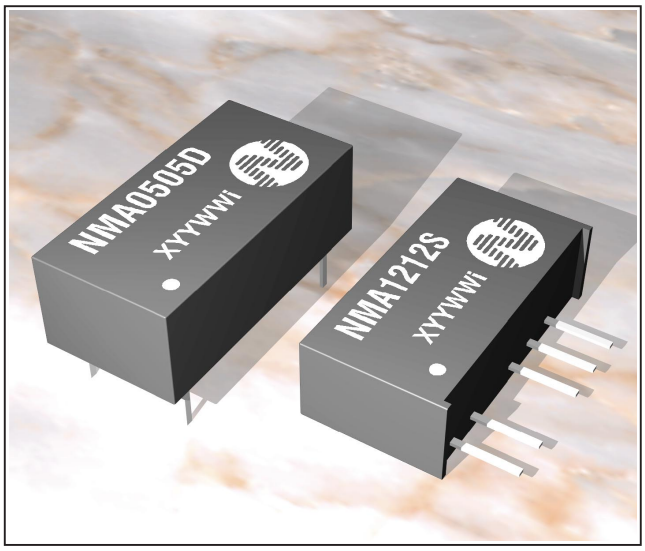
NMA SERIES
Isolated 1W Dual Output DC-DC Converters

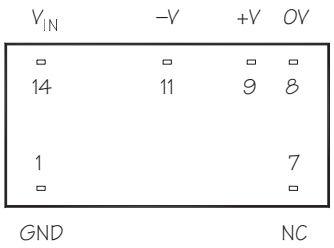
features

- Wide Temperature performance at full 1 Watt load, –40°C to 85°C
- Dual Output from a Single Input Rail
- Industry Standard Pinout
- Power Sharing on Output
- 1kVDC Isolation
- Efficiency to 78%
- Power Density upto 0.85W/cm^3
- 5V & 12V Input
- 5V, 9V, 12V and 15V Output
- Footprint from 1.17cm^2
- UL 94V-0 Package Material
- No Heatsink Required
- Internal SMD Construction
- Toroidal Magnetics
- Fully Encapsulated
- No External Components Required
- MTTF up to 2.1 Million hours
- Custom Solutions Available
- No Electrolytic or Tantalum Capacitors

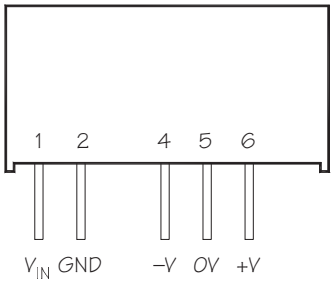


pin connections

14 Pin DIP (top view)



7 Pin SIP



description

The NMA series of industrial temperature range DC-DC converters are the standard building blocks for on-board distributed power systems. They are ideally suited for providing dual rail supplies on primarily digital boards with the added benefit of galvanic isolation to reduce switching noise. All of the rated power may be drawn from a single pin provided the total load does not exceed 1watt.

PRELIMINARY
Notice : This is not a final specification.
Some parametric limits may be subject to change.

absolute maximum ratings

Short circuit duration[1] . . . . . 1 second

Internal power dissipation 450mW

Lead temperature 1.5mm from case for 10 seconds . . . . . 300°C

Input voltage V_{IN}, NMA05 types 7V

Input voltage V_{IN}, NMA12 types 15V

electrical specifications

Specifications typical at T_A=25°C, nominal input voltage and rated output current unless otherwise specified.

Order Code	Nominal Input Voltage	Rated Output Voltage	Rated Output Current	Input Current at Rated Load	Efficiency	Isolation Capacitance	Package Style
	(V)	(V)	(mA)	(mA)	(%)	(pF)	
NMA0505D	5	5	±100	289	69	28	1
NMA0509D	5	9	±55	270	75	32	
NMA0512D	5	12	±42	266	77	34	
NMA0515D	5	15	±33	263	78	36	
NMA0505S	5	5	±100	289	69	28	2
NMA0509S	5	9	±55	270	75	32	
NMA0512S	5	12	±42	266	77	34	
NMA0515S	5	15	±33	263	78	36	
NMA1205D	12	5	±100	120	69	33	1
NMA1209D	12	9	±55	113	74	46	
NMA1212D	12	12	±42	111	75	55	
NMA1215D	12	15	±33	110	76	54	
NMA1205S	12	5	±100	120	69	33	2
NMA1209S	12	9	±55	113	74	46	
NMA1212S	12	12	±42	111	75	55	
NMA1215S	12	15	±33	110	76	54	

i When operated **without** additional external load capacitance, the output voltage of the NMA devices is guaranteed to be within 95% of its steady state value within 100ms after the input voltage has reached 95% of its steady state value, **irrespective of the rise time of the input voltage.**

ii When operated **with** additional external load capacitance the rise time of the input voltage will determine the maximum external capacitance value for guaranteed start up. The slower the rise time of the input voltage the greater the maximum value of the additional external capacitance for reliable start up.

1 Supply voltage must be discontinued at the end of the short circuit duration.

family characteristics - input

Specifications typical at T_A=25°C, nominal input voltage and rated output current unless otherwise specified.

Parameter	Conditions	MIN	NOM	MAX	Units
Voltage Range	Continuous operation, 5V input types	4.5	5	5.5	V
	Continuous operation, 12V input types	10.8	12	13.2	
Reflected Ripple Current			20	33	mA p-p

family characteristics - output

Specifications typical at T_A=25°C, nominal input voltage and rated output current unless otherwise specified.

Parameter	Conditions	MIN	TYP	MAX	Units
Rated Power[1]	T_A = –40°C to 120°C			1	W
Voltage Set point Accuracy	See tolerance envelope				
Line Regulation	High V_{IN} to low V_{IN}		1.0	1.2	%/%
Load Regulation	10% load to rated load, 5V output types		10	12.5	%
	10% load to rated load, 9V output types		9	10	
	10% load to rated load, 12V output types		6.5	7.5	
	10% load to rated load, 15V output types		6	7.5	
Ripple and Noise	BW=DC to 20MHz, 5V output types		40	75	mV p-p
	BW=DC to 20MHz, 9V output types		25	50	
	BW=DC to 20MHz, 12V output types		25	50	
	BW=DC to 20MHz, 15V output types		20	50	

family characteristics - isolation

Specifications typical at T_A=25°C, nominal input voltage and rated output current unless otherwise specified.

Parameter	Conditions	MIN	TYP	MAX	Units
Isolation Voltage	Flash tested for 1 second	1000			VDC
Test Voltage	50Hz, 10 seconds	1000			Vpk
Resistance	Viso=500V		10		GΩ

1 See derating curve.

family characteristics - general

Specifications typical at T_A=25°C, nominal input voltage and rated output current unless otherwise specified.

Parameter	Conditions	MIN	TYP	MAX	Units
Switching Frequency	V_{IN} 5V types		110		kHz
	V_{IN} 12V types		140		
Package Weight	SIL		2.1		g
	DIL		2.4		

family characteristics - temperature

Specifications typical at T_A=25°C, nominal input voltage and rated output current unless otherwise specified.

Parameter	Conditions	MIN	TYP	MAX	Units
Specification	All output types	–40		85	°C
Storage		–50		130	°C
Case Temperature above Ambient	5V output types		33		°C
	All other output types		28		

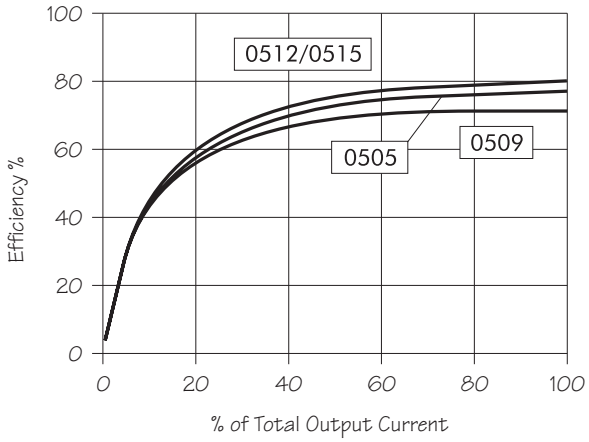
family characteristics - mean time to failure (MTTF)

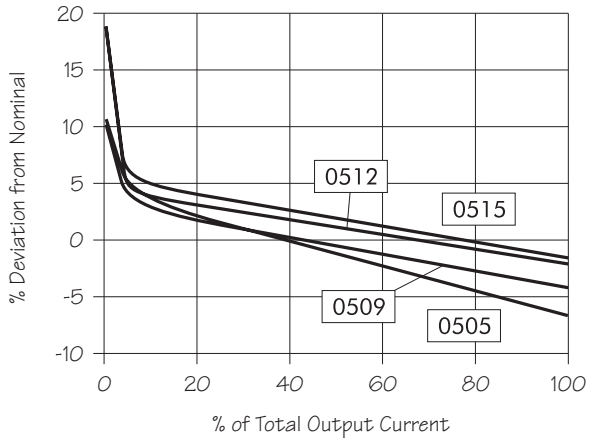
Calculated using MIL-HDBK-217F with nominal input voltage at full load.

Part Number	–40°C	25°C	85°C	Units
NMA0505	2068	1697	1368	kHrs
NMA0509	652	682	567	
NMA0512	412	343	287	
NMA0515	226	188	158	
NMA1205	675	559	464	kHrs
NMA1209	452	375	314	
NMA1212	292	243	204	
NMA1215	184	154	129	

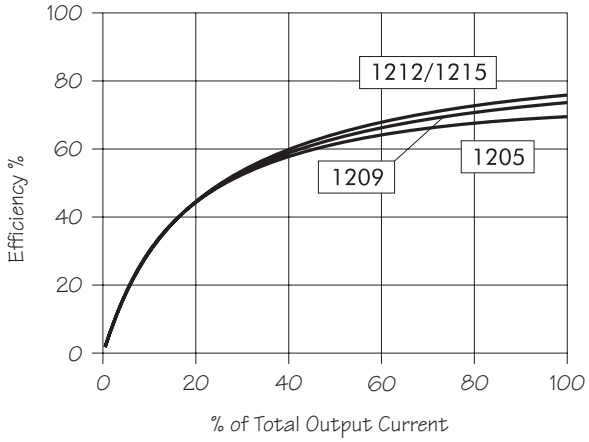
typical characteristics[1]

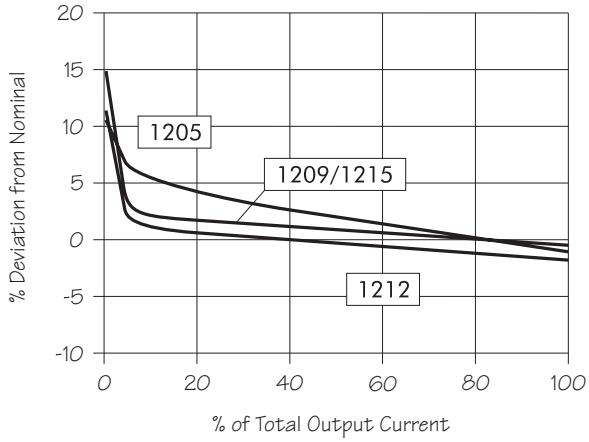
NMA05 series



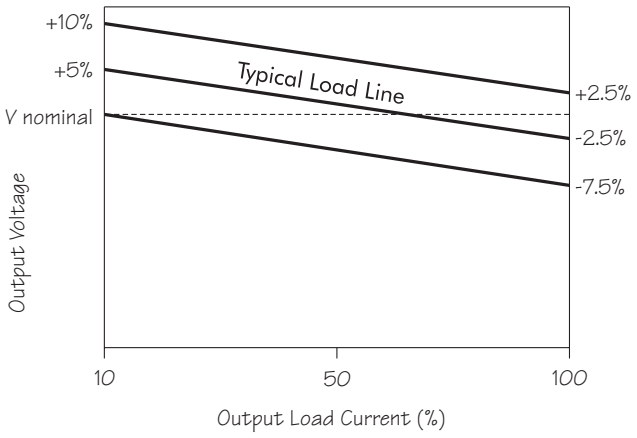


NMA12 series

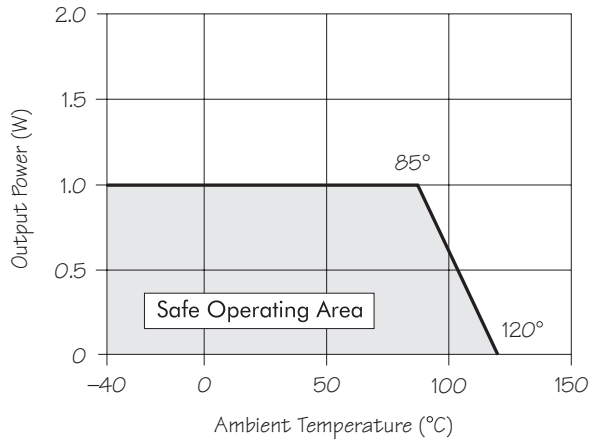




tolerance envelope



temperature derating graph

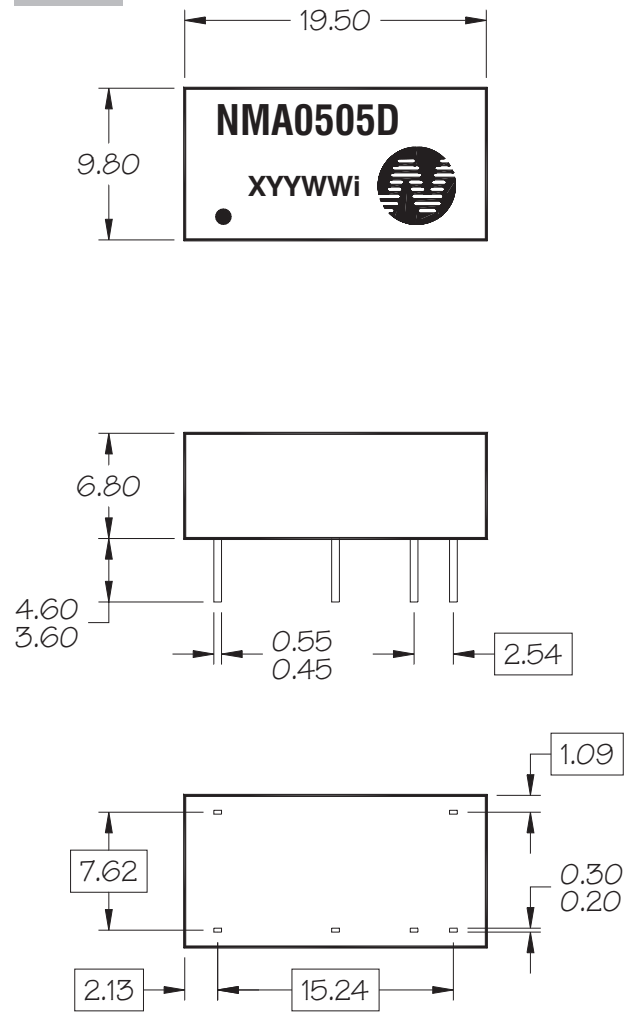


1 All data taken at T_A=25°C.

outline dimensions[1]

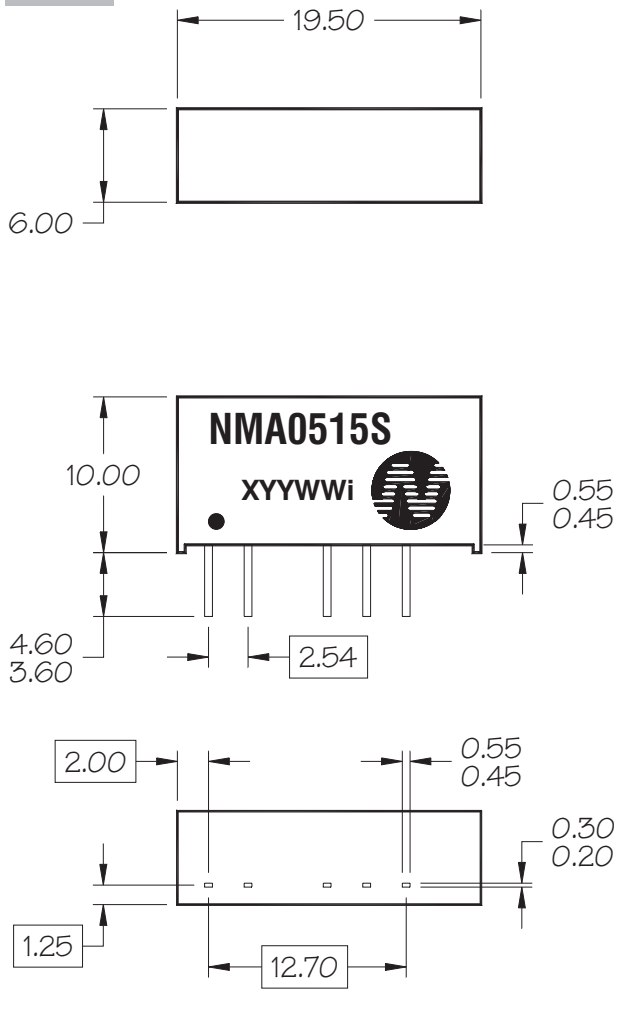
14 Pin DIP Package style

1

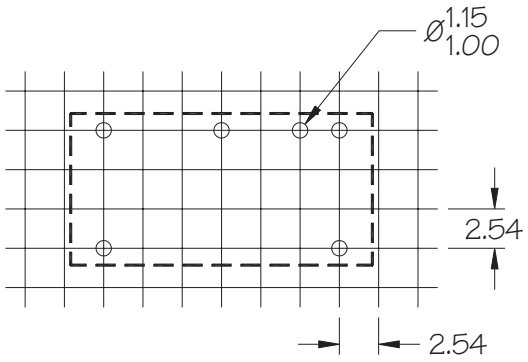


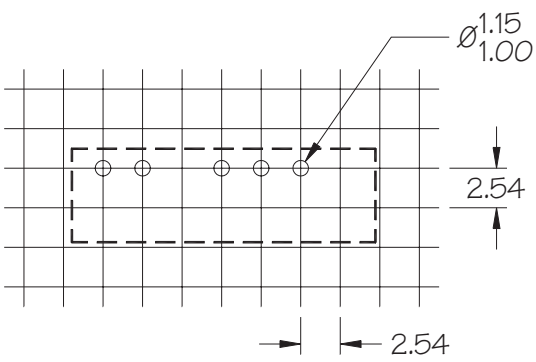
7 Pin SIP package style

2



recommended footprint details





1 All dimensions in mm XX.XX ±0.25mm.
All pins on a 2.54mm pitch and within ±0.25mm of true position.