

## ZN5683E/J

### PCM LINE INTERFACE CIRCUIT

The ZN5683E/J is a PCM line interface circuit suitable for 2.048Mbit/s or 8.448Mbit/s PCM systems. It contains both transmit and receive channels in a single 18 pin dual in-line package. The incoming bipolar PCM signal, which has been attenuated and distorted by the cable is processed by the receiver to extract Data<sup>-</sup>, Data<sup>+</sup> and clock signals. These are then level shifted to TTL levels suitable for further digital processing.

In the transmit direction the TTL data input is used to drive a centre tapped transformer, which is used to interface with the transmission line.

#### FEATURES

- Operation up to 8.448Mbit/s in both Transmit and Receive Directions
- Supports Balanced and Unbalanced Receiver Inputs
- Single +5V Supply
- TTL Compatible
- Suitable for T1, T2, 2.048 and 8.448Mbit Systems
- 18 Pin Ceramic or Plastic DIL

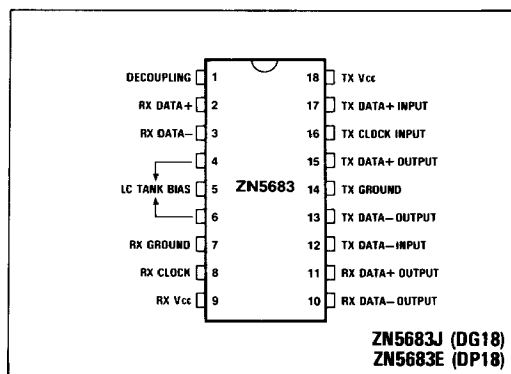


Fig. 1 Pin connections - top view

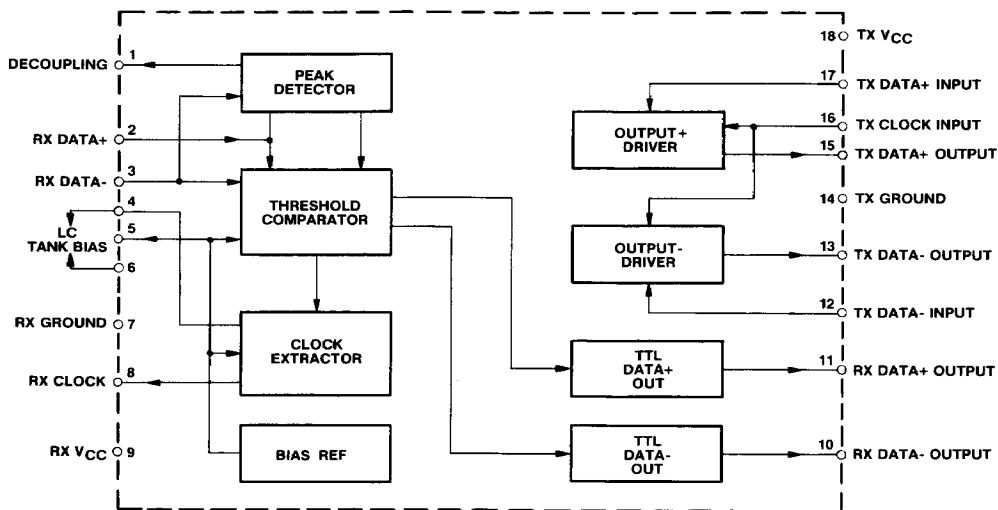


Fig. 2 Block diagram

**ELECTRICAL CHARACTERISTICS****Test conditions (unless otherwise stated):** $T_{amb} : -40^{\circ}\text{C to } +85^{\circ}\text{C}, V_{CC} +5\text{V} \pm 0.25\text{V}$ **DC CHARACTERISTICS**

Characteristic	Symbol	Pins	Value			Units	Conditions
			Min.	Typ.	Max.		
Supply current	$I_{CC}$			35.0	60.0	mA	Output drivers open
Low level input current - data	$I_{ILD}$	12, 17	-200		-50	$\mu\text{A}$	$V_{IN} = 0\text{V}$
Low level input current - clock	$I_{ILC}$	16	-400		-100	$\mu\text{A}$	$V_{IN} = 0\text{V}$
Low level output voltage - clock	$V_{OLC}$	8		0.4	0.8	V	$I_{CL} = 2\text{mA}$
High level output voltage - clock	$V_{OHC}$	8	3	3.6		V	
Low level output voltage - data	$V_{OLD}$	10, 11		0.4	0.8	V	$I_{CL} = 2\text{mA}$
High level output voltage - data	$V_{OHD}$	10, 11	3	3.6		V	
Low level output voltage - line driver	$V_{OLO}$	13, 15	0.6	0.8	0.9	V	See Note 3
High level output current - line driver	$I_{OHO}$	13, 15			100	$\mu\text{A}$	
Output driver current sink	$I_{OLO}$	13, 15			40	mA	
Input voltage		2, 3		3	3.3	V	See Note 4

**AC CHARACTERISTICS**

Characteristic	Symbol	Value			Units	Conditions
		Min.	Typ.	Max.		
Output driver rise time	$t_{ro}$		20	25	ns	See Note 5

**ABSOLUTE MAXIMUM RATINGS (See Note 1)**

Supply voltage, $V_{CC}$	+20V
Input voltage, $V_{IN}$ (See Note 2)	-0.3V to +20V
Current sink	40mA
Operating temperature range	-40°C to +85°C
Storage temperature range	-55°C to +125°C

**NOTES**

- The absolute maximum ratings are limiting values above which operating life may be shortened or specified parameters may be degraded.
- $V_{IN}$  = input voltage relative to pins 7, 14.
- Measured at pins 13, 15 with 300 Ohms pull up to 5.0V.
- Per CCITT G.703 pulse mask. See Fig.3.
- Measured at pins 13, 15 with 150 Ohms pull up to 5.0V.

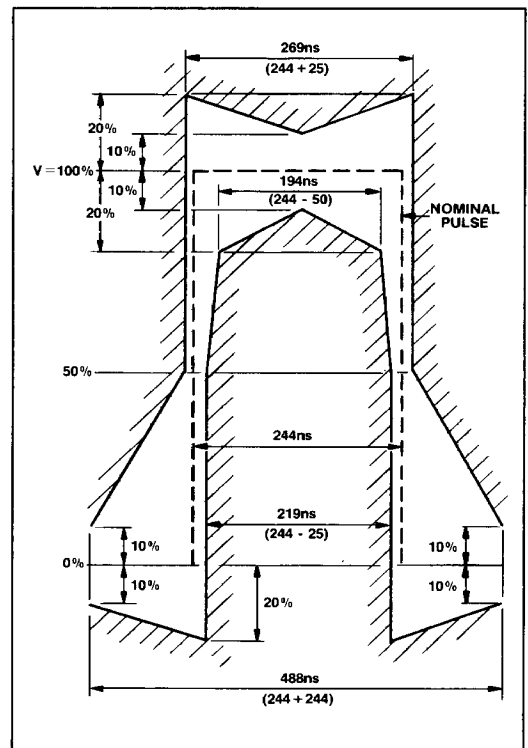


Fig.3 Input signal pulse mask

## PIN DESIGNATION

Pin No.	Name	Description
1	Decoupling	Pin for connection of an external decoupling capacitor to the peak detector circuit.
2	RX DATA +	Received data input from isolating transformer. A '1' on this pin represents a positive going HDB3 pulse.
3	RX DATA-	Received data input from isolating transformer. A '1' on this pin represents a negative going HDB3 pulse.
4, 5, 6	LC TANK BIAS	L and C components are connected to form a circuit which is tuned to optimise the extraction of the HDB3 signal.
7	RX GROUND	Ground pin for receiving circuitry.
8	RX CLOCK	Output for clock extracted from received data stream.
9	RX V <sub>cc</sub>	Positive supply pin for receive circuitry.
10	RX DATA- O/P	TTL compatible output for -ve pulses extracted from the transmission line.
11	RX DATA + O/P	TTL compatible output for +ve pulses extracted from the transmission line.
12	TX DATA- I/P	Data input for transmission as negative going pulses.
13	TX DATA- O/P	Data output to isolating transformer for -ve pulses.
14	TX GROUND	Ground pin for transmit circuitry.
15	TX DATA + O/P	Data output to isolating transformer for +ve pulses.
16	TX CLOCK I/P	Synchronising clock input for transmit circuitry.
17	TX DATA + I/P	Data input for transmission as positive going pulses.
18	TX V <sub>cc</sub>	Positive supply pin for transmit circuitry.

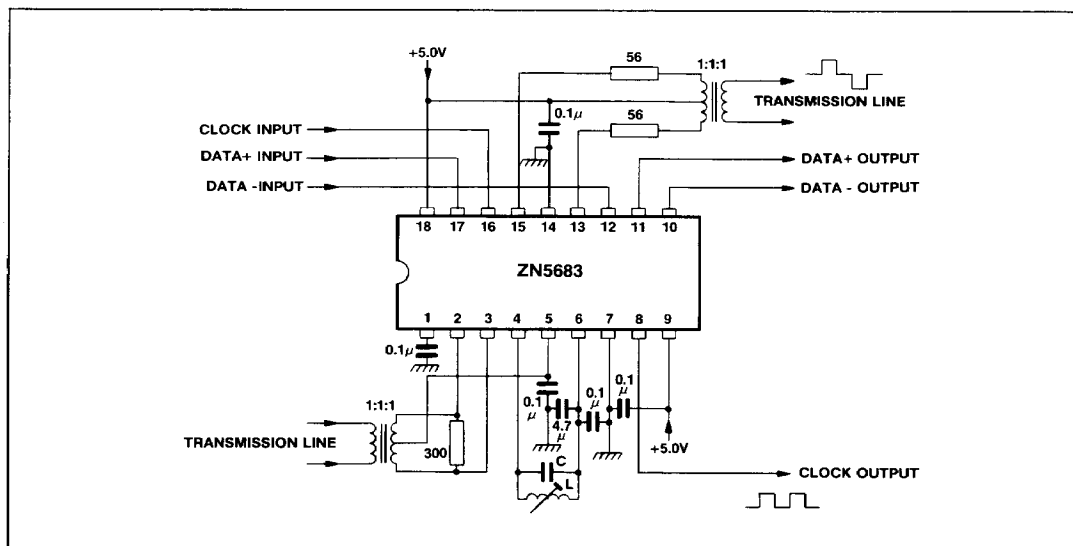


Fig 4 Recommended circuit