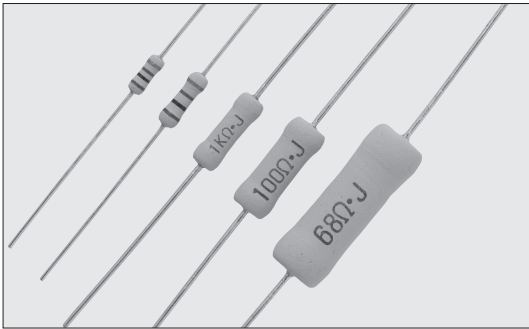


MOS 小型氧化金属膜固定电阻器 Fixed Metal Oxide Film Resistors (Small type)

MOSX 小型金属膜固定电阻器 Fixed Metal Film Resistors (Small type)



外观颜色: 淡紫色 Coating color: Lavender
表示: 颜色代码 (0.5W,1W)
文字表示 (2W,3W,5W)
Marking: Color code (0.5W,1W)
Alphanumeric (2W,3W,5W)

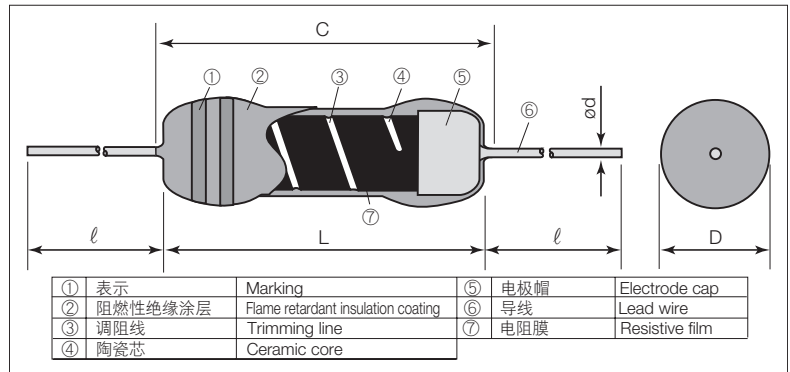
特点 Features

- 是小型功率型电阻器。
- 是阻燃性涂层 (相当UL94 V-0品)。
- 可以自动插入。
- 可以进行各种成形加工。
- 高信赖性。
- 符合欧盟RoHS。
- 由于对应表面贴装成形, 所以可自动贴装。
- Small size power type resistors.
- Flame retardant coating. (Equivalent to UL94 V-0)
- Automatic insertion is applicable.
- Various types of formings are available.
- High reliability.
- Products meet EU-RoHS requirements.
- Automatic mounting machine is applicable by surface mounted device style lead forming.

参考标准 Reference Standards

IEC 60115-4
JIS C 5201-4
EIAJ RC-2138

结构图 Construction



外形尺寸 Dimensions

| 型号 Type | 尺寸 Dimensions (mm) | | | | d (Nominal) | φ ^{*1} | Weight (g) (1,000pcs) |
|-------------|--------------------|--------|---------|--|-------------|-----------------|--------------------------|
| | L | C Max. | D | | | | |
| MOS (X) 1/2 | 6.2±0.5 | 7.1 | 2.5±0.5 | | 0.6 | 24Min. | 250 |
| MOS (X) 1 | 9.0±1.0 | 11.1 | 3.0±0.5 | | | | 350 |
| MOS (X) 2 | 12.0±1.0 | 15.0 | 4.0±0.5 | | 0.8 | 30±3 | 800 |
| MOS (X) 3 | 15.5±1.0 | 18.0 | 6.0±1.0 | | | | 1,400 |
| MOS (X) 5 | 24.5±1.0 | 28.0 | 9.0±1.0 | | | | 5,240 |

*1 引线长度按照成型和编带而改变。
*1 Lead length changes depending on taping and forming type.

品名构成 Type Designation

实例 Example

| MOS | 1 | C | T52 | A | 103 | J |
|---|---|-------------------------------------|--------------------------|---|-----------------------------|--------------------------------|
| 品种 Product Code | 额定功率 Power Rating | 端子表面材质 Terminal Surface Material | 二次加工 Taping & Forming | 包装 Packaging | 公称电阻值 Nominal Resistance | 阻值允许偏差 Resistance Tolerance |
| MOS: 小型氧化金属膜 固定电阻 Fixed Metal Oxide Film Resistors (Small Type) MOSX: 小型金属膜 固定电阻 Fixed Metal Film Resistors (Small Type) | 1/2: 0.5W 1: 1W 2: 2W 3: 3W 5: 5W | C: SnCu | 参照下述 See table below | A: AMMO包装 A: AMMO R: 卷 R: REEL 空栏: 箱子 Nil: BOX TEB: TEG-Plastic embossed (N forming) | F: 4 digits G: 3 digits | F: ±1% G: ±2% J: ±5% |

欲知关于此产品含有的环境负荷物质详情 (除EU-RoHS以外), 请与我们联系。
编带细节请参考卷末附录C。

Contact us when you have control request for environmental hazardous material other than the substance specified by EU-RoHS.

For further information on taping, please refer to APPENDIX C on the back pages.

二次加工对应表 Taping & Forming Matrix

| 型号 Type | 轴向编带 Axial Taping | | | | 成型编带 Stand-off Axial Taping | | | VT径向编带 VT Radial Taping | | | | GT径向编带 GT Radial Taping | | | | L成形 ^{*2} L Forming | | | | | U成形 U Forming | | M成形 ^{*2} M Forming | | | | | N成形 N Forming | | | | | | | | | | |
|------------|----------------------|-----|------|------|--------------------------------|------|------|----------------------------|-----|-----|----|----------------------------|------|--------|------|--------------------------------|------|------|------|---|------------------|-----|--------------------------------|-----|-----|-----|-----|------------------|-------|-----|-----|---|---|---|---|---|---|---|
| | T26 | T52 | T521 | T631 | L52 | L521 | L631 | VTP | VTE | VTF | GT | GT4 | L10A | L12.5A | L15A | L20A | L25A | L30A | L35A | U | UCL | M10 | M12.5 | M15 | M16 | M20 | M26 | M30 | N14.5 | N17 | N20 | | | | | | | |
| | MOS (X) 1/2C | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | |
| MOS (X) 1C | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | |
| MOS (X) 2C | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| MOS (X) 3C | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| MOS (X) 5C | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

*2 请参考P198二次加工。Refer to P198 "Secondary Processed Products"

额定值 Ratings

| 型号 Type | 额定功率 Power Rating | 电阻值范围 Resistance Range (Ω) | | | 电阻温度系数 T.C.R. (×10 ⁻⁶ /K) | 最高使用电压 Max. Working Voltage | 最高过载电压 Max. Overload Voltage | 耐电压 Dielectric Withstanding Voltage | 编带和包装数/AMMO包装 Taping & Q'ty/AMMO pack (pcs) | | | |
|------------|----------------------|-----------------------------------|-------------------------------|-----------------|--|--------------------------------|---------------------------------|--|--|-------|-------|-------|
| | | F: ±1% (E24+E96) ^{*3} | G: ±2% (E24) ^{*3} | J: ±5% (E24) | | | | | T26A | T52A | T521A | T631A |
| MOS1/2C | 0.5W | 10~47k | 10~47k | 10~47k | ±300 | E = √P×R | 600V | 400V | 2,000 | 2,000 | - | - |
| MOS1C | 1W | 10~68k | 10~68k | - | | | | 500V | - | 2,000 | - | - |
| MOS2C | 2W | 10~100k | - | - | | 350V | 700V | 700V | - | 1,000 | 1,000 | - |
| MOS3C | 3W | - | 10~100k | 10~100k | | | | 800V | - | - | 500 | 1,000 |
| MOS5C | 5W | - | - | - | | 500V | 1000V | 800V | - | - | - | - |
| MOSX1/2C | 0.5W | - | - | - | | | | 400V | 2,000 | 2,000 | - | - |
| MOSX1C | 1W | 0.1~9.1 | 0.1~9.1 | - | | E = √P×R | E×2.5 | 500V | - | 2,000 | - | - |
| MOSX2C | 2W | - | - | - | | | | 700V | - | 1,000 | 1,000 | - |
| MOSX3C | 3W | - | - | - | | | | 800V | - | 500 | 1,000 | - |
| MOSX5C | 5W | - | 0.22~9.1 | - | | | | 800V | - | - | - | - |
| | | | | | | | | | | | | |

*3 如果需要F级、G级产品目录范围以外的电阻值, 请与我们联系。

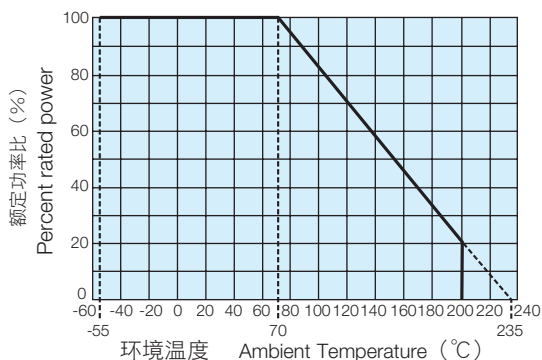
额定环境温度 Rated Ambient Temperature: +70℃

使用温度范围 Operating Temperature Range: -55℃~+200℃

额定电压是√额定功率×公称电阻值所算出的值或表中最高使用电压两者中小的值为额定电压。

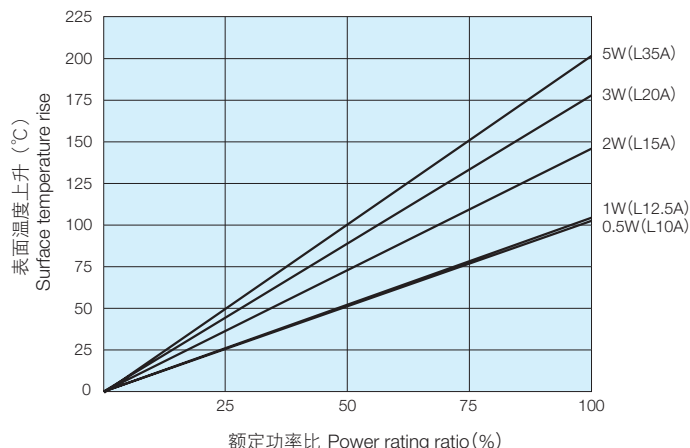
Rated voltage = √Power Rating×Resistance value or Max. working voltage, whichever is lower.

■ 负荷减轻特性曲线 Derating Curve



在环境温度70°C以上使用时，应按照上图负荷减轻特性曲线，减小额定功率。
For resistors operated at an ambient temperature of 70°C or above, a power rating shall be derated in accordance with the above derating curve.

■ 表面温度上升 Surface Temperature Rise



■ 性能 Performance

| 试验项目 Test Items | 标准值 Performance Requirements $\Delta R \pm (\% + 0.05 \Omega)$ | | 试验方法 Test Methods |
|--------------------------------------|---|-------------|--|
| | 保证值 Limit | 代表值 Typical | |
| 电阻值 Resistance | 在规定的允许偏差内 Within specified tolerance | - | 测定处应离主体10mm±1mm Measuring points are 10mm±1mm from the end cap. |
| 电阻温度系数 T.C.R. | 在规定的允许偏差内 Within specified tolerance | - | +25°C/+125°C |
| 过载(短时间) Overload (Short time) | ±(2%+0.1Ω) | 1 | 额定电压×2.5倍施加5秒钟。 Rated voltage ×2.5 for 5s |
| 耐焊接热 Resistance to soldering heat | 1 | 0.5 | 260°C±5°C, 10s±1s |
| 端子强度 Terminal strength | 应当导线没有脱落、端子没有松动 No lead-coming off and loose terminals | - | Twist 360°, 5 times |
| 温度突变 Rapid change of temperature | 1 | 0.5 | -55°C (30min.) / +155°C (30min.) 5 cycles |
| 耐湿负荷 Moisture resistance | ±(5%+0.1Ω) | 2.5 | 40°C±2°C, 90%~95%RH, 1000h 1.5小时ON、0.5小时OFF的周期 1.5h ON/0.5h OFF cycle |
| 在70°C时的耐久性 Endurance at 70°C | ±(5%+0.1Ω) | 2.5 | 70°C±2°C, 1000h 1.5小时ON、0.5小时OFF的周期 1.5h ON/0.5h OFF cycle |
| 耐溶剂性 Resistance to solvent | 应当外观没有异常，表示容易辨认 No abnormality in appearance. Marking shall be easily legible | - | 进行异丙醇的超声波清洗2分钟 Ultrasonic washing with Isopropyl alcohol for 2 min. 输出 Power : 0.3W/cm², 频率 f : 28kHz, 温度 Temp : 35°C±5°C |
| 阻燃性 Flame retardant | 应不发火和不自动发火。 No evidence of flaming or self-flaming. | - | 耐火性：把试验火焰在主体上烧15秒钟，取下15秒钟，5次循环。 Flame test : The test flame shall be applied and removed for each 15s respectively to repeat the cycle 5 times. 过载耐燃性：把相当于额定功率2倍、4倍、8倍、16倍、32倍的电力(AC)分别施加1分钟直至断线。 但施加电压不应超过最高使用电压的4倍。 Overload flame retardant : Power (AC) corresponding to 2, 4, 8, 16 and 32 times the power rating shall be applied for each 1min. until disconnection occurs. However the applied voltage shall not exceed the value of 4 times the maximum operating voltage. |

■ 使用注意事项 Precautions for Use

- 保护漆颜色，标示，外形尺寸根据生产场所的不同有区别，请确认产品规格书。
- 由于包装涂层是阻燃性特种涂料，对外部冲击比较脆弱，使用时应注意。清洗应在最小限度。清洗后涂层膜比较弱，因此，在充分干燥前在涂层膜上不要施加外力。由于干燥后才恢复原来的强度，因此应注意在清洗后约20分钟内，不施加外力到电阻的涂层膜上。
- Coating color, marking and dimensions are different depending on the manufacturing base. Verify them on the delivery specification.
- Be careful to handle these resistors because outer coatings are comparatively weak to outer shock due to flameproof special coats. Please wash them to a minimum. No external force is given to the coating films until they are well dried because the coating films become weaker right after washing. The original strength will be returned after they are dried, so please pay attention not to apply any external force onto the coating film of resistors for 20 minutes after drying. Especially no PC boards shall be piled up.

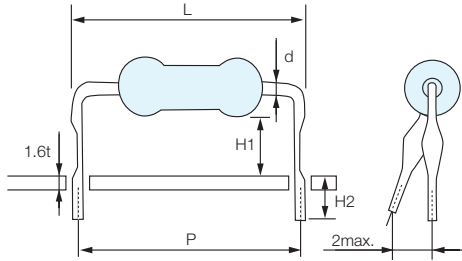
POWER TYPE

MOS 小型氧化金属膜固定电阻器
Fixed Metal Oxide Film Resistors (Small type)

MOSX 小型金属膜固定电阻器
Fixed Metal Film Resistors (Small type)

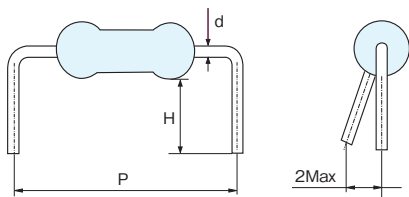
■ 二次加工 Secondary Processed Products (mm)

L成形 L Forming



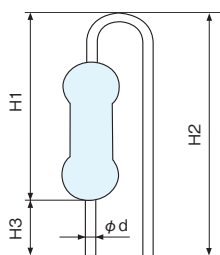
| 型号 Type MOS MOSX | P±1 | H ₁ ±1 | H ₂ ±1 | d (公称值) (Nominal) | L max. | 基板孔径 Substrate hole dia |
|------------------------|------|-------------------|-------------------|-------------------------|--------|-------------------------------|
| 1/2CL10A | 10.0 | 5.3 | 4.0 | 0.6 | 17.5 | φ 0.8 |
| 1CL12.5A | 12.5 | 7.0 | | | | |
| 1CL15A | 15.0 | 6.5 | | 0.8 | 17.5 | φ 1.0 |
| 2CL15A | | 7.0 | | | | |
| 2CL15F | | 4.5 | | | | |
| 2CL20A | 20.0 | 9.0 | | | | |
| 2CL20D | | 4.8 | | | | |
| 3CL20A | | 8.0 | | | | |
| 3CL20C | | 10.0 | | | | |
| 3CL20T | 25.0 | 4.0 | | | | |
| 3CL25A | | 7.0 | | | | |
| 3CL30A | | 7.0 | | | | |
| 5CL30A | 30.0 | 8.5 | | | | |
| 5CL35A | 35.0 | 5.5 | | | | |

M成形 M Forming



| 型号 Type MOS MOSX | P±1 | H±1 | d (公称值) (Nominal) | 基板孔径 Substrate hole dia |
|------------------------|------|------|-------------------------|-------------------------------|
| 1/2CM10C | 10.0 | 3.5 | 0.6 | φ 0.8 |
| 1/2CM10F | 10.0 | 5.0 | 0.6 | |
| 1CM12.5C | 12.5 | 3.5 | 0.8 | φ 1.0 |
| 1CM12.5D | 12.5 | 4.0 | 0.8 | |
| 1CM15F | 15.0 | 5.0 | 0.8 | |
| 1CM15J | 15.0 | 6.3 | 0.8 | |
| 1CM15S | 15.0 | 11.0 | 0.8 | |
| 2CM15C | 15.0 | 3.5 | 0.8 | |
| 2CM15E | 15.0 | 4.5 | 0.8 | |
| 2CM16D | 16.0 | 4.0 | 0.8 | |
| 2CM20D | 20.0 | 4.0 | 0.8 | |
| 2CM20U | 20.0 | 13.5 | 0.8 | |
| 3CM20E | 20.0 | 4.6 | 0.8 | |
| 3CM26E | 26.0 | 4.7 | 0.8 | |
| 5CM30U | 30.0 | 13.0 | 0.8 | |

UCL成形 UCL Forming

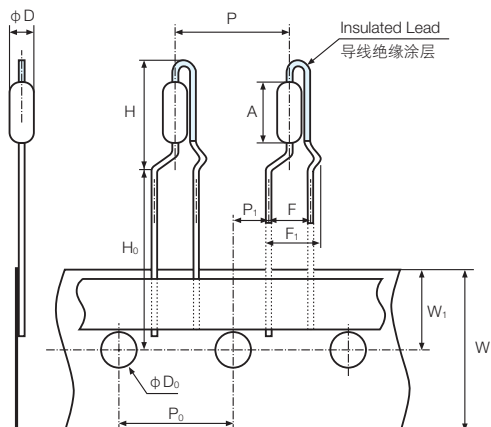


| 型号 Type MOS MOSX | H ₁ ±1 | H ₂ ±1 | H ₃ ±1 | d (公称值) (Nominal) | 基板插入节距 Insertion pitch | 基板孔径 Substrate hole dia |
|------------------------|-------------------|-------------------|-------------------|-------------------------|---------------------------|-------------------------------|
| 1CUCL | 13.0 | 17.0 max | 3.5 | 0.8 | 5.0 | φ 1.0 |
| 2CUCL | 14.5 | 18.5 max | 3.5 | | | |
| 3CUCL | 20.0 max | 22.0 | 4.0 | | | |

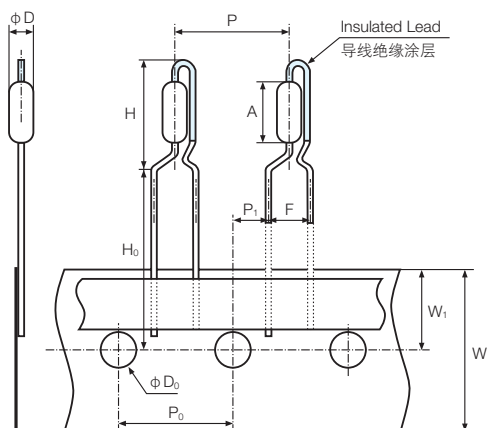
■二次加工 Secondary Processed Products (mm)

NEW

VTF径向编带 VTF Radial Taping



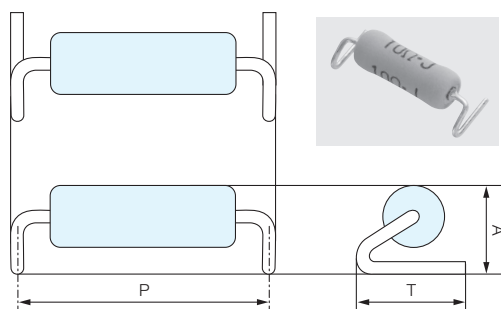
VTP径向编带 VTP Radial Taping



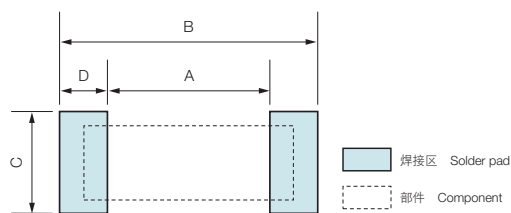
| 品种 | MOS/MOSX | | | |
|-------------------------------|-----------|---------|----------|----------|
| 额定值 | 1/2C | 1C | 2C | 2C |
| 型号 | VTP | VTP | VTP | VTF |
| A | 6.2±0.5 | 9.0±1.0 | 12.0±1.0 | 12.0±1.0 |
| φD | 2.5±0.5 | 3.0±0.5 | 4.0±0.5 | 4.0±0.5 |
| d (nominal) | 0.6 | | 0.65 | 0.8 |
| F | 5.0±0.5 | | | |
| F ₁ | | | | 7.3max. |
| H | 13max. | 16max. | 22.5max. | 22.5max. |
| H ₀ | 16+1.0/-0 | | | |
| P | 12.7±1.0 | | | |
| P ₀ | 12.7±0.3 | | | |
| P ₁ | 3.85±0.7 | | | |
| W | 18.0±0.5 | | | |
| W ₁ | 9.0±0.5 | | | |
| φD ₀ | 4.0±0.2 | | | |
| 基板孔径 Substrate hole dia | φ 0.8 | | | φ 1.0 |

- 导线绝缘涂层颜色 The color of insulated Lead: 绿色 Green
- 基板插入节距 Insertion pitch: 5.0mm

N成形 N Forming



推荐的焊盘尺寸 Recommended Pad Dimensions



可根据客户的需求提出各种导线成形方案。
欢迎咨询。

Various lead forming shapes are available upon request. Please feel free to ask us.

| 品种 | MOS/MOSX | | |
|----------------------|----------|--------|---------|
| 额定值 | 1C | 2C | 3C |
| 型号 | N14.5TEB | N17TEB | N20TEG |
| P±1 | 14.5 | 17.0 | 20.0 |
| T±0.5 | 5.0 | 6.0 | 7.5±1.0 |
| A±0.5 | 4.8 | 5.8 | 6.5 |
| d (公称值) (nominal) | 0.8 | 0.8 | 0.8 |

- 需要使用专用喷嘴。使用时请咨询。
- Need a dedicated nozzle for automatic mounting.
- Please inquire to us before use.

| 品种 | MOS/MOSX | | |
|-----|----------|--------|--------|
| 额定值 | 1C | 2C | 3C |
| 型号 | N14.5TEB | N17TEB | N20TEG |
| A | 12.5 | 14.6 | 17.6 |
| B | 16.5 | 19.4 | 22.4 |
| C | 7.0 | 8.0 | 9.5 |
| D | 2.0 | 2.4 | 2.4 |

- 包装规格请参照附录。
- Please refer to APPENDIX for the packaging specification.