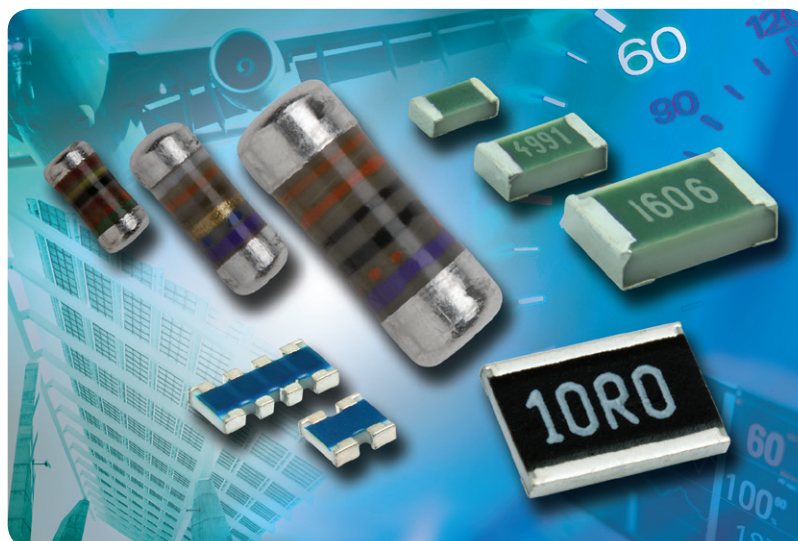




SMD RESISTORS

Vishay Draloric / Beyschlag

Vishay Draloric / Beyschlag SMD Resistor Solutions for All Types of Applications



KEY BENEFITS

- Broadest portfolio
- High-performing products
- Standard, professional, precision, semi-precision, and ultra-precision product range

FEATURES

- Resistor solutions for application-specific requirements, such as:
 - High pulse load
 - High voltage
 - High power
 - High reliability
 - High frequency
 - Conductive gluing
 - Sulfur resistant
 - Lead-bearing
 - Voltage divider
 - Trimmable
 - Fully green

RESOURCES

- For technical questions, please contact: melf@vishay.com, thinfilmchip@vishay.com, thickfilmchip@vishay.com, thinfilmmarray@vishay.com, specialresistors@vishay.com
- Please find your relevant sales contacts at: www.vishay.com/doc?99914

A **WORLD OF**
SOLUTIONS



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ACCURACY CLASSIFICATION

	Standard e.g. TCR 100 / 1 %	Semi-Precision e.g. TCR 100 / 0.5 %	Professional e.g. TCR 50 / 1 %	Precision e.g. TCR 25 / 0.1 %	Ultra-Precision e.g. TCR 5 / 0.05 %
Thin Film MELF (pp. 5-6)			MM SMM	MM SMM	UM
Thin Film Chip and Array (pp. 7-9)			MC MC AT MCW AT ACAS	MC MC AT MCW AT ACAS AT TNPW e3	TNPU e3 ACAS ACAS AT
Thick Film Chip and Array (pp. 10-12)	CRCW e3 RCA e3 CRA RCL e3	CRCW-P e3			



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RESISTOR SOLUTIONS FOR SPECIFIC APPLICATION REQUIREMENTS

	High Pulse Load	High Power	High Voltage	Sulfur Resistant	High Reliability	High Frequency
Thin Film MELF (pp. 5-6)	MM SMM	MMA 0204 HT MM SMM	MM HV	MM SMM	MM VG03 SMM0204 EN803 E8 MS1	MM HF SMM0204 HF
Thin Film Chip (pp. 7-9)	MC MC AT MCW AT	MC AT MCW AT NCW AT	TNPV e3	MC MC AT MCW AT NCW AT TNPW e3	MC VG01 TNPS	
Thick Film Chip (pp. 10-12)	CRCW-HP e3 CRCW-IF e3 RCA-IF AT e3	CRCW-HP e3 RCL e3 RCA-LS e3	RCV e3	RCA e3 RCA-LS e3 RCA-IF AT e3	D EN802 E6 CRCW EN802 E6	
Carbon Film MELF (p. 6)	CM	CM	CMB	CM		CMA HF



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RESISTOR SOLUTIONS FOR SPECIFIC APPLICATION REQUIREMENTS









	Conductive Gluing	Lead-Bearing	Voltage Divider	Trimmable	Fully Green	AEC-Q200 Qualified
Thin Film MELF (pp. 5-6)		MS1 ESCC MS1 EN803			MM SMM	MM SMM
Thin Film Chip (pp. 7-9)	MC ATAU ACAS ATAU	TNPW	ACAS ACAS AT			ACAS AT ACAS ATAU MC AT MC ATAU MCW AT NCW AT TNPW e3 TNPU e3 TNPV e3 ⁽¹⁾
Thick Film Chip (pp. 10-12)	D AP CRCW-AP	CRCW CRCW-P D EN802 CRCW-TR CRCW-HR		CRCW-TR e3	RCG e3	CRCW e3 CRCW-P e3 RCA e3 RCL e3 CRCW-HP e3 CRCW-IF e3 CRA RCA-IF AT e3
Carbon Film MELF (p. 6)					CM	CM

⁽¹⁾ Qualification under preparation.



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Thin Film MELF Resistors			
Series	Description	Features	Brand
MMU, MMA, MMB Professional  	<ul style="list-style-type: none"> Professional MELF Resistors Size: 0102 to 0207 Tolerance: $\pm 0.5\%$ to $\pm 5\%$ TCR: ± 25 ppm/K to ± 100 ppm/K Resistance range: $0.22\ \Omega$ to $15\ \text{M}\Omega$; $0\ \Omega$ Power ratings: $0.3\ \text{W}$ to $1\ \text{W}$ 	<ul style="list-style-type: none"> Precise and stable thin film technology High power ratings IECQ - CECC approval to EN 140401-803 AEC-Q200 qualified 	Beyschlag
MMU, MMA, MMB Precision  	<ul style="list-style-type: none"> Precision MELF Resistors Size: 0102 to 0207 Tolerance: $\pm 0.1\%$ to $\pm 0.5\%$ TCR: ± 15 ppm/K to ± 25 ppm/K Resistance range: $10\ \Omega$ to $1\ \text{M}\Omega$ Power ratings: $0.2\ \text{W}$ to $0.4\ \text{W}$ 	<ul style="list-style-type: none"> Precise and stable thin film technology IECQ - CECC approval to EN 140401-803 Advanced level of precision and stability AEC-Q200 qualified 	Beyschlag
SMM 0102, 0204, 0207  	<ul style="list-style-type: none"> Precision and Professional MELF Resistors Size: 0102 to 0207 Tolerance: $\pm 0.1\%$ to $\pm 5\%$ TCR: ± 15 ppm/K to ± 100 ppm/K Resistance range: $0.16\ \Omega$ to $10\ \text{M}\Omega$; (OMM) $0\ \Omega$ Power rating: $0.2\ \text{W}$ to $1\ \text{W}$ 	<ul style="list-style-type: none"> Precise and stable thin film technology High power rating AEC-Q200 qualified 	Draloric
UMA 0204, UMB 0207  	<ul style="list-style-type: none"> High-Precision MELF Resistors Size: 0204, 0207 Tolerance: $\pm 0.02\%$ to $\pm 0.25\%$ TCR: ± 5 ppm/K to ± 15 ppm/K Resistance range: $22\ \Omega$ to $390\ \text{k}\Omega$ Power rating: $0.25\ \text{W}$ to $0.4\ \text{W}$ 	<ul style="list-style-type: none"> Superior overall stability High-precision thin film technology IECQ - CECC approval to EN 140401-803 	Beyschlag
SMM 0204 EN803 E0  	<ul style="list-style-type: none"> MINI-MELF Resistors (CECC approved) Size: 0204 Tolerance: $\pm 0.1\%$ to $\pm 5\%$ TCR: ± 15 ppm/K to ± 100 ppm/K Resistance range: $1\ \Omega$ to $2.21\ \text{M}\Omega$ Power rating: $0.25\ \text{W}$ 	<ul style="list-style-type: none"> High-reliability product AEC-Q200 qualified IECQ-CECC approval to EN 140401-803 	Draloric
SMM 0204.... EN803 E8  	<ul style="list-style-type: none"> MINI-MELF Resistors with Established Reliability Size: 0204 Tolerance: $\pm 0.1\%$; $\pm 1\%$ TCR: ± 15 ppm/K; ± 50 ppm/K Resistance range: $1\ \Omega$ to $2.21\ \text{M}\Omega$ Power rating: $0.25\ \text{W}$ 	<ul style="list-style-type: none"> Approved to EN 140401-803, version E: Established reliability, failure rate level E8 Stable metal film on high-quality ceramic 	Draloric
MS1....EN803 E8  	<ul style="list-style-type: none"> Lead (Pb)- Bearing MINI-MELF Resistors with Established Reliability Size: 0204 Tolerance: $\pm 0.1\%$; $\pm 1\%$ TCR: ± 15 ppm/K; ± 50 ppm/K Resistance range: $1\ \Omega$ to $2.21\ \text{M}\Omega$ Power rating: $0.25\ \text{W}$ 	<ul style="list-style-type: none"> Approved to EN 140401-803, version E: Established reliability, failure rate level E8 Stable metal film on high-quality ceramic SnPb termination plating, Pb contents $> 6\%$ Meets Bellcore, MIL, and ESCC plating requirements 	Draloric



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Thin Film MELF Resistors			
Series	Description	Features	Brand
MS1...ESCC 	<ul style="list-style-type: none"> • Hi-Rel Thin Film MINI-MELF Resistors • Size: 0204 • Tolerance: $\pm 0.1\%$ to $\pm 1\%$ • TCR: ± 15 ppm/K to ± 50 ppm/K • Resistance range: 2.21 Ω to 5.11 MΩ • Power rating: 0.25 W 	<ul style="list-style-type: none"> • High-reliability product • ESA approved to ESCC 4001/022 • Advanced thin film technology • SnPb termination plating, minimum 6 % Pb 	Draloric
MMU 0102 HF, MMA 0204 HF, MMB 0207 HF 	<ul style="list-style-type: none"> • High-Frequency MELF Resistors • Size: 0102 to 0207 • Tolerance: $\pm 1\%$ to $\pm 2\%$ • TCR: ± 50 ppm/K • Resistance range: 1.5 Ω to 475 Ω • Power ratings: 0.3 W to 1.0 W 	<ul style="list-style-type: none"> • Speciality product for RF applications • Low-inductance non-helical trimmed product 	Beyschlag
MMU 0102 VG03, MMA 0204 VG03, MMB 0207 VG03 	<ul style="list-style-type: none"> • Precision and Professional MELF Resistors with Established Reliability • Size: 0102 to 0207 • Tolerance: $\pm 0.1\%$ to $\pm 1\%$ • TCR: ± 15 ppm/K to ± 50 ppm/K • Resistance range: 1 Ω to 10 MΩ; 0 Ω • Power ratings: 0.2 W to 0.4 W 	<ul style="list-style-type: none"> • Established reliability, failure rate level E6 (corresponds to MIL level P) • Precise and stable thin film technology • IECQ - CECC approval to EN 140401-803 	Beyschlag
MMA 0204 HT 	<ul style="list-style-type: none"> • Professional High-Temperature MINI-MELF Resistor • Size: 0204 • Tolerance: $\pm 0.5\%$ to $\pm 1\%$ • TCR: ± 25 ppm/K to ± 50 ppm/K • Resistance range: 47 Ω to 100 kΩ; 0 Ω • Power rating: 0.5 W 	<ul style="list-style-type: none"> • 175 °C specified operating temperature • AEC-Q200 qualified • Excellent stability, $< 0.1\%$ 	Beyschlag
MMA 0204 HV MMB 0207 HV 	<ul style="list-style-type: none"> • Professional High-Voltage Thin Film MELF Resistors • Size: 0204 and 0207 • Tolerance: $\pm 1\%$ • TCR: ± 50 ppm/K • Resistance range: 340 kΩ to 10 MΩ • Power rating: 0.4 W to 1.0 W 	<ul style="list-style-type: none"> • High operating voltage, $U_{max.} = 1000$ V • Advanced metal film technology • Matte Sn termination on Ni barrier layer 	Beyschlag
Carbon Film MELF Resistors			
Series	Description	Features	Brand
CMA 0204, CMB 0207 	<ul style="list-style-type: none"> • High Pulse Load MELF Resistors • Size: 0204 and 0207 • Tolerance: $\pm 1\%$ to $\pm 5\%$ • TCR: see datasheet • Resistance range: 2.2 Ω to 1.5 MΩ • Power rating: 0.4 W to 1 W • Up to 10 kV or 17 kW single pulse capability 	<ul style="list-style-type: none"> • Special carbon film technology • Outstanding pulse load stability • High power ratings • AEC-Q200 qualified • CMB: VDE approval to IEC 60065, 14.2.a (= VDE 0860, 14.1.a) 	Beyschlag
CMA 0204 HF 	<ul style="list-style-type: none"> • Pulse Load MELF Resistors for High-Frequency Applications • Size: 0204 • Tolerance: $\pm 2\%$ • TCR: -250 ppm/K • Resistance range: 47 Ω to 300 Ω • Power rating: 0.4 W 	<ul style="list-style-type: none"> • Specialty product for RF applications • ESD capability: 3 kV, human body model • Suitable for more than 10 GHz 	Beyschlag



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Thin Film Chip Resistors			
Series	Description	Features	Brand
TNPW e3  	<ul style="list-style-type: none"> • High-Stability Precision Thin Film Chip Resistors • Size: 0402 to 1210 • Tolerance: $\pm 0.1\%$ to $\pm 1\%$ • TCR: ± 10 ppm/K to ± 50 ppm/K • Resistance range: $4.7\ \Omega$ to $3.01\ M\Omega$ • Power ratings: $0.063\ W$ to $0.33\ W$ 	<ul style="list-style-type: none"> • Low temperature coefficient and tight tolerances • Superior moisture resistivity • Excellent overall stability at different environmental conditions • AEC-Q200 qualified (sizes 0402 to 1206) 	Vishay
TNPW 	<ul style="list-style-type: none"> • High-Stability Precision Thin Film Chip Resistors • Size: 0402 to 1210 • Tolerance: $\pm 0.1\%$ to $\pm 1\%$ • TCR: ± 10 ppm/K to ± 50 ppm/K • Resistance range: $10\ \Omega$ to $3.01\ M\Omega$ • Power ratings: $0.063\ W$ to $0.33\ W$ 	<ul style="list-style-type: none"> • SnPb termination plating, minimum 6 % Pb • Excellent overall stability at different environmental conditions • Low temperature coefficient and tight tolerances 	Vishay
TNPU e3  	<ul style="list-style-type: none"> • High-Precision Thin Film Chip Resistors • Size: 0603 to 1206 • Tolerance: $\pm 0.02\%$ to $\pm 0.1\%$ • TCR: ± 2 ppm/K to ± 10 ppm/K • Resistance range: $100\ \Omega$ to $511\ k\Omega$ • Power ratings: $0.1\ W$ to $0.25\ W$ 	<ul style="list-style-type: none"> • Low temperature coefficient and tight tolerances • Superior moisture resistivity • AEC-Q200 qualified 	Draloric
TNPV e3 	<ul style="list-style-type: none"> • High-Voltage Thin Film Flat Chip Resistors • Size: 1206 and 1210 • Tolerance: $\pm 0.1\%$ to $\pm 1\%$ • TCR: ± 10 ppm/K to ± 50 ppm/K • Resistance range: $121\ k\Omega$ to $3.01\ M\Omega$ • Power rating: $0.25\ W$ to $0.33\ W$ 	<ul style="list-style-type: none"> • High operating voltage U_{max} up to $1000\ V$ • Precision properties: TCR and tolerances down to ± 10 ppm/K; $\pm 0.1\%$ • Excellent overall stability at different environmental conditions • Superior moisture resistivity 	Draloric
MC Professional 	<ul style="list-style-type: none"> • Professional Thin Film Chip Resistors • Size: 0402 to 1206 • Tolerance: $\pm 0.5\%$ to $\pm 1\%$ • TCR: ± 25 ppm/K to ± 50 ppm/K • Resistance range: $1\ \Omega$ to $10\ M\Omega$; $0\ \Omega$ • Power ratings: $0.1\ W$ to $0.4\ W$ 	<ul style="list-style-type: none"> • Excellent overall stability: Class 0.5 • IECQ - CECC approval to EN 140401-801 	Beyschlag
MC Precision 	<ul style="list-style-type: none"> • Precision Thin Film Chip Resistors • Size: 0402 to 1206 • Tolerance: $\pm 0.1\%$ to $\pm 0.25\%$ • TCR: ± 10 ppm/K to ± 25 ppm/K • Resistance range: $39\ \Omega$ to $2\ M\Omega$ • Power ratings: $0.063\ W$ to $0.25\ W$ 	<ul style="list-style-type: none"> • Superior overall stability: Class 0.1 and 0.25 • IECQ - CECC approval to EN 140401-801 	Beyschlag
MC AT Professional  	<ul style="list-style-type: none"> • Professional Automotive Grade Thin Film Chip Resistors • Size: 0402 to 1206 • Tolerance: $\pm 0.5\%$ to $\pm 1\%$ • TCR: ± 25 ppm/K to ± 50 ppm/K • Resistance range: $1\ \Omega$ to $1\ M\Omega$; $0\ \Omega$ • Power ratings: $0.1\ W$ to $0.4\ W$ 	<ul style="list-style-type: none"> • High-temperature operation up to $175\ ^\circ C$ • IECQ - CECC approval to EN 140401-801 • AEC-Q200 qualified • Superior moisture resistivity 	Beyschlag
MC AT Precision  	<ul style="list-style-type: none"> • Precision Automotive Grade Thin Film Chip Resistors • Size: 0402 to 1206 • Tolerance: $\pm 0.1\%$ • TCR: ± 10 ppm/K to ± 25 ppm/K • Resistance range: $47\ \Omega$ to $1\ M\Omega$ • Power ratings: $0.1\ W$ to $0.4\ W$ 	<ul style="list-style-type: none"> • Advanced level of precision and stability • IECQ - CECC approval to EN 140401-801 • AEC-Q200 qualified • Superior moisture resistivity 	Beyschlag



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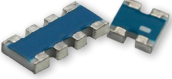

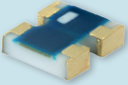

Thin Film Chip Resistors			
Series	Description	Features	Brand
MC ATAU Precision 	<ul style="list-style-type: none"> • Precision Gold-Terminated Thin Film Chip Resistors for Conductive Gluing • Size: 0402 and 0603 • Tolerance: $\pm 0.1\%$ • TCR: ± 15 ppm/K and ± 25 ppm/K • Resistance range: 100 Ω to 100 kΩ • Power rating: 0.1 W to 0.125 W 	<ul style="list-style-type: none"> • Gold terminations for conductive gluing • Superior temperature cycling robustness • Superior moisture resistivity • AEC-Q200 qualified 	Beyschlag
MCW 0406 AT Professional 	<ul style="list-style-type: none"> • Professional Wide Terminal Thin Film Chip Resistor • Size: 0406 • Tolerance: $\pm 0.5\%$ to $\pm 1\%$ • TCR: ± 25 ppm/K to ± 50 ppm/K • Resistance range: 1 Ω to 100 kΩ • Power rating: 0.3 W 	<ul style="list-style-type: none"> • Rated dissipation P_{85} up to 300 mW • Superior temperature cycling robustness • AEC-Q200 qualified • High-temperature operation up to 175 $^{\circ}\text{C}$ 	Beyschlag
MCW 0406 AT Precision 	<ul style="list-style-type: none"> • Precision Wide Terminal Thin Film Chip Resistor • Size: 0406 • Tolerance: $\pm 0.1\%$ • TCR: ± 15 ppm/K to ± 25 ppm/K • Resistance range: 1 Ω to 100 kΩ • Power rating: 0.25 W 	<ul style="list-style-type: none"> • Advanced level of precision and stability • Precision (TCR ± 15 ppm/K; $\pm 0.1\%$ tolerance) down to 1 Ω • Superior temperature cycling robustness • AEC-Q200 qualified 	Beyschlag
NCW 0406 AT 	<ul style="list-style-type: none"> • Low-Ohmic Wide Terminal Thin Film Chip Resistors • Size: 0406 • Tolerance: $\pm 1\%$ • TCR: ± 50 ppm/K • Resistance range: 0.33 Ω to 0.91 Ω • Power rating: 0.3 W 	<ul style="list-style-type: none"> • Rated power dissipation $P_{85} = 300$ mW • Resistance range down to 0.33 Ω • Superior temperature cycling robustness • Superior moisture resistivity • AEC-Q200 qualified 	Beyschlag
MC VG01 	<ul style="list-style-type: none"> • Thin Film Chip Resistors with Established Reliability • Size: 0402 to 1206 • Tolerance: $\pm 0.1\%$; $\pm 1\%$ • TCR: ± 15 ppm/K; ± 50 ppm/K • Resistance range: 1 Ω to 1 MΩ; 0 Ω • Power ratings: 0.063 W to 0.25 W 	<ul style="list-style-type: none"> • Established reliability, failure rate level 6 (corresponds to MIL level P) • Advanced level of precision and stability • IECQ - CECC Approval to EN 140401-801 	Beyschlag
TNPS...ESCC 	<ul style="list-style-type: none"> • Hi-Rel Thin Film Chip Resistors • Size: 0603 to 1206 • Tolerance: $\pm 0.1\%$ to $\pm 1\%$ • TCR: ± 15 ppm/K to ± 50 ppm/K • Resistance range: 10 Ω to 1 MΩ • Power ratings: 0.1 W to 0.25 W 	<ul style="list-style-type: none"> • ESA approval to ESCC 4001/029 • Advanced level of precision and stability • SnPb termination plating, minimum 6 % Pb 	Draloric
ACAS 0612 Professional 	<ul style="list-style-type: none"> • Professional Thin Film Chip Resistor Array • Size: 0612 • Tolerance: $\pm 0.5\%$; $\pm 1\%$ • TCR: ± 25 ppm/K to ± 50 ppm/K • Resistance range: 47 Ω to 221 kΩ • Power rating per element: 0.1 W 	<ul style="list-style-type: none"> • Four insulated resistors on one substrate • Two pairs or four equal resistor values • Resistance ratio up to 10:1 • Professional applications with space constraints 	Beyschlag
ACAS 0612 Precision 	<ul style="list-style-type: none"> • Precision Thin Film Chip Resistor Array • Size: 0612 • Relative tolerance: down to $\pm 0.05\%$ • Relative TCR: down to ± 5 ppm/K • Resistance range: 47 Ω to 221 kΩ • Power rating per element: 0.1 W 	<ul style="list-style-type: none"> • Four insulated resistors on one substrate • Tight TCR tracking and tolerance matching • Resistance ratio up to 5:1 • For all applications with matched resistors like voltage dividers or feedback circuits 	Beyschlag



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Thin Film Chip Resistors

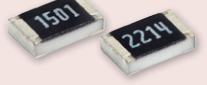
Series	Description	Features	Brand
ACAS 0606 AT ACAS 0612 AT  	<ul style="list-style-type: none"> • Precision Automotive Grade Thin Film Chip Resistor Array • Size: 0606 and 0612 • Relative tolerance: down to $\pm 0.05\%$ • Relative TCR: down to ± 5 ppm/K • Resistance Range: $47\ \Omega$ to $150\ \text{k}\Omega$ • Power rating per element: $0.125\ \text{W}$ 	<ul style="list-style-type: none"> • Superior moisture resistivity • Two or four insulated resistors on one substrate • Tight TCR tracking and tolerance matching • Resistance ratio up to 20:1 • AEC-Q200 qualified • Perfect for automotive and industrial applications with matched resistors like voltage dividers or feedback circuits 	Beyschlag
ACAS 0606 ATAU Precision  	<ul style="list-style-type: none"> • Precision Gold-Terminated Thin Film Chip Resistor Array for Conductive Gluing • Size: 0606 • Relative tolerance: down to $\pm 0.05\%$ • Relative TCR: down to ± 5 ppm/K • Resistance range: $100\ \Omega$ to $150\ \text{k}\Omega$ • Power rating per element: $0.125\ \text{W}$ 	<ul style="list-style-type: none"> • Gold terminations for conductive gluing • Two insulated resistors on one substrate • Tight TCR tracking and tolerance matching • Resistance ratio up to 20:1 • Superior moisture resistivity • AEC-Q200 qualified 	Beyschlag



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Thick Film Chip Resistors			
Series	Description	Features	Brand
D/CRCW e3 	<ul style="list-style-type: none"> • Standard Thick Film Chip Resistors • Size: 0402 to 2512 • Resistance range: 1 Ω to 10 MΩ • Power ratings: 0.063 W to 1 W • Zero ohm jumper: available for all sizes 	<ul style="list-style-type: none"> • AEC-Q200 qualified • Metal glaze on high-quality ceramic 	Vishay
D/CRCW 	<ul style="list-style-type: none"> • Lead (Pb)-Bearing Thick Film Chip Resistors • Size: 0402 to 2512 • Resistance range: 1 Ω to 10 MΩ • Power ratings: 0.063 W to 1 W • Zero ohm jumper: available for all sizes 	<ul style="list-style-type: none"> • SnPb termination plating on Ni barrier, minimum 10% Pb • AEC-Q200 qualified • Metal glaze on high-quality ceramic 	Vishay
RCA e3 	<ul style="list-style-type: none"> • Automotive Grade, Sulfur-Resistant, Lead (Pb)-Free, Thick Film Chip Resistors • Size: 0402 to 2512 • Resistance range: 1 Ω to 10 MΩ • Power ratings: 0.063 W to 1 W • Zero ohm jumper: available for all sizes 	<ul style="list-style-type: none"> • Superior resistance against H₂S-atmosphere • AEC-Q200 qualified • Metal glaze on high-quality ceramic 	Draloric
RCA 	<ul style="list-style-type: none"> • Lead (Pb)-Bearing Automotive Grade, Sulfur-Resistant, Thick Film Chip Resistors • Size: 0402 to 2512 • Resistance range: 1 Ω to 10 MΩ • Power ratings: 0.063 W to 1 W • Zero ohm jumper: available for all sizes 	<ul style="list-style-type: none"> • Superior resistance against H₂S-atmosphere • SnPb termination plating on Ni barrier, minimum 10% Pb • AEC-Q200 qualified 	Vishay
D/CRCW-P e3 	<ul style="list-style-type: none"> • Thick Film Semi-Precision Chip Resistor • Size: 0402 to 2512 • Resistance range: 1 Ω to 10 MΩ • Power ratings: 0.063 W to 1 W 	<ul style="list-style-type: none"> • AEC-Q200 qualified • Tight tolerances (\pm 0.25 %) • Metal glaze on high-quality ceramic • Low TCR (\pm 50 ppm/K) 	Vishay
D/CRCW-P 	<ul style="list-style-type: none"> • Lead (Pb)-Bearing Thick Film Semi-Precision Chip Resistors • Size: 0402 to 2512 • Resistance range: 10 Ω to 10 MΩ • Power ratings: 0.063 W to 1 W 	<ul style="list-style-type: none"> • AEC-Q200 qualified • Tight tolerances (\pm 0.25 %) • Low TCR (\pm 50 ppm/K) • Metal glaze on high-quality ceramic 	Vishay
CRCW... EN802 	<ul style="list-style-type: none"> • Thick Film Chip Resistors with CECC Approval • Size: 0805 / 1206 • Resistance range: 1 Ω to 1 MΩ • Power ratings: 0.125 W / 0.25 W • Zero ohm jumper: available for all sizes 	<ul style="list-style-type: none"> • Compatible with lead (Pb)-free and lead (Pb)-bearing processes • IECQ - CECC approval to EN 140401-802 • Available with established reliability, failure rate level E6 (cor. to MIL level P) 	Draloric
D.. EN802 	<ul style="list-style-type: none"> • Lead (Pb)-Bearing Thick Film Chip Resistors with CECC Approval • Size: 0805 (D12) / 1206 (D25) • Resistance range: 1 Ω to 1 MΩ • Power ratings: 0.125 W / 0.25 W • Zero ohm jumper: available for all sizes 	<ul style="list-style-type: none"> • SnPb termination plating on Ni barrier, minimum 10% Pb • IECQ - CECC approval to EN 140401-802 • Available with established reliability, failure rate level E6 (cor. to MIL level P) 	Draloric

Thick Film Chip Resistors			
Series	Description	Features	Brand
CRCW-HP e3 	<ul style="list-style-type: none"> • Pulse-Proof, High-Power Thick Film Chip Resistors • Size: 0402 to 2512 • Resistance range: 1 Ω to 1 MΩ • Power ratings: 0.125 W to 1.5 W • Tolerance: 0.5 % 	<ul style="list-style-type: none"> • Excellent pulse load capability • Enhanced power rating • Double-sided printed resistor element • Protective overglaze • AEC-Q200 qualified, rev. C compliant 	Draloric
RCL e3 	<ul style="list-style-type: none"> • Long Side Termination Thick Film Chip Resistors • Size: 0406 to 1225 • Resistance range: 1 Ω to 2.2 MΩ • Power ratings: 0.25 W to 2 W 	<ul style="list-style-type: none"> • Enhanced power rating • Long side terminations • Protective overglaze • AEC-Q200 qualified, rev. C compliant • Better performance in temperature cycles 	Draloric
RCA-LS e3 	<ul style="list-style-type: none"> • Sulfur-Resistant, Long Side Termination Thick Film Chip Resistors • Size: 0406 to 1225 • Resistance range: 1 Ω to 2.2 MΩ • Power ratings: 0.25 W to 2 W 	<ul style="list-style-type: none"> • Excellent performance in sulfur environment • Better performance in temperature cycles • Enhanced power rating • Long side terminations • Protective overglaze 	Draloric
RCV e3 	<ul style="list-style-type: none"> • High-Voltage Thick Film Chip Resistors • Size: 0805 to 1206 • Resistance range: 100 kΩ to 10 MΩ • Power ratings: 0.125 W to 0.25 W 	<ul style="list-style-type: none"> • High operating voltage, (up to 500 V) • Metal glaze on high-quality ceramic 	Draloric
RCG e3 	<ul style="list-style-type: none"> • Fully RoHS-Compliant, Green, Thick Film, Rectangular Chip Resistors • Size: 0402 to 1206 • Resistance range: 1 Ω to 10 MΩ • Power ratings: 0.063 W to 0.25 W 	<ul style="list-style-type: none"> • Green resistor – does not use RoHS exemptions • Stability < 1 % = 1 % for 1000 h at 70 °C • Metal glaze on high-quality ceramic 	Draloric
D/CRCW-IF e3 	<ul style="list-style-type: none"> • Thick Film, Rectangular, Pulse-Proof Chip Resistors • Size: 0402 to 2512 • Resistance range: 1 Ω to 100 kΩ • Power ratings: 0.063 W to 1.0 W 	<ul style="list-style-type: none"> • AEC-Q200 qualified • High pulse performance • Metal glaze on high-quality ceramic • Protective overglaze • Lead (Pb)-free solder contacts on Ni barrier layer 	Vishay
RCA-IF AT e3 	<ul style="list-style-type: none"> • Sulfur-Resistant, Pulse-Proof Thick Film Chip Resistors • Size: 0402 to 2512 • Resistance range: 1 Ω to 100 kΩ • Power ratings: 0.063 W to 1.0 W 	<ul style="list-style-type: none"> • AEC-Q200 qualified • Excellent performance in sulfur environment • High pulse performance • Metal glaze on high-quality ceramic • Protective overglaze • Lead (Pb)-free solder contacts on Ni barrier layer 	Draloric
D AP, CRCW-AP 	<ul style="list-style-type: none"> • Thick Film, Rectangular Chip Resistors for Conductive Gluing • Size: 0402 to 2512 • Ohmic range: 3.6 Ω to 10 MΩ • Power ratings: 0.063 W to 1 W • Zero ohm jumper: available for all sizes 	<ul style="list-style-type: none"> • AgPd-terminations for conductive gluing • Stability < 1 % = 1 % for 1000 h at 70 °C • Metal glaze on high-quality ceramic 	Draloric
D/CRCW-HR e3 	<ul style="list-style-type: none"> • Thick Film, Rectangular, High-Value Chip Resistors • Size: 0603 to 1206 • Resistance range: 11 MΩ to 470 MΩ • Power ratings: 0.1 W to 0.25 W 	<ul style="list-style-type: none"> • High resistance values (up to 470M) • Suitable for voltage dividers and hybrids • Metal glaze on high-quality ceramic • Protective overglaze 	Vishay



SMD RESISTORS


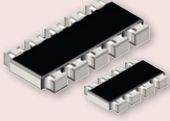
Vishay Draloric / Beyschlag

Thick Film Chip Resistors			
Series	Description	Features	Brand
D/CRCW-HR 	<ul style="list-style-type: none"> Lead (Pb)-bearing Thick Film, Rectangular High-Value Chip Resistor Size: 0603 to 1206 Resistance range: 11 MΩ to 470 MΩ Power ratings: 0.1 W to 0.25 W 	<ul style="list-style-type: none"> High resistance values (up to 470M) Suitable for voltage dividers and hybrids SnPb termination plating on Ni barrier, minimum 10% Pb Metal glaze on high-quality ceramic Protective overglaze 	Vishay
D/CRCW-TR e3 	<ul style="list-style-type: none"> Thick Film, Rectangular, Trimmable Chip Resistors Size: 0402 to 2512 Resistance range: 0.47 Ω to 10 MΩ Power ratings: 0.063 W to 1.0 W 	<ul style="list-style-type: none"> Can be trimmed to the required value after insertion For applications in precision circuitry where relative tolerances can be compensated by trimming Metal glaze on high-quality ceramic Protective overglaze 	Vishay
D/CRCW-TR 	<ul style="list-style-type: none"> Lead (Pb)-Bearing Thick Film, Rectangular, Trimmable Chip Resistors Size: 0402 to 2512 Resistance range: 0.47 Ω to 10 MΩ Power ratings: 0.063 W to 1.0 W 	<ul style="list-style-type: none"> Can be trimmed to the required value after insertion For applications in precision circuitry where relative tolerances can be compensated by trimming SnPb termination plating on Ni barrier, minimum 10% Pb Metal glaze on high-quality ceramic Protective overglaze 	Vishay
CRCW0201 e3 	<ul style="list-style-type: none"> Commodity Thick Film Chip Resistors Size: 0201 Resistance range: 1 Ω to 10 MΩ Power rating: 0.05 W Tolerance: 0.5 % 	<ul style="list-style-type: none"> High-volume product suitable for commercial applications Metal glaze on high-quality ceramic 	Vishay
CRCW01005 e3 	<ul style="list-style-type: none"> Commodity Thick Film Chip Resistors Size: 01005 Resistance range: 1 Ω to 1 MΩ Power rating: 0.031 W Tolerance: 1 % 	<ul style="list-style-type: none"> High-volume product suitable for commercial applications Metal glaze on high-quality ceramic 	Vishay
CRA04S 	<ul style="list-style-type: none"> Thick Film Chip Resistor Array Size: 0404 to 0408 Power rating: 0.063 W Resistance range: 10 Ω to 1 MΩ 	<ul style="list-style-type: none"> Convex terminal array with square corners 4- or 8-terminal package with isolated resistors 	Vishay
CRA04P 	<ul style="list-style-type: none"> Thick Film Chip Resistor Array Size: 0408 Power rating: 0.063 W Resistance range: 1 Ω to 1 MΩ 	<ul style="list-style-type: none"> Concave terminal array with square corners 8-terminal package with isolated resistors 	Vishay
CRA06E, CRA06S 	<ul style="list-style-type: none"> Thick Film Chip Resistor Array Size: 0606 to 0612 Power rating: 0.063 W Resistance range: 10 Ω to 1 MΩ 	<ul style="list-style-type: none"> Convex terminal array available with either scalloped corners (E version) or square corners (S version) 4- or 8-terminal package with isolated resistors 	Vishay



SMD RESISTORS

Vishay Draloric / Beyschlag

Thick Film Chip Resistors			
Series	Description	Features	Brand
<p>CRA06P</p> 	<ul style="list-style-type: none"> • Thick Film Chip Resistor Array • Size: 0606 to 0612 • Power rating: 0.063 W • Resistance range: 10 Ω to 1 MΩ 	<ul style="list-style-type: none"> • Concave terminal array with square corners • 4- or 8-terminal package with isolated resistors 	Vishay
<p>CRA12E, CRA12S</p> 	<ul style="list-style-type: none"> • Thick Film Chip Resistor Array • Size: 1220 to 1225 • Power ratings: 0.1 W to 0.125 W • Resistance range: 10 Ω to 1 MΩ 	<ul style="list-style-type: none"> • Convex terminal array available with either scalloped corners (E version) or square corners (S version) • Wide ohmic range: 10 Ω to 1 MΩ • 8- or 10-terminal package with isolated resistors 	Vishay



SMD RESISTORS

Selector Guide

Vishay Intertechnology – A Global Industry Leader

Vishay Intertechnology components are used in virtually all types of electronic devices and equipment, in the industrial, computing, automotive, consumer, telecommunications, military, aerospace, power supplies, and medical markets. Vishay has manufacturing plants in the Americas, Asia, Europe, and Israel, as well as sales offices worldwide. Vishay Intertechnology has a diverse portfolio of semiconductors and passive components, including diodes, MOSFETs (metal-oxide semiconductor field-effect transistors), optoelectronic products, selected integrated circuits (ICs), resistors, inductors, and capacitors. This enables it to provide “one-stop shop” service and offer many different parts for each customer design. Its innovations in technology, successful acquisition strategy, superior product quality, and “one-stop shop” service to customers have made the Company a global industry leader.

www.vishay.com

Two of the most important manufacturers of fixed film resistors are the Vishay Draloric and the Vishay Beyschlag brands.

About Draloric

In 1900, in Germany, Mr. Philip Rosenthal, as a sideline to his established business of porcelain tableware, started to manufacture ceramics for electronic applications. Starting in 1910, these were also made in Selb, Germany. In 1936, this electronic ceramics activity was separated from Rosenthal AG and made part of a joint venture with AEG named Rosenthal Isolatoren GmbH, or “RIG.”

The RIG name lasted until 1974, when AEG took over all of RIG and renamed it “CRL” because of its portfolio of passive components. The name was changed again in 1974 to Draloric Electronic GmbH. With the acquisition of Draloric Electronic GmbH by the electronics division of Corning Glass Works in 1981, the name was changed to Corning-Draloric, which lasted until its acquisition by Vishay Intertechnology in 1987.

Vishay Draloric is a leading brand for MELF resistors and ceramic capacitor products. The Vishay Draloric product portfolio also includes thin film flat chip resistors, leaded film and wirewound resistors, and large ceramic power capacitors. As part of Vishay Intertechnology, Draloric Electronic has had production sites in Israel since 1989, and in the Czech Republic since 1991.

Draloric competitors Roederstein GmbH (resistors and capacitors), and Vitramon GmbH (capacitors only) were acquired by Vishay Intertechnology in 1993 and 1994, respectively, and merged with Draloric Electronic GmbH, which has its headquarters in Selb. Since then, the name Vishay Draloric has been used as a brand name for resistor products.

Visit us at:

<http://www.vishay.com/company/brands/draloric>

About Beyschlag

A look back into the history of the company shows a solid business based on natural growth. From the moment the company was founded in 1931, the customer has always come first. At the time, Dr. Bernhard Beyschlag started producing rectifiers in Berlin, Germany, to meet the growing needs of the new radio industry. Soon, carbon film resistors were in production. The company spent periods in Hitzacker and Westerland on the Island of Sylt before finally relocating to Heide in 1974. From the early 1970s, Beyschlag belonged to Philips Components, until 1999, when Philips divested itself of its passive components business to allow the foundation of BCcomponents. In 2002, BCcomponents was bought by Vishay.

For more than 80 years, Beyschlag has stood for expertise in thin film technology, continuous innovation, excellence in service and logistics, and customer-oriented solutions.

Visit us at:

<http://www.vishay.com/company/brands/beyschlag>