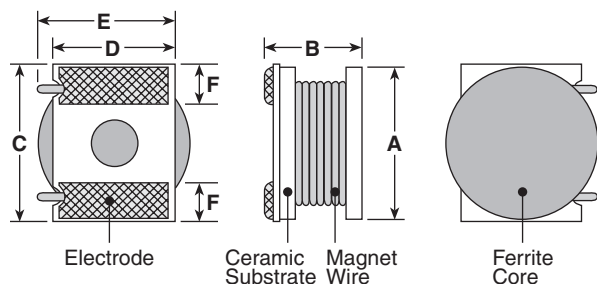


## features

- Small size allows for high mounting density
- Operating temperature: LPC9040E: -40°C ~ +125°C, all others: -40°C ~ +85°C
- Large DC current capacity with low DC resistance
- Polarity identification available
- E-6 series of values (customs available)
- Marking: Black body color with no marking
- Products with lead-free terminations meet EU RoHS requirements
- AEC-Q200 Qualified (LPC4045 only)

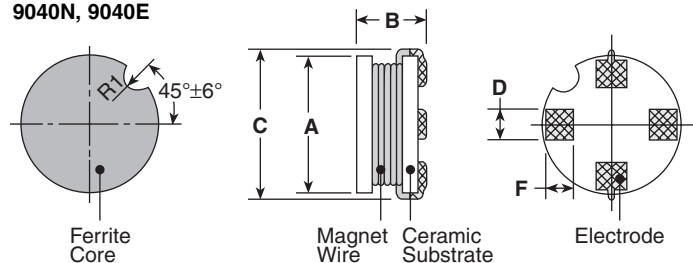
## dimensions and construction

4045, 10065, 12065



| Size  | Dimensions inches (mm)   |                         |                         |                         |                |                        |
|-------|--------------------------|-------------------------|-------------------------|-------------------------|----------------|------------------------|
|       | A                        | B                       | C                       | D                       | E              | F                      |
| 4045  | 0.157±.008<br>(4.0±0.2)  | .169±.009<br>(4.3±0.2)  | .177±.008<br>(4.5±0.2)  | .118±.008<br>(3.0±0.2)  | .138<br>(3.5)  | .039±.012<br>(1.0±0.3) |
| 10065 | 0.394±.008<br>(10.0±0.2) | .295 Max.<br>(7.5 Max.) | .409±.008<br>(10.4±0.2) | .315±.008<br>(8.0±0.2)  | .354<br>(9.0)  | .098±.008<br>(2.5±0.2) |
| 12065 | 0.472±.008<br>(12.0±0.2) | .295 Max.<br>(7.5 Max.) | .488±.008<br>(12.4±0.2) | .472±.008<br>(10.0±0.2) | .433<br>(11.0) | .146±.012<br>(3.7±0.3) |

9040N, 9040E



| Size           | Dimensions inches (mm)  |                         |                          |                        |                        |
|----------------|-------------------------|-------------------------|--------------------------|------------------------|------------------------|
|                | A                       | B                       | C                        | D                      | F                      |
| 9040N<br>9040E | 0.354±.004<br>(9.0±0.1) | .193 Max.<br>(4.9 Max.) | .402 Max.<br>(10.2 Max.) | .071±.008<br>(1.8±0.2) | .079±.008<br>(2.0±0.2) |

## ordering information

| New Part # | LPC  | 4045                                     | A                    | TED                                                                                                                                                                         | 101                                     | K                             |
|------------|------|------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------|
|            | Type | Size                                     | Termination Material | Packaging                                                                                                                                                                   | Nominal Inductance                      | Tolerance                     |
|            |      | 4045<br>9040N<br>9040E<br>10065<br>12065 | A: SnAg              | TED: 10" embossed plastic<br>(4045 - 1,000 pieces/reel)<br>(9040N - 500 pieces/reel)<br>(9040E - 500 pieces/reel)<br>(10065 - 300 pieces/reel)<br>(12065 - 300 pieces/reel) | 101: 100μH<br>221: 220μH<br>152: 1500μH | K: ±10%<br>M: ±20%<br>N: ±30% |

For further information on packaging, please refer to Appendix A.

## applications and ratings

| Part Designation | Nominal Inductance (μH) | Inductance Tolerance | Quality Factor Minimum (MHz) | Self Resonant Frequency Minimum (MHz) | DC Resistance Maximum (Ω) | Allowable DC Current Maximum (Amps) | Measured Frequency                                      |
|------------------|-------------------------|----------------------|------------------------------|---------------------------------------|---------------------------|-------------------------------------|---------------------------------------------------------|
| LPC4045ATED1R0M  | 1.0                     | M: ±20%              | 20                           | 90.0                                  | 0.015                     | 3.10                                | 1 kHz                                                   |
| LPC4045ATED1R5M  | 1.5                     |                      |                              | 70.0                                  | 0.020                     | 2.80                                |                                                         |
| LPC4045ATED2R2M  | 2.2                     |                      |                              | 55.0                                  | 0.023                     | 2.50                                |                                                         |
| LPC4045ATED3R3M  | 3.3                     |                      |                              | 45.0                                  | 0.044                     | 1.80                                |                                                         |
| LPC4045ATED4R7M  | 4.7                     |                      |                              | 35.0                                  | 0.062                     | 1.45                                |                                                         |
| LPC4045ATED6R8M  | 6.8                     |                      |                              | 25.0                                  | 0.075                     | 1.30                                |                                                         |
| LPC4045ATED100K  | 10                      | K: ±10%              |                              | 23.5                                  | 0.10                      | 1.02                                |                                                         |
| LPC4045ATED150K  | 15                      |                      |                              | 18.5                                  | 0.15                      | 0.84                                |                                                         |
| LPC4045ATED220K  | 22                      |                      |                              | 14.0                                  | 0.21                      | 0.70                                |                                                         |
| LPC4045ATED330K  | 33                      |                      |                              | 12.0                                  | 0.41                      | 0.52                                |                                                         |
| LPC4045ATED470K  | 47                      |                      |                              | 10.5                                  | 0.52                      | 0.46                                |                                                         |
| LPC4045ATED680K  | 68                      |                      |                              | 8.0                                   | 0.67                      | 0.40                                |                                                         |
| LPC4045ATED101K  | 100                     |                      |                              | 6.3                                   | 0.92                      | 0.28                                |                                                         |
| LPC4045ATED151K  | 150                     |                      |                              | 5.2                                   | 1.80                      | 0.25                                |                                                         |
| LPC4045ATED221K  | 220                     |                      | 3.9                          | 2.25                                  | 0.18                      |                                     |                                                         |
| LPC4045ATED331K  | 330                     |                      | 3.0                          | 4.27                                  | 0.15                      |                                     |                                                         |
| LPC4045ATED471K  | 470                     |                      | 2.7                          | 5.23                                  | 0.14                      |                                     |                                                         |
| LPC4045ATED681K  | 680                     |                      | 2.2                          | 6.67                                  | 0.12                      |                                     |                                                         |
| LPC9040NATED100M | 10                      | M: ±20%              | 40                           | 25.0                                  | 0.07                      | 1.55                                | 10 kHz                                                  |
| LPC9040NATED150K | 15                      | K: ±10%              | 30                           | 21.0                                  | 0.09                      | 1.40                                |                                                         |
| LPC9040NATED220K | 22                      |                      | 20                           | 15.0                                  | 0.11                      | 1.25                                |                                                         |
| LPC9040NATED330K | 33                      |                      |                              | 13.5                                  | 0.14                      | 1.10                                |                                                         |
| LPC9040NATED470K | 47                      |                      | 10                           | 11.5                                  | 0.20                      | 0.99                                |                                                         |
| LPC9040NATED680K | 68                      |                      |                              | 10.0                                  | 0.27                      | 0.91                                |                                                         |
| LPC9040NATED101K | 100                     |                      |                              | 8.0                                   | 0.41                      | 0.70                                |                                                         |
| LPC9040NATED151K | 150                     |                      |                              | 7.0                                   | 0.55                      | 0.60                                |                                                         |
| LPC9040NATED221K | 220                     |                      |                              | 5.0                                   | 0.81                      | 0.50                                |                                                         |
| LPC9040NATED331K | 330                     |                      |                              | 3.3                                   | 1.86                      | 0.29                                |                                                         |
| LPC9040NATED471K | 470                     |                      |                              | 2.8                                   | 2.07                      | 0.22                                |                                                         |
| LPC9040NATED681K | 680                     |                      |                              | 1.2                                   | 2.65                      | 0.14                                |                                                         |
| LPC9040EATED100M | 10                      | M: ±20%              | 40                           | 25.0                                  | 0.07                      | 2.40                                | 10 kHz                                                  |
| LPC9040EATED150K | 15                      | K: ±10%              | 30                           | 21.0                                  | 0.09                      | 2.20                                |                                                         |
| LPC9040EATED220K | 22                      |                      | 20                           | 15.0                                  | 0.11                      | 2.00                                |                                                         |
| LPC9040EATED330K | 33                      |                      |                              | 13.5                                  | 0.14                      | 1.80                                |                                                         |
| LPC9040EATED470K | 47                      |                      | 10                           | 11.5                                  | 0.20                      | 1.40                                |                                                         |
| LPC9040EATED680K | 68                      |                      |                              | 10.0                                  | 0.27                      | 1.20                                |                                                         |
| LPC9040EATED101K | 100                     |                      |                              | 8.0                                   | 0.41                      | 1.00                                |                                                         |
| LPC9040EATED151K | 150                     |                      |                              | 7.0                                   | 0.55                      | 0.80                                |                                                         |
| LPC9040EATED221K | 220                     |                      |                              | 5.0                                   | 0.81                      | 0.60                                |                                                         |
| LPC9040EATED331K | 330                     |                      |                              | 3.3                                   | 1.86                      | 0.45                                |                                                         |
| LPC9040EATED471K | 470                     |                      |                              | 2.8                                   | 2.07                      | 0.40                                |                                                         |
| LPC9040EATED681K | 680                     |                      |                              | 1.2                                   | 2.65                      | 0.35                                |                                                         |
| LPC10065ATEDR68M | 0.68                    | M: ±20%              | 40                           | 75.0                                  | 0.006                     | 9.50                                | L Meas. Freq.<br>1 MHz<br><br>Q Meas. Freq.<br>2.52 MHz |
| LPC10065ATED1R0M | 1.0                     |                      | 30                           | 65.0                                  | 0.007                     | 9.00                                |                                                         |
| LPC10065ATED1R5M | 1.5                     |                      |                              | 50.0                                  | 0.008                     | 8.50                                |                                                         |
| LPC10065ATED2R2M | 2.2                     |                      |                              | 40.0                                  | 0.009                     | 7.50                                |                                                         |
| LPC10065ATED3R3M | 3.3                     |                      |                              | 30.0                                  | 0.012                     | 6.80                                |                                                         |
| LPC10065ATED4R7M | 4.7                     |                      |                              | 25.0                                  | 0.017                     | 5.70                                |                                                         |
| LPC10065ATED6R8M | 6.8                     | K: ±10%              | 20                           | 20.0                                  | 0.024                     | 4.70                                |                                                         |
| LPC10065ATED100K | 10                      |                      |                              | 15.0                                  | 0.036                     | 3.90                                |                                                         |
| LPC10065ATED150K | 15                      |                      | 15                           | 12.0                                  | 0.054                     | 3.15                                |                                                         |
| LPC10065ATED220K | 22                      |                      |                              | 9.0                                   | 0.080                     | 2.60                                |                                                         |
| LPC10065ATED330K | 33                      |                      |                              | 8.0                                   | 0.120                     | 2.30                                |                                                         |
| LPC10065ATED470K | 47                      |                      |                              | 6.0                                   | 0.175                     | 1.79                                |                                                         |

LPC9045E only: operating temperature range: -40°C to +125°C. The operating temperature range of the coil (ambient temperature + self heating) must remain at +125°C or less

All others: -40°C to +85°C. The operating temperature range of the coil (ambient temperature + self heating) must remain at +85°C or less

## applications and ratings (continued)

| Part Designation | Nominal Inductance (μH) | Inductance Tolerance | Quality Factor Minimum (MHz) | Self Resonant Frequency Minimum (MHz) | DC Resistance Maximum (Ω) | Allowable DC Current Maximum (Amps) | Measured Frequency (Hz) |
|------------------|-------------------------|----------------------|------------------------------|---------------------------------------|---------------------------|-------------------------------------|-------------------------|
| LPC10065ATED680K | 68                      | K: ±10%              | 30                           | 5.0                                   | 0.255                     | 1.48                                | 100 MHz                 |
| LPC10065ATED101K | 100                     |                      |                              | 4.0                                   | 0.380                     | 1.22                                |                         |
| LPC10065ATED151K | 150                     |                      |                              | 3.0                                   | 0.580                     | 1.00                                |                         |
| LPC10065ATED221K | 220                     |                      |                              | 2.5                                   | 0.850                     | 0.82                                |                         |
| LPC10065ATED331K | 330                     |                      |                              | 2.0                                   | 1.30                      | 0.67                                |                         |
| LPC10065ATED471K | 470                     |                      |                              | 1.5                                   | 1.85                      | 0.57                                |                         |
| LPC10065ATED681K | 680                     |                      |                              | 1.0                                   | 2.70                      | 0.47                                |                         |
| LPC10065ATED102K | 1000                    |                      |                              | 0.95                                  | 4.00                      | 0.38                                |                         |
| LPC10065ATED152K | 1500                    |                      |                              | 0.85                                  | 6.10                      | 0.31                                |                         |
| LPC10065ATED222K | 2200                    |                      |                              | 0.70                                  | 9.00                      | 0.26                                |                         |
| LPC10065ATED332K | 3300                    | N: ±30%              | 40                           | 0.55                                  | 13.5                      | 0.21                                | 2.52 MHz                |
| LPC12065ATEDR68N | 0.68                    |                      |                              | 77.0                                  | 0.005                     | 10.0                                |                         |
| LPC12065ATED1R0N | 1.0                     |                      |                              | 60.0                                  | 0.007                     | 9.50                                |                         |
| LPC12065ATED1R5N | 1.5                     |                      |                              | 47.0                                  | 0.008                     | 9.00                                |                         |
| LPC12065ATED2R2N | 2.2                     | M: ±20%              | 30                           | 38.0                                  | 0.010                     | 8.00                                |                         |
| LPC12065ATED3R3M | 3.3                     |                      |                              | 30.0                                  | 0.012                     | 7.00                                |                         |
| LPC12065ATED4R7M | 4.7                     |                      |                              | 24.0                                  | 0.016                     | 6.50                                |                         |
| LPC12065ATED6R8M | 6.8                     |                      |                              | 19.0                                  | 0.022                     | 5.40                                |                         |
| LPC12065ATED100K | 10                      | K: ±10%              | 20                           | 15.0                                  | 0.031                     | 4.50                                | 100 KHz                 |
| LPC12065ATED150K | 15                      |                      |                              | 12.0                                  | 0.046                     | 3.63                                |                         |
| LPC12065ATED220K | 22                      |                      |                              | 9.5                                   | 0.065                     | 3.00                                |                         |
| LPC12065ATED330K | 33                      |                      |                              | 7.5                                   | 0.093                     | 2.40                                |                         |
| LPC12065ATED470K | 47                      |                      | 15                           | 6.2                                   | 0.130                     | 2.05                                |                         |
| LPC12065ATED680K | 68                      |                      |                              | 4.9                                   | 0.182                     | 1.70                                |                         |
| LPC12065ATED101K | 100                     |                      |                              | 4.0                                   | 0.260                     | 1.38                                |                         |
| LPC12065ATED151K | 150                     |                      |                              | 3.2                                   | 0.380                     | 1.14                                |                         |
| LPC12065ATED221K | 220                     |                      |                              | 2.5                                   | 0.540                     | 0.94                                |                         |
| LPC12065ATED331K | 330                     |                      |                              | 2.0                                   | 0.790                     | 0.77                                |                         |
| LPC12065ATED471K | 470                     | K: ±10%              | 30                           | 1.6                                   | 1.08                      | 0.65                                |                         |
| LPC12065ATED681K | 680                     |                      |                              | 1.3                                   | 1.55                      | 0.53                                |                         |
| LPC12065ATED102K | 1000                    |                      |                              | 1.0                                   | 2.21                      | 0.44                                |                         |
| LPC12065ATED152K | 1500                    |                      |                              | 0.83                                  | 3.20                      | 0.35                                |                         |
| LPC12065ATED222K | 2200                    |                      |                              | 0.67                                  | 4.60                      | 0.29                                |                         |
| LPC12065ATED332K | 3300                    |                      |                              | 0.53                                  | 6.60                      | 0.23                                |                         |
| LPC12065ATED472K | 4700                    |                      |                              | 0.43                                  | 9.30                      | 0.19                                |                         |
| LPC12065ATED682K | 6800                    |                      |                              | 0.34                                  | 13.2                      | 0.16                                |                         |

LPC9045E only: operating temperature range: -40°C to +125°C. The operating temperature range of the coil (ambient temperature + self heating) must remain at +125°C or less

All others: -40°C to +85°C. The operating temperature range of the coil (ambient temperature + self heating) must remain at +85°C or less

## environmental applications

### Performance Characteristics

| Parameter                 | Performance Requirements ΔL/L |         | Test Method                                                                                                                                                  |
|---------------------------|-------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           | Limit                         | Typical |                                                                                                                                                              |
| High Temperature Exposure | ±5%                           | ±1.3%   | LPC4045, LPC9040N, LPC10065, LPC12065: +85°C ± 2°C, 500 hours<br>LPC9040E: +125°C ± 2°C, 500 hours                                                           |
| Low Temperature Exposure  | ±5%                           | ±1.3%   | -40°C ± 2°C, 500 hours                                                                                                                                       |
| Moisture Exposure         | ±5%                           | ±1.6%   | +40°C, 90 - 95% RH, 500 hours                                                                                                                                |
| Heat Shock                | ±5%                           | ±1.3%   | LPC4045, LPC9040N, LPC10065, LPC12065: -40°C (30 minutes)/<br>+85°C (30 minutes), 100 cycles<br>LPC9040E: -40°C (30 minutes)/+125°C (30 minutes), 100 cycles |

### Coil Temperature

|                              | LPC4045/LPC9040N/<br>LPC10065/LPC12065 | LPC9040E |
|------------------------------|----------------------------------------|----------|
| Coil Temperature Rise ΔT     | +20°C                                  | +40°C    |
| Inductance Change Ratio ΔL/L | -10%                                   | -10%     |

Surface Temperature Rise graphs and additional environmental applications can also be found at [www.koaspeer.com](http://www.koaspeer.com)

Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.

12/01/14