DESCRIPTION

A6303 series is a group of positive voltage output, low power consumption, low dropout voltage regulator.

A6303 can provide output value in the range of 0.9V~4.5V every 0.1V step. It also can be customized on command. A6303 can also work under a wide input voltage ranging from 2.0V to 6V.

A6303 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

A6303 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 A6303 is available in SOT-25, SC70-5 and DFN4(1x1) packages.

ORDERING INFORMATION

Package Type	Part Number	
SOT-25 SPQ: 3,000pcs/Reel	E5	A6303E5R-XXA
		A6303E5VR-XXA
SC70-5 SPQ: 3,000pcs/Reel	C5	A6303C5R-XX
		A6303C5VR-XX
DFN4(1x1) SPQ: 5,000pcs/Reel	J4	A6303J4R-XX
		A6303J4VR-XX
Note	XX: Output Voltage A: Type A V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS free products		

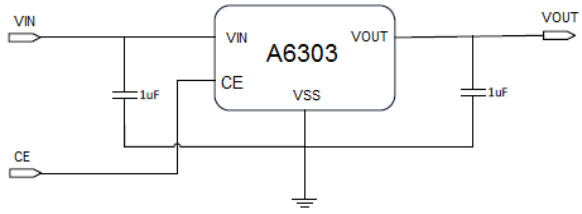
FEATURES

- Output voltage range: 0.9V~4.5V (customized on command every 0.1V step)
- Low power consumption: 80uA (Typ.)
- Low output noise (47uVRMS)
- Shutdown mode: 0.1uA
- Low dropout voltage: 65mV@100mA @V_{OUT}=3.3V(Typ.)
- High ripple rejection:70dB@1kHz (Typ.)
- Low temperature coefficient: ±100ppm/ °C
- Excellent line regulation: 0.05%/V
- Build-in 1.5k discharge resistor when CE low
- Highly accurate: ±2%
- Output current limit
- Fold-back output short circuit protection
- Available in SOT-25, SC70-5 and DFN4(1x1) packages

APPLICATION

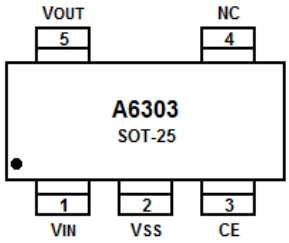
- Power source for cellular phones and various kind of PCSs
- Battery Powered equipment
- Power Management of MP3, PDA, DSC, Mouse, PS2 Games
- Voltage Reference
- Regulation after Switching Power

TYPICAL APPLICATION



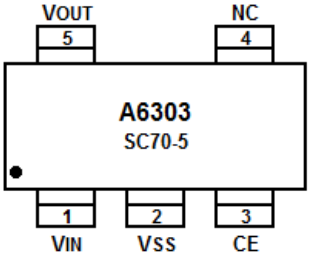
NOTE: Input capacitor (C_{IN}=1uF) and Output capacitor (C_{OUT}=1uF) are recommended in all application circuit.

PIN DESCRIPTION



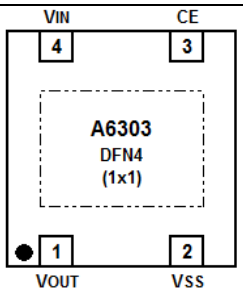
SOT-25, E5

Top View



SC70-5, C5

Top View



DFN4, J4

Top View

Pin #			Symbol	Function
SOT-25	SC70-5	DFN4(1x1)		
2	2	2	V_{SS}	Ground Pin
1	1	4	V_{IN}	Supply Voltage Input
5	5	1	V_{OUT}	Output Voltage
3	3	3	CE	Chip Enable
4	4	-	NC	No Connection

ABSOLUTE MAXIMUM RATINGS

Max Input Voltage		8V
T_J, Operating Junction Temperature		125°C
Output Current		300mA
T_A, Ambient Temperature		-40°C ~85°C
Power Dissipation	SOT-25	400mW
	SC-70-5	250mW
	DFN4(1x1)	600mW
Ts, Storage Temperature		-40°C ~150°C
Lead Temperature & Time		260°C, 10s
ESD(HBM)		>2000V

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

RECOMMENDED OPERATING CONDITIONS

Parameter	MIN	MAX	Units
Input Voltage Range	2	6	V
Ambient Temperature[NOTE2]	-40	85	°C

NOTE2: The operation ambient temperature range is verified on several test samples. Not a test condition for volume production whose test is only performed under 25°C.

ELECTRICAL CHARACTERISTICS

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

A6303, For Arbitrary Output Voltage

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
Input Voltage	V_{IN}			2	-	6	V
Output Voltage	V_{OUT}	V_{IN}=Set V_{OUT}+1V 1mA≦I_{OUT}≦30mA	V_{OUT}>1.5V	V_{OUT} x0.98	V_{OUT}	V_{OUT} x1.02	V
			V_{OUT}≤1.5V	V_{OUT} -0.03		V_{OUT} +0.03	
Max Output Current	I_{OUT} (Max)	V_{IN} - V_{OUT} =1V		300	-	-	mA
Dropout Voltage V_{OUT}≥2.8V	V_{DROP}NOTE3	I_{OUT}=100mA		-	65	100	mV
		I_{OUT}=300mA		-	195	300	
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	I_{OUT}=40mA 2.8V≤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		-	80	-	uA
Supply Current (Standby)	$I_{STANDBY}$	V_{IN}=Set V_{OUT}+1V, V_{CE}= V_{SS}		-	0.1	1.0	uA
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T \times V_{OUT}}$	I_{OUT}=30mA		-	±100	-	ppm/°C
Ripple Rejection	PSRR	F=1kHz, Ripple=0.5Vp-p V_{IN}=Set V_{OUT}+1V		-	70	-	dB
Current Limit	I_{LIM}			300	-	-	mA
CE Input Voltage “H”	V_{CEH}			1.5	-	V_{IN}	V
CE Input Voltage “L”	V_{CEL}			0	-	0.25	V
Output Noise	EN	BW=10Hz~100kHz		-	47	-	uV_{RMS}
Discharge Resistor	Rdischarge	CE=0, V_{OUT}=3.0V		-	1.5k	-	Ω
CE pin pull down resistor	Rcepd	CE=V_{IN}=5V		-	500k	-	Ω

NOTE3: V_{DROP}=V_{IN}1-(V_{OUT}2*0.98) V_{OUT}2 is the output voltage when V_{IN}=V_{OUT}1+1.0V and I_{OUT}=300mA.

V_{IN}1 is the input voltage at which the output voltage becomes 98% of V_{OUT}1 after gradually decreasing the input voltage.

TYPICAL PERFORMANCE CHARACTERISTICS

T=25°C

Fig.1 Load Regulation, V_{OUT}=3.3V

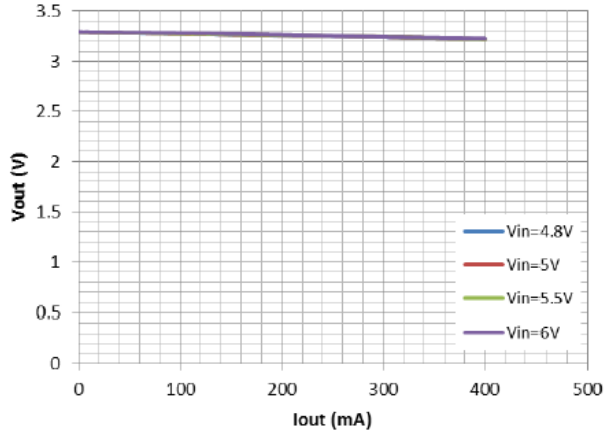


Fig.2 Load Regulation, V_{OUT}=2.8V

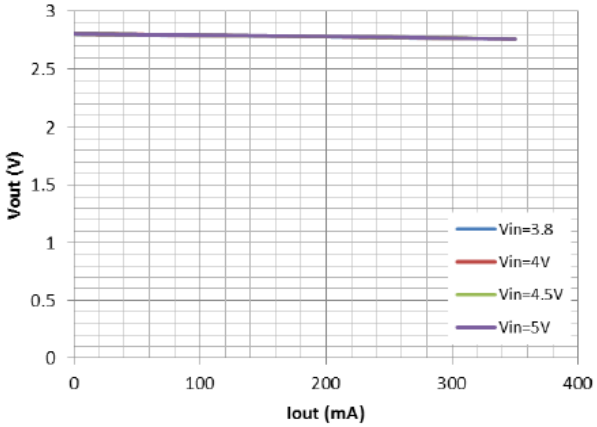


Fig.3 Load Regulation, V_{OUT}=1.0V

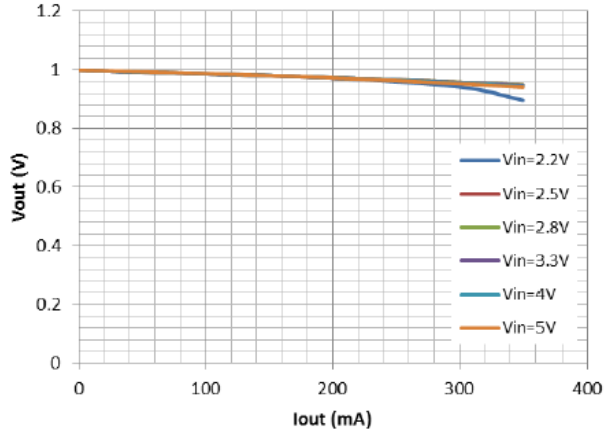


Fig.4 Line Regulation, I_{OUT}=0mA

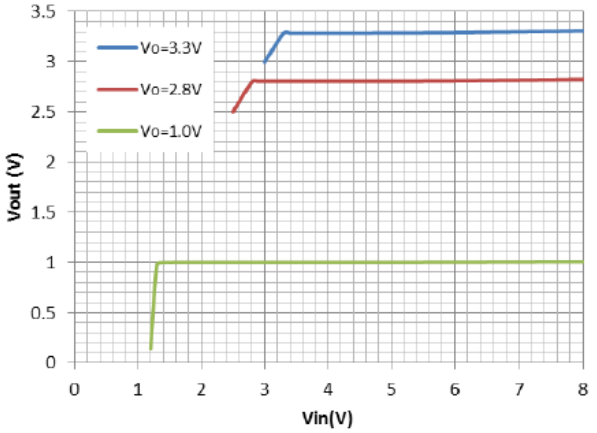


Fig.5 Quiescent Current, I_{OUT}=0mA,CE=high

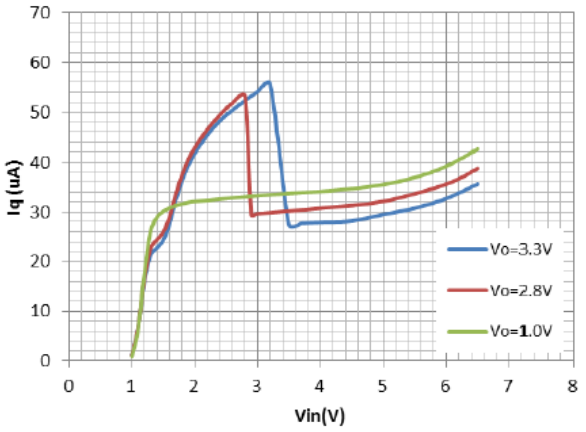


Fig.6 Dropout Voltage, V_{OUT}=3.3V

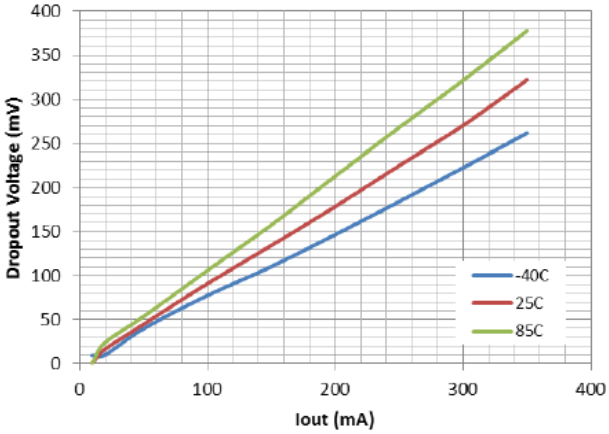


Fig.7 Dropout Voltage

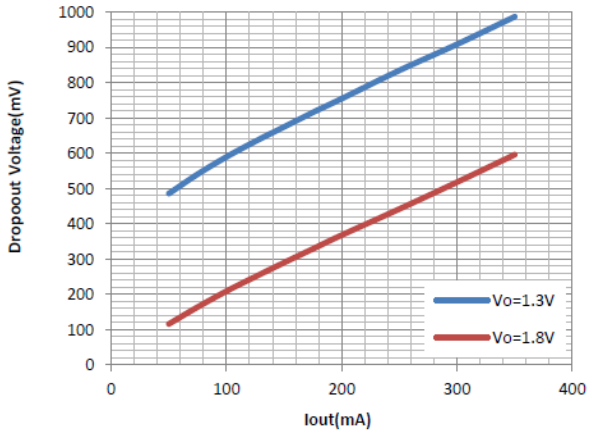


Fig.8 V_{OUT} Temperature Coefficient, V_{OUT}=3.3V

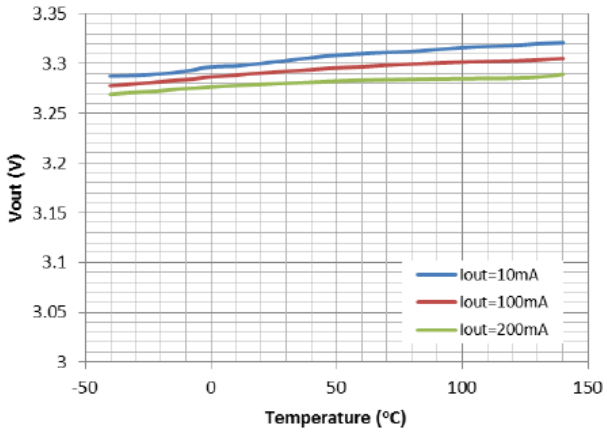


Fig.9 Line Transient Response,

V_{OUT}=3.3V, I_{OUT}=20mA, Brown: V_{IN}; Red: V_{OUT}

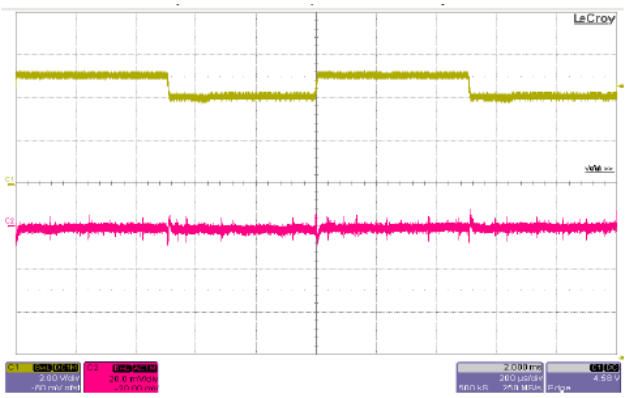


Fig.10 Load Transient Response, V_{IN}=5V,V_{OUT}=3.3V,

I_{OUT}=1~100mA, Green: I_{OUT}; Red: V_{OUT}

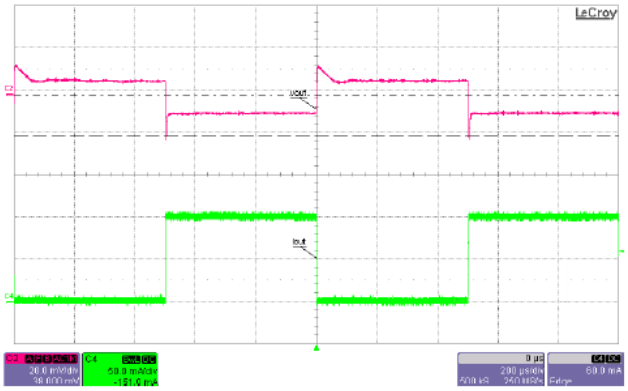
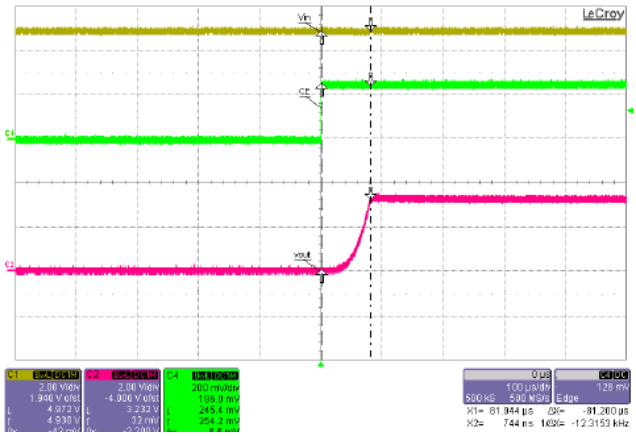
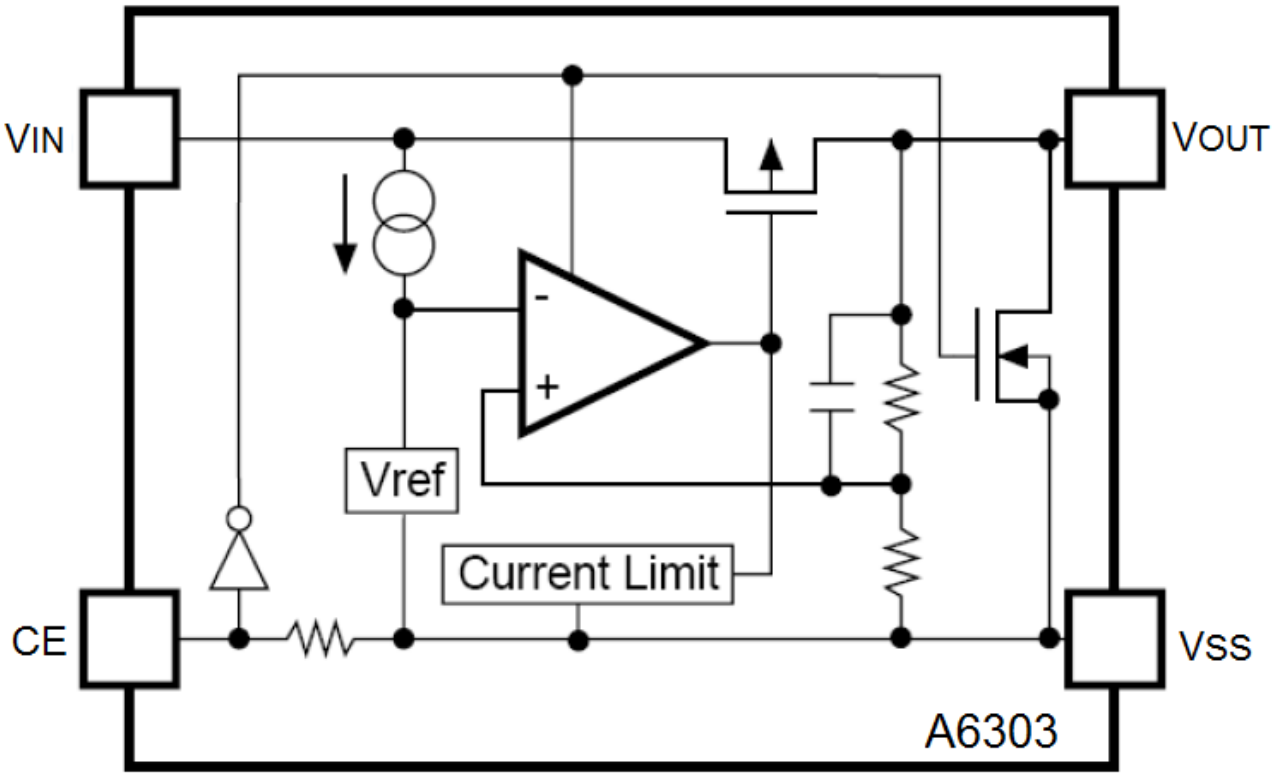


Fig.11 CE Chip Enable Response



BLOCK DIAGRAM



DETAILED INFORMATION

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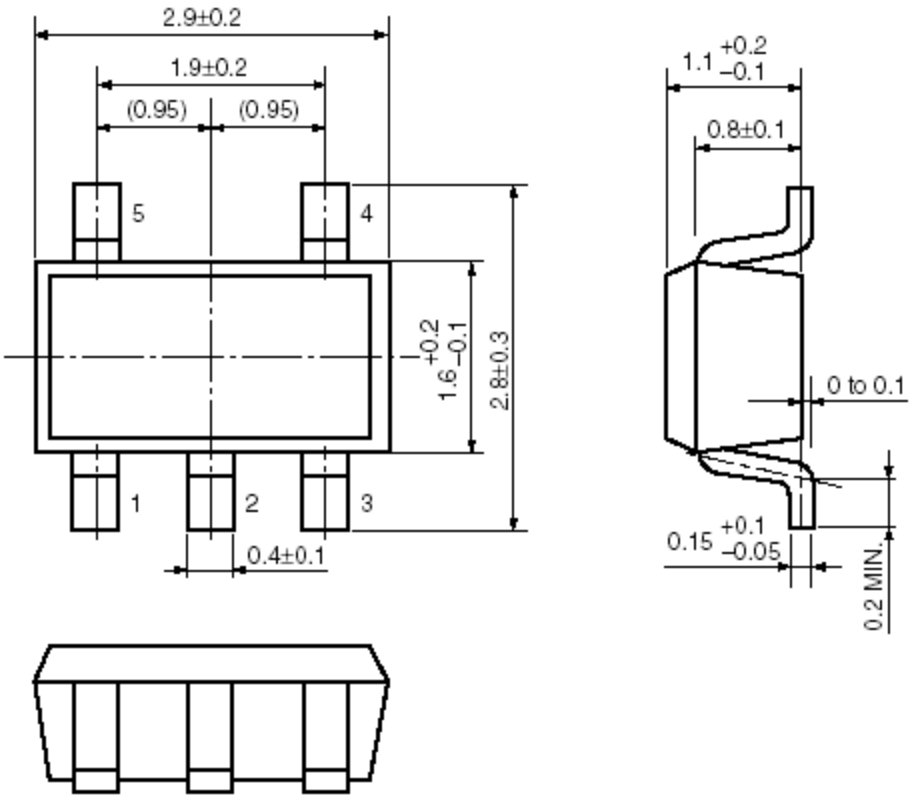
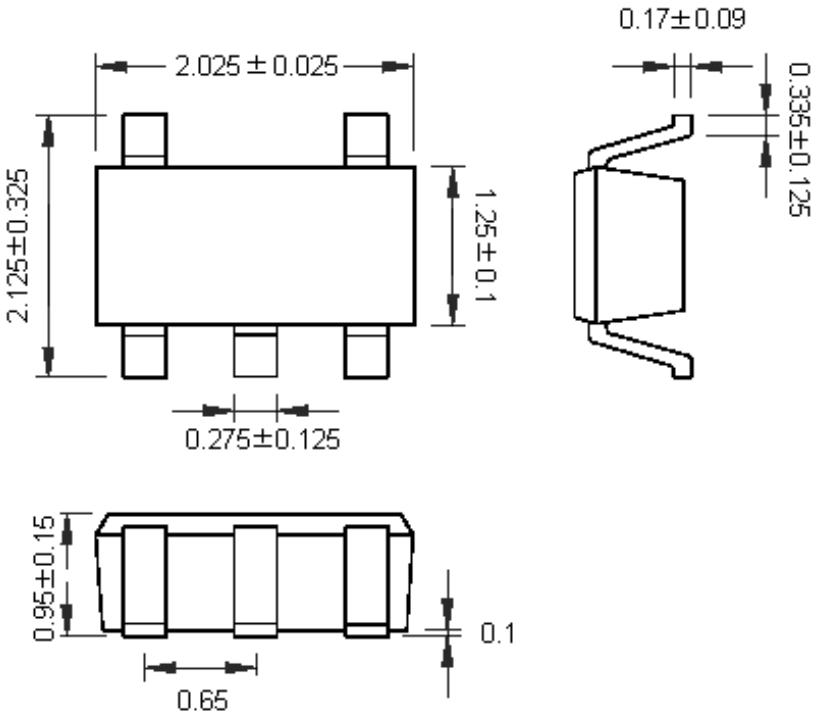
PACKAGE INFORMATION

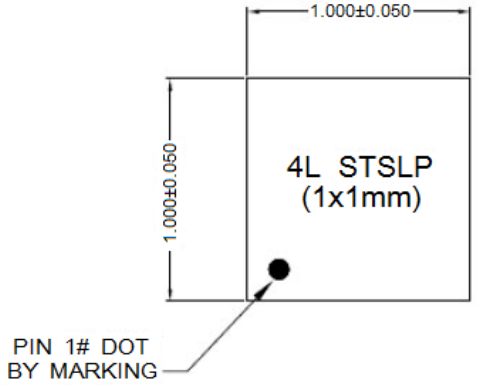
Dimension in SOT-25 (Unit: mm)



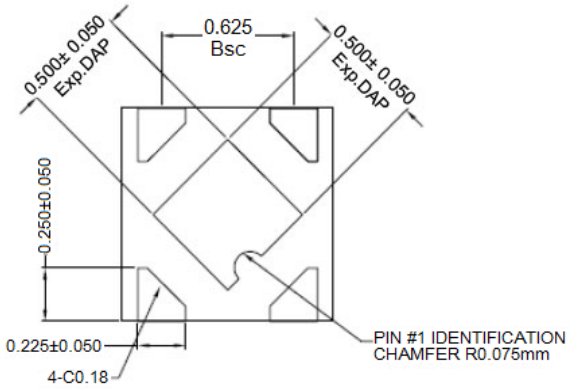
Dimension in SC70-5 (Unit: mm)



Dimension in DFN4 (1x1) (Unit: mm)



TOP WIEW

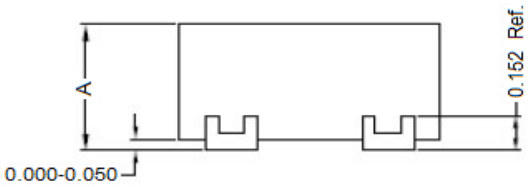


BOTTOM VIEW

NOTE:

1) 'A' DIMENSION AS BELOW TABLE

		STSLP
A	MAX.	0.600
	NOM.	0.550
	MIN.	0.500



SIDE VIEW

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