

Hand Held Gaming

1 x AirJet® Pro



Today's Hand Held Gaming Devices support 15 Watts sustained processor power. However, the skin temperature is high, in some cases exceeding 60 C. In addition to high skin temperatures, hand held gaming devices are very noisy, with fan noise reaching or exceeding 45 dBA. Using AirJet®, the thermal solution can be improved, still supporting 15 Watts sustained processor power, while reducing the skin temperature to 50C and noise level to 24 dBA - quieter than a whisper.

Frore Systems has developed a revolutionary active cooling chip, AirJet®, the first ever solid state thermal solution. AirJet® is a fully self contained active heat sink module. AirJet® is silent, thin, light and outperforms fans.

AirJet® Pro generates 1750 Pascals of back pressure, ensuring air flow into and out from product enclosures. When integrated into a compute platform with a processor die temperature of 90C, AirJet® Pro removes a net 8.75 Watts of heat at a silent 24 dBA noise level, while consuming 1.75 Watts of power.

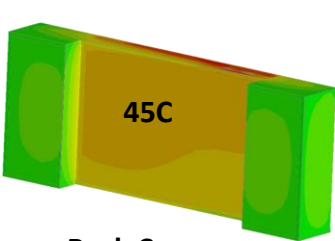
In the Hand Held Gaming Device, after discounting for voltage regulator overhead, 8 Watts “Active” heat removal can be added to the sustained processor power by using just a single AirJet® Pro. Simultaneously, 7 Watts of “Passive” heat removal can be realized with only 50 C maximum skin temperature owing to the excellent spreading coefficient achieved through inlet air sculpting made possible by the AirJet® Pro's high back pressure.

Therefore, with AirJet®, the processor in the Hand Held Gaming Device still runs at 15W, while significantly reducing the noise level to 24 dBA and keeping the device skin cooler at 50C.

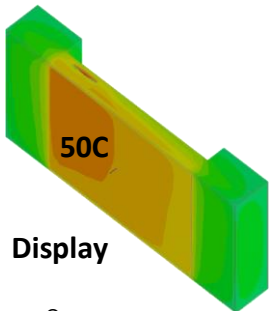


AirJet® Pro

Metric	AirJet® Pro
Total heat dissipation (@ 85C die temperature, 25C ambient)	10.5 W (net 8.75 W)
Maximum noise inside device at 50 cm	24 dBA
Maximum power consumption	1.75 W
Back pressure	1750 Pa
Dimensions (width x length x thickness)	31.5 x 71.5 x 2.8 mm
Weight	22g



Back Cover



Display

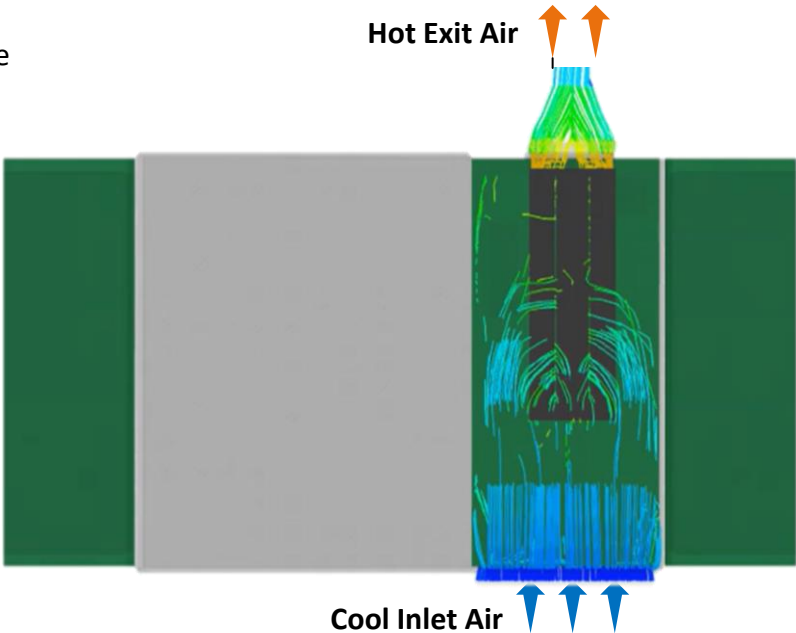
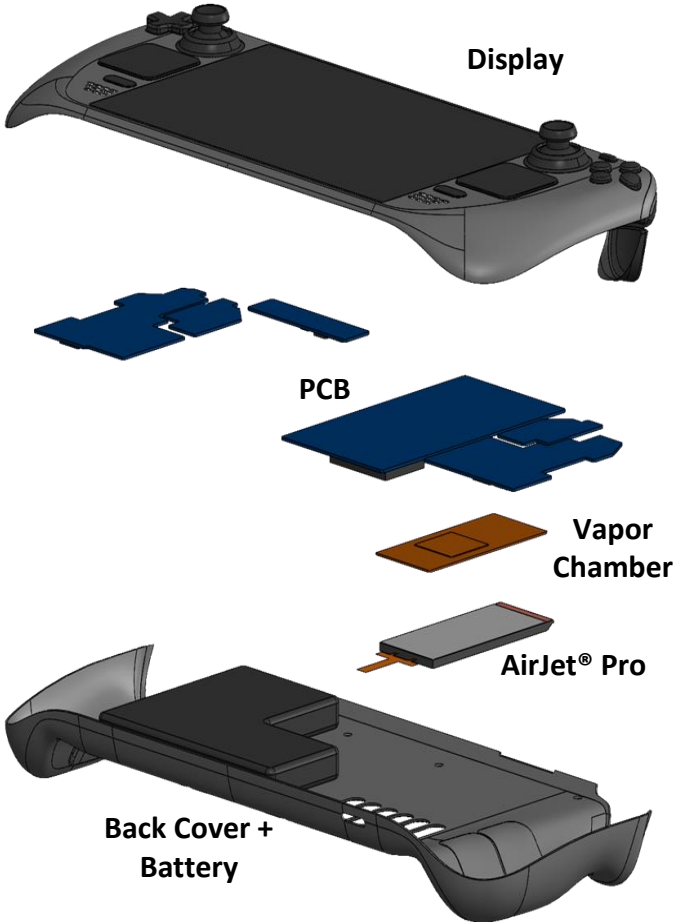
Skin Temperature with 1 x AirJet® Pro

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Let’s dig deeper into how the AirJet® Pro is designed into the Hand Held Gaming Device. First, a thermal solution subassembly is created with the AirJet® Pro mounted on a vapor chamber. Second, the thermal solution subassembly is mounted directly on top of the hot processor located at the center of the PCB. The vapor chamber acts as a super conductor of heat, transporting heat from the processor to the AirJet® Pro.

The Device casing is designed with discrete air vents in the bottom of the Device, for cool ambient air to enter and exit vents at the top to facilitate easy ejection of hot air. No other air vents are needed anywhere else in the Device casing making for a sleek design. Moreover, thanks to AirJet®’s high back pressure, the inlet vent can be covered with air filter material rendering the Device dust-proof. When activated, the AirJet® Pro generate a strong airflow, pulling ambient air in through the inlet vents and channeling the air across the PCB before entering the AirJet® Pro. This movement of air inside the Device helps keep the skin temperatures low and even increases the spreading coefficient. Further, inside the AirJet® Pro, heat is efficiently transferred to the air until saturation. This hot air is then expelled out of the Device through the exit vents.

The AirJet® Pro solution achieves 15 Watts processor power in the Hand Held Gaming Device while significantly reducing the noise level to 24 dBA and maintaining lower skin temperatures of 50 C.



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