

DIO27L2

Anti-current Leakage, Dual channel, Low Power Amplifier

Features

- Anti Current Leakage function on Output
- 0.65mV Typical offset (V_{OS})
- Unity Gain Stable
- Gain Bandwidth Product: 550KHz
- Very low input bias currents : 0.5pA
- Wide supply range: 3.3V to 5.5V
- Input Voltage Range:
-0.1V to +5.6V with $V_+ = 5.5V$
- Ultra low power: 16 μ A per channel
- Small size packaging best for portable applications
- Available in SOIC-8 and MSOP-8

Descriptions

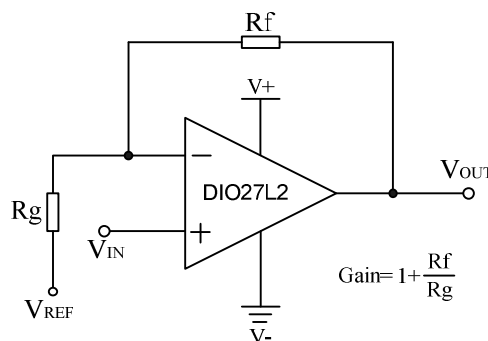
DIO27L2 is dual channel CMOS operational amplifiers with ultra low offset. Features include wide input common-mode voltage range and broad output voltage swing with operating supply voltage from 3.3V to 5.5 V. Products are fully specified over the extended $-40^{\circ}C$ to $+125^{\circ}C$ temperature range.

DIO27L2 provides 550kHz bandwidth consuming ultra low current of 16 μ A per channel. Very low input bias currents of 0.5pA enable the DIO27L2 ideal for integrators, photodiode amplifiers, and piezoelectric sensors.

Applications

- ASIC Input or Output Amplifier
- Sensor Interface
- Piezo Electric Transducer Amplifier
- Medical Instrumentation
- Audio Output
- Portable Systems
- Smoke Detectors
- Notebook PC
- Battery-Powered equipment

Typical Application



Non-Inverting Amplifier

Ordering Information

Order Part Number	Top Marking		T_A		Package
DIO27L2MP8	DO27L2	Green or RoHS	-40 to $+125^{\circ}C$	MSOP-8	Tape & Reel, 3000
DIO27L2SO8	DO27L2	Green or RoHS	-40 to $+125^{\circ}C$	SOIC-8	Tape & Reel, 2500

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Pin Assignments

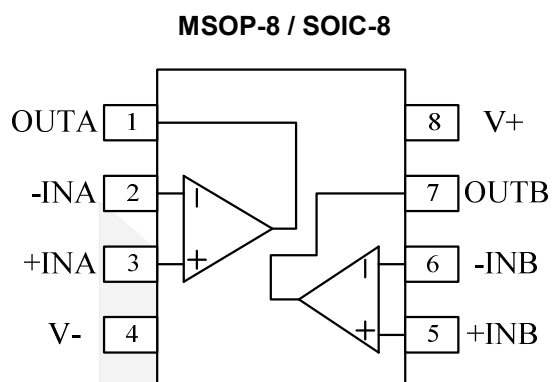


Figure 1 Top View

Pin Description

Pin name	Description
V+	Positive supply
V-	Negative supply
+IN (+IN A/+IN B)	Positive Input (channel A/ B)
-IN (-IN A/-IN B)	Negative Input (channel A/ B)
OUT (OUT A/OUT B)	Output (channel A/ B)

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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 maximum rating conditions for extended periods may affect device reliability.

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
SOIC-8 Θ_{JA}		130	°C/W
MSOP-8 Θ_{JA}		210	°C/W
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 to ensure optimal performance to the datasheet specifications. DIOO does not recommend exceeding them or designing to Absolute Maximum Ratings.

Parameter	Rating	Unit
Supply Voltage	3.3 to 5.5	V
Input Voltage	0 to 5	V
Operating Temperature Range	-40 to 125	°C

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Electrical Characteristics

Typical value: $V_+ = 5V$, $R_L = 200k\Omega$ to $V_+/2$, $T_A = 25^\circ C$, unless otherwise specified.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
INPUT CHARACTERISTICS						
V_{OS}	Input Offset Voltage	$-40^\circ C \leq T_A \leq 125^\circ C$, $V_+ = 3.3V$ to $5V$		± 0.65	± 2.0	mV
I_B	Input Bias Current	$-40^\circ C \leq T_A \leq 125^\circ C$, $V_+ = 3.3V$ to $5V$		0.5		pA
I_{OS}	Input Offset Current	$-40^\circ C \leq T_A \leq 125^\circ C$, $V_+ = 3.3V$ to $5V$		0.5		pA
V_{CM}	Common Mode Voltage Range		-0.1		(V_+) $+0.1$	V
CMRR	Common Mode Rejection Ratio	$-40^\circ C \leq T_A \leq 125^\circ C$, $V_{CM} = -0.1$ to $(V_+) + 0.1$	70	85		dB
A_{OL}	Open Loop Voltage Gain	$R_L = 5k\Omega$, $V_o = 0.1$ to $(V_+) - 1.6$	82	100		dB
		$R_L = 200k\Omega$, $V_o = 0.1$ to $(V_+) - 1.6$	100	120		
$\Delta V_{OS}/\Delta T$	Input Offset Voltage Drift	$-40^\circ C \leq T_A \leq 125^\circ C$			5	$\mu V/^\circ C$
OUTPUT CHARACTERISTICS						
V_{OH}	Output Voltage High	$V_+ = 5V$, $R_L = 100k\Omega$, $-40^\circ C \leq T_A \leq 125^\circ C$		3.4		V
V_{OL}	Output Voltage Low	$V_+ = 5V$, $R_L = 100k\Omega$, $-40^\circ C \leq T_A \leq 125^\circ C$		2.5		mV
I_{SC}	Output Short Circuit Current	Source I_{SC} , $V_+ = 5V$		25		mA
		Sink I_{SC} , $V_+ = 5V$		20		
I_{LK}	Current Leakage	$V_{CC} = 0V$, $V_o = 5V$, $-40^\circ C \leq T_A \leq 125^\circ C$			0.1	μA
POWER SUPPLY						
PSRR	Power Supply Rejection Ration		75	90		dB
I_s	Supply Current per Channel	$-40^\circ C \leq T_A \leq 125^\circ C$		16	20	μA
DYNAMIC PERFORMANCE						
GBP	Gain Bandwidth Product	$R_L = 100k\Omega$, $C_L = 100pF$		550		KHz
SR	Slew Rate	$G = 1$, 2V Output Step		0.32		V/ μs
t_s	Setting Time	$G = 1$, 2V Output Step		6.7		μs
NOISE PERFORMANCE						
THD	Total Harmonic Distortion	$f = 10kHz$, 1V Output Step, $R_L = 10k\Omega$, $V_+ = 5V$		0.007		%
e_n	Voltage Noise Density	$f = 1kHz$		49		$nV/\sqrt{Hz}$
		$f = 10kHz$		42		

Specifications subject to change without notice.

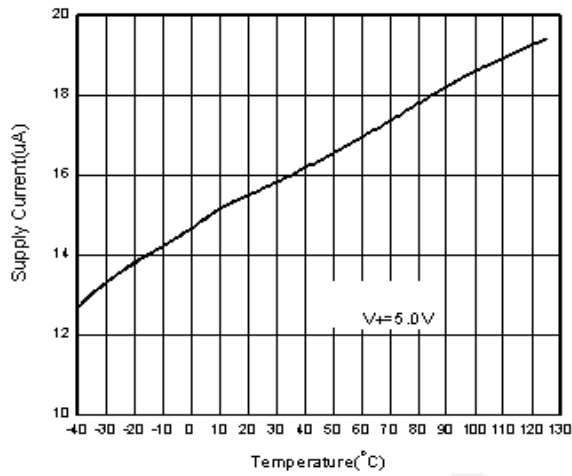
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Typical Performance Characteristics

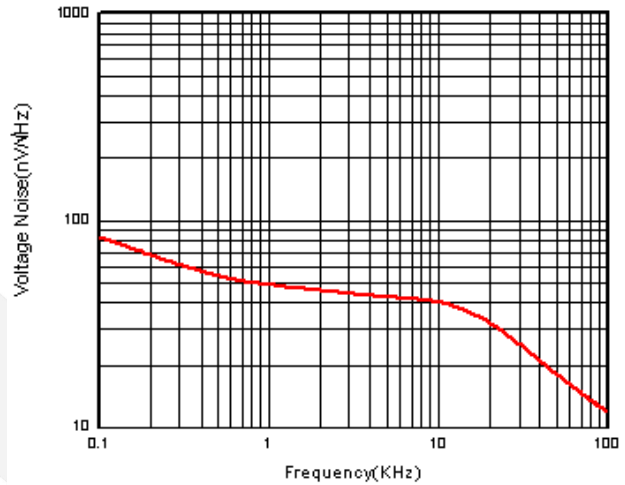
All typical value are at $V_+ = 5V$, $R_L = 200k\Omega$ to $V_+/2$, $T_A = 25^\circ C$, unless otherwise specified.

Supply Current Vs. Temperature



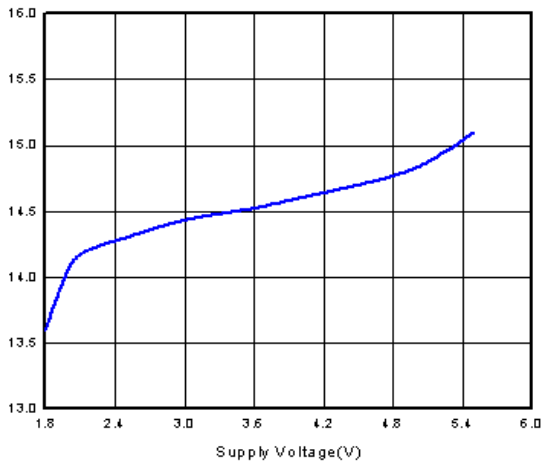
Supply current vs. Temperature

Input Voltage Noise Spectral Density Vs. Frequency



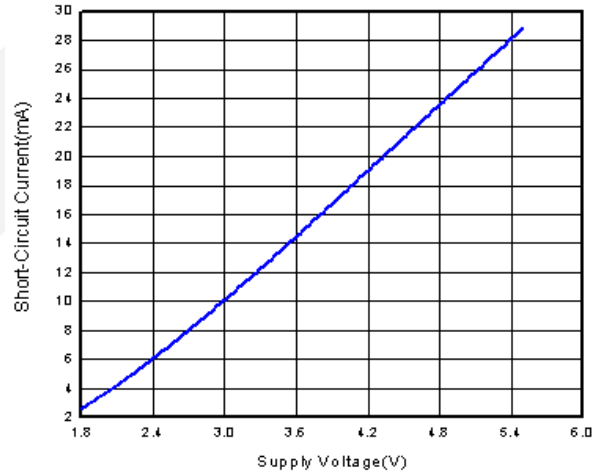
Input voltage noise spectral density vs. frequency

Quiescent Current Vs. Supply Voltage



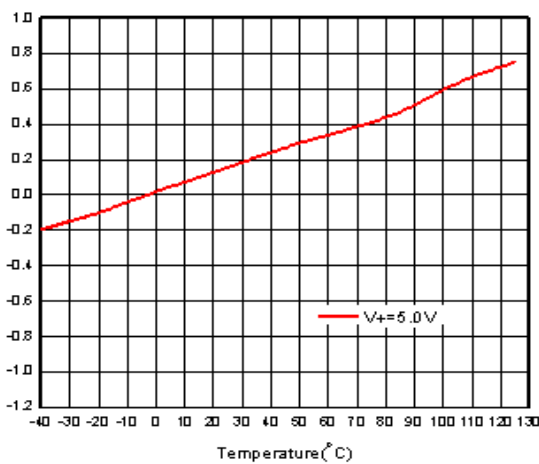
Quiescent Current vs. Supply Voltage

Short-Circuit Current Vs. Supply Voltage

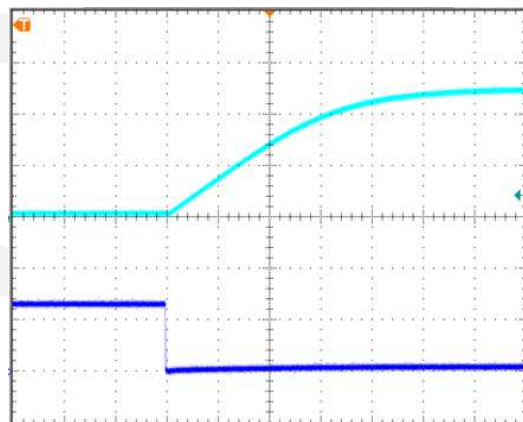


Short Current vs. Supply Voltage

Offset Voltage Vs. Temperature



Offset Voltage vs. Temperature



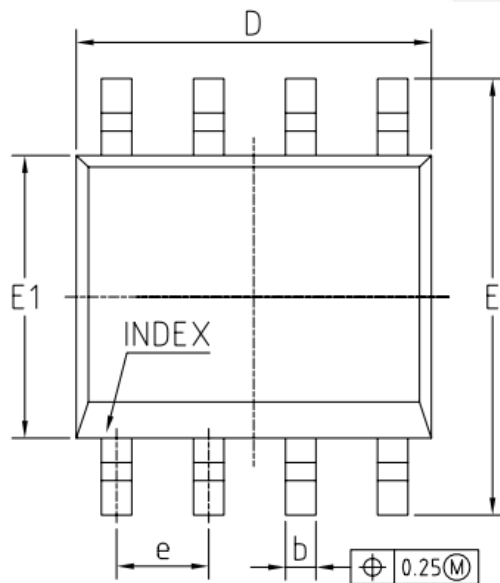
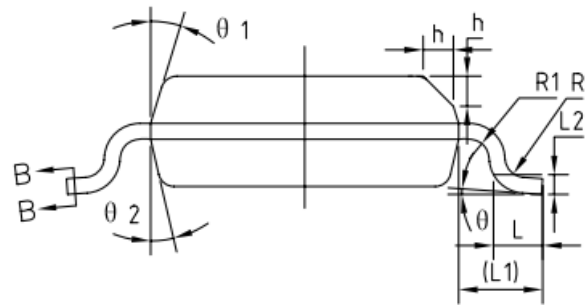
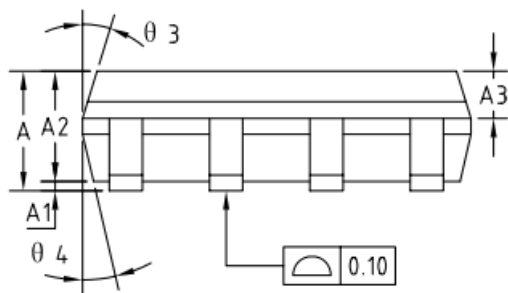
10µs/div

Overload recovery time

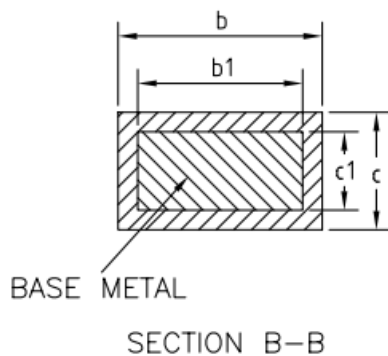
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Physical Dimensions: SOIC-8

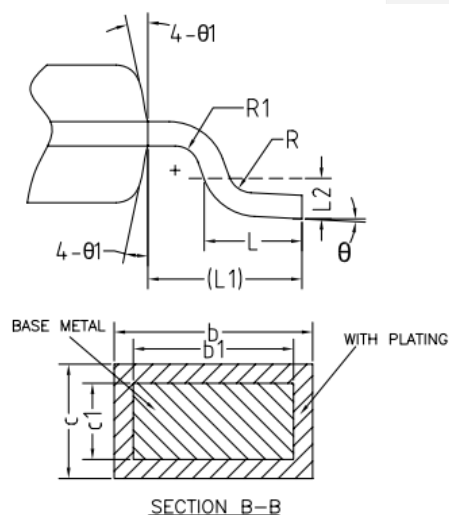
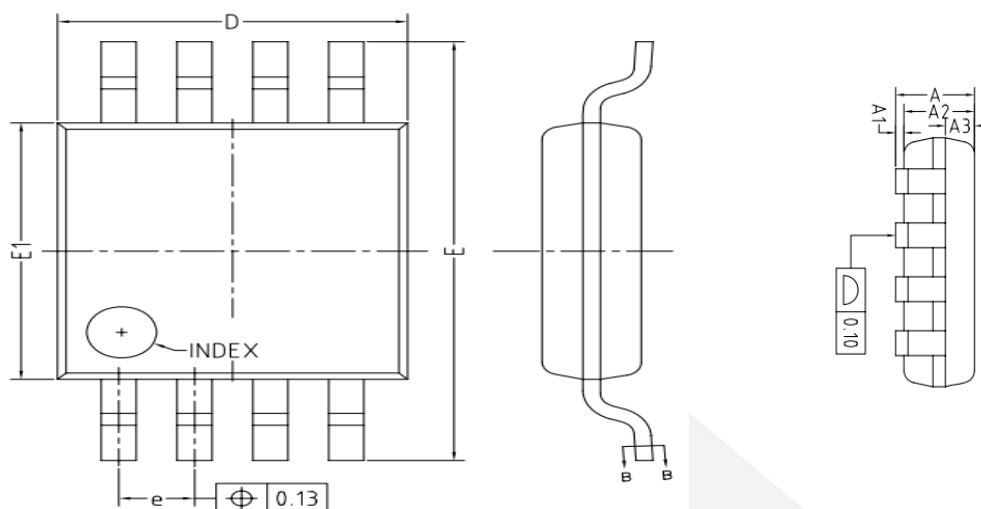


COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)			
Symbol	MIN	NOM	MAX
A	1.35	1.55	1.75
A1	0.10	0.15	0.25
A2	1.25	1.40	1.65
A3	0.50	0.60	0.70
b	0.38	-	0.51
b1	0.37	0.42	0.47
c	0.17	-	0.25
c1	0.17	0.20	0.23
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.27BSC		
L	0.45	0.60	0.80
L1	1.04REF		
L2	0.25BSC		
R	0.07	-	-
R1	0.07	-	-
h	0.30	0.40	0.50
θ	0°	-	8°
θ1	15°	17°	19°
θ2	11°	13°	15°
θ3	15°	17°	19°
θ4	11°	13°	15°



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Physical Dimensions: MSOP-8



COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)			
Symbol	MIN	NOM	MAX
A	-	-	1.10
A1	0	-	0.15
A2	0.75	0.85	0.95
A3	0.25	0.35	0.39
b	0.28	-	0.37
b1	0.27	0.30	0.33
c	0.15	-	0.20
c1	0.14	0.15	0.16
D	2.90	3.00	3.10
E	4.70	4.90	5.10
E1	2.90	3.00	3.10
e	0.55	0.65	0.75
L	0.45	0.60	0.80
L1	0.95REF		
L2	0.25BSC		
R	0.07	-	-
R1	0.07	-	-
θ	0°	-	8°
θ1	9°	12°	15°

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CONTACT US

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