HEF4894B-Q100

12-stage shift-and-store register LED driver

Rev. 2 — 23 November 2021 Product data sheet

1. General description

The HEF4894B-Q100 is a 12-stage serial shift register. It has a storage latch associated with each stage for strobing data from the serial input (D) to the parallel LED driver outputs (QP0 to QP11). Data is shifted on positive-going clock (CP) transitions. The data in each shift register stage is transferred to the storage register when the strobe (STR) input is HIGH. Data in the storage register appears at the output whenever the output enable (OE) input signal is HIGH.

Two serial outputs (QS1 and QS2) are available for cascading a number of HEF4894B-Q100 devices. Serial data is available at QS1 on positive-going clock edges to allow high-speed operation in cascaded systems with a fast clock rise time. The same serial data is available at QS2 on the next negative going clock edge. This is used for cascading HEF4894B-Q100 devices when the clock has a slow rise time.

It operates over a recommended V_{DD} power supply range of 3 V to 15 V referenced to V_{SS} (usually ground). Unused inputs must be connected to V_{DD}, V_{SS}, or another input.

This product has been qualified to the Automotive Electronics Council (AEC) standard Q100 (Grade 1) and is suitable for use in automotive applications.

2. Features and benefits

- Automotive product qualification in accordance with AEC-Q100 (Grade 1)
  - Specified from -40 °C to +85 °C and from -40 °C to +125 °C
- Wide supply voltage range from 3.0 V to 15.0 V
- CMOS low power dissipation
- High noise immunity
- Fully static operation
- 5 V, 10 V, and 15 V parametric ratings
- Standardized symmetrical output characteristics
- Complies with JEDEC standard JESD 13-B
- ESD protection:
  - MIL-STD-833, method 3015 exceeds 2000 V
  - HBM JESD22-A114F exceeds 2000 V
  - MM JESD22-A115-B exceeds 200 V (C = 200 pF, R = 0 Ω)

3. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
HEF4894BT-Q100	-40 °C to +125 °C	SO20	plastic small outline package; 20 leads; body width 7.5 mm	SOT163-1
HEF4894BTT-Q100	-40 °C to +125 °C	TSSOP20	plastic thin shrink small outline package; 20 leads; body width 4.4 mm	SOT360-1

nexperia

4. Functional diagram

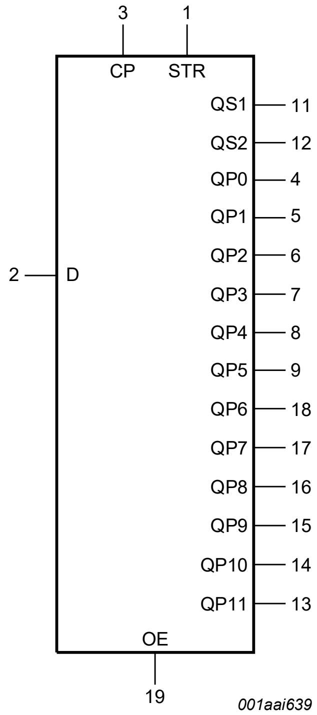


Fig. 1. Logic Symbol

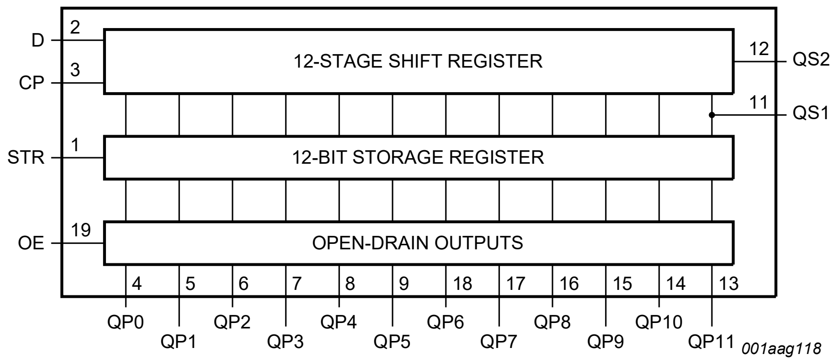


Fig. 2. Functional diagram

All information provided in this document is subject to legal disclaimers.
© Nexperia B.V. 2021. All rights reserved

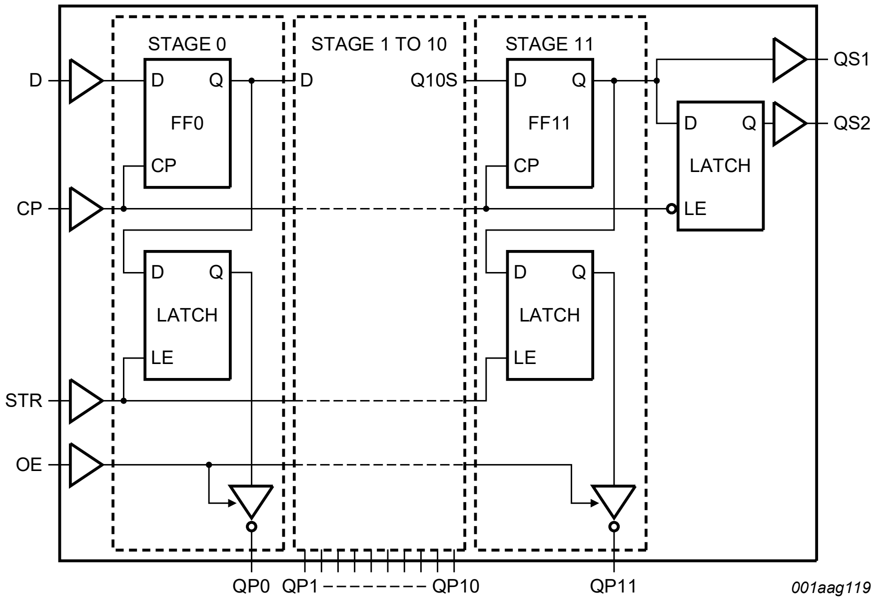


Fig. 3. Logic diagram

5. Pinning information

5.1. Pinning

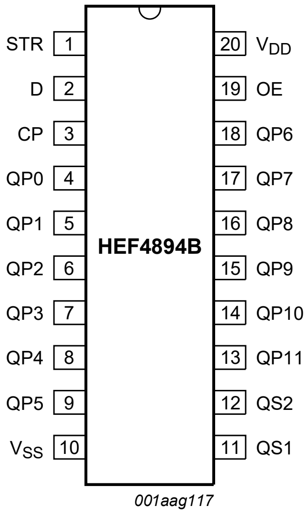


Fig. 4. Pin configuration for SOT163-1 (SO20) and SOT360-1 (TSSOP20)

All information provided in this document is subject to legal disclaimers.
© Nexperia B.V. 2021. All rights reserved

5.2. Pin description

Table 2. Pin description

Symbol	Pin	Description
D	2	serial input
QP0 to QP11	4, 5, 6, 7, 8, 9, 18, 17, 16, 15, 14, 13	parallel output
QS1	11	serial output
QS2	12	serial output
CP	3	clock input
STR	1	strobe input
OE	19	output enable input
V_{DD}	20	supply voltage
V_{SS}	10	ground (0 V)

6. Functional description

Table 3. Function table

H = HIGH voltage level; L = LOW voltage level; X = don't care; ↑ = LOW-to-HIGH clock transition;
↓ = HIGH-to-LOW clock transition; Z = high-impedance OFF-state.
At the LOW-to-HIGH clock transition, the information in the 10th register stage is transferred to the 11th register stage and the QS output.

Control			Input	Parallel output		Serial output	
CP	**OE**	**STR**	**D**	**QP0**	**QPn**	**QS1**[1]	**QS2**[2]
↑	L	X	X	Z	Z	Q10S	no change
↓	L	X	X	Z	Z	no change	Q11S
↑	H	L	X	no change	no change	Q10S	no change
↑	H	H	L	Z	QPn - 1	Q10S	no change
↑	H	H	H	L	QPn - 1	Q10S	no change
↓	H	H	H	no change	no change	no change	Q11S

[1] Q10S = the data in register stage 10 before the LOW-to-HIGH clock transition.
[2] Q11S = the data in register stage 11 before the HIGH-to-LOW clock transition.

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2021. All rights reserved

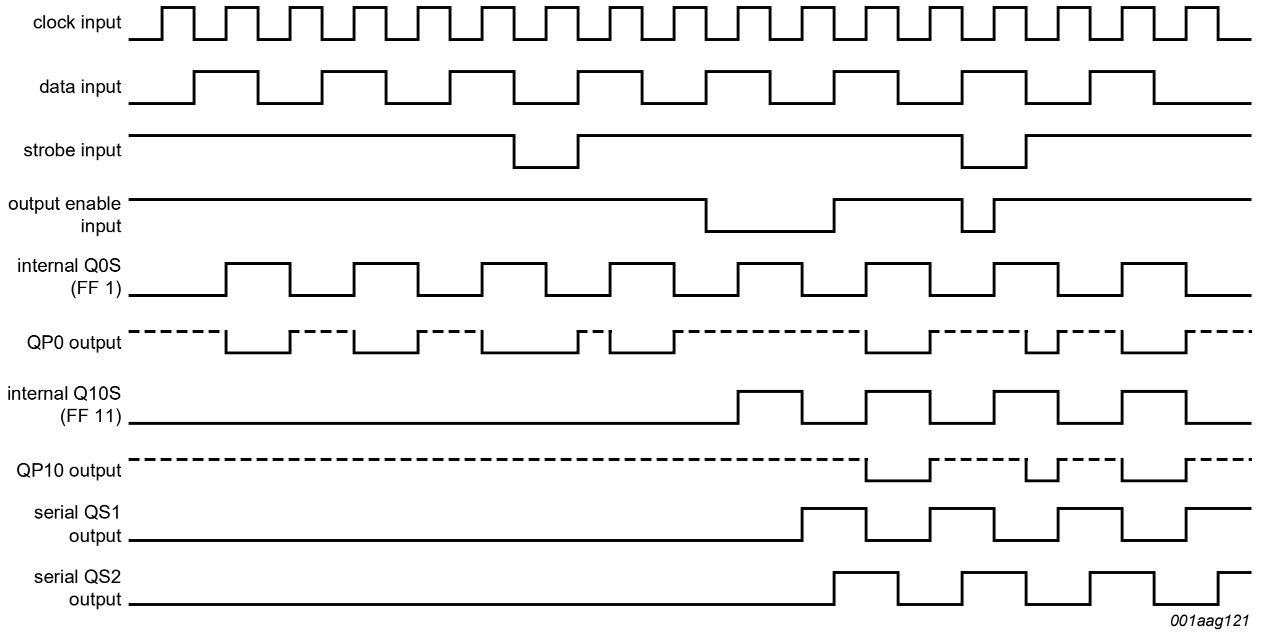


Fig. 5. Timing diagram

7. Limiting values

Table 4. Limiting values

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

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DD}	supply voltage		-0.5	+18	V
I_{IK}	input clamping current	$V_I < -0.5$ V or $V_I > V_{DD} + 0.5$ V	-	±10	mA
V_I	input voltage		-0.5	$V_{DD} + 0.5$	V
I_{OK}	output clamping current	QSn outputs; $V_O < -0.5$ V or $V_O > V_{DD} + 0.5$ V	-	±10	mA
		QPn outputs; $V_O < 0.5$ V	-	40	mA
I_I	input leakage current		-	±10	mA
I_O	output current	QSn outputs	-	±10	mA
		QPn outputs	-	40	mA
T_{stg}	storage temperature		-65	+150	°C
T_{amb}	ambient temperature		-40	+125	°C
P_{tot}	total power dissipation	T_{amb} = -40 °C to +125 °C [1]	-	500	mW
P	power dissipation	per output	-	100	mW

[1] For SOT163-1 (SO20) package: P_{tot} derates linearly with 12.3 mW/K above 109 °C.
For SOT360-1 (TSSOP20) package: P_{tot} derates linearly with 10.0 mW/K above 100 °C.

8. Recommended operating conditions

Table 5. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{DD}	supply voltage		3	-	15	V
V_I	input voltage		0	-	V_{DD}	V
T_{amb}	ambient temperature	in free air	-40	-	+125	°C

All information provided in this document is subject to legal disclaimers.
© Nexperia B.V. 2021. All rights reserved

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Δt/ΔV	input transition rise and fall rate	V_{DD} = 5 V	-	-	3.75	μs/V
		V_{DD} = 10 V	-	-	0.5	μs/V
		V_{DD} = 15 V	-	-	0.08	μs/V

9. Static characteristics

Table 6. Static characteristics

V_{SS} = 0 V; V_I = V_{SS} or V_{DD}; unless otherwise specified.

Symbol	Parameter	Conditions	V_{DD}	T_{amb} = -40 °C		T_{amb} = +25 °C		T_{amb} = +85 °C		T_{amb} = +125 °C		Unit
				Min	Max	Min	Max	Min	Max	Min	Max	
V_{IH}	HIGH-level input voltage	$\|I_O\|$ < 1 μA	5 V	3.5	-	3.5	-	3.5	-	3.5	-	V
			10 V	7.0	-	7.0	-	7.0	-	7.0	-	V
			15 V	11.0	-	11.0	-	11.0	-	11.0	-	V
V_{IL}	LOW-level input voltage	$\|I_O\|$ < 1 μA	5 V	-	1.5	-	1.5	-	1.5	-	1.5	V
			10 V	-	3.0	-	3.0	-	3.0	-	3.0	V
			15 V	-	4.0	-	4.0	-	4.0	-	4.0	V
V_{OH}	HIGH-level output voltage	QSn outputs; $\|I_O\|$ < 1 μA	5 V	4.95	-	4.95	-	4.95	-	4.95	-	V
			10 V	9.95	-	9.95	-	9.95	-	9.95	-	V
			15 V	14.95	-	14.95	-	14.95	-	14.95	-	V
V_{OL}	LOW-level output voltage	QSn outputs; $\|I_O\|$ < 1 μA	5 V	-	0.05	-	0.05	-	0.05	-	0.05	V
			10 V	-	0.05	-	0.05	-	0.05	-	0.05	V
			15 V	-	0.05	-	0.05	-	0.05	-	0.05	V
		QPn outputs; $\|I_O\|$ < 20 mA	5 V	-	0.75	-	0.75	-	1.5	-	1.5	V
			10 V	-	0.75	-	0.75	-	1.5	-	1.5	V
			15 V	-	0.75	-	0.75	-	1.5	-	1.5	V
I_{OH}	HIGH-level output current	QSn outputs										
		V_O = 2.5 V	5 V	-	-1.7	-	-1.4	-	-1.1	-	-1.1	mA
		V_O = 4.6 V	5 V	-	-0.64	-	-0.5	-	-0.36	-	-0.36	mA
		V_O = 9.5 V	10 V	-	-1.6	-	-1.3	-	-0.9	-	-0.9	mA
		V_O = 13.5 V	15 V	-	-4.2	-	-3.4	-	-2.4	-	-2.4	mA
I_{OL}	LOW-level output current	QSn outputs										
		V_O = 0.4 V	5 V	0.64	-	0.5	-	0.36	-	0.36	-	mA
		V_O = 0.5 V	10 V	1.6	-	1.3	-	0.9	-	0.9	-	mA
		V_O = 1.5 V	15 V	4.2	-	3.2	-	2.4	-	2.4	-	mA
I_I	input leakage current		15 V	-	±0.1	-	±0.1	-	±1.0	-	±1.0	μA
I_{OZ}	OFF-state output current	QPn output is HIGH; V_O = 15 V	5 V	-	2	-	2	-	15	-	15	μA
			10 V	-	2	-	2	-	15	-	15	μA
			15 V	-	2	-	2	-	15	-	15	μA
I_{DD}	supply current	I_O = 0 A	5 V	-	5	-	5	-	150	-	150	μA
			10 V	-	10	-	10	-	300	-	300	μA
			15 V	-	20	-	20	-	600	-	600	μA
C_I	input capacitance		-	-	-	-	7.5	-	-	-	-	pF

All information provided in this document is subject to legal disclaimers.
© Nexperia B.V. 2021. All rights reserved

10. Dynamic characteristics

Table 7. Dynamic characteristics

V_{SS} = 0 V; T_{amb} = 25 °C unless otherwise specified. For test circuit see Fig. 10.

Symbol	Parameter	Conditions	V_{DD}		Extrapolation formula	Min	Typ	Max	Unit
t_{PHL}	HIGH to LOW propagation delay	CP to QS1; see Fig. 6	5 V	[1]	132 ns + (0.55 ns/pF)C_L	-	160	320	ns
			10 V		53 ns + (0.23 ns/pF)C_L	-	65	130	ns
			15 V		37 ns + (0.16 ns/pF)C_L	-	45	90	ns
		CP to QS2; see Fig. 6	5 V		92 ns + (0.55 ns/pF)C_L	-	120	240	ns
			10 V		39 ns + (0.23 ns/pF)C_L	-	50	100	ns
			15 V		32 ns + (0.16 ns/pF)C_L	-	40	80	ns
t_{PLH}	LOW to HIGH propagation delay	CP to QS1; see Fig. 6	5 V	[1]	102 ns + (0.55 ns/pF)C_L	-	130	260	ns
			10 V		44 ns + (0.23 ns/pF)C_L	-	55	110	ns
			15 V		32 ns + (0.16 ns/pF)C_L	-	40	80	ns
		CP to QS2; see Fig. 6	5 V		102 ns + (0.55 ns/pF)C_L	-	130	260	ns
			10 V		49 ns + (0.23 ns/pF)C_L	-	60	120	ns
			15 V		37 ns + (0.16 ns/pF)C_L	-	45	90	ns
t_{PZL}	OFF-state to LOW propagation delay	CP to QPn; see Fig. 6	5 V			-	240	480	ns
			10 V			-	80	160	ns
			15 V			-	55	110	ns
		STR to QPn; see Fig. 7	5 V			-	140	280	ns
			10 V			-	70	140	ns
			15 V			-	55	110	ns
t_{PLZ}	LOW to OFF-state propagation delay	CP to QPn; see Fig. 6 and Fig. 7	5 V			-	170	340	ns
			10 V			-	75	150	ns
			15 V			-	60	120	ns
		STR to QPn; see Fig. 7	5 V			-	100	200	ns
			10 V			-	40	100	ns
			15 V			-	35	70	ns
t_{en}	enable time	OE to QPn; see Fig. 8	5 V	[2]		-	100	200	ns
			10 V			-	55	110	ns
			15 V			-	50	100	ns
t_{dis}	disable time	OE to QPn; see Fig. 8	5 V	[2]		-	80	160	ns
			10 V			-	40	80	ns
			15 V			-	30	60	ns
t_t	transition time	QS1, QS2; see Fig. 6	5 V	[1][3]	35 ns + (1.00 ns/pF)C_L	-	85	170	ns
			10 V		19 ns + (0.42 ns/pF)C_L	-	40	80	ns
			15 V		16 ns + (0.28 ns/pF)C_L	-	30	60	ns
t_W	pulse width	CP; LOW and HIGH; see Fig. 6	5 V			60	30	-	ns
			10 V			30	15	-	ns
			15 V			24	12	-	ns
		STR; HIGH; see Fig. 7	5 V			80	40	-	ns
			10 V			60	30	-	ns
			15 V			24	12	-	ns

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2021. All rights reserved

Symbol	Parameter	Conditions	V_{DD}	Extrapolation formula	Min	Typ	Max	Unit
t_{su}	set-up time	D to CP; see Fig. 9	5 V		60	30	-	ns
			10 V		20	10	-	ns
			15 V		15	5	-	ns
t_h	hold time	D to CP; see Fig. 9	5 V		+5	-15	-	ns
			10 V		20	5	-	ns
			15 V		20	5	-	ns
$f_{clk(max)}$	maximum clock frequency	CP; see Fig. 6	5 V		5	10	-	MHz
			10 V		11	22	-	MHz
			15 V		14	28	-	MHz

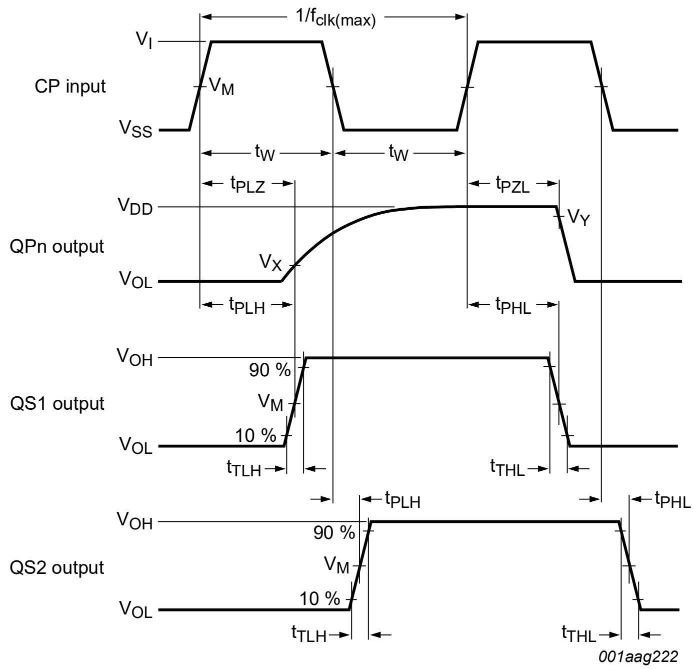
[1] The typical values of the propagation delay and transition times are calculated from the extrapolation formulas shown (C_L in pF).
[2] t_{en} is the same as t_{PZL} and t_{dis} is the same as t_{PLZ}.
[3] t_t is the same as t_{TLH} and t_{THL}.

Table 8. Dynamic power dissipation

P_D can be calculated from the formulas shown. V_{SS} = 0 V; $t_r = t_f \leq$ 20 ns; T_{amb} = 25 °C.

Symbol	Parameter	V_{DD}	Typical formula	Where
P_D	dynamic power dissipation	5 V	$P_D = 1200 \times f_i + \Sigma(f_o \times C_L) \times V_{DD}{}^2$ μW	f_i = input frequency in MHz; f_o = output frequency in MHz; C_L = output load capacitance in pF; $\Sigma(f_o \times C_L)$ = sum of the outputs; V_{DD} = supply voltage in V.
		10 V	$P_D = 5550 \times f_i + \Sigma(f_o \times C_L) \times V_{DD}{}^2$ μW	
		15 V	$P_D = 15000 \times f_i + \Sigma(f_o \times C_L) \times V_{DD}{}^2$ μW	

10.1. Waveforms and test circuit



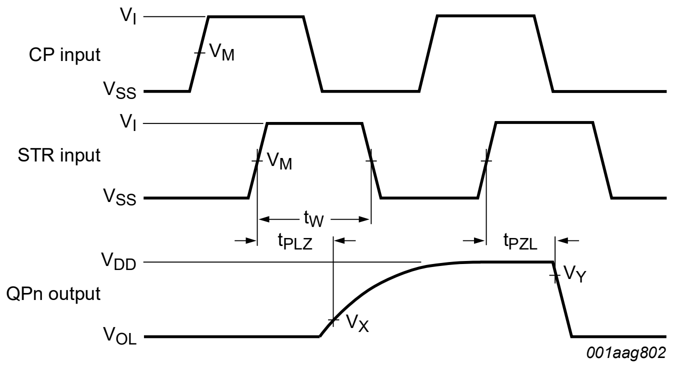
Measurement points are given in Table 9.
V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Fig. 6. Propagation delay clock (CP) to output (QPn, QS1, QS2), clock pulse width and maximum clock frequency

All information provided in this document is subject to legal disclaimers.
© Nexperia B.V. 2021. All rights reserved

Table 9. Measurement points

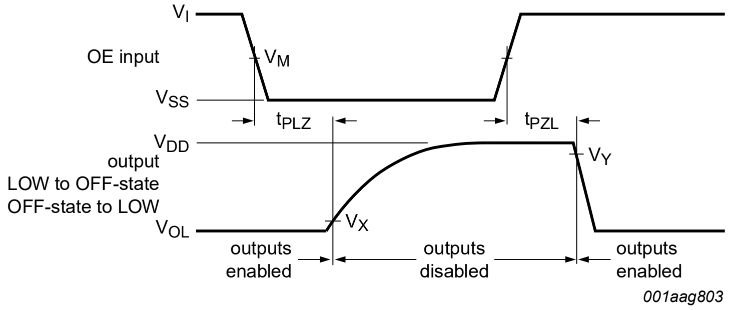
Supply	Input	Output		
V_{DD}	V_M	V_M	V_X	V_Y
5 V to 15 V	$0.5V_{DD}$	$0.5V_{DD}$	$0.1V_O$	$0.9V_O$



Measurement points are given in Table 9.

V_{OL} is the typical output voltage level that occurs with the output load.

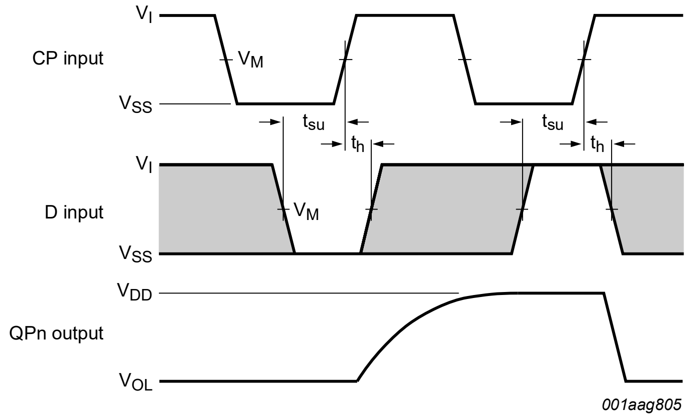
Fig. 7. Strobe (STR) to output (QPn) propagation delays and the strobe pulse width



Measurement points are given in Table 9.

V_{OL} is the typical output voltage level that occurs with the output load.

Fig. 8. Enable and disable times for input OE



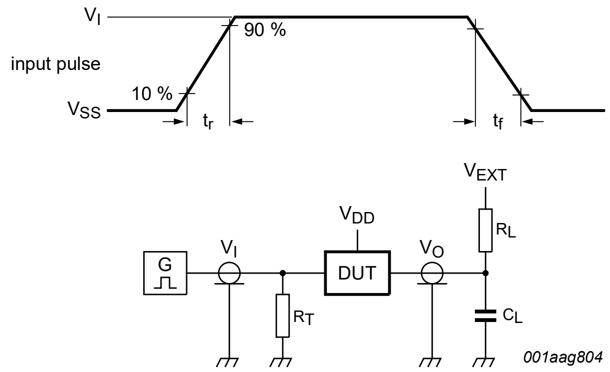
Measurement points are given in Table 9.

V_{OL} is a typical output voltage level that occurs with the output load.

The shaded areas indicate when the input is permitted to change for predictable output performance.

Fig. 9. Set-up and hold times for the data input (D)

All information provided in this document is subject to legal disclaimers.
© Nexperia B.V. 2021. All rights reserved



Test data is given in Table 10.

Definitions for test circuit:

R_L = Load resistance;

C_L = load capacitance;

R_T = Termination resistance should be equal to output impedance of Z_o of the pulse generator;

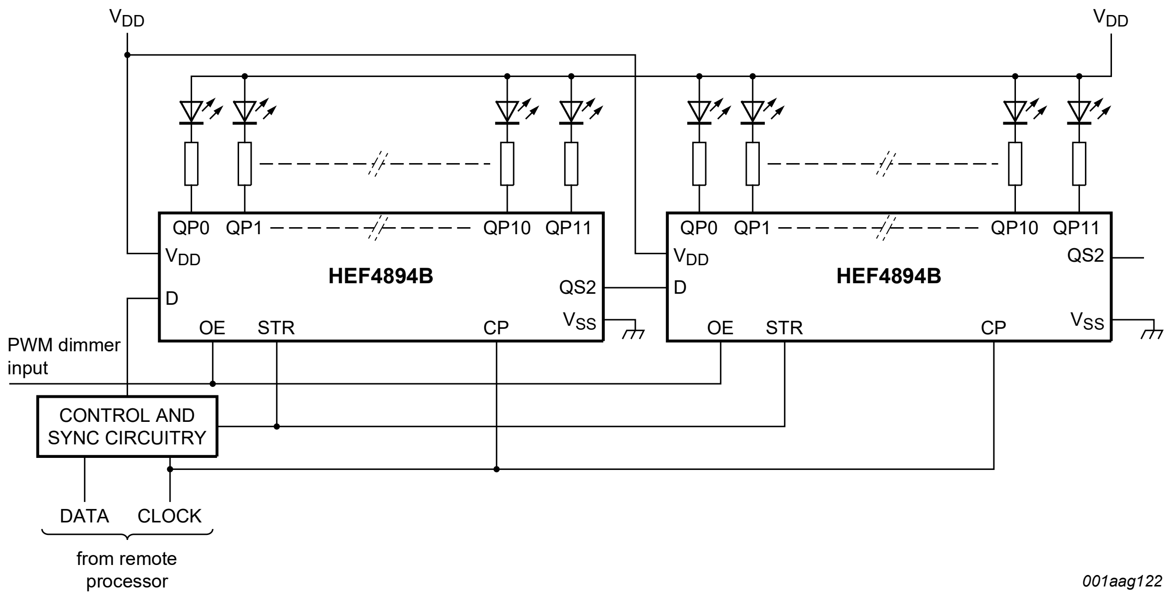
V_{EXT} = External voltage for measuring switching times.

Fig. 10. Test circuit for measuring switching times

Table 10. Test data

Supply	Input		V_{EXT}		Load	
V_{DD}	V_I	t_r, t_f	t_{PLZ}, t_{PZL}	t_{PLH}, t_{PHL}	C_L	R_L
5 V to 15 V	V_{DD}	≤ 20 ns	V_{DD}	open	50 pF	1 kΩ

11. Application information



Application example: serial-to-parallel data converting LED driver.

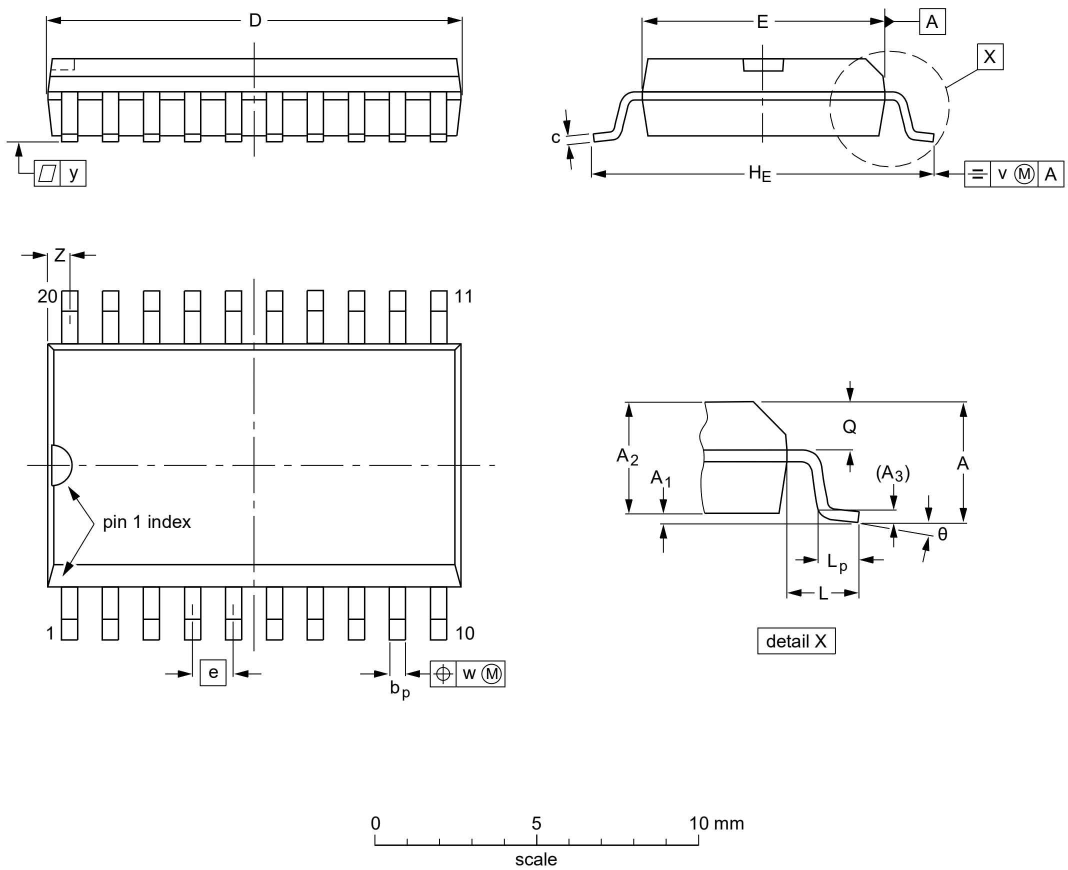
Fig. 11. Serial-to-parallel converting LED drivers

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2021. All rights reserved

12. Package outline

SO20: plastic small outline package; 20 leads; body width 7.5 mm **SOT163-1**



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 (1)	e	H_E	L	L_p	Q	v	w	y	Z (1)	θ
mm	2.65	0.3 0.1	2.45 2.25	0.25	0.49 0.36	0.32 0.23	13.0 12.6	7.6 7.4	1.27	10.65 10.00	1.4	1.1 0.4	1.1 1.0	0.25	0.25	0.1	0.9 0.4	8° 0°
inches	0.1	0.012 0.004	0.096 0.089	0.01	0.019 0.014	0.013 0.009	0.51 0.49	0.30 0.29	0.05	0.419 0.394	0.055	0.043 0.016	0.043 0.039	0.01	0.01	0.004	0.035 0.016	

Note

1. Plastic or metal protrusions of 0.15 mm (0.006 inch) maximum per side are not included.

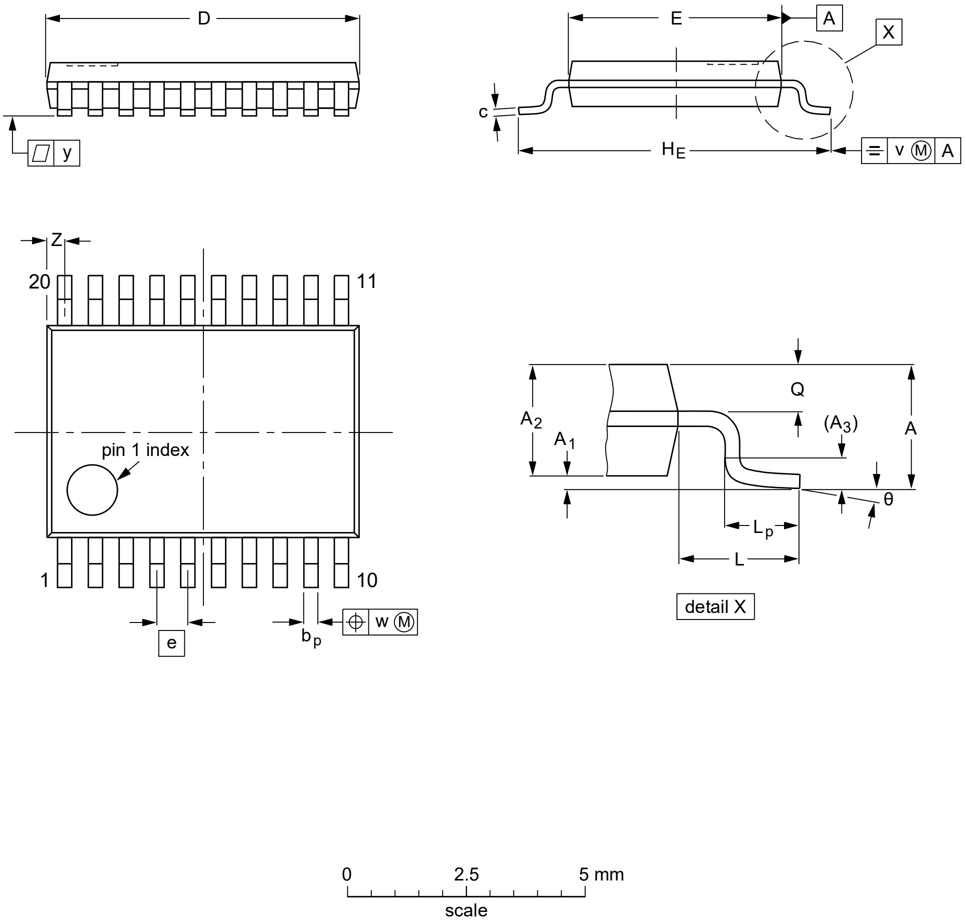
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT163-1	075E04	MS-013				~~99-12-27~~ 03-02-19

Fig. 12. Package outline SOT163-1 (SO20)

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2021. All rights reserved

TSSOP20: plastic thin shrink small outline package; 20 leads; body width 4.4 mm **SOT360-1**



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 [(1)]	θ
mm	1.1	0.15 0.05	0.95 0.80	0.25	0.30 0.19	0.2 0.1	6.6 6.4	4.5 4.3	0.65	6.6 6.2	1	0.75 0.50	0.4 0.3	0.2	0.13	0.1	0.5 0.2	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	JEITA			
SOT360-1		MO-153				~~99-12-27~~ 03-02-19

Fig. 13. Package outline SOT360-1 (TSSOP20)

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2021. All rights reserved

13. Abbreviations

Table 11. Abbreviations

Acronym	Description
CMOS	Complementary Metal-Oxide Semiconductor
DUT	Device Under Test
ESD	ElectroStatic Discharge
HBM	Human Body Model
LED	Light Emitting Diode
MIL	Military
MM	Machine Model

14. Revision history

Table 12. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
HEF4894B_Q100 v.2	20211123	Product data sheet	-	HEF4894B_Q100 v.1
Modifications:	• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. • Legal texts have been adapted to the new company name where appropriate. • Section 7: Derating values for P_{tot} total power dissipation updated. • Section 2 updated.			
HEF4894B_Q100 v.1	20120712	Product data sheet	-	-

All information provided in this document is subject to legal disclaimers.
© Nexperia B.V. 2021. All rights reserved

15. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.
[2] The term 'short data sheet' is explained in section "Definitions".
[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at https://www.nexperia.com.

Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. Nexperia does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local Nexperia sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

Product specification — The information and data provided in a Product data sheet shall define the specification of the product as agreed between Nexperia and its customer, unless Nexperia and customer have explicitly agreed otherwise in writing. In no event however, shall an agreement be valid in which the Nexperia product is deemed to offer functions and qualities beyond those described in the Product data sheet.

Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, Nexperia does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information. Nexperia takes no responsibility for the content in this document if provided by an information source outside of Nexperia.

In no event shall Nexperia be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory.

Notwithstanding any damages that customer might incur for any reason whatsoever, Nexperia's aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the Terms and conditions of commercial sale of Nexperia.

Right to make changes — Nexperia reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use in automotive applications — This Nexperia product has been qualified for use in automotive applications. Unless otherwise agreed in writing, the product is not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or malfunction of an Nexperia product can reasonably be expected to result in personal injury, death or severe property or environmental damage. Nexperia and its suppliers accept no liability for inclusion and/or use of Nexperia products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Quick reference data — The Quick reference data is an extract of the product data given in the Limiting values and Characteristics sections of this document, and as such is not complete, exhaustive or legally binding.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. Nexperia makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Customers are responsible for the design and operation of their applications and products using Nexperia products, and Nexperia accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the Nexperia product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

Nexperia does not accept any liability related to any default, damage, costs or problem which is based on any weakness or default in the customer's applications or products, or the application or use by customer's third party customer(s). Customer is responsible for doing all necessary testing for the customer's applications and products using Nexperia products in order to avoid a default of the applications and the products or of the application or use by customer's third party customer(s). Nexperia does not accept any liability in this respect.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) will cause permanent damage to the device. Limiting values are stress ratings only and (proper) operation of the device at these or any other conditions above those given in the Recommended operating conditions section (if present) or the Characteristics sections of this document is not warranted. Constant or repeated exposure to limiting values will permanently and irreversibly affect the quality and reliability of the device.

Terms and conditions of commercial sale — Nexperia products are sold subject to the general terms and conditions of commercial sale, as published at http://www.nexperia.com/profile/terms, unless otherwise agreed in a valid written individual agreement. In case an individual agreement is concluded only the terms and conditions of the respective agreement shall apply. Nexperia hereby expressly objects to applying the customer's general terms and conditions with regard to the purchase of Nexperia products by customer.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from competent authorities.

Translations — A non-English (translated) version of a document is for reference only. The English version shall prevail in case of any discrepancy between the translated and English versions.

Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

© Nexperia B.V. 2021. All rights reserved

Contents

© Nexperia B.V. 2021. All rights reserved

For more information, please visit: http://www.nexperia.com
For sales office addresses, please send an email to: salesaddresses@nexperia.com
Date of release: 23 November 2021

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Counter Shift Registers ***category:***

Click to view products by Nexperia ***manufacturer:***

Other Similar products are found below :

74HC165N 74HC195N CD4031BE CD4034BE NLV74HC165ADTR2G 5962-9172201M2A MC74HC597ADG MC100EP142MNG MC100EP016AMNG 5962-9172201MFA TC74HC165AP(F) NTE4517B MC74LV594ADR2G 74HCT4094D-Q100J 74HCT595D,118 TPIC6C595PWG4 74VHC164MTCX CD74HC195M96 NLV74HC165ADR2G NPIC6C596ADJ NPIC6C596D-Q100,11 74HC164T14-13 STPIC6D595MTR 74HC164D.652 74HCT164D.652 74HCT164D.653 74HC4094D.653 74VHC4020FT(BJ) 74HC194D,653 74HCT164DB.118 74LV164DB.112 74LVC594AD.112 74VHC164FT(BE) 74HCT594DB.112 74HCT597DB.112 74LV164D.112 74LV165D.112 74LV4094D.112 74LV4094PW.112 CD74HC165M 74AHC594T16-13 74AHCT595T16-13 74HC164S14-13 74HC595S16-13 74AHCT595S16-13 74AHC595S16-13 74AHC594S16-13 74HC594S16-13 74HCT594S16-13 74HCT595S16-13