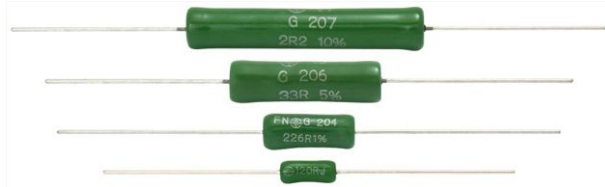


## Axial Vitreous Wirewound Resistors



### 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](http://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 <sup>(1)</sup> $\Omega$ TCR = 100 ppm/K to 180 ppm/K	TOLERANCE <sup>(2)</sup> $\pm$ %
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																							
<table border="1" style="width:100%; text-align:center;"> <tr> <td>G</td><td>2</td><td>4</td><td>0</td><td>7</td><td>1</td><td>9</td><td>3</td><td>3</td><td>9</td><td>0</td><td>2</td><td>J</td><td>4</td><td>B</td><td>0</td><td>0</td><td>0</td> </tr> </table>						G	2	4	0	7	1	9	3	3	9	0	2	J	4	B	0	0	0
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 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 <sup>(3)</sup>																				



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 $\Omega$ TCR = 100 ppm/K to 180 ppm/K	TOLERANCE <sup>(1)</sup> $\pm$ %
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

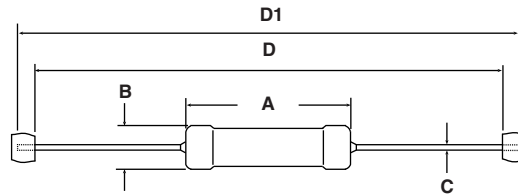
PART NUMBER AND PRODUCT DESCRIPTION FOR CECC 40201-801 QUALIFIED PART																																		
Part Number: FDPCEE031809JLA000																																		
<table border="1" style="width:100%; text-align:center;"> <tr> <td>F</td><td>D</td><td>P</td><td>C</td><td>E</td><td>E</td><td>0</td><td>3</td><td>1</td><td>8</td><td>0</td><td>9</td><td>J</td><td>L</td><td>A</td><td>0</td><td>0</td><td>0</td> </tr> </table>																	F	D	P	C	E	E	0	3	1	8	0	9	J	L	A	0	0	0
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 <sup>(2)</sup> FDKCEE0 = G204 <sup>(2)</sup> FDPCEE0 = G206 <sup>(2)</sup> FDGCEE7 = G202 <sup>(3)</sup> FDKCEE7 = G204 <sup>(3)</sup> FDPCEE7 = G206 <sup>(3)</sup>		3 = Class 3 WM 110 100 to 180 ppm/K		3 digit value 1 digit multiplier MULTIPLIER 7 = *10 <sup>-3</sup> 8 = *10 <sup>-2</sup> 9 = *10 <sup>-1</sup> 0 = *10 <sup>0</sup> 1 = *10 <sup>1</sup> 2 = *10 <sup>2</sup> 3 = *10 <sup>3</sup>			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			
		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

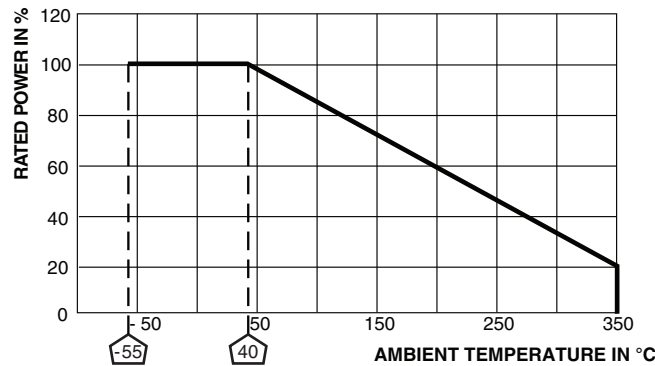
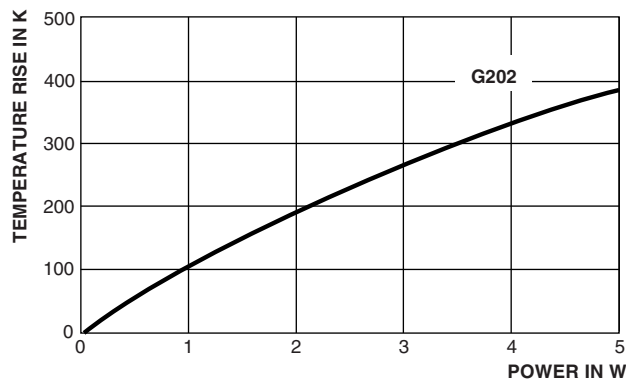
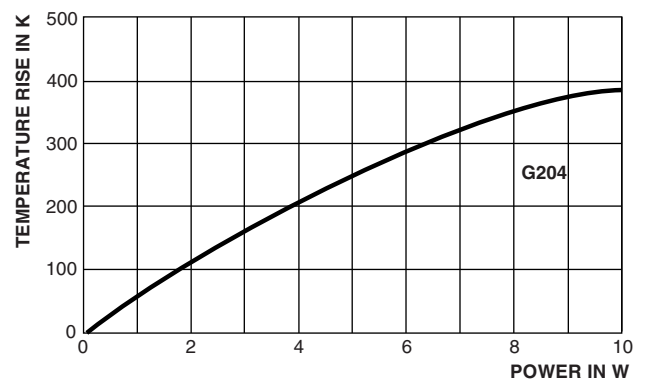
**DIMENSIONS**


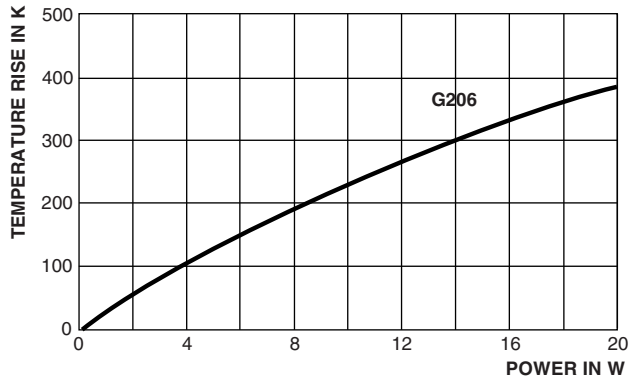
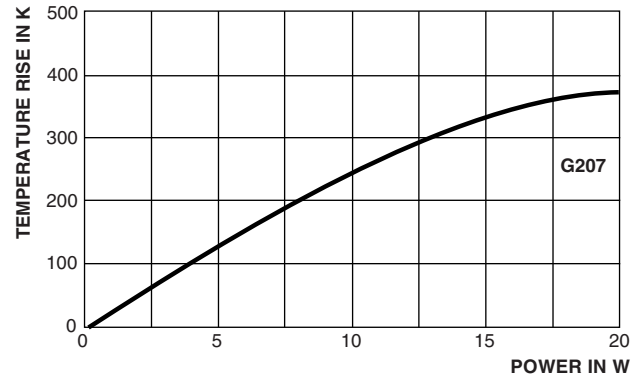
For packaging dimensions see separate packaging dimensions page.

MODEL	DIMENSIONS in millimeters [inches]					MASS (g)
	A <sub>max.</sub>	B <sub>max.</sub> <sup>(1)</sup>	C <sup>(2)</sup>	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 ( $\Delta R$ )
4.7	-	Voltage proof	V-block-method; $U = U_{ins}$ ; 60 s		No flashover or breakdown
			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		100 ppm/K to 180 ppm/K
4.13	-	Short time overload	Overload voltage = $\sqrt{10}$ x rated voltage		$\pm (1.0 \% R + 0.05 \Omega)$ no visible damage
			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		$\pm (1.0 \% R + 0.05 \Omega)$ , no visible damage
4.17.2	20 (Ta)	Solderability	Solder bath method; SnPb40; non-activated flux (235 $\pm$ 5) °C; (2 $\pm$ 0.2) s		Good tinning ( $\geq$ 95 % covered, no visible damage)
			Solder bath method; SnAg3Cu0.5; non-activated flux; (245 $\pm$ 5) °C; (3 $\pm$ 0.3) s		
4.18.2	20 (Tb, Method 1A)	Resistance to soldering heat	Unmounted components; (260 $\pm$ 3) °C; (10 $\pm$ 1) s		$\pm (1.0 \% R + 0.05 \Omega)$ , no visible damage
4.19	14 (Na)	Rapid change of temperature	30 min at LCT = - 55 °C 30 min at UCT = 200 °C 5 cycles		$\pm (1.0 \% R + 0.05 \Omega)$ , no visible damage
4.21	27 (Ea)	Shock	Acceleration: 981 m/s <sup>2</sup> Pulse Duration: 11 ms Wave Form: Half sine 3 successive shocks to be applied in each perpendicular direction		$\pm (1.0 \% R + 0.05 \Omega)$ , no visible damage



TEST PROCEDURES AND REQUIREMENTS				
EN 60115-1 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS PERMISSIBLE CHANGE ( $\Delta R$ )
4.22	6 (B4)	Vibration	6 h; 10 Hz to 2000 Hz 1.5 mm or 196 m/s <sup>2</sup>	$\pm (1.0 \% R + 0.05 \Omega)$ , no visible damage
4.23 4.23.2 4.23.3 4.23.4 4.23.5 4.23.6	2 (Ba) 30 (Db) 1 (Aa) 13 (M) 30 (Db)	Climatic sequence	Dry heat 200 °C; 16 h Damp heat, cyclic 55 °C; 24 h; 90 % to 100 % RH; 1 cycle Cold - 55 °C; 2 h Low air pressure; 1.0 kPa; 2 h; 15 °C to 35 °C Damp heat, cyclic 55 °C; 5 days; 95 % to 100 % RH; 5 cycles	$\pm (5.0 \% R + 0.05 \Omega)$
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	$\pm (5.0 \% R + 0.05 \Omega)$



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