

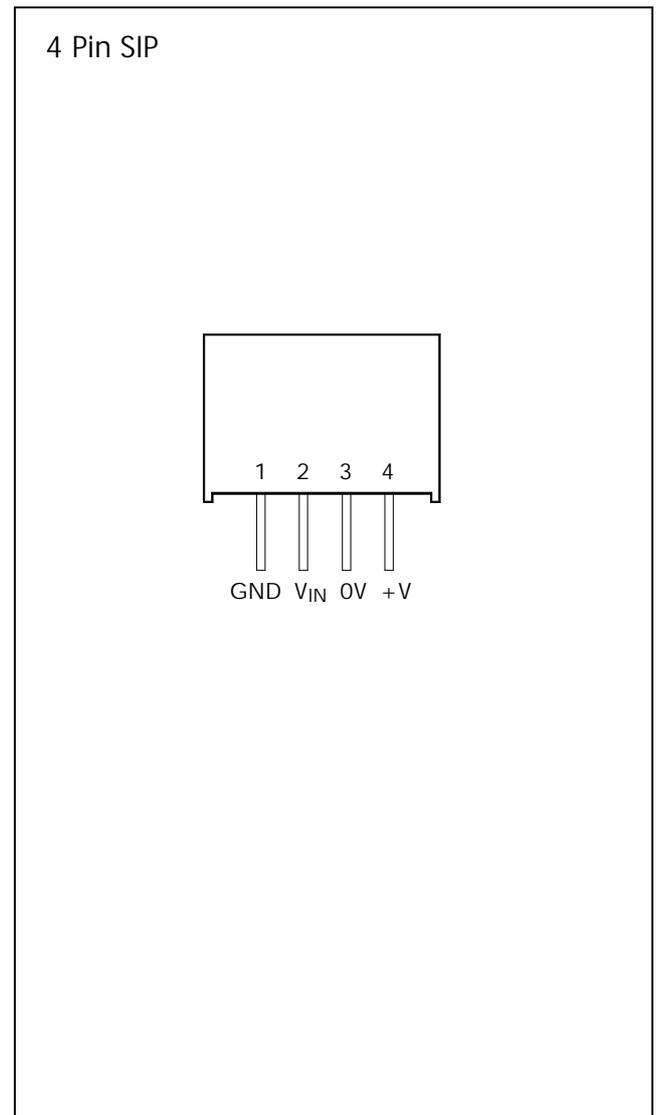
features

- Full 2 Watt Output Power
- 1kVDC Isolation
- Single Isolated Output
- Pin Compatible with LME and NME
- SIP Package Style
- Efficiency to 85%
- Power Density 2.01W/cm³
- 5V & 12V Input
- 5V, 9V, 12V and 15V Output
- Footprint 1.05 cm²
- UL 94V-0 Package Material
- No Heatsink Required
- Internal SMD Construction
- Toroidal Magnetics
- Fully Encapsulated
- No External Components Required
- MTTF up to 2.5 Million Hours
- PCB Mounting
- Custom Solutions Available

description

The NML is the smallest footprint 2 Watt DC-DC Converter currently available. Pin compatibility with the LME and NME ensures ease of upgradeability. The devices may be used wherever an isolated supply is required. The devices provide the isolation for 10 BASE 2 Ethernet applications and are particularly suited to Notebook Computer applications

pin connections



NML SERIES

Isolated 2W Single Output

absolute maximum ratings over operating free air* temperature range

Input voltage V_{IN} NML05 types	7V
Input voltage V_{IN} NML12 types	15V
Output power total	2W
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 NML05 types	5V \pm 10%
Input voltage range NML12 types	12V \pm 10%
Load voltage regulation (10% to 100% full load)	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), NML05 types	150mV p-p max.
Input reflected ripple (20MHz Band limited), NML12 types	300mV p-p max.
Output ripple (20MHz Band limited)	200mV p-p max.
Insulation resistance at 500VDC	1000 M Ω min.
Efficiency at full load, 5V output types	80% typical 70% min.
Efficiency at full load, 9V, 12V and 15V output types	85% typical 75% min.
Temperature rise above ambient at full load	30°C max.
Weight (typical)	2.0 grams
Switching frequency at full load (typical)	75kHz
No load power consumption (typical), NML05 types	200mW
No load power consumption (typical), NML12 types	250mW

* Free air – requires a minimum of 10mm air space around the component.

¹ See derating curve.

selection guide

5V and 12V input types

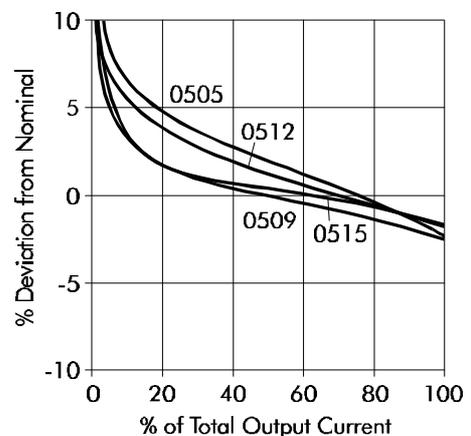
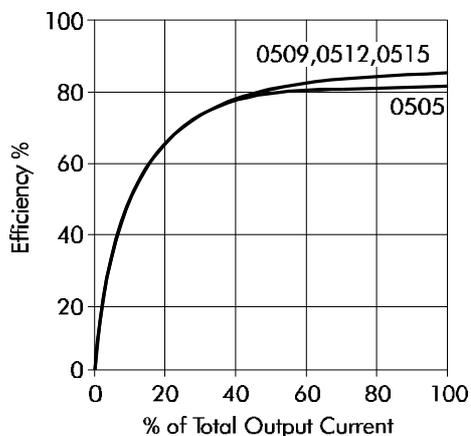
Part Number	Output Voltage (V)	Output Current (mA)	Package Style
NMLXX05S	5	400	1
NMLXX09S	9	222	
NMLXX12S	12	167	
NMLXX15S	15	133	

typical isolation capacitance (pF)

Part Number	Output Voltage (V)			
	05	09	12	15
NML05XXS	28	34	36	38
NML12XXS	37	59	65	72

typical characteristics

NML05 series



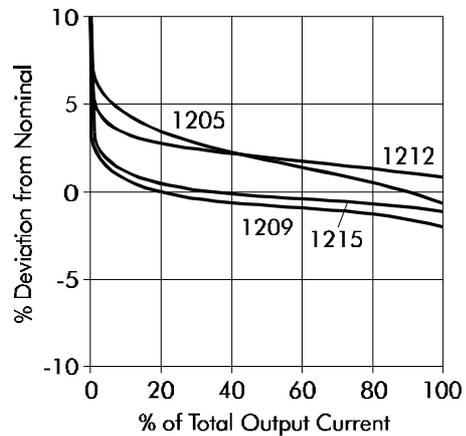
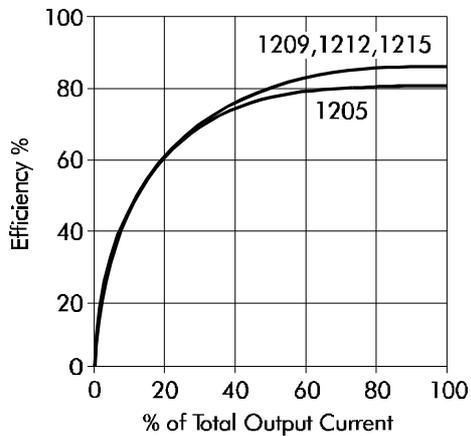
Note : All data taken at $T_A=25^{\circ}\text{C}$.

NML SERIES

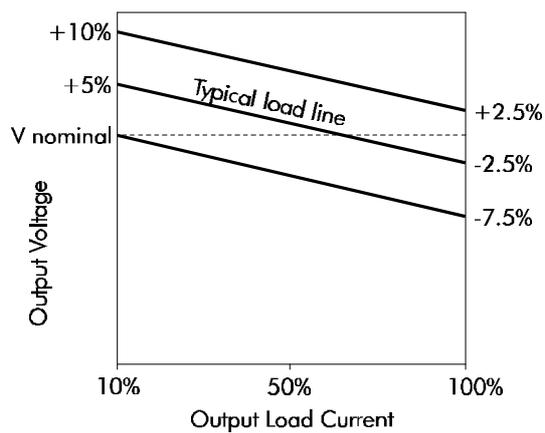
Isolated 2W Single Output

typical characteristics

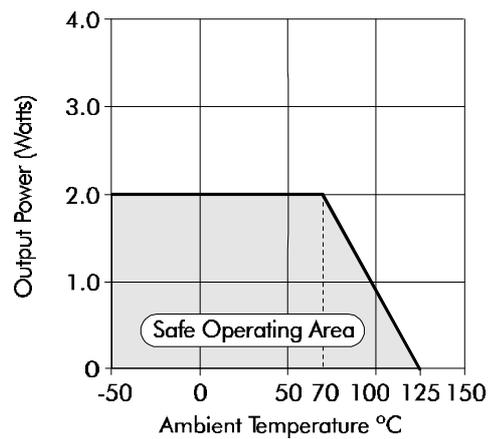
NML12 series



tolerance envelope

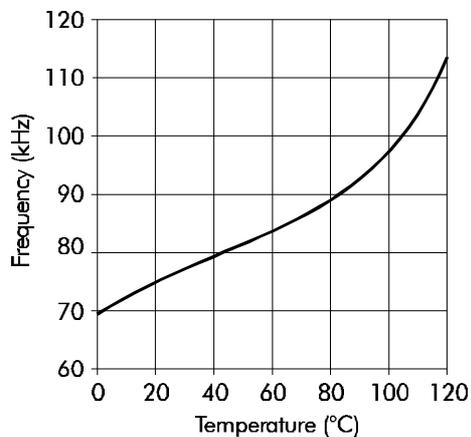


temperature derating graph



See application notes on page 2-132

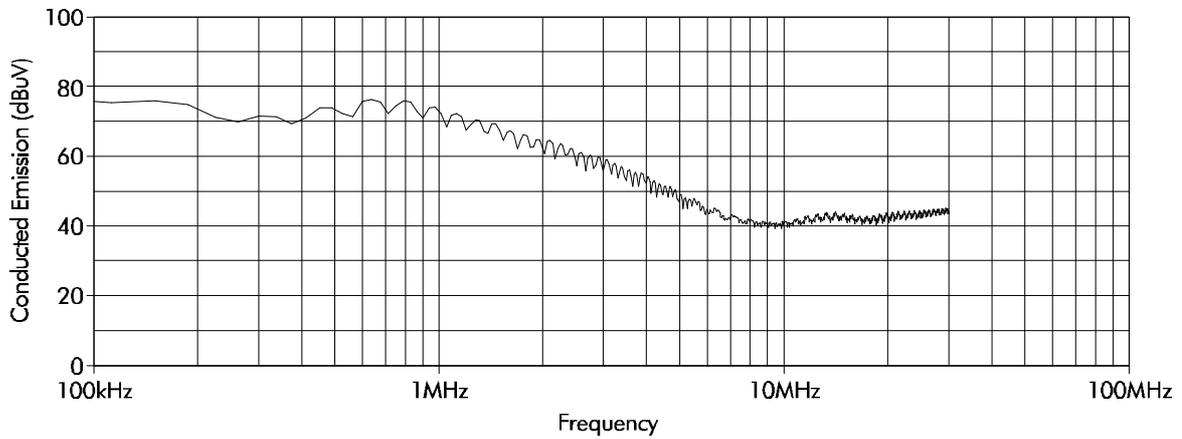
temperature test (under full load)



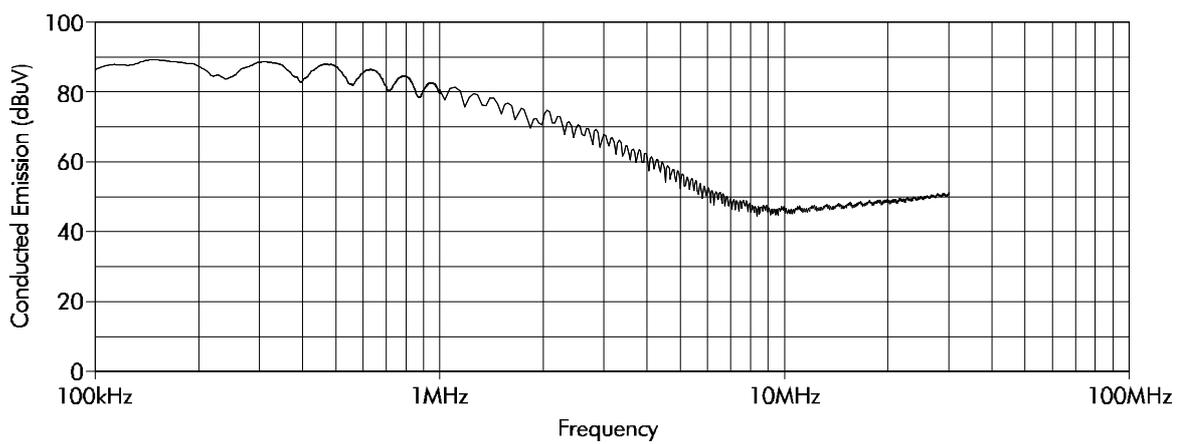
Note : All data taken at $T_A=25^\circ\text{C}$.

typical characteristics

NML05 series spectrum analysis (RBW=100kHz)



NML12 series spectrum analysis (RBW=100kHz)



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

NML SERIES

Isolated 2W Single Output

mean time to failure (MTTF) in thousands of hours

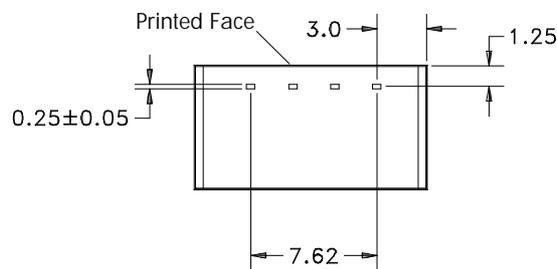
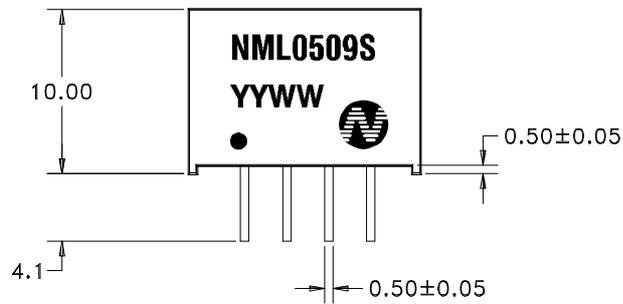
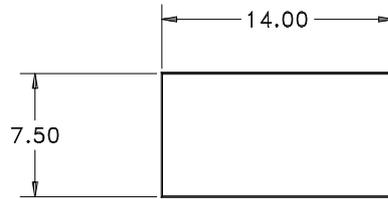
Part Number	-25°C	25°C	70°C
NML0505S	2526	2146	1824
NML0509S	1223	1060	923
NML0512S	660	576	508
NML0515S	374	328	289
NML1205S	612	528	460
NML1209S	486	422	369
NML1212S	363	316	278
NML1215S	256	223	197

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

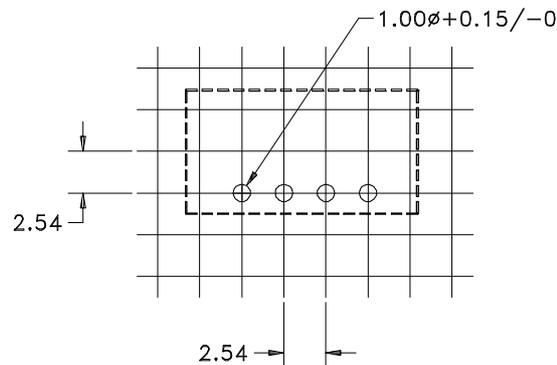
outline dimensions

4 Pin SIP package style

1



recommended footprint details



All pins on a 2.54mm pitch.

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