

类比半导体

CSA521/CSA5212

电压输出、低边或高边测量、双向、零漂移系列、分流监视器

1. 特性

- 宽共模范围：-0.3V 至 36V
- 偏移电压：±35μV
- 准确性：
 - 增益误差：±1%
 - 0.5μV/°C 失调漂移(最大值)
 - 10ppm/°C 增益漂移(最大值)
- 增益的选择：
 - CSA521-20 / CSA5212-20: 20V/V
 - CSA521-25 / CSA5212-25: 25V/V
 - CSA521-50 / CSA5212-50: 50V/V
 - CSA521-75 / CSA5212-75: 75V/V
 - CSA521-100 / CSA5212-100: 100V/V
 - CSA521-200 / CSA5212-200: 200V/V
- 静态电流：100μA (最大值)
- 单通道 SC70-6、SOT23-6 封装
- 双通道 MSOP-10 封装

2. 应用

- 笔记本电脑
- 手机
- 电信器件
- 能源管理
- 电池充电器

3. 说明

CSA521/CSA5212 是电压输出、电流分流监控器(也称为电流检测放大器)，通常用于过流保护、用于系统优化的精密电流测量或闭环反馈电路。该系列器件可以在 -0.3V 至 36V 的共模电压下感测分流器上的压降，与电源电压无关。提供六种固定增益：20V/V、25V/V、50V/V、75V/V、100V/V、200V/V。

这些器件采用 2.7V 至 5.5V 单电源供电，最大消耗 100μA 电源电流。工作温度范围 -55°C 至 +125°C，并提供 SC70-6、SOT23-6 和 MSOP-10 封装。

有关订购信息，请参见 Table 1。

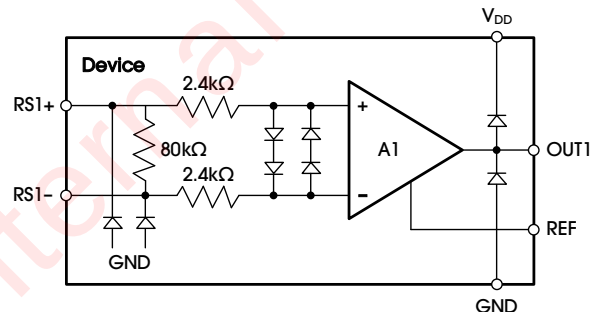


Table 1 lists the order information.

Table 1. Order Information

ORDER NUMBER ⁽¹⁾	PART NUMBER	CH (#)	PKG.	BIDIRECTIONAL	MARK	GAIN (TYP) (V/V)	GBW (kHz)	RATING	OP. TEMP (°C)	PKG. OPTION
CSA521HASC706 ⁽²⁾	CSA521-25	1	SC70-6	Y	1HXX	25	TBD	Industrial	-40-125	T/R-3000
CSA521NASC706 ⁽²⁾	CSA521-50	1	SC70-6	Y	1NXX	50	TBD	Industrial	-40-125	T/R-3000
CSA521KASC706 ⁽²⁾	CSA521-75	1	SC70-6	Y	1KXX	75	TBD	Industrial	-40-125	T/R-3000
CSA521PASC706 ⁽²⁾	CSA521-100	1	SC70-6	Y	1PXX	100	TBD	Industrial	-40-125	T/R-3000
CSA521RASC706 ⁽²⁾	CSA521-200	1	SC70-6	Y	1RXX	200	TBD	Industrial	-40-125	T/R-3000
CSA521SASC706 ⁽²⁾	CSA521-500	1	SC70-6	Y	1SXX	500	TBD	Industrial	-40-125	T/R-3000
CSA521TASC706 ⁽²⁾	CSA521-1000	1	SC70-6	Y	1TXX	1000	TBD	Industrial	-40-125	T/R-3000
CSA521MASOT236 ⁽²⁾	CSA521-20	1	SOT23-6	Y	CSA521 MXXXXX	20	TBD	Industrial	-40-125	T/R-3000
CSA521NASOT236 ⁽²⁾	CSA521-50	1	SOT23-6	Y	CSA521 NXXXXX	50	TBD	Industrial	-40-125	T/R-3000
CSA521PASOT236 ⁽²⁾	CSA521-100	1	SOT23-6	Y	CSA521 PXXXXX	100	TBD	Industrial	-40-125	T/R-3000
CSA521RASOT236 ⁽²⁾	CSA521-200	1	SOT23-6	Y	CSA521 RXXXXX	200	TBD	Industrial	-40-125	T/R-3000
CSA5212MAMSOP10 ⁽²⁾	CSA5212-20	2	MSOP-10	Y	CSA5212 MXXXXXX	20	TBD	Industrial	-40-125	T/R-4000
CSA5212NAMSOP10 ⁽²⁾	CSA5212-50	2	MSOP-10	Y	CSA5212 NXXXXXX	50	TBD	Industrial	-40-125	T/R-4000
CSA5212PAMSOP10 ⁽²⁾	CSA5212-100	2	MSOP-10	Y	CSA5212 PXXXXXX	100	TBD	Industrial	-40-125	T/R-4000
CSA5212RAMSOP10 ⁽²⁾	CSA5212-200	2	MSOP-10	Y	CSA5212 RXXXXXX	200	TBD	Industrial	-40-125	T/R-4000

Table 2. Family Selection Guide

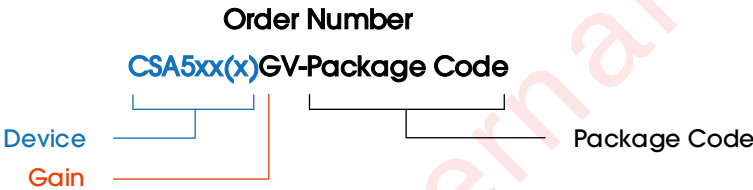
ORDER NUMBER ⁽¹⁾	PART NUMBER	CH (#)	PKG.	BIDIRECTIONAL	MARK	GAIN (TYP) (V/V)	GBW (kHz)	RATING	OP. TEMP (°C)	PKG. OPTION
CSA500HAQFN10 ⁽²⁾	CSA500-25	1	QFN10	N	TBD	25	TBD	Industrial	-40-125	TBD
CSA500NAQFN10 ⁽²⁾	CSA500-50	1	QFN10	N	TBD	50	TBD	Industrial	-40-125	TBD
CSA500PAQFN10 ⁽²⁾	CSA500-100	1	QFN10	N	TBD	100	TBD	Industrial	-40-125	TBD
CSA500RAQFN10 ⁽²⁾	CSA500-200	1	QFN10	N	TBD	200	TBD	Industrial	-40-125	TBD
CSA501HASC706 ⁽²⁾	CSA501-25	1	SC706	Y	9HXX	25	TBD	Industrial	-40-125	T/R-3000
CSA501NASC706 ⁽²⁾	CSA501-50	1	SC706	Y	9NXX	50	TBD	Industrial	-40-125	T/R-3000
CSA501PASC706 ⁽²⁾	CSA501-100	1	SC706	Y	9PXX	100	TBD	Industrial	-40-125	T/R-3000
CSA501RASC706 ⁽²⁾	CSA501-200	1	SC706	Y	9RXX	200	TBD	Industrial	-40-125	T/R-3000
CSA501SASC706 ⁽²⁾	CSA501-500	1	SC706	Y	9SXX	500	TBD	Industrial	-40-125	T/R-3000
CSA501HASOT238 ⁽²⁾	CSA501-25	1	SOT238	Y	TBD	25	TBD	Industrial	-40-125	TBD
CSA501NASOT238 ⁽²⁾	CSA501-50	1	SOT238	Y	TBD	50	TBD	Industrial	-40-125	TBD
CSA501PASOT238 ⁽²⁾	CSA501-100	1	SOT238	Y	TBD	100	TBD	Industrial	-40-125	TBD
CSA501RASOT238 ⁽²⁾	CSA501-200	1	SOT238	Y	TBD	200	TBD	Industrial	-40-125	TBD
CSA501SASOT238 ⁽²⁾	CSA501-500	1	SOT238	Y	TBD	500	TBD	Industrial	-40-125	TBD
CSA511NASC706 ⁽²⁾	CSA511-50	1	SC706	Y	5NXX	50	TBD	Industrial	-40-125	T/R-3000
CSA511KASC706 ⁽²⁾	CSA511-75	1	SC706	Y	5KXX	75	TBD	Industrial	-40-125	T/R-3000
CSA511PASC706 ⁽²⁾	CSA511-100	1	SC706	Y	5PXX	100	TBD	Industrial	-40-125	T/R-3000
CSA511RASC706 ⁽²⁾	CSA511-200	1	SC706	Y	5RXX	200	TBD	Industrial	-40-125	T/R-3000
CSA511SASC706 ⁽²⁾	CSA511-500	1	SC706	Y	5SXX	500	TBD	Industrial	-40-125	T/R-3000
CSA511TASC706 ⁽²⁾	CSA511-1000	1	SC706	Y	5TXX	1000	TBD	Industrial	-40-125	T/R-3000
CSA520MASOT235 ⁽²⁾	CSA520-20	1	SOT235	N	CSA520 MXXXXX	20	TBD	Industrial	-40-125	T/R-3000
CSA520NASOT235 ⁽²⁾	CSA520-50	1	SOT235	N	CSA520 NXXXXX	50	TBD	Industrial	-40-125	T/R-3000
CSA520PASOT235 ⁽²⁾	CSA520-100	1	SOT235	N	CSA520 PXXXXX	100	TBD	Industrial	-40-125	T/R-3000
CSA520RASOT235 ⁽²⁾	CSA520-200	1	SOT235	N	CSA520 RXXXXX	200	TBD	Industrial	-40-125	T/R-3000
CSA522MASOT235 ⁽²⁾	CSA522-20	1	SOT235	N	CSA522 MXXXXX	20	TBD	Industrial	-40-125	T/R-3000
CSA522NASOT235 ⁽²⁾	CSA522-50	1	SOT235	N	CSA522 NXXXXX	50	TBD	Industrial	-40-125	T/R-3000
CSA522PASOT235 ⁽²⁾	CSA522-100	1	SOT235	N	CSA522 PXXXXX	100	TBD	Industrial	-40-125	T/R-3000

ORDER NUMBER ⁽¹⁾	PART NUMBER	CH (#)	PKG.	BIDIRECTIONAL	MARK	GAIN (TYP) (V/V)	GBW (kHz)	RATING	OP. TEMP (°C)	PKG. OPTION
CSA522RASOT235 ⁽²⁾	CSA522-200	1	SOT235	N	CSA522 RXXXXX	200	TBD	Industrial	−40-125	T/R-3000
CSA5202MAMSOP8 ⁽²⁾	CSA5202-20	2	MSOP8	N	CSA5202 MXXXXXX	20	TBD	Industrial	−55-125	T/R-4000
CSA5202NAMSOP8 ⁽²⁾	CSA5202-50	2	MSOP8	N	CSA5202 NXXXXXX	50	TBD	Industrial	−55-125	T/R-4000
CSA5202PAMSOP8 ⁽²⁾	CSA5202-100	2	MSOP8	N	CSA5202 PXXXXXX	100	TBD	Industrial	−55-125	T/R-4000
CSA5202RAMSOP8 ⁽²⁾	CSA5202-200	2	MSOP8	N	CSA5202 RXXXXXX	200	TBD	Industrial	−55-125	T/R-4000

Devices can be ordered via the following two ways:

- Place orders directly on our website (www.analogyssemi.com), or;
- Contact our sales team by mailing to sales@analogyssemi.com.

Note 1:



Note 2: Available in the future.

Note 3: "XXXXXX": For internal use.

4. PIN CONFIGURATION AND FUNCTIONS

4.1 SC70-6 AND SOT23-6 PACKAGES

Figure 1 illustrates the pin configuration (SC70-6 and SOT23-6 packages).

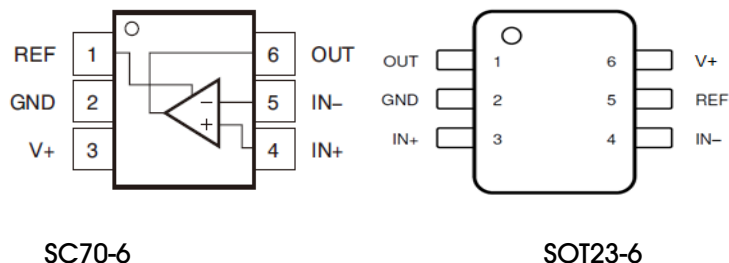


Figure 1. Pin Configuration (SC70-6 and SOT23-6 Packages)

Table 3 lists the pin functions (SC70-6 and SOT23-6 packages).

Table 3. Pin Functions (SC70-6 and SOT23-6 packages)

POSITION		NAME	TYPE	DESCRIPTION
SC70-6	SOT23-6			
1	5	REF	Analog input	Reference voltage, 0V to V+
2	2	GND	Analog	Ground
3	6	V+	Analog	Power supply, 2.7V to 5V
4	3	IN+	Analog input	Connect to supply side of shunt resistor
5	4	IN-	Analog input	Connect to load side of shunt resistor
6	1	OUT	Analog output	Output voltage

4.2 MSOP-10 PACKAGE

Figure 2 illustrates the pin configuration (MSOP-10 package).

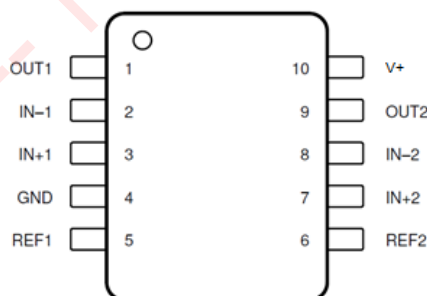


Figure 2. Pin Configuration (MSOP-10 Package)

Table 4 lists the pin functions (MSOP-10 package).

Table 4. Pin Functions (MSOP-10 Package)

POSITION	NAME	TYPE	DESCRIPTION
1	OUT1	Analog output	Output voltage
2	IN-1	Analog input	Connect to load side of shunt resistor
3	IN+1	Analog input	Connect to supply side of shunt resistor
4	GND	Analog	Ground
5	REF1	Analog input	Reference voltage, 0V to V+
6	REF2	Analog input	Reference voltage, 0V to V+
7	IN+2	Analog input	Connect to supply side of shunt resistor
8	IN-2	Analog input	Connect to load side of shunt resistor
9	OUT2	Analog output	Output voltage
10	V+	Analog	Power supply, 2.7V to 26V

5. SPECIFICATIONS

5.1 ABSOLUTE MAXIMUM RATINGS

Table 5 lists the absolute maximum ratings of the CSA521/CSA5212.

Table 5. Absolute Maximum Ratings

PARAMETER	DESCRIPTION		MIN	MAX	UNITS
Voltage	Supply voltage, V_s		-0.3	6	V
	Analog inputs, V_{IN+} , V_{IN-} ⁽²⁾	Differential (V_{IN+}) - (V_{IN-})	-36	36	V
		Common-mode ⁽³⁾	GND - 0.3	36	V
	REF input		GND - 0.3	$(V_s) + 0.3$	V
	Output ⁽³⁾		GND - 0.3	$(V_s) + 0.3$	V
Current	Input current into any terminal ⁽³⁾			5	mA
Temperature	Operating, T_A		-55	150	°C
	Junction, T_J			150	
	Storage, T_{stg}		-65	150	

Note 1: Stresses beyond those listed under Table 5 may cause permanent damage to the device. These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under Table 7. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

Note 2: V_{IN+} and V_{IN-} are the voltages at the IN+ and IN- pins, respectively.

Note 3: Input voltage at any terminal may exceed the voltage shown if the current at that pin is limited to 5mA.

5.2 ESD RATINGS

Table 6 lists the ESD ratings of the CSA521/CSA5212.

Table 6. ESD Ratings

PARAMETER	SYMBOL	DESCRIPTION	VALUE	UNITS
Electrostatic Discharge	$V_{(ESD)}$	Human-body model (HBM), per ANSI/ESDA/JEDEC JS-001 ⁽¹⁾	TBD	V
		Charged-device model (CDM), per JEDEC specification JESD22-C101 ⁽²⁾	TBD	

Note 1: The JEDEC document JEP155 indicates that 500V HBM allows safe manufacturing with a standard ESD control process.

Note 2: The JEDEC document JEP157 indicates that 250V CDM allows safe manufacturing with a standard ESD control process.

5.3 RECOMMENDED OPERATING CONDITIONS

Table 7 lists the recommended operating conditions for the CSA521/CSA5212.

Table 7. Recommended Operating Conditions

PARAMETER	SYMBOL	MIN	NOM	MAX	UNITS
Common-Mode Input Voltage	V_{CM}	0	12	36	V
Operating Supply Voltage	V_S	2.7	5	5.5	V
Operating Free-Air Temperature	T_A	-40		125	°C

5.4 THERMAL INFORMATION

Table 8 lists the thermal information for the CSA521/CSA5212.

Table 8. Thermal Information

PARAMETER	SYMBOL	SC70-6	SOT23-6	MSOP-10	UNITS
Junction-to-Ambient Thermal Resistance	$R_{\theta JA}$	TBD	TBD	TBD	°C/W
Junction-to-Board Thermal Resistance	$R_{\theta JB}$	TBD	TBD	TBD	°C/W
Junction-to-Top Characterization Parameter	ψ_{JT}	TBD	TBD	TBD	°C/W
Junction-to-Board Characterization Parameter	ψ_{JB}	TBD	TBD	TBD	°C/W
Junction-to-Case (Top) Thermal Resistance	$R_{\theta JC(top)}$	TBD	TBD	TBD	°C/W

5.5 ELECTRICAL CHARACTERISTICS

Table 9 lists the electrical characteristics of the CSA521/CSA5212. At $T_A = 25^\circ\text{C}$, $V_{\text{SENSE}} = V_{\text{IN}+} - V_{\text{IN}-}$, $V_S = 5\text{V}$, $V_{\text{IN}+} = 12\text{V}$, and $V_{\text{REF}} = V_S / 2$, unless otherwise noted.

Table 9. Electrical Characteristics

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
INPUT						
Common-Mode Input Range	V_{CM}	$T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$	-0.3		36	V
Common-Mode Rejection Ratio	CMRR	$V_{\text{IN}+} = 0\text{V}$ to 36V , $V_{\text{SENSE}} = 0\text{mV}$, $T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$		120		dB
Offset Voltage, RTI ⁽¹⁾	V_O			± 15		μV
RTI vs. Temperature	dV_{OS}/dT	$V_{\text{SENSE}} = 0\text{mV}$, $T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$		± 0.08		$\mu\text{V}/^\circ\text{C}$
RTI vs. Power Supply Ratio	PSRR	$V_S = 2.7\text{V}$ to 5.5V		± 0.5		$\mu\text{V}/\text{V}$
Input Bias Current	I_{IB}	$V_{\text{SENSE}} = 0\text{mV}$		± 0.03		μA
Input Offset Current	I_{IO}	$V_{\text{SENSE}} = 0\text{mV}$		± 0.03		μA
OUTPUT						
Gain	G	CSA521-20 / CSA5212-20		20		V/V
		CSA521-25 / CSA5212-25		25		V/V
		CSA521-50 / CSA5212-50		50		V/V
		CSA521-75 / CSA5212-75		75		V/V
		CSA521-100 / CSA5212-100		100		V/V
		CSA521-200 / CSA5212-200		200		V/V
Gain Error	E_G	$V_{\text{SENSE}} = -5\text{mV}$ to 5mV , $T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$		± 0.5		%
Gain Error vs. Temperature		$T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$		3		ppm/ $^\circ\text{C}$
Nonlinearity Error		$V_{\text{SENSE}} = -5\text{mV}$ to 5mV		± 0.01		%
Maximum Capacitive Load		No sustained oscillation		1		nF
VOLTAGE OUTPUT						
Swing to V+ Power-Supply Rail		$R_L = 10\text{k}\Omega$ to GND, $T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$		$(V_+) - 0.05$	$(V_+) - 0.2$	V
Swing to GND		$R_L = 10\text{k}\Omega$ to GND, $T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$		$(V_{\text{GND}}) + 0.005$	$(V_{\text{GND}}) + 0.05$	V
REF CMRR		REF = 0V to 5V, $V_{\text{SENSE}} = 0\text{mV}$, $T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$	100	120		dB
REF Input Impedance				80		k Ω
FREQUENCY RESPONSE						
Bandwidth	BW	$C_{\text{LOAD}} = 10\text{pF}$, CSA521-20 / CSA5212-20		80		kHz
		$C_{\text{LOAD}} = 10\text{pF}$, CSA521-25 / CSA5212-25		40		kHz
		$C_{\text{LOAD}} = 10\text{pF}$, CSA521-50 / CSA5212-50		30		kHz
		$C_{\text{LOAD}} = 10\text{pF}$, CSA521-75 / CSA5212-75		14		kHz
		$C_{\text{LOAD}} = 10\text{pF}$, CSA521-100 / CSA5212-100		7		kHz
		$C_{\text{LOAD}} = 10\text{pF}$, CSA5212-200 / CSA5212-200		4		kHz
Slew Rate	SR			0.4		V/ μs
NOISE, RTI⁽¹⁾						
Voltage Noise Density				25		nV/ $\sqrt{\text{Hz}}$
Input Voltage Noise		0.1Hz to 10Hz		5		μV_{PP}
POWER SUPPLY						
Operating Voltage Range	V_S	$T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$	2.7		5.5	V
Quiescent Current	I_Q	$V_{\text{SENSE}} = 0\text{mV}$		200		μA

CSA521/CSA5212

电压输出、低边或高边测量、双向、零漂移系列、分流监视器

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
I _Q Overtemperature		T _A = -55°C to +125°C		200		μA
TEMPERATURE RANGE						
Specified Range			-55		125	°C
Operating Range			-55		150	°C

Note: RTI = Referred-to-input.

6. TYPICAL CHARACTERISTICS

The CSA521-50 is used for typical characteristics at $T_A = 25^{\circ}\text{C}$, $V_S = 5\text{V}$, $V_{IN+} = 12\text{V}$, and $V_{REF} = V_S / 2$, unless otherwise noted.

TBD

Figure 3.

TBD

Figure 5.

TBD

Figure 7.

TBD

Figure 4.

TBD

Figure 6.

TBD

Figure 8.

7. 详细说明

7.1 概述

CSA521/CSA5212 是 36V 共模、零漂移拓扑、电流检测放大器，可用于低边和高边配置。这些专门设计的电流检测放大器能够准确测量电流检测电阻两端产生的共模电压，该共模电压远远超过为器件供电的电源电压。电流可在高达 36V 的输入电压轨上测量，而该器件可由低至 2.7V 的电源电压供电。

7.2 功能模块框图

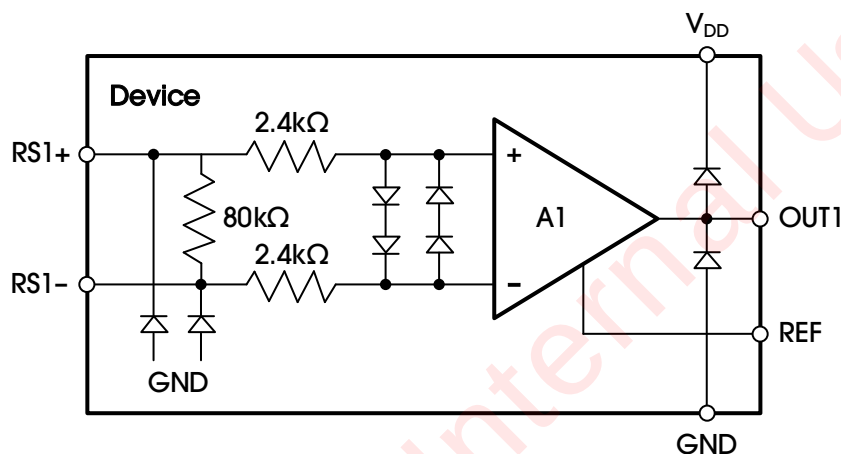


Figure 9. Functional Block Diagram

7.3 REF 输入阻抗效应

与任何差分放大器一样，CSA521/CSA5212 系列共模抑制比受 REF 输入端存在的任何阻抗的影响。当 REF 引脚直接连接到大多数基准或电源时，这个问题就不是问题了。当使用来自电源或参考电压的电阻分压器时，REF 引脚必须由运算放大器缓冲。

8. 电源供电推荐

CSA521/CSA5212 的输入电路可以准确地测量超出电源电压 V_{+} 的值。例如， V_{+} 电源可以是 5V，而负载电源电压可以高达 36V。但是，OUT 引脚的输出电压范围受限于电源引脚上的电压。另请注意，CSA521/CSA5212 无论器件是否通电，输入引脚均可承受高达 36V 的完整输入信号范围应用与否。

9. 布局

9.1 布局指南

- 使用开尔文或 4 线连接将输入引脚连接到感应电阻器。这种连接技术确保仅检测输入引脚之间的电流检测电阻器阻抗。路由不佳电流检测电阻器通常会导致输入引脚之间出现额外电阻。鉴于电流电阻的欧姆值非常低，任何额外的高载流阻抗都可能导致重大测量误差。
- 将电源旁路电容器放置在尽可能靠近电源和接地引脚的位置。该旁路电容的推荐值为 0.1 μ F。额外的去耦电容可以添加到补偿嘈杂或高阻抗电源。

10. PACKAGE INFORMATION

The CSA521/CSA5212 is available in the SC70-6, SOT23-6, and MSOP-10 packages.

10.1 SC70-6 PACKAGE

Figure 10 shows the SC70-6 package view.

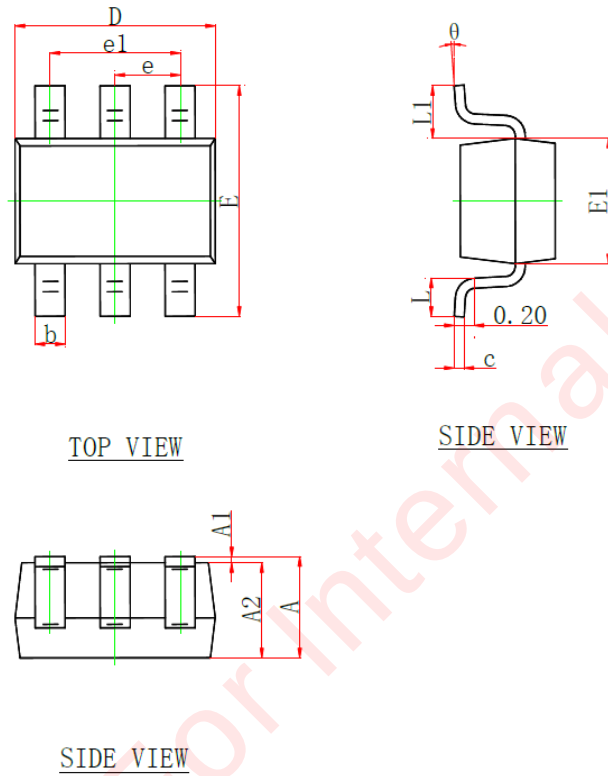


Figure 10. SC70-6 Package View

Table 10 provides detailed information about the dimensions of the SC70-6 package.

Table 10. Dimensions of the SC70-6 Package

SYMBOL	DIMENSIONS IN MILLIMETERS		DIMENSIONS IN INCHES	
	MIN	MAX	MIN	MAX
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.110	0.175	0.004	0.007
D	2.000	2.200	0.079	0.087
E	2.150	2.450	0.085	0.096
E1	1.150	1.350	0.045	0.053
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.260	0.460	0.010	0.018
L1	0.525 REF.		0.021 REF.	
θ	0°	8°	0°	8°

10.2 SOT23-6 PACKAGE

Figure 11 shows the SOT23-6 package view.

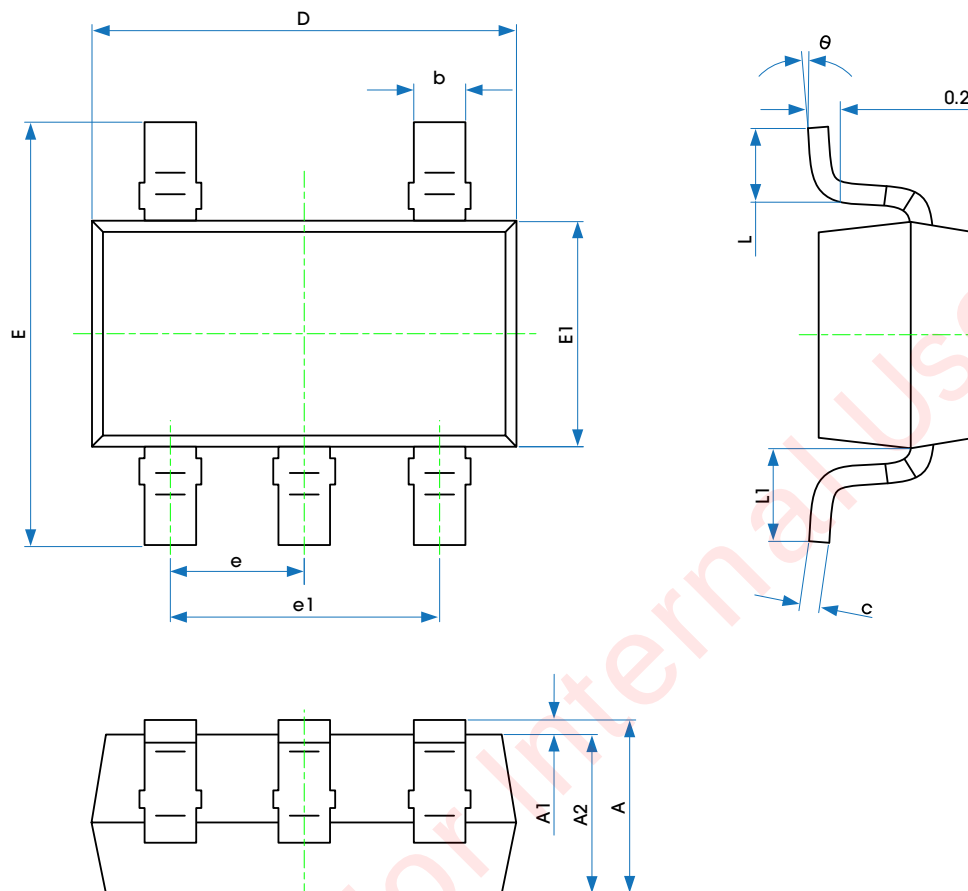


Figure 11. SOT23-6 Package View

Table 11 provides detailed information about the dimensions of the SOT23-6 package.

Table 11. Dimensions of the SOT23-6 Package

SYMBOL	DIMENSIONS IN MILLIMETERS		DIMENSIONS IN INCHES	
	MIN	MAX	MIN	MAX
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	2.650	2.950	0.104	0.116
E1	1.500	1.700	0.059	0.067
e	0.950 (BSC)		0.037 (BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
L1	0.600 REF.		0.024 REF.	
θ	0°	8°	0°	8°

10.3 MSOP-10 PACKAGE

Figure 12 shows the MSOP-10 package view.

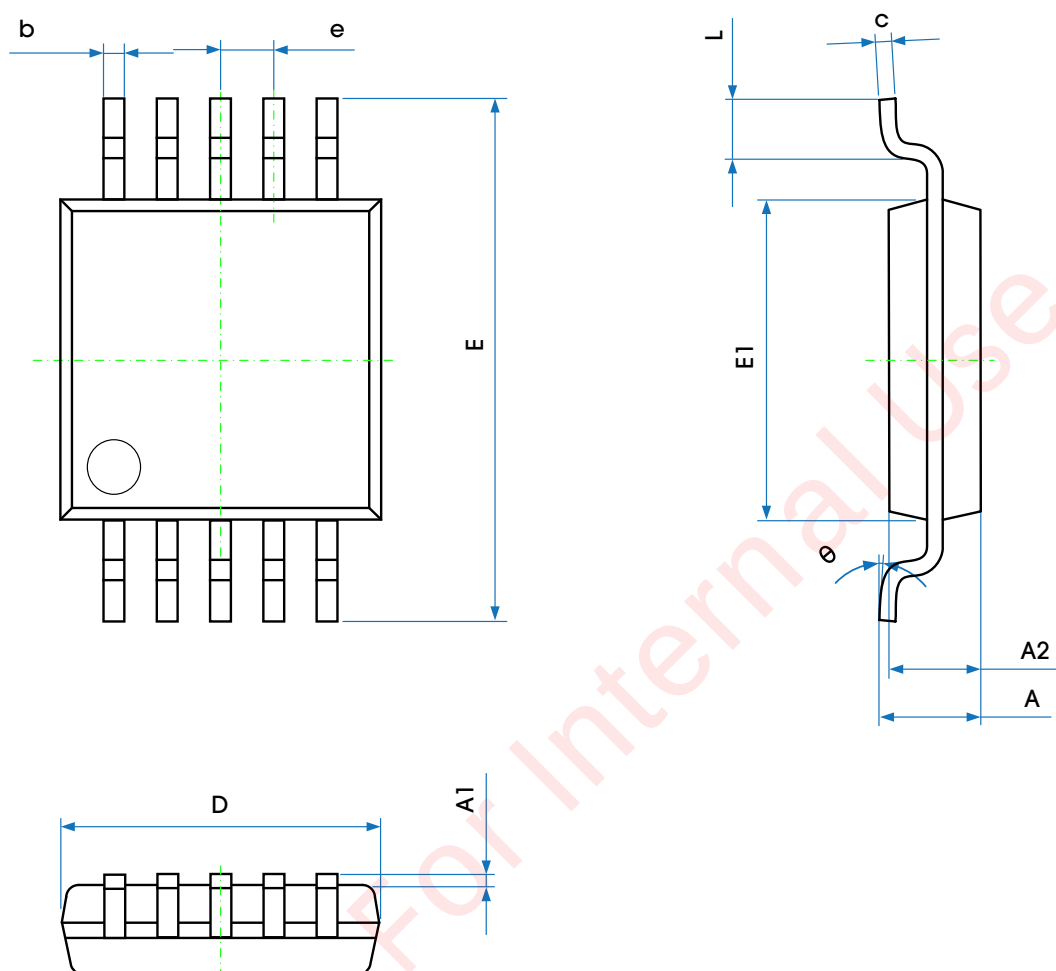


Figure 12. MSOP-10 Package View

Table 12 provides detailed information about the dimensions of the MSOP-10 package.

Table 12. Dimensions of the MSOP-10 Package

SYMBOL	DIMENSIONS IN MILLIMETERS		DIMENSIONS IN INCHES	
	MIN	MAX	MIN	MAX
A	—	1.100	—	0.043
A1	0.020	0.150	0.001	0.006
A2	0.750	0.950	0.030	0.037
b	0.180	0.330	0.007	0.013
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
e	0.500 (BSC)		0.020 (BSC)	
E	4.750	5.050	0.187	0.199
E1	2.900	3.100	0.114	0.122
L	0.400	0.800	0.016	0.031
θ	0°	6°	0°	6°

11. TAPE AND REEL INFORMATION

TBD

REVISION HISTORY

REVISION	DATE	DESCRIPTION
Rel 1.0	15 December 2023	Preliminary release.
Rel 1.1	22 December 2023	Updated Page 1, Table 5, and Table 7 through Table 9.