

Series M1213 Metallized Polypropylene Pulse Capacitors

Features: Flame retardant to UL94, high peak/pulse current, low ESR, low inductance, high frequency operation, self healing.

Applications: DC, AC and pulse applications.

Packaging: Axial wrap and fill (TF, TC), radial lead box (EFR).

Specifications

1) Temperature Range

-55°C to +85°C at rated voltage.

2) Capacitance

0.047μF to 4.7μF

3) Dielectric Strength

At 25°C, 200% of rated voltage when applied terminal to terminal for 10 seconds through a current limiting resistance.

4) Insulation Resistance

At 25°C after 2 minutes charge time at rated voltage or 500 VDC, whichever is less, the minimum IR shall be 80,000 Megohm-Microfarads, but need not exceed 120,000 Megohms.

5) Humidity Resistance

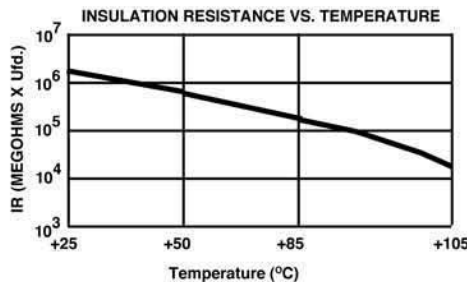
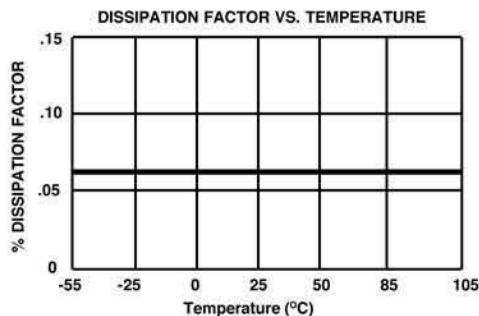
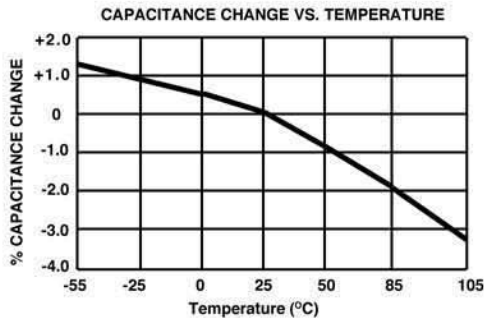
Series M1213 shall meet the requirements of MIL-STD. 202, Method 103B.

6) Dissipation Factor

Shall be 0.1% max. when measured at 1 KHz and 25°C.

7) Life Test

Will withstand the application of 150% rated voltage at + 85°C for 250 hours with not more than one failure in 12 permitted.



Typical Temperature Curves Metallized Polypropylene

Catalog Nomenclature

*** 1 3 0 6 E F R - 3 - . 0 0 1 - 1 - 5**

Case Code:

TC - Wrap & Fill - Round - Axial
 TF - Wrap & Fill - Flat - Axial
 EC - Epoxy Case - Round - Axial
 EFR - Epoxy Case - Flat - Radial
 DFR - Dipped Construction - Flat - Radial
 HS - Hermetically Sealed

Dielectric Code:

1206 - Polypropylene/Foil
 1213 - Metallized Polypropylene
 1306 - Polyester/Foil
 1313 - Metallized Polyester
 1613 - Metallized Polycarbonate
 1906 - Polystyrene/Foil
 2113 - Metallized Polyphenylene Sulfide

Size Code:

3 - Standard
 2 - Miniature (1313DFR Series Only)
 X - Non-standard
 Or one letter case code

Capacitance:

In microfarads (μ F)

Voltage:

.35 - 35 VDC
 0 - 50 VDC
 1 - 100 VDC
 2 - 200 VDC
 3 - 300 VDC
 4 - 400 VDC
 10 - 1000 VDC
 1.6K - 1600VDC
 Etc.

Tolerance:

1 - 1%
 2 - 2%
 5 - 5%
 Etc.

*** Options**

The following options are available from EFC by specifying the appropriate prefix.

- A - Aluminum foil electrodes
- T - Tin foil electrodes
- HV - High voltage DC applications
- AC - AC voltage rated applications
- MF - Metallized and foil hybrid for maximum pulse current applications
- M - Dual metallized design for pulse current applications
- SP - Low ESR, high RMS current applications
- PC - Direct mount terminals for high current filter applications
- FT - Feed thru filter applications
- RC - Resistor capacitor suppressors

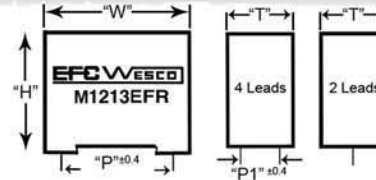


Please consult factory for special requirements, including non-standard values and sizes

M1213EFR
Rectangular Plastic Case
(Radial Leads)

Metallized Polypropylene Pulse Capacitors

Dimensions and Ratings



| Cap. | | 850 VDC / 500 VAC | | | | | | | | | | | | |
|------|-----------------------|-------------------|-----------|-----------|-----------|------------|---------------------------|--|---------------------|---------------------|-------------------------|---------------------|---------------------|---------------|
| μF | Part # | "T" mm | "W" mm | "H" mm | "P" mm | "P1" mm | I _{PEAK} AMPS | I _{RMS} AMPS 100kHz @ 70°C | | | ESR (mΩ) Max @100kHz | | | dV/dT V/μS |
| | | | | | | | | d=0.8 2 wires | d=1.2 2 wires | d=1.2 4 wires | d=0.8 2 wires | d=1.2 2 wires | d=1.2 4 wires | |
| .15 | M1213EFR-32-.15-8.5-* | 11.0 | 32.0 | 20.0 | 27.5 | - | 184 | 8.0 | 8.0 | - | 14.2 | 13.6 | - | 1225 |
| .22 | M1213EFR-32-.22-8.5-* | 11.0 | 32.0 | 20.0 | 27.5 | - | 270 | 9.0 | 10.0 | - | 10.1 | 9.4 | - | 1225 |
| .33 | M1213EFR-32-.33-8.5-* | 16.0 | 32.0 | 25.5 | 27.5 | - | 405 | 9.0 | 12.9 | - | 7.5 | 6.8 | - | 1225 |
| .33 | M1213EFR-34-.33-8.5-* | 16.0 | 32.0 | 25.5 | 27.5 | 5.1 | 405 | - | - | 14.0 | - | - | 5.9 | 1225 |
| .47 | M1213EFR-32-.47-8.5-* | 18.0 | 32.0 | 30.0 | 27.5 | - | 577 | 9.0 | 13.9 | - | 6.2 | 5.2 | - | 1225 |
| .47 | M1213EFR-34-.47-8.5-* | 18.0 | 32.0 | 30.0 | 27.5 | 5.1 | 577 | - | - | 14.0 | - | - | 4.3 | 1225 |
| .82 | M1213EFR-32-.82-8.5-* | 20.0 | 42.0 | 41.0 | 37.5 | - | 615 | 9.0 | 13.9 | - | 6.5 | 5.4 | - | 750 |
| .82 | M1213EFR-34-.82-8.5-* | 20.0 | 42.0 | 41.0 | 37.5 | 10.2 | 615 | - | - | 22.0 | - | - | 4.2 | 750 |
| 1.00 | M1213EFR-32-1.0-8.5-* | 20.0 | 42.0 | 41.0 | 37.5 | - | 750 | 9.0 | 13.9 | - | 6.3 | 5.2 | - | 750 |
| 1.00 | M1213EFR-34-1.0-8.5-* | 20.0 | 42.0 | 41.0 | 37.5 | 10.2 | 750 | - | - | 23.0 | - | - | 4.1 | 750 |
| 1.50 | M1213EFR-32-1.5-8.5-* | 32.0 | 42.0 | 35.0 | 37.5 | - | 750 | 9.0 | 13.9 | - | 5.0 | 4.7 | - | 750 |
| 1.50 | M1213EFR-34-1.5-8.5-* | 32.0 | 42.0 | 35.0 | 37.5 | 10.2 | 750 | - | - | 28.0 | - | - | 3.8 | 750 |
| 2.20 | M1213EFR-32-2.2-8.5-* | 35.0 | 57.5 | 51.0 | 52.5 | - | 1034 | 9.0 | 13.9 | - | 5.9 | 5.1 | - | 470 |
| 2.20 | M1213EFR-34-2.2-8.5-* | 35.0 | 57.5 | 51.0 | 52.5 | 20.3 | 1034 | - | - | 29.0 | - | - | 4.6 | 470 |
| 3.00 | M1213EFR-32-3.0-8.5-* | 35.0 | 57.5 | 51.0 | 52.5 | - | 1410 | 9.0 | 13.9 | - | 5.6 | 4.5 | - | 470 |
| 3.00 | M1213EFR-34-3.0-8.5-* | 35.0 | 57.5 | 51.0 | 52.5 | 20.3 | 1410 | - | - | 29.0 | - | - | 3.3 | 470 |
| 4.00 | M1213EFR-32-4.0-8.5-* | 35.0 | 57.5 | 60.5 | 52.5 | - | 1880 | 9.0 | 13.9 | - | 5.0 | 3.8 | - | 470 |
| 4.00 | M1213EFR-34-4.0-8.5-* | 35.0 | 57.5 | 60.5 | 52.5 | 20.3 | 1880 | - | - | 29.0 | - | - | 2.6 | 470 |
| 4.70 | M1213EFR-32-4.7-8.5-* | 35.0 | 57.5 | 60.5 | 52.5 | - | 2209 | 9.0 | 13.9 | - | 4.6 | 3.5 | - | 470 |
| 4.70 | M1213EFR-34-4.7-8.5-* | 35.0 | 57.5 | 60.5 | 52.5 | 20.3 | 2209 | - | - | 29.0 | - | - | - | 470 |

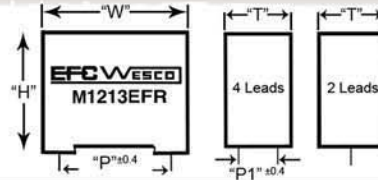
* - Please insert appropriate tolerance code



M1213EFR
Rectangular Plastic Case
(Radial Leads)

Metallized Polypropylene Pulse Capacitors

Dimensions and Ratings



| Cap. | | 1000 VDC / 600 VAC | | | | | | | | | | | | |
|------|----------------------|--------------------|-----------|-----------|-----------|------------|---------------------------|--|------------|------------|-------------------------|------------|------------|---------------|
| µF | Part # | "T" mm | "W" mm | "H" mm | "P" mm | "P1" mm | I _{PEAK} AMPS | I _{RMS} AMPS 100kHz @ 70°C | | | ESR (mΩ) Max @100kHz | | | dV/dT V/µs |
| | | | | | | | | d=0.8 | d=1.2 | d=1.2 | d=0.8 | d=1.2 | d=1.2 | |
| | | | | | | | | 2 wires | 2 wires | 4 wires | 2 wires | 2 wires | 4 wires | |
| .15 | M1213EFR-32-15-10-* | 11.0 | 32.0 | 20.0 | 27.5 | - | 201 | 8.0 | 8.0 | - | 13.2 | 12.6 | - | 1340 |
| .22 | M1213EFR-32-22-10-* | 11.0 | 32.0 | 20.0 | 27.5 | - | 295 | 9.0 | 10.9 | - | 9.7 | 9.1 | - | 1340 |
| .33 | M1213EFR-32-33-10-* | 16.0 | 32.0 | 25.5 | 27.5 | - | 442 | 9.0 | 14.0 | - | 7.3 | 6.5 | - | 1340 |
| .33 | M1213EFR-34-33-10-* | 16.0 | 32.0 | 25.5 | 27.5 | 5.1 | 442 | - | - | 15.0 | - | - | 5.5 | 1340 |
| .47 | M1213EFR-32-47-10-* | 18.0 | 32.0 | 30.0 | 27.5 | - | 630 | 9.0 | 14.0 | - | 5.9 | 5.1 | - | 1340 |
| .47 | M1213EFR-34-47-10-* | 18.0 | 32.0 | 30.0 | 27.5 | 5.1 | 630 | - | - | 20.0 | - | - | 4.2 | 1340 |
| .82 | M1213EFR-32-82-10-* | 20.0 | 42.0 | 41.0 | 37.5 | - | 678 | 9.0 | 13.9 | - | 6.2 | 5.1 | - | 827 |
| .82 | M1213EFR-34-82-10-* | 20.0 | 42.0 | 41.0 | 37.5 | 10.2 | 678 | - | - | 22.0 | - | - | 3.8 | 827 |
| 1.00 | M1213EFR-32-1.0-10-* | 20.0 | 42.0 | 41.0 | 37.5 | - | 827 | 9.0 | 13.9 | - | 6.0 | 5.1 | - | 827 |
| 1.00 | M1213EFR-34-1.0-10-* | 20.0 | 42.0 | 41.0 | 37.5 | 10.2 | 827 | - | - | 23.0 | - | - | 3.4 | 827 |
| 1.50 | M1213EFR-32-1.5-10-* | 32.0 | 42.0 | 35.0 | 37.5 | - | 1240 | 9.0 | 13.9 | - | 4.6 | 3.7 | - | 827 |
| 1.50 | M1213EFR-34-1.5-10-* | 32.0 | 42.0 | 35.0 | 37.5 | 10.2 | 1240 | - | - | 29.0 | - | - | 2.7 | 827 |
| 2.20 | M1213EFR-32-2.2-10-* | 35.0 | 57.5 | 51.0 | 52.5 | - | 1126 | 9.0 | 13.9 | - | 5.9 | 5.1 | - | 512 |
| 2.20 | M1213EFR-34-2.2-10-* | 35.0 | 57.5 | 51.0 | 52.5 | 20.3 | 1126 | - | - | 29.0 | - | - | 4.3 | 512 |
| 3.00 | M1213EFR-32-3.0-10-* | 35.0 | 57.5 | 51.0 | 52.5 | - | 1536 | 9.0 | 13.9 | - | 5.6 | 4.5 | - | 512 |
| 3.00 | M1213EFR-34-3.0-10-* | 35.0 | 57.5 | 51.0 | 52.5 | 20.3 | 1536 | - | - | 29.0 | - | - | 3.3 | 512 |
| 4.70 | M1213EFR-32-4.7-10-* | 35.0 | 57.5 | 60.5 | 52.5 | - | 2406 | 9.0 | 13.9 | - | 4.6 | 3.5 | - | 512 |
| 4.70 | M1213EFR-34-4.7-10-* | 35.0 | 57.5 | 60.5 | 52.5 | 20.3 | 2406 | - | - | 29.0 | - | - | 2.2 | 512 |

| Cap. | | 1200 VDC / 630 VAC | | | | | | | | | | | | |
|------|------------------------|--------------------|-----------|-----------|-----------|------------|---------------------------|--|------------|------------|-------------------------|------------|------------|---------------|
| µF | Part # | "T" mm | "W" mm | "H" mm | "P" mm | "P1" mm | I _{PEAK} AMPS | I _{RMS} AMPS 100kHz @ 70°C | | | ESR (mΩ) Max @100kHz | | | dV/dT V/µs |
| | | | | | | | | d=0.8 | d=1.2 | d=1.2 | d=0.8 | d=1.2 | d=1.2 | |
| | | | | | | | | 2 wires | 2 wires | 4 wires | 2 wires | 2 wires | 4 wires | |
| .10 | M1213EFR-32-1-1.2K-* | 11.0 | 32.0 | 20.0 | 27.5 | - | 157 | 7.0 | 7.0 | - | 17.2 | 16.7 | - | 1570 |
| .15 | M1213EFR-32-15-1.2K-* | 13.0 | 32.0 | 27.0 | 27.5 | - | 236 | 9.0 | 10.0 | - | 12.1 | 11.5 | - | 1570 |
| .22 | M1213EFR-32-22-1.2K-* | 13.0 | 32.0 | 27.0 | 27.5 | - | 345 | 9.0 | 10.0 | - | 9.1 | 8.3 | - | 1570 |
| .22 | M1213EFR-34-22-1.2K-* | 13.0 | 32.0 | 27.0 | 27.5 | 5.1 | 345 | - | - | 13.0 | - | - | 7.5 | 1570 |
| .33 | M1213EFR-32-33-1.2K-* | 18.0 | 32.0 | 30.0 | 27.5 | - | 518 | 9.0 | 14.0 | - | 7.0 | 6.0 | - | 1570 |
| .33 | M1213EFR-34-33-1.2K-* | 18.0 | 32.0 | 30.0 | 27.5 | 5.1 | 518 | - | - | 17.8 | - | - | 5.0 | 1570 |
| .68 | M1213EFR-32-68-1.2K-* | 20.0 | 42.0 | 41.0 | 37.5 | - | 656 | 9.0 | 14.0 | - | 7.0 | 6.0 | - | 965 |
| .68 | M1213EFR-34-68-1.2K-* | 20.0 | 42.0 | 41.0 | 37.5 | 10.2 | 656 | - | - | 19.8 | - | - | 4.8 | 965 |
| .82 | M1213EFR-32-82-1.2K-* | 20.0 | 42.0 | 41.0 | 37.5 | - | 791 | 9.0 | 14.0 | - | 5.6 | 4.6 | - | 965 |
| .82 | M1213EFR-34-82-1.2K-* | 20.0 | 42.0 | 41.0 | 37.5 | 10.2 | 791 | - | - | 25.8 | - | - | 3.5 | 965 |
| 1.00 | M1213EFR-32-1.0-1.2K-* | 20.0 | 42.0 | 41.0 | 37.5 | - | 965 | 9.0 | 14.0 | - | 5.5 | 4.5 | - | 965 |
| 1.00 | M1213EFR-34-1.0-1.2K-* | 20.0 | 42.0 | 41.0 | 37.5 | 10.2 | 965 | - | - | 26.2 | - | - | 3.4 | 965 |
| 1.20 | M1213EFR-32-1.2-1.2K-* | 32.0 | 42.0 | 35.0 | 37.5 | - | 1158 | 9.0 | 14.0 | - | 5.1 | 4.0 | - | 965 |
| 1.20 | M1213EFR-34-1.2-1.2K-* | 32.0 | 42.0 | 35.0 | 37.5 | 10.2 | 1158 | - | - | 29.0 | - | - | 3.0 | 965 |

* - Please insert appropriate tolerance code

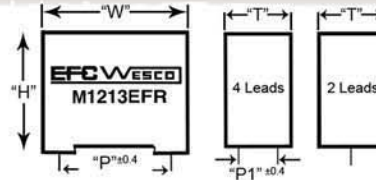


Please consult factory for special requirements, including non-standard values and sizes

M1213EFR
Rectangular Plastic Case
(Radial Leads)

Metallized Polypropylene Pulse Capacitors

Dimensions and Ratings



| Cap. | | 2000 VDC / 700 VAC | | | | | | | | | | | | |
|-------|-----------------------|---------------------------|-----------|-----------|-----------|------------|---------------------------|--|---------------------|---------------------|-------------------------|---------------------|---------------------|---------------|
| μF | Part # | "T" mm | "W" mm | "H" mm | "P" mm | "P1" mm | I _{PEAK} AMPS | I _{RMS} AMPS 100kHz @ 70°C | | | ESR (mΩ) Max @100kHz | | | dV/dT V/μs |
| | | | | | | | | d=0.8 2 wires | d=1.2 2 wires | d=1.2 4 wires | d=0.8 2 wires | d=1.2 2 wires | d=1.2 4 wires | |
| 0.033 | M1213EFR-32-.033-2K-* | 11.0 | 32.0 | 20.0 | 27.5 | - | 73 | 5.0 | 5.0 | - | 39.8 | 39.0 | - | 2200 |
| 0.047 | M1213EFR-32-.047-2K-* | 11.0 | 32.0 | 20.0 | 27.5 | - | 103 | 5.9 | 5.9 | - | 28.6 | 28.0 | - | 2200 |
| 0.068 | M1213EFR-32-.068-2K-* | 13.0 | 32.0 | 27.0 | 27.5 | - | 150 | 8.0 | 8.0 | - | 20.0 | 19.5 | - | 2200 |
| 0.10 | M1213EFR-32-.1-2K-* | 16.0 | 32.0 | 25.5 | 27.5 | - | 220 | 9.0 | 10.0 | - | 14.5 | 13.8 | - | 2200 |
| 0.10 | M1213EFR-34-.1-2K-* | 16.0 | 32.0 | 25.5 | 27.5 | 5.1 | 220 | - | - | 11.0 | - | - | 13.1 | 2200 |
| 0.15 | M1213EFR-32-.15-2K-* | 18.0 | 32.0 | 30.0 | 27.5 | - | 330 | 9.0 | 14.0 | - | 10.5 | 9.8 | - | 2200 |
| 0.15 | M1213EFR-34-.15-2K-* | 18.0 | 32.0 | 30.0 | 27.5 | 5.1 | 330 | - | - | 15.2 | - | - | 8.7 | 2200 |
| 0.33 | M1213EFR-32-.33-2K-* | 20.0 | 42.0 | 41.0 | 37.5 | - | 459 | 9.0 | 14.0 | - | 8.0 | 7.0 | - | 1390 |
| 0.33 | M1213EFR-34-.33-2K-* | 20.0 | 42.0 | 41.0 | 37.5 | 10.2 | 459 | - | - | 17.1 | - | - | 6.0 | 1390 |
| 0.47 | M1213EFR-32-.47-2K-* | 32.0 | 42.0 | 35.0 | 37.5 | - | 653 | 9.0 | 14.0 | - | 6.8 | 6.2 | - | 1390 |
| 0.47 | M1213EFR-34-.47-2K-* | 32.0 | 42.0 | 35.0 | 37.5 | 10.2 | 653 | - | - | 24.0 | - | - | 5.2 | 1390 |
| 1.20 | M1213EFR-32-1.2-2K-* | 35.0 | 57.5 | 51.0 | 52.5 | 20.3 | 1014 | 9.0 | 14.0 | - | 6.9 | 6.3 | - | 845 |
| 1.20 | M1213EFR-34-1.2-2K-* | 35.0 | 57.5 | 51.0 | 52.5 | 20.3 | 1014 | - | - | 27.8 | - | - | 5.1 | 845 |
| 1.50 | M1213EFR-32-1.5-2K-* | 35.0 | 57.5 | 51.0 | 52.5 | 20.3 | 1267 | 9.0 | 14.0 | - | 6.2 | 5.0 | - | 845 |
| 1.50 | M1213EFR-34-1.2-2K-* | 35.0 | 57.5 | 51.0 | 52.5 | 20.3 | 1267 | - | - | 29.0 | - | - | 3.8 | 845 |

| Cap. | | 3000 VDC / 750 VAC | | | | | | | | | | | | |
|-------|-----------------------|---------------------------|-----------|-----------|-----------|------------|---------------------------|--|---------------------|---------------------|-------------------------|---------------------|---------------------|---------------|
| μF | Part # | "T" mm | "W" mm | "H" mm | "P" mm | "P1" mm | I _{PEAK} AMPS | I _{RMS} AMPS 100kHz @ 70°C | | | ESR (mΩ) Max @100kHz | | | dV/dT V/μs |
| | | | | | | | | d=0.8 2 wires | d=1.2 2 wires | d=1.2 4 wires | d=0.8 2 wires | d=1.2 2 wires | d=1.2 4 wires | |
| 0.022 | M1213EFR-32-.022-3K-* | 11.0 | 32.0 | 20.0 | 27.5 | - | 74 | 5.0 | 5.0 | - | 47.5 | 47.1 | - | 3350 |
| 0.033 | M1213EFR-32-.033-3K-* | 13.0 | 32.0 | 27.0 | 27.5 | - | 111 | 7.0 | 7.0 | - | 32.5 | 32.0 | - | 3350 |
| 0.047 | M1213EFR-32-.047-3K-* | 16.0 | 32.0 | 25.5 | 27.5 | - | 157 | 9.0 | 9.0 | - | 23.5 | 22.7 | - | 3350 |
| 0.047 | M1213EFR-34-.047-3K-* | 16.0 | 32.0 | 25.5 | 27.5 | 5.1 | 157 | - | - | 9.0 | - | - | 22.0 | 3350 |
| 0.056 | M1213EFR-32-.056-3K-* | 16.0 | 32.0 | 25.5 | 27.5 | - | 188 | 9.0 | 9.5 | - | 19.4 | 18.2 | - | 3350 |
| 0.056 | M1213EFR-34-.056-3K-* | 16.0 | 32.0 | 25.5 | 27.5 | 5.1 | 188 | - | - | 10.8 | - | - | 16.7 | 3350 |
| 0.068 | M1213EFR-32-.068-3K-* | 16.0 | 32.0 | 25.5 | 27.5 | - | 227 | 9.0 | 10.0 | - | 17.1 | 16.0 | - | 3350 |
| 0.068 | M1213EFR-34-.068-3K-* | 16.0 | 32.0 | 25.5 | 27.5 | 5.1 | 228 | - | - | 11.0 | - | - | 15.2 | 3350 |
| 0.10 | M1213EFR-32-.1-3K-* | 18.0 | 32.0 | 30.0 | 27.5 | - | 335 | 9.0 | 13.0 | - | 12.2 | 11.4 | - | 3350 |
| 0.10 | M1213EFR-34-.1-3K-* | 18.0 | 32.0 | 30.0 | 27.5 | 5.1 | 335 | - | - | 15.0 | - | - | 10.3 | 3350 |

* - Please insert appropriate tolerance code