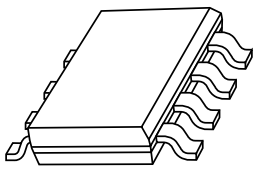
DATA SHEET



UZZ7000T
Trigger amplifier with two wire current interface

Preliminary specification

2000 Sep 05

Philips
Semiconductors

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Trigger amplifier with two wire current interface UZZ7000T

FEATURES

- Differential input trigger amplifier
- Designed for signal conditioning of magnetoresistive sensor bridges
- Two wire 7 and 14 mA current interface
- Stabilized voltage supply source for external sensor bridges
- Comparator with temperature controlled hysteresis
- Wide temperature range
- Max. 19 V supply.

PINNING

PIN	SYMBOL	DESCRIPTION
1	SA	positive differential input
2	n.c.	not connected
3	n.c.	not connected
4	VAC	current output and supply
5	GND	ground
6	n.c.	not connected
7	VP	bridge supply
8	SB	negative differential input

DESCRIPTION

The UZZ7000T is a differential input amplifier circuit with a trigger mechanism for application with magnetoresistive sensor bridges.

It is equipped with a two wire current interface. The polarity of an input voltage difference triggers the circuit supply current between 7 and 14 mA.

The device also includes a voltage regulator for supply to an external sensor bridge.

An on-chip temperature sensor adapts the comparator hysteresis to the temperature dependent sensitivity of typical magnetoresistive sensors, such as the Philips KMZ family types.

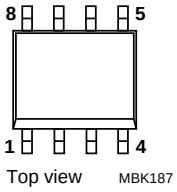


Fig.1 Simplified outline SOT96-1.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{VAC}	DC supply voltage	T_{amb} = –40 to +60 °C	5.5	12	19	V
		T_{amb} = –40 to +150 °C	–	–	15	V
$I_{VAC(L)}$	DC supply and output current	V_{VAC} = 12 V; V_{in} > 0; note 1	–	7	–	mA
$I_{VAC(H)}$	DC supply and output current	V_{VAC} = 12 V; V_{in} < 0; note 1	–	14	–	mA
V_{VP}	DC bridge supply voltage		–	4.9	–	V
I_{VP}	bridge supply current capability	V_{VP} > 4.7 V	–	–	–4.3	mA
T_{amb}	ambient operating temperature	V_{CC} = 12 V; note 2	–40	–	+150	°C

Notes

1. $V_{in} = V_{SA} - V_{SB}$.
2. Maximum power consumption according to power derating curve, see Fig.2.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{VAC}	DC supply voltage	not protected against incorrect polarity			
		T_{amb} = –40 to +60 °C	–0.5	+19	V
		T_{amb} = –40 to +150 °C	–	15	V
V_{SA}	maximum input voltage range	t ≤ 5 s; T_{amb} = 26 ± 10 °C	–0.5	7	V
V_{SB}	maximum input voltage range	t ≤ 5 s; T_{amb} = 26 ± 10 °C	–0.5	7	V
P_{tot}	total power dissipation	note 1	–	320	mW
T_{amb}	ambient operating temperature	V_{CC} = 12 V; note 1	–40	+150	°C
T_{stg}	storage temperature		–40	+150	°C

Note

1. Maximum power consumption according to power derating curve, see Fig.2.

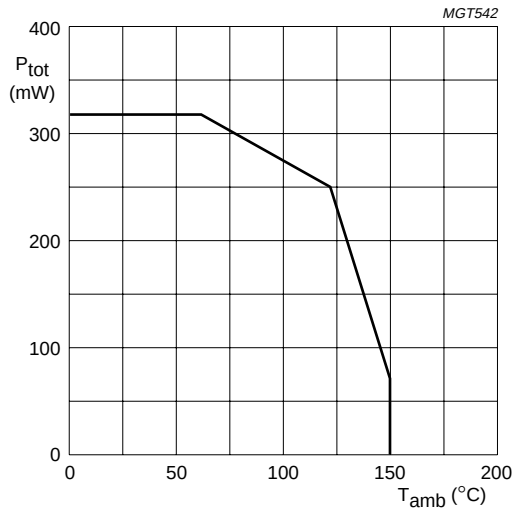


Fig.2 Power derating curve.

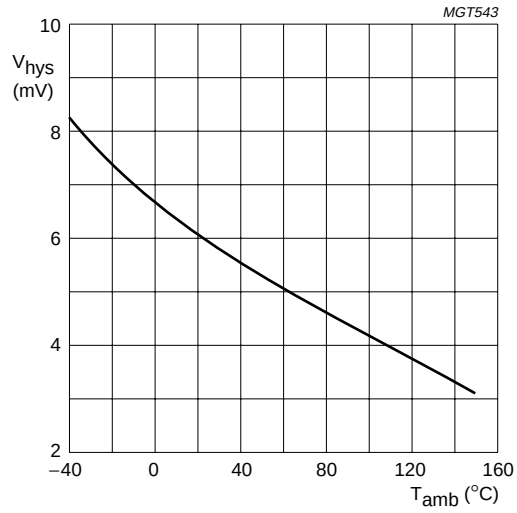


Fig.3 Hysteresis voltage as a function of temperature.

CHARACTERISTICS

T_{amb} = 26 °C; V_{VAC} = 12 V; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Supply conditions						
$I_{VAC(L)}$	DC supply current	$T_{amb} \pm 10$ °C	5.6	7	8.4	mA
$I_{VAC(H)}$	DC supply current	$T_{amb} \pm 10$ °C	11.2	14	16.8	mA
V_{VAC}	DC supply voltage	T_{amb} = –40 to +150 °C	5.5	12	15	V
Signal input characteristics						
f_{rm}	input frequency range		0	–	25000	Hz
V_{SA}	maximum input voltage range		–0.5	–	7	V
	operating input voltage range		2.4	–	2.6	V
V_{SB}	maximum input voltage range		–0.5	–	7	V
	operating input voltage range		2.4	–	2.6	V
V_{OFF}	input offset voltage	$T_{amb} \pm 10$ °C	–2.1	–	2.1	mV
I_{BIAS}	input bias current	$V_{SA} - V_{SB} = 0$	0.14	0.5	1.6	µA
I_{OFF}	input offset current	$V_{SA} - V_{SB} = 0$	–75	–	75	nA
V_{HYS}	input hysteresis voltage	at T_{amb}; notes 1 and 2	5.4	6	6.9	mV
Bridge supply output characteristics						
V_{VP}	DC bridge supply voltage		4.7	4.9	5	V
I_{VP}	DC bridge supply current		–	–	–4.3	mA
Environmental conditions						
	ESD protection of output pins VAC and GND	compliance to IEC 0801-2 (IV); note 3	2	–	–	kV
	ESD protection of sensor interface pins SA, SB and VP	compliance to IEC 0801-2 (IV); note 4	0.3	–	–	kV

Notes

1. Input hysteresis voltage is the difference between higher and lower switching point referred to input.
2. Temperature dependence of voltage hysteresis; see Fig.3.
3. Output pins are designed for electrostatic sensitivity with field strengths up to 2 kV according to Human Body Model (HBM), MIL-STD-883, method 3015.
4. Differential input pins are designed for electrostatic sensitivity with field strengths up to 0.3 kV according to Human Body Model (HBM), MIL-STD-883, method 3015.

FUNCTIONAL DESCRIPTION

The UZZ7000 is a differential input trigger amplifier with a two wire interface and sensor supply regulator. It is designed for application with magnetoresistive sensor bridges. The block diagram is shown in Fig.4

The circuitry includes a voltage regulator for supply to an external sensor bridge.

An on-chip temperature sensor adapts the comparator hysteresis to the temperature dependent sensitivity of a typical magnetoresistive sensor from the Philips MR-Sensor KMZ families.

The UZZ7000T device and the connected sensor bridge are supplied from a two wire current interface. The digital output is directly related to the differential voltage input between pins SA and SB which switches the constant current source between 7 and 14 mA.

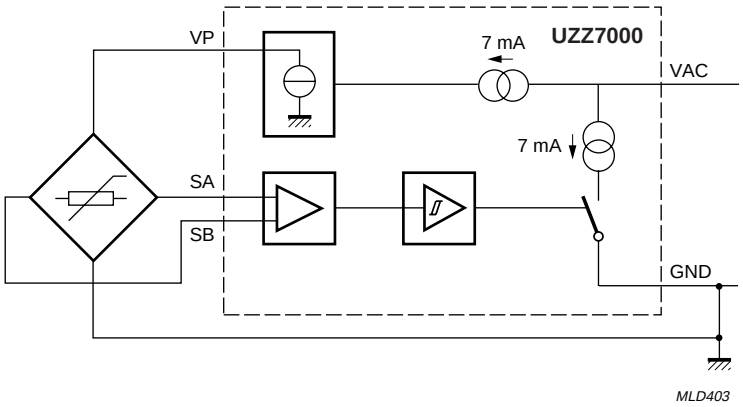
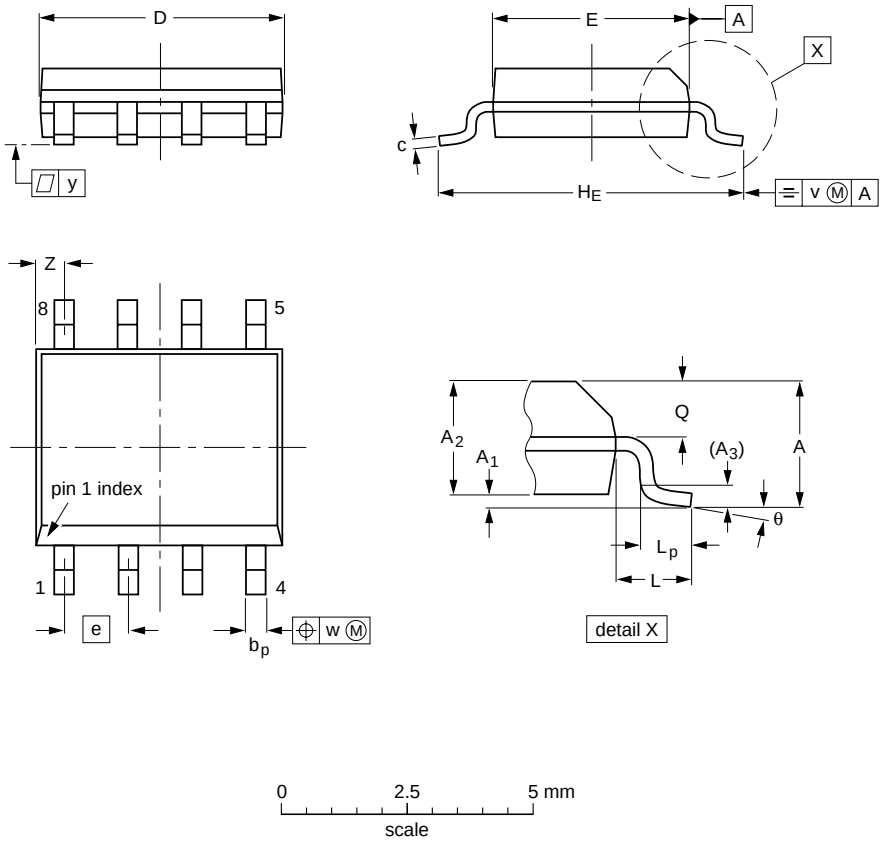


Fig.4 Block diagram.

PACKAGE OUTLINE

SO8: plastic small outline package; 8 leads; body width 3.9 mm **SOT96-1**



DIMENSIONS (inch dimensions are derived from the original mm dimensions)

UNIT	A max.	A_1	A_2	A_3	b_p	c	$D^{(1)}$	$E^{(2)}$	e	H_E	L	L_p	Q	v	w	y	$Z^{(1)}$	θ
mm	1.75	0.25 0.10	1.45 1.25	0.25	0.49 0.36	0.25 0.19	5.0 4.8	4.0 3.8	1.27	6.2 5.8	1.05	1.0 0.4	0.7 0.6	0.25	0.25	0.1	0.7 0.3	8^o 0^o
inches	0.069	0.010 0.004	0.057 0.049	0.01	0.019 0.014	0.0100 0.0075	0.20 0.19	0.16 0.15	0.050	0.244 0.228	0.041	0.039 0.016	0.028 0.024	0.01	0.01	0.004	0.028 0.012	

Notes

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.
2. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT96-1	076E03	MS-012				~~97-05-22~~ 99-12-27

DATA SHEET STATUS

DATA SHEET STATUS	PRODUCT STATUS	DEFINITIONS (1)
Objective specification	Development	This data sheet contains the design target or goal specifications for product development. Specification may change in any manner without notice.
Preliminary specification	Qualification	This data sheet contains preliminary data, and supplementary data will be published at a later date. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.
Product specification	Production	This data sheet contains final specifications. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.

Note

1. Please consult the most recently issued data sheet before initiating or completing a design.

DEFINITIONS

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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