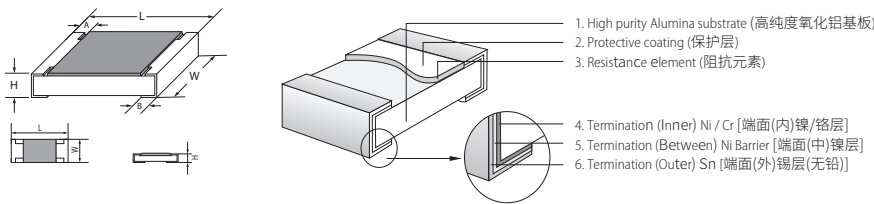


Feature (特性)

- Small size & light weight 短小轻薄
- Reduction of assembly costs and matching with placement machine. 可降低装置成本及配合机器组装
- Suitable for both wave & re-flow soldering. 适合波峰焊与回流焊
- Applications: Navigator (GPS), Mobile Phone, Telecom, PDA, Digital CATV Receiver, Meter. 应用于GPS、移动电话、PDA、机顶盒、仪表

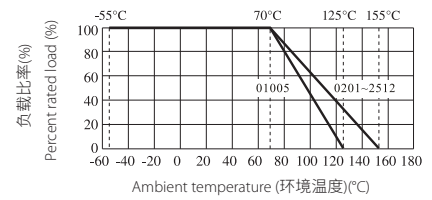


Figures (形状)



Derating Curve & Specification

降功率曲线及性能



| Type 类型 | 01005 | 0201 | 0402 | 0603 | 0805 | 1206 | 1210 | 1812 | 2010 | 2512 |
|--------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Size 尺寸 | 0402 | 0603 | 1005 | 1608 | 2012 | 3216 | 3225 | 4532 | 5025 | 6432 |
| Max. Working Voltage 最大工作电压 | 15V | 25V | 50V | 75V | 150V | 200V | 200V | 200V | 200V | 200V |
| Max. Overload Voltage 最大过负荷电压 | 30V | 50V | 100V | 150V | 300V | 400V | 500V | 500V | 500V | 500V |
| Dielectric withstanding Voltage 绝缘耐压 | - | - | 100V | 300V | 500V | 500V | 500V | 500V | 500V | 500V |
| Operating Temperature 工作温度范围 | -55~+125°C | -55~+155°C | -55~+155°C | -55~+155°C | -55~+155°C | -55~+155°C | -55~+155°C | -55~+155°C | -55~+155°C | -55~+155°C |

| Type 类型 | 01005 | 0201 | 0402 | 0603 | 0805 | 1206 | 1210 | 1812 | 2010 | 2512 | |
|--|-------|-----------|-----------|-----------|-----------|--|--|-----------|-----------|-----------|-----------|
| Dimension 尺寸 (mm) | L | 0.40±0.02 | 0.60±0.03 | 1.00±0.10 | 1.60±0.10 | 2.00±0.15 | 3.10±0.15 | 3.10±0.10 | 4.50±0.20 | 5.00±0.10 | 6.35±0.10 |
| | W | 0.20±0.02 | 0.30±0.03 | 0.50±0.05 | 0.80±0.10 | 1.25 ^{+0.15} _{-0.10} | 1.55 ^{+0.15} _{-0.10} | 2.60±0.20 | 3.20±0.20 | 2.50±0.20 | 3.20±0.20 |
| | H | 0.13±0.02 | 0.23±0.03 | 0.35±0.05 | 0.45±0.10 | 0.55±0.10 | 0.55±0.10 | 0.55±0.10 | 0.55±0.20 | 0.55±0.10 | 0.55±0.10 |
| | A | 0.10±0.03 | 0.10±0.05 | 0.20±0.10 | 0.30±0.20 | 0.40±0.20 | 0.45±0.20 | 0.50±0.25 | 0.50±0.20 | 0.60±0.25 | 0.60±0.25 |
| | B | 0.10±0.03 | 0.15±0.05 | 0.25±0.10 | 0.30±0.20 | 0.40±0.20 | 0.45±0.20 | 0.50±0.20 | 0.50±0.20 | 0.50±0.20 | 0.50±0.20 |
| Resistance Value of Jumper 零欧姆电阻阻值 | <50mΩ | | | | | | | | | | |
| Rated Current of Jumper 零欧姆电阻额定电流 | 0.5A | 0.5A | 1A | 1A | 2A | 2A | 2A | 2A | 2A | 2A | |
| Max. Overload Current of Jumper 零欧姆电阻最大过负荷电流 | 1A | 1A | 2A | 2A | 5A | 10A | 10A | 10A | 10A | 10A | |

| Type 类型 | 01005 | 0201 | 0402 | 0603 | 0805 | 1206 | 1210 | 1812 | 2010 | 2512 | | |
|--|------------|----------|-------------|--------------|-----------------|--------------|---------------|------|------------|---------|---------|---------|
| Power Rating 额定功率 | 1/32W | 1/20W | 1/16W | 1/10W | 1/8W | 1/4W | 1/4W | 1/3W | 1/2W | 3/4W | 3/4W | 1W |
| Resistance Range of 0.5%(E-96) 0.5% 的阻值范围 (E-96) | - | - | 1Ω~10MΩ | 1Ω~10MΩ | 1Ω~10MΩ | - | 1Ω~10MΩ | - | 1Ω~10MΩ | 1Ω~10MΩ | 1Ω~10MΩ | 1Ω~10MΩ |
| Resistance Range of 1%,2%(E-96) 1%,2% 的阻值范围 (E-96) | 10Ω ~ 10MΩ | 1Ω~ 10MΩ | 0.01Ω~ 10MΩ | 0.1Ω≤R <10MΩ | 0.01Ω ≤R <0.1 Ω | 0.1Ω≤R <10MΩ | 0.01Ω≤R <0.1Ω | | 0.01Ω~10MΩ | | | |
| Resistance Range of 5%(E-24) 5% 的阻值范围 (E-24) | | 1Ω~10MΩ | 0.01Ω~ 10MΩ | 0.1Ω≤R <10MΩ | 0.01Ω ≤R <0.1 Ω | 0.1Ω≤R <10MΩ | 0.01Ω≤R <0.1Ω | | 0.01Ω~10MΩ | | | |

Marking on the Resistors Body (电阻本体字码标示)

- No marking on resistor body due to tiny size in 01005, 0201 and 0402 series.
01005, 0201, 0402因电阻本体太小, 故本体无标示字码
- ±5% tolerance product: the marking is 3 digits, the first 2 digits are the significant of the resistance and the 3rd digit denotes number of zeros following.
±5%公差产品字码是三位数, 前二位是阻值的有效数, 第三位表示有几个0
- 0805, 1206, 1210, 2010, 2512 ≤±1%: the marking is 4 digits, the first 3 digits are the significant of the resistance and the 4th digit denotes number of zeros following.
0805, 1206, 1210, 2010, 2512 ≤±1%公差产品字码有四位数字, 前三位是阻值的有效数, 第四位表示有几个0
- Standard E-96 series values of 0603 ≤±1%: due to the small size of the resistor's body, 3 digits marking will be used to indicate the accurate resistance value by using the following Multiplier & Resistance Code.
0603 ≤±1%公差 E-96系列标准阻值, 因电阻本体太小, 采用三位阻值代码(数字)及下列指数代码(字母)配合来指明标准的阻值。



153 = 15000Ω = 15KΩ



Below 10Ω: 6R8 = 6.8Ω
10Ω 以下标示: 6R8 = 6.8Ω



2372 = 23700Ω = 23.7KΩ



Below 10Ω: 3R24 = 3.24Ω
10Ω 以下标示: 3R24 = 3.24Ω

Multiplier Code (for 0603 ≤±1% marking) [指数码 (0603≤±1% 标示)]

| Code 代码 | A | B | C | D | E | F | G | H | X | Y | Z |
|---------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|
| Power 幂 | 10 ⁰ | 10 ¹ | 10 ² | 10 ³ | 10 ⁴ | 10 ⁵ | 10 ⁶ | 10 ⁷ | 10 ⁻¹ | 10 ⁻² | 10 ⁻³ |

Standard E-96 series Resistance Value code (for 0603≤±1% marking) [E-96系列标准阻值代码 (对0603≤±1%的字码)]

| Value 阻值 | Code 代码 | Value 阻值 | Code 代码 | Value 阻值 | Code 代码 | Value 阻值 | Code 代码 | Value 阻值 | Code 代码 | Value 阻值 | Code 代码 |
|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|
| 100 | 01 | 147 | 17 | 215 | 33 | 316 | 49 | 464 | 65 | 681 | 81 |
| 102 | 02 | 150 | 18 | 221 | 34 | 324 | 50 | 475 | 66 | 698 | 82 |
| 105 | 03 | 154 | 19 | 226 | 35 | 332 | 51 | 487 | 67 | 715 | 83 |
| 107 | 04 | 158 | 20 | 232 | 36 | 340 | 52 | 499 | 68 | 732 | 84 |
| 110 | 05 | 162 | 21 | 237 | 37 | 348 | 53 | 511 | 69 | 750 | 85 |
| 113 | 06 | 165 | 22 | 243 | 38 | 357 | 54 | 523 | 70 | 768 | 86 |
| 115 | 07 | 169 | 23 | 249 | 39 | 365 | 55 | 536 | 71 | 787 | 87 |
| 118 | 08 | 174 | 24 | 255 | 40 | 374 | 56 | 549 | 72 | 806 | 88 |
| 121 | 09 | 178 | 25 | 261 | 41 | 383 | 57 | 562 | 73 | 825 | 89 |
| 124 | 10 | 182 | 26 | 267 | 42 | 392 | 58 | 576 | 74 | 845 | 90 |
| 127 | 11 | 187 | 27 | 274 | 43 | 402 | 59 | 590 | 75 | 866 | 91 |
| 130 | 12 | 191 | 28 | 280 | 44 | 412 | 60 | 604 | 76 | 887 | 92 |
| 133 | 13 | 196 | 29 | 287 | 45 | 422 | 61 | 619 | 77 | 909 | 93 |
| 137 | 14 | 200 | 30 | 294 | 46 | 432 | 62 | 634 | 78 | 931 | 94 |
| 140 | 15 | 205 | 31 | 301 | 47 | 442 | 63 | 649 | 79 | 953 | 95 |
| 143 | 16 | 210 | 32 | 309 | 48 | 453 | 64 | 665 | 80 | 976 | 96 |

So the resistance value are marked as the following examples (阻值标示如下):



1.96KΩ = 196 × 10¹ Ω = 29B



12.4Ω = 124 × 10⁻¹ = 10X

- Standard E-24 and not belong to E-96 series values (≤±1%) of 0603 size: the marking is the same as 5% tolerance but marking as underline.
0603≤±1%公差, 在标准 E-24 系列中, 但不属 E-96 系列的阻值, 标示和5%的公差相同, 但是在字码下多加一条线



122 = 1200 = 1.2 KΩ



680 = 68Ω

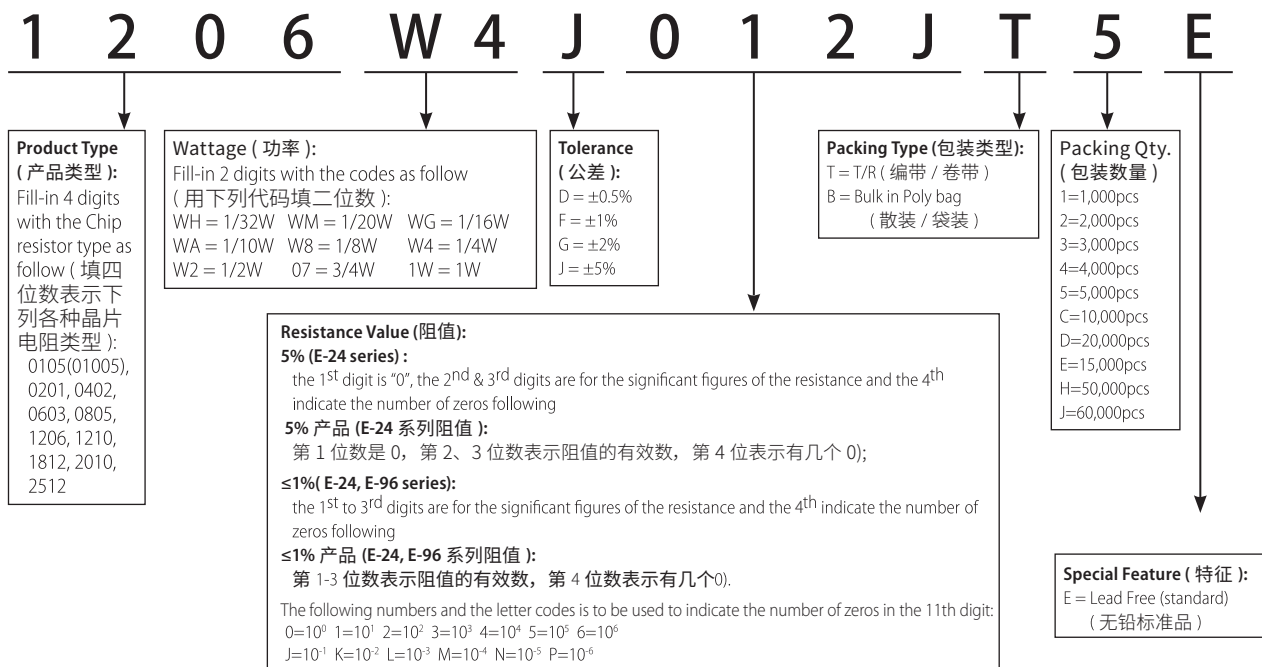
Performance Specifications (性能)

| | | | |
|---------------------------------|--------|---|---|
| Temperature coefficient | 温度系数 | 01005: $1\Omega \leq R < 10\Omega$: -200~+600ppm/°C | 0603: $0.01\Omega \leq R \leq 0.03\Omega$: $\pm 1500\text{PPM}/^\circ\text{C}$ |
| | | $10\Omega \leq R < 100\Omega$: $\pm 300\text{ppm}/^\circ\text{C}$ | $0.03\Omega < R \leq 0.05\Omega$: $\pm 1000\text{PPM}/^\circ\text{C}$ |
| Short-time overload | 短时间过负荷 | $100\Omega \leq R \leq 10\text{M}\Omega$: $\pm 200\text{ppm}/^\circ\text{C}$ | $0.05\Omega < R < 1\Omega$: $\pm 800\text{PPM}/^\circ\text{C}$ |
| | | 0201: $1\Omega \leq R \leq 10\Omega$: -100~+350ppm/°C | $1\Omega \leq R \leq 10\Omega$: $\pm 200\text{PPM}/^\circ\text{C}$ |
| Insulation resistance | 绝缘电阻 | >10Ω: $\pm 200\text{ppm}/^\circ\text{C}$ | >10Ω: $\pm 100\text{PPM}/^\circ\text{C}$ |
| | | 0402: $1\Omega \leq R \leq 10\Omega$: $\pm 200\text{ppm}/^\circ\text{C}$ | 0805, 1206, 1210, 1812, 2010, 2512: |
| Dielectric withstanding voltage | 绝缘耐压 | >10Ω: $\pm 100\text{ppm}/^\circ\text{C}$ | $0.01\Omega \leq R \leq 0.015\Omega$: $\pm 1500\text{ppm}/^\circ\text{C}$ |
| | | $\geq 1,000\text{ M}\Omega$ | $0.015\Omega < R \leq 0.03\Omega$: $\pm 1000\text{ppm}/^\circ\text{C}$ |
| Terminal bending | 端子弯曲 | No evidence of flashover, mechanical damage, arcing or insulation breakdown | $0.03\Omega < R < 1\Omega$: $\pm 800\text{ppm}/^\circ\text{C}$ |
| | | 无击穿, 飞弧及可见机械性损伤 | $1\Omega \leq R \leq 10\Omega$: $\pm 200\text{ppm}/^\circ\text{C}$ |
| Soldering heat | 耐焊接热 | $\pm(1.0\% + 0.05\Omega)$ | >10Ω: $\pm 100\text{ppm}/^\circ\text{C}$ |
| | | $\pm(1.0\% + 0.05\Omega)$ | |
| Solderability | 可焊性 | Coverage must be over 95%. | |
| | | | |
| Rapid change of temperature | 温度快速变化 | $\pm 5\%$, $\pm 2\%$: $\pm(2.0\% + 0.05\Omega)$ | |
| | | $\pm 1\%$, $\pm 0.5\%$: $\pm(0.5\% + 0.05\Omega)$ | |
| Humidity (Steady State) | 恒定湿热 | 01005 $\pm 5\% \pm 1\%$: $\pm(2.0\% + 0.05\Omega)$ | |
| | | $\pm 5\%$, $\pm 2\%$: $\pm(3.0\% + 0.05\Omega)$ | |
| Load life in humidity | 湿度寿命 | $\pm 1\%$, $\pm 0.5\%$: $\pm(1\% + 0.05\Omega)$ | |
| | | $\pm 5\%$, $\pm 2\%$: $\pm(3.0\% + 0.05\Omega)$ | |
| Load life | 负载寿命 | 01005: $\pm(3.0\% + 0.05\Omega)$ | |
| | | $\pm 1\%$, $\pm 0.5\%$: $\pm(1\% + 0.05\Omega)$ | |
| | | 01005: $\pm(3.0\% + 0.05\Omega)$ | |

• The values which are not of standard E-24 series (2% & 5%) and not of E-96 series (1%) could be offered on a case to case basis.
阻值如不在 E-24 系列 (2% & 5%) 及 E-96 系列 (1%) 可特别提供

Ordering Procedure (Example: 1206 1/4W 5% 1.2 Ω T/R-5000)

订购方式 (例如: 1206 1/4W 5% 1.2 Ω T/R-5000)

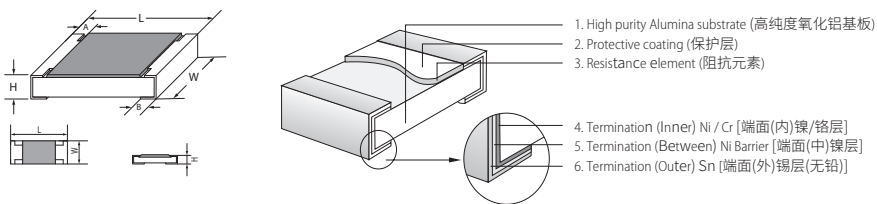


Remark: For more details, please check page 152, Part No. System. 注: 更多细节详见P152标准料号系统。

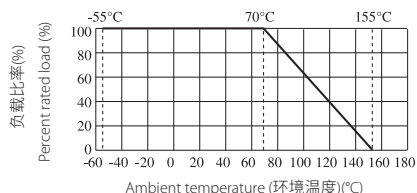
Feature (特性)

- High Resistance 高阻值
- Suitable for reflow & wave soldering 适合波峰焊与回流焊
- AV adapters, LCD back-light camera strobe etc. 适用于AV适配器, LCD背光电路, 照相机快门等.

Figures (型状)



Derating Curve & Specification (降功率曲线及性能)



| Type 类型 | Max Working Voltage 最大工作电压 | Max Overload Voltage 最大过负荷电压 | Dielectric Withstanding Voltage 绝缘耐压 | Operating Temperature Range 工作温度范围 |
|---------|----------------------------|------------------------------|--------------------------------------|------------------------------------|
| 0603 | 75V | 150V | 300V | -55~+155°C |
| 0805 | 150V | 300V | 500V | |
| 1206 | 200V | 400V | 500V | |
| 1210 | 200V | 500V | 500V | |

| Type 类型 | Size 尺寸 | Power Rating 额定功率 | L (mm) | W (mm) | H (mm) | A (mm) | B (mm) | Resistance Range (阻值范围) 5% (E24) |
|---------|---------|-------------------|-----------|--|-----------|-----------|-----------|----------------------------------|
| 0603 | 1608 | 1/10W | 1.60±0.10 | 0.80±0.10 | 0.45±0.10 | 0.30±0.20 | 0.30±0.20 | 10M~100M |
| 0805 | 2012 | 1/8W | 2.00±0.15 | 1.25 ^{+0.15} _{-0.10} | 0.55±0.10 | 0.40±0.20 | 0.40±0.20 | |
| 1206 | 3216 | 1/4W | 3.10±0.15 | 1.55 ^{+0.15} _{-0.10} | 0.55±0.10 | 0.45±0.20 | 0.45±0.20 | |
| 1210 | 3225 | 1/2W | 3.10±0.10 | 2.60±0.20 | 0.55±0.10 | 0.50±0.25 | 0.50±0.20 | |

Performance Specification (性能)

| | |
|--------------------------------------|---|
| Temperature coefficient 温度系数 | ±200ppm/°C |
| Short time overload 短时间过负荷 | ±(2.0%+0.05Ω) |
| Terminal bending 端子弯曲 | ±(1.0%+0.05Ω) |
| Solderability 可焊性 | Coverage must be over 95%. |
| Dielectric withstanding voltage 绝缘耐压 | No evidence of flashover, mechanical damage, arcing or insulation breakdown (无击穿, 飞弧及可见机械性损伤) |
| Soldering heat 耐焊接热 | ±(1.0%+0.05Ω) |
| Rapid change of temperature 温度快速变化 | ±(1.0%+0.05Ω) |
| Load Life in humidity 湿度寿命 | ±(3.0%+0.05Ω) |
| Load life 负载寿命 | ±(3.0%+0.05Ω) |
| Humidity (steady state) 恒定湿热 | ±(3.0%+0.05Ω) |
| Insulation resistance 绝缘电阻 | ≥1,000 MΩ |

New/Old Part No. (新旧料号对照)

| New Part.no 新料号 | Old Part.no 旧料号 |
|-----------------------|---|
| 0603WAJ****T5E | 0603SAJ****T5E /0603WGJ****T5E |
| 0805W8****T5E | 0805S8****T5E /0805WA****T5E |
| 1206W4****T5E | 1206S4****T5E /1206W8****T5E |
| 1210W2****T5E | 1210U2****T5E /1210S3****T5E /1210W4****T5E |
| 181207****T4E | 1812W2****T4E |
| 201007****T4E | 201034****T4E /2010W2****T4E |

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| <u>25121WJ0135T4E</u> | <u>25121WJ0136T4E</u> | <u>25121WJ013JT4E</u> | <u>25121WJ013KT4E</u> | <u>25121WJ013LT4E</u> | <u>25121WJ0140T4E</u> |
| <u>25121WJ0143T4E</u> | <u>25121WJ0151T4E</u> | <u>25121WJ0154T4E</u> | <u>25121WJ015JT4E</u> | <u>25121WJ015LT4E</u> | <u>25121WJ0160T4E</u> |
| <u>25121WJ0161T4E</u> | <u>25121WJ0162T4E</u> | <u>25121WJ0166T4E</u> | <u>25121WJ016JT4E</u> | <u>25121WJ016KT4E</u> | <u>25121WJ016LT4E</u> |
| <u>25121WJ0181T4E</u> | <u>25121WJ0183T4E</u> | <u>25121WJ0185T4E</u> | <u>25121WJ0186T4E</u> | <u>25121WJ018JT4E</u> | <u>25121WJ018KT4E</u> |
| <u>25121WJ018LT4E</u> | <u>25121WJ0191T4E</u> | <u>25121WJ0201T4E</u> | <u>25121WJ0202T4E</u> | <u>25121WJ0203T4E</u> | <u>25121WJ0204T4E</u> |
| <u>25121WJ020LT4E</u> | <u>25121WJ0220T4E</u> | <u>25121WJ0221T4E</u> | <u>25121WJ0222T4E</u> | <u>25121WJ0223T4E</u> | <u>25121WJ0224T4E</u> |
| <u>25121WJ0225T4E</u> | <u>25121WJ0226T4E</u> | <u>25121WJ022LT4E</u> | <u>25121WJ0241T4E</u> | <u>25121WJ0242T4E</u> | <u>25121WJ0244T4E</u> |
| <u>25121WJ024JT4E</u> | <u>25121WJ024LT4E</u> | <u>25121WJ0250T4E</u> | <u>25121WJ025KT4E</u> | <u>25121WJ025LT4E</u> | <u>25121WJ0271T4E</u> |
| <u>25121WJ0273T4E</u> | <u>25121WJ0275T4E</u> | <u>25121WJ027JT4E</u> | <u>25121WJ027KT4E</u> | <u>25121WJ0301T4E</u> | <u>25121WJ0302T4E</u> |
| <u>25121WJ0303T4E</u> | <u>25121WJ0304T4E</u> | <u>25121WJ0305T4E</u> | <u>25121WJ030JT4E</u> | <u>25121WJ0330T4E</u> | <u>25121WJ0333T4E</u> |
| <u>25121WJ033JT4E</u> | <u>25121WJ033KT4E</u> | <u>25121WJ033LT4E</u> | <u>25121WJ0360T4E</u> | <u>25121WJ0361T4E</u> | <u>25121WJ0362T4E</u> |
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| <u>25121WJ0393T4E</u> | <u>25121WJ0394T4E</u> | <u>25121WJ039LT4E</u> | <u>25121WJ040KT4E</u> | <u>25121WJ040LT4E</u> | <u>25121WJ0430T4E</u> |
| <u>25121WJ0432T4E</u> | <u>25121WJ0435T4E</u> | <u>25121WJ043KT4E</u> | <u>25121WJ043LT4E</u> | <u>25121WJ0472T4E</u> | <u>25121WJ0474T4E</u> |
| <u>25121WJ0475T4E</u> | <u>25121WJ047JT4E</u> | <u>25121WJ047KT4E</u> | <u>25121WJ047LT4E</u> | <u>25121WJ0501T4E</u> | <u>25121WJ050LT4E</u> |
| <u>25121WJ0510T4E</u> | <u>25121WJ0511T4E</u> | <u>25121WJ0514T4E</u> | <u>25121WJ051JT4E</u> | | |