



CD2912 2920 2925 2930 2933

2940

Programmable Precision Shunt Regulator

Version: Rev 1.0.0 Date: 2025-6-12

Features ■■

- MicroSIZE Package: SOT23-3
- Low Dropout: 1mV
- High Output Current: 25mA
- Low Temperature Drift: Maximum of 100
- High Accuracy: 2%
- Low IQ: Maximum of 50μA

Application ■■

- Portable, Battery-Powered Equipment
- Data Acquisition Systems
- Medical Equipment
- Hand-Held Test Equipment

Description ■■

The CD29xx is a precision, low-power, low-voltage dropout voltage reference family available in a tiny 3- pin SOT-23 package. The small size and low power consumption (50μA maximum) of the CD29xx make it ideal for portable and battery-powered applications.

The CD29xx does not require a load capacitor, but it is stable with any capacitive load. Unloaded, the CD29xx can be operated with supplies within 1 mV of output voltage. All models are specified for the wide temperature range, -40°C to 125°C.

Contents

Features.....

- 1 -

Application.....

- 1 -

Description.....

- 1 -

Device Comparison Table.....

- 3 -

Pin Configurations.....

- 3 -

Pin Description.....

- 3 -

Functional Block diagram.....

- 4 -

Absolute Maximum Ratings.....

- 4 -

Recommended Operating Conditions.....

- 5 -

Electrical Characteristics.....

- 5 -

Typical Characteristics.....

- 7 -

Application Information.....

- 8 -

Package Outline Dimensions.....

- 9 -

Package/Ordering Information.....

- 10 -

Revision Log.....

- 11 -

Device Comparison Table

Product	Voltage (V)
CD2912	1.25
CD2920	2.048
CD2925	2.5
CD2930	3
CD2933	3.3
CD2940	4.096

Pin Configurations

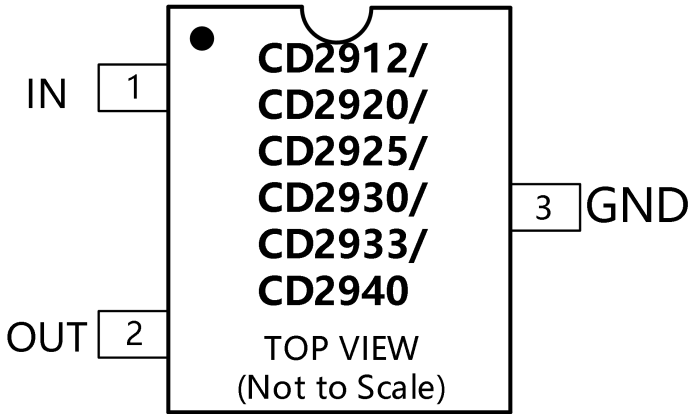


Figure 1. SOT23-3 Pin Configuration

Pin Description

Pin		I/O	Description
NO.	NAME		
1	IN	I	Input supply voltage
2	OUT	O	Reference output voltage
3	GND	--	Ground

Functional Block diagram

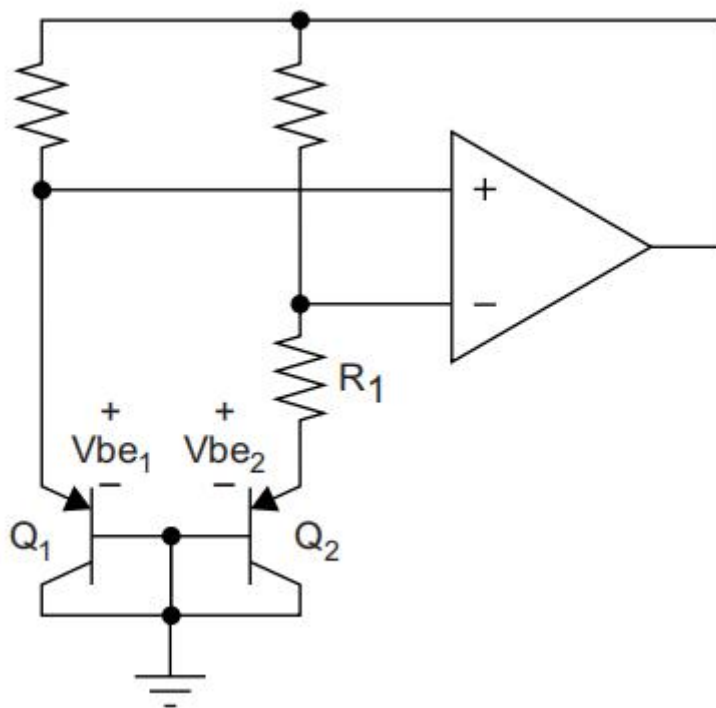


Figure 2. Simplified Schematic of Band-Gap Reference

Absolute Maximum Ratings

Parameter	Rating
Supply voltage, V+ to V-	-0.3 V to +6 V
Output short circuit	Continuous
Operating Temperature Range	-40°C to +125°C
Storage Temperature Range	-65°C to +150°C
Junction Temperature	-65~150°C
Lead Temperature, Soldering (10 sec)	300°C
ESD	2 kV(HBM)

Recommended Operating Conditions

Parameter	Rating
Input voltage	VREF+0.05V~5.5V
Load current	25mA(max)
Operating Temperature Range	-40°C to +125°C

Electrical Characteristics

Boldface limits apply over the specified temperature range, TA=-40°C to 125°C. At TA=25°C, ILOAD=0mA, VIN=5V, unless otherwise noted.

PARAMETER	Min	Typ	Max	Test Conditions	UNIT
CD2912-1.25V					
Output Voltage (V _{OUT})	1.225	1.25	1.275		V
Initial accuracy	--	--	2%		
Output voltage noise	--	14	--	f = 0.1 Hz to 10 Hz,	μV _{pp}
Voltage noise	--	42	--	f = 10 Hz to 10 kHz	μV _{rms}
Line regulation	--	60	--	1.8 V ≤ VIN ≤ 5.5 V	μV/V
CD2920-2.048V					
Output Voltage (V _{OUT})	2.007	2.048	2.089		V
Initial accuracy	--	--	2%		
Output voltage noise	--	23	--	f = 0.1 Hz to 10 Hz,	μV _{pp}
Voltage noise	--	65	--	f = 10 Hz to 10 kHz	μV _{rms}
Line regulation	--	110	290	V _{REF} + 50 mV ≤ VIN ≤ 5.5 V	μV/V
CD2925-2.5V					
Output Voltage (V _{OUT})	2.45	2.5	2.55		V
Initial accuracy	--	--	2%		
Output voltage noise	--	28	--	f = 0.1 Hz to 10 Hz,	μV _{pp}
Voltage noise	--	80	--	f = 10 Hz to 10 kHz	μV _{rms}
Line regulation	--	120	325	V _{REF} + 50 mV ≤ VIN ≤ 5.5 V	μV/V
CD2930-3V					
Output Voltage (V _{OUT})	2.94	3	3.06		V
Initial accuracy	--	--	2%		

Output voltage noise	--	33	--	$f = 0.1 \text{ Hz to } 10 \text{ Hz}$,	μV_{pp}
Voltage noise	--	94	--	$f = 10 \text{ Hz to } 10 \text{ kHz}$	μV_{rms}
Line regulation	--	120	375	$V_{\text{REF}} + 50 \text{ mV} \leq V_{\text{IN}} \leq 5.5 \text{ V}$	$\mu\text{V/V}$
CD2933-3.3V					
Output Voltage (V_{OUT})	3.234	3.3	3.366		V
Initial accuracy	--	--	2%		
Output voltage noise	--	36	--	$f = 0.1 \text{ Hz to } 10 \text{ Hz}$,	μV_{pp}
Voltage noise	--	105	--	$f = 10 \text{ Hz to } 10 \text{ kHz}$	μV_{rms}
Line regulation	--	130	400	$V_{\text{REF}} + 50 \text{ mV} \leq V_{\text{IN}} \leq 5.5 \text{ V}$	$\mu\text{V/V}$
CD2940-4V					
Output Voltage (V_{OUT})	4.014	4.096	4.178		V
Initial accuracy	--	--	2%		
Output voltage noise	--	45	--	$f = 0.1 \text{ Hz to } 10 \text{ Hz}$,	μV_{pp}
Voltage noise	--	128	--	$f = 10 \text{ Hz to } 10 \text{ kHz}$	μV_{rms}
Line regulation	--	160	410	$V_{\text{REF}} + 50 \text{ mV} \leq V_{\text{IN}} \leq 5.5 \text{ V}$	$\mu\text{V/V}$
CD2912,CD2920,CD2925,CD2930,CD2933,CD2940					
dV_{OUT}/dT Output voltage temperature drift(1)	--	35	100	$-40^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$	V
Output current	--	--	25		mA
Long-term stability	--	24	--	0 to 1000H	ppm
	--	15	--	1000 to 2000H	
$dV_{\text{OUT}}/dI_{\text{LOAD}}$ Load regulation(2)	--	3	100	$0 \text{ mA} < I_{\text{LOAD}} < 25 \text{ mA}$, $V_{\text{IN}} = V_{\text{REF}} + 500 \text{ mV}$ (3)	$\mu\text{V/mA}$
Thermal Hysteresis(4)(d_T)	--	25	100		ppm
Dropout voltage($V_{\text{IN}} - V_{\text{OUT}}$)	--	1	50		mV
Short-circuit current(ISC)	--	45	--		mA
Turnon settling time	--	120	--	to 0.1% at $V_{\text{IN}} = 5 \text{ V}$ with $C_L = 0$	μs
POWER SUPPLY					
Voltage	$V_{\text{REF}} + 0.001$	--	5.5	$I_L = 0$	V
Voltage over temperature	$V_{\text{REF}} + 0.05$	--	5.5	$-40^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$	V

Quiescent current	--	42	50		μA
Quiescent current over temperature	--	--	59	-40°C ≤ TA ≤ 125°C	μA
TEMPERATURE RANGE					
Specified range	-40	--	125		°C
Operating range	-40	--	125		°C
Storage range	-65	--	150		°C
Thermal resistance for SOT-23 surface-mount(RθJC)	--	110	--		°C/W
Thermal resistance for SOT-23 surface-mount(RθJA)	--	336	--		°C/W

Typical Characteristics

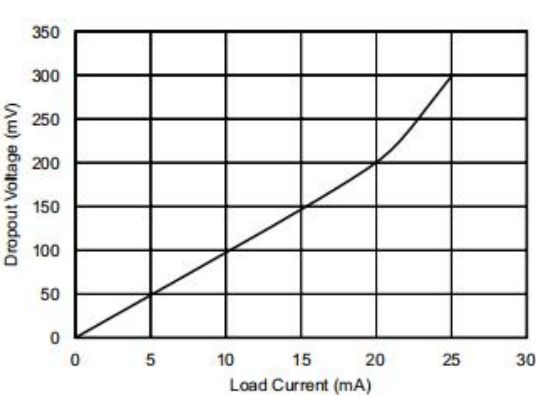


Figure 5.Dropout Voltage vs Load Current

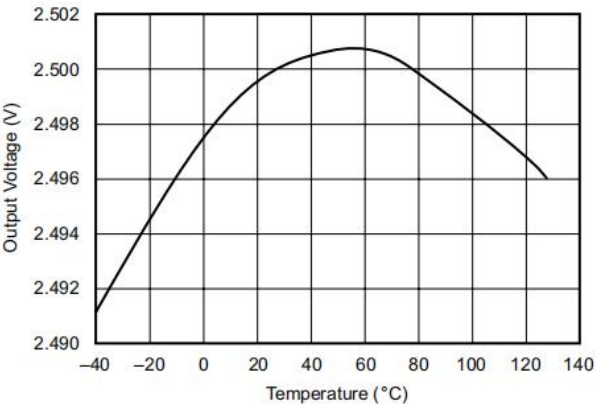


Figure 6.Output Voltage vs Temperature

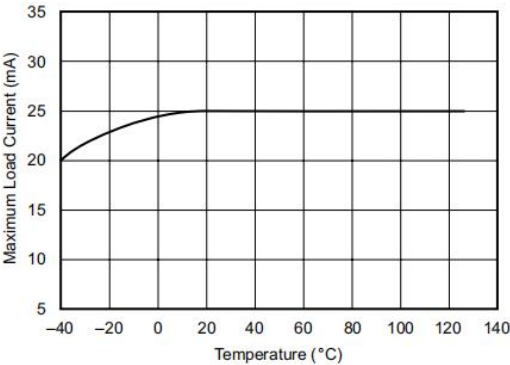
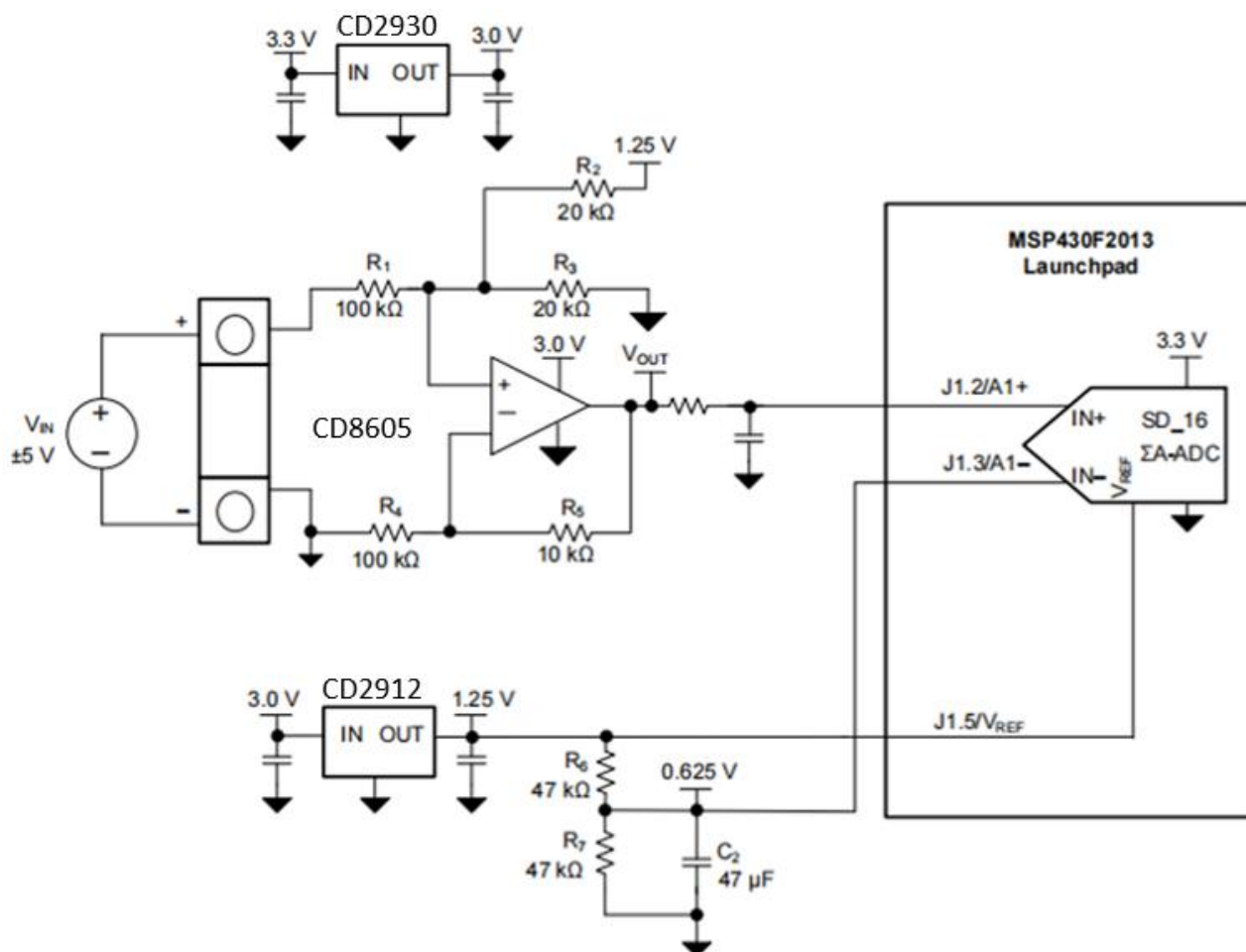
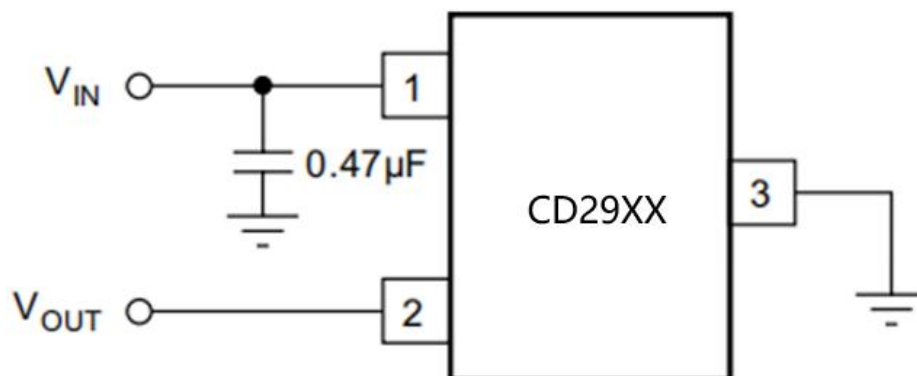
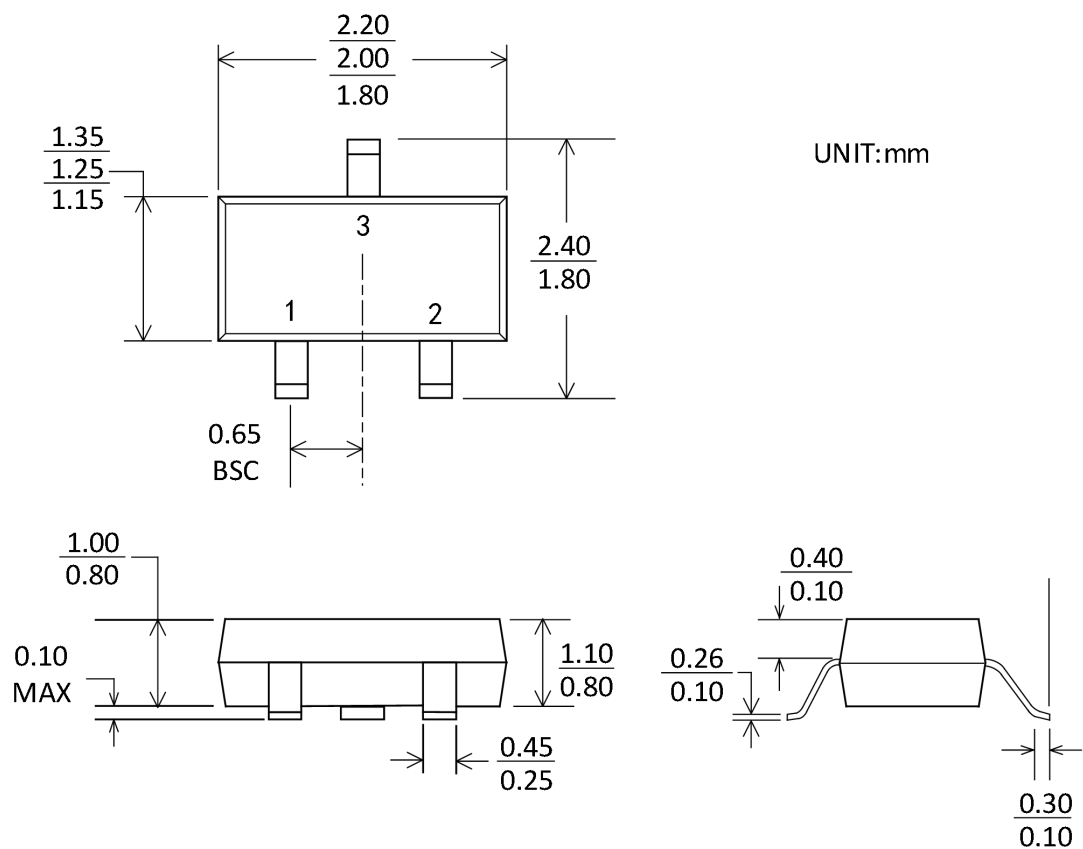


Figure 7.Maximum Load Current vs Temperature



Package Outline Dimensions

SOT23-3



Package/Ordering Information

MODEL	TEMPERATURE	PACKAGE DESCRIPTION	PACKAGE OPTION
CD2912AST-1.25V	-40°C~125°C	SOT23-3	Tape and Reel, 3000
CD2920AST-2.048V	-40°C~125°C	SOT23-3	Tape and Reel, 3000
CD2925AST-2.5V	-40°C~125°C	SOT23-3	Tape and Reel, 3000
CD2930AST-3V	-40°C~125°C	SOT23-3	Tape and Reel, 3000
CD2933AST-3.3V	-40°C~125°C	SOT23-3	Tape and Reel, 3000
CD2940AST-4V	-40°C~125°C	SOT23-3	Tape and Reel, 3000

Revision Log

Version	Revision date	Change content	Reason for Change	Modified by	Reviewed By	Note
V1.0	2025.6.12	Initial version	Regular update	WW	LYL	