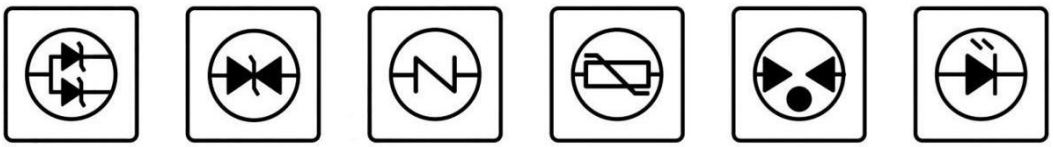
MSKSEMI 美森科
SEMICONDUCTOR



LM358QT-MS

Product specification

产品简介

LM358QT-MS 是一款双路低功耗的差分式运算放大器，可以单电源或双电源供电。具有较高的开环增益、内部补偿、高共模范围和良好的温度稳定性，以及具有输出短路保护的特点。广泛应用于传感器的放大电路、直流放大模块、音频放大电路和传统的运算放大电路中。

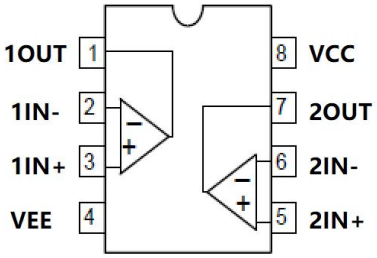
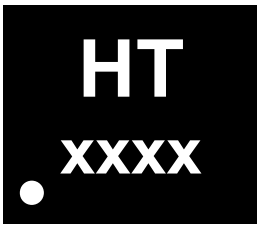
产品特点

- 内部频率补偿
- 短路保护
- 低功耗：典型值 0.5mA @ V_{cc}=5V
- 封装形式：
- 单电源电压范围：3V～36V
- 双电源电压范围：±18V
- 单位增益带宽:可达 1.2MHZ

产品用途

- 传感器信号放大器
- 直流增益
- 音频放大器
- 其它应用领域

产品概要及封装信息

DFN-8-EP(2x2)	引脚配置	管体标记
		

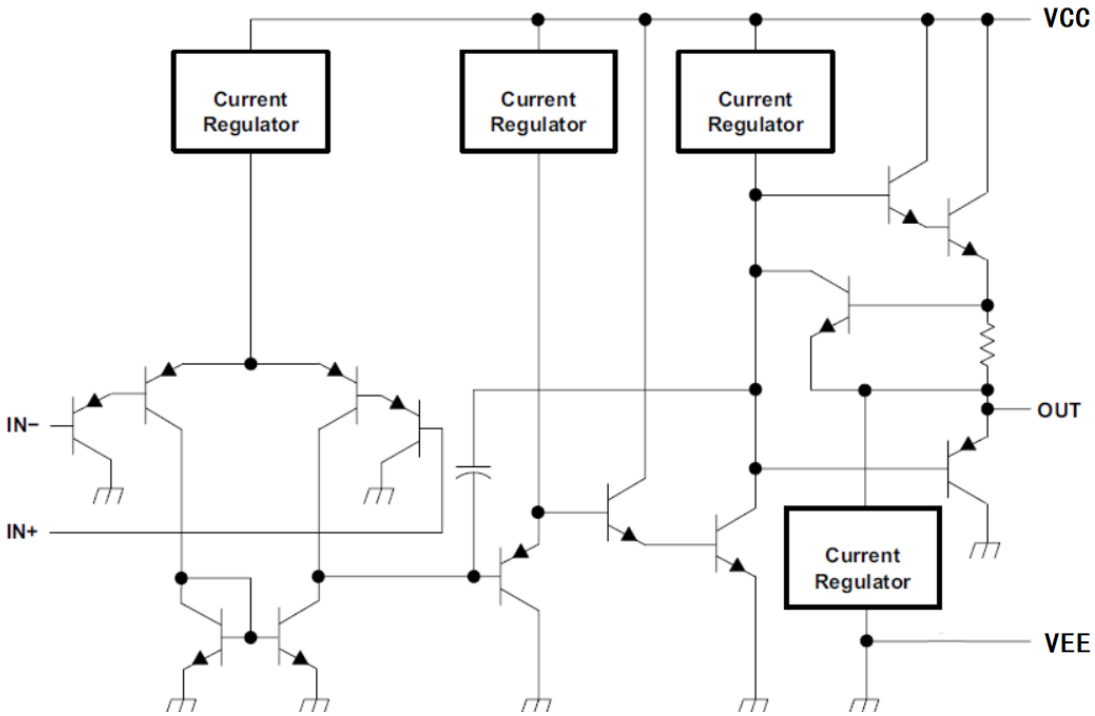
Order information

封装	型号	包装数量
DFN-8-EP(2x2)	LM358QT-MS	Tape and Reel,4000

管脚功能定义

管脚序号	管脚定义	功能说明
1	1OUT	第1路运放输出
2	1IN-	第1路运放反相输入
3	1IN+	第1路运放正相输入
4	VEE	负电源
5	2IN+	第2路运放正相输入
6	2IN-	第2路运放反相输入
7	2OUT	第2路运放输出
8	VCC	正电源

等效原理图



极限参数

项目	符号	极限值(1)	单位
单电源供电电压	V_{cc}	40	V
双电源供电电压	Vs	±20	V
差分输入电压(2)	V_{ID}	±40	V
共模输入电压	V_{ICR}	-0.3～40V	V
输出短路时间	t_{sc}	连续	
耗散功率	P_D	400	mW
工作温度	T_A	-20° ～70°	℃
储存温度	T_S	-65-150	℃
焊接温度	T_W	260,10s	℃

注:(1)极限值是指无论在任何条件下都不能超过的极限值。如果达到此极限值，将有可能造成产品劣化等物理性 损伤；同时在接近极限参数下，不能保证芯片可以正常工作。

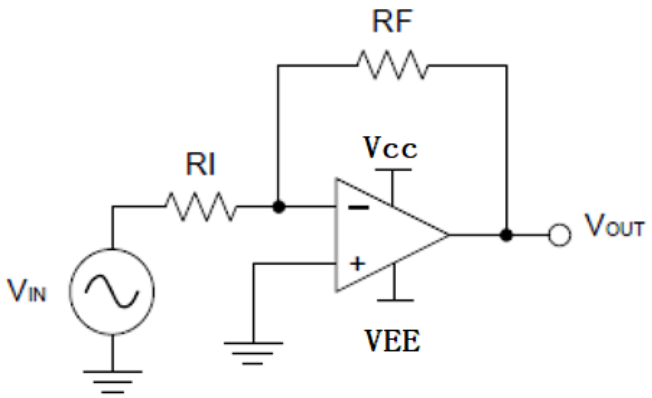
（2）输入端IN+相对于IN-之间的电压差。

直流电学特性 （T_A=25℃， VCC=5V, VEE=GND 除非特别指定）

项目	符号	测试条件		最小值	典型值	最大值	单位
输入失调电压	VIO	VCC=5V to MAX, V_{IC}=VICR (min), VO=1.4V		–	5	–	mV
输入失调电流	IIO	VO = 1.4 V		–	10	50	nA
偏置电流	IBIAS	VO = 1.4 V		–	50	250	nA
共模输入电压	VICR	VCC=5V to 36V		VEE	–	VCC-1.5V	V
开环电压增益	AOL	VCC=15V, VO=1V to 11V, RL≥2k Ω			100	–	V/mV
共模抑制比	CMRR	VCC=5V to MAX, V_{IC}=VICR (min)		–	80	–	dB
单位增益带宽	GBWP			–	1.2	–	MHZ
电源电压抑制比 P_{SSR}	ΔVVDD/ΔVIO	VCC=5V to MAX, f=20kHz		–	90	–	dB
串扰衰减抑制比CS	VO1/VO2	f=1kHz to 20kHz		–	120	–	dB
输出高电平电压	VOH	VCC=15V, VID=1V	Iout =-50uA	–	13.6	–	V
			Iout =-1mA	–	13.5	–	V
			Iout =-5mA	–	13.4	–	V
		VCC=28V	RL=2k		26	–	V
输出低电平电压	VOL	VCC=15V, VID=-1V	Iout =50uA	–	0.1	–	V
			Iout =1mA	–	0.7	–	V
			Iout =5mA	–	1.0	–	V
		VCC=28V	RL=2k	–	0.85	–	V
输出短路电流	IOS	VCC=5V, VEE=-5V, VO=0V		–	±24	–	mA
电源工作电流	ICC	VCC=5V, VO=1/2VCC, No load		–	0.5	–	mA
		VCC=36, VO=1/2VCC, No load		–	0.8	–	mA
单电源工作电压	VCC	VEE=0V (GND)		3	–	36	V
双电源工作电压	VS	VCC, VEE		-18	–	+18	V

典型应用

线路图



2、设计要求

必须选择大于输入电压范围和输出范围的电源电压。

例如，将信号源 VIN 从±0.5 V 放大到±1.8V。将电源设置为± 5 V 足以适应此应用要求。

3、设计过程

根据公式(1)计算放大倍数(增益) Av

$$Av = -VO/VIN \quad ------(1)$$

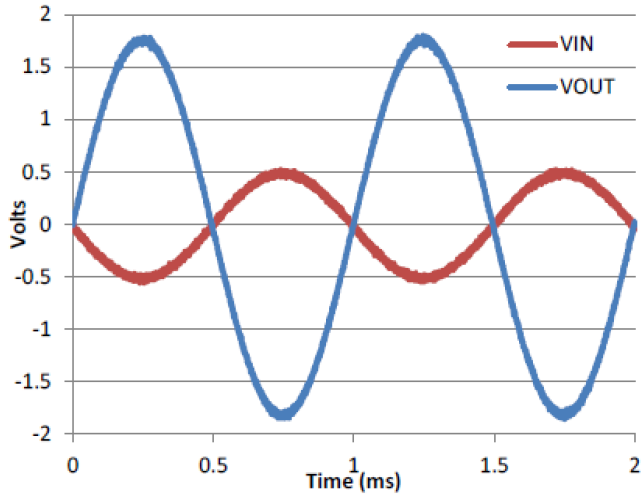
$$Av = -VO/VIN = -1.8/0.5 = -3.6$$

一旦确定了所需的增益 Av，就要为 RI 或 RF 电阻选择一个值。根据运放的电特性及功耗的需要，可选择 1kΩ-100kΩ范围内的值。本例将选择 RI=10 kΩ，则 RF=36kΩ。这由方程式 2 确定。

$$Av = -RF/RI \quad --------(2)$$

$$RF = -Av * RI = 3.6*10 = 36\ k\Omega$$

4、应用曲线图

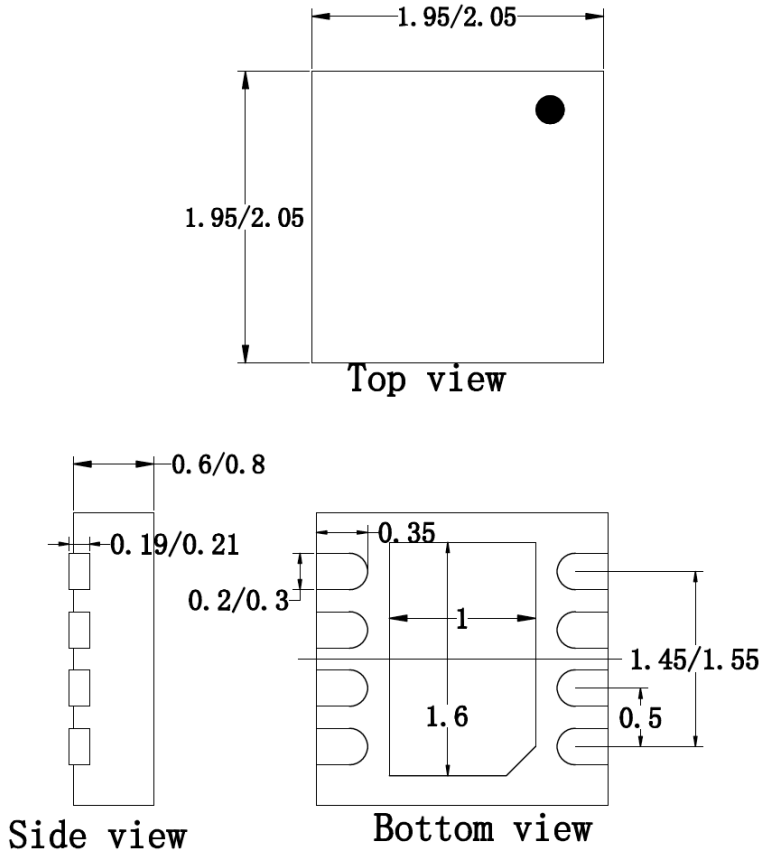


反相放大器的输入电压 VS 输出电压

封装信息

DFN-8-EP(2x2)

单位：毫米



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