

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 | G220414 | 4 | 200 | 0R10 to 10K0 | 2, 5, 10 |
| G204 | G240719 | 7 | 350 | 0R10 to 39K0 | |
| G206 | G260933 | 13 | 500 | 0R15 to 68K0 | |
| G207 | G270947 | 17 | 650 | 0R20 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 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 % | (³) | 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) | | | | | | | | | | | | | | | | | | | | |

Note

- ⁽³⁾ See "Packaging Table"



| ELECTRICAL SPECIFICATIONS FOR PARTS QUALIFIED ACCORDING TO CECC 40201-801 | | | | | | |
|---------------------------------------------------------------------------|-----------------------------|--------------------------------------|--------------------------------------|--------------------|----------------------------------------------------|---------------------------------|
| MODEL | STYLE ACC. TO CECC40201-801 | POWER RATING W P _{25 °C} | POWER RATING W P _{40 °C} | LIMITING VOLTAGE V | RESISTANCE RANGE Ω TCR = 100 ppm/K to 180 ppm/K | TOLERANCE ⁽¹⁾ ± % |
| 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 ± 5 % and ± 2 % from E24

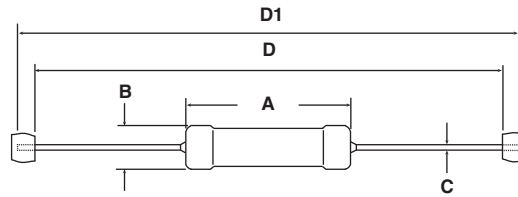
| PART NUMBER AND PRODUCT DESCRIPTION FOR CECC 40201-801 QUALIFIED PART | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|-----------------------------------------------------------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 ⁽²⁾ FDKCEE0 = G204 ⁽²⁾ FDPCEE0 = G206 ⁽²⁾ FDPCEE7 = G202 ⁽³⁾ FDPCEE7 = G204 ⁽³⁾ FDPCEE7 = G206 ⁽³⁾ | | 3 = Class 3 WM 110 100 to 180 ppm/K | | 3 digit value 1 digit multiplier MULTIPLIER 7 = *10 ⁻³ 8 = *10 ⁻² 9 = *10 ⁻¹ 0 = *10 ⁰ 1 = *10 ¹ 2 = *10 ² 3 = *10 ³ | | | F = ± 1.0 % G = ± 2.0 % J = ± 5.0 % K = ± 10.0 % | | 4C = Ammopack tape 73 mm, 500 pcs 7B = Ammopack tape 88 mm, 250 pcs LA = Loose, 100 pcs 4A = Ammopack tape 73 mm, 100 pcs F1 = Reel tape 73 mm, 1000 pcs | | | | 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



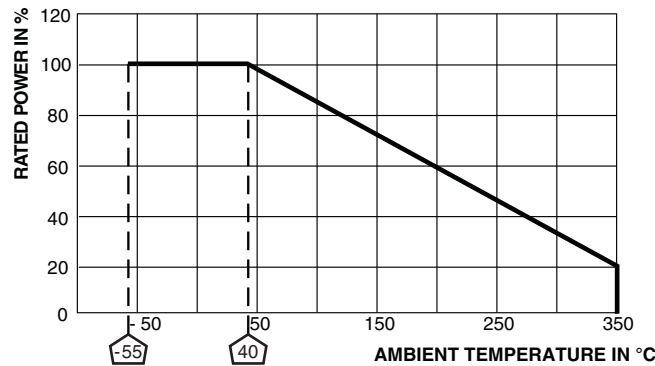
For packaging dimensions see separate packaging dimensions page.

| MODEL | DIMENSIONS in millimeters [inches] | | | | | MASS (g) |
|-------|------------------------------------|----------------------------------|------------------|------------------------|-------------------------|----------|
| | A _{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 |

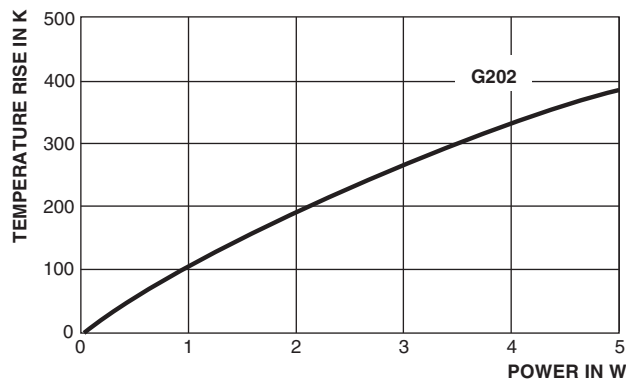
Notes

- (1) The body diameter should be increased by 1 mm [0.039"] for ohmic values ≤ 10 Ω
- (2) C according to IEC 60301

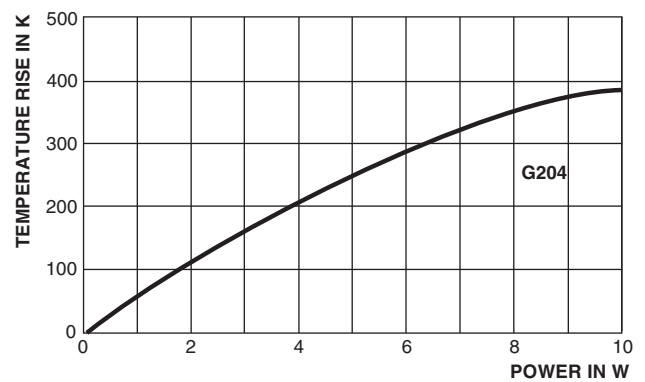
DERATING

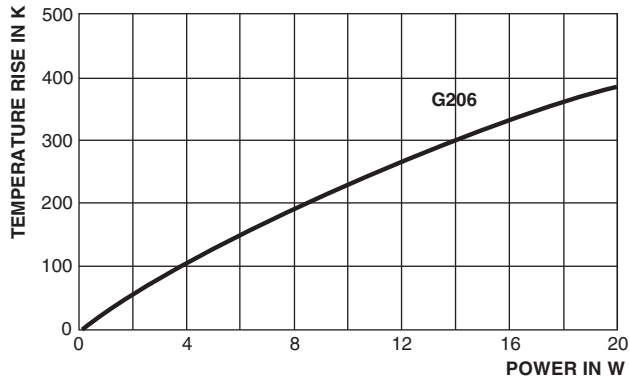
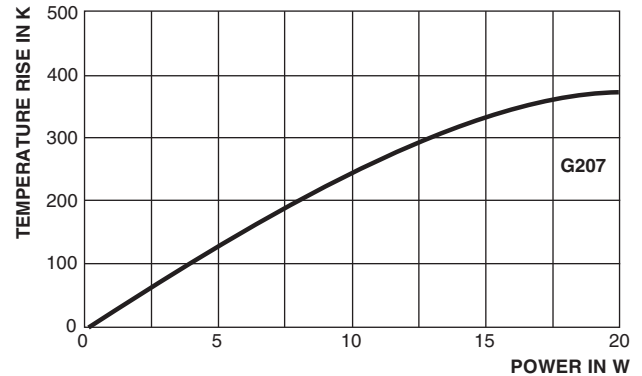


TEMPERATURE RISE



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 | | 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 ² 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 (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 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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