

Overview

The KEMET LF metal box filters cover single-phase or three-phase requirements with a wide variety of characteristics. These filters are optimized for conduction noise. Their input/output terminals are screw type or lead wire type.

Applications

- Industrial equipment
- Machine tool
- Inverters

Benefits

- Single-phase or three-phase 250 VAC
- Current range from 2 to 60 A
- Operating temperature range from -25°C to +55°C (with some exceptions at -20°C to 45°C and -20°C to +55°C)
- UL approved versions available
- RoHS compliant

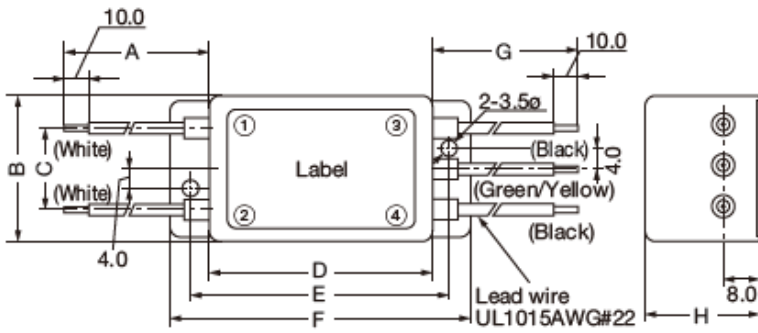


Part Number System

| LF- | 2 | 02 | U | | -1 |
|--------|-------------------------------------|------------------------|---|--|--------------------------|
| Series | Phase | Rated Current (A) | Approval | Specification | Internal Management Code |
| LF | 2 = Single-phase 3 = Three-phase | 0x = 0x A xx = xx A | Blank = No approvals U = UL approved Note: With exceptions, see Table 1 for details | Blank = Standard N = Double common choke P = Hi pot 2,000 V for single-phase | -F -1 -9 |

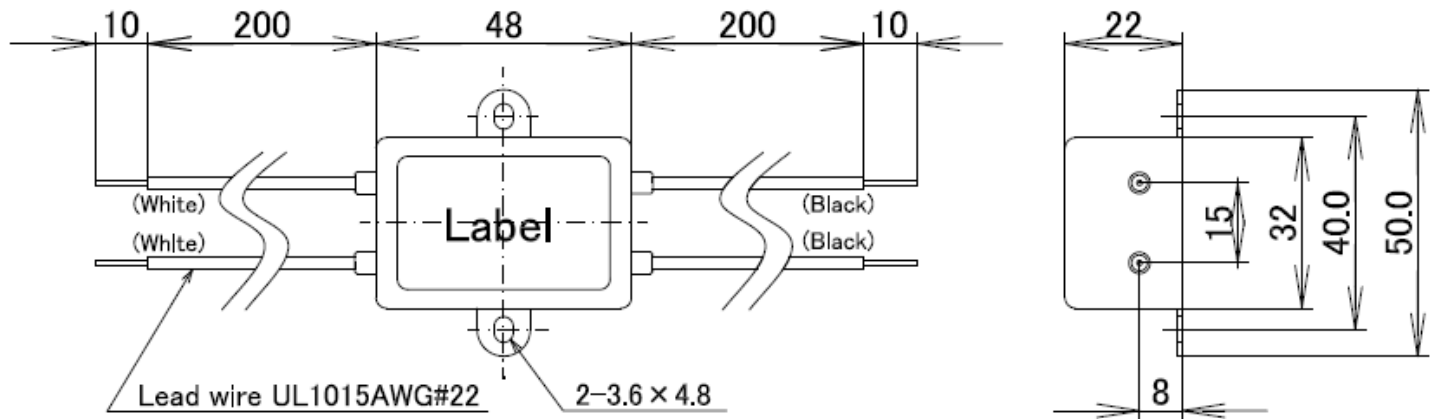
Dimensions - Millimeters

LF-202U-1



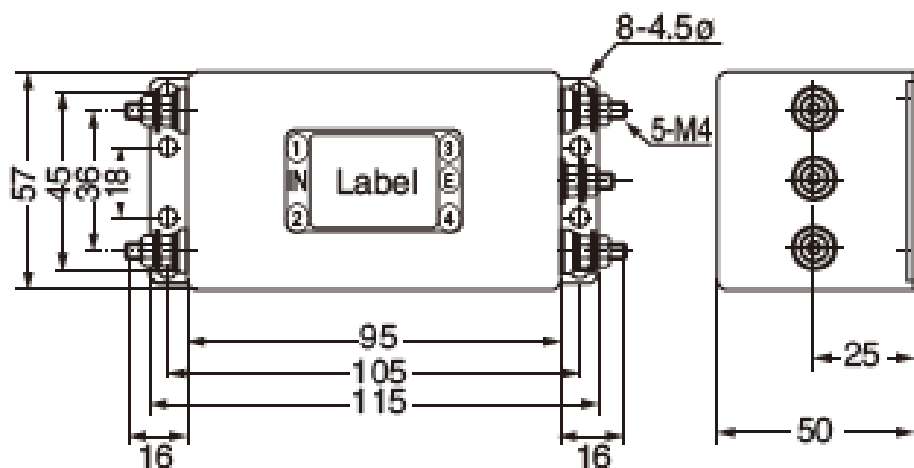
| A | B | C | D | E | F | G | H |
|-----|----|----|----|----|----|-----|----|
| 200 | 32 | 17 | 48 | 56 | 64 | 200 | 25 |

LF-202-9



Dimensions - Millimeters cont.

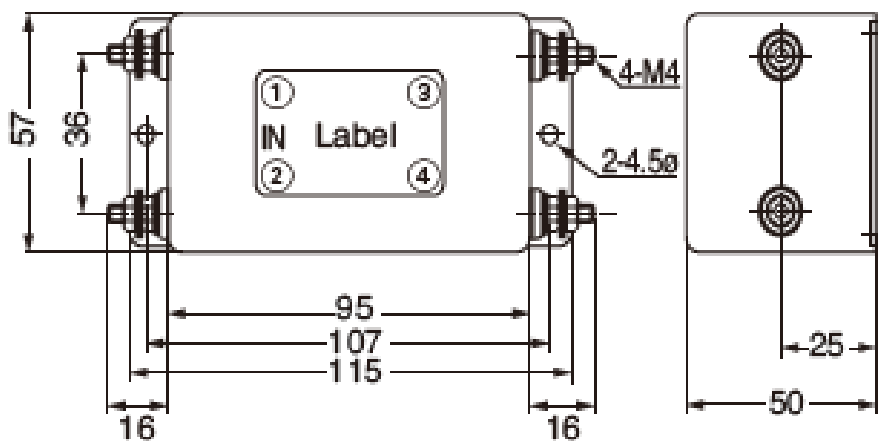
LF-210, LF-210N, LF-215N



Recommended torque (N-m) maximum

- Line terminal (M4: 0.78)
- Earth terminal (M4: 1.18)

LF-215F, LF-215U

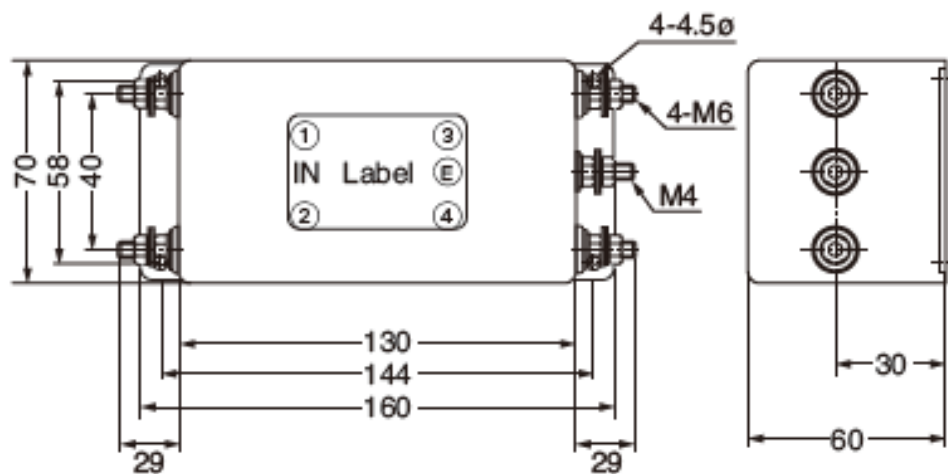


Recommended torque (N-m) maximum

- Line terminal (M4: 0.78)

Dimensions – Millimeters cont.

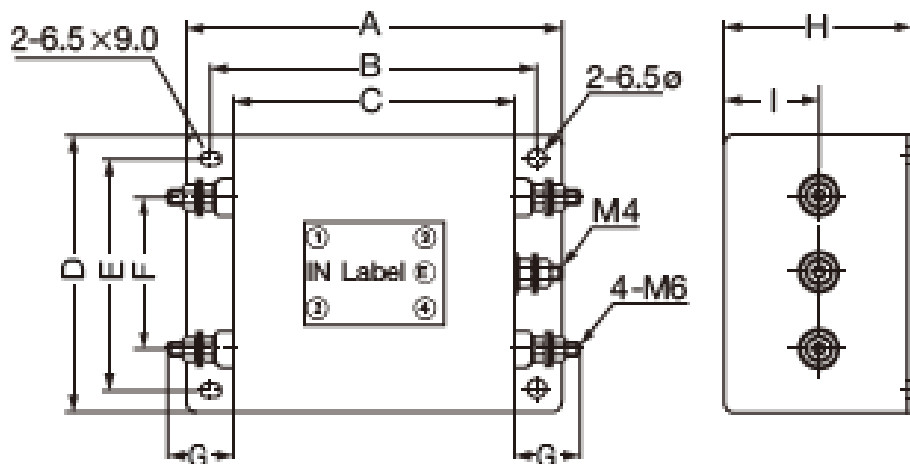
LF-220N, LF-230N



Recommended torque (N-m) maximum

- Line terminal (M6: 1.18)
- Earth terminal (M4: 1.18)

LF-240, LF-240P, LF-250, LF-250P



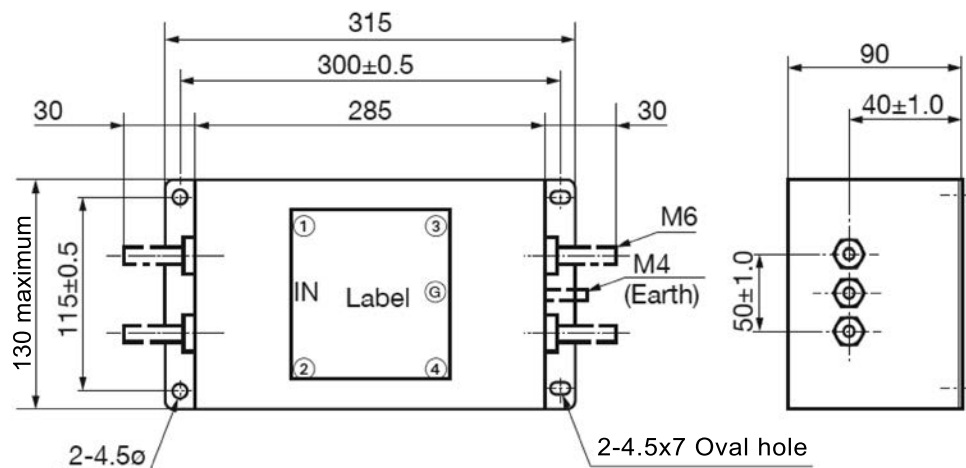
Recommended torque (N-m) maximum

- Line terminal (M6: 1.18)
- Earth terminal (M4: 1.18)

| Part Number | A | B | C | D | E | F | G | H | I |
|-------------|-----|-----|-----|-----|-----|----|----|----|----|
| LF-240 | 210 | 190 | 170 | 120 | 100 | 60 | 29 | 75 | 40 |
| LF-240P | | | | | | | | | |
| LF-250 | 240 | 220 | 200 | 90 | 70 | 40 | 30 | 80 | 40 |
| LF-250P | | | | | | | | | |

Dimensions – Millimeters cont.

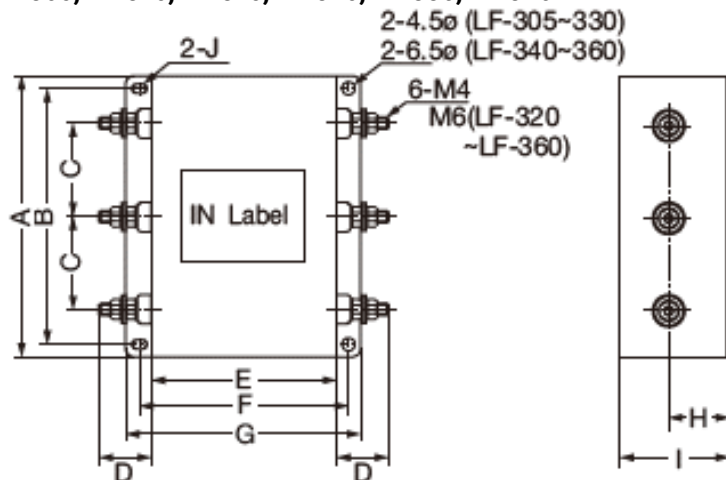
LF-260N



Recommended torque (N-m) maximum

- Line terminal (M6: 1.18)
- Earth terminal (M4: 1.18)

LF-305, LF-310, LF-315, LF-320, LF-330, LF-340



Recommended torque (N-m) maximum

- Line terminal (M6: 1.18)

| Part Number | A | B | C | D | E | F | G | H | I | J | | | |
|-------------|-----|-----|----|-----|-----|-----|-----|-----|----|-------|-------|----|----|
| LF-305 | 120 | 110 | 40 | 25 | 80 | 95 | 110 | 25 | 45 | 4.5x7 | | | |
| LF-310 | 180 | 170 | 60 | | 29 | 120 | 135 | 150 | 35 | | 65 | | |
| LF-315 | | | | 200 | | 220 | 240 | 40 | 80 | | 6.5x9 | | |
| LF-320 | | | | | 160 | | | | | | | 50 | 30 |
| LF-330 | | | | | | | | | | | | | |
| LF-340 | | | | | | | | | | | | | |

Environmental Compliance

KEMET LF EMI-RFI Filters comply with EU RoHS Directive 2011/65/EU and (EU) 2015/863. Products that fall under the exemptions listed in below table are also included.



| Part Number | RoHS Compliant | RoHS Exemption Code |
|-------------|----------------|---------------------|
| LF-202U-1 | Yes | No |
| LF-202-9 | Yes | No |
| LF-210 | Yes | 6(c) |
| LF-210N | Yes | 6(c) and 7(c)-I |
| LF-215N | Yes | 6(c) and 7(c)-I |
| LF-215F | Yes | 6(c) |
| LF-215U | Yes | 6(c) |
| LF-220N | Yes | 6(c) and 7(c)-I |
| LF-230N | Yes | 6(c) and 7(c)-I |
| LF-240 | Yes | 6(c) |
| LF-240P | Yes | 6(c) |
| LF-250 | Yes | 6(c) |
| LF-250P | Yes | 6(c) |
| LF-260N | Yes | 6(c) and 7(c)-I |
| LF-305 | Yes | 6(c) |
| LF-310 | Yes | 6(c) |
| LF-315 | Yes | 6(c) |
| LF-320 | Yes | 6(c) |
| LF-330 | Yes | 6(c) |
| LF-340 | Yes | 6(c) |

| Code | Exemption |
|--------|--|
| 6(c) | Copper alloy containing up to 4% lead by weight |
| 7(c)-I | Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound |

Approvals

| Certification Body | File Number | Part Number |
|--------------------|-------------|---------------------------------------|
| UL | E59551 | LF-202U-1, LF-210, LF-215U and LF-310 |

Performance Characteristics

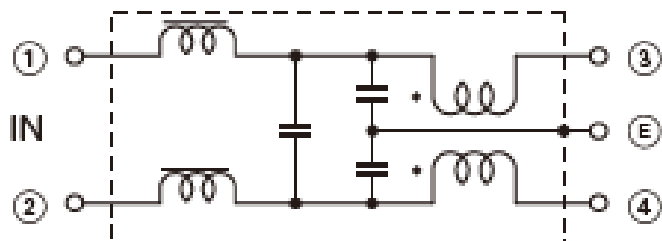
| Item | Performance Characteristics |
|-----------------------------|--|
| Rated Voltage | 250 V |
| Rated Current Range | 2 – 60 A |
| Withstanding Voltage | 1,500 VAC (1 minute, line to ground) except LF-xxxP: 2,000 VAC (1 minute, line to ground) |
| Insulation Resistance | 300 M Ω minimum at 500 VDC (1 minute, line to ground) |
| Leakage Current Range | 0.005 – 1.000 mA maximum at 250 V/60 Hz |
| Input/Output Terminal Type | Screw and Lead Wire |
| Operating Temperature Range | -25°C to +55°C (not including self temperature rise) (with some exceptions at -20°C to 45°C and -20°C to +55°C) |

Table 1 – Ratings & Part Number Reference

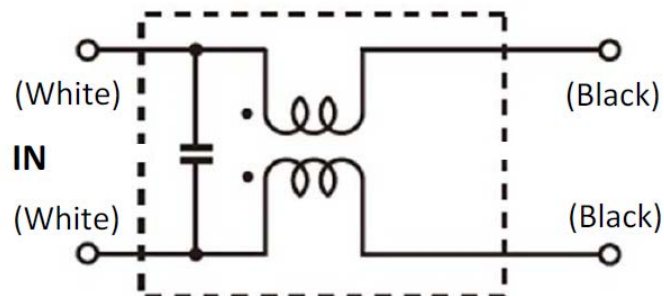
| Part Number | Phase | Rated Voltage AC (V) | Rated Current AC (A) | DC Available | Leakage Current at 250 V/60 Hz (mA) Maximum | Temperature Rise (K) Maximum | Operating Temperature Range | Terminal Type | Approval | Weight (g) |
|-------------|--------------|----------------------|----------------------|--------------|---|------------------------------|-----------------------------|---------------|----------|------------|
| LF-202U-1 | Single-phase | 250 | 2 | Yes | 1.000 | 30 | -20°C to +55°C | Lead wire | UL | 95 |
| LF-202-9 | Single-phase | 250 | 2 | Yes | 0.005 | 30 | -25°C to +55°C | Lead wire | | 50 |
| LF-210 | Single-phase | 250 | 10 | Yes | 1.000 | 30 | -20°C to +55°C | Screw | UL | 590 |
| LF-210N | Single-phase | 250 | 10 | Yes | 1.000 | 30 | -20°C to +55°C | Screw | | 650 |
| LF-215N | Single-phase | 250 | 15 | Yes | 1.000 | 30 | -20°C to +55°C | Screw | | 650 |
| LF-215F | Single-phase | 250 | 15 | Yes | 1.000 | 30 | -20°C to +55°C | Screw | | 650 |
| LF-215U | Single-phase | 250 | 15 | Yes | 1.000 | 30 | -20°C to +55°C | Screw | UL | 620 |
| LF-220N | Single-phase | 250 | 20 | Yes | 1.000 | 30 | -20°C to +55°C | Screw | | 1,200 |
| LF-230N | Single-phase | 250 | 30 | Yes | 1.000 | 30 | -20°C to +55°C | Screw | | 1,200 |
| LF-240 | Single-phase | 250 | 40 | Yes | 1.000 | 40 | -20°C to +45°C | Screw | | 3,200 |
| LF-240P | Single-phase | 250 | 40 | Yes | 1.000 | 40 | -20°C to +45°C | Screw | | 3,200 |
| LF-250 | Single-phase | 250 | 50 | Yes | 1.000 | 40 | -20°C to +45°C | Screw | | 4,000 |
| LF-250P | Single-phase | 250 | 50 | Yes | 1.000 | 40 | -20°C to +45°C | Screw | | 4,000 |
| LF-260N | Single-phase | 250 | 60 | Yes | 1.000 | 30 | -20°C to +55°C | Screw | | 6,500 |
| LF-305 | Three-phase | 250 | 5 | No | 1.000 | 30 | -20°C to +55°C | Screw | | 650 |
| LF-310 | Three-phase | 250 | 10 | No | 1.000 | 30 | -20°C to +55°C | Screw | UL | 1,900 |
| LF-315 | Three-phase | 250 | 15 | No | 1.000 | 30 | -20°C to +55°C | Screw | | 1,900 |
| LF-320 | Three-phase | 250 | 20 | No | 1.000 | 30 | -20°C to +55°C | Screw | | 2,300 |
| LF-330 | Three-phase | 250 | 30 | No | 1.000 | 30 | -20°C to +55°C | Screw | | 2,400 |
| LF-340 | Three-phase | 250 | 40 | No | 1.000 | 40 | -20°C to +45°C | Screw | | 5,300 |

Circuit Diagram

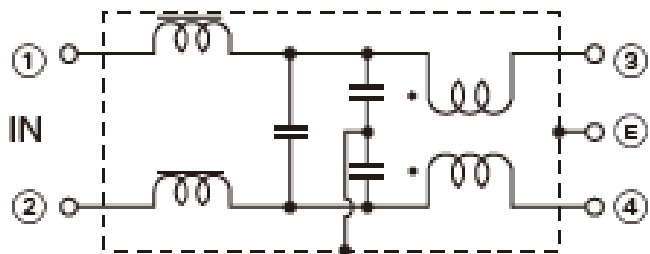
LF-202U-1



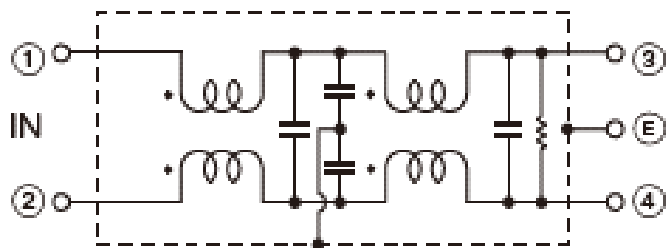
LF-202-9



LF-210

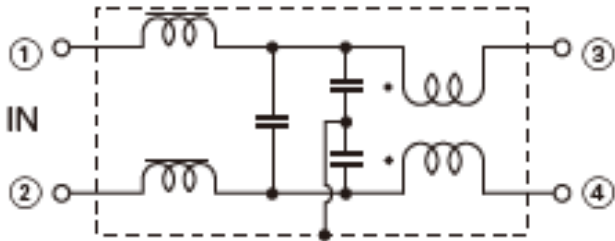


LF-210N, LF-215N, LF-220N, LF-230N

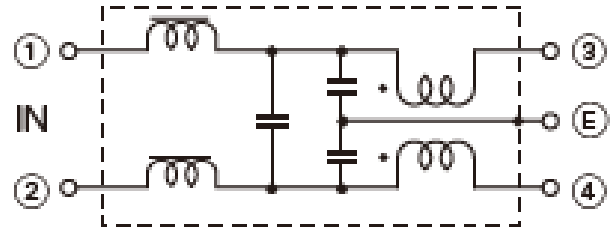


Circuit Diagram cont.

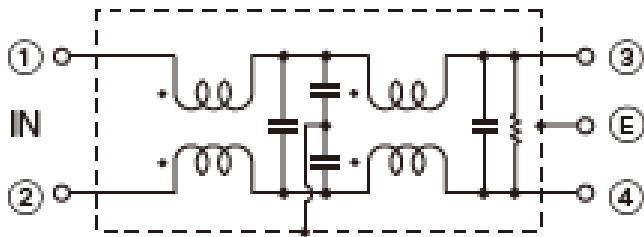
LF-215F, LF-215U



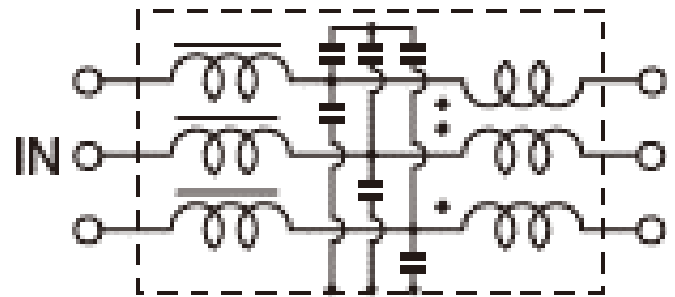
LF-240, LF-240P, LF-250, LF-250P



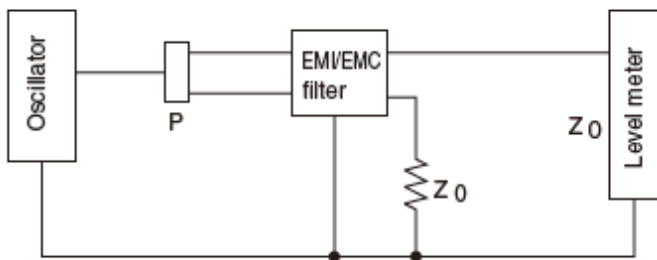
LF-260N



LF-305, LF-310, LF-315, LF-320, LF-330, LF-340



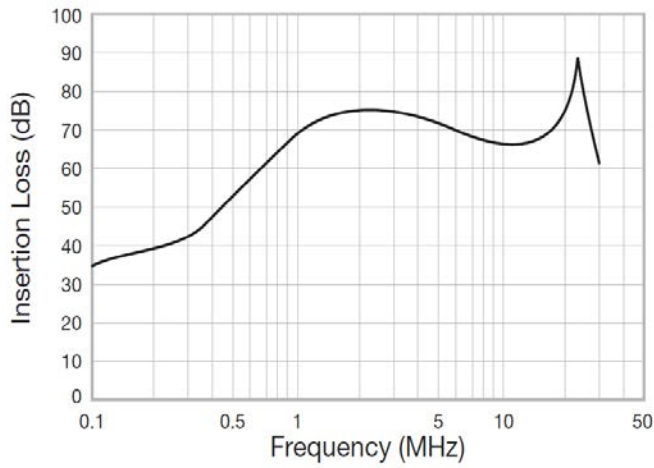
Measuring Circuit - Common Mode



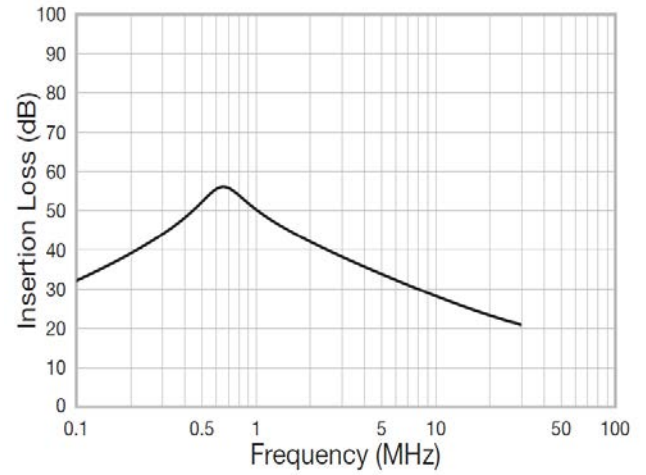
P: Power divider $Z_0: 50\Omega$

Attenuation (Static Characteristics)

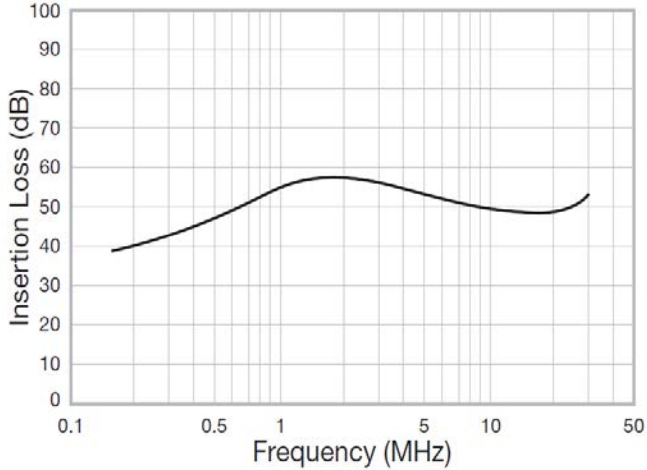
LF-202U-1



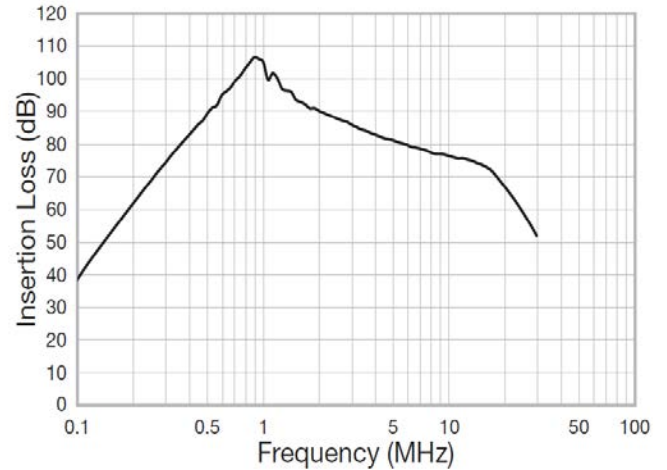
LF-202-9



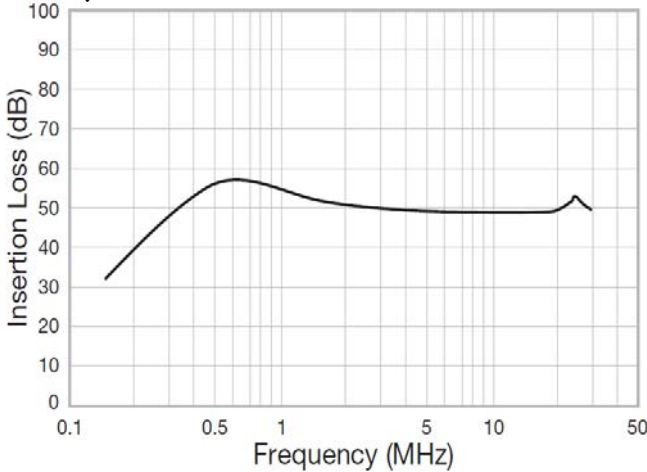
LF-210



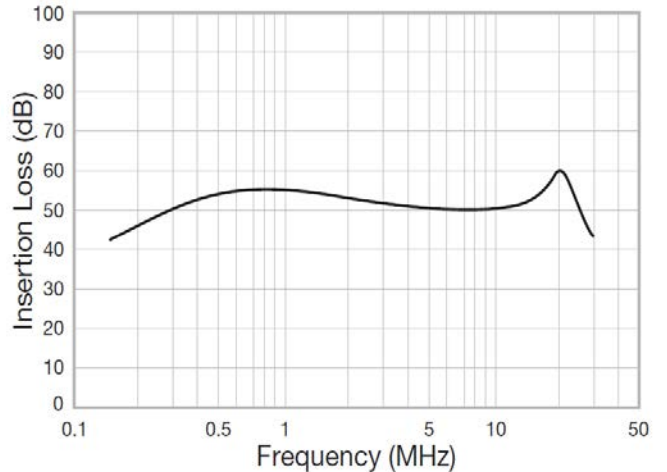
LF-210N



LN-215F, LF-215U

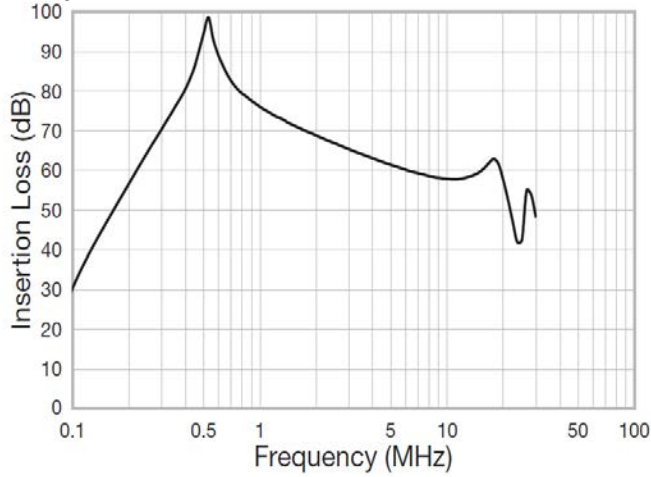


LF-215N

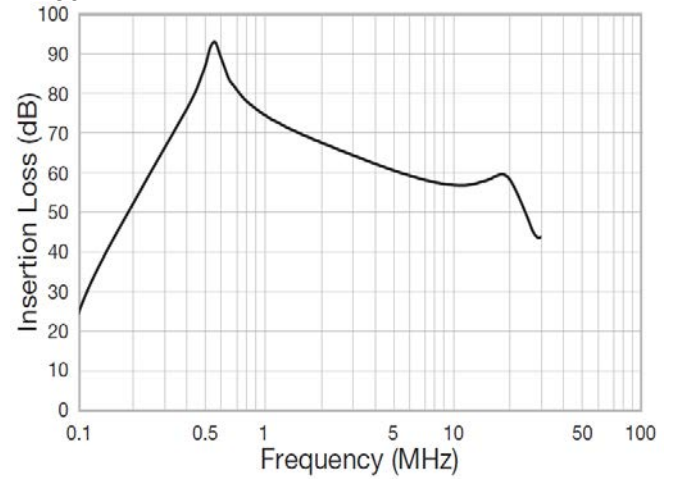


Attenuation (Static Characteristics) cont.

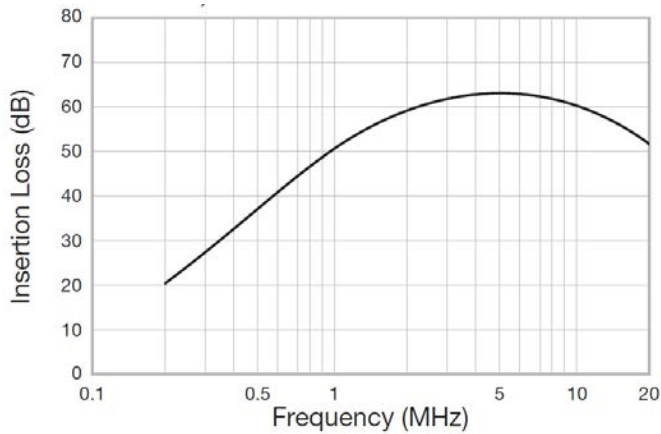
LF-220N



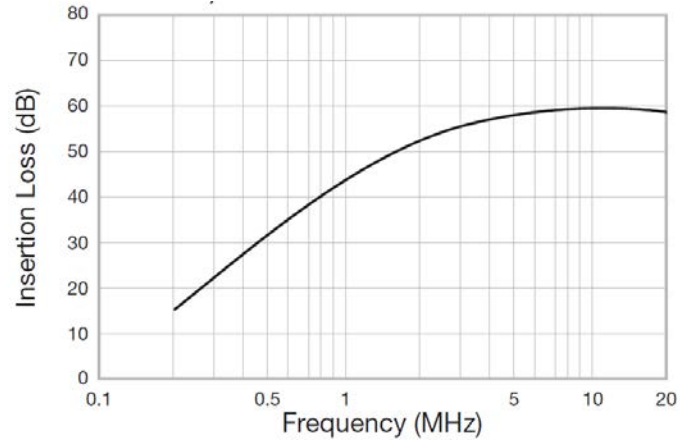
LF-230N



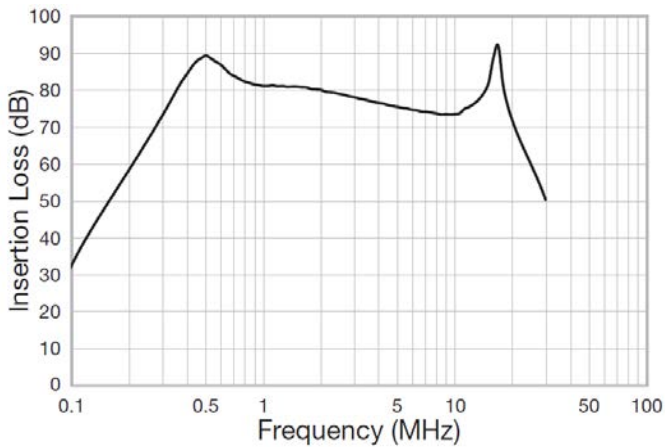
LF-240, LF-240P



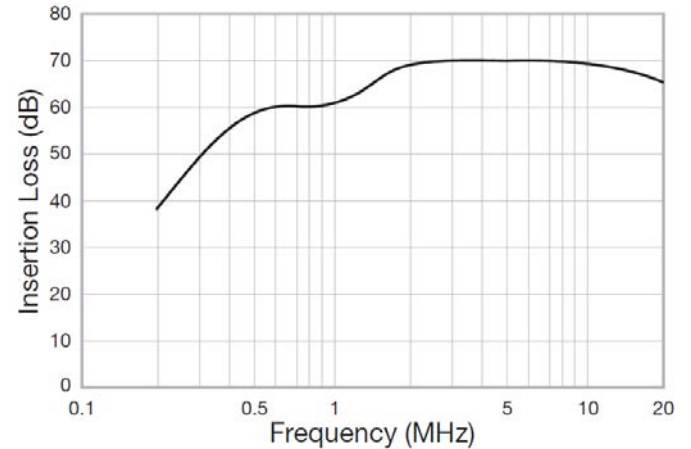
LF-250, LF-250P



LF-260N

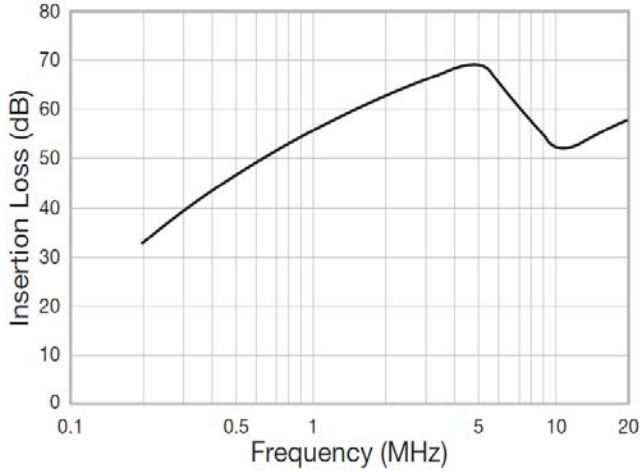


LF-305

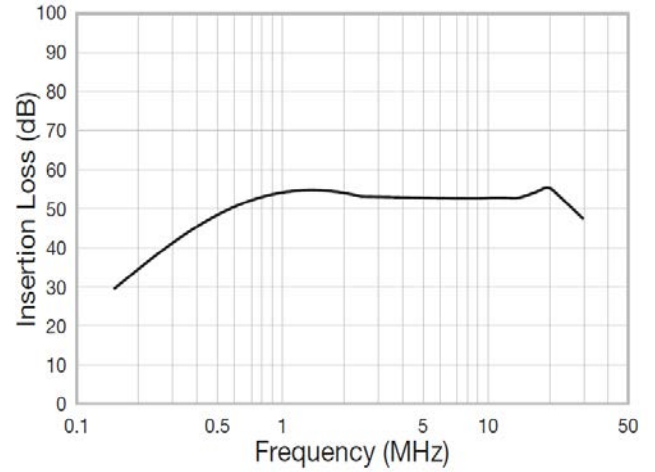


Attenuation (Static Characteristics) cont.

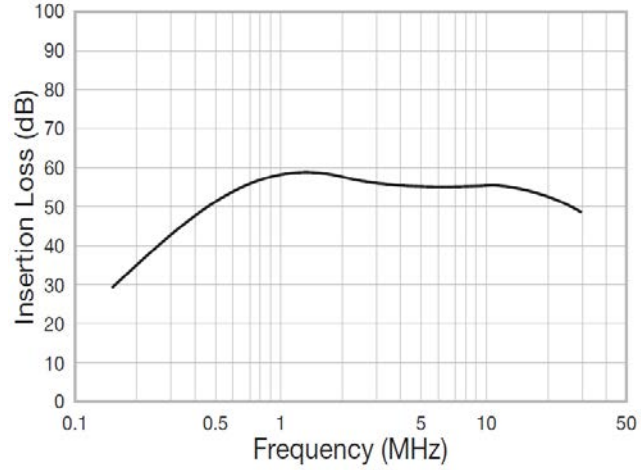
LF-310



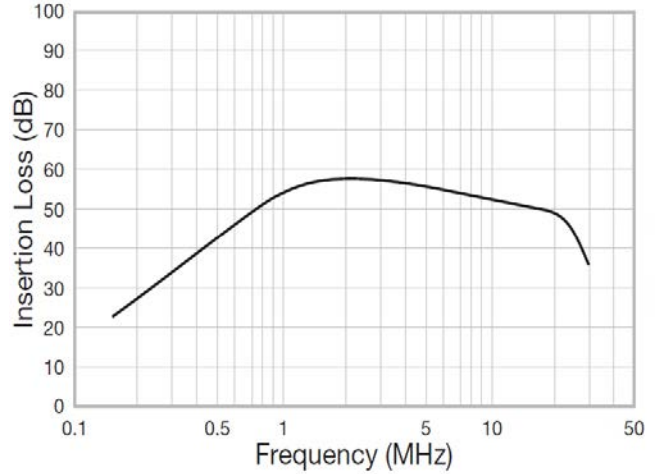
LF-315



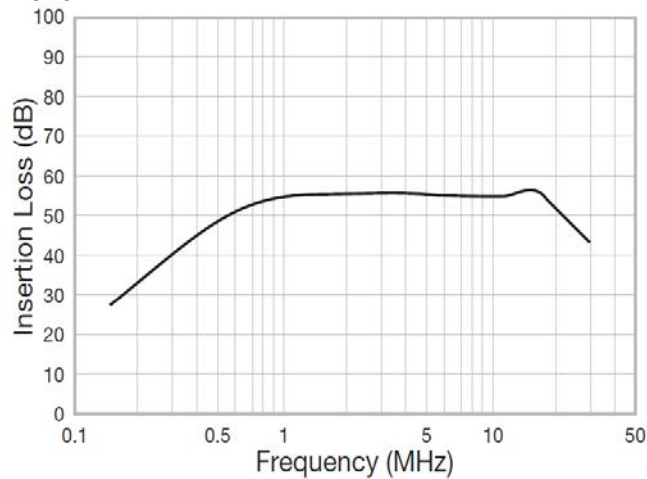
LF-320



LF-330



LF-340



Packaging

| Part Type | Packaging Type | Pieces per Box |
|-----------|----------------|----------------|
| LF-202U-1 | Tray | 10 |
| LF-202-9 | | |
| LF-210 | | |
| LF-210N | | 15 |
| LF-215N | | |
| LF-215F | | 5 |
| LF-215U | | 15 |
| LF-220N | | |
| LF-230N | | 12 |
| LF-240 | | |
| LF-240P | | 5 |
| LF-250 | | |
| LF-250P | | |
| LF-260N | | 2 |
| LF-305 | | 16 |
| LF-310 | | |
| LF-315 | | 7 |
| LF-320 | | |
| LF-330 | | |
| LF-340 | | 3 |

Handling Precautions

Precautions for product storage

EMI-RFI Filters should be stored in normal working environments. While the filters themselves are quite robust in other environments, solderability will be degraded by exposure to high temperatures, high humidity, corrosive atmospheres, and long term storage.

KEMET recommends that maximum storage temperature not exceed 40°C and maximum storage humidity not exceed 70% relative humidity and atmospheres should be free of chlorine and sulfur bearing compounds. Temperature fluctuations should be minimized to avoid condensation on the parts. Also, avoid storage near strong magnetic fields as this might magnetize the product.

For the parts LF-202U-1 and LF-202-9, for optimized solderability on their lead wires, their stock should be used promptly, preferably within 6 months of receipt. For the other parts, having screw terminals, their stock should be used preferably within 12 months of receipt.

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