



## Limited Datasheet

For full content datasheet, please go to [www.dioo.com/support/doc.html](http://www.dioo.com/support/doc.html)  
Email [datasheet.requiry@dioo.com](mailto:datasheet.requiry@dioo.com)

# DIO2031/2032/2033/2034/2036

## 500 $\mu$ A, 6MHz, Rail-to-Rail I/O CMOS Operational Amplifiers

### Features

- Supply Voltage Range: 2.5V to 5.5V
- Low Supply Current: 500 $\mu$ A Typically
- Rail-to-Rail Input and Output
- 6MHz High Gain-Bandwidth Product
- High Slew Rate: 3.6V/ $\mu$ s
- Settling Time to 0.1% with 2V Step: 2.1 $\mu$ s
- Overload Recovery Time: 0.9 $\mu$ s
- Packages:
  - DIO2031 Available in: SOT23-5/SOIC-8
  - DIO2032 Available in: SOIC-8/MSOP-8
  - DIO2033 Available in: SOT23-6/SOIC-8
  - DIO2034 Available in: TSSOP-14/SOIC-14
  - DIO2036 Available in: QFN4\*4-20

### Applications

- Audio Output
- Sensor Interface
- Active Filters
- A/D Converters
- Cellular and Cordless Phones
- Laptops and PDAs
- Photodiode Amplification
- Battery-Powered Instrumentation

### Descriptions

The DIO2031 (single), DIO2032 (dual), DIO2033 (single with shutdown), DIO2034 (quad) and DIO2036 (Triple) are amplifiers with very low noise, low voltage, and low power operational. The DIO2031/2/3/4/6 has a high gain-bandwidth product of 6MHz, a slew rate of 3.6V/ $\mu$ s, and a quiescent current of 500 $\mu$ A/amplifier at 5V typically.

The DIO2031/2/3/4/6 is designed to provide optimal performance in low voltage and low noise systems. All these chips provide rail-to-rail output swing into heavy loads. The input common-mode voltage range includes ground, and the maximum input offset voltage is 3.5mV for DIO2031/2/3/4/6.

The DIO2033 has a power-down disable feature that reduces the supply current to 90nA individually.

They are specified over the extended industrial temperature range (-40 $^{\circ}$ C to +125 $^{\circ}$ C). The operating range is from 2.5V to 5.5V.

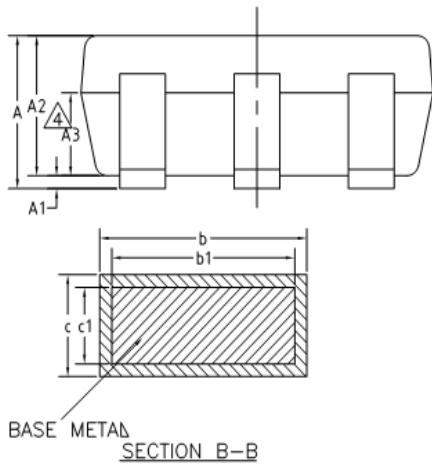
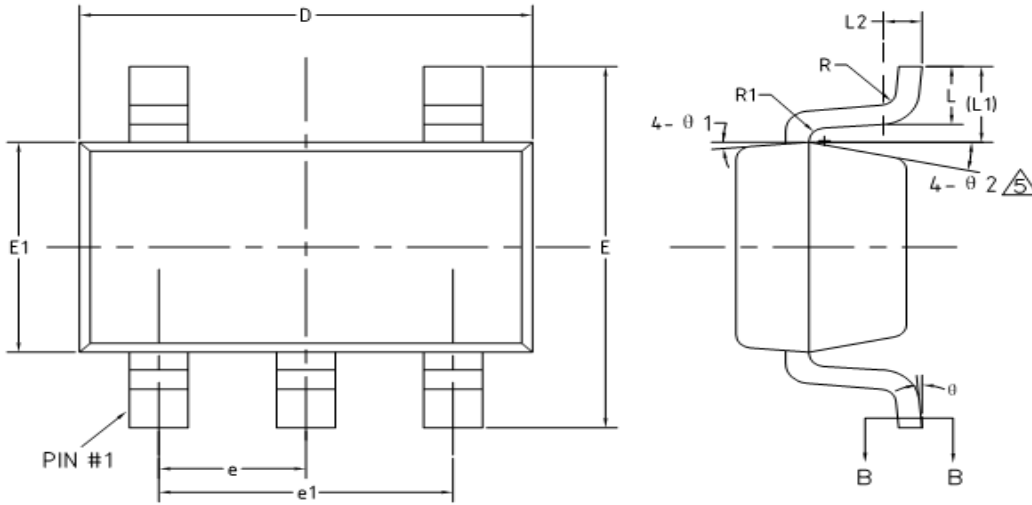
### Ordering Information

Order Part Number	Top Marking		T <sub>A</sub>	Package	
DIO2031ST5	YWXM	RoHS/Green	-40 to +125 $^{\circ}$ C	SOT23-5	Tape & Reel, 3000
DIO2031SO8	DIO2031	RoHS/Green	-40 to +125 $^{\circ}$ C	SOIC-8	Tape & Reel, 2500
DIO2032SO8	DIO2032	RoHS/Green	-40 to +125 $^{\circ}$ C	SOIC-8	Tape & Reel, 2500
DIO2032MP8		RoHS/Green	-40 to +125 $^{\circ}$ C	MSOP-8	Tape & Reel, 3000
DIO2033SO8	DIO2033	RoHS/Green	-40 to +125 $^{\circ}$ C	SOIC-8	Tape & Reel, 2500
DIO2033ST6	YWXM	RoHS/Green	-40 to +125 $^{\circ}$ C	SOT23-6	Tape & Reel, 3000
DIO2034SO14	DIO2034	RoHS/Green	-40 to +125 $^{\circ}$ C	SOP-14	Tape & Reel, 2500
DIO2034TP14		RoHS/Green	-40 to +125 $^{\circ}$ C	TSSOP-14	Tape & Reel, 2500
DIO2036QN20	D2036	RoHS/Green	-40 to +125 $^{\circ}$ C	QFN4*4-20	Tape & Reel, 5000

# DIO2031/2032/2033/2034/2036

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## Physical Dimensions: SOT-23-5

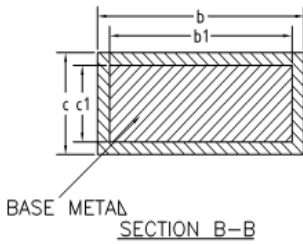
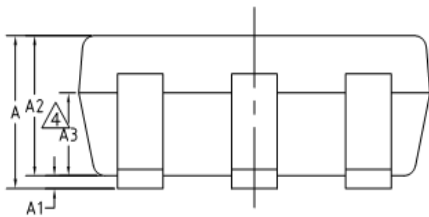
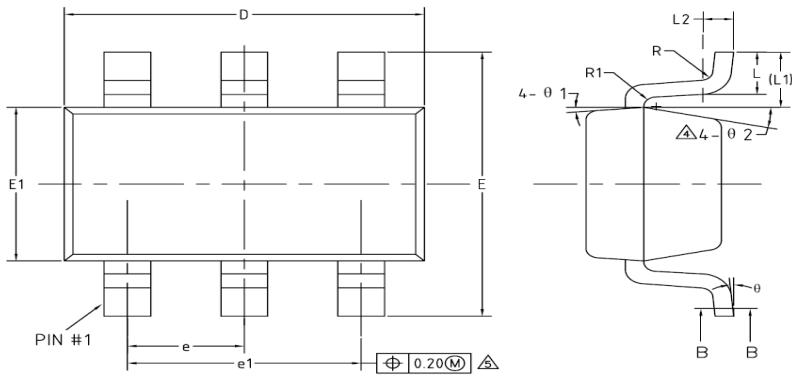


COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)			
Symbol	MIN	NOM	MAX
A	-	-	1.25
A1	0	-	0.15
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
b	0.36	-	0.50
b1	0.36	0.38	0.45
c	0.14	-	0.20
c1	0.14	0.15	0.16
D	2.826	2.926	3.026
E	2.60	2.80	3.00
E1	1.526	1.626	1.726
e	0.90	0.95	1.00
e1	1.80	1.90	2.00
L	0.35	0.45	0.60
L1	0.59REF		
L2	0.25BSC		
R	0.10	-	-
R1	0.10	-	0.25
θ	0°	-	8°
θ1	3°	5°	7°
θ2	6°	-	14°

# DIO2031/2032/2033/2034/2036

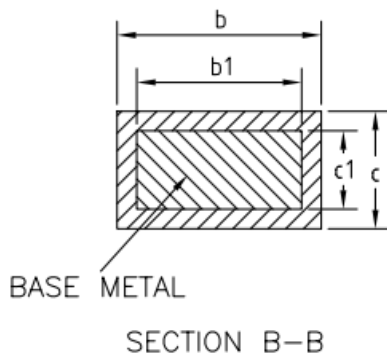
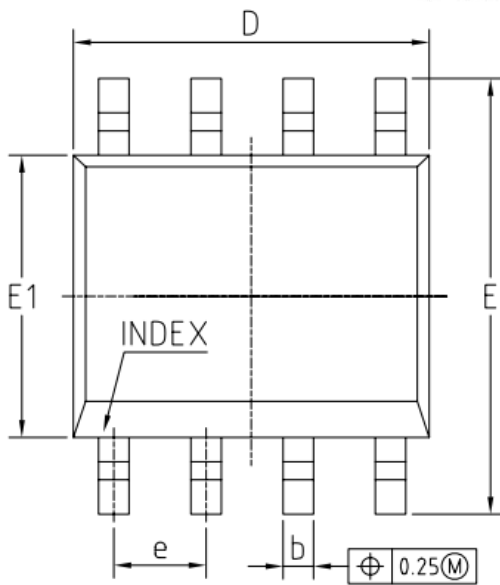
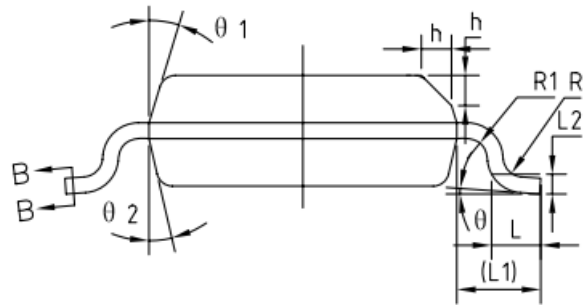
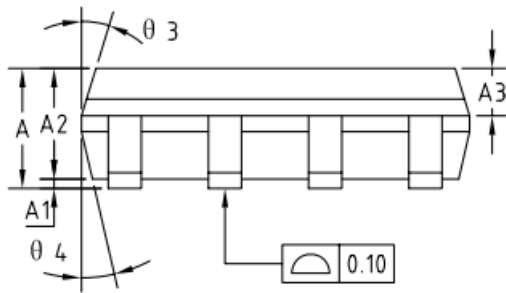
500uA. 6MHz. Rail-to-Rail I/O CMOS Operational Amplifiers

## Physical Dimensions: SOT-23-6



COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)			
Symbol	MIN	NOM	MAX
A	-	-	1.25
A1	0	-	0.15
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
b	0.36	-	0.50
b1	0.36	0.38	0.45
c	0.14	-	0.20
c1	0.14	0.15	0.16
D	2.826	2.926	3.026
E	2.60	2.80	3.00
E1	1.526	1.626	1.726
e	0.90	0.95	1.00
e1	1.80	1.90	2.00
L	0.35	0.45	0.60
L1	0.59REF		
L2	0.25BSC		
R	0.10	-	-
R1	0.10	-	0.25
θ	0°	-	8°
θ1	3°	5°	7°
θ2	6°	-	14°

Physical Dimensions: SOIC-8

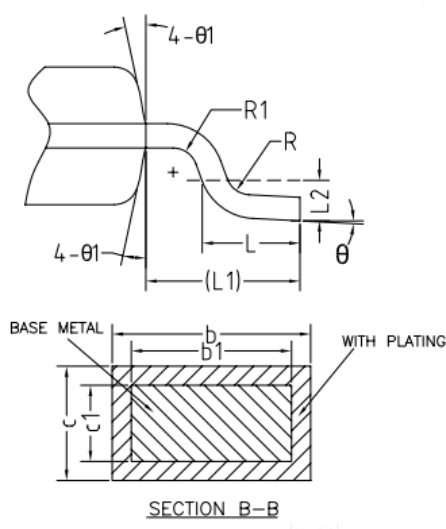
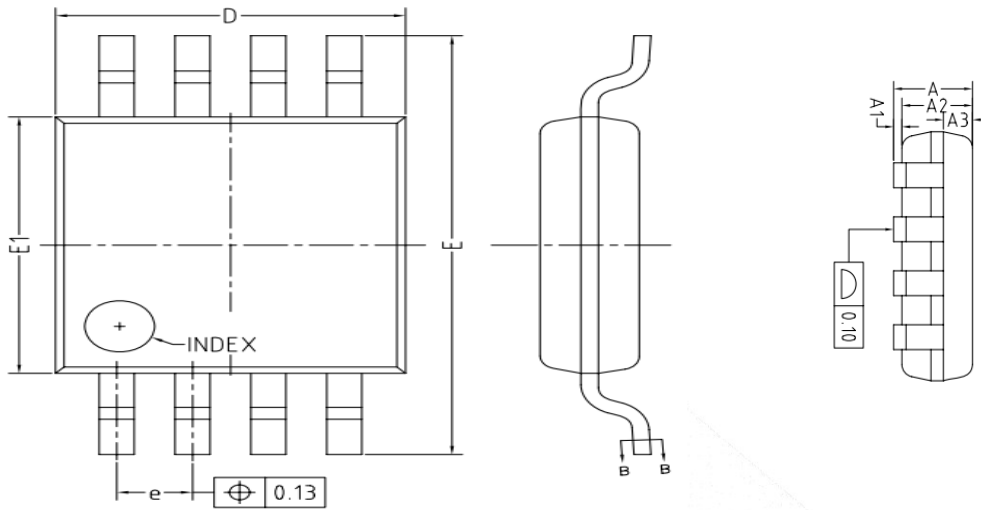


COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)			
Symbol	MIN	NOM	MAX
A	1.35	1.55	1.75
A1	0.10	0.15	0.25
A2	1.25	1.40	1.65
A3	0.50	0.60	0.70
b	0.38	-	0.51
b1	0.37	0.42	0.47
c	0.17	-	0.25
c1	0.17	0.20	0.23
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.27BSC		
L	0.45	0.60	0.80
L1	1.04REF		
L2	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°

# DIO2031/2032/2033/2034/2036

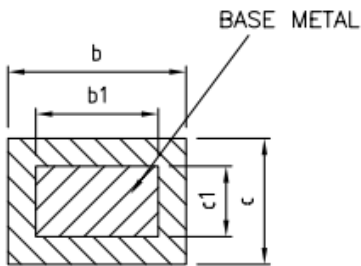
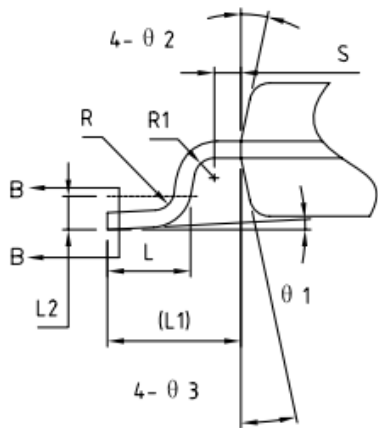
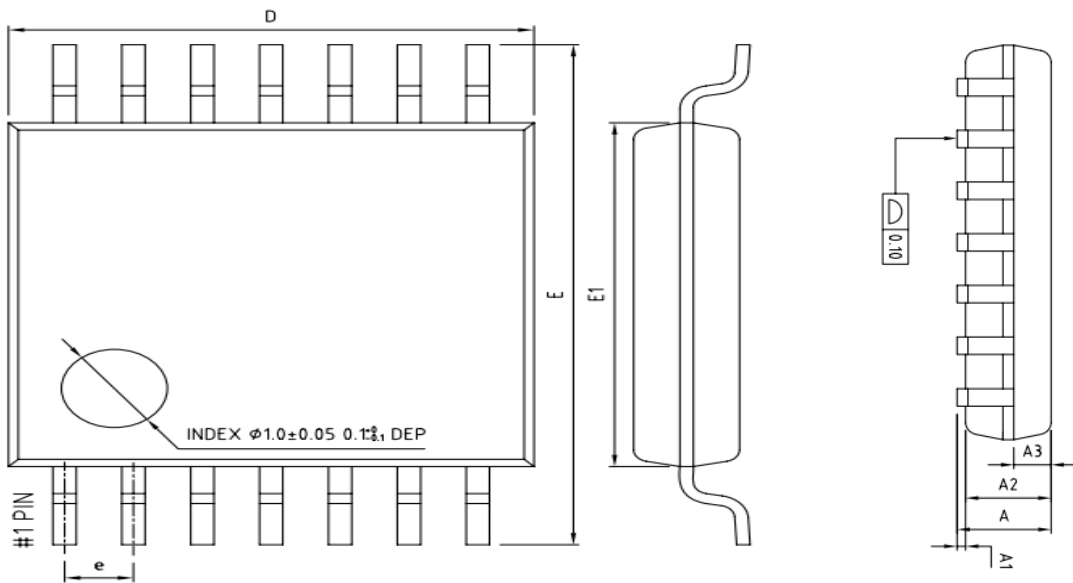
500uA. 6MHz. Rail-to-Rail I/O CMOS Operational Amplifiers

## 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°

Physical Dimensions: TSSOP-14



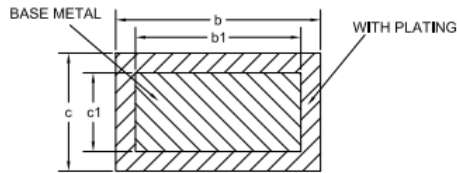
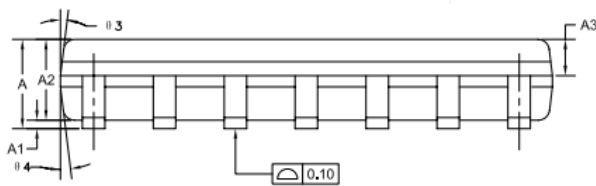
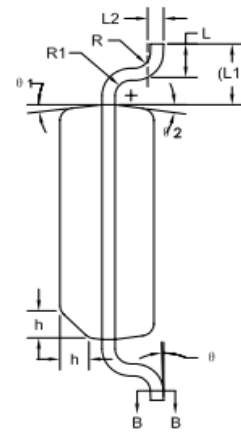
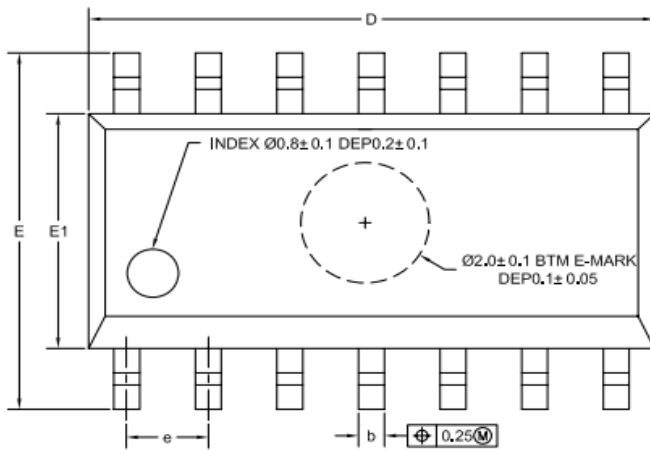
SECTION B-B

COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)			
Symbol	MIN	NOM	MAX
A	-	-	1.20
A1	0.05	-	0.15
A2	0.90	1.00	1.05
A3	0.34	0.44	0.54
b	0.20	-	0.28
b1	0.20	0.22	0.24
c	0.10	-	0.19
c1	0.10	0.13	0.15
D	4.86	4.96	5.06
E	6.20	6.40	6.60
E1	4.30	4.40	4.50
e	0.65BSC		
L	0.45	0.60	0.75
L1	1.00REF		
L2	0.25BSC		
R	0.09	-	-
R1	0.09	-	-
S	0.20	-	-
Ø1	0°	-	8°
Ø2	10°	12°	14°
Ø3	10°	12°	14°

# DIO2031/2032/2033/2034/2036

500uA. 6MHz. Rail-to-Rail I/O CMOS Operational Amplifiers

## Physical Dimensions: SOIC-14



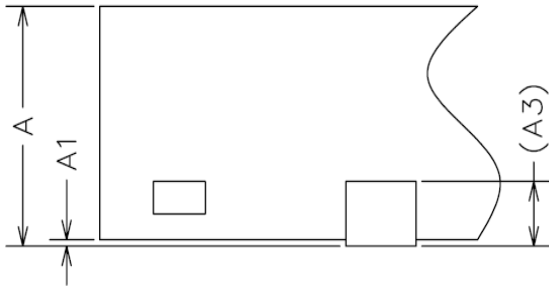
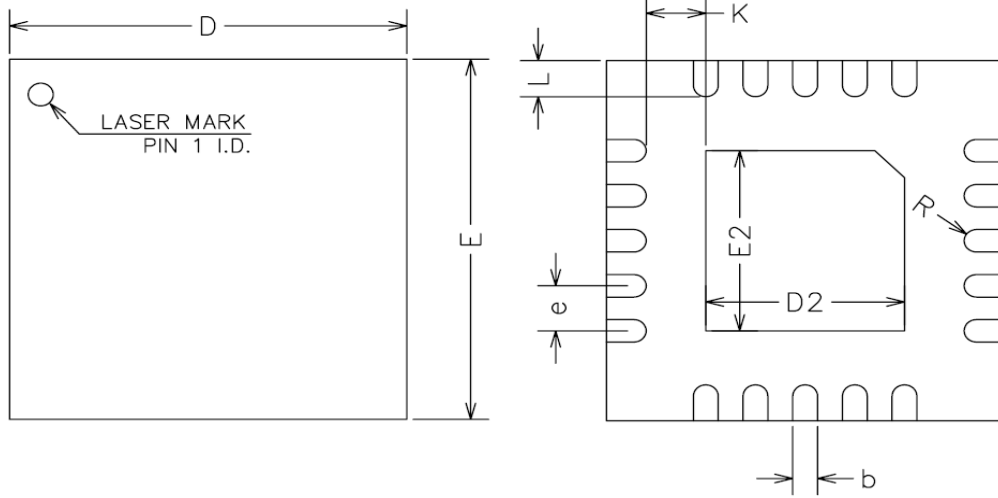
SECTION B-B

COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)			
Symbol	MIN	NOM	MAX
A	1.35	1.60	1.75
A1	0.10	0.15	0.25
A2	1.25	1.45	1.65
A3	0.55	0.65	0.75
b	0.36	-	0.49
b1	0.35	0.40	0.45
c	0.17	-	0.25
c1	0.17	0.20	0.23
D	8.53	8.63	8.73
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
∅	0°	-	8°
∅1	6°	8°	10°
∅2	6°	8°	10°
∅3	5°	7°	9°
∅4	5°	7°	9°

# DIO2031/2032/2033/2034/2036

500uA. 6MHz. Rail-to-Rail I/O CMOS Operational Amplifiers

## Physical Dimensions: QFN-20



COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)			
Symbol	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0	0.02	0.05
A3	0.20REF		
b	0.18	0.25	0.30
D	3.90	4.00	4.10
E	3.90	4.00	4.10
D2	1.90	2.00	2.10
E2	1.90	2.00	2.10
e	0.40	0.50	0.60
K	0.20	-	-
L	0.35	0.40	0.45
R	0.09	-	-