Draloric / Beyschlag Resistors

March 2026

VISHAY

The DNA of tech.®

AMERICAS SALES CONFERENCE

Our resistors are everywhere – trusted for reliability and performance. We lead with the widest portfolio and unmatched technologies.

Under Vishay 3.0, we’re transforming our portfolio and strategy – driving innovation and unlocking massive growth potential

Draloric / Beyschlag at a Glance

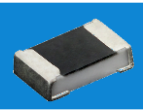
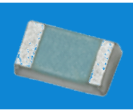
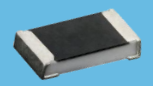
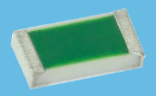
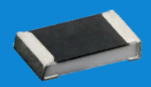
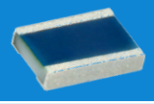
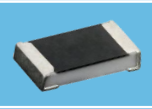
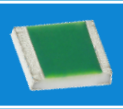
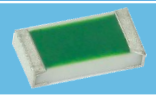
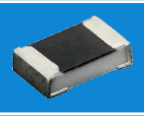
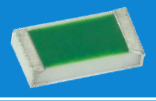
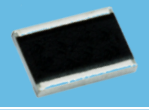
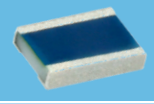
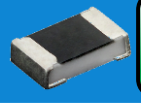
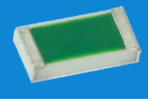
Strong brand. Broad portfolio. Competitive prices.

- One of the largest Vishay divisions ($250M - $300M)
- We have a worldwide manufacturing base and can offer COO outside Greater China for all our product lines
- We have invested heavily in capacity expansion (mainly thick and thin film)
- We are the salt, pepper, and spice for any application, or any PCB
- Easy to work with: fast, reliable, and partnership-driven

Upgrade in 2025 / 2026

New in 2025 / 2026

We Offer the Widest Portfolio in the Market

	Thick Film	Thin Film	MELF	Wirewound
General Purpose	 CRCW	 MC Prof MC Prec	-	-
Precision & Stability	 CRCW-SP	 TNPW TNPU	 MM_ SMM	-
High Power	 CRCW-HP RCS	 MC-HP MCW-AT	 MM_ SMM	 AC-AT AC-CS
High Pulse	 CRCW-HP RCS	-	 CMA CMB	 AC-AT AC-CS
High Voltage	 RCV RCV-AT	 TNPV	 MM_	-
High Frequency	-	 TNPR	 MM-HF CMA-HF	-
Sulfur-Resistant	 CRCW-SR RCA-SR	 TNP* MC-AT	 MM_, CM SMM	-
Temperature Cycling	 RCL	 MCW-AT	 MM_, CM SMM	-
Miniaturization	 CRCW0201- AT	 TNPW0201 MC-AT0201	-	-

Products in Focus

Draloric / Beyschlag Resistors

VISHAY

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Focus Products
Why Vishay?

Thin Film

- TNPW, TNPV, TNPR
- Technology leader
- Capacity expansion
- Improved pricing
- Pb version available
- COO: Germany, Israel

Precision, Stability

Thick Film

- CRCW, CRCW*HP, RC*
- Technology leader
- Capacity expansion
- Improved pricing
- Pb version available
- COO: Israel, Taiwan

High Power, High Pulse

Wirewound

- AC-AT, AC-CS, AC-NI
- The only supplier offering AEC-Q200
- Most cost-effective solution for customers
- Capacity expansion
- COO: India, Czech Republic

Pre-charge and Discharge

Melf

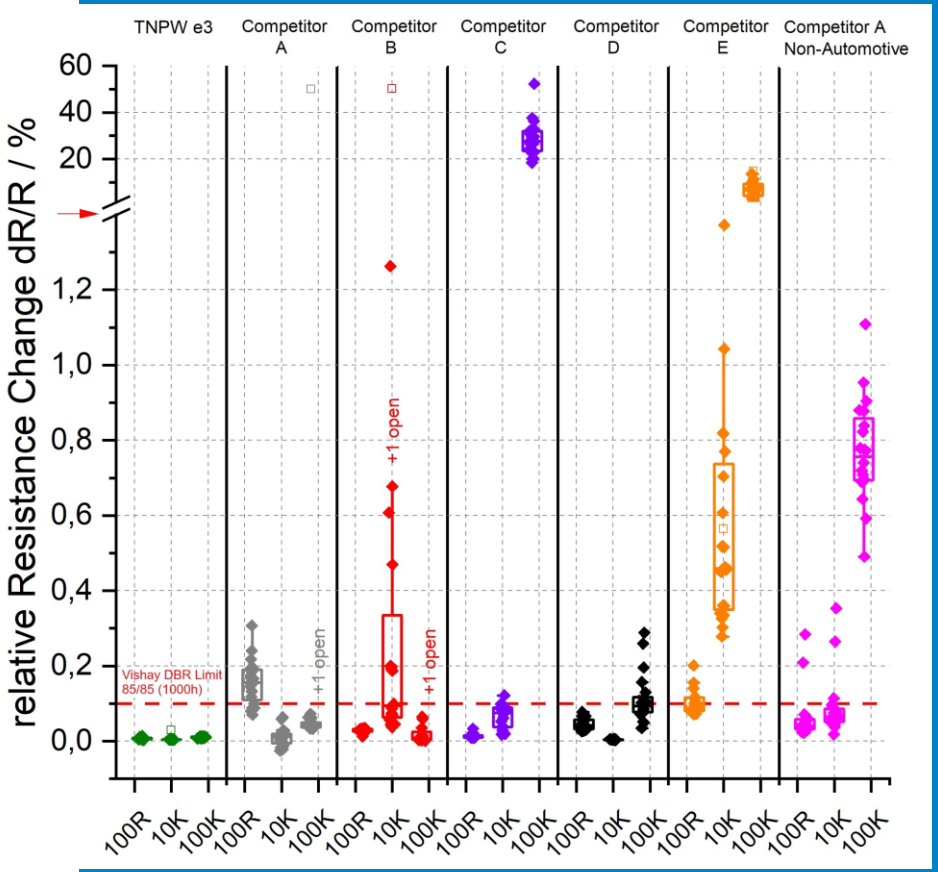
- MMA, MMB, SMM
- CMA, CMB
- Market & technology leader
- Very little competition
- Specification upgrades
- COO: Germany

High Pulse and High Precision

Thin Film Resistor

Proven Reliability Beyond Industry Standards

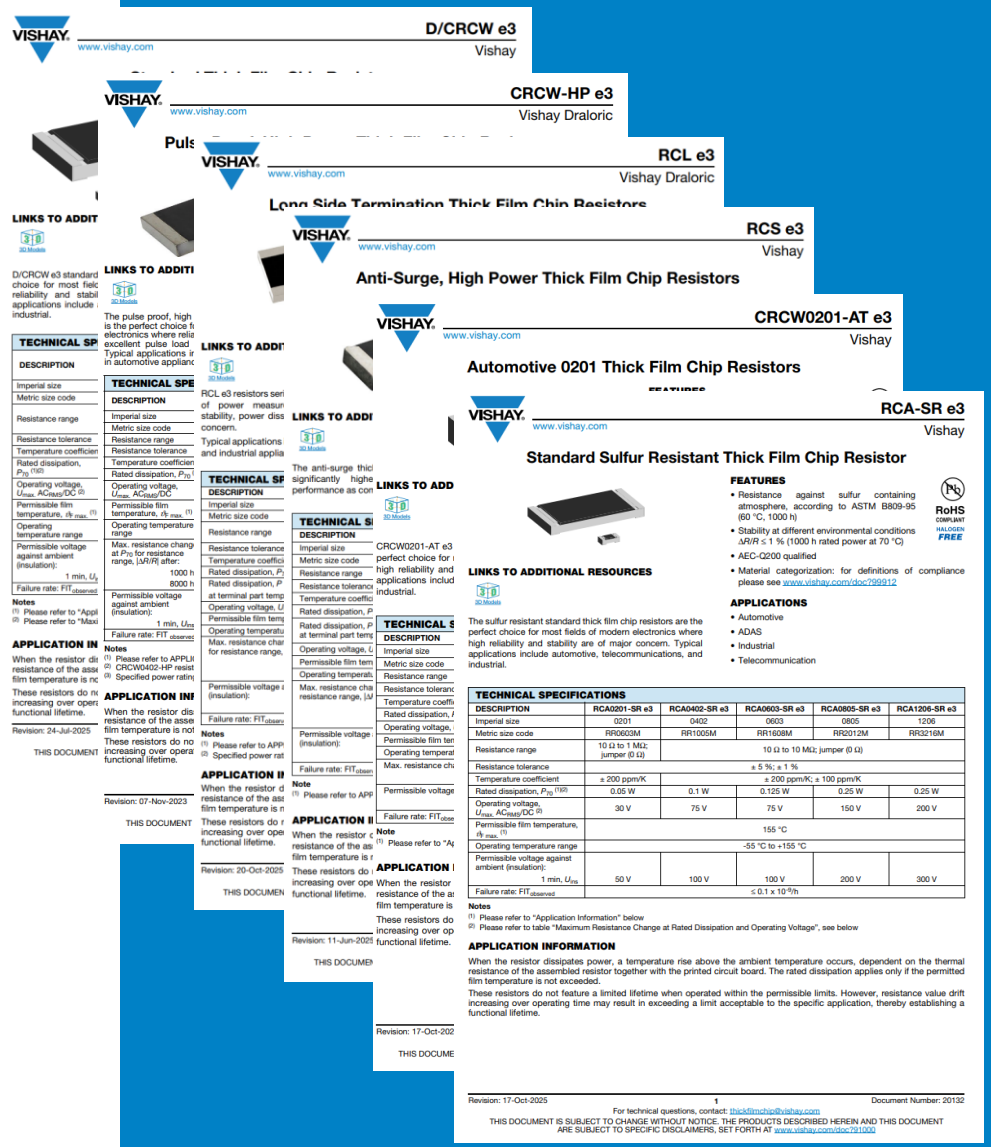
- We offer the broadest thin film portfolio in the industry – covering all applications and needs
- When others fail, Vishay performs – proven after 10 000 h in the toughest AEC-Q200 test
- **NEXT BIG THING:** patented technology for the ultimate corrosion protection and long-term stability, launching in 2027
- Leading in sustainability: first to market with green and PFAS-free thin film resistors



Thick Film Resistor

Driving Performance and Competitiveness

- Specification Upgrades
  - CRCW (standard automotive R chip)
  - CRCW-HP, RCL, RCA, RCS (special R chips)
- New Product Launches:
  - CRCW0201-AT (miniaturization)
  - RCA-SR / CRCW-SR (anti-sulfur thick film)
  - CRCW-SP (precision thick film)
  - More subcon products (thick film specials)
- **Competitive prices** for all new products



Applications in Focus

Draloric / Beyschlag Resistors

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Focus Applications Where to position?

High Voltage Dividers

- **TNPV, MMx HV AT, RCV AT**
- Precise measurement with thin film technology over lifetime $\Delta R/R < \pm 1$ %
- Redundant or basic measurement with thick film technology over lifetime $\Delta R/R \geq \pm 6$ %

Precision, Stability, Redundancy

Gate & Snubber Circuits

- **CRCW HP, MMx, RCL**
- Limit peak current
- Suppress surge voltages
- Controlling switching speeds
- Prevent gate ringing
- Avoid parasitics turn-on

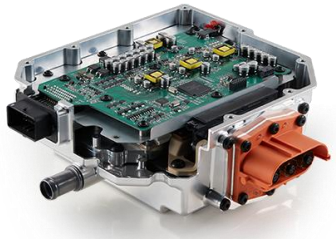
High Power, High Pulse

Pre- and Discharge Circuits

- **AC-AT, MMx, RCL**
- Active or passive discharge of capacitors
- Limit peak current
- Suppress surge voltage
- Safe open function in case of failure

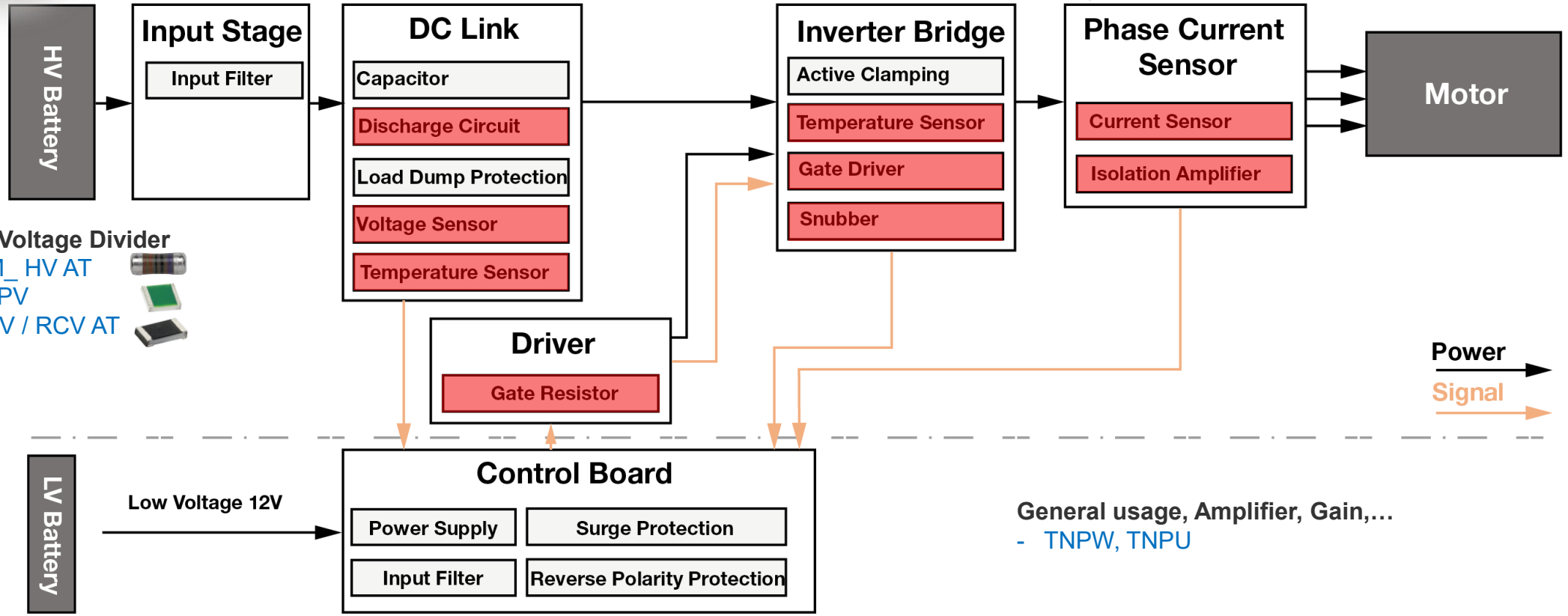
High Pulse, High Energy

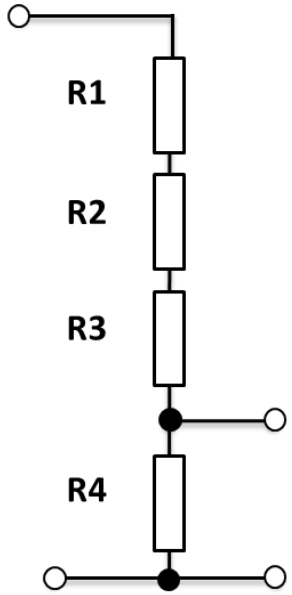
Where to Find These Resistors in an Inverter



DC-Link Discharge R
- MM_, CM_
- RCL,
- AC-AT

Gate Resistor & Snubber
- MM_, CM_
- CRCW HP
- RCL
- AC-NI





High Voltage Divider

Application

- Battery management systems
- Battery junction box, battery disconnect unit, power distribution unit
- DC/DC converter
- On-board and wall charger

Combo

- Inverters
- e-compressor / e-supercharger
- Server and AI power supplies
- Uninterruptible power supplies

Benefits

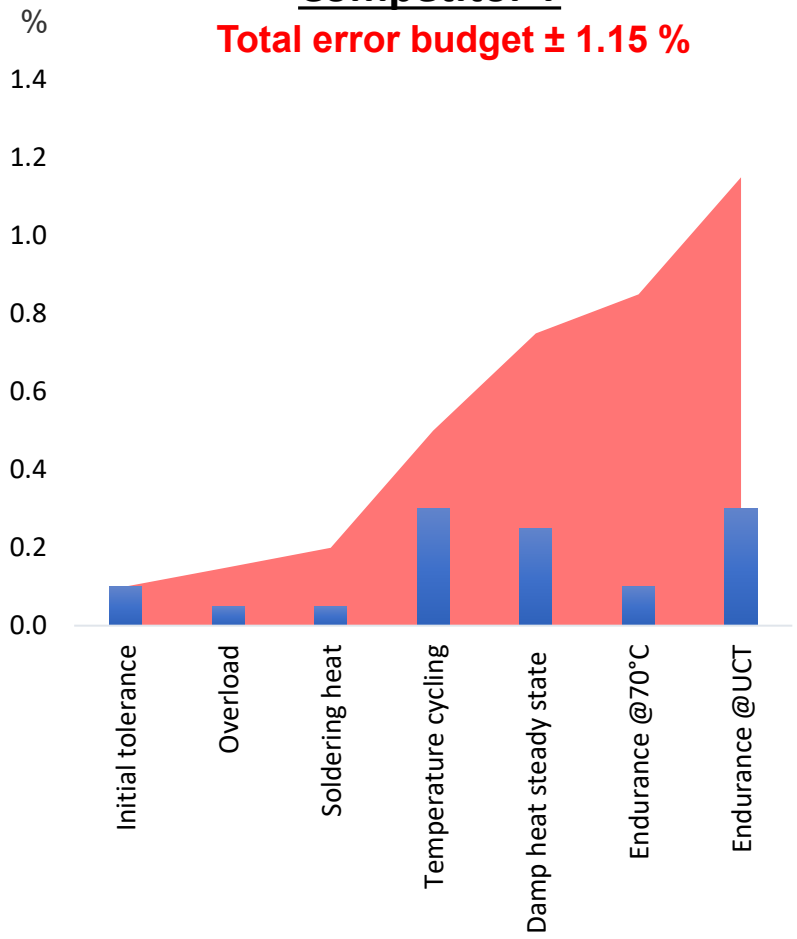
- Reduce component counts
- Reduce board space requirements
- Reduce assembly costs
- Reduce failure rate of entire circuit
- Reduce drift behavior over lifetime (thin film)

High Voltage Thin Film – Vishay vs Competition

… Vishay Has 2x Lower Error Budget

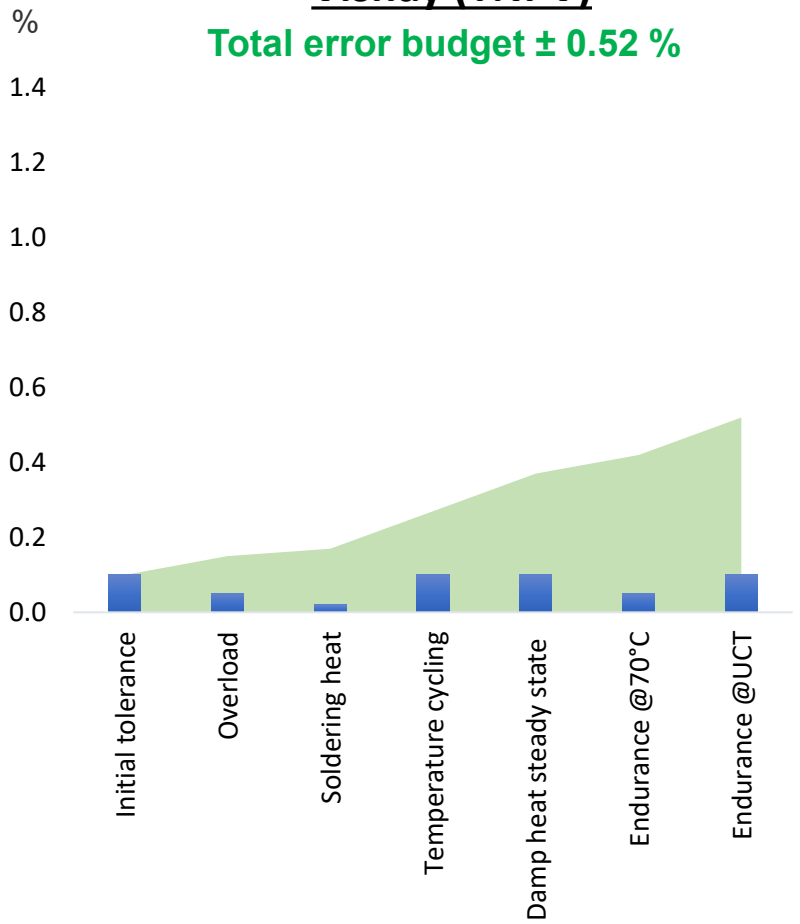
Competitor Y

Total error budget ± 1.15 %



Vishay (TNPV)

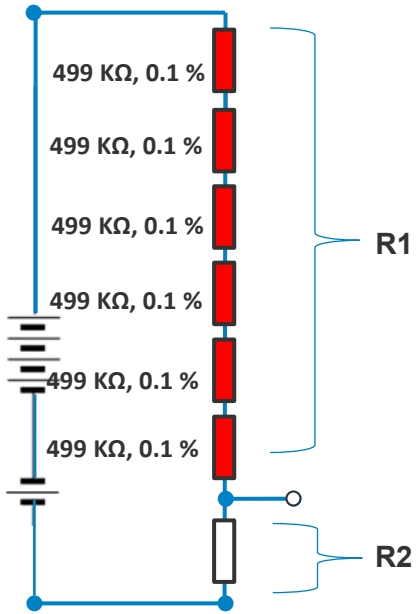
Total error budget ± 0.52 %



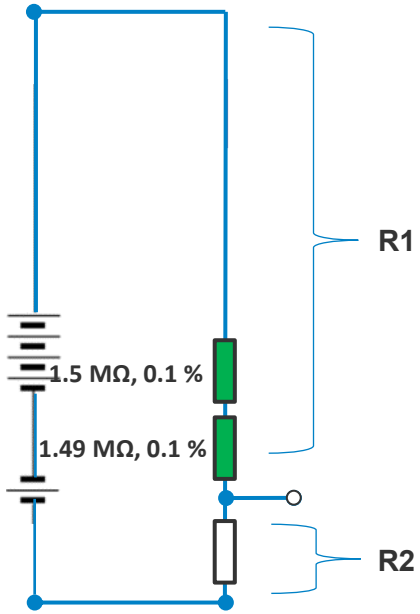
High Voltage Thin Film – Why Our TNPV Is the Best Choice

… Save Space and Money

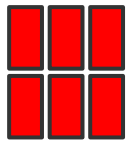
Standard Thin Film (1206)



Vishay TNPV (1206)

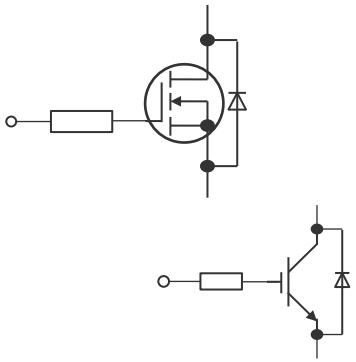


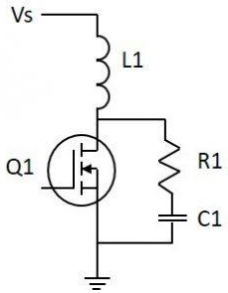
	Standard	TNPV
Products	499 KΩ 6pcs	1.5 MΩ 1pcs 1.49 MΩ 1pcs
R1 (Total)	2.994 MΩ	2.99 MΩ
Voltage (Umax)	1200 V	1400V
Tolerance	0.1 %	0.1 %
TCR	25 ppm/°C	25 ppm/°C
Size (inch)	1206	1206
Total Q'ty	6	2
Price (pcs)		
Price (total)		

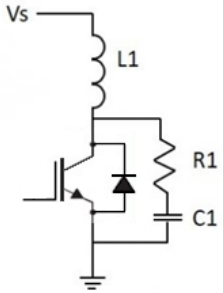


3.0x smaller

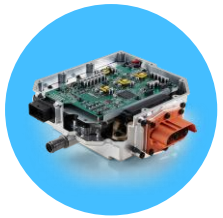
Cost savings up to 55 %







Gate & Snubber Circuits



Applications

- DC/DC converters
- On-board and wall chargers
- Inverters
- eFuses / circuit breakers
- e-compressor / e-supercharger
- Server / AI power supplies
- Uninterruptible power supplies

Benefits

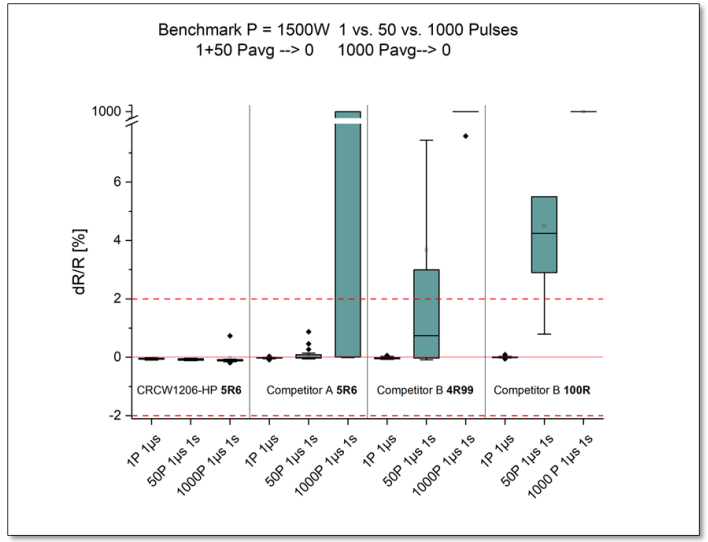
- Reduce component counts
- Reduce board space requirements
- Reduce assembly costs
- Reduce failure rate of entire circuit

Vishay CRCW-HP Series

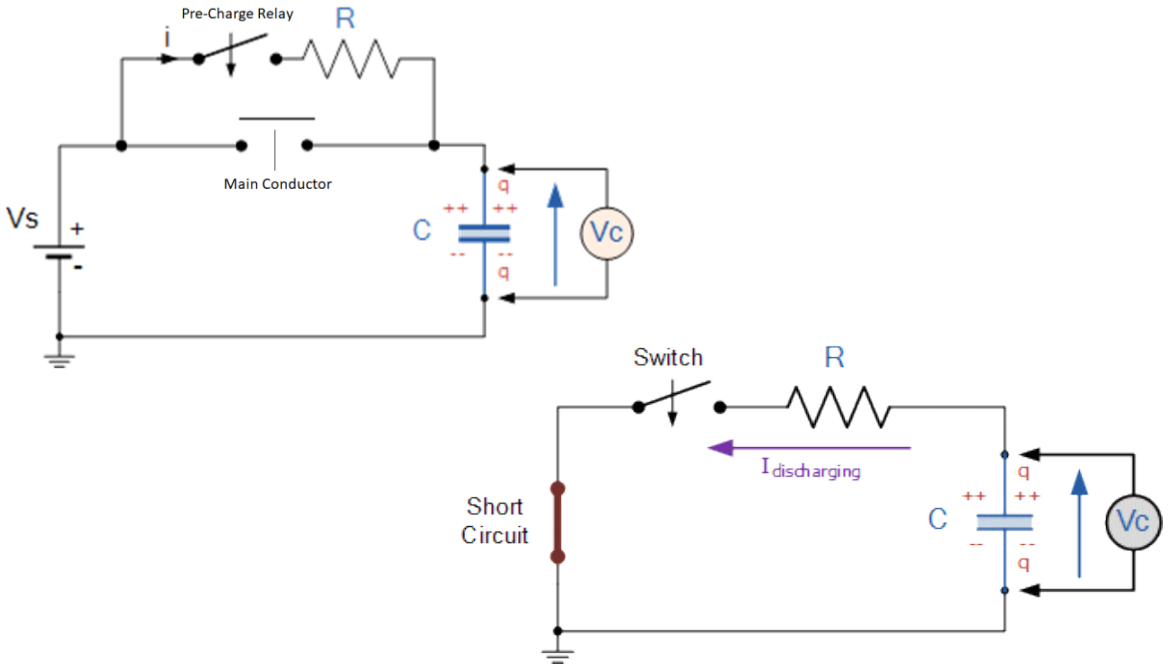
… High Pulse and High Power Handling in Small Form Factors

Features

- Double-sided printed design with flexible terminations
- Increased power rating to footprint ratio
- Superior pulse characteristics
- Better thermal cycling performance
- Rated power is 1.5x to 3x higher than std. R chips
- New pulse upgrade implemented



Size	Power [W]		CRCW-HP TPT_{105}
	Standard	CRCW-HP P_{70}	
0402	0.063	**0.200**	**0.330**
0603	0.100	**0.330**	**0.750**
0805	0.125	**0.500**	**1.500**
1206	0.250	**0.750**	**1.500**
1210	0.500	**0.750**	**2.500**
1218	1.000	**1.500**	**3.500**
2010	0.750	**1.000**	**1.750**
2512	1.000	**1.500**	**2.000**



Pre- and Discharge Circuits

Applications

- Battery management systems
- Battery junction boxes, battery disconnect units, power distribution units
- DC/DC converters
- On-board and wall chargers
- Inverters
- e-compressors / e-superchargers

Benefits

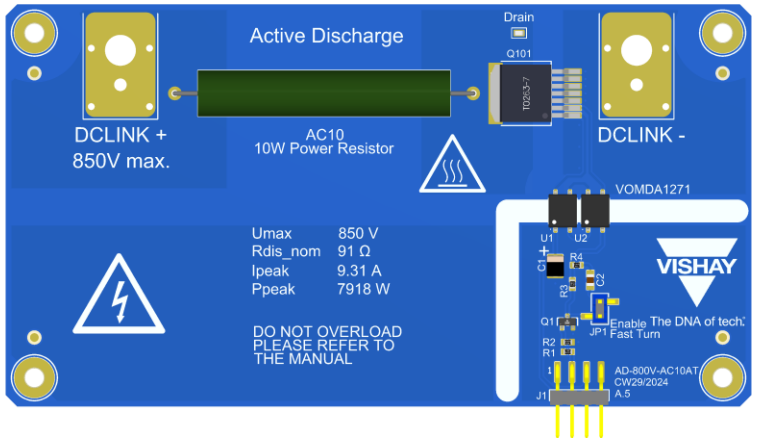
- Reduce component counts
- Reduce board space requirements
- Reduce assembly costs
- Reduce failure rate of entire circuit
- Reduce drift behavior over lifetime (thin film)

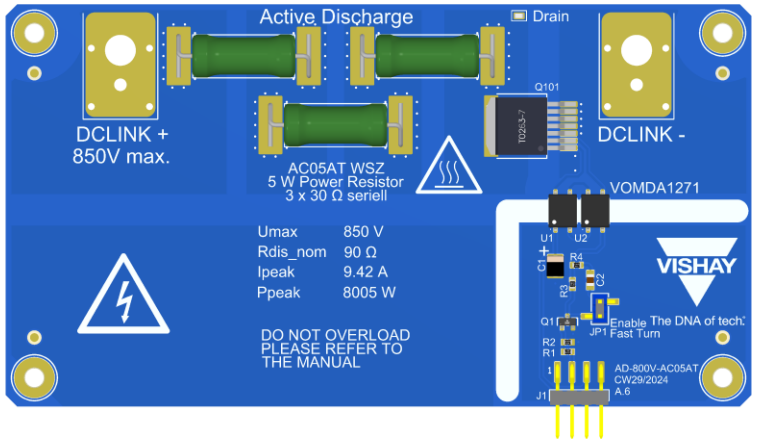
Vishay AC, AC-AT Series

… Only Automotive Grade Wirewound Resistor

Features

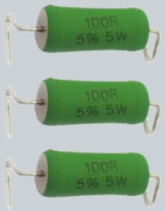
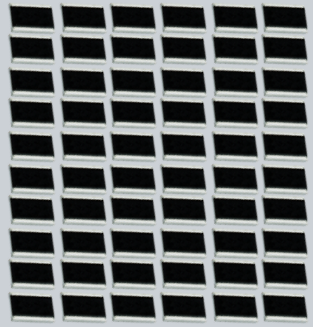
- AC-AT = AEC-Q200 qualified
- Extremely high adiabatic energy handling up to 100 J, equal to 100 kW for 1 ms
- No active cooling necessary
- SMD and customized solutions
- Failure rate $< \mathbf{0.7} \cdot \mathbf{10^{-9}}/\boldsymbol{h}$, with safe open fail
- Non-inductive and AEC-Q200 qualified
- Thermal simulation supported by Vishay to decrease time to market



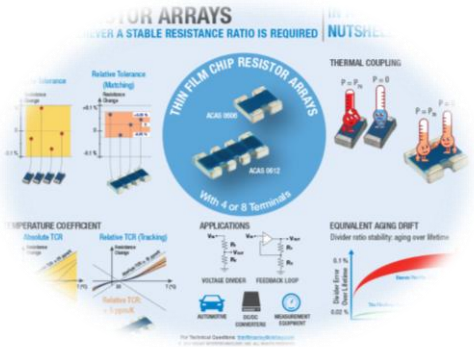


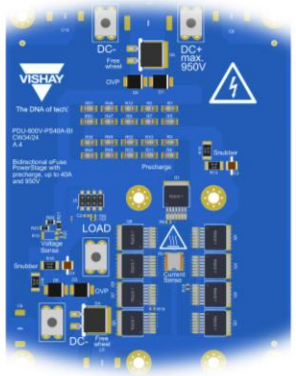
Vishay AC, AC-AT Series

… the most cost-effective solution for precharge and discharge applications

Technology	Wirewound THT	Wirewound SMD	Melf	Thick Film Long Side 1225	Other solutions
Resistor Space					…
Resistor Solution Cost (relative)	$	$ $	$ $ $ $	$ $ $ $ $	…

Design Resources & Selling Tools





Promotion Materials

- Cheat Sheets
- Selector Guides
- Infographics
- Application Notes, White Papers
- Sample Kits

Simulation Tools

- 3D Models
- S-Parameters
- Parasitics
- Calculators

Reference Designs

- Insulated Voltage Sensor
- Precharge
- Active Discharge
- DC/DC Converter
- eFuse

BUILT TO WIN

Vishay Everyday – DBR Everywhere

- **Our products are everywhere,** the “salt, pepper and spice” of every electronics design: essential, reliable, always present (CRCW, TNPW)
- **We make customers’ lives easier,** fewer components, less board space, lower cost, higher reliability – with solutions like TNPV and AC-AT
- **We lead the technology game** in Thin Film, Thick Film, MELF and Wirewound – and with our upgrades, the gap to competitors is bigger than ever
- **We deliver – today and tomorrow** with expanded capacity, stronger pricing and global COO options that ensure stability and performance

Better specs. More capacity. Global COO flexibility. Stronger prices.

DBR is more competitive than ever – and ready to win with you, everywhere.

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