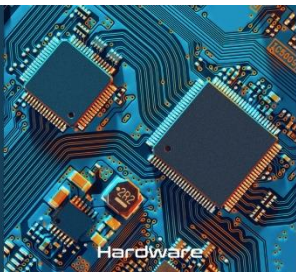


Verhoog de betrouwbaarheid en de levensduur van elektronische componenten door contactloze temperatuurmetingen

Jan Delye



D&E
EVENT



Hardware



Software



Test & Measurement



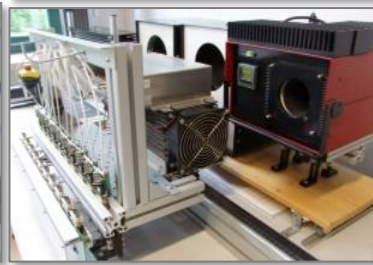
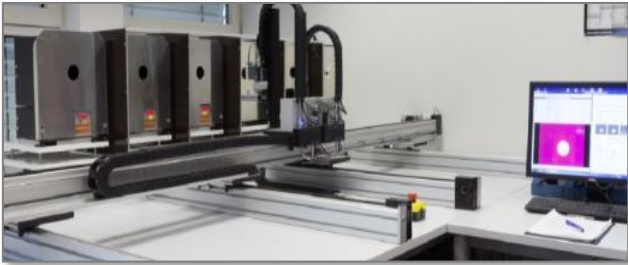
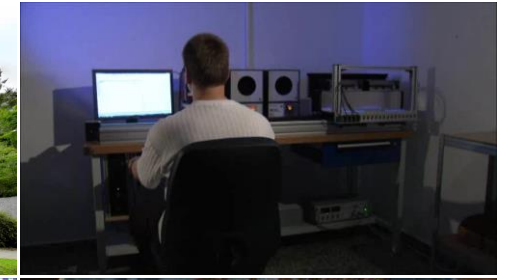
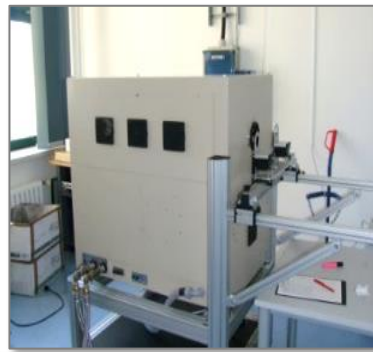
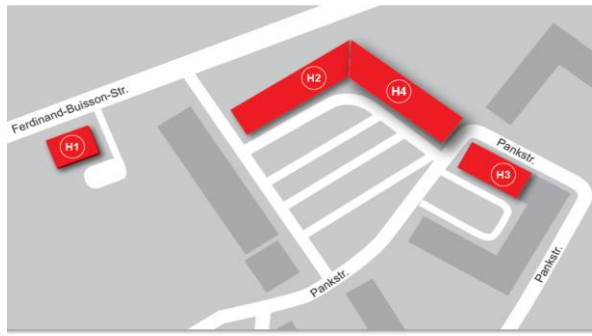
Engineering



Research & Development

Het ontwerpen van
innovatieve elektronica

Woensdag 20 maart 2024
1931 Congressentrum 's-Hertogenbosch



- Opgericht in Berlijn door Dr.-Ing. Ulrich Kienitz
- 20 jaar actief in het ontwikkelen van industriële pyrometers en infrarood camera's
- Wereldwijd ingezet voor constante temperatuurbewaking en -controle van vrijwel elk denkbaar productieproces
- 115 medewerkers

Omgevingsinvloeden op elektronica

- Omgevingselementen zoals temperatuur, trillingen, vochtigheid en stof behoren tot de vele oorzaken van storingen in elektrische apparatuur.
- Temperatuur veroorzaakt meer dan 55% van de storingen
- Om de betrouwbaarheid en levensduur van elektronische apparatuur te waarborgen, is het essentieel om bij de ontwikkeling ervan, rekening te houden met deze omgevingselementen

SINCE 2003  **optris**
infrared measurements

D&E
EVENT  Het ontwerpen van innovatieve elektronica

Woensdag 20 maart 2024
1931 Congressentrum 's-Hertogenbosch

Enkele voordelen van contactloze temperatuurmetingen



- Contactloze TM helpen ingenieurs om het thermische patroon op de printplaat te visualiseren en zodoende te optimaliseren.
- Contactloze TM brengen lokale oververhittingen in beeld, doeltreffende aanpassingen zullen bijdragen aan het verlengen van de levensduur en betrouwbare prestaties garanderen.
- Door de temperatuurresultaten te analyseren, kunnen fabrikanten kortere ontwikkelingscycli aanhouden en sneller overgaan tot het produceren.
- Deze optimalisatie zal leiden tot hogere kwaliteitspercentages en uiteindelijk een hogere winstmarge.

Werkingstemperaturen van elektronische componenten

Microscope optics are required for a precise temperature measurement!

New 3.0V SCC Series Supercapacitors

High Capacitance Cylindrical Supercapacitors

The new series of cylindrical electrochemical double-layer capacitors offers excellent pulse power handling characteristics based on the combination of very high capacitance and very low ESR. Used by themselves or in conjunction with primary or secondary batteries, they provide extended back up time, longer battery life, and provide instantaneous power pulses as needed. Offers great solutions to Hold-Up, Energy Harvesting, and Pulse Power Applications.

FEATURES

- Cap Values from 1F – 50F
- High pulse power capability
- Low ESR
- Low Leakage Current
- Capability to couple with battery

APPLICATIONS

- Camera Flash Systems
- Energy Harvesting
- GSM/GPRS Pulse Applications
- UPS/Industrial
- Wireless Alarms
- Remote Metering
- Scanners
- Toys and Games

HOW TO ORDER

SCC S 30 E 106 S R B -

Series SuperCap Cylindrical
Diameter
D = 6.3mm
R = 8mm
S = 10mm
T = 12.5mm
U = 16mm
V = 18mm

Case Length
Two digits represent case Length in mm

Voltage Code
E = 3.0V

Capacitance Code
for two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)

Tolerance
M = ±20%
S = ±30%/±10%

Lead Format
R = Radial


Package
B = Bulk
T = Tray

Custom Code
A1 = 4mm Bent Leads
C1 = 2mm Bent Leads
*Inquire about availability

QUALITY INSPECTION
Parts are tested for Life Cycle, high temperature load life, temperature characteristics, vibration resistance, and humidity characteristics. See page 2 for more information.


TERMINATION
These supercapacitors are compatible with hand soldering, as well as reflow and wave soldering processes, so long as appropriate precautions are followed. See page 4 for more information.

OPERATING TEMPERATURE
-40°C to +65°C @ 3.0V
-40°C to +85°C @ 2.5V



Single-Ended Conductive Polymer Aluminum Solid Electrolytic Capacitors

A750 Series, 105°C



Overview


KEMET's A750 Series of Single-Ended Conductive Polymer Aluminum Solid Electrolytic Capacitors offer longer life and greater stability across a wide range of temperatures. The A750 Series cathode is a solid conductive polymer not a liquid electrolyte, which eliminates the risk of explosion from drying out and due to its low ESR properties is able to withstand higher ripple currents during normal operation. The A750 Series are ideally suited for industrial and commercial applications.

Applications

Typical applications include mobile phone chargers, computer motherboards, servers and adapters (laptop power supplies).

Benefits

- Through-hole form factor
- Low impedance
- High ripple current
- 105°C/2,000 hours
- RoHS compliant



Click image above for interactive 3D content
Open PDF in Adobe Reader for full functionality

Part Number System


A	750	EK	567	M	BE	AA	E820
Capacitor Class	Series	Size Code	Capacitance Code (pF)	Tolerance	Rated Voltage (VDC)	Packaging	ESR
A = Aluminum	Single-Ended Conductive Polymer Solid Capacitor 105°C 2,000 Hour	See Dimension Table	First two digits represent significant figures for capacitance values. Last digit specifies the number of zeros to be added.	M = ±20%	2.5 = 0E 4 = 0D 6.3 = 0J 10 = 1A 16 = 1C 25 = 1E	See Ordering options Table	Last 3 digits represent significant figures for ESR values. (mΩ)

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A4067_A750 - 7/15/2016 1

KEMET Electronics Corporation • P.O. Box 9928 • Greenville, SC 29606 (864) 963-6300 • www.kemet.com

Tantalum Surface Mount Capacitors – Standard Tantalum

T491 Series Industrial Grade MnO₂




Overview

The KEMET T491 Series, designed specifically for today's highly automated surface mount processes and equipment, is the leading choice for surface mount designs. The T491 combines KEMET's proven solid tantalum technology, acclaimed and respected throughout the world, with the latest in materials, processes and automation, resulting in unsurpassed total performance and value. This product meets or exceeds the requirements of EIA standard 535BAAC. This series is classified as MSL (Moisture Sensitivity Level) 1 under J STD 020: unlimited floor life time at ≤30°C / 85% RH. The T491 standard terminations are available in 100% matte tin and provide excellent wetting characteristics and compatibility with today's surface mount solder systems. Tin/lead (Sn/Pb) terminations are available upon request for any part number. Gold-plated terminations are also available for use with conductive epoxy attachment processes. Standard packaging of these devices is tape and reel in accordance with EIA 481. This system provides perfect compatibility with all taped placement units.

Benefits

- Meets or exceeds EIA Standard 535BAAC
- Taped and reeled per EIA 481
- Symmetrical, compliant terminations
- Optional gold-plated terminations
- Laser-marked case
- 100% surge current test on C, D, E, U, V, X sizes
- Halogen free epoxy
- Capacitance 0.1 µF to 1,000 µF
- Tolerance ±10%, ±20%
- Voltage 2.5 – 50 VDC
- Extended range values
- Low profile case sizes
- RoHS Compliant and lead-free terminations (See www.kemet.com for transition information)
- Operating temperature: -55°C to +125°C



Click image above for interactive 3D content
Open PDF in Adobe Reader for full functionality

Applications

Typical applications include decoupling and filtering in industrial and automotive end applications such as DC/DC converters, portable electronics, telecommunications, and control units.

Environmental Compliance

RoHS 2002/95/EC when ordered with 100% Sn solder.

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T2006_T491 - 1/20/2016 1

KEMET Electronics Corporation • Greenville, SC 29606 (864) 963-6300 • www.kemet.com

Operating Temperature | -55°C to +105°C

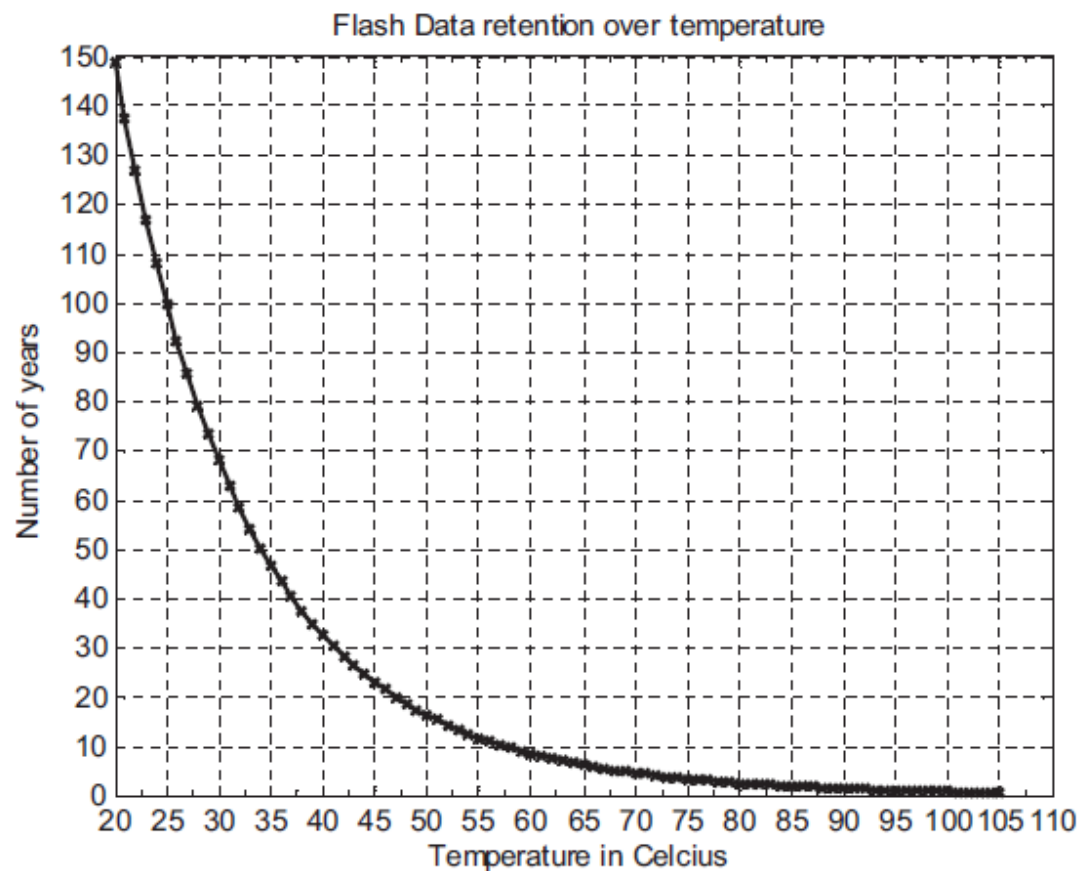
• Operating temperature: -55°C to +125°C



Het ontwerpen van innovatieve elektronica

Woensdag 20 maart 2024
1931 Congresscentrum 's-Hertogenbosch

420-Hour Baking Time at 170°C



Temperature (°C)	Data Retention (Years)
20	148.912
25	100
30	68.006
35	46.843
40	32.652
45	23.02
50	16.406
55	11.814
60	8.591
65	6.307
70	4.672
75	3.491
80	2.63
85	1.997
90	1.528

Figure 1. Flash Data Retention vs Temperature for 170°C 420-Hour Test

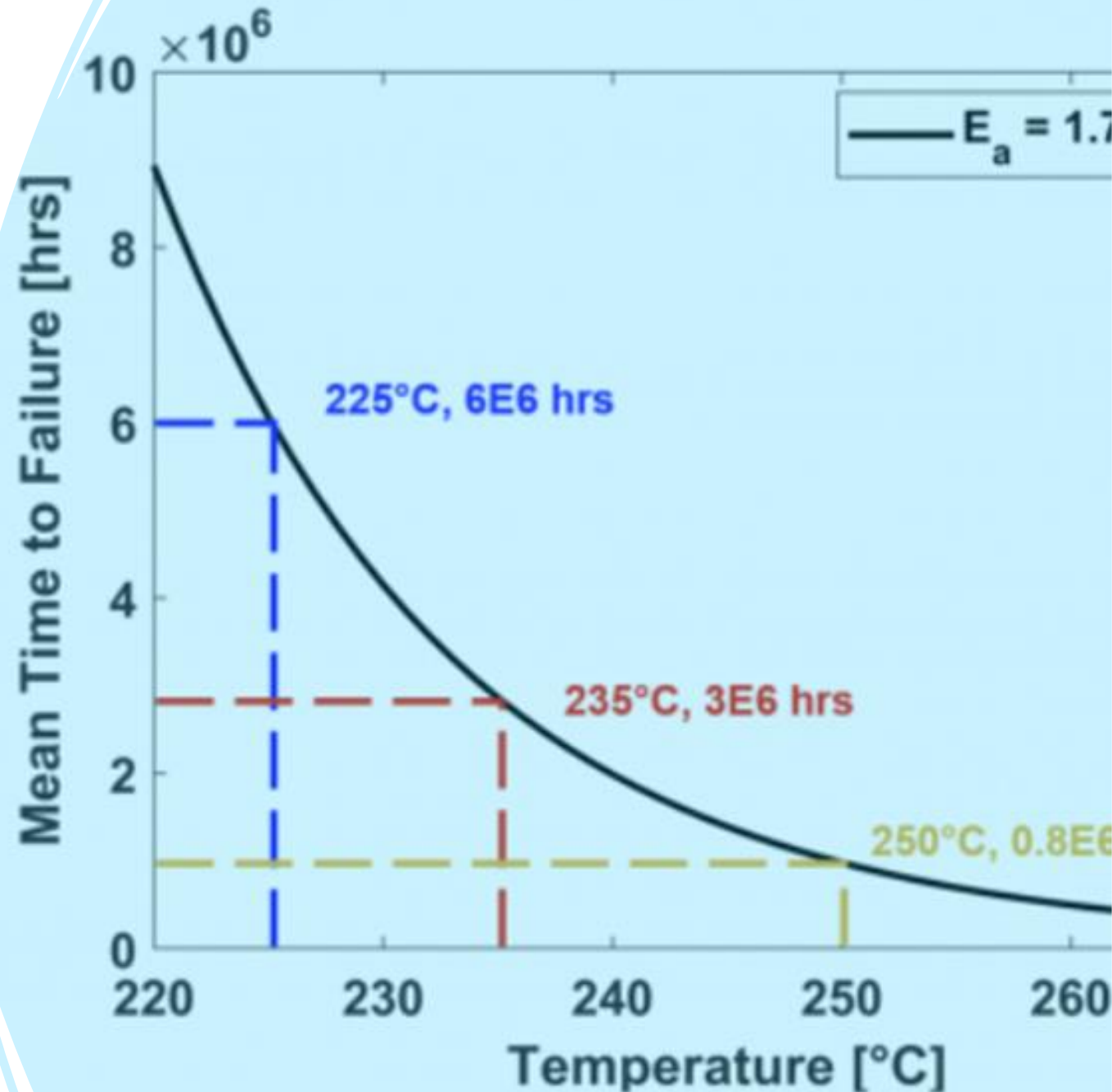
MSP430 Flash Characteristics

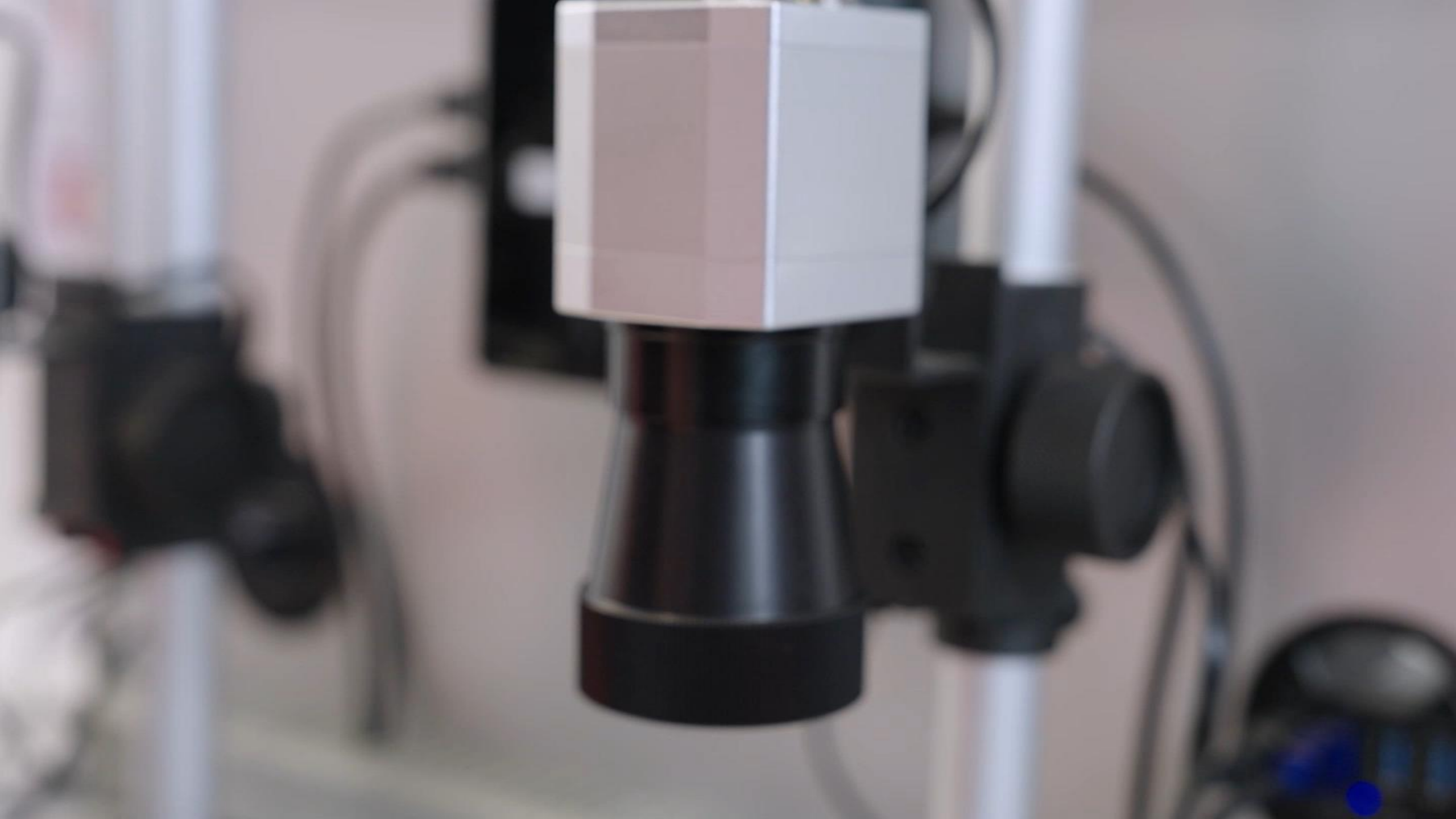
Source: www.ti.com Application Report
SLAA392A–March 2008–Revised August 2018

Duimregel

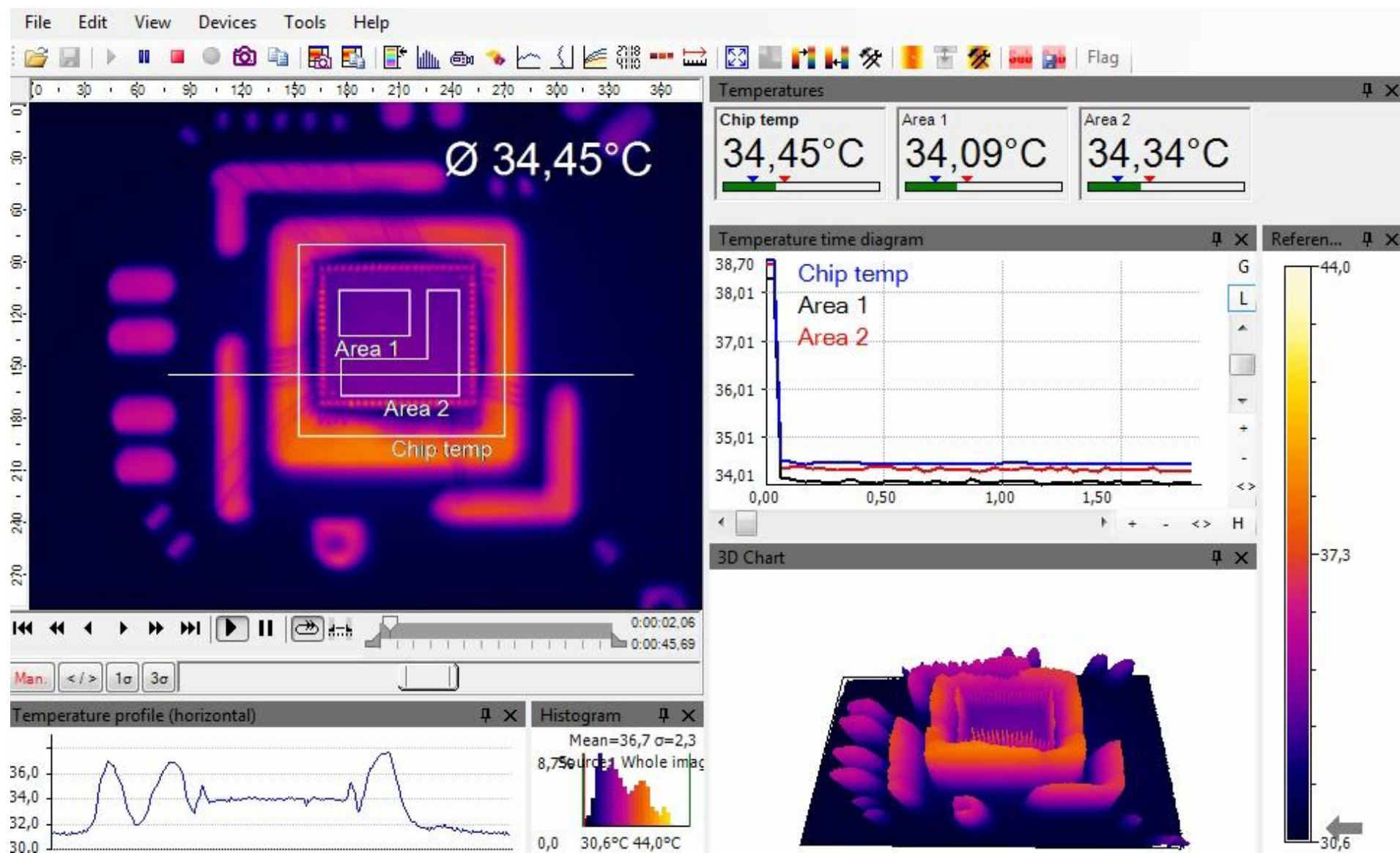
- Door de temperatuur van het component met slechts 10°C te verhogen, verkorten we de levensduur x2
- Door de temperatuur met 25°C te verhogen van 225°C naar 250°C , daalt de levensduur van ≈ 500 jaar tot ≈ 50 jaar

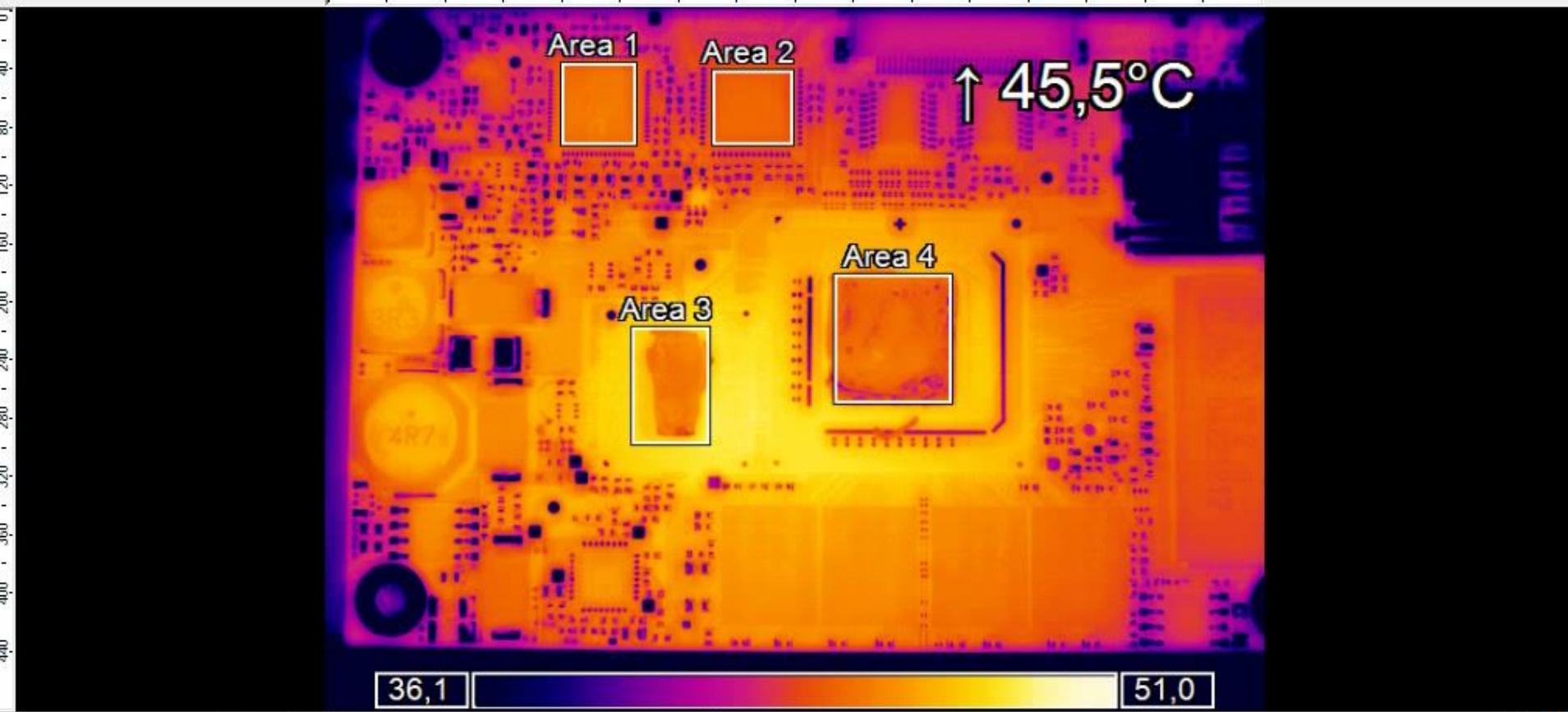
Arrhenius Equation



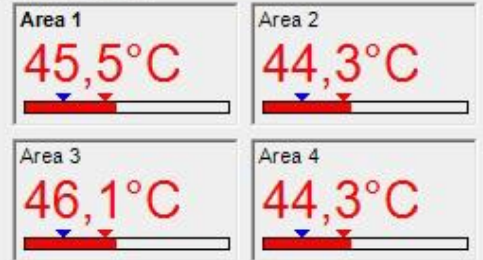


Van buitenaf bekijken wat er binnenin gebeurt

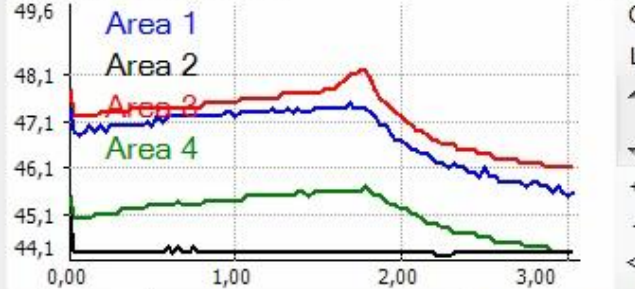




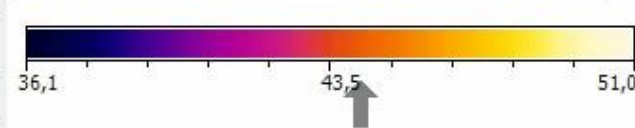
Temperatures



Temperature time diagram



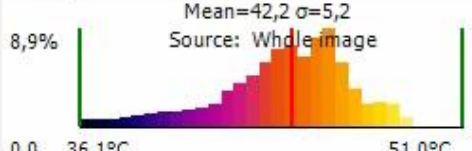
Reference bar



Temperature profile (horizontal)



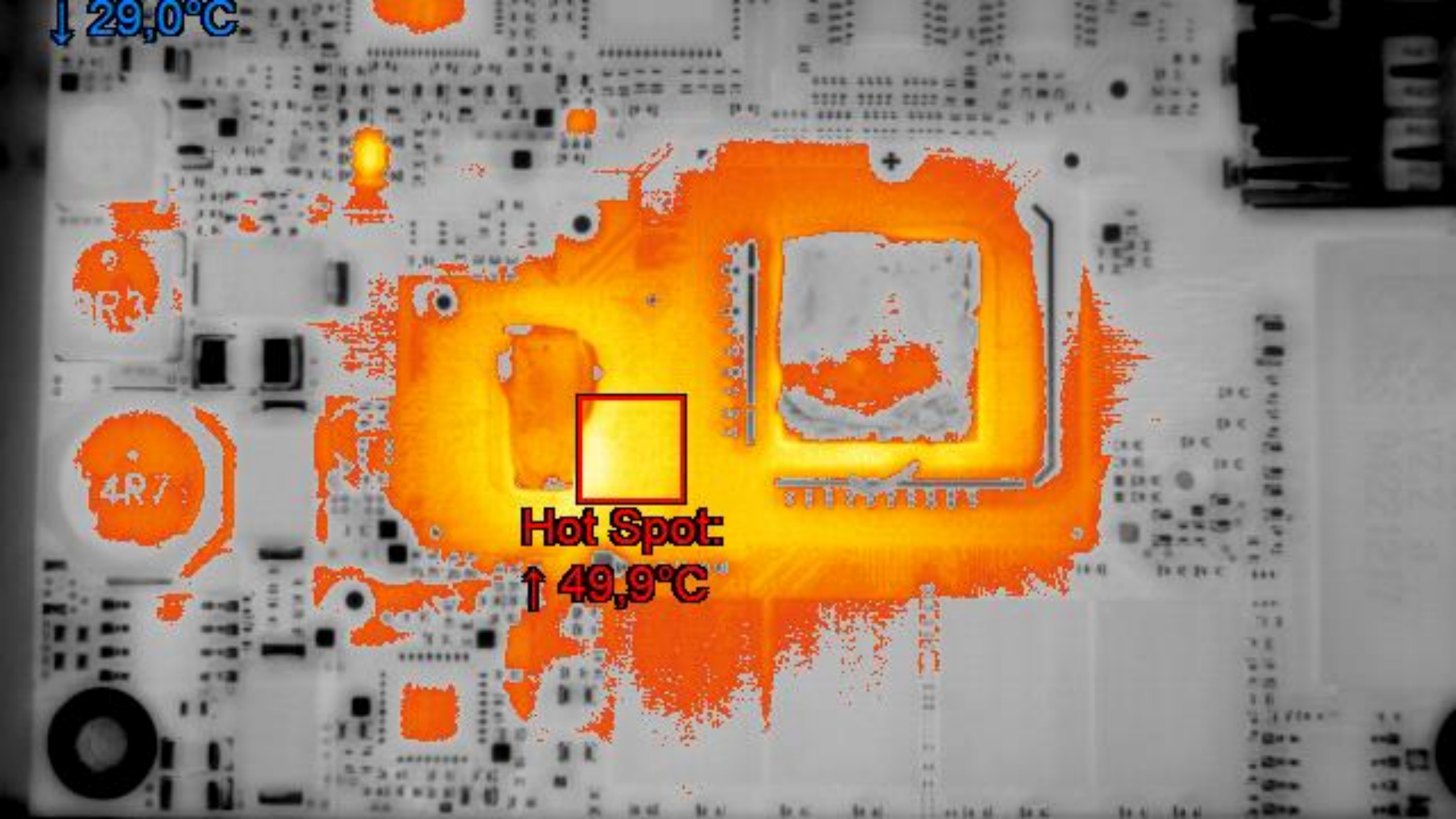
Histogram



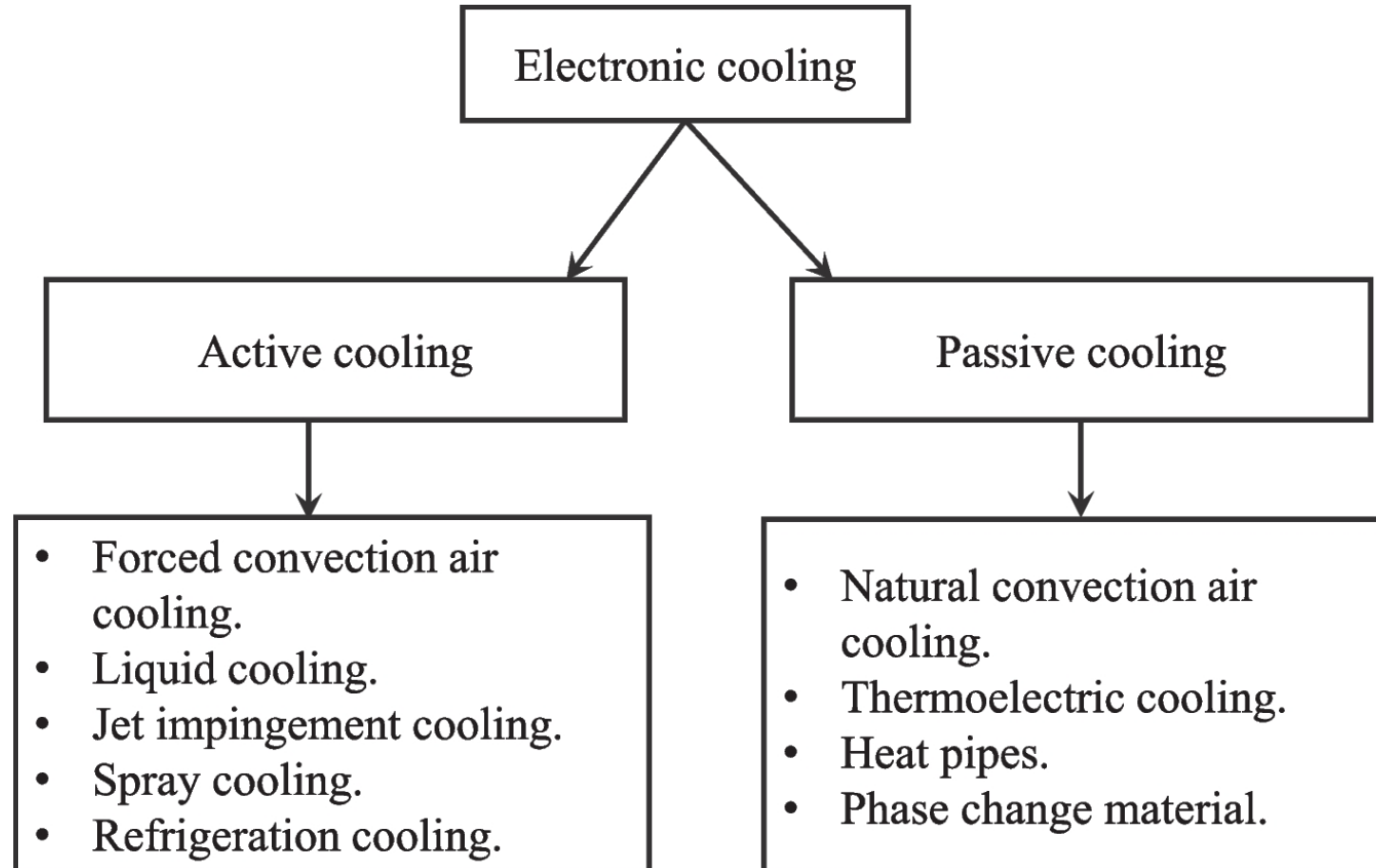
↓ 29,0°C

Hot Spot:
↑ 49,9°C

4R7

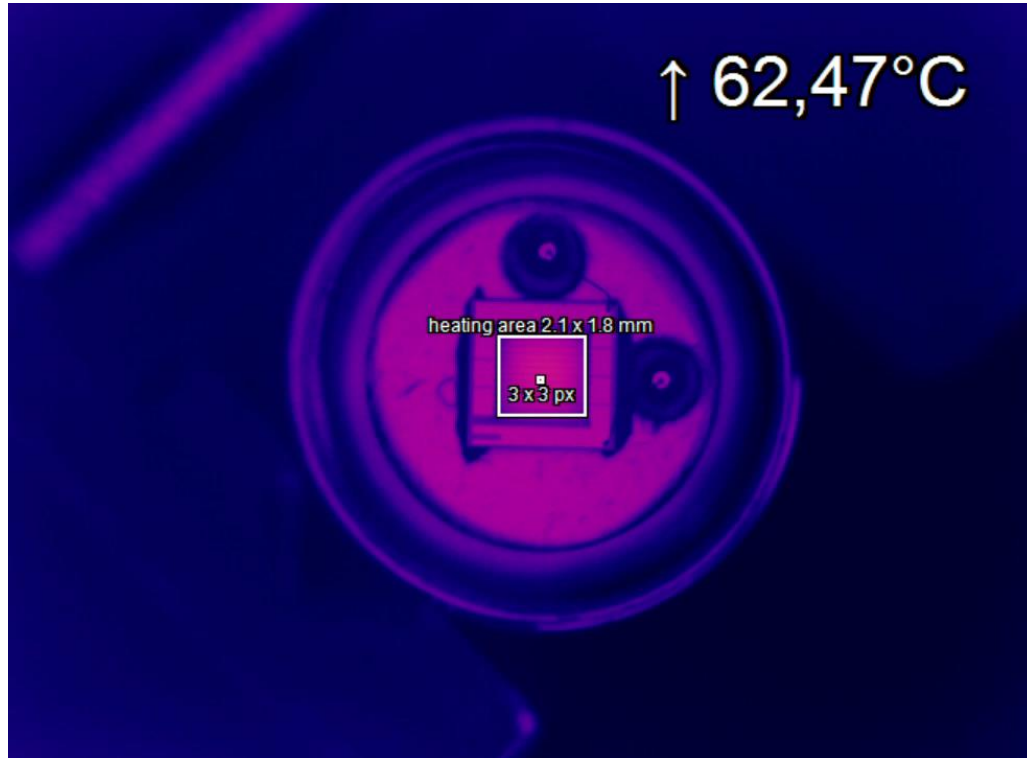
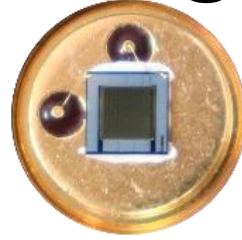


Warmteoverdracht

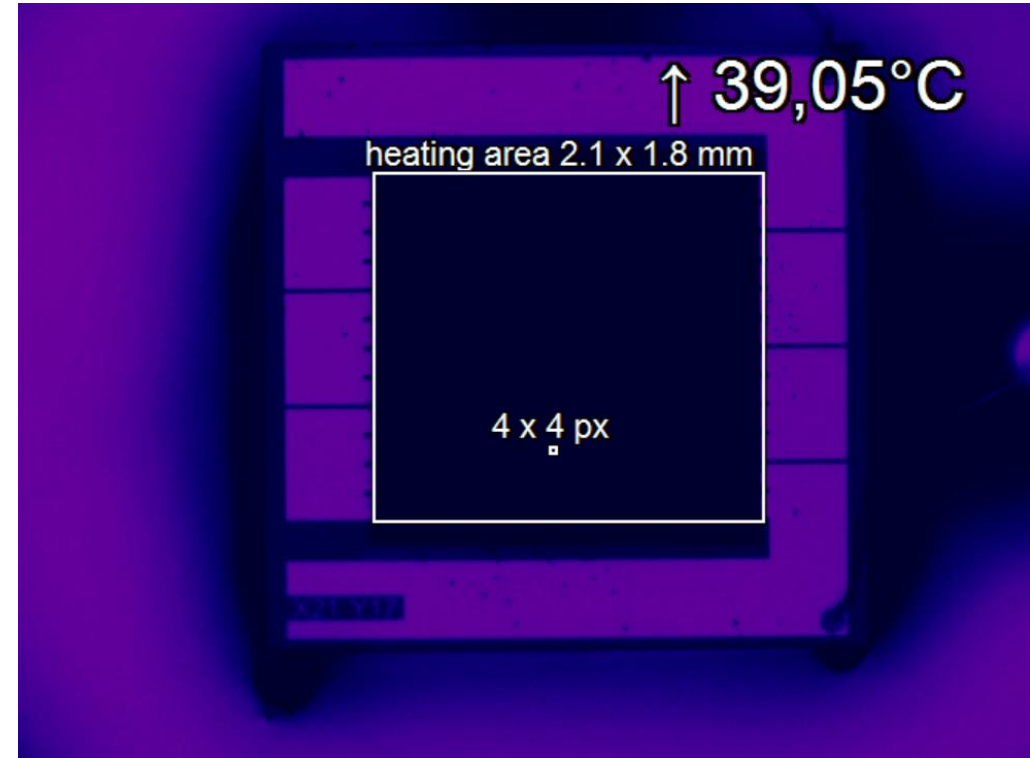


conduction, convection, and radiation

Verschillende lenzen vergelijken



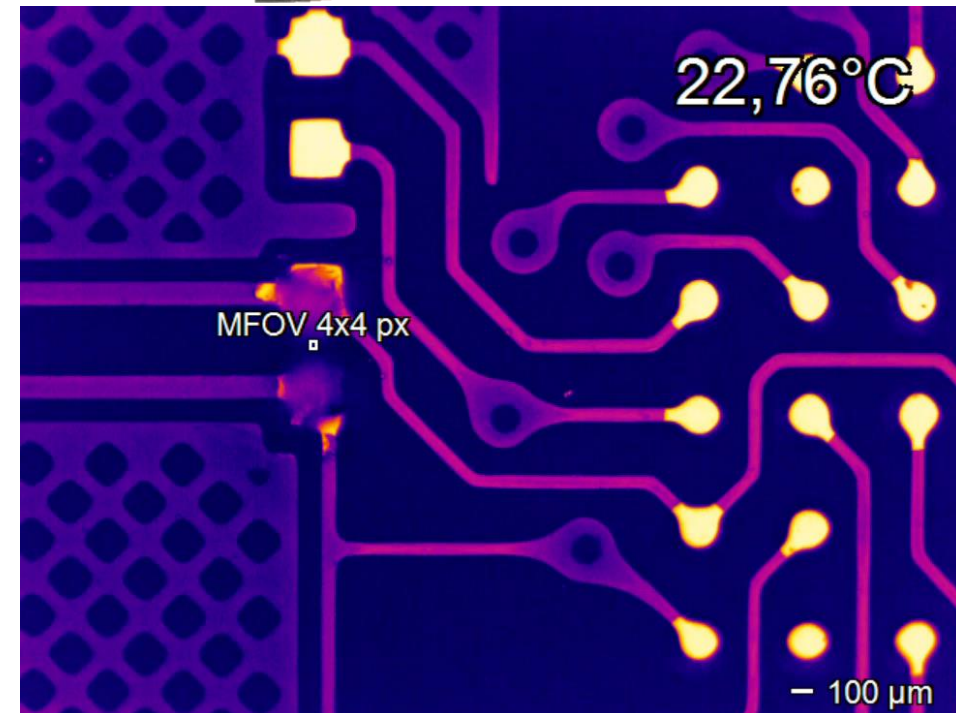
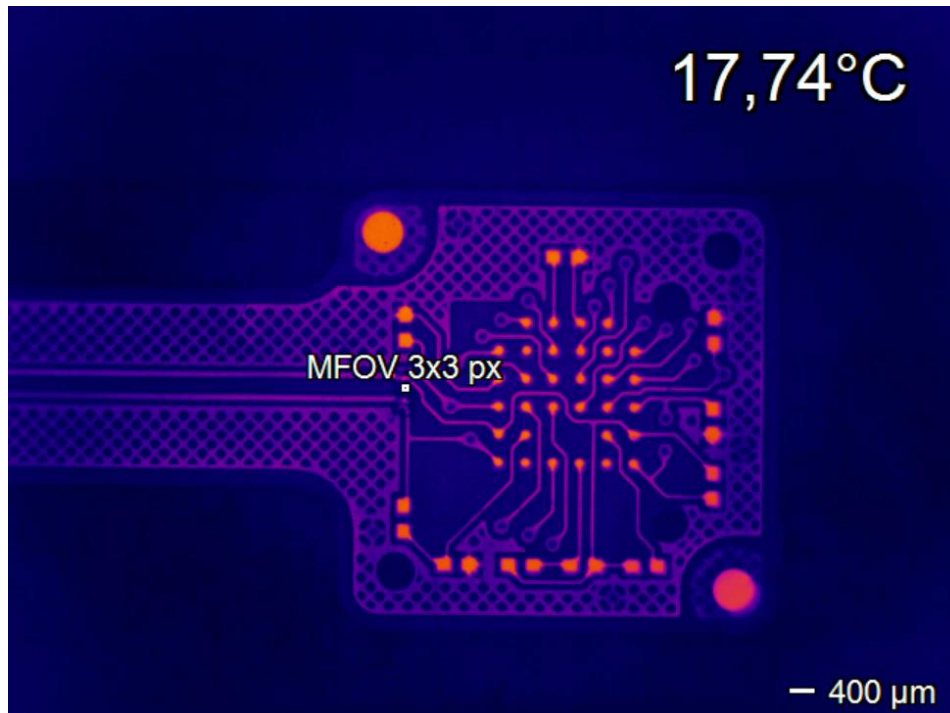
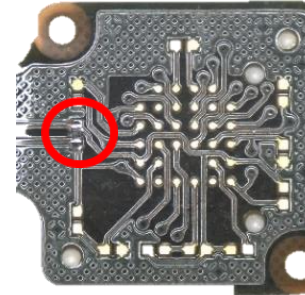
IFOV: $28\mu\text{m}$ | MFOV: $85\mu\text{m}$ (3x3)



IFOV: $8\mu\text{m}$ | MFOV: $34\mu\text{m}$ (4x4)

Verschillende lenzen vergelijken

- 0603 SMD weerstand (0.6 x 0.3 mm)



De voordelen van thermische metingen op elektronische componenten tijdens ontwikkeling

- Prestaties garanderen in extreme omstandigheden/omgevingen
- Zwakke punten en kwetsbaarheden identificeren tijdens het ontwikkelen
- Het garanderen en verbeteren van de betrouwbaarheid en de levensduur
- Validatie van ontwerp- en materiaalkeuzes
- Voldoen aan industriestandaarden en -voorschriften
- Door productieprocessen te optimaliseren, kan deze optimalisatie leiden tot kortere productiecycli, verbeterde opbrengstpercentages en uiteindelijk een hogere winstgevendheid.



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Optris stand N° 16