

DATA SHEET

GTL2020/GTL2021/GTL2022/GTL2023 32-bit GTL terminator with octal enables

Product specification
Supersedes data of 2000 Jan 14

2000 May 16

32-bit GTL terminator with octal enables

GTL2020/GTL2021/ GTL2022/GTL2023

FEATURES

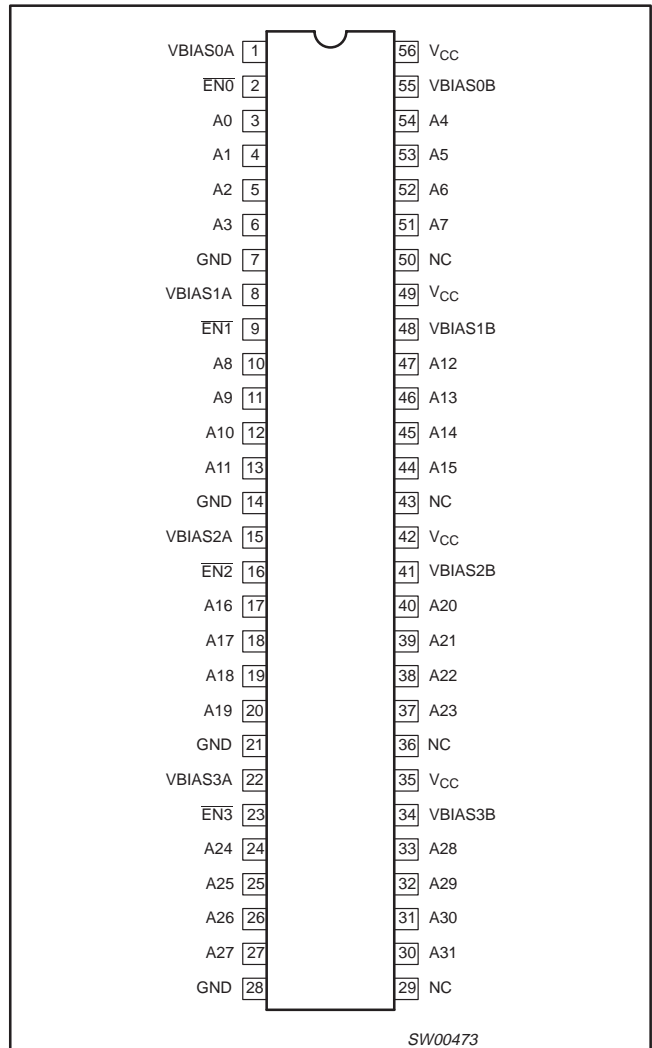
- GTL2020 r_{ON} is 56 Ω typical connected to 1.5 V V_{BIAS}
- GTL2021 r_{ON} is 75 Ω typical connected to 1.5 V V_{BIAS}
- GTL2022 r_{ON} is 100 Ω typical connected to 1.5 V V_{BIAS}
- GTL2023 r_{ON} is 150 Ω typical connected to 1.5 V V_{BIAS}
- Low power: 50 μ W
- Switching speed: 5 ns max.
- Channel on capacitance: 3 pF
- V_{CC} operating range: +5 V \pm 10%
- Latch-up protection passes Class II JESD78
- ESD protection exceeds 2000 V HBM per JESD22-A114, 200 V MM per JESD22-A115, and 1000 V CDM per JESD22-C101
- Available in TSSOP56 package

DESCRIPTION

The GTL202x series are 32-bit bus switches with GTL termination and octal output enables. The GTL202x is intended to provide GTL bus termination in multi-processor environments.

The enable pins allow the system control to disconnect the bus termination. When the bus switch is enabled, a 56, 75, 100 or 150 Ω series resistance is connected to the GTL Vbias.

PIN CONFIGURATION



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYPICAL	UNIT
		$T_{amb} = 25^{\circ}\text{C}; \text{GND} = 0\text{V}$		
$t_{PE/PD}$	Bus enable/disable	$C_L = 20 \text{ pF}, R_L = 500 \Omega$	2.5	nS
C_{ON}	Input capacitance switch on	$V_{IN} = 0 \text{ V}$	3	pF
C_{OFF}	Input capacitance switch off	$V_{IN} = 0 \text{ V}$	6	pF

ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DWG NUMBER
56-Pin Plastic TSSOP Type II	-40°C to +85°C	GTL2020 DGG	SOT364-1
56-Pin Plastic TSSOP Type II	-40°C to +85°C	GTL2021 DGG	SOT364-1
56-Pin Plastic TSSOP Type II	-40°C to +85°C	GTL2022 DGG	SOT364-1
56-Pin Plastic TSSOP Type II	-40°C to +85°C	GTL2023 DGG	SOT364-1

32-bit GTL terminator with octal enables

GTL2020/GTL2021/ GTL2022/GTL2023

LOGIC DIAGRAM

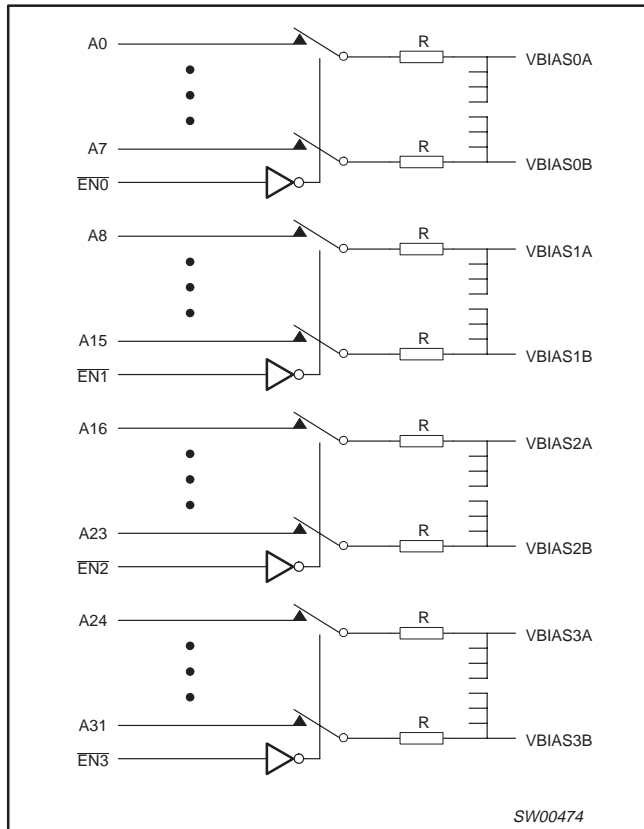


Figure 1.

FUNCTION TABLE

\overline{ENn}	SWITCH
L	ON
H	OFF

NOTES:

When enabled:

Ports Ax connect to V_{BIASnA}

Ports Ay connect to V_{BIASnB}

Where:

X = 0–3, 8–11, 16–19, 24–27

Y = 4–7, 12–15, 20–23, 28–31

ABSOLUTE MAXIMUM RATINGS¹

Above which the useful life may be impaired. For user guidelines, not tested.

SYMBOL	PARAMETER	CONDITIONS	RATING	UNIT
V_{CC}	Supply voltage to ground potentials	Inputs and V_{CC} only	-0.5 to +7.0	V
V_I	DC input voltage		-0.5 to +7.0	V
T_{stg}	Storage temperature range		-65 to +150	°C
T_{amb}	Ambient temperature range with power applied		-40 to +85	°C

NOTE:

- Stresses greater than those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods of time may affect reliability.

RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNIT
			MIN.	TYP. ¹	MAX.	
V_{IH}	TTL input HIGH voltage	Control Inputs	2.0	—	—	V
V_{IL}	TTL input LOW voltage	Control Inputs	—	—	0.8	V
V_{CC}	DC supply voltage		4.5	—	5.5	V
V_{IH}	High-level input voltage (control pin)		2.0	—	—	V
V_{IL}	Low-level input voltage (control pin)		—	—	0.8	V
V_{BIAS}	DC supply voltage		1.35	—	1.65	V
T_{amb}	Operating free-air temperature range		-40	—	+85	°C

32-bit GTL terminator with octal enables

GTL2020/GTL2021/ GTL2022/GTL2023

DC ELECTRICAL CHARACTERISTICS

$V_{CC} = 5\text{ V} \pm 5\%$; $T_{amb} = 0^\circ\text{C}$ to $+70^\circ\text{C}$

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNIT
			MIN.	TYP. ¹	MAX.	
I_I	Control inputs	$V_{CC} = 5.5\text{ V}$, $V_I = V_{CC}$ or GND	—	0.1	± 1	μA
	Switch inputs	$V_{CC} = 5.5\text{ V}$, $V_I = 1.65\text{ V}$, $V_{BIAS} = 0\text{ V}$	—	0.01	± 1	μA
V_{IK}	Input clamp voltage	$V_{CC} = 4.5\text{ V}$, $I_{IK} = -18\text{ mA}$	—	-0.85	-1.2	V
r_{ON}	GTL2020 switch on resistance	$V_{CC} = \text{MIN}$, $V_{IN} = 0\text{ V}$, $V_{BIAS} = 1.5\text{ V}$	48	56	64	Ω
	GTL2021 switch on resistance	$V_{CC} = \text{MIN}$, $V_{IN} = 0\text{ V}$, $V_{BIAS} = 1.5\text{ V}$	64	75	86	Ω
	GTL2022 switch on resistance	$V_{CC} = \text{MIN}$, $V_{IN} = 0\text{ V}$, $V_{BIAS} = 1.5\text{ V}$	85	100	115	Ω
	GTL2023 switch on resistance	$V_{CC} = \text{MIN}$, $V_{IN} = 0\text{ V}$, $V_{BIAS} = 1.5\text{ V}$	128	150	173	Ω
C_{IN}	Input capacitance ENx pins	$V_{IN} = 0\text{ V}$	—	5.6	—	pF
C_{ON}	Input capacitance, switch on	$V_{IN} = 0\text{ V}$	—	3	—	pF
C_{OFF}	Input capacitance, switch off	$V_{IN} = 0\text{ V}$	—	6	—	pF
I_{CC}	Power supply quiescent	$V_{BIAS} = 1.5\text{ V}$ OE = 0 V or V_{CC}	—	—	10	μA
ΔI_{CC}	Additional supply current per input pin ²	$V_{CC} = 4.5\text{ V}$ to 5.5 V ; one input at $V_{CC} - 3.0\text{ V}$, other inputs at V_{CC} or GND	—	0.1	0.5	mA

NOTES:

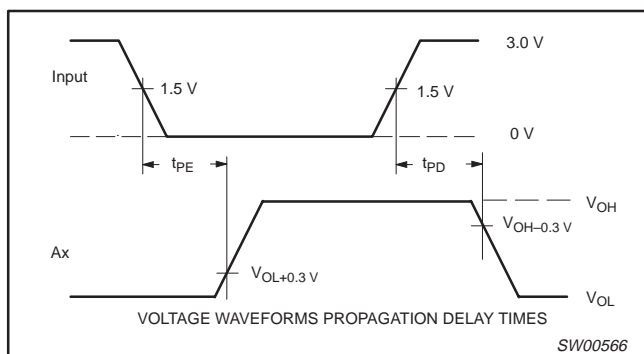
1. Typical values are shown at $V_{CC} = 5.0\text{ V}$, $+25^\circ\text{C}$ ambient and maximum loading.
2. This is the increase in supply current for each LVTTTL input at the specified voltage level other than V_{CC} or GND.

AC ELECTRICAL CHARACTERISTICS

$V_{CC} = 5\text{ V} \pm 10\%$; $T_{amb} = -40^\circ\text{C}$ to $+85^\circ\text{C}$; $t_r = t_f = 2.5\text{ ns}$

SYMBOL	PARAMETER		WAVEFORM	TEST CONDITIONS	LIMITS			UNIT
					MIN.	TYP.	MAX.	
t_{PE}	Bus enable	GTL2020	1	$C_L = 20\text{ pF}$, $R_L = 500\ \Omega$	1	—	3	ns
t_{PD}	Bus disable		1	$C_L = 20\text{ pF}$, $R_L = 500\ \Omega$	1	—	3	ns
t_{PE}	Bus enable	GTL2021	1	$C_L = 20\text{ pF}$, $R_L = 500\ \Omega$	1	—	3	ns
t_{PD}	Bus disable		1	$C_L = 20\text{ pF}$, $R_L = 500\ \Omega$	1	—	3	ns
t_{PE}	Bus enable	GTL2022	1	$C_L = 20\text{ pF}$, $R_L = 500\ \Omega$	1	—	3	ns
t_{PD}	Bus disable		1	$C_L = 20\text{ pF}$, $R_L = 500\ \Omega$	1	—	4	ns
t_{PE}	Bus enable	GTL2023	1	$C_L = 20\text{ pF}$, $R_L = 500\ \Omega$	1	—	5	ns
t_{PD}	Bus disable		1	$C_L = 20\text{ pF}$, $R_L = 500\ \Omega$	1	—	5	ns

AC WAVEFORMS



Waveform 1.

TEST CIRCUIT

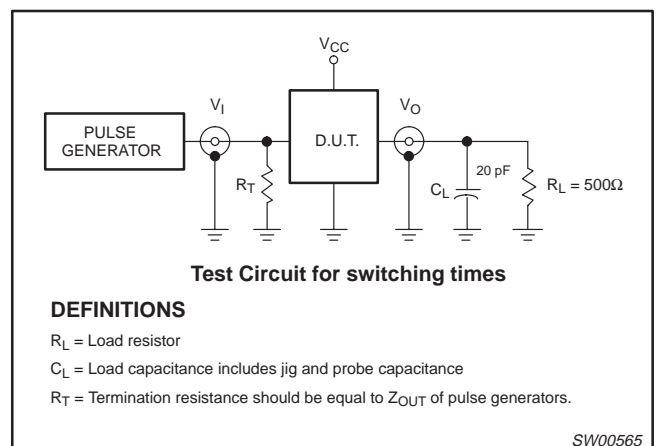


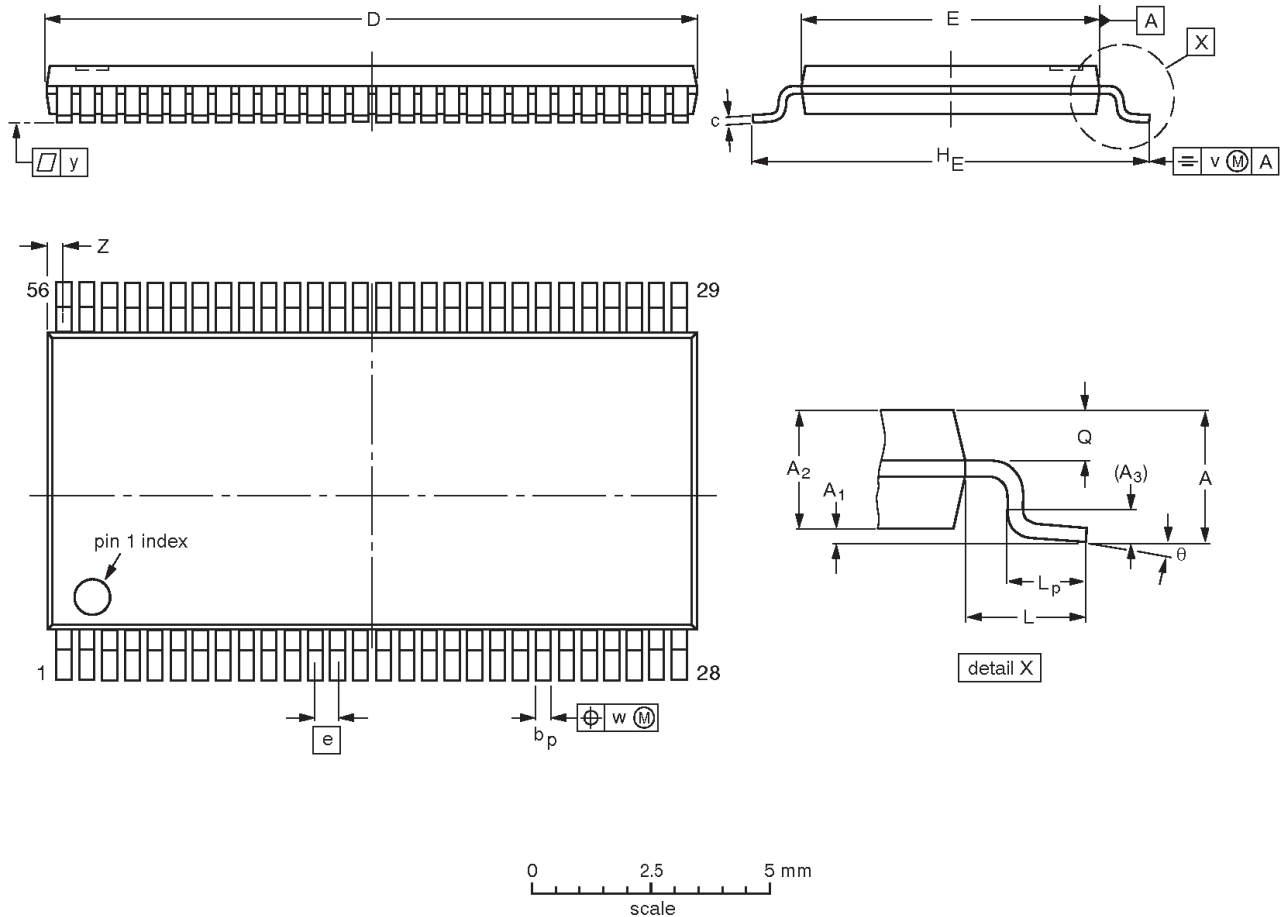
Figure 2.

32-bit GTL terminator with octal enables

GTL2020/GTL2021/
GTL2022/GTL2023

TSSOP56: plastic thin shrink small outline package; 56 leads; body width 6.1mm

SOT364-1



DIMENSIONS (mm are the original 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	θ
mm	1.2	0.15 0.05	1.05 0.85	0.25	0.28 0.17	0.2 0.1	14.1 13.9	6.2 6.0	0.5	8.3 7.9	1.0	0.8 0.4	0.50 0.35	0.25	0.08	0.1	0.5 0.1	8° 0°

Notes

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

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT364-1		MO-153EE				93-02-03 95-02-10

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GTL2020/GTL2021/
GTL2022/GTL2023

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.
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[1] Please consult the most recently issued datasheet before initiating or completing a design.

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

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Description

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Cross reference

Models

Packages

Application notes

Selection guides

Other technical documentation

End of Life information

Datahandbook system

Features

- GTL2020 r_{ON} is 56 Ohm typical connected to 1.5 V V_{BIAS}
- GTL2021 r_{ON} is 75 Ohm typical connected to 1.5 V V_{BIAS}
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- Low power: 50 μ W
- Switching speed: 5 ns max.
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- ESD protection exceeds 2000 V HBM per JESD22-A114, 200 V MM per JESD22-A115, and 1000 V CDM per JESD22-C101
- Available in TSSOP56 package

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Datasheet

Type nr.	Title	Publication release date	Datasheet status	Page count	File size (kB)	Datasheet
GTL2020; GTL2021; GTL2022; GTL2023	32-bit GTL terminator with octal enables	16-May-00	Product Specification	6	54	<input type="checkbox"/> Download

Products, packages, availability and ordering

Partnumber	North American Partnumber	Order code (12nc)	marking/packing	package	device status	buy online
GTL2020DGG		9352 667 07112	Standard Marking * Tube	SOT364	Full production	-
		9352 667 07118	Standard Marking * Reel Pack, SMD, 13"	SOT364	Full production	-
GTL2021DGG		9352 666 75112	Standard Marking * Tube	SOT364	Full production	-
		9352 666 75118	Standard Marking * Reel Pack, SMD, 13"	SOT364	Full production	-
GTL2022DGG		9352 671 54112	Standard Marking * Tube	SOT364	Full production	-
		9352 671 54118	Standard Marking * Reel Pack, SMD, 13"	SOT364	Full production	-
GTL2023DGG		9352 668 01112	Standard Marking * Tube	SOT364	Full production	-
		9352 668 01118	Standard Marking * Reel Pack, SMD, 13"	SOT364	Full production	-

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