin Out Specifications	
Pin	Single
1	+Vin
2	On/Off Ctrl
3	Case
4	-Vin
5	-Vout
6	- Sense
7	Trim
8	+Sense
9	+Vout

Projection：Third angle projection
Unit：mm(inch)
Pin 1, 4, 5, 9 = Ø2.0±0.1(Ø0.08±0.004)
Pin 2, 3, 6, 7, 8 = Ø1.0±0.1(Ø0.04±0.004)
Tolerance：±0.25(±0.01)

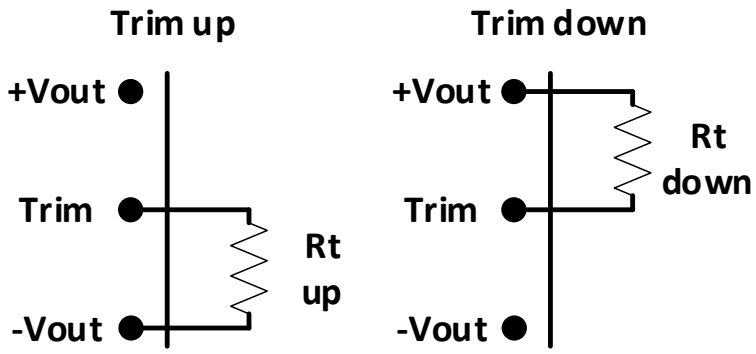
Recommended Footprint



Package



Trim



Vout=	12									
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=	15									
Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	14.850	14.700	14.550	14.400	14.250	14.100	13.950	13.800	13.650	13.500
Rt down (KΩ)	4048.667	1965.333	1270.889	923.667	715.333	576.444	477.238	402.833	344.963	298.667
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	15.150	15.300	15.450	15.600	15.750	15.900	16.050	16.200	16.350	16.500
Rt up (KΩ)	765.333	348.667	209.778	140.333	98.667	70.889	51.048	36.167	24.593	15.333

Vout=	24									
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)	8027.070	4302.355	2908.188	2178.475	1729.614	1425.630	1206.128	1040.187	910.333	805.950
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)	611.252	244.063	138.817	88.912	59.786	40.696	27.219	17.195	9.449	3.283
Vout=	**48**									
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)	3401.617	1676.408	1101.339	813.804	641.283	526.269	444.117	382.502	334.580	296.242
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)	177.183	82.392	50.794	34.996	25.517	19.197	14.683	11.298	8.665	6.558