



# Application Note



## Product and Quality Assurance Overview for VPT Hybrid DC-DC Converters and Accessory Products

Shawn Graham - COO & Executive Director of Quality

### DESCRIPTION

VPT, Inc., a Heico company, is dedicated to the highest level of quality. With expert, experienced personnel, state-of-the-art technology, and strict quality procedures, VPT produces reliable power supply products for the demanding environments of avionics, military, and space environments.

VPT products are designed and produced at MIL-PRF-38534 certified, MIL-STD-883 lab suitable, and ISO9001 registered sites. VPT's R&D headquarters are in Blacksburg, VA, manufacturing is at Delta Electronics, Inc. in Taoyuan, Taiwan, and sales and marketing facilities are in Bothell, WA.

VPT employs a comprehensive Quality Assurance System to ensure that all products are designed, developed, manufactured, tested, stored, and delivered in compliance with all government and customer specified and contractual requirements. The System includes detailed policies, objectives, plans, and methods to ensure that requirements are effectively implemented and to provide defect-free products through concurrent engineering and process controls.

The VPT Quality Assurance System utilizes a proactive approach to ensure the design quality of products prior to manufacturing. VPT's System manages design and process quality rather than product defects. This is achieved through a complete set of quality procedures, which include process capability, quality management methodology, supplier quality control, component and raw material standardization and minimization, process control and capability studies, and design assurance. The System provides for the early detection of actual and potential deficiencies, system incompatibilities, marginal quality, trends, and any other conditions which could result in reduced performance. Finally, VPT's System enables VPT to provide effective and timely action to correct any such conditions.

VPT's Quality Assurance Manual (QA1-001) and System includes more than 300 specific quality and process procedures. These procedures detail VPT's configuration and documentation/software/record control, responsibilities and authorities, contract review, self auditing, calibration, cleanroom and facility control, ESD control, testing, processes, manufacturing, qualification, training, and all other aspects of each requirement and function performed. When pertaining to quality, every requirement and procedure is documented and every action is recorded. This document highlights a few key aspects of VPT's Quality Assurance System, certifications, and policies. VPT welcomes customer inquiries into any areas not specifically covered in this document. Please contact your sales representative or the VPT Sales Department for more information.

### TOPICS

- Quality Certifications
- DLA Land and Maritime SMDs / Drawings
- Product Part Numbering
- Product Environmental Screening
- Component Element Evaluation
- Specialty Metals
- Counterfeit Electronics Parts Control Program
- Contamination Control, FOE, and FOC Program
- Technology and ITAR Control Program
- Prohibited Materials (Pure Tin, Lead, RoHS, WEEE, REACH, and SVHC)
- Contact Information

## QUALITY CERTIFICATIONS

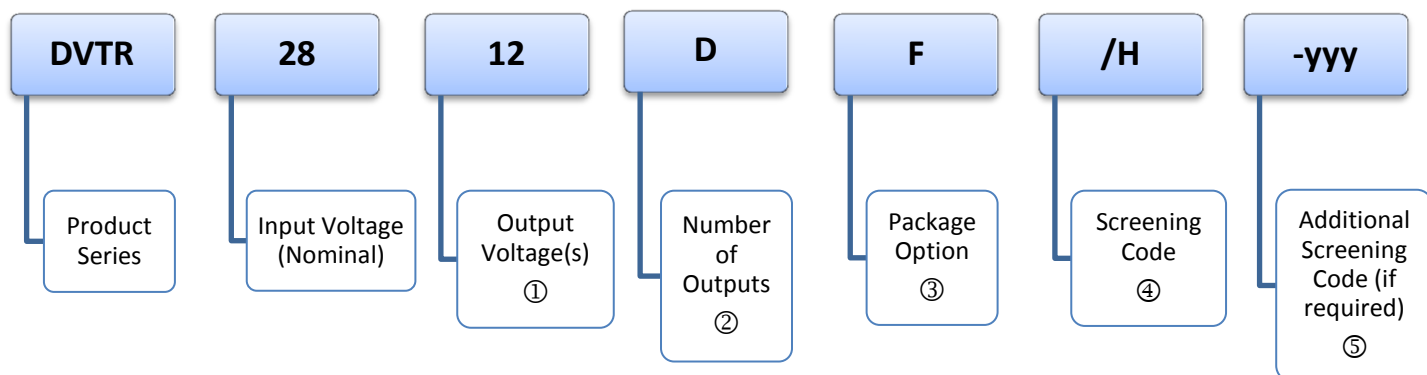
- **MIL-PRF-38534 Certification:** All sites share a joint certification to MIL-PRF-38534 (Hybrid Microcircuits, General Specification for), through the highest certification and reliability level, Class K. All sites are audited by DLA (Defense Logistics Agency) Land and Maritime (formerly DSCC) with active participation by representatives from customers and other government agencies including NASA, The Aerospace Corporation, NAVSEA, and others.
- **MIL-PRF-38534 QML:** VPT is listed on the DLA QML / QPD (Qualified Manufacturer's List / Qualified Products Database), QML-38534 / QPDSIS-38534 for compliance to build and ship products qualified to MIL-PRF-38534 Class K, Class H, and Class E.
- **MIL-STD-883 Lab Suitability:** The dedicated manufacturing facilities at Delta Electronics, Inc. in Taoyuan, Taiwan are audited and certified during the MIL-PRF-38534 certification process for lab suitability to MIL-STD-883 (Test Method Standards for Microcircuits) for a multitude of test methods.
- **MIL-PRF-38534, Appendix G, RHA Certification:** VPT is certified to MIL-PRF-38534, Appendix G, Radiation Hardness Assurance (RHA) for Hybrid Microcircuits and Multichip Modules, based upon VPT's Radiation Hardness Assurance Plans on file with DLA. This certification is based upon review and approval by DLA, Air Force, NASA, Navy and DTRA. VPT's SMD products with RHA codes ("R", "P", etc.) meet all SMD and MIL-PRF-38534 requirements as referenced. Please contact your sales representative or the VPT Inc. Sales Department to request further information about the VPT radiation hardness assurance program and products.
- **ISO9001:2008 Certification:** All sites share a joint quality systems certification and registration to ISO9001:2008 (Quality management systems — Requirements) from Kiwa International Cert GmbH, certificate number H1205007.
- VPT's certificates, listings, certifications, and letters are available through <http://www.vpt-inc.com/>.

## DLA LAND AND MARITIME SMDs / DRAWINGS

- VPT offers DC/DC converter products qualified to MIL-PRF-38534 Class K and Class H on DLA SMDs (Standard Microcircuit Drawings), and EMI Filter products qualified to MIL-PRF-38534 Class K and Class H on DLA Land and Maritime Drawings. All SMD and DLA Land and Maritime drawing products are marked with a "Q" on the cover as specified by the QML certification mark requirement of MIL-PRF-38534.
- VPT SMDs and DLA Land and Maritime Drawings are available through the DLA Land and Maritime website or through <http://www.vpt-inc.com/>.

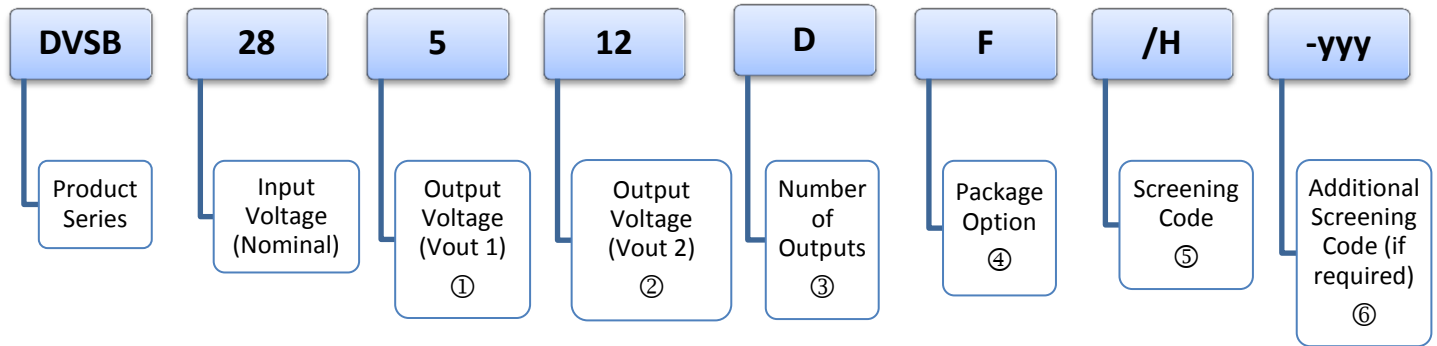
## PRODUCT PART NUMBERING

### Standard “DV” Series DC/DC Converters (Single and $\pm$ Dual Outputs):



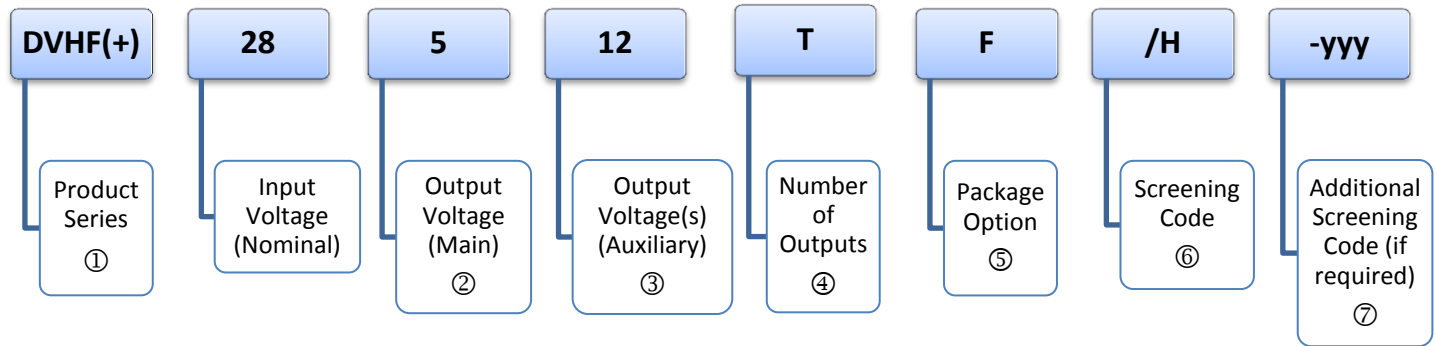
- Notes:
- ① Used for single output; i.e., +12V. Used for  $\pm$  dual outputs; i.e.,  $\pm$ 12V. Outputs with decimal points (3.3V, 5.2V, 9.5V, etc.) are represented by an “R” in the decimal point location; i.e., 3.3 = 3R3, 5.2 = 5R2, 9.5 = 9R5, etc. Output values with single digits use a preceding zero; i.e., 5 = 05. See specific product datasheet for values available.
  - ② S = Single, D = Dual.
  - ③ Leave blank for standard, non-flanged package. F = flanged package. DL = side-leaded package with down-leaded pin extensions. UL = side-leaded package with up-leaded pin extensions.
  - ④ See environmental screening tables herein for options available.
  - ⑤ Contact Sales for customer specific additional screening codes.

## Standard “DV” Series DC/DC Converters (Dual Positive Outputs):



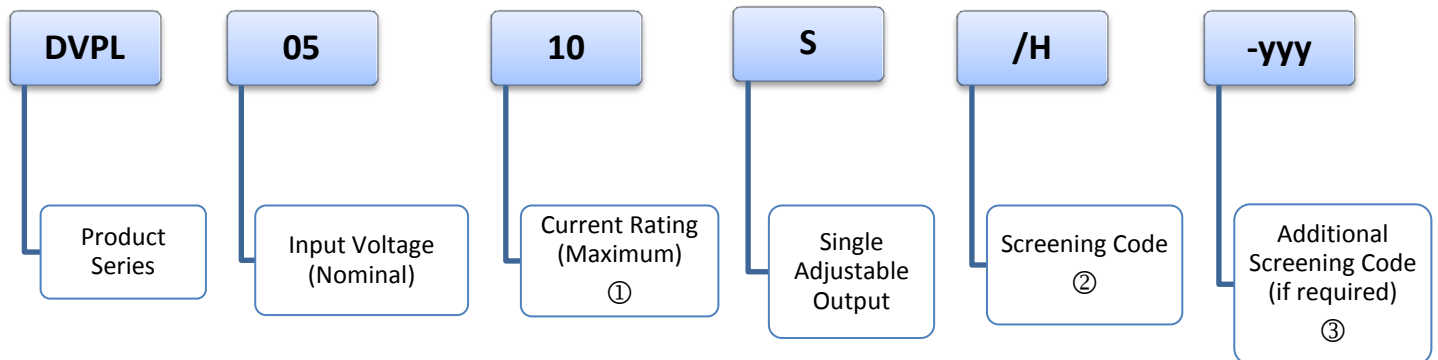
- Notes:
- ① Vout 1 positive output. Outputs with decimal points (3.3V, 5.2V, 9.5V, etc.) are represented by an “R” in the decimal point location; i.e., 3.3 = 3R3, 5.2 = 5R2, 9.5 = 9R5, etc. See specific product datasheet for values available.
  - ② Vout 2 positive output. Outputs with decimal points (3.3V, 5.2V, 9.5V, etc.) are represented by an “R” in the decimal point location; i.e., 3.3 = 3R3, 5.2 = 5R2, 9.5 = 9R5, etc. See specific product datasheet for values available.
  - ③ D = Dual.
  - ④ Leave blank for standard, non-flanged package. F = flanged package.
  - ⑤ See environmental screening tables herein for options available.
  - ⑥ Contact Sales for customer specific additional screening codes.

## Standard “DV” Series DC/DC Converters (Triple Outputs):



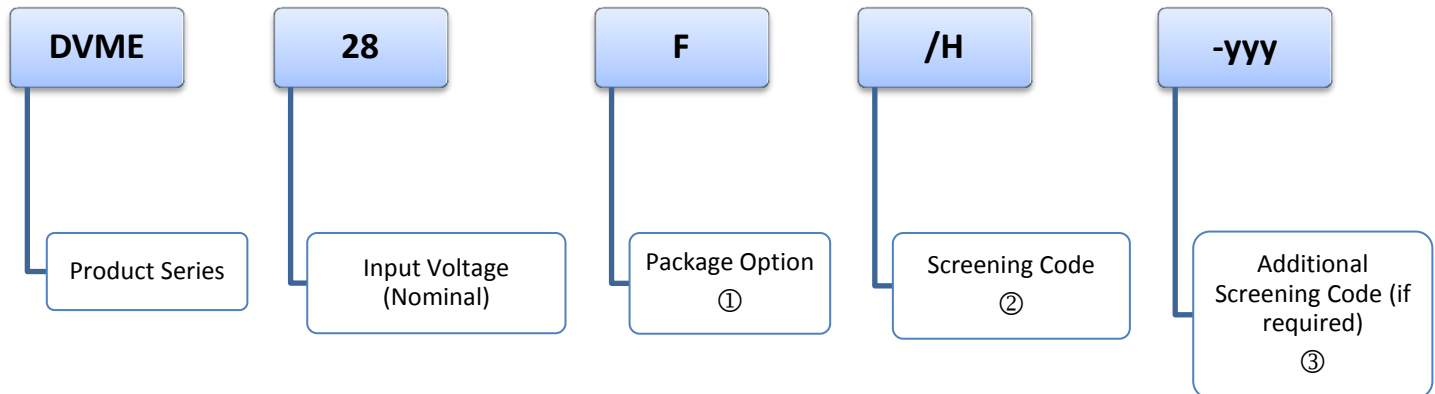
- Notes:
- ① Product series may contain a plus “+” after the product series letters.
  - ② Main positive output. Outputs with decimal points (3.3V, 5.2V, 9.5V, etc.) are represented by an “R” in the decimal point location; i.e., 3.3 = 3R3, 5.2 = 5R2, 9.5 = 9R5, etc. See specific product datasheet for values available.
  - ③ Auxiliary  $\pm$  outputs; i.e.,  $\pm 12V$ . Outputs with decimal points (3.3V, 5.2V, 9.5V, etc.) are represented by an “R” in the decimal point location; i.e., 3.3 = 3R3, 5.2 = 5R2, 9.5 = 9R5, etc. See specific product datasheet for values available.
  - ④ T = Triple.
  - ⑤ Leave blank for standard, non-flanged package. F = flanged package.
  - ⑥ See environmental screening tables herein for options available.
  - ⑦ Contact Sales for customer specific additional screening codes.

## Standard “DV” Series Point-Of-Load DC/DC Converters:



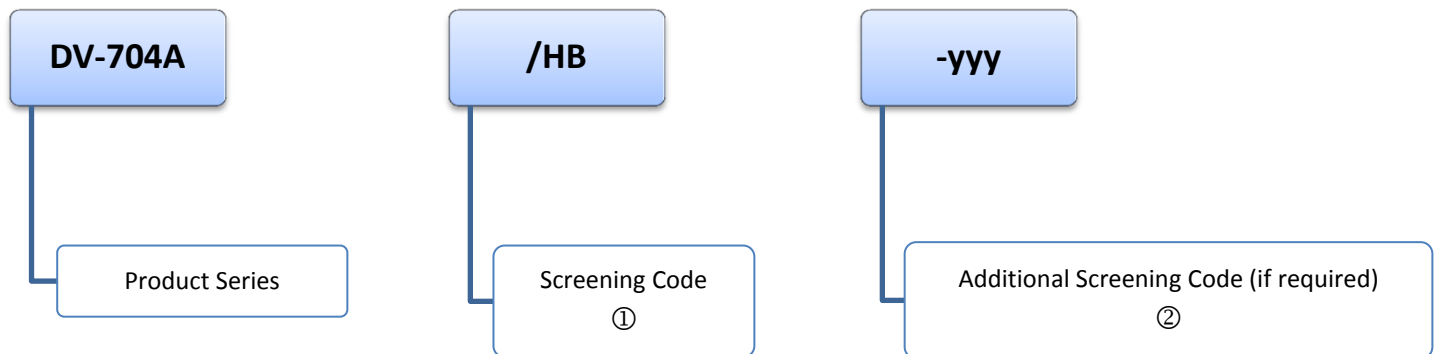
- Notes:
- ① See specific product datasheet for values available.
  - ② See environmental screening tables herein for options available.
  - ③ Contact Sales for customer specific additional screening codes.

## Standard “DV” Series Accessory Products (EMI Filters and Inrush Current Protection Modules):



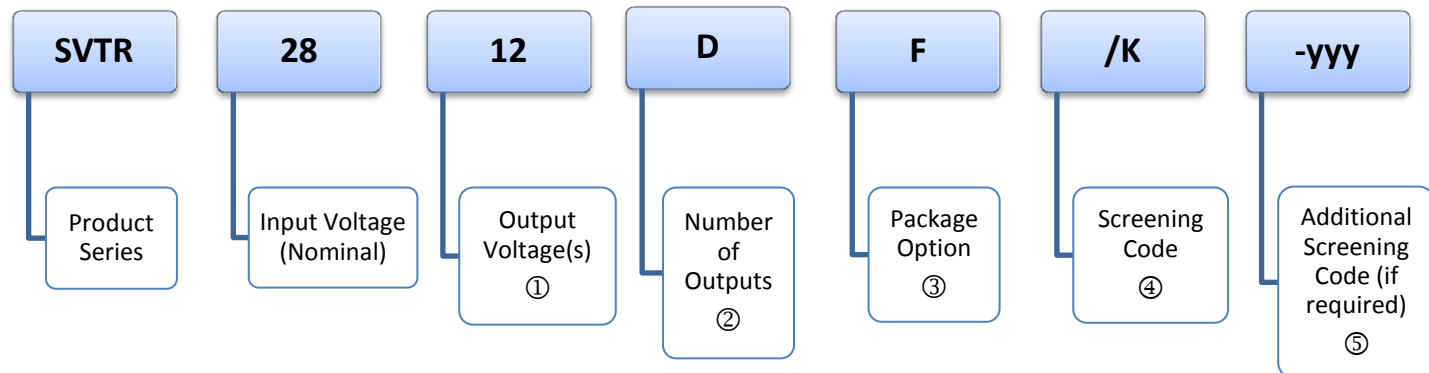
- Notes:
- ① Leave blank for standard, non-flanged package. F = flanged package. DL = side-leaded package with down-leaded pin extensions. UL = side-leaded package with up-leaded pin extensions.
  - ② See environmental screening tables herein for options available.
  - ③ Contact Sales for customer specific additional screening codes.

## Standard “DV” Series Accessory Products (EMI Filter + Voltage Spike Protection Modules):



- Notes:
- ① See environmental screening tables herein for options available.
  - ② Contact Sales for customer specific additional screening codes.

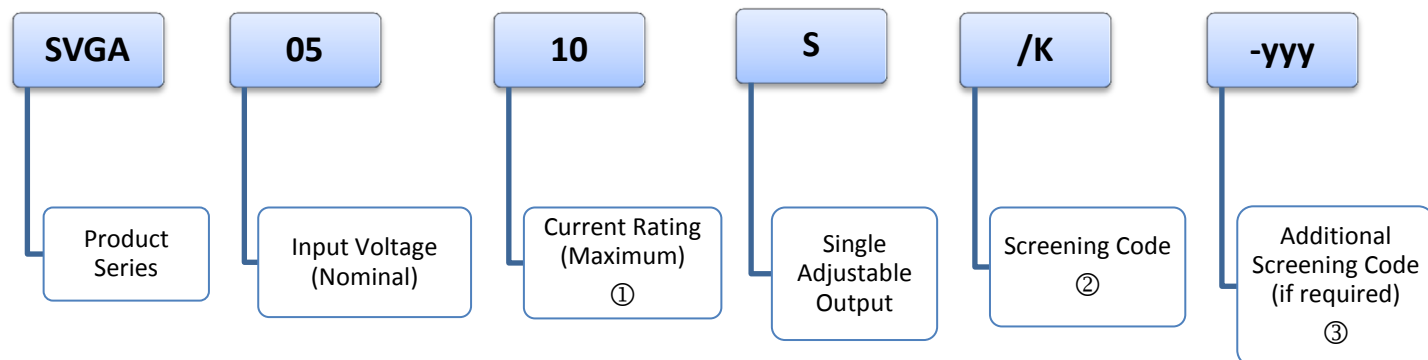
## Standard “SV” Series DC/DC Converters (Single and ± Dual Outputs):



- Notes:
- ① Used for single output; i.e., +12V. Used for ± dual outputs; i.e., ±12V. Outputs with decimal points (3.3V, 5.2V, 9.5V, etc.) are represented by an “R” in the decimal point location; i.e., 3.3 = 3R3, 5.2 = 5R2, 9.5 = 9R5, etc. Output values with single digits use a preceding zero; i.e., 5 = 05. See specific product datasheet for values available.
  - ② S = Single, D = Dual.
  - ③ Leave blank for standard, non-flanged package. F = flanged package.
  - ④ See environmental screening tables herein for options available.
  - ⑤ Contact Sales for customer specific additional screening codes.
  - ⑥ See radiation hardness assurance section herein for options available.



## Standard “SV” Series Point-Of-Load DC/DC Converters:



- Notes:
- ① See specific product datasheet for values available.
  - ② See environmental screening tables herein for options available.
  - ③ Contact Sales for customer specific additional screening codes.
  - ④ See radiation hardness assurance section herein for options available.

## PRODUCT ENVIRONMENTAL SCREENING (100% Tested per MIL-STD-883 referenced to MIL-PRF-38534)

Test	MIL-STD-883 Test Method, Condition	No Suffix (Standard) Non-QML ⑤	/ES (Extended) Non-QML ⑤	/HB (HB) Non-QML ⑤	/HB+ (HB + PIND) Non-QML ⑤	/H (Class H) ⑩	/H+ (Class H + PIND) ⑩	/KB (KB) Non-QML ⑤	/K (Class K) ⑩	/EM (Engineering Model) Non-QML ⑤ ⑥
Non-Destructive Bond Pull ⑨	TM2023	• ④	• ④	• ④	• ④	• ④	• ④	•	•	• ④
Internal Visual	TM2010, TM2017, TM2032 (MIL-STD-750, TM2072, TM2073)	•	•	•	•	•	•	•	•	•
Temperature Cycling	TM1010, Condition C -65°C to 150°C, Ambient			•	•	•	•	•	•	
	TM1010, Condition B -55°C to 125°C, Ambient		•							
Constant Acceleration	TM2001, 3000g, Y1 Direction			•	•	•	•	•	•	
	TM2001, 500g, Y1 Direction		•							
PIND ⑦	TM2020, Condition A				• ④		• ④	•	•	
Pre Burn-In Electrical	25°C							•	•	
Burn-In	TM1015, 320 hrs, 125°C, Case Typ							•	•	
	TM1015, 160 hrs, 125°C, Case Typ			•	•	•	•			
	96 hrs, 125°C, Case Typ		•							
	24 hrs, 125°C, Case Typ	•								•
Final Electrical	MIL-PRF-38534, Group A Subgroups 1-6 -55°C, 25°C, 125°C ③			•	•	•	•	•	•	
	MIL-PRF-38534, Group A Subgroups 1 and 4 25°C	•	•							•
Hermeticity (Seal)	TM1014, Fine Leak, Condition A2		•	•	•	•	•	•	•	
	TM1014, Gross Leak, Condition C		•	•	•	•	•	•	•	
	Gross Leak, Dip (1 x 10 <sup>-3</sup> )	•								•
Radiography ⑧	TM2012							•	•	
External Visual	TM2009	•	•	•	•	•	•	•	•	•

- Notes:
- ① Contact Sales for more information concerning additional environmental screening and testing options desired.
  - ② VPT Inc. reserves the right to ship higher screened or SMD products to meet lower screened orders at our sole discretion unless specifically forbidden by customer contract.
  - ③ 100% R&R testing with all test data included in product shipment.
  - ④ Not required per MIL-PRF-38534. Test is performed for additional product quality assurance.
  - ⑤ Non-QML products may not meet all requirements of MIL-PRF-38534.
  - ⑥ Engineering models utilize only the screening specified and are not considered compliant for flight use.
  - ⑦ PIND test Certificate of Compliance included in product shipment.
  - ⑧ Radiographic test Certificate of Compliance and film(s) or data CD included in product shipment.
  - ⑨ Bond pull is not applicable to EMI filters which contain no wirebonds.
  - ⑩ QML screening levels are not available for products with Up-Leaded or Down-Leaded pin extensions added.

## ACTIVE COMPONENT DICE ELEMENT EVALUATION (as referenced to MIL-PRF-38534)

Test	Specification	-H (Class H) ②			-K (Class K)		
		MC ①	TR ①	DI ①	MC ①	TR ①	DI ①
Element Electrical	Internal	•	•	•	•	•	•
Element Visual	MIL-STD-883	•			•		
	MIL-STD-750		•	•		•	•
Internal Visual	MIL-STD-883	•			•		
	MIL-STD-750		•	•		•	•
Initial Electrical	Internal				•	•	•
Temperature Cycling	MIL-STD-883				•		
	MIL-STD-750					•	•
Constant Acceleration	MIL-STD-883				•		
	MIL-STD-750					•	•
Interim Electrical	Internal				•	•	•
Burn-In	MIL-STD-883				•		
	MIL-STD-750					•	•
Post Burn-In Electrical and Delta Limits	Internal				•	•	•
Steady-State Life	MIL-STD-883				•		
	MIL-STD-750					•	•
Final Electrical and Delta Limits	Internal				•	•	•
Final Electrical	Internal	•	•	•			
Wire Bond Evaluation ④	MIL-STD-883	•	•	•	•	•	•
SEM (Scanning Electron Microscopy)	MIL-STD-883				•		
	MIL-STD-750					•	

- Notes:
- ① MC = Microcircuit / Integrated Circuit. TR = Transistor. DI = Diode.
  - ② -H element evaluated components are used in product environmental screening levels /H+, /H, /HB+, /HB, /ES, Standard, and /EM. See environmental screening tables herein.
  - ③ -T components element evaluated to Aerospace Corporation TOR requirements are used in space level products by contract. -T element evaluated components may not meet all requirements of MIL-PRF-38534. Contact Sales for more information concerning programs requiring -T element evaluation.
  - ④ Wire bond evaluation is not applicable to dice with solderable top surfaces.
  - ⑤ All parts, components, and materials are procured by internal part numbers to revision and configuration controlled SCDs (Source Control Drawings) which define all approved sources of supply and all form, fit, function, material, testing, survivability, and element evaluation requirements. Parts, components, and materials are not procured to manufacturer or distributor part numbers. Verification of all requirements is completed by VPT during incoming inspection.

### PASSIVE COMPONENT CERAMIC CAPACITOR ELEMENT EVALUATION (as referenced to MIL-PRF-38534)

Test	Specification	-H (Class H) ①	-K (Class K)
Element Electrical	Internal	•	•
Visual / Mechanical Inspection	MIL-STD-883	•	•
Temperature Cycling	MIL-STD-883		•
Constant Acceleration	MIL-STD-883		•
Voltage Conditioning	MIL-PRF-123		•
Visual / Mechanical Inspection	MIL-STD-883		•
Element Electrical	Internal	•	•

- Notes:
- ① -H element evaluated components are used in product environmental screening levels /H+, /H, /HB+, /HB, /ES, Standard, and /EM. See environmental screening tables herein.
  - ② -T components element evaluated to Aerospace Corporation TOR requirements are used in space level products by contract. -T element evaluated components may not meet all requirements of MIL-PRF-38534. Contact Sales for more information concerning programs requiring -T element evaluation.
  - ③ All parts, components, and materials are procured by internal part numbers to revision and configuration controlled SCDs (Source Control Drawings) which define all approved sources of supply and all form, fit, function, material, testing, survivability, and element evaluation requirements. Parts, components, and materials are not procured to manufacturer or distributor part numbers. Verification of all requirements is completed by VPT during incoming inspection.

## PASSIVE COMPONENT TANTALUM CAPACITOR ELEMENT EVALUATION (as referenced to MIL-PRF-38534)

Test	Specification	-H (Class H) ①	-K (Class K)
Element Electrical	Internal	•	•
Surge Current ④	MIL-PRF-55365	•	•
Visual / Mechanical Inspection	MIL-STD-883	•	•
Temperature Cycling	MIL-STD-883		•
Constant Acceleration	MIL-STD-883		•
Voltage Conditioning	MIL-PRF-55365		•
Visual / Mechanical Inspection	MIL-STD-883		•
Element Electrical	Internal	•	•

- Notes:
- ① -H element evaluated components are used in product environmental screening levels /H+, /H, /HB+, /HB, /ES, Standard, and /EM. See environmental screening tables herein.
  - ② -T components element evaluated to Aerospace Corporation TOR requirements are used in space level products by contract. -T element evaluated components may not meet all requirements of MIL-PRF-38534. Contact Sales for more information concerning programs requiring -T element evaluation.
  - ③ All parts, components, and materials are procured by internal part numbers to revision and configuration controlled SCDs (Source Control Drawings) which define all approved sources of supply and all form, fit, function, material, testing, survivability, and element evaluation requirements. Parts, components, and materials are not procured to manufacturer or distributor part numbers. Verification of all requirements is completed by VPT during incoming inspection.
  - ④ Not required per MIL-PRF-38534. Test is performed for additional product quality assurance.

## PASSIVE COMPONENT RESISTOR ELEMENT EVALUATION (as referenced to MIL-PRF-38534)

Test	Specification	-H (Class H) ①	-K (Class K)
Element Electrical	Internal	•	•
Visual / Mechanical Inspection	MIL-STD-883	•	•
Temperature Cycling	MIL-STD-883		•
Constant Acceleration	MIL-STD-883		•
Power Conditioning	MIL-PRF-55342		•
Visual / Mechanical Inspection	MIL-STD-883		•
Element Electrical	Internal	•	•
Wire Bond Evaluation ④	MIL-STD-883	•	•

- Notes:
- ① -H element evaluated components are used in product environmental screening levels /H+, /H, /HB+, /HB, /ES, Standard, and /EM. See environmental screening tables herein.
  - ② -T components element evaluated to Aerospace Corporation TOR requirements are used in space level products by contract. -T element evaluated components may not meet all requirements of MIL-PRF-38534. Contact Sales for more information concerning programs requiring -T element evaluation.
  - ③ All parts, components, and materials are procured by internal part numbers to revision and configuration controlled SCDs (Source Control Drawings) which define all approved sources of supply and all form, fit, function, material, testing, survivability, and element evaluation requirements. Parts, components, and materials are not procured to manufacturer or distributor part numbers. Verification of all requirements is completed by VPT during incoming inspection.
  - ④ Wire bond evaluation is not applicable to resistors with solderable terminations.

## PASSIVE COMPONENT MAGNETICS ELEMENT EVALUATION (as referenced to MIL-PRF-38534)

Test	Specification	-H (Class H) ①	-K (Class K)
Element Electrical	Internal	•	•
Visual / Mechanical Inspection	MIL-STD-883	•	•
Temperature Cycling	MIL-STD-883		•
Constant Acceleration	MIL-STD-883		•
Visual / Mechanical Inspection	MIL-STD-883		•
Element Electrical	Internal	•	•

- Notes:
- ① -H element evaluated components are used in product environmental screening levels /H+, /H, /HB+, /HB, /ES, Standard, and /EM. See environmental screening tables herein.
  - ② -T components element evaluated to Aerospace Corporation TOR requirements are used in space level products by contract. -T element evaluated components may not meet all requirements of MIL-PRF-38534. Contact Sales for more information concerning programs requiring -T element evaluation.
  - ③ All parts, components, and materials are procured by internal part numbers to revision and configuration controlled SCDs (Source Control Drawings) which define all approved sources of supply and all form, fit, function, material, testing, survivability, and element evaluation requirements. Parts, components, and materials are not procured to manufacturer or distributor part numbers. Verification of all requirements is completed by VPT during incoming inspection.
  - ④ Magnetics utilized in VPT hybrid products are classified as open construction per MIL-PRF-27.



## **SPECIALTY METALS**

VPT hybrid products comply with FARS 252.225-7014, Preference for Domestic Specialty Metals, Alternate I (Deviation) clause which exempts “Commercially Available Electronic Components With De Minimis Specialty Metal Content”.

## **COUNTERFEIT ELECTRONIC PARTS CONTROL PROGRAM**

VPT implements an extensive counterfeit electronics parts control procedure, QC1-016, which documents and describes the methods used to identify and control counterfeit electronic parts in order prevent them from entering VPT inventory and VPT products. This program is modeled after the requirements of SAE AS5553. Please contact your sales representative or the VPT Inc. Sales Department to request further information about the VPT counterfeit electronics parts control program.

## **CONTAMINATION CONTROL, FOE, AND FOC PROGRAM**

VPT implements, controls, and assures cleanliness and performs contamination and FOC (Foreign Object Control) and FOE (Foreign Object Elimination) in accordance with qualified processes as listed in procedures GNL-003 and QA2-001. Please contact your sales representative or the VPT Inc. Sales Department to request further information about the VPT contamination control, FOE, and FOC program.

## **TECHNOLOGY AND ITAR CONTROL PROGRAM**

VPT’s technology and ITAR (International Traffic in Arms Regulations) control program, ITR-001, delineates the policies and internal controls of VPT to ensure that no transfer of defense-related technology or assistance subject to control under U.S. export control laws and regulations takes place beyond what is authorized and approved by the U.S. Government. VPT is committed to compliance with all aspects of U.S. laws and regulations governing the export of ITAR-controlled Defense Articles, Defense Services and Technical Data. Please contact your sales representative or the VPT Inc. Sales Department to request further information about the VPT technology and ITAR control program.

## PROHIBITED MATERIALS (PURE TIN, LEAD, RoHS, WEEE, REACH, and SVHC)

- **Prohibited Material Restrictions:** MIL-PRF-38534 prohibits the use of pure tin finishes (less than 3% alloy material) on internal elements and as a final finish and undercoat on the external surfaces of MIL-PRF-38534 QML qualified hybrids. Most readily available and qualified solderable non-pure tin finishes use percentages of lead in the mixture as the alloy material. The majority of space, military, and high-reliability users of VPT products support the position of using lead bearing solderable finishes because of the risk of tin whisker formation caused by pure tin coatings, as outlined in numerous papers published by NASA, The Aerospace Corporation, Boeing, University Researchers, and other experts. This position is, however, in direct conflict with the initiatives set forth by Japan and the European Union directives; Article 95 of the EC Treaty - RoHS (Restriction of Hazardous Substances), and Article 175 of the EC Treaty - WEEE (Waste Electrical and Electronic Equipment). These initiatives restrict the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB's), polybrominated diphenyl ethers (PBDE's), zinc, selenium, beryllium oxide, and alloys of zinc, cadmium and mercury.
- **Pure Tin Finishes:** VPT does not use pure tin finishes internally or externally on our hybrid products and certifies these products to be pure tin free. VPT verifies prohibited pure tin compliance by component and material lot sample testing for each manufacturer lot of components and materials that use solderable or silver colored finishes.
- **Lead:** To comply with the restriction of pure tin, VPT uses solders and solderable finishes on components internally to hybrid products which contain small percentages of lead. VPT does not use lead bearing solders and solderable finishes externally on hybrid products unless a customer specifically requests solder dipped leads.
- **RoHs and WEEE:** VPT does not use components, materials, or finishes which contain mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB's), polybrominated diphenyl ethers (PBDE's), zinc, selenium, beryllium oxide, or alloys of zinc, cadmium and mercury in or on any hybrid products.
- **REACH and SVHC:** VPT has completed a thorough review of all components and materials used in the construction of hybrid products. VPT has received REACH Certificates of Conformance from all component and material manufacturers willing and able to provide such documentation. Investigation into the components and materials has yielded no traces of the Substances of Very High Concern (SVHC's) listed in Article 57 of European Community Regulation 1907/2006. This investigation includes all 84 substances added to the SVHC list as of June 18th, 2012. VPT is unaware of any potential source for the introduction of SVHC's into VPT products from the manufacturing or packaging processes utilized, or from the packaging materials themselves. VPT does not specifically analyze our products for the presence of these substances; therefore cannot guarantee the level of these substances to any specific threshold or value. This information is provided in good faith and believed to be accurate based on the current composition and information provided by our vendors. No warranty is expressed or implied. Liability is expressly disclaimed.



### CONTACT INFORMATION

For further information about any of VPT's products, policies, or programs contained herein, or to request a quotation or place orders please contact your sales representative or the VPT Inc. Sales Department at:

**Phone:** (425) 353-3010

**Fax:** (425) 353-4030

**E-mail:** [vptsales@vpt-inc.com](mailto:vptsales@vpt-inc.com)

**Website:** [www.vpt-inc.com](http://www.vpt-inc.com)

**Sales & Marketing Headquarters:**

19909 120th Avenue NE

Suite 102

Bothell, WA 98011

**Company Headquarters:**

2801 Commerce Street

Blacksburg, VA 24060

All information contained in this document is believed to be accurate, however, no responsibility is assumed for possible errors or omissions. The products or specifications contained herein are subject to change without notice.