

SOT23-3 封装高精度、低噪声、低温漂 CMOS 电压基准源

概述

CLREF20 为超低噪声、低温漂电压基准，采用小型 3 引脚 SOT23 封装。输出电压为 2.5V 时，1/f 噪声电压仅为 4.8 μ Vpp，最大温漂为 20ppm/ $^{\circ}$ C (CLREF20)。CLREF20 可以工作在 2.7V 至 5.5V 之间，工作电流为 230 μ A，最大负载电流为 10mA。CLREF20 提供 $\pm$ 0.2%的初始精度(B 尾缀),低温漂和低噪声指标有利于提高系统精度，理想用于高精度工业设计。CLREF20 提供 1.25V, 1.8V, 2.048V, 2.5V, 3.0V, 3.3V, 4.096V 和 5.0V 电压选项（5V 电压选项，电源电压需要在 5.3V~5.5V 之间）。器件采用 3 引脚 SOT23 封装，工作在 -40 $^{\circ}$ C 至 +125 $^{\circ}$ C 温度范围内。

特性

- $\pm$ 0.2%的初始精度（B 尾缀）
- 15ppm/ $^{\circ}$ C 低温漂（典型值）
- 4.8 μ Vpp 超低噪声（0.1Hz~10Hz）@2.5V
- 230 μ A 低工作电流
- 10mA 驱动电流
- 200mV 低压差
- 85dB 纹波抑制
- SOT23-3 小型封装
- 多电压选项：1.25V, 1.8V, 2.048V, 2.5V, 3.0V, 3.3V, 4.096V 和 5.0V
- 0 μ F~10 μ F 负载电容无条件稳定(可选)

应用

- 高精度工业与过程控制
- 精密仪器仪表
- 高分辨率 ADC 和 DAC
- 精密电流源

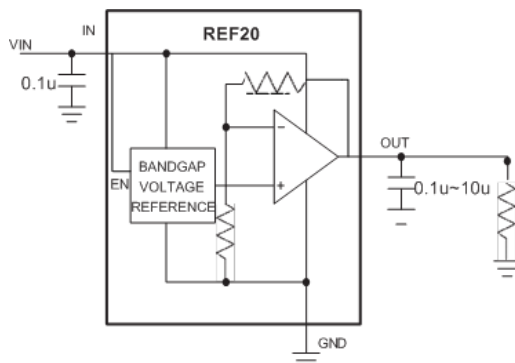


图 1 典型应用电路

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版本历史

2020 年 8 月 5 日星期三：Rev 0.1

技术规格

$V_{IN} = +5.0V$, $I_{OUT} = 0mA$, $C_{OUT} = 0.1\mu F$, $T_A = -40^{\circ}C$ to $+125^{\circ}C$, unless otherwise noted. Typical values are at $T_A = +25^{\circ}C$.

表格 1 技术指标：如非特别说明，适用于 CLREF20XXB

参数	条件	最小	典型	最大	单位
初始精度	CLREF20XXB	-0.2		0.2	%
噪声	1/f noise, 0.1Hz to 10Hz		4.8		μV_{p-p}
	thermal noise, 10Hz ~ 10kHz		16		μV_{RMS}
温度漂移	CLREF20XX		15	20	ppm/ $^{\circ}C$
线性调整率			145		μV
负载调整率			140		$\mu V/mA$
负载驱动能力		-10		10	mA
短路电流	Sourcing to ground		25		mA
长期稳定性	1000 hours at $T_A = +25^{\circ}C$		TBD		ppm/ $^{\circ}C$
纹波抑制比			85		dB
电源抑制比	100Hz		90		dB
	100KHz		40		dB
模拟工作电压		2.7		5.5	V
工作温度范围		-40		125	$^{\circ}C$
上电建立时间	建立到 0.01%, $C_{OUT}=0.1\mu F$		30		μs
ENABLE 建立时间	建立到 0.01%, $C_{OUT}=0.1\mu F$		75		μs
工作模式电流			230		μA
关断模式电流	EN 为低电平			2	μA

引脚配置和功能描述

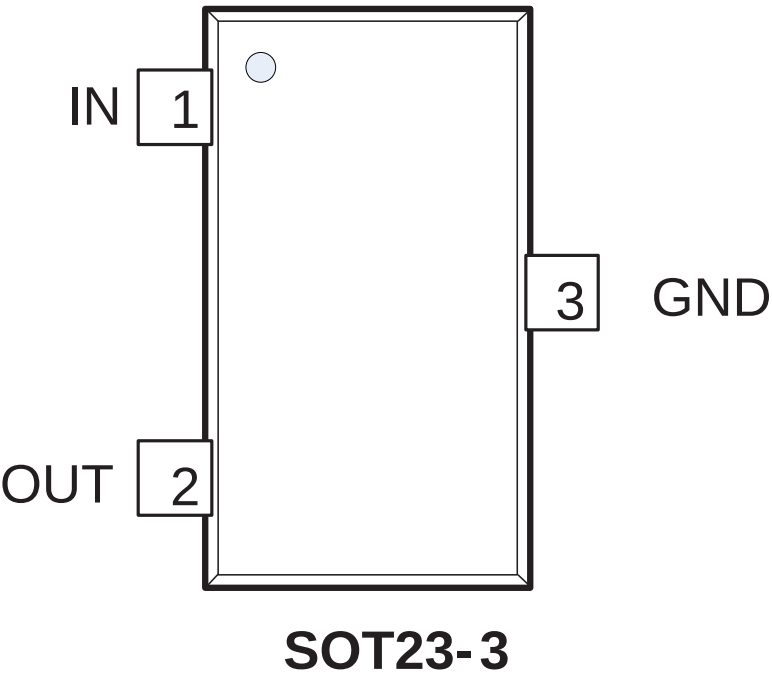


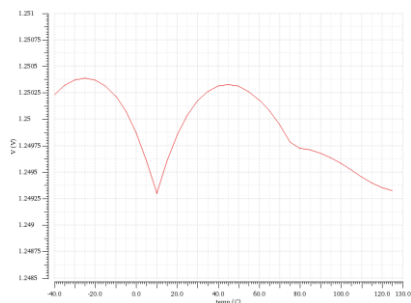
图 2 引脚图

表格 2

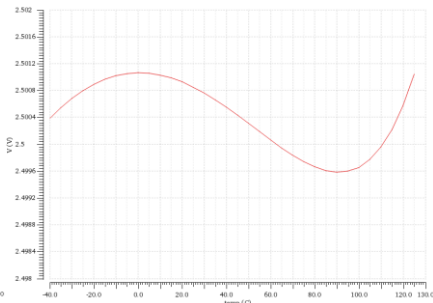
引脚	名称	
1	IN	电源输入
2	OUT	模拟输出
3	GND	地

典型工作特性

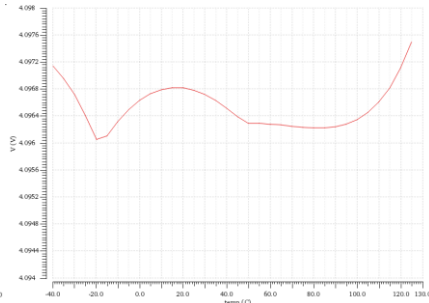
CLREF2012 OUTPUT
VOLTAGE TEMPERATURE DFIFT



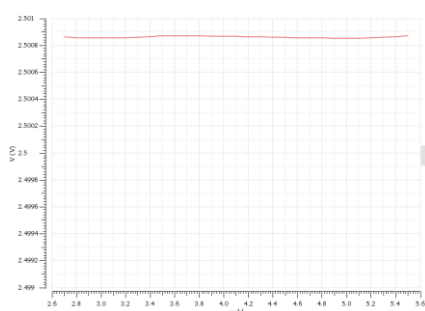
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VOLTAGE TEMPERATURE DFIFT



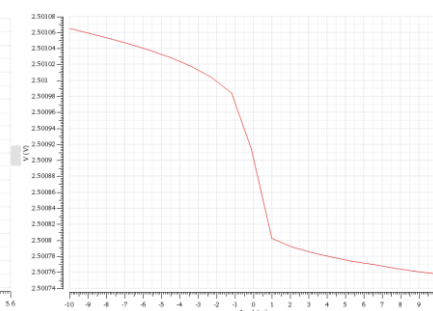
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VOLTAGE TEMPERATURE DFIFT



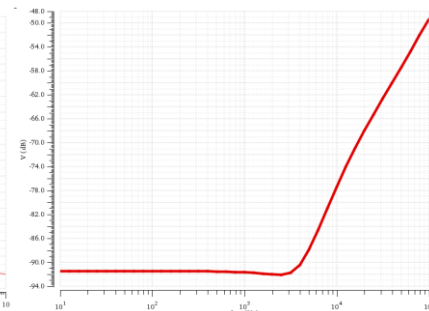
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LINE REGULATION



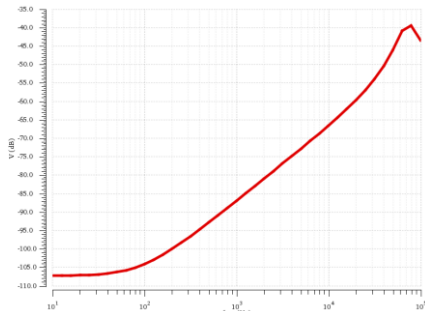
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LOAD REGULATION



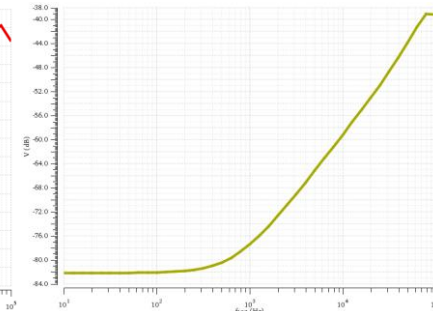
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PSRR vs. FREQUENCY



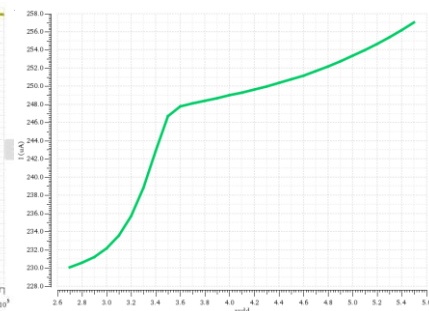
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PSRR vs. FREQUENCY



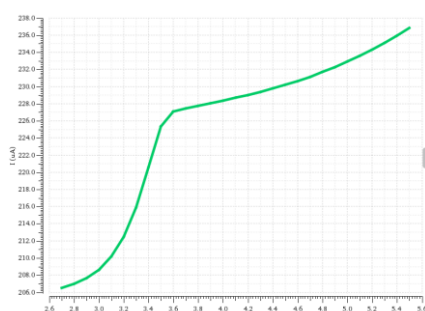
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PSRR vs. FREQUENCY



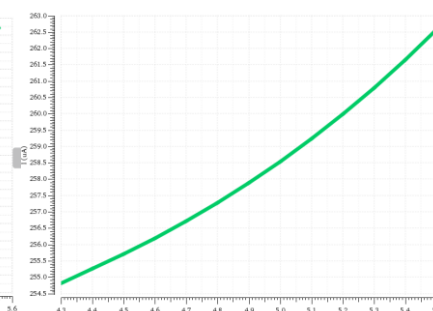
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SUPPLY CURRENT vs. INPUT VOLTAGE



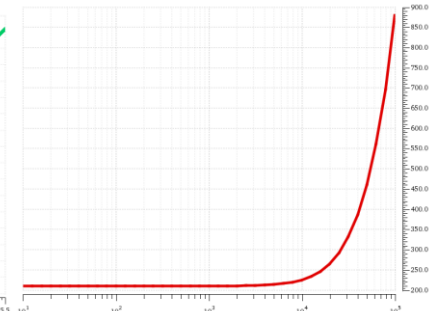
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SUPPLY CURRENT vs. INPUT VOLTAGE



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SUPPLY CURRENT vs. INPUT VOLTAGE

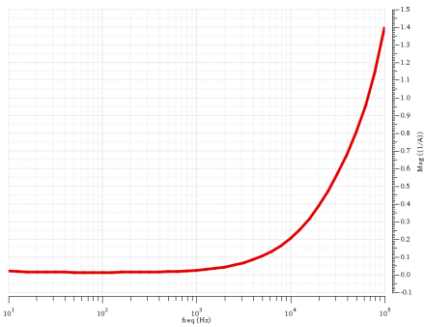


CLREF2012 OUTPUT
ROUT vs. FREQUENCY



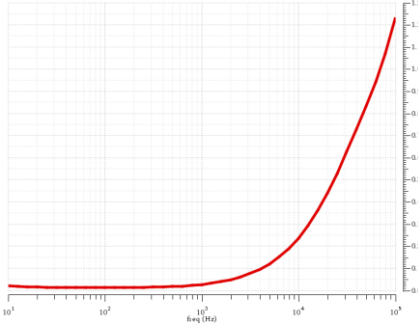
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ROUT vs. FREQUENCY



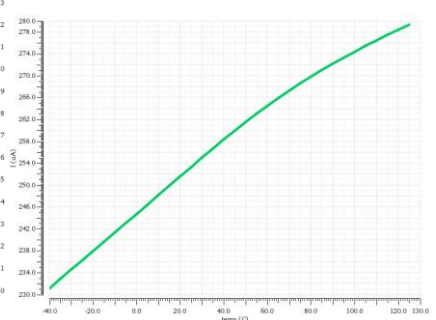
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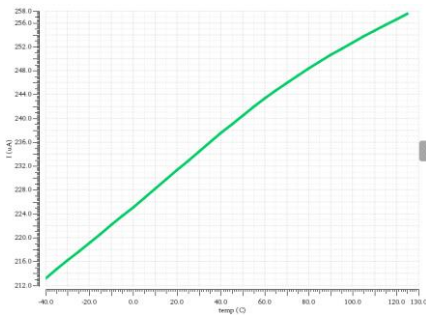
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SUPPLY CURRENT vs. TEMPERATURE



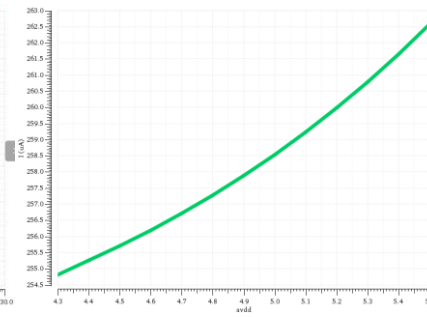
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SUPPLY CURRENT vs. TEMPERATURE



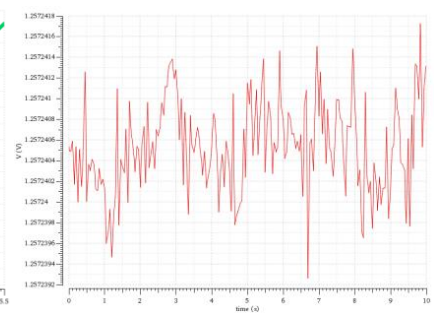
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SUPPLY CURRENT vs. TEMPERATURE



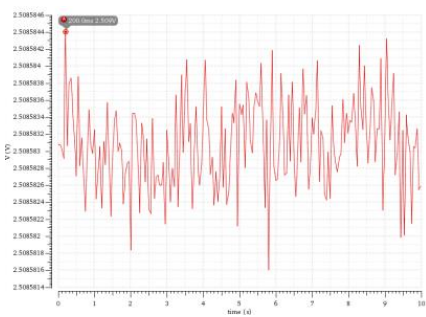
CLREF2012 OUTPUT NOISE

(0.1Hz to 10Hz)



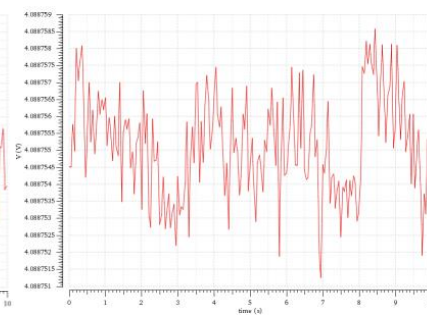
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(0.1Hz to 10Hz)



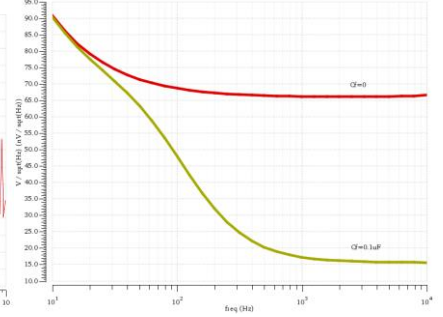
CLREF2040 OUTPUT NOISE

(0.1Hz to 10Hz)



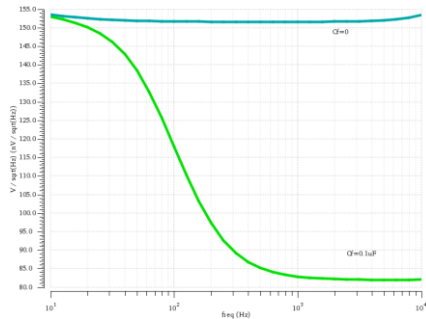
CLREF2012 OUTPUT

OUTPUT NOISE DENSITY



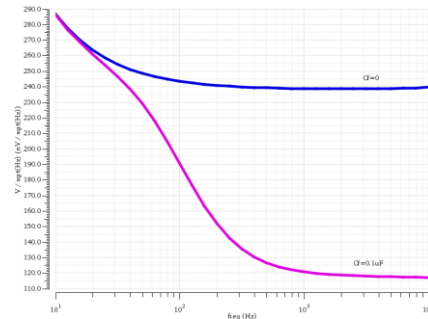
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OUTPUT NOISE DENSITY



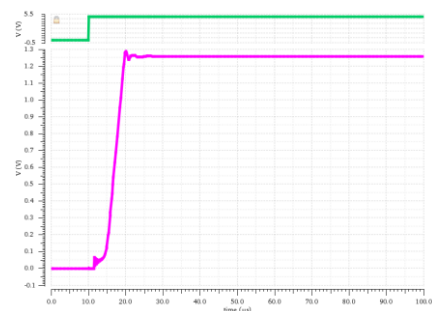
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OUTPUT NOISE DENSITY



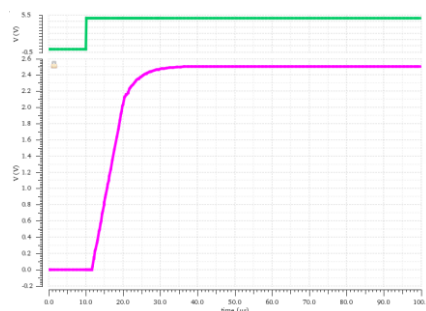
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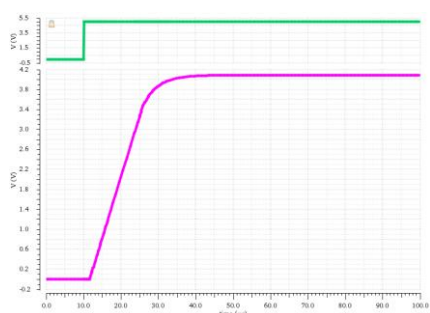
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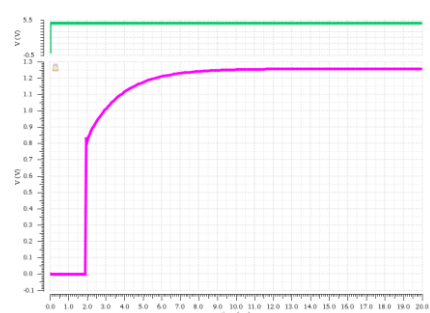
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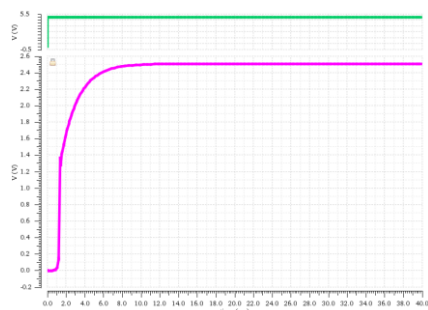
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(CFILTER=0.1uF)



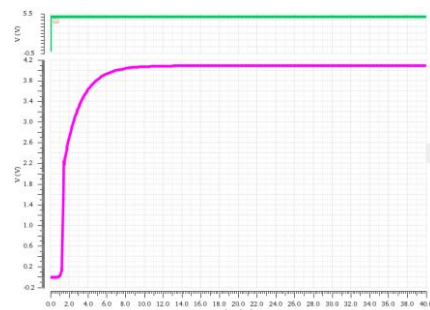
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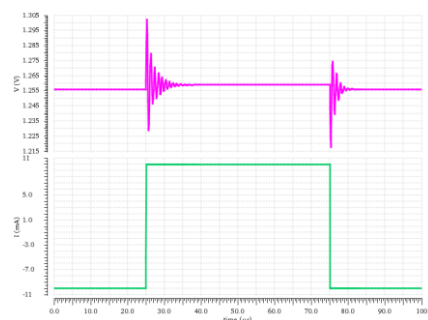
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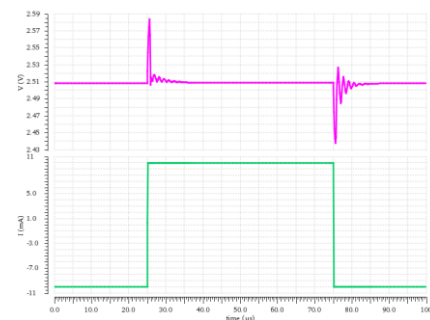
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(Cout=0.1uF)



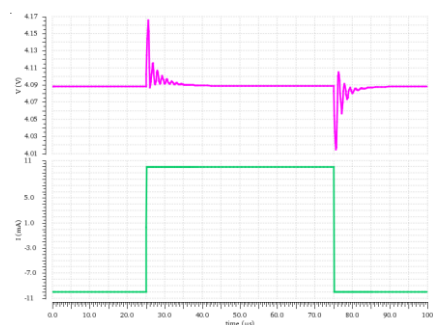
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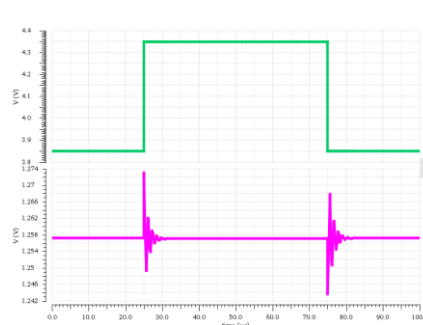
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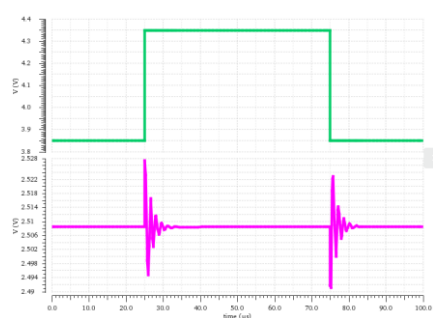
CLREF2012 LINE TRAN

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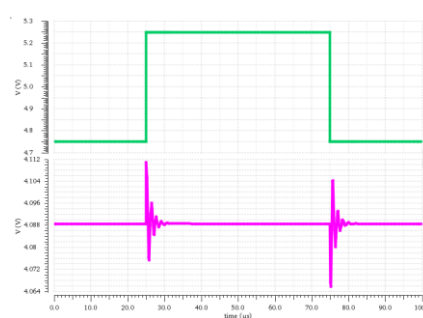
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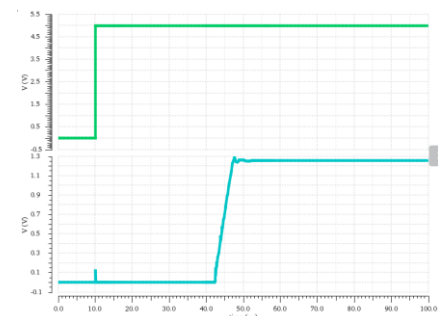
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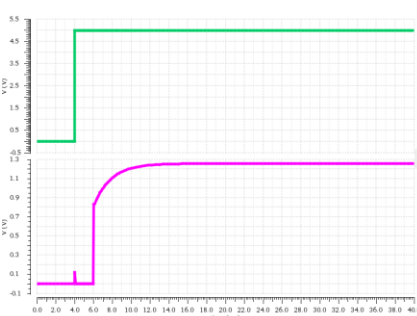
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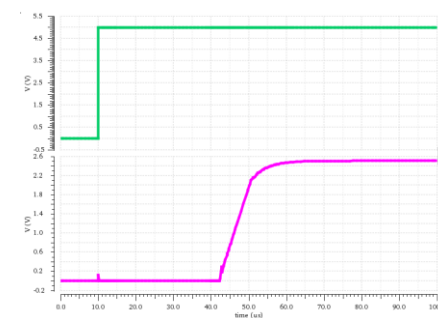
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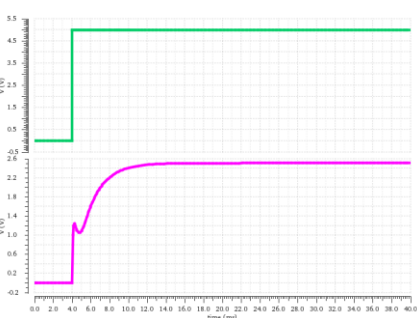
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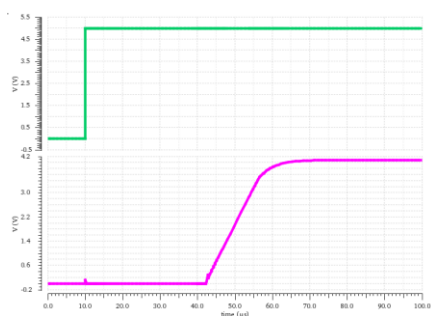
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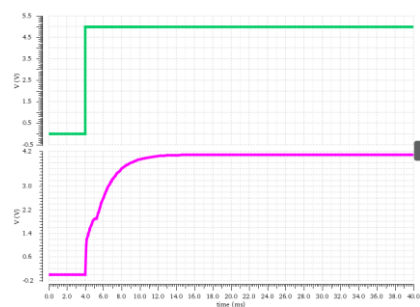
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(Cout=0uF)



CLREF2040 ENABLE TRAN

(Cout=0.1uF)

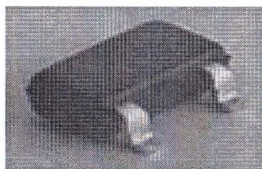
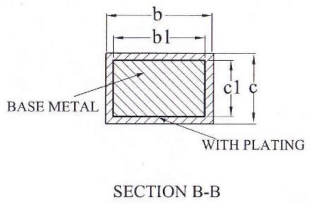
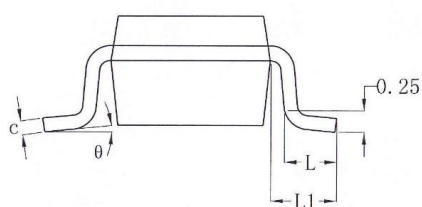
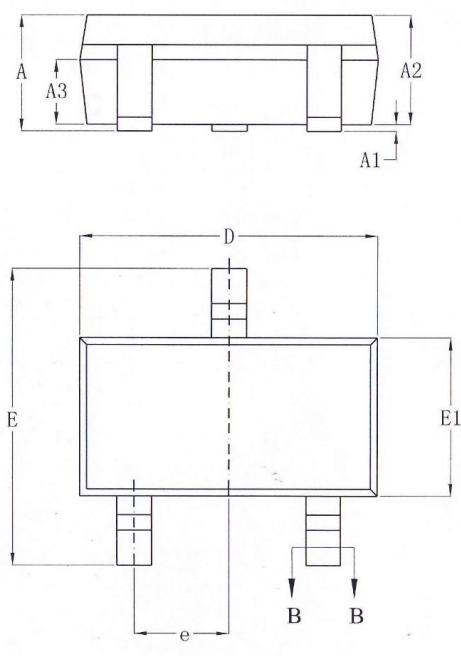


订货信息

表格 3 CLREF20XXB 订货信息

订货型号	输出电压(V)	封装	包装数量(pcs)	包装形式	温度系数	工作温度℃
CLREF2012BR	1.25	SOT23-3	3000	Reel	20ppm	-40 to 125
CLREF2018BR	1.8	SOT23-3	3000	Reel	20ppm	-40 to 125
CLREF2020BR	2.048	SOT23-3	3000	Reel	20ppm	-40 to 125
CLREF2025BR	2.5	SOT23-3	3000	Reel	20ppm	-40 to 125
CLREF2030BR	3.0	SOT23-3	3000	Reel	20ppm	-40 to 125
CLREF2033BR	3.3	SOT23-3	3000	Reel	20ppm	-40 to 125
CLREF2040BR	4.096	SOT23-3	3000	Reel	20ppm	-40 to 125
CLREF2050BR	5.0	SOT23-3	3000	Reel	20ppm	-40 to 125

封装图



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.25
A1	0.04	—	0.10
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
b	0.33	—	0.41
b1	0.32	0.35	0.38
c	0.15	—	0.19
c1	0.14	0.15	0.16
D	2.82	2.92	3.02
E	2.60	2.80	3.00
E1	1.50	1.60	1.70
e	0.95BSC		
L	0.30	—	0.60
L1	0.60REF		
theta	0	—	8°