



# L3845

## 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

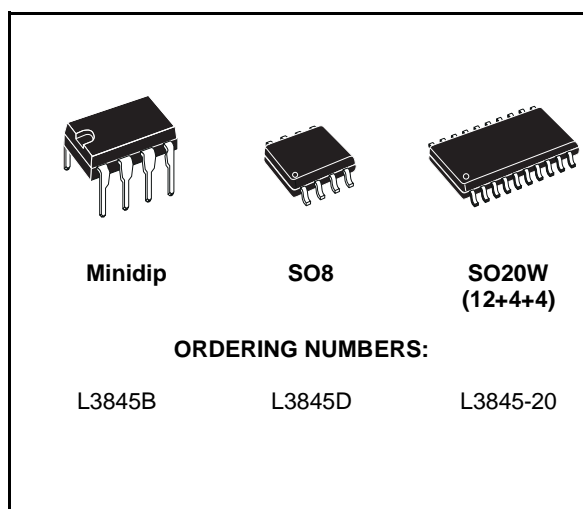
### DESCRIPTION

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.

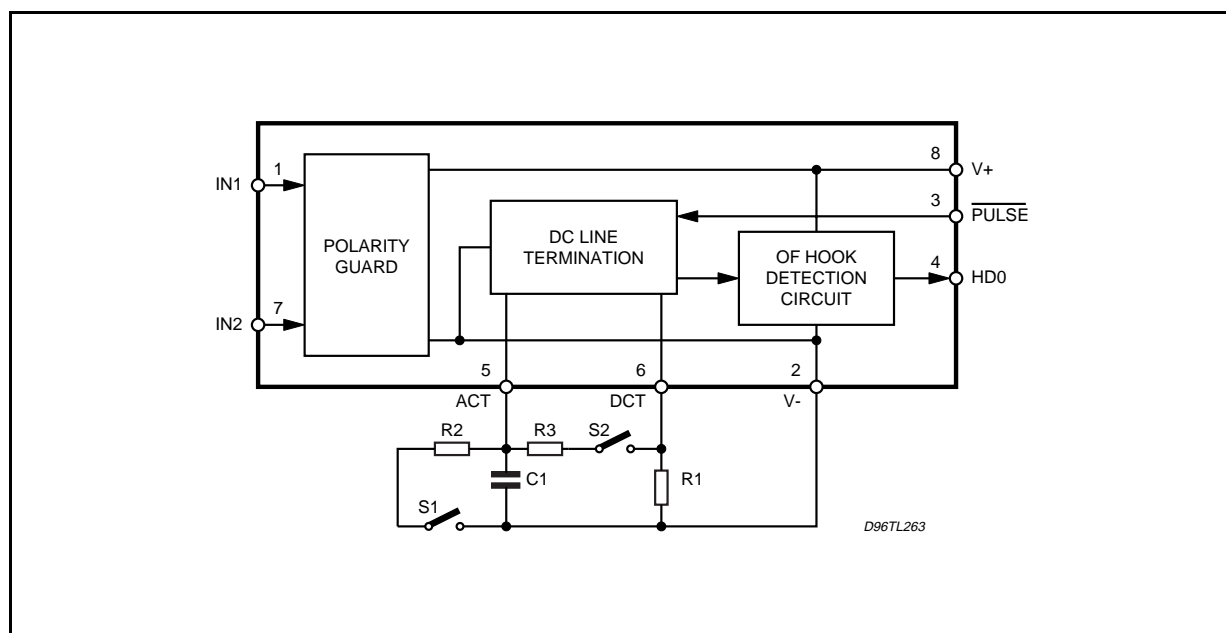
The Off-Hook status is detected all the time a typical of 8 mA is flowing into the circuit. In this condition a constant current generator is activated to



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.

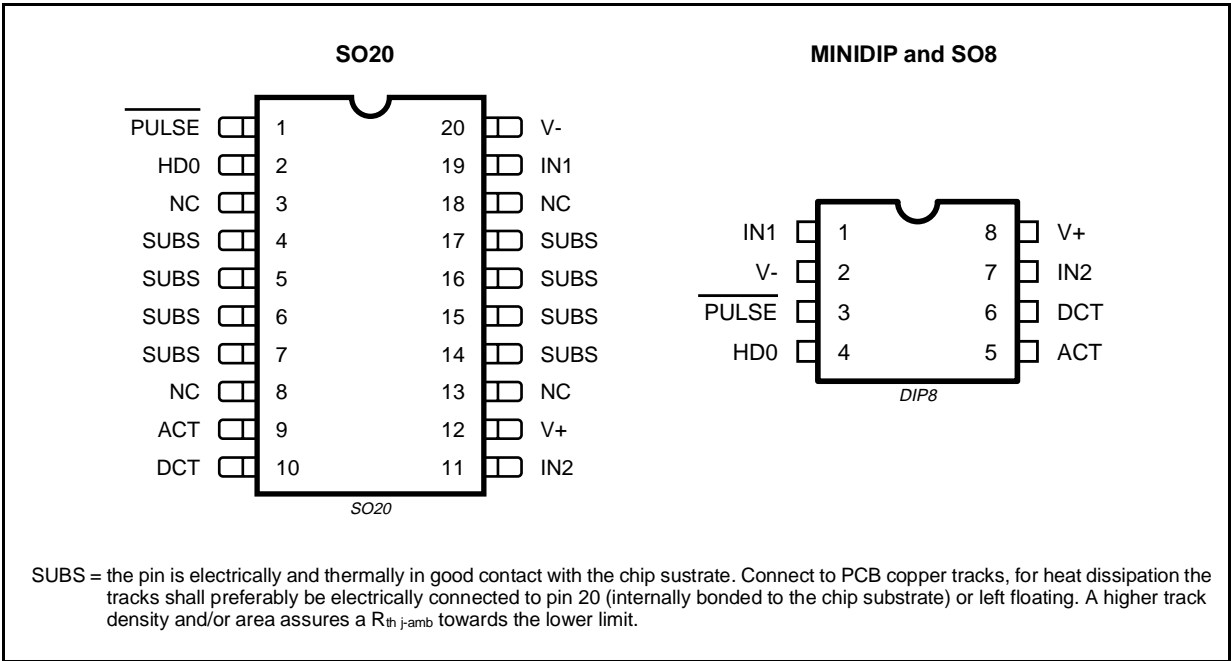
### BLOCK DIAGRAM



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	SO20	Unit
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient (*) Max.	80	140 to 180	50 to 70	$^{\circ}\text{C}/\text{W}$

(\*) Mounted on FR4 Boards

**DC ELECTRICAL CHARACTERISTICS** ( $I_L = 10 \text{ mA}$  to  $100 \text{ mA}$ ,  $R_1 = 56 \Omega$ ,  $S_1 = \text{Open}$ ,  $T_{\text{amb}} = + 25 \text{ }^\circ\text{C}$ , 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 1.8			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	$\mu\text{A}$
$I_{NM}$	Input Current at Pin Pulse (normal mode)				3	$\mu\text{A}$

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

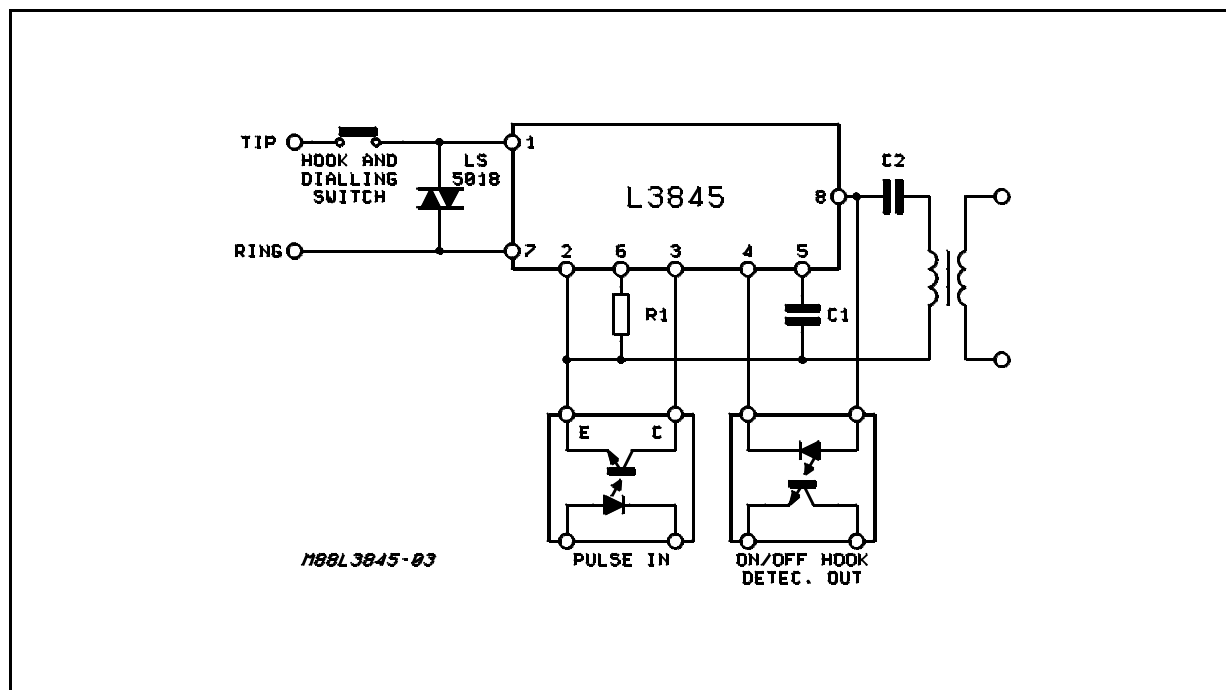
With the use of this circuit it is possible to terminate an analog trunk so that all the DC current component is flowing in the TRUNK TERMINATION CIRCUIT while the AC component is decoupled with a low voltage capacitor and can be used with a small and low cost audio coupler transformer to provide the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

Therefore it is usefull 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.

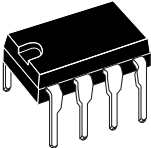
The PULSE input when connected to  $V^-$  allows the device to reduce the Line Voltage and to show a resistive impedance equal to  $R_1$  to the line. When PULSE input is left open, this function is disable.

Figure 1: Typical Application.

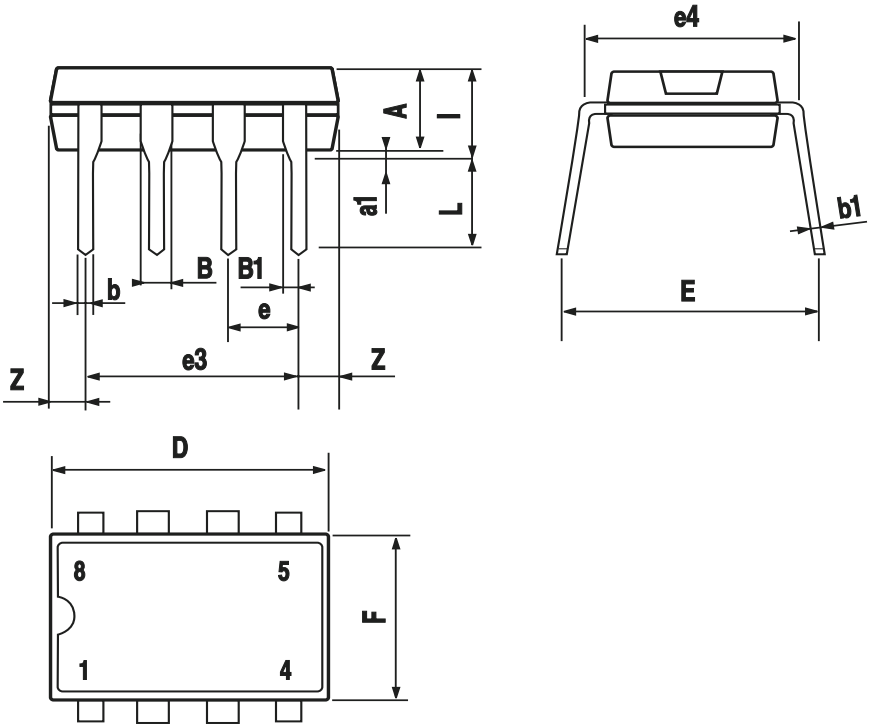


DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		3.32			0.131	
a1	0.51			0.020		
B	1.15		1.65	0.045		0.065
b	0.356		0.55	0.014		0.022
b1	0.204		0.304	0.008		0.012
D			10.92			0.430
E	7.95		9.75	0.313		0.384
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			6.6			0.260
I			5.08			0.200
L	3.18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

OUTLINE AND  
MECHANICAL DATA



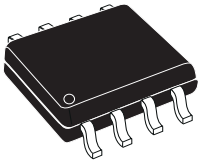
Minidip



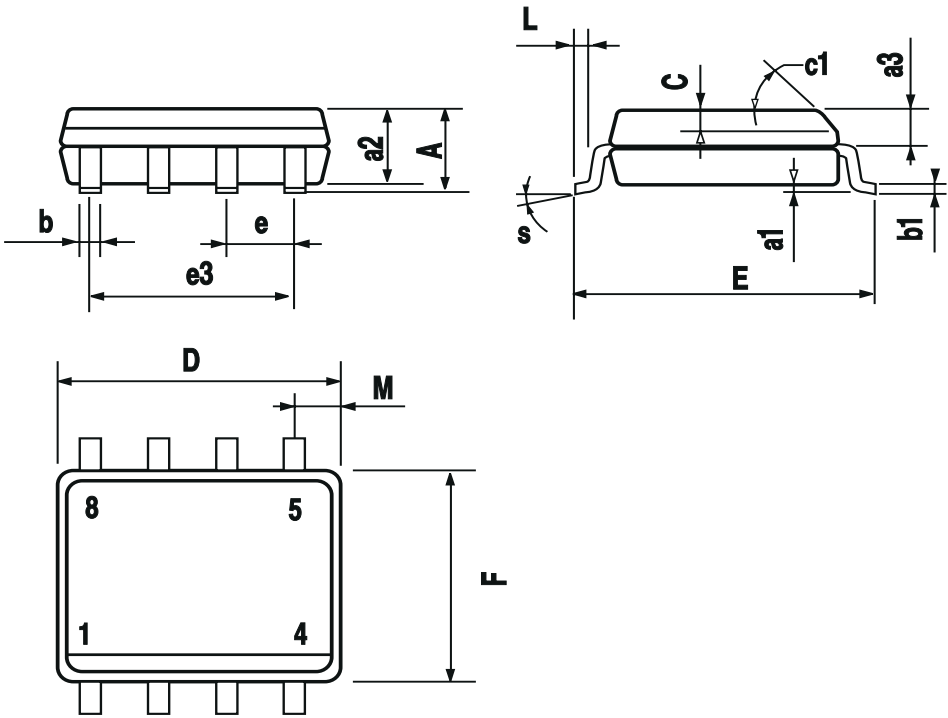
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.069
a1	0.1		0.25	0.004		0.010
a2			1.65			0.065
a3	0.65		0.85	0.026		0.033
b	0.35		0.48	0.014		0.019
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.020
c1	45° (typ.)					
D (1)	4.8		5.0	0.189		0.197
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F (1)	3.8		4.0	0.15		0.157
L	0.4		1.27	0.016		0.050
M			0.6			0.024
S	8° (max.)					

(1) D and F do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15mm (.006inch).

OUTLINE AND  
MECHANICAL DATA

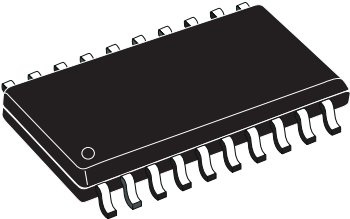


SO8

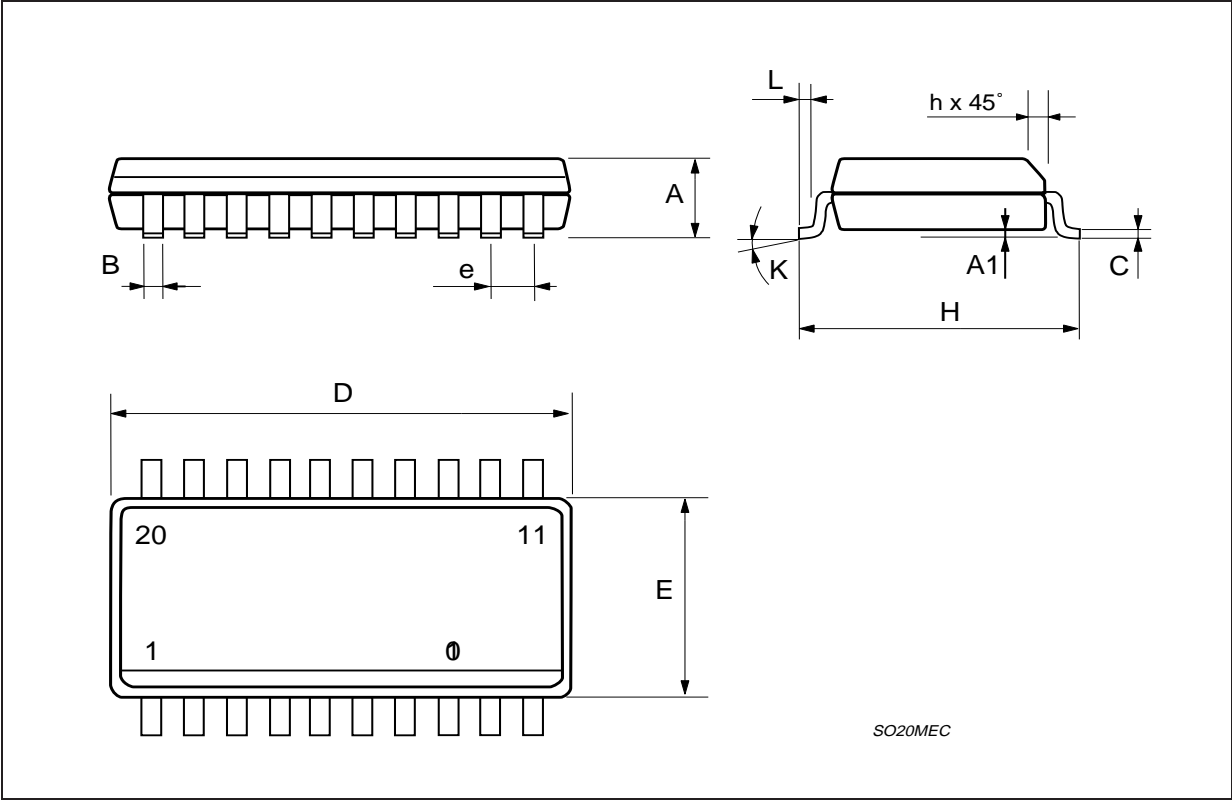


DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	2.35		2.65	0.093		0.104
A1	0.1		0.3	0.004		0.012
B	0.33		0.51	0.013		0.020
C	0.23		0.32	0.009		0.013
D	12.6		13	0.496		0.512
E	7.4		7.6	0.291		0.299
e		1.27			0.050	
H	10		10.65	0.394		0.419
h	0.25		0.75	0.010		0.030
L	0.4		1.27	0.016		0.050
K	0° (min.)8° (max.)					

OUTLINE AND MECHANICAL DATA



SO20



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