



**8-BIT SHIFT REGISTER WITH
8-BIT OUTPUT REGISTER**

HTC74HC595

DATA SHEET

Rev 0.92

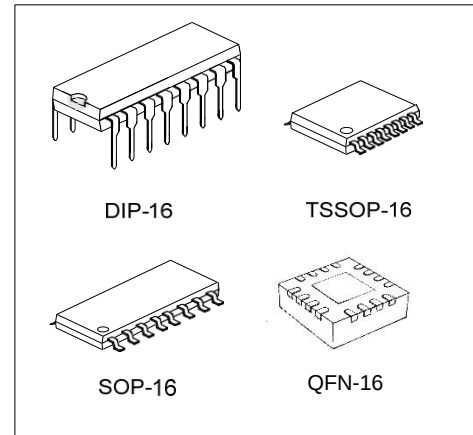
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1. DESCRIPTION

The **HTC74HC595** contains an 8-bit register with asynchronous reset input and an 8-bit latch with output. The Serial Data Input (SER) will shift into the internal shift register during every LOW-to-HIGH transition on the Shift Clock. The latch will latch the 8-bit data from the shift register during the LOW-to-HIGH transition on the Latch Clock. The shift register also provides a serial output.

2. FEATURES

- Operation Voltage Range: 2 ~ 6V
- High Noise Immunity
- Output Compatibility with CMOS and TTL
- Specified from -40 ~ +125 °C
- Package option: DIP-16,SOP-16,TSSOP-16 and QFN-16
- Latch-up performance ≤ 250 mA
- ESD protection:
 - HBM: ANSI/ESDA/JEDEC JS-001 2023 exceeds 2000 V
 - CDM: ANSI/ESDA/JEDEC JS-002 2022 exceeds 2000 V



3. ORDERING INFORMATION

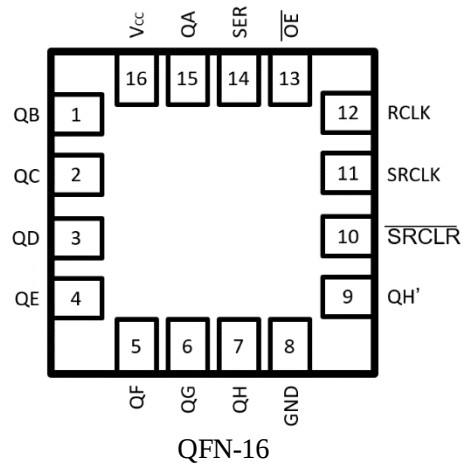
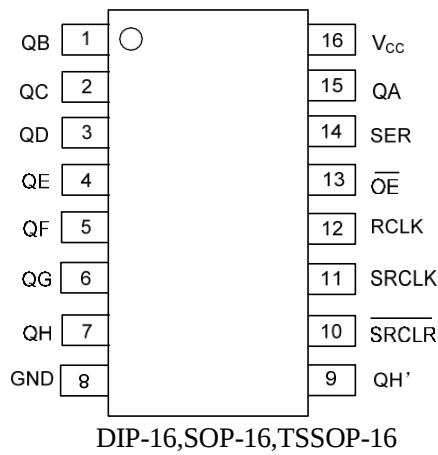
● Tube

Part Number	Marking code	Package	Packing	Pcs/Tube	Pcs/Box
HTC74HC595D-T	HTC74HC595	DIP-16	Tube	25	7500

● Tape Reel

Part Number	Marking code	Package	Packing	Pcs/Reel	Pcs/ Box
HTC74HC595S-R	HTC74HC595	SOP-16	Tape Reel	4K	64K
HTC74HC595T-R	HTC74HC595	TSSOP-16	Tape Reel	5K	80K
HTC74HC595Q-R	HTC74HC595	QFN-16	Tape Reel	3K	120K

4. PIN CONFIGURATION



5. FUNCTION TABLE

FUNCTION	INPUTS					OUTPUTS	
	SRCLK	RCLK	$\overline{OE}$	$\overline{SRCLR}$	SER	QH'	Qn
A Low-Level on $\overline{SRCLR}$ only affects the shift registers.	X	X	L	L	X	L	NC
Empty shift register loaded into storage register.	X	↑	L	L	X	L	L
Shift register clear. Parallel outputs in high-impedance OFF-state	X	X	H	L	X	L	Z
Logic high level shifted into the first shift register. Contents of all shift register stages shifted through, e.g. previous state of stage G(internal QG') appears on the serial output(QH').	↑	X	L	H	H	QG'	NC
Contents of shift register stages (internal Qn') are transferred to the storage register and parallel output stages.	X	↑	L	H	X	NC	Qn'
Contents of shift register shifted through. Previous contents of the shift register is transferred to the storage register and the parallel output stages.	↑	↑		H	X	QG'	Qn'

Note: H : HIGH voltage level.

L : LOW voltage level.

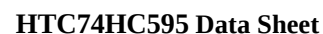
X : Don't care.

Z : High impedance OFF-state.

NC: No change.

↑ : Low-to-High transition.

↓ : High-to-Low transition.



8. ABSOLUTE MAXIMUM RATING (Note 1)

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V_{CC}	-0.5~7.0	V
Input Clamp Current ($V_{IN} < 0$ or $V_{IN} > V_{CC}$)		I_{IK} (Note 2)	± 20	mA
Output Clamp Current ($V_{OUT} < 0$ or $V_{OUT} > V_{CC}$)		I_{OK} (Note 2)	± 20	mA
Output Current		I_{OUT}	± 35	mA
V_{CC} or GND Current		I_{CC}	± 75	mA
Power Dissipation	DIP-16	P_D	750	mW
	QFN-16		100	mW
	SOP-16		500	mW
	SOP-16N		550	mW
	SSOP-16		450	mW
	SSOP-16N TSSOP-16			
Storage Temperature		T_{STG}	-65 ~ +150	℃

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

9. RECOMMENDED OPERATING COMDITIONS

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage		V_{CC}	2	-	6	V
Input Voltage		V_{IN}	0	-	V_{CC}	V
Output Voltage		V_{OUT}	0	-	V_{CC}	V
Operating Temperature		T_A	-40	-	+125	℃
Input Transition Rise or Fall Time	$V_{CC}=2V$	t_R / t_F	-	-	100	ns
	$V_{CC}=4.5V$		-	-	20	ns
	$V_{CC}=6V$		-	-	20	ns

10. ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25 °C			T _A =-40 °C~+125 °C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Input Voltage	V _{IH}	V _{CC} =2V	1.5	-	-	1.5	-	-	V
		V _{CC} =3V	2.1	-	-	2.1	-	-	V
		V _{CC} =4.5V	3.15	-	-	3.15	-	-	V
		V _{CC} =6V	4.2	-	-	4.2	-	-	V
Low-Level Input Voltage	V _{IL}	V _{CC} =2V	-	-	0.5	-	-	0.5	V
		V _{CC} =3V	-	-	0.9	-	-	0.9	V
		V _{CC} =4.5V	-	-	1.35	-	-	1.35	V
		V _{CC} =6V	-	-	1.8	-	-	1.8	V
High-Level Output Voltage, QA-QH	V _{OH}	V _{CC} =2V, I _{OH} =-20μA	1.9	2.0	-	1.9	-	-	V
		V _{CC} =4.5V, I _{OH} =-20μA	4.4	4.5	-	4.4	-	-	V
		V _{CC} =6V, I _{OH} =-20μA	5.9	6.0	-	5.9	-	-	V
		V _{CC} =3V, I _{OH} =-2.4mA	2.48	-	-	2.3	-	-	V
		V _{CC} =4.5V, I _{OH} =-6mA	3.98	-	-	3.7	-	-	V
		V _{CC} =6V, I _{OH} =-7.8mA	5.48	-	-	5.2	-	-	V
Low-Level Output Voltage, QA-QH	V _{OL}	V _{CC} =2V, I _{OL} =20μA	-	0.002	0.1	-	-	0.1	V
		V _{CC} =4.5V, I _{OL} =20μA	-	0.001	0.1	-	-	0.1	V
		V _{CC} =6V, I _{OL} =20μA	-	0.001	0.1	-	-	0.1	V
		V _{CC} =3V, I _{OL} =2.4mA	-	-	0.26	-	-	0.4	V
		V _{CC} =4.5V, I _{OL} =6mA	-	-	0.26	-	-	0.4	V
		V _{CC} =6V, I _{OL} =7.8mA	-	-	0.26	-	-	0.4	V
High-Level Output Voltage, QH'	V _{OH}	V _{CC} =2V, I _{OH} =-20μA	1.9	2.0	-	1.9	-	-	V
		V _{CC} =4.5V, I _{OH} =-20μA	4.4	4.5	-	4.4	-	-	V
		V _{CC} =6V, I _{OH} =-20μA	5.9	6.0	-	5.9	-	-	V
		V _{CC} =3V, I _{OH} =-2.4mA	2.48	-	-	2.3	-	-	V
		V _{CC} =4.5V, I _{OH} =-4mA	3.98	-	-	3.7	-	-	V
		V _{CC} =6V, I _{OH} =-5.2mA	5.48	-	-	5.2	-	-	V
Low-Level Output Voltage, QH'	V _{OL}	V _{CC} =2V, I _{OL} =20μA	-	0.002	0.1	-	-	0.1	V
		V _{CC} =4.5V, I _{OL} =20μA	-	0.001	0.1	-	-	0.1	V
		V _{CC} =6V, I _{OL} =20μA	-	0.001	0.1	-	-	0.1	V
		V _{CC} =3V, I _{OL} =2.4mA	-	-	0.26	-	-	0.4	V
		V _{CC} =4.5V, I _{OL} =4mA	-	-	0.26	-	-	0.4	V
		V _{CC} =6V, I _{OL} =5.2mA	-	-	0.26	-	-	0.4	V
Input Leakage Current	I _{I(LEAK)}	V _{CC} =6V, V _{IN} = V _{CC} or GND	-	-	±0.1	-	-	±1	μA
Output Off-State Current	I _{OZ}	V _{CC} =6V V _{OUT} =V _{CC} or GND	-	-	±0.5	-	-	±10	μA
Quiescent Supply Current	I _{CC}	V _{CC} =6V V _{IN} = V _{CC} or GND, I _{OUT} =0	-	-	4	-	-	160	μA

11. DYNAMIC CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS		T _A =25 °C			T _A =-40 °C~+125 °C			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
Maximum Clock Pulse Frequency	f _{max}	C _L =50pF	V _{CC} =2V	6	26	-	4	-	-	MHz
			V _{CC} =4.5V	30	38	-	20	-	-	MHz
			V _{CC} =6V	35	42	-	24	-	-	MHz
Propagation Delay From Input (SRCLK) to Output (Q _H ')	t _{PD}	C _L =50pF	V _{CC} =2V	-	210	500	-	-	600	ns
			V _{CC} =4.5V	-	70	175	-	-	300	ns
			V _{CC} =6V	-	50	150	-	-	250	ns
Propagation Delay From Input (RCLK) to Output (Q _A -Q _H)		C _L =50pF	V _{CC} =2V	-	50	140	-	-	265	ns
			V _{CC} =4.5V	-	17	28	-	-	53	ns
			V _{CC} =6V	-	14	24	-	-	45	ns
		C _L =150pF	V _{CC} =2V	-	60	200	-	-	250	ns
			V _{CC} =4.5V	-	22	40	-	-	50	ns
			V _{CC} =6V	-	19	34	-	-	43	ns
Propagation Delay From Input (SRCLR) to Output (Q _H ')	t _{PHL}	C _L =50pF	V _{CC} =2V	-	210	500	-	-	600	ns
			V _{CC} =4.5V	-	70	175	-	-	300	ns
			V _{CC} =6V	-	50	150	-	-	250	ns
Propagation Delay From Input ($\overline{\text{OE}}$) to Output (Q _A -Q _H)	t _{en}	C _L =50pF	V _{CC} =2V	-	40	135	-	-	225	ns
			V _{CC} =4.5V	-	15	27	-	-	45	ns
			V _{CC} =6V	-	13	23	-	-	38	ns
		C _L =150pF	V _{CC} =2V	-	70	200	-	-	250	ns
			V _{CC} =4.5V	-	23	40	-	-	50	ns
			V _{CC} =6V	-	19	34	-	-	43	ns
Propagation Delay From Input ($\overline{\text{OE}}$) to Output (Q _A -Q _H)	t _{dis}	C _L =50pF	V _{CC} =2V	-	41	150	-	-	250	ns
			V _{CC} =4.5V	-	15	30	-	-	50	ns
			V _{CC} =6V	-	12	26	-	-	43	ns
Output Transition Time (Q _A -Q _H)	t _t	C _L =50pF	V _{CC} =2V	-	28	60	-	-	75	ns
			V _{CC} =4.5V	-	8	12	-	-	15	ns
			V _{CC} =6V	-	6	10	-	-	13	ns
		C _L =150pF	V _{CC} =2V	-	45	210	-	-	265	ns
			V _{CC} =4.5V	-	17	42	-	-	53	ns
V _{CC} =6V			-	13	36	-	-	45	ns	
Output Transition Time (Q _H ')		C _L =50pF	V _{CC} =2V	-	28	75	-	-	95	ns
			V _{CC} =4.5V	-	8	15	-	-	19	ns
			V _{CC} =6V	-	6	13	-	-	16	ns

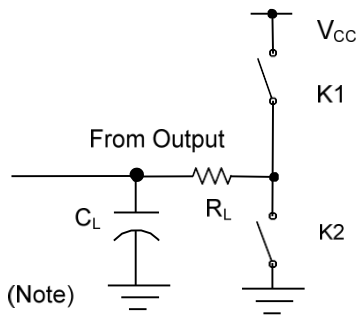
12. TIMING REQUIREMENTS

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25 °C			T _A =-40 °C~+125 °C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Pulse Duration, SRCLK or RCLK High or Low	t _w	V _{CC} =2V	80	-	-	110	-	-	ns
		V _{CC} =4.5V	16	-	-	22	-	-	ns
		V _{CC} =6V	14	-	-	19	-	-	ns
V _{CC} =2V		80	-	-	110	-	-	ns	
V _{CC} =4.5V		16	-	-	22	-	-	ns	
V _{CC} =6V		14	-	-	19	-	-	ns	
Pulse Duration, $\overline{\text{SRCLR}}$ Low	t _{su}	V _{CC} =2V	100	-	-	125	-	-	ns
		V _{CC} =4.5V	20	-	-	25	-	-	ns
		V _{CC} =6V	17	-	-	21	-	-	ns
V _{CC} =2V		75	-	-	94	-	-	ns	
V _{CC} =4.5V		15	-	-	19	-	-	ns	
V _{CC} =6V		13	-	-	16	-	-	ns	
V _{CC} =2V		50	-	-	65	-	-	ns	
V _{CC} =4.5V		10	-	-	13	-	-	ns	
V _{CC} =6V		9	-	-	11	-	-	ns	
V _{CC} =2V		50	-	-	60	-	-	ns	
V _{CC} =4.5V		10	-	-	12	-	-	ns	
V _{CC} =6V		9	-	-	11	-	-	ns	
Setup Time, SER Before SRCLK↑	t _H	V _{CC} =2V	3	-	-	3	-	-	ns
		V _{CC} =4.5V	3	-	-	3	-	-	ns
		V _{CC} =6V	3	-	-	3	-	-	ns

13. OPERATING CHARACTERISTIC

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C _{IN}	V _{CC} =6V, V _{IN} =V _{CC} or GND	-	-	10	pF
Power Dissipation Capacitance	C _{PD}	No load	-	400	-	pF

14. TEST CIRCUIT AND WAVEFORMS



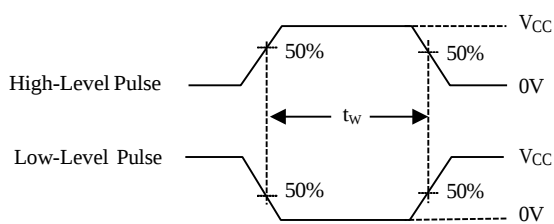
Note: C_L includes probe and jig capacitance. $C_L=50\text{pF}$ or 150pF , $R_L=1\text{K}\Omega$

TEST	K1	K2
t_{PLH}/t_{PHL}	Open	Open
t_{PHZ}/t_{PZH}	Open	Close
t_{PLZ}/t_{PZL}	Close	Open

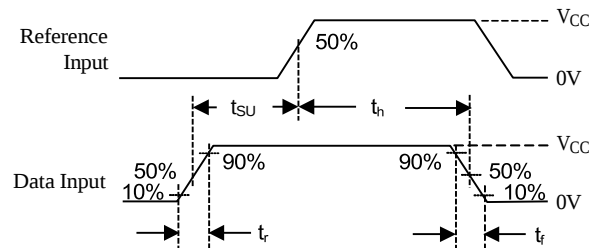
t_{PD} is the same as t_{PHL} and t_{PLH} .

t_{en} is the same as t_{PZL} and t_{PZH} .

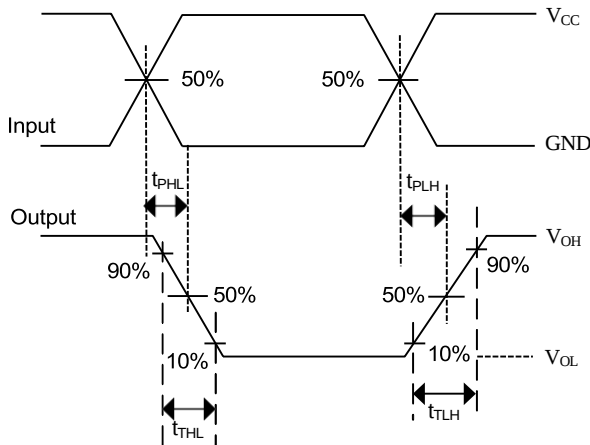
t_{dis} is the same as t_{PLZ} and t_{PHZ} .



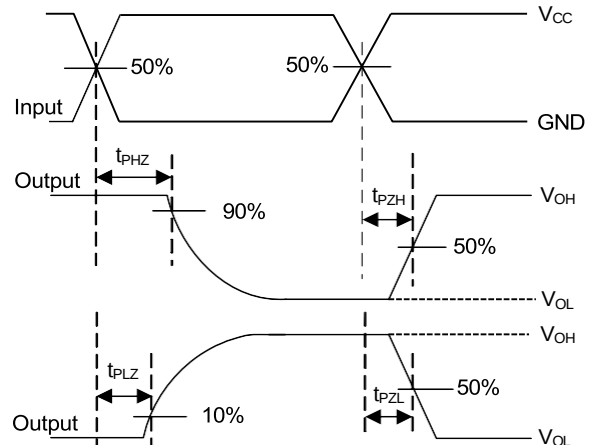
Voltage Waveforms, Pulse Duration



Voltage Waveforms



Voltage Waveforms Propagation Delays

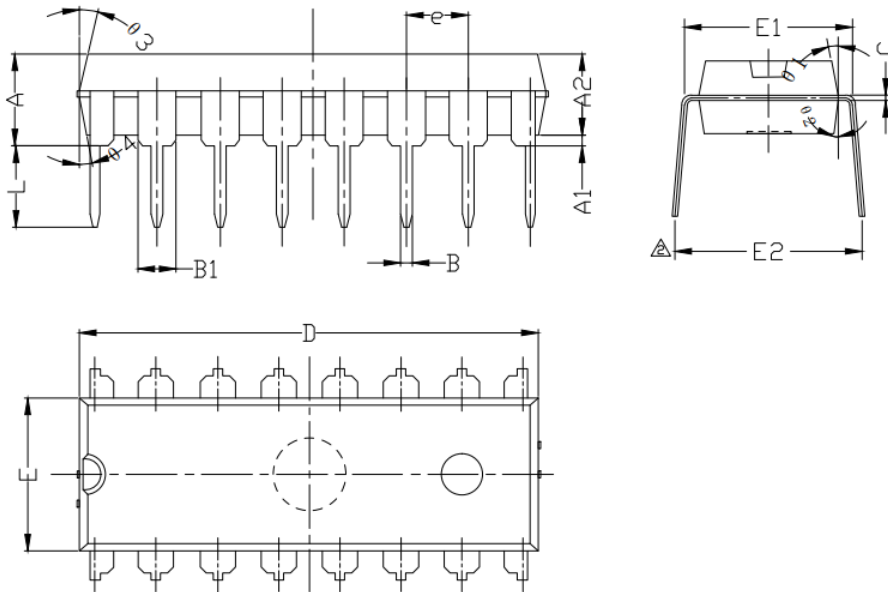


Voltage Waveforms Propagation Delays

Note: All input pulses are supplied by generators having the following characteristics: $P_{RR} \leq 1\text{MHz}$, $Z_O = 50\Omega$, $t_r \leq 3\text{ns}$, $t_f \leq 3\text{ns}$.

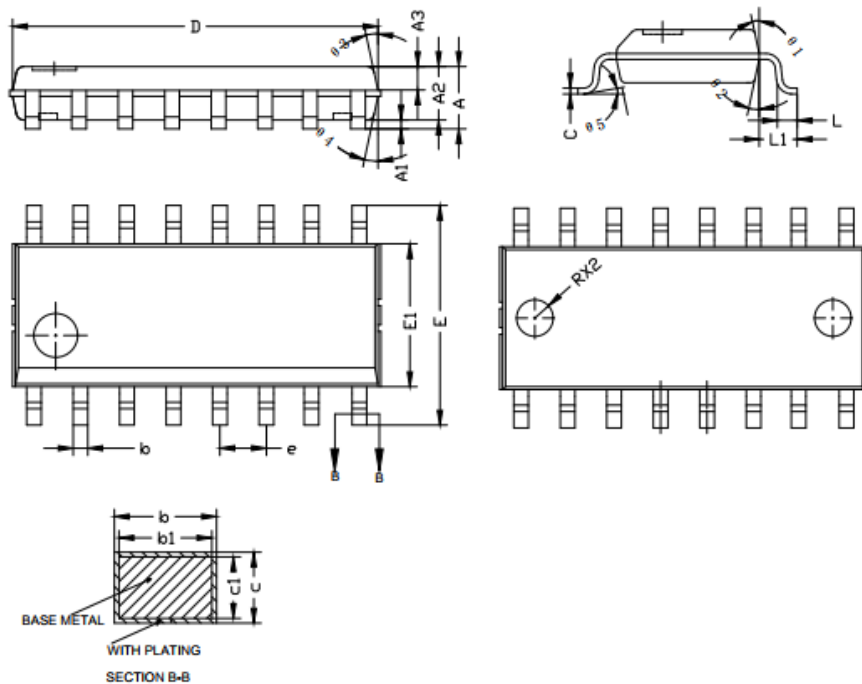
15. PACKAGE INFORMATION

DIP16 package information

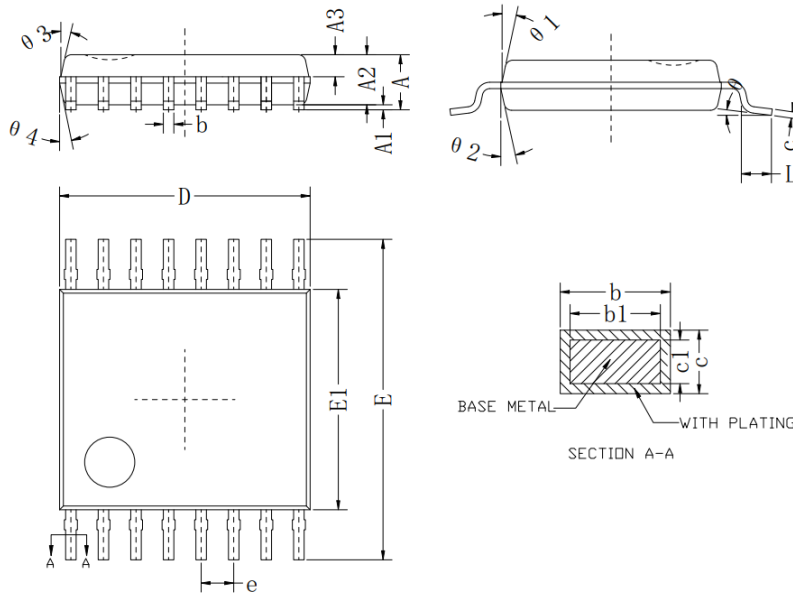


SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	3.75	3.90	4.05
A1	0.51	--	--
A2	3.20	3.30	3.45
B	0.38	0.48	0.56
B1	1.52(BSC)		
C	0.20	0.25	0.34
D	18.80	19.05	19.30
E	6.20	6.35	6.50
E1	7.35	7.62	7.85
e	2.54(BSC)		
L	3.00	3.30	3.60
E2	8.00	8.40	8.80
θ 1	9°	~	15°
θ 2	7°	~	13°
θ 3	8°	~	14°
θ 4	5°	~	12°

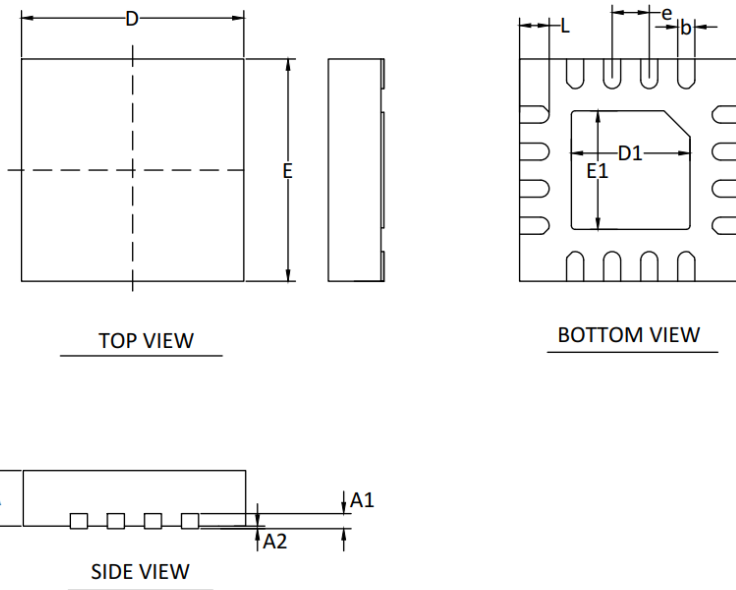
SOP16 package information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	--	--	1.70
A1	0.10	0.15	0.21
A2	1.40	1.45	1.50
A3	0.60	0.65	0.70
b	0.33	--	0.47
b1	0.32	0.41	0.44
c	0.20	--	0.24
c1	0.19	0.20	0.21
D	9.50	9.90	10.05
E	5.80	6.00	6.20
E1	3.85	3.90	4.00
e	1.27(BSC)		
L	0.50	0.60	0.70
L1	1.10(BSC)		
θ 1	8°	~	15°
θ 2	8°	~	15°
θ 3	8°	~	15°
θ 4	8°	~	15°
θ 5	0°	~	6°
R	0.45°	0.50°	0.05°

TSSOP16 package information


SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.20
A1	0.05	0.10	0.15
A2	0.80	1.00	1.05
A3	0.38	0.43	0.48
b	0.19	—	0.29
b1	0.16	0.22	0.26
c	0.13	—	0.15
c1	0.12	0.13	0.14
D	4.90	5.00	5.10
E	6.20	6.40	6.60
E1	4.30	4.40	4.50
e	0.65 (BSC)		
L	0.45	0.60	0.75
θ	0°	~	8°
$\theta 1$	10°	~	14°
$\theta 2$	10°	~	14°
$\theta 3$	10°	~	14°
$\theta 4$	10°	~	14°

QFN16 package information


SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.203REF		
A2	0.00	0.02	0.05
b	0.20	0.25	0.30
D	2.95	3.00	3.05
D1	1.60	1.65	1.70
e	0.50BSC		
E	2.95	3.00	3.05
E1	1.60	1.65	1.70
L	0.35	0.40	0.45

16. REVISION HISTORY

 海速芯（杭州）科技有限公司 Hitenx(hanghou)Technology co.,Ltd		Total page	12
		Rev.	V0.92
File Name	DS-HTC74HC595_EV092		
Edition number	Effective date	Summary of revised contents	
V0.90	2025/04/11	New Release	
V0.91	2025/07/09	Parameter modification	
V0.92	2025/11/17	Add QFN16 package	