The AD8221
Setting a New Industry Standard for Instrumentation Amplifiers
### What is Your Main Design Consideration?

#### Price and Package Size
- **AD8221ARM (MSOP)**
  - Half the size of SOIC
  - Only $1.99 at 1k pcs
  - Matches LT1167I (SOIC) performance and is $2 cheaper
  - Beats INA129UA (SOIC) performance and is $1 cheaper

  **AD8221ARM**
  - Cheap!
  - Small!
  - Great Performance!

#### Pure Performance
- **AD8221BR (SOIC)**
  - Best Performance Available
  - Beats LT1167AI performance and is cheaper
  - Beats INA129U performance and is cheaper

- **AD8221AR (SOIC)**
  - Better Performance than the AD8221ARM but higher price and larger package
  - Beats both LT1167I and INA129UA performance and is cheaper too
### The AD8221 vs. the LT1167

#### High Grade

<table>
<thead>
<tr>
<th>Package</th>
<th>8221BR</th>
<th>LT1167AI</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMRR DC (G=1)</td>
<td>Min dB</td>
<td>90</td>
</tr>
<tr>
<td>CMRR 10KHz (G=1)</td>
<td>Typ dB</td>
<td>80</td>
</tr>
<tr>
<td>Vosi</td>
<td>Max uV</td>
<td>25</td>
</tr>
<tr>
<td>Vosi Drift</td>
<td>Max uV/C</td>
<td>0.3</td>
</tr>
<tr>
<td>Voso</td>
<td>Max uV</td>
<td>200</td>
</tr>
<tr>
<td>Voso Drift</td>
<td>Max uV/C</td>
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#### Low Grade

<table>
<thead>
<tr>
<th>Package</th>
<th>8221AR</th>
<th>LT1167I</th>
<th>8221ARM</th>
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<td>CMRR 10KHz (G=1)</td>
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<td>Vosi</td>
<td>Max uV</td>
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<td>60</td>
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<tr>
<td>Vosi Drift</td>
<td>Max uV/C</td>
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<td>0.4</td>
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<td>Voso</td>
<td>Max uV</td>
<td>300</td>
<td>300</td>
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<tr>
<td>Voso Drift</td>
<td>Max uV/C</td>
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<td>$1k</td>
<td></td>
<td>$4.06</td>
<td>$5.40</td>
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</table>

### Pure Performance

- **Look at the Numbers**
  - AD8221BR Meets or Beats Every Parameter of the LT1167AI
  - It’s Cheaper Too!

### Best Value

- **Look at the Numbers**
  - AD8221AR Meets or Beats Every Parameter of the LT1167I
  - It’s Cheaper Too!

- **The AD8221ARM Matches the Performance but is $2.00 LESS and half the size!**

Beats LT1920 Too!
The AD8221 vs. the LT1167 over Frequency

The AD8221 rejects common mode voltage on its inputs better than the LT1167.

At 10KHz:
AD8221 CMR is 95dB.
LT1167 CMR is 64dB.

That is a difference of 31 dB.

That means that the AD8221 performs **30X better** than the LT1167 in rejecting common mode voltage. (ex at 10KHz)
Compare the CMRR Performance Side by Side

20V p-p @ 10KHz

Output

AD8221
Gain=1

LT1167
Gain=1

Input Signal (10V Scale)

Common Mode Error at the Output (10mV Scale)

AD8221 common mode error = 0.450mV
LT1167 common mode error = 13.5mV

The LT1167 gives you 30x the error at a higher cost!
The AD8221 vs. the LT1167 at DC

Comparison of the AD8221 and the LT1167 in a typical application*

* - 5V common mode signal
- 20mV full scale signal
- G=100 configuration
- .02% resistor matching

The AD8221 gives you lower cost and lower total error than the LT1167.
# The AD8221 vs. the INA129

## High Grade

<table>
<thead>
<tr>
<th>Parameter</th>
<th>AD8221BR</th>
<th>INA129U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package</td>
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<td>SOIC</td>
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<tr>
<td>CMRR DC (G=1) Min dB</td>
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</tr>
<tr>
<td>CMRR 10KHz (G=1) Typ dB</td>
<td>80</td>
<td>60</td>
</tr>
<tr>
<td>Vosi Max uV</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>Vosi Drift Max uV/C</td>
<td>0.3</td>
<td>0.5</td>
</tr>
<tr>
<td>Voso Max uV</td>
<td>200</td>
<td>500</td>
</tr>
<tr>
<td>Voso Drift Max uV/C</td>
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<td>20</td>
</tr>
<tr>
<td>Max $ 1k</td>
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<td>$4.70</td>
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## Low Grade

<table>
<thead>
<tr>
<th>Parameter</th>
<th>AD8221AR</th>
<th>INA129UA</th>
<th>AD8221ARM</th>
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<tbody>
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<td>Package</td>
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<td>SOIC</td>
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<td>CMRR DC (G=1) Min dB</td>
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<td>CMRR 10KHz (G=1) Typ dB</td>
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<tr>
<td>Vosi Max uV</td>
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</tr>
<tr>
<td>Vosi Drift Max uV/C</td>
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<tr>
<td>Voso Max uV</td>
<td>300</td>
<td>1000</td>
<td>600</td>
</tr>
<tr>
<td>Voso Drift Max uV/C</td>
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<tr>
<td>Max $ 1k</td>
<td>$2.32</td>
<td>$3.15</td>
<td>$1.99</td>
</tr>
</tbody>
</table>

## Pure Performance
- **Look at the Numbers**
  - AD8221BR Beats Every Parameter of the INA129U
  - It’s Cheaper Too!

## Best Value
- **Look at the Numbers**
  - AD8221AR Beats Every Parameter of the LT1167I
  - It’s $1.00 Less!
- **The AD8221ARM BEATS Every Parameter but is $1.00 LESS and Half the Size!**
The AD8221 vs. the INA129 over Frequency

The AD8221 rejects common mode voltage on its inputs better than the INA129.

At 10Khz:
AD8221 CMR is 95dB.
INA129 CMR is 62dB.

That is a difference of 33 dB.

That means that the AD8221 performs **>30X better** than the INA129U in rejecting common mode voltage. (ex at 10KHz)
Compare the CMRR Performance Side by Side

AD8221
Gain=1

INA129U
Gain=1

20V p-p @ 10KHz

Input Signal (10V Scale)

Common Mode Error at the Output (10mV Scale)

AD8221 common mode error = 0.450mV
INA129U common mode error = 15mV

The INA129 gives you >30x the error at a higher cost!
The AD8221 vs. the INA129 at DC

Comparison of the AD8221 and the INA129 in a typical application*

* - 5V common mode signal  - G=100 configuration
    - 20mV full scale signal  - .02% resistor matching

The AD8221 gives you lower cost and lower total error than the INA129
The AD8221ARM Gives You What You Need……

Low Price - $1.99 @ 1kpcs
Smallest Package - MSOP
Great Performance!

Upgrade your AD620 applications to the AD8221
AD8221ARM – KILLER IN AMP in MSOP! (Summary)

- AD8221ARM vs. LT1167I
  - Beats CMRR Performance
  - Matches All Other DC’s
  - $2 Cheaper and Half Size!

- AD8221ARM vs. INA129UA
  - Beats All Parameters
  - $1 Cheaper and Half Size!

**CMRR VS. Frequency; G=1**

<table>
<thead>
<tr>
<th></th>
<th>8221ARM</th>
<th>LT1167I</th>
<th>INA129UA</th>
</tr>
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<tbody>
<tr>
<td>Vosi</td>
<td>uV</td>
<td>70</td>
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</tr>
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<td>$ 1k</td>
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MSOP is Half the Size of SOIC

No Competition in MSOP! Upgrade your AD620 designs by using the AD8221ARM!