

# TYPES TIL31B, TIL33B, TIL34B P-N GALLIUM ARSENIDE INFRARED-EMITTING DIODES

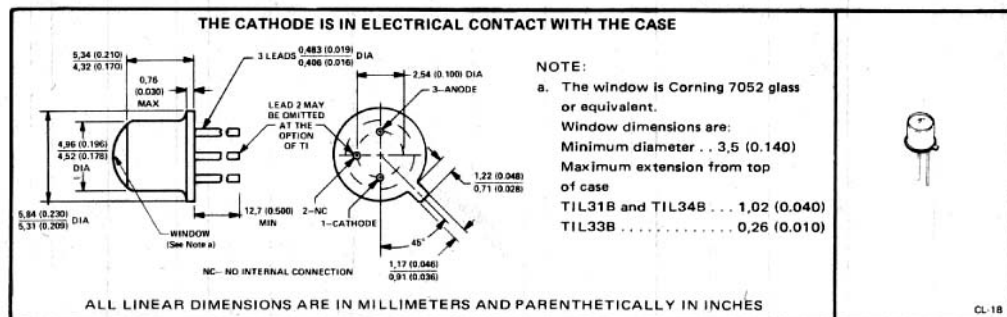
D1934, NOVEMBER 1974—REVISED FEBRUARY 1983

## DESIGNED TO EMIT NEAR-INFRARED RADIATION WHEN FORWARD BIASED

- "B" Versions Especially Designed for Low Degradation and are Direct Replacements for the "A" Versions
- Spectrally and Mechanically Compatible with TIL81 and TIL99 Phototransistors
- Typical Applications Include Card Readers, Encoders, Intrusion Alarms, Sector Sensors, Level Indicators, and Beginning-of-Tape/End-of-Tape Indicators
- TIL31HR2\* Includes High-Reliability Processing and Lot Acceptance (See Page 3-11 for Summary of Processing)

### mechanical data

Each device is in a hermetically sealed welded case similar to JEDEC TO-18 with window. The TIL31B and TIL34B have convex lenses while that of the TIL33B is essentially flat. A coin header is used to increase dissipation capability. All TO-18 registration notes also apply to this outline. Approximate weight is 0.35 gram.



\*On the original TIL31, TIL33, and TIL34, the anode was in electrical contact with the case. Lead 2, which had no internal connection, is omitted on the B-suffix versions.

### absolute maximum ratings

|                                                                  |                |
|------------------------------------------------------------------|----------------|
| Reverse Voltage at 25°C Case Temperature                         | 5 V            |
| Continuous Forward Current at 25°C Case Temperature (See Note 1) | 200 mA         |
| Operating Case Temperature Range                                 | -65°C to 150°C |
| Storage Temperature Range                                        | -65°C to 150°C |
| Lead Temperature 1.6 mm (1/16 Inch) from Case for 10 Seconds     | 240°C          |

### operating characteristics at 25°C case temperature

| PARAMETER                                  | TEST CONDITIONS                                    | TIL31B |     |      | TIL33B |     |      | TIL34B |     |      | UNIT |
|--------------------------------------------|----------------------------------------------------|--------|-----|------|--------|-----|------|--------|-----|------|------|
|                                            |                                                    | MIN    | TYP | MAX  | MIN    | TYP | MAX  | MIN    | TYP | MAX  |      |
| P <sub>O</sub> Radiant Power Output        | I <sub>F</sub> = 100 mA                            | 3.3    | 6   |      | 2.5    | 5   |      | 2      | 3   |      | mW   |
| λ <sub>p</sub> Wavelength at Peak Emission |                                                    | 915    | 940 | 975  | 915    | 940 | 975  | 915    | 940 | 975  | nm   |
| Δλ Spectral Bandwidth                      |                                                    |        | 50  | 75   |        | 50  | 75   |        | 50  | 75   | nm   |
| θ <sub>HI</sub> Half-Intensity Beam Angle  |                                                    |        | 10° |      |        | 80° |      |        | 10° |      |      |
| V <sub>F</sub> Static Forward Voltage      |                                                    |        | 1.4 | 1.75 |        | 1.4 | 1.75 |        | 1.4 | 1.75 | V    |
| t <sub>r</sub> Radiant Pulse Rise Time†    | I <sub>FM</sub> = 100 mA,<br>t <sub>W</sub> ≥ 5 μs |        | 600 |      |        | 600 |      |        | 600 |      | ns   |
| t <sub>f</sub> Radiant Pulse Fall Time†    |                                                    |        | 350 |      |        | 350 |      |        | 350 |      |      |

\*All electrical and mechanical specifications for the TIL24 also apply for TIL24HR2.

†Radiant pulse rise time is the time required for a change in radiant intensity from 10% to 90% of its peak value for a step change in current; radiant pulse fall time is the time required for a change in radiant intensity from 90% to 10% of its peak value for a step change in current.

NOTE 1: Derate linearly to 150°C case temperature at the rate of 1.6 mA/°C.

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