

TRUNK INTERFACE

- ON CHIP POLARITY GUARD
- MEETS DC LINE CHARACTERISTICS OF EITHER CCITT AND EIA RS 464 SPECS
- PULSE FUNCTION
- HIGH AC IMPEDANCE
- OFF HOOK-STATUS DETECTION OUTPUT
- LOW EXTERNAL COMPONENT COUNT

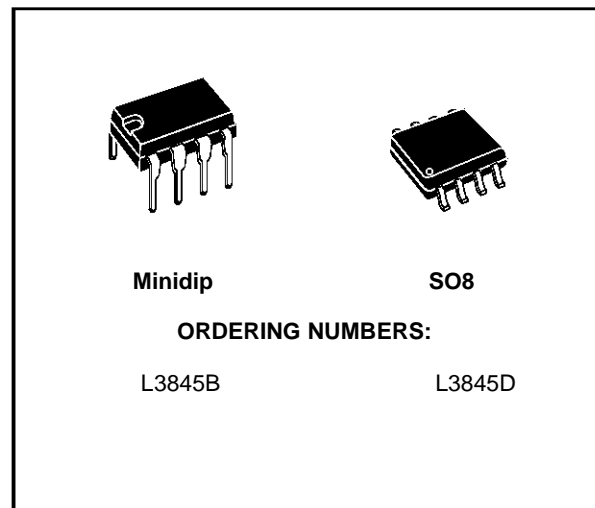
DESCRIPTION

The circuit provides DC loop termination for analog trunk lines.

The V-I characteristics is equivalent to a fixed voltage drop (zener like characteristic) in series with an external resistance that determines the slope of the DC characteristic.

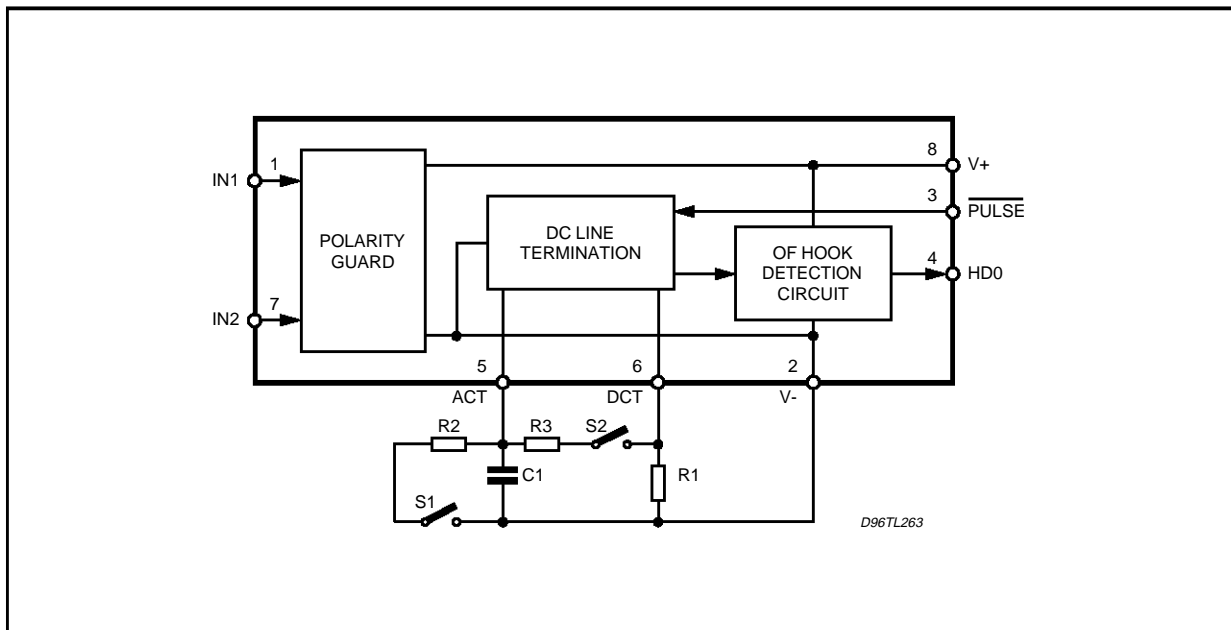
An external low voltage electrolytic capacitor causes the circuit to exhibit a very high impedance to all AC signal above a minimum frequency that is determined by the capacitor itself and by a 20 K nominal resistor integrated on the chip.

The Off-Hook status is detected all the time a typical of 8 mA is flowing into the circuit. In this condition a constant current generator is activated to



supply an external device (typically an optocoupler) without affecting the AC characteristic of the circuit.

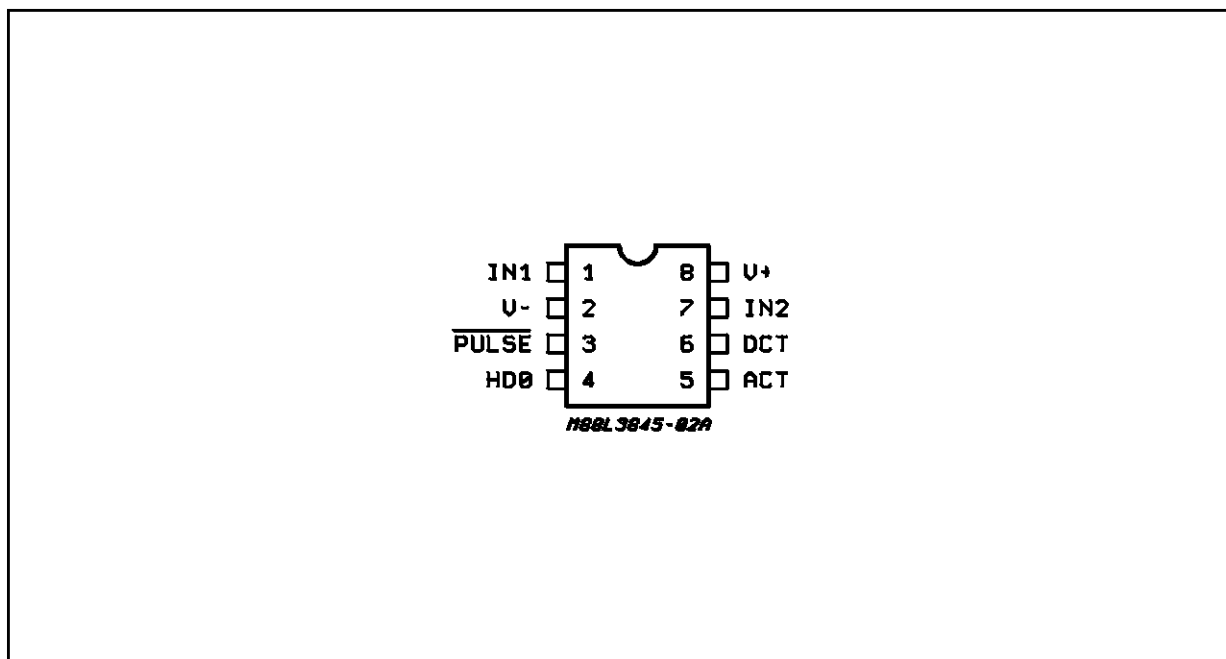
When Pulse Dialing is required the $\overline{\text{PULSE}}$ input (pin 3) connected to V- causes the device to reduce the fixed DC voltage drop and to exhibit a pure resistive impedance equal to the external resistor.

BLOCK DIAGRAM


ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|----------------|---|---------------|------------------|
| V_L | Max Line Voltage (pulse duration 10 ms max) | 20 | V |
| I_L | Max Line Current | 150 | mA |
| P_{tot} | Total Power Dissipation at $T_{amb} = 70\text{ }^\circ\text{C}$ | 800 | mW |
| T_{op} | Operating Temperature | - 40 to + 70 | $^\circ\text{C}$ |
| T_{srg}, T_j | Storage and Junction Temperature | - 55 to + 150 | $^\circ\text{C}$ |

PIN CONNECTION (Top view)



THERMAL DATA

| Symbol | Parameter | Minidip | SO8 | Unit |
|-----------------|---|---------|------------|---------------------------|
| $R_{th\ j-amb}$ | Thermal Resistance Junction-ambient (*) | Max. 80 | 140 to 180 | $^\circ\text{C}/\text{W}$ |

(*) Mounted on FR4 Boards

DC ELECTRICAL CHARACTERISTICS ($I_L = 10 \text{ mA}$ to 100 mA , $R_1 = 56 \Omega$, $S_1 = \text{Open}$, $T_{\text{amb}} = +25 \text{ }^\circ\text{C}$, unless otherwise specified)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|-----------|---|--|----------|------|-----------------|---------------|
| V_L | Line Voltage (normal mode) | PULSE = Open $I_L = 10 \text{ mA}$ $I_L = 20 \text{ mA}$ $I_L = 100 \text{ mA}$ | | | 5 6 12 | V V V |
| V_{LP} | Line Voltage (pulse mode) | PULSE = V^- $I_L = 20 \text{ mA}$ $I_L = 35 \text{ mA}$ $I_L = 80 \text{ mA}$ | | | 4 5.5 9.5 | V V V |
| I_{hn} | ON/OFF-Hook Line Current Detection Threshold | | 6.5 | | 9.5 | mA |
| I_{hf} | OFF/ON-Hook Line Current Detection Threshold | | 5 | | 9.2 | mA |
| I_{OUT} | OFF-Hook Output Drive Current at Pin HDO | $I_L = 10 \text{ mA}$ $I_L \geq 20 \text{ mA}$ | 1.5 2 | | | mA mA |
| V_{PM} | Pulse Input Low Voltage | | | | 0.8 | V |
| I_{PM} | Pull-up Input Current at Pin PULSE (pulse mode) | $I_L = 100 \text{ mA}$ Pulse = V^- | | | 20 | μA |
| I_{NM} | Input Current at Pin Pulse (normal mode) | | | | 3 | μA |

AC ELECTRICAL CHARACTERISTICS ($I_L = 10 \text{ mA}$ to 100 mA , $R_1 = 56 \Omega$, $R_2 = 470 \text{ K}\Omega$, $R_3 = 130 \text{ K}\Omega$, $T_{\text{amb}} = +25 \text{ }^\circ\text{C}$, unless otherwise specified)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|--------|------------------------------|---|------|------|------|------------------|
| Z_L | AC Line Impedance | $S_1 = \text{Open}$, $S_2 = \text{Open}$ $C_1 = 2.2 \text{ mF}$ $f = 1 \text{ KHz}$ | | 20 | | $\text{K}\Omega$ |
| | Sending/Receiving Distortion | $S_1 = \text{Open}$, $S_2 = \text{Open}$ $f = 1 \text{ KHz}$ $V_{AC-L} = 775 \text{ mVrms}$ $I_L = 15 \text{ to } 100 \text{ mA}$ | | | 2 | % |
| | Sending/Receiving Distortion | $S_1 = \text{Closed}$; $S_2 = \text{Open}$ $V_{AC-L} = 1.3 \text{ Vrms}$ | | 2 | | % |
| | Sending/Receiving Distortion | $S_1 = \text{Open}$; $S_2 = \text{Closed}$ $V_{AC-L} = 1.9 \text{ Vrms}$ | | 2(*) | | % |

(*) Not tested, guaranteed only by design.

APPLICATION INFORMATION

With the use of this circuit it is possible to terminate an analog trunk so that all the DC current component is flowing in the TRUNK TERMINATION CIRCUIT while the AC component is decoupled with a low voltage capacitor and can be used with a small and low cost audio coupler transformer to provide the AC balancing termination and two to four wire conversion.

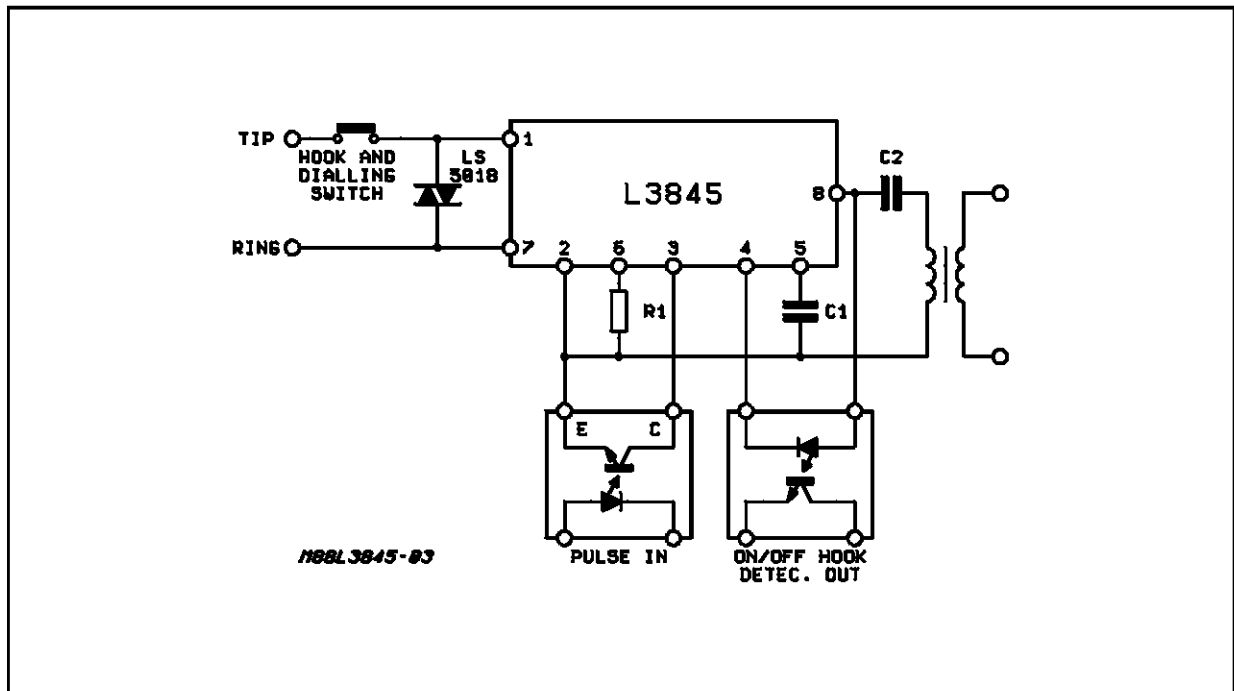
Therefore it is useful both for MODEM and PABX systems.

Figure 1 gives the typical application circuit ; it is worth to note that the TRUNK TERMINATION CIRCUIT, together with the LS5018 transient suppressor provides a compact and low cost module fully protected against lightning or overvoltages frequently present on telephone lines.

The PULSE input when connected to V^- allows the device to reduce the Line Voltage and to show a resistive impedance equal to R_1 to the line. When PULSE input is left open, this function is disable.

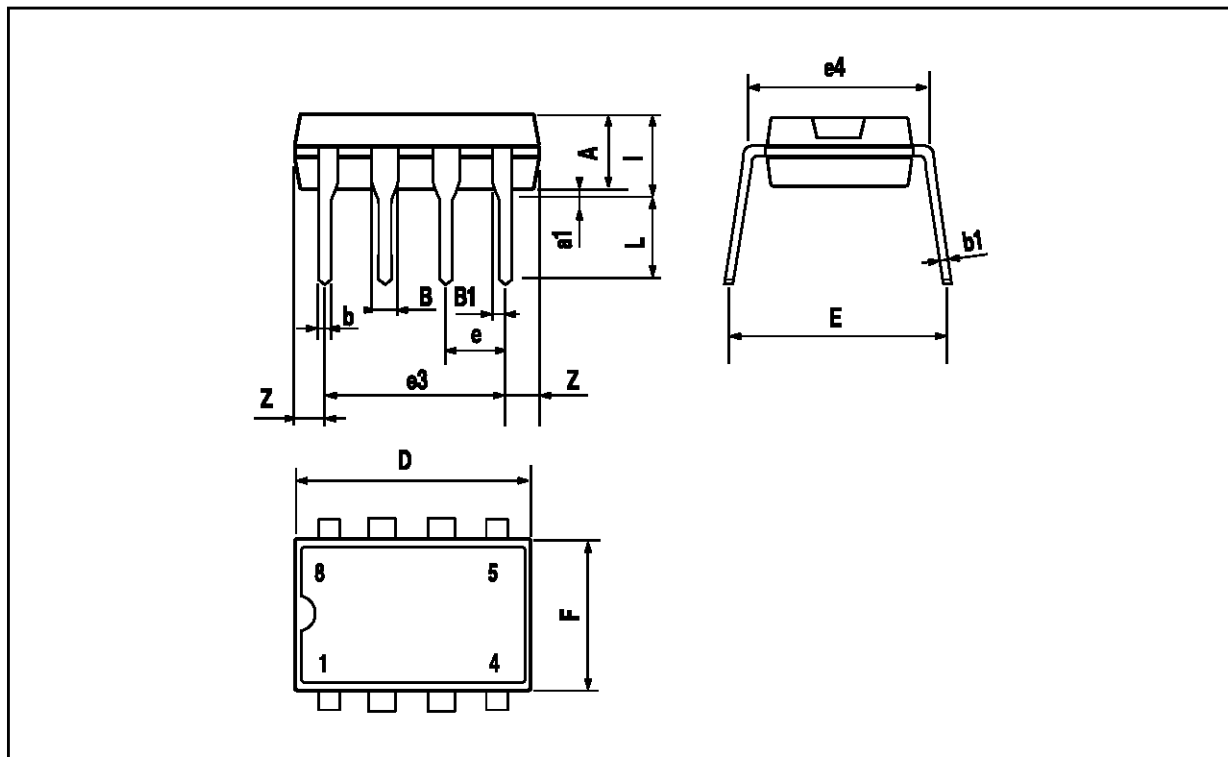
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Figure 1: Typical Application.



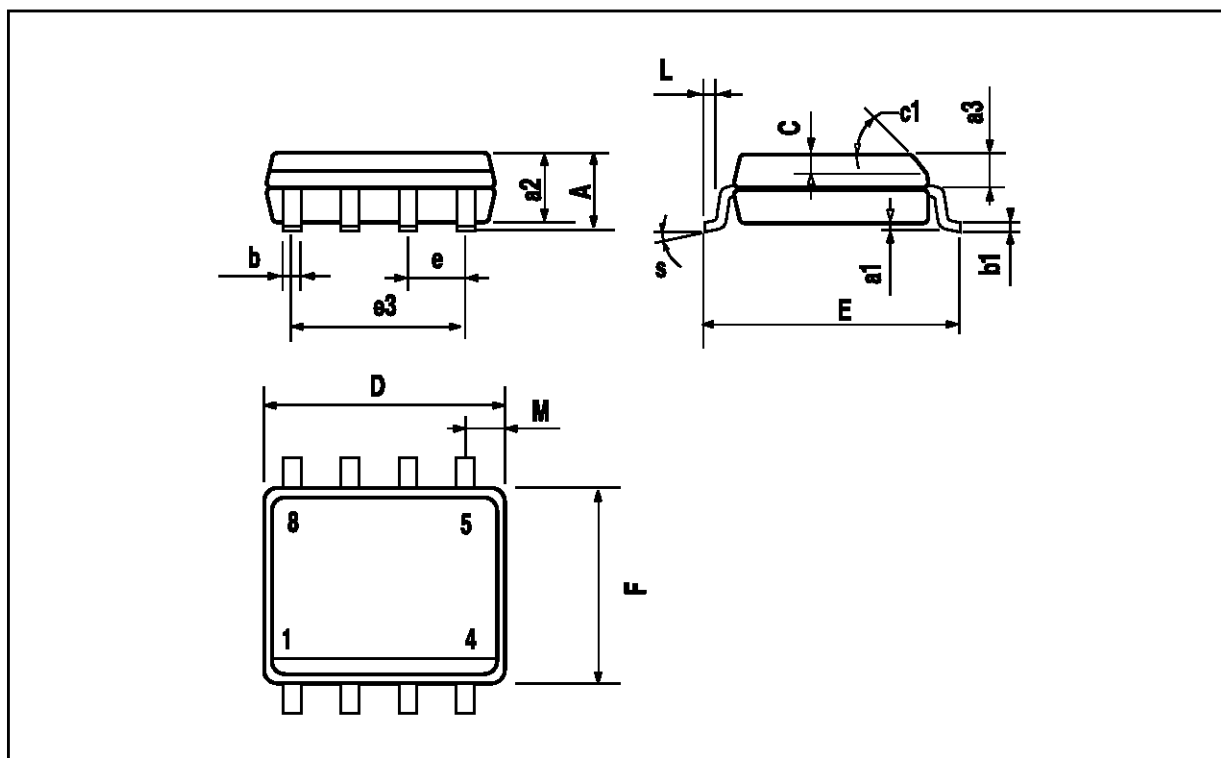
MINIDIP PACKAGE MECHANICAL DATA

| 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 |



SO8 PACKAGE MECHANICAL DATA

| DIM | mm | | | inch | | |
|-----|------------|------|------|-------|-------|-------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 1.75 | | | 0.069 |
| a1 | 0.1 | | 0.25 | 0.004 | | 0.010 |
| a2 | | | 1.65 | | | 0.065 |
| a3 | 0.65 | | 0.85 | 0.026 | | 0.033 |
| b | 0.35 | | 0.48 | 0.014 | | 0.019 |
| b1 | 0.19 | | 0.25 | 0.007 | | 0.010 |
| C | 0.25 | | 0.5 | 0.010 | | 0.020 |
| c1 | 45° (typ.) | | | | | |
| D | 4.8 | | 5.0 | 0.189 | | 0.197 |
| E | 5.8 | | 6.2 | 0.228 | | 0.244 |
| e | | 1.27 | | | 0.050 | |
| e3 | | 3.81 | | | 0.150 | |
| F | 3.8 | | 4.0 | 0.150 | | 0.157 |
| L | 0.4 | | 1.27 | 0.016 | | 0.050 |
| M | | | 0.6 | | | 0.024 |
| S | 8° (max.) | | | | | |



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