DIO2172

Dual Channel, RRIO 10 MHz Amplifier

Features

- Rail-to-rail input and output
- 0.8 mV typical offset (V_{OS})
- Low distortion
- Gain bandwidth product: 10 MHz
- Wide supply range: 3.0 V to 5.5 V
- 3 mA/Amplifier typical supply current
- Slew rate: 7.0 V/μs
- DIO2172 available in TSOT23-8

Applications

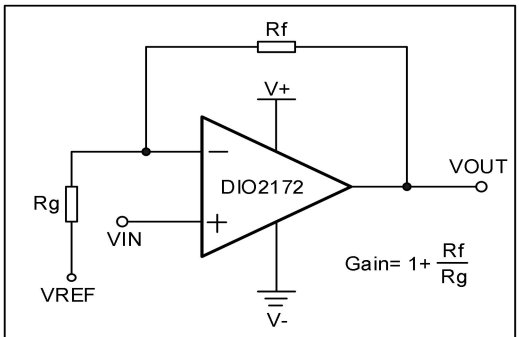
- Portable equipment
- Active filters
- Data acquisition
- Portable equipment
- Test equipment
- Broadband communication
- Process control
- Audio and video processing

Descriptions

The DIO2172 is a dual channel, rail-to-rail I/O operational amplifier which allows low load impedances to be driven. With a 10MHz unity-gain frequency and low noise, low distortion and high output current capability, the DIO2172 provides excellent choice for high quality systems. The input common-mode voltage range includes ground, and the maximum input offset voltage is 0.8mV (guaranteed). They are also capable of comfortably driving large capacitive loads.

DIO2172 is offered in Green or RoHS package and ESD (HBM) excesses 4kV. It is specified over the extended -40 to +125°C.

Typical Application



Non-Inverting Amplifier

Ordering Information

Part Number	Top Marking	RoHS	T_A	Package	
DIO2172TST8	7BYW	Green	-40 to +125°C	TSOT23-8	Tape & Reel, 4000

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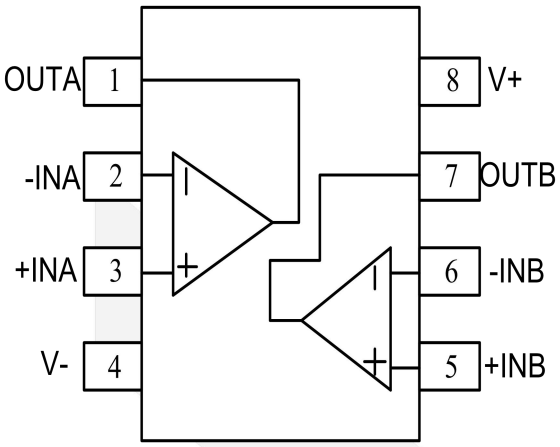
1. Pin Assignments



TSOT23-8

Figure 1 Top view

Pin Description

Pin name	Description
V+	Positive supply
V-	Negative supply
+INA,+INB	Positive input (channel A,B)
-INA,-INB	Negative input (channel A,B)
OUTA,OUTB	Output (channel A,B)

2. Absolute Maximum Ratings

Stresses beyond those listed under “Absolute Maximum Rating” 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 maxim rating conditions for extended periods may affect device reliability. DIOO does not recommend exceeding them or designing to Absolute Maximum Ratings.

Parameter		Rating	Unit
Supply voltage		7	V
Input voltage		(V-)-0.5 to 7	V
Storage temperature range		-65 to 150	°C
Junction temperature		150	°C
Lead temperature range		260	°C
ESD	HBM, JEDEC: JESD22-A114	4	kV
	CDM, JEDEC: JESD22-C101	1	

3. Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation to ensure optimal performance to the datasheet specifications.

Parameter	Rating	Unit
Supply voltage	3 to 5.5	V
Input voltage	0 to 5	V
Operating temperature range	-40 to 125	°C

4. Electrical Characteristics

Typical value: V+ = 5 V/3.3 V, V_{CM} = V+/2, R_L = 600 Ω, T_A = 25°C, unless otherwise specified.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Input characteristic						
V_{OS}	Input offset voltage	-40°C ≤ T_A ≤ 125°C, V+ = 3.3 V to 5 V	-5	0.8	+5	mV
I_B	Input bias current	-40°C ≤ T_A ≤ 125°C, V+ = 3.3 V to 5 V		10		pA
I_{OS}	Input offset current	-40°C ≤ T_A ≤ 125°C, V+ = 3.3 V to 5 V		1		pA
V_{CM}	Common mode voltage range		-0.1		(V+) +0.1	V
CMRR	Common mode rejection ratio	-40°C ≤ T_A ≤ 125°C, V_{CM} = -0.1 to (V+) +0.1, V+ = 5 V	75	90		dB
A_{OL}	Open loop voltage gain	R_L = 600 Ω, Vo = 0.1 to (V+) -0.1	100	130		dB
$\Delta V_{OS}/\Delta_T$	Input offset voltage drift	-40°C ≤ T_A ≤ 125°C			2	μV/°C
Output characteristics						
	Output voltage swing from rail	R_L = 600 Ω, -40°C ≤ T_A ≤ 125°C		0.1		V
		R_L = 10 kΩ, -40°C ≤ T_A ≤ 125°C		0.015		
I_{OUT}	Output current	V+ = 5 V	220	260		mA
		V+ = 3.3 V	150	170		
	Closed loop output impedance	f = 1 MHz, G = +1, V+ = 5 V		1.6		Ω
		f = 1 MHz, G = +1, V+ = 2.5 V		4.2		
Power supply						
PSRR	Power supply rejection ratio		75	110		dB
I_S	Supply current per channel/amp	V+ = 5 V , -40°C ≤ T_A ≤ 125°C	2.2	3.0	3.9	mA
		V+ = 3.3 V , -40°C ≤ T_A ≤ 125°C	1.5	2.2	3.2	
Dynamic performance						
GBP	Gain bandwidth product			10		MHz
SR	Slew rate	G=1, 2V Output Step		7.0		V/μs
t_S	Setting time	G=1, 2V Output Step		0.25		μs
Noise performance						
THD	Total harmonic distortion	f = 10 kHz, 2 V output step, R_L = 600 Ω, V+ = 5 V		0.04		%
e_n	Voltage noise density	f = 1 kHz, V+ = 5 V		28		nV/√Hz
		f = 10 kHz, V+ = 5 V		20		

Specifications subject to change without notice.

5. Typical Performance Characteristics

All typical value are at V+ = 5 V, R_L = 600 Ω, T_A = 25°C, unless otherwise specified.

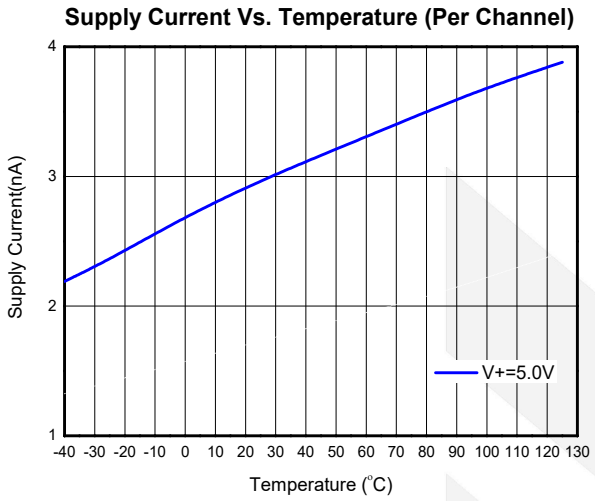


Figure 2 Supply current vs. Temperature (per channel)

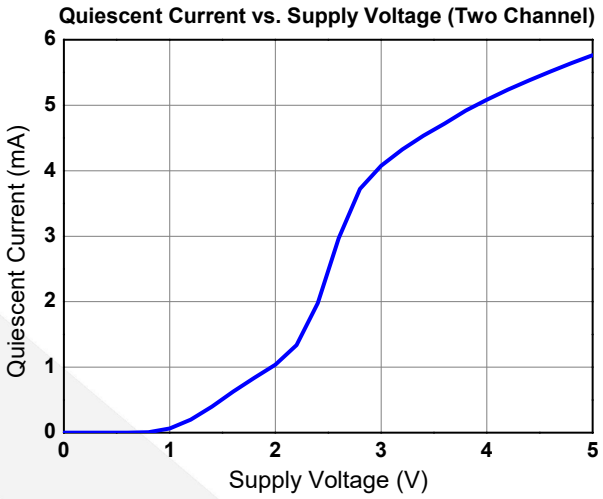


Figure 3 Quiescent current vs. Supply voltage (two channel)

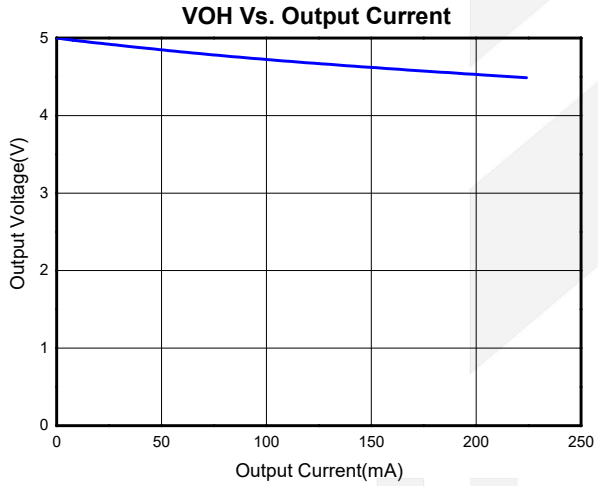


Figure 4 VOH vs. Output current

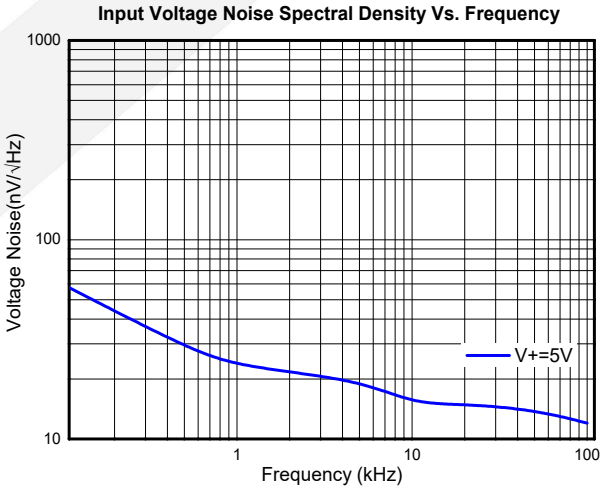


Figure 5 Input voltage noise spectral density vs. Frequency

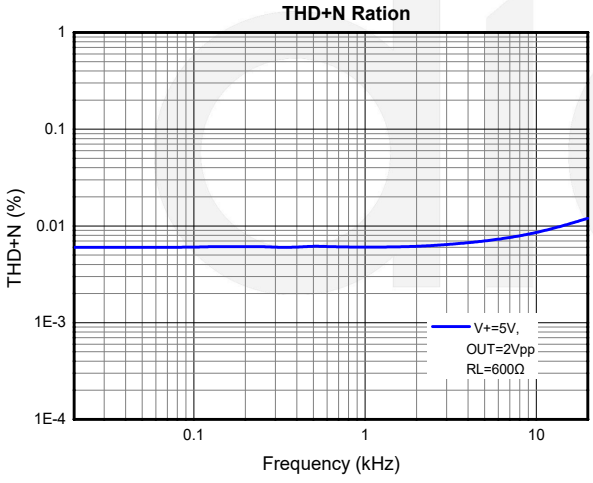


Figure 6 THD+N Ratio

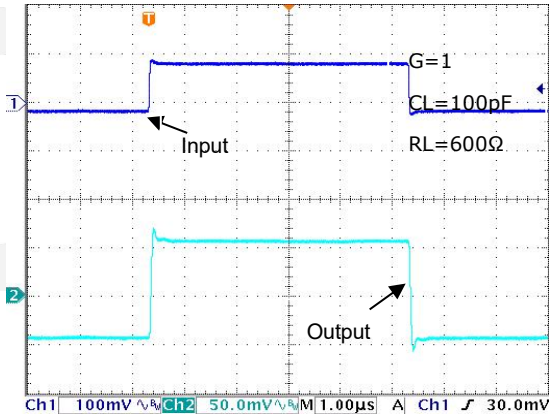


Figure 7 Small-signal step response

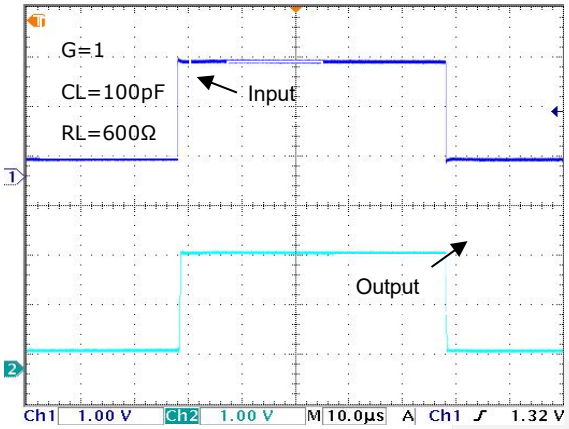


Figure 8 Large-signal step response

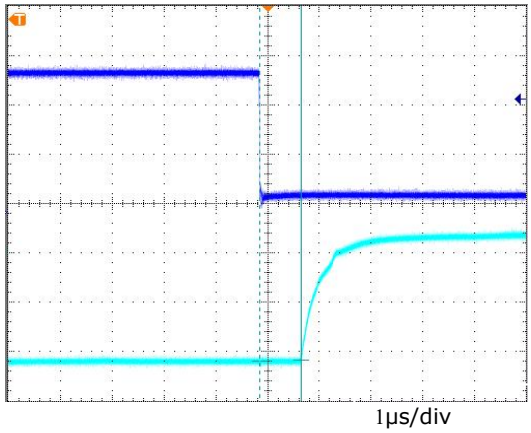
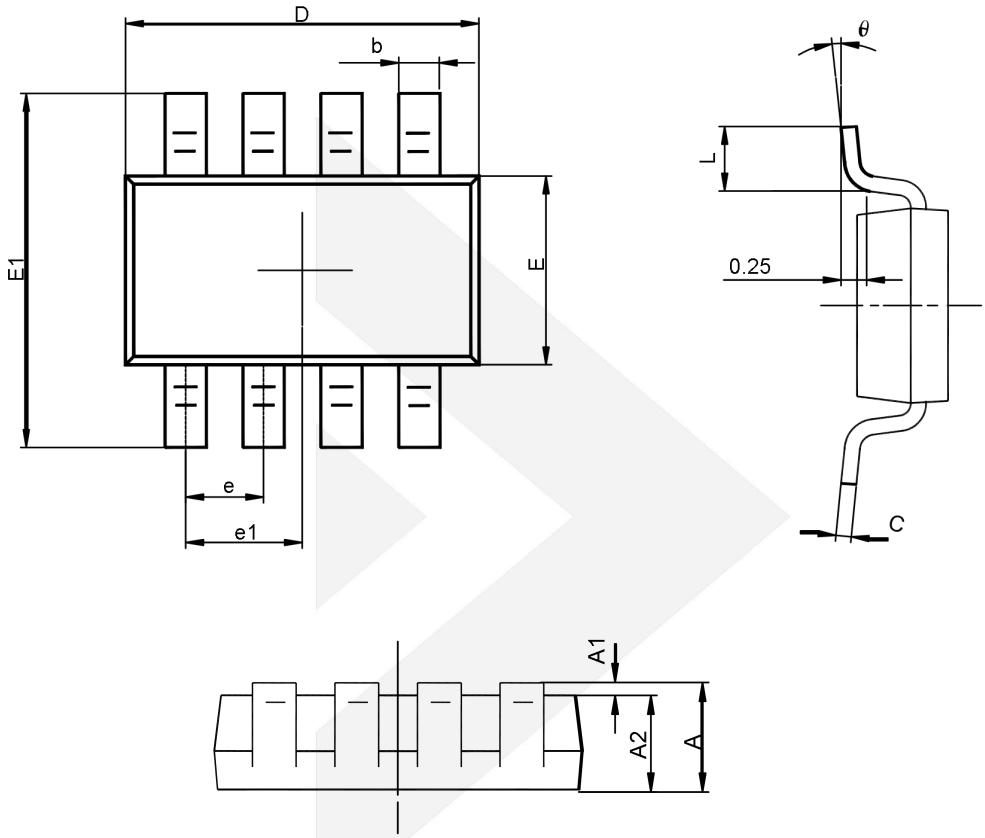


Figure 9 Overload recovery time

6. Physical Dimensions: TSOT-23-8



Common Dimensions (Units of Measure = Millimeter)		
Symbol	**MIN**	**MAX**
A	0.700	0.900
A1	0.000	0.100
A2	0.700	0.800
b	0.300	0.500
C	0.080	0.200
D	2.820	3.020
E	1.600	1.700
E1	2.650	2.950
e	0.65 BSC	
e1	0.975 BSC	
L	0.300	0.600
θ	0°	8°

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 phone, handheld products, laptop, and medical equipment and so on. Dioo's product families include analog signal processing and amplifying, LED drivers and charger IC. Go to http://www.dioo.com for a complete list of Dioo product families.

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