

Sysmetric-ltd Thermal solutions for Silicon Validation industry

Content

1. The need for thermal solutions for Silicon validation – a brief introduction
2. Current technology solutions.
3. Sysmetric Thermal forcing cooling solution:
 - Artic (Desk top Thermal solution)
 - Samson (Rack mount High Power thermal solution).
 - Neptune (prototype stage)
 - DTC (Desk top Chamber)
 - Clamping options
 - Car Industry solutions (Lidar & Radar)

Introduction

The demand for high-performance microprocessors has resulted in an escalation of power dissipation and heat flux at the silicon level. High Si temperature cause various problems such as increased leakage, accelerating failure mechanisms and influence timing failures.

The tests have to be conducted to get necessary data to show any gaps from the spec provided by the vendor and the actual product. The desire for small form- factor chassis, and new car industry specification demand for very low and very high Silicon operating temperatures bring the thermal solution challenge to new levels. Silicon validation platforms are built to validate Processors, Chipset and PCB's to ensure quality and reliable products in a temperature range of -40^c to 125^c.

This validation phase is a crucial step in releasing the product to market.

Recently it beaome challenging to design a forcing thermal solution for high-speed processors, Networks components, Graphic cards, Memory voltage regulators, etc. Thermal-related effects are considered as a major roadblock in the design on next generation microprocessors.

Current cooling Technology for Si validation

1. liquid or Air cooling is commonly used to cool CPUs as well as other computer components. It usually consists of a CPU liquid block, a liquid pump, and a heat exchanger (mostly a radiator and fan). Advantage is low cost. Liquid cooling allows quieter operation (potentially fan less), or improved processor speeds.
2. Phase change cooling technology (vapor compression) is suitable when a very low temperature is desired, efficiency is much higher and does not need cooling liquid to remove the heat. Disadvantage of phase change technology is higher cost for initial system purchase but it is very energy efficient - for long term usage.
3. Thermal Electrical Cooler (TEC-Known also as Peltier cooling). Advantage is low cost, disadvantage is that it can't always remove the amount of heat capacity needed at very low temperatures and it's efficiency is very low (~30%) .

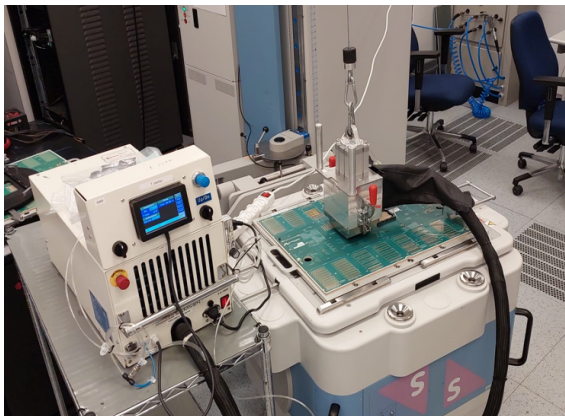
Sysmetric Thermal Solutions



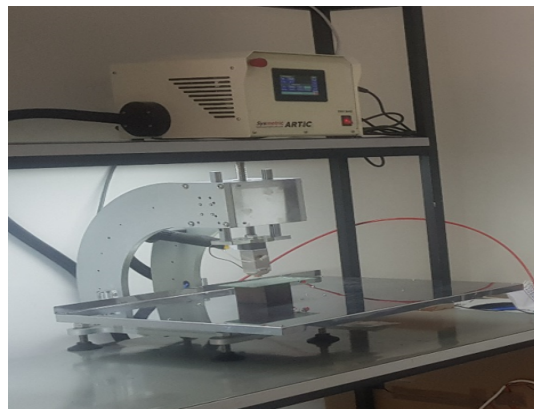
SAMSON	DTC	ARTIC
Vapor Compression Technology -60°C to 125°C, 750w@0°C Head Size: 70X70X90mm	Desktop Climate Chamber 100w@-10°C, 200w@80°C w/ Air Flow Speed Control	Mobile Thermal Forcing System -60°C to 125°C, 150w@0°C Head Size: 20x20x60mm

Clamping

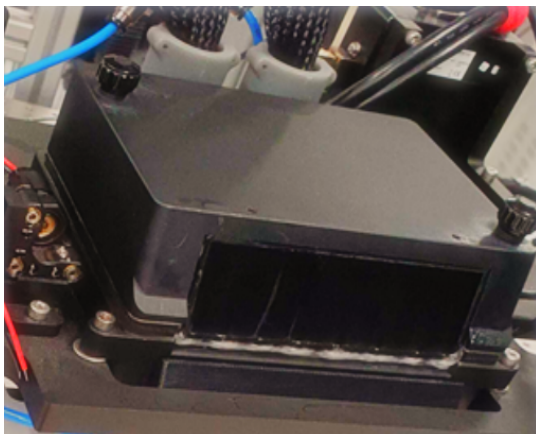
Air Control



Motor Control



Car LIDAR solution



	Product	Temp Range	Head Size mm	Max Cooling @0c	Options
1	Artic 0.3 -230v	--60- +125	20	150w	M. Press
2	Artic 0.3 110v	-60 +125	20	150w	M. Press
3	Artic 110/230 0.3 hp New Heater	-60-150C	20	150w	M. Press
4	Artic 110/230 1.0 NH	-60-150C	20,30 40	265w @ 20mm 350w @30mm	M. Press
5	Samson Water cooling 230v	-60 +125- 150C	70x70	700w	M. Press or Air Clamp
6	Samson Water cooling 110v	-60 +125	70x70	700w	M. Press or Air Clamp
7	Samson Air Cool 230V	-60 +125	70x70	700w	M. Press or Air Clamp
8	Samson Air Cool 110v	-60 +125	70X70	700w	M. Press or Air Clamp
9	Climate Chamber	-30- +80c		150w	M. Press or Air Clamp
10	Neptune 230V 1.5 Hp	-60 +150	92X70	1100w	2- 4 hp 3 Ph
12	Neptune 110v 1.5 H.p	-60 +150	92X70	1100w	2-4 hp 3 Phase
13	Samson for Radar	-60 +125c		400 w	

For mor info contact:

Dov Lotan Thermal Application Eng'

Cell: +972-54-7885241

Email :dovlotan@sysmetric-ltd.com
<https://www.sysmetric-ltd.com/>