FEATURES

Programmable Output Voltage to 40V
Low Dynamic Output Impedance 0.27Ω (Typ)
Sink Current Capability of 0.1 mA to 100 mA
Equivalent Full-Range Temperature Coefficient of 50ppm/℃
Temperature Compensated for Operation over Full Rated Operating Temperature Range
Low Output Noise Voltage
Fast Turn on Respons
SOT-23 and TO-92 packages

DESCRIPTION

The IL431LB Series is a three-terminal adjustable regulator series with a guaranteed thermal stability over applicable temperature ranges. The output voltage may be set to any value between Vref (approximately 2.5 volts) and 40 volts with two external resistors. These devices have a typical dynamic output impedance of 0.2Ω. Active output circuitry provides a very sharp turn-on characteristic,making these devices excellent replacement for zener diodes in many applications.

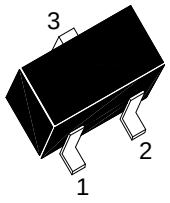
概述

IL431LB为三端可调节精密基准源。通过两个外接电阻，输出电压可在 V_{REF}(约2.5V)到40V连续调节。该电路输出阻抗小(0.2Ω)。开启特性好，在许多应用场合，它能较好地替换齐纳二极管。采用 SOT-23、TO-92 封装

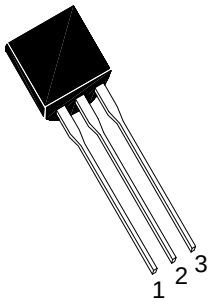
特征

■平均温度系数50ppm/℃ ■全工作温度范围内带温度补偿
■可调节输出电压 ■快速的响应速度 ■低输出噪声

IL431LB Series Pin Assignment



3-Lead Plastic SOT-23
Package Code: N
Pin 1: Reference
Pin 2: Cathode
Pin 3: Anode

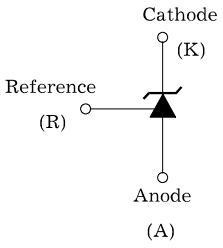


3-Lead Plastic TO-92
Package Code: A
Pin 1: Reference
Pin 2: Anode
Pin 3: Cathode

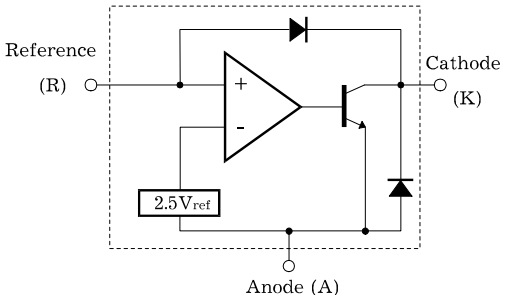
■ Ordering Information & Ordering methods

Package		V_{REF}: 2.495±0.3%	V_{REF}: 2.495±0.5%	V_{REF}: 2.495±1%	V_{REF}: 2.495±2%
N	SOT-23	IL431LB-AN	IL431LB-BN	IL431LB-CN	IL431LB-DN
A	TO-92	IL431LB-AA	IL431LB-BA	IL431LB-CA	IL431LB-DA

SYMBOL



FUNCTIONAL BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (Operating temperature range applies unless otherwise specified)

Characteristic		Symbol	Value	Unit
Cathode Voltage		V_{KA}	40	V
Cathode Current Range (Continuous)		I_K	-100~+150	mA
Reference Input Current Range		I_{REF}	0.05~10	
Power Dissipation at 25℃	TO-92 Package (R_{JA}=178℃/W)	P_D	0.7	W
	SOT-23 Package (R_{JA}=625℃/W)		0.2	
Junction Temperature Range		T_J	0~150	℃
Storage Temperature Range		T_{stg}	-65~+150	

■ RECOMMENDED OPERATING CONDITIONS

Characteristic	Symbol	Test condition	Min	Typ	Max	Unit
Cathode Voltage	V_{KA}		V_{REF}		40	V
Cathode Current	I_K		0.5		100	mA

■ ELECTRICAL CHARACTERISTICS (T_A=25℃, V_{KA}=V_{REF}, I_K=10mA unless otharwise specified)

Characteristic	Symbol	Test condition		Min	Typ	Max	Unit
Reference Input Voltage	V_{REF}	V_{KA}=V_{REF} I_K=10mA	±0.3%	2.488	2.495	2.502	V
			±0.5%	2.483	2.495	2.507	
			±1%	2.470	2.495	2.520	
			±2%	2.445	2.495	2.545	
Deviation of Reference Input Volage Over Full Temperature Range	$V_{REF(dev)}$	T_{min}			3	17	mV
Ratio of Change in Reference Input Volage to the Change in Cathode Voltage	$\triangle V_{REF}/\triangle V_{KA}$	$\triangle V_{KA}$=10V-V_{REF}		-0.4	0.0	2.7	mV/V
		$\triangle V_{KA}$=36V-10V		-0.4	0.0	2.0	
Reference Input Current	I_{REF}	R_1=10KΩ, R_2=∞			1.8	4.0	μA
Deviation of Reference Input Current Over Full Temperature Range	$I_{REF(dev)}$	R_1=10KΩ, R_2=∞			0.4	1.2	
Minimum Cathode Current for Regulation	$I_{K(MIN)}$				0.25	0.50	mA
Off-State Cathode Current	$I_{K(off)}$	V_{KA}=40V, V_{REF}=0			0.17	0.90	μA
Dynamic Impedance	Z_{KA}	I_K=1mA to 100mA, f≤1.0KHz			0.27	0.50	Ω

■ TEST CIRCUITS

Fig-1. Test Circuit for V_{KA}=V_{REF}

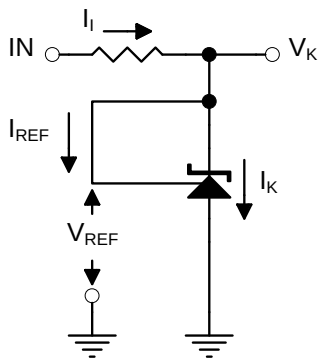
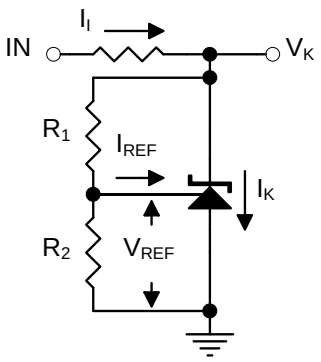
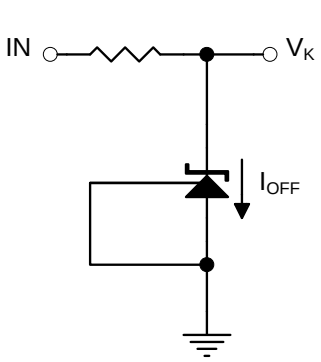


Fig-2. Test Circuit for V_{KA}≥V_{REF}

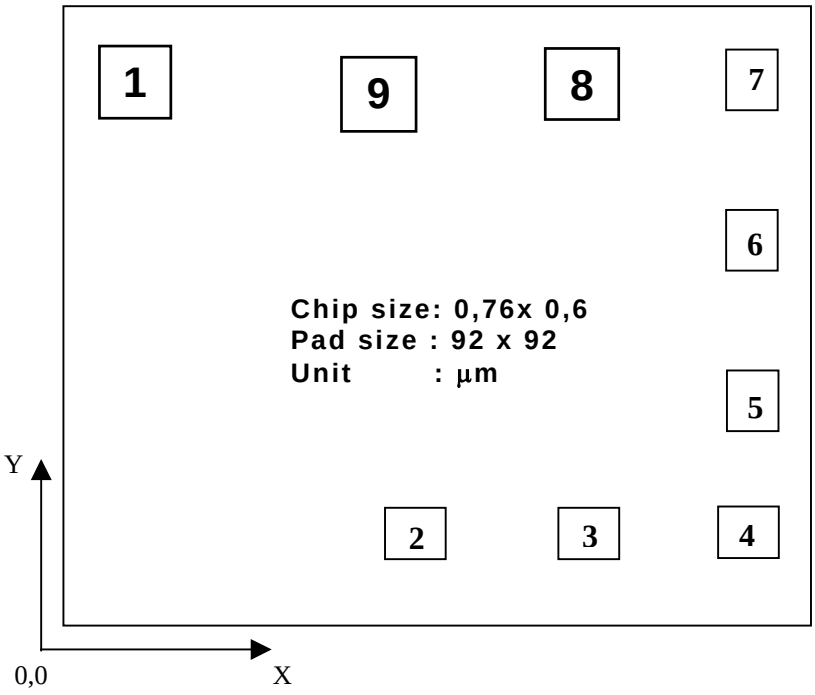


V_{KA}=V_{REF}(1+R1/R2)+I_{REF}R1

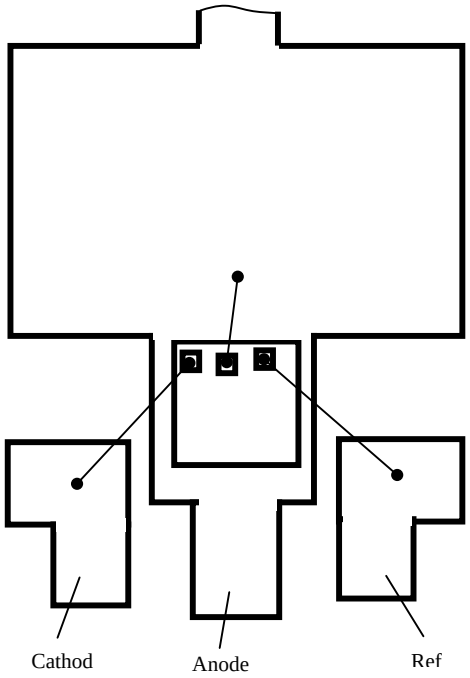
Fig-3. Test Circuit for I_{off}



PAD LAYOUT



BONDING DIAGRAM



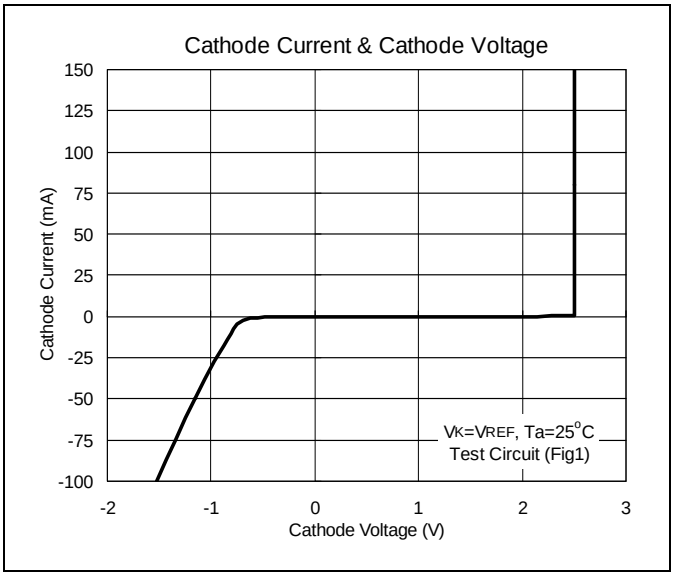
PAD LOCATION

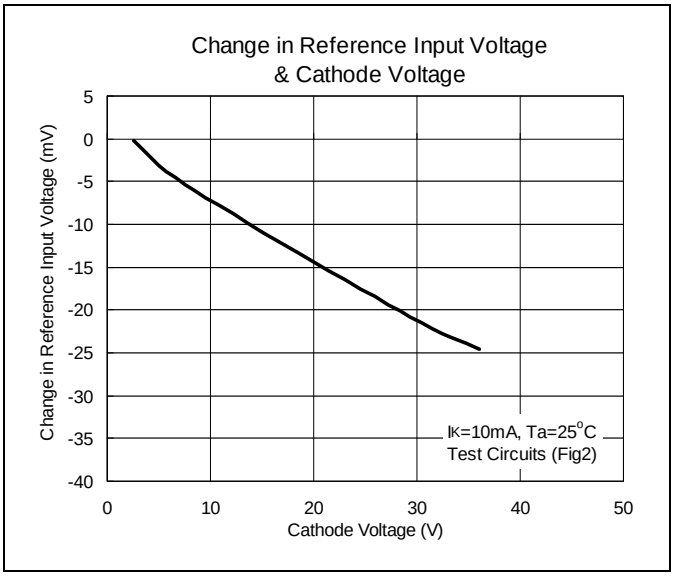
Pad No.	Pad Name	Description	X	Y
1	K	Cathode	53	442
9	A	Anode	325	437
8	R	Reference	525	450

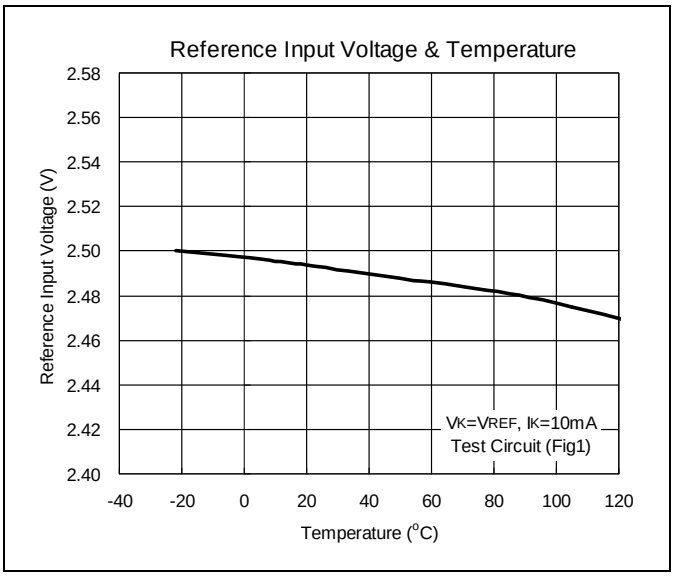
PHYSICAL CHARACTERISTIC

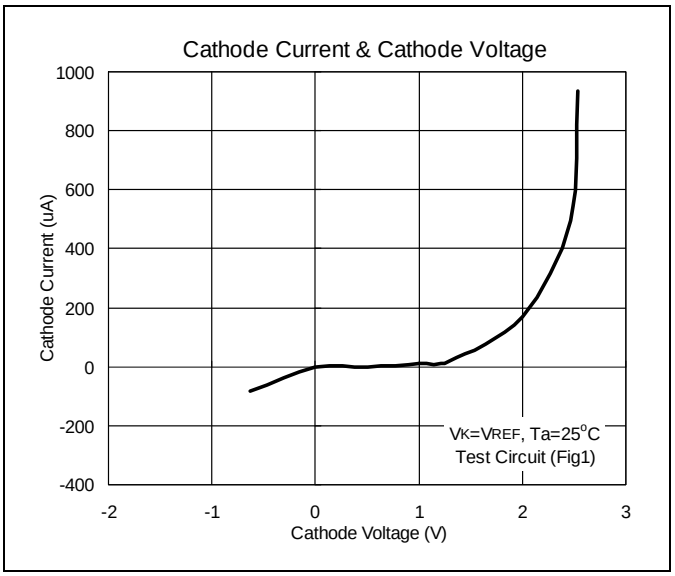
Wafes dia	100 mm (4")
Wafes width	280 ±20µm
Scribe width	60 µm
Passivation	PSG
Backside metallization	Without metallization

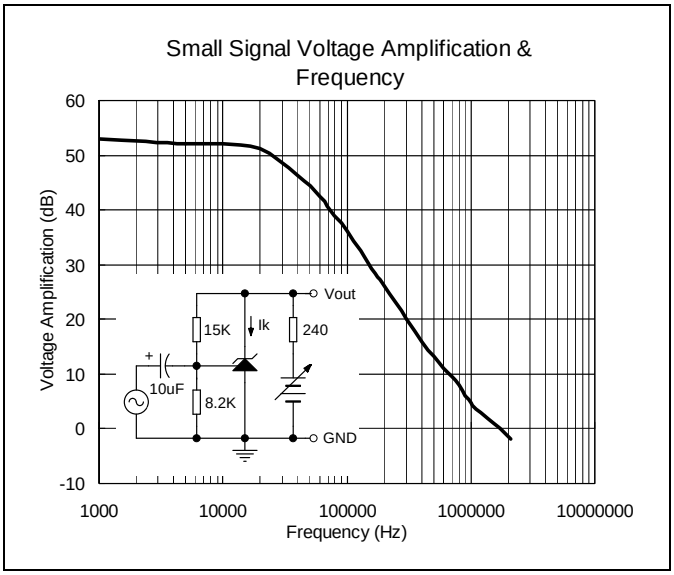
Characteristics Curve





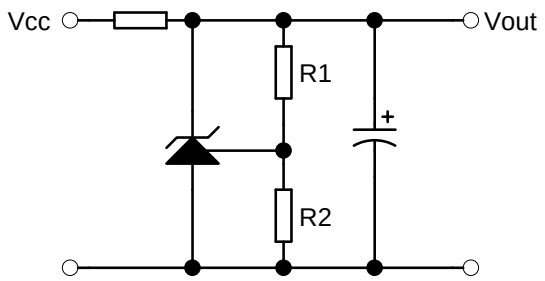






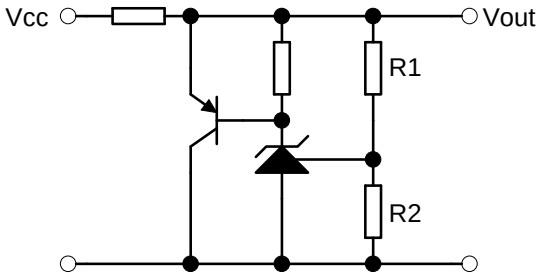
Typical Application

Fig 4. Shunt Regulator



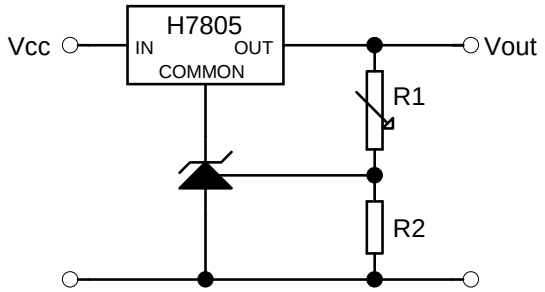
$V_{out}=(1+R_1/R_2)V_{REF}$

Fig 5. High Current Shunt Regulator



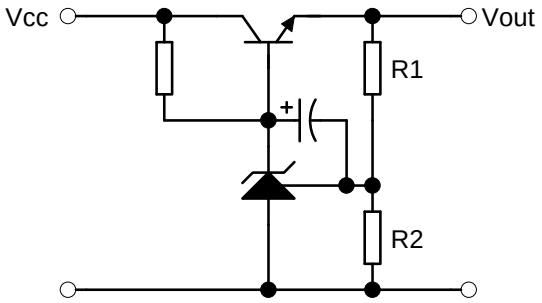
$V_{out}=(1+R_1/R_2)V_{REF}$

Fig 6. Output Control of a Three-Terminal Fixed Regulator



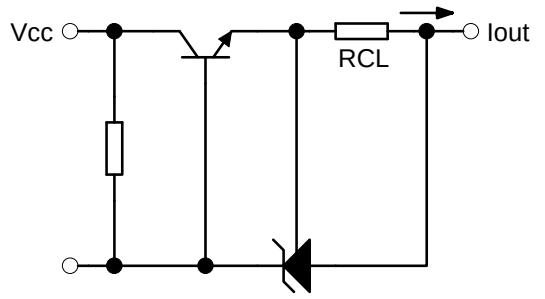
$V_{out}=(1+R_1/R_2)V_{REF}$; $V_{out(min)}=V_{REF}+5V$

Fig 7. Series Pass Regulator



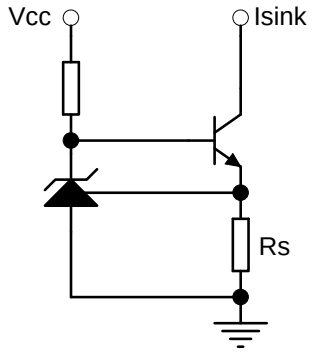
$V_{out}=(1+R_1/R_2)V_{REF}$; $V_{out(min)}=V_{REF}+V_{BE}$

Fig 8. Current Limiter or Current Source



$I_{out}=V_{REF}/R_{CL}$

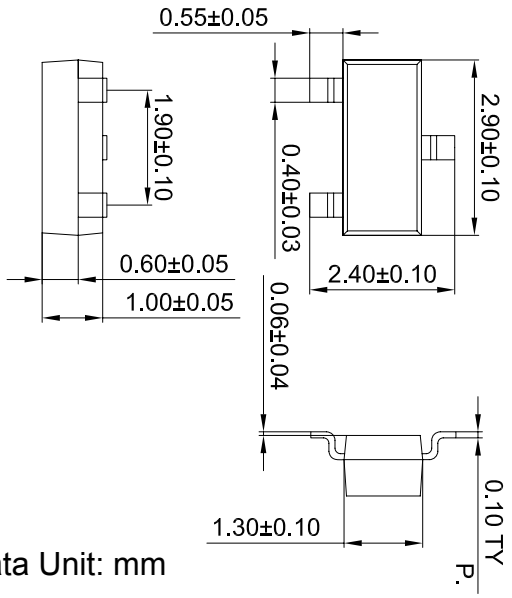
Fig 9. Constant Current Sink



$I_{sink}=V_{REF}/R_S$

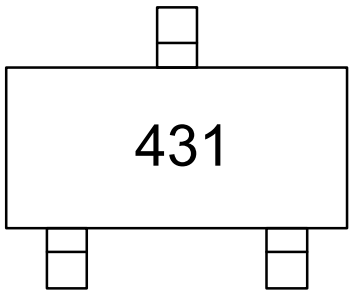
SOT-23 Package Dimension

3-Lead SOT-23 Plastic
Surface Mounted Package
HAOHAI Package Code: N



Data Unit: mm

Marking

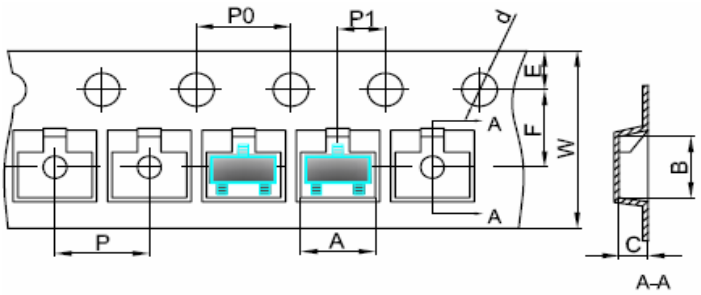


All products are
lead-free processes Packaging
所有产品均为无铅环保制程封装

SOT-23 包装规格及包装尺寸数据 Packaging Specifications

SOT-23 Tape and Reel

SOT-23 Embossed Carrier Tape



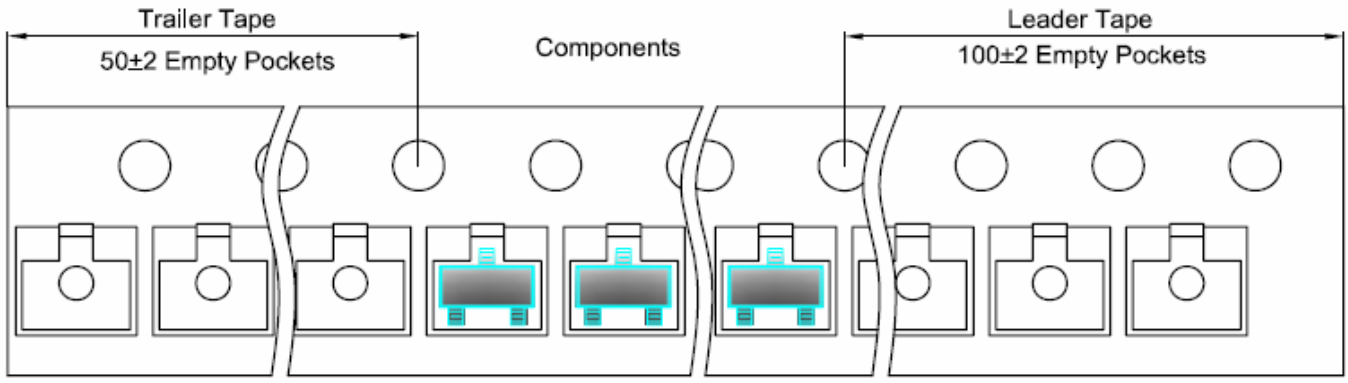
Packaging Description:

SOT-23 parts are shipped in tape, The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a muitllayer film (Heat Activated Adhesive in nature) prmarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3000 units per 7″ or 17.8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (antl-static coated).

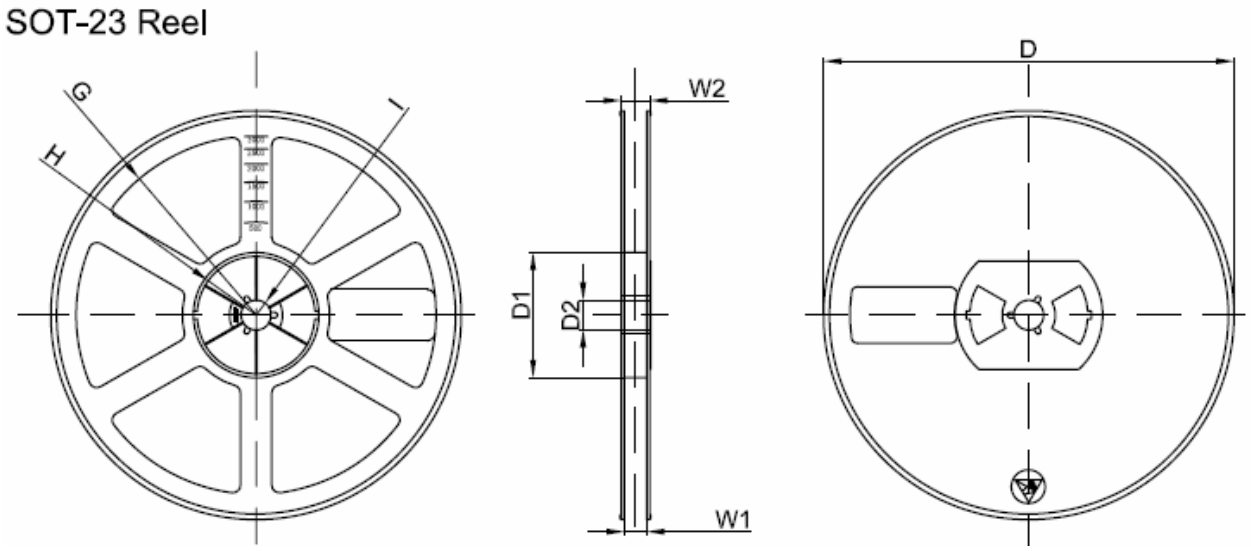
Dimensions are in millimeter（单位：毫米）

Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Φ1.50	1.75	3.50	4.00	4.00	2.00	8.00
(Tolerance)	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	+0.3/-0.1

SOT-23 Tape Leader and Trailer（载带尺寸）



SOT-23 Tape Leader and Trailer（卷盘尺寸）



Dimensions are in millimeter

Reel Option	D	D1	D2	G	H	I	W1	W2
7″ Dia	Φ178	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.3
Tolerance	±2	±1	±1	±1	±1	±1	±1	±1

REEL	Reel Size	BOX	Box Size(mm)	Carton	Carton Size(mm)	G.W.(Kg)
3000 Pcs	7 Inch	45,000 Pcs	203×203×195	180,000 Pcs	438×438×220	

SOT-23 产品装箱规格 Packaging Specifications

Tape & Reel Packing 3Kpcs/Reel 45Kpcs/BOX 180Kpcs/Cartons	载带卷盘包装 每卷3,000只 每盒45,000只 每箱180,000只

3000×15 Pcs

3000×1 Pcs

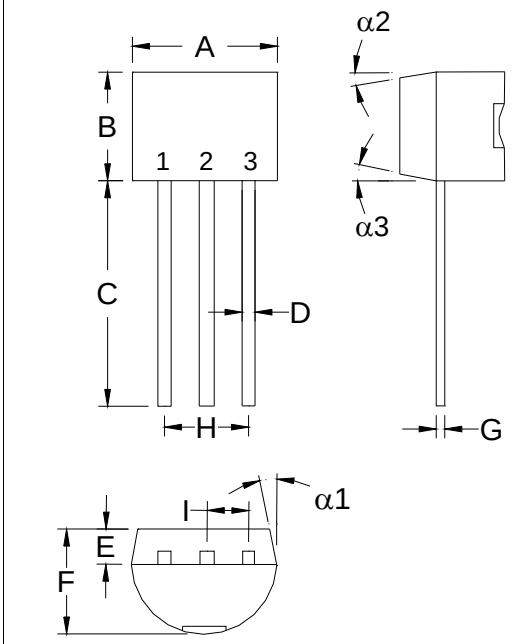
Label on the Inner BOX
Inner BOX:
210×210×205 mm

45,000×4 Pcs

Label on the Outer BOX
Outer BOX:
445×435×230 mm

TO-92 Package Dimension

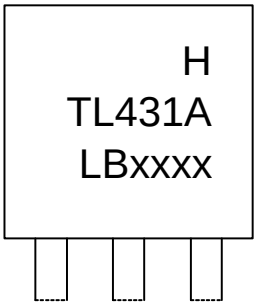
3-Lead TO-92 Plastic Package
HAOHAI Package Code: A



DIM	Min.	Max.
A	4.33	4.83
B	4.33	4.83
C	12.70	--
D	0.36	0.56
E	--	*1.27
F	3.36	3.76
G	0.36	0.56
H	--	*2.54
J	--	*1.27
α1	--	*5°
α2	--	*2°
α3	--	*2°

*: Typical, Unit: mm

Marking



All products are
lead-free processes Packaging

H: HAOHAI
LB: Chip code
XXX: Iron foot lead
XXXX: Copper foot lead

TO-92 产品装箱规格 Packaging Specifications

1000×10 Pcs

1000×1 Pcs

Label on the Inner BOX
Inner BOX:
238×161×96 mm

10,000×10 Pcs

Label on the Outer BOX
Outer BOX:
502×348×252 mm

BAG	BOX	Box Size(mm)	Carton	Carton Size(mm)	G.W.(Kg)
1000 Pcs	10,000 Pcs	238×161×96	100,000 Pcs	502×348×252	

Manufacturers version information
2011-08-05， HAOHAI ™ Product Data-V1.0
2014-05-05， HAOHAI ™ Product Data-V2.0
2015-12-10， HAOHAI ™ Product Data-V2.1

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