

Product Specification

XBLW 74HC595D

八位串并行转换寄存器集成电路

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概述

74HC595D是8位的串并行转换寄存器，由内部的8位数据存储寄存器来实现其功能的。该存储寄存器具有并行的三态输出驱动器。

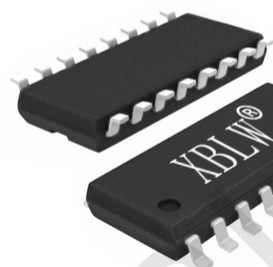
转换寄存器和存储寄存器使用各自独立的时钟。转换寄存器有清零的快捷输入端口SRCLR、串行输入端口SER和级连用的串行输入端口。转换寄存器时钟RCLK 和存储寄存器时钟SRCLK都是上升沿触发式的。如果把两个时钟相连的话，那么转换寄存器将只能比存储器提前一个时钟脉冲。

特点

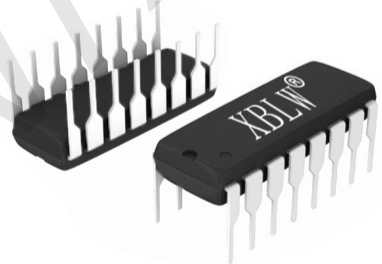
- 8 位串行输入，转换为并行输出
- 大电流的三态输出可驱动 15 个LSTTL 负载
- 可直接清除转换寄存器的内容
- 最高时钟工作频率45MHz
- 封装形式为DIP16、SOP16、TSSOP16

应用

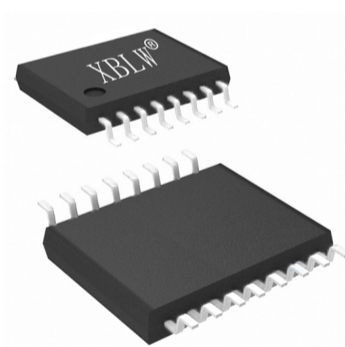
- ASIC 输入和输出运放
- 传感器接口
- 压电传感放大器
- 医疗器械
- 移动通信
- 音频输出
- 便携式系统
- 烟雾探测器、笔记本电脑、PCMCIA 卡
- 电池供电设备
- DSP 接口



SOP-16



DIP-16

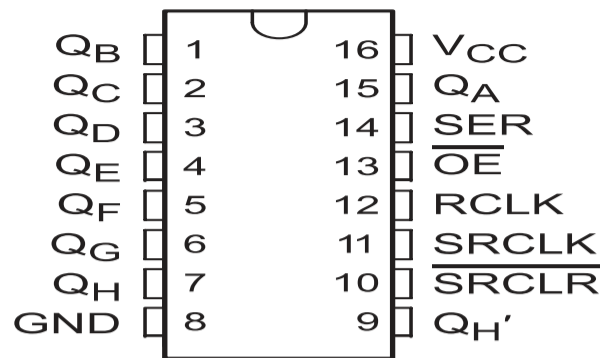


TSSOP-16

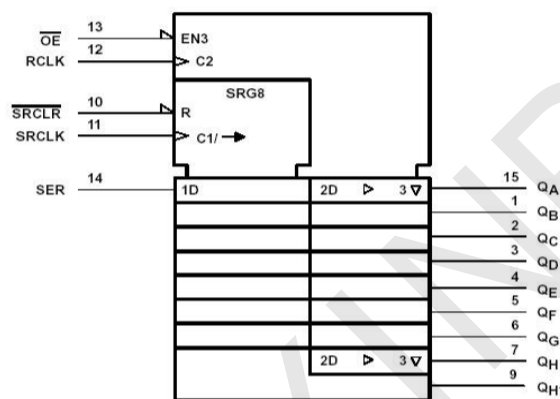
订购信息

Product Model	Package Type	Marking	Packing	Packing Qty
XBLW 74HC595N	DIP-16	74HC595DN	Tube	1000Pcs/Box
XBLW 74HC595D	SOP-16	74HC595D	Tape	2500Pcs/Reel
XBLW 74HC595DT	TSSOP-16	74HC595DT	Tape	3000Pcs/Reel

管脚图



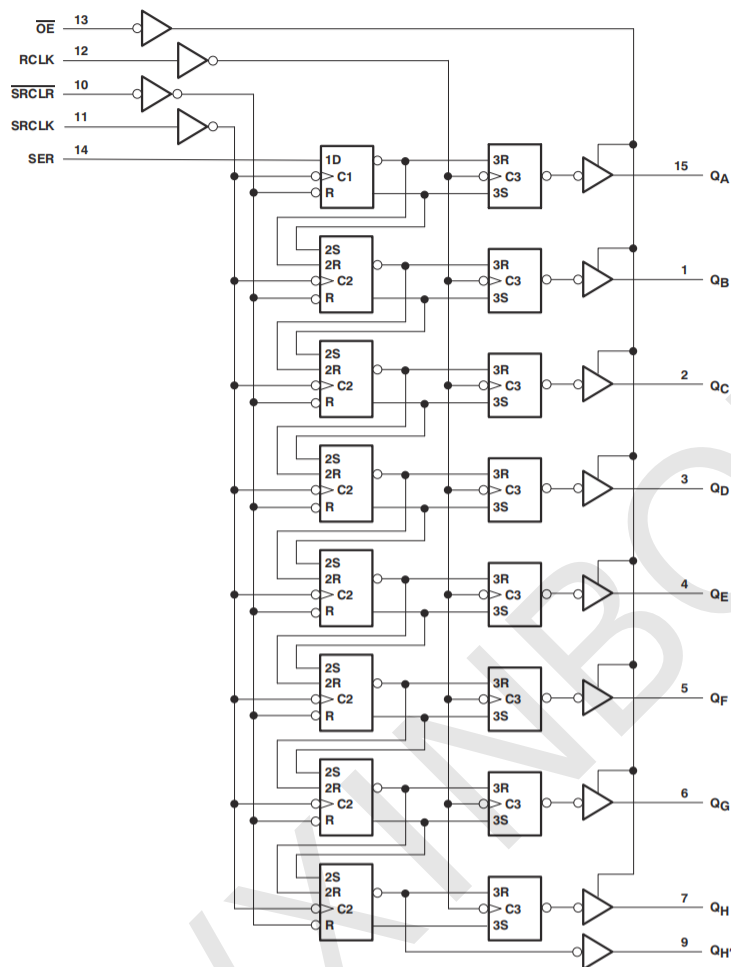
结构框图



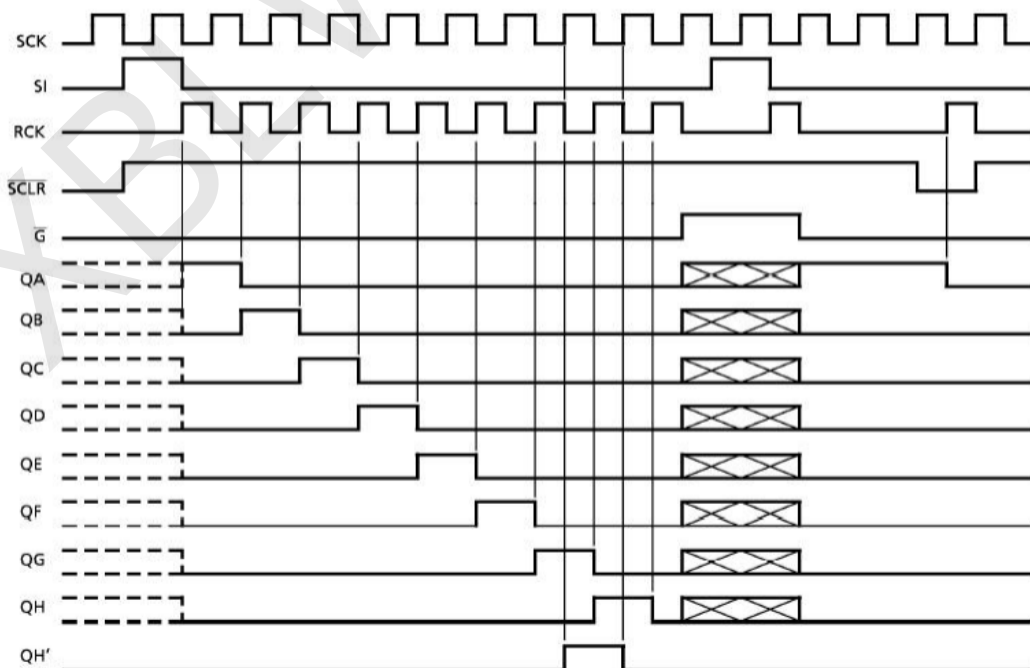
真值表

输入					功能描述
SER	SRCLK	SRCLR	RCLK	OE	
x	x	x	x	H	禁止 QA~QH 输出
x	x	x	x	L	允许 QA~QH 输出
x	x	L	x	x	转换寄存器清零
L	┐	H	x	x	转换寄存器的第一级变为“L”，其他位存储 其前一级的数据，依次类推。
H	┐	H	x	x	转换寄存器的第一级变为“H”，其他位存储 其前一级的数据，依次类推。
x	┐	H	x	x	保持转换寄存器的内容
x	x	x	┐	x	转换寄存器的内容转入存储寄存器
x	x	x	┐	x	存储寄存器状态锁存

逻辑图



波形图



极限参数(室温下)

参数	符号	数值	单位
电源电压	V_{CC}	-0.5~7	V
输入钳位电流 ($V_I < 0$ 或 $V_I > V_{CC}$)	I_{IK}	± 20	mA
输出钳位电流 ($V_I < 0$ 或 $V_I > V_{CC}$)	I_{OK}	± 20	mA
持续输出电流	I_O	± 35	mA
V_{CC} 与 GND 间持续电流	V	± 70	mA
封装热阻	θ_{JA}	113	$^{\circ}\text{C/W}$

特别要指出的是，芯片在超过上述所列的极限参数下工作的话，会导致其损坏。这只是些极限参数，各功能模块工作的实际条件将在《推荐工作参数》中列明。而且长期工作在极限参数下，会影响芯片的可靠性。

推荐工作参数

项目	符号	工作条件	最小值	典型值	最大值	单位
电源电压	V_{CC}		3	5	6	V
高电平输入电压	V_{IH}	$V_{CC}=2V$	1.5			V
		$V_{CC}=4.5V$	3.15			
		$V_{CC}=6V$	4.2			
低电平输入电压	V_{IL}	$V_{CC}=2V$	0		0.5	V
		$V_{CC}=4.5V$	0		1.35	
		$V_{CC}=6V$	0		1.8	
输入电压	V_I		0		V_{CC}	V
输出电压	V_O		0		V_{CC}	V
输入转换(上升或下降)时间	t_t	$V_{CC}=2V$	0		1000	ns
		$V_{CC}=4.5V$	0		500	
		$V_{CC}=6V$	0		400	
室外工作温度	T_A		-20		85	$^{\circ}\text{C}$

其他电参数

符号	工作条件		VCC	TA=25°C			单位
				最小值	典型值	最大值	
VOH	VI=V _{IH} or V _{IL}	I _{OH} =-20uA	2V	1.9	1.998		V
			4.5V	4.4	4.499		
			6V	5.9	5.999		
		QH', I _{OH} =-4mA	4.5V	3.98	4.3		
		QA-QH, I _{OH} =-6mA		3.98	4.3		
		QH', I _{OH} =-5.2Ma	6V	5.48	5.8		
		QA-QH, I _{OH} =-7.8mA		5.48	5.8		
VOL	VI=V _{IH} or V _{IL}	I _{OL} =20uA	2V		0.002	0.1	V
			4.5V		0.001	0.1	
			6V		0.001	0.1	
		QH', I _{OL} =4mA	4.5V		0.17	0.26	
		QA-QH, I _{OL} =6mA			0.17	0.26	
		QH', I _{OL} =5.2mA	6V		0.15	0.26	
		QA-QH, I _{OL} =7.8mA			0.15	0.26	
I _I	VI=V _{CC} or 0		6V		±0.1	±100	nA
I _{OZ}	VO=V _{CC} or 0		6V		±0.01	±0.5	uA
I _{CC}	VI=V _{CC} or 0, I _O =0		6V			8	uA
C _I			2V to 6V		3	10	pF

时序要求参数

符号	工作条件		VCC	TA=25°C		单位
				最小值	最大值	
fclock	时钟频率		2V	0	6	MHz
			4.5V	0	31	
			6V	0	36	
tW	脉冲宽度	SRCLK或RCLK为高或低电平	2V	80		ns
			4.5V	16		
			6V	14		
		SRCLR为低电平	2V	80		
			4.5V	16		
			6V	14		
t _{su}	建立时间	SER在SRCLK上升沿之前	2V	100		ns
			4.5V	20		
			6V	17		
		SRCLK上升沿在RCLK上升沿之前	2V	75		
			4.5V	15		
			6V	13		
		SRCLR低电平在RCLK上升沿之前	2V	50		
			4.5V	10		
			6V	9		
		SRCLR高电平在SRCLK上升沿之前	2V	50		
			4.5V	10		
			6V	9		
th	保持时间， SER在SRCLK上升沿之后		2V	0		ns
			4.5V	0		
			6V	0		

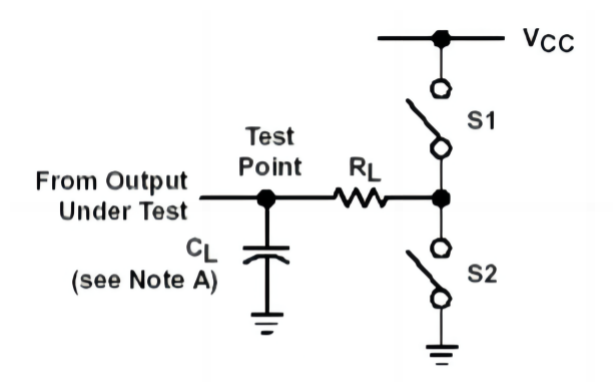
其他电参数(CL=50pF)

符号	从输入	到输出	VCC	TA=25°C			单位
				最小值	典型值	最大值	
fmax			2V	6	26		MHz
			4.5V	31	38		
			6V	36	42		
t _{pd}	SRCLK	QH'	2V		50	160	ns
			4.5V		17	32	
			6V		14	27	
	RCLK	QA-QH	2V		50	150	
			4.5V		17	30	
			6V		14	26	
t _{PHL}	SRCLR	QH'	2V		51	175	ns
			4.5V		18	35	
			6V		15	30	
t _{en}	OE	QA-QH	2V		40	150	ns
			4.5V		15	30	
			6V		13	26	
t _{dis}	OE	QA-QH	2V		42	200	ns
			4.5V		23	40	
			6V		20	34	
t _t		QA-QH	2V		28	60	ns
			4.5V		8	12	
			6V		6	10	
		QH'	2V		28	75	
			4.5V		8	15	
			6V		6	13	

其他电参数(CL=150pF)

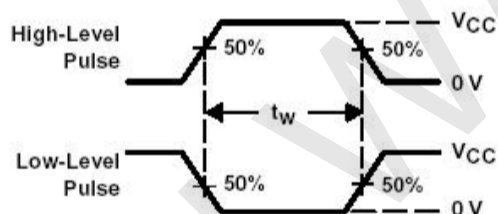
符号	从输入	到输出	VCC	TA=25°C			单位
				最小值	典型值	最大值	
t _{pd}	RCLK	QA-QH	2V		60	200	ns
			4.5V		22	40	
			6V		19	34	
t _{en}	OE	QA-QH	2V		70	200	ns
			4.5V		23	40	
			6V		19	34	
t _t		QA-QH	2V		45	210	ns
			4.5V		17	42	
			6V		13	36	

参数测量信息

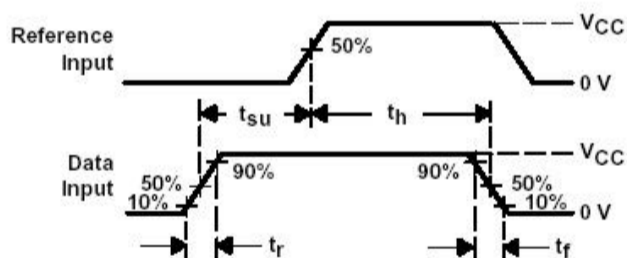


负载电路

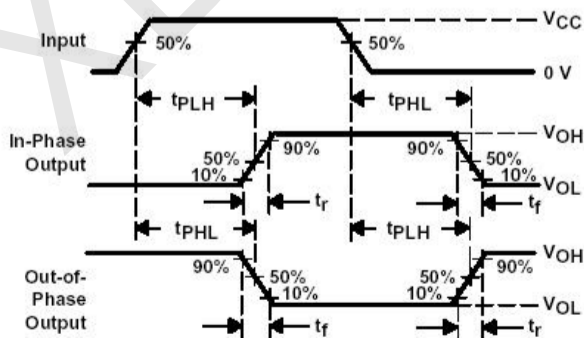
参数		RL	CL	S1	S2
ten	t _{PZH}	1kΩ	50pF 或 150pF	接通	断开
	t _{PZL}			断开	接通
t _{dis}	t _{PZH}	1kΩ	50pF	接通	断开
	t _{PZL}			断开	接通
T _{pd} 或 t _t			50pF 或 150pF	接通	断开



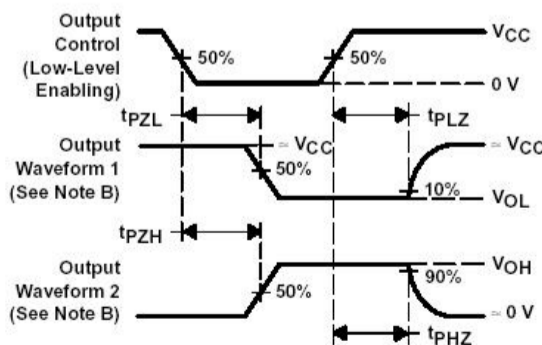
脉冲周期波形图



建立和保持及数据输入脉冲时序波形图



传输延时和输出转换时序波形图

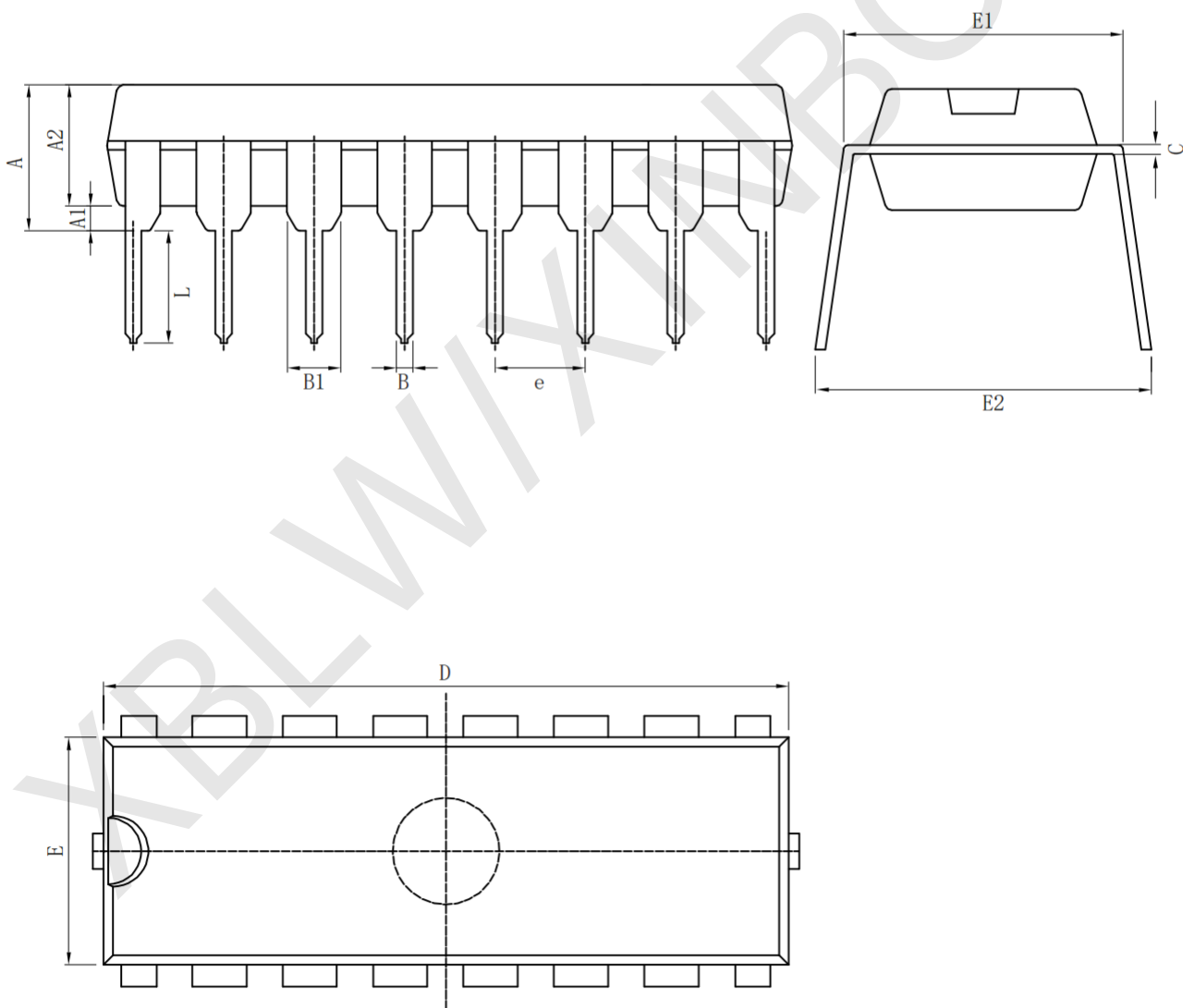


三态输出状态下的使能和禁止波形图

封装尺寸与外形图

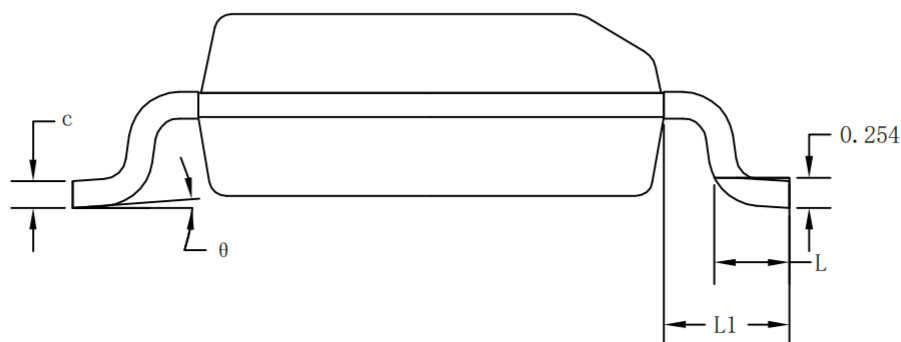
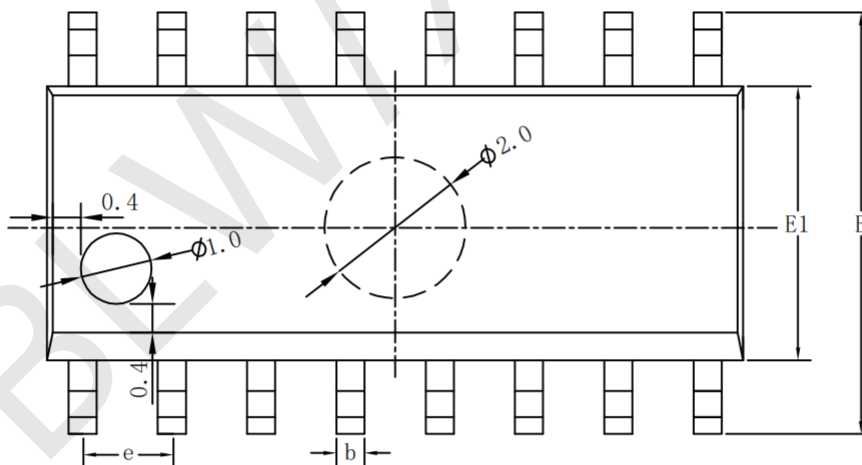
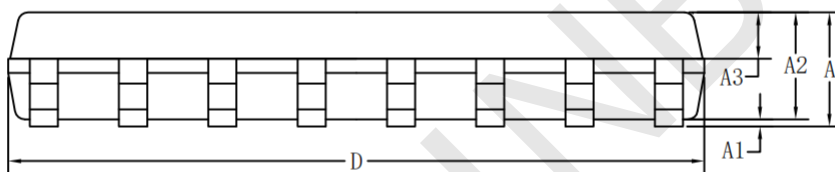
· DIP-16

Symbol	Size	Dimensions In Millimeters		Symbol	Size	Dimensions In Inches	
		Min(mm)	Max(mm)			Min(in)	Max(in)
A		3.710	4.310	A		0.146	0.170
A1		0.510		A1		0.020	
A2		3.200	3.600	A2		0.126	0.142
B		0.380	0.570	B		0.015	0.022
B1		1.524 (BSC)		B1		0.060 (BSC)	
C		0.204	0.360	C		0.008	0.014
D		18.80	19.20	D		0.740	0.756
E		6.200	6.600	E		0.244	0.260
E1		7.320	7.920	E1		0.288	0.312
e		2.540 (BSC)		e		0.100 (BSC)	
L		3.000	3.600	L		0.118	0.142
E2		8.400	9.000	E2		0.331	0.354



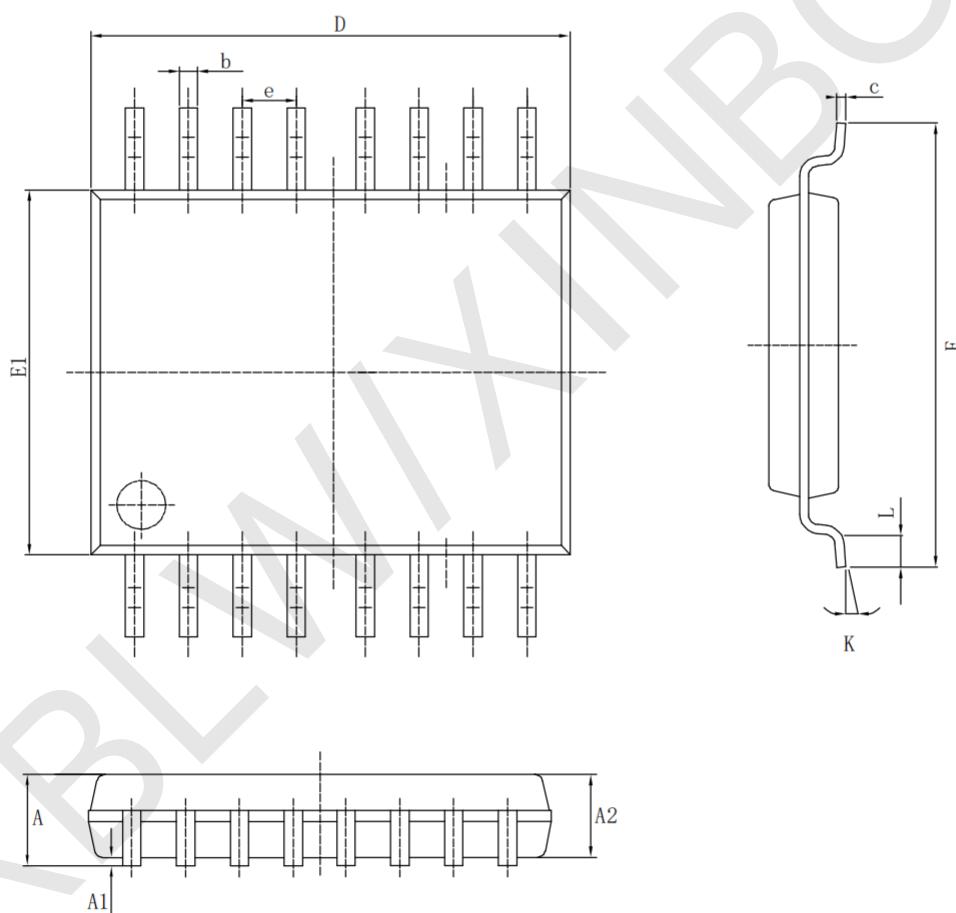
· SOP-16

Size Symbol	Dimensions In Millimeters			Size Symbol	Dimensions In Inches		
	Min (mm)	Nom (mm)	Max (mm)		Min (in)	Nom (in)	Max (in)
A	1.500	1.600	1.700	A	0.059	0.063	0.067
A1	0.100	0.150	0.250	A1	0.004	0.006	0.010
A2	1.400	1.450	1.500	A2	0.055	0.057	0.059
A3	0.600	0.650	0.700	A3	0.024	0.026	0.028
b	0.300	0.400	0.500	b	0.012	0.016	0.020
c	0.150	0.200	0.250	c	0.006	0.008	0.010
D	9.800	9.900	10.00	D	0.386	0.390	0.394
E	5.800	6.000	6.200	E	0.228	0.236	0.244
E1	3.850	3.900	3.950	E1	0.152	0.154	0.156
e	1.27 (BSC)			e	0.050 (BSC)		
L	0.500	0.600	0.700	L	0.020	0.024	0.028
L1	1.05 (BSC)			L1	0.041 (BSC)		
θ	0°	4°	8°	θ	0°	4°	8°



· TSSOP-16

Size Symbol	Dimensions In Millimeters		Size Symbol	Dimensions In Inches	
	Min(mm)	Max(mm)		Min(in)	Max(in)
A		1.200	A		0.047
A1	0.050	0.150	A1	0.002	0.006
A2	0.800	1.050	A2	0.031	0.041
b	0.190	0.300	b	0.007	0.012
c	0.090	0.200	c	0.004	0.0089
D	4.900	5.100	D	0.193	0.201
E	6.200	6.600	E	0.244	0.260
E1	4.300	4.480	E1	0.169	0.176
e	0.65 (BSC)		e	0.0256 (BSC)	
K	0°	8°	K	0°	8°
L	0.450	0.750	L	0.018	0.030



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