Silicore
芯谷科技

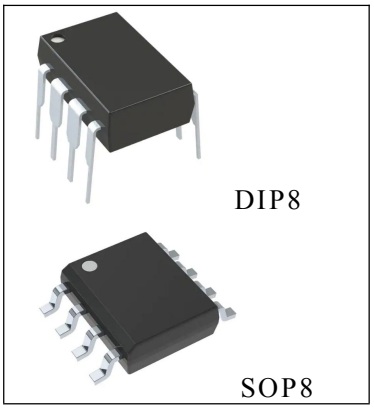
D4310

Dual Operational Amplifier and Voltage Reference

DESCRIPTION

The D4310 is a monolithic IC that includes one independent op-amp and another op-amp for which the non inverting input is wired to a 2.5V fixed Voltage Reference. This device is offering space and cost saving in many applications like power supply management or data acquisition systems.

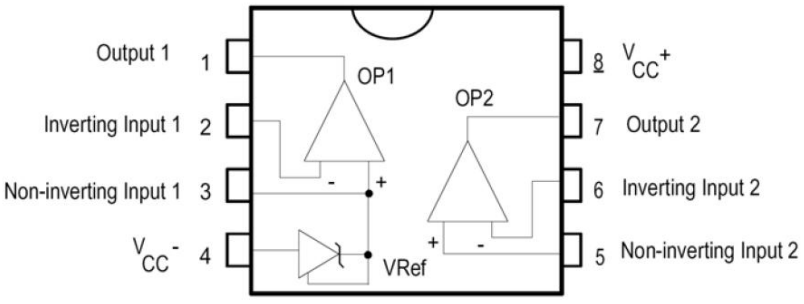
The D4310 is available in DIP8 and SOP8 packages.



FEATURES

- Low input offset voltage: 0.5mV typ.
- Low supply current : 350μA/op. (@ Vcc = 5V)
- Medium bandwidth (unity gain) : 0.9MHz
- Large output voltage swing : 0V to (Vcc - 1.5V)
- Input common mode voltage range includes ground
- Wide power supply range: 3 to 32V ±1.5 to ±16V
- Fixed output voltage reference 2.5V
- 0.4% and 1% Voltage precision
- Sink current capability : 1 to 100mA
- Typical output impedance: 0.2Ω

PIN CONFIGURATION



Package Information

PART NO.	PACKAG DESCRIPTION	PACKAGE MARKING	PACKAGE OPTION
D4310	DIP8	CHMC D4310 SXXXX	50/Tube
D4310F	SOP8	CHMC D4310F SXXXX	4000/Reel 100/Tube

CHMC:Trademark D4310/D4310F:Part NO. SXXXX:Lot NO.

ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	Value	Unit
Supply voltage	Vcc	36	V
Differential input voltage	Vid	36	V
Input voltage	Vi	-0.3～+36	V
Operating free-air temperature range	Toper	-40～+125	°C
Max junction Temperature	Tj	150	°C
Thermal resistance junction to ambient (SOP8)	Rthja	175	°C/W

ELECTRICAL CHARACTERISTICS

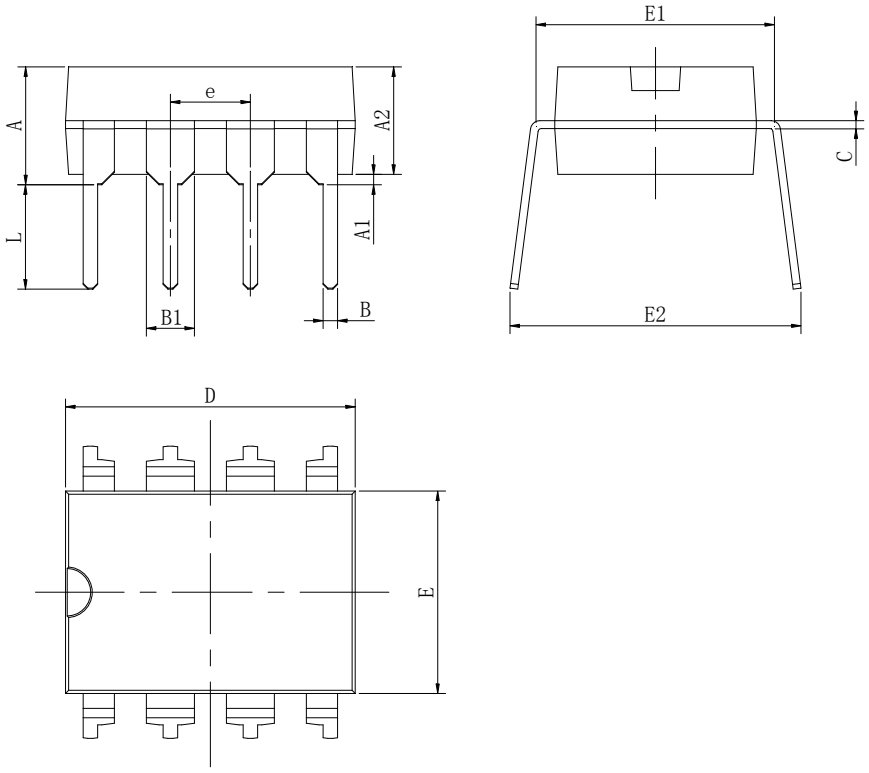
Characteristics	Symbol	Test conditions	Min	Typ	Max	Unit
Total supply current, excluding current in the voltage reference	Icc	Vcc^+=5V,no load Tmin<Tamb<Tmax		0.7	1.2	mA
		Vcc^+=30V,no load Tmin<Tamb<Tmax			2.0	
Independent Op-amp (unless otherwise specified: Vcc^+=5V,Vcc=Ground,Tamb=25°C)						
Input offset voltage	Vio	Tamb=25°C Tmin≤Tamb≤Tmax		1	4 5	mV
Input offset voltage drift	DVio			7		μV/°C
Input offset current	Iio	Tmin≤Tamb≤Tmax		2	30 50	nA
Large signal voltage gain	Avd	Vcc=15V,R_L=2k Vo=1.4V to 11.4V Tmin≤Tamb≤Tmax	50 25	100		V/mV
Supply voltage rejection ratio	SVR	Vcc=5V to 30V	65	100		dB
Input common mode voltage range	Vicm	Vcc=+30V *1 Tmin≤Tamb≤Tmax	0 0		(Vcc+) -1.5 (Vcc+) -2	V
Common mode rejection ratio	CMR	Tmin≤Tamb≤Tmax	70 60	85		dB
Output current source	Isource	Vcc=15V,Vo=2V, Vid=1V	20	40		mA
Short circuit to ground	Io	Vcc=15V		40	60	mA
Output current sink	Isink	Vid=-1V Vcc=15V,Vo=2V	10	20		mA
High level output voltage	V_{OH}	Vcc^+=30V, R_L=10k Tamb=25°C Tmin≤Tamb≤Tmax	27 27	28		V
Low level output voltage	V_{OL}	R_L=10k Tmin≤Tamb≤Tmax		5	20 20	mV
Slew rate at unity gain	SR	Vi=0.5 to 3V, Vcc=15V R_L=2k, C_L=100pF	0.2	0.4		V/μs

Gain bandwidth product	GBP	Vcc=30V, R_L=2k C_L=100pF,f=100kHz,Vin=10mV	0.5	0.9		MHz
Total harmonic distortion	THD	f=1kHz,Av=20dB R_L=2k,Vcc=30V C_L=100pF,Vo=2Vpp		0.02		%
Op-amp with non-inverting input connect to the internal Vref (unless otherwise specified: Vcc^+=5V,Vcc=Ground,Tamb=25°C)						
Input offset voltage	Vio	Vicm=0V,Tamb=25°C Tmin≤Tamb≤Tmax		1	4 5	mV
Input offset voltage drift	DVio			7		μV/°C
Input bias current negative input	Iio			20		nA
Large signal voltage gain	Avd	Vcc=15V,R_L=2k Vicm=0V		100		V/mV
Supply voltage rejection ratio	SVR	Vicm=0V Vcc^+=5V to 30V	65	100		dB
Output current source	Isource	Vcc=15V,Vo=2V, Vid=1V	20	40		mA
Short circuit to ground	Io	Vcc=15V		40	60	mA
Output current sink	Isink	Vid=-1V Vcc=15V,Vo=2V	10	20		mA
High level output voltage	V_{OH}	Vcc^+=30V, R_L=10k Tamb=25°C Tmin≤Tamb≤Tmax	27 27	28		V
Low level output voltage	V_{OL}	R_L=10k Tmin≤Tamb≤Tmax		5	20 20	mV
Slew rate at unity gain	SR	Vi=0.5 to 2V, Vcc=15V R_L=2k, C_L=100pF	0.2	0.4		V/μs
Gain bandwidth product	GBP	Vcc=30V, R_L=2k C_L=100pF,f=100kHz,Vin=10mV	0.5	0.9		MHz
Total harmonic distortion	THD	f=1kHz,Av=20dB R_L=2k,Vcc=30V C_L=100pF,Vo=2Vpp		0.02		%
Cathode current	Ik		1		100	mA
Reference input voltage	Vref	Tamb=25°C Tmin≤Tamb≤Tmax	2.475 2.45	2.5	2.525 2.55	V
Reference input voltage deviation over temperature range	ΔVref	V_{KA}=Vref,Ik=10mA Tmin≤Tamb≤Tmax		7	30	mV
Minimum cathode current for regulation	Imin	V_{KA}=Vref		0.5	1	mA
Dynamic impedance *2	$\lvert Z_{KA} \rvert$	V_{KA}=Vref, Δik=1 to 100mA,f<1kHz		0.2	0.5	Ω

*1 The input common-mode voltage of either input signal voltage should not be allowed to go negative by more than 0.3V.The upper end of the common-mode voltage range is Vcc+-1.5V.But either of both inputs can go to +36V without damage. *2 The dynamic impedance is defined as $\lvert Z_{KA} \rvert = \Delta V_{KA} / \Delta Ik$

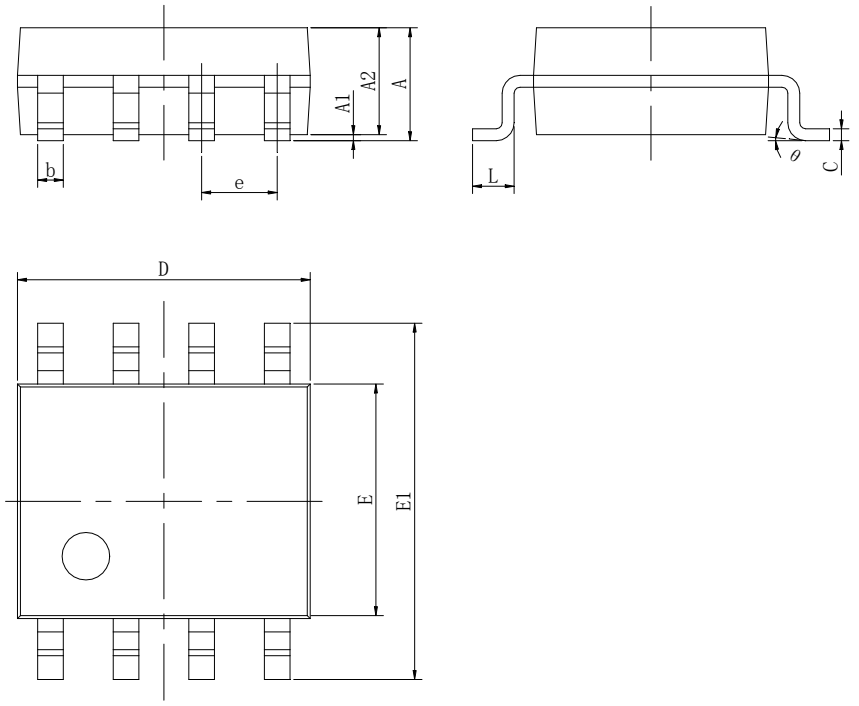
OUTLINE DRAWING

DIP8: Unit: mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.380	0.570	0.015	0.022
B1	1.524(BSC)		0.060(BSC)	
C	0.204	0.360	0.008	0.014
D	9.000	9.400	0.354	0.370
E	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
e	2.540(BSC)		0.100(BSC)	
L	3.000	3.600	0.118	0.142
E2	8.400	9.000	0.331	0.354

SOP8: Unit: mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.800	0.053	0.071
A1	0.050	0.250	0.004	0.010
A2	1.250	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.780	5.000	0.185	0.197
E	3.800	4.000	0.150	0.157
E1	5.800	6.300	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

Statements

- Silicore Technology reserves the right to make changes without further notice to any products or specifications herein. Before customers place an order, customers need to confirm whether datasheet obtained is the latest version, and to verify the integrity of the relevant information.

- Failure or malfunction of any semiconductor products may occur under particular conditions, customers shall have obligation to comply with safety standards when customers use Silicore Technology products to do their system design and machine manufacturing, and take corresponding safety measures in order to avoid potential risk of failure that may cause personal injury or property damage.

- The product upgrades without end, Silicore Technology will wholeheartedly provide customers integrated circuits that have better performance and better quality.