



THE DATASHEET OF AM1P-242424DZ

Series AM1P-Z

1 Watt | DC-DC Converter



FEATURES:

- RoHS compliant
- 8 Pin DIP Package
- Low ripple and noise
- High efficiency up to 85%
- Operating temperature -40°C to + 85°C
- Input / Output Isolation 1000 & 3000VDC
- Pin compatible with multiple manufacturers



Models

Single output

Model	Input Voltage (V)	Output Voltage (V)	Output Current Max (mA)	Isolation (VDC)	Max Capacitive Load (uF)	Input Current Full Load No Load (mA)		Efficiency (%)
AM1P-0303SZ	2.97-3.63	3.3	303	1000	220	410	25	74
AM1P-0305SZ	2.97-3.63	5	200	1000	220	394	25	77
AM1P-0307SZ	2.97-3.63	7.2	138.9	1000	220	404	30	75
AM1P-0309SZ	2.97-3.63	9	111.1	1000	220	399	30	76
AM1P-0312SZ	2.97-3.63	12	100	1000	220	485	45	75
AM1P-0315SZ	2.97-3.63	15	66.6	1000	220	384	25	79
AM1P-0318SZ	2.97-3.63	18	55.5	1000	220	399	35	76
AM1P-0324SZ	2.97-3.63	24	50	1000	220	485	90	75
AM1P-0503SZ	4.5-5.5	3.3	303	1000	220	256	16	78
AM1P-0505SZ	4.5-5.5	5	200	1000	220	253	15	79
AM1P-0507SZ	4.5-5.5	7.2	138.9	1000	220	241	16	83
AM1P-0509SZ	4.5-5.5	9	111.1	1000	220	253	25	79
AM1P-0512SZ	4.5-5.5	12	100	1000	220	296	25	81
AM1P-0515SZ	4.5-5.5	15	66.6	1000	220	244	25	82
AM1P-0518SZ	4.5-5.5	18	55.5	1000	220	241	25	83
AM1P-0524SZ	4.5-5.5	24	50	1000	220	293	28	82
AM1P-1203SZ	10.8-13.2	3.3	303	1000	220	108	15	77
AM1P-1205SZ	10.8-13.2	5	200	1000	220	105	16	79
AM1P-1207SZ	10.8-13.2	7.2	138.9	1000	220	100	16	83
AM1P-1209SZ	10.8-13.2	9	111.1	1000	220	105	15	79
AM1P-1212SZ	10.8-13.2	12	100	1000	220	125	20	80
AM1P-1215SZ	10.8-13.2	15	66.6	1000	220	105	17	79
AM1P-1218SZ	10.8-13.2	18	55.5	1000	220	103	15	81
AM1P-1224SZ	10.8-13.2	24	50	1000	220	127	25	79
AM1P-2403SZ	21.6-26.4	3.3	303	1000	220	53	8	79
AM1P-2405SZ	21.6-26.4	5	200	1000	220	53	8	79
AM1P-2407SZ	21.6-26.4	7.2	138.9	1000	220	56	10	74
AM1P-2409SZ	21.6-26.4	9	111.1	1000	220	53	7	79
AM1P-2412SZ	21.6-26.4	12	100	1000	220	63	8	80
AM1P-2415SZ	21.6-26.4	15	66.6	1000	220	52	8	80
AM1P-2418SZ	21.6-26.4	18	55.5	1000	220	51	8	82
AM1P-2424SZ	21.6-26.4	24	50	1000	220	61	9	82
AM1P-0303SH30Z	2.97-3.63	3.3	303	3000	220	410	25	74
AM1P-0305SH30Z	2.97-3.63	5	200	3000	220	394	25	77
AM1P-0307SH30Z	2.97-3.63	7.2	138.9	3000	220	404	30	75
AM1P-0309SH30Z	2.97-3.63	9	111.1	3000	220	399	30	76
AM1P-0312SH30Z	2.97-3.63	12	100	3000	220	485	45	75
AM1P-0315SH30Z	2.97-3.63	15	66.6	3000	220	384	25	79
AM1P-0318SH30Z	2.97-3.63	18	55.5	3000	220	399	35	76
AM1P-0324SH30Z	2.97-3.63	24	50	3000	220	485	90	75
AM1P-0503SH30Z	4.5-5.5	3.3	303	3000	220	256	16	78
AM1P-0505SH30Z	4.5-5.5	5	200	3000	220	253	15	79
AM1P-0507SH30Z	4.5-5.5	7.2	138.9	3000	220	241	16	83
AM1P-0509SH30Z	4.5-5.5	9	111.1	3000	220	253	25	79
AM1P-0512SH30Z	4.5-5.5	12	100	3000	220	296	25	81
AM1P-0515SH30Z	4.5-5.5	15	66.6	3000	220	244	25	82
AM1P-0518SH30Z	4.5-5.5	18	55.5	3000	220	241	25	83
AM1P-0524SH30Z	4.5-5.5	24	50	3000	220	293	28	82

AM1P-1203SH30Z	10.8-13.2	3.3	303	3000	220	108	15	77
AM1P-1205SH30Z	10.8-13.2	5	200	3000	220	105	16	79
AM1P-1207SH30Z	10.8-13.2	7.2	138.9	3000	220	100	16	83
AM1P-1209SH30Z	10.8-13.2	9	111.1	3000	220	105	15	79
AM1P-1212SH30Z	10.8-13.2	12	100	3000	220	125	20	80
AM1P-1215SH30Z	10.8-13.2	15	66.6	3000	220	105	17	79
AM1P-1218SH30Z	10.8-13.2	18	55.5	3000	220	103	15	81
AM1P-1224SH30Z	10.8-13.2	24	50	3000	220	127	25	79
AM1P-2403SH30Z	21.6-26.4	3.3	303	3000	220	53	8	79
AM1P-2405SH30Z	21.6-26.4	5	200	3000	220	53	8	79
AM1P-2407SH30Z	21.6-26.4	7.2	138.9	3000	220	56	10	74
AM1P-2409SH30Z	21.6-26.4	9	111.1	3000	220	53	7	79
AM1P-2412SH30Z	21.6-26.4	12	100	3000	220	63	8	80
AM1P-2415SH30Z	21.6-26.4	15	66.6	3000	220	52	8	80
AM1P-2418SH30Z	21.6-26.4	18	55.5	3000	220	51	8	82
AM1P-2424SH30Z	21.6-26.4	24	50	3000	220	61	9	82

Models

Dual output

Model	Input Voltage (V)	Output Voltage (V)	Output Current max (mA)	Isolation (VDC)	Max Capacitive Load	Input Current Full Load No Load (mA)		Efficiency (%)
AM1P-0503DZ	4.5-5.5	±3.3	±152	1000	±100	299	15	67
AM1P-0505DZ	4.5-5.5	±5	±100	1000	±100	270	20	74
AM1P-0507DZ	4.5-5.5	±7.2	±69	1000	±100	260	15	77
AM1P-0509DZ	4.5-5.5	±9	±56	1000	±100	260	20	77
AM1P-0512DZ	4.5-5.5	±12	±50	1000	±100	300	22	80
AM1P-0515DZ	4.5-5.5	±15	±33	1000	±100	247	20	81
AM1P-0518DZ	4.5-5.5	±18	±28	1000	±100	244	22	82
AM1P-0524DZ	4.5-5.5	±24	±25	1000	±100	300	20	85
AM1P-1203DZ	10.8-13.2	±3.3	±152	1000	±100	121	10	69
AM1P-1205DZ	10.8-13.2	±5	±100	1000	±100	110	7	76
AM1P-1207DZ	10.8-13.2	±7.2	±69	1000	±100	109	15	76
AM1P-1209DZ	10.8-13.2	±9	±56	1000	±100	109	15	78
AM1P-1212DZ	10.8-13.2	±12	±50	1000	±100	123	12	81
AM1P-1215DZ	10.8-13.2	±15	±33	1000	±100	102	10	82
AM1P-1218DZ	10.8-13.2	±18	±28	1000	±100	103	15	81
AM1P-1224DZ	10.8-13.2	±24	±25	1000	±100	125	20	80
AM1P-2403DZ	21.6-26.4	±3.3	±152	1000	±100	60	5	70
AM1P-2405DZ	21.6-26.4	±5	±100	1000	±100	56	6	74
AM1P-2407DZ	21.6-26.4	±7.2	±69	1000	±100	55	6	76
AM1P-2409DZ	21.6-26.4	±9	±56	1000	±100	56	7	75
AM1P-2412DZ	21.6-26.4	±12	±50	1000	±100	62	5	81
AM1P-2415DZ	21.6-26.4	±15	±33	1000	±100	51	5	81
AM1P-2418DZ	21.6-26.4	±18	±28	1000	±100	53	7	78
AM1P-2424DZ	21.6-26.4	±24	±25	1000	±100	64	7	78

Models

Dual Separated Output

Model	Input Voltage (V)	Output Voltage (V)	Output Current max (mA)	Isolation (VDC)	Max Capacitive Load (uF)	Input Current Full Load No Load (mA)		Efficiency (%)
AM1P-050303DZ	4.5-5.5	3.3 / 3.3	152 / 152	1000	100	299	15	67
AM1P-050505DZ	4.5-5.5	5 / 5	100 / 100	1000	100	247	30	81
AM1P-050707DZ	4.5-5.5	7.2 / 7.2	69 / 69	1000	100	260	16	77
AM1P-050909DZ	4.5-5.5	9 / 9	56 / 56	1000	100	253	15	79
AM1P-051212DZ	4.5-5.5	12 / 12	50 / 50	1000	100	300	20	80
AM1P-051515DZ	4.5-5.5	15 / 15	33 / 33	1000	100	247	20	81
AM1P-051818DZ	4.5-5.5	18 / 18	28 / 28	1000	100	247	20	81
AM1P-052424DZ	4.5-5.5	24 / 24	25 / 25	1000	100	320	25	75

AM1P-120303DZ	10.8-13.2	3.3 / 3.3	152 / 152	1000	100	111	15	75
AM1P-120505DZ	10.8-13.2	5 / 5	100 / 100	1000	100	111	10	75
AM1P-120707DZ	10.8-13.2	7.2 / 7.2	69 / 69	1000	100	107	10	78
AM1P-120909DZ	10.8-13.2	9 / 9	56 / 56	1000	100	105	10	79
AM1P-121212DZ	10.8-13.2	12 / 12	50 / 50	1000	100	125	15	80
AM1P-121515DZ	10.8-13.2	15 / 15	33 / 33	1000	100	104	13	80
AM1P-121818DZ	10.8-13.2	18 / 18	28 / 28	1000	100	107	20	78
AM1P-122424DZ	10.8-13.2	24 / 24	25 / 25	1000	100	128	20	78
AM1P-240303DZ	21.6-26.4	3.3 / 3.3	152 / 152	1000	100	53	5	79
AM1P-240505DZ	21.6-26.4	5 / 5	100 / 100	1000	100	50	8	83
AM1P-240707DZ	21.6-26.4	7.2 / 7.2	69 / 69	1000	100	53	5	78
AM1P-240909DZ	21.6-26.4	9 / 9	56 / 56	1000	100	54	8	77
AM1P-241212DZ	21.6-26.4	12 / 12	50 / 50	1000	100	63	6	80
AM1P-241515DZ	21.6-26.4	15 / 15	33 / 33	1000	100	54	6	77
AM1P-241818DZ	21.6-26.4	18 / 18	28 / 28	1000	100	56	13	74
AM1P-242424DZ	21.6-26.4	24 / 24	25 / 25	1000	100	65	5	77

Input Specifications

Parameters	Nominal	Typical	Maximum	Units
Voltage range	3.3 Vin	2.97-3.63		VDC
	5 Vin	4.5-5.5		VDC
	12 Vin	10.8-13.2		VDC
	24 Vin	21.6-26.4		VDC
Filter	Capacitor			
Absolute Maximum Rating	3.3 Vin		6	VDC
	5 Vin		7	VDC
	12 Vin		15	VDC
	24 Vin		28	VDC
Peak Input Voltage time		100		ms
Input reflective ripple current	With a 12μH inductor and a 47μF capacitor		20	mAp-p

Isolation Specifications

Parameters	Conditions	Typical	Rated	Units
Tested I/O voltage	60 sec		1000	VDC
	60 sec, H30 models		3000	VDC
Resistance		> 1000		MOhm
Capacitance		60		pF

Output Specifications

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy		±3		%
Line voltage regulation	for 1% change of Vin	±1.2		%
Load voltage regulation	20-100% load, Single 3.3Vout models		±20	%
	20-100% load, Single other output models		±10	%
	20-100% load, Dual 3.3V output models	±20		%
	20-100% load, Dual Separated 3.3Vout models	±15		%
	20-100% load, Others	±10		%
Temperature coefficient		±0.02		%/°C
Ripple & Noise	At 20MHz Bandwidth	100		mV p-p

General Specifications

Parameters	Conditions	Typical	Maximum	Units
Switching frequency	100% load, Variable	80		KHz
Operating temperature	Full Load without Derating	-40 to +85		°C
Storage temperature		-40 to +125		°C
Max Case temperature			100	°C
Cooling	Free air convection			
Humidity			90	%

Case material	Non-conductive black plastic			
Weight		1.8		g
Dimensions (L x W x H)	0.50 x 0.40 x 0.27 inches		12.70 x 10.16 x 6.85 mm	
MTBF	>1 121 000 hrs (MIL-HDBK -217F, Ground Benign, 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

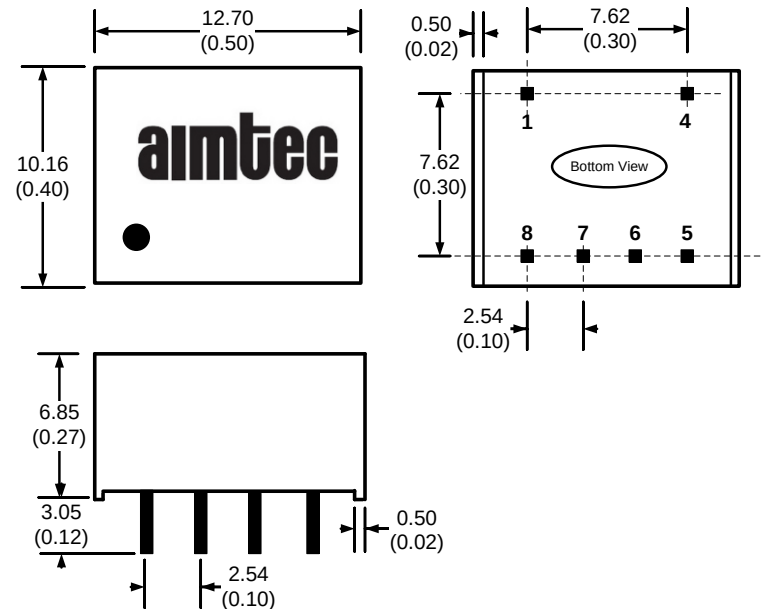
Safety Specifications

Parameters	
Agency approvals	CE
Standards	EN55032 (Radiated & Conducted Emissions) class B, with recommended EMC circuit. EN55024:2010.
	IEC61000-4-2(ESD) Criteria A
	IEC61000-4-3(Radiated immunity) Criteria A
	IEC61000-4-4(EFT) Criteria A, with an external 470uF/100V filter capacitor
	IEC61000-4-5(Surge) Criteria A, with an external 470uF/100V filter capacitor
	IEC61000-4-6(CS) Criteria A
	IEC61000-4-8(PFMF) Criteria A

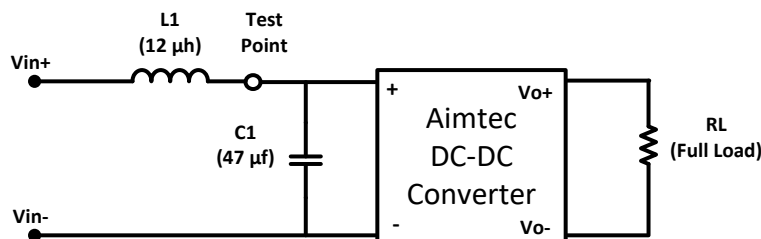
Pin Out Specifications

Pin	1000 and 3000 VDC		1000 VDC
	Single	Dual	Dual Separated
1	- V Input	- V Input	- V Input
4	+ V Input	+ V Input	+ V Input
5	+ V Output	+ V Output	+ V1 Output
6	No pin	No pin	- V1 Output
7	- V Output	Common	+ V2 Output
8	No pin	- V Output	- V2 Output

Dimensions



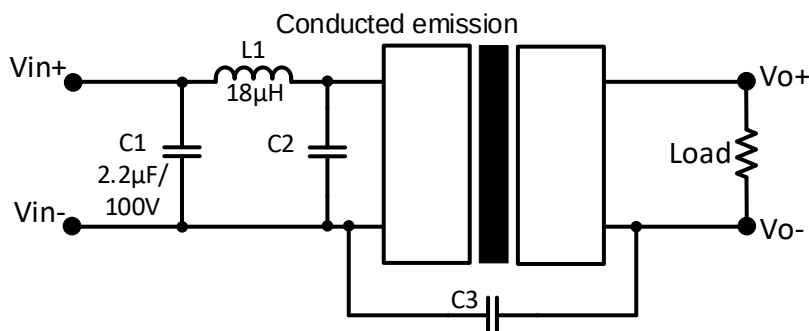
Input Reflected Ripple Test Circuit



* Tested at full load, and nominal input

Recommended EMC circuit for single and dual output models

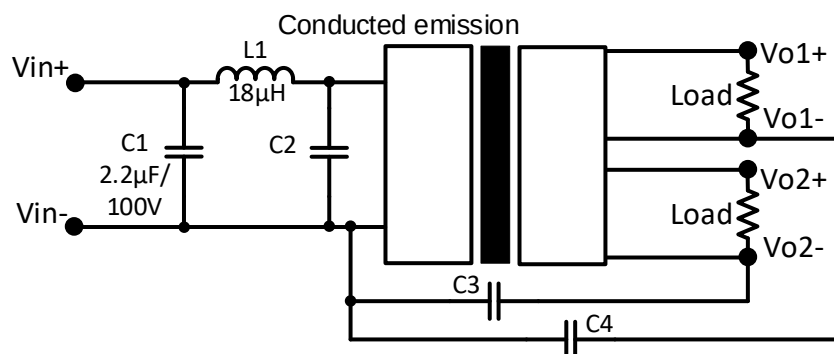
To meet conducted emissions, the following circuit is recommended with the external components as noted in the table below.



Model	C1	L1	C2	C3
3.3Vin	2.2 μF / 100V	18 μH		
5 Vin	2.2 μF / 100V	18 μH		
12 Vin	2.2 μF / 100V	18 μH		
24 Vin	2.2 μF / 100V	18 μH	2.2 μF / 100V	470pF / 2KV

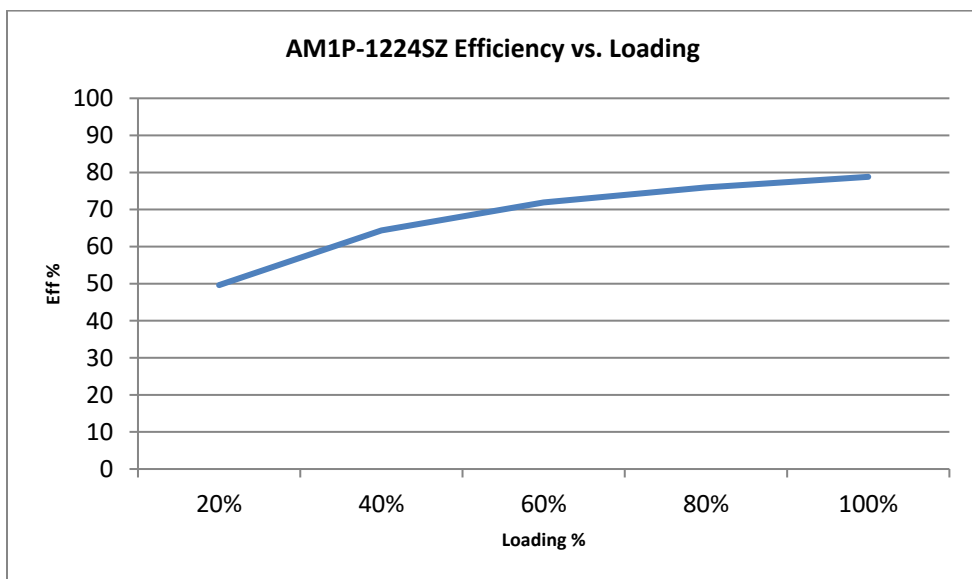
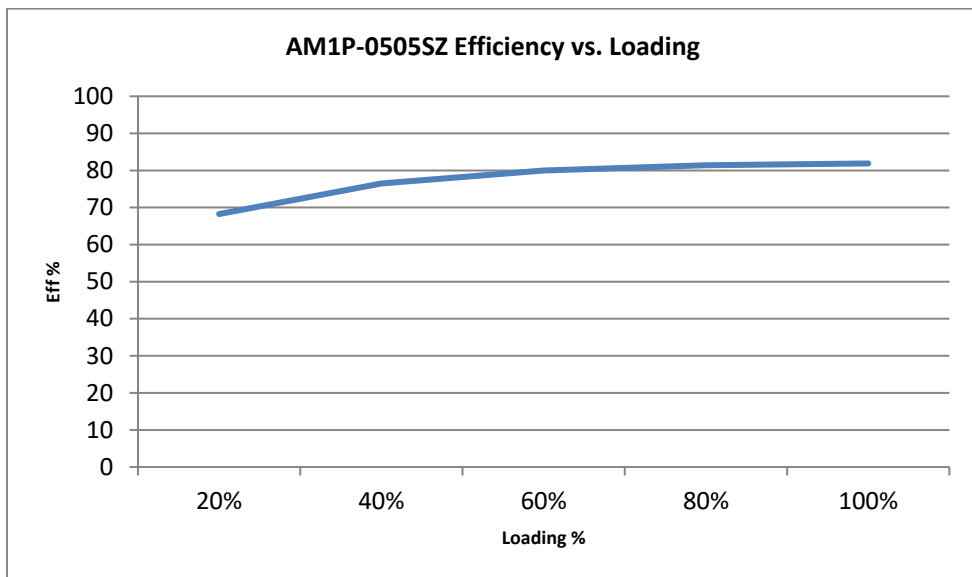
Recommended EMC circuit for dual separated output models

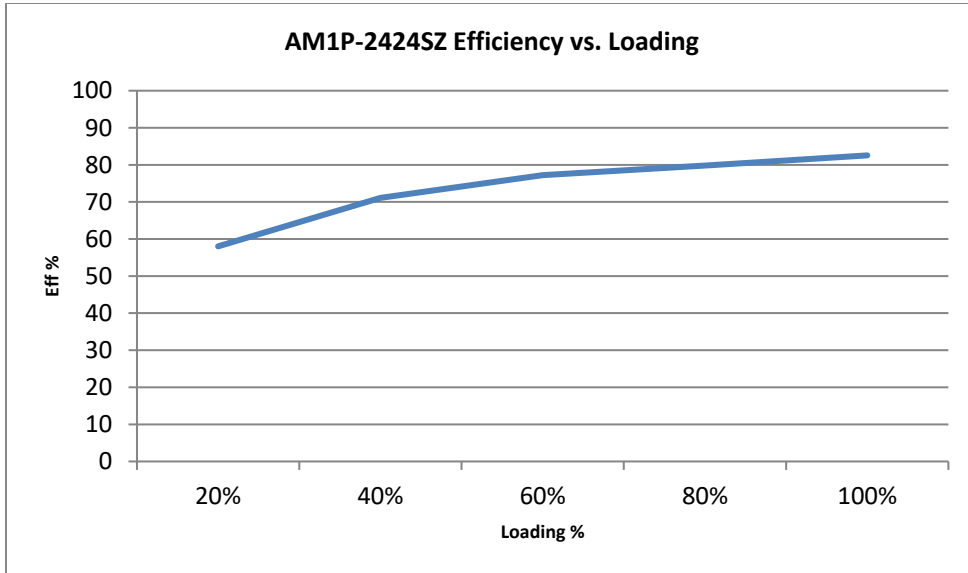
To meet conducted emissions, the following circuit is recommended with the external components as noted in the table below.



Model	C1	L1	C2	C3	C4
3.3Vin	2.2 μF / 100V	18 μH			
5 Vin	2.2 μF / 100V	18 μH			
12 Vin	2.2 μF / 100V	18 μH			
24 Vin	2.2 μF / 100V	18 μH	2.2 μF / 100V	470pF / 2KV	470pF / 2KV

Typical Efficiency Chart Examples





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