

features

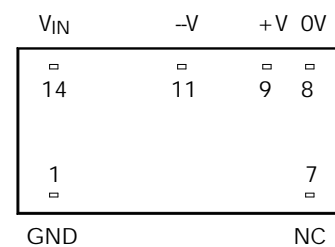
- Full 2 Watt Output Power
- Pin Compatible with NMA
- 1kVDC Isolation
- Dual Outputs
- SIP & DIP package Styles
- Efficiency to 80%
- Power Density 1.42W/cm³
- 5V, 12V, 24V & 48V Input
- 5V, 9V, 12V, and 15V Output
- Footprint from 1.46 cm²
- UL 94V-0 Package Material
- No Heatsink Required
- Internal SMD Construction
- Toroidal Magnetics
- Fully Encapsulated
- No External Components Required
- MTTF up to 1.8 Million hours
- PCB Mounting
- Custom Solutions Available

description

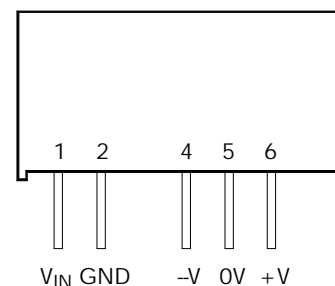
The NMH Series of DC-DC Converters offer the smallest footprint of any dual-output 2 Watt DC-DC Converter. Pin compatibility with the NMA series ensures minimal effort in upgrading distributed power systems. The devices are suited to any application where a dual rail supply is required in a minimum of pcb space.

pin connections

14 Pin DIP (top view)



7 Pin SIP



NMH SERIES

Isolated 2W Dual Output

absolute maximum ratings over operating free air* temperature range

Input voltage V_{IN} NMH05 types	7V
Input voltage V_{IN} NMH12 types	15V
Input voltage V_{IN} NMH24 types	28V
Input voltage V_{IN} NMH48 types	54V
Output power total	2W
Short-circuit duration	1s
Isolation voltage (flash tested for 1 second)	1000VDC
Operating free air temperature range	0°C to 70°C ¹
Storage temperature range	-55°C to 150°C
Lead temperature 1.5mm from case for 10 seconds	300°C

electrical specifications

(measured at $T_A=25^\circ\text{C}$, at nominal input voltage)

Input voltage range NMH05 types	5V±10%
Input voltage range NMH12 types	12V±10%
Input voltage range NMH24 types	24V±10%
Input voltage range NMH48 types	48V±10%
Load voltage regulation (10% to 100% full load)	
5V output types	15% max.
9V, 12V and 15V output types	10% max.
Line voltage regulation (10% to 100% full load)	1.2%/1% of V_{IN}
Output voltage accuracy	See tolerance envelope graph
Input reflected ripple (20MHz Band limited)	100mV p-p max.
Output ripple (20MHz Band limited)	150mV p-p max.
Insulation resistance at 500VDC	1000MΩ min.
Efficiency at full load, 5V output type	65% min.
Efficiency at full load, 9V, 12V and 15V output type	70% min.
Temperature drift (V_{OUT})	0.01% per °C max.
Temperature rise above ambient at full load	25°C max.
Weight (typical)	2.35 grams
Switching frequency at full load (typical)	75kHz
No load power consumption (typical)	180mW

* Free air – requires a minimum of 10mm air space around the component. ¹ See derating curve.

selection guide

5V, 12V, 24V and 48V input types

Part Number	Output Voltage (V)	Output Current Each Output (mA)	Package Style
NMHXX05D	±5	200	1
NMHXX09D	±9	111	
NMHXX12D	±12	83	
NMHXX15D	±15	67	
NMHXX05S	±5	200	2
NMHXX09S	±9	111	
NMHXX12S	±12	83	
NMHXX15S	±15	67	

2 - NMH SERIES

typical isolation capacitance (pF)

Part Number	Output Voltage (V)			
	05	09	12	15
NMH05XXX	29	37	41	44
NMH12XXX	43	57	73	81
NMH24XXX	42	64	81	98
NMH48XXX	40	60	79	94

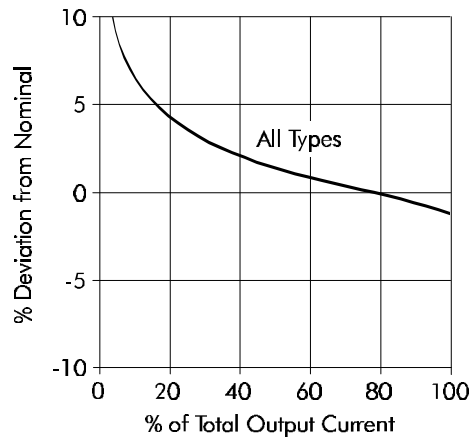
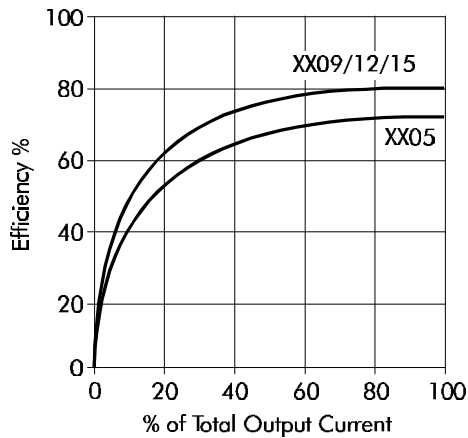
Note : All data taken at $T_A = 25^\circ\text{C}$.

NMH SERIES

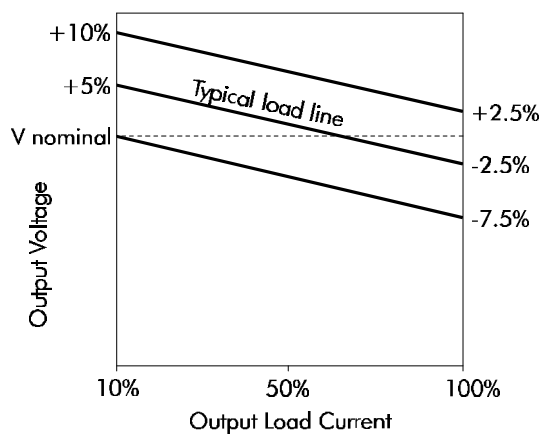
Isolated 2W Dual Output

typical characteristics

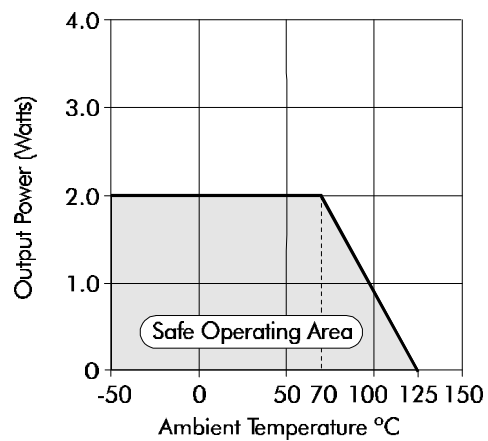
NMH05, 12, 24 and 48 series



tolerance envelope

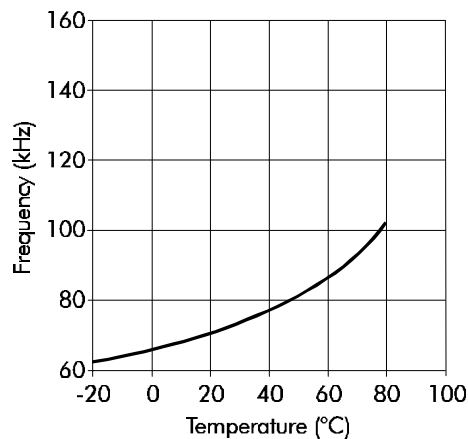


temperature derating graph



See application notes on page 2-132

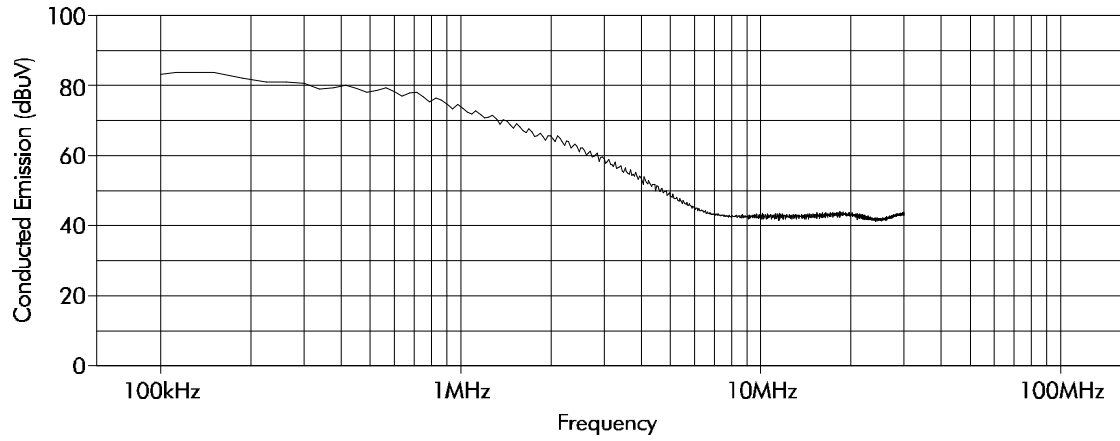
temperature test (under full load)



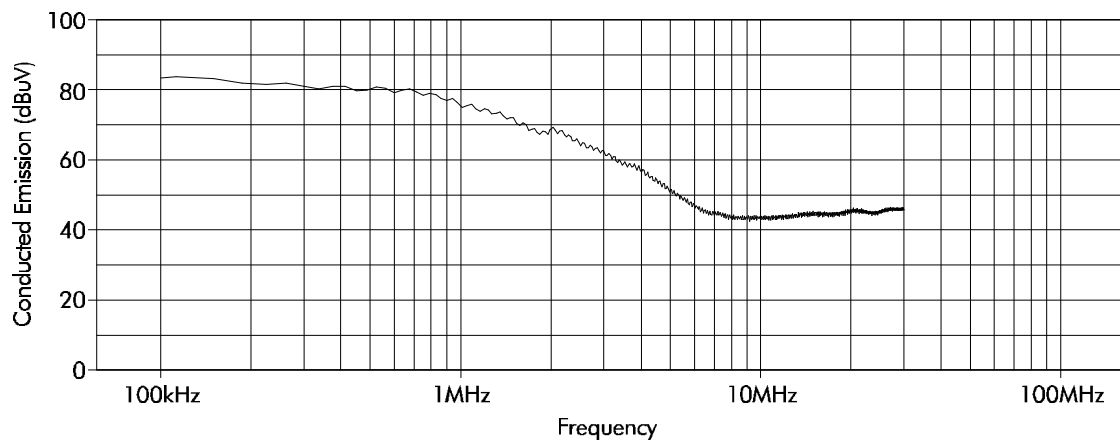
Note : All data taken at $T_A=25^\circ\text{C}$.

typical characteristics

NMH05 series spectrum analysis (RBW=100kHz)



NMH12 series spectrum analysis (RBW=100kHz)



Note : All data taken at $T_A=25^{\circ}\text{C}$.

NMH SERIES

Isolated 2W Dual Output

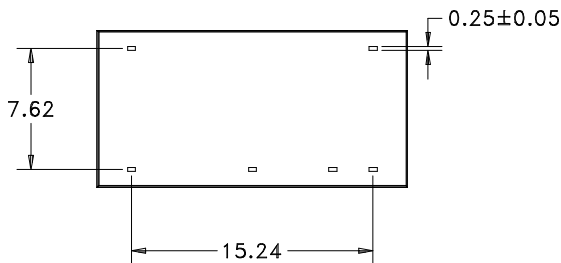
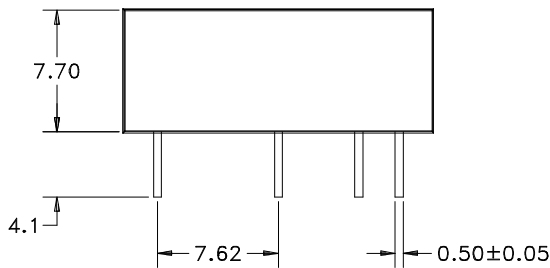
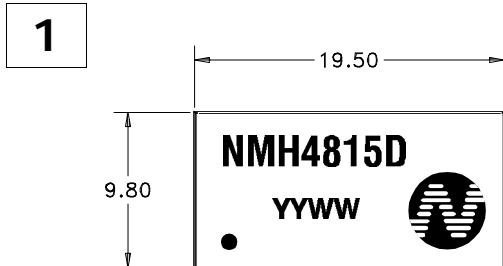
mean time to failure (MTTF) in thousands of hours

Part Number	-25°C	25°C	70°C
NMH0505	1874	1568	1309
NMH0509	771	660	569
NMH0512	391	337	294
NMH0515	215	186	162
NMH1205	564	484	419
NMH1209	394	340	296
NMH1212	263	228	199
NMH1215	170	147	128
NMH2405	1080	917	782
NMH2409	569	489	423
NMH2412	319	276	241
NMH2415	185	160	140
NMH4805	236	204	178
NMH4809	197	171	149
NMH4812	155	134	118
NMH4815	115	99	87

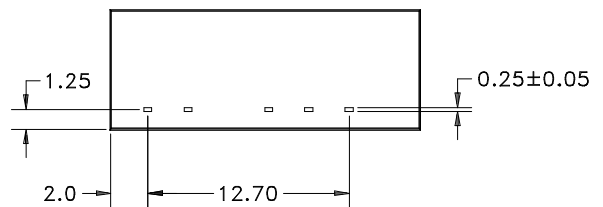
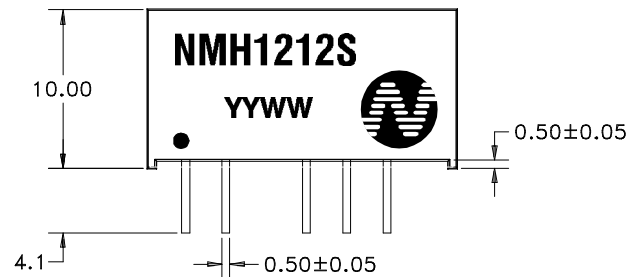
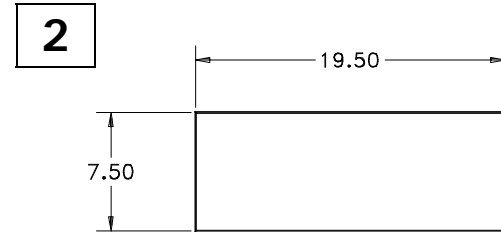
Note : MTTF figures derived from hybrid model of MIL-HDBK-217F.

outline dimensions

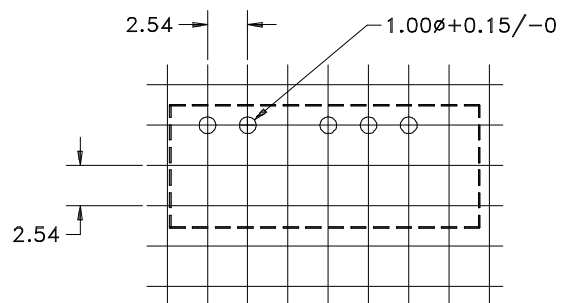
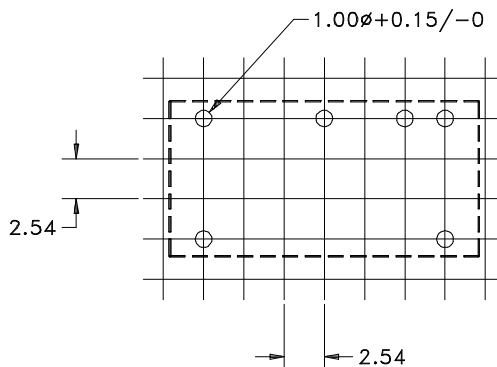
14 Pin DIP package style



7 Pin SIP package style



recommended footprint details



All pins on a 2.54mm pitch.

All dimensions in mm $XX.X \pm 0.50$, $XX.XX \pm 0.25$