LC1465

500mA High PSRR, Linear Regulator

DESCRIPTION

LC1465 series are a group of positive voltage output, low power consumption, low dropout voltage regulators. It can provide foldback short-circuit protection and output current limit function.

LC1465 can provide output value in the range of 1.0V~4.5V every 0.1V step. It also can be customized on command. LC1465 can also work under a wide input voltage ranging from 2V to 7V.

LC1465 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

LC1465 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%.

LC1465 is available in SOT-23-3, SOT-23-5 and SOT89-3 packages which are lead free.

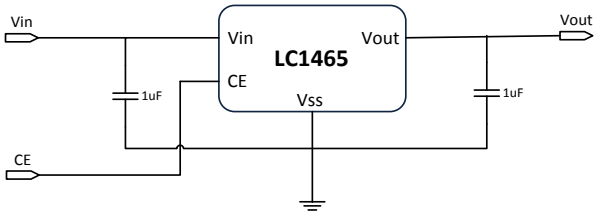
FEATURES

- Input voltage range: 2 – 7V
- Output voltage range: 1.0V~4.5V (customized on command every 0.1V step)
- Low power consumption: 35uA (Typ.)
- Low output noise (47uVRMS)
- Shutdown mode: 0.1uA
- Low dropout voltage:
  300mV@300mA (Vout=3.3V)
  500mV@500mA (Vout=3.3V)
- High ripple rejection:70dB@1KHz (Typ.)
- Low temperature coefficient: ±100ppm/°C
- Excellent line regulation: 0.05%/V
- Build-in chip enable circuit
- Highly accurate: ±2%
- Output current limit
  800mA@Vout=3.3V
- Fold-back short circuit current
  250mA@Vout=3.3V

APPLICATIONS

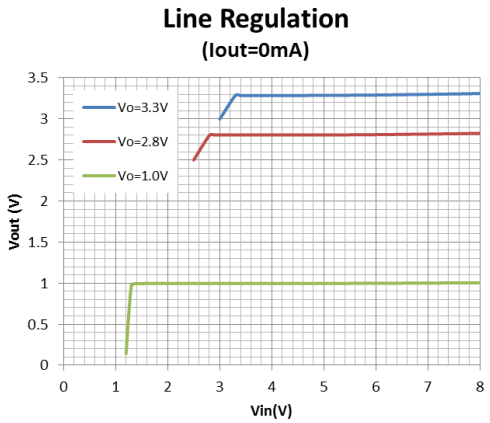
- Power source for cellular phones and various kind of PCSs
- Battery Powered equipment
- Power Management of MP3, PDA, DSC, Mouse, PS2 Games
- Voltage Reference
- Regulation after Switching Power

TYPICAL APPLICATION



NOTE: *Input capacitor (Cin=1uF) and Output capacitor (Cout=1uF) are recommended in all application circuit.*

ELECTRICAL CHARACTERISTICS



ORDERING INFORMATION

LC1465 [1][2][3][4]

Code	Description
[1]	Temperature&Rohs: C:-40~85°C ,Pb Free Rohs Std.
[2]	Package type: B3:SOT-23-3 B5A:SOT-23-5(A) C3B:SOT-89-3(B)
[3]	Packing type: TR:Tape&Reel (Standard)
[4]	Output voltage: e.g. 15=1.5V 18=1.8V 44=4.4V

MARKING DESCRIPTON

F/AD: Product Code

X: Output Voltage Code (for SOT23-3, SOT23-5)

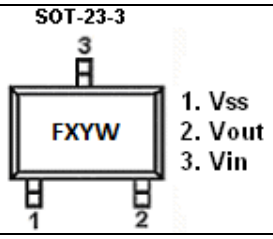
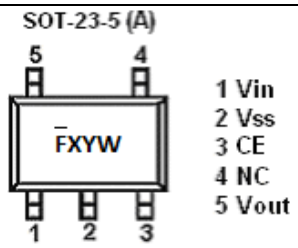
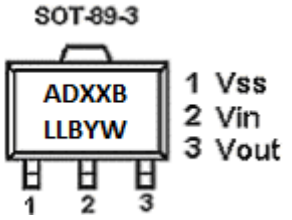
Vout	Code	Vout	Code	Vout	Code
1.0V	0	2.3V	$\bar{3}$	3.6V	$\underline{6}$
1.1V	1	2.4V	$\bar{4}$	3.7V	$\underline{7}$
1.2V	2	2.5V	$\bar{5}$	3.8V	$\underline{8}$
1.3V	3	2.6V	$\bar{6}$	3.9V	$\underline{9}$
1.4V	4	2.7V	$\bar{7}$	4.0V	$\underline{0}$
1.5V	5	2.8V	$\bar{8}$	4.1V	$\underline{1}$
1.6V	6	2.9V	$\bar{9}$	4.2V	$\underline{2}$
1.7V	7	3.0V	$\underline{0}$	4.3V	$\underline{3}$
1.8V	8	3.1V	$\underline{1}$	4.4V	$\underline{4}$
1.9V	9	3.2V	$\underline{2}$	4.5V	$\underline{5}$
2.0V	$\bar{0}$	3.3V	$\underline{3}$		
2.1V	$\bar{1}$	3.4V	$\underline{4}$		
2.2V	$\bar{2}$	3.5V	$\underline{5}$		

XX: Output Voltage (for SOT89-3).
”18”stands for 1.8V, ”28” stands for 2.8V, and “$2\bar{8}$” stands for 2.85V.

Y: The Year of manufacturing,”1” stands for year 2011,”2” stands for year 2012, and ”8” stands for year 2018.

W: The week of manufacturing. ”A” stands for week 1,”Z” stands for week 26,” $\bar{A}$ ” stands for week 27,” $\bar{Z}$ ” stands for week 52.

PIN CONFIGURATION

Product Classification	LC1465CB3TR□□
F: Product Code X: Output Voltage YW: Date Code	
Product Classification	LC1465CB5ATR□□
$\bar{F}$: Product Code X: Output Voltage YW: Date Code	
Product Classification	LC1465CC3BTR□□
AD: Product Code XX: Output Voltage B: Package LL: Lot No. B: Fab Code YW: Date Code	

Vss	Ground Pin
Vin	Supply Voltage Input
Vout	Output Voltage
CE	Chip Enable
NC	No Connection

ABSOLUTE MAXIMUM RATING

Parameter		Value
Max Input Voltage		8V
Operating Junction Temperature(Tj)		125°C
Output Current		500mA
Ambient Temperature(Ta)		-40°C –85°C
Power Dissipation	SOT-23-3	250mW
	SOT-23-5	250mW
	SOT-89-3	500mW
Storage Temperature(Ts)		-40°C -150°C
Lead Temperature & Time		260°C,10S

Note:
Exceed these limits to damage to the device.
Exposure to absolute maximum rating conditions may affect device reliability.

RECOMMENDED WORK CONDITIONS

Item	Min	Recommended	Max.	Unit
Input Voltage Range	2		7	V
Ambient Temperature*	-40		85	°C

**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: Cin=1uF,Cout=1uF,TA=25°C, unless otherwise specified.)
LC1465, For Arbitrary Output Voltage

Symbol	Parameter		Conditions	Min	Typ	Max	Units
Vin	Input Voltage			2		7	V
Vout	Output Voltage	Vout>1.5V	Vin=Set Vout+1V 1mA≤Iout≤30mA	Vout x0.98	Vout	Vout X1.02	V
		Vout<=1.5V		Vout -0.03		Vout +0.03	
Iout (Max.)	Maximun Output Current		Vin-Vout=1V	500			mA
Vdrop[1]	Dropout Voltage,Vout≥2.8V		Iout=100mA		100	150	mV
			Iout=300mA		300	400	mV
			Iout=500mA		500	800	mV
$\frac{\Delta Vout}{\Delta Vin \cdot Vout}$	Line Regulation		Iout=40mA 2.8V≤Vin≤6V		0.05	0.2	%/V
$\Delta Vout / \Delta Iout$	Load Regulation		Vin=Set Vout+1V 1mA≤Iout≤500mA		70	100	mV
Iss	Supply Current		Vin=Set Vout+1V		35	80	uA
Istandby	Supply Current (Srandby)		Vin=Set Vout+1V Vce=Vss		0.1	1.0	uA
$\frac{\Delta Vout}{\Delta T \cdot Vout}$	Output Voltage Temperature Coefficient		Iout=30mA		±100		ppm/°C

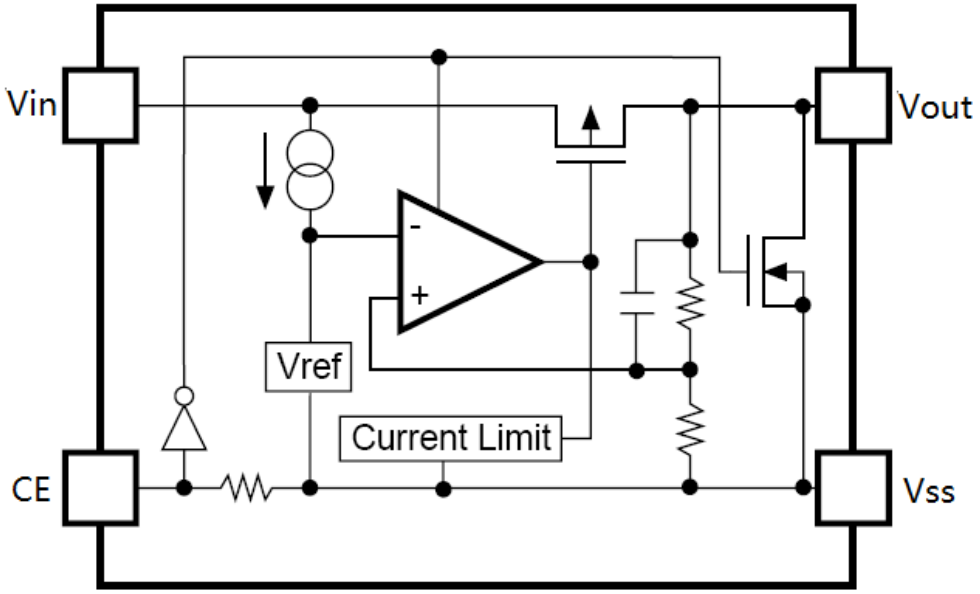
PSRR	Ripple Rejection	F=1KHz, Ripple=0.5Vp-p Vin=Set Vout+1V		70		dB
Ilim	Current Limit			800		mA
Rcepd	CE pin pull down resistor	CE=Vin=5V		5		Mohm
Vceh	CE Input Voltage "H"		1.5		Vin	V
Vcel	CE Input Voltage "L"		0		0.25	V
en	Output Noise	BW=10Hz~100kHz		47		uVrms

NOTE:

*Vdrop=Vin1-(Vout2*0.98) Vout2 is the output voltage when Vin=Vout1+1.0V and Iout=500mA.*

Vin1 is the input voltage at which the output voltage becomes 98% of Vout1 after gradually decreasing the input voltage.

BLOCK DIAGRAM



EXPLANATION

LC1465 series is a group of positive voltage output, low noise, low power consumption, low dropout voltage regulator.

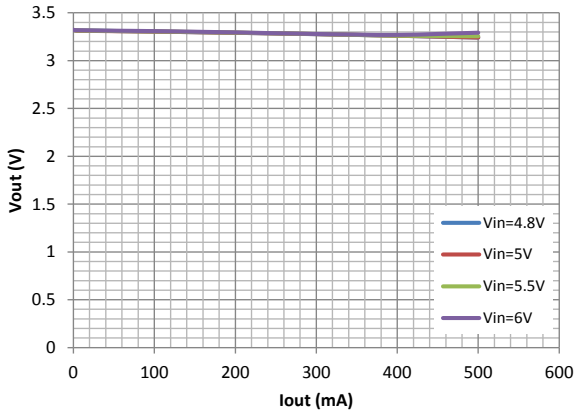
LC1465 can provide output value in the range of 1.0V~4.5V every 0.1V step. It also can be customized on command.

LC1465 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

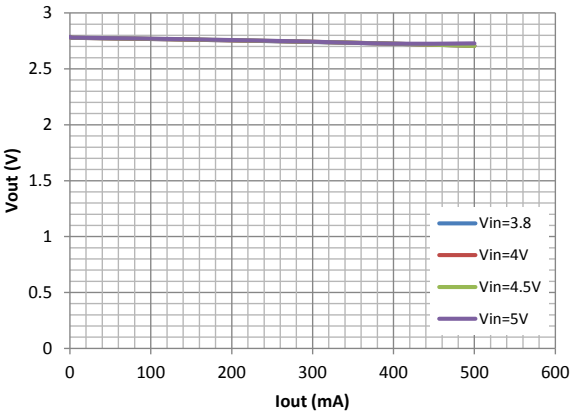
LC1465 has excellent load and line transient response and good temperature characteristics, which can assure the stability of chip and power system. And it uses trimming technique to guarantee output voltage accuracy within±2%.

TYPICAL PERFORMANCE CHARACTERISTICS *(T=25°C)*

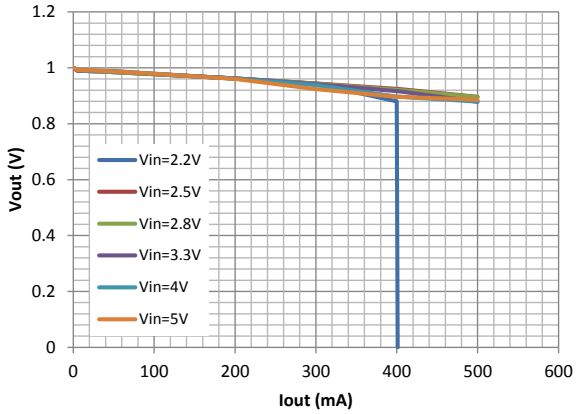
Load Regulation
(Vout=3.3V)



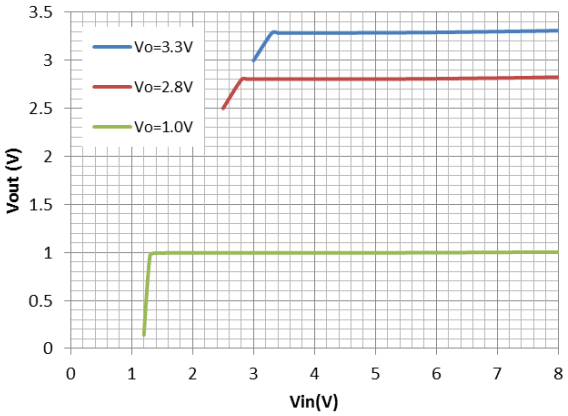
Load Regulation
(Vout=2.8V)



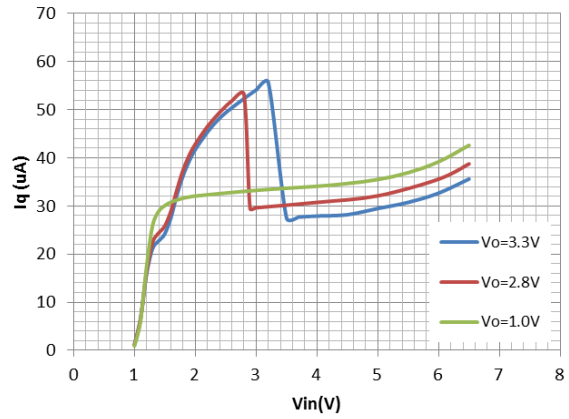
Load Regulation
(Vout=1.0V)



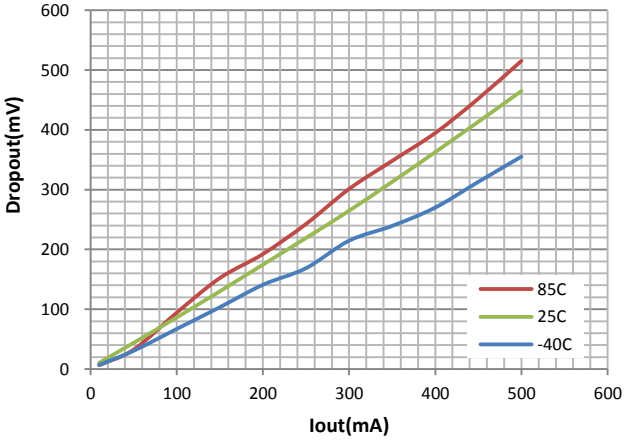
Line Regulation
(Iout=0mA)



Quienscent Current
(Iout=0mA and CE=high)

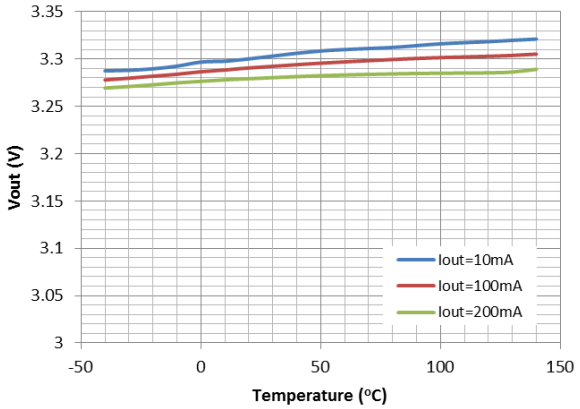


Dropout Voltage
(Vout=3.3V)

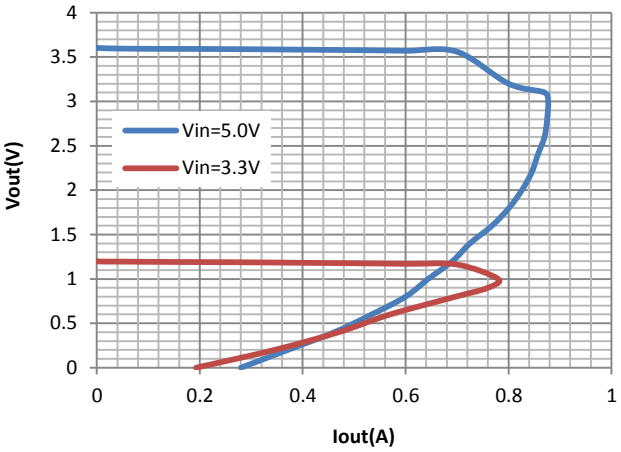


Vout Temperature Coefficient

(Vout=3.3V)



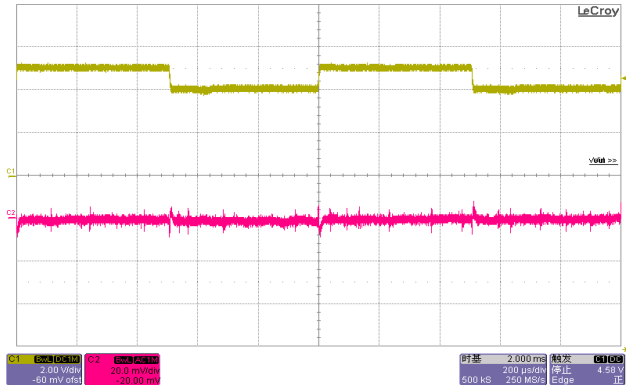
Current Limit



Line Transient Response

Vout=3.3V, Iout=20mA

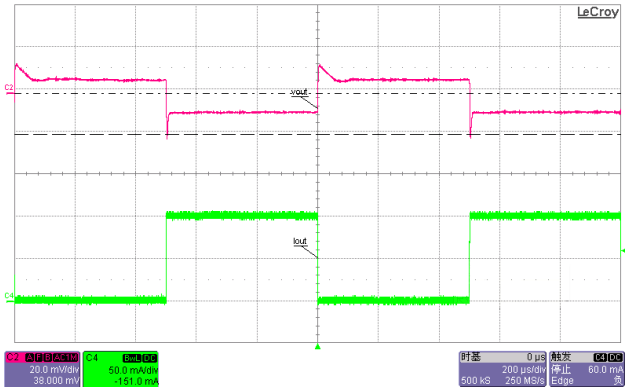
(brown: Vin; Red: Vout)



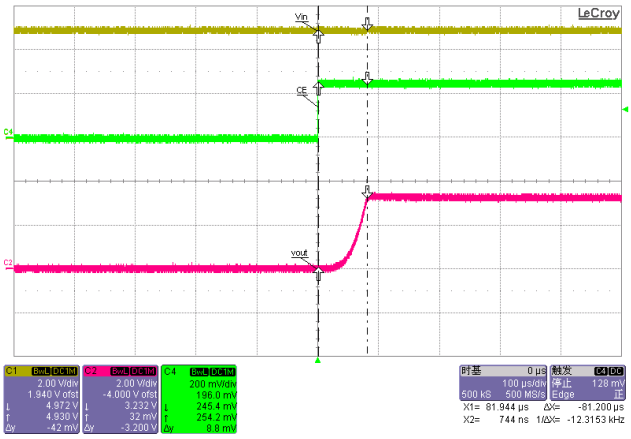
Load Transient Response

Vin=5V, Vout=3.3V, Iout=1-100mA

(Green: Iout; Red: Vout)



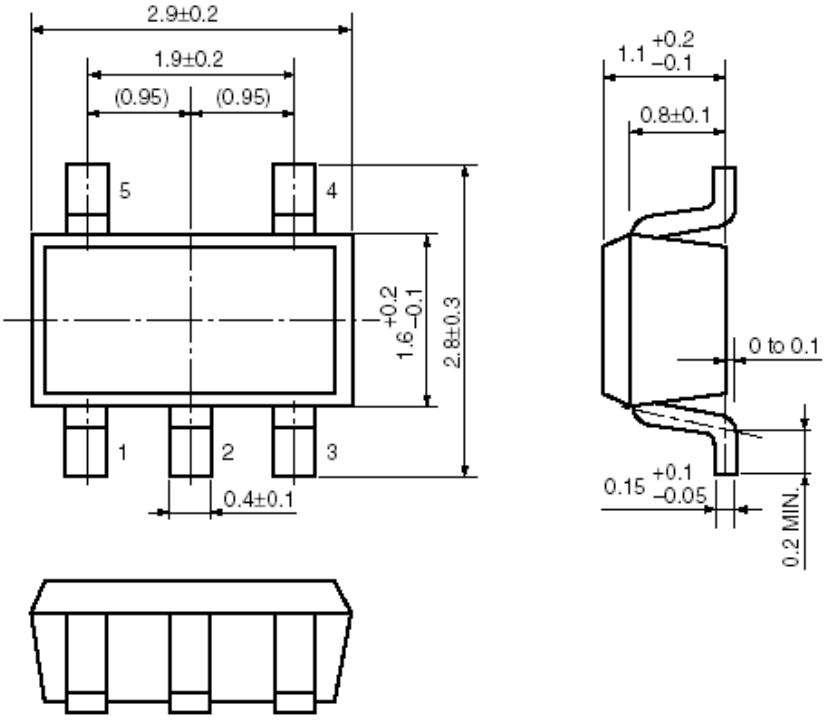
CE Chip Enable Response



PACKAGE OUTLINE

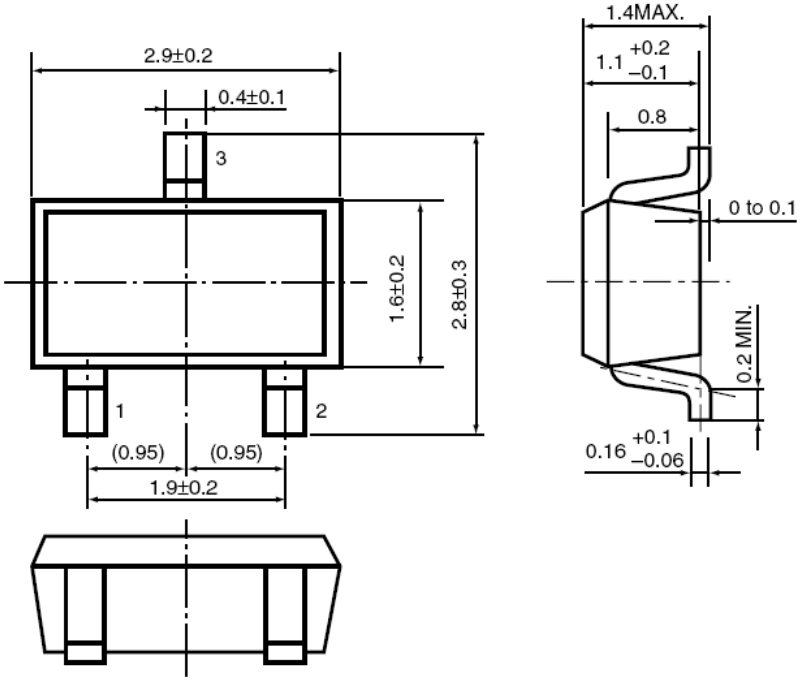
Package	SOT-23-5	Devices per reel	3000Pcs	Unit	mm

Package Dimension:



Package	SOT-23-3	Devices per reel	3000Pcs	Unit	mm

Package Dimension:



Package	SOT-89-3	Devices per reel	1000Pcs	Unit	mm

Package dimension：