SGS-THOMSON MICROELECTRONICS

# L601-L603
# L602-L604

## DARLINGTON ARRAYS

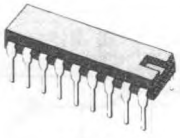
- EIGHT DARLINGTONS PER PACKAGE
- OUTPUT CURRENT 400 mA PER DRIVER (500 mA PEAK)
- OUTPUT VOLTAGE 90 V ($V_{CE\ (sus)}$ = 70 V)
- INTEGRAL SUPPRESSION DIODES FOR INDUCTIVE LOADS
- OUTPUTS CAN BE PARALLELED FOR HIGHER CURRENT
- TTL / CMOS / PMOS / DTL COMPATIBLE INPUTS
- INPUTS PINNED OPPOSITE OUTPUTS TO SIMPLIFY LAYOUT

The four versions interface to all common logic families :

| | |
|---|---|
| L601 | General purpose |
| L602 | 14 - 25 V PMOS |
| L603 | 5 V TTL, CMOS |
| L604 | 6 - 15 V CMOS, PMOS |

These versatile devices are useful for driving a wide range of loads, including solenoids, relays DC motors, LED displays, filament lamps, thermal printheads and high power buffers.

The L601, L602, L603 and L604 are supplied in 18 pin plastic DIP packages with a copper leadframe to reduce thermal resistance.



**DIP-18**
(Plastic)

**ORDER CODES :** L601C, L603B
L602B, L604B

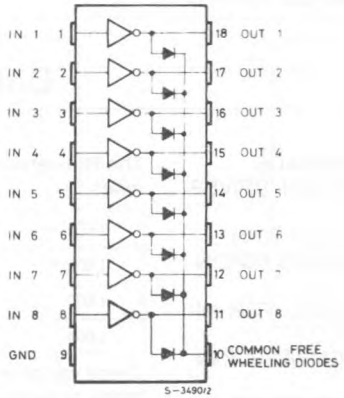
### DESCRIPTION

The L601, L602, L603 and L604 are high voltage, high current darlington arrays each containing eight open collector darlington pairs with common emitters. Each channel is rated at 400 mA and can with stand peak currents of 500 mA. Suppression diodes are included for inductive load driving and the inputs are pinned opposite the outputs to simplify board layout.

### ABSOLUTE MAXIMUM RATINGS

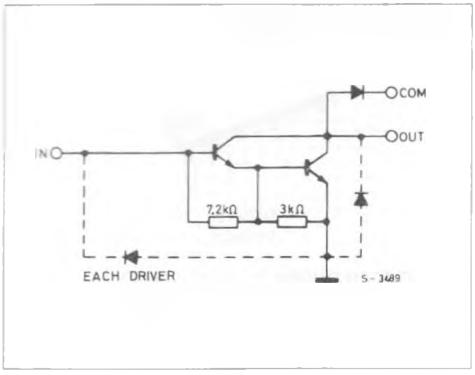
| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CEX}$ | Collector Emitter Voltage (input open) | 90 | V |
| $I_C$ | Collector Current | 0.4 | A |
| $I_C$ | Collector Peak Current | 0.5 | A |
| $V_i$ | Input Voltage (for L602, L603 and L604) | 30 | V |
| $I_i$ | Input Current (for L601 only) | 25 | mA |
| $P_{tot}$ | Total Power Dissipation a $T_{amb}$ = 25 C | 1.8 | W |
| $T_{op}$ | Operating Junction Temperature | – 25 to 150 | °C |

## PIN CONNECTIONS (top view)

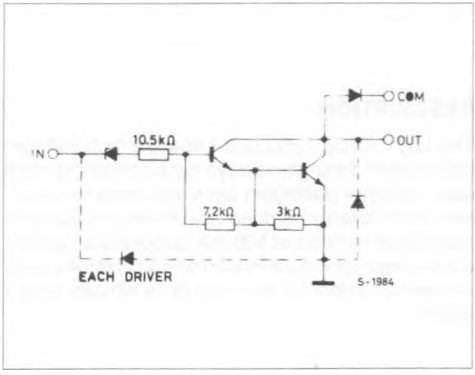



## SCHEMATIC DIAGRAMS

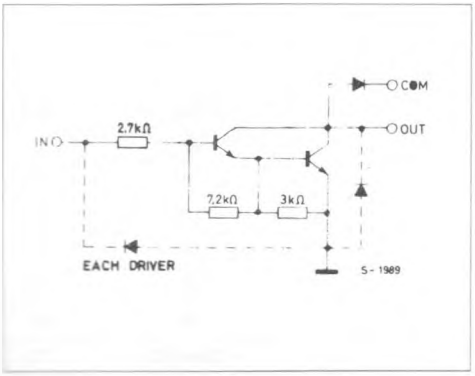
### L601



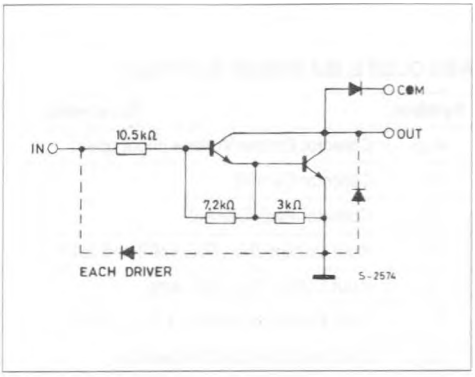

### L602




### L603




### L604



## THERMAL DATA

| | | | | |
|---|---|---|---|---|
| $R_{th\ j\text{-}amb}$ | Thermal Resistance Junction-ambient | Max | 70 | °C/W |

## ELECTRICAL CHARACTERISTICS ($T_{amb}$ = 25 °C, unless otherwise specified)

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{CEX}$ | Output Leakage Current | $V_{CE}$ = 90 V | | | 10 | µA |
| $V_{CE(sat)}$ | Collector Emitter Saturation Voltage | $I_C$ = 300 mA $I_B$ = 500 µA<br>$I_C$ = 200 mA $I_B$ = 350 µA<br>$I_C$ = 100 mA $I_B$ = 250 µA | | | 2<br>1.7<br>1.2 | V<br>V<br>V |
| $h_{FE}$ | DC Forward Current Gain (L601 only) | $V_{CE}$ = 3 V $I_C$ = 300 mA | 1000 | | | – |
| $V_i$ | Minimum Input Voltage (ON condition) | $V_{CE}$ = 3 V $I_C$ = 300 mA<br>for L602<br>for L603<br>for L604 | | | <br>11.5<br>2.5<br>5 | <br>V<br>V<br>V |
| $V_i$ | Maximum Input Voltage (OFF condition) | $V_{CE}$ = 90 V $I_C$ = 25 µA<br>for L601<br>for L602<br>for L603<br>for L604 | <br>0.55<br>7<br>0.75<br>1 | | | <br>V<br>V<br>V<br>V |
| $I_R$ | Clamp Diode Reverse Current | $V_R$ = 90 V | | | 50 | µA |
| $V_F$ | Clamp Diode Forward Voltage | $I_F$ = 300 mA | | 2 | 2.4 | V |
| $t_{on}$ | Turn-on Delay | 0.5 $V_i$ to 0.5 $V_o$ | | 0.4 | | µs |
| $t_{off}$ | Turn-off Delay | 0.5 $V_i$ to 0.5 $V_o$ | | 0.4 | | µs |