DIO32051A

0.5 MHz, 24 µA, High Performance CMOS Amplifier

Features

- Max offset (V_{OS}): DIO32051A at ±3mV
- Unity gain stable
- Gain bandwidth product: 0.5 MHz
- Wide supply range: 1.8 V to 5.5 V
- Input voltage range: 0 V to 5 V
- Ultra low power: 24 µA
- Compact package best for portable applications
  DIO32051A: DFN0.8*0.8-4

Applications

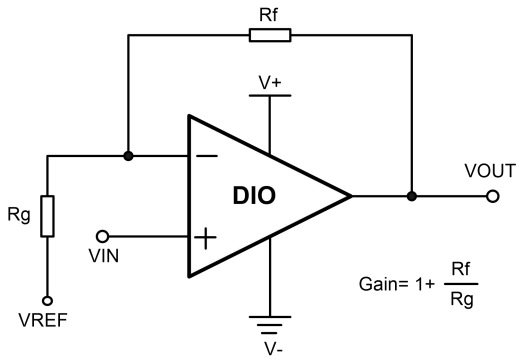
- ASIC input or output amplifiers
- Sensor interfaces
- Audio output
- Portable systems
- Notebook PCs
- Battery-powered equipment

Descriptions

The DIO32051A is a high performance CMOS operational amplifier with ultra low offset. Features include wide input common-mode voltage range and broad output voltage swing with operating supply voltage from 1.8 V to 5.5 V. Product is fully specified over the extended –40 to +125°C temperature range.

The DIO32051A provides 0.5 MHz bandwidth consuming an ultra-low current of 24 µA. Featuring very low input bias current. It is ideal for integrators and photodiode amplifiers.

Typical Application

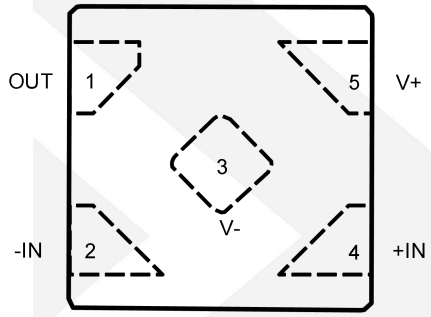


Non-Inverting Amplifier

Ordering Information

Order Part Number	Top Marking		T_A	Package	
DIO32051ACN4	U	RoHS or Green	-40 to +125°C	DFN0.8*0.8-4	Tape & Reel, 5000

Pin Assignments



DFN0.8*0.8-4

Figure 1. Pin Assignment (Top View)

Pin Description

Pin name	Description
V+	Positive supply
V-	Negative supply
+IN	Positive Input
-IN	Negative Input
OUT	Output

Absolute Maximum Ratings

Stresses beyond those listed under the Absolute Maximum Rating table may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other condition beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Symbol	Parameter	Rating	Unit
V_{CC}	Supply Voltage	7	V
V_{IN}	Input Voltage	(V-)-0.1 to 7	V
T_{STG}	Storage Temperature Range	-65 to 150	°C
T_J	Junction Temperature	150	°C
T_L	Lead Temperature Range	260	°C
ESD	HBM, JEDEC: JESD22-A114	8	kV
	CDM, JEDEC: JESD22-C101	2	

Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. DIOO does not recommend exceeding them or designing to absolute maximum ratings.

Symbol	Parameter	Rating	Unit
V_{CC}	Supply Voltage	1.8 to 5.5	V
V_{IN}	Input Voltage	0 to V+	V
T_A	Operating Temperature Range	-40 to 125	°C

Electrical Characteristics

Typical value: V+ = 5 V, R_L = 100 kΩ to V+/2, T_A = 25°C, unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Input characteristics						
V_{OS}	Input offset voltage	-40°C ≤ T_A ≤ 125°C, V+ = 1.8 V to 5 V	-3	0	3	mV
I_B	Input bias current	-40°C ≤ T_A ≤ 125°C, V+ = 1.8 V to 5 V		20		pA
I_{OS}	Input offset current	-40°C ≤ T_A ≤ 125°C, V+ = 1.8 V to 5 V		5		pA
V_{CM}	Common mode voltage range		0.1		V+	V
CMRR	Common mode rejection ratio	-40°C ≤ T_A ≤ 125°C, V_{CM} =0.1 to V+		75		dB
A_{OL}	Open loop voltage gain	R_L = 5 kΩ, V_O = 0.1 to (V+) - 0.1	80	102		dB
		R_L = 200 kΩ, V_O = 0.1 to (V+) - 0.1	100	128		
d_{VOS}/dt	Input offset voltage drift	-40°C ≤ T_A ≤ 125°C			2.5	µV/°C
Output characteristics						
V_{OH}	Output voltage high	V+ = 5V, R_L = 100 kΩ, -40°C ≤ T_A ≤ 125°C		4.995		V
		V+ = 1.8 V, R_L = 100 kΩ, -40°C ≤ T_A ≤ 125°C		1.79		
V_{OL}	Output voltage low	V+ = 5 V, R_L = 100 kΩ, -40°C ≤ T_A ≤ 125°C		5		mV
		V+ = 1.8V, R_L = 100 kΩ, -40°C ≤ T_A ≤ 125°C		5		
I_{SC}	Output short circuit current	Source I_{SC}, V+ = 5 V		28		mA
		Sink I_{SC}, V+ = 5 V		28		
Power supply						
PSRR	Power supply rejection ration		65	85		dB
I_S	Supply current	-40°C ≤ T_A ≤ 125°C		24		µA
Dynamic performance						
GBP	Gain bandwidth product	R_L = 100 K, C_L = 100 pF		0.5		MHz
SR	Slew rate	G=1, 2 V output step		0.29		V/µs
t_S	Setting time	G=1, 2 V output step		4		µs
Noise performance						
THD	Total harmonic distortion	f = 10 kHz, 2 V output step, R_L = 10 kΩ		0.02		%
e_n	Voltage noise density	f = 1 kHz		66		nV/√Hz
		f = 10 kHz		54		

Specifications subject to change without notice.

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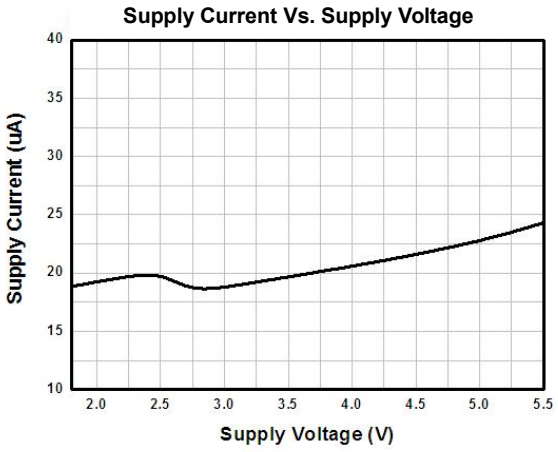

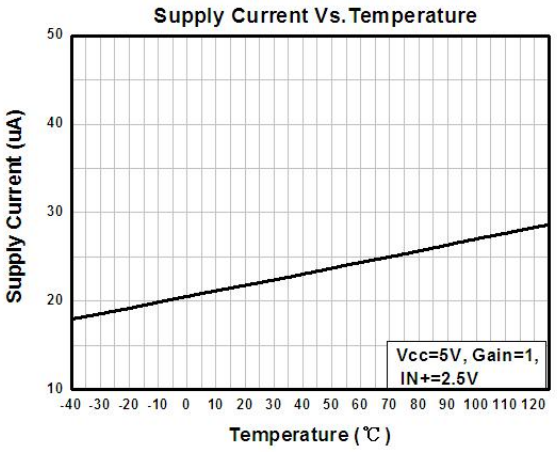

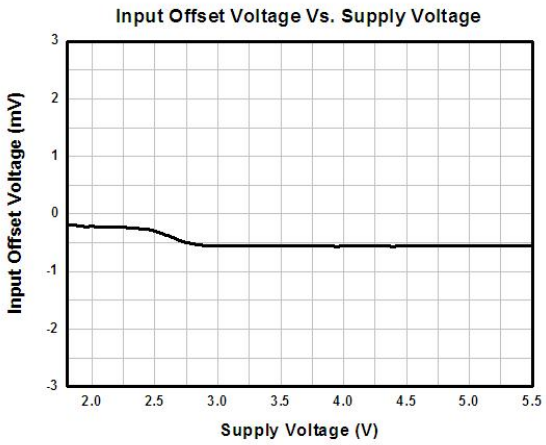

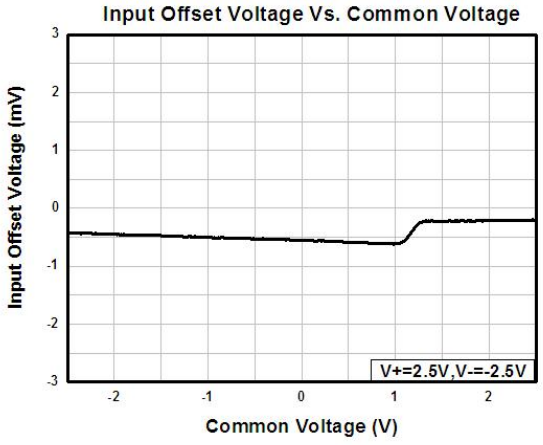

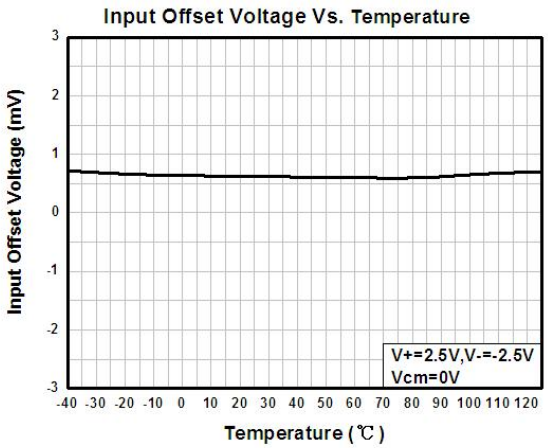

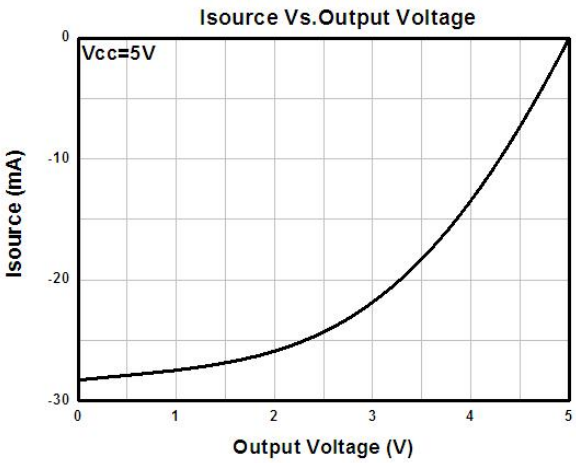

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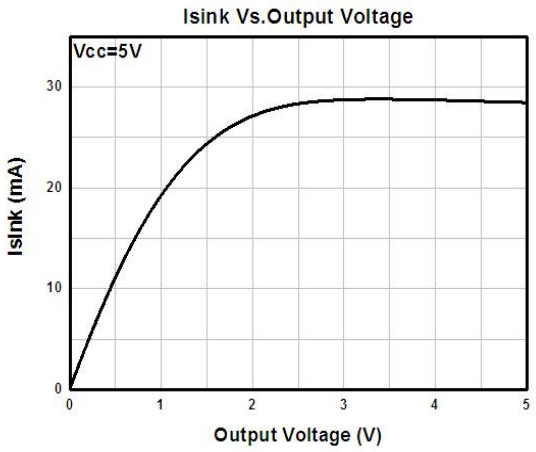
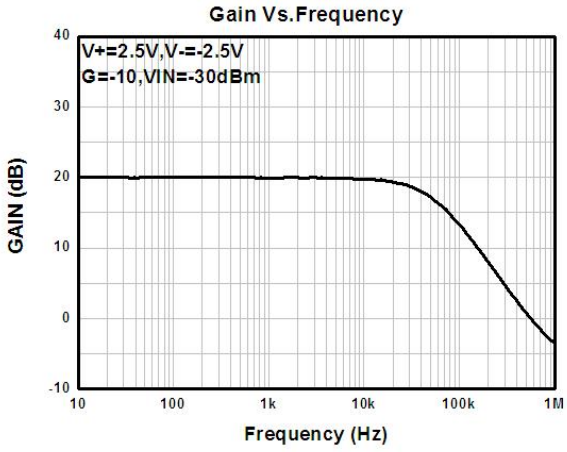
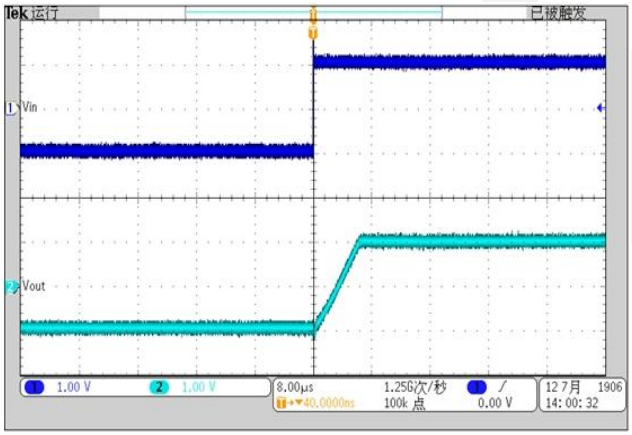
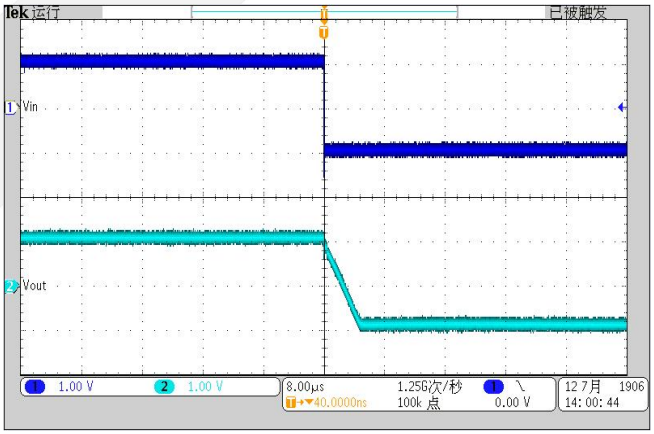




Slew Rate



Slew Rate



CONTACT US

Dioo is a professional design and sales corporation for high-quality and performance analog semiconductors. The company focuses on industry markets, such as cell phones, handheld products, laptops, medical equipment, and so on. Dioo's product families include analog signal processing and amplifying, LED drivers, and charger ICs. Go to http://www.dioo.com for a complete list of Dioo product families.

For additional product information or full datasheet, please contact our sales department or representatives.