

# www.royalohm.com

### **CARBON FILM FIXED RESISTORS**

#### **Features**

- Automatically insertable
- High quality performance
- Non Flame type available
- Cost effective and commonly used
- Too low or too high values can be supplied on a case to case basis



#### Ordering Procedure: (Ex.: CFR 1/4W, +/-5%, 10KΩ, T/B-5000)

| С                           | F   | R   | 0  | W   | 4  | J  | 0   | 1  | 0   | 3  | Α  | 5  | 0         |
|-----------------------------|---|---|--|---|--|--|---|--|---|--|--|--|-----------|
|                             | tor Type:   |   |  |   |  |  |   |  |   |  |  |  |           |
| FK =                        | Carbon Filr<br>Fixed Resi   |   |  |   |  |  |   | ance Va  |   |  |  |  |           |
| -                           |   |   |  |   |  |  | • E-24 s  | eries: the   | 1 <sup>st</sup> digit is "(   | )", the  |  |  |           |
|                             |   | ial Feat  |  |   |  |  | 2 <sup>nd</sup> &   | 3 <sup>ru</sup> digits a   | re for the si   | gnificant  |  |  |           |
|                             |   | Standard I<br>Non-Flam  |  |   |  |  | figures of the resistance and the 4 <sup>th</sup> indicate the number of zero   |  |   |  |  |  |           |
|                             |   | Non-Induc   |  |   |  |  |   | .1, "K" ~ 0.   |   | 01 20103.  |  |  |           |
|                             | -   |   |  | 1   |  |  |   |  | 4.7KΩ ~ 4   |  |  |  |           |
|                             | Nattage:  |   |  |   |  |  |   |  | 1 <sup>st</sup> to 3 <sup>rd</sup> dig  |  |  |  |           |
| l                           | Normal size   |   |  | W, W4=1/4<br>/, 2W=2W, 3  |  |  |   |  | cant figures<br>nd the 4 <sup>th</sup> di   |  |  |  |           |
|                             |   | VVZ-1/ZV  | v, ivv=ivv   | , 200–200, <b>(</b>   | 500-500  |  |   |  | ber of zero   |  |  |  |           |
| :                           | Small size:   |   |  |   | 2W-S,  |  | <b>Ex.:</b> 1   | .33KΩ = 13   | 331   |  |  |  |           |
|                             |   | 13-10-3,  | 23-200-3   | s, 3S=3W-S  |  |  |   | ~  | ookina T  |  |  |  | 1         |
| I                           | Extra small   | size: U2='  | 1/2W-SS  |   |  |  |   |  | <b>acking T</b><br>= Tape / Bo  |  |  |  |           |
|                             | -   |   |  |   |  | 1  |   | T  | = Tape / Re   | eel  |  |  |           |
|                             |   |   | Tolera   |   |  |  |   |  | = Bulk / Bo   |  |  |  |           |
|                             |   |   | F _ 140/   | ' - 100'  |  | V = 100/   |   | D  | = lono / R/   | v of PT_2  | 6 product  |  |           |
| - · - · -                   | e explanatio  |   | t no, plea   |   |  |  |   | P  | <b>Pac</b><br>1 = 1<br>4 = 4  | <b>king Q</b><br>1,000 pcs,<br>4,000 pcs,                                  | 2 = 2,000<br>5 = 5,000   | DCS,   |           |
|                             | e explanatio  |   | t no, plea   | se see deta   |  |  |   | Ρ  | Pac<br>1 = 1<br>4 = 2<br>A = 5  | <b>:king Q</b><br>1,000 pcs,<br>4,000 pcs,<br>500 pcs, E                   | t <b>y:</b><br>2 = 2,000   | DCS,<br>DS,  |           |
| - · - · -                   |   | e Spec  | t no, plea<br>Nicatio  | se see deta   | iils on pa   | ges 79-80  |   | Ρ  | Pac<br>1 = 1<br>4 = 2<br>A = 5  | <b>:king Q</b><br>1,000 pcs,<br>4,000 pcs,<br>500 pcs, E                   | <b>ty:</b><br>2 = 2,000  <br>5 = 5,000  <br>3 = 2,500 pc<br>Box packing  | DCS,<br>CS,<br>I   |           |
|                             | rmance  | e Spec  | t no, plea<br>Nicatio  | se see deta<br>MS<br>±350PPM<br>±450PPM   | /°C for ≤ 1  | <b>ges 79-80</b><br>0Ω<br>Ω ~ 99ΚΩ   | 1   | P  | Pac<br>1 = 1<br>4 = 2<br>A = 5  | <b>:king Q</b><br>1,000 pcs,<br>4,000 pcs,<br>500 pcs, E                   | <b>ty:</b><br>2 = 2,000  <br>5 = 5,000  <br>3 = 2,500 pc   | ocs,<br>cs,<br>n <b>al</b>   |           |
| - · - · -                   | rmance  | e Spec  | t no, plea<br>Nicatio  | se see deta<br>±350PPM<br>±450PPM<br>0 ~ -700P  | /°C for ≤ 1<br>/°C for 119<br>PM/°C for  | <b>ges 79-80</b><br>0Ω<br>Ω ~ 99ΚΩ<br>100ΚΩ ~  | ··'<br>1MΩ  | Ρ  | Pac<br>1 = 1<br>4 = 2<br>A = 5  | <b>:king Q</b><br>1,000 pcs,<br>4,000 pcs,<br>500 pcs, E                   | ty:<br>2 = 2,000 p<br>5 = 5,000 p<br>3 = 2,500 pc<br>30x packing<br>Additio<br>Informa<br>P = Pana:  | ocs,<br>cs,<br><b>nal</b><br>ation:<br>sert type                                     |           |
|                             | Temperate   | B Spec  | t no, plea<br>ficatio  | se see deta<br>±350PPM<br>±450PPM<br>0 ~ -700P<br>0 ~ -1500   | /°C for ≤ 1<br>/°C for ≤ 1<br>/°C for 119<br>PM/°C for<br>PPM/°C for   | <b>ges 79-80</b><br>0Ω<br>Ω ~ 99ΚΩ<br>100ΚΩ ~<br>or 1.1ΜΩ ~  | '<br>1ΜΩ<br>· 10ΜΩ  |  | <b>Pac</b><br>1 = 1<br>4 = 2<br>A = 5<br>0 = f  | king Q<br>1,000 pcs,<br>4,000 pcs,<br>500 pcs, E<br>or Bulk / E            | ty:<br>2 = 2,000 p<br>5 = 5,000 p<br>3 = 2,500 pc<br>30x packing<br>Additio<br>Informa<br>P = Pana:<br>1 = Avise   | nal<br>ation:<br>sert type<br>rt type  |           |
|                             | I'MANCO<br>Temperati<br>Short   | spec<br>ure coeffi<br>time ove  | t no, plea<br>iiiCaliiC<br>cient<br>rload  | se see deta<br>±350PPM<br>±450PPM<br>0 ~ -700P<br>0 ~ -15000<br>ΔR/R ≤ ±(   | hils on page<br>/°C for ≤ 1<br>/°C for 119<br>PM/°C for<br>PPM/°C for<br>1.0% + 0.0  | <b>ges 79-80</b><br>0Ω<br>Ω ~ 99ΚΩ<br>100ΚΩ ~<br>or 1.1ΜΩ ~<br>05Ω), with  | ··'<br>1MΩ  |  | <b>Pac</b><br>1 = 1<br>4 = 2<br>A = 5<br>0 = f  | king Q<br>1,000 pcs,<br>4,000 pcs,<br>500 pcs, E<br>or Bulk / E            | ty:<br>2 = 2,000 p<br>5 = 5,000 p<br>3 = 2,500 pc<br>30x packing<br>Additio<br>Informa<br>P = Pana:  | nal<br>ation:<br>sert type<br>rt type 2  |           |
| <mark>erfo</mark>           | Temperate<br>Short  | e Spec<br>ure coeffi<br>time over<br>ion resist   | t no, plea<br>ficatio<br>cient<br>rload<br>ance  | se see deta<br>±350PPM<br>±450PPM<br>0 ~ -700P<br>0 ~ -1500<br>ΔR/R ≤ ±(<br>Min. 10,00  | /°C for ≤ 1<br>/°C for ≤ 1<br>/°C for 119<br>PM/°C for<br>PPM/°C for<br>1.0% + 0.0   | <b>ges 79-80</b><br>0Ω<br>Ω ~ 99ΚΩ<br>100ΚΩ ~<br>or 1.1ΜΩ ~<br>05Ω), with<br>Dhm   | 1MΩ<br>• 10MΩ<br>no evidenc   | e of mecha   | <b>Pac</b><br>1 = 1<br>4 = 2<br>A = 9<br>0 = f  | <b>king Q</b><br>1,000 pcs,<br>4,000 pcs,<br>500 pcs, E<br>or Bulk / E     | ty:<br>2 = 2,000  <br>5 = 5,000  <br>3 = 2,500 pc<br>Box packing<br>Additio<br>Informa<br>P = Pana:<br>1 = Avise<br>2 = Avise<br>3 = Avise<br>0 = PT-52                            | ncs,<br>cs,<br>ation:<br>sert type<br>rt type<br>rt type 2<br>rt type 3<br>2mm, NIL  | for PT-26 |
| <mark>erfo</mark>           | I'MANCO<br>Temperati<br>Short   | e Spec<br>ure coeffi<br>time over<br>ion resist   | t no, plea<br>ficatio<br>cient<br>rload<br>ance  | se see deta<br>$\pm 350$ PPM<br>$\pm 450$ PPM<br>$0 \sim -700$ P<br>$0 \sim -1500$ I<br>$\Delta R/R \le \pm ($<br>Min. 10,00<br>No eviden   | /°C for ≤ 1<br>/°C for ≤ 1<br>/°C for 119<br>PM/°C for<br>PPM/°C for<br>1.0% + 0.0<br>00 Mega C<br>ce of flash   | <b>ges 79-80</b><br>0Ω<br>Ω ~ 99ΚΩ<br>100ΚΩ ~<br>or 1.1ΜΩ ~<br>05Ω), with<br>Dhm   | '<br>1ΜΩ<br>· 10ΜΩ  | e of mecha   | <b>Pac</b><br>1 = 1<br>4 = 2<br>A = 9<br>0 = f  | <b>king Q</b><br>1,000 pcs,<br>4,000 pcs,<br>500 pcs, E<br>or Bulk / E     | ty:<br>2 = 2,000 p<br>5 = 5,000 p<br>3 = 2,500 p<br>3 ox packing<br>Additio<br>Informa<br>P = Pana:<br>1 = Avise<br>2 = Avise<br>3 = Avise   | nal<br>ation:<br>sert type<br>rt type<br>rt type 2<br>rt type 3<br>Rmm, NIL          | for PT-26 |
| <mark>erfo</mark>           | Temperate<br>Short<br>Insulat   | time over<br>time over<br>ion resist  | t no, plean  | se see deta<br>$\pm 350$ PPM<br>$\pm 450$ PPM<br>$0 \sim -700$ P<br>$0 \sim -1500$ I<br>$\Delta R/R \le \pm ($<br>Min. 10,00<br>No eviden<br>breakdow   | $f^{o}C$ for ≤ 1<br>/°C for 119<br>PM/°C for<br>PPM/°C for<br>1.0% + 0.0<br>00 Mega C<br>ce of flash<br>n.   | <b>ges 79-80</b><br>0Ω<br>2 ~ 99ΚΩ<br>100ΚΩ ~<br>or 1.1ΜΩ ~<br>05Ω), with<br>Dhm<br>nover, med   | 1MΩ<br>· 10MΩ<br>no evidenc<br>chanical dar   | e of mecha   | <b>Pac</b><br>1 = 1<br>4 = 2<br>A = 9<br>0 = f  | <b>king Q</b><br>1,000 pcs,<br>4,000 pcs,<br>500 pcs, E<br>or Bulk / E     | ty:<br>2 = 2,000  <br>5 = 5,000  <br>3 = 2,500 pc<br>3 ox packing<br>Additio<br>Informa<br>1 = Avise<br>2 = Avise<br>3 = Avise<br>0 = PT-52<br>8 = PT-58<br>9 = PT-64              | nal<br>ation:<br>sert type<br>rt type<br>rt type 2<br>rt type 3<br>Rmm, NIL          |           |
| <mark>erfo</mark><br>Dielec | Temperate<br>Short<br>Insulat   | time over<br>ion resist<br>anding vo  | t no, pleas<br>Cent<br>cient<br>rload<br>ance<br>ltage   | se see deta<br>$\pm 350$ PPM<br>$\pm 450$ PPM<br>$0 \sim -700$ P<br>$0 \sim -1500$ I<br>$\Delta R/R \le \pm ($<br>Min. 10,00<br>No eviden<br>breakdow<br>No eviden  | /°C for ≤ 1<br>/°C for 119<br>PM/°C for<br>1.0% + 0.0<br>00 Mega C<br>ce of flash<br>n.<br>ce of mec   | ges <b>79-80</b><br>0Ω<br>Ω ~ 99ΚΩ<br>100ΚΩ ~<br>or 1.1ΜΩ ~<br>05Ω), with<br>Dhm<br>nover, med   | 1MΩ<br>· 10MΩ<br>no evidenc<br>chanical dar   | e of mecha<br>mage, arcin  | Pac<br>1 = 1<br>4 = 2<br>A = 9<br>0 = f   | eking Q<br>1,000 pcs,<br>4,000 pcs, E<br>500 pcs, E<br>or Bulk / E<br>age. | ty:<br>2 = 2,000  <br>5 = 5,000  <br>3 = 2,500 pc<br>3 ox packing<br>Additio<br>Informa<br>1 = Avise<br>2 = Avise<br>3 = Avise<br>0 = PT-52<br>8 = PT-58<br>9 = PT-64              | nal<br>ation:<br>sert type<br>rt type<br>rt type 2<br>rt type 3<br>2mm, NIL -<br>3mm |           |
| <mark>erfo</mark><br>Dielec | Temperati<br>Short<br>Insulat<br>tric withsta   | time over<br>ion resist<br>anding vo  | t no, plea<br>file<br>cient<br>rload<br>ance<br>ltage<br>ength<br>heat                                   | se see deta<br>$\pm 350$ PPM<br>$\pm 450$ PPM<br>$0 \sim -700$ P<br>$0 \sim -1500$ I<br>$\Delta R/R \le \pm ($<br>Min. 10,00<br>No eviden<br>breakdow<br>No eviden  | $f^{o}$ C for ≤ 1<br>$f^{o}$ C for ≤ 1<br>$f^{o}$ C for 119<br>PM/°C for<br>PPM/°C for<br>1.0% + 0.0<br>00 Mega C<br>ce of flash<br>n.<br>ce of mec<br>1.0% + 0.0  | ges <b>79-80</b><br>0Ω<br>Ω ~ 99ΚΩ<br>100ΚΩ ~<br>or 1.1ΜΩ ~<br>05Ω), with<br>Dhm<br>nover, med<br>chanical da<br>05Ω), with  | 1MΩ<br>· 10MΩ<br>no evidenc<br>chanical dar<br>mage.  | e of mecha<br>mage, arcin  | Pac<br>1 = 1<br>4 = 2<br>A = 9<br>0 = f   | eking Q<br>1,000 pcs,<br>4,000 pcs, E<br>500 pcs, E<br>or Bulk / E<br>age. | ty:<br>2 = 2,000  <br>5 = 5,000  <br>3 = 2,500 pc<br>3 ox packing<br>Additio<br>Informa<br>1 = Avise<br>2 = Avise<br>3 = Avise<br>0 = PT-52<br>8 = PT-58<br>9 = PT-64              | nal<br>ation:<br>sert type<br>rt type<br>rt type 2<br>rt type 3<br>2mm, NIL -<br>3mm |           |
| <mark>erfo</mark><br>Dielec | Temperate<br>Short<br>Insulat<br>tric withsta<br>Terr<br>sistance to                                | e Spec<br>ure coeffi<br>time over<br>ion resist<br>anding vo<br>minal stre<br>soldering                             | t no, plea<br>iiiCaliio<br>cient<br>rload<br>ance<br>itage<br>ength<br>heat<br>bility                    | se see deta<br>$\pm 350$ PPM<br>$\pm 450$ PPM<br>$0 \sim -700P$<br>$0 \sim -1500$<br>$\Delta R/R \le \pm ($<br>Min. 10,00<br>No eviden<br>breakdow<br>No eviden<br>$\Delta R/R \le \pm ($<br>Min. 95%   | $f^{*}$ C for ≤ 1<br>$f^{*}$ C for 119<br>PM/°C for<br>PPM/°C for<br>PPM/°C for<br>1.0% + 0.0<br>00 Mega C<br>ce of flash<br>n.<br>ce of mec<br>1.0% + 0.0<br>coverage.  | ges 79-80<br>$0\Omega$<br>$\Omega \sim 99K\Omega$<br>$100K\Omega \sim$<br>or $1.1M\Omega \sim$<br>$05\Omega$ ), with<br>hover, mec<br>chanical da<br>$05\Omega$ ), with  | 1MΩ<br>· 10MΩ<br>no evidenc<br>chanical dar<br>mage.  | e of mecha<br>mage, arcin<br>e of mecha  | Pac<br>1 = 1<br>4 = 2<br>A = 9<br>0 = f   | eking Q<br>1,000 pcs,<br>4,000 pcs, E<br>500 pcs, E<br>or Bulk / E<br>age. | ty:<br>2 = 2,000  <br>5 = 5,000  <br>3 = 2,500 pc<br>3 ox packing<br>Additio<br>Informa<br>1 = Avise<br>2 = Avise<br>3 = Avise<br>0 = PT-52<br>8 = PT-58<br>9 = PT-64              | nal<br>ation:<br>sert type<br>rt type<br>rt type 2<br>rt type 3<br>2mm, NIL -<br>3mm |           |
| <b>erfo</b><br>Dielec       | Temperation<br>Short<br>Insulat<br>Stric withsta<br>Terrisistance to<br>Resista                     | time over<br>ion resist<br>anding vo<br>minal stre<br>soldering<br>Soldera  | t no, plea<br>iiiCaliio<br>cient<br>rload<br>ance<br>itage<br>ength<br>heat<br>bility<br>Ivent           | se see deta<br>$\pm 350$ PPM<br>$\pm 450$ PPM<br>$0 \sim -700$ P<br>$0 \sim -1500$ I<br>$\Delta R/R \le \pm ($<br>Min. 10,00<br>No eviden<br>breakdow<br>No eviden<br>$\Delta R/R \le \pm ($<br>Min. 95%<br>No deterio  | $f^{o}$ C for ≤ 1<br>$f^{o}$ C for ≤ 1<br>$f^{o}$ C for 119<br>PM/°C for<br>PPM/°C for<br>PPM/°C for<br>1.0% + 0.0<br>Core of flash<br>n.<br>ce of mec<br>1.0% + 0.0<br>coverage.<br>pration of p  | ges 79-80<br>$0\Omega$<br>$\Omega \sim 99K\Omega$<br>$100K\Omega \sim$<br>or $1.1M\Omega \sim$<br>$05\Omega$ ), with<br>hover, mec<br>thanical da<br>$05\Omega$ ), with<br>protective of                       | 1MΩ<br>• 10MΩ<br>no evidenc<br>chanical dar<br>mage.<br>no evidenc  | e of mecha<br>mage, arcin<br>e of mecha<br>markings.   | Pac<br>1 = 1<br>4 = 2<br>A = 9<br>0 = f<br>anical dama<br>ang or insula                               | eking Q<br>1,000 pcs,<br>1,000 pcs,<br>500 pcs, E<br>or Bulk / E<br>age.   | ty:<br>2 = 2,000  <br>5 = 5,000  <br>3 = 2,500 pc<br>3 ox packing<br>Additio<br>Informa<br>1 = Avise<br>2 = Avise<br>3 = Avise<br>0 = PT-52<br>8 = PT-58<br>9 = PT-64              | nal<br>ation:<br>sert type<br>rt type<br>rt type 2<br>rt type 3<br>2mm, NIL -<br>3mm |           |
| <mark>erfo</mark><br>Dielec | Temperation<br>Temperation<br>Short<br>Insulat<br>Stric withstat<br>Sistance to<br>Resista<br>Tempe | e Spec<br>ure coeffi<br>time over<br>ion resist<br>anding vo<br>minal stre<br>soldering<br>Soldera<br>nce to so     | t no, pleas<br>iiiCCLIIC<br>cient<br>rload<br>ance<br>ltage<br>ength<br>heat<br>bility<br>lvent<br>cling | se see deta<br>$\pm 350$ PPM<br>$\pm 450$ PPM<br>$0 \sim -700$ P<br>$0 \sim -1500$ I<br>$\Delta R/R \le \pm ($<br>Min. 10,00<br>No eviden<br>breakdow<br>No eviden<br>$\Delta R/R \le \pm ($<br>Min. 95%<br>No deterio<br>$\Delta R/R \le \pm ($                          | $f^{o}$ C for ≤ 1<br>$f^{o}$ C for ≤ 1<br>$f^{o}$ C for 119<br>PM/°C for<br>PPM/°C for<br>PPM/°C for<br>1.0% + 0.0<br>00 Mega C<br>1.0% + 0.0<br>ce of flash<br>n.<br>ce of mec<br>1.0% + 0.0<br>coverage.<br>pration of p<br>1.0% + 0.0                             | ges 79-80<br>$0\Omega$<br>$\Omega \sim 99K\Omega$<br>$100K\Omega \sim$<br>or $1.1M\Omega \sim$<br>$05\Omega$ ), with<br>hover, mec<br>chanical da<br>$05\Omega$ ), with<br>protective of<br>$05\Omega$ ), with | 1MΩ<br>• 10MΩ<br>no evidenc<br>chanical dar<br>image.<br>no evidenc<br>coating and  | e of mecha<br>mage, arcin<br>e of mecha<br>markings.<br>e of mecha   | Pac<br>1 = 1<br>4 = 2<br>A = 9<br>0 = f<br>anical dama<br>anical dama                                 | eking Q<br>1,000 pcs,<br>1,000 pcs,<br>500 pcs, E<br>or Bulk / E<br>age.   | ty:<br>2 = 2,000  <br>5 = 5,000  <br>3 = 2,500 pc<br>3 ox packing<br>Additio<br>Informa<br>1 = Avise<br>2 = Avise<br>3 = Avise<br>0 = PT-52<br>8 = PT-58<br>9 = PT-64              | nal<br>ation:<br>sert type<br>rt type<br>rt type 2<br>rt type 3<br>2mm, NIL -<br>3mm |           |
| <b>erfo</b><br>Dielec       | Temperation<br>Temperation<br>Short<br>Insulat<br>Stric withstat<br>Sistance to<br>Resista<br>Tempe | time over<br>ion resist<br>anding vo<br>minal stre<br>soldering<br>Soldera<br>nce to so<br>erature cy<br>ife in hum | t no, pleas  | se see deta<br>$\pm 350$ PPM<br>$\pm 450$ PPM<br>$0 \sim -700$ P<br>$0 \sim -1500$ I<br>$\Delta R/R \le \pm ($<br>Min. 10,00<br>No eviden<br>breakdow<br>No eviden<br>$\Delta R/R \le \pm ($<br>Min. 95%<br>No deterio<br>$\Delta R/R \le \pm ($<br>Normal ty<br>Non-Flam | $f^{0}$ C for ≤ 1<br>$f^{0}$ C for 119<br>PM/°C for<br>PPM/°C for<br>1.0% + 0.0<br>00 Mega C<br>1.0% + 0.0<br>00 Mega C<br>1.0% + 0.0<br>coverage.<br>pration of p<br>1.0% + 0.0<br>coverage.<br>pration of p<br>1.0% + 0.0<br>coverage.<br>AR/R ±<br>e type: ΔR/R ± | <b>ges 79-80</b><br>0Ω<br>$\Omega \sim 99KΩ$<br>100KΩ ~<br>or 1.1MΩ ~<br>05Ω), with<br>Dhm<br>nover, mec<br>chanical da<br>05Ω), with<br>chanical da<br>05Ω), with<br>±3% for <1<br>$R/R \pm5\%$ for           | 1MΩ<br>10MΩ<br>no evidence<br>chanical dar<br>image.<br>no evidence<br>coating and<br>no evidence<br>00KΩ, ±5%<br>r <100KΩ, | e of mecha<br>mage, arcin<br>e of mecha<br>markings.<br>e of mecha<br>$5$ for $\ge 1000$<br>$\pm 10\%$ for $\ge$ | Pac<br>1 = 1<br>4 = 2<br>A = 2<br>0 = f<br>anical dama<br>anical dama<br>anical dama<br>KΩ<br>≥ 100KΩ | eking Q<br>1,000 pcs,<br>1,000 pcs,<br>500 pcs, E<br>or Bulk / E<br>age.   | ty:<br>2 = 2,000  <br>5 = 5,000  <br>3 = 2,500 pc<br>3 ox packing<br>Additio<br>Informa<br>1 = Avise<br>2 = Avise<br>3 = Avise<br>0 = PT-52<br>8 = PT-58<br>9 = PT-64              | nal<br>ation:<br>sert type<br>rt type<br>rt type 2<br>rt type 3<br>mm, NIL -<br>amm  |           |
| <b>erfo</b><br>Dielec       | Temperation<br>Temperation<br>Short<br>Insulat<br>Stric withstat<br>Sistance to<br>Resista<br>Tempe | time over<br>ion resist<br>anding vo<br>minal stre<br>soldering<br>Soldera<br>nce to so<br>erature cy<br>ife in hum | t no, pleas<br>iiiCCLIIC<br>cient<br>rload<br>ance<br>ltage<br>ength<br>heat<br>bility<br>lvent<br>cling | se see deta<br>$\pm 350$ PPM<br>$\pm 450$ PPM<br>$0 \sim -700$ P<br>$0 \sim -1500$ I<br>$\Delta R/R \le \pm ($<br>Min. 10,00<br>No eviden<br>breakdow<br>No eviden<br>$\Delta R/R \le \pm ($<br>Min. 95%<br>No deterio<br>$\Delta R/R \le \pm ($<br>Normal ty<br>Non-Flam | $f^{0}$ C for ≤ 1<br>$f^{0}$ C for 119<br>PM/°C for<br>PPM/°C for<br>1.0% + 0.0<br>00 Mega C<br>1.0% + 0.0<br>00 Mega C<br>1.0% + 0.0<br>coverage.<br>pration of p<br>1.0% + 0.0<br>coverage.<br>pration of p<br>1.0% + 0.0<br>coverage.<br>AR/R ±<br>e type: ΔR/R ± | <b>ges 79-80</b><br>0Ω<br>$\Omega \sim 99KΩ$<br>100KΩ ~<br>or 1.1MΩ ~<br>05Ω), with<br>Dhm<br>nover, mec<br>chanical da<br>05Ω), with<br>chanical da<br>05Ω), with<br>±3% for <1<br>$R/R \pm5\%$ for           | 1MΩ<br>10MΩ<br>no evidenc<br>chanical dar<br>image.<br>no evidenc<br>coating and<br>no evidenc<br>00KΩ, ±5%                 | e of mecha<br>mage, arcin<br>e of mecha<br>markings.<br>e of mecha<br>$5$ for $\ge 1000$<br>$\pm 10\%$ for $\ge$ | Pac<br>1 = 1<br>4 = 2<br>A = 2<br>0 = f<br>anical dama<br>anical dama<br>anical dama<br>KΩ<br>≥ 100KΩ | eking Q<br>1,000 pcs,<br>1,000 pcs,<br>500 pcs, E<br>or Bulk / E<br>age.   | ty:<br>2 = 2,000  <br>5 = 5,000  <br>3 = 2,500 pc<br>3 = 2,500 pc<br>3 = 2,500 pc<br>3 = 2,500 pc<br>3 = 2,500 pc<br>1 = Avise<br>2 = Avise<br>3 = Avise<br>3 = Avise<br>9 = PT-64 | nal<br>ation:<br>sert type<br>rt type<br>rt type 2<br>rt type 3<br>mm, NIL -<br>amm  |           |

\*More details, please see pages 77-78.







### **CARBON FILM FIXED RESISTORS**

#### **Dimension** (mm)



### Normal Size

|          |         | Power             | Dimension (mm) |        |     |          | Max.               | Max.                | Dielectric<br>With- | Resistance |
|----------|---------|-------------------|----------------|--------|-----|----------|--------------------|---------------------|---------------------|------------|
| Part No. | Style   | Rating<br>at 70°C | D Max.         | L Max. | H±3 | d ± 0.05 | Working<br>Voltage | Overload<br>Voltage | standing<br>Voltage | Range      |
| CFR0W8   | CFR-125 | 1/8W (0.125W)     | 1.85           | 3.5    | 28  | 0.45     | 200 V              | 400 V               | 400 V               | 1Ω~1MΩ     |
| CFR0W4   | CFR-25  | 1/4W (0.25W)      | 2.5            | 6.8    | 28  | 0.54 (1) | 250 V              | 500 V               | 500 V               | 1Ω~10ΜΩ    |
| CFR0W2   | CFR-50  | 1/2W (0.5W)       | 3.5            | 10.0   | 28  | 0.54     | 350 V              | 700 V               | 700 V               | 1Ω~10ΜΩ    |
| CFR01W   | CFR-100 | 1W                | 5.5            | 16.0   | 28  | 0.70     | 500 V              | 1,000 V             | 1,000 V             | 1Ω~10ΜΩ    |
| CFR02W   | CFR-200 | 2W                | 6.5            | 17.5   | 28  | 0.75     | 500 V              | 1,000 V             | 1,000 V             | 1Ω~10ΜΩ    |

# **Small Size**

|          |           | Power             | Dimension (mm) |        |     |          | Max.               | Max.                | Dielectric                   | Desistance          |
|----------|-----------|-------------------|----------------|--------|-----|----------|--------------------|---------------------|------------------------------|---------------------|
| Part No. | Style     | Rating<br>at 70°C | D Max.         | L Max. | H±3 | d ± 0.05 | Working<br>Voltage | Overload<br>Voltage | With-<br>standing<br>Voltage | Resistance<br>Range |
| CFR0S4   | CFR-25-S  | 1/4W (0.25W)      | 1.85           | 3.5    | 28  | 0.45     | 200 V              | 400 V               | 400 V                        | 1Ω~1MΩ              |
| CFRFU2   | CFR-50-SS | 1/2W (0.5W)       | 2.5            | 6.8    | 28  | 0.54 (1) | 250 V              | 500 V               | 250 V                        | 1Ω~10ΜΩ             |
| CFR0S2   | CFR-50-S  | 1/2W (0.5W)       | 3.0            | 9.0    | 28  | 0.54     | 350 V              | 700 V               | 700 V                        | 1Ω~10ΜΩ             |
| CFR01S   | CFR-100-S | 1W                | 5.0            | 12.0   | 28  | 0.70     | 500 V              | 1,000 V             | 1,000 V                      | 1Ω~10ΜΩ             |
| CFR02S   | CFR-200-S | 2W                | 5.5            | 16.5   | 28  | 0.70     | 500 V              | 1,000 V             | 1,000 V                      | 1Ω~10ΜΩ             |
| CFR03S   | CFR-300-S | 3W                | 6.5            | 17.5   | 28  | 0.75     | 500 V              | 1,000 V             | 1,000 V                      | 1Ω~10ΜΩ             |

Note: • Standard E-24 series values in ±5% tolerance

• Standard beige base color; Light brown base color for CFR01S, CFR02S & CFR03S

- Standard grayish-green base color (Non-flammable coating) for CFRFU2
- <sup>(1)</sup> Lead diameter of CFR0W4 & CFRFU2 can be provided in 0.50mm, 0.54mm & 0.60mm
- For any special inquiry which includes too low or high ohmic values are available on a case to case basis

#### **Derating Curve**









Page 19





# **CARBON FILM FIXED RESISTORS**



### (2) Cutting (CO) Type



| Part No.  | Dimension | Power Rating | Dimensi                | Resistance             |           |  |
|-----------|-----------|--------------|------------------------|------------------------|-----------|--|
| T dit No. | (mm)      | at 70°C      | D                      | L                      | Range     |  |
| COW8      | CO-12     | 0.125W       | +0.10<br>1.6<br>- 0.00 | 3.2 ±0.1               | 1Ω ~ 10ΜΩ |  |
| COW4      | CO-25     | 0.25W        | +0.09<br>2.1<br>- 0.00 | +0.10<br>5.6<br>- 0.20 | 1Ω ~ 10MΩ |  |
| COW4A     | CO-25-A   | 0.25W        | +0.09<br>2.1<br>- 0.00 | +0.10<br>5.9<br>- 0.15 | 1Ω ~ 10MΩ |  |
| COW4B     | СО-25-В   | 0.25W        | +0.09<br>2.1<br>- 0.01 | +0.10<br>6.4<br>- 0.15 | 1Ω ~ 10MΩ |  |

\* Cutting type resistors are produced without lead-wire and without coating \* Cap plated: 1. Tin-plated (Royal std), 2. Nickel-plated (Special request)



RoHS

2006 - 2007