

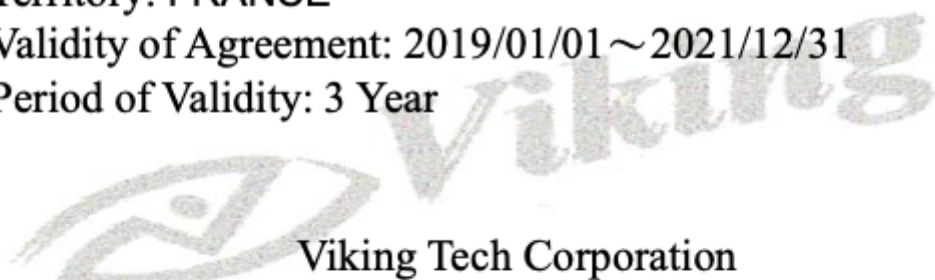
Viking Tech Corporation License of Agent in France

This is to certify that Viking Tech Corporation hereby appoint JBG-METAFIX as its Agent to sell all the products on Viking's catalogues and Website which is included Integrated Passive Devices, Resistors, Capacitors and Inductors under Viking's Brand.


Territory: FRANCE

Validity of Agreement: 2019/01/01 ~ 2021/12/31

Period of Validity: 3 Year



Viking Tech Corporation

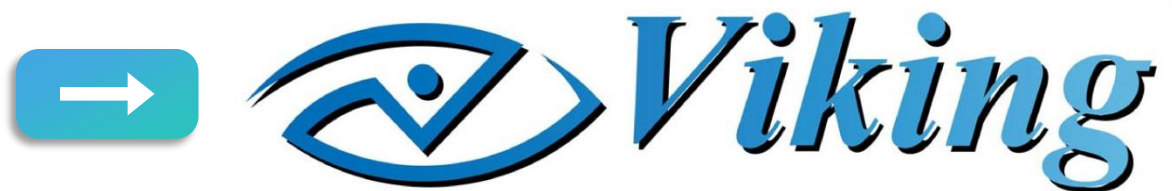


No. 70, GuanFu N. Road, Hsin Chu
Industrial Park, Taiwan

Company profile

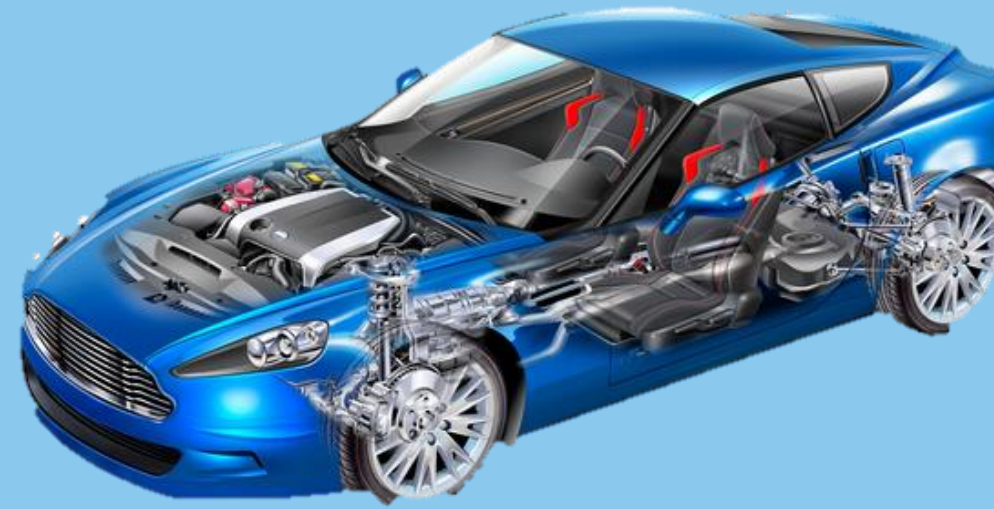
Viking Tech Corporation

ISO9001
ISO14001
ISO13485
IATF16949
AEC-Q200
VDA6.3





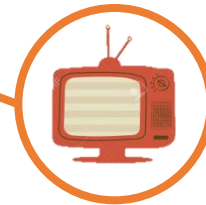
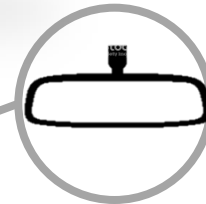
Healthcare



Automotive



Automotive Product Overview



Safety Control System 18%

Tire Monitor/Lane-Chang Monitor/Distance Radar

AUTOGRADE Thick Film Chip Resistor (CR..A)

AUTOGRADE Thin Film Chip Resistor (AR..A)

Auto Parts/Comfort 16%

Remote Control Entry/Auto Power Mirror

Auto Power Window/Power Seat Adjustment etc.

AUTOGRADE Thick Film Chip Resistor (CR..A)

AUTOGRADE Thin Film Chip Resistor (AR..A)

Car Media 27%

Digital screen system, digital audio, decorative lights, etc.

AUTOGRADE Thick Film Chip Resistor (CR..A)

AUTOGRADE Thin Film Chip Resistor (AR..A)

Lighting/LED 39%

AUTOGRADE Thick Film Chip Resistor (CR..A)

METAL FILM PRECISION MELF Resistor (CSRA)

Anti-Sulfurated Chip Resistor (AS..A)

AUTOGRADE Current Sensing Chip Resistor Chip(CS..A)



HealthCare product Overview



Thick Film Chip Hearing aid 助聽器



Current Sensing Chip

- Blood analyzer
血液分析儀
- **Mask machine**
口罩機



Precision thin film Chip

- Medical instruments
醫療器械



- AED/Monitor 監護儀/
• Hyperbaric Therapy
高壓治療版



- Ear thermometer
耳溫槍
- Sphygmomanometer
血壓計
- **Ultrasonic machine**
超音波儀器



MELF

New Product 2020-2021

THIN FILM
HIGH VOLTAGE
PRECISION

SOLUTIONS
FOR ENVIRONMENT
AND FUTURE

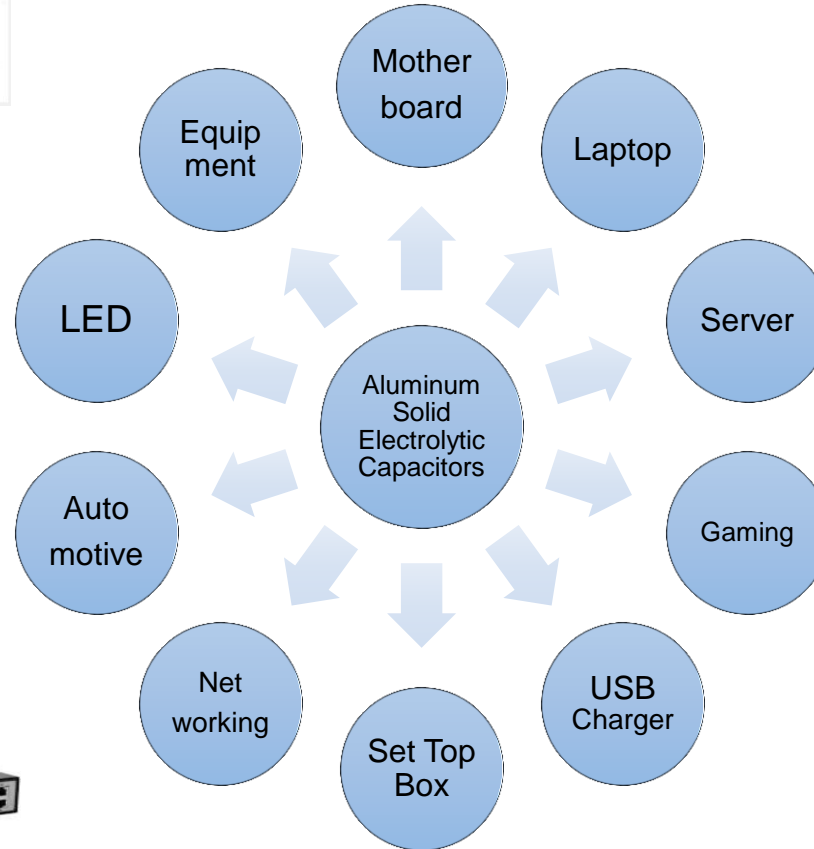
ISO9001 AEC-Q200
ISO14001 TS16949



Aluminum Solid Electrolytic Capacitors



Application



New product overview

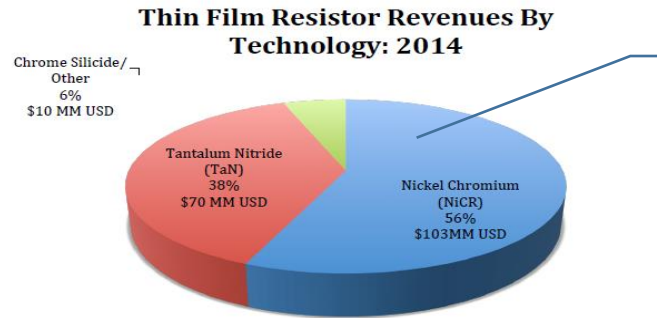


Competitor Series	Brand	VIKING Cross Reference	Features
New Products			
PAT	V competitor	TAR	Tantalum Nitride, Immunity to humidity, moisture and sulfur
MCx/ MCx AT Precision	V competitor	ART	Operating Temp(85°C)、 Permissible Film Temp(175°C)
MCx HP	V competitor	ARTP	Operating Temp(85°C)、 Permissible Film Temp(175°C) & High Power
PCAN	V competitor	ARN	Aluminum Nitride, Higher Power Rating (1206 2W/ 2512 6W)
TNPW e3	V competitor	To Be Defined	
HRG	S competitor	ARP	1206 with 2Watts
RG	S competitor	To Be Defined	
RCP	V competitor	CRP	Aluminum Nitride, Higher Power Rating (1206 2.4W/ 2512 3.5W)
TNPV e3	V competitor	ARHV	High Voltage Thin Film
FC (40G)	V competitor	To Be Defined	High Frequency Thin Film (40GHz)
MM* HF (10G)	V competitor	CSRF	MELF High Frequency (10 GHz)

TaN(Tantalum) Thin Film Precision Chip R - TAR series



Figure 9: Global Consumption Value for Thin Film Resistors By Technology (NiCR, TaN, Other): 2014



Tantalum Nitride is used about 40% global market!

Source: Paumanok Publications, Inc.

Features

- Tantalum nitride thin film resistor
- High stability in humid environments
- High Temperature Exposure stability 0.1 % at 1000 h at 155 °C
- AEC-Q200 Compliance
- Tight tolerance down to $\pm 0.05\%$
- Extremely low TCR down to $\pm 10\text{PPM}/^\circ\text{C}$
- Resistance values from 40 ohm to 250K ohm
- Special materials, design, and processing for high sulfur applications
- Test proven immunity to humidity, moisture, and sulfur

Standard Electrical Specifications

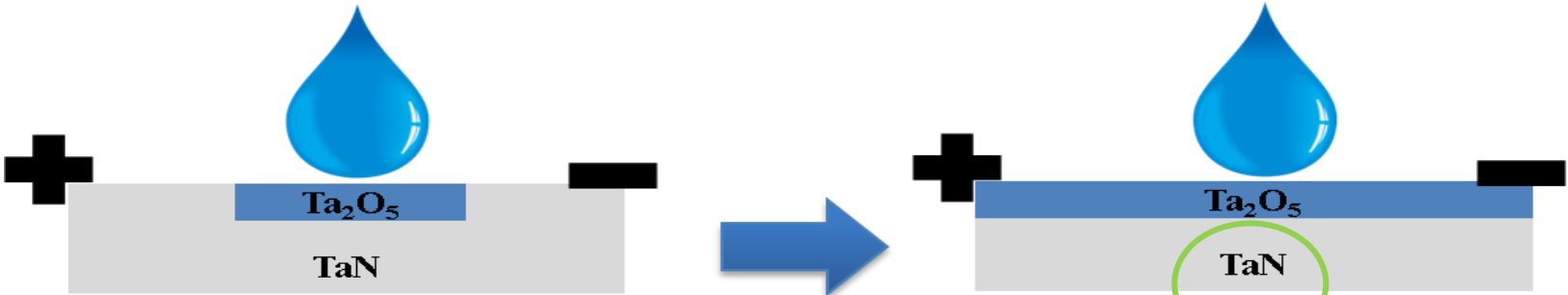
Type \ Item	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range					TCR (PPM/°C)
					$\pm 0.05\%$	$\pm 0.1\%$	$\pm 0.25\%$	$\pm 0.5\%$	$\pm 1\%$	
TAR02 (0402)	1/16W	-55 ~ +155°C	50V	100V	40Ω – 20kΩ					$\pm 10, \pm 15, \pm 25, \pm 50$
TAR03 (0603)	1/6W	-55 ~ +155°C	75V	150V	40Ω – 50kΩ					$\pm 10, \pm 15, \pm 25, \pm 50$
TAR05 (0805)	1/5W	-55 ~ +155°C	100V	200V	40Ω – 150kΩ					$\pm 10, \pm 15, \pm 25, \pm 50$
TAR06 (1206)	1/2W	-55 ~ +155°C	200V	400V	40Ω – 250kΩ					$\pm 10, \pm 15, \pm 25, \pm 50$

Applications

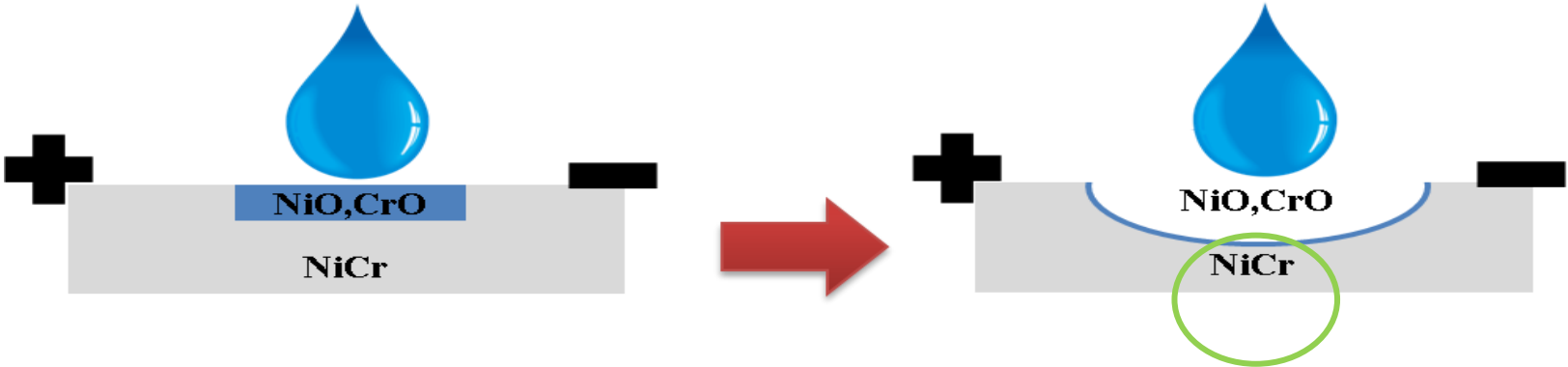
- Automotive
- Medical Equipment
- Testing / Measurement Equipment
- Automatic Equipment Controller
- Converters
- Communication Device

ISO13485
IATF16949
AEC-Q200

TaN(Tantalum) Thin Film Precision Chip R - TAR series



Better Humidity Performance



Resistance Failure

Open Circuit

Professional/High power Thin Film Chip Resistors

ART Series /ARTP Series



■ Features

- Operating temperature up to 175°C for 1000 hr
- AEC-Q200 Compliance
- Superior temperature cycling robustness
- Advanced sulfur resistance verified according to ASTM B 809

■ Applications

- Automotive
- Telecommunication
- Medical equipment
- Industrial equipment

■ Rated power at different operating temperatures

Operation Mode		Standard P ₇₀	Power P ₇₀	Advanced Temperature P ₈₅
ART03	Power Rating	1/10W	1/8W	3/20W
	Operating temperature range	-55 ~ +125°C	-55 ~ +155°C	-55 ~ +175°C
	Permissible film temperature	+125°C	+155°C	+175°C

■ Rated power at different operating temperatures

Operation Mode		Power	Advanced Temperature
ARTP05	Power Rating	2/5W	2/5W
	Operating temperature range	-55 ~ +155°C	-55 ~ +175°C
	Permissible film temperature	+155°C	+175°C

High Power Thin Film Chip Resistors ARP Series



■Features

- Wider bottom terminal enabling higher power capability (short side terminal)
- Significantly larger power handling capability than existing same size resistors
- Size: 1206, Power rating: 1.0W, Resistance range: 10 ~ 100KΩ
- AEC-Q200 Compliance
- Advanced sulfur resistance verified according to ASTM B 809

■Applications

- Power source related devices
- DC motors, inverters
- Robotics, Industrial control system

■Standard Electrical Specifications

Type \ Item	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range			TCR (PPM/°C)
					±0.1%	±0.5%	±1%	
1206	1W	-55 ~ +155°C	200V	400V	47Ω – 100KΩ		–	±25
					47Ω – 100KΩ	10Ω – 100KΩ		±50

Thin Film High Power Chip Resistor (Aluminum Nitride Substrate)-ARN Series *Viking*

■ Features

- High thermal conductivity aluminum nitride substrate
- Power rating up to 6.0W
- Resistance 50Ω ~ 30.1KΩ
- Resistor tolerance to ± 0.1%
- TCR to ± 25ppm/ ° C

■ Applications

- Power Supplies
- Power Switching
- Braking System

■ Typical Performance

- TCR. 25 ppm/°C
- TOL. 0.1 %



■ Standard Electrical Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max Operating Voltage	Max Overload Voltage	Resistance Range				TCR (PPM/°C)
					±0.1%	±0.25%	±0.5%	±1%	
ARN06 (1206)	2W (1)	-55°C ~ +150°C	100V	200V	50Ω~30.1KΩ				±25 ±50
ARN12 (2512)	6W (1)	-55°C ~ +150°C	100V	200V	100Ω~30.1KΩ				±25 ±50

Thick Film High Power Chip Resistor (Aluminum Nitride Substrate)-CRP Series

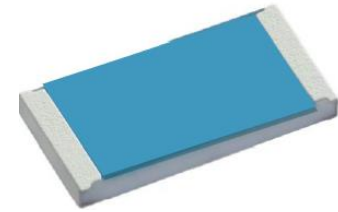


■ Features

- Thick film resistive element on an aluminum nitride (AlN) substrates
- Lead (Pb)-free wraparound termination over nickel barrier.

■ Applications

- Industrial
- Telecom markets



■ Electrical Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Resistance Range (Ω)		TCR (PPM/°C)
				±1%(E24、E96)	±5%(E24)	
CRP06	2.4W	-55 ~ +155°C	200	10Ω – 2KΩ		±150
CRP12	3.5W	-55 ~ +155°C	200	3Ω – 2KΩ		±150

Automotive Grade Chip Resistor (Wide Terminal)-CRW..A Series



■ Features

- AEC-Q200 Compliance
- Highly reliable multilayer electrode construction
- Compatible with all soldering process
- 100% CCD inspection

■ Scope

- This specification applies to all sizes of rectangular-type fixed chip resistors with Ruthenium-base as material.



Viking is capable of manufacturing the optional spec based on customer's requirement.

■ High Power Rating Electrical Specifications

Item Type	Power Rating at 70°C Jumper Rated Current	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range			TCR (PPM/°C)
					±0.5% (E24,E96)	±1% (E24,E96)	±5% (E24)	
CRW25 (1225)	3W	-55 ~ +155°C	200V	400V	1Ω – 29.4Ω			200
					30Ω – 2KΩ			100

Metal Film High Frequency Melf Resistor CSRF Series



Features

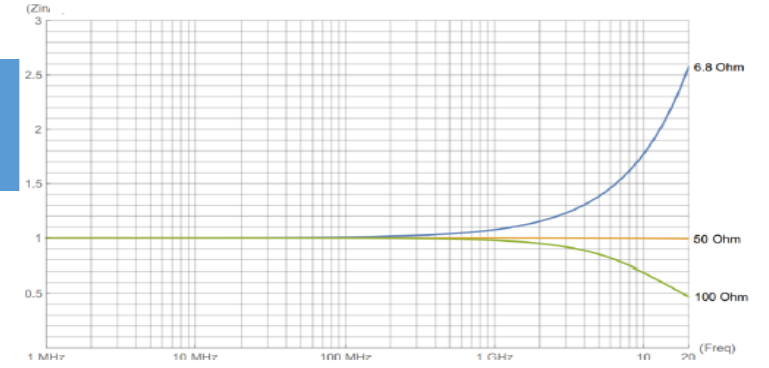
- Suitable for RF applications
- Specialty trimmed technology
- Sn termination on Ni barrier layer
- SMD enabled structure
- Lead-free and RoHS compliant

Applications

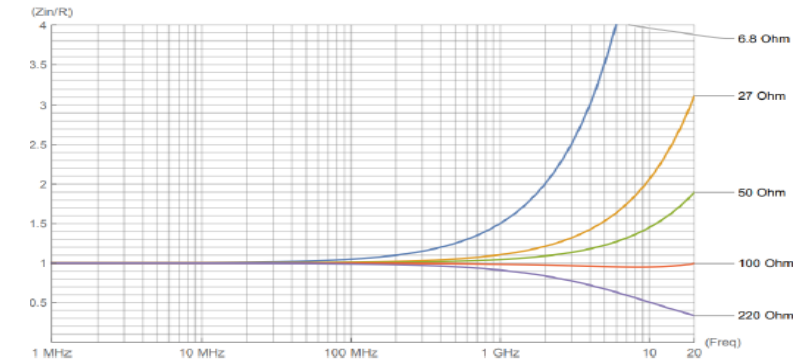
- Industrial
- Telecommunication



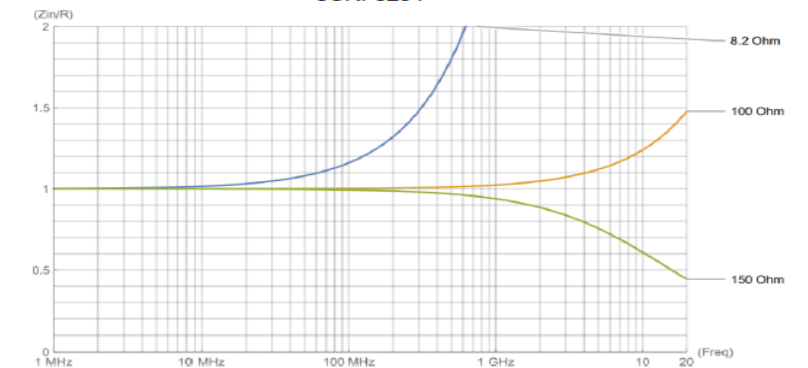
Frequency Behavior



CSRF0102



CSRF0204



CSRF0207

TECHNICAL SPECIFICATIONS

DESCRIPTION	CSRF0102		CSRF0204		CSRF0207	
Resistance range	6.8Ω-100Ω; 50Ω		1.5Ω-220Ω; 50Ω		6.8Ω-220Ω; 50Ω	
Resistance tolerance	±1%					
Temperature coefficient	±50ppm/°C					
Power rating P ₇₀	1/5W	0.3W	1/4W	2/5W	1/2W	1W
Operating voltage U _{max}	150V		200V		350V	
Operating temperature range	-55°C~155°C					
Max. resistance change at P70 for resistance range, ΔR/R max., after 1000 h	≤0.5%		≤0.5%		≤0.5%	

Automotive Grade Metal Film Precision MELF Resistor-**CSRA** Series



■ Features

- AEC-Q200 Compliance
- Thin film technology
- Excellent overall stability
- Sn termination on Ni barrier layer
- Tight tolerance down to $\pm 0.1\%$
- Extremely low TCR down to $\pm 5 \text{ PPM}/^\circ\text{C}$
- High power rating up to 1 Watts
- SMD enabled structure
- Lead-free and RoHS compliant

■ Applications

- Automotive
- Industrial
- Telecommunication
- Medical Equipment
- Measurement/Testing Equipment



- Different coating material leads to different color on appearance.

CSRV	CSRA
Blue coating	Brown coating

Ingredients	
CSRV	CSRA
Epoxy Resin	Silicone Intermediat
Pigment	Mica Powder
Titanium Dioxide	Modified Alkyd Resin

Roadmap



2019

- **TaN resistor layer** material→TAR series
- **ALN substrate** apply to Thin and Thick Film→ARN and CRP series
- **Power and Resistance range Upgrade:** Current Sense(CS 1020-2W, CR 1225-3W) /Metal Foil(2010/2512) /4T 1206
- **High Power Metal Foil Resistor** (0402~1206) R<10mohm(CSM)
- PWR Jumper Series
- (0603 R<8mohm ; 0805/1206 R<5mohm)
- Melf High Voltage resistance range extended(CSRP- 10M)

2020

- **Long side development:** 4-terminal(2010), current sensing chip(7520)
- **TaN thin film resistor (TAR Series)** 0402~1206 size 、 10Ω~1MΩ 、 TCR ±10
- **CSRF series, MELF High Frequency Series**
- High Voltage Low VCR series (1206/1210/2512)
- High Power thin film chip resistor (0603 & 0805)

2021

- Microwave thin film chip resistors (low noise)
- Thin film High moisture resistance Chip Resistor: **ARP/ARTP series**
- Low ohm thick film resistor(LRP) extend size and resistance value
- **CSN series**, competitive low ohm current sense resistor
- MELF resistor extend to **10Mohm!**
- **CNF series(Flat array)**
- **HVRC series, High frequency low VCR(1206/2512)**

2022

- TaN thin film resistor (TAR Series) upgrade High reliability
- Thin film chip Resistor Safety Automotive
- Thin film chip Resistor upgrade Operating temperature(230°C)
- Thin film chip Resistor upgrade Operating temperature



Business Strategy

01

All product meet AEC-Q200 standards and both factory passing VDA6.3 audition.

02

Focusing on customer's new design & development. Taking one manufacturer as our reference for developing new product.

03

Focusing on ISO13485 ,Class I & II.
5G application product

04

Upgrade current product for well replacement of remarkable brand

Automotive Market



High-End Market



Medical Devices Market
5G Market



5G

Consumer Market





THANK YOU!

Pam Tu

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Viking Product Overview

Resistors



Precision
Metal Strip
Ultra Low Ohm
Surge Withstanding
Anti-Sulfurated
Power Resistor

R

Inductor

High Frequency
Miniture
High Power
Thin Film Common Mode Filter



I

Capacitors



Multilayer Capacitor
Ultra High Q and Low ESR

C

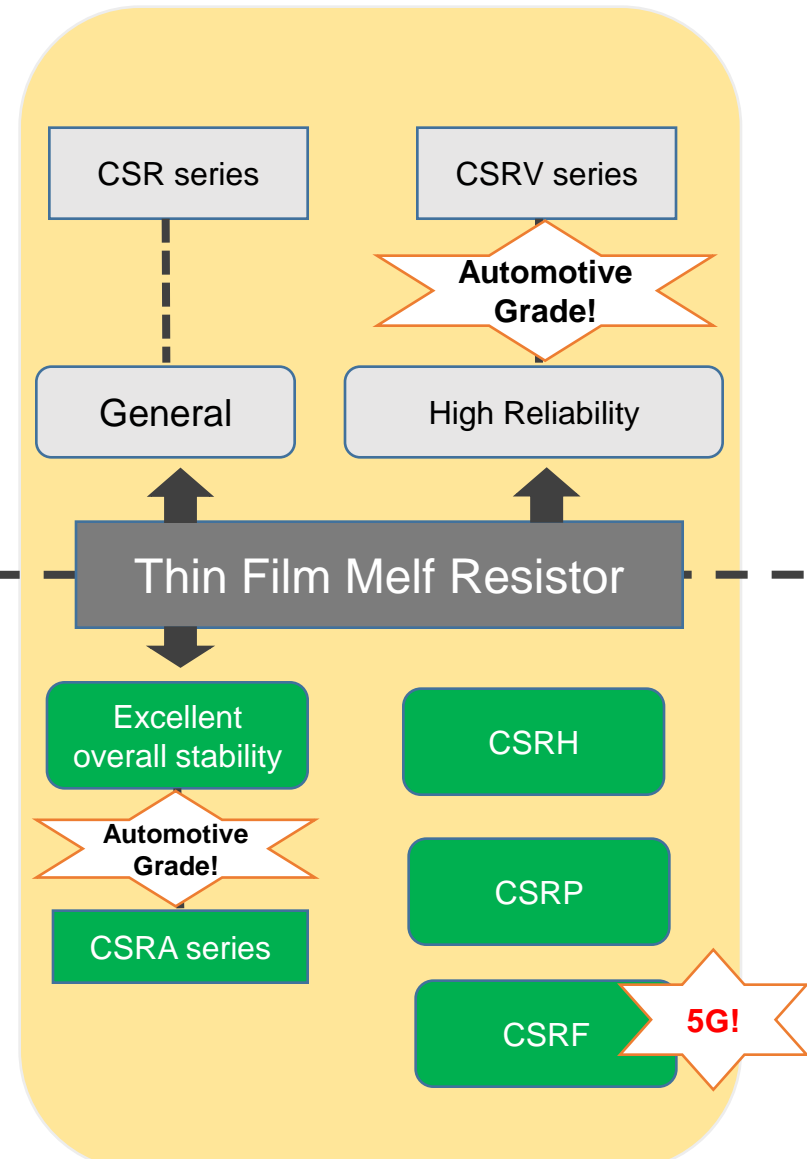
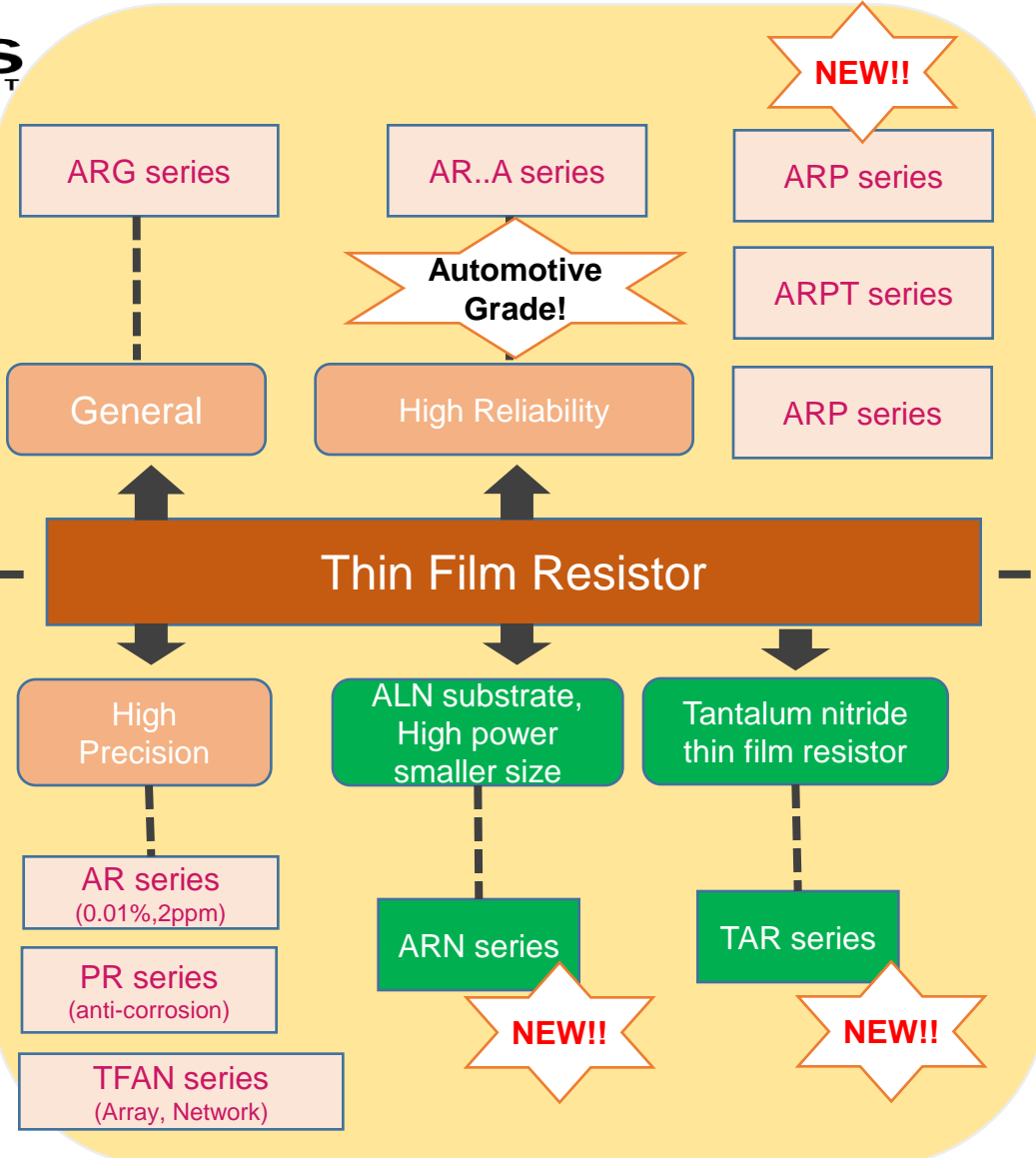
Melf Resistors

AEC Q200 Compliance
Thin film technology
Excellent overall stability
Sn termination on Ni barrier layer
Tight tolerance down to ± 1
Extremely low TCR down to 10 PPM/ C
High power rating up to 1 Watts

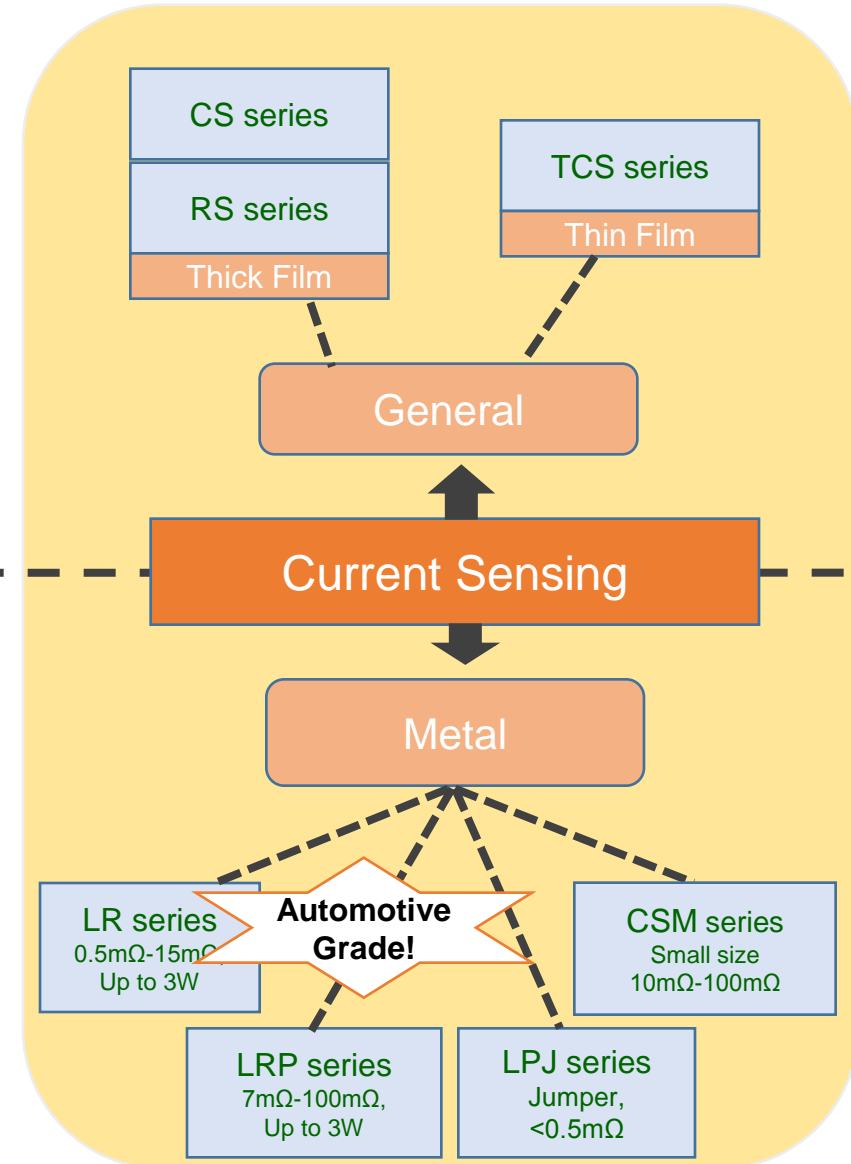
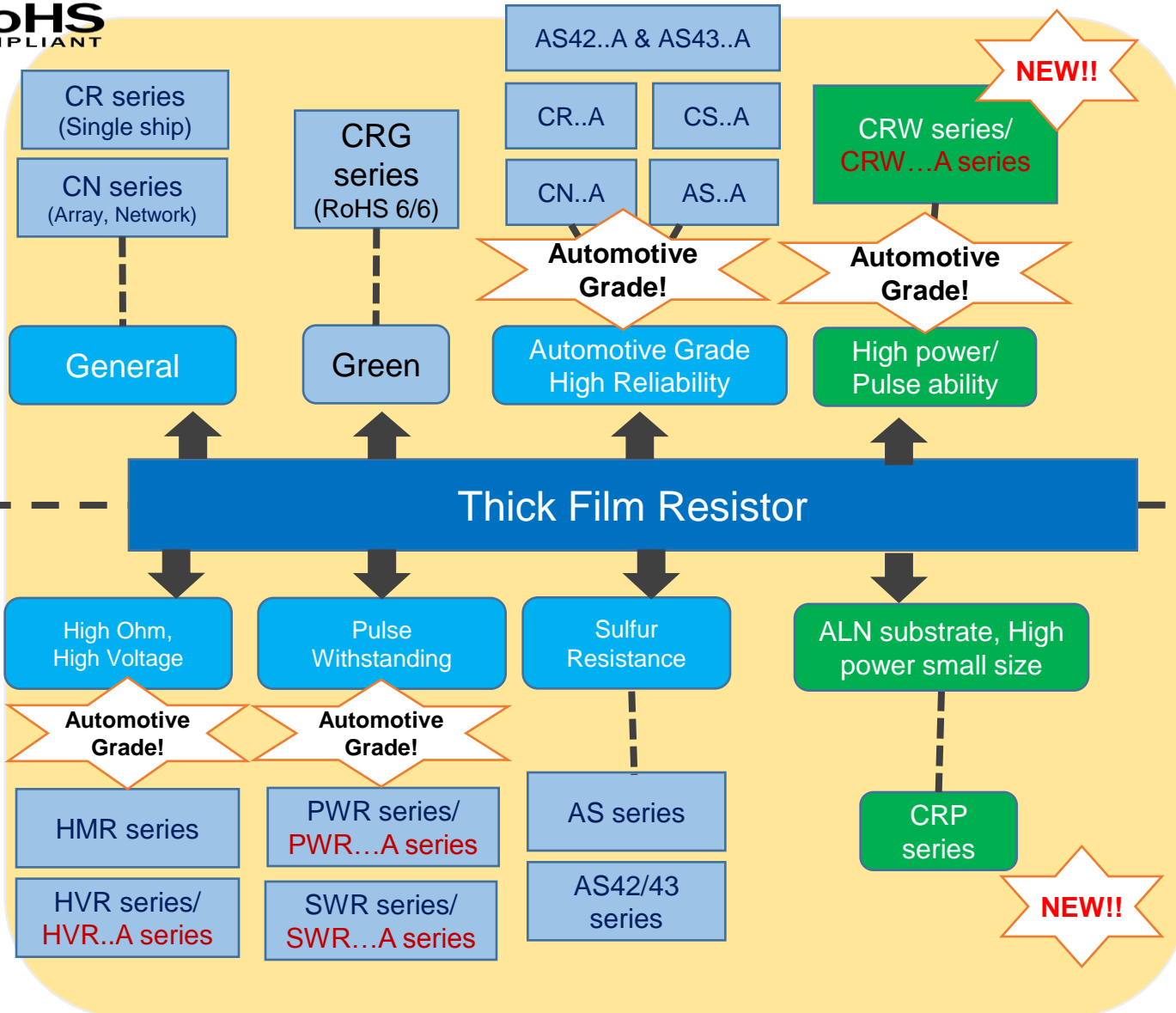


M

Product portfolio- Chip Resistor



Product portfolio- Chip Resistor



Product portfolio- Inductor & Capacitor

