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XINBOLE

Product Specification

XBLW REF30xxE

20ppm/°C Maximum, Voltage Reference

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Descriptions

The REF30xxE series devices are low temperature drift (20ppm/°C maximum), low-power, high-precision CMOS voltage reference, featuring ±0.1% initial accuracy, low operating current with power consumption less than 500μA. This device also offers very low output noise of 15 μVPP/V, which enables its ability to maintain high signal integrity with high-resolution data converters in noise critical systems.

Packaged in the same SOT23-3 package ,Stability and system reliability are further improved by the low output-voltage hysteresis of the device and low long-term output voltage drift.

REF30xxE is specified for the wide temperature range of −40 to +125 °C.

Applications

- Data acquisition (DAQ)
- PLC analog I/O modules
- Field transmitters
- Motor drive control module
- Battery test equipment
- LCR meters



SOT-23-3L

Features and Benefits

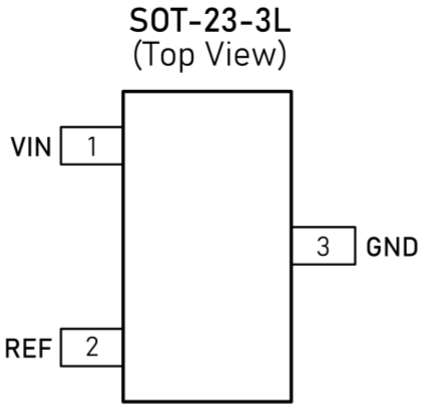
- Voltage options: 1.25V, 1.8V, 2.048V, 2.5V, 3.0V, 3.3V, 4.096V
- Initial accuracy: ±0.1% (maximum)
- Low temperature coefficient: 20 ppm/°C (maximum)
- Output 1/f noise at 0.1 to 10 Hz: 15 μVPP/V
- Supply voltage: 2.7 to 5.5 V
- Power consumption: < 500 μA
- Startup time: <400us
- Operating temperature: −40 to 125 °C
- Output Current: ±5mA

Ordering Information

Product Model	Package Type	Marking	Packing	Packing Qty	Output Voltage
XBLW REF3012EAIDBZR	SOT-23-3L	30EAC	Tape	3000Pcs/Reel	1.25V
XBLW REF3018EAIDBZR	SOT-23-3L	30ECC	Tape	3000Pcs/Reel	1.8V
XBLW REF3020EAIDBZR	SOT-23-3L	30EDC	Tape	3000Pcs/Reel	2.048V
XBLW REF3025EAIDBZR	SOT-23-3L	30EEC	Tape	3000Pcs/Reel	2.5V
XBLW REF3030EAIDBZR	SOT-23-3L	30EFC	Tape	3000Pcs/Reel	3.0V
XBLW REF3033EAIDBZR	SOT-23-3L	30EGC	Tape	3000Pcs/Reel	3.3V
XBLW REF3040EAIDBZR	SOT-23-3L	30EHC	Tape	3000Pcs/Reel	4.096V

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Pin Configuration



Pin Description

Pin. Name	Pin Description
VIN	Power supply voltage
GND	Ground.
REF	Reference voltage outputs , an external capacitor is required.

Absolute Maximum Ratings

In accordance with the Absolute Maximum Rating System (IEC 60134).

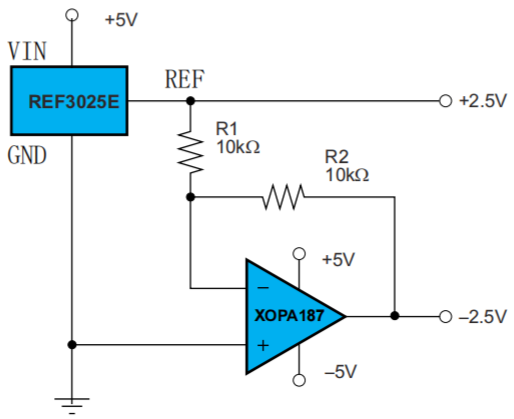
Operating Ambient Temperature Range	-40 to 125 °C
Storage Temperature Range	-50 to 125 °C
Input Voltage Range	-0.3 V to 5.5 V
ESD protection	> 3000 V

Note: Stresses exceeding those listed in the Maximum Rating table may damage the device. Operation beyond the maximum Rating conditions or under harsh conditions may affect product reliability and function.

Recommended Operating Conditions

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_{IN}	Supply input voltage	V_{OUT}+0.2		5.5	V
I_{CC}	Output current range	-5		5	mA

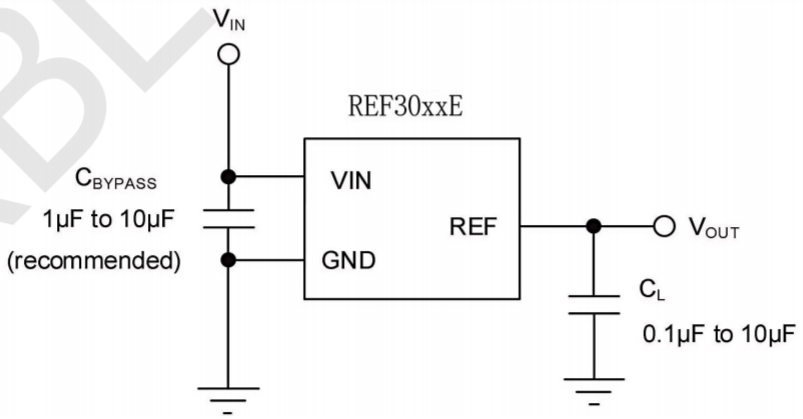
Typical applications of negative reference voltage



Electrical Characteristics

Symbol	Parameter	Description	Min.	Typ.	Max.	Unit
I_{CC}	Power consumption	V_{CC} = 5.0V, no load.		300	500	μA
V_{OUT}	Output voltage	REF3012E		1.25		V
		REF3018E		1.8		V
		REF3020E		2.048		V
		REF3025E		2.5		V
		REF3030E		3.0		V
		REF3033E		3.3		V
		REF3040E		4.096		V
ΔV_{OUT}	Output voltage accuracy		-0.1		0.1	%
V_{noise}	Output Noise	0.1Hz~10Hz		15		uVpp/V
T_C	Temperature coefficient	-40 to 125 °C			20	ppm/°C
$V_{IN_V_{OUT}}$	Dropout Voltage			200		mV
ΔV_{OUT} /ΔV_{IN}	Line Regulation				100	ppm/V
ΔV_{OUT}/ ΔI_L	Load Regulation				50	ppm/mA
dT	Thermal hysteresis			80		ppm
	Long-term stability	0h to 1000h at 25 °C		200		ppm
I_{SC}	Short-circuit current	Souring and sinking		50		mA
	Capacitive load		0.1		10	μF
	Turn-on setting time				400	us

Typical Application



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Layout Guidelines

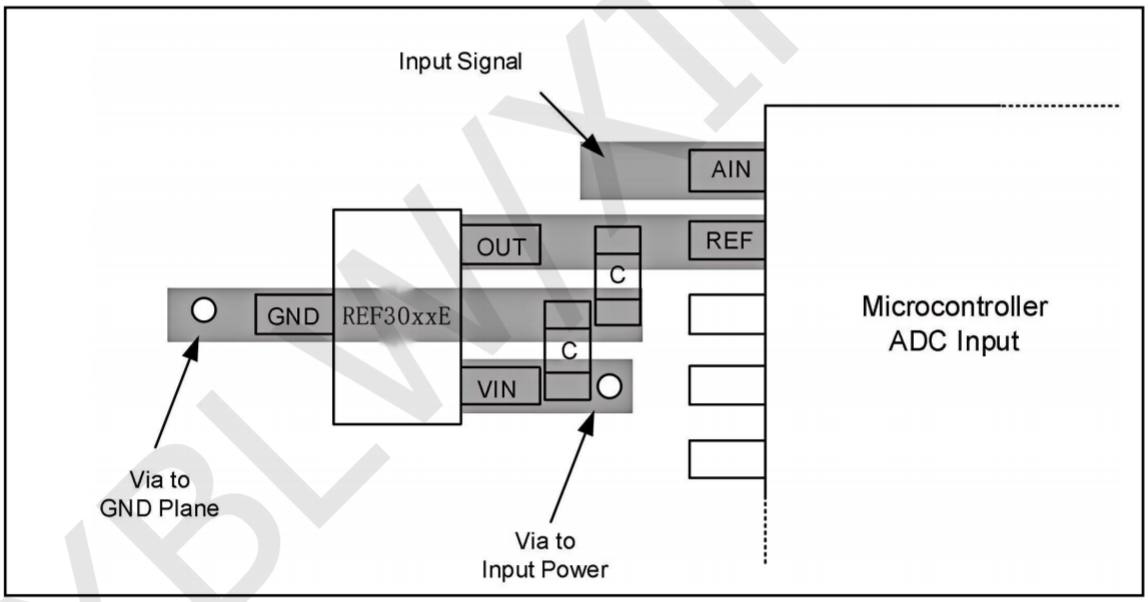
For optimal performance of this design，please follow standard printed circuit board (PCB) layout guidelines, including proper decoupling close to all integrated circuits and adequate power and ground connections with large copper pours.

As shown below an example of a PCB layout for a data acquisition system using the REF30xxE.

Some key considerations are:

- Connect a low-ESR, 1μF ceramic capacitor at the IN pin for bypass, and a 0.1uF to 10uF ceramic capacitor at the OUT pin for stability of the REF30xxE.
- Decouple other active devices in the system per the device specifications.
- Use a solid ground plane helps distribute heat and reduces EMI noise pickup.
- Place the external components as close to the device as possible. This configuration prevents parasitic errors (such as the Seebeck effect) from occurring.
- Minimize trace length between the reference and bias connections to the ADC to reduce noise pickup·
- Do not run sensitive analog traces in parallel with digital traces. Avoid crossing digital and analog traces if possible, and only make perpendicular crossings when absolutely necessary

Layout Example



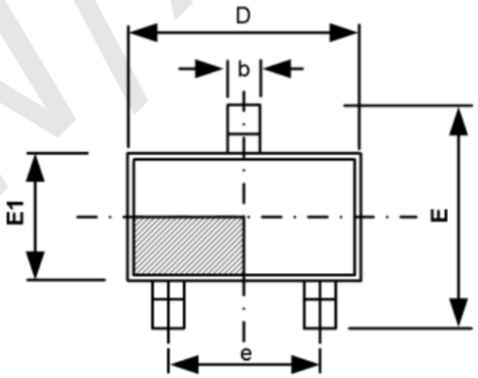
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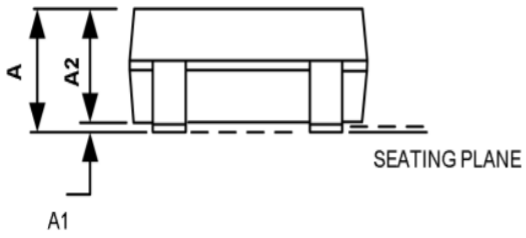
Package Information

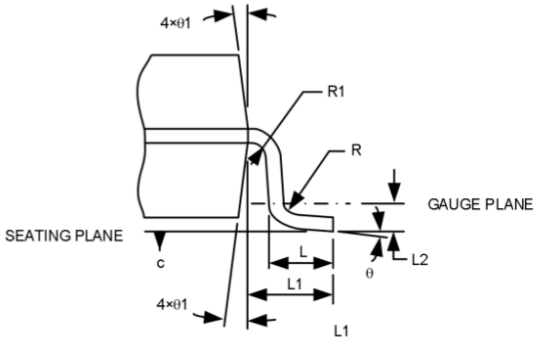
- SOT-23-3L

(Unit: mm)

Symbol	Min.	Typ.	Max.
A	–	–	1.35
A1	0	–	0.15
A2	1.0	1.1	1.2
b	0.35	–	0.45
b1	0.32	–	0.38
C	0.14	–	0.20
C1	0.14	0.15	0.16
D	2.82	2.92	3.02
E	2.60	2.80	3.00
E1	1.526	1.626	1.726
e	1.8	1.9	2.0
L	0.35	0.45	0.6
L1	0.6REF		
L2	0.25REF		
R	0.1	–	–
R1	0.1	–	0.25
θ	0°	4°	8°
θ1	5°	10°	15°







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