

Product Specification

SN74LVC2G17

2路施密特缓冲器

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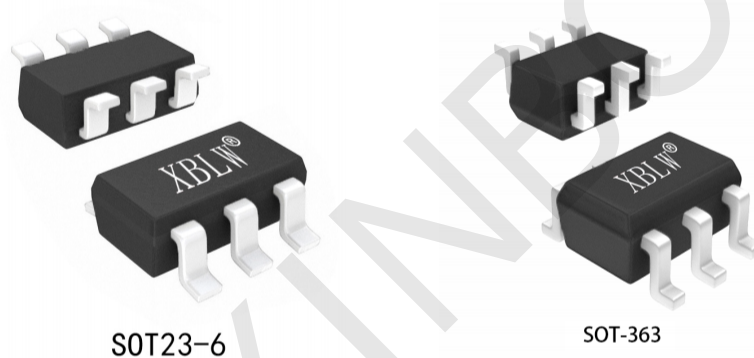


概述

SN74LVC2G17提供2路施密特缓冲器。输入兼容3.3V或5V电平，允许该电路在3.3V和5V混合的电压环境下使用。所有输入端口均有施密特触发器，使电路可兼容较慢输入上升时间与下降时间的输入信号。

其主要特点如下

- 电源电压范围：1.65V~5.5V
- 兼容5V输入
- ± 24 mA输出驱动 ($V_{CC}=3.0V$)
- CMOS低功耗
- 工作环境温度：-40℃~+125℃
- 封装形式：SOT-23-6/SOT-363



Ordering Information

Product Model	Package Type	Marking	Packing	Packing Qty
XBLW SN74LVC2G17T236	SOT23-6	BIXX	Tape	3000Pcs/Reel
XBLW SN74LVC2G17T363	SOT363	BIXX	Tape	3000Pcs/Reel

注：“XX”为可变丝印，表示封装流水号/年份批次。

功能框图

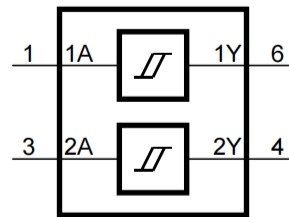


图 1 逻辑符号

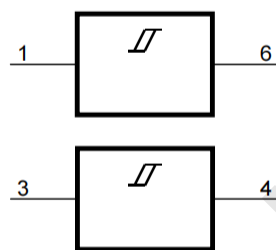


图 2 IEC 逻辑符号

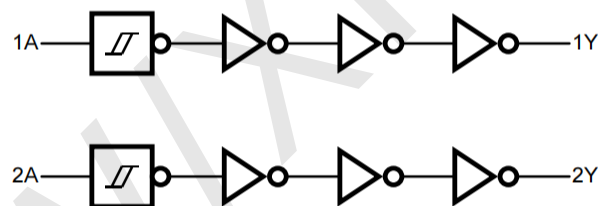
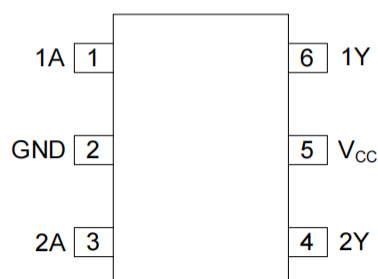


图 3 逻辑框图

引脚排列图



引脚说明

引脚	符 号	功 能
1	1A	数据输入
2	GND	地（0V）
3	2A	数据输入
4	2Y	数据输出
5	V _{CC}	电源电压
6	1Y	数据输出

功能表

输入	输出
nA	nY
L	L
H	H

注：H=高电平；L=低电平

电特性

极限参数

（除非另有规定，T_{amb}=25℃，GND=0V）

参 数 名 称	符 号	条 件	最小	最大	单 位
电源电压	V _{CC}	—	-0.5	+6.5	V
输入钳位电流	I _{IK}	V _I <0V	—	-50	mA
输入电压	V _I	—	-0.5	+6.5	V
输出钳位电流	I _{OK}	V _O <0V	—	-50	mA
输出电压	V _O	工作模式 ^[1]	-0.5	V _{CC} +0.5	V
		掉电模式 ^[1]	-0.5	+6.5	V
输出电流	I _O	V _O =0V~V _{CC}	—	±50	mA
电源电流	I _{CC}	—	—	100	mA
地电流	I _{GND}	—	—	-100	mA
总功耗	P _{tot}	—	-65	+150	mW
贮存温度	T _{stg}	—	—	300	℃
焊接温度	T _L	10 秒	260		℃

注：[1] 当 V_{CC}=0V 时（掉电模式），在正常工作下，输出电压可以为 5.5V。

推荐使用条件

参 数 名 称	符 号	条 件	最小	典型	最大	单 位
电源电压	V _{CC}	—	1.65	—	5.5	V
输入电压	V _I	—	0	—	5.5	V
输出电压	V _O	—	0	—	V _{CC}	V
工作环境温度	T _{amb}	—	-40	—	+125	℃

电气特性

直流参数 1

(除非另有规定, $T_{amb} = -40^{\circ}\text{C} \sim +85^{\circ}\text{C}$, $GND = 0V$)

参数名称	符号	测试条件		最小	典型	最大	单位
高电平输出电压	V_{OH}	$V_I = V_{T+}$ 或 V_{T-}	$I_O = -100\mu A$; $V_{CC} = 1.65V \sim 5.5V$	$V_{CC} - 0.1$	—	—	V
			$I_O = -4mA$; $V_{CC} = 1.65V$	1.2	—	—	V
			$I_O = -8mA$; $V_{CC} = 2.3V$	1.9	—	—	V
			$I_O = -12mA$; $V_{CC} = 2.7V$	2.2	—	—	V
			$I_O = -24mA$; $V_{CC} = 3.0V$	2.3	—	—	V
			$I_O = -32mA$; $V_{CC} = 4.5V$	3.8	—	—	V
低电平输出电压	V_{OL}	$V_I = V_{T+}$ 或 V_{T-}	$I_O = 100\mu A$; $V_{CC} = 1.65V \sim 5.5V$	—	—	0.10	V
			$I_O = 4mA$; $V_{CC} = 1.65V$	—	—	0.45	V
			$I_O = 8mA$; $V_{CC} = 2.3V$	—	—	0.30	V
			$I_O = 12mA$; $V_{CC} = 2.7V$	—	—	0.40	V
			$I_O = 24mA$; $V_{CC} = 3.0V$	—	—	0.55	V
			$I_O = 32mA$; $V_{CC} = 4.5V$	—	—	0.55	V
输入漏电流	I_I	$V_I = 5.5V$ 或 GND ; $V_{CC} = 5.5V$		—	—	± 1	μA
掉电漏电流	I_{OFF}	V_I 或 $V_O = 5.5V$; $V_{CC} = 0V$		—	—	± 2	μA
静态电流	I_{CC}	$V_I = V_{CC}$ 或 GND ; $I_O = 0A$; $V_{CC} = 5.5V$		—	—	4	μA
串通电流	ΔI_{CC}	$V_I = V_{CC} - 0.6V$; $I_O = 0A$; $V_{CC} = 2.3V \sim 5.5V$		—	—	500	μA
输入电容	C_I	—		—	3.5	—	pF

直流参数 2

(除非另有规定, $T_{amb} = -40^{\circ}\text{C} \sim +125^{\circ}\text{C}$, $GND = 0V$)

参数名称	符号	测试条件		最小	典型	最大	单位
高电平输出电压	V_{OH}	$V_I = V_{T+}$ 或 V_{T-}	$I_O = -100\mu A$; $V_{CC} = 1.65V \sim 5.5V$	$V_{CC} - 0.1$	—	—	V
			$I_O = -4mA$; $V_{CC} = 1.65V$	0.95	—	—	V
			$I_O = -8mA$; $V_{CC} = 2.3V$	1.7	—	—	V
			$I_O = -12mA$; $V_{CC} = 2.7V$	1.9	—	—	V
			$I_O = -24mA$; $V_{CC} = 3.0V$	2.0	—	—	V
			$I_O = -32mA$; $V_{CC} = 4.5V$	3.4	—	—	V
低电平输出电压	V_{OL}	$V_I = V_{T+}$ 或 V_{T-}	$I_O = 100\mu A$; $V_{CC} = 1.65V \sim 5.5V$	—	—	0.10	V
			$I_O = 4mA$; $V_{CC} = 1.65V$	—	—	0.70	V
			$I_O = 8mA$; $V_{CC} = 2.3V$	—	—	0.45	V
			$I_O = 12mA$; $V_{CC} = 2.7V$	—	—	0.60	V
			$I_O = 24mA$; $V_{CC} = 3.0V$	—	—	0.80	V
			$I_O = 32mA$; $V_{CC} = 4.5V$	—	—	0.80	V

输入漏电流	I_I	$V_I=5.5V$ 或GND; $V_{CC}=5.5V$	—	—	± 1	μA
掉电漏电流	I_{OFF}	V_I 或 $V_O=5.5V$; $V_{CC}=0V$	—	—	± 2	μA
静态电流	I_{CC}	$V_I=V_{CC}$ 或GND; $I_O=0A$; $V_{CC}=5.5V$			4	μA
串通电流	ΔI_{CC}	$V_I=V_{CC}-0.6V$; $I_O=0A$; $V_{CC}=2.3V \sim 5.5V$			500	μA

交流参数 1

(除非另有规定, $T_{amb}=-40^{\circ}C \sim +85^{\circ}C$, GND=0V)

参 数 名 称	符 号	测 试 条 件		最小	典型 ^[1]	最大	单 位
nA到nY的传输 延时	t _{PLH}	见图5	V _{CC} =1. 65V~1. 95V	—	14	21	ns
			V _{CC} =2. 3V~2. 7V	—	10	15	ns
			V _{CC} =2. 7V	—	9	13. 5	ns
			V _{CC} =3. 0V~3. 6V	—	8	12	ns
			V _{CC} =4. 5V~5. 5V	—	7	10. 5	ns
nA到nY的传输 延时	t _{PHL}	见图5	V _{CC} =1. 65V~1. 95V	—	12. 5	18. 8	ns
			V _{CC} =2. 3V~2. 7V	—	11	16. 5	ns
			V _{CC} =2. 7V	—	11	16. 5	ns
			V _{CC} =3. 0V~3. 6V	—	11	16. 5	ns
			V _{CC} =4. 5V~5. 5V	—	10	15	ns

注: [1] 典型值分别在 $T_{amb}=25^{\circ}C$ 和 $V_{CC}=1.8V, 2.5V, 2.7V, 3.3V$ 和 $5.0V$ 时测量。

交流参数 2

(除非另有规定, $T_{amb}=-40^{\circ}C \sim +125^{\circ}C$, GND=0V)

参 数 名 称	符 号	测 试 条 件		最小	典型	最大	单 位
nA到nY的传输 延时	t_{PLH}	见图5	$V_{CC}=1.65V\sim 1.95V$	—	—	23	ns
			$V_{CC}=2.3V\sim 2.7V$			17	ns
			$V_{CC}=2.7V$	—	—	15.5	ns
			$V_{CC}=3.0V\sim 3.6V$	—	—	14	ns
			$V_{CC}=4.5V\sim 5.5V$	—	—	12.5	ns
nA到nY的传输 延时	t_{PHL}	见图5	$V_{CC}=1.65V\sim 1.95V$	—	—	20.8	ns
			$V_{CC}=2.3V\sim 2.7V$	—	—	18.5	ns
			$V_{CC}=2.7V$	—	—	18.5	ns
			$V_{CC}=3.0V\sim 3.6V$	—	—	18.5	ns
			$V_{CC}=4.5V\sim 5.5V$	—	—	17	ns

传输参数 1

(除非另有规定, $T_{amb} = -40^{\circ}\text{C} \sim +85^{\circ}\text{C}$, $GND = 0V$)

参 数 名 称	符 号	测 试 条 件		最小	典型	最大	单 位
正阈值电压	V _{T+}	见图6和图7	V _{CC} =1. 8V	0. 82	1. 02	1. 2	V
			V _{CC} =2. 3V	1. 03	1. 25	1. 45	V
			V _{CC} =3. 0V	1. 29	1. 5	1. 71	V
			V _{CC} =4. 5V	1. 84	2. 15	2. 41	V
			V _{CC} =5. 5V	2. 19	2. 6	2. 91	V
负阈值电压	V _{T-}	见图6和图7	V _{CC} =1. 8V	0. 45	0. 6	0. 75	V
			V _{CC} =2. 3V	0. 64	0. 8	0. 96	V
			V _{CC} =3. 0V	0. 86	1. 1	1. 34	V
			V _{CC} =4. 5V	1. 35	1. 75	2. 09	V
			V _{CC} =5. 5V	1. 61	2. 15	2. 59	V
滞后电压	V _H	(V _{T+} - V _{T-}) ; 见图6和图7	V _{CC} =1. 8V	—	0. 4	—	V
			V _{CC} =2. 3V	—	0. 4	—	V
			V _{CC} =3. 0V	—	0. 42	—	V
			V _{CC} =4. 5V	—	0. 45	—	V
			V _{CC} =5. 5V	—	0. 47	—	V

传输参数 2

(除非另有规定, $T_{amb} = -40^{\circ}\text{C} \sim +125^{\circ}\text{C}$, $GND = 0V$)

参 数 名 称	符 号	测 试 条 件		最小	典型	最大	单 位
正阈值电压	V _T +	见图6和图7	V _{CC} =1. 8V	0. 79	—	1. 2	V
			V _{CC} =2. 3V	1. 00	—	1. 45	V
			V _{CC} =3. 0V	1. 26	—	1. 71	V
			V _{CC} =4. 5V	1. 81	—	2. 41	V
			V _{CC} =5. 5V	2. 16	—	2. 91	V
负阈值电压	V _T -	见图6和图7	V _{CC} =1. 8V	0. 45	—	0. 78	V
			V _{CC} =2. 3V	0. 64	—	0. 99	V
			V _{CC} =3. 0V	0. 86	—	1. 37	V
			V _{CC} =4. 5V	1. 35	—	2. 12	V
			V _{CC} =5. 5V	1. 61	—	2. 62	V
滞后电压	V _H	(V _{T+} - V _{T-}) ; 见图6和图7	V _{CC} =1. 8V	—	0. 4	—	V
			V _{CC} =2. 3V	—	0. 4	—	V
			V _{CC} =3. 0V	—	0. 42	—	V
			V _{CC} =4. 5V	—	0. 45	—	V
			V _{CC} =5. 5V	—	0. 47	—	V

测试线路

交流测试线路

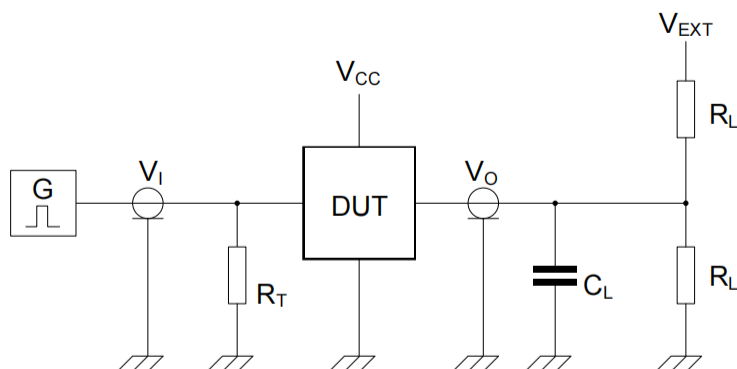


图4 测试开关时间的测试电路

测试电路的定义：

R_L = 负载电阻

C_L = 负载电容，包括探针、夹子上的电容

R_T = 终端电阻须与信号发生器的输出阻抗 Z_o 匹配

V_{EXT} = 用于测量切换时间的外部电压

交流测试波形

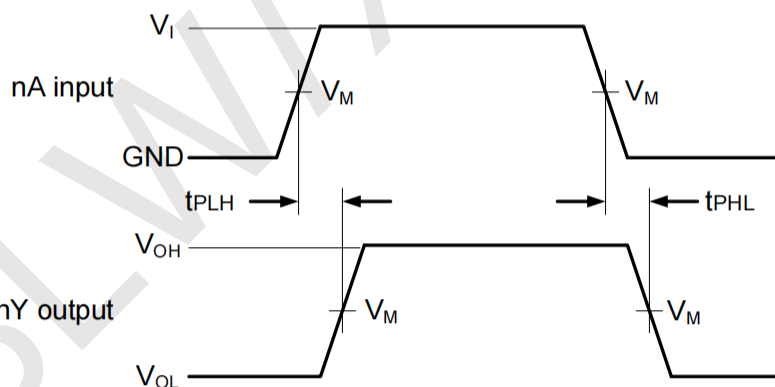


图5 输入nA到输出nY传输延迟及输出转换时间

传输特性波形

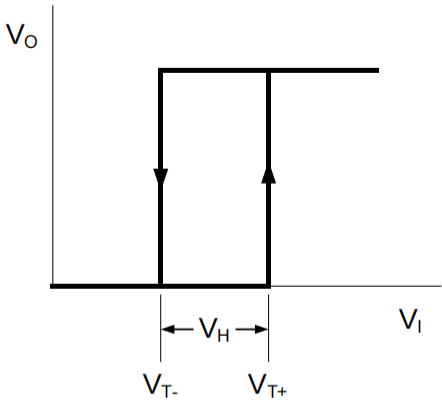


图6 传输特性

V_{T+} 和 V_{T-} 的限制为70%和20%:

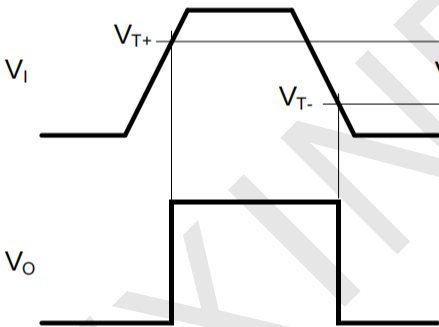


图7 V_{T+} , V_{T-} 和 V_H 的定义

测试点

电源电压	输入	输出
V_{CC}	V_M	V_M
1. 65V~1.95V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$
2. 3V~2.7V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$
2.7V	1.5V	1.5V
3. 0V~3.6V	1.5V	1.5V
4. 5V~5.5V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$

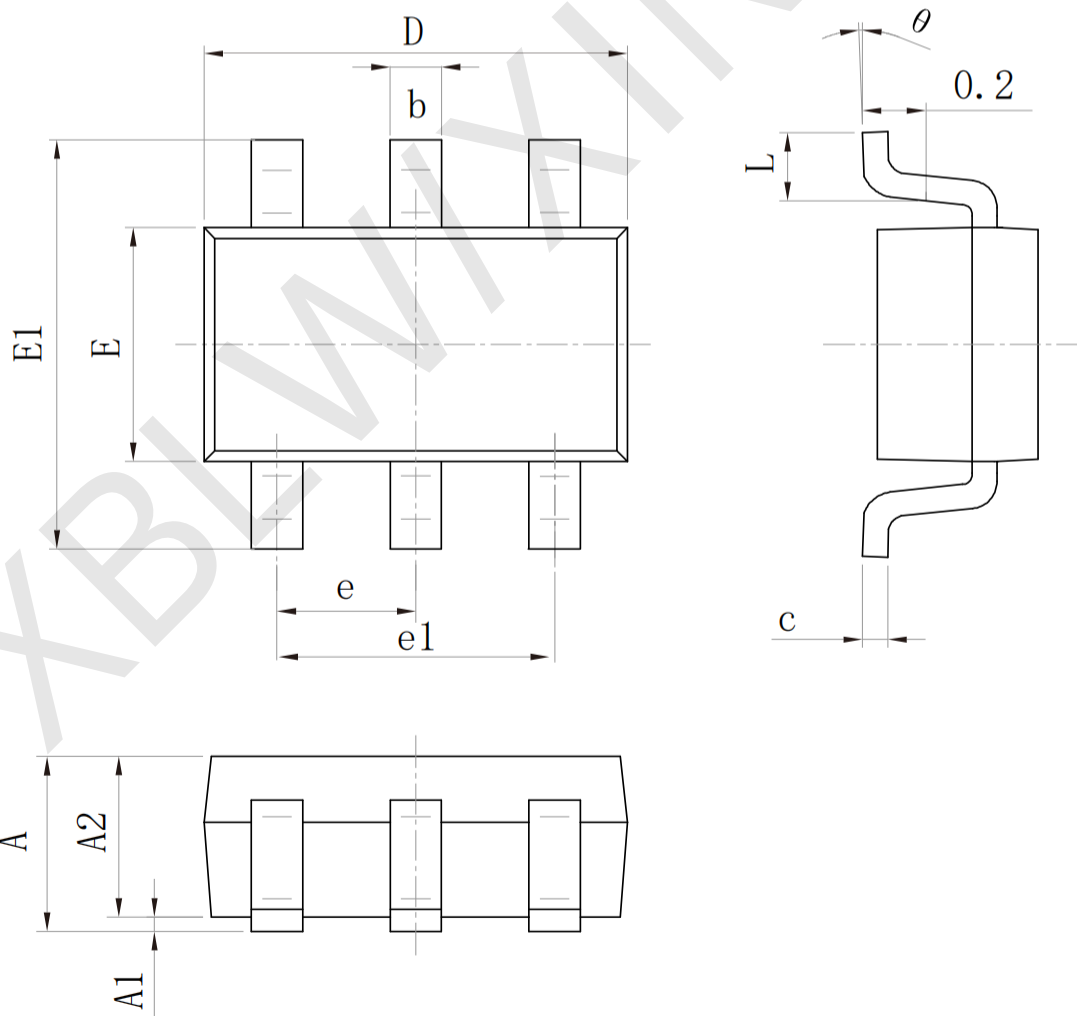
测试数据

电源电压	输入		负载		V_{EXT}
V_{CC}	V_I	$t_r=t_f$	C_L	R_L	t_{PLH} , t_{PHL}
1. 65V~1.95V	V_{CC}	$\leq 3ns$	30pF	1k Ω	open
2. 3V~2.7V	V_{CC}	$\leq 3ns$	30pF	500 Ω	open
2.7V	2.7V	$\leq 3ns$	50pF	500 Ω	open
3. 0V~3.6V	2.7V	$\leq 3ns$	50pF	500 Ω	open
4. 5V~5.5V	V_{CC}	$\leq 3ns$	50pF	500 Ω	open

Package Information

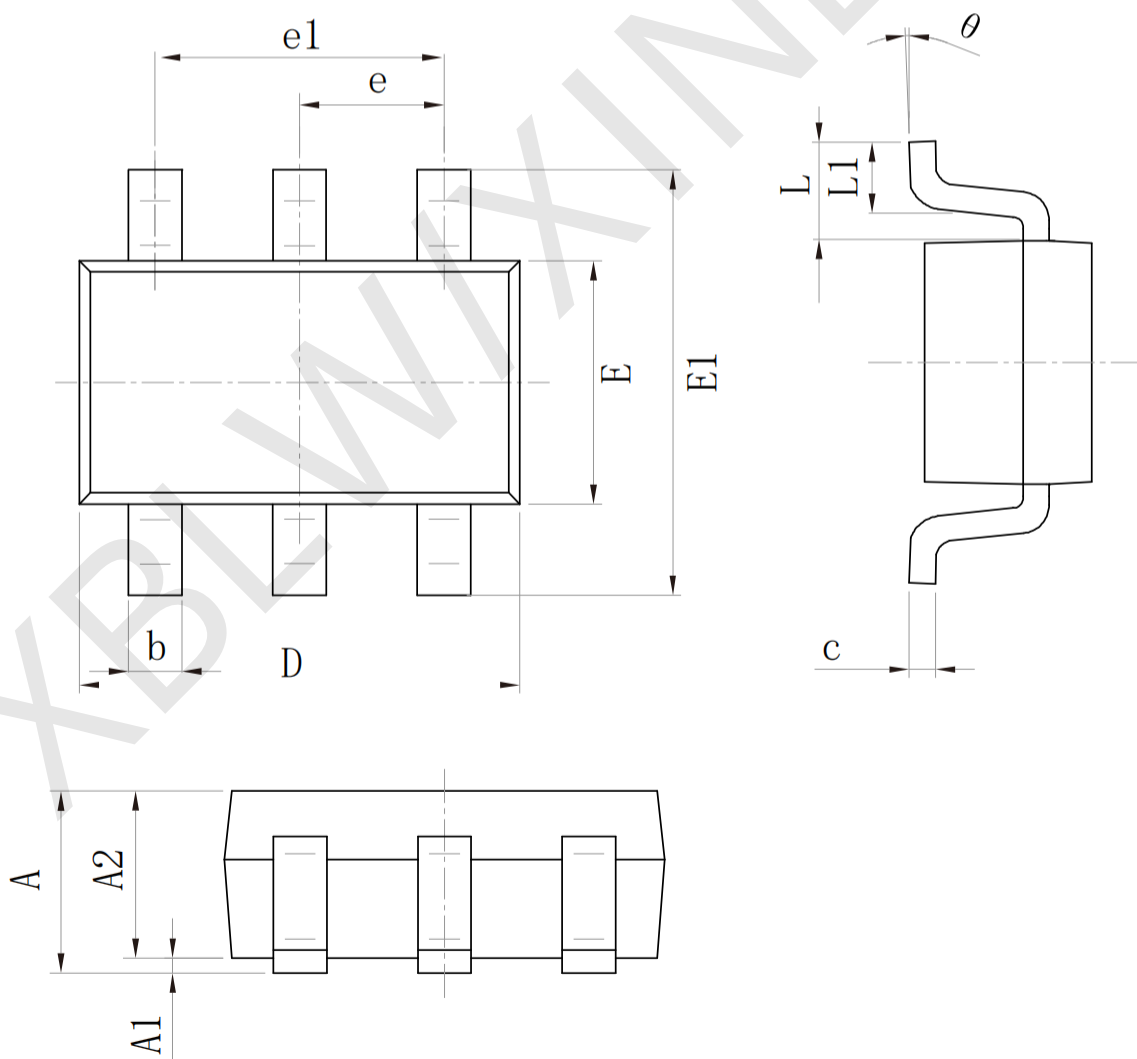
• SOT23-6

SIZE SYMBOL	Dimensions In Millimeters		SIZE SYMBOL	Dimensions In Inches	
	MIN (mm)	MAX (mm)		MIN (mm)	MAX (mm)
A	1.050	1.250	A	0.041	0.049
A1	0.000	0.100	A1	0.000	0.004
A2	1.050	1.150	A2	0.041	0.045
b	0.300	0.500	b	0.012	0.020
c	0.100	0.200	c	0.004	0.008
D	2.820	3.020	D	0.111	0.119
E	1.500	1.700	E	0.059	0.067
E1	2.650	2.950	E1	0.104	0.116
e	0.950 (BSC)		e	0.037 (BSC)	
e1	1.800	2.000	e1	0.071	0.079
L	0.300	0.600	L	0.012	0.024
θ	0°	8°	θ	0°	8°



• SOT-363

Size Symbol	Dimensions In Millimeters		Size Symbol	Dimensions In Inches	
	Min (mm)	Max (mm)		Min (in)	Max (in)
A	0.900	1.100	A	0.035	0.043
A1	0.000	0.100	A1	0.000	0.004
A2	0.900	1.000	A2	0.035	0.039
b	0.150	0.350	b	0.006	0.014
c	0.080	0.150	C	0.003	0.006
D	2.000	2.200	D	0.079	0.087
E	1.150	1.350	E	0.045	0.053
E1	2.150	2.450	E1	0.085	0.096
e	0.650 (TYP)		e	0.026 (TYP)	
e1	1.200	1.400	e1	0.047	0.055
L	0.525 (REF)		L	0.021 (REF)	
L1	0.260	0.460	L1	0.010	0.018
θ	0°	8°	θ	0°	8°



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Specification information

Version	Release Date	New/Revised Content
V1.0	2023/10	Initial Writing
V2.0	2025/05	Update Template
V2.1	2026/09	Update packaging size diagram identification