

# COPPERHEAD SERIES FIBRE CHANNEL TRANSCEIVER

Line Interface Module



- High Performance, low-cost alternative to complete fiber systems.
- Compact, small package saves PCB footprint.
- Equalizer and transformers isolation provides long distance applications, better transient protection, and common mode rejection.
- Low transmit / receive jitter.
- Low Power dissipation; 500mW Maximum

| Transmitter                                    |          | Vcc : + 3.13 V to 3.47 V |         |      |        |
|------------------------------------------------|----------|--------------------------|---------|------|--------|
| Parameter                                      | SYM      | MIN                      | Typical | MAX  | UNIT   |
| Power Supply Current (Transmitter + Receiver)  | Icc      | —                        | 90      | 110  | mA     |
| Input Data Voltage Low                         | VIL      | 1.35                     | —       | 1.88 | V      |
| Input Data Voltage High                        | VIH      | 2.07                     | —       | 2.58 | V      |
| Differential Input Data Voltage                | VIN      | 150                      | 800     | 1200 | mV P-P |
| Input High Voltage Common Range (Differential) | VIHCMR   | 2                        | —       | 3.3  | V      |
| Transmitter Output Impedance (Diff)            | Ztx-Diff | 100                      | 150     | —    | Ohms   |
| Output Differential signal level (p-p)         | VO       | 1000                     | 1250    | 1600 | mV     |
| Data Rate (NRZ)                                | DR       | —                        | 266     | —    | Mb/s   |
| Total P-P transmit jitter                      | TJ       | —                        | 500     | 900  | ps     |
| Output rise-fall time (20%-80%)                | TRO      | —                        | —       | 500  | ps     |

| Receiver                          |       | Vcc : + 3.13 V to 3.47 V |         |      |        |
|-----------------------------------|-------|--------------------------|---------|------|--------|
| Parameter                         | SYM   | MIN                      | Typical | MAX  | UNIT   |
| Input signal swing (Differential) | VIN   | 150                      | —       | 1200 | mV     |
| Differential Output Data Voltage  | VO    | 423                      | —       | 1175 | mV P-P |
| Output Common-Mode Voltage        | VOCMR | 1.75                     | 1.93    | 2.05 | V      |
| Data Rate (NRZ)                   | DR    | —                        | 266     | —    | Mb/s   |
| Total P-P transmit jitter         | TJ    | —                        | 1000    | 2000 | ps     |

TM 531 D S A 1 (XX)

|                                                      |   |                                                                       |
|------------------------------------------------------|---|-----------------------------------------------------------------------|
| (XX)                                                 | - | Custom product designator                                             |
| blank                                                | - | No transmit driver                                                    |
| 1                                                    | - | 1100 mV output transmit driver and military temperature range         |
| 2                                                    | - | 1100 mV output transmit driver and industrial temperature range       |
| 5                                                    | - | Active cable equalizer circuit                                        |
| A                                                    | - | 5.00 Volt                                                             |
| B                                                    | - | 3.30 Volt                                                             |
| S                                                    | - | Impedance matched for STP and twinax (150 ohm)                        |
| U                                                    | - | Impedance matched for unshielded twisted pair (100 ohm)               |
| V                                                    | - | Impedance matched for video and mini-coax (75 ohm)                    |
| C                                                    | - | Impedance matched for coax (50 ohm)                                   |
| D                                                    | - | Gull wing DIP 28-pin package: 0.800"L x 0.400"W x 0.200"H             |
| F                                                    | - | Gull wing flat pack 28-pin package: 0.760"L x 0.610"W x 0.125"H       |
| H                                                    | - | Gull wing half DIP 16-pin package: 0.300"L x 0.500"W x 0.250"H        |
| (16-pin package is only available on passive units.) |   |                                                                       |
| 133                                                  | - | 132.8125 Mbaud version 1/8 speed Fibre Channel/ATM                    |
| 266                                                  | - | 265.625 Mbaud version 1/4 Speed Fibre Channel                         |
| 531                                                  | - | 531.25 Mbaud version 1/2 Speed Fibre Channel                          |
| 1062                                                 | - | 1.0625 Gbaud version Full Speed Fibre Channel                         |
| 1250                                                 | - | 1.250 Gbaud version, Gigabit Ethernet (both short haul and long haul) |
| 1485                                                 | - | 1.485 Gbaud version, SMPTE                                            |

## Ordering Information - Part No.



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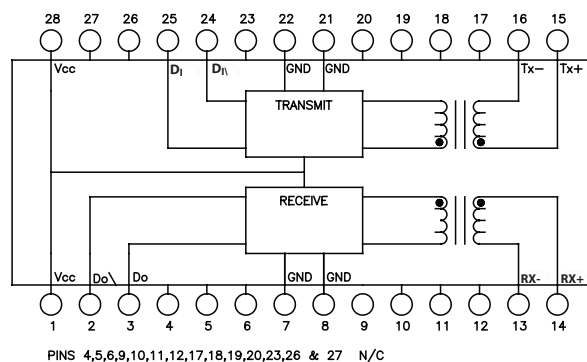
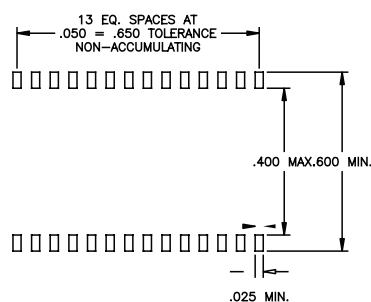
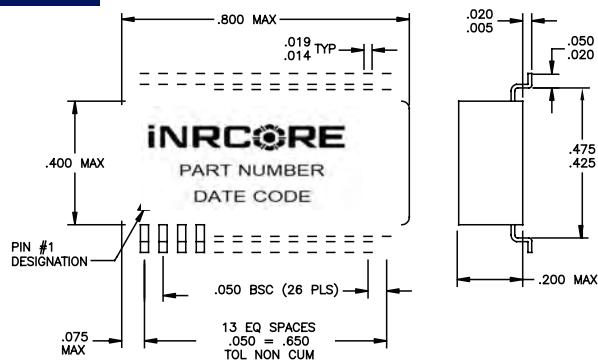
Line Interface Module



## Mechanical

## Electrical Schematic

### SAMPLE SPECS



Dimensions:  $\frac{\text{Inches}}{\text{mm}}$

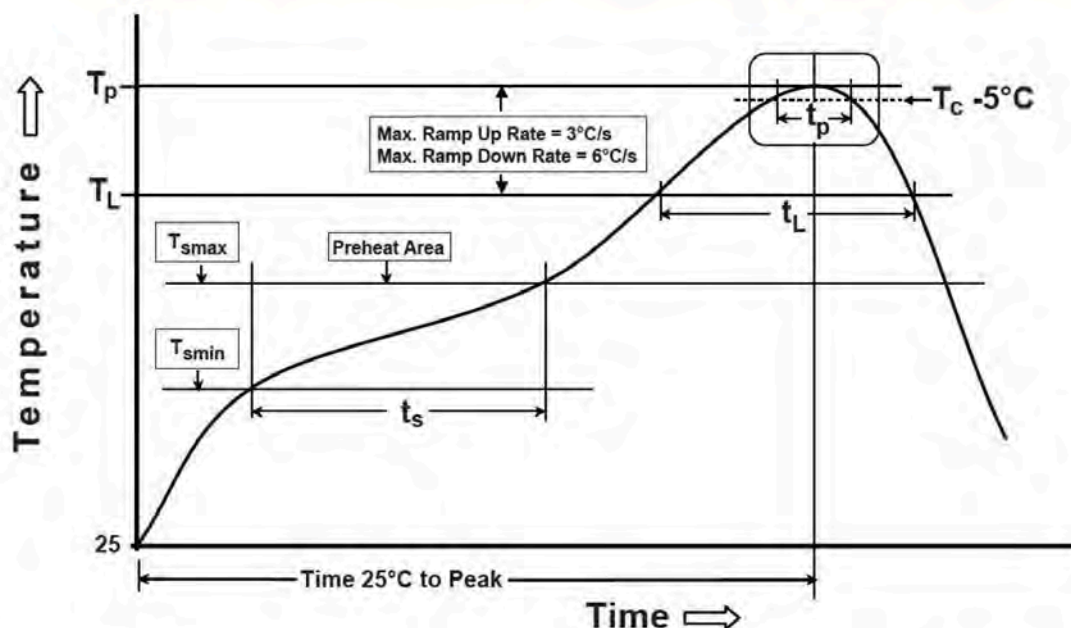
Unless otherwise specified, all tolerances are:  $\pm \frac{.010}{0,25}$

#### Pin number(s)

|                                                    |                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1, 28                                              | The positive supply for the line interface module. Connect to +3.3V for LVPECL applications.                                                                                                                                                                                                          |
| 2, 3                                               | D0, D1: Differential LVPECL data outputs. These outputs can drive 50 ohm loads connected to VCC - 2.0V. Recommend 150 ohms to Gnd.                                                                                                                                                                    |
| 7, 8                                               | Gnd (V EE): The negative supply for the line interface module. Connect to Gnd for LVPECL applications.                                                                                                                                                                                                |
| 13, 14                                             | R X -, R X + : Transformer coupled differential inputs to receiver section. For coax applications, R X - should be connected to shield of cable/earth Gnd; R X + should be connected to the center conductor. Earth Gnd should be AC coupled to DC signal Gnd using a 0.027 $\mu$ F capacitor, ~500V. |
| 15, 16                                             | T X -, T X + : Transformer coupled differential outputs to cable. For coax applications, T X - should be connected to shield of cable/earth Gnd; T X + should be connected to the center conductor. Earth Gnd should be AC coupled to DC signal Gnd using a 0.027 $\mu$ F capacitor, 500V.            |
| 21, 22                                             | Gnd (V EE): The negative supply for the line interface module. Connect to Gnd for LVPECL applications.                                                                                                                                                                                                |
| 24, 25                                             | D -, D I : Differential LVPECL compatible data inputs to the transmitter side of the module.                                                                                                                                                                                                          |
| 4, 5, 6, 9, 10, 11, 12, 17, 18, 19, 20, 23, 26, 27 | These pins are "no connect," do not apply Gnd, VCC, or signal lines to these pins.                                                                                                                                                                                                                    |



## Transceiver Tin/Lead Recommended Reflow Profile (Based on J-STD-020D)



| $T_{SMIN}$<br>(°C) | $T_{SMAX}$<br>(°C) | $T_L$<br>(°C) | $T_P$<br>(°C MAX) | $t_s$<br>(s) | $t_L$<br>(s) | $t_p$<br>(s MAX) | Ramp-up rate<br>( $T_L$ to $T_P$ ) | Ramp-down rate<br>( $T_P$ to $T_L$ ) | Time<br>25°C to peak temperature<br>(s MAX) |
|--------------------|--------------------|---------------|-------------------|--------------|--------------|------------------|------------------------------------|--------------------------------------|---------------------------------------------|
| 100                | 150                | 183           | 225               | 60-120       | 60-150       | 20               | 3°C/s MAX                          | 6°C/s MAX                            | 360                                         |

Notes:

1. All temperatures measured on the package leads.
2. Maximum times of reflow cycle: 2.

### For More Information

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