



+



Vishay Intertechnology, Inc.

Avionics, Military, and Space (AMS)



One of the World's Largest Manufacturers of
Discrete Semiconductors and Passive Components





Avionics, Military, and Space (AMS)

AMS

Airborne Systems	2
Satellite / GPS	3
Flight Control Computers	4
Cockpit Panels	5
Braking Systems	6
UAVs (Unmanned Aerial Vehicles) / Drones	7

More information on the Engineer's Toolbox, including product datasheet links, can be found at www.vishay.com/ref/et3.

For inquiries, please contact your local sales representative.

Key components for AMS (AVIONICS, MILITARY, AND SPACE)



THE VISHAY ADVANTAGE

- High Reliability
- MIL-PRF Qualifications
- CECC Approvals
- S-Level Failure Rates
- Hermetic Sealing
- and more...

**Airborne
Systems**



Satellite / GPS



**Flight Control
Computers**



**Cockpit
Panels**



**Braking
Systems**




**UAVs (Unmanned
Aerial Vehicles) /
Drones**



Airborne Systems




RESISTORS
Lead (Pb)-Bearing MINI-MELF Resistors with Established Reliability
[MS1...EN803E8](#)
 • Failure rate level 8, high stability over life time, proven reliability
 • TCR and tolerance of 15 ppm/K and 0.1 % available, ohmic range from 1 Ω to 2.21 MΩ




MOSFETs
N-Channel 60 V (D-S) Power MOSFET
[IRFZ44](#)
 • Rugged planar technology, maximum $R_{DS(on)}$ 28 mΩ
 • Popular TO-220 packaging, maximum continuous current of 50 A




INDUCTORS
Custom Magnetics
 • High-reliability custom designs for all types of AMS applications
 • Many magnetic materials available with outstanding engineering design support




RESISTORS
Metal Film Resistors, Military / Established Reliability, MIL-PRF-55182 Qualified
[RNC](#)
 • Very low noise (-40 dB)
 • ERC (RNC) series has an operating temperature range of -65 °C to +175 °C




RESISTORS
Precision Rotative Transducers, Conductive Plastic, Servo Mounting
[ROT SF](#)
 • 8 diameters from 19 mm to 76 mm, redundant signals, tight linearity down to ± 0.015 %
 • Excellent repeatability, life span up to 50M cycles, low current consumption



CERAMIC CAPACITORS
MIL-PRF-55681-Qualified Facility, Reliability Testing Done on Maintenance Basis
[MLCC Hi-Rel](#)
 • Multiple screening options (group A, group C, voltage conditioning) available
 • Customized certification available on request to meet your quality requirements



RESISTORS
Metal Film Resistors, Established Reliability, Hermetically Sealed, MIL-PRF-55182 Qualified
[RNR / RNN](#)
 • Hermetic glass enclosure is impervious to harmful environments
 • The glass enclosure will withstand in excess of 3000 psi external pressure




TANTALUM CAPACITORS
Solid Tantalum Chip Capacitors, TANTAMOUNT®, Hi-Rel COTS, Ultra-Low ESR
[T97](#)
 • High capacitance, high-voltage tantalum capacitors with low ESR and low ESL
 • Hi-rel screening in accordance with MIL-PRF-55365



RESISTORS
Thick Film Resistor Networks, Military, MIL-PRF-83401 Qualified
[MSM](#)
 • Isolated, bussed, and dual-terminator schematics available
 • Rugged molded case construction




CERAMIC CAPACITORS
MIL-PRF-55681-Qualified Facility, BP, BR, and BX Dielectrics
[DSCC](#)
 • Multiple screening options (group A, group C, voltage conditioning) available
 • Lead (Pb)-free termination code “M”, tin / lead termination code “Z”



RESISTORS
Thick Film Chip Resistors, Military / Established Reliability, MIL-PRF-55342 Qualified
[RCWPM](#)
 • Construction is impervious to a high-sulfur environment
 • Also qualified to Mil-PRF-32159 zero ohm jumper



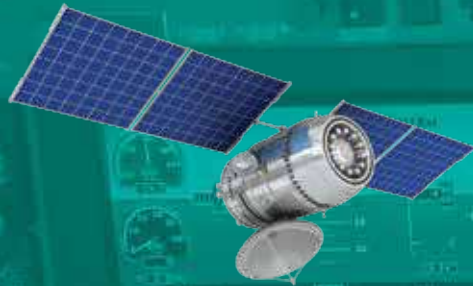
TANTALUM CAPACITORS
SuperTan® Wet Tantalum Capacitors with Hermetic Seal
[STE / T16](#)
 • Extended capacitance, 6 V_{DC} to 125 V_{DC}, -55 °C to +125 °C operation
 • Axial leaded, industry-standard case sizes (T1, T2, T3, T4)



View datasheets for these products
www.vishay.com/ref/et3as1a



Satellite / GPS



RESISTORS

Hi-Rel Thin Film Chip Resistors



[TNPS...ESCC](#)

- ESA approved according to ESCC 4001/029, high-reliability product
- Advanced thin film technology, SnPb plating with Pb content > 6 %

MOSFETs

N-Channel 80 V (D-S) MOSFET



[SiR880DP](#)

- Medium-voltage ThunderFET® technology, maximum $R_{DS(on)}$ down to 5.9 mΩ
- Thermally enhanced PowerPAK® SO-8 packaging

RESISTORS

ESCC 4001/023 Qualified, High-Precision Thin Film Chip Resistors




[PHR](#)

- ESA qualified, failure rate E7, down to 0.01 % tolerance and 5 ppm/°C (-55 °C to +155 °C)
- Process QML certified, screening tests: 100 % overload, 100 % burn In

RESISTORS

Metal Film Resistors, Military / Established Reliability, MIL-PRF-39017 Qualified, Type RLR




[RLR](#)

- Epoxy-coated construction provides superior moisture protection
- Very low noise (-40 dB)

DIODES

Small-Signal Zener Diodes




[1N5235B](#)

- Standard Zener voltage tolerance is ± 5 %
- AEC-Q101 qualified

INDUCTORS

Low-Profile, High-Current IHLP® Inductors



[IHLP-2525CZ](#)

- Compact, high-current power inductor for DC/DC conversion, filter applications
- High-frequency operation up to 5 MHz, high-temperature and gold terminations available

CERAMIC CAPACITORS

Body Sizes: 0402 to 3838, Excellent Power Handling Capabilities



[MLCC RF Capacitors](#)

- Non-magnetic available with copper or epoxy bondable termination
- Lead-bearing termination available for high-reliability applications

RESISTORS

QPL MIL-PRF-55342-Qualified Thin Film Resistor, Surface-Mount Chip




[M55342](#)

- Case sizes 0201 to 2512 with reliability level T (space level) available
- Both short-side and long-side terminations available

TANTALUM CAPACITORS

Solid Tantalum Surface-Mount Capacitors, TANTAMOUNT®, Military MIL-PRF-55365/4 Qualified

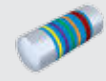


[CWR06](#)

- MIL-PRF-55365 established reliability failure rate style
- High capacitance, conformal coated, 8 case sizes

MELF RESISTORS

MELF Resistors with Established Reliability




[MM...VG03](#)

- Approved to EN 140401-803, version E, single lot date code
- Established reliability, failure rate level E6, advanced thin film technology

RESISTORS

Wirewound Resistor, Military / Established Reliability, MIL-PRF-39007 Qualified Type RWR



[RWR](#)

- High energy pulse capability, all welded construction, “S” failure rate
- Non-inductive Ayrton-Perry winding available, high-temp. silicone coating

RESISTORS

Thick Film Resistor Networks, Military, MIL-PRF-83401 Qualified, Type RZ030, Flat Pack



[DFM](#)

- 0.065 in (1.65 mm) height for high-density packaging

View datasheets for these products www.vishay.com/ref/et3as1b

Flight Control Computers



RESISTORS

CECC High-Precision Wraparound Thin Film Chip Resistors



[RV \(0503 to 1206\) / P \(0302 to 2512\)](#)

- Low TCR down to 5 ppm/°C (-55 °C to +155 °C), tight tol. down to 0.01 %
- Sulfur resistant, failure rate E7 level, from 10 Ω up to 200 MΩ

DISPLAYS

High-Quality Displays Offer Excellent Human-to-Machine Interface Solutions



[LCD, Color TFT, OLED](#)

- Standard and custom display / modules for flight control and monitoring
- High-brightness options for LCD, OLED, and color TFT

NON-LINEAR RESISTORS

NTC Thermistors, SMD 0603 Chip



[NTHS0603N03N1001JE](#)

- Standard series
- Glass protected

INDUCTORS

Custom Magnetics



- Custom designed to customer requirements, focus on reliability and performance
- Internal test lab can perform almost any electrical and environment test

RECTIFIERS

Surface-Mount Schottky Barrier Rectifier

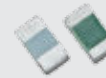


[SS32HE3](#)

- Low-profile package ideal for automated assembly process
- Low power losses, high efficiency

RESISTORS

QPL MIL-PRF-55342-Qualified Thin Film Resistor, Surface-Mount Chip



[M55342](#)

- Case sizes 0201 to 2512 with reliability level T (space level) available
- Tantalum nitride and nichrome resistive film available

INDUCTORS

MIL-PRF-15305 Qualified, Type LT, Molded Axial Leaded Inductors



[MS7508x](#)

- Axial inductors for RF filter applications

NON-LINEAR RESISTORS

SMD PTC – Nickel Thin Film Linear Thermistors



[TFPT](#)

- Standard R_{25} tolerances of $\pm 0.5 \%$, $\pm 1 \%$ available
- cUL-recognized component: file E148885

DIODES

6-Line ESD Protection Diode Array in LLP75



[VESD05A6A-HAF](#)

- 6-line ESD protection
- Low load capacitance $C_D = 40 \text{ pF}$

INDUCTORS

Inductors, Military, MIL-PRF-15305 Qualified, Type LT, Molded, Shielded, Miniature, Axial Leaded



[MS21426](#)

- Axial inductors for RF filter applications

TANTALUM CAPACITORS

SuperTan® Wet Tantalum Capacitors with Hermetic Seal



[ST / STE](#)

- Extended capacitance, $6 V_{DC}$ to $125 V_{DC}$, -55 °C to $+125 \text{ °C}$ operation
- Axial leaded, industry-standard case sizes (T1, T2, T3, T4)

TANTALUM CAPACITORS

Solid Tantalum Chip Capacitors, TANTAMOUNT®, Hi-Rel COTS, Ultra-Low ESR



[T97](#)

- High-capacitance, high-voltage tantalum capacitors with low ESR and low ESL
- Hi-rel screening in accordance with MIL-PRF-55365

View datasheets for these products
www.vishay.com/ref/et3as1c




Cockpit Panels



MOSFETs

N-Channel 100 V (D-S) MOSFET




[SiS892ADN](#)

- Medium-voltage ThunderFET® technology, maximum $R_{DS(on)}$ down to 33 mΩ
- Thermally enhanced PowerPAK® 1212-8 is 1/3 the size of an SO-8

DISPLAYS

High-Quality Displays Offer Excellent Human-to-Machine Interface Solutions



[LCD, Color TFT, OLED](#)

- Standard and custom display / modules for flight control and monitoring
- High-frequency operation up to 5 MHz, high temperature available

RESISTORS

Leaded Metal Film Resistors with Established Reliability




[MB / SMA VG06](#)

- IECQ-CECC approved to EN 140101-806, version E, est. reliability, level E7
- Advanced thin film technology, fused pure tin (Sn) plating on copper (Cu) wire, single lot date code

RESISTORS

Power Metal Strip® Resistors, Low Value (Down to 0.0005 Ω), Surface-Mount




[WSL2512](#)

- Extremely low resistance values from 0.0005 Ω to 0.5 Ω and tolerance of 1 %
- High power of 1 W in 2512 size resistor

RESISTORS

Long-Life Cermet Potentiometer



[P11L](#)

- Long life of 2M cycles, 12.5 mm square single-turn panel control, versatile options
- Compliant to RoHS, tested according to CECC, value added and customs available

RESISTORS

QPL MIL-PRF-55342-Qualified Thin Film Resistor, Surface-Mount Chip




[M55342](#)

- Case sizes 0201 to 2512 with reliability level T (space level) available
- Tantalum nitride and nichrome resistive film available

CERAMIC CAPACITORS

MIL-PRF-55681-Qualified Facility, BP, BR, and BX dielectrics




[DSCC](#)

- Multiple screening options (group A, group C, voltage conditioning) available
- Lead (Pb)-free termination code “M”, tin / lead termination code “Z”

INDUCTORS

Low-Profile, High-Current IHLP® Inductors




[IHLP-6767GZ](#)

- Very high current SMD inductor for DC/DC conversion and filtering
- High-frequency operation up to 5 MHz, high temperature available

RECTIFIERS

High-Performance Schottky Rectifier, 8 A



[8TQ100SPBF](#)

- 175 °C T_j operation
- AEC-Q101 qualified and halogen-free

MOSFETs

N-Channel 400 V (D-S) Power MOSFET



[IRF740AS](#)

- Rugged planar technology, maximum $R_{DS(on)}$ 550 mΩ
- Popular D²PAK packaging, maximum continuous current of 10 A

TANTALUM CAPACITORS

Solid Tantalum Chip Capacitors, MICROTAN®, High Reliability, Low DC Leakage



[TM8](#)

- Hi-rel devices with maximum capacitance in case sizes as small as 0402
- Hi-rel screening in accordance with MIL-PRF-55365

MELF RESISTORS

Hi-Rel Thin Film MINI-MELF Resistors











[MS1...ESCC](#)

- ESA approved to ESCC 4001/022, high-reliability product
- Advanced thin film technology, SnPb plating with Pb content > 6 %

View datasheets for these products www.vishay.com/ref/et3as1d

Braking Systems



<p>RESISTORS</p> <p>High-Stability, High-Temperature 230 °C Thin Film Wraparound Chip Resistors </p> <p>PHT</p> <ul style="list-style-type: none"> • Operating temp. up to 215 °C, low TCR down to 15 ppm/°C (-55 °C to +215 °C) • Sulfur resistant, from 10 Ω up to 7.5 MΩ, tight tolerance down to 0.05 % 	<p>INDUCTORS</p> <p>Inductors, Military, MIL-PRF-15305 Qualified, Type LT, Molded, Shielded, Miniature, Axial Leaded </p> <p>MS21426</p> <ul style="list-style-type: none"> • Axial inductors for RF filter applications 	<p>CERAMIC CAPACITORS</p> <p>MIL-PRF-55681-Qualified Facility, Cage Code SHV71BP, BR and BX Dielectrics </p> <p>CDR</p> <ul style="list-style-type: none"> • Tin / lead termination codes “Z” and “U” • Lead (Pb)-free termination codes “W,” “Y,” and “M”
<p>INDUCTORS</p> <p>MIL-PRF-15305 Qualified, Type LT, Molded Axial Leaded Inductors </p> <p>MS7508x</p> <ul style="list-style-type: none"> • Axial inductors for RF filter applications 	<p>RESISTORS</p> <p>Thick Film Resistor Networks, Military, MIL-PRF-83401 Qualified, Type RZ030, Flat Pack </p> <p>DFM</p> <ul style="list-style-type: none"> • 0.065 in (1.65 mm) height for high-density packaging 	<p>INDUCTORS</p> <p>Custom Magnetics </p> <ul style="list-style-type: none"> • Custom designed to customer requirements, focus on reliability and performance • Internal test lab can perform almost any electrical and environment test
<p>TANTALUM CAPACITORS</p> <p>Wet Tantalum Capacitors, Tantalum Case with Glass-to-Tantalum Hermetic Seal </p> <p>135D</p> <ul style="list-style-type: none"> • High capacitance, 6 V to 125 V, -55 °C to +200 °C operation, high vibration • Axial leaded, industry-standard case sizes (T1, T2, T3, T4) 	<p>TANTALUM CAPACITORS</p> <p>SuperTan® Wet Tantalum Capacitors with Hermetic Seal </p> <p>ST / STE</p> <ul style="list-style-type: none"> • Extended capacitance, 6 V_{DC} to 125 V_{DC}, -55 °C to +125 °C operation • Axial leaded, industry-standard case sizes (T1, T2, T3, T4) 	<p>RESISTORS</p> <p>Wirewound Resistors, Military / Established Reliability MIL-PRF-39009 Qualified, Type RER, R Level </p> <p>RER</p> <ul style="list-style-type: none"> • Heat sink / chassis mount, rated power up to 30 W, all welded construction • Aluminum housing, molded construction for total environmental protection

View datasheets for these products
www.vishay.com/ref/et3as1e

UAVs (Unmanned Aerial Vehicles) / Drones

TRANSDUCERS

Precision Rotative Transducers, Conductive Plastic, Servo Mounting

[ROT SF](#)

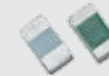


- 8 diameters from 19 mm to 76 mm, redundant signals, tight linearity down to $\pm 0.015\%$
- Excellent repeatability, lifespan up to 50M cycles, low current consumption

RESISTORS

QPL MIL-PRF-55342-Qualified Thin Film Resistor, Surface-Mount Chip

[M55342](#)



- Case sizes 0201 to 2512 with reliability level T (space level) available
- Tantalum nitride and nichrome resistive film available

DISPLAYS

High-Quality Displays Offer Excellent Human-to-Machine Interface Solutions

[LCD, Color TFT, OLED](#)



- Standard and custom display / modules for flight control and monitoring
- High-brightness options for LCD, OLED, and color TFT

TANTALUM CAPACITORS

SuperTan® Wet Tantalum Capacitors with Hermetic Seal

[ST / STE](#)



- Extended capacitance, $6 V_{DC}$ to $125 V_{DC}$, $-55\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$ operaton
- Axial leaded, industry standard case sizes (T1, T2, T3, T4)

MOSFETs

N-Channel 35 V (D-S) MOSFET

[2N6659, 2N6659-2](#)



- Military qualified, low on-resistance: $1.3\ \Omega$, low input and output leakage
- Low threshold: 1.7 V, low input capacitance: 35 pF, fast switching speed: 8 ns

CERAMIC CAPACITORS

MIL-PRF-55681-Qualified Facility BP, BR and BX Dielectrics

[DSCC](#)



- Multiple screening options (group A, group C, voltage conditioning) available
- Lead (Pb)-free termination code "M", tin / lead termination code "Z"

MELF RESISTORS

Hi-Rel Thin Film MINI-MELF Resistors

[MS1...ESCC](#)



- ESA approved to ESCC 4001/022, high-reliability product
- Advanced thin film technology, SnPb plating with Pb content $> 6\%$

TANTALUM CAPACITORS

Solid Tantalum Chip Capacitors, TANTAMOUNT®, Hi-Rel COTS, Ultra-Low ESR

[T97](#)

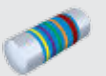


- High-capacitance, high-voltage tantalum capacitors with low ESR and low ESL
- Hi-rel screening in accordance with MIL-PRF-55365

MELF RESISTORS

MELF Resistors with Established Reliability

[MM...VG03](#)



- Approved to EN 140401-803, version E, single lot date code
- Established reliability, failure rate level E6, advanced thin film technology





+



ABOUT TTI, INC.

TTI Inc., a subsidiary of Berkshire Hathaway, is a world leading specialist distributor of connectors and passive, electromechanical and discrete components. TTI's philosophy is "Lead by Design", and the company differentiates itself by focusing on people, parts and processes. The company's aim is to become the distributor of choice for customers and suppliers in Europe alike by introducing new product technologies and by stocking broad and deep across its franchise base. TTI employs sophisticated inventory management processes which ensure that the company can react immediately to changes in component demand due to fluctuating markets and supply chains. For further information about TTI, please refer to: www.ttieurope.com.



**A WORLD OF
SOLUTIONS**

TTI, INC.

Ganghoferstr. 34
82216 Maisach-Gernlinden
Germany
Tel.: +49 (0)8142 6680 – 0
Fax: +49 (0)8142 6680 – 490
Email: sales@de.ttiinc.com
www.ttieurope.com