INTEGRATED CIRCUITS



Product specification Supersedes data of 2000 May 19 2000 Sep 01



CBT6832E

FEATURES	PIN CONFIGURATION	1
 5 Ω typical r_{on} 		
• Pull-up on B port	1B1 1	56 1A
 Undershoot protection on A port only: -2.0 V 	2B1 2	55 1B2
Near zero propagation delay	2A 3	54 2B2
Controlled enable rate	3B1 4	53 3A
	4B1 5	52 382
 V_{CC} operating range: +4.5 V to +5.5 V 	4A 6	51 482
 > 100 MHz bandwidth (or clock rate) at 20 pF load capacitance 	5B1 7	50 5A
 56-pin TSSOP package 	6B1 8	49 582
 Bias voltage pre-charges the B output when the channel is 	6A 9	48 682
disabled	7B1 10	47 7A
 Latch-up protection exceeds 100 mA per JESD78 	8B1 11	
 ESD protection exceeds 2000 V HBM per JESD22-A114, 	OA 12 CND 13	43 062 44 CND
200 V MM per JESD22-A115 and 1000 V CDM per JESD22-C101	Vec 14	
	9B1 [15	42 94
APPLICATION	10B1 [16	41 9B2
Provides PCI hot-plugging	10A [17	40 10B2
······································	11B1 18	39 11A
	12B1 19	38 11B2
DESCRIPTION	12A 20	37 12B2
multiplexer/demultiplexer with precharged outputs and Schottky	13B1 21	36 13A
undershoot protection for live insertion. Advantages of the CBT6832	14B1 22	35 13B2
include a propagation delay of 250 ps, resulting from 5 Ω channel	14A 23	34] 14B2
1B and 2B, or to both. The switch is bi-directional.	15B1 24	33 15A
	16B1 25	32 15B2
	16A 26	31] 16B2
	V _{BIAS1} 27	30 V _{BIAS2}
	SEL1 28	29 SEL2
	-	SW00478

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS T _{amb} = 25°C; GND = 0 V	TYPICAL	UNIT
t _{PLH} t _{PHL}	Propagation delay An to Bn or Bn to An	C _L = 50 pF; V _{CC} = 5 V	.25	ns
C _{IN}	Input capacitance control pins	$V_{I} = 0 V \text{ or } V_{CC}$	4.5	pF
C _{OFF B}	B capacitance, switch off	Outputs disabled; $V_0 = 0 V$	8	pF
C _{OFF A}	A capacitance, switch off	Outputs disabled; $V_0 = 0 V$	13	pF
C _{ON 1}	One channel enabled capacitance	One B enabled; $V_0 = 0 V$	21	pF
C _{ON 2}	Both channels enabled capacitance	Both B channels enabled; $V_0 = 0 V$	34	pF

ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DWG NUMBER
56-Pin Plastic TSSOP Type II	0°C to +70°C	CBT6832E DGG	SOT364-1

CBT6832E

PIN DESCRIPTION

PIN NUMBER	SYMBOL	NAME AND FUNCTION
3, 6, 9, 12, 17, 20, 23, 26, 33, 36, 39, 42, 47, 50, 53, 56	1A1–16A1	Inputs
1, 2, 4, 5, 7, 8, 10, 11, 15, 16, 18, 19, 21, 22, 24, 25	1B1–16B1	Outputs
31, 32, 34, 35, 37, 38, 40, 41, 45, 46, 48, 49, 51, 52, 54, 55	1B2–16B2	Outputs
27, 30	V _{BIAS1} , V _{BIAS2}	Precharge bias voltage inputs
28, 29	SEL1, SEL2	Select-control inputs
13, 44	GND	Ground (0 V)
14, 43	V _{CC}	Positive supply voltage

FUNCTION TABLE

SEL1	SEL2	FUNCTION
L	Н	nA to nB1
Н	L	nA to nB2
L	L	nA to nB1 and nB2
Н	Н	nB1, nB2 = V _{BIAS}

LOGIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS^{1, 2}

SYMBOL	PARAMETER	CONDITIONS	RATING	UNIT
V _{CC}	DC supply voltage		–0.5 to +7.0	V
I _{IK}	DC input diode current	V ₁ < 0	-50	mA
VI	DC input voltage ³		-0.5 to +7.0	V
V _{OUT}	DC output voltage ³	output in Off or High state	-0.5 to +7.0	V
I _{OUT}	DC output current	output in Low state	120	mA
T _{stg}	Storage temperature range		–65 to +150	°C
ΘJA	Power dissipation		95	°C/W

NOTES:

1. Stresses beyond those listed may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

2. The performance capability of a high-performance integrated circuit in conjunction with its thermal environment can create junction temperatures which are detrimental to reliability. The maximum junction temperature of this integrated circuit should not exceed 150°C. 3. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

RECOMMENDED OPERATING CONDITIONS

SYMBOL	DADAMETED	LIM	LINUT	
	PARAMETER	MIN	MAX	
V _{CC}	DC supply voltage	4.5	5.5	V
V _{IH}	High-level input voltage	2.0		V
V _{IL}	Low-level Input voltage		0.8	V
Tamb	Operating free-air temperature range	0	+70	°C

CBT6832E

DC ELECTRICAL CHARACTERISTICS

Over operating temperature range $T_{amb} = 0^{\circ}C$ to +70°C; $V_{CC} = 5 V \pm 10\%$; $V_{BIAS} = 1.3 V$ to V_{CC} , unless otherwise specified.

SYMBOL	DADAMETED	TEST CONDITIONS	LIMITS			LINUT
	PARAMETER	TEST CONDITIONS	MIN	TYP ¹	MAX	UNIT
V _{IH}	Input HIGH voltage	Guaranteed logic HIGH level	2.0			V
V _{IL}	Input LOW voltage	Guaranteed logic LOW level	-0.5		0.8	V
IIH	Input HIGH current	V_{CC} = 5.5 V, V_{IN} = V_{CC}			±5	μA
Ι _{ΙL}	Input LOW current	V_{CC} = 5.5 V, V_{IN} = GND			±5	μΑ
I _{OZH}	High impedance output current				±1	μΑ
I _{OZL}	Low impedance output current		-0.2		-2	mA
V _{IK}	Input clamp voltage	$V_{CC} = 4.5 \text{ V}; I_{I} = -18 \text{ mA}$		-0.7	-1.8	V
	Switch on registeres ²	$V_{CC} = 4.5 \text{ V}; \text{ V}_{I} = 0 \text{ V}; \text{ I}_{I} = 48 \text{ mA}$		5	8	Ω
Ion	Switch on resistance-	$V_{CC} = 4.5 \text{ V}; \text{ V}_{I} = 2.4 \text{ V}; \text{ I}_{I} = -15 \text{ mA}$		10	15	Ω
Capacitanc	e ³ (T _{amb} = +25°C; f = 1 MHz)					
C _{IN}	Input capacitance	$V_{I} = 0 V$		4.5		pF
C _{OFF B}	B capacitance, switch off	$V_{I} = 0 V$		8		pF
C _{OFF A}	A capacitance, switch off	$V_{I} = 0 V$		13		pF
C _{ON 1}	Capacitance, switch on (one B)	$V_{I} = 0 V$		21		pF
C _{ON 2}	Capacitance, both B channels enabled V _I = 0 V			34		pF
Power supp	bly					
I _{CC}	Quiescent supply current enabled	$V_{CC} = 5.5 \text{ V}; \text{ V}_{I} = V_{CC} \text{ or GND}$			100	μΑ
ΔI _{CC}	Additional supply current per input pin ⁵	V_{CC} = 5.5 V, one input at 3.4 V, other inputs at V _{CC} or GND			2.5	mA

NOTES:

All typical values are at V_{CC} = 5 V, T_{amb} = +25°C ambient and maximum loading.
 Measured by the voltage drop between the A and the B terminals at the indicated current through the switch.

On-state resistance is determined by the lowest voltage of the two (A or B) terminals. These parameters are determined by device characterization, but is not production tested.

3.

4. Not more than one output should be shorted at one time. Duration of the test should not exceed one second.

5. Per TTL driven input ($V_I = 3.4$ V, control inputs only); A and B pins do not contribute to I_{CC} . 6. This current applies to the control inputs only and represent the current required to switch internal capacitance at the specified frequency. The A and B inputs generate no significant AC or DC currents as they transition. this parameter is not tested, but is guaranteed by design.

CBT6832E

AC CHARACTERISTICS

 V_{CC} = 5.0 V ±0.5 V; GND = 0 V; C_L = 50 pF, R_L = 500 Ω

SYMPOL	DADAMETED	TEST CONDITIONS	LIMITS			LINUT
STIVIDUL	PARAIVIETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t _{PLH} t _{PHL}	Propagation delay ¹ A to B	Waveform 1		0.25		ns
t _{PZH} t _{PZL}	Bus enable time SEL to A, B	Waveform 2	10 5		30 25	ns
t _{PHZ} t _{PLZ}	Bus disable time SEL to A, B	Waveform 2	0.5 0.5		6 7	ns

NOTE:

1. This parameter is warranted but not production tested. The propagation delay is based on the RC time constant of the typical on-state resistance of the switch and a load capacitance of 50 pF, when driven by an ideal voltage source (zero output impedance).

AC WAVEFORMS

 V_{M} = 1.5 V, V_{IN} = GND to 3.0 V



Waveform 1. Input (An) to Output (Bn) Propagation Delays



Waveform 2. 3-State Output Enable and Disable Times

TEST CIRCUIT AND WAVEFORMS

CBT6832E

CBT6832E

NOTES

CBT6832E

Data sheet status

Data sheet status	Product status	Definition ^[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.

[1] Please consult the most recently issued datasheet 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 134). 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.

Application information - Applications that are described herein for any of these products are for illustrative purposes only. Philips Semiconductors make no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Disclaimers

Life support — These products are not designed for use in life support appliances, devices or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips Semiconductors customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips Semiconductors for any damages resulting from such application.

Right to make changes — Philips Semiconductors reserves the right to make changes, without notice, in the products, including circuits, standard cells, and/or software, described or contained herein in order to improve design and/or performance. Philips Semiconductors assumes no responsibility or liability for the use of any of these products, conveys no license or title under any patent, copyright, or mask work right to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified.

Philips Semiconductors 811 East Arques Avenue P.O. Box 3409 Sunnyvale, California 94088-3409 Telephone 800-234-7381

© Copyright Philips Electronics North America Corporation 2000 All rights reserved. Printed in U.S.A.

Date of release: 09-00

Document order number:

9397 750 07485

Let's make things better.

