

## 8-BIT SHIFT REGISTERS WITH 3-STATE OUTPUT REGISTERS

Check for Samples: [SN54AHC595](#), [SN74AHC595](#)

### FEATURES

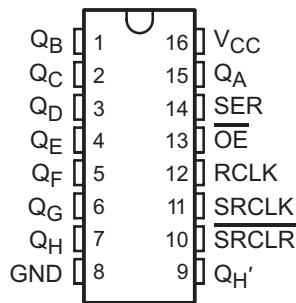
- Operating Range 2-V to 5.5-V  $V_{CC}$
- 8-Bit Serial-In, Parallel-Out Shift
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 200-V Machine Model (A115-A)
  - 1000-V Charged-Device Model (C101)

### DESCRIPTION

The 'AHC595 devices contain an 8-bit serial-in, parallel-out shift register that feeds an 8-bit D-type storage register. The storage register has parallel 3-state outputs. Separate clocks are provided for both the shift and storage registers. The shift register has a direct overriding clear (SRCLR) input, serial (SER) input, and a serial output for cascading. When the output-enable ( $\overline{OE}$ ) input is high, all outputs, except QH', are in the high-impedance state.

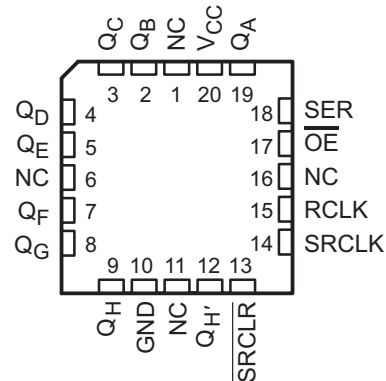
Both the shift-register clock (SRCLK) and storage-register clock (RCLK) are positive-edge triggered. If both clocks are connected together, the shift register always is one clock pulse ahead of the storage register.

SN54AHC595 . . . J OR W PACKAGE  
SN74AHC595 . . . D, DB, N, NS, OR PW PACKAGE  
(TOP VIEW)



NC – No internal connection

SN54AHC595 . . . FK PACKAGE  
(TOP VIEW)

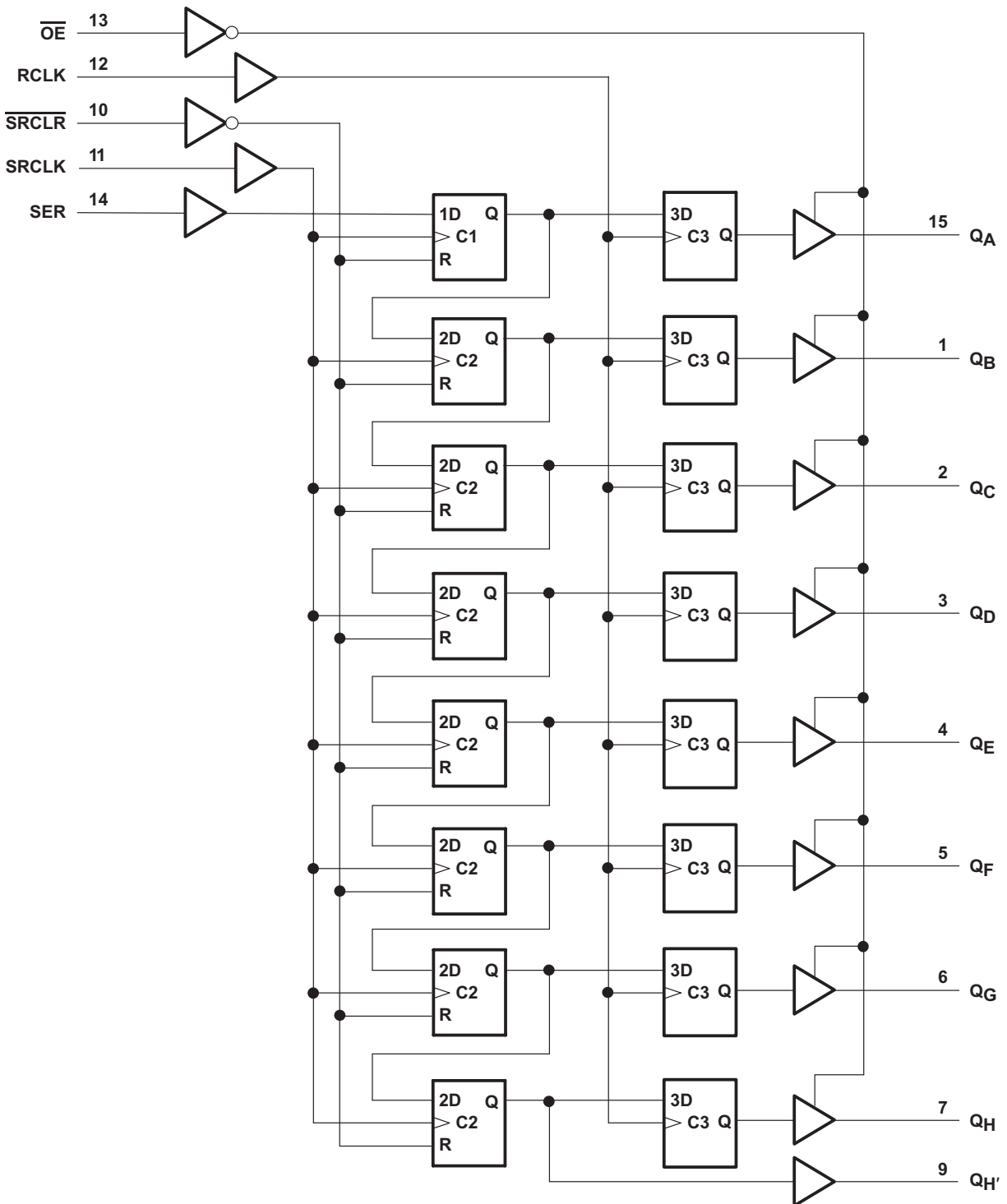


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**FUNCTION TABLE**

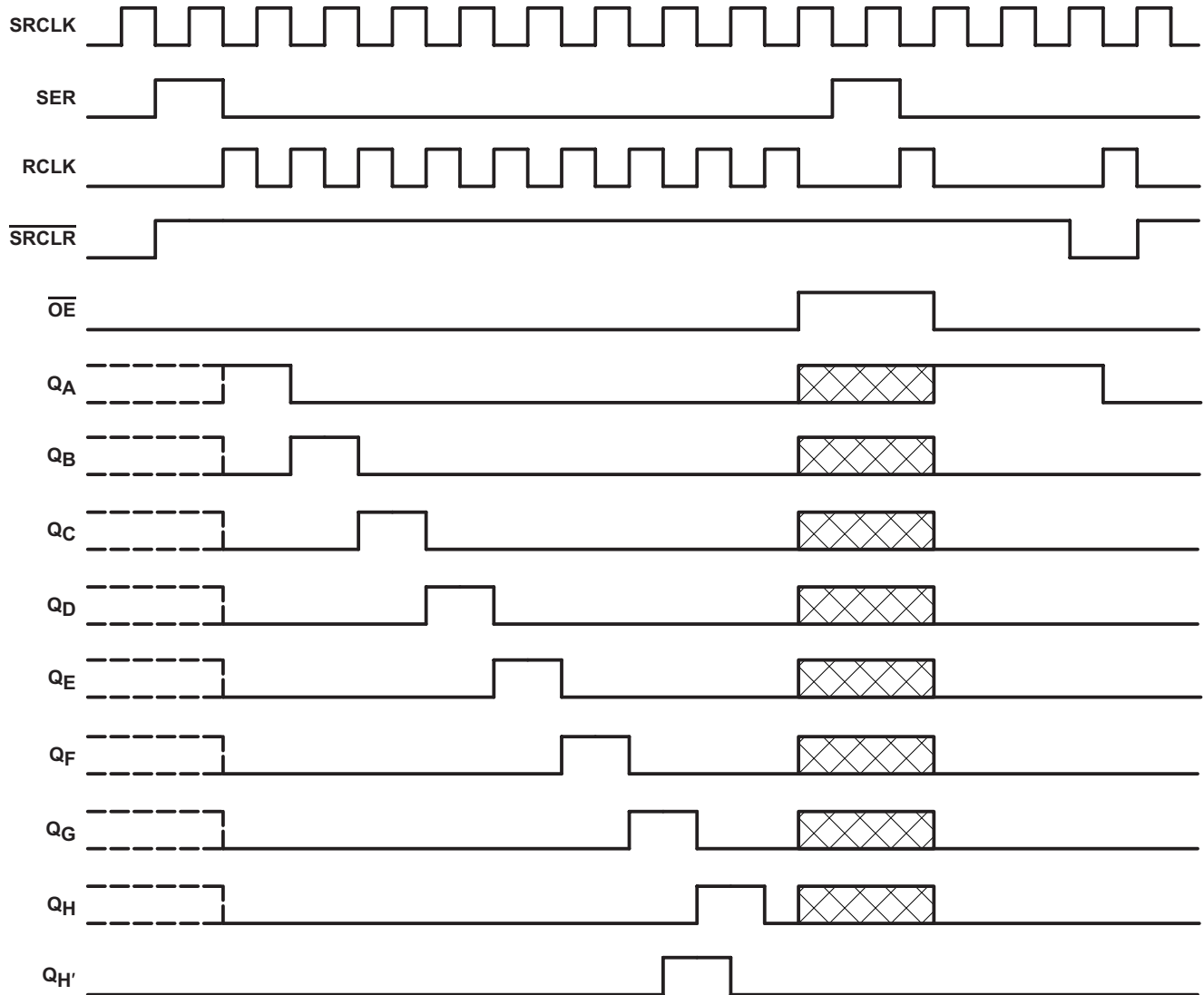
INPUTS					FUNCTION
SER	SRCLK	SRCLR	RCLK	OE	
X	X	X	X	H	Outputs Q <sub>A</sub> –Q <sub>H</sub> are disabled.
X	X	X	X	L	Outputs Q <sub>A</sub> –Q <sub>H</sub> are enabled.
X	X	L	X	X	Shift register is cleared.
L	↑	H	X	X	First stage of the shift register goes low. Other stages store the data of previous stage, respectively.
H	↑	H	X	X	X First stage of the shift register goes high. Other stages store the data of previous stage, respectively.
X	X	X	↑	X	Shift-register data is stored into the storage register.

LOGIC DIAGRAM (POSITIVE LOGIC)



Pin numbers shown are for the D, DB, J, N, NS, PW, and W packages.

TIMING DIAGRAM



NOTE:  implies that the output is in 3-State mode.

## ABSOLUTE MAXIMUM RATINGS

 over operating free-air temperature range (unless otherwise noted)<sup>(1)</sup>

		VALUE	UNIT
Supply voltage range, $V_{CC}$		-0.5 to 7	V
Input voltage range, $V_I$ <sup>(2)</sup>		-0.5 to 7	V
Output voltage range, $V_O$ <sup>(2)</sup>		-0.5 to $V_{CC} + 0.5$	V
Input clamp current, $I_{IK}$ ( $V_I < 0$ )		-20	mA
Output clamp current, $I_{OK}$ ( $V_O < 0$ or $V_O > V_{CC}$ )		$\pm 20$	mA
Continuous output current, $I_O$ ( $V_O = 0$ to $V_{CC}$ )		$\pm 25$	mA
Continuous current through $V_{CC}$ or GND		$\pm 75$	mA
Package thermal impedance, $\theta_{JA}$	D package <sup>(3)</sup>	73	°C/W
	DB package <sup>(3)</sup>	82	
	N package <sup>(3)</sup>	67	
	NS package <sup>(3)</sup>	64	
	PW package <sup>(3)</sup>	108	
Storage temperature range, $T_{stg}$		-65 to 150	°C

- (1) Stresses beyond those listed under “absolute maximum ratings” 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 input and output voltage ratings may be exceeded if the input and output current ratings are observed.
- (3) The package thermal impedance is calculated in accordance with JESD 51-7.

## RECOMMENDED OPERATING CONDITIONS<sup>(1)</sup>

		SN54AHC595 <sup>(2)</sup>		SN74AHC595		UNIT
		MIN	MAX	MIN	MAX	
$V_{CC}$	Supply voltage	2	5.5	2	5.5	V
$V_{IH}$	High-level input voltage	$V_{CC} = 2$ V	1.5	1.5		V
		$V_{CC} = 3$ V	2.1	2.1		
		$V_{CC} = 5.5$ V	3.85	3.85		
$V_{IL}$	Low-level Input voltage	$V_{CC} = 2$ V		0.5	0.5	V
		$V_{CC} = 3$ V		0.9	0.9	
		$V_{CC} = 5.5$ V		1.65	1.65	
$V_I$	Input voltage	0	5.5	0	5.5	V
$V_O$	Output voltage	0	$V_{CC}$	0	$V_{CC}$	V
$I_{OH}$	High-level output current	$V_{CC} = 2$ V		-50	-50	mA
		$V_{CC} = 3.3$ V $\pm 0.3$ V		-4	-4	
		$V_{CC} = 5$ V $\pm 0.5$ V		-8	-8	
$I_{OL}$	Low-level output current	$V_{CC} = 2$ V		50	50	mA
		$V_{CC} = 3.3$ V $\pm 0.3$ V		4	4	
		$V_{CC} = 5$ V $\pm 0.5$ V		8	8	
$\Delta t/\Delta v$	Input Transition rise or fall rate	$V_{CC} = 3.3$ V $\pm 0.3$ V		100	100	ns/V
		$V_{CC} = 5$ V $\pm 0.5$ V		20	20	
$T_A$	Operating free-air temperature	-55	125	-40	125	°C

- (1) All unused inputs of the device must be held at  $V_{CC}$  or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number [SCBA004](#).
- (2) Product Preview.

## ELECTRICAL CHARACTERISTICS

over operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS	V <sub>CC</sub>	T <sub>A</sub> = 25°C			–55°C TO 125°C SN54AHC595 <sup>(1)</sup>		–40°C TO 85°C SN74AHC595		–40°C TO 125°C Recommended SN74AHC595		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
V <sub>OH</sub>	I <sub>OH</sub> = –50 μA	2 V	1.9	2		1.9		1.9		1.9	V	
		3 V	2.9	3		2.9		2.9		2.9		
		4.5 V	4.4	4.5		4.4		4.4		4.4		
	I <sub>OH</sub> = –4 mA	3 V	2.58			2.48		2.48		2.48		
		4.5 V	3.94			3.8		3.8		3.8		
V <sub>OL</sub>	I <sub>OL</sub> = 50 μA	2 V			0.1		0.1		0.1		V	
		3 V			0.1		0.1		0.1			
		4.5 V			0.1		0.1		0.1			
	I <sub>OH</sub> = 4 mA	3 V			0.36		0.5		0.44			0.44
		4.5 V			0.36		0.5		0.44			0.44
I <sub>I</sub>	V <sub>I</sub> = 5.5 V or GND	0 V to 5.5 V			±0.1		±1 <sup>(2)</sup>		±1		μA	
I <sub>OZ</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND, V <sub>O</sub> = V <sub>CC</sub> or GND, OE = V <sub>IH</sub> or V <sub>IL</sub> , Q <sub>A</sub> – Q <sub>H</sub>	5.5 V			±0.25		±2.5		±2.5		±2.5	
I <sub>CC</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0	5.5 V			4		40		40		μA	
C <sub>i</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND	5 V		3	10				10		pF	
C <sub>O</sub>	V <sub>O</sub> = V <sub>CC</sub> or GND,	5 V		5.5								

(1) Product Preview.

(2) On products compliant to MIL-PRF-38535, this parameter is not production tested at V<sub>CC</sub> = 0 V.

## TIMING REQUIREMENTS

over recommended operating free-air temperature range, V<sub>CC</sub> = 3.3 V ± 0.3 V (unless otherwise noted) (see [Figure 1](#))

			T <sub>A</sub> = 25°C		–55°C TO 125°C SN54AHC595 <sup>(1)</sup>		–40°C TO 85°C SN74AHC595		–40°C TO 125°C Recommended SN74AHC595		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t <sub>w</sub>	Pulse duration	SRCLK high or low	5		5		5		6		ns
		RCLK high or low	5		5		5		6		
		SRCLR low	5		5		5		6.5		
t <sub>su</sub>	Setup time	SER before SRCLK↑	3.5		3.5		3.5		4.5		ns
		SRCLK↑ before RCLK↑ <sup>(2)</sup>	8		8.5		8.5		9.5		
		SRCLR low before RCLK↑	8		9		9		10		
		SRCLR high (inactive) before SRCLK↑	3		3		3		4		
t <sub>h</sub>	Hold time	SER after SRCLK↑	1.5		1.5		1.5		2.5		ns

(1) Product Preview.

(2) This setup time allows the storage register to receive stable data from the shift register. The clocks can be tied together, in which case the shift register is one clock pulse ahead of the storage register.

## TIMING REQUIREMENTS

 over recommended operating free-air temperature range,  $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$  (unless otherwise noted) (see [Figure 1](#))

			$T_A = 25^\circ\text{C}$		–55°C TO 125°C SN54AHC595 <sup>(1)</sup>		–40°C TO 85°C SN74AHC595		–40°C TO 125°C Recommended SN74AHC595		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
$t_W$	Pulse duration	SRCLK high or low	5		5		5		6		ns
		RCLK high or low	5		5		5		6		
		SRCLR low	5		5		5		6.2		
$t_{su}$	Setup time	SER before SRCLK $\uparrow$	3		3		3		4		ns
		SRCLK $\uparrow$ before RCLK $\uparrow$ <sup>(2)</sup>	5		5		5		6		
		SRCLR low before RCLK $\uparrow$	5		5		5		6		
		SRCLR high (inactive) before SRCLK $\uparrow$	2.5		2.5		2.5		3.5		
$t_h$	Hold time	SER after SRCLK $\uparrow$	2		2		2		3		ns

(1) Product Preview.

(2) This setup time allows the storage register to receive stable data from the shift register. The clocks can be tied together, in which case the shift register is one clock pulse ahead of the storage register.

## SWITCHING CHARACTERISTICS

 over recommended operating free-air temperature range,  $V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$  (unless otherwise noted) (see [Figure 1](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANC E	$T_A = 25^\circ\text{C}$			–55°C TO 125°C SN54AHC595		–40°C TO 85°C SN74AHC595		–40°C TO 125°C Recommended SN74AHC595		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
$f_{max}$			$C_L = 15\text{ pF}$	80 <sup>(1)</sup>	120 <sup>(1)</sup>		70 <sup>(1)</sup>		70		60	MHz	
			$C_L = 50\text{ pF}$	55	105		50		50		40		
$t_{PLH}$	RCLK	$Q_A - Q_H$	$C_L = 15\text{ pF}$	6 <sup>(1)</sup>	11.9 <sup>(1)</sup>		1 <sup>(1)</sup>	13.5 <sup>(1)</sup>	1	13.5	1	14.9	ns
$t_{PHL}$				6 <sup>(1)</sup>	11.9 <sup>(1)</sup>		1 <sup>(1)</sup>	13.5 <sup>(1)</sup>	1	13.5	1	14.9	
$t_{PLH}$	SRCLK	$Q_H$	$C_L = 15\text{ pF}$	6.6 <sup>(1)</sup>	13 <sup>(1)</sup>		1 <sup>(1)</sup>	15 <sup>(1)</sup>	1	15	1	16.4	ns
$t_{PHL}$				6.6 <sup>(1)</sup>	13 <sup>(1)</sup>		1 <sup>(1)</sup>	15 <sup>(1)</sup>	1	15	1	16.4	
$t_{PHL}$	SRCLR	$Q_H$	$C_L = 15\text{ pF}$	6.2 <sup>(1)</sup>	12.8 <sup>(1)</sup>		1 <sup>(1)</sup>	13.7 <sup>(1)</sup>	1	13.7	1	15	ns
$t_{PZH}$	$\overline{OE}$	$Q_A - Q_H$	$C_L = 15\text{ pF}$	6 <sup>(1)</sup>	11.5 <sup>(1)</sup>		1 <sup>(1)</sup>	13.5 <sup>(1)</sup>	1	13.5	1	14.9	ns
$t_{PZL}$				7.8 <sup>(1)</sup>	11.5 <sup>(1)</sup>		1 <sup>(1)</sup>	13.5 <sup>(1)</sup>	1	13.5	1	14.9	
$t_{PLH}$	RCLK	$Q_A - Q_H$	$C_L = 50\text{ pF}$	7.9	15.4		1	17	1	17	1	18.6	ns
$t_{PHL}$				7.9	15.4		1	17	1	17	1	18.6	
$t_{PLH}$	SRCLK	$Q_H$	$C_L = 50\text{ pF}$	9.2	16.5		1	18.5	1	18.5	1	20	ns
$t_{PHL}$				9.2	16.5		1	18.5	1	18.5	1	20	
$t_{PHL}$	SRCLR	$Q_H$	$C_L = 50\text{ pF}$	9	16.3		1	17.2	1	17.2	1	18.7	ns
$t_{PZH}$	$\overline{OE}$	$Q_A - Q_H$	$C_L = 50\text{ pF}$	7.8	15		1	17	1	17	1	18.6	ns
$t_{PZL}$				9.6	15		1	17	1	17	1	18.6	
$t_{PHZ}$	$\overline{OE}$	$Q_A - Q_H$	$C_L = 50\text{ pF}$	8.1	15.7		1	16.2	1	16.2	1	17.4	ns
$t_{PLZ}$				9.3	15.7		1	16.2	1	16.2	1	17.4	

(1) On products compliant to MIL-PRF-38535, this parameter is not production tested.

## SWITCHING CHARACTERISTICS

over recommended operating free-air temperature range,  $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$  (unless otherwise noted) (see [Figure 1](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	$T_A = 25^\circ\text{C}$			$-55^\circ\text{C TO } 125^\circ\text{C}$ SN54AHC595		$-40^\circ\text{C TO } 85^\circ\text{C}$ SN74AHC595		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
$f_{\text{max}}$			$C_L = 15\text{ pF}$	135 <sup>(1)</sup>	170 <sup>(1)</sup>		115 <sup>(1)</sup>		115	MHz	
			$C_L = 50\text{ pF}$	95	140		85		85		
$t_{\text{PLH}}$	RCLK	$Q_A - Q_H$	$C_L = 15\text{ pF}$		4.3 <sup>(1)</sup>	7.4 <sup>(1)</sup>	1 <sup>(1)</sup>	8.5 <sup>(1)</sup>	1	8.5	ns
$t_{\text{PHL}}$					4.3 <sup>(1)</sup>	7.4 <sup>(1)</sup>	1 <sup>(1)</sup>	8.5 <sup>(1)</sup>	1	8.5	
$t_{\text{PLH}}$	SRCLK	$Q_{H'}$	$C_L = 15\text{ pF}$		4.5 <sup>(1)</sup>	8.2 <sup>(1)</sup>	1 <sup>(1)</sup>	9.4 <sup>(1)</sup>	1	9.4	ns
$t_{\text{PHL}}$					4.5 <sup>(1)</sup>	8.2 <sup>(1)</sup>	1 <sup>(1)</sup>	9.4 <sup>(1)</sup>	1	9.4	
$t_{\text{PHL}}$	$\overline{\text{SRCLR}}$	$Q_{H'}$	$C_L = 15\text{ pF}$		4.5 <sup>(1)</sup>	8 <sup>(1)</sup>	1 <sup>(1)</sup>	9.1 <sup>(1)</sup>	1	9.1	ns
$t_{\text{PZH}}$	$\overline{\text{OE}}$	$Q_A - Q_H$	$C_L = 15\text{ pF}$		4.3 <sup>(1)</sup>	8.6 <sup>(1)</sup>	1 <sup>(1)</sup>	10 <sup>(1)</sup>	1	10	ns
$t_{\text{PZL}}$					5.4 <sup>(1)</sup>	8.6 <sup>(1)</sup>	1 <sup>(1)</sup>	10 <sup>(1)</sup>	1	10	
$t_{\text{PLH}}$	RCLK	$Q_A - Q_H$	$C_L = 50\text{ pF}$		5.6	9.4	1	10.5	1	10.5	ns
$t_{\text{PHL}}$					5.6	9.4	1	10.5	1	10.5	
$t_{\text{PLH}}$	SRCLK	$Q_{H'}$	$C_L = 50\text{ pF}$		6.4	10.2	1	11.4	1	11.4	ns
$t_{\text{PHL}}$					6.4	10.2	1	11.4	1	11.4	
$t_{\text{PHL}}$	$\overline{\text{SRCLR}}$	$Q_{H'}$	$C_L = 50\text{ pF}$		6.4	10	1	11.1	1	11.1	ns
$t_{\text{PZH}}$	$\overline{\text{OE}}$	$Q_A - Q_H$	$C_L = 50\text{ pF}$		5.7	10.6	1	12	1	12	ns
$t_{\text{PZL}}$					6.8	10.6	1	12	1	12	
$t_{\text{PHZ}}$	$\overline{\text{OE}}$	$Q_A - Q_H$	$C_L = 50\text{ pF}$		3.5	10.3	1	11	1	11	ns
$t_{\text{PLZ}}$					3.4	10.3	1	11	1	11	

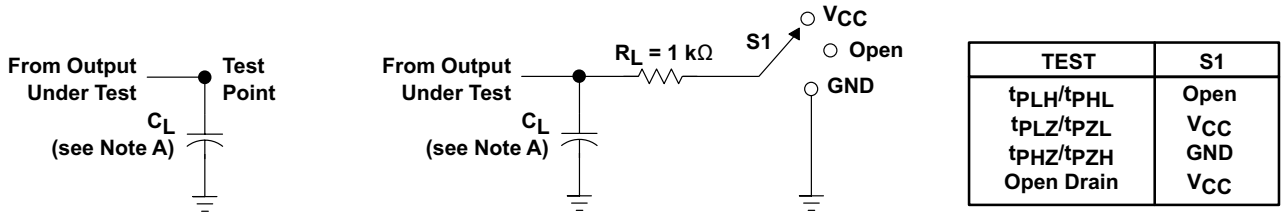
(1) On products compliant to MIL-PRF-38535, this parameter is not production tested.

## OPERATING CHARACTERISTICS

$V_{CC} = 5\text{ V}$ ,  $T_A = 25^\circ\text{C}$

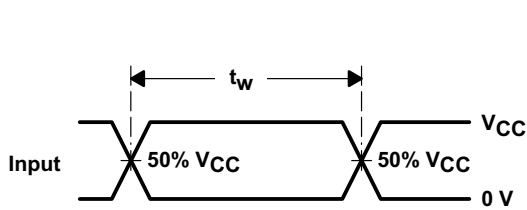
PARAMETER		TEST CONDITIONS	TYP	UNIT
$C_{\text{pd}}$	Power dissipation capacitance	No load, $f = 1\text{ MHz}$	25.2	pF

PARAMETER MEASUREMENT INFORMATION

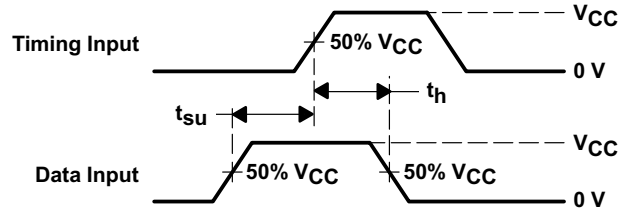


LOAD CIRCUIT FOR TOTEM-POLE OUTPUTS

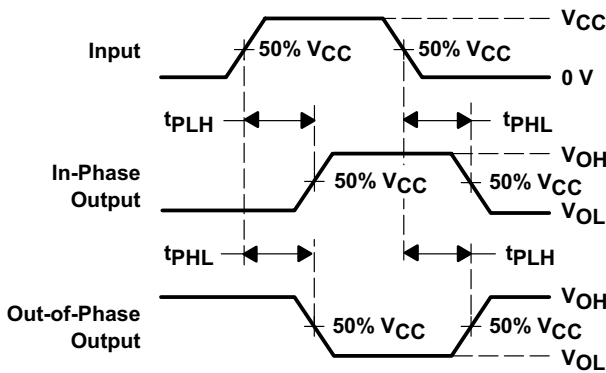
LOAD CIRCUIT FOR 3-STATE AND OPEN-DRAIN OUTPUTS



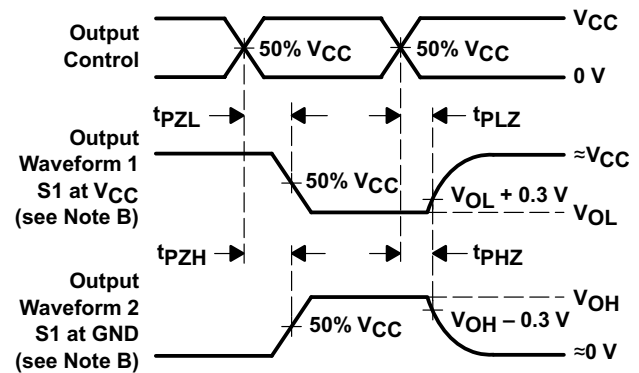
VOLTAGE WAVEFORMS PULSE DURATION



VOLTAGE WAVEFORMS SETUP AND HOLD TIMES



VOLTAGE WAVEFORMS PROPAGATION DELAY TIMES INVERTING AND NONINVERTING OUTPUTS



VOLTAGE WAVEFORMS ENABLE AND DISABLE TIMES LOW- AND HIGH-LEVEL ENABLING

- A.  $C_L$  includes probe and jig capacitance.
- B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control.  
Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
- C. All input pulses are supplied by generators having the following characteristics:  $PRR \leq 1$  MHz,  $Z_O = 50 \Omega$ ,  $t_r \leq 3$  ns,  $t_f \leq 3$  ns.
- D. The outputs are measured one at a time with one input transition per measurement.
- E. All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuit and Voltage Waveforms

## REVISION HISTORY

Changes from Revision I (June 2004) to Revision J	Page
• Changed Updated document to new TI datasheet format. ....	1
• Extended operating temperature range to 125°C .....	5

**PACKAGING INFORMATION**

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
SN74AHC595D	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AHC595	<a href="#">Samples</a>
SN74AHC595DBR	ACTIVE	SSOP	DB	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA595	<a href="#">Samples</a>
SN74AHC595DBRE4	ACTIVE	SSOP	DB	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA595	<a href="#">Samples</a>
SN74AHC595DBRG4	ACTIVE	SSOP	DB	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA595	<a href="#">Samples</a>
SN74AHC595DE4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AHC595	<a href="#">Samples</a>
SN74AHC595DG4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AHC595	<a href="#">Samples</a>
SN74AHC595DR	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AHC595	<a href="#">Samples</a>
SN74AHC595DRE4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AHC595	<a href="#">Samples</a>
SN74AHC595DRG4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AHC595	<a href="#">Samples</a>
SN74AHC595N	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-40 to 85	SN74AHC595N	<a href="#">Samples</a>
SN74AHC595NE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-40 to 85	SN74AHC595N	<a href="#">Samples</a>
SN74AHC595PW	ACTIVE	TSSOP	PW	16	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA595	<a href="#">Samples</a>
SN74AHC595PWE4	ACTIVE	TSSOP	PW	16	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA595	<a href="#">Samples</a>
SN74AHC595PWG4	ACTIVE	TSSOP	PW	16	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA595	<a href="#">Samples</a>
SN74AHC595PWR	ACTIVE	TSSOP	PW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA595	<a href="#">Samples</a>
SN74AHC595PWRE4	ACTIVE	TSSOP	PW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA595	<a href="#">Samples</a>
SN74AHC595PWRG4	ACTIVE	TSSOP	PW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA595	<a href="#">Samples</a>

(1) The marketing status values are defined as follows:

**ACTIVE:** Product device recommended for new designs.

**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

**NRND:** Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

**PREVIEW:** Device has been announced but is not in production. Samples may or may not be available.

**OBSOLETE:** TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

**TBD:** The Pb-Free/Green conversion plan has not been defined.

**Pb-Free (RoHS):** TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

**Pb-Free (RoHS Exempt):** This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

**Green (RoHS & no Sb/Br):** TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

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#### **OTHER QUALIFIED VERSIONS OF SN74AHC595 :**

- Automotive: [SN74AHC595-Q1](#)

NOTE: Qualified Version Definitions:

- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects

## TAPE AND REEL INFORMATION



### QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74AHC595DBR	SSOP	DB	16	2000	330.0	16.4	8.2	6.6	2.5	12.0	16.0	Q1
SN74AHC595DR	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
SN74AHC595PWR	TSSOP	PW	16	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74AHC595PWR	TSSOP	PW	16	2000	330.0	12.4	7.0	5.6	1.6	8.0	12.0	Q1
SN74AHC595PWRG4	TSSOP	PW	16	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1

**TAPE AND REEL BOX DIMENSIONS**


\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74AHC595DBR	SSOP	DB	16	2000	367.0	367.0	38.0
SN74AHC595DR	SOIC	D	16	2500	367.0	367.0	38.0
SN74AHC595PWR	TSSOP	PW	16	2000	367.0	367.0	35.0
SN74AHC595PWR	TSSOP	PW	16	2000	364.0	364.0	27.0
SN74AHC595PW RG4	TSSOP	PW	16	2000	367.0	367.0	35.0

N (R-PDIP-T\*\*)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
  - The 20 pin end lead shoulder width is a vendor option, either half or full width.

D (R-PDSO-G16)

PLASTIC SMALL OUTLINE

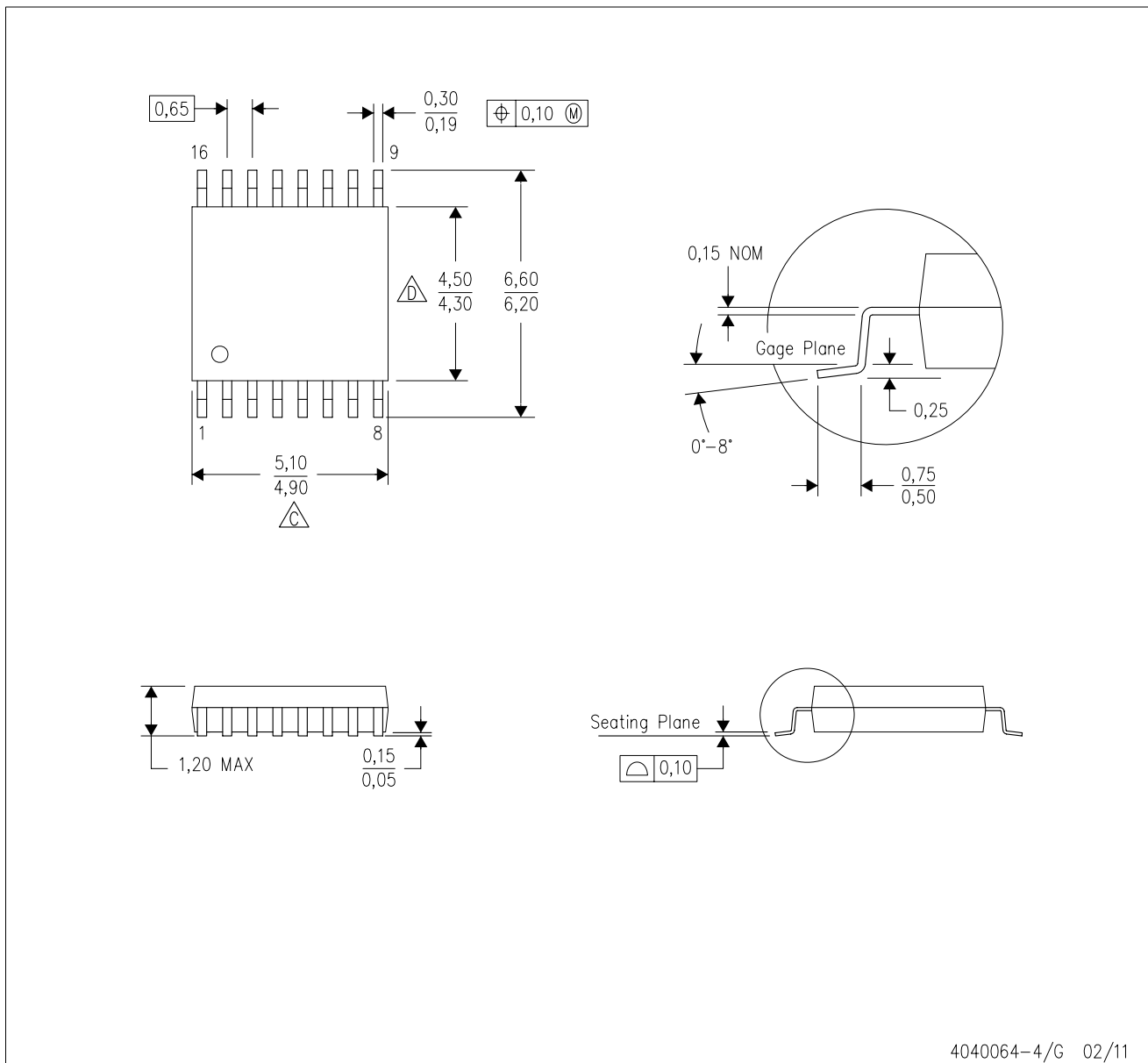




4040047-6/M 06/11

- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  -  C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
  -  D. Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
  - E. Reference JEDEC MS-012 variation AC.

PW (R-PDSO-G16)

PLASTIC SMALL OUTLINE



- NOTES:
- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
  - B. This drawing is subject to change without notice.
  -  C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0,15 each side.
  -  D. Body width does not include interlead flash. Interlead flash shall not exceed 0,25 each side.
  - E. Falls within JEDEC MO-153

DB (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE

28 PINS SHOWN



- NOTES: A. All linear dimensions are in millimeters.  
 B. This drawing is subject to change without notice.  
 C. Body dimensions do not include mold flash or protrusion not to exceed 0,15.  
 D. Falls within JEDEC MO-150

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