

Non-inverting 1-to-2 Demultiplexer with 3-state Deselected

General Description

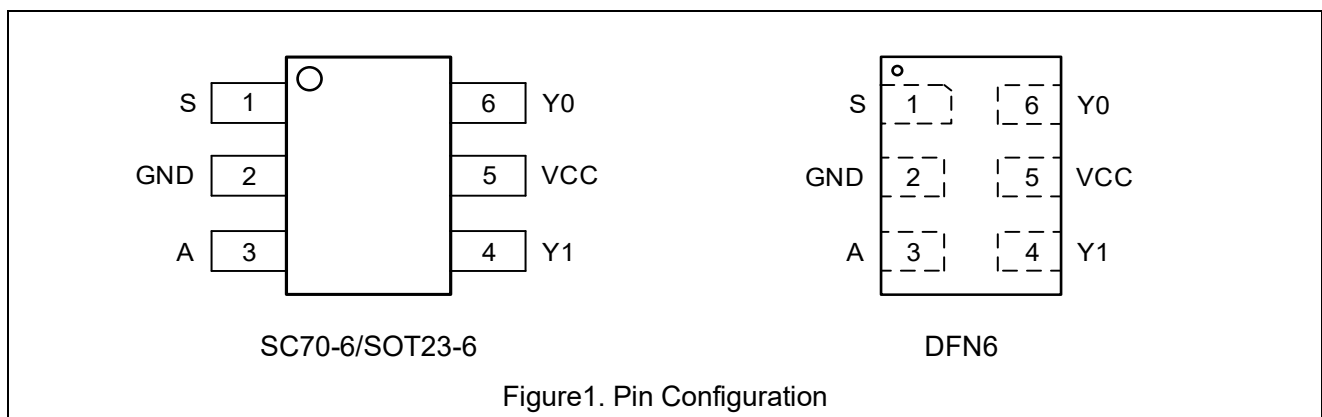
The ET74AUP1G18 is a high-performance non-inverting 1-to-2 demultiplexer. With the Select input [S] at Low, data at A is passed to Y0 and Y1 is set to high impedance. With the Select input [S] at High, data at A is passed to Y1 and Y0 is set to high impedance. The device operates over the voltage range from 0.8V to 3.6V.

Features

- Designed for 0.8V to 3.6V V_{CC} Operation
- Over-voltage Tolerant Inputs Accept Voltages to 3.6V
- $\pm 4\text{mA}$ Balanced Output Sink and Source Capability
- Near Zero Static Supply Current Substantially Reduces System Power Requirements
- These Devices are Pb-Free and RoHS Compliant
- ESD Protection Complies with JESD22 Standard
 - HBM: $\pm 4000\text{V}$ Pass (JEDEC JS-001)
 - CDM: $\pm 1000\text{V}$ Pass (JEDEC JS-002)
- Latch-up Performance Exceeds $\pm 100\text{mA}$ per JEDEC JESD78F
- Part No. and Package Information

Part No.	Package	Packing Option	MSL
ET74AUP1G18	SC70-6 (1.3mm × 2.1mm)	Tape and Reel, 3K/Reel	1
ET74AUP1G18T	SOT23-6 (1.6mm × 2.9mm)	Tape and Reel, 3K/Reel	3
ET74AUP1G18Y	DFN6 (1.0mm × 1.5mm)	Tape and Reel, 3K/Reel	1

Pin Configuration



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Pin Function

Pin No.	Pin Name	Pin Function
1	S	Demultiplexer Select
2	GND	Ground
3	A	Data Input
4	Y1	Output 2
5	VCC	Power
6	Y0	Output 1

Block Diagram

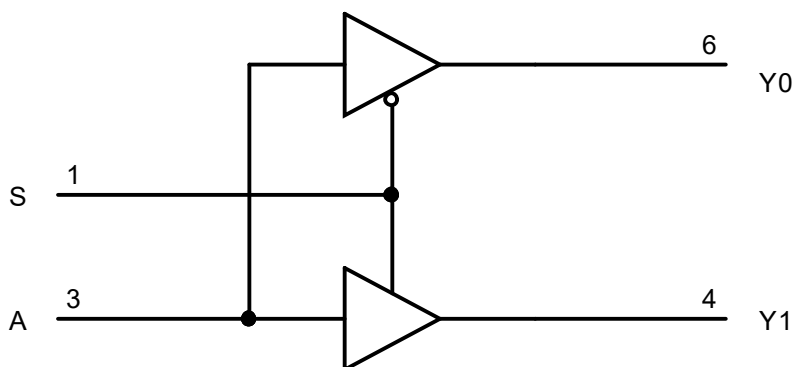


Figure2. Logic Symbol

Functional Table

Input		Output	
S	A	Y0	Y1
L	L	L	Z
L	H	H	Z
H	L	Z	L
H	H	Z	H

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Absolute Maximum Ratings

Symbol	Parameter		Value	Unit
V _{CC}	DC Supply Voltage		-0.5 to 4.6	V
V _I	DC Input Voltage ⁽¹⁾		-0.5 ≤ V _I ≤ 4.6	V
V _O	DC Output Voltage Output in Higher or Low State		-0.5 to V _{CC} + 0.5	V
I _{IK}	DC Input Diode Current, V _I < GND		-50	mA
I _{OK}	DC Output Diode Current, V _O < GND, V _O > V _{CC}		±50	mA
I _O	DC Output Sink Current		±20	mA
I _{CC}	DC Supply Current per Supply Pin		±50	mA
I _{GND}	DC Ground Current per Supply Pin		±50	mA
T _{STG}	Storage Temperature Range		-65 to 150	°C
T _L	Lead Temperature, Soldering 10 Seconds		260	°C
T _J	Max Junction Temperature		150	°C
V _{ESD}	ESD Classification	Human Body Model ⁽²⁾	±4000	V
		Charged Device Model ⁽³⁾	±1000	
I _{LU}	Max Latch up Current Above V _{CC} and GND at 85°C ⁽⁴⁾		±100	mA

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

Note1: I_O absolute maximum rating must be observed.

Note2: HBM tested per JEDEC JS-001;

Note3: CDM tested per JEDEC JS-002;

Note4: Latch up Current Maximum Rating tested per JEDEC JESD78F.

Thermal Characteristics

Symbol	Package	Ratings	Value	Unit
R _{θJA}	SC70-6	Thermal Characteristics, Thermal Resistance, Junction-to-Air	280	°C/W
	SOT23-6		180	
	DFN6		440	
P _D	SC70-6	Power Dissipation in Still Air at 85°C	230	mW
	SOT23-6		360	
	DFN6		150	

Recommended Operating Conditions

Symbol	Parameter		Min	Max	Unit
V _{CC}	DC Supply Voltage Operating		0.8	3.6	V
V _I	DC Input Voltage		0	V _{CC}	V
V _O	DC Output Voltage (High or Low State)		0	V _{CC}	V
T _A	Operating Temperature Range		-40	85	°C
t _r , t _f	Input Rise and Fall Time	V _{CC} = 0.8V to 3.6V	0	20	ns/V

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Electrical Characteristics

DC Electrical Characteristics

Symbol	Parameter	Condition	V _{CC} (V)	T _A = 25°C			-40°C ≤ T _A ≤ 85°C		Unit
				Min	Typ	Max	Min	Max	
V _{IH}	High-Level Input Voltage		0.8	0.75V _{CC}			0.75V _{CC}		V
			0.9~1.95	0.7V _{CC}			0.7V _{CC}		
			2.3~2.7	1.6			1.6		
			3.0~3.6	2.0			2.0		
V _{IL}	Low-Level Input Voltage		0.8			0.25V _{CC}		0.25V _{CC}	V
			0.9~1.95			0.3V _{CC}		0.3V _{CC}	
			2.3~2.7			0.7		0.7	
			3.0~3.6			0.9		0.9	
V _{OH}	High-Level Output Voltage	I _{OH} = -20uA	0.8~3.6	V _{CC} - 0.1			V _{CC} - 0.1		V
		I _{OH} = -1.1mA	1.1	0.82	1.02		0.77		
		I _{OH} = -1.7mA	1.4	1.11	1.32		1.03		
		I _{OH} = -1.9mA	1.65	1.32	1.58		1.30		
		I _{OH} = -2.3mA	2.3	2.05	2.24		1.97		
		I _{OH} = -3.1mA		1.9	2.22		1.85		
		I _{OH} = -2.7mA	3.0	2.72	2.95		2.67		
		I _{OH} = -4.0mA		2.6	2.92		2.55		
V _{OL}	Low-Level Output Voltage	I _{OL} = 20uA	0.8~3.6			0.1		0.1	V
		I _{OL} = 1.1mA	1.1		0.11	0.33		0.33	
		I _{OL} = 1.7mA	1.4		0.12	0.31		0.37	
		I _{OL} = 1.9mA	1.65		0.11	0.31		0.35	
		I _{OL} = 2.3mA	2.3		0.14	0.31		0.33	
		I _{OL} = 3.1mA			0.19	0.44		0.45	
		I _{OL} = 2.7mA	3.0		0.11	0.31		0.33	
		I _{OL} = 4.0mA			0.16	0.44		0.45	
I _{IN}	Input Leakage Current	V _I = V _{CC} or GND	0~3.6			±0.1		±0.2	uA
I _{OFF}	Power Off Leakage Current	V _I = 3.6V or V _O = 3.6V	0			±0.2		±0.5	uA
I _{CC}	Quiescent Supply Current	V _I = 3.6V or GND	3.6			±0.2		±0.7	uA
ΔI _{CC}	Additional Quiescent Supply Current	V _I = 2.7V	3.3			60		90	uA

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AC Electrical Characteristics

$t_r = t_f = 3\text{ns}$

Symbol	Parameter	Condition	V _{CC} (V)	T _A = 25°C			-40°C ≤ T _A ≤ 85°C		Unit
				Min	Typ	Max	Min	Max	
t _{PLH} , t _{PHL}	Propagation Delay (xA to xY; See Figure 3 & 4)	C _L = 15pF ⁽⁵⁾	0.8	15.3	32.5	106	13.8	259	ns
			1.2 ± 0.1	5.8	8.9	16.3	5.3	16.3	
			1.5 ± 0.1	4.0	5.6	10.1	3.5	10.9	
			1.8 ± 0.1	3.1	4.2	7.8	2.6	8.6	
			2.5 ± 0.2	2.1	2.8	5.8	1.8	6.4	
			3.3 ± 0.3	1.7	2.2	4.9	1.4	5.4	
		C _L = 30pF ⁽⁵⁾	0.8	18.3	37.5	130	16.6	323	ns
			1.2 ± 0.1	7.0	10.7	19.3	6.4	19.3	
			1.5 ± 0.1	4.8	6.9	12.0	4.2	12.9	
			1.8 ± 0.1	3.7	5.1	9.2	3.2	10.2	
			2.5 ± 0.2	2.6	3.5	6.7	2.2	7.5	
			3.3 ± 0.3	2.0	2.2	5.6	1.7	6.3	
t _{PZL} , t _{PZH}	Output Enable Time (xOE to xY; See Figure 5 & 6)	C _L = 15pF ⁽⁵⁾	0.8		32.4	108.7		242.5	ns
			1.2 ± 0.1		9.2	14.1		14.4	
			1.5 ± 0.1		6.0	8.5		9.5	
			1.8 ± 0.1		4.6	6.1		7.3	
			2.5 ± 0.2		3.1	3.9		4.9	
			3.3 ± 0.3		2.4	2.9		3.8	
		C _L = 30pF ⁽⁵⁾	0.8		40.8	149.6		305.9	ns
			1.2 ± 0.1		11.2	17.2		17.7	
			1.5 ± 0.1		7.4	10.3		11.7	
			1.8 ± 0.1		5.6	7.5		9.0	
			2.5 ± 0.2		3.9	4.9		6.2	
			3.3 ± 0.3		3.1	3.7		4.8	
t _{PLZ} , t _{PHZ}	Output Disable Time (xOE to xY; See Figure 5 & 6)	C _L = 15pF ⁽⁵⁾	0.8		24.3	58.6		142.3	ns
			1.2 ± 0.1		10.2	12.6		12.9	
			1.5 ± 0.1		7.8	8.9		9.6	
			1.8 ± 0.1		7.7	8.5		9.2	
			2.5 ± 0.2		5.9	6.3		6.9	
			3.3 ± 0.3		6.9	7.1		7.6	
		C _L = 30pF ⁽⁵⁾	0.8		29.8	65.1		160.3	ns
			1.2 ± 0.1		13.6	16.0		16.3	
			1.5 ± 0.1		10.5	11.6		12.3	
			1.8 ± 0.1		11.2	11.9		12.6	
			2.5 ± 0.2		8.4	8.8		9.3	
			3.3 ± 0.3		10.7	10.9		11.4	

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Capacitance Characteristics

Symbol	Parameter	Condition		Typ	Unit
C _I	Input Capacitance	V _{CC} = 3.6V, V _I = 0V or V _{CC}		2	pF
C _O	Output Capacitance	V _{CC} = 0V, V _O = GND		3	pF
C _{PD}	Power Dissipation Capacitance ⁽⁵⁾	1MHz, V _I = 0V to V _{CC}	V _{CC} = 0.8V	7.6	pF
			V _{CC} = 1.2V	8.1	
			V _{CC} = 1.5V	8.5	
			V _{CC} = 1.8V	8.6	
			V _{CC} = 2.5V	9.0	
			V _{CC} = 3.3V	9.6	

Note5: C_{PD} is used to determine the dynamic power dissipation (P_D in μW).

$$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o) \text{ where:}$$

f_i = input frequency in MHz;

f_o = output frequency in MHz;

C_L = output load capacitance in pF;

V_{CC} = supply voltage in V;

N = number of inputs switching;

$\Sigma(C_L \times V_{CC}^2 \times f_o)$ = sum of outputs.

AC Test Circuit

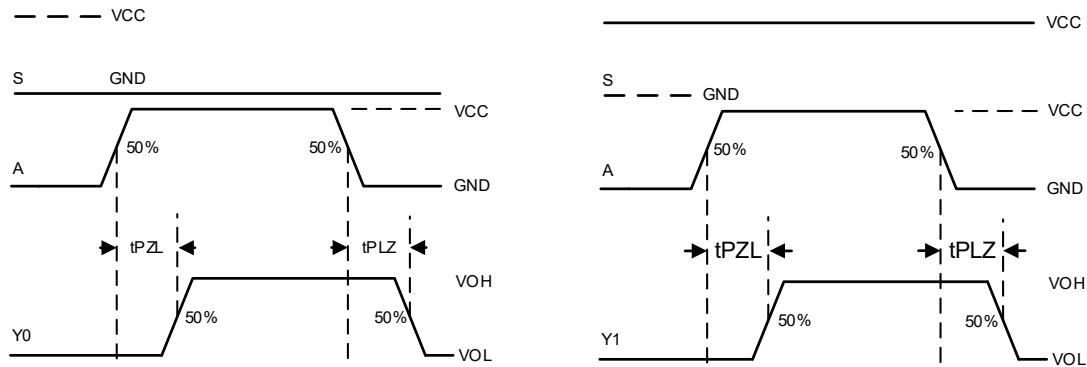


Figure3. Switching Waveform

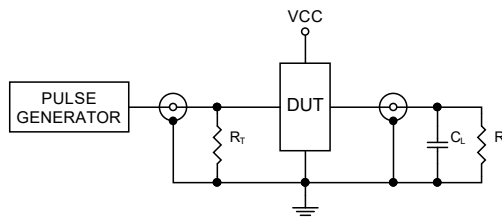


Figure4. Test Circuit $R_T = 50\Omega(\text{typ})$

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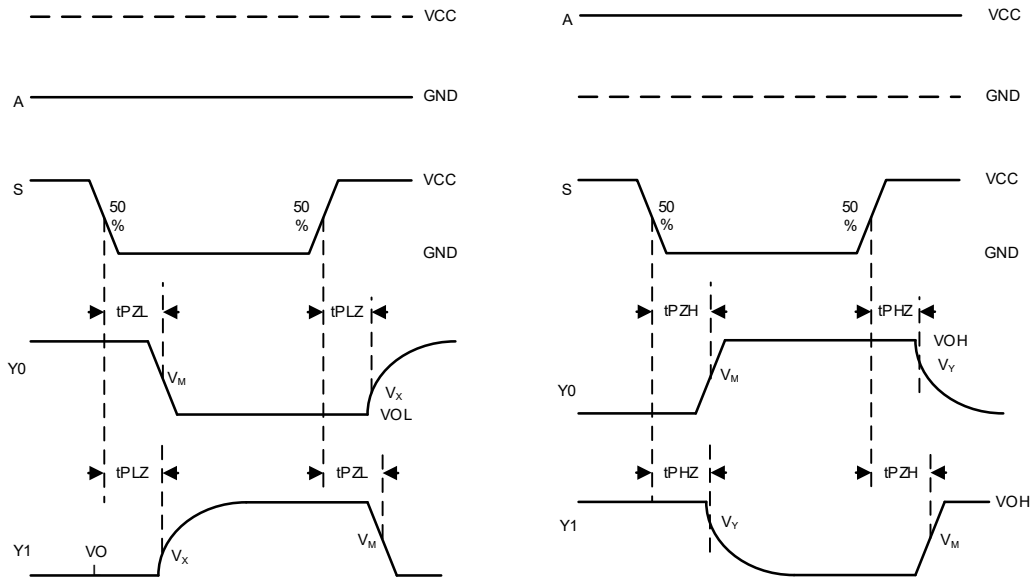


Figure5. Output Enable/Disable Waveform

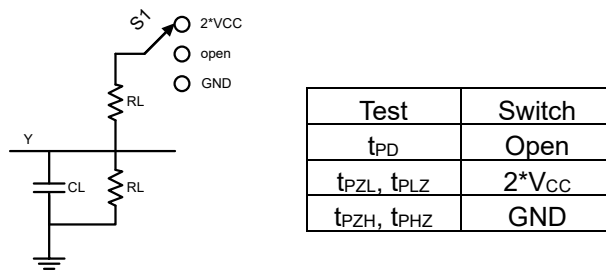


Figure6. Output Enable/Disable Time Test Circuit

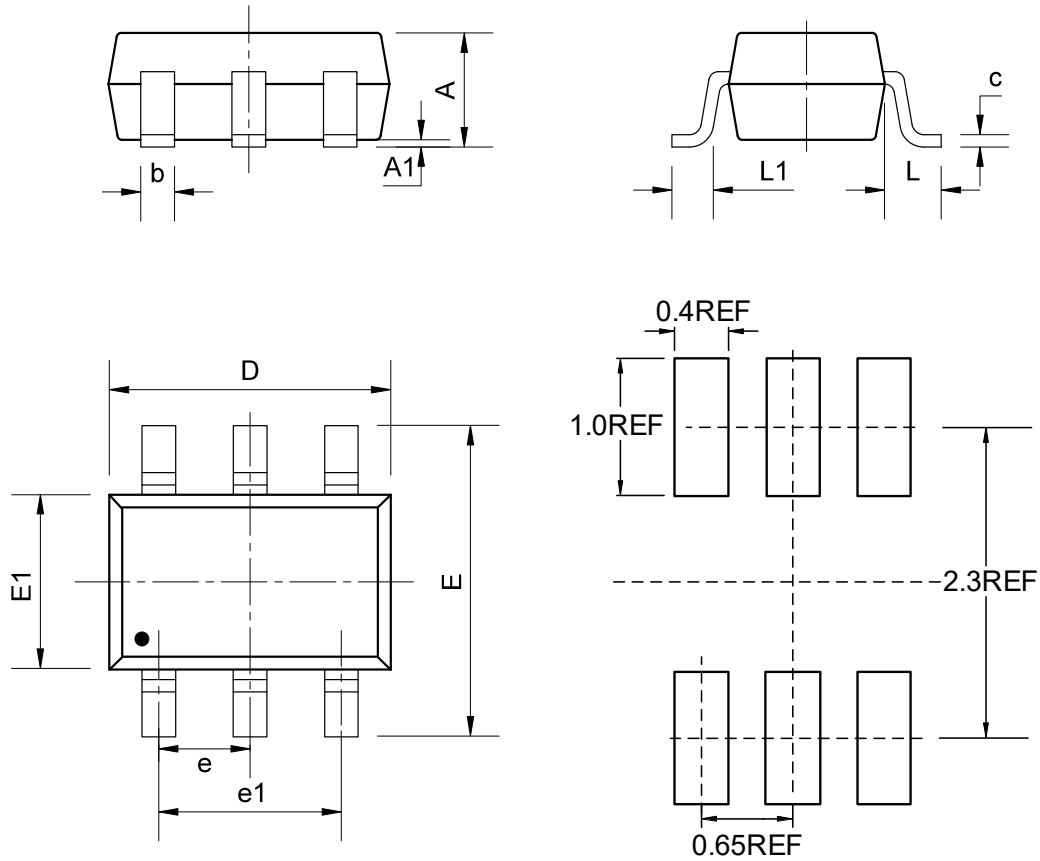
Table1. Measurement Points

Supply Voltage	Input	Output		
V_{CC}	V_M	V_M	V_X	V_Y
0.8V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.1V$	$V_{OH} - 0.1V$
$1.2V \pm 0.1V$	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.1V$	$V_{OH} - 0.1V$
$1.5V \pm 0.1V$	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.1V$	$V_{OH} - 0.1V$
$1.8V \pm 0.1V$	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.15V$	$V_{OH} - 0.15V$
$2.5V \pm 0.2V$	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.15V$	$V_{OH} - 0.15V$
$3.3V \pm 0.3V$	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.3V$	$V_{OH} - 0.3V$

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Package Dimension

SC70-6 (1.3mm × 2.1mm)



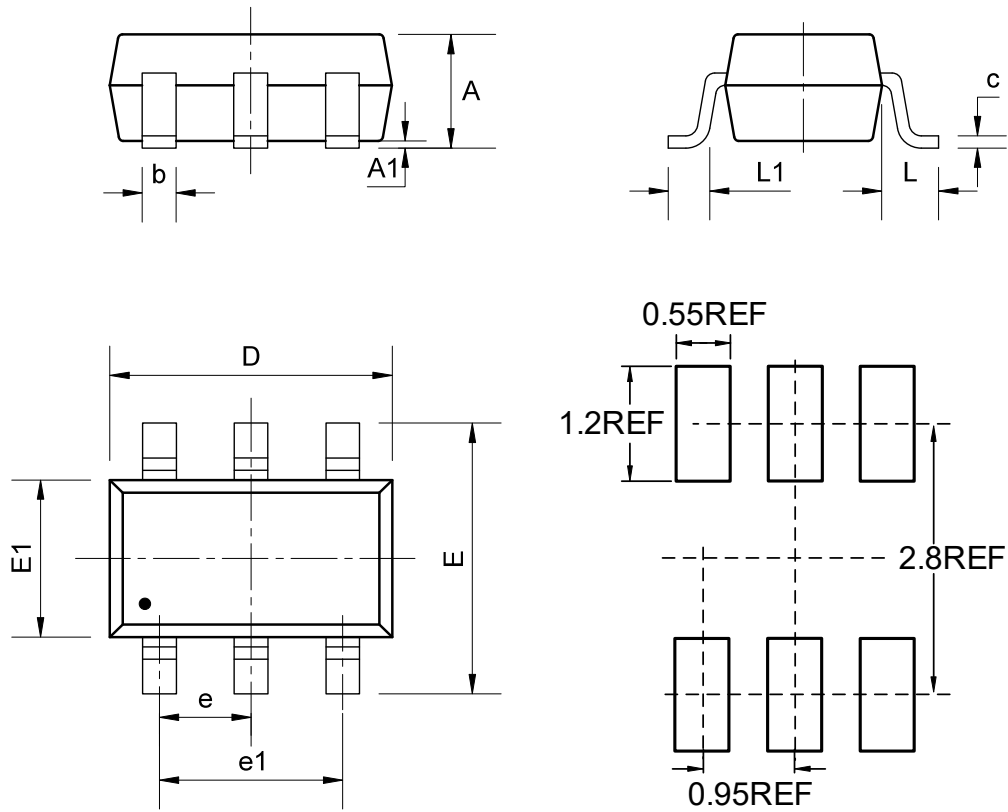
COMMON DIMENSIONS

(Unit: mm)

SYMBOL	MIN	NOM	MAX
A	-	-	1.10
A1	0.00	-	0.15
b	0.15	-	0.35
c	0.08	-	0.20
D	2.00	2.10	2.30
e	0.65BSC		
e1	1.30BSC		
E	2.15	2.30	2.50
E1	1.15	1.30	1.45
L	0.50REF		
L1	0.33REF		

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SOT23-6 (1.6mm × 2.9mm)



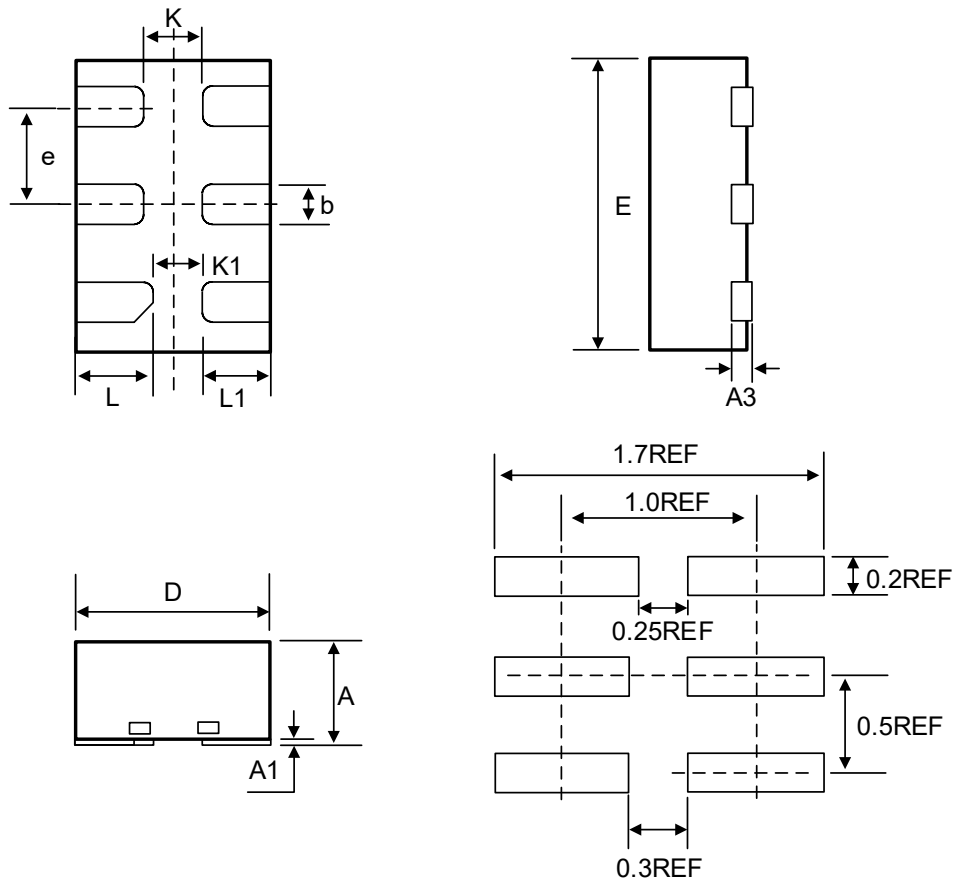
COMMON DIMENSIONS

(Unit: mm)

SYMBOL	MIN	NOM	MAX
A	-	-	1.45
A1	0.00	-	0.15
b	0.28	0.35	0.50
c	0.08	0.15	0.22
D	2.75	2.9	3.05
e	0.90	0.95	1.00
e1	1.80	1.90	2.00
E	2.60	2.80	3.00
E1	1.45	1.6	1.75
L	0.60REF		
L1	0.30	0.45	0.60

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DFN6 (1.0mm × 1.5mm)



COMMON DIMENSIONS

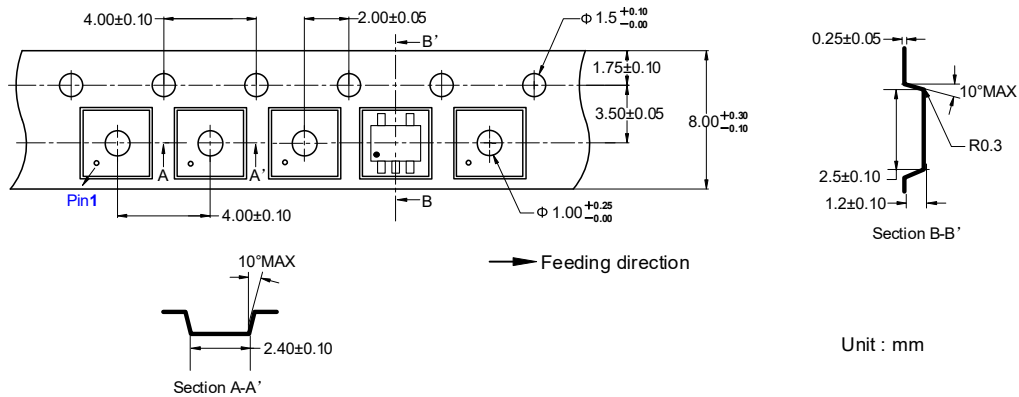
(Unit: mm)

SYMBOL	MIN	NOM	MAX
A	0.50	--	0.60
A1	0.00	0.02	0.05
A3	0.10REF		
b	0.15	0.20	0.25
D	0.90	1.00	1.10
E	1.40	1.50	1.60
e	0.50BSC		
K	0.30REF		
K1	0.25REF		
L	0.35	0.40	0.45
L1	0.30	0.35	0.40

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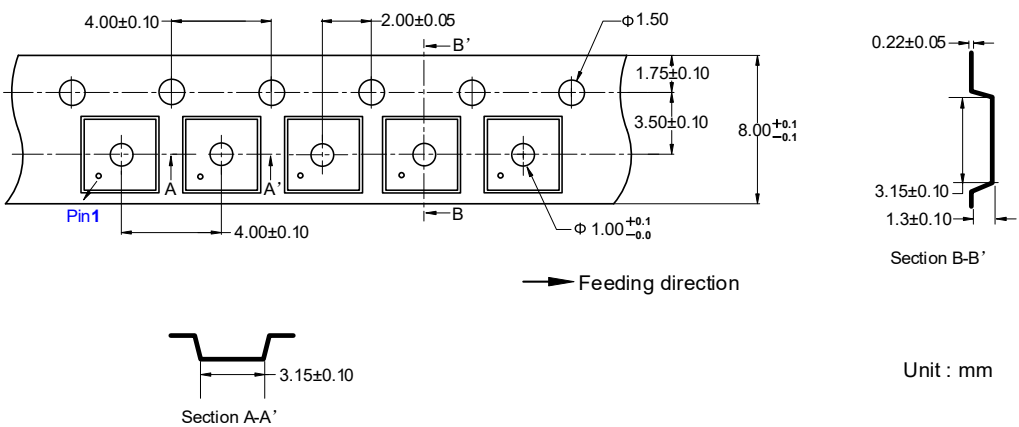
Tape Information

SC70-6 (1.3mm x 2.1mm)



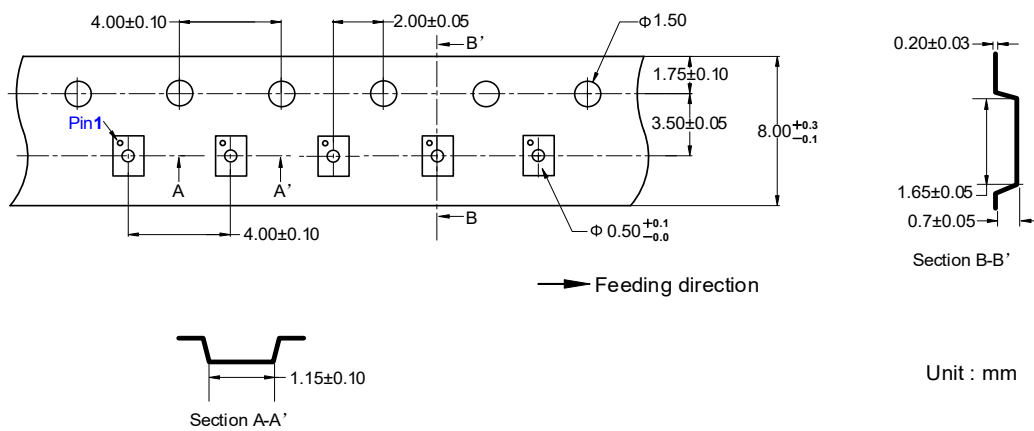
Unit : mm

SOT23-6 (1.6mm × 2.9mm)



Unit : mm

DFN6 (1.0mm × 1.5mm)



Unit : mm

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Marking Information

1U18X ● ET74AUP1G18 1U18 = Part Number X = Tracking Number	U118 XXXXX ● ET74AUP1G18T U118 = Part Number XXXXX = Tracking Number
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Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1.0	2026-04-08	Official Version	Xu tao	Yang xiaoxu	Liu jiaying