



EIA Low ESR
Multi-Layer Ceramic Capacitors

0805N (0.080" x 0.050")

≠ Product Features

- High Q
- High Power
- Low ESR/ESL
- Low Noise
- High Self-Resonance
- Ultra Stable Performance
- Capacitance Range:
0.1pF to 220pF

≠ Product Applications

Typical Functional Applications

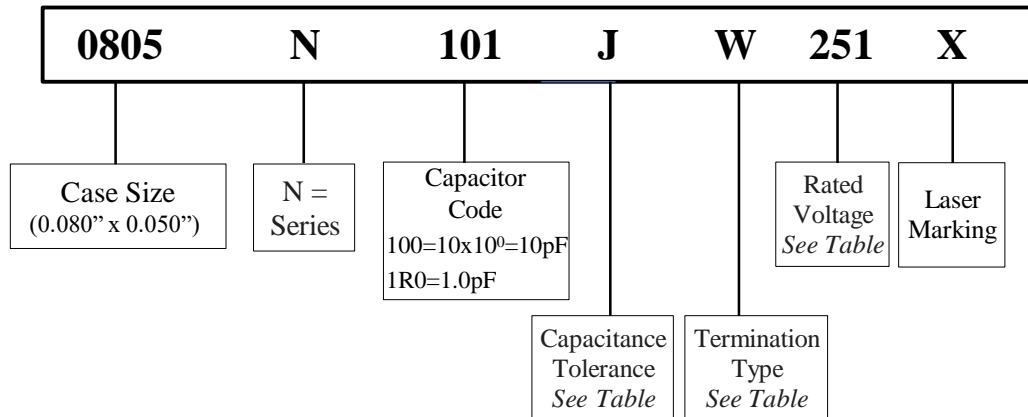
- Tuning • Bypass • Coupling
- Feedback • D.C. Blocking
- Impedance Matching

Typical Circuit Applications

- UHF/Microwave RF Power Amplifiers
- Mixers • Oscillators • Filter Networks
- Low Noise Amplifiers • Timing Circuits and Delay Lines

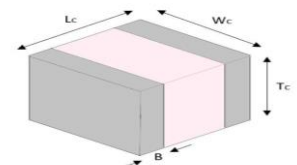


≠ Part Numbering



≠ Capacitor Dimensions Unit: inch (millimeter)

Code	Term.	Length	Width	Thickness	Overlap
		Lc	Wc	Tc	B
W	Chip	0.080 ± 0.008 (2.03±0.20)	0.050 ± 0.008 (1.27 ±0.20)	0.040±0.006 (1.02±0.15)	0.020±0.010 (0.50±0.25)



≠ Capacitance Tolerance Codes

Code	A	B	C	D	F	G	J	K
Tol.	±0.05pF	±0.1pF	±0.25pF	±0.5pF	±1%	±2%	±5%	±10%






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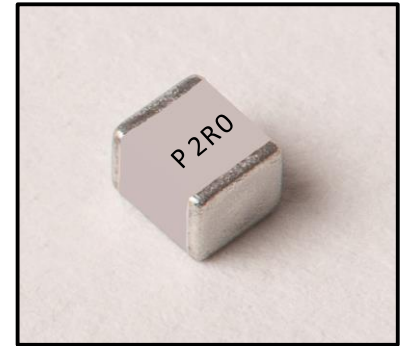
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≠ Termination Types and Codes

Termination Code	Termination
W 	100% Sn Solder over Nickel Plating
L	90%Sn10%Pb Tin/Lead

≠ Voltage Code

Voltage	Code
250V	251



≠ 0805N Capacitance Values

For special capacitances, tolerances and WVDC, please contact PPI.

Cap. pF	Code	Tol.	Rated WVDC	Cap. pF	Code	Tol.	Rated WVDC	Cap. pF	Code	Tol.	Rated WVDC
0.1	0R1			3.0	3R0			30	300		
0.2	0R2			3.3	3R3			33	330		
0.3	0R3			3.6	3R6			36	360		
0.4	0R4			3.9	3R9			39	390		
0.5	0R5			4.3	4R3	A,B,C,D		43	430		
0.6	0R6			4.7	4R7			47	470		
0.7	0R7			5.1	5R1			51	510		
0.8	0R8			5.6	5R6			56	560		
0.9	0R9			6.2	6R2			62	620		
1.0	1R0			6.8	6R8			68	680		
1.1	1R1			7.5	7R5	B,C		75	750	F,G,J,K	250V
1.2	1R2	A,B,C,D	250V	8.2	8R2		250V	82	820		
1.3	1R3			9.1	9R1			91	910		
1.4	1R4			10	100			100	101		
1.5	1R5			11	110			110	111		
1.6	1R6			12	120			120	121		
1.7	1R7			13	130			130	131		
1.8	1R8			15	150			150	151		
1.9	1R9			16	160	F,G,J,K		160	161		
2.0	2R0			18	180			180	181		
2.1	2R1			20	200			200	201		
2.2	2R2			22	220			220	221		
2.4	2R4			24	240						
2.7	2R7			27	270						





⚡ Electrical Specifications

Quality Factor (Q)	2,000 at 1 MHz
Insulation Resistance (IR)	10 ⁵ Megaohms min. @ +25°C rated WVDC 10 ⁴ Megaohms min. @ +125°C rated WVDC
Rated Voltage	250V
Dielectric Withstanding Voltage (WVDC)	250% of Rated Voltage of 5 seconds
Operating Temperature Range	-55°C to 175°C
Temperature Coefficient (TC)	0±30ppm/°C
Capacitance Drift	±0.02% or ±0.02pF, whichever is greater
Piezoelectric Effects	None

⚡ Environmental Specifications

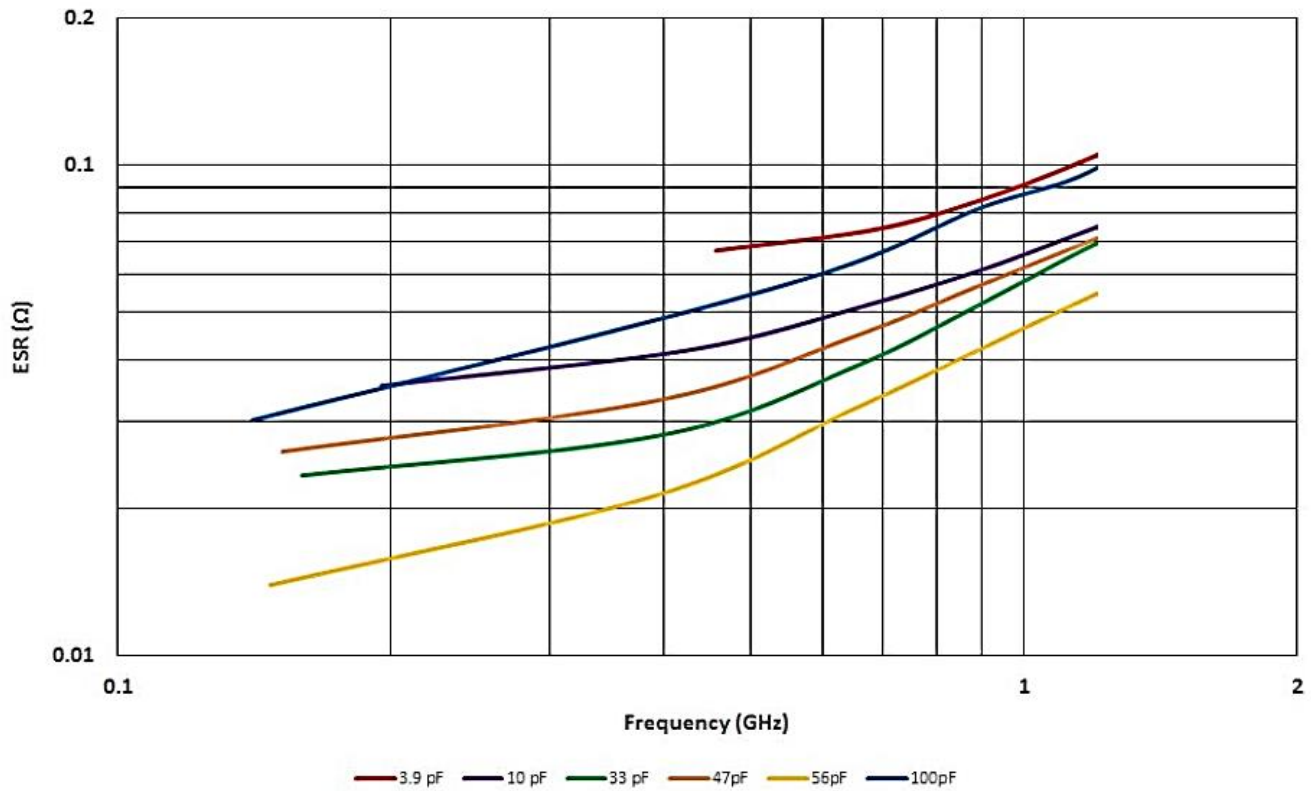
	Specification	Test Parameters
Thermal Shock	No mechanical damage Capacitance Change: ±0.5% or 0.5pF max IR: >10 G Ohms Q>2000 Breakdown Voltage: 2.5x WVDC	MIL-STD-202, Method 107, Condition A. At the maximum rated temperature (-55°C and 175°C) stay 30 minutes, the time of removing shall not be more than 3 minutes. Perform five cycles.
Humidity (Steady State)	No mechanical damage Capacitance Change: ±0.5% or 0.5pF max IR: >1 G Ohms Q>300 Breakdown Voltage: 2.5x WVDC	MIL-STD-202, Method 106
Life	No mechanical damage Capacitance Change: ±2.0% or 0.5pF max IR: >1 G Ohms Q>500 Breakdown Voltage: 2.5x WVDC	MIL-STD-202, Method 108. For 1000 hours, at 175°C. 200% of Voltage for Capacitors, Rated Voltage ≤ 500VDC; 120% of Voltage for Capacitors, 500VDC < Rated Voltage ≤ 1250VDC; 100% for Voltage for Capacitors, Rated Voltage > 1250VDC
Terminal Adhesion	Termination should not pull off. Ceramic should remain undamaged	Linear pull force exerted on axial leads soldered to each terminal. 2.0lbs.
Resistance to Soldering Heat	No mechanical damage Capacitance Change: -1.0%~+2.0% IR: >10 G Ohms Q>500 Breakdown Voltage: 2.5x WVDC	Preheat device to 150°C -180°C for 60 seconds. Dip in 260°C ±5°C solder for 10 ±1 second. Measure after 24± 2 hour cooling period.

Capacitors are designed and manufactured to meet the requirements of MIL-PRF-55681 and MIL-PRF-123.

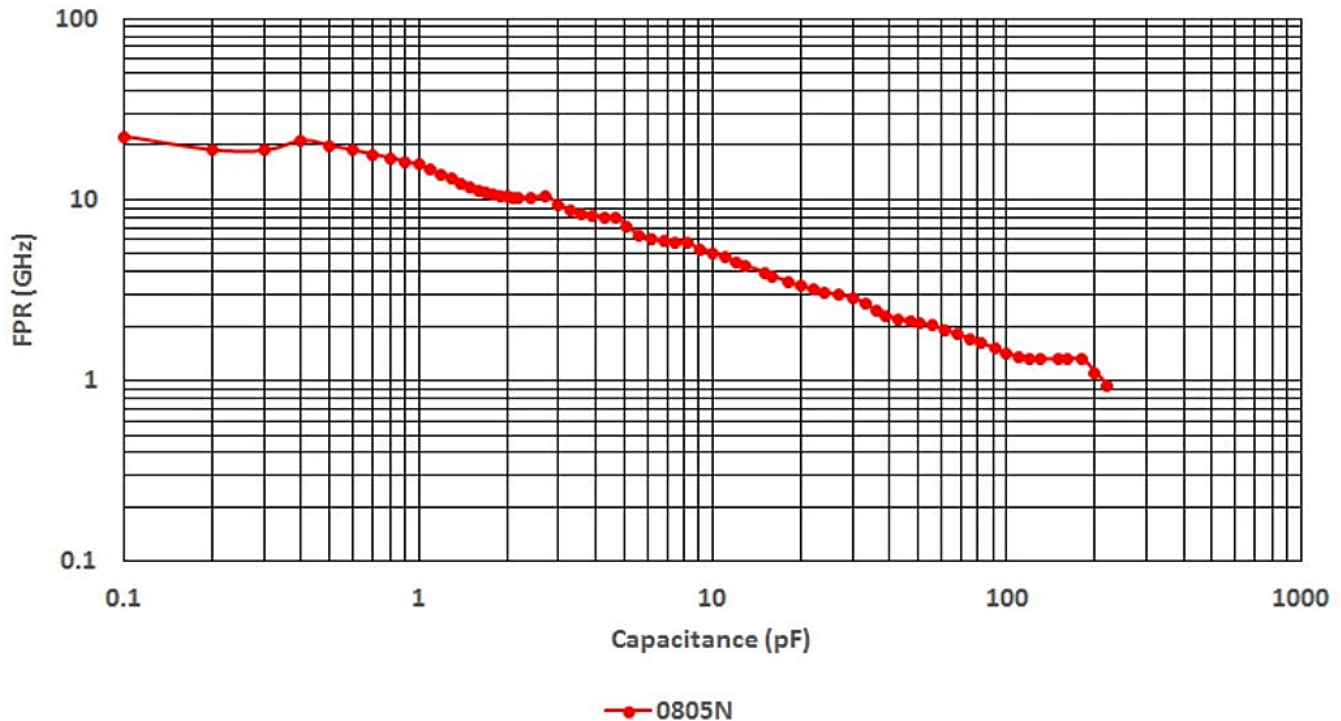


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≠ ESR vs. Frequency 3.9pF to 100pF



≠ First Parallel Resonance



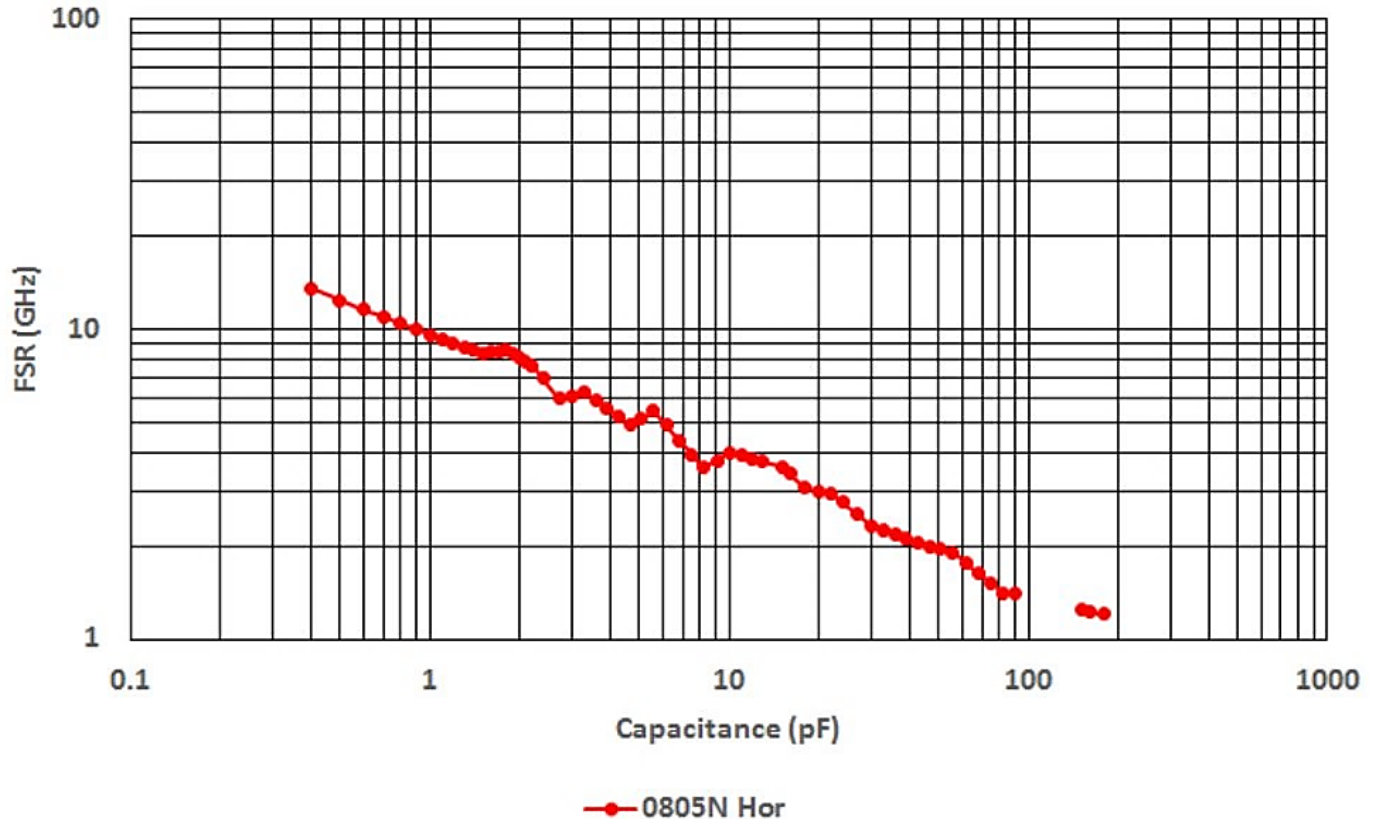
≠ Definitions and Measurement Conditions

The **First Parallel Resonance, FPR**, is defined as the lowest frequency at which a suckout or notch appears in $|S_{21}|$. It is generally independent of substrate thickness or dielectric constant, but does depend on capacitor orientation. A horizontal orientation means the capacitor electrode planes are parallel to the plane of the substrate; a vertical orientation means the electrode planes are perpendicular to the substrate.

The definitions on the charts are for a capacitor in a series configuration, i.e., mounted across a gap in a microstrip trace with 50-Ohm termination. The measurement conditions are: substrate – Rogers RO3003; substrate dielectric constant = 3.00; substrate thickness (mils) = 23; gap in microstrip trace (mils) = 23.6; microstrip trace width (mils) = 57.1; Reference planes at sample edges.

All data has been derived from electrical models created by Modelithics, Inc., a specialty vendor contracted by PPI. The models are derived from measurements on a large number of parts disposed on several different substrates.

≠ First Series Resonance



≠ Definitions and Measurement Conditions

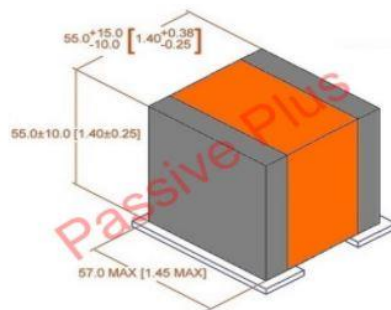
The **First Series Resonance, FSR**, is defined as the lowest frequency at which the imaginary part of the input impedance, $\text{Im}[Z_{in}]$, equals zero. Should $\text{Im}[Z_{in}]$ or the real part of the input impedance, $\text{Re}[Z_{in}]$, not be monotonic with frequency at frequencies lower than those at which $\text{Im}[Z_{in}] = 0$, the FSR shall be considered as undefined (represented as a gap in the plot). FSR is dependent on internal capacitor structure; substrate thickness and dielectric constant; capacitor orientation, as defined alongside the FPR plot; and mounting pad dimensions.

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All data has been derived from electrical models created by Modelithics, Inc., a specialty vendor contracted by PPI. The models are derived from measurements on a large number of parts disposed on several different substrates.

⚡ Capacitor Application Program

Passive Plus, Inc.'s brand new **online Capacitor Application Program (C.A.P.)** helps Engineers and Designers select capacitors according to parameters such as cap value and frequency. C.A.P. allows engineers to insert capacitors requirements (Cap value, Frequency), producing Scattering Matrices (S2P) Charts while providing options (Case Size, Terminations, Mounting), and parameters (ESR, Q, Impedance) along with Datasheets. Once engineers have determined their capacitor requirements, C.A.P. also includes online Requests For Quotes (RFQs) and/or sample requests.



⚡ Modelithics Vendor Program

PPI offers design engineers a Free 90-Day Trial license for the Modelithics PPI Component Library. This program provides engineers access to extremely accurate scalable simulation models for Passive Plus capacitors with advanced features that enable a more precise and rapid design process.

Microwave Global Models include every part value in a series and permit users to input substrate thickness, dielectric constant, and loss tangent, as well as mounting pad layout dimensions. Selected models also include capacitor orientation – vertical or horizontal – as an input. Engineers can request FREE use of the models, by either visiting the [Passive Plus Resources page](http://passiveplus.com/addldocs_resources.php) (http://passiveplus.com/addldocs_resources.php).



≠ Recommended Land Pattern Dimensions

When mounting the capacitor to substrate, it's important to carefully consider that the amount of solder (size of fillet) used has a direct effect upon the capacitor once it's mounted.

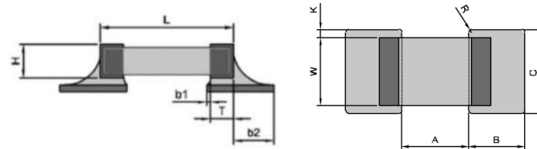


1) The greater the amount of solder, the greater the stress to the elements. This may cause the substrate to break or crack.

2) In the situation where two or more devices are mounted onto a common land, be sure to separate the device into exclusive pads by using soldering resist.

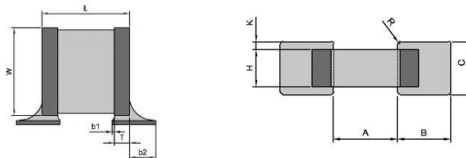
≠ Horizontal Mounting Dimensions: mm

A	B	C
1.10	1.10	1.40



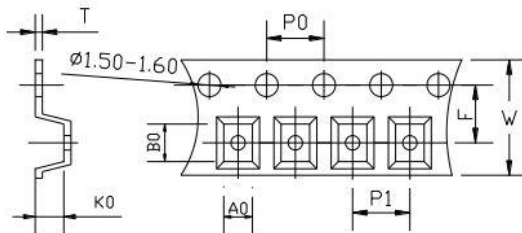
≠ Vertical Mounting Dimensions: mm

A	B	C
1.10	1.10	1.40

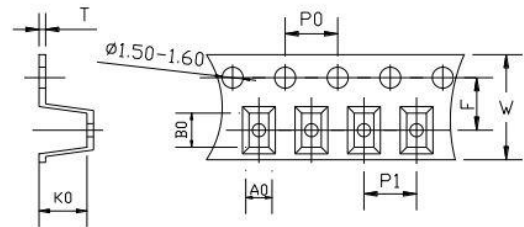


≠ Tape & Reel Specifications Dimensions: mm

Horizontal Orientation



Vertical Orientation



Orientation	A0	B0	K0	W	P0	P1	T	F	Qty Min	Qty/reel	Tape Material
Horizontal	1.60	1.60	2.40	8.00	4.00	4.00	0.20	3.50	500	500	Paper



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≠ Engineering Design Kits

PPI offers Design Kits for engineers who are building and testing prototypes. Each kit contains 16 values; 10 pieces per value.

Kits are 100% RoHS compliant.



Kit Number	Value Range	Capacitance (pF)	Tolerance
DKD0805N01	0.1pF to 2.0pF	0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.2, 1.5, 1.6, 1.8, 2.0	±1pF
DKD0805N02	1.0pF to 10pF	1.0, 1.2, 1.5, 1.8, 2.0, 2.2, 2.4, 2.7, 3.0, 3.3, 3.9, 4.7, 5.6, 6.8, 8.2, 10	±1pF ±5%
DKD0805N03	10pF to 100pF	10, 12, 15, 18, 20, 22, 24, 27, 30, 33, 39, 47, 56, 68, 82, 100	±5%
DKD0805N04	10pF to 220pF	10, 15, 18, 20, 27, 30, 39, 47, 56, 68, 82, 100, 120, 150, 180, 220	±5%

PPI Passive Plus Inc.
RF & Microwave Components

Ultra-Low ESR
Capacitor Design Kit
Size: 0.08" x 0.05"

0805N Series 0.1pF – 2.0pF

TC = NP0 WVDC=250V DKD0805N01

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0805N Series 10pF – 100pF

TC = NP0 WVDC=250V DKD0805N03

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0805N Series 1.0pF – 10.0pF

TC = NP0 WVDC=250V DKD0805N02

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