**SPECIFICATIONS**

- **Performance**.............. BLIP @ 300K background, standard FOV, unfiltered
- **Quantum Efficiency**........... ≥ 75% at wafer test wavelength near 4.5 microns (excluding window transmission losses)
- **Responsivity**.............. ≥ 2.9 amps/watt at 4.8 microns is typical
- **Other descriptions**: Photovoltaic InSb; "buried metallization" (for sizes < 1.25 mm dia.); passivated for longevity; spectral response: 1.0 to 5.5 μm (peak 4.8 to 5.0 μm); P-type mesas on N-type monolithic substrate

**SINGLE-ELEMENT DETECTOR DEWARs**

- **Dewar Dimensions**........... 7" high, 2.5" dia., side-look base 2.625" dia., side-look optical center 1.45" above base
- **Dewar Hold Time**........... 12 hours (liquid nitrogen)
- **Weight**............. 1 lb empty, 1.25 lb filled
- **Optical Window**........... Sapphire, 5/8" clear aperture
- **Power Requirements**........... ≥ 15 volts, approx. 4 mA
- **Preamp**.............. Nominal output: -1/2 V DC (background flux) @ BNC
- **Cold Shield/Aperture**........... 60" nominal FOV is standard (30° FOV and Narrow FOV also provided)

**MULTIPLE-ELEMENT ARRAY DETECTOR DEWARs**

- **Dewar Dimensions**........... 8" tall x 3.5" diameter (side-look only), optical center 2.6" above base
- **Electronics Box Size**........... 6.8" long x 4.1" tall x 2.7" wide
- **Overall Length**........... 12"
- **Dewar Hold Time**........... ≥ 12 hours (liquid nitrogen)
- **Weight**............. 5.5 lb empty, 6.5 lb filled
- **Optical Window**........... Sapphire, 1.5" dia., clear aperture
- **Cold Shield/Aperture**........... 1 cm nominal from focal plane
- **Power Requirements**........... ≥ 15 volts, approx. 50 mA per 8 channel board
- **AM-1000's preamp**........... Nominal output: -1/2 V DC (background flux)
- **AM-1000's postamp**........... 10x, AC coupled standard, gain changeable, DC output capable

**DATA PROVIDED TO CUSTOMER WITH UNIT**

- **Optical tests on customer's specific unit**:
  - Responsivity wavelength, responsivity blackbody
  - D* wavelength, D* blackbody
  - Quantum efficiency wavelength (Wavelength tests made near 4.5 microns)

- **Representative information supplied**:
  - Responsivity versus wavelength curve
  - Quantum efficiency versus wavelength curve

- **Standard Detector Dewar and amplifier applications notes**

**WARRANTY**

Covers defective material or workmanship for one year after shipment by CE. Since Cincinnati Electronics continually improves its products, specifications are subject to change without notice.

---

**STANDARD DETECTOR SIZES AVAILABLE**

**InSb SINGLE-ELEMENT STANDARD DETECTOR DEWARs**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Diameter or Side (mm)</th>
<th>Shape</th>
<th>Feedback resistor (Rf) (Ohms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDD-0019</td>
<td>0.43</td>
<td>square</td>
<td>22M</td>
</tr>
<tr>
<td>SDD-0066</td>
<td>0.61</td>
<td>square</td>
<td>11M</td>
</tr>
<tr>
<td>SDD-0410</td>
<td>0.23</td>
<td>square</td>
<td>1.8M</td>
</tr>
<tr>
<td>SDD-0491</td>
<td>0.25</td>
<td>circle</td>
<td>1.5M</td>
</tr>
<tr>
<td>SDD-1963</td>
<td>0.50</td>
<td>circle</td>
<td>360K</td>
</tr>
<tr>
<td>SDD-4418</td>
<td>0.75</td>
<td>circle</td>
<td>160K</td>
</tr>
<tr>
<td>SDD-5027</td>
<td>0.80</td>
<td>circle</td>
<td>150K</td>
</tr>
<tr>
<td>SDD-7854</td>
<td>1.00</td>
<td>circle</td>
<td>91K</td>
</tr>
<tr>
<td>SDD-12E0</td>
<td>1.25</td>
<td>circle</td>
<td>56K</td>
</tr>
<tr>
<td>SDD-32E0</td>
<td>2.032</td>
<td>circle</td>
<td>22K</td>
</tr>
<tr>
<td>SDD-20E1</td>
<td>5.030</td>
<td>circle</td>
<td>3.6K</td>
</tr>
</tbody>
</table>

**InSb MULTIPLE-ELEMENT ARRAY STANDARD DETECTOR DEWARs**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Element Size (mm)</th>
<th>Center Line Spacing (mm)</th>
<th>Rf (Ohms)</th>
<th>Array Sizes, No. of Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDD-0019</td>
<td>0.43 x 0.43</td>
<td>0.061</td>
<td>50M</td>
<td>08, 16, 24, or 32</td>
</tr>
<tr>
<td>SDD-0066</td>
<td>0.81 x 0.061</td>
<td>1.00</td>
<td>10M</td>
<td>08, 16, 24, or 32</td>
</tr>
<tr>
<td>SDD-0085</td>
<td>0.81 x 1.04</td>
<td>0.100</td>
<td>6.8M</td>
<td>08, 16, 24, or 32</td>
</tr>
<tr>
<td>SDD-0103</td>
<td>0.81 x 1.27</td>
<td>0.100</td>
<td>5.6M</td>
<td>08, 16, 24, or 32</td>
</tr>
<tr>
<td>SDD-0410</td>
<td>0.23 x 0.23</td>
<td>2.034</td>
<td>1.5M</td>
<td>08, 16, 24, or 32</td>
</tr>
<tr>
<td>SDD-2000</td>
<td>0.25 x 0.80</td>
<td>2.75</td>
<td>270K</td>
<td>08, 16, 24, or 32</td>
</tr>
<tr>
<td>SDD-2254</td>
<td>0.47 x 0.49</td>
<td>0.49</td>
<td>240K</td>
<td>08, 16, 24, or 32</td>
</tr>
<tr>
<td>SDD-2304</td>
<td>0.48 x 0.48</td>
<td>0.5 x 5</td>
<td>240K</td>
<td>16, 24, or 32</td>
</tr>
</tbody>
</table>

**ORDERING INSTRUCTIONS**

Specify model desired as follows:

**SINGLE-ELEMENT STANDARD DETECTOR DEWARs**

- SDD-xxxx-S1........... for side-looking dewar
- SDD-xxxx-D1........... for down-looking dewar
- Add "-NP..." for no preamp with unit

- "xxxx" designates detector size/shape from above list

Example: SDD-0066-S1

Selects the 0.61 mm square, side-looking dewar

*Without integral matched preamp, optimum detector performance cannot be assured to the customer.

**MULTIPLE-ELEMENT ARRAY STANDARD DETECTOR DEWARs**

- SDD-xxxx-##-H........... for horizontal orientation of array
- SDD-xxxx-##-V........... for vertical orientation of array

- "##" designates the number of elements in the array
- "H" designates detector size/shape from above list

Example: SDD-0019-24-H

Selects 0.43 mm square, 24 diodes, horizontal array orientation.

It is the policy of Cincinnati Electronics to formally accept and acknowledge orders only when they are confirmed in writing; therefore, it is best to simply send a written purchase order. Telex of the PO information or FAX versions of a PO are typically accepted. Advising CE by phone that an order is about to be placed is helpful and may help avoid delays or identify situations where the purchase order has not arrived in a reasonable time. CE will verify by phone the current list price for a standard model Standard Detector Dewar.

For more specific information or to discuss your application, please contact DMDL Marketing.

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FOR MORE INFORMATION CONTACT: DETECTOR & MICROCIRCUIT DEVICES LABORATORIES (DMDL) MARKETING (513) 573-6275
I. INTRODUCTION

The AM-05M is an amplifier option available in the single-element SDD product line. This amp offers moderately wide bandwidth (> 5 MHz) and considerable versatility. There are provisions for tailoring amplifier performance to provide an optimized trade-off between bandwidth and noise. The AM-05M is DC coupled, and has a low 1/f noise corner despite its wide bandwidth capabilities. Detector bias is held to $0 \pm 100 \mu V$ without external adjustments.

II. THEORY OF OPERATION

Photodiode is best modeled as a current source with shunt capacitance. The most efficient means of reading out photon induced signal current is with a transimpedance amplifier (figure 1). In an attempt to maximize the high frequency response of this circuit one will encounter a limitation caused by the destabilizing effect of $C_j$ on the feedback circuit’s phase margin. A wider bandwidth op-amp will improve this, but most wideband op-amps are not unity gain stable, complicating the stability requirements further.

![Diagram of Transimpedance amplifier (TIA)](image)

The AM-05M offers a solution to this problem using a 2-stage amplifier and a "bandwidth boosting" technique (figure 2). The first stage is a TIA with controlled bandwidth and damping factor. This is followed by a "booster" voltage amplifier whose frequency response rises to cancel the TIA roll-off (figure 3). The crossover frequency ($F_C$) is the -3 dB frequency of the TIA, and must coincide with the +3 dB frequency of the boost amplifier for effective cancellation. The crossover frequency in the AM-05M is fixed at 100 kHz.
The combined frequency response is determined by the failure of the TIA and/or the boost amplifier to maintain a 6 dB/octave slope to infinite frequency. The boost amplifier is designed to maintain a constant +6 dB/octave slope to 7 MHz, although this may be altered to reduce noise bandwidth, and is discussed further in the applications section. The TIA will at some frequency exhibit a second pole \(F_2\) in its closed loop response. This will increase the slope of the TIA roll-off to -12 dB/octave beginning at the frequency of the second pole. The location of this second TIA pole is a function of damping factor and may be controlled independently of \(F_c\) by the relationship:

\[
F_2 = F_c \left( \delta + \sqrt{\delta^2 - 1} \right)^2
\]  

(1)

where \(\delta\) = damping factor; \(F_2\) = frequency of second pole; \(F_c = 100\) kHz.
Manipulation of the TIA feedback components will control amplifier damping:

\[
R_f \equiv \frac{\left(\frac{1.7 \times 10^7}{F_n}\right)^2 - 2\delta \left(\frac{1.7 \times 10^7}{F_n}\right) + 1}{1.07 \times 10^8 C_{in}}
\]

(2)

\[
C_f \equiv \frac{1.07 \times 10^8}{(2\pi F_n)^2 R_F} - C_{in}
\]

(3)

where:

\[
F_n = \frac{F_c}{\left[\sqrt{\left(\frac{2\delta^2 - 1}{2\delta^2 - 1}\right)^2 + 1 - (2\delta^2 - 1)}\right]^{1/2}}
\]

\[C_{in} = \text{total capacitance at TIA input (Farads)}\]
\[\equiv C_j + 8 \text{ pF (8 pF is a typical stray capacitance of wiring and electronics)}\]
\[C_j = A_j \times 6,000 \text{ to } 8,000 \text{ (typical) } \text{pF/cm (high speed InSb process devices only, supplied in SDD when AM-05M is specified)}\]
\[A_j = \text{detector area (cm}^2)\}; \text{ junction area is slightly larger than the active area}\]

For a given TIA configuration damping factor can be predicted by:

\[\delta \equiv 0.5 \left[ R_f C_f + 9.4 \times 10^{-9} \right] \sqrt{\frac{1.07 \times 10^8}{R_f \left( C_f + C_{in} \right)}}\]

(4)

The high frequency noise performance of the AM-05M is no different from a TIA of identical bandwidth (figure 4). Thermal noise, shot noise and op-amp input current noise sources are amplified to the output as white (spectrally uniform) noise at frequencies below \(F_c\) (figure 5). The op-amp input voltage noise, \(e_n\), is amplified by the circuit’s non-inverting voltage gain (noise gain) whose value below \(F_c\) is frequency dependent. Depending on circuit parameters, \(e_n\) will be the dominant noise source at approximately 1 MHz. Dashed lines in figure 5 indicate the effect of either increased TIA bandwidth or bandwidth boosting post amplifier. In the bandwidth range of the AM-05M, low \(e_n\) is a more important attribute than low \(i_n\).

\[\text{Figure 4}\]

TIA noise model
III. APPLICATIONS

Single-element SDD’s equipped with the AM-05M are delivered with TIA feedback components selected for 5 MHz (guaranteed minimum) bandwidth. The AM-05M circuit board is equipped with bifurcated stand-off terminals for easy replacement of components (figure 6) which are used to optimize AM-05M performance. This allows the user maximum versatility in adjusting performance to meet individual system needs.

Modifying Bandwidth Alone

In most applications, AM-05M bandwidth will be controlled by the combined effect of TIA second pole, $F_2$ Eq. (1) and boost amplifier roll-off, $(F_9)$ (figure 7). It is possible to use $F_2$ alone to control bandwidth, if $F_2 << 7$ MHz (boost amplifier curve A). The drawback to this is that the boost amp +6 dB/octave slope beyond the desired bandwidth, while contributing nothing to amplifier signal response, continues to boost the TIA noise gain.
Controlling boost amplifier roll-off ($F_B$)

Nominal values of electronic components $C_8$ and $C_9$ to control $F_B$ alone are shown in Figure 8.

<table>
<thead>
<tr>
<th>Line</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C_8$</td>
<td>120 pF</td>
<td>140 pF</td>
<td>150 pF</td>
<td>170 pF</td>
<td>188 pF</td>
<td>220 pF</td>
<td>240 pF</td>
<td>300 pF</td>
<td>340 pF</td>
</tr>
<tr>
<td>$C_9$</td>
<td>0 pF</td>
<td>4 pF</td>
<td>7 pF</td>
<td>12 pF</td>
<td>24 pF</td>
<td>35 pF</td>
<td>48 pF</td>
<td>82 pF</td>
<td>150 pF</td>
</tr>
</tbody>
</table>

Alternatively it is also possible to use Eq. (1), (2), (3) to set $F_2$ arbitrarily large and control AM-05M bandwidth using boost amplifier roll-off ($F_B$) alone. A larger-than-necessary $F_2$ requires a less than maximum value of $R_F$ (gain of the TIA). This will degrade signal/noise ratio but may be an acceptable solution when large signals are available, or low $R_F$ is necessary ($\lambda \leq 10/R_F$).

Optimizing Signal to Noise and Bandwidth

In circumstances where both wide bandwidth and high sensitivity are required a compromise is necessary where $F_B$ and $F_2$ should be set approximately equal, and greater than the desired bandwidth.

The desired AM-05M bandwidth ($F_{3dB}$) is then described by:

$$2 = \left[ 1 + \left( \frac{F_{3dB}}{F_2} \right)^2 \right] \left[ 1 + \left( \frac{F_{3dB}}{F_B} \right)^2 \right]$$

(5)
or, when $F_2 = F_B$

$$F_{3dB} = 0.64 F_2$$ (6)

For these circumstances, start with Eq. (6) to determine $F_2$ and $F_B$. Use Eq. (1), (2), (3) to determine TIA component values, and figures 7 and 8 for boost amplifier components.

Due to variations in wiring and stray capacitance, component tolerances, etc., some experimentation with component values may be necessary to achieve predicted performance (see Figure 9). Best results can be expected when using ceramic or mica dielectric capacitors. Avoid inductive (i.e. wirewound) resistors. Keep lead lengths as short as practical, and do not permit components on terminals to touch adjacent circuitry.

Since effective signal to noise performance is dependent on both the TIA gain and the output noise, the performance improvement depends on both the $R_f$ and $V_{rms}$ values.

As described previously, strays and component tolerances cause deviations from predicted performance. Hence, figure 9 performance values are for reference only and cannot be guaranteed.

<table>
<thead>
<tr>
<th>DETECTOR SIZE</th>
<th>((R_1))</th>
<th>((C_1))</th>
<th>((C_8))</th>
<th>((C_9))</th>
<th>(F_{3dB})</th>
<th>OUTPUT NOISE (Vrms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25 mm*</td>
<td>91KΩ</td>
<td>18 pF</td>
<td>120 pF</td>
<td>0</td>
<td>5.2 MHz</td>
<td>5.97 mV</td>
</tr>
<tr>
<td>0.25 mm</td>
<td>160K</td>
<td>10 pF</td>
<td>170 pF</td>
<td>12 pF</td>
<td>3.7 MHz</td>
<td>3.82 mV</td>
</tr>
<tr>
<td>0.25 mm</td>
<td>330K</td>
<td>5 pF</td>
<td>170 pF</td>
<td>12 pF</td>
<td>3.1 MHz</td>
<td>4.48 mV</td>
</tr>
<tr>
<td>0.25 mm</td>
<td>820K</td>
<td>2 pF</td>
<td>220 pF</td>
<td>35 pF</td>
<td>1.8 MHz</td>
<td>3.62 mV</td>
</tr>
<tr>
<td>0.50 mm*</td>
<td>68K</td>
<td>24 pF</td>
<td>120 pF</td>
<td>0</td>
<td>5.6 MHz</td>
<td>5.81 mV</td>
</tr>
<tr>
<td>0.50 mm</td>
<td>110K</td>
<td>15 pF</td>
<td>120 pF</td>
<td>0</td>
<td>5.0 MHz</td>
<td>6.34 mV</td>
</tr>
<tr>
<td>0.50 mm</td>
<td>160K</td>
<td>10 pF</td>
<td>170 pF</td>
<td>12 pF</td>
<td>4.0 MHz</td>
<td>3.95 mV</td>
</tr>
<tr>
<td>0.50 mm</td>
<td>220K</td>
<td>7 pF</td>
<td>188 pF</td>
<td>24 pF</td>
<td>3.5 MHz</td>
<td>3.72 mV</td>
</tr>
<tr>
<td>0.50 mm</td>
<td>422K</td>
<td>4 pF</td>
<td>240 pF</td>
<td>48 pF</td>
<td>2.4 MHz</td>
<td>2.82 mV</td>
</tr>
<tr>
<td>0.50 mm</td>
<td>560K</td>
<td>3 pF</td>
<td>340 pF</td>
<td>150 pF</td>
<td>1.7 MHz</td>
<td>1.70 mV</td>
</tr>
<tr>
<td>1.00 mm</td>
<td>47K</td>
<td>36 pF</td>
<td>120 pF</td>
<td>0</td>
<td>6.3 MHz</td>
<td>5.44 mV</td>
</tr>
<tr>
<td>1.00 mm*</td>
<td>56K</td>
<td>30 pF</td>
<td>120 pF</td>
<td>0</td>
<td>5.7 MHz</td>
<td>5.58 mV</td>
</tr>
<tr>
<td>1.00 mm</td>
<td>82K</td>
<td>20 pF</td>
<td>120 pF</td>
<td>0</td>
<td>5.1 MHz</td>
<td>6.11 mV</td>
</tr>
<tr>
<td>1.00 mm</td>
<td>110K</td>
<td>15 pF</td>
<td>150 pF</td>
<td>7 pF</td>
<td>4.1 MHz</td>
<td>4.74 mV</td>
</tr>
<tr>
<td>1.00 mm</td>
<td>160K</td>
<td>10 pF</td>
<td>170 pF</td>
<td>12 pF</td>
<td>3.3 MHz</td>
<td>4.36 mV</td>
</tr>
<tr>
<td>2.00 mm</td>
<td>8.2K</td>
<td>200 pF</td>
<td>120 pF</td>
<td>0</td>
<td>4.9 MHz</td>
<td>4.03 mV</td>
</tr>
<tr>
<td>2.00 mm</td>
<td>11K</td>
<td>150 pF</td>
<td>150 pF</td>
<td>7 pF</td>
<td>4.0 MHz</td>
<td>3.21 mV</td>
</tr>
<tr>
<td>2.00 mm</td>
<td>16K</td>
<td>100 pF</td>
<td>150 pF</td>
<td>7 pF</td>
<td>3.5 MHz</td>
<td>3.66 mV</td>
</tr>
</tbody>
</table>

*Nominal values as units are provided for detector sizes from CE

Note: Actual values may vary with tolerance of components used and strays.

Figure 9

Examples of performance demonstrated for various combinations of nominal component values.
Power Supply

The recommended power supply voltage is fifteen (± 15) volts DC. Eighteen (± 18) volts is the recommended maximum voltage to be supplied. Since the AM-05M is sold with a matched high speed (low capacitance) detector in a dewar, the J-1 power connector for the 2.5" diameter dewar is shown in figure 10.

Figure 10

J1 - Power connector (as seen on 2.5" diameter dewar)

USER NOTES AND REFERENCES

CINCINNATI ELECTRONICS CORPORATION
DETECTOR & MICROCIRCUIT DEVICES LABORATORIES
7500 INNOVATION WAY
MASON, OH 45040-9699 U.S.A.
FAST PREAMPS FOR PHOTOVOLTAIC INFRARED DETECTORS
AM-05M AND AM-35M

Low-noise JFET input transimpedance amplifiers (TIA), such as CE's AM-300, provide high sensitivity for high impedance indium antimonide (InSb) photovoltaic (PV) detectors from DC to a few hundred kilohertz bandwidth. To use capacitive photodiodes at frequencies of 1 megahertz and greater, two additional high speed preamplifier designs are required. These are provided by the AM-05M and AM-35M preamps with specially processed CE InSb detectors in sizes up to 1 mm in diameter.

The AM-05M and AM-35M are DC coupled to allow the user to study both transient and steady-state events.

AM-05M 5 MHz Boosted TIA Preamp

The AM-05M achieves minimum 3 dB bandwidths of 5 MHz by two stage amplification. The first stage is a low e-noise bipolar TIA, which is dampened to maintain stability and steady signal-to-noise ratio at higher frequencies. The second stage is a matched booster that extends the effective 3 dB. Uniform signal gain is provided over the usable bandwidth.

The AM-05M is provided to customers integrated into the Standard Detector Dewar Series (SDD) turnkey unit. The amp is matched to the detector's size and capacitance. It is optimized with the detector for maximum bandwidth.

Bandwidth of 5 MHz or greater (risetime <= 70 nanoseconds) is provided. The amp's design has a bandwidth limit of about 7 MHz.

Flexibility is provided to the user by being able to change special components at bifurcated terminals. Rolling-off of the booster stage's 3 dB response allows lower total noise for those not requiring the maximum speed provided. Corresponding optimizations may be performed to the first stage TIA.

AM-35M 35 MHz Voltage Preamp for PV Detectors

The AM-35M is for those applications where high speeds of 8 MHz to 35 MHz is the user's primary concern with reasonable noise levels. The AM-35M is a type of voltage amplifier that provides a 35 MHz 3 dB bandwidth (rise time <= 10 nanoseconds).

A switchable constant internal reverse bias voltage is available for the detector. The 1.2 volt internal bias voltage is stable with both temperature and supply voltage variations. Utilization of reverse bias helps to extend the frequency and the range of linear photodiode response in high flux applications.

Filtering of wide-band noise has to be performed externally to the AM-35M if this desired by a customer.

The AM-35M is provided in a stand-alone package or integrated into a SDD unit for many of the various standard detector sizes. The stand-alone version is provided in a package that is physically similar to that of the AM-300 preamplifier.
## SPECIFICATIONS

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>AM-05M</th>
<th>AM-35M</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MIN.</td>
<td>TYPICAL</td>
</tr>
<tr>
<td>Preamp Type</td>
<td>Boosted TIA</td>
<td>Voltage Amp</td>
</tr>
<tr>
<td>Bandwidth (3 dB) (MHz)</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Pulse Response (10-90% Risetime)</td>
<td>50 nS</td>
<td>70 nS</td>
</tr>
<tr>
<td>Power Supply Required</td>
<td>±15 (Volts DC)</td>
<td>±6</td>
</tr>
<tr>
<td>Input Voltage Noise</td>
<td>N/A</td>
<td>1 nV/rtHz</td>
</tr>
<tr>
<td>Output Resistance</td>
<td>50 Ohms</td>
<td>50 Ohms</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>250 mW</td>
<td>300 mW</td>
</tr>
<tr>
<td>Output Voltage Swing</td>
<td>±10</td>
<td>±12</td>
</tr>
<tr>
<td>Input Equivalent</td>
<td>Measured for unit sold 100 nA RMS @ 5.5 MHz</td>
<td>Measured for unit sold 900 nA RMS @ 50 MHz</td>
</tr>
<tr>
<td>Broad Band Noise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typical for 1 mm:</td>
<td>Measured for unit sold 100 nA RMS @ 5.5 MHz</td>
<td>Measured for unit sold 900 nA RMS @ 50 MHz</td>
</tr>
<tr>
<td>Gain</td>
<td>Determined by diode size (56 Kohms for 1 mm dia.)</td>
<td>Approx. 1700 ohms</td>
</tr>
<tr>
<td>Noise 1/F Corner</td>
<td>35 Hz</td>
<td>5 KHz</td>
</tr>
<tr>
<td>Detector Sizes</td>
<td>≤1 mm dia. (&gt;1 mm inquire)</td>
<td>≤1 mm dia. (&gt;1 mm inquire)</td>
</tr>
<tr>
<td>Package</td>
<td>CE SDD unit only</td>
<td>With CE SDD unit or stand alone</td>
</tr>
</tbody>
</table>

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**AM-05M EFFECTIVE BANDWIDTH**

**AM-35M EFFECTIVE BANDWIDTH**

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SINCE CINCINNATI ELECTRONICS CONTINUALLY IMPROVES ITS PRODUCTS, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

FOR MORE INFORMATION CONTACT: DMDL MARKETING (513) 573-6275

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