

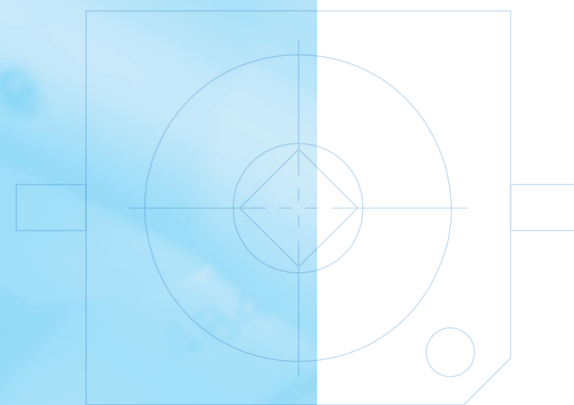
cy - Mechanical Precision.

are miniature capacitors designed for high resolution tuning of RF power circuits. Knowles Air Capacitors are available in a variety of sizes and mounting configurations incorporating a one piece, self-locking, constant torque drive mechanism. Ceramic Trimmer Capacitors are available in surface mount, strip-line and through hole lead styles. Microwave Tuning Elements are an economical means of tuning waveguides, cavities and other microwave structures.

Please see our website at www.johansonmfg.com

Johanson components

- Tuning Elements
- Non-magnetic Trimmer Caps
- Thin-Trim
- Cera-Trim
- Seal-Trim
- Giga-Trim
- Air Trimmer Capacitors
- Non-magnetic Variable Inductors



www.knowlesc capacitors.com



DLI•JohansonMFG•Novacap•Syfer•Voltronics

Knowles Capacitors designs, manufactures and sells special electronic components. Our products are used in military, space, telecom infrastructure, medical and industrial applications where function and reliability are crucial.



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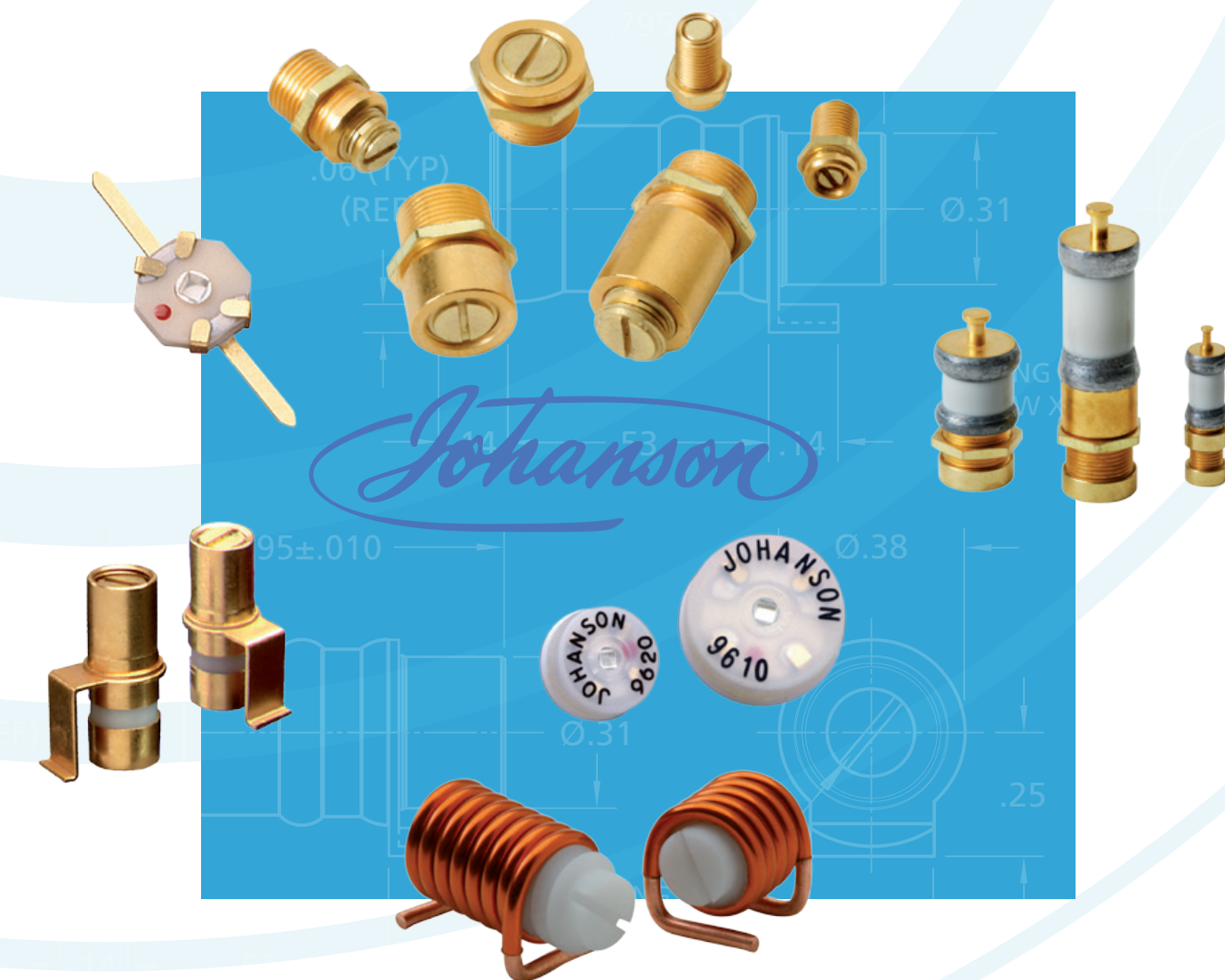


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Johanson Capability Guide



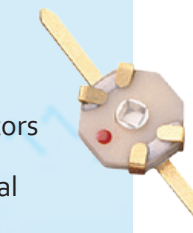
Electronic Accuracy Through Mech

Knowles Capacitors is the result of the merging of some of the world's leading speciality capacitor manufacturers. With a combined history exceeding 175 years, Dielectric Laboratories (DLI), Johanson MFG, Novacap, Syfer and Voltronics have come together in a single organisation, with one team of great people sharing a common vision.

With facilities located worldwide, Knowles Capacitors is an outstanding, environmentally conscious global supplier. Knowles is proud to be certified to ISO 9001:2008. State-of-the-art technology and equipment in pristine facilities enable Knowles to control the product from design through manufacturing.

Knowles Capacitors is a world-class supplier of Trimmer Capacitors and microwave Tuning Elements.

We offer a wide variety of variable capacitors for RF and microwave applications. Giga-Trim® capacitors



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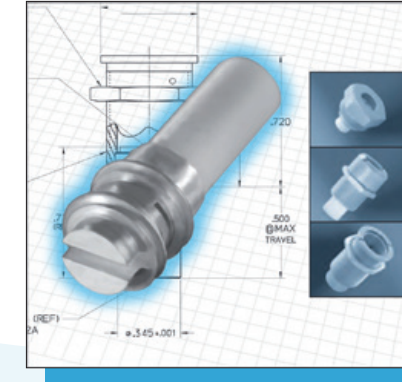
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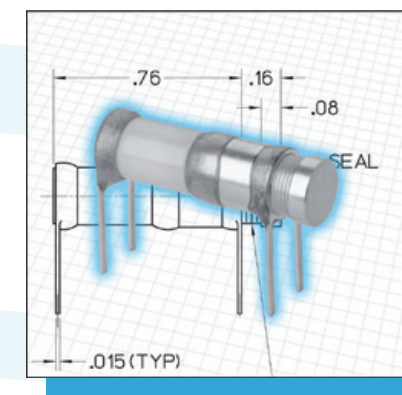
Tuning Elements



- Typical Applications**
- Microwave Filter Positioning
 - Fiber Optic Alignment
 - Metering Valve Adjustment
 - X Y Z Stage Positioning
 - Self Locking Fastener
 - Limit Switch/Sensor Positioning

- Other Products Available**
- Posi-Torque®
 - Taps
 - Tuning Rotors
 - DynaTrim / Tuners
 - Comb Line Filters

- Features**
- One handed adjusting/tuning
 - Self-Locking/Constant torque mechanism
 - Eliminates need for "jam" nuts
 - Produced with fine-pitched threads for high resolution zero back lash positioning from 24 TPI to 108 TPI
 - Basic thread diameters available from 0.060" to 1.00", SI and US customary threads
 - Excellent electrical conduction (Contact resistance <0.01 Ω)
 - Capable of re-tuning/re-positioning
 - Available with Gold, Silver, Nickel Plating and Chromate Finish
 - Can be assembled with other materials, (Ceramic, Ferrites, Sapphire, Glass, etc.)
 - Available as a set, to provide a positive stop or extended travel range
 - Available in copper or ferrous alloys
 - Custom torque designs available



Non-magnetic trimmer Caps

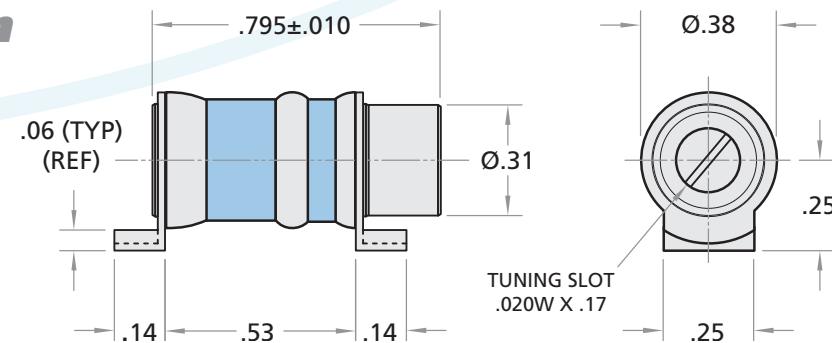
| Working Voltage | Cap. Range | Series | Q |
|-----------------|--------------|--------|----------------|
| 5000 VDC | 1 to 7.5pF | 5610 | >1000 @100MHz |
| 1250 VDC | 1.5 to 10pF | 52H | >1400 @195MHz |
| 1000 VDC | 1.5 to 19pF | 55H | >1000 @175MHz |
| | 1 to 25pF | 59H | >1000 @175MHz |
| 250 VDC | 2 to 30pF | 56H | >1000 @175MHz |
| | 0.4 to 3.5pF | 5860 | >10000 @100MHz |
| | 0.6 to 6.0pF | 5760 | >10000 @100MHz |
| 250 VDC | 0.8 to 10pF | 5240 | >4000 @100MHz |
| | 1 to 30pF | 5640 | >800 @100MHz |

- Characteristics**
- Working Voltage: From 250 VDC to 5000 VDC
 - Long Rotational life
 - Insulation Resistance: > 10⁶ MΩ
 - Temperature range: -65°C to +125°C
 - RoHS Compliant parts available

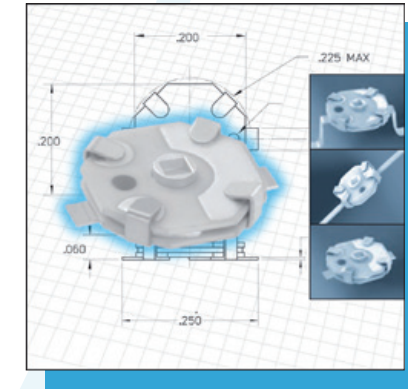
- Specifications (53H18NM)**
- Capacity Range: 3.0pF to 55pF (>17 Turns)
 - Working Voltage: 1000 VDC (Test Volt. 2000 VDC)
 - Q @ 175 MHz: >800
 - Insulation Resistance: >10⁶ MEGOHMS
 - Temperature Range: -65°C to +125°C
 - Tuning Torque: 1.0 to 6.0 OZ. IN

Unit Construction

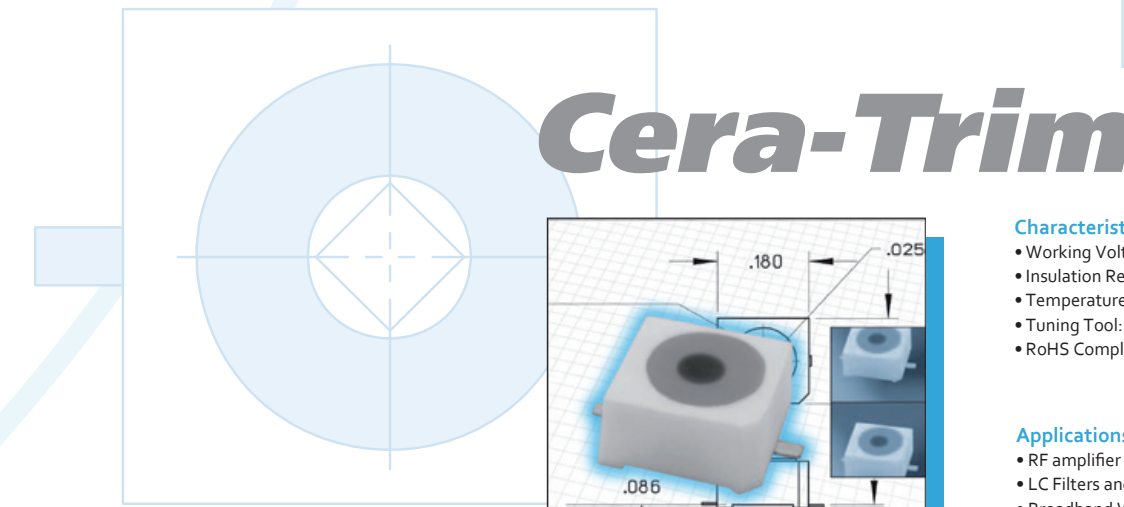
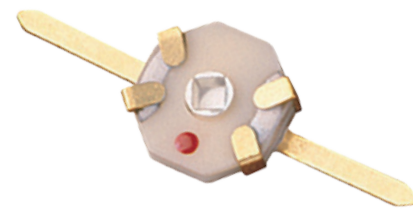
- Non-magnetic structure with PTFE dielectric**
- Brass Structure
 - Glazed Alumina Insulation
 - 574^oF Solder Used in Assembly
 - Gold, Silver and Chromate Finish
 - Vertical Mount Version also Available



Thin-Trim



| Series | Disk Size | Capacitance | Tuning Resolution |
|--------|------------------|---------------|-------------------|
| 9401 | 0.140" (3.56 mm) | 0.25 to 4.0pF | 90° |
| 9402 | 0.125" (3.18 mm) | 0.5 to 25pF | 180° |
| 9410 | 0.200" (5.08 mm) | 1 to 50pF | 180° |

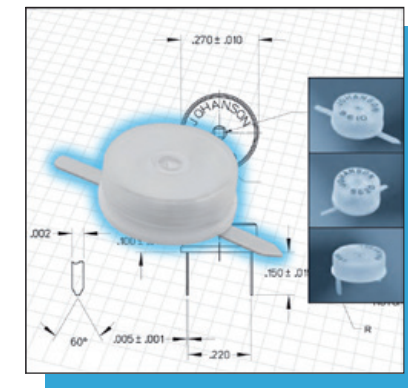


Cera-Trim

- Characteristics**
- Working Voltage: 250 VDC (500 VDC Test)
 - Insulation Resistance: > 104 MΩ
 - Temperature Range: -55°C to +125°C
 - Tuning Tool: 4192
 - RoHS Compliant parts available

- Applications**
- RF amplifier
 - LC Filters and Networks
 - Broadband Wireless LAN
 - Medical Devices
 - Cordless and Cellular phones
 - DR/Crystal Oscillator
 - Microstrip line filters

Seal-Trim



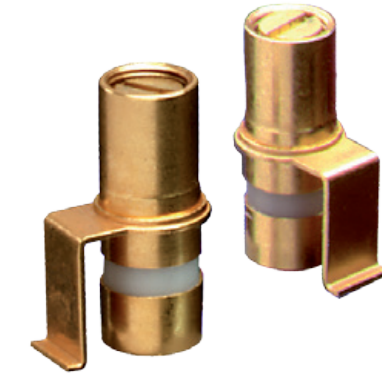
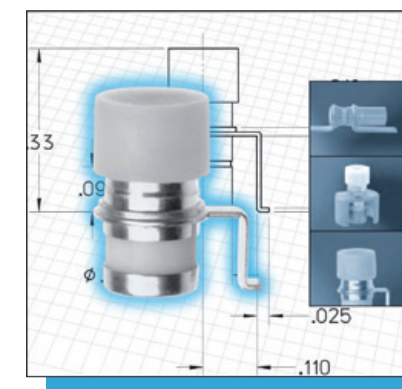
| Series | Disk Size | Capacitance | Tuning Resolution |
|-----------|------------------|-------------|-------------------|
| 9610/9810 | 0.270" (6.86 mm) | 1 to 50pF | 180° |
| 9620/9820 | 0.180" (4.57 mm) | 0.5 to 25pF | 180° |



- Applications**
- RF amplifier
 - LC Filters and Networks
 - Broadband Wireless LAN
 - Medical Devices
 - Cordless and Cellular phones
 - DR/Crystal Oscillator
 - Microstrip line filters

- Characteristics**
- Working Voltage: 250 VDC (500 VDC Test)
 - Long Rotational life
 - Insulation Resistance: > 104 MΩ
 - Temperature Range: -55°C to +125°C
 - RoHS Compliant parts available

Giga-Trim



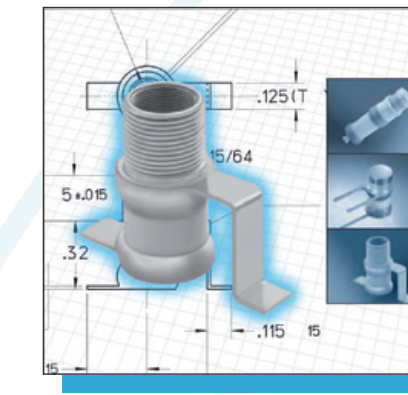
- Applications**
- RF amplifier
 - Impedance matching
 - Crystal trimming
 - Interstage coupling
 - Filter tuning

- Characteristics**
- Working Voltage: 500 VDC (1000 VDC Test)
 - Long rotational life
 - Insulation resistance: > 10⁶ MΩ
 - Temperature range: -65°C to +125°C
 - RoHS Compliant parts available

Air Trimmer Capacitors

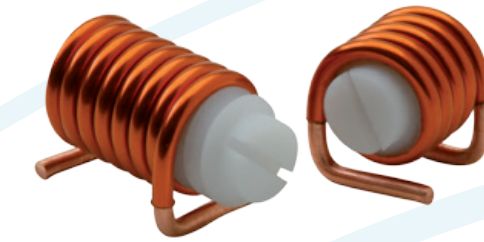
- Applications**
- RF amplifier and oscillators
 - Impedance matching
 - Interstage coupling
 - Filter tuning
 - Crystal trimming

| Capacitance | Series | Q @ 100MHz |
|---------------|--------|----------------|
| 0.35 to 3.5pF | 5800 | > 10000 |
| 0.5 to 5pF | 5850 | > 7500 |
| 0.6 to 6pF | 5700 | > 10000 |
| 1.0 to 10pF | 1500 | > 4000 @195MHz |
| 0.8 to 10pF | 5200 | > 5000 |
| 0.8 to 10pF | 5750 | > 7500 |
| 1 to 10pF | 5300 | > 2000 |
| 1 to 14pF | 5400 | > 3000 |
| 1 to 16pF | 5450 | > 3000 |
| 1 to 20pF | 5500 | > 1500 |
| 1 to 30pF | 5600 | > 800 |



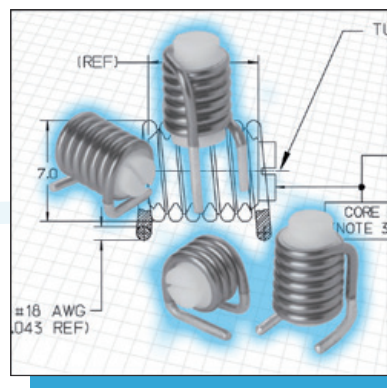
- Characteristics**
- Working Voltage: 250 VDC (500 VDC Test)
 - Long Rotational life
 - Insulation resistance: > 10⁶ MΩ
 - Temperature range: -65°C to +125°C
 - RoHS Compliant parts available

Non-magnetic variable inductors



- Applications**
- MRI / NMR Systems
 - Radios / Jammers
 - Power Amplifiers
 - Radar
 - Avionics Instrumentation
 - Test Equipment

- Characteristics**
- Precision machined design. US Patent No. 8,248,198
 - 7mm high in SMD, Vertical SMD and thru-hole versions
 - Nominal values of 32 to 118nH, 2 to 7 turns
 - Q as high as 121 @ 100MHz, SRF 0.7 – 1.2GHz
 - Superb shock, vibration and thermal tolerances
 - -40°C to +85°C
 - Customized version requests welcomed



| Part No. | L(nH) Q | | | | (@ 100MHz) | SRF (GHz) | Turns | Thread (mm) |
|---------------|---------|-----|-----|---------|------------|-----------|-------|-------------|
| | Min | Nom | Max | No Core | | | | |
| JLC02E030TRSM | 32 | 33 | 34 | 39 | 90 | 1.2 | 2 | 6 |
| JLC03E048TRSM | 46 | 49 | 52 | 59 | 95 | 1 | 3 | 6 |
| JLC04E065TRSM | 60 | 64 | 68 | 78 | 101 | 0.9 | 4 | 6 |
| JLC05E088TRSM | 74 | 81 | 87 | 99 | 114 | 0.9 | 5 | 8 |
| JLC06E110TRSM | 94 | 107 | 119 | 123 | 119 | 0.7 | 6 | 8 |
| JLC07E130TRSM | 104 | 118 | 133 | 142 | 121 | 0.7 | 7 | 10 |
| JLC09E160TRSM | 122 | 139 | 170 | 191 | 162 | 0.58 | 9 | 13 |
| JLC13E250TRSM | 185 | 219 | 270 | 294 | 199 | 0.43 | 13 | 18 |
| JLC19E375TRSM | 281 | 345 | 436 | 457 | 171 | 0.31 | 19 | 25 |

| Part No. | L(nH) Q | | | | (@ 100MHz) | SRF (GHz) | Turns | Thread (mm) |
|---------------|---------|-----|-----|---------|------------|-----------|-------|-------------|
| | Min | Nom | Max | No Core | | | | |
| JLC02E030TVSM | 32 | 33 | 34 | 39 | 90 | 1.2 | 2 | 6 |
| JLC03E048TVSM | 46 | 49 | 52 | 59 | 95 | 1 | 3 | 6 |
| JLC04E065TVSM | 60 | 64 | 68 | 78 | 101 | 0.9 | 4 | 6 |
| JLC05E088TVSM | 74 | 81 | 87 | 99 | 114 | 0.9 | 5 | 8 |
| JLC06E110TVSM | 94 | 107 | 119 | 123 | 119 | 0.7 | 6 | 8 |
| JLC07E130TVSM | 104 | 118 | 133 | 142 | 121 | 0.7 | 7 | 10 |

| Part No. | L(nH) Q | | | | (@ 100MHz) | SRF (GHz) | Turns | Thread (mm) |
|---------------|---------|-----|-----|---------|------------|-----------|-------|-------------|
| | Min | Nom | Max | No Core | | | | |
| JLC02E030TVPC | 32 | 33 | 34 | 39 | 90 | 1.2 | 2 | 6 |
| JLC03E048TVPC | 46 | 49 | 52 | 59 | 95 | 1 | 3 | 6 |
| JLC04E065TVPC | 60 | 64 | 68 | 78 | 101 | 0.9 | 4 | 6 |
| JLC05E088TVPC | 74 | 81 | 87 | 99 | 114 | 0.9 | 5 | 8 |
| JLC06E110TVPC | 94 | 107 | 119 | 123 | 119 | 0.7 | 6 | 8 |
| JLC07E130TVPC | 104 | 118 | 133 | 142 | 121 | 0.7 | 7 | 10 |