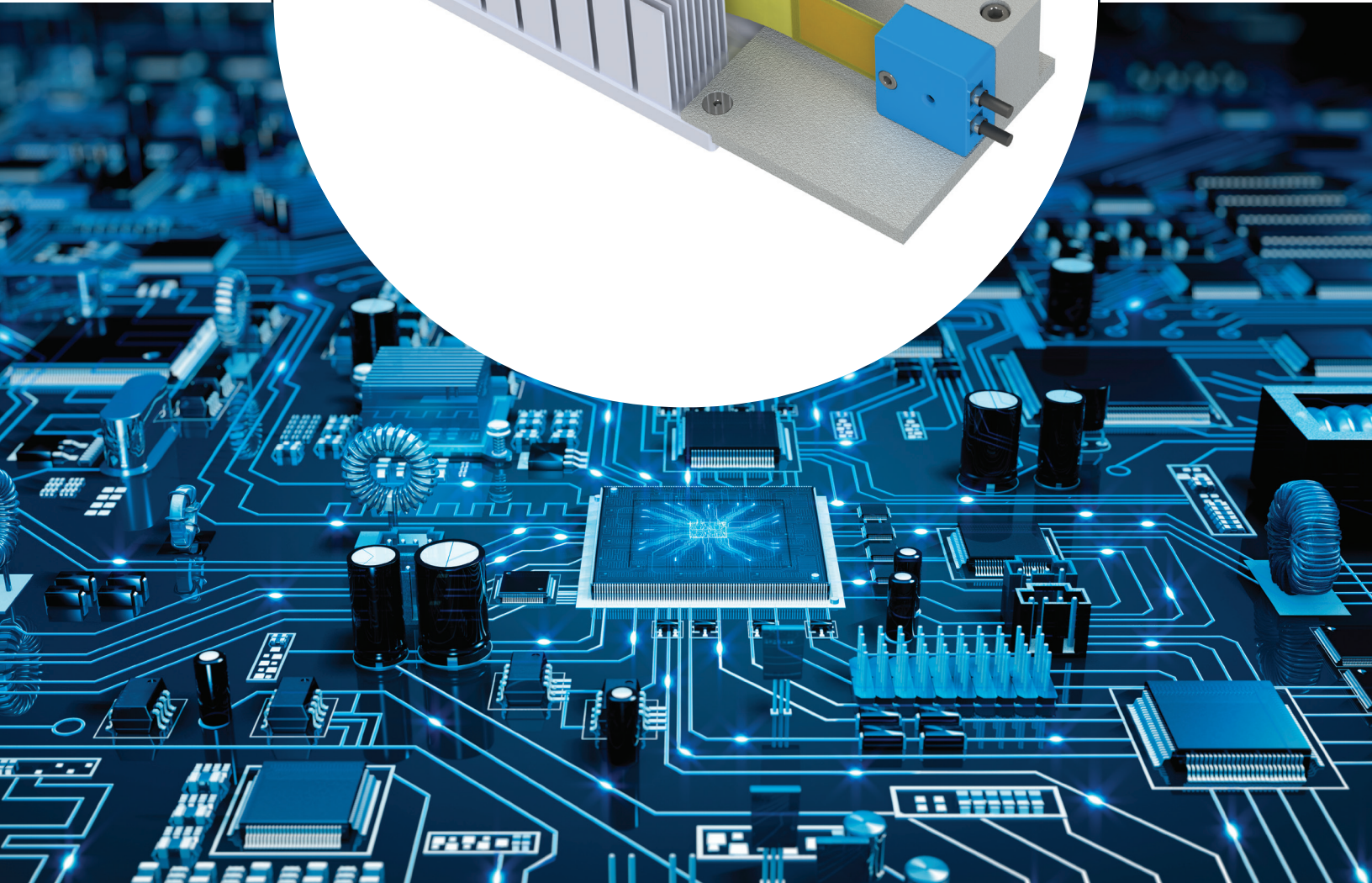
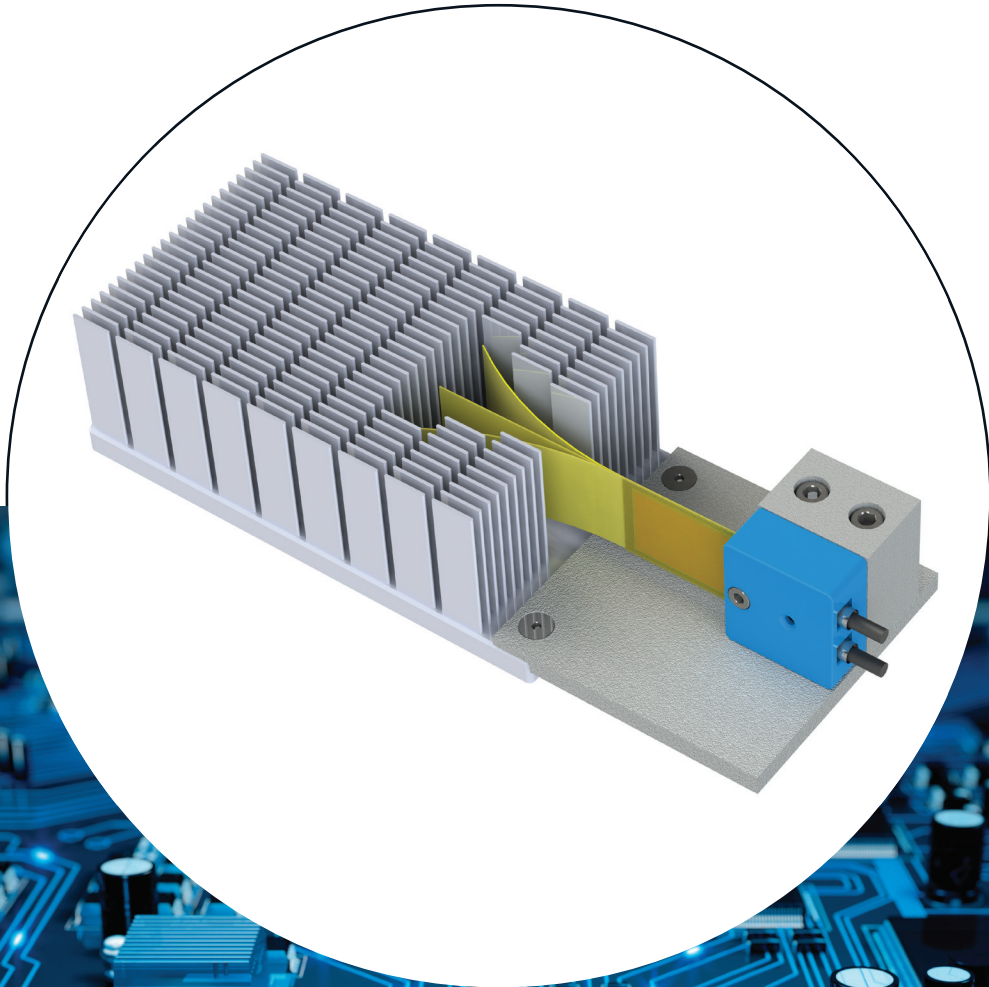




PIEZOFLO™
LONG-LIFE ACTIVE COOLING TECHNOLOGY

Datasheet





FEATURES

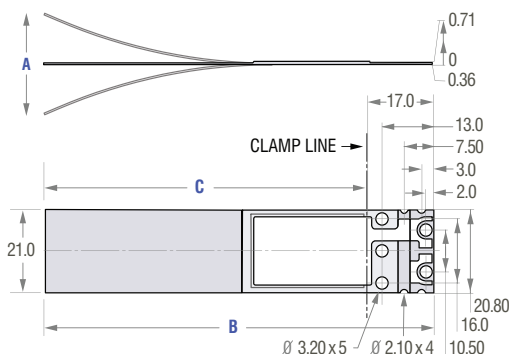
- Highly Reliable Active Cooling Solution
- Solid State Piezoelectric Actuation
- Operates in Extreme Temperatures -55C to 125C
- Patented Protective Piezo Packaging Process
- Easy to Integrate Electrically -
Line power or COTS piezo drivers
- Non Magnetic
- Quiet Operation
- Low Power / Low Profile

APPLICATIONS

- Aerospace Actuators and Systems
- LED Lighting
- Biomedical Devices-Magnetic Imaging Systems
- Laboratory and Test Equipment
- Sensitive Electronics
- Low profile electronics
- Automotive
- Telecommunications Equipment

DIMENSIONS

All dimensions are in millimeters (mm).



	PFN-1011	PFN-1012
A (mm)	40	28
B (mm)	103.5	97
C (mm)	86.5	80

DESCRIPTION

PiezoFlo products are highly reliable solid state active cooling solutions. Developed to integrate into heat sinks, and add air flow to normally passive heat sink solutions, they can also directly cool critical components on electronics boards. They excel as an active cooling solution in applications where: reliability is critically important; use of magnetic based fan technology is not permitted; a thin form factor is required; a dusty or extreme temperature environment is expected; or where audible noise needs to be kept to a minimum.

Unlike other active cooling products, such as standard rotary fans, whose bearings and moving parts can wear and fail, PiezoFlo products have no moving parts. They are solid state, and offer a highly reliable solution utilizing the unique properties of piezoelectric materials.

PiezoFlo's piezoelectric materials have patented protective packaging (known as the [Piezo Protection Advantage](#)). The protected piezos enable PiezoFlo products to be easily integrated into electronic systems, survive harsh environments and provide superior reliability performance compared to other non-packaged piezoelectric products.

PiezoFlo products can be used in both indoor and outdoor applications and can operate effectively in the harshest environments; including military applications requiring -55C to 125C operating temperature ranges. PiezoFlo products have undergone substantial accelerated life testing and are based on a technology platform that has been fielded for over twenty years. Testing has shown that a single PiezoFlo PFN-1011 product can dissipate up to 70W of power from a standard heat sink.

SPECIFICATIONS

Environmental	Specification	Note
Operating Temperature	-55C to 125C	
Humidity	0 to 95 %RH	Non-condensing

Physical	Specification	Note
Mounting Torque	2.2 N-m	Grade 12.9 M3x.5 bolt
Materials	PZT, FR4, Copper, Adhesive	
L10 Lifetime	> 15 Years	Testing still being performed
MTBF	> 150 kHrs	Testing still being performed

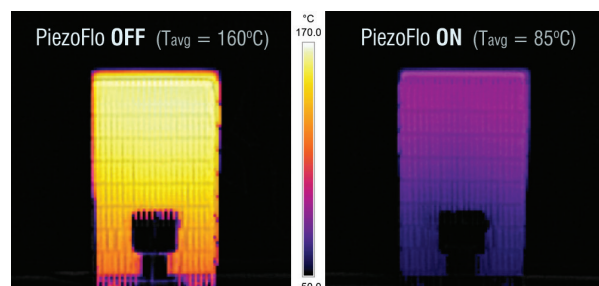
Specification	PFN-1011	PFN-1012
Static Pressure @Max. Voltage	25 Pa	32 Pa
Max Flowrate @ Max. Voltage	10.2 CFM	10.6 CFM
Capacitance	27 nF	41 nF
Resonant Frequency (f _n) @20 C	51 +/-1 Hz	61 +/- 1 Hz
Resonant Frequency (f _n) @85 C	50 +/-1 Hz	60 +/- 1Hz
Max Voltage	240 VAC RMS	120 VAC RMS*
Current at f _n at Max Voltage	3.2 mA	7.7 mA
Current at f _n at 120 VAC RMS	1.3 mA	7.7 mA
Power at f _n at Max Voltage	0.77 W	0.99 W
Displacement at Max Voltage	40 mm	24 mm
Displacement at 120 VAC RMS	20 mm	24 mm
Max Current	10 mA	10 mA
Mass	2.9 g	2.7 g

*PFN-1012 requires current limiting electronics when being driven at 120 VAC RMS.

FLOW & POWER DISSIPATION DATA

The flow generated by PiezoFlo products is more complex than standard fans. Many factors can influence the power dissipation potential of a PiezoFlo device, including the surrounding structure and heat sink design. Midé can assist in optimizing designs. Using the PFN-9001 development kit, a single PFN-1011 was

able to dissipate 70 watts of power from a standard heat sink (Alpha Novatec LT70130-40W) with an input power of 100W. The heat sink was mounted vertically in a room temperature ambient condition and reduced the average temperature from 160°C to 85°C.





PRODUCTS & PRICING

For the latest pricing and volume discounts please visit
our PiezoFlo pricing page:
www.mide.com/piezo-cooling/piezoflo-pricing



PiezoFlo is a Midé Technology Long-Life Active Cooling Solution
Web: www.mide.com | Contact: mide.com/contact