

Axial Vitreous Wirewound Resistors



FEATURES

- Complete welded construction
- Vitreous coating
- Enhanced humidity protection
- TCR 100 ppm/K to 180 ppm/K
- CECC 40201-801 approved version available
- Pure tin plating provides compatibility with lead (Pb)-free and lead containing soldering processes
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	SIZE	POWER RATING W $P_{40\text{ }^{\circ}\text{C}}$	LIMITING VOLTAGE V	RESISTANCE RANGE ⁽¹⁾ Ω TCR = 100 ppm/K to 180 ppm/K	TOLERANCE ⁽²⁾ $\pm$ %
G202	0414	4	200	0.10 to 10.0K	2, 5, 10
G204	0719	7	350	0.10 to 39.0K	
G206	0933	13	500	0.15 to 68.0K	
G207	0947	17	650	0.20 to 120K	

Notes

⁽¹⁾ Resistance value to be selected for $\pm$ 10 % tolerance from E12 and for $\pm$ 5 % and $\pm$ 2 % from E24

⁽²⁾ 1 % (special version) on request

PART NUMBER AND PRODUCT DESCRIPTION

Part Number: G24071933902J4B000

G 2 4 0 7 1 9 3 3 9 0 2 J 4 B 0 0 0

MODEL	TCR/MATERIAL	VALUE	TOLERANCE CODE	PACKAGING CODE	SPECIAL
G220414 = G202 G240719 = G204 G260933 = G206 G270947 = G207	3 = Class 3 WM 110 100 to 180 ppm/K	3 digit value 1 digit multiplier 7 = $\times 10^{-3}$ 8 = $\times 10^{-2}$ 9 = $\times 10^{-1}$ 0 = $\times 10^0$ 1 = $\times 10^1$ 2 = $\times 10^2$ 3 = $\times 10^3$	F = $\pm$ 1.0 % (special version) G = $\pm$ 2.0 % J = $\pm$ 5.0 % K = $\pm$ 10.0 %	See Packaging table	000 = Standard 3 digit code = Special version (contact marketing)

Product Description: G204 39K 5 % AB G73

G204	39K	5 %	AB G73
MODEL	VALUE	TOLERANCE CODE	PACKAGING DESCRIPTION ⁽³⁾

**ELECTRICAL SPECIFICATIONS FOR PARTS QUALIFIED ACCORDING TO CECC 40201-801**

MODEL	STYLE ACC. TO CECC40201-801	POWER RATING W $P_{25\text{ }^{\circ}\text{C}}$	POWER RATING W $P_{70\text{ }^{\circ}\text{C}}$	LIMITING VOLTAGE V	RESISTANCE RANGE Ω TCR = 100 ppm/K to 180 ppm/K	TOLERANCE ⁽¹⁾ $\pm$ %
G202	FDG	3.5	3.0	100	0R10 to 10K0	5 2
G204	FDK	6.5	5.5	200	0R10 to 39K0 0R10 to 22K0	5 2
G206	FDP	11.5	10	350	0R15 to 68K0 0R15 to 33K0	5 2

Note(1) Resistance value to be selected for $\pm 5\%$ and $\pm 2\%$ from E24**PART NUMBER AND PRODUCT DESCRIPTION FOR CECC 40201-801 QUALIFIED PART**

Part Number: FDPCEE031809JLA000

F	D	P	C	E	E	0	3	1	8	0	9	J	L	A	0	0	0
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

MODEL	TCR/MATERIAL	VALUE	TOLERANCE CODE	PACKAGING CODE	SPECIAL
FDGCEE0 = G202 ⁽²⁾ FDKCEE0 = G204 ⁽²⁾ FDPCEE0 = G206 ⁽²⁾ FDGCEE7 = G202 ⁽³⁾ FDKCEE7 = G204 ⁽³⁾ FDPCEE7 = G206 ⁽³⁾	3 = Class 3 WM 110 100 to 180 ppm/K	3 digit value 1 digit multiplier MULTIPLIER 7 = $\times 10^{-3}$ 8 = $\times 10^{-2}$ 9 = $\times 10^{-1}$ 0 = $\times 10^0$ 1 = $\times 10^1$ 2 = $\times 10^2$ 3 = $\times 10^3$	G = $\pm 2.0\%$ J = $\pm 5.0\%$	See Packaging table	000 = Standard

Product Description: G206 18R 5 % LA CECC 40201-801S FDP E0

G206	18R	5 %	LA	CECC 40201-801S FDP E0
MODEL	VALUE	TOLERANCE CODE	PACKAGING DESCRIPTION	VARIANT

Notes

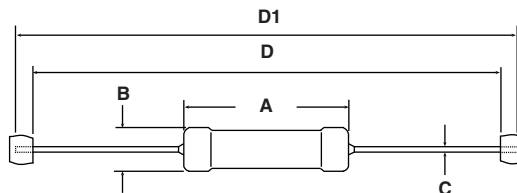
(2) E0 = Without failure rate level.

(3) E7 = With failure rate level.

PACKAGING TABLE

MODEL	TAPE/LEAD LENGTH (mm)	AMMO PACK			REEL			LOOSE		
		PCS	PACKAGING CODE	PACKAGING DESCRIPTION	PCS	PACKAGING CODE	PACKAGING DESCRIPTION	PCS	PACKAGING CODE	PACKAGING DESCRIPTION
G202	53	500	2C	AC G53	1000	D1	R1 R53			
	73	500	4C	AC G73	1000	F1	R1 R73			
G204	73	250	4B	AB G73	500	FC	RC R73			
	88	250	7B	AB G88	500	IC	RC R88			
		250	8B	AB G88 CL						
	98							50	LD	LD
								200	LJ	LJ
G206	107							100	LA	LA
G207	120							100	LA	LA

DIMENSIONS



For packaging dimensions see separate packaging dimensions page.

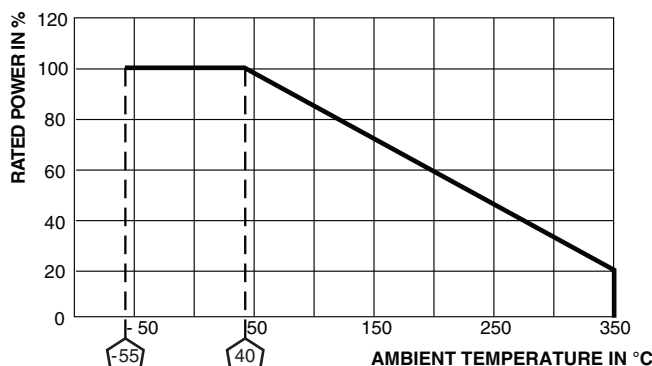
MODEL	DIMENSIONS in millimeters [inches]					MASS (g)
	A _{max.}	B _{max.} ⁽¹⁾	C ⁽²⁾	D	D1	
G202	13 [0.512]	5.7 [0.224]	0.8 [0.031]	53 ± 1 [2.087 ± 0.039]		1
G204	19.3 [0.760]	8.5 [0.335]	0.8 [0.031]	73 ± 1 [2.874 ± 0.039]		2.2
G206	32.3 [1.272]	9.8 [0.386]	0.8 [0.031]		107 ± 2 [4.213 ± 0.079]	6.5
G207	49.3 [1.941]	10.5 [0.413]	0.8 [0.031]		120 ± 2 [4.724 ± 0.079]	10

Notes

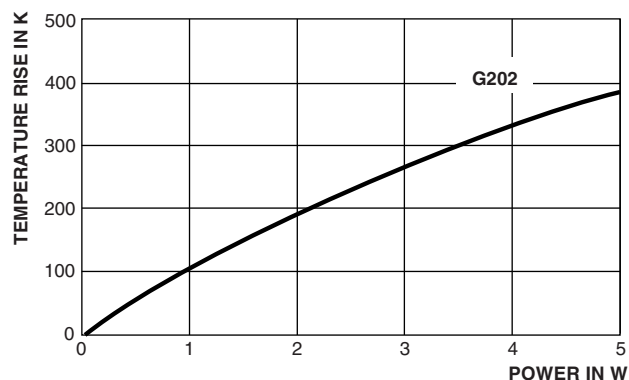
⁽¹⁾ The body diameter should be increased by 1 mm [0.039"] for ohmic values ≤ 10 Ω

⁽²⁾ C according to IEC 60301

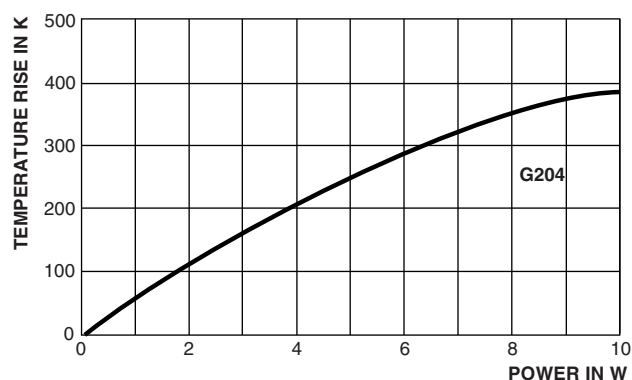
DERATING

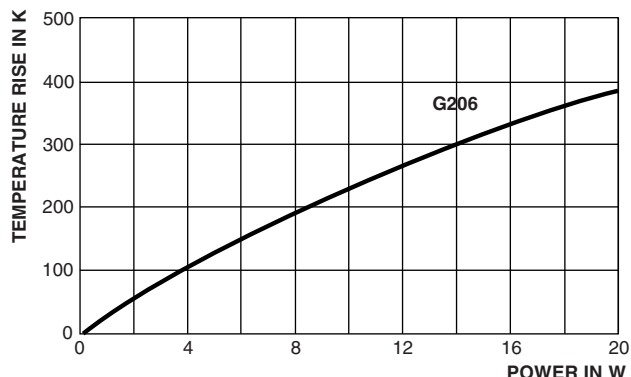
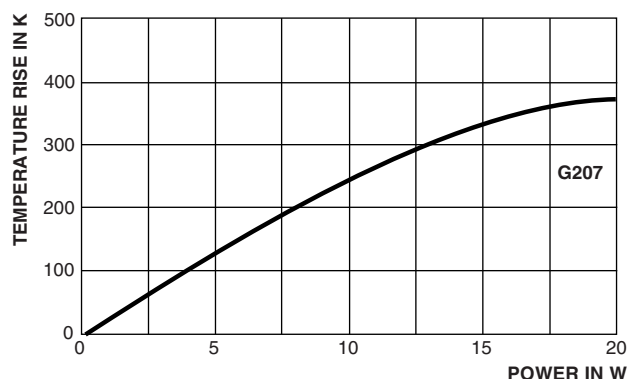


TEMPERATURE RISE



TEMPERATURE RISE



TEMPERATURE RISE

TEMPERATURE RISE

TEST PROCEDURES AND REQUIREMENTS

EN 60115-1 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS PERMISSIBLE CHANGE (ΔR)
4.7	-	Voltage proof	V-block-method; $U = U_{ins}$; 60 s	
			Model	U_{ins} (V)
			G202/FDG	300
			G204/FDK	400
			G206/FDP	500
			G207	650
4.8.4.2	-	Temperature coefficient	At (20/- 55/20) °C and (20/200/20) °C	
4.13	-	Short time overload	Overload voltage = $\sqrt{10}$ x rated voltage	
			Model	Duration (s)
			G202/FDG	5
			G204/FDK	6
			G206/FDP	10
			G207	10
4.16	21 (Ua1) 21 (Ub) 21 (Uc)	Robustness of terminations	Tensile, bending and torsion	
4.17.2	20 (Ta)	Solderability	Solder bath method; SnPb40; non-activated flux (235 ± 5) °C; (2 ± 0.2) s	
			Solder bath method; SnAg3Cu0.5; non-activated flux; (245 ± 5) °C; (3 ± 0.3) s	
4.18.2	20 (Tb, Method 1A)	Resistance to soldering heat	Unmounted components; (260 ± 3) °C; (10 ± 1) s	
4.19	14 (Na)	Rapid change of temperature	30 min at LCT = - 55 °C 30 min at UCT = 200 °C 5 cycles	
4.21	27 (Ea)	Shock	Acceleration: 981 m/s ² Pulse Duration: 11 ms Wave Form: Half sine 3 successive shocks to be applied in each perpendicular direction	

TEST PROCEDURES AND REQUIREMENTS				
EN 60115-1 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS PERMISSIBLE CHANGE (ΔR)
4.22	6 (B4)	Vibration	6 h; 10 Hz to 2000 Hz 1.5 mm or 196 m/s ²	$\pm (1.0 \% R + 0.05 \Omega)$, no visible damage
4.23	2 (Ba)	Climatic sequence	Dry heat 200 °C; 16 h	$\pm (5.0 \% R + 0.05 \Omega)$
4.23.2	30 (Db)		Damp heat, cyclic 55 °C; 24 h; 90 % to 100 % RH; 1 cycle	
4.23.3	1 (Aa)		Cold - 55 °C; 2 h	
4.23.4	13 (M)		Low air pressure; 1.0 kPa; 2 h; 15 °C to 35 °C	
4.23.5	30 (Db)		Damp heat, cyclic 55 °C; 5 days; 95 % to 100 % RH; 5 cycles	
4.23.6				
4.25.2	-	Endurance at RT °C	P_{RT} , 1000 h ($P_{RT} = P_{25}$ for CECC qualified model and P_{40} for commercial model) $U = 1.5$ h on; 0.5 h off P_{RT} , 8000 h	$\pm (5.0 \% R + 0.05 \Omega)$ $\pm (8.0 \% R + 0.05 \Omega)$
4.25.3	-	Endurance at upper category temperature	UCT = 200 °C acc. to CECC40201-801; load 54 % P_{70} ; 1000 h $U = 1.5$ h on; 0.5 h off	$\pm (5.0 \% R + 0.05 \Omega)$
4.24	78 (Cab)	Damp heat, steady state	(40 $\pm$ 2) °C; 56 days; (93 $\pm$ 3) % RH	$\pm (5.0 \% R + 0.05 \Omega)$



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.