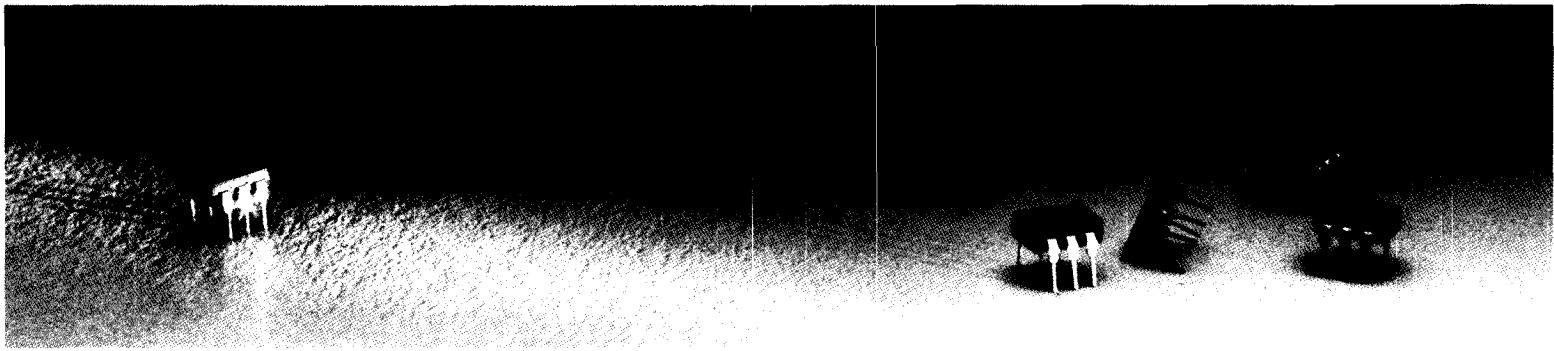




# **Couplers— Transistor Output (Cont'd)**

Max Ratings @ T<sub>A</sub> = 25°C

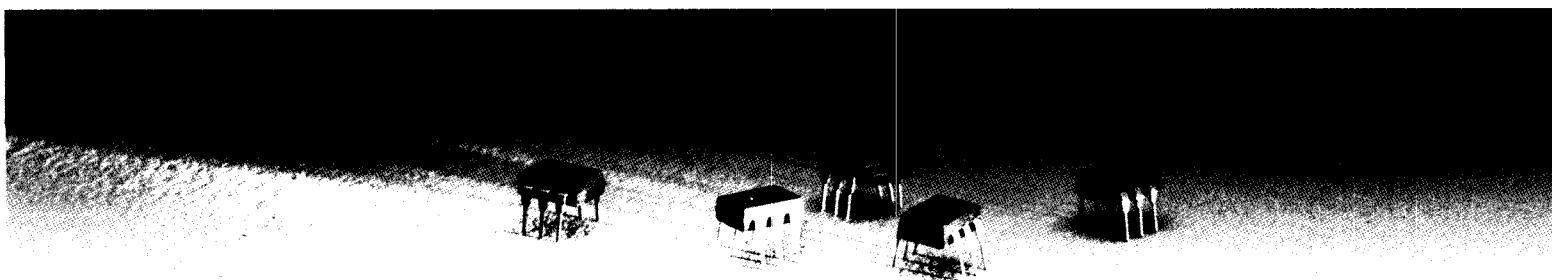
| Device No.            | P <sub>D</sub><br>mW | Transistor           |                       | Diode               |                      |                        |
|-----------------------|----------------------|----------------------|-----------------------|---------------------|----------------------|------------------------|
|                       |                      | I <sub>C</sub><br>mA | V <sub>CEO</sub><br>V | V <sub>R</sub><br>V | I <sub>F</sub><br>mA | V <sub>ISO</sub><br>kV |
| TIL111 <sup>(3)</sup> | 250                  | —                    | 30                    | 3.0                 | 100                  | 1.5                    |
| TIL112                | 250                  | —                    | 20                    | 3.0                 | 100                  | 1.5                    |
| TIL114 <sup>(3)</sup> | 250                  | —                    | 30                    | 3.0                 | 100                  | 2.5                    |
| TIL115                | 250                  | —                    | 20                    | 3.0                 | 100                  | 2.5                    |
| TIL116                | 250                  | —                    | 30                    | 3.0                 | 100                  | 2.5                    |
| TIL117                | 250                  | —                    | 30                    | 3.0                 | 100                  | 2.5                    |
| TIL118                | 250                  | —                    | 20                    | 3.0                 | 100                  | 1.5                    |

# **Couplers— Darlington Output**

Max Ratings @ T<sub>A</sub> = 25°C

| Device No.             | P <sub>D</sub><br>mW | Transistor           |                       | Diode               |                      |                        |
|------------------------|----------------------|----------------------|-----------------------|---------------------|----------------------|------------------------|
|                        |                      | I <sub>C</sub><br>mA | V <sub>CEO</sub><br>V | V <sub>R</sub><br>V | I <sub>F</sub><br>mA | V <sub>ISO</sub><br>kV |
| FCD850                 | 250                  | 125                  | 30                    | 3.0                 | 80                   | 1.5 ac                 |
| FCD850C                | 250                  | 125                  | 30                    | 3.0                 | 80                   | 5.0                    |
| FCD855                 | 250                  | 125                  | 55                    | 3.0                 | 80                   | 1.5 ac                 |
| FCD855C                | 250                  | 125                  | 55                    | 3.0                 | 80                   | 5.0                    |
| FDC860 <sup>(3)</sup>  | 250                  | 125                  | 30                    | 3.0                 | 80                   | 1.5 ac                 |
| FCD860C <sup>(3)</sup> | 250                  | 125                  | 30                    | 3.0                 | 80                   | 5.0                    |
| FCD865 <sup>(3)</sup>  | 250                  | 125                  | 30                    | 3.0                 | 80                   | 1.5 ac                 |
| FCD865C <sup>(3)</sup> | 250                  | 125                  | 30                    | 3.0                 | 80                   | 5.0                    |
| 4N29 <sup>(4)</sup>    | 250                  | 125                  | 30                    | 3.0                 | 80                   | 2.5                    |
| 4N30 <sup>(4)</sup>    | 250                  | 125                  | 30                    | 3.0                 | 80                   | 1.5                    |
| 4N31 <sup>(4)</sup>    | 250                  | 125                  | 30                    | 3.0                 | 80                   | 1.5                    |
| 4N32 <sup>(4)</sup>    | 250                  | 125                  | 30                    | 3.0                 | 80                   | 2.5                    |
| 4N33 <sup>(4)</sup>    | 250                  | 125                  | 30                    | 3.0                 | 80                   | 1.5                    |
| H11B1                  | 250                  | 100                  | 25                    | 3.0                 | 60                   | 2.5                    |
| H11B2                  | 250                  | 100                  | 25                    | 3.0                 | 60                   | 1.5                    |
| TIL113 <sup>(3)</sup>  | 250                  | —                    | 30                    | 3.0                 | 100                  | 1.5                    |
| TIL119                 | 250                  | —                    | 30                    | 3.0                 | 100                  | 1.5                    |
| MCA230                 | 250                  | —                    | 30                    | 3.0                 | 60                   | 1.5                    |
| MCA231 <sup>(3)</sup>  | 250                  | 50                   | 30                    | 3.0                 | 60                   | 1.5                    |
| MCA255                 | 250                  | —                    | 55                    | 3.0                 | 60                   | 1.5                    |

Notes:  
 1. Standard transistor output  
 2. High-speed transistor output guaranteed 2.0 μs max t<sub>r</sub> and t<sub>f</sub> with 100 Ω RL  
 8.0 μs typ at 1K Ω RL  
 3. CTR guaranteed with transistor in saturation  
 4. JEDEC registered data and conditions  
 5. CTR typ at 1.0 mA 40%



| Coupled Characteristics       |                                        |                        |                              | Input Diode Characteristics |                      | Output Transistor Characteristics |                      |                      | Package No. |
|-------------------------------|----------------------------------------|------------------------|------------------------------|-----------------------------|----------------------|-----------------------------------|----------------------|----------------------|-------------|
| Min Current<br>$I_C/I_F$<br>% | Transfer Ratio<br>$(\alpha) I_F$<br>mA | $(\alpha) V_{CE}$<br>V | $t_r, t_f$<br>$\mu s$<br>Typ | $V_F$<br>V<br>Max           | $(\alpha) I_F$<br>mA | $V_{CE(sat)}$<br>V<br>Max         | $(\alpha) I_C$<br>mA | $(\alpha) I_F$<br>mA |             |
| 12                            | 16                                     | 0.4                    | 5.0                          | 1.4                         | 16                   | 0.4                               | 2.0                  | 16                   | Opto-37     |
| 2.0                           | 10                                     | 5.0                    | 15                           | 1.5                         | 10                   | 0.5                               | 2.0                  | 50                   | Opto-37     |
| 12                            | 16                                     | 0.4                    | 5.0                          | 1.4                         | 16                   | 0.4                               | 2.0                  | 16                   | Opto-37     |
| 2.0                           | 10                                     | 5.0                    | 15                           | 1.5                         | 10                   | 0.5                               | 2.0                  | 50                   | Opto-37     |
| 20                            | 10                                     | 10                     | 7.0                          | 1.5                         | 60                   | 0.4                               | 2.2                  | 15                   | Opto-37     |
| 50                            | 10                                     | 10                     | 9.0                          | 1.4                         | 16                   | 0.4                               | 0.5                  | 10                   | Opto-37     |
| 10                            | 10                                     | 5.0                    | 15                           | 1.5                         | 10                   | 0.5                               | 2.0                  | 50                   | Opto-37     |

| Coupled Characteristics             |                          |                          |                |                | Input Diode Characteristics |                          | Output Darlington Characteristics |                          |                |
|-------------------------------------|--------------------------|--------------------------|----------------|----------------|-----------------------------|--------------------------|-----------------------------------|--------------------------|----------------|
| Min Current                         | Transfer Ratio           |                          | t <sub>r</sub> | t <sub>f</sub> | V <sub>F</sub>              |                          | I <sub>CEO</sub>                  |                          |                |
| I <sub>C</sub> /I <sub>F</sub><br>% | (α) I <sub>F</sub><br>mA | (α) V <sub>CE</sub><br>V | μs<br>Typ      | μs<br>Typ      | V<br>Max                    | (α) I <sub>F</sub><br>mA | μA<br>Max                         | (α) V <sub>CE</sub><br>V | Package<br>No. |
| 100                                 | 10                       | 5.0                      | 15             | 150            | 1.5                         | 20                       | 0.1                               | 10                       | Opto-37        |
| 100                                 | 10                       | 5.0                      | 15             | 150            | 1.5                         | 20                       | 0.1                               | 10                       | Opto-37        |
| 100                                 | 10                       | 5.0                      | 15             | 150            | 1.5                         | 20                       | 0.1                               | 10                       | Opto-37        |
| 100                                 | 10                       | 5.0                      | 15             | 150            | 1.5                         | 20                       | 0.1                               | 10                       | Opto-37        |
| 200                                 | 1.0                      | 1.0                      | 80             | 150            | 1.5                         | 20                       | 0.1                               | 10                       | Opto-37        |
| 200                                 | 1.0                      | 1.0                      | 80             | 150            | 1.5                         | 20                       | 0.1                               | 10                       | Opto-37        |
| 400                                 | 0.5                      | 1.0                      | 80             | 150            | 1.5                         | 20                       | 0.1                               | 10                       | Opto-37        |
| 400                                 | 0.5                      | 1.0                      | 80             | 150            | 1.5                         | 20                       | 0.1                               | 10                       | Opto-37        |
| 100                                 | 10                       | 10                       | 10             | 45             | 1.5                         | 50                       | 0.1                               | 10                       | Opto-37        |
| 100                                 | 10                       | 10                       | 10             | 45             | 1.5                         | 50                       | 0.1                               | 10                       | Opto-37        |
| 50                                  | 10                       | 10                       | 10             | 45             | 1.5                         | 50                       | 0.1                               | 10                       | Opto-37        |
| 500                                 | 10                       | 10                       | 10             | 120            | 1.5                         | 50                       | 0.1                               | 10                       | Opto-37        |
| 500                                 | 10                       | 10                       | 10             | 120            | 1.5                         | 50                       | 0.1                               | 10                       | Opto-37        |
| 500                                 | 1.0                      | 5.0                      | 125            | 100            | 1.5                         | 10                       | 0.1                               | 10                       | Opto-37        |
| 200                                 | 1.0                      | 5.0                      | 125            | 100            | 1.5                         | 10                       | 0.1                               | 10                       | Opto-37        |
| 300                                 | 10                       | 1.0                      | 50             | 50             | 1.5                         | 10                       | 0.1                               | 10                       | Opto-37        |
| 300                                 | 10                       | 2.0                      | 50             | 50             | 1.5                         | 10                       | 0.1                               | 10                       | Opto-37        |
| 100                                 | 10                       | 5.0                      | 5.0            | 35             | 1.5                         | 20                       | 0.1                               | 10                       | Opto-37        |
| 200                                 | 5.0                      | 1.0                      | 5.0            | 35             | 1.5                         | 10                       | 0.1                               | 10                       | Opto-37        |
| 100                                 | 10                       | 5.0                      | 5.0            | 35             | 1.5                         | 20                       | 0.1                               | 10                       | Opto-37        |