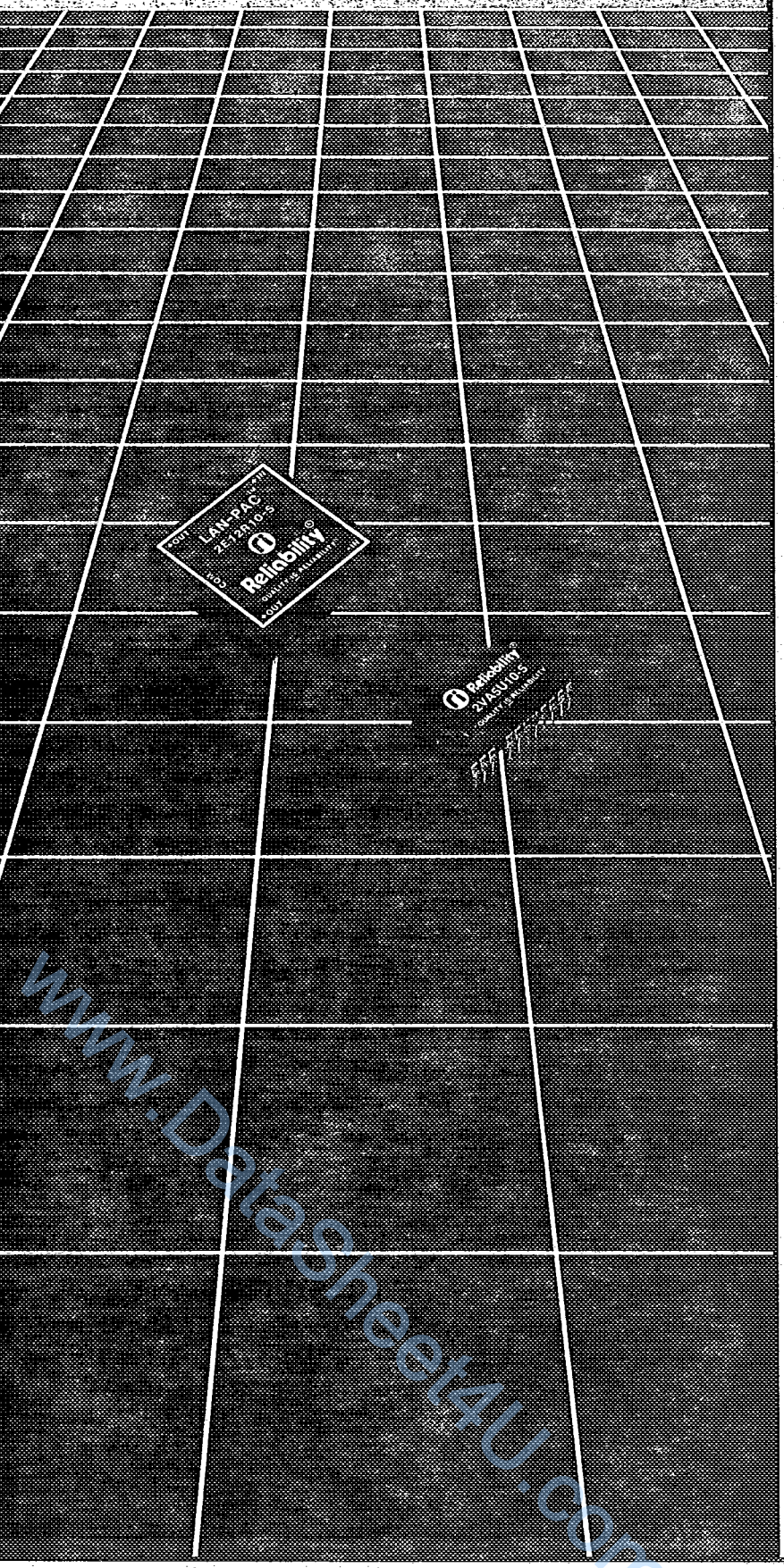
# LAN-PAC SERIES

## DC/DC CONVERTERS—9V OUTPUT




## FEATURES

- IEEE 802.3 standards
- Meets FCC Sec 15, Sub Part J, A&B
- Input/Output isolated to IEEE 802.3 standards
- PC mountable, low profile
- Continuous short circuit protected, self recovering (2E12R10-5)
- No derating to 71°C
- Wide input voltage range
- 100% burned-in and triple tested
- 3 year warranty

## GENERAL DESCRIPTION

The Lan-Pac Series of DC/DC converters is designed to provide power and isolation for local area network (LAN) transceiver chips.

The Lan-Pac Series covers both the Cheapernet and Ethernet LAN (IEEE 802.3 10base 5 and 10base 2 standards) approach. The use of a compact and inexpensive DC/DC converter as the power source for these new transceiver chips allows conversion of the normal buss power to the isolated power required.

The series operates from inputs of 5 and 12 VDC for Cheapernet with input/output isolation of 500 VDC and wide input models of 10.2 - 15.75 VDC for Ethernet, with 2500 VDC isolation.

## GENERAL ELECTRICAL SPECIFICATIONS

(Specifications at Nominal Input and 25°C)

| PARAMETER | LIMIT | CONDITIONS |
|---|---|---|
| **2VA5U10-5, 2VA12U10-5** | | |
| Input Voltage Range | 4.75 - 5.25 VDC | 5V Input Devices |
| | 11.4 - 12.6 VDC | 12V Input Devices |
| Input Filter | Filter Capacitor | All Device Types |
| Input/Output Isolation | | |
| Voltage | 500 VDC (Min.) | All Device Types |
| Resistance | $10^3$ megohms (Min.) | |
| Power Efficiency | 70% | All Units |
| Output Voltage Accuracy | ±4% | Nom. Line at Full Load |
| Load Regulation | See Graphs | |
| Minimum Load Required | 10% of Full Load | All Units |
| Line Regulation | See Graphs | |
| Output Noise/Ripple | 300 mV, P-P (Max.) | 20 HZ-20MHZ Bandwidth |
| Short Circuit Protection | Momentary | All Units |
| Switching Frequency | 100 KHZ | Typical |
| Operating Temperature | -25° to +71°C | |
| Derating | None | To 71°C |
| Storage Temperature | -55°C to +125°C | |
| FCC Sec 15 Sub Part J | Yes | Class B Radiated, Class A Conducted |
| **2E12R10-5** | | |
| Input Voltage Range | 10.2 - 15.75 VDC | |
| Input Filter | Filter Capacitor | All Device Types |
| Input/Output Isolation | | |
| Voltage | 2500 VDC (Min.) | All Device Types |
| Resistance | $10^3$ megohms (Min.) | |
| Output Voltage Accuracy | ±5% | Nom. Line at Full Load |
| Load Regulation | 50 mV | 20ma to Full Load, Both Outputs |
| Minimum Load Required | 20 ma | Each Output |
| Line Regulation | 50 mV | Full Load, Both Outputs |
| Output Noise/Ripple | 50 mV, P-P (Max.) | Each Output, 20HZ-20MHZ Bandwidth |
| Short Circuit Protection | Constant Current Limited | All Units |
| Duration | Continuous | |
| Switching Frequency | 40 KHZ | Typical |
| Operating Temperature | 0° to +71°C | |
| Derating | None | To 71°C |
| Storage Temperature | -55°C to +125°C | |
| External Heatsink | Recommended for still air environments | |
| Case | UL94V-0 | |
| Encapsulant | UL94H-B | |
| Heat Dissipation | 40°C Case Rise | High Line, Full Load |
| FCC Sec 15 Sub Part J | Yes | Class B Radiated, Class A Conducted |

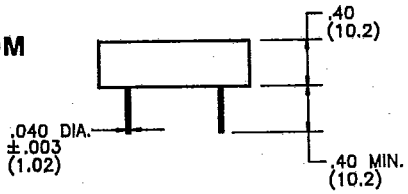
# SELECTION GUIDE
# STANDARD PRODUCTS

| DEVICE TYPE | INPUT VOLTAGE VDC | INPUT CURRENT A (MAX) | OUTPUT VOLTAGE VDC | OUTPUT CURRENT ma (MAX) | PACKAGE | APPLICATION |
|---|---|---|---|---|---|---|
| 2VA5U10-5 | 5 | .400 | +10, +5 | 100ma, 80ma | 2VA | Cheapernet |
| 2VA12U10-5 | 12 | .170 | +10, +5 | 100ma, 80ma | 2VA | Cheapernet |
| 2E12R10-5 | 12 | .300 | +10, +5 | 100ma, 80ma | 2E | Ethernet |

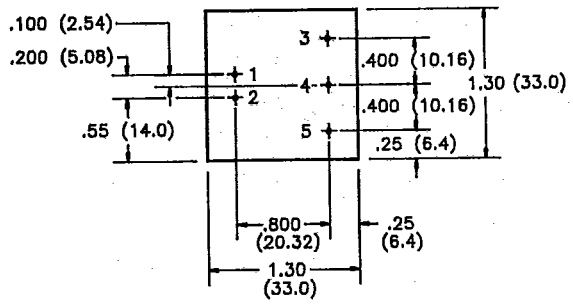
(1) Capable of supplying 150ma at 10VDC and 110ma at 5 VDC, however, at this power level, adequate thermal management must be provided. Consult factory for details.

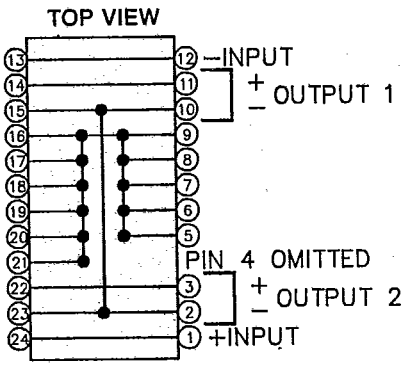
# MECHANICAL DIMENSIONS AND PIN CONNECTIONS

**2E BOTTOM VIEW**



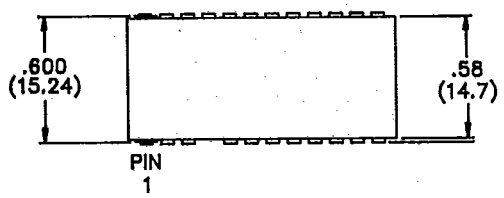

| PIN | PIN CONNECTIONS |
|---|---|
| 1 | + INPUT |
| 2 | – INPUT |
| 3 | + 10V OUTPUT |
| 4 | OUTPUT COMMON |
| 5 | + 5V OUTPUT |



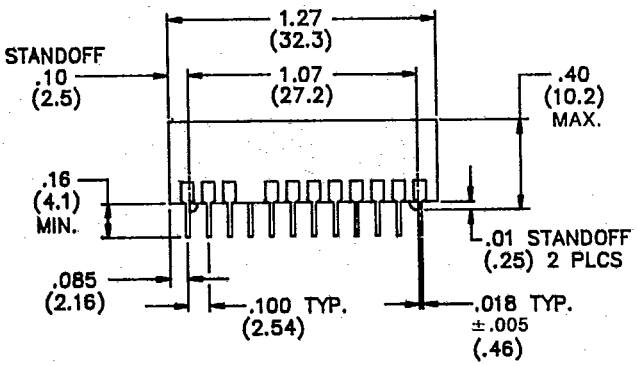




Note: All dimensions in parentheses are mm.
Tolerances unless otherwise specified: .XX ± .03
.XXX ± .010

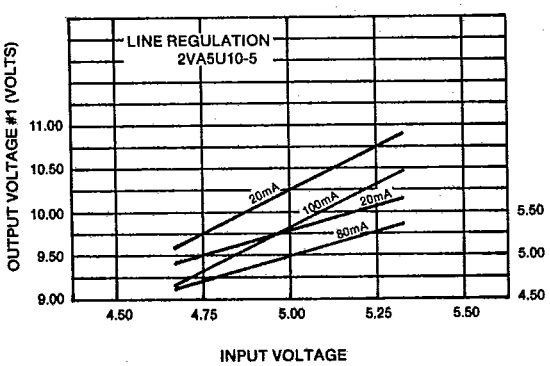
**2 VA** TOP

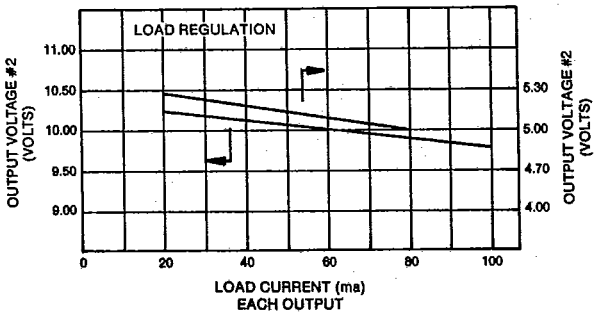



SIDE




# PERFORMANCE DATA
# 2VA5U10-5

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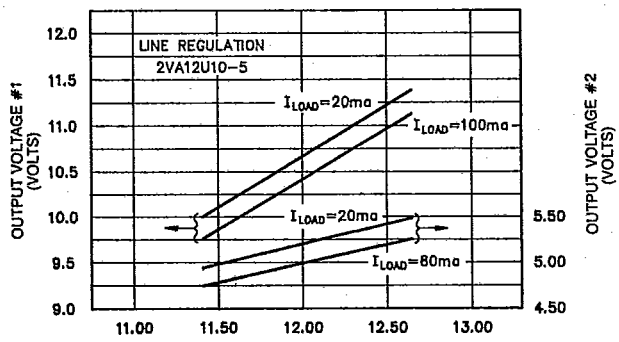
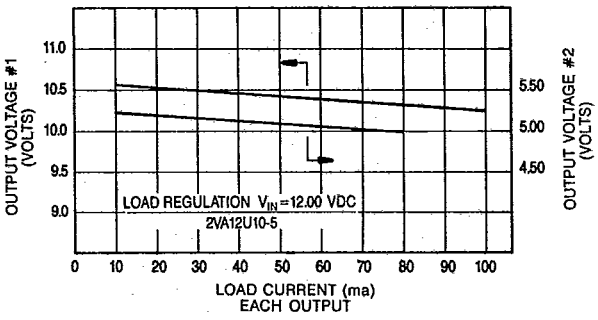
# PERFORMANCE DATA
# 2VA12U10-5




## APPLICATIONS

The Reliability family of Lan-Pac converters is designed to provide the isolated power requirements for transceiver integrated circuits used in either Ethernet or Cheapernet Local Area Networks.

For Ethernet applications, IEEE 802.3 specifies a power connection cable not more than 50 meters long with the Vc (voltage common) line capable of sinking 2 amps. Also, the DC power pair shall be composed of a twisted pair of sufficient gauge stranded wires to result in a nominal DC resistance not to exceed 1.75 ohms per conductor. Furthermore, IEEE 802.3 requires that the local power supply be capable of operating at one fixed level (VP) between +12 VDC - 6% and +15VDC + 5% with respect to circuit Vc for all current values from 0 to 500 ma.

From the above, we can see that the minimum input voltage to the Lan-Pac Converter is:

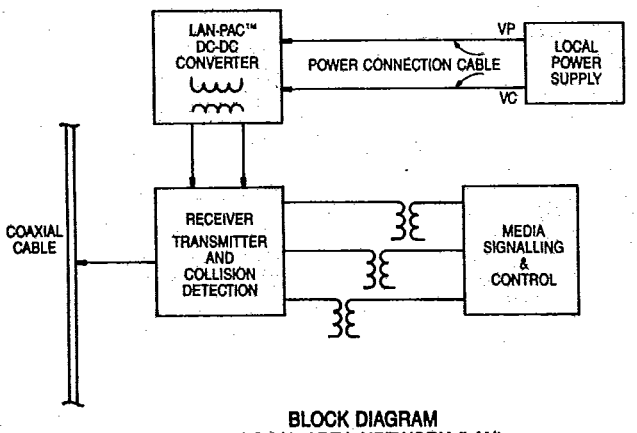
$$12-(12x.06)-(3.5\ \text{ohms})\ (\text{Input current}) \text{ or } 11.28 - 3.5\ \text{Iin} = \text{Vmin}$$

similarly, the maximum input voltage is:

$$15+(15x.05)-(3.5\text{ohms})\ (\text{Input current}) \text{ or } 15.75-3.5\ \text{Iin} = \text{Vmax}$$

with a total power cable resistance of 3.5 ohms.

Obviously, with no input current or zero cable resistance, the maximum input voltage to the Ethernet DC/DC converters is 15.75 and is so specified in the General Electrical Specifications. However, as regards minimum input voltage, all Ethernet converters are guaranteed to meet their specifications with a local power supply voltage of 11.28V and source impedance of 3.5 ohms, while the converter is operating at maximum output current/s.




BLOCK DIAGRAM
LOCAL AREA NETWORK (LAN)