



ACE535C

300mA High PSRR, Fast Response Linear Regulator

Description

ACE535C series is a group of positive voltage output, low power consumption, low dropout voltage regulator.

ACE535C can provide output value in the range of 1.0V~4.5V every 0.1V step. It also can be customized on command.

ACE535C includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module with discharge capability.

ACE535C 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 $\pm 2\%$.

ACE535C is available in SOT23-5 and DFN1x1-4 packages which are lead free.

Features

- Low Power Consumption: 50uA (Typ.)
- Low output noise (47uVRMS)
- Standby Mode: 0.1uA
- Low dropout Voltage: 470mV@200mA (Typ.)
- High Ripple Rejection: 70dB@1KHz (Typ.)
- Low Temperature Coefficient: $\pm 100\text{ppm}/^\circ\text{C}$
- 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: $\pm 2\%$
- Output Current Limit

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

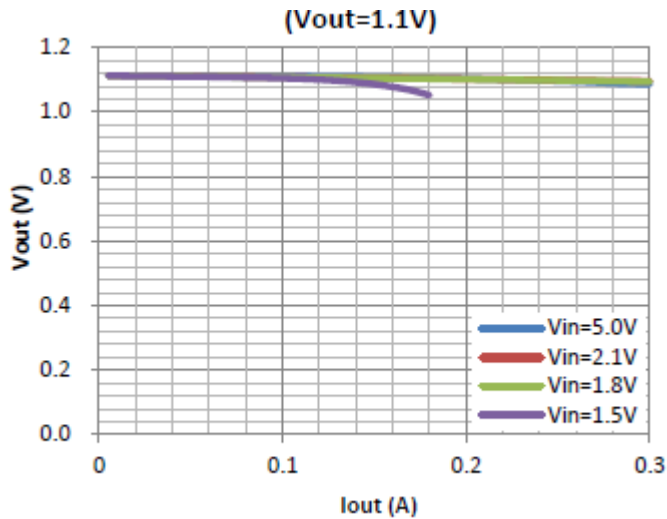


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Typical Performance Characteristic:

Line Regulation



Absolute Maximum Ratings

Parameter	Max	Unit
Max Input voltage	8	V
Operating Junction Temperature(Tj)	125	°C
Output Current	300	mA
Ambient Temperature(Ta)	-40~85	°C
Package Thermal Resistance (θ_{jA}) SOT-23-5	220	°C/W
Power Dissipation	SOT-23-5	250
	DFN1*1-4	600
Storage temperature (Ts)	- 45 to 150	°C
Lead Temperature & Time	260 °C,10S	°C

Note:

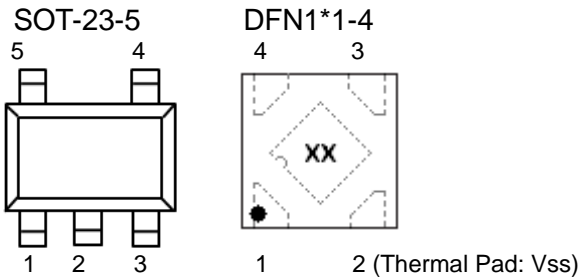
- 1) Heat Sink Area of PCB for DFN1x1-4 is recommended at least 2.5mmx4mm.
- 2) Package Thermal Resistance value can be affected by PCB design, outside radiator, ambient airflow, operating power, it just shows for reference.
- 3) Exceed these limits to damage to the device.
- 4) Exposure to absolute maximum rating conditions may affect device reliability



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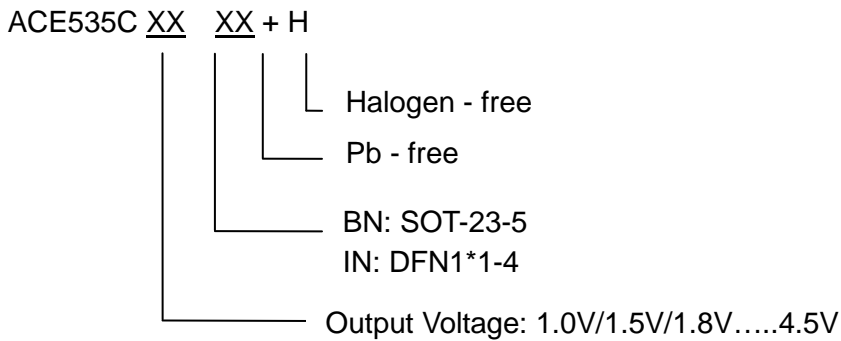
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Packaging Type

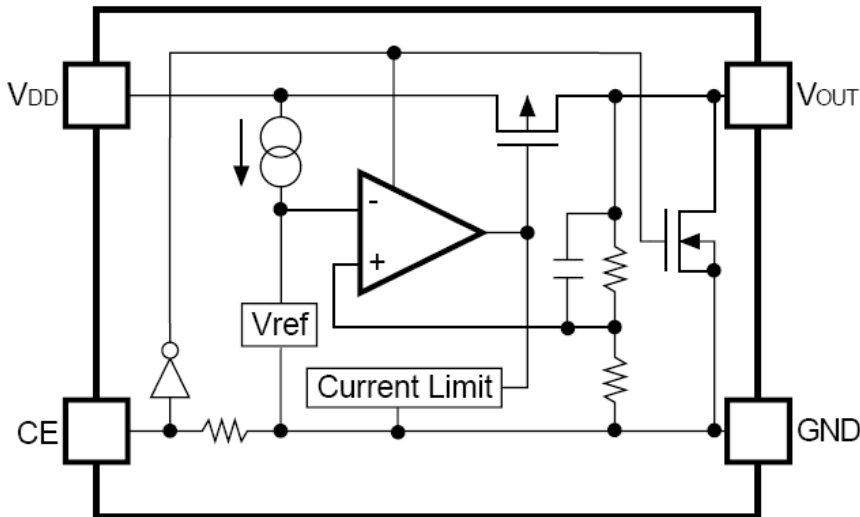


SOT-23-5	DFN1*1-4	Description	Function
5	1	Vout	Output pin
1	4	Vin	Input pin
2	2	V _{SS}	Ground pin
3	3	CE	Chip Enable pin
4		NC	No Connection

Ordering information



Block Diagram



Recommended Work Conditions

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



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Electrical Characteristics

ACE535C, For Arbitrary Output Voltage. (Test Conditions: $C_{in}=1\mu F, C_{out}=1\mu F, T_A=25^\circ C$, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
V_{in}	Input Voltage		1.5		6	V
V_{out}	Output Voltage	$V_{in} = \text{Set } V_{out} + 1V$ $1mA \leq I_{out} \leq 30mA$	$V_{out} \times 0.98$	Vout	$V_{out} \times 1.02$	V
			$V_{out} - 0.03$		$V_{out} + 0.03$	
$I_{out} (\text{Max.})$	Maximun Output Current	$V_{in} - V_{out} = 1V$	300			mA
V_{drop}^{**}	Dropout Voltage, $V_{out} = 1.1V$	$I_{out} = 200mA$		470	600	mV
		$I_{out} = 300mA$		600	800	mV
$\frac{\Delta V_{out}}{\Delta V_{in} \times V_{out}}$	Line Regulation	$I_{out} = 10mA$ $1.8V \leq V_{in} \leq 6V$		0.05	0.2	%/V
$\frac{\Delta V_{out}}{\Delta I_{out}}$	Load Regulation	$V_{in} = \text{Set } V_{out} + 1V$ $1mA \leq I_{out} \leq 300mA$		50	80	mV
I_{ss}	Supply Current	$V_{in} = \text{Set } V_{out} + 1V$		50	120	μA
$I_{standby}$	Supply Current ($I_{standby}$)	$V_{in} = \text{Set } V_{out} + 1V$ $V_{ce} = GND$		0.1	1.0	μA
$\frac{\Delta V_{out}}{\Delta T \times V_{out}}$	Output Voltage Temperature Coefficient	$I_{out} = 30mA$		± 100		ppm/ $^\circ C$
PSRR	Ripple Rejection	$F = 1KHz, \text{Ripple} = 0.5V_{p-p}$ $V_{in} = \text{Set } V_{out} + 1V$		70		dB
I_{lim}	Current Limit		500			mA
$R_{discharge}$	Discharge Resistor	$CE = 0, V_{out} = 3.0V$		150		ohm
V_{ceh}	CE Input Voltage "H"		0.95		V_{in}	V
V_{cel}	CE Input Voltage "L"		0		0.25	V
e_n	Output Noise	$BW = 10Hz \sim 100kHz$		47		μV_{rms}

Note:

$I_{out} = 100mA @ V_{out} = 1.0V - 1.2V$

$V_{drop} = V_{in1} - (V_{out2} \times 0.98)$ 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.

EXPLANATION

ACE535C series is a group of positive voltage output, low noise, low power consumption, low dropout voltage regulator.

ACE535C can provide output value in the range of 1.0V~4.5V every 0.1V step. It also can be customized on command.

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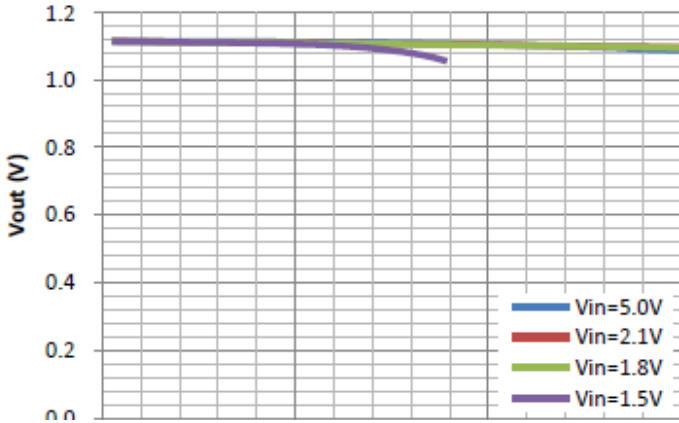


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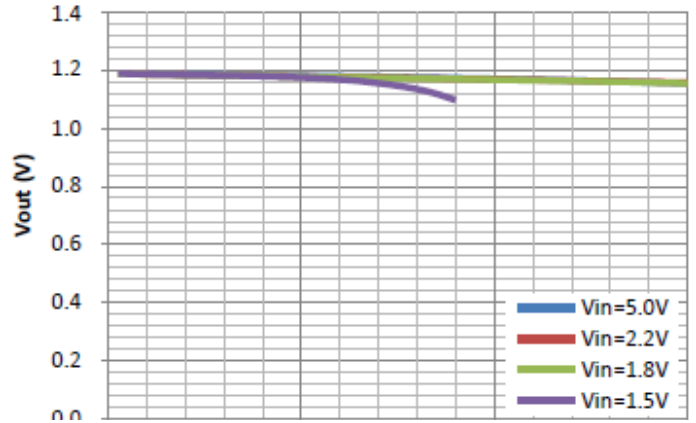
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Typical Performance Characteristics (T_A=25°C)

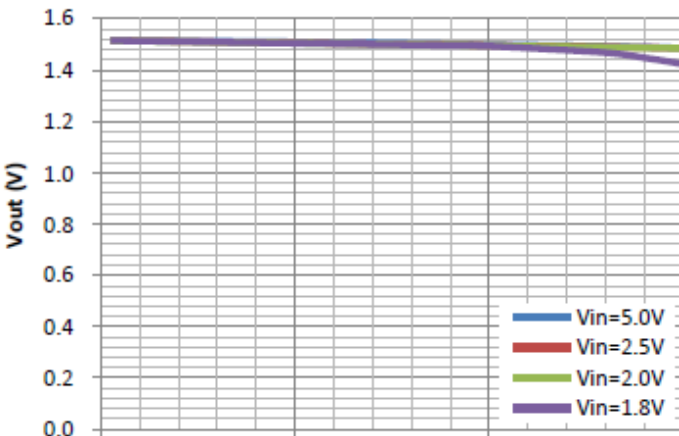
Load Regulation
(V_{out}=1.1V)



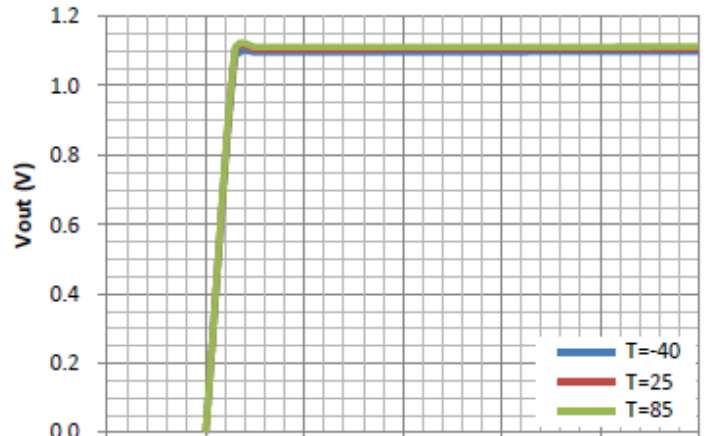
Load Regulation
(V_{out}=1.2V)



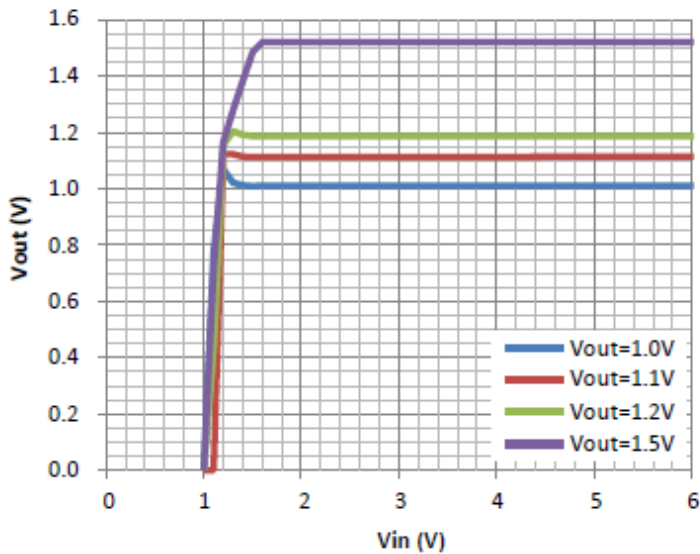
Load Regulation
(V_{out}=1.5V)



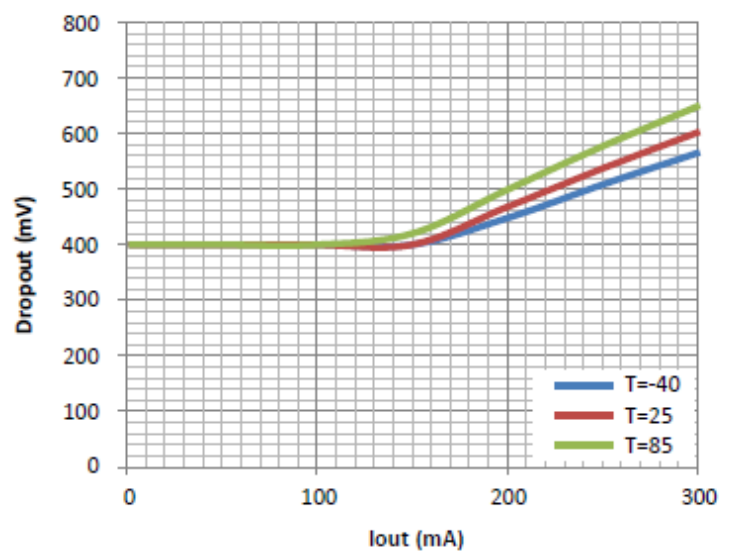
Load Regulation
(V_{out}=1.1V)



Line Regulation



Dropout Voltage



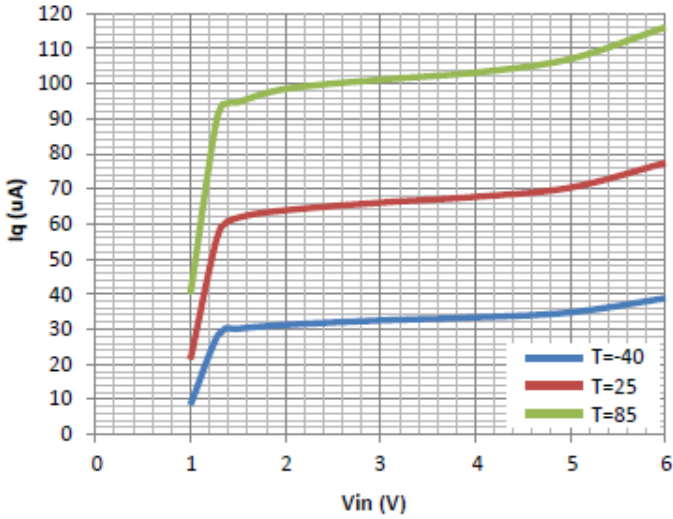


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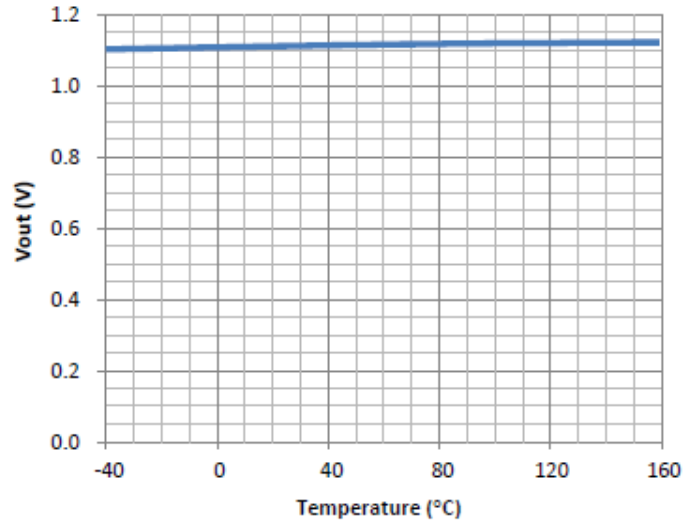
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Typical Performance Characteristics

I_q

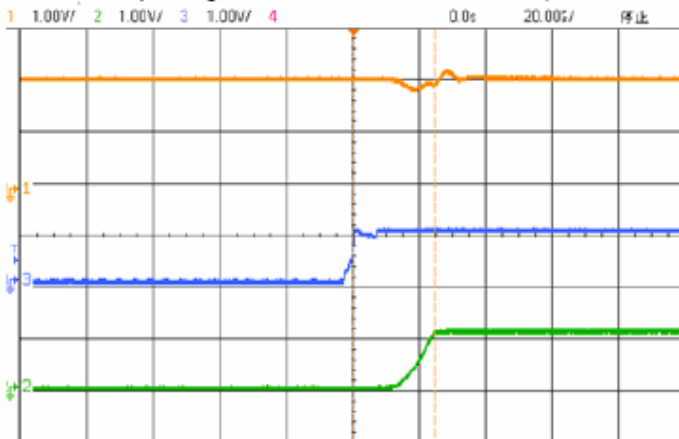


V_{out} vs. Temperature



CE Chip Enable Response

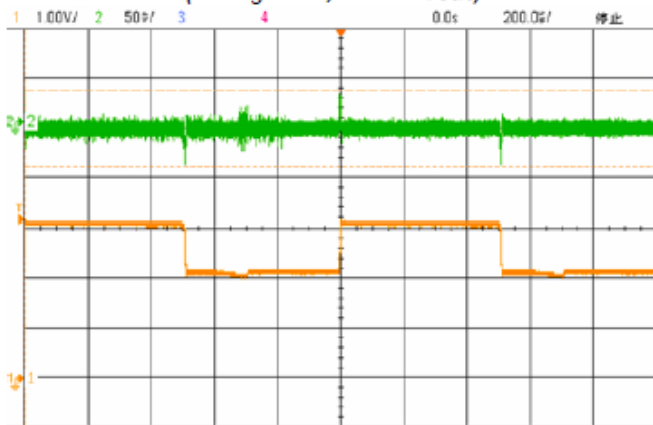
(Orange: Vin; Blue: CE; Green: V_{out})



Line Transient Response

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

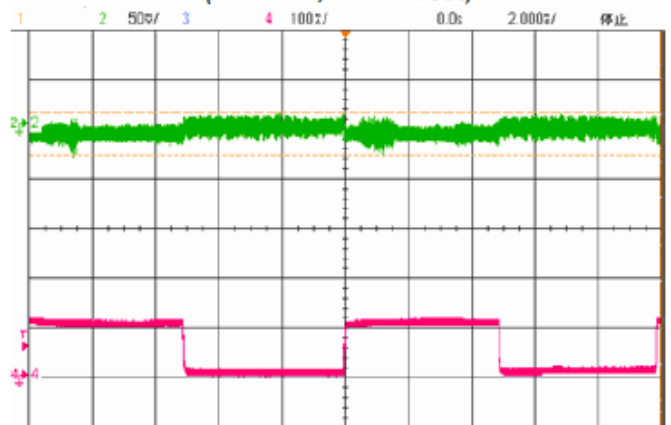
(Orange: Vin; Green: V_{out})



Load Transient Response

V_{in}=2.1V, V_{out}=1.1V, I_{out}=1-100mA

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



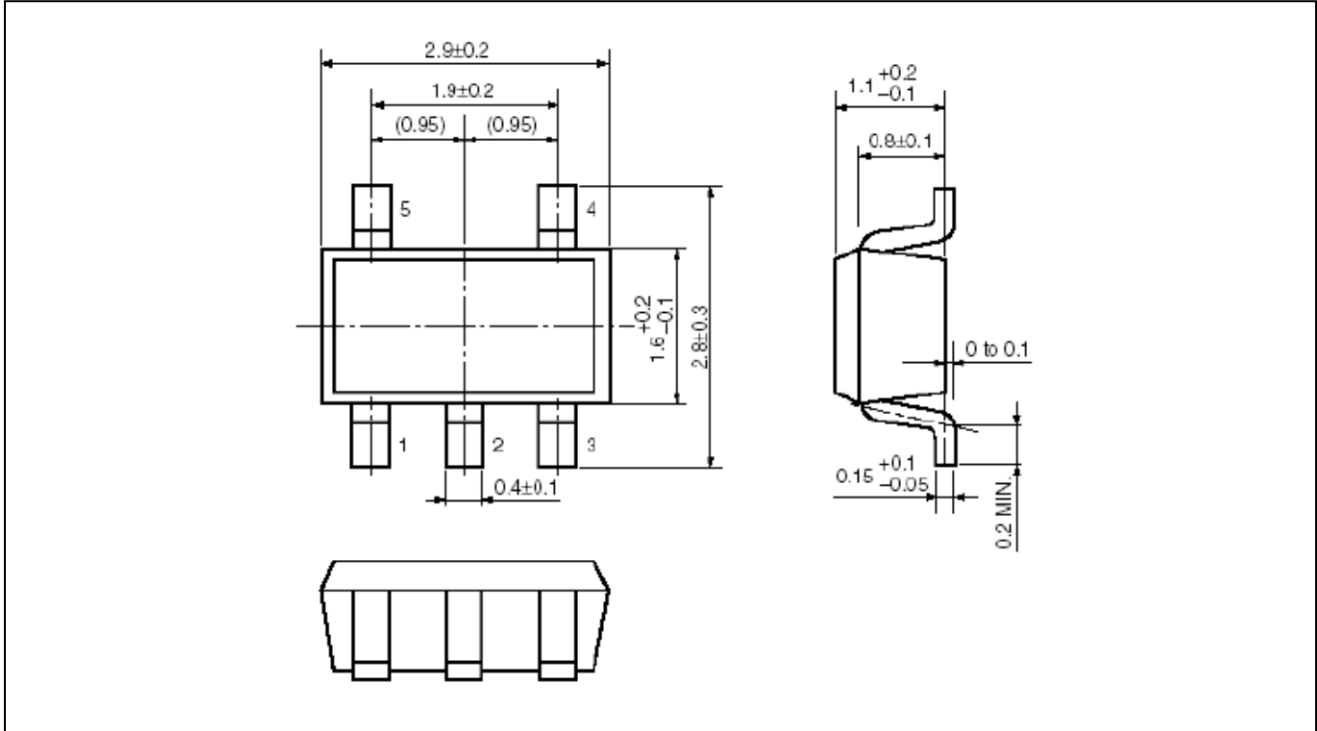


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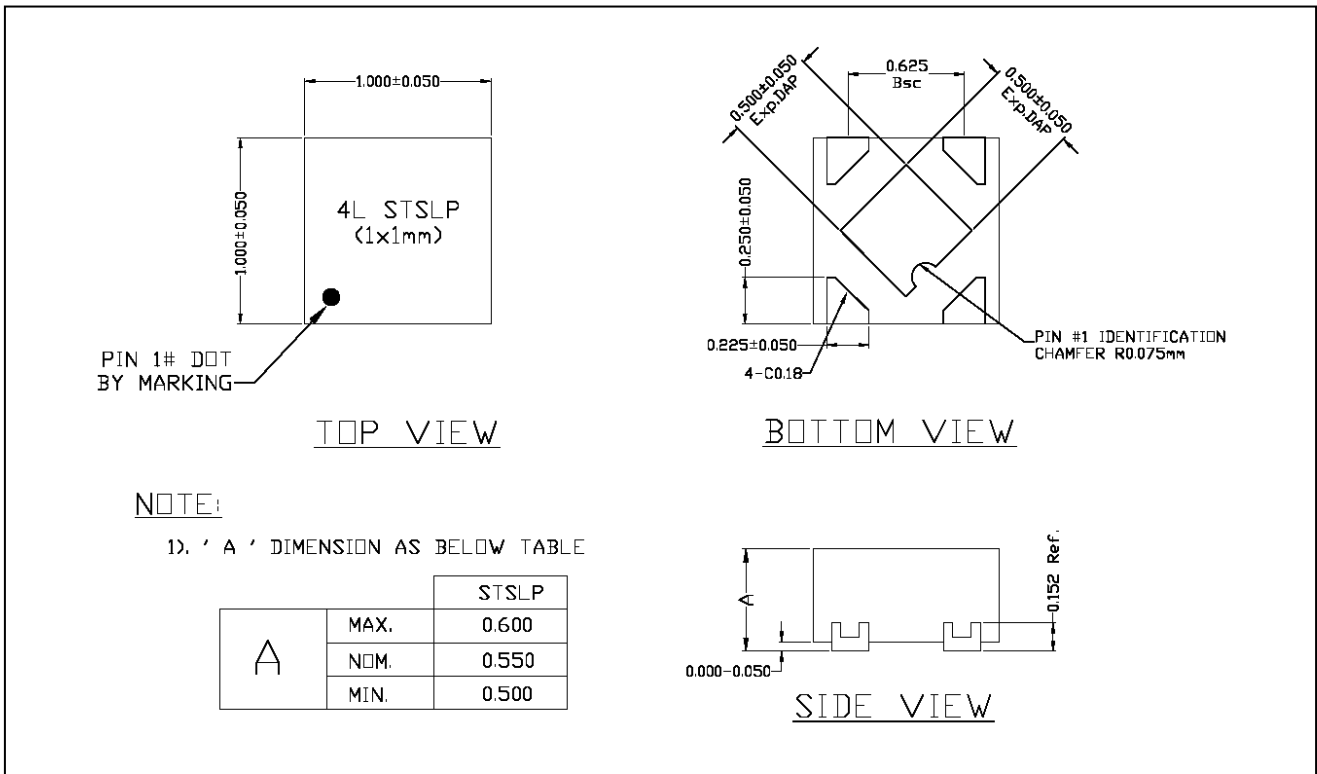
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Packing Information

SOT-23-5



DFN1*1-4





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Notes

ACE does not assume any responsibility for use as critical components in life support devices or systems without the express written approval of the president and general counsel of ACE Electronics Co., LTD. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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