DESCRIPTION

A6303B series is a group of positive voltage output, low power consumption, low dropout voltage regulator.

A6303B can provide output value in the range of 1.0V~4.5V every 0.1V step. It also can be customized on command.

A6303B includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module with discharge capability.

A6303B has excellent load and line transient response and good temperature characteristics, which can assure the stability of chip and power system. And it uses trimming technique to guarantee output voltage accuracy within ±2%.

The A6303B is available in TSOT-23, SOT-25 and DFN4(1x1) packages.

ORDERING INFORMATION

| Package Type		Part Number
TSOT-23 SPQ: 3,000pcs/Reel	TE3	A6303BTE3R-XX
		A6303BTE3VR-XX
SOT-25 SPQ: 3,000pcs/Reel	E5	A6303BE5R-XXZ
		A6303BE5VR-XXZ
DFN4(1x1) SPQ: 5,000pcs/Reel	J4	A6303BJ4R-XX
		A6303BJ4VR-XX
Note	XX: Output Voltage Z: Pin Type (See Pin Description) V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

FEATURES

- Low Power Consumption: 50μA (Typ.)
- Low output noise (47μV$_{RMS}$)
- Standby Mode: 0.1μA
- Low dropout Voltage:
  210mV@I$_{OUT}$=300mA,V$_{OUT}$=3V
- High Ripple Rejection: 68dB@1kHz (Typ.)
- Low Temperature Coefficient: ±100ppm/°C
- Excellent Line regulation: 0.05%/V
- Build-in chip enable and discharge circuit
- Output Voltage Range: 1.0V~4.5V (customized on command every 0.1V step)
- Highly Accurate: ±2%
- Output Current Limit
- Available in TSOT-23, SOT-25 and DFN4(1x1) packages

APPLICATION

- Power source for cellular phones and various kind of PCSs
- Battery Powered equipment
- Power Management of MP3, PDA, DSC, Mouse, PS2 Games
- Reference Voltage Source
- Regulation after Switching Power

TYPICAL APPLICATION
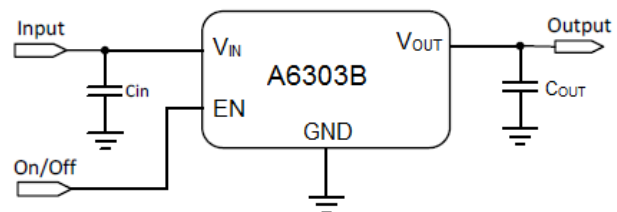
NOTE: Input capacitor (C$_{IN}$=1uF) and Output capacitor (C$_{OUT}$=1uF) are recommended in all application circuit.

PIN DESCRIPTION

| VIN | EN | A6303B TSOT-23 Top View | A6303B DFN4 (1x1) Top View |

Top View — A6303B TSOT-23 (Pins: 3 = VIN, 1 = GND, 2 = VOUT)

Top View — A6303B DFN4 (1x1) (Pins: 4 = VIN, 3 = EN, 1 = VOUT, 2 = GND)

Top View — A6303B-A SOT-25 (Pins: 5 = VOUT, 4 = NC, 1 = VIN, 2 = GND, 3 = EN)

Top View — A6303B-B SOT-25 (Pins: 5 = EN, 4 = NC, 1 = GND, 2 = VIN, 3 = VOUT)

Pin #				Symbol	Function
TSOT-23	SOT-25		DFN4(1x1)		
	Type A	Type B			
1	2	1	2	GND	Ground Pin
2	5	3	1	VOUT	Output Voltage
3	1	2	4	VIN	Supply Voltage Input
-	3	5	3	EN	Chip Enable
-	4	4	-	NC	No Connection
-	-	-	Thermal Pad: GND	PG	Thermal Pad Ground

ABSOLUTE MAXIMUM RATINGS

Max Input Voltage		8V
T_J, Operating Junction Temperature		150°C
Output Current		300mA
T_A, Ambient Temperature		-40°C ~85°C
θ_{JA}, Package Thermal Resistance	SOT-25	220°C/W
Power Dissipation	TSOT-23	250mW
	SOT-25	250mW
	DFN4(1x1)	600mW
T_S, Storage Temperature		-40°C~150°C
Lead Temperature & Time		260°C,10S

Stress beyond above listed "Absolute Maximum Ratings" may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

NOTE1: Heat Sink Area of PCB for DFN4(1x1) is recommended at least 2.5mmx4mm.

NOTE2: Package Thermal Resistance value can be affected by PCB design, outside radiator, ambient airflow, operating power, it just shows for reference.

RECOMMENDED OPERATING CONDITIONS

Parameter	Min.	Max.	Unit
Input Voltage Range	1.5	6	V
Ambient Temperature	-40	85	°C

ELECTRICAL CHARACTERISTICS

Test Conditions: C_{IN}=1uF, C_{OUT}=1uF, T_A=25°C, unless otherwise specified.

A6303B, For Arbitrary Output Voltage

Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Voltage		V_{IN}		1.5 NOTE3	-	6	V
Output Voltage	V_{OUT}>1.5V	V_{OUT}	V_{IN}=Set Vout+1V 1mA≤I_{OUT}≤30mA	V_{OUT} x0.98	V_{OUT}	V_{OUT} X1.02	V
	V_{OUT}<=1.5V			V_{OUT} -0.03		V_{OUT} +0.03	
Maximum Output Current		I_{OUT} (Max.)	V_{IN}-V_{OUT}=1V	300	-	-	mA
Dropout Voltage, V_{OUT}=3V		V_{DROP}NOTE4	I_{OUT}=200mA	-	135	250	mV
			I_{OUT}=300mA	-	210	350	
Line Regulation		$\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	I_{OUT}=10mA 1.8V≤V_{IN}≤6V	-	0.05	0.2	%/V
Load Regulation		ΔV_{OUT} / ΔI_{OUT}	V_{IN}=Set V_{OUT}+1V 1mA≤I_{OUT}≤300mA	-	50	80	mV
Supply Current		I_{SS}	V_{IN}=Set V_{OUT}+1V	-	50	120	µA
Supply Current (Standby)		$I_{STANDBY}$	V_{IN}=Set V_{OUT}+1V V_{EN}=GND	-	0.1	1.0	µA
Output Voltage Temperature Coefficient		$\dfrac{\Delta V_{OUT}}{\Delta T \times V_{OUT}}$	I_{OUT}=30mA	-	±100	-	ppm/°C
Ripple Rejection		PSRR	f=1kHz, Ripple=0.5Vp-p V_{IN}=Set V_{OUT}+1V	-	68	-	dB
Current Limit		I_{LIM}	V_{IN}=5V, V_{OUT}=3V	-	1	-	A
Discharge Resistor		$R_{DISCHARGE}$	EN=0, V_{OUT}=3.0V	-	150	-	ohm
EN Input Voltage "H"		V_{ENH}		0.95	-	V_{IN}	V
EN Input Voltage "L"		V_{ENL}		0	-	0.25	V
Output Noise		en	BW=10Hz~100kHz	-	47	-	uVrms

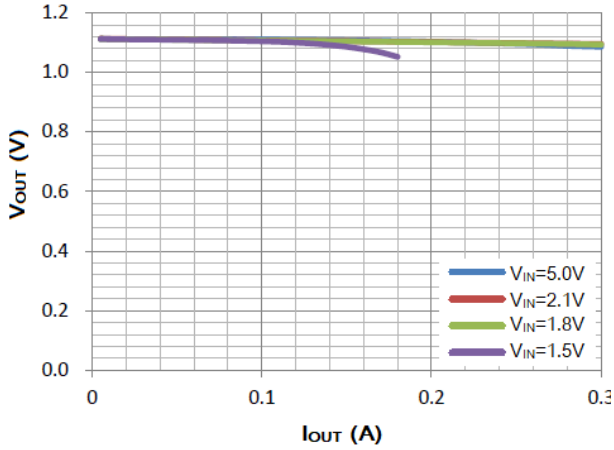NOTE3: I_{OUT}=100mA @V_{OUT}=1.0V - 1.2V

NOTE4: V_{DROP}=V_{IN1}-(V_{OUT2}*0.98) V_{OUT2} is the output voltage when V_{IN}=V_{OUT1}+1.0V and I_{OUT}=300mA. V_{IN1} is the input voltage at which the output voltage becomes 98% of V_{OUT1} after gradually decreasing the input voltage.
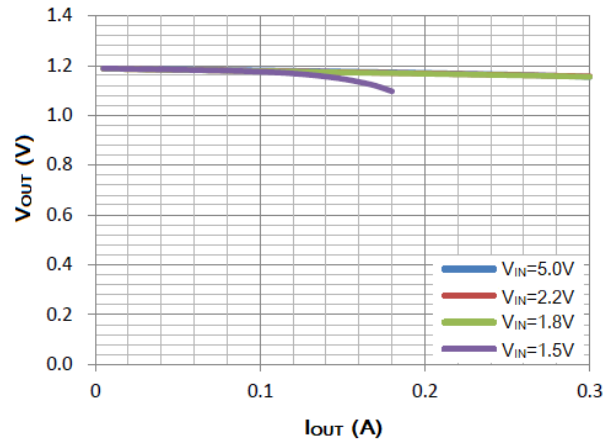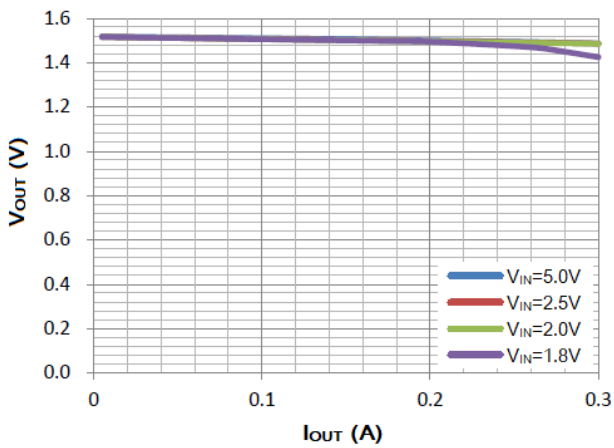
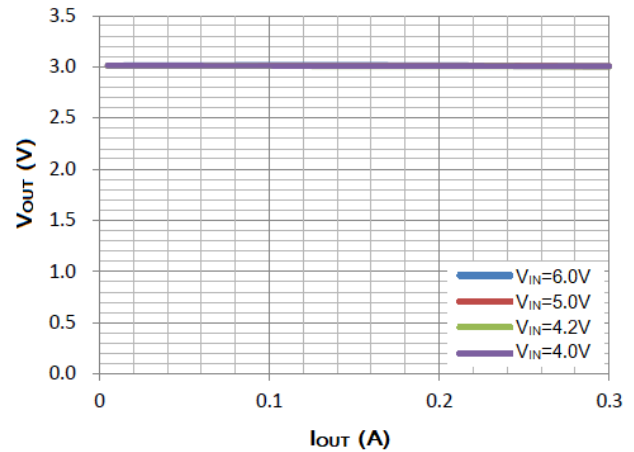## TYPICAL PERFORMANCE CHARACTERISTICS

1. Load Regulation (V$_{OUT}$=1.1V)

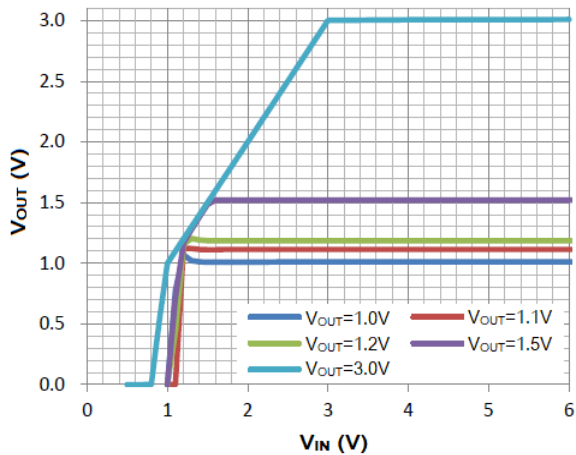2. Load Regulation (V$_{OUT}$=1.2V)
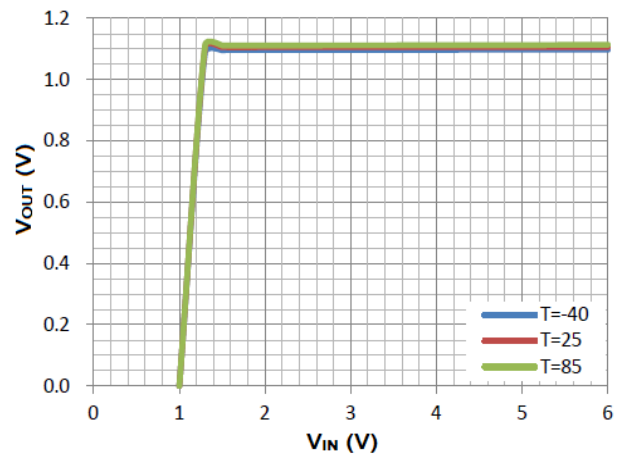
3. Load Regulation (V$_{OUT}$=1.5V)

4. Load Regulation (V$_{OUT}$=3V)
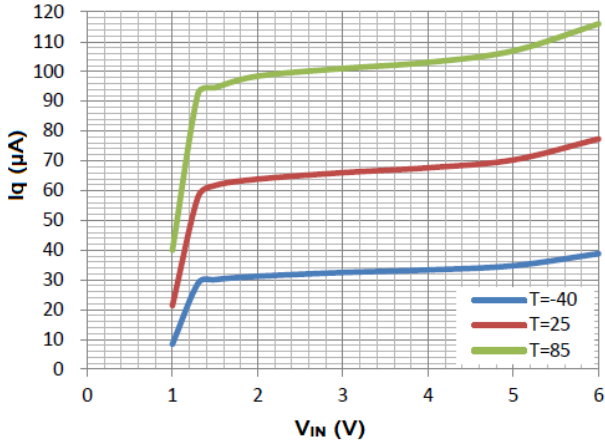
5. Line Regulation
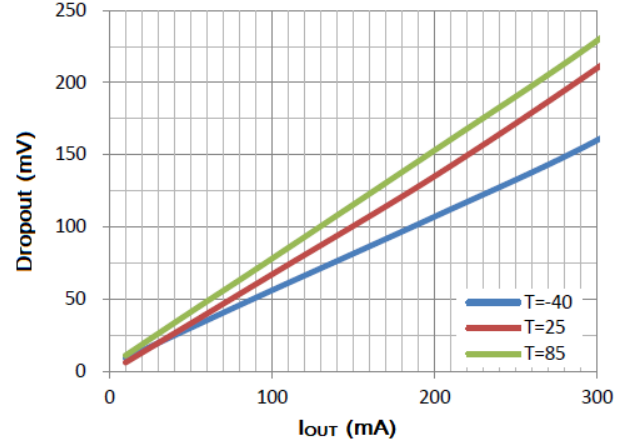
6. Line Regulation (V$_{OUT}$=1.1V)
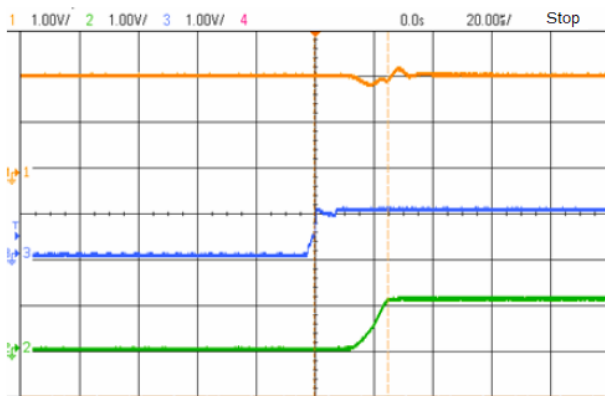
7. I_Q (V_{OUT}=1V)

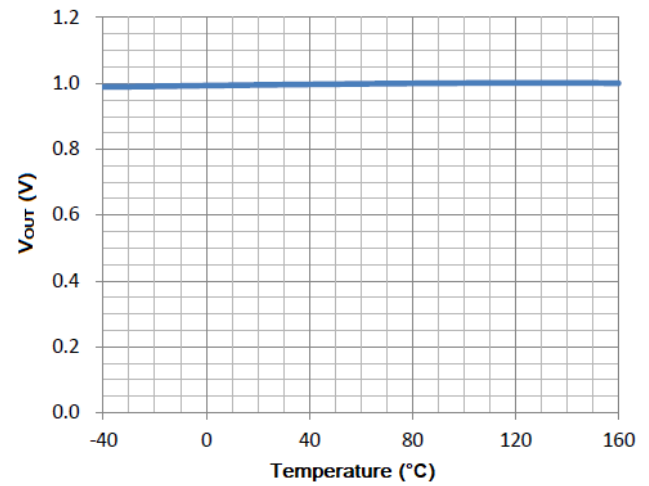8. Dropout Voltage (V_{OUT}=3V)

9. EN Chip Enable Response

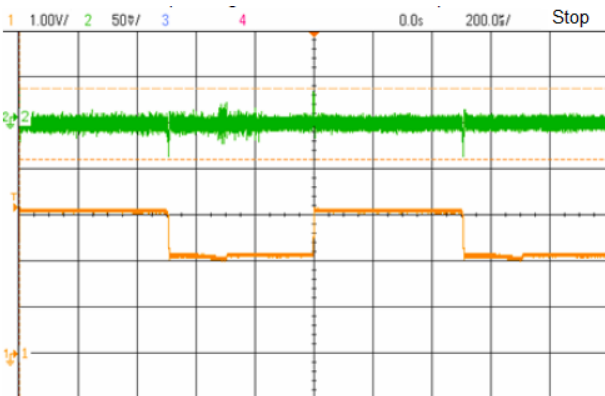(Orange: V_{IN}; Blue: EN; Green: V_{OUT})

10. V_{OUT} vs. Temperature
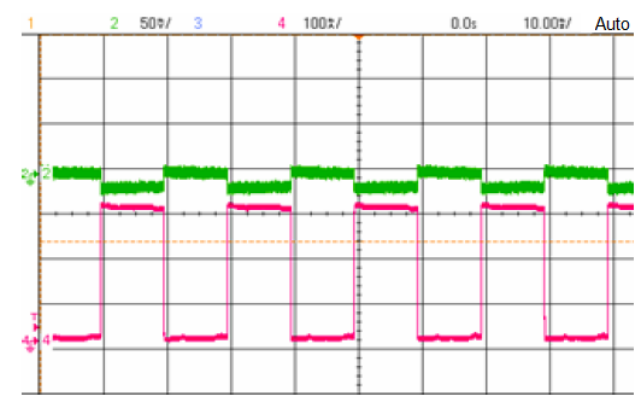

11. Line Transient Response

V_{OUT}=1.1V, I_{OUT}=10mA

(Orange: V_{IN}; Green: V_{OUT})
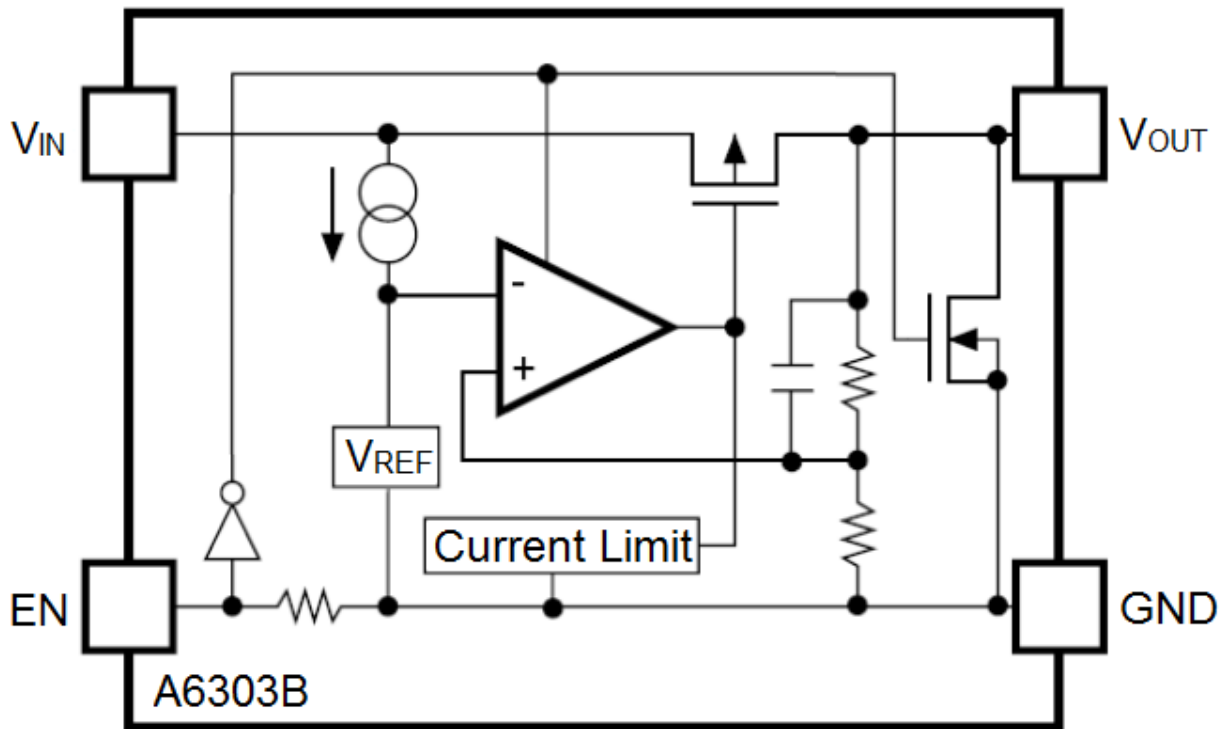

12. Load Transient Response

V_{IN}=2V, V_{OUT}=1V, I_{OUT}=10-300mA

(Pink: I_{OUT}; Green: V_{OUT})

BLOCK DIAGRAM

EXPLANATION

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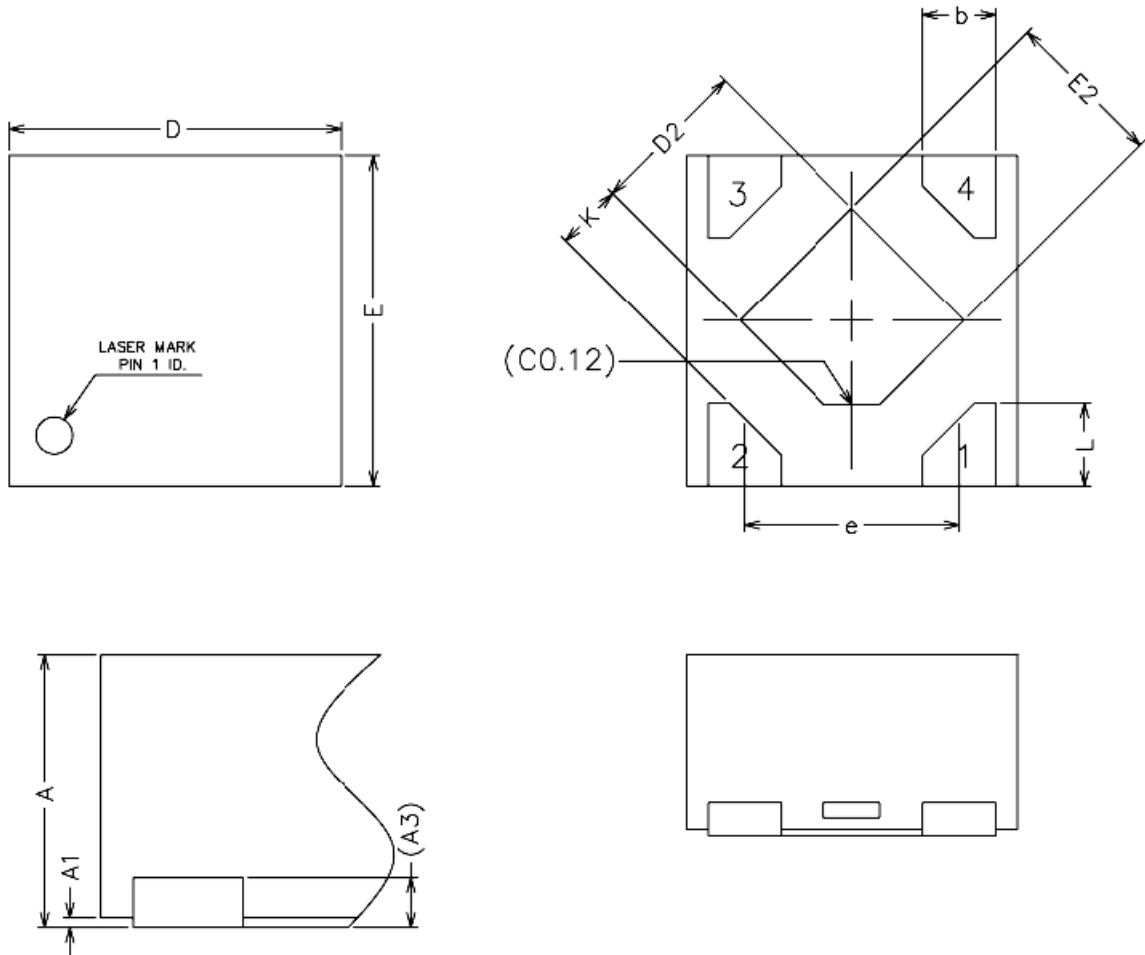
PACKAGE INFORMATION

Dimension in TSOT-23 (Unit: mm)

Dimension in SOT-25 (Unit: mm)
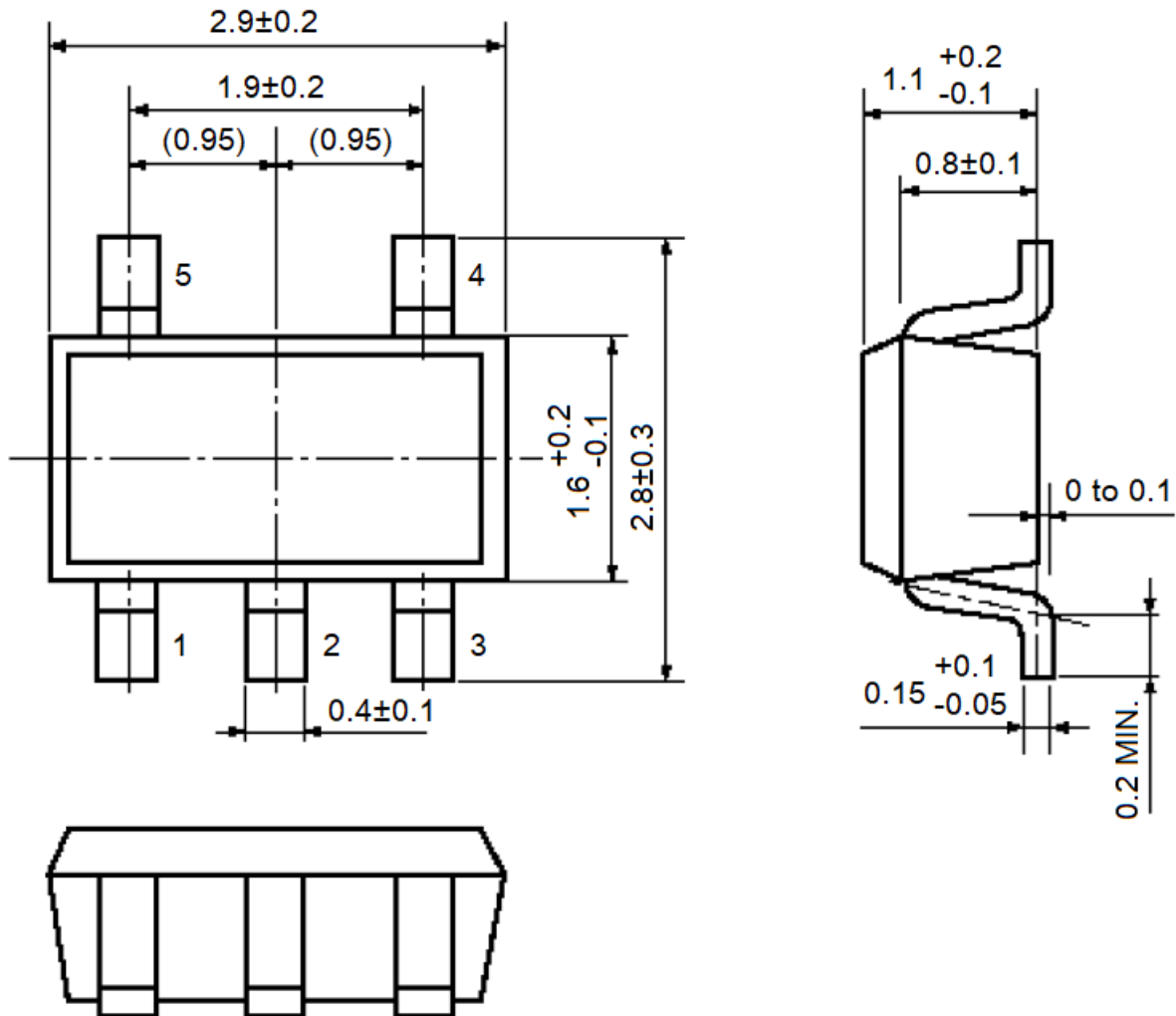
Dimension in DFN4(1x1) (Unit: mm)

Symbol	Min	Max
A	0.50	0.60
A1	0.00	0.05
A3	0.100 REF	
b	0.17	0.27
D	0.95	1.05
E	0.95	1.05
D2	0.43	0.53
E2	0.43	0.53
L	0.20	0.30
e	0.60	0.70
K	0.15	-

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