

# INTEGRATED POWER SEMICONDUCTORS, LTD.

## Darlington Transistor Arrays

T-43-25

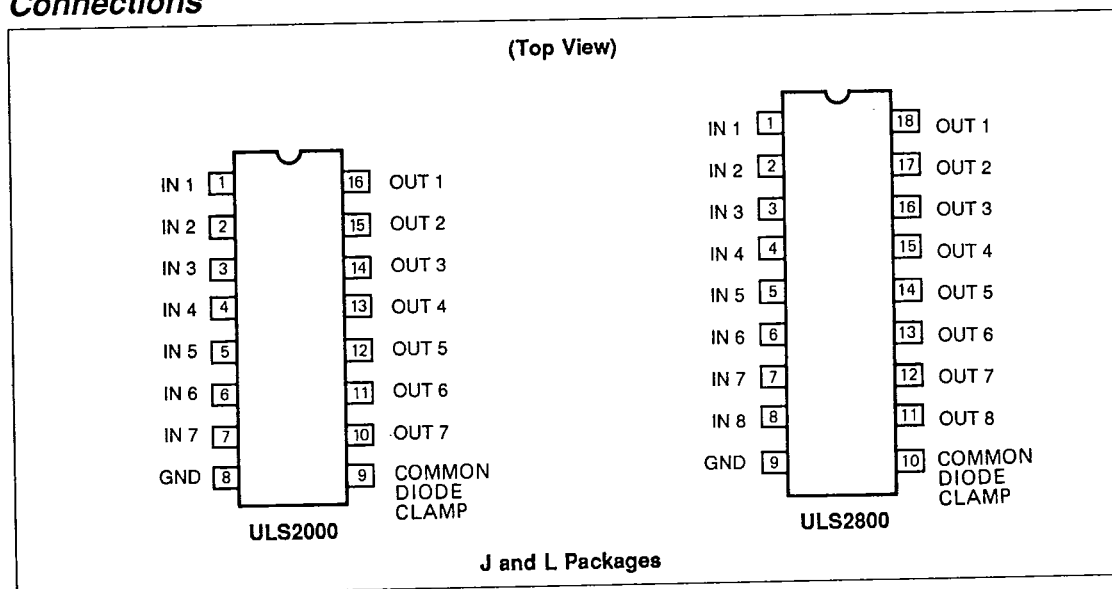
### Description

These power driver arrays are an arrangement of either seven (2000 series) or eight (2800 series) darlington transistors with independent inputs and outputs. They are designed to provide high voltage, medium current interface between low voltage control logic and peripheral loads. The range of inputs available allow specific compatibility with all popular logic families (PMOS, CMOS, TTL, Schottky TTL). Different maximum output current / output voltage combinations allow the customer to select the device closest to the exact needs of the application. Each darlington is configured as an open collector output with internal flyback diode to protect against potentially destructive transient voltages caused by inductive loads.

### Features

- 7 or 8 darlington power drives in single package
- 50V or 95V breakdown voltage ratings
- 500mA or 600mA output current capability per driver
- Low saturation voltage
- 5 Input options to allow correct interface with all popular logic families
- Internal clamp diodes for driving inductive loads
- Improved cross-talk noise suppression
- Hermetically sealed package
- Operating temperature range; -55°C to +125°C

### Connections


Section 4 - Power Drivers  
ULS2000 Series, ULS2800 Series

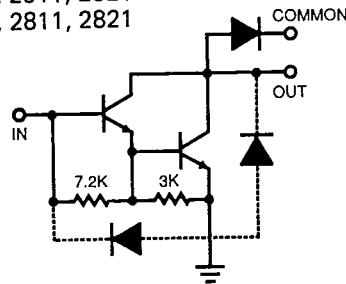
### Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ )

|                                                       |       |                                                                                                    |                 |
|-------------------------------------------------------|-------|----------------------------------------------------------------------------------------------------|-----------------|
| <b>Output Voltage, <math>V_{CE}</math></b>            |       | <b>Ground Pin Current, <math>I_{GND}</math></b>                                                    | 3.0A            |
| ULS2000, 2010, 2800, 2810 Series                      | 50V   | <b>Continuous Base Current, <math>I_B</math></b>                                                   | 25mA            |
| ULS2020, 2820 Series                                  | 95V   |                                                                                                    |                 |
| <b>Input Voltage, <math>V_{IN}</math></b>             |       | <b>Power Dissipation, <math>P_D</math></b>                                                         |                 |
| ULS2002, 2003, 2004, 2802, 2803, 2804                 | 30V   | (Single Darlington Drive)                                                                          | 1.0W            |
| ULS2005, 2805                                         | 15V   | (Total Package Power Dissipation is Specified on<br>Graphs of Collector Current Versus Duty Cycle) |                 |
| <b>Continuous Collector Current, <math>I_C</math></b> |       | <b>Operating Temp. Range, <math>T_A</math></b>                                                     | -55°C to +125°C |
| ULS2000, 2020, 2800, 2820 Series                      | 500mA | <b>Storage Temp. Range, <math>T_S</math></b>                                                       | -65°C to +150°C |
| ULS2010, 2810 Series                                  | 600mA |                                                                                                    |                 |

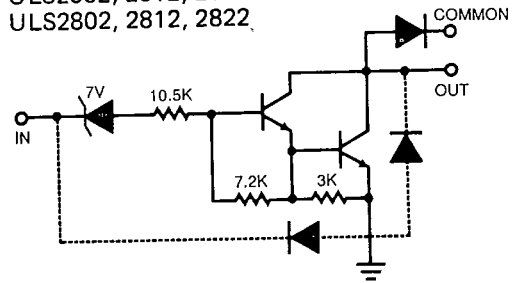
Absolute maximum ratings are those values beyond which the safety of the device cannot be guaranteed. They are not meant to imply that the device should be operated at these limits. The electrical characteristics provide conditions for actual device operation.

### Schematic Diagrams (Single Darlington Shown)

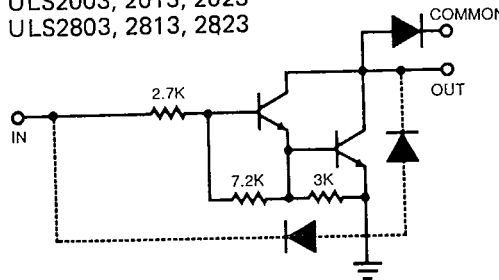
ULS2001, 2011, 2021  
ULS2801, 2811, 2821



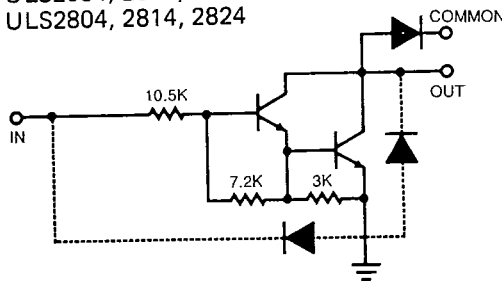
ULS2002, 2012, 2022  
ULS2802, 2812, 2822



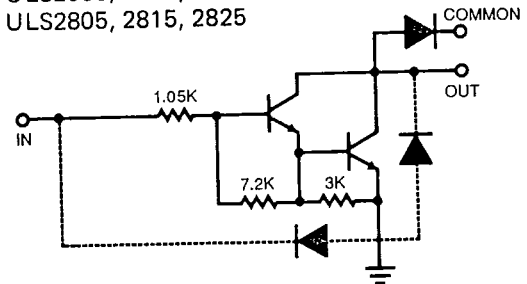
ULS2003, 2013, 2023  
ULS2803, 2813, 2823



ULS2004, 2014, 2024  
ULS2804, 2814, 2824



ULS2005, 2015, 2025  
ULS2805, 2815, 2825



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**Electrical Characteristics**

| Characteristic                                      | Conditions                    | Device     | Temp   | ULS2000/ULS2800 |      |      | Units   |
|-----------------------------------------------------|-------------------------------|------------|--------|-----------------|------|------|---------|
|                                                     |                               |            |        | Min             | Typ  | Max  |         |
| Output Leakage Current, $I_{CEX}$                   | $V_{CE} = 50V$                | All        | •      |                 |      | 100  | $\mu A$ |
|                                                     | $V_{CE} = 50V, V_{IN} = 6V$   | 2002, 2802 | •      |                 |      | 500  | $\mu A$ |
|                                                     | $V_{CE} = 50V, V_{IN} = 1V$   | 2004, 2804 | •      |                 |      | 500  | $\mu A$ |
| Collector-Emitter Saturation Voltage, $V_{CE(SAT)}$ | $I_C = 350mA, I_B = 850\mu A$ | All        | -55°C  |                 | 1.6  | 1.8  | V       |
|                                                     | $I_C = 200mA, I_B = 550\mu A$ |            | -55°C  |                 | 1.3  | 1.5  | V       |
|                                                     | $I_C = 100mA, I_B = 350\mu A$ |            | -55°C  |                 | 1.1  | 1.3  | V       |
|                                                     | $I_C = 350mA, I_B = 500\mu A$ |            |        |                 | 1.25 | 1.6  | V       |
|                                                     | $I_C = 200mA, I_B = 350\mu A$ |            |        |                 | 1.1  | 1.3  | V       |
|                                                     | $I_C = 100mA, I_B = 250\mu A$ |            |        |                 | 0.9  | 1.1  | V       |
|                                                     | $I_C = 350mA, I_B = 500\mu A$ |            | +125°C |                 | 1.6  | 1.8  | V       |
|                                                     | $I_C = 200mA, I_B = 350\mu A$ |            | +125°C |                 | 1.3  | 1.5  | V       |
|                                                     | $I_C = 100mA, I_B = 250\mu A$ |            | +125°C |                 | 1.1  | 1.3  | V       |
|                                                     |                               |            |        |                 |      |      |         |
| Input Current, $I_{IN}(ON)$                         | $V_{IN} = 17V$                | 2002, 2802 | •      | 480             | 850  | 1300 | $\mu A$ |
|                                                     | $V_{IN} = 3.85V$              | 2003, 2803 | •      | 650             | 930  | 1350 | $\mu A$ |
|                                                     | $V_{IN} = 5V$                 | 2004, 2804 | •      | 240             | 350  | 500  | $\mu A$ |
|                                                     | $V_{IN} = 12V$                |            | •      | 650             | 1000 | 1450 | $\mu A$ |
|                                                     | $V_{IN} = 3V$                 | 2005, 2805 | •      | 1180            | 1500 | 2400 | $\mu A$ |
| Input Current, $I_{IN}(OFF)$                        | $I_C = 500\mu A$              | All        | +125°C | 25              | 50   |      | $\mu A$ |
| Input Voltage, $V_{IN}(ON)$                         | $V_{CE} = 2V, I_C = 300mA$    | 2002, 2802 | -55°C  |                 |      | 18   | V       |
|                                                     | $V_{CE} = 2V, I_C = 300mA$    |            | +125°C |                 |      | 13   | V       |
|                                                     | $V_{CE} = 2V, I_C = 200mA$    | 2003, 2803 | -55°C  |                 |      | 3.3  | V       |
|                                                     | $V_{CE} = 2V, I_C = 250mA$    |            | -55°C  |                 |      | 3.6  | V       |
|                                                     | $V_{CE} = 2V, I_C = 300mA$    |            | -55°C  |                 |      | 3.9  | V       |
|                                                     | $V_{CE} = 2V, I_C = 200mA$    |            | +125°C |                 |      | 2.4  | V       |
|                                                     | $V_{CE} = 2V, I_C = 250mA$    |            | +125°C |                 |      | 2.7  | V       |
|                                                     | $V_{CE} = 2V, I_C = 300mA$    |            | +125°C |                 |      | 3.0  | V       |
|                                                     | $V_{CE} = 2V, I_C = 125mA$    | 2004, 2804 | -55°C  |                 |      | 6.0  | V       |
|                                                     | $V_{CE} = 2V, I_C = 200mA$    |            | -55°C  |                 |      | 8.0  | V       |
|                                                     | $V_{CE} = 2V, I_C = 275mA$    |            | -55°C  |                 |      | 10   | V       |
|                                                     | $V_{CE} = 2V, I_C = 350mA$    |            | -55°C  |                 |      | 12   | V       |
|                                                     | $V_{CE} = 2V, I_C = 125mA$    |            | +125°C |                 |      | 5.0  | V       |
|                                                     | $V_{CE} = 2V, I_C = 200mA$    |            | +125°C |                 |      | 6.0  | V       |
|                                                     | $V_{CE} = 2V, I_C = 275mA$    |            | +125°C |                 |      | 7.0  | V       |
|                                                     | $V_{CE} = 2V, I_C = 350mA$    |            | +125°C |                 |      | 8.0  | V       |
|                                                     | $V_{CE} = 2V, I_C = 350mA$    | 2005, 2805 | -55°C  |                 |      | 3.0  | V       |
|                                                     | $V_{CE} = 2V, I_C = 350mA$    |            | +125°C |                 |      | 2.4  | V       |
|                                                     | $V_{CE} = 2V, I_C = 350mA$    | 2001, 2801 | -55°C  | 500             |      |      |         |
|                                                     | $V_{CE} = 2V, I_C = 350mA$    |            |        | 1000            |      |      |         |
| DC Forward Current                                  |                               |            |        |                 |      |      |         |
| Transfer Ratio, $h_{FE}$                            |                               | All        |        |                 | 15   | 25   | pF      |
| Input Capacitance, $C_{IN}$                         |                               | All        |        |                 | 250  | 1000 | ns      |
| Turn-on Delay, $t_{PLH}$                            | 0.5 $E_{IN}$ to 0.5 $E_{OUT}$ | All        |        |                 | 250  | 1000 | ns      |
| Turn-off Delay, $t_{PHL}$                           | 0.5 $E_{IN}$ to 0.5 $E_{OUT}$ | All        |        |                 | 250  | 1000 | ns      |
| Clamp Diode Leakage Current, $I_R$                  | $V_R = 50V$                   | All        | •      |                 |      | 50   | $\mu A$ |
| Clamp Diode Forward Voltage, $V_F$                  | $I_F = 350mA$                 | All        | •      |                 | 1.7  | 2.0  | V       |

The • denotes the specifications which apply over the full operating temperature range, all others apply at  $T_A = 25^\circ C$  unless otherwise specified.



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**Electrical Characteristics Continued**

| Characteristic                                      | Conditions                     | Device     | Temp   | ULS2010/ULS2810 |      |      | Units   |
|-----------------------------------------------------|--------------------------------|------------|--------|-----------------|------|------|---------|
|                                                     |                                |            |        | Min             | Typ  | Max  |         |
| Output Leakage Current, $I_{CEX}$                   | $V_{CE} = 50V$                 | All        | •      |                 |      | 100  | $\mu A$ |
|                                                     | $V_{CE} = 50V, V_{IN} = 6V$    | 2012, 2812 | •      |                 |      | 500  | $\mu A$ |
|                                                     | $V_{CE} = 50V, V_{IN} = 1V$    | 2014, 2814 | •      |                 |      | 500  | $\mu A$ |
| Collector-Emitter Saturation Voltage, $V_{CE(SAT)}$ | $I_C = 500mA, I_B = 1100\mu A$ | All        | -55°C  |                 | 1.8  | 2.1  | V       |
|                                                     | $I_C = 350mA, I_B = 850\mu A$  |            | -55°C  |                 | 1.6  | 1.8  | V       |
|                                                     | $I_C = 200mA, I_B = 550\mu A$  |            | -55°C  |                 | 1.3  | 1.5  | V       |
|                                                     | $I_C = 500mA, I_B = 600\mu A$  |            |        |                 | 1.7  | 1.9  | V       |
|                                                     | $I_C = 350mA, I_B = 500\mu A$  |            |        |                 | 1.25 | 1.6  | V       |
|                                                     | $I_C = 200mA, I_B = 350\mu A$  |            |        |                 | 1.1  | 1.3  | V       |
|                                                     | $I_C = 500mA, I_B = 600\mu A$  |            | +125°C |                 | 1.8  | 2.1  | V       |
|                                                     | $I_C = 350mA, I_B = 500\mu A$  |            | +125°C |                 | 1.6  | 1.8  | V       |
|                                                     | $I_C = 200mA, I_B = 350\mu A$  |            | +125°C |                 | 1.3  | 1.5  | V       |
|                                                     |                                |            |        |                 |      |      |         |
| Input Current, $I_{IN(ON)}$                         | $V_{IN} = 17V$                 | 2012, 2812 | •      | 480             | 850  | 1300 | $\mu A$ |
|                                                     | $V_{IN} = 3.85V$               | 2013, 2813 | •      | 650             | 930  | 1350 | $\mu A$ |
|                                                     | $V_{IN} = 5V$                  | 2014, 2814 | •      | 240             | 350  | 500  | $\mu A$ |
|                                                     | $V_{IN} = 12V$                 |            | •      | 650             | 1000 | 1450 | $\mu A$ |
|                                                     | $V_{IN} = 3V$                  | 2015, 2815 | •      | 1180            | 1500 | 2400 | $\mu A$ |
| Input Current, $I_{IN(OFF)}$                        | $I_C = 500\mu A$               | All        | +125°C | 25              | 50   |      | $\mu A$ |
| Input Voltage, $V_{IN(ON)}$                         | $V_{CE} = 2V, I_C = 500mA$     | 2012, 2812 | -55°C  |                 |      | 23.5 | V       |
|                                                     | $V_{CE} = 2V, I_C = 500mA$     |            | +125°C |                 |      | 17   | V       |
|                                                     | $V_{CE} = 2V, I_C = 250mA$     | 2013, 2813 | -55°C  |                 |      | 3.6  | V       |
|                                                     | $V_{CE} = 2V, I_C = 300mA$     |            | -55°C  |                 |      | 3.9  | V       |
|                                                     | $V_{CE} = 2V, I_C = 500mA$     |            | -55°C  |                 |      | 6.0  | V       |
|                                                     | $V_{CE} = 2V, I_C = 250mA$     |            | +125°C |                 |      | 2.7  | V       |
|                                                     | $V_{CE} = 2V, I_C = 300mA$     |            | +125°C |                 |      | 3.0  | V       |
|                                                     | $V_{CE} = 2V, I_C = 500mA$     |            | +125°C |                 |      | 3.5  | V       |
|                                                     | $V_{CE} = 2V, I_C = 275mA$     | 2014, 2814 | -55°C  |                 |      | 10   | V       |
|                                                     | $V_{CE} = 2V, I_C = 350mA$     |            | -55°C  |                 |      | 12   | V       |
|                                                     | $V_{CE} = 2V, I_C = 500mA$     |            | -55°C  |                 |      | 17   | V       |
|                                                     | $V_{CE} = 2V, I_C = 275mA$     |            | +125°C |                 |      | 7.0  | V       |
|                                                     | $V_{CE} = 2V, I_C = 350mA$     |            | +125°C |                 |      | 8.0  | V       |
|                                                     | $V_{CE} = 2V, I_C = 500mA$     |            | +125°C |                 |      | 9.5  | V       |
|                                                     | $V_{CE} = 2V, I_C = 350mA$     | 2015, 2815 | -55°C  |                 |      | 3.0  | V       |
|                                                     | $V_{CE} = 2V, I_C = 500mA$     |            | -55°C  |                 |      | 3.5  | V       |
|                                                     | $V_{CE} = 2V, I_C = 350mA$     |            | +125°C |                 |      | 2.4  | V       |
|                                                     | $V_{CE} = 2V, I_C = 500mA$     |            | +125°C |                 |      | 2.6  | V       |
| DC Forward Current                                  | $V_{CE} = 2V, I_C = 500mA$     | 2011, 2811 | -55°C  | 450             |      |      |         |
| Transfer Ratio, $h_{FE}$                            | $V_{CE} = 2V, I_C = 500mA$     |            |        | 900             |      |      |         |
| Input Capacitance, $C_{IN}$                         |                                | All        |        |                 | 15   | 25   | pF      |
| Turn-on Delay, $t_{PLH}$                            | 0.5 $E_{IN}$ to 0.5 $E_{OUT}$  | All        |        |                 | 250  | 1000 | ns      |
| Turn-off Delay, $t_{PHL}$                           | 0.5 $E_{IN}$ to 0.5 $E_{OUT}$  | All        |        |                 | 250  | 1000 | ns      |
| Clamp Diode Leakage Current, $I_R$                  | $V_R = 50V$                    | All        | •      |                 |      | 50   | $\mu A$ |
| Clamp Diode Forward Voltage, $V_F$                  | $I_F = 350mA$                  | All        | •      |                 | 1.7  | 2.0  | V       |
|                                                     | $I_F = 500mA$                  |            | •      |                 |      | 2.5  | V       |

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# Electrical Characteristics Continued

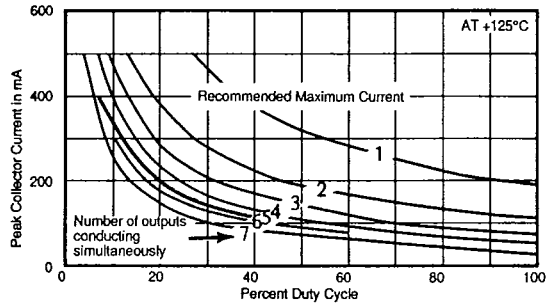
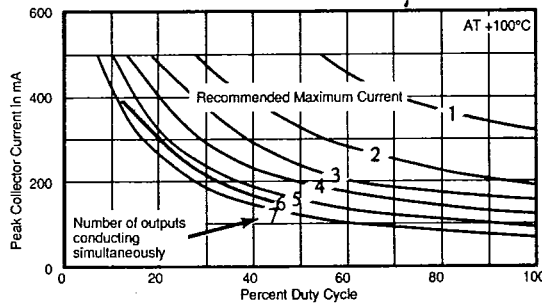
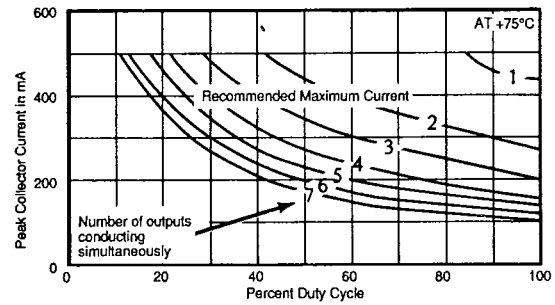
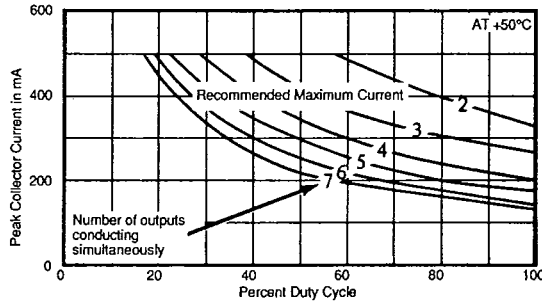
| Characteristic                                              | Conditions                    | Device     | Temp   | ULS2020 / ULS2820 |      |      | Units   |
|-------------------------------------------------------------|-------------------------------|------------|--------|-------------------|------|------|---------|
|                                                             |                               |            |        | Min               | Typ  | Max  |         |
| Output Leakage Current, $I_{CEX}$                           | $V_{CE} = 95V$                | All        | •      |                   |      | 100  | $\mu A$ |
|                                                             | $V_{CE} = 95V, V_{IN} = 6V$   | 2022, 2822 | •      |                   |      | 500  | $\mu A$ |
|                                                             | $V_{CE} = 95V, V_{IN} = 1V$   | 2024, 2824 | •      |                   |      | 500  | $\mu A$ |
|                                                             | $I_C = 350mA, I_B = 850\mu A$ | All        | -55°C  |                   | 1.6  | 1.8  | V       |
| Collector-Emitter Saturation Voltage, $V_{CE(SAT)}$         | $I_C = 200mA, I_B = 550\mu A$ |            | -55°C  |                   | 1.3  | 1.5  | V       |
|                                                             | $I_C = 100mA, I_B = 350\mu A$ |            | -55°C  |                   | 1.1  | 1.3  | V       |
|                                                             | $I_C = 350mA, I_B = 500\mu A$ |            |        |                   | 1.25 | 1.6  | V       |
|                                                             | $I_C = 200mA, I_B = 350\mu A$ |            |        |                   | 1.1  | 1.3  | V       |
|                                                             | $I_C = 100mA, I_B = 250\mu A$ |            |        |                   | 0.9  | 1.1  | V       |
|                                                             | $I_C = 350mA, I_B = 500\mu A$ |            | +125°C |                   | 1.6  | 1.8  | V       |
|                                                             | $I_C = 200mA, I_B = 350\mu A$ |            | +125°C |                   | 1.3  | 1.5  | V       |
|                                                             | $I_C = 100mA, I_B = 250\mu A$ |            | +125°C |                   | 1.1  | 1.3  | V       |
|                                                             | $V_{IN} = 17V$                | 2022, 2822 | •      | 480               | 850  | 1300 | $\mu A$ |
|                                                             | $V_{IN} = 3.85V$              | 2023, 2823 | •      | 650               | 930  | 1350 | $\mu A$ |
|                                                             | $V_{IN} = 5V$                 | 2024, 2824 | •      | 240               | 350  | 500  | $\mu A$ |
|                                                             | $V_{IN} = 12V$                |            | •      | 650               | 1000 | 1450 | $\mu A$ |
| Input Current, $I_{IN(ON)}$                                 | $V_{IN} = 3V$                 | 2025, 2825 | •      | 1180              | 1500 | 2400 | $\mu A$ |
|                                                             | $I_C = 500\mu A$              | All        | +125°C | 25                | 50   |      | $\mu A$ |
| Input Current, $I_{IN(OFF)}$<br>Input Voltage, $V_{IN(ON)}$ | $V_{CE} = 2V, I_C = 300mA$    | 2022, 2822 | -55°C  |                   |      | 18   | V       |
|                                                             | $V_{CE} = 2V, I_C = 300mA$    |            | +125°C |                   |      | 13   | V       |
|                                                             | $V_{CE} = 2V, I_C = 200mA$    | 2023, 2823 | -55°C  |                   |      | 3.3  | V       |
|                                                             | $V_{CE} = 2V, I_C = 250mA$    |            | -55°C  |                   |      | 3.6  | V       |
|                                                             | $V_{CE} = 2V, I_C = 300mA$    |            | -55°C  |                   |      | 3.9  | V       |
|                                                             | $V_{CE} = 2V, I_C = 200mA$    |            | +125°C |                   |      | 2.4  | V       |
|                                                             | $V_{CE} = 2V, I_C = 250mA$    |            | +125°C |                   |      | 2.7  | V       |
|                                                             | $V_{CE} = 2V, I_C = 300mA$    |            | +125°C |                   |      | 3.0  | V       |
|                                                             | $V_{CE} = 2V, I_C = 125mA$    | 2024, 2824 | -55°C  |                   |      | 6.0  | V       |
|                                                             | $V_{CE} = 2V, I_C = 200mA$    |            | -55°C  |                   |      | 8.0  | V       |
|                                                             | $V_{CE} = 2V, I_C = 275mA$    |            | -55°C  |                   |      | 10   | V       |
|                                                             | $V_{CE} = 2V, I_C = 350mA$    |            | -55°C  |                   |      | 12   | V       |
|                                                             | $V_{CE} = 2V, I_C = 125mA$    |            | +125°C |                   |      | 5.0  | V       |
|                                                             | $V_{CE} = 2V, I_C = 200mA$    |            | +125°C |                   |      | 6.0  | V       |
|                                                             | $V_{CE} = 2V, I_C = 275mA$    |            | +125°C |                   |      | 7.0  | V       |
|                                                             | $V_{CE} = 2V, I_C = 350mA$    |            | +125°C |                   |      | 8.0  | V       |
|                                                             | $V_{CE} = 2V, I_C = 350mA$    | 2025, 2825 | -55°C  |                   |      | 3.0  | V       |
|                                                             | $V_{CE} = 2V, I_C = 350mA$    |            | +125°C |                   |      | 2.4  | V       |
|                                                             | $V_{CE} = 2V, I_C = 350mA$    | 2021, 2821 | -55°C  | 500               |      |      |         |
|                                                             | $V_{CE} = 2V, I_C = 350mA$    |            |        | 1000              |      |      |         |
| DC Forward Current                                          | $V_{CE} = 2V, I_C = 350mA$    | All        |        |                   | 15   | 25   | pF      |
| Transfer Ratio, $h_{FE}$                                    | $V_{CE} = 2V, I_C = 350mA$    | All        |        |                   | 250  | 1000 | ns      |
| Input Capacitance, $C_{IN}$                                 | $0.5 E_{IN}$ to $0.5 E_{OUT}$ | All        |        |                   | 250  | 1000 | ns      |
| Turn-on Delay, $t_{PLH}$                                    | $0.5 E_{IN}$ to $0.5 E_{OUT}$ | All        | •      |                   |      | 50   | $\mu A$ |
| Turn-off Delay, $t_{PHL}$                                   | $V_R = 95V$                   | All        | •      |                   |      | 1.7  | 2.0     |
| Clamp Diode Leakage Current, $I_R$                          | $I_F = 350mA$                 | All        | •      |                   |      |      | V       |
| Clamp Diode Forward Voltage, $V_F$                          |                               |            |        |                   |      |      |         |

The • denotes the specifications which apply over the full operating temperature range, all others apply at  $T_A = 25^\circ C$  unless otherwise specified.

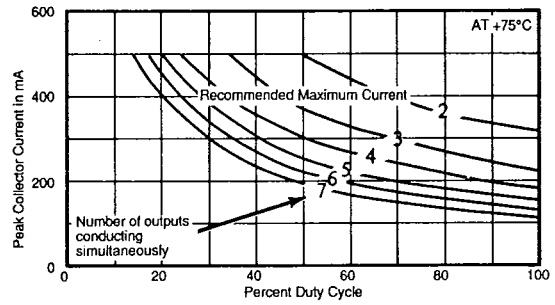
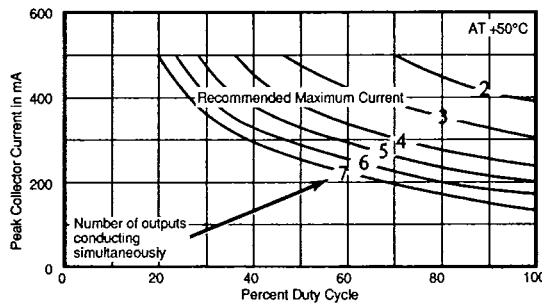


# Operating Conditions

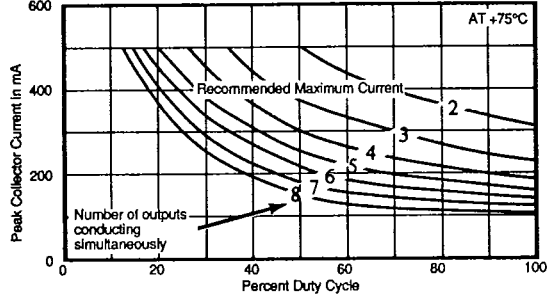
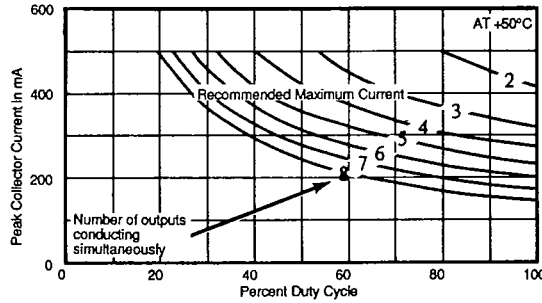
## ULS2000L — Peak Collector Current as a Function of Duty Cycle (See Note)



## ULS2000J — Peak Collector Current as a Function of Duty Cycle (See Note)



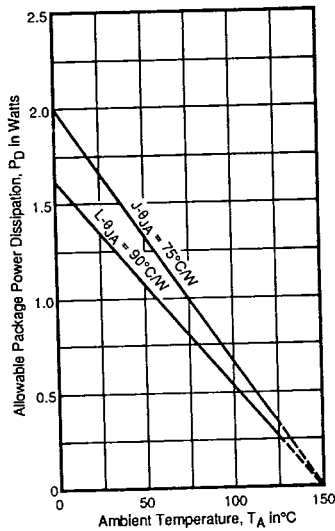
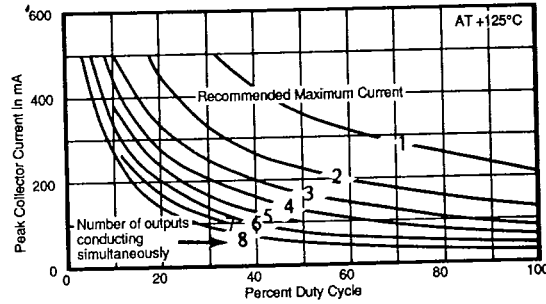
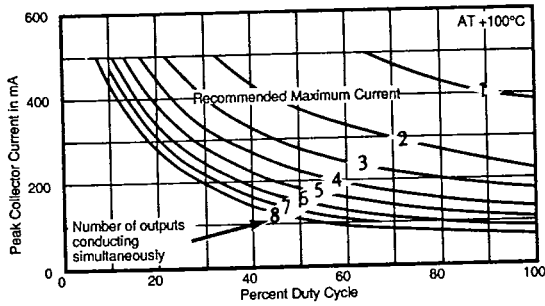
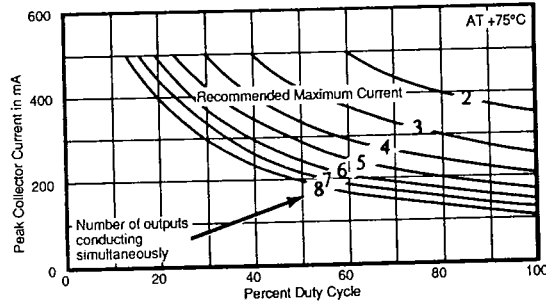
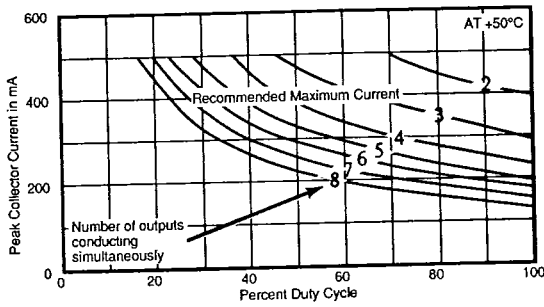
## ULS2800J — Peak Collector Current as a Function of Duty Cycle (See Note)



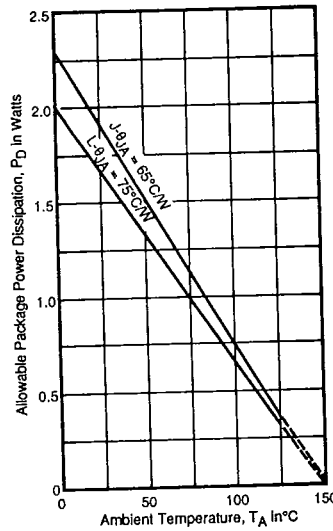
Note: The recommended maximum currents apply to the 2000, 2800, 2020, and 2820 series.

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# ULS2800L — Peak Collector Current as a Function of Duty Cycle (See Note)



Allowable Package Power Dissipation  
ULS-2000J and ULS-2000L



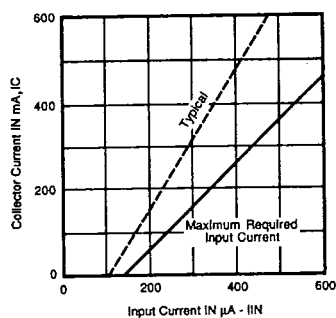
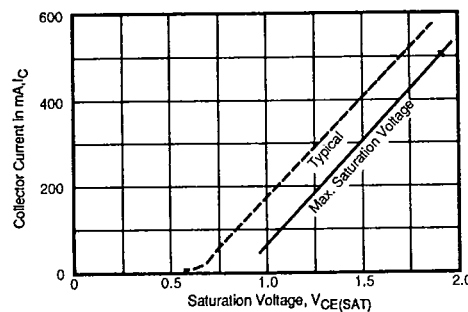
Allowable Package Power Dissipation  
ULS-2800J and ULS-2800L

Note: The recommended maximum currents apply to 2000, 2800, 2020, and 2820 series.

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**Saturation Voltage Characteristics**Collector Current as a  
Function of Input CurrentCollector Current as a  
Function of Saturation Voltage**Order Information**

| Input Conditions              | Maximum Output Conditions       |                                 |                                 |                                 |                                 |                                 |
|-------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
|                               | 7 Segment Drive                 |                                 |                                 | 8 Segment Drive                 |                                 |                                 |
|                               | $V_{CE} = 50V$<br>$I_C = 500mA$ | $V_{CE} = 50V$<br>$I_C = 600mA$ | $V_{CE} = 95V$<br>$I_C = 500mA$ | $V_{CE} = 50V$<br>$I_C = 500mA$ | $V_{CE} = 50V$<br>$I_C = 600mA$ | $V_{CE} = 95V$<br>$I_C = 500mA$ |
| General Purpose<br>CMOS, PMOS | ULS2001J<br>ULS2001L            | ULS2011J<br>ULS2011L            | ULS2021J<br>ULS2021L            | ULS2801J<br>ULS2801L            | ULS2811J<br>ULS2811L            | ULS2821J<br>ULS2821L            |
| 14 - 25V<br>PMOS              | ULS2002J<br>ULS2002L            | ULS2012J<br>ULS2012L            | ULS2022J<br>ULS2022L            | ULS2802J<br>ULS2802L            | ULS2812J<br>ULS2812L            | ULS2822J<br>ULS2822L            |
| 5V<br>TTL, CMOS               | ULS2003J<br>ULS2003L            | ULS2013J<br>ULS2013L            | ULS2023J<br>ULS2023L            | ULS2803J<br>ULS2803L            | ULS2813J<br>ULS2813L            | ULS2823J<br>ULS2823L            |
| 6 - 15V<br>CMOS, PMOS         | ULS2004J<br>ULS2004L            | ULS2014J<br>ULS2014L            | ULS2024J<br>ULS2024L            | ULS2804J<br>ULS2804L            | ULS2814J<br>ULS2814L            | ULS2824J<br>ULS2824L            |
| High Output<br>TTL            | ULS2005J<br>ULS2005L            | ULS2015J<br>ULS2015L            | ULS2025J<br>ULS2025L            | ULS2805J<br>ULS2805L            | ULS2815J<br>ULS2815L            | ULS2825J<br>ULS2825L            |

Note: J — 16 or 18 pin Cerdip  
L — 16 or 18 pin side braised ceramic

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