

# QPL MIL-STD-1553 INTERFACE TRANSFORMERS

**Pulse Specialty Components**

**Two Pearl Buck Court**

**Bristol, PA 19007-6812**

**Tel 215-781-6400 ■ Fax 215-781-6403**

**[www.pulsespecialty.com](http://www.pulsespecialty.com)**

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## For non-QPL pulse transformers....

In addition to the QPL transformers described in this catalog, Pulse Specialty Components offers scores of low-power pulse transformer models for commercial, industrial, COTS, and other (non-QPL) military applications. These include:

- surface-mount or through-the board
- standard profile, low profile, or stacked
- single- or dual-ratio
- single- or dual-interface

For more information, request catalog

*“Non-QPL MIL-STD-1553*

*Low-Power Pulse Transformers”*



### MIL-STD-1553 Interface Transformers

As “Technitrol Components Division,” we were the first to achieve QPL status for MIL-STD 1553B interface transformers, also known as low-power pulse transformers. Today, as “Pulse Specialty Components,” our QPL transformer line includes a wide selection of products for each of the product levels called for by MIL-PRF-21038/27, formerly MIL-T-21038/27.

We also were the first to achieve QPL status on surface-mount MIL-STD-1553 pulse transformers -- more than 15 years ago. To this day, many manufacturers have difficulty producing components that can survive the high-heat rigors of surface mounting and the performance, reliability, part-to-part repeatability, and lifespan required by high-rel military and commercial applications.

This catalog covers all of our QPL transformer products. Each part has a military designation number (found on DESC/DSCC approved drawings) as well as our own product number. These part numbers are listed in the specification tables.

### About MIL-T-21038/27 and MIL-PRF-21038/27

MIL-PRF-21038E (8 July 1998) supersedes MIL-T-21038D (11 May 1979) and establishes three

product levels for low power pulse transformers. The new specification allows designers to select a QPL device and limit the testing to what's needed for the application:

- Level C - for high reliability commercial/industrial applications;
- Level M - for general purpose military applications;
- Level T - for high reliability critical military applications.

Level C parts are tested to our internal specifications. Group A or B testing is not performed on Level C parts. A Level M part is exactly the same as the original QPL product that was defined by the earlier MIL-T-21038/27 specification. A Level T part receives the most extensive testing along with thermal cycling. For more details, see next page.

### COTS transformers.

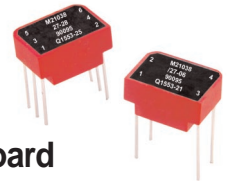
Several of our QPL transformers have non-QPL COTS counterparts -- same component layout and electrical characteristics but they're built for commercially-oriented requirements, and manufactured in higher volume at lower cost. We've noted where a COTS counterpart to a QPL product exists with the symbol shown here.



For more information on COTs transformers, refer to our non-QPL transformer catalog.

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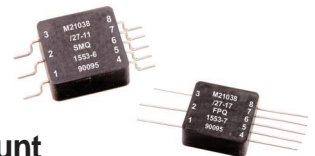
### Dual ratio



### through-the-board

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### Dual ratio



### surface mount

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## MIL-PRF-21038/27 Inspection, Sampling, Testing

### Table 1: Group A Inspection

Level "C" **		Level "M"		Level "T"	
Tests	Sampling Plan	Tests	Sampling Plan	Tests	Sampling Plan
NA		Electrical Characteristics per MIL-PRF-21038/27	sample per Table 3	Thermal Shock	100%
NA		Visual and mechanical inspection	sample per Table 3	Winding Continuity	100%
NA		NA		Electrical Characteristics per MIL-PRF-21038/27	100%
NA		NA		Visual and mechanical inspection	sample per Table 3

### Table 2: Group B Inspection

Level "C" **		Level "M"		Level "T"	
Tests	Sampling Plan	Tests	Sampling Plan	Tests	Sampling Plan
NA		Dielectric Withstanding Voltage	sample per Table 3	Dielectric Withstanding Voltage	sample per Table 3
NA		Insulation Resistance	sample per Table 3	Insulation Resistance	sample per Table 3

### Table 3: Sampling Plans for Group A and Group B inspections

Lot size	Group A, group II inspections	Group B
1 to 5	all	all
6 to 13	all	5
14 to 50	13	5
51 to 90	13	7
91 to 150	13	11
151 to 280	20	13
281 to 500	29	16
501 to 1200	34	19
1,201 to 3,200	42	23
3,201 to 10,000	50	29

\*\* Parts ordered to Level C are certified to comply with MIL-PRF-21038 Level C, however testing will be performed per manufacturer's internal requirements and sampling rates.

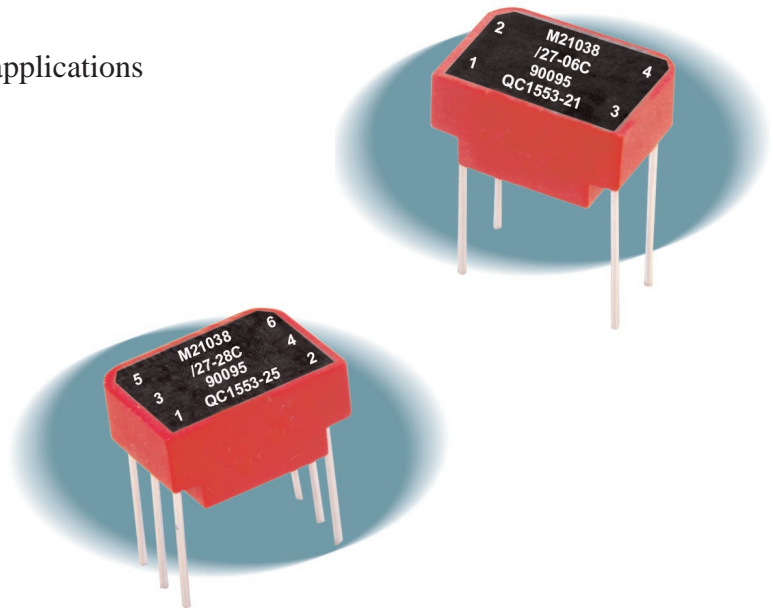


# Single ratio through-the-board QPL pulse transformers

- qualified for use in QPL MIL-STD-1553 applications
- single ratio packages, see schematics
- designed, built, and tested to MIL-PRF-21038 Levels C, M, and T\*
- package C is 4-lead; package D is 6-lead (center tap)
- built in ISO 9002 facility

## APPLICABLE SPECIFICATIONS

- MIL-STD-1553B
- MIL-STD-202
- MIL-T-10727
- MIL-PRF-21038/27\*
- ISO 9002



## SUMMARY PERFORMANCE SPECIFICATIONS

Impedance.....	see table, next page
Droop.....	≤ 20%
Overshoot.....	± 1V max
Common mode rejection (CMR).....	≥ 45 dB
Frequency range (no load).....	75 kHz to 1MHz
Operating temperature range.....	-55°C to 130°C
Weight.....	≤ 5 grams
Insulation resistance (min).....	10K megohms @ 250 Vdc
Dielectric withstanding voltage.....	100 Vrms

*\*MIL-PRF-21038E (8 July 1998) supersedes MIL-T-21038D (11 May 1979) and establishes three product levels for low power pulse transformers:*

- *Level C - for high reliability commercial/industrial applications;*
- *Level M - for general purpose military applications;*
- *Level T - for high reliability critical military applications.*

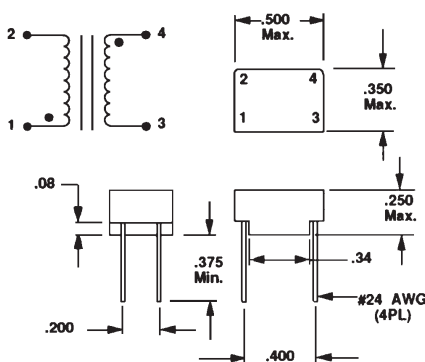
### CHARACTERISTICS

■ single ratio ■ through the board

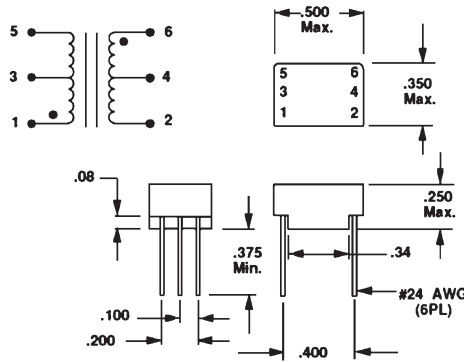
LINE	LEVEL	MILITARY DESIGNATION NUMBER	TECHNITROL PART NO.	PACKAGE	HEIGHT (in.) MAX	TERMINALS	RATIO (±3%)	RDC (ohms) MAX	IMPEDANCE (ohms) MIN
1	C	M21038/27-05C	QC1553-20	C	.250	1-2:4-3	1:1.41	1-2 2.2 4-3 2.7	(4-3) 3,000
2	M	M21038/27-05	Q1553-20						
3	T	M21038/27-05T	QT1553-20						
4	C	M21038/27-06C	QC1553-21	D	.250	1-5:6-2	1CT:1CT	1-5 2.5 6-2 2.8	(6-2) 3,000
5	M	M21038/27-06	Q1553-21						
6	T	M21038/27-06T	QT1553-21						
7	C	M21038/27-07C	QC1553-22	D	.250	1-5:6-2	1CT:1.41CT	1-5 2.2 6-2 2.7	(6-2) 3,000
8	M	M21038/27-07	Q1553-22						
9	T	M21038/27-07T	QT1553-22						
10	C	M21038/27-08C	QC1553-23	D	.250	1-5:6-2	1CT:1.66CT	1-5 1.5 6-2 2.4	(6-2) 3,000
11	M	M21038/27-08	Q1553-23						
12	T	M21038/27-08T	QT1553-23						
13	C	M21038/27-09C	QC1553-24	D	.250	1-5:6-2	1CT:2CT	1-5 1.3 6-2 2.6	(6-2) 3,000
14	M	M21038/27-09	Q1553-24						
15	T	M21038/27-09T	QT1553-24						
16	C	M21038/27-28C	QC1553-25*	D	.250	1-5:6-2	1CT:1.5CT	1-3 0.90 6-2 2.5	(6-2) 3,000
17	M	M21038/27-28	Q1553-25*						
18	T	M21038/27-28T	QT1553-25*						
19	C	M21038/27-29C	QC1553-51*	D	.250	1-5:6-2	1CT:1.79CT	1.5 0.90 6-2 2.5	(6-2) 3,000
20	M	M21038/27-29	Q1553-51*						
21	T	M21038/27-29T	QT1553-51*						
22	C	M21038/27-30C	QC1553-52*	D	.250	1-5:6-2	1CT:2.5CT	1-5 1.0 6-2 2.8	(6-2) 3,000
23	M	M21038/27-30	Q1553-52*						
24	T	M21038/27-30T	QT1553-52*						

\*Designed for transceivers utilizing a single supply voltage (+5V).

### Package C



### Package D



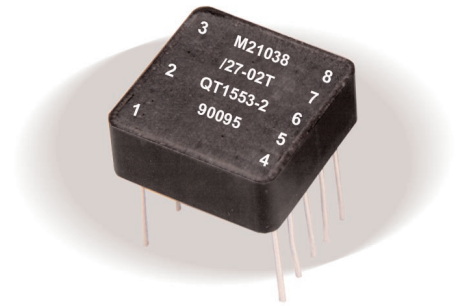
**Notes:**

1. All dimensions are in inches.
2. Tolerances: .xx = +.008
3. All specifications and dimensions are subject to change without notice.

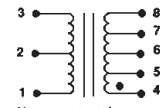


# Dual ratio through-the-board QPL pulse transformers

- qualified for use in QPL MIL-STD-1553 applications
- dual ratio in a single package, see schematic
- designed, built, and tested to MIL-PRF-21038 Levels C, M, and T\*
- two packages available: Package A without standoffs, Package G with standoffs
- built in ISO 9002 facility



## SCHEMATIC AND DIMENSIONS



### APPLICABLE SPECIFICATIONS

- MIL-STD-1553B
- MIL-STD-202
- MIL-T-10727
- MIL-PRF-21038/27\*
- ISO 9002

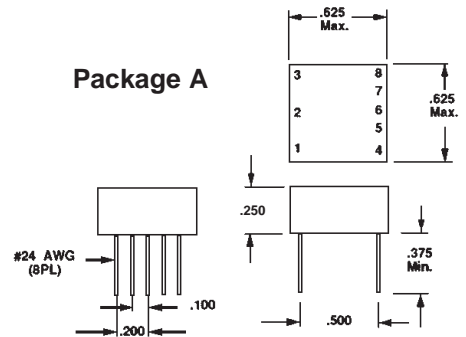
### SUMMARY PERFORMANCE SPECIFICATIONS

Impedance.....	see table, next page
Droop.....	≤ 20%
Overshoot.....	± 1V max
Common mode rejection (CMR).....	≥ 45 dB
Frequency range (no load).....	75 kHz to 1MHz
Operating temperature range.....	-55°C to 130°C
Weight.....	≤ 5 grams
Insulation resistance (min).....	10K megohms @ 250 Vdc
Dielectric withstanding voltage.....	100 Vrms

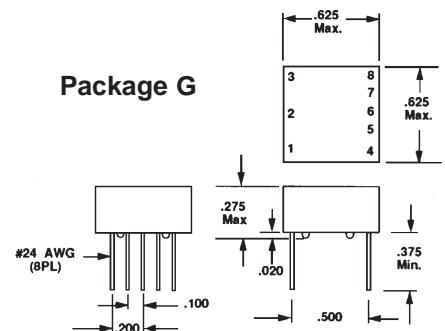
\*MIL-PRF-21038E (8 July 1998) supersedes MIL-T-21038D (11 May 1979) and establishes three product levels for low power pulse transformers:

- Level C - for high reliability commercial/industrial applications;
- Level M - for general purpose military applications;
- Level T - for high reliability critical military applications.

Package A



Package G



#### Notes:

1. All dimensions are in inches.
2. Tolerances: .xx = +.008
3. All specifications and dimensions are subject to change without notice.



## CHARACTERISTICS

■ dual ratio ■ through the board

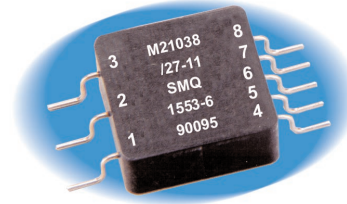
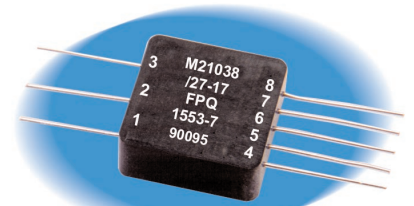
LINE	LEVEL	MILITARY DESIGNATION NUMBER	TECHNITROL PART NO.	PACKAGE	HEIGHT (in.) MAX	TERMINALS	RATIO (±3%)	RDC (ohms) MAX	IMPEDANCE (ohms) MIN
1	C	M21038/27-01C	QC1553-1	A	.250	1-3:4-8 1-3:5-7	1CT:1CT 1CT:707CT	1-3 3.0 4-8 3.0	(1-3) 4000
2	M	M21038/27-01	Q1553-1						
3	T	M21038/27-01T	QT1553-1						
4	C	M21038/27-02C	QC1553-2	A QPL COTS	.250	1-3:4-8 1-3:5-7	1.4CT:1CT 2CT:1CT	1-3 3.5 4-8 3.0	(1-3) 7,200
5	M	M21038/27-02	Q1553-2						
6	T	M21038/27-02T	QT1553-2						
7	C	M21038/27-03C	QC1553-3	A QPL COTS	.250	1-3:4-8 1-3:5-7	1.25CT:1CT 1.66CT:1CT	1-3 3.2 4-8 3.0	(1-3) 4000
8	M	M21038/27-03	Q1553-3						
9	T	M21038/27-03T	QT1553-3						
10	C	M21038/27-10C	QC1553-5*	A	.250	1-3:4-8 1-3:5-7	1CT:2.12CT 1CT:1.5CT	1-3 1.0 4-8 3.5	(4-8) 4,000
11	M	M21038/27-10	Q1553-5*						
12	T	M21038/27-10T	QT1553-5*						
13	C	M21038/27-21C	QC1553-81	G	.275	1-3:4-8 1-3:5-7	1CT:1CT 1CT:707CT	1-3 3.0 4-8 3.0	(1-3) 4,000
14	M	M21038/27-21	Q1553-81						
15	T	M21038/27-21T	QT1553-81						
16	C	M21038/27-22C	QC1553-82	G	.275	1-3:4-8 1-3:5-7	1.4CT:1CT 2CT:1CT	1-3 3.5 4-8 3.0	(1-3) 7,200
17	M	M21038/27-22	Q1553-82						
18	T	M21038/27-22T	QT1553-82						
19	C	M21038/27-23C	QC1553-83	G	.275	1-3:4-8 1-3:5-7	1.25CT:1CT 1.66CT:1CT	1-3 3.2 4-8 3.0	(1-3) 4,000
20	M	M21038/27-23	Q1553-83						
21	T	M21038/27-23T	QT1553-83						
22	C	M21038/27-24C	QC1553-84	G	.275	1-3:4-8 1-3:5-7	1CT:2.12CT 1CT:1.5CT	1-3 1.0 4-8 3.5	(4-8) 4,000
23	M	M21038/27-24	Q1553-84						
24	T	M21038/27-24T	QT1553-84						
25	C	M21038/27-25C	QC1553-85	G	.275	1-3:4-8 1-3:5-7	1CT:2.50CT 1CT:1.79CT	1-3 1.0 4-8 3.5	(4-8) 4,000
26	M	M21038/27-25	Q1553-85						
27	T	M21038/27-25T	QT1553-85						
28	C	M21038/27-26C	QC1553-45*	A QPL COTS	.250	1-3:4-8 1-3:5-7	1CT:2.50CT 1CT:1.79CT	1-3 1.0 4-8 3.5	(4-8) 4,000
29	M	M21038/27-26	Q1553-45*						
30	T	M21038/27-26T	QT1553-45*						

\*Designed for transceivers utilizing a single supply voltage (+5V).



# Dual ratio surface mount QPL pulse transformers

- qualified for use in QPL MIL-STD-1553 applications
- dual ratio in a single package, see schematic
- designed, built, and tested to MIL-PRF-21038 Level C, M, and T\*
- two packages available: Package B has gull-wing leads; Package F is flat pack
- built in ISO 9002 facility



## APPLICABLE SPECIFICATIONS

- MIL-STD-1553B      ■ MIL-T-10727
- MIL-STD-202        ■ ISO 9002
- MIL-PRF-21038/27\*

\*MIL-PRF-21038E (8 July 1998) supersedes MIL-T-21038D (11 May 1979) and establishes three product levels for low power pulse transformers:

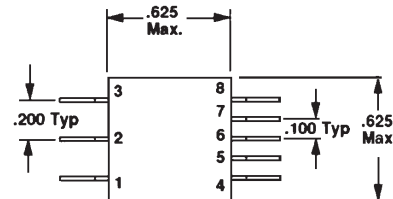
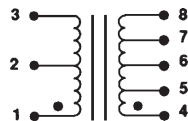
- *Level C - for high reliability commercial/industrial applications;*
- *Level M - for general purpose military applications;*
- *Level T - for high reliability critical military applications.*

## SUMMARY PERFORMANCE SPECIFICATIONS

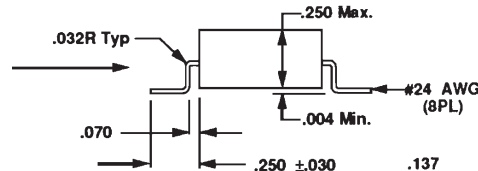
Impedance.....	see table, next page
Droop.....	≤ 20%
Overshoot.....	± 1V max
Common mode rejection (CMR).....	≥ 45 dB
Frequency range (no load).....	75 kHz to 1MHz
Operating temperature range.....	-55°C to 130°C
Weight.....	≤ 5 grams
Insulation resistance (min).....	10K megohms @ 250 Vdc
Dielectric withstanding voltage.....	100 Vrms

## SCHEMATIC AND DIMENSIONS

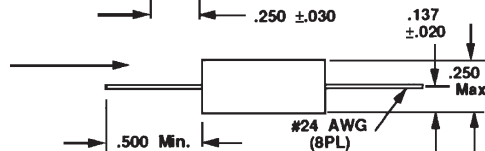
Note: Contact factory for SMQ1553-9 and FPQ1553-9 schematic



**Package "B"**  
(side view)



**Package "F"**  
(side view)







## CHARACTERISTICS

■ dual ratio ■ surface mounting

LINE	LEVEL	MILITARY DESIGNATION NUMBER	TECHNITROL PART NO.	PACKAGE	HEIGHT (in.) MAX	TERMINALS	RATIO (±3%)	RDC (ohms) MAX	IMPEDANCE (ohms) MIN
1	C	M21038/27-11C	SMQC1553-6	B	.250	1-3:4-8	1CT:1CT	1-3 3.0	(1-3)
2	M	M21038/27-11	SMQ1553-6			1-3:5-7	1CT:707CT	1-3 3.0	4,000
3	T	M21038/27-11T	SMQT1553-6						
4	C	M21038/27-12C	SMQC1553-7	B	.250	1-3:4-8	1.4CT:1CT	1-3 3.5	(1-3)
5	M	M21038/27-12	SMQ1553-7			1-3:5-7	2CT:1CT	4-8 3.0	7,200
6	T	M21038/27-12T	SMQT1553-7						
7	C	M21038/27-13C	SMQC1553-8	B	.250	1-3:4-8	1.25CT:1CT	1-3 3.2	(1-3)
8	M	M21038/27-13	SMQ1553-8			1-3:5-7	1.66CT:1CT	4-8 3.0	4,000
9	T	M21038/27-13T	SMQT1553-8						
10	C	M21038/27-15C	SMQC1553-10	B	.250	1-3:4-8	1CT:2.12CT	1-3 1.0	(4-8)
11	M	M21038/27-15	SMQ1553-10			1-3:5-7	1CT:1.5CT	4-8 3.5	4,000
12	T	M21038/27-15T	SMQT1553-10						
13	C	M21038/27-16C	FPQC1553-6	F	.250	1-3:4-8	1CT:1CT	1-3 3.0	(1-3)
14	M	M21038/27-16	FPQ1553-6			1-3:5-7	1CT:707CT	4-8 3.0	4,000
15	T	M21038/27-16T	FPQT1553-6						
16	C	M21038/27-17C	FPQC1553-7	F	.250	1-3:4-8	1.4CT:1CT	1-3 3.5	(1-3)
17	M	M21038/27-17	FPQ1553-7			1-3:5-7	2CT:1CT	4-8 3.0	7,200
18	T	M21038/27-17T	FPQT1553-7						
19	C	M21038/27-18C	FPQC1553-8	F	.250	1-3:4-8	1.25CT:1CT	1-3 3.2	(1-3)
20	M	M21038/27-18	FPQ1553-8			1-3:5-7	1.66CT:1CT	4-8 3.0	4,000
21	T	M21038/27-18T	FPQT1553-8						
22	C	M21038/27-20C	FPQC1553-10	F	.250	1-3:4-8	1CT:2.12CT	1-3 1.0	(4-8)
23	M	M21038/27-20	FPQ1553-10			1-3:5-7	1CT:1.5CT	4-8 3.5	4,000
24	T	M21038/27-20T	FPQT1553-10						
25	C	M21038/27-27C	SMQC1553-45*	B	.250	1-3:4-8	1CT:2.50CT	1-3 1.0	(4-8)
26	M	M21038/27-27	SMQ1553-45*			1-3:5-7	1CT:1.79CT	4-8 3.5	4,000
27	T	M21038/27-27T	SMQT1553-45*						
28	C	M21038/27-31C	FPQC1553-45*	F	.250	1-3:4-8	1CT:2.50CT	1-3 1.0	(4-8)
29	M	M21038/27-31	FPQ1553-45*			1-3:5-7	1CT:1.79CT	4-8 3.5	4,000
30	T	M21038/27-31T	FPQT1553-45*						

\*Designed for transceivers utilizing a single supply voltage (+5V).



## WARRANTY

Pulse Specialty Components warrants for a period of 90 days from the date of shipment, that under normal use and service, its products will be free from defects in workmanship and material. Pulse Specialty Components' sole responsibility under this warranty is, at its option, to repair or replace, without charge, any defective product or part, or to credit buyer for the purchase price of such defective product, provided:

- 1) Buyer promptly notifies Pulse Specialty Components in writing within the warranty period, and
- 2) The defective product or part is returned to Pulse Specialty Components with transportation charges prepaid by Buyer, and
- 3) Pulse Specialty Components examination of such product shall disclose to its satisfaction that said defect exists and has not been caused by misuse, neglect, improper installation, repair or alteration, or accident.

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