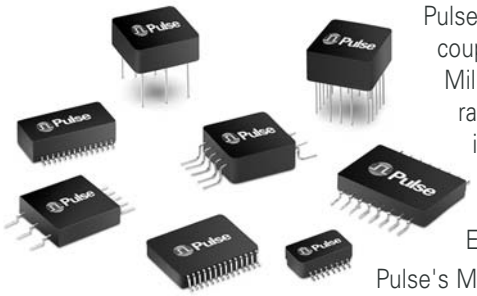
# MILITARY/AEROSPACE PRODUCTS



Pulse is one of the leading manufacturers of magnetic interface transformers, data bus couplers, delay lines, Ethernet transformers, and custom electronic components for Military/Aerospace applications. Both catalog and custom designs include a comprehensive range of high-performance solutions and packaging for QPL and non-QPL MIL-STD-1553 interface transformers, various MIL-STD-1553 Data Bus Couplers and QPL and non-QPL active and passive delay lines. In addition, Copperhead transformers and transceivers support a variety of high-speed applications that includes Fibre Channel, Gigabit Ethernet, SONET, HDTV, IEEE1394B, SMTPE, Ethernet and AFDX buses.

Pulse's Military/Aerospace products are designed to meet the most demanding requirements for military, aerospace and industrial applications. For catalog and/or custom designed products, contact Pulse's Military/Aerospace Division at 215-781-6400 or find an authorized distributor or representative on the Pulse website. See back cover.

## HIGH SPEED DATA BUS

### Copperhead™ Series Transceiver Line Interface Modules

**High Speed Data and Communications over 100+ Meters of Copper:**

- Withstands infrared and vapor phase soldering
- Military temperature range -55°C to +125°C
- Low transmit/receive jitter
- Low power dissipation; 450 mW typical
- ECL logic interface
- Surface mount – pick and place compatible

**Applications:**

Fibre Channel, Gigabit Ethernet, SONET, HDTV, IEEE 1394B, SMTPE

### Ordering Information[1]

TM 531 D S A 1 (XX)

- (XX) – Customer product designator
- blank – No transmit driver
- 1 – 1100 mV output transmit driver and military temperature range
- 2 – 1100 mV output transmit drive and industrial temperature range
- 5 – Active cable equalizer circuit
- A – 5.00 Volt
- B – 3.30 Volt
- S – Impedance matched for STP and Twinax (150 Ω)
- U – Impedance matched for Unshielded Twisted Pair (100 Ω)
- V – Impedance matched for Video and Mini-Coax (75 Ω)
- C – Impedance matched for Coax (50 Ω)
- D – Gull wing, DIP, 28-pin package: 0.800"L x 0.400"W x 0.200"H
- F – Gull wing, flatpack, 28-pin package: 0.760"L x 0.610"W x 0.125"H
- H – Gull wing, half-DIP, 16-pin package: 0.300"L x 0.500"W x 0.250"H
- 133 – 132.8125 Mbaud version, 1/8 Speed Fibre Channel/ATM
- 266 – 265.625 Mbaud version, 1/4 Speed Fibre Channel
- 531 – 531.25 Mbaud version, 1/2 Speed Fibre Channel
- 1062 – 1.0625 Gbaud version, Full Speed Fibre Channel
- 1250 – 1.250 Gbaud version, Gigabit Ethernet (both short haul and long haul)
- 1485 – 1.485 Gbaud version, SMPTE
- (16-pin package is only available on passive units.)
- 2125 – 2.125 Gbaud Double Speed Fiber Channel

***1. Web:*** *http://www.pulseeng.com/products/datasheets/fibre.pdf*

**Copperhead™ Series [1, 2]**

| Part Number | Turns Ratio (±5%) | Primary Inductance (µH MIN) | Rise Time (ps MAX @ 20-80%) | DC Resistance (Ω MAX) | Hipot (Vrms MIN) | Insertion Loss (dB MAX) | Application Nominal Bit Rate (Mbaud) |
|---|---|---|---|---|---|---|---|
| T-330SCT | 1CT:1CT | 26.0 (@ 1.0 Vrms, 100 kHz) | 350 | 0.2 | 1500 | -1.5 (15-165 MHz) | 265.625 (quarter speed) |
| T-1062SCT | 1CT:1CT | 3.75 (@ 1.0 Vrms, 100 kHz) | 280 | 0.2 | 1500 | -2.0 (100-625 MHz) | 1062.50 (full speed) |
| T-1250SCT | 1CT:1CT | 3.75 | 280 | 0.2 | 1500 | -2.0 | 1250 |
| T-1485SCT | 1CT:1CT | 3.75 | 280 | 0.2 | 1500 | -2.0 | 1485 (SMPTE) |
| T-3200SCT | 1:1 | 0.70 | 200 | 0.2 | 1500 | -4.50 | 3200 |

***1. Web:*** *http://www.pulseeng.com/products/datasheets/M105.pdf*

***2. Dual Transformers*** *designed specifically for Point-to-Point Coupling to 150 Ω Twinax Cable:* ***Withstands*** *infrared and vapor phase soldering;* ***Military Temp Range*** *= -55°C to +125°C;* ***Weight*** *= 1.0 grams;* ***Surface Mount*** *= pick-and-place compatible.* ***Applications:*** *Fibre Channel, Gigabit Ethernet, SONET, HDTV, IEEE 1394B, SMTPE.*

***Application Notes****: These isolation transformers protect the station from static charges that may develop on the cable and prevent ground loop currents from being transferred between stations. They have also been designed to provide common mode rejection within the transmission band, reducing EMI.*

## MILITARY/AEROSPACE ETHERNET/AFDX

**10/100**

| Number of Ports | Part Number | Turns Ratio | Configuration [2] RX | Configuration [2] TX | Package Style | Package Size L/W/H (in.) | Data Sheet [1] |
|---|---|---|---|---|---|---|---|
| Single | 100B-1001 | 1CT:1CT | T, C, S | T,C | 12-pin SMT | .630 / .470 / .185 | M101 |
| | 100B-1001X | 1CT:1CT | T, C, S | T,C | 12-pin SMT | .630 / .470 / .185 | M101 |
| | 100B-1003 | 1CT:1CT | T,C | T,C | 16-pin SOIC | .500 / .265 / .235 | M101 |
| | 100B-1003X | 1CT:1CT | T,C | T,C | 16-pin SOIC | .500 / .265 / .235 | M101 |
| Dual | 100B-2002 | 1CT:1CT | T, C | T,C | 24-pin SMT | .518 / .595 / .241 | M110 |
| | 100B-2002X | 1CT:1CT | T, C | T,C | 24-pin SMT | .518 / .595 / .241 | M110 |
| Quad | 100B-4005 | 1CT:1CT | T,C | T,C | 40-pin SOIC | 1.120 / .480 / .280 | M102 |
| | 100B-4005X | 1CT:1CT | T,C | T,C | 40-pin SOIC | 1.120 / .480 / .280 | M102 |

***1. Web:*** *http://www.pulseeng.com/products/datasheets/M101.pdf or M102.pdf*

***2. T*** *= Transformer,* ***C*** *= Choke,* ***S*** *= Shunt inductor,* ***SMT*** *= 50 mil pitch leads,* ***SOIC*** *= 100 mil pitch leads*

**SM** = Surface Mount

# MILITARY/AEROSPACE PRODUCTS

## MILITARY/AEROSPACE ETHERNET/AFDX *(continued)*

### Gigabit

| Number of Ports | Part Number | Turns Ratio | Configuration [3] RX | Configuration [3] TX | Package Style | Package Size L/W/H (in.) | Data Sheet [1] |
|---|---|---|---|---|---|---|---|
| Single | 1000B-5001 | 1CT:1CT | T, C, S | T, C, S | 24-pin SOIC | .695 / .635 / .230 | M106 |
| | 1000B-5001X | 1CT:1CT | T, C, S | T, C, S | 24-pin SOIC | .695 / .635 / .230 | M106 |
| | 1000B-5002 | 1CT:1CT | T, C, S | T, C, S | 24-pin SOIC | .695 / .635 / .230 | M106 |
| | 1000B-5002X | 1CT:1CT | T, C, S | T, C, S | 24-pin SOIC | .695 / .635 / .230 | M106 |
| Dual | 1000B-5003 | 1CT:1CT | T, C | T, C | 50-pin SOIC [2] | 1.095 / .430 / .340 | M106 |
| | 1000B-5003X | 1CT:1CT | T, C | T, C | 50-pin SOIC [2] | 1.095 / .430 / .340 | M106 |

1. ***Web:*** *http://www.pulseeng.com/products/datasheets/M106.pdf*
2. ***0.99mm*** *(.039") pitch leads*
3. ***T*** *= Transformer,* ***C*** *= Choke,* ***S*** *= Shunt inductor,* ***SMT*** *= 50 mil pitch leads,* ***SOIC*** *= 100 mil pitch leads*

## MIL-STD-1553

### Non-QPL, Low Profile and Stacked [1]

| Part [2] Number | Turns Ratio (±3%) | Impedance (Ω MIN) | Package* L/W/H (in.) | Data Sheet |
|---|---|---|---|---|
| FL1553-1 | 1CT:1CT/1CT:.707CT | 4,000 | .630 / .630 / .155 | NQPLC2 [2,3] |
| GL1553-1 | 1CT:1CT/1CT:.707CT | 4,000 | .630 / .630 / .155 | NQPLC2 [2,3] |
| TL1553-1 | 1CT:1CT/1CT:.707CT | 4,000 | .630 / .630 / .155 | NQPLC2 [2,3] |
| FL1553-2 | 1.4CT:1CT/2CT:1CT | 7,200 | .630 / .630 / .155 | NQPLC2 [2,3] |
| GL1553-2 | 1.4CT:1CT/2CT:1CT | 7,200 | .630 / .630 / .155 | NQPLC2 [2,3] |
| TL1553-2 | 1.4CT:1CT/2CT:1CT | 7,200 | .630 / .630 / .155 | NQPLC2 [2,3] |
| FL1553-3 | 1.25CT:1CT/1.66CT:1CT | 4,000 | .630 / .630 / .155 | NQPLC2 [2,3] |
| GL1553-3 | 1.25CT:1CT/1.66CT:1CT | 4,000 | .630 / .630 / .155 | NQPLC2 [2,3] |
| TL1553-3 | 1.25CT:1CT/1.66CT:1CT | 4,000 | .630 / .630 / .155 | NQPLC2 [2,3] |
| FL1553-5 | 1CT:2.12CT/1CT:1.5CT | 4,000 | .630 / .630 / .155 | NQPLC2 [2,3] |
| GL1553-5 | 1CT:2.12CT/1CT:1.5CT | 4,000 | .630 / .630 / .155 | NQPLC2 [2,3] |
| TL1553-5 | 1CT:2.12CT/1CT:1.5CT | 4,000 | .630 / .630 / .155 | NQPLC2 [2,3] |
| FL1553-45 | 1CT:2.5CT/1CT:1.79CT | 4,000 | .630 / .630 / .155 | NQPLC2 [2,3] |
| GL1553-45 | 1CT:2.5CT/1CT:1.79CT | 4,000 | .630 / .630 / .155 | NQPLC2 [2,3] |
| TL1553-45 | 1CT:2.5CT/1CT:1.79CT | 4,000 | .630 / .630 / .155 | NQPLC2 [2,3] |
| DFL1553-1 | 1CT:1CT/1CT:.707CT | 4,000 | .930 / .630 / .155 | NQPLC2 [2,3] |
| DGL1553-1 | 1CT:1CT/1CT:.707CT | 4,000 | .930 / .630 / .155 | NQPLC2 [2,3] |
| DTL1553-1 | 1CT:1CT/1CT:.707CT | 4,000 | .930 / .630 / .155 | NQPLC2 [2,3] |
| DFL1553-2 | 1.4CT:1CT/2CT:1CT | 7,200 | .930 / .630 / .155 | NQPLC2 [2,3] |
| DGL1553-2 | 1.4CT:1CT/2CT:1CT | 7,200 | .930 / .630 / .155 | NQPLC2 [2,3] |
| DTL1553-2 | 1.4CT:1CT/2CT:1CT | 7,200 | .930 / .630 / .155 | NQPLC2 [2,3] |
| DFL1553-3 | 1.25CT:1CT/1.66CT:1CT | 4,000 | .930 / .630 / .155 | NQPLC2 [2,3] |
| DGL1553-3 | 1.25CT:1CT/1.66CT:1CT | 4,000 | .930 / .630 / .155 | NQPLC2 [2,3] |
| DTL1553-3 | 1.25CT:1CT/1.66CT:1CT | 4,000 | .930 / .630 / .155 | NQPLC2 [2,3] |
| DFL1553-5 | 1CT:2.12CT/1CT:1.5CT | 4,000 | .930 / .630 / .155 | NQPLC2 [2,3] |
| DGL1553-5 | 1CT:2.12CT/1CT:1.5CT | 4,000 | .930 / .630 / .155 | NQPLC2 [2,3] |
| DTL1553-5 | 1CT:2.12CT/1CT:1.5CT | 4,000 | .930 / .630 / .155 | NQPLC2 [2,3] |
| DFL1553-45 | 1CT:2.5CT/1CT:1.79CT | 4,000 | .930 / .630 / .155 | NQPLC2 [2,3] |
| DGL1553-45 | 1CT:2.5CT/1CT:1.79CT | 4,000 | .930 / .630 / .155 | NQPLC2 [2,3] |
| DTL1553-45 | 1CT:2.5CT/1CT:1.79CT | 4,000 | .930 / .630 / .155 | NQPLC2 [2,3] |
| STQ1553-1 | 1CT:1CT/1CT:.707CT | 4,000 | .630 / .630 / .340 | NQPLC2 [2,3] |
| STQ1553-2 | 1.4CT:1CT/2CT:1CT | 7,200 | .630 / .630 / .340 | NQPLC2 [2,3] |
| STQ1553-3 | 1.25CT:1CT/1.66CT:1CT | 4,000 | .630 / .630 / .340 | NQPLC2 [2,3] |
| STQ1553-5 | 1CT:2.12CT/1CT:1.5CT | 4,000 | .630 / .630 / .340 | NQPLC2 [2,3] |
| STQ1553-45 | 1CT:2.5CT/1CT:1.79CT | 4,000 | .630 / .630 / .340 | NQPLC2 [2,3] |
| SFQ1553-1 | 1CT:1CT/1CT:.707CT | 4,000 | .630 / .630 / .340 | NQPLC2 [2,3] |
| SGQ1553-1 | 1CT:1CT/1CT:.707CT | 4,000 | .630 / .630 / .340 | NQPLC2 [2,3] |
| SFQ1553-2 | 1.4CT:1CT/2CT:1CT | 7,200 | .630 / .630 / .340 | NQPLC2 [2,3] |
| SGQ1553-2 | 1.4CT:1CT/2CT:1CT | 7,200 | .630 / .630 / .340 | NQPLC2 [2,3] |
| SFQ1553-3 | 1.25CT:1CT/1.66CT:1CT | 4,000 | .630 / .630 / .340 | NQPLC2 [2,3] |
| SGQ1553-3 | 1.25CT:1CT/1.66CT:1CT | 4,000 | .630 / .630 / .340 | NQPLC2 [2,3] |
| SFQ1553-5 | 1CT:2.12CT/1CT:1.5CT | 4,000 | .630 / .630 / .340 | NQPLC2 [2,3] |
| SGQ1553-5 | 1CT:2.12CT/1CT:1.5CT | 4,000 | .630 / .630 / .340 | NQPLC2 [2,3] |
| SFQ1553-45 | 1CT:2.5CT/1CT:1.79CT | 4,000 | .630 / .630 / .340 | NQPLC2 [2,3] |
| SGQ1553-45 | 1CT:2.5CT/1CT:1.79CT | 4,000 | .630 / .630 / .340 | NQPLC2 [2,3] |
| SLQG1553-1 | 1CT:1CT/1.4CT:1CT | 4,000 | .630 / .630 / .280 | M104 [2] |
| SLQG1553-2 | 1.4CT:1CT/2CT:1CT | 7,200 | .630 / .630 / .280 | M104 [2] |
| SLQG1553-3 | 1.25CT:1CT/1.66CT:1CT | 4,000 | .630 / .630 / .280 | M104 [2] |
| SLQG1553-5 | 1CT:2.12CT/1CT:1.5CT | 4,000 | .630 / .630 / .280 | M104 [2] |
| SLQG1553-45 | 1CT:2.5CT/1CT:1.79CT | 4,000 | .630 / .630 / .280 | M104 [2] |
| SLQT1553-1 | 1CT:1CT/1.4CT:1CT | 4,000 | .630 / .630 / .280 | M104 [2] |
| SLQT1553-2 | 1.4CT:1CT/2CT:1CT | 7,200 | .630 / .630 / .280 | M104 [2] |
| SLQT1553-3 | 1.25CT:1CT/1.66CT:1CT | 4,000 | .630 / .630 / .280 | M104 [2] |
| SLQT1553-5 | 1CT:2.12CT/1CT:1.5CT | 4,000 | .630 / .630 / .280 | M104 [2] |
| SLQT1553-45 | 1CT:2.5CT/1CT:1.79CT | 4,000 | .630 / .630 / .280 | M104 [2] |
| SLQF1553-1 | 1CT:1CT/1.4CT:1CT | 4,000 | .630 / .630 / .280 | M104 [2] |
| SLQF1553-2 | 1.4CT:1CT/2CT:1CT | 7,200 | .630 / .630 / .280 | M104 [2] |
| SLQF1553-3 | 1.25CT:1CT/1.66CT:1CT | 4,000 | .630 / .630 / .280 | M104 [2] |
| SLQF1553-5 | 1CT:2.12CT/1CT:1.5CT | 4,000 | .630 / .630 / .280 | M104 [2] |
| SLQF1553-45 | 1CT:2.5CT/1CT:1.79CT | 4,000 | .630 / .630 / .280 | M104 [2] |

1. ***Designed*** *and built to conform to MIL-PRF-21038/27*
2. ***Web:*** *http://www.pulseeng.com/products/datasheets/N_QPL_Cat2_links.pdf or M104.pdf*
3. ***Prefix / Operating Temperature : xxxC1553-xx*** */ 0°C to +70°C ;* ***xxxN1553-xx*** */ -40°C to +85°C;* ***xxx1553-xx*** */ -55°C to +125°C*

### Interface Transformers: COTS Series [1]

| Part [2] Number | Turns Ratio (±3%) | Impedance (W MIN) | Package* (L/W/H) in. | Data [3] Sheet |
|---|---|---|---|---|
| x1553-1 | 1CT:1CT/1CT:.707CT | 4,000 | .625 / .625 / .250 | NQPLC2 |
| x1553-2 | 1.4CT:1CT/2CT:1CT | 7,200 | .625 / .625 / .250 | NQPLC2 |
| x1553-3 | 1.25CT:1CT/1.66CT:1CT | 4,000 | .625 / .625 / .250 | NQPLC2 |
| x1553-5 | 1CT:2.12CT/1.5CT:1CT | 4,000 | .625 / .625 / .250 | NQPLC2 |
| x1553-45 | 1CT:2.5CT/1CT:1.79CT | 4,000 | .625 / .625 / .250 | NQPLC2 |

1. ***Designed*** *and built to conform to MIL-PRF-21038/27*
2. ***Prefix / Operating Temperature: C /*** *0°Cto +70°C;* ***N*** */ -40°C to +85°C;* ***TQ*** */ -55°C to +125°C*
3. ***Web:*** *http://www.pulseeng.com/pdf/N_QPL_Cat2_links.pdf*

### Interface Transformers - Low Profile Miniature Series

| Part Number | Turns Ratio (±3%) | Impedance (Ω MIN) | Package* (L/W/H) in. | Data Sheet |
|---|---|---|---|---|
| SMG1553-60 | 1.25CT:1CT | 4,000 | .400 / .400 / .185 | M112 |
| SMG1553-61 | 1.66CT:1CT | 4,000 | .400 / .400 / .185 | M112 |
| SMG1553-62 | 1.41CT:1CT | 7,200 | .400 / .400 / .185 | M112 |
| SMG1553-63 | 2CT:1CT | 7,200 | .400 / .400 / .185 | M112 |
| SMG1553-65 | 1CT:1.79CT | 4,000 | .400 / .400 / .185 | M112 |
| SMG1553-66 | 1CT:2.7CT | 4,000 | .400 / .400 / .185 | M112 |

***Mounting:** **FP** = Flat Pack **TH** = Through Hole **SM** = Surface Mount

# MILITARY/AEROSPACE PRODUCTS

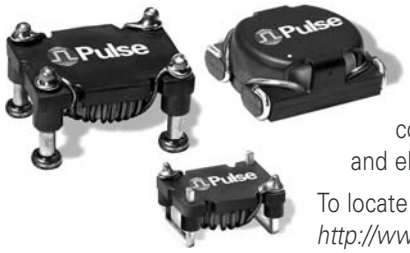
## MIL-STD-1553 *(continued)*

### QPL Series — Qualified to MIL-PRF-21038/27

| Part [1] Number | Military Designation Number | Turns Ratio (±3%) | Impedance (Ω MIN) | Package* L/W/H (in.) | Data [2] Sheet |
|---|---|---|---|---|---|
| Q1553-20 | M21038/27-05 | 1:1.41 | 3,000 | .500 / .350 / .250 | QPL6 |
| Q1553-21 | M21038/27-06 | 1CT:1CT | 3,000 | .500 / .350 / .250 | QPL6 |
| Q1553-22 | M21038/27-07 | 1CT:1.41CT | 3,000 | .500 / .350 / .250 | QPL6 |
| Q1553-23 | M21038/27-08 | 1CT:1.66CT | 3,000 | .500 / .350 / .250 | QPL6 |
| Q1553-24 | M21038/27-09 | 1CT:2CT | 3,000 | .500 / .350 / .250 | QPL6 |
| Q1553-25 | M21038/27-28 | 1CT:1.5CT | 3,000 | .500 / .350 / .250 | QPL6 |
| Q1553-51 | M21038/27-29 | 1CT:1.79CT | 3,000 | .500 / .350 / .250 | QPL6 |
| Q1553-52 | M21038/27-30 | 1CT:2.5CT | 3,000 | .500 / .350 / .250 | QPL6 |
| Q1553-1 | M21038/27-01 | 1CT:1CT/1CT:.707CT | 4,000 | .625 / .625 / .250 | QPL6 |
| Q1553-2 | M21038/27-02 | 1.4CT:1CT/2CT:1CT | 7,200 | .625 / .625 / .250 | QPL6 |
| Q1553-3 | M21038/27-03 | 1.25CT:1CT/1.66CT:1CT | 4,000 | .625 / .625 / .250 | QPL6 |
| Q1553-5 | M21038/27-10 | 1CT:2.12CT/1CT:1.5CT | 4,000 | .625 / .625 / .250 | QPL6 |
| Q1553-45 | M21038/27-26 | 1CT:2.5CT/1CT:1.79CT | 4,000 | .625 / .625 / .275 | QPL6 |
| Q1553-81 | M21038/27-21 | 1CT:1CT/1CT:.707CT | 4,000 | .625 / .625 / .275 | QPL6 |
| Q1553-82 | M21038/27-22 | 1.4CT:1CT/2CT:1CT | 7,200 | .625 / .625 / .275 | QPL6 |
| Q1553-83 | M21038/27-23 | 1.25CT:1CT/1.66CT:1CT | 4,000 | .625 / .625 / .275 | QPL6 |
| Q1553-84 | M21038/27-24 | 1CT:2.12CT/1CT:1.5CT | 4,000 | .625 / .625 / .275 | QPL6 |
| Q1553-85 | M21038/27-25 | 1CT:2.5CT/1CT:1.79CT | 4,000 | .625 / .625 / .275 | QPL6 |
| FPQ1553-6 | M21038/27-16 | 1CT:1CT/1CT:.707CT | 4,000 | .625 / .625 / .250 | QPL6 |
| SMQ1553-6 | M21038/27-11 | 1CT:1CT/1CT:.707CT | 4,000 | .625 / .625 / .250 | QPL6 |
| FPQ1553-7 | M21038/27-17 | 1.4CT:1CT/2CT:1CT | 7,200 | .625 / .625 / .250 | QPL6 |
| SMQ1553-7 | M21038/27-12 | 1.4CT:1CT/2CT:1CT | 7,200 | .625 / .625 / .250 | QPL6 |
| FPQ1553-8 | M21038/27-18 | 1.25CT:1CT/1.66CT:1CT | 4,000 | .625 / .625 / .250 | QPL6 |
| SMQ1553-8 | M21038/27-13 | 1.25CT:1CT/1.66CT:1CT | 4,000 | .625 / .625 / .250 | QPL6 |
| FPQ1553-10 | M21038/27-20 | 1CT:2.12CT/1CT:1.5CT | 4,000 | .625 / .625 / .250 | QPL6 |
| SMQ1553-10 | M21038/27-15 | 1CT:2.12CT/1CT:1.5CT | 4,000 | .625 / .625 / .250 | QPL6 |
| FPQ1553-45 | M21038/27-31 | 1CT:2.5CT/1CT:1.79CT | 4,000 | .625 / .625 / .250 | QPL6 |
| SMQ1553-45 | M21038/27-27 | 1CT:2.5CT/1CT:1.79CT | 4,000 | .625 / .625 / .250 | QPL6 |

1. ***Part number options:*** *C and T level QPL testing (xxQC1553-xx, xxQT1553-xx, M21038/27-xxC, M21038/27-xxT).*
2. ***Web:*** *http://www.pulseeng.com/products/datasheets/QPL6.pdf*
3. ***Summary Performance Specifications: Droop*** *= 20%;* ***Overshoot*** *= ±1 VMAX;* ***Common Mode Rejection*** *= 45 dB;* ***Frequency Range*** *(no load) = 75 kHz to 1 MHz;* ***Operating Temperature Range*** *= -55°C to +130°C;* ***Weight*** *= 5 grams;* ***Insulation Resistance*** *= 10 kMΩ @ 250 Vdc;* ***Dielectric Withstanding Voltage*** *= 100 Vrms*

Pulse offers off-the-shelf inductors and transformers for modern military and aerospace power applications–the SLED™, the SLIC, and the POGO™ series. The SLED series consists of rail-mount inductors with a ruggedized header for durable board connections, utilizing two rails for board mounting and cores bonded to high temperature headers for durability and mechanical strength. The SLIC series, self-leaded transformers and inductors, have ruggedized construction. The structural header is bonded to the cores and lead wires, increasing mechanical durability. The POGO series are pad-mounted inductors with open construction for robust board mounting with rugged pins used for both surface board-mounting and electrical connection.




To locate the current data sheets for these products, go to the Pulse website at the following URL: *http://www.pulseeng.com* and click the "Military / Aerospace" tile on the Pulse home page.

## OFF-THE-SHELF POWER INDUCTORS & TRANSFORMERS

### Toroid Power Inductors - SLED Series

| Part Number | @ IRATED (µH) | IRATED (A) | DCR (mΩ MAX) | Inductance @0A$_{DC}$ (µH) | Package* L/W/H (in.) | Data Sheet |
|---|---|---|---|---|---|---|
| **SLED 20** | | | | | | |
| PL8100 | 1.01 | 3.40 | 11 | 1.1 | .400 / .345 / .250 | M107 |
| PL8101 | 6.2 | 1.40 | 70 | 7 | .400 / .345 / .250 | M107 |
| PL8102 | 17.6 | 1.00 | 125 | 22.7 | .400 / .345 / .250 | M107 |
| **SLED 30** | | | | | | |
| PL8110 | 3.8 | 4.80 | 17.3 | 5.2 | .625 / .525 / .400 | M107 |
| PL8111 | 9.4 | 2.80 | 43.4 | 12.3 | .625 / .525 / .400 | M107 |
| PL8112 | 29.7 | 1.40 | 166 | 35.3 | .625 / .525 / .400 | M107 |
| PL8113 | 114 | 0.94 | 380 | 167 | .625 / .525 / .400 | M107 |
| **SLED 40** | | | | | | |
| PL8120 | 2.5 | 8.00 | 8.3 | 3.8 | .725 / .575 / .410 | M107 |
| PL8121 | 5.1 | 5.40 | 17.7 | 7.5 | .725 / .575 / .410 | M107 |
| PL8122 | 16.2 | 2.70 | 72 | 21.9 | .725 / .575 / .410 | M107 |
| PL8123 | 58.1 | 1.30 | 290 | 73 | .725 / .575 / .410 | M107 |
| PL8124 | 192 | 0.90 | 560 | 292 | .725 / .575 / .410 | M107 |
| PL8125 | 383 | 0.72 | 862 | 672 | .725 / .575 / .410 | M107 |
| PL8130 | 4.9 | 7.80 | 12.4 | 7.9 | .725 / .575 / .410 | M107 |
| PL8131 | 9 | 5.50 | 28 | 14 | .725 / .575 / .410 | M107 |
| PL8132 | 29.1 | 2.70 | 100 | 40.5 | .725 / .575 / .410 | M107 |
| PL8133 | 645 | 0.74 | 1250 | 1134 | .725 / .575 / .410 | M107 |
| PL8150 | 0.81 | 14.30 | 2.5 | 1.25 | .725 / .575 / .410 | M107 |
| PL8151 | 1.32 | 11.50 | 4.0 | 2.1 | .725 / .575 / .410 | M107 |

### Toroid Power Inductors - SLED Series *(continued*

| Part Number | @ IRATED (µH) | IRATED (A) | DCR (mΩ MAX) | Inductance @0A$_{DC}$ (µH) | Package* L/W/H (in.) | Data Sheet |
|---|---|---|---|---|---|---|
| **SLED 50** | | | | | | |
| PL8140 | 9.3 | 7.20 | 18.7 | 16 | .900 / .690 / .520 | M107 |
| PL8141 | 16.1 | 5.10 | 32.0 | 25.9 | .900 / .690 / .520 | M107 |
| PL8142 | 50 | 2.60 | 133 | 72.9 | .900 / .690 / .520 | M107 |
| PL8143 | x1070 | 0.71 | 1700 | 1950 | .900 / .690 / .520 | M107 |
| PL8160 | 1.68 | 13.90 | 3.6 | 2.8 | .900 / .690 / .520 | M107 |
| PL8161 | 2.5 | 11.40 | 5.4 | 4.2 | .900 / .690 / .520 | M107 |
| PL8170 | 3.5 | 12.40 | 6.6 | 6.5 | .900 / .690 / .520 | M107 |
| PL8171 | 4.7 | 10.40 | 8.3 | 8.4 | .900 / .690 / .520 | M107 |

### SMT Common Mode Chokes: SLIC Series

| Part Number | Inductance (mH ±35%) | IRATED (A) | DCR (mΩ MAX) | Package* L/W/H (in.) | Data Sheet |
|---|---|---|---|---|---|
| PL8200 | 0.47 | 14.0 | 8 | 1.220 / 1.000 / .500 | M108 |
| PL8201 | 0.63 | 11.6 | 10 | 1.220 / 1.000 / .500 | M108 |
| PL8202 | 0.81 | 9.70 | 14 | 1.220 / 1.000 / .500 | M108 |
| PL8203 | 0.53 | 7.20 | 15 | 1.110 / 1.00 / 395 | M108 |
| PL8204 | 0.59 | 5.60 | 21 | .770 / .670 / .395 | M108 |
| PL8205 | 0.77 | 4.70 | 40 | .770 / .670 / .395 | M108 |
| PL8206 | 0.22 | 3.30 | 60 | .770 / .670 / .390 | M108 |
| PL8207 | 1.32 | 3.30 | 60 | .770 / .670 / .395 | M108 |
| PL8208 | 1.47 | 2.80 | 80 | .770 / .670 / .395 | M108 |
| PL8209 | 0.88 | 1.63 | 110 | .500 / .500 / .215 | M108 |
| PL8210 | 1.17 | 1.22 | 200 | .500 / .500 / .215 | M108 |

***Mounting:** **FP** = Flat Pack **TH** = Through Hole **SM** = Surface Mount

# MILITARY/AEROSPACE PRODUCTS

## OFF-THE-SHELF POWER INDUCTORS & TRANSFORMERS *(continued)*

### SMT Power Inductors: SLIC (HCCI-80) Series

| Part Number[1] | @ IRATED (µH) | IRATED (A) | DCR (mΩ) MAX | Inductance @0ADC (µH) | Package* L/W/H (in.) | Data Sheet |
|---|---|---|---|---|---|---|
| PL8304 P | 1.1 | 38 | 1.3 | 2.1 | 1.220 / 1.000 / .500 | M109 |
| PL8303 P | 1.6 | 34 | 1.6 | 3.5 | 1.220 / 1.000 / .500 | M109 |
| PL8302 P | 2.45 | 27 | 2.5 | 5.1 | 1.220 / 1.000 / .500 | M109 |
| PL8301 P | 3.2 | 24 | 3.5 | 7.2 | 1.220 / 1.000 / .500 | M109 |
| PL8304 S | 4.3 | 19 | 5.1 | 8.4 | 1.220 / 1.000 / .500 | M109 |
| PL8300 P | 4.52 | 19 | 4.8 | 9.5 | 1.220 / 1.000 / .500 | M109 |
| PL8303 S | 6.4 | 17 | 6.4 | 13.8 | 1.220 / 1.000 / .500 | M109 |
| PL8302 S | 9.8 | 13.5 | 10.1 | 20.4 | 1.220 / 1.000 / .500 | M109 |
| PL8301 S | 12.8 | 12 | 13.8 | 28.7 | 1.220 / 1.000 / .500 | M109 |
| PL8300 S | 18.1 | 9.5 | 19.3 | 38.0 | 1.220 / 1.000 / .500 | M109 |

*1. **Connection: P** = Parallel, **S** = Series*

### SMT Power Inductors: Toroid, POGO Series

| | | | | | | |
|---|---|---|---|---|---|---|
| **POGO 40** | | | | | | |
| PL8400 S | 43.6 | 1.1 | 309 | 77 | .725 / .575 / .380 | M111 |
| **POGO 50** | | | | | | |
| PL8401 S | 21.9 | 2.7 | 90.5 | 39.5 | .910 / .700 / .510 | M111 |
| PL8402 S | 4.025 | 6.4 | 23 | 6.575 | .910 / .700 / .510 | M111 |
| PL8403 P | 0.53 | 23.8 | 3 | 0.88 | .910 / .700 / .510 | M111 |
| PL8404 P | 1.1 | 21 | 2.5 | 2.1 | .910 / .700 / .510 | M111 |
| **POGO 60** | | | | | | |
| PL8405 P | 2.1 | 22.4 | 3.4 | 4 | 1.280 / 1.070 / .510 | M111 |

*1. **Connection: P** = Parallel, **S** = Series*

### SMT Power Inductors: Toroid, SLED Series

| | | | | | | |
|---|---|---|---|---|---|---|
| **SLED 25** | | | | | | |
| PL8500 | 9.4 | 3.8 | 32 | 10.4 | .625 / .525 / .310 | M113 |
| PL8501 | 13.3 | 3.2 | 46 | 14.6 | .625 / .525 / .310 | M113 |
| PL8502 | 23 | 2.4 | 74 | 25 | .625 / .525 / .310 | M113 |
| PL8503 | 50 | 1.6 | 135 | 56 | .625 / .525 / .310 | M113 |
| PL8504 | 75 | 1.3 | 220 | 83 | .625 / .525 / .310 | M113 |
| PL8505 | 90 | 1.2 | 285 | 100 | .625 / .525 / .310 | M113 |
| PL8506 | 137 | 1 | 425 | 152 | .625 / .525 / .310 | M113 |
| PL8507 | 200 | .82 | 673 | 220 | .625 / .525 / .310 | M113 |
| PL8508 | 305 | .66 | 972 | 331 | .625 / .525 / .310 | M113 |
| PL8509 | 439 | .56 | 1520 | 472 | .625 / .525 / .310 | M113 |

### SMT Power Inductors: Toroid, POGO Series

| | | | | | | |
|---|---|---|---|---|---|---|
| **POGO 25** | | | | | | |
| PL8600 P | 2.0 | 8.30 | 7.6 | 2.2 | .625 / .525 / .310 | M114 |
| PL8601 P | 2.4 | 7.20 | 10.9 | 2.6 | .625 / .525 / .310 | M114 |
| PL8602 P | 5.0 | 5.20 | 19.0 | 5.5 | .625 / .525 / .310 | M114 |
| PL8600 S | 7.0 | 4.16 | 16.0 | 8.75 | .625 / .525 / .310 | M114 |
| PL8603 P | 9.3 | 3.80 | 29.8 | 10.4 | .625 / .525 / .310 | M114 |
| PL8601 S | 8.4 | 3.78 | 21.8 | 10.4 | .625 / .525 / .310 | M114 |
| PL8604 P | 14.1 | 3.10 | 45.3 | 15.7 | .625 / .525 / .310 | M114 |
| PL8605 P | 19.8 | 2.6 | 66.3 | 22.1 | .625 / .525 / .310 | M114 |
| PL8602 S | 17.9 | 2.6 | 38.0 | 22.45 | .625 / .525 / .310 | M114 |
| PL8606 P | 29.3 | 2.20 | 106 | 32.8 | .625 / .525 / .310 | M114 |
| PL8603 S | 33.8 | 1.89 | 60 | 41.7 | .625 / .525 / .310 | M114 |
| PL8607 P | 42.6 | 1.80 | 151 | 47.6 | .625 / .525 / .310 | M114 |
| PL8604 S | 50.9 | 1.54 | 91 | 62.8 | .625 / .525 / .310 | M114 |
| PL8608 P | 61.3 | 1.50 | 224 | 67.5 | .625 / .525 / .310 | M114 |
| PL8605 S | 71.5 | 1.30 | 133 | 88.2 | .625 / .525 / .310 | M114 |
| PL8609 P | 84.2 | 1.20 | 324 | 91.0 | .625 / .525 / .310 | M114 |
| PL8606 S | 106.1 | 1.07 | 202 | 131.0 | .625 / .525 / .310 | M114 |
| PL8607 S | 154.2 | 0.89 | 302 | 190.3 | .625 / .525 / .310 | M114 |
| PL8608 S | 218.9 | 0.74 | 444 | 270.2 | .625 / .525 / .310 | M114 |
| PL8609 S | 295.0 | 0.64 | 636 | 364.0 | .625 / .525 / .310 | M114 |
| **POGO 40** | | | | | | |
| PL8700 P | 1.5 | 14.40 | 4.41 | 2.2 | .725 / .600 / .380 | M115 |
| PL8701 P | 2.4 | 11.20 | 6.54 | 3.5 | .725 / .600 / .380 | M115 |
| PL8702 P | 4.2 | 8.20 | 10.47 | 5.9 | .725 / .600 / .380 | M115 |
| PL8703 P | 5.8 | 6.80 | 14.94 | 7.9 | .725 / .600 / .380 | M115 |
| PL8700 S | 6.1 | 7.20 | 17.60 | 9.0 | .725 / .600 / .380 | M115 |
| PL8704 P | 7.6 | 5.70 | 20.99 | 10.1 | .725 / .600 / .380 | M115 |

### SMT Power Inductors: Toroid, POGO Series *(continued)*

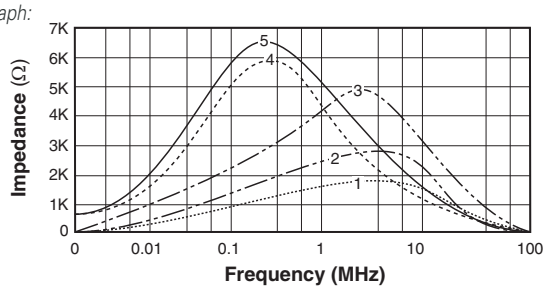
| Part Number[1] | @ IRATED (µH) | IRATED (A) | DCR (mΩ) MAX | Inductance @0ADC (µH) | Package* L/W/H (in.) | Data Sheet |
|---|---|---|---|---|---|---|
| **POGO 40** *(continued)* | | | | | | |
| PL8701 S | 9.7 | 5.60 | 26.20 | 14.0 | .725 / .600 / .380 | M115 |
| PL8705 P | 12.1 | 5.40 | 23.24 | 18.5 | .725 / .600 / .380 | M115 |
| PL8702 S | 17.0 | 4.10 | 41.90 | 23.7 | .725 / .600 / .380 | M115 |
| PL8706 P | 18.0 | 4.40 | 38.15 | 27.4 | .725 / .600 / .380 | M115 |
| PL8703 S | 23.1 | 3.40 | 59.70 | 31.5 | .725 / .600 / .380 | M115 |
| PL8707 P | 27.0 | 3.54 | 53.21 | 40.5 | .725 / .600 / .380 | M115 |
| PL8704 S | 30.6 | 2.85 | 84.00 | 40.5 | .725 / .600 / .380 | M115 |
| PL8708 P | 34.8 | 3.00 | 73.89 | 50.5 | .725 / .600 / .380 | M115 |
| PL8705 S | 48.5 | 2.70 | 93.00 | 74.1 | .725 / .600 / .380 | M115 |
| PL8706 S | 72.0 | 2.20 | 152.60 | 109.8 | .725 / .600 / .380 | M115 |
| PL8708 S | 139.1 | 1.50 | 295.60 | 202.2 | .725 / .600 / .380 | M115 |
| PL8707 S | 108.0 | 1.77 | 212.80 | 161.8 | .725 / .600 /.380 | M115 |

*1. **Connection: P** = Parallel, **S** = Series*

### SMT Common Mode Inductors: Toroid, POGO Series

| Part Number | Inductance (mH ±30%) | IRATED (A) | DCR (mΩ) MAX | SRF (MHz) | Impedance Curve[1] | Package L/W/H (in.) | Data Sheet |
|---|---|---|---|---|---|---|---|
| **POGO 40** | | | | | | | |
| PL8801 | 1.5 | 1.50 | 60 | 2 | 2 | .725 / .575 / .380 | M116 |
| PL8803 | 10.0 | 1.00 | 450 | 0.5 | 4 | .725 / .575 / .380 | M116 |
| PL8804 | 22.0 | 0.50 | 850 | 0.3 | 5 | .725 / .575 / .380 | M116 |
| **POGO 50** | | | | | | | |
| PL8800 | 1.0 | 3.60 | 50 | 4 | 1 | .910 / .700 / .510 | M116 |
| PL8802 | 3.0 | 2.50 | 80 | 2.2 | 3 | .910 / .700 / .510 | M116 |

*1. **See** graph:*




### SMT Power Inductors: Shielded Drum Core

| Part Number | Inductance @IRATED (µH TYP) | IRATED[1] (A) | DCR (mΩ MAX) | Inductance @0ADC[2] (µH) | Saturation Current @25°C | Package L/W/H (in.) | Data Sheet |
|---|---|---|---|---|---|---|---|
| PL8901 | 0.80 | 11 | 4.0 | 1.0[2] | 14 | .413 / .413 / .280 | M117 |
| PL8902 | 1.20 | 10 | 6.0 | 1.5[2] | 13 | .413 / .413 / .280 | M117 |
| PL8903 | 2.1 | 9.0 | 7.3 | 2.7[2] | 11 | .413 / .413 / .280 | M117 |
| PL8904 | 2.9 | 8.0 | 8.5 | 3.7[2] | 9.2 | .413 / .413 / .280 | M117 |
| PL8905 | 3.7 | 7.3 | 9.5 | 4.7[2] | 8.2 | .413 / .413 / .280 | M117 |
| PL8906 | 4.8 | 6.0 | 16.5 | 6.0[2] | 6.9 | .413 / .413 / .280 | M117 |
| PL8907 | 6 | 5.5 | 18.5 | 7.6[2] | 6.2 | .413 / .413 / .280 | M117 |
| PL8908 | 8 | 5.0 | 21.8 | 10 | 5.5 | .413 / .413 / .280 | M117 |
| PL8909 | 9.6 | 4.5 | 29.0 | 12 | 5.1 | .413 / .413 / .280 | M117 |
| PL8910 | 12 | 4.1 | 35.4 | 15 | 4.4 | .413 / .413 / .280 | M117 |
| PL8911 | 14.4 | 4.0 | 37.0 | 18 | 4.3 | .413 / .413 / .280 | M117 |
| PL8912 | 17.6 | 3.8 | 42.0 | 22 | 3.8 | .413 / .413 / .280 | M117 |
| PL8913 | 21.6 | 3.4 | 45.9 | 27 | 3.4 | .413 / .413 / .280 | M117 |
| PL8914 | 26.4 | 3.0 | 64.8 | 33 | 3.0 | .413 / .413 / .280 | M117 |
| PL8915 | 31.2 | 2.7 | 81.5 | 39 | 2.8 | .413 / .413 / .280 | M117 |
| PL8916 | 37.6 | 2.6 | 89.0 | 47 | 2.6 | .413 / .413 / .280 | M117 |
| PL8917 | 54.4 | 2.1 | 135.0 | 68 | 2.1 | .413 / .413 / .280 | M117 |

*1. **The rated** current as listed is either the saturation current or the heating current depending on which value is lower.*

*2. **Inductance** at 0ADC tolerance is ±30%. The tolerance is ±20% on all other parts.*

***Optional** Tape and Reel packaging can be ordered by adding a **"T"** suffix to the end of the part number.*

**SM** = Surface Mount