

INTERFACE CIRCUIT – RELAY AND LAMP – DRIVER

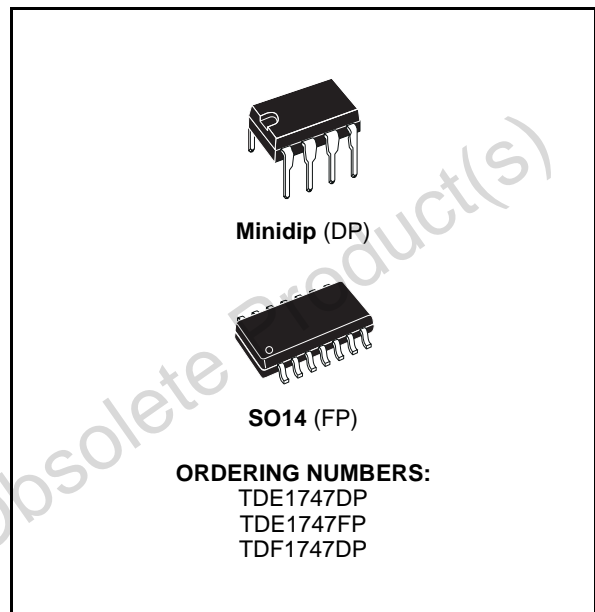
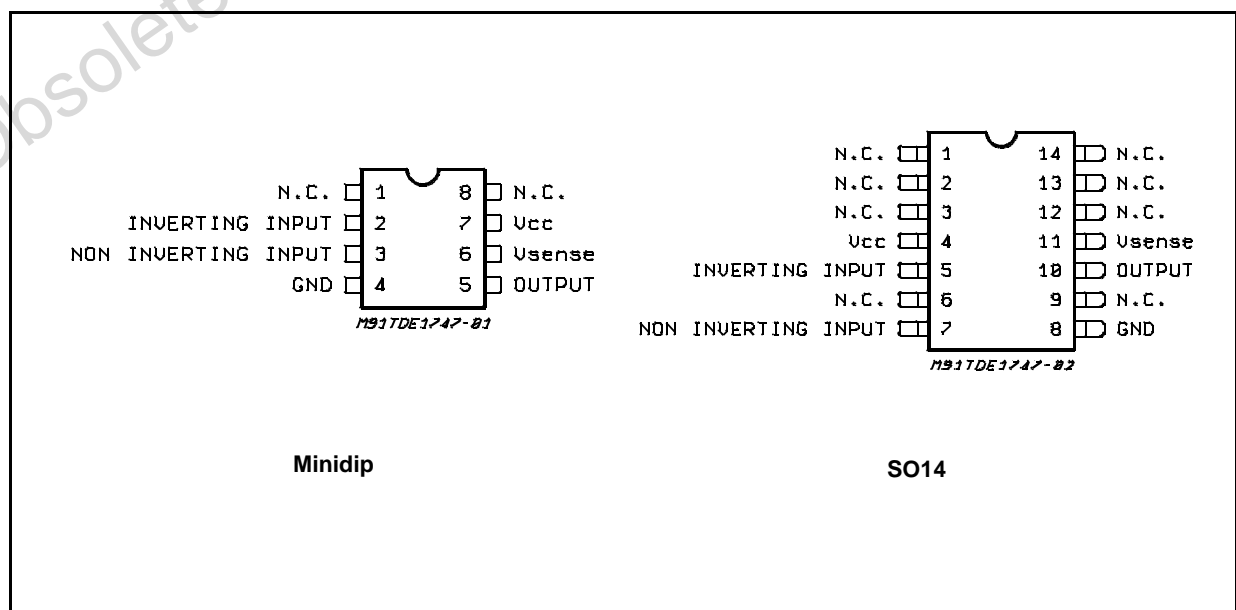
- OPEN GROUND PROTECTION
- HIGH OUTPUT CURRENT
- ADJUSTABLE SHORT-CIRCUIT PROTECTION TO GROUND
- THERMAL PROTECTION WITH HYSTERESIS TO AVOID THE INTERMEDIATE OUTPUT LEVELS
- LARGE SUPPLY VOLTAGE RANGE : + 10 V TO + 45 V
- SHORT-CIRCUIT PROTECTION TO V_{CC}

DESCRIPTION

The TDE/TDF1747 is a monolithic comparator designed for high current and high voltage applications, specifically to drive lamps, relays, stepping motors.

These device is essentially blow-out proof. Current limiting is available to limit the peak output current to safe values, the adjustment only requires one external resistor. In addition, thermal shut down is provided to keep the I.C. from overheating. If internal dissipation becomes too great, the driver will shut down to prevent excessive heating. TDE1747 has an open ground protection. The output is also protected from short-circuits with the positive power supply.

PIN CONNECTIONS (Top view)



The device operates over a wide range of supply voltages from standard ± 15 V operational amplifier supplies down to the single + 12 V or + 24 used for industrial electronic systems.

TDE1747 - TDF1747

ABSOLUTE MAXIMUM RATINGS

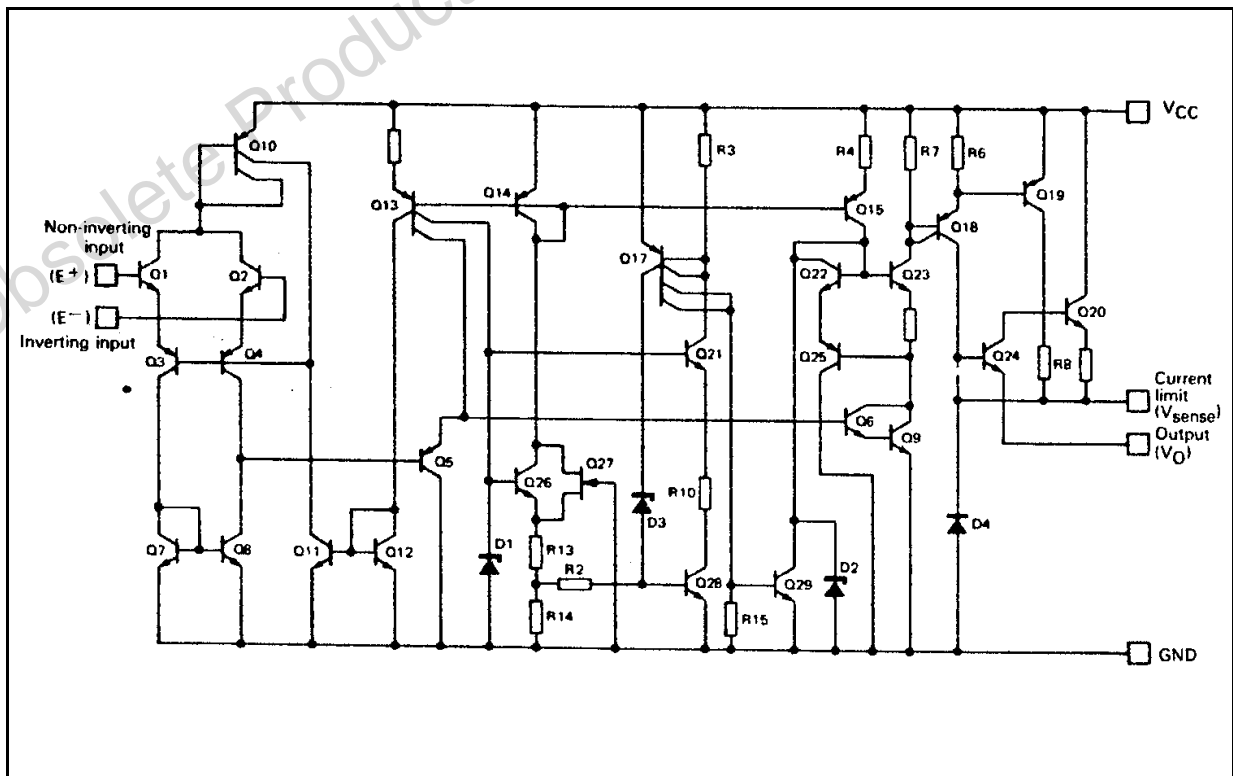
| Symbol | Parameter | Value | Unit |
|-------------------|---|------------------------------|----------|
| V _{CC} | Supply Voltage | 50 * | V |
| V _{ID} | Differential Input Voltage | 50 | V |
| V _I | Input Voltage | 50 | V |
| I _O | Output Current | 1 | A |
| P _{tot} | Power Dissipation (T _{amb} = + 25 °C) | Internally Limited | W |
| T _{stg} | Storage Temperature Range | - 65 to + 150 | °C |
| T _{oper} | Operating Ambient Temperature Range TDE1747 TDF1747 | - 25 to + 85 - 40 to + 85 | °C °C |

(*) 60V, t à 10ms

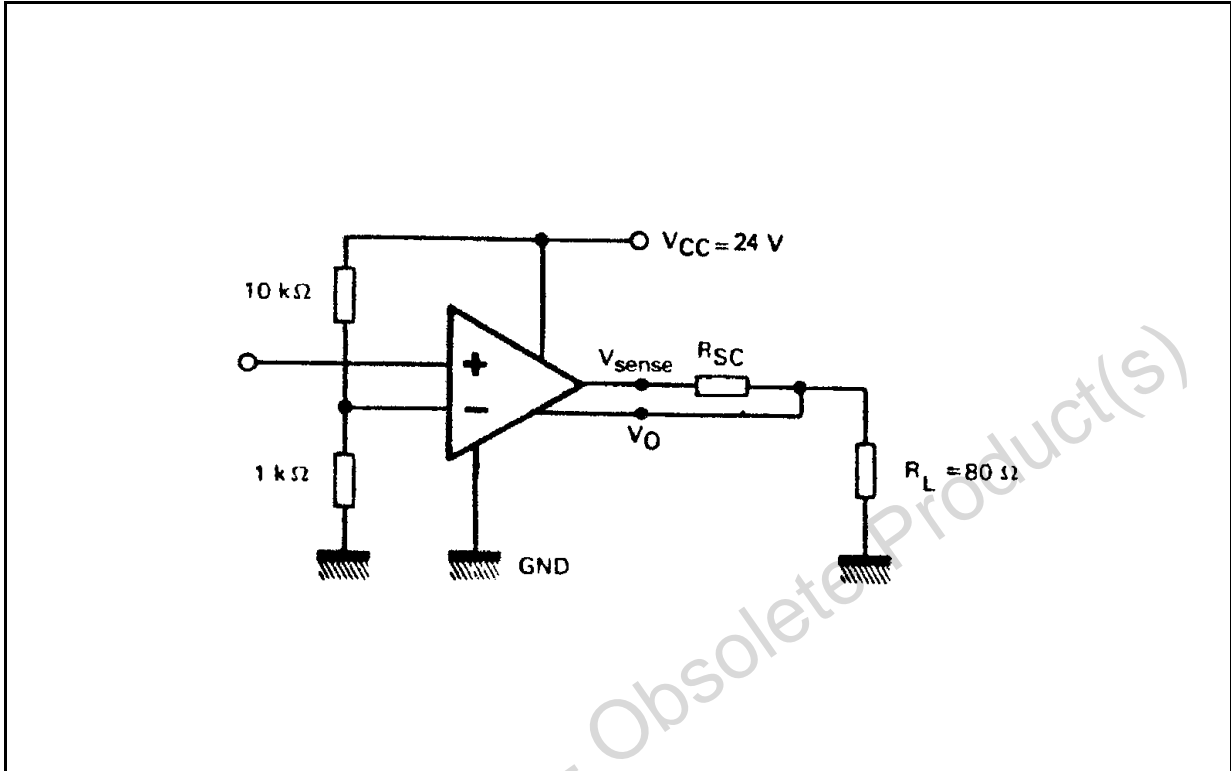
THERMAL CHARACTERISTICS

| Symbol | Parameter | Value | Unit |
|----------------------|--|-------|------|
| R _{th(j-c)} | Maximum Junction-case Thermal Resistance | 50 | °C/W |
| R _{th(j-a)} | Maximum Junction-ambient Thermal Resistance | 120 | °C/W |
| R _{th} | Junction-ceramic Substrate (case glued to substrate) SO14 | 90 | °C/W |
| R _{th} | Junction-ceramic Substrate (case glued to substrate, substrate temperature maintained constant) SO14 | 65 | °C/W |

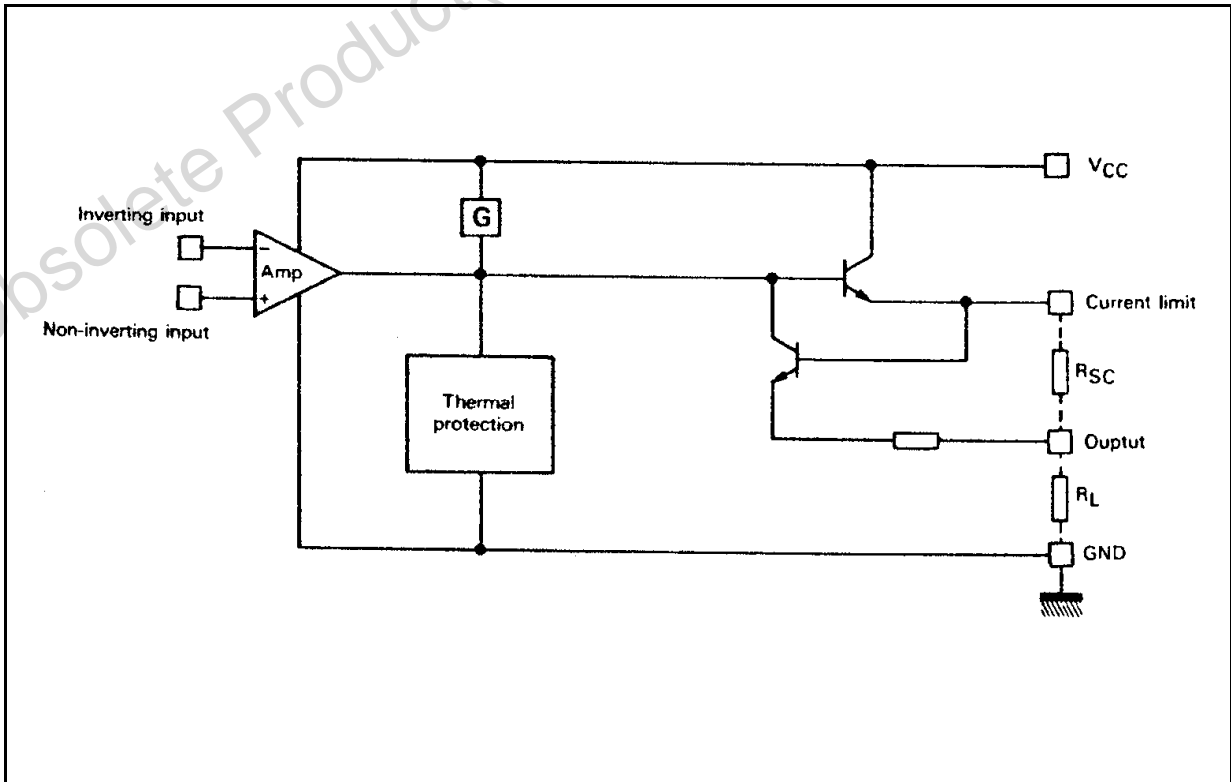
SCHEMATIC DIAGRAM



TEST CIRCUIT



SIMPLIFIED CIRCUIT



ELECTRICAL CHARACTERISTICS $T_j = -25$ to $+85$ °C, $V_{CC} = 8$ to 45 V, unless otherwise specified (note 1).

| Symbol | Parameter | Min. | Typ. | Max. | Unit |
|--------------|---|---------|------|------------|------|
| V_{IO} | Input Offset Voltage - (note 2) | - | 2 | 50 | mV |
| I_B | Input Bias Current | - | 0.1 | 1.5 | mA |
| I_{CC} | Supply Current ($V_{CC} = +24$ V, $I_O = 0$) | | | | |
| | High Level | - | 4 | 6 | mA |
| | Low Level | - | 2 | 4 | mA |
| $V_{I(max)}$ | Common-mode Input Voltage Range | 2 | - | $V_{CC}-2$ | V |
| I_{SC} | Short-circuit Current Limit ($T_{amb} = +25$ °C, $V_{CC} = +24$) $R_{SC} = 1.5$ Ω $R_{SC} = \infty$ | | | | |
| | | TDE1747 | - | 480 | - |
| | | - | 35 | 50 | mA |
| $V_{CC}-V_O$ | Output Saturation Voltage (output high) ($R_{SC} = 0$, $V_I+V_I- \geq 50$ mV) $I_O = 300$ mA, $T_j = +25$ °C $T_j = +150$ °C | | | | |
| | | - | 1.15 | 1.4 | V |
| | | - | 1.05 | 1.3 | V |
| I_{OL} | Low Level Output Current ($V_O = 0$, $V_{CC} = +24$ V) $T_j = +25$ °C | - | 0.01 | 10 | μA |

Notes :

- 1) For operating at high temperature, the TDE/TDF1747, must be derated based on a $+150$ C maximum junction temperature and a junction-ambient thermal resistance of 120 °C/W for Minidip and 100 °C/W for the SO14.
- 2) The offset voltage given is the maximum value of input voltage required to drive the output voltage within 2 V of the ground or the supply voltage.

Figure 1: Available Output Current vs. Limiting Resistor

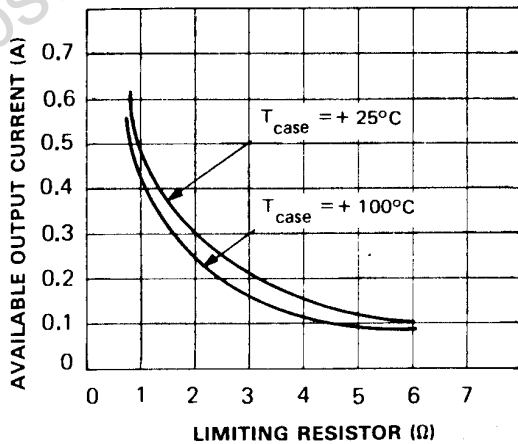


Figure 2: Peak Short-circuit Output Current vs. Limiting Resistor

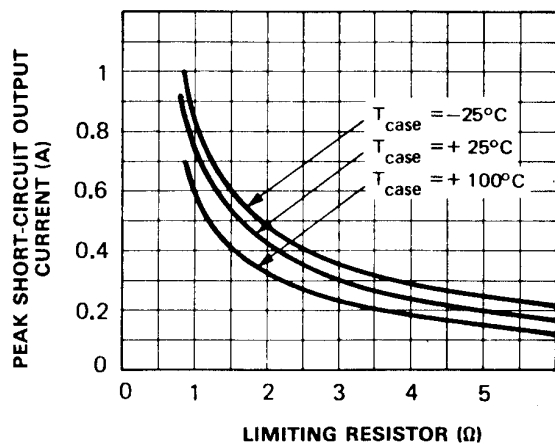


Figure 3: Short-circuit Current vs. Case Temperature

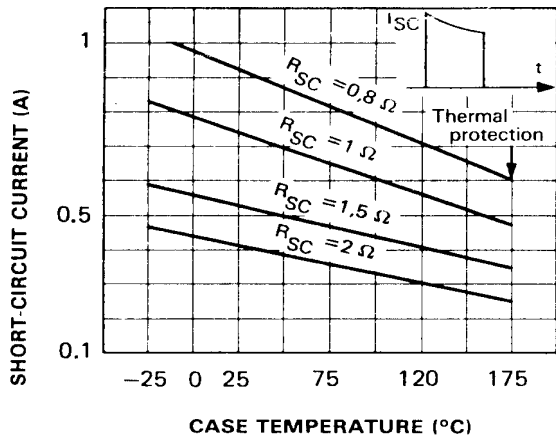


Figure 4: Minimum Limiting Resistor Value vs. Supply Voltage

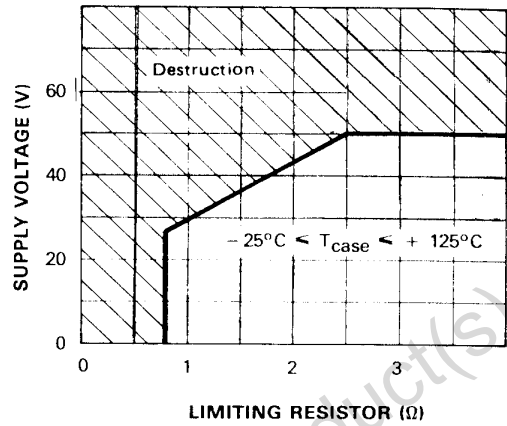


Figure 5: Output Current vs. Output Saturation Voltage

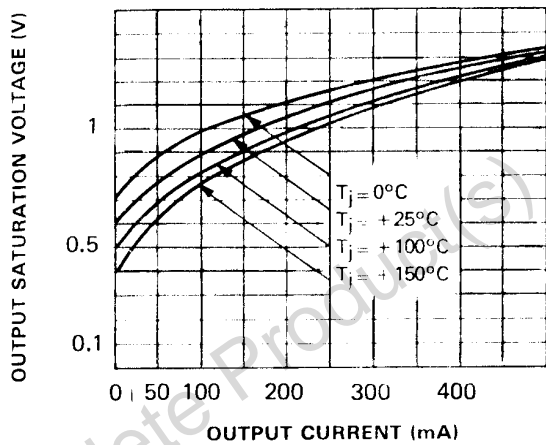


Figure 6: Supply Current vs. Supply Voltage

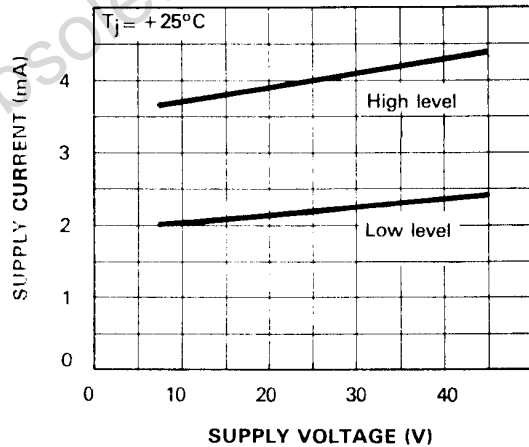


Figure 7: Supply Current vs. Junction Temperature

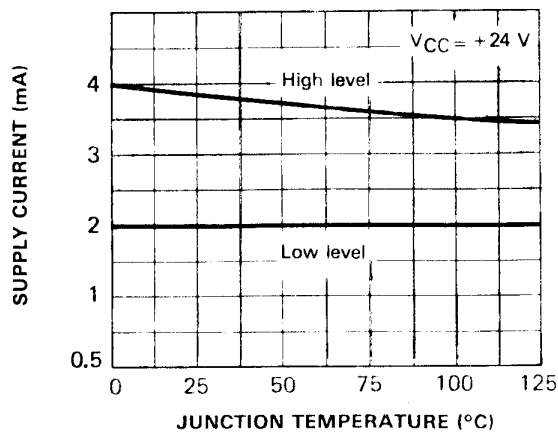


Figure 8: Safe Operating Area (non repetitive surge)

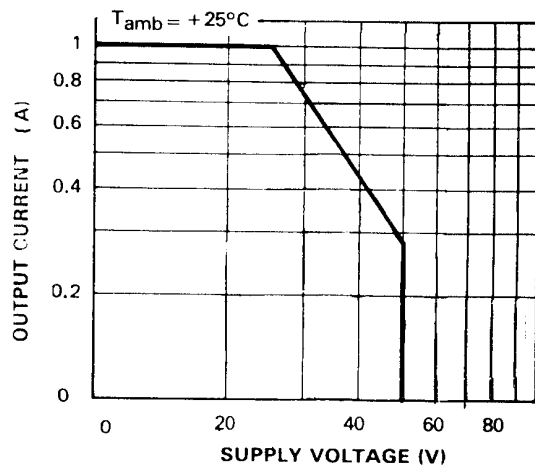
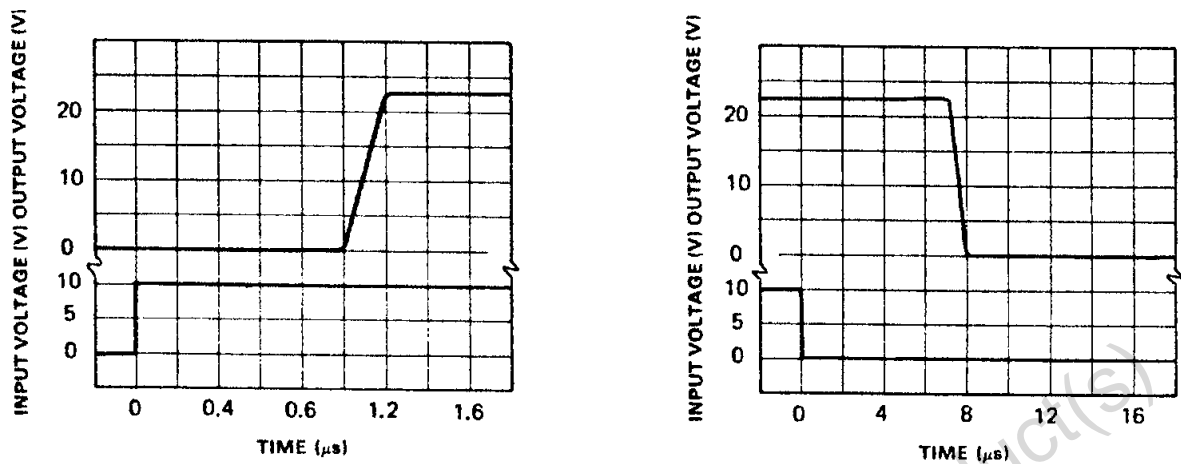


Figure 9: Response Time



TYPICAL APPLICATIONS

Figure 10: Base Circuit

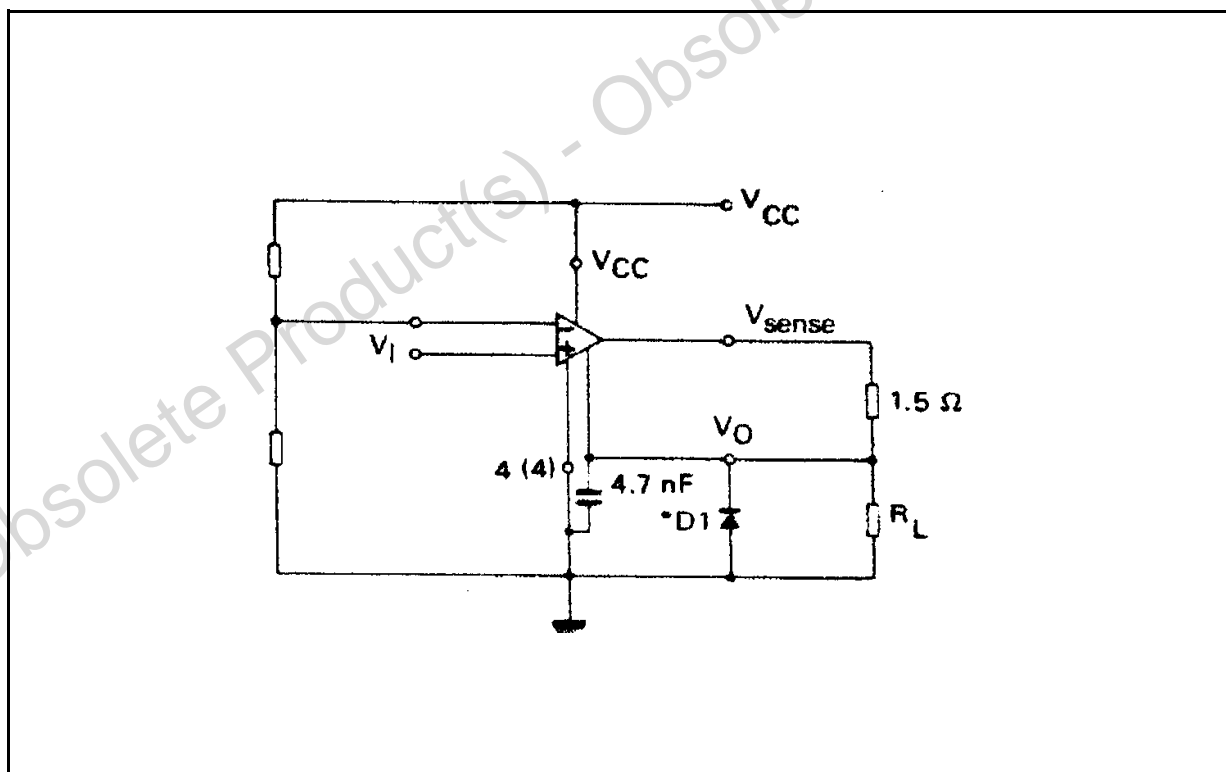


Figure 11: Output Current Extension (5A)

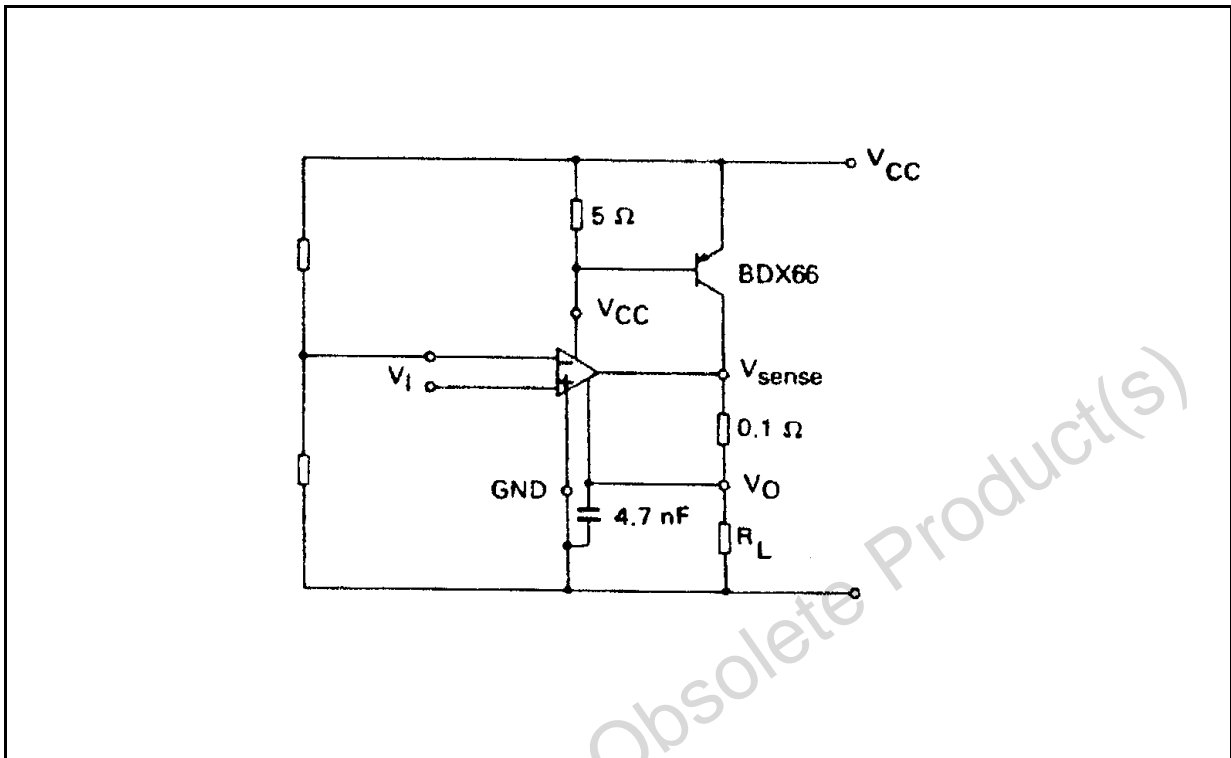


Figure 12: Driving Low Impedance Relays ($I_o = 300\text{mA}$)

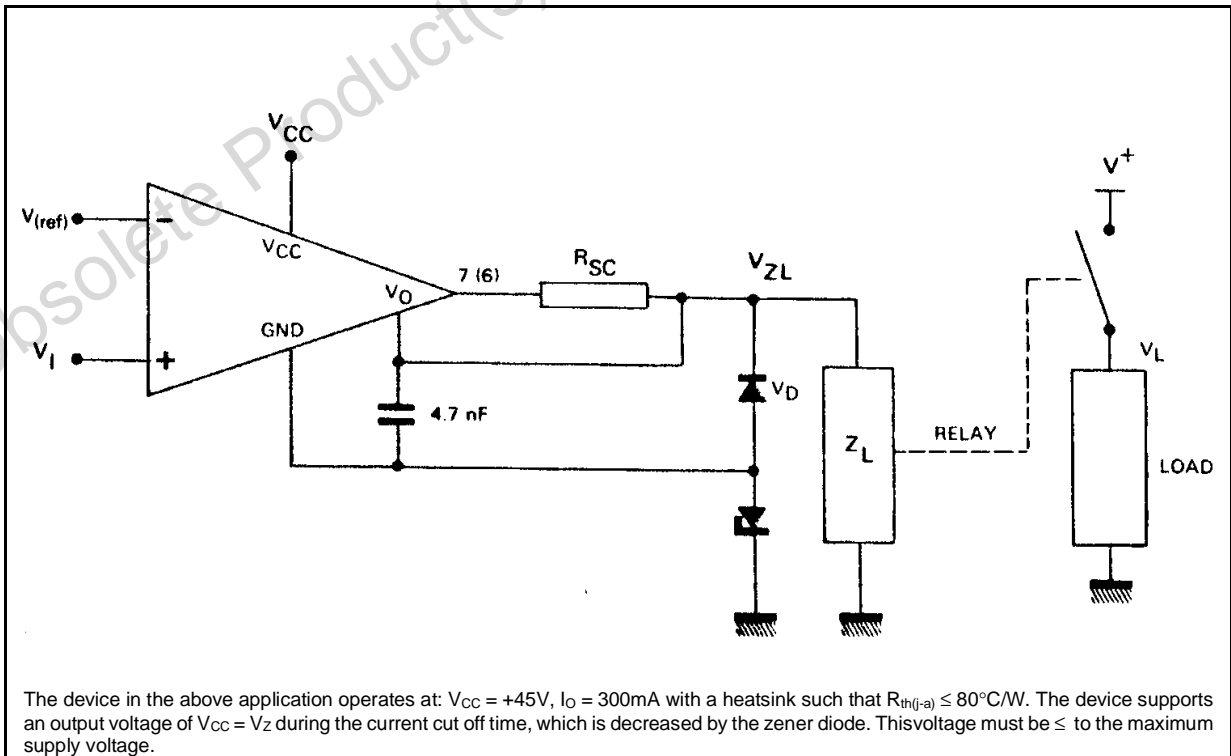
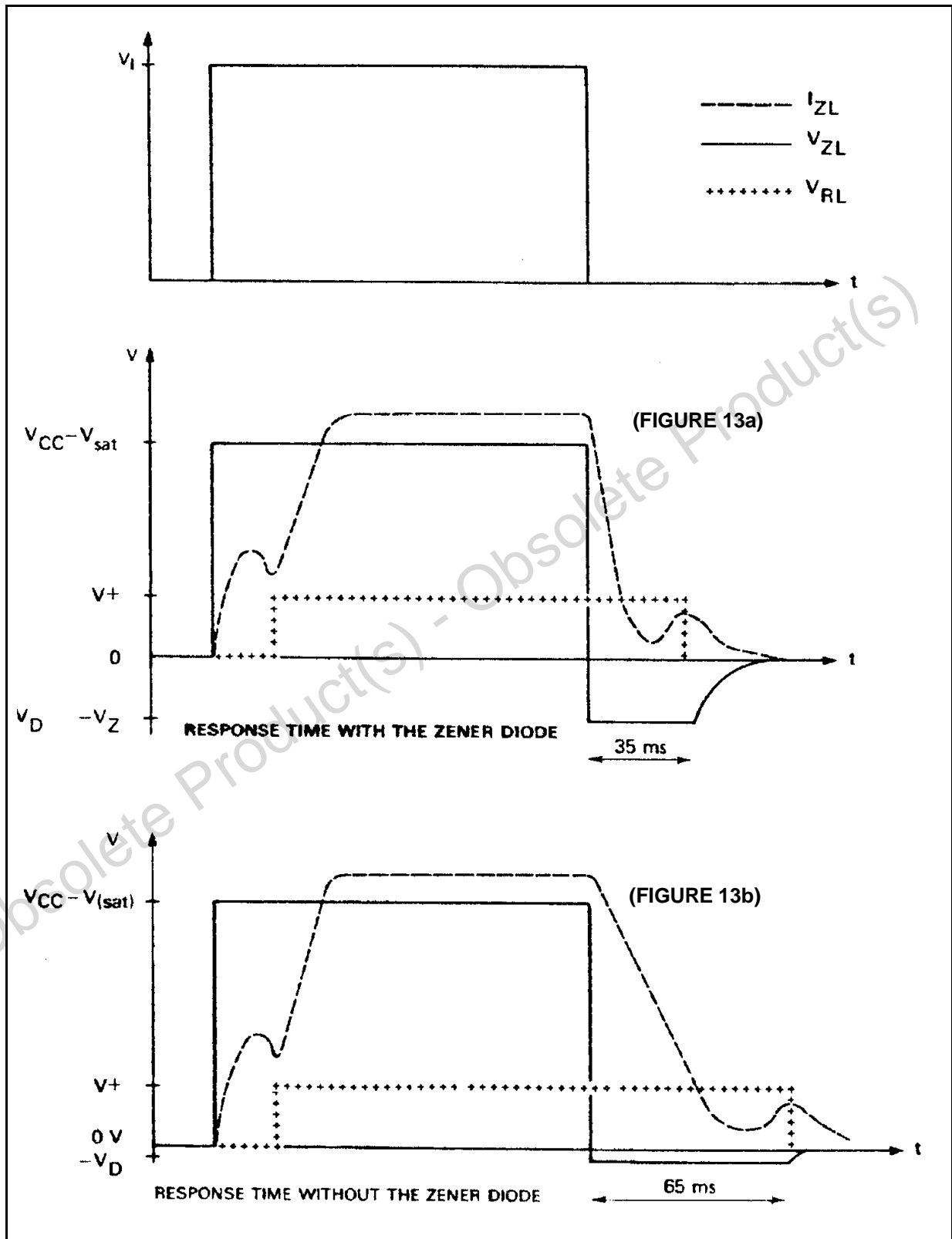
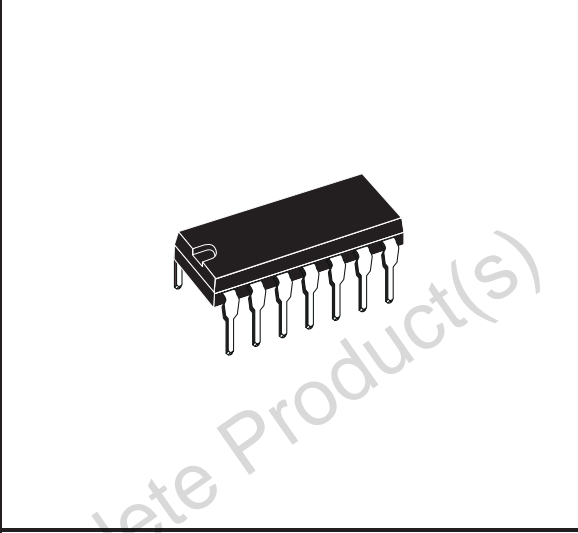


Figure 13: Waveforms

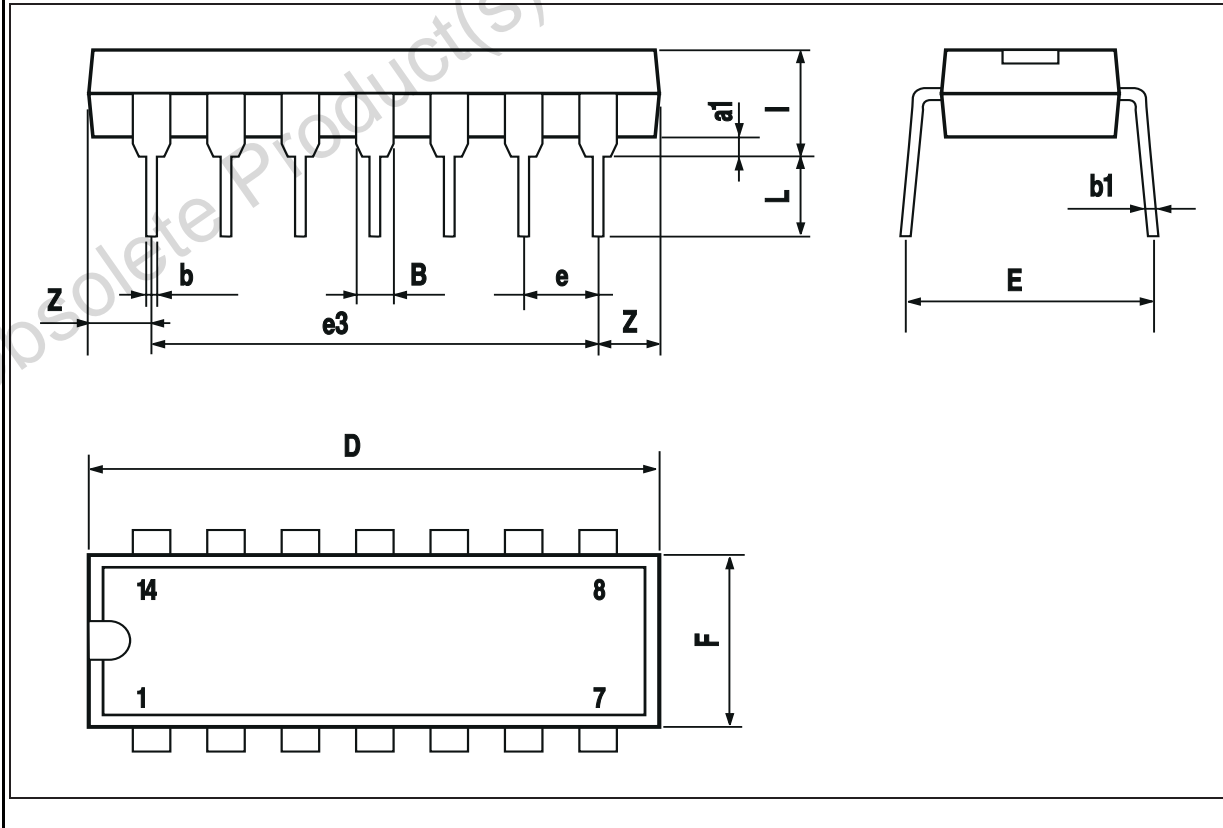


| DIM. | mm | | | inch | | |
|------|------|-------|------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| a1 | 0.51 | | | 0.020 | | |
| B | 1.39 | | 1.65 | 0.055 | | 0.065 |
| b | | 0.5 | | | 0.020 | |
| b1 | | 0.25 | | | 0.010 | |
| D | | | 20 | | | 0.787 |
| E | | 8.5 | | | 0.335 | |
| e | | 2.54 | | | 0.100 | |
| e3 | | 15.24 | | | 0.600 | |
| F | | | 7.1 | | | 0.280 |
| I | | | 5.1 | | | 0.201 |
| L | | 3.3 | | | 0.130 | |
| Z | 1.27 | | 2.54 | 0.050 | | 0.100 |

OUTLINE AND MECHANICAL DATA



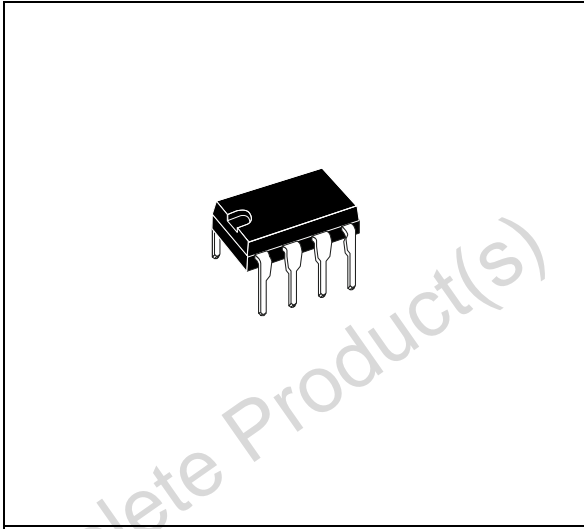
DIP14



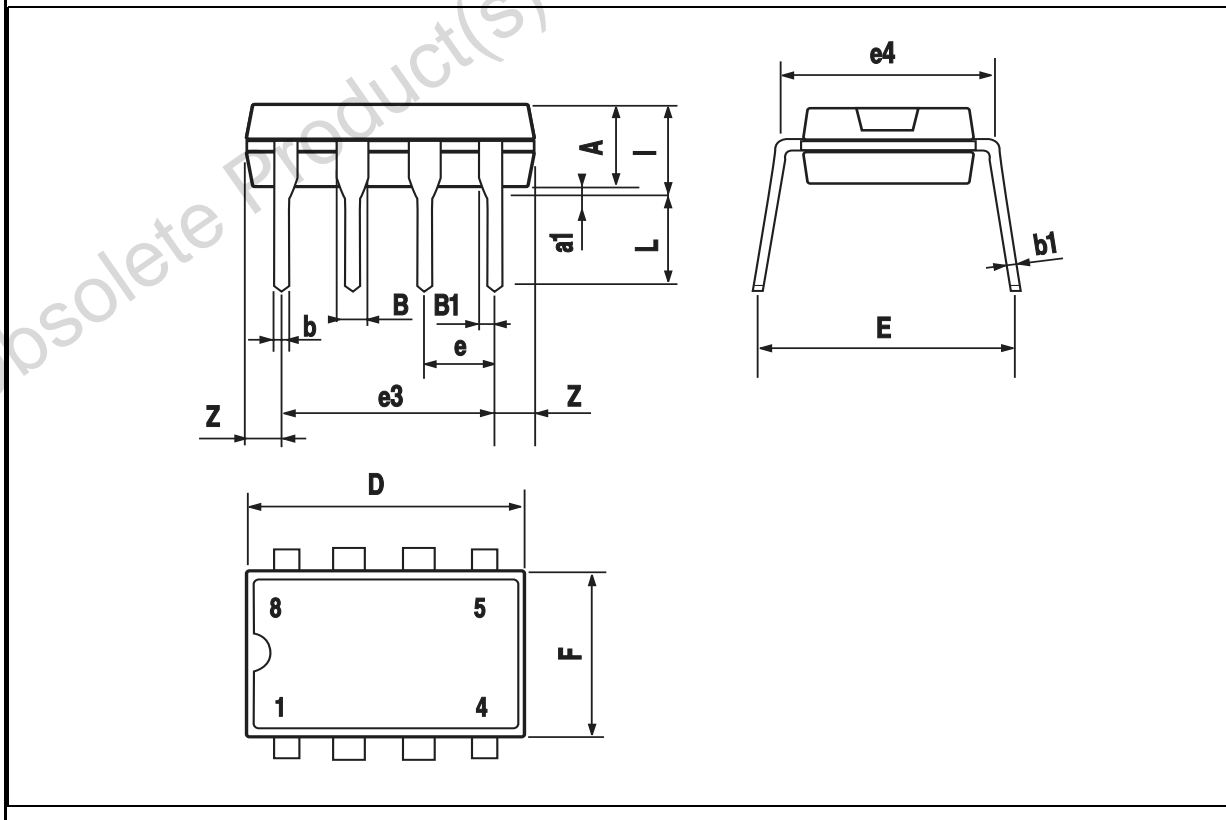
TDE1747 - TDF1747

| DIM. | mm | | | inch | | |
|------|-------|------|-------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | | 3.32 | | | 0.131 | |
| a1 | 0.51 | | | 0.020 | | |
| B | 1.15 | | 1.65 | 0.045 | | 0.065 |
| b | 0.356 | | 0.55 | 0.014 | | 0.022 |
| b1 | 0.204 | | 0.304 | 0.008 | | 0.012 |
| D | | | 10.92 | | | 0.430 |
| E | 7.95 | | 9.75 | 0.313 | | 0.384 |
| e | | 2.54 | | | 0.100 | |
| e3 | | 7.62 | | | 0.300 | |
| e4 | | 7.62 | | | 0.300 | |
| F | | | 6.6 | | | 0.260 |
| I | | | 5.08 | | | 0.200 |
| L | 3.18 | | 3.81 | 0.125 | | 0.150 |
| Z | | | 1.52 | | | 0.060 |

OUTLINE AND MECHANICAL DATA



Minidip



Obsolete Product(s) - Obsolete Product(s)

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