Welcome to the new Passives Quarterly Newsletter which covers Q2 of 2013. Included in this newsletter are brief items on recent product releases, divisional news, new and updated literature, and other highlights of the past 90 days. Please remember that we encourage your feedback or suggestions on any additional pieces of information or improvements that we could consider for inclusion.

Paul Harrison

Product News

Capacitors

Aluminum

Electronic Design Top 101 Components
Vishay Intertechnology has a total of 6 products on this year’s Top 101 Components list from Electronic Design, including:

#8 - IWAS-3827EC-50
#21 - VCNL3020
#40 - SMA6F TVS
#73 - P16S (potentiometer)
#74 - 193 PUR-SI Solar (capacitors)
#82 - VLMU3100 (UV LED)

The complete list is available on the magazine’s website here: http://electronicdesign.com/components/top-101-components-2013

Ceramic – Single-Layer

Datasheets Updated for all Draloric and Cera-Mite AC and DC Disc Caps
The layout of the original datasheets has been reworked and remaining errors have been corrected. A link section to the related documents has been implemented. Additionally the safety agency approval certifications for the AC rated safety capacitors have been uploaded and are linked in the corresponding datasheets as well.

Datasheets updated for automotive A…V and K…V series
Due to the new RoHS Directive 2011/65/EU eliminating the 7(c)-III exemption as of Jan. 1 2013, the classification/declaration concerning the RoHS status of Vishay components has changed and has been updated in the datasheets of the automotive leaded MLCCs of the A…V and K…V series.

Datasheets updated for RF power capacitors
The datasheets for the RF power capacitors have been reworked to update the layout and correct errors.

Ceramic – MLCCs

New QUAD Hi FREQ Series of MLCC for High Frequency Applications
For high-frequency RF applications in telecommunications, medical, military, and industrial equipment and instrumentation, Vishay’s new QUAD HIFREQ surface-mount MLCCs combine ultra-high Q > 2000, ultra-low ESR down to 0.01 Ω, and voltage ratings to 1500 V in quad 0505 and 1111 case sizes.

Product Benefits:
- Optimized for high-frequency RF applications
- Broad working voltages from 200 V to 1500 V
- Wide capacitance ranges from 1.0 pF to 1000 pF
- Tight tolerances to ± 0.1 pF
- Excellent aging rate of 0 % per decade
- Operating temperature range of -55 °C to +125 °C
Vishay MarCom / July 2013

Available with RoHS-compliant nickel barrier terminations and with a lead-bearing termination finish
Halogen-free and conform to Vishay “Green” standards

Market Applications
- High-frequency RF applications in telecommunications, medical, military, and industrial equipment and instrumentation
- Filter and impedance matching networks, timing circuits, mixers, and oscillators

Data Sheet Link
http://www.vishay.com/doc?45221

Enhanced VJ X8R Series Surface-Mount MLCCs
Vishay has extended its VJ X8R series of surface-mount MLCCs with a new 0402 case size for board space savings, and higher 100 V ratings in the 0603 and 0805 case sizes.

Product Benefits:
- X8R dielectric
- High operating temperature to +150 °C
- Available with a conductive epoxy assembly termination (termination code “E”) for hybrid applications
- Wide capacitance range of 470 pF to 390 nF
- Temperature coefficient of capacitance (TCC) of ± 15 % over the temperature range of -55 °C to +150 °C

Market Applications:
- Sensors, power supplies, and signal converters in oil exploration, drilling monitoring, and industrial equipment

Datasheet link:
http://www.vishay.com/doc?45006 (VJ X8R)

Enhanced VJ Automotive Series Surface-Mount MLCCs
Vishay has extended its VJ automotive series of surface-mount MLCCs featuring an X8R dielectric with a new 0402 case size for board space savings, and higher 100 V ratings in the 0603 and 0805 case sizes for increased reliability.

Product Benefits:
- Two termination options
- 100 % tin plate matte finish (VJ….31)
- Conductive epoxy assembly termination (VJ….34) for hybrid applications
- Qualified according to AEC-Q200
- PPAP available on request
- Wide capacitance range of 330 pF to 27 nF
- Temperature coefficient of capacitance (TCC) of ± 15 % over the temperature range of
- -55 °C to +150 °C

Market Applications:
- High-temperature automotive applications, including sensors, engine/ignition control, boardnet management, power steering and active safety controls, and control for doors, windows, and air conditioning

Datasheet link:
http://www.vishay.com/doc?45040 (VJ….31/VJ….34 Automotive MLCC)
Surface Mount (SMD) Multilayer Ceramic Chip Capacitors (MLCC) - Datasheet Updates

Due to the new RoHS Directive 2011/65/EU eliminating the 7(c)-III exemption as of Jan. 1 2013, the classification/declaration concerning the RoHS status of Vishay components has changed and has been updated in the MLCC datasheets listed on this page: http://www.vishay.com/capacitors/ceramic/ceramic-multilayer-smd/.

Film

New MKP386M Metallized Polypropylene Film Snubber Capacitor

Configurable for direct mounting on IGBT modules, the Vishay Roederstein MKP386M high-performance metallized polypropylene film snubber capacitor features a wide capacitance range from 0.047 µF up to 10 µF, high-temperature operation to + 105 ºC, and voltage ratings to 2500 VDC.

Product Benefits:

- Configurable for direct mounting on IGBT modules
- Wide capacitance range from 0.047 µF up to 10 µF
- High-temperature operation to + 105 ºC
- Seven DC voltage ratings:
  - 700 VDC to 2500 VDC
- High pulse strength to 2500 V/µs
- Peak current capabilities to 1850 A
- Long life of > 300,000 hours
- Low ESR down to 1.5 mΩ
- Capacitance tolerance down to ± 5 %
- Low self inductance of 0.7 nH per mm of lead spacing
- High RMS current up to 20 A
- Lead (Pb)-free, RoHS compliant, and halogen free

Market Applications:

- Power converters, frequency converters, and motor drives in wind inverters, mid- and high-power solar inverters, and automotive drive trains

Datasheet link:
http://www.vishay.com/doc?28170 (MKP386M)

New Series of X1 EMI Suppression Film Capacitors With High Voltage Ratings of 480 VAC and 330 VAC for Across-the-Line Applications in Automotive, Industrial, and Renewable Energy Systems

Offering a series construction, the F339X1 480 V capacitor is also designed for a high grade of capacitance stability, ensuring its suitability for continuous operation in across-the-line applications and for series impedance in capacitive power supplies. With its mono construction, the F339X1 330 V device is optimized for withstanding the short pulse loads of uncontrolled mains switching, in standard X1 across-the-line applications.

Product Benefits:

- 7.5 mm to 27.5 mm lead pitch for 330 VAC device, 10 mm to 27.5 mm for 480 VAC device
- Supplied loose in box or taped on reel
- Capacitance range of 0.001 µF to 2.2 µF for 330 VAC device, to 1.2 µF for 480 VAC (preferred values according to E6)
- Standard capacitance tolerance of ± 10 % or ± 20 % with ± 5 % available on request

Market Applications:

- Standard across-the-line X1 applications
Polypropylene Film Capacitor MKP1848S Honored With China Electronic Market Editors’ Choice Awards
Vishay’s Si7655DN - 20 V p-channel power MOSFET and MKP1848S high-performance metallized DC polypropylene film capacitor have received China Electronic Market (CEM) magazine 2012 Editors’ Choice Awards in the categories of “The Most Competitive Power Devices Product in China” and “The Most Competitive Capacitor Product in China,” respectively.

Winners of the CEM 2012 Editors’ Choice Awards were chosen based on their sales performance in the Chinese market and technological innovation. Vishay’s Si7655DN and MKP1848S were selected because of their demonstrated success in the power devices and capacitor categories.

For more information please see: http://www.vishay.com/company/press/releases/2013/130321CEMaward/

Tantalum
Enhanced T16 Series of Wet Tantalum Capacitors
For avionics and aerospace applications, Vishay’s T16 series of tantalum-cased wet tantalum capacitors with glass-to-tantalum hermetic seals is now available in the A, B, C, and D case codes with improved vibration (sine: 50 g; random: 27.7 g) capability.

Product Benefits:
- Reverse voltage of 1.5 V at +85 °C
- Thermal shock of 300 cycles
- High capacitance from 10 μF to 680 μF
- Capacitance tolerance of ± 10 % and ± 20 % standard at 120 Hz and +25 °C
- Low ESR down to 0.70 Ω at 120 Hz and +25 °C
- Standard tin / lead terminations, with RoHS-compliant 100 % tin terminations available

Market Applications:
- Timing, filtering, energy hold-up, and pulse power applications in power supplies for space and avionics equipment

Datasheet link:
http://www.vishay.com/doc?40139 (T16)

New CWR26 TANTAMOUNT® Solid Tantalum Chip Capacitor
Vishay’s new CWR26 TANTAMOUNT® solid tantalum chip capacitor for military avionics and aerospace applications is qualified to MIL-PRF-55365/13 and offers exceptionally low ESR down to 0.180 Ω at 100 kHz.

Product Benefits:
- Offered with Weibull level B, C, and T failure rates
- Capacitance range of 10 μF to 100 μF over voltage ratings from 15 VDC to 35 VDC
- Capacitance tolerance of ± 5 %, ± 10 %, and ± 20 %
- Available in three case sizes
- High operating temperature to +125 °C with voltage derating
- Offered in tape-and-reel packaging per EIA 481
- Available with gold plate, solder plated, solder fused, and hot solder dipped terminations
Market Applications:
- Military, avionics, and aerospace applications

Datasheet link:
http://www.vishay.com/doc?40163  (CWR26)

New 13008 Series of TANTAMOUNT® Solid Tantalum Chip Capacitors
Vishay has extended its TANTAMOUNT® 597D series of commercial solid tantalum chip capacitors with a new Hi-Rel version approved to Defense Logistics Agency (DLA) Specification 13008 for +28 V power supplies in military and aerospace applications.

Product Benefits:
- High-reliability screening and surge current testing options in accordance with MIL-PRF-55365
- Available in nine case sizes
- Capacitance range of 10 μF to 1500 μF over a voltage range from 4 V to 63 V
- 63 V rating allows designers to meet derating requirements of 50 % rated voltage for use in MIL-STD-1275 +28 V power supply designs
- Low ESR down to 0.015 Ω at +25 °C and 100 kHz
- Conformal coating for better volumetric efficiency than molded devices

Market Applications:
- DC/DC conversion and power distribution in weapons and radar systems, avionics, and space-based electronics

Datasheet link:
http://www.vishay.com/doc?40164  (13008)

Tantalum Capacitors Division Earns ISO 13485:2003 Certification for Dimona, Israel Plant
Vishay's Tantalum Capacitors Division has earned the International Organization for Standardization (ISO) 13485:2003 certification for its Dimona, Israel plant. Vishay's ISO 13485:2003 registration audit was conducted by the Standards Institution of Israel (SII), and the site was certified for the design and manufacture of tantalum capacitors for the medical market.

ISO 13485:2003 certification specifies processes for an organization's quality management system to demonstrate its ability to provide medical devices and related services that consistently meet regulatory and customer requirements pertaining to medical device application standards.

At Vishay's Dimona plant, the company manufactures tantalum capacitors for implantable life support equipment, such as pacemakers and ICDs, as well as neurostimulation devices. By producing these components to the stringent requirements set by ISO 13485:2003, the company continues to demonstrate its commitment to the medical industry.
Inductors

Vishay Dale

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The complete list is available on the magazine’s website here:
http://electronicdesign.com/components/top-101-components-2013

New IHTH-0750IZ-5A and IHTH-1125KZ-5A High-Current, High-Temperature Through-Hole Inductors

For automotive applications, Vishay’s new IHTH-0750IZ-5A and IHTH-1125KZ-5A high-current, high-temperature through-hole inductors in the 0750 and 1125 case sizes feature high operating temperatures to +155 °C and high rated currents to 125 A.

Product Benefits:

- AEC-Q200 qualified
- Wide range of inductance values from 0.47 µH to 100 µH
- Frequency range up to 10 MHz for some values
- Handle high transient current spikes without hard saturation
- Halogen-free and conform to Vishay “Green” standards

Market Applications:

- Voltage regulator modules (VRM) and DC/DC converters in high-temperature automotive applications, including engine and transmission control units, diesel injection drivers, LED drivers, HID lighting, and noise suppression for motors in windshield wipers, power seats and mirrors, and heating and ventilation blowers

Datasheet link:

http://www.vishay.com/doc?34348 (IHTH-0750IZ-5A)
http://www.vishay.com/doc?34349 (IHTH-1125KZ-5A)

Vishay Dale Inductors Division Receives Recognition of Excellence from Lockheed Martin Aeronautics Company for Second Consecutive Year

The Vishay Dale Inductors Division has received a Recognition of Excellence from Lockheed Martin Aeronautics, one of the world’s largest manufacturers of military and commercial aircraft. The award recognizes the success of the Inductors Division of Vishay Intertechnology in delivering product to Lockheed Martin 100 % on time and with perfect quality for all of 2012. For more information please see:
Resistors
Vishay Dale

WANTED POSTERS

Vishay Dale Resistor Division will continue issuing monthly “WANTED” posters based on the playing card marketing campaign. These posters will contain the focus product(s) for the month and will contain the playing card, applications (Common Hideouts) they can be found in, competitors (Aliases) with similar product, and contact information. Along with the poster, there will be several training slides for the product – these can be used for training in the field or QBRs. Detailed information will be released via Fast Facts.

For Q3 2013 – the three posters will be for WSLP High-Power SMD Current Sense Resistors (King of Spades); PLT and P- Precision Low TCR Thin Film Chip Resistors (9 of Diamonds) and Commercial Wirewound Resistors (5 of Diamonds).

If there are any questions, please contact james.ryba@vishay.com

New WSL1020 Power Metal Strip® Resistor

Vishay’s new WSL1020 surface-mount Power Metal Strip® resistor combines a high 2 W power rating with extremely low resistance values down to 0.003 Ω in the compact 1020 case size.

Product Benefits:

- Wide side terminal construction
- Tight tolerances to 0.5 %
- High-temperature capability to + 170 °C
- Features an all-welded construction
- Very low inductance of 0.5 nH to 5 nH
- Excellent response to 50 MHz
- Low thermal EMF (< 3 μV/°C)
- RoHS compliant
- Conforms to Vishay “Green” standards

Market Applications:

- Current sensing and pulse applications, including switching and linear power supplies, instruments, power amplifiers, and shunts
- Automotive electronic controls such as engine, brushless DC motors, anti-lock brakes, climate, and battery management controls
- Industrial controls, including down-hole test/measurement equipment for oil/gas well drilling
Inverter controls for HVAC systems
DC/DC converters for servers, VRMs for laptops, and Li-Ion battery safety and management

Datasheet link: http://www.vishay.com/doc?30183 (WSL1020)

**New WSBM8518 Power Metal Strip® Battery Shunt Resistor**
Vishay's new WSBM8518 Power Metal Strip® battery shunt resistor features a molded enclosure to simplify PCB connection, high 36 W power capability, and low resistance of 100 µΩ in the 8518 package size.

**Product Benefits:**
- Molded enclosure with a 4-pin connector
  - Provides easy PCB connection to the shunt resistor assembly
  - Simplifies designs to reduce overall solution costs
- High 36 W power capability
- 8518 package size
- Extremely low resistance of 100 µΩ
- Tolerance of 5.0%
- Features an all-welded construction that allows operation with continuous currents as high as 600 A
- Low inductance values of < 5 nH
- Low thermal EMF of < 3 µV/°C
- Lead (Pb)-free and RoHS compliant

**Market Applications:**
- Battery shunt applications for gas, diesel, hybrid, and electric cars and trucks, as well as electric forklifts, utility trucks, and other heavy industrial applications

Datasheet link: http://www.vishay.com/doc?31094

**RD - Roundwire Resistors**
Vishay Milwaukee RD Roundwire style resistors offer a versatile range of resistance and power ratings to meet the needs of many applications.

**Product Benefits:**
- High power rating
  - 8 W to 1150 W
- Wider resistance ranges
  - 0.012 Ω to 227 kΩ
- Drop in replacement for competitors product
- Highly Customizable to any application
  - Available individually, mounted on brackets, wired and/or in enclosures with adjustable or fixed resistance ranges.

**Market Applications**
- Motor control test systems, rail car HVAC, medical imaging, dynamic braking, fan speed control, harmonic filtering,

**Perspective**
High power Roundwire resistors are constructed by winding a resistance wire alloy over a ceramic tube core and held in place by a vitreous enamel or silicone coating.

**Availability**
*Sample quantities are available now, with a lead time of one to two weeks.*
Production quantities of resistors are available now, with a lead time of five weeks. Rush services available.

To access the product datasheets on the Vishay Web site, go to
www.vishay.com/doc?31829 (Fixed RD)
www.vishay.com/doc?31830 (Adjustable RD)

Global contact information
Milwaukee Resistor
Zak Paulus
Email: zak.paulus@vishay.com
Phone: +1 414-434-1716

G, GN – Miniature Precision Axial Leaded Wirewound

The G, GN series are miniature precision wirewound resistors that come in power ratings from 1 W to 10 W. The all welded wirewound construction allows the G, GN to perform in high-voltage, high-power, and high-pulse applications while requiring less space than conventional precision resistors. The silicone coated construction provides complete environmental protection that allows these resistors to excel in both low- and high-temperature environments. As an optional construction, the products are available in the GN non-inductive version. The G, GN resistors can also be customized to meet specific application needs, including special testing, or many other custom options. The G, GN series are available in either RoHS-compliant lead (Pb)-free or Pb-bearing versions.

Product Benefits
- From 1.4 to 4 times higher power ratings than conventional resistors of equivalent size
- High-temperature silicone coated construction for total environmental protection.
- Completely welded construction.
- Available in non-inductive styles (type GN) with Aryton-Perry winding for lowest reactive components
- Meets applicable requirements of MIL-PRF-26
- Excellent stability in operation (< 1 % change in resistance)

To learn more about G, GN, please visit http://www.vishay.com/docs/30205/30205.pdf

End-Of-Life for FP-Glass Series

Final countdown is fast approaching on the last time buy for the FP-Glass products.
- Reference PCN-DR-001-2013 Rev 0
- Conversion to the CMF..146 (for FPs) or CMF..147 (for FP..P’s) are hopefully progressing
- Production is quite busy, but if there are still orders to be submitted, please insure those get entered ASAP

Legacy Product Review:
- PTF: High-Precision, High-Stability Metal Film Resistors
  - Three sizes (PTF51; ..56; ..65) of axial leaded product
  - Tolerances to ± 0.01 %
  - TC of R to 5 ppm/°C
  - For SMD alternative, see PSF series (www.vishay.com/doc?30162)

Vishay Dale Thin Film

New E/H (Ta2N) Series of QPL MIL-PRF-55342-Qualified Thin Film SMD Chip Resistors With “R” Level Failure Rate

For military and aerospace applications, Vishay’s new E/H (Ta2N) series of QPL MIL-PRF-55342-qualified surface-mount chip resistors offers an established reliability “R” failure rate of 0.01% per 1000 hours, in addition to tolerances to ± 0.1 % and a TCR of ± 25 ppm/°C.
Product Benefits:
- Built on a moisture resistant tantalum nitride resistive film technology
- Moisture resistance level exceeds MIL-PRF-55342 limits by a factor of 50
- Very low noise of less than –25 dB
- Low voltage coefficient of 0.5 ppm/V
- All sputtered wraparound terminations for excellent adhesion and dimensional uniformity
- Wraparound resistance of less than 0.010 Ω typical
- Offered in 12 case sizes
- Power ratings from 50 mW to 1000 mW
- Working voltages from 30 V to 200 V
- Resistance ranges from 49.9 Ω to 3.3 MΩ, depending on tolerance

Market Applications:
- Control systems for military and aerospace applications

Datasheet link:
http://www.vishay.com/doc?60120 (E/H Ta2N)

E/H Series of MIL-PRF-55342-Qualified Thin Film SMD Resistor Chips With “S” Level Failure Rate
For high-reliability military and aerospace applications with stringent performance requirements, Vishay’s E/H series of MIL-PRF-55342-qualified thin film surface-mount resistor chips now offers an “S” level failure rate of 0.001 % per 1,000 hours in 12 case sizes.

Product Benefits:
- Qualified to TCR characteristics E, H, K, and M
- All-sputtered wraparound terminations ensure excellent adhesion and dimensional uniformity
- Electroplated nickel barrier layer for operating conditions to +150 ºC
- Features a TAMELOX resistive element
- High-purity alumina substrate allows for high power ratings to 1000 mW
- Very low noise of less than – 25 dB
- Low voltage coefficient of < 0.1 ppm/V
- Absolute TCR down to ± 25 ppm/°C
- Laser-trimmed tolerances down to 0.1 %
- Resistance range from 10 Ω to 6.19 MΩ, depending on case size and TCR characteristics
- Provides a shelf-life stability of ± 0.01 %

Market Applications:
- High-reliability military and aerospace applications

Datasheet link:
Vishay Draloric/Beyschlag

**New HCTF Series of Thermal Fuses**

For high-current automotive applications, Vishay’s HCTF series of thermal fuses is the industry’s first to offer high current capabilities up to 55 A and operation at temperatures to +160 °C for 1,000 hours without unexpected breakdown.

**Product Benefits:**
- AEC-Q200 tested
- Functioning temperature of + 235 °C (± 15 K)
- Robust, solid-state design
- Low cold resistance of ≤ 0.1 mΩ
- RoHS compliant
- Rated voltage of 24 V
- Assembly options:
  - Crimping units (HCTF 235 and HCTF 235 CP)
  - Electric resistance welding (HCTF 235)
  - Insertion into clamp terminations (HCTF 235 CP)

**Market Applications:**
- Safety interrupt of electrical power in high-current automotive applications
- Automotive power electronics that are connected to steady battery power (B+ or terminal number 30), such as control units of fans and pumps for liquid engine cooling, inlet air control units, diesel pre-heaters, engine control units, ABS control units, and diesel heater plugs

**Datasheet link:**

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**Enhanced ACAS 0606 AT and ACAS 0612 AT Precision Thin Film Chip Resistor Arrays**

Now available with S, T, and U accuracy grades, Vishay's ACAS 0606 AT and ACAS 0612 AT precision thin film chip resistor arrays for automotive and industrial applications have been enhanced with tighter absolute tolerance of ± 0.1 %, relative tolerance of ± 0.05 %, and relative TCR down to ± 5 ppm/K.

**Product Benefits:**
- Absolute TCR down to ± 10 ppm/K
- Equal or different resistor values from 47 Ω to 150 kΩ
- Maximum resistance ratio of 1:20
- High-temperature operation to +155 °C
- Superior moisture resistivity of |ΔR/RI| < 0.5 % at +85 °C and 85 % relative humidity for 1,000 hours
- 1,000 V ESD capability
- Maximum rated dissipation to 0.125 W per element
- Qualified according to AEC-Q200

**Market Applications:**
- Precision analog circuits, voltage dividers, and feedback circuit applications
- Automotive electronics, including engine control units, gear box controls, safety, power supply electronics, body electronics, braking systems, climate control, steering technology, and lighting
- Industrial electronics, such as energy management, measurement control, sensors, scales, and precision amplifiers

**Datasheet link:**
New VACR Series of Compact Aluminum-Housed Resistors

Vishay's new VACR series of compact aluminum-housed resistors features power ratings up to 500 W and protection of IP20 or IP65 for high-power, heavy-duty applications.

Product Benefits:
- High overload capacity
- Multiple construction and heatsink mounting is possible for higher power ratings
- IP20 or IP65 protection
- Standard tolerance of ± 10 %
- Maximum permissible voltage: UL 600 V or UL 1000 V or EN 1000 V DC
- Completely housed construction
- Enhanced humidity protection
- Compact enclosures
- Low weight up to 1.1 kg

Market Applications:
- Braking, chopper, pre-discharging, and voltage-limiting resistors in industrial, motor drive, railway, renewable energy, and other high-power systems

Datasheet link:
http://www.vishay.com/doc?21035 (VACR)

New Axial Cemented Wirewound Safety Resistor With Surge Withstanding Capability of 2 kV and Fusing Time of < 30 s for 45 W Overload

Vishay introduces a new axial cemented wirewound safety resistor specially designed to ensure safe and silent fusing operation during overload conditions in electric appliances, energy meters, and power supplies. Featuring a fusing time of < 30 s for a 45 W overload and high surge voltage capability, the new AC03..CS offers a special cement coating for immediate interruption without flame and explosion when mains voltage (220 Vrms) is applied.

- Fuses “without a bang” in electric appliances
- During normal operation, acts as in-rush current limiting resistor
- Allows designers to meet the requirements for UL approval easier
- Eliminates the need to utilize additional fuses in series with the input resistor

Product Benefits:
- Power rating:
  - 3 W at 40 ºC
  - 2.5 W at 70 ºC
- Resistance from 10 Ω to 100 Ω
- Resistance tolerance of ± 5 %
- Temperature coefficient (TCR) of ± 200 ppm/K

Market Applications:
Electric appliances, energy meters, power supplies and white goods like washing machines.

Datasheet link:
http://www.vishay.com/docs/28861/ac03cs.pdf
Vishay MarCom / July 2013

Vishay Sfernice

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The complete list is available on the magazine's website here: http://electronicdesign.com/components/top-101-components-2013

Vishay Intertechnology Announces Acquisition of MCB Industrie S.A., a Specialty Resistor Company
Vishay announced the acquisition of MCB Industrie S.A., a manufacturer of specialty resistors for professional market segments. MCB Industrie S.A. resistors are used as motion sensors in avionics, military, and space applications and as power resistors in traction, energy distribution, and various other industrial applications.

LPS 1100 Thick Film Power Resistor Honored With 2013 EE Times and EDN ACE Award
The Vishay Sfernice LPS 1100 thick film power resistor has received a UBM Tech 2013 EE Times and EDN Annual Creativity in Electronics (ACE) Award (http://ubm-ace.com/winners.php) in the Ultimate Products of the Year: Passives, Interconnects, and Electromechanical category.

The ACE award in the Ultimate Products of the Year: Passives, Interconnects, and Electromechanical category was presented by Paul Miller, CEO, UBM Tech, and accepted on behalf of Vishay by Dean Rambo, Vishay Sfernice/Spectrol regional marketing manager, Americas. In introducing the award category, Patrick Mannion, brand director for EDN, Test & Measurement World, and Planet Analog, said of the LPS 1100, “Tonight’s winner puts the spotlight on materials science and its application in electronic engineering. It’s the first in its field that combines both performance and ease of use for the most powerful new applications.”

The LPS 1100 is the industry’s first resistor in the compact 57 mm by 60 mm package to offer a power rating of 1100 W at a heat sink temperature of +25 °C. The LPS 1100 offers high-temperature derating performance and a broad range of resistance values from 1 ohm to 1.3 kilohms. Designed for easy mounting to a heat sink, the device’s compact footprint, low 25 mm profile, and low weight of 79 grams save valuable space to help designers reduce the size of their end products.

With its high power capabilities and high dielectric strength to 12 kv RMS, the LPS 1100 is intended for power supply, inverter, converter, HEV-EV battery management, and snubber, chopper, pre-charge, discharge, and filtering resistor applications. Typical end products include windmill turbines, X-ray and oncology tables, trains, HVDC equipment, and large UPS drives. Link to product datasheet: http://www.vishay.com/doc?50059

PRAHT High-Precision Thin Film SMD Wraparound Chip Resistor Arrays Receive 2012 Design News Golden Mousetrap Award
Vishay’s PRAHT series of high-precision thin film SMD wraparound chip resistor arrays has received a 2012 Design News Golden Mousetrap Award in the category of Electronics & Test: Analog/Power Management/Control. Optimized for high-temperature down-hole and aeronautics applications, Vishay Sfernice PRAHT resistors are the first such products on the market to offer the combination of an operating temperature range to +215 °C and industry-high maximum storage temperature up to +230 °C.
A complete list of Golden Mousetrap Award winners can be found at www.designnews.com.
For more information please see: http://www.vishay.com/company/press/releases/2013/130312PRAHT/
Displays
Vishay Dale

Information Display Products has just released a new standard item for the LCD-016N002B series which features a VATN LCD. The vertical alignment (VA) displays are a form of LCDs in which the liquid crystals naturally align vertically to the glass substrates. When no voltage is applied, the liquid crystals remain perpendicular to the substrate creating a black display between crossed polarizer for excellent contrast. When voltage is applied, the liquid crystals shift to a tilted position allowing light to pass through and create a gray-scale display depending on the amount of tilt generated by the electric field.

Advantages of VA Displays

- Super black background
- Super high contrast ratio
- Wide viewing angle
- Better performance, as it can replace the traditional Black Mask

For more information, questions or data sheets, please contact Neal Kratochvil.

MarCom News
Awards

AWARD ASSODEL: “Best Manufacturer” 2013
Promoted by the National Association of Electronic Supplier (Associazione nationale fornitore elettronica – Assodel); the 11th edition of the Assodel Award recognized Vishay as the best Manufacturer of the Electronic Market in the Passives criteria, for the excellent product quality and collaboration with Italian customers and distribution partners

Vishay Intertechnology Claims Six Spots on Electronic Design’s Annual “Top 101 Components”
Vishay announced that the company’s IWAS-3827EC-50 wireless charging receiving coil, VCNL3020 proximity sensor, SMA6F transient voltage suppressors (TVS), P16S panel potentiometer, 193 PUR-SI Solar power aluminum capacitors, and VLMU3100 ultraviolet (UV) LED have been selected for Electronic Design’s “Top 101 Components.” The annual list compiles the 101 most popular components from the previous year among readers of the magazine’s Products of the Week newsletter. The complete list is available on the magazine’s website here: http://electronicdesign.com/components/top-101-components-2013

LPS 1100 Thick Film Power Resistor Honored With 2013 EE Times and EDN ACE Award
The Vishay Sfernica LPS 1100 thick film power resistor has received a UBM Tech 2013 EE Times and EDN Annual Creativity in Electronics (ACE) Award (http://ubm-ace.com/winners.php) in the Ultimate Products of the Year: Passives, Interconnects, and Electromechanical category.

The EE Times and EDN ACE Awards are judged by a panel of industry experts, composed of the leading voices of academia and the industry. The Ultimate Products of the Year — awarded to the most significant products introduced in the last 12 months in 11 categories — are determined by large-scale peer review. Winners were announced at the April 23 EE Times EDN ACE Awards ceremony in San Jose, Calif.

For more information please see: http://www.vishay.com/company/press/releases/2013/130508ACEAward/index.html

PRAHT High-Precision Thin Film SMD Wraperaround Chip Resistor Arrays Receive 2012 Design News Golden Mousetrap Award
Vishay’s PRAHT series of high-precision thin film SMD wraparound chip resistor arrays has received a 2012 Design News Golden Mousetrap Award in the category of Electronics & Test: Analog/Power Management/Control. Optimized for high-temperature down-hole and aeronautics applications, Vishay Sfernica PRAHT resistors are the first such products on the
market to offer the combination of an operating temperature range to + 215 °C and industry-high maximum storage temperature up to + 230 °C.  
A complete list of Golden Mousetrap Award winners can be found at www.designnews.com. For more information please see: http://www.vishay.com/company/press/releases/2013/130312PRAHT/  

**Polypropylene Film Capacitor MKP1848S Honored With China Electronic Market Editors’ Choice Awards**  
Vishay’s Si7655DN - 20 V p-channel power MOSFET and MKP1848S high-performance metallized DC polypropylene film capacitor have received China Electronic Market (CEM) magazine 2012 Editors’ Choice Awards in the categories of “The Most Competitive Power Devices Product in China” and “The Most Competitive Capacitor Product in China,” respectively.  
Winners of the CEM 2012 Editors’ Choice Awards were chosen based on their sales performance in the Chinese market and technological innovation. Vishay’s Si7655DN and MKP1848S were selected because of their demonstrated success in the power devices and capacitor categories. For more information please see: http://www.vishay.com/company/press/releases/2013/130321CEMaward/  

**Vishay Intertechnology Honored by SPDEI, the French Association of Distributors of Electronic Components, in “Standard Semiconductors” and “Passive Components” Categories**  
This year’s SPDEI Awards recognize the best semiconductor and passive component manufacturers of 2012 in nine product categories. Members of Syndicat Professionnel de la Distribution en Electronique Industrielle (SPDEI) evaluated suppliers based on five criteria: partnership with the distributor, innovation, price, quality, and durability of products; product range; profitability for the retailer; resources to support the distributor; and protection and traceability of designs.  
For more information please see: http://www.vishay.com/company/press/releases/2013/130128SPDEI/  

**PRAHT Series of High-Precision Thin Film SMD Wraparound Resistor Arrays Receives 2012 Product of the Year Award From Electronic Products Magazine**  
Vishay’s PRAHT series of high-precision thin film SMD wraparound resistor arrays has been honored with a 2012 Product of the Year Award from Electronic Products magazine. Presented annually, the Product of the Year Awards are bestowed by the editors of Electronic Products magazine on those new products they feel are among the most significant of the thousands introduced during the year. Their selection is based on a significant advance in technology or its application, innovation in design, or improvement in price and performance. The Vishay Sfernice PRAHT series was selected for its performance in high-temperature down-hole and aeronautics applications.  
For more information please see: http://www.vishay.com/company/press/releases/2013/130114PRAHTaward/  

**Power Resistor Among Trio of Vishay Products in EDN’s List of Hot 100 Products for 2012**  
The Vishay Draloric VSGR stainless steel power resistor is one of three Vishay products to be featured in EDN magazine’s prestigious list of Hot 100 Products for 2012, which highlights the electronics industry’s most significant products of the year based on innovation, significance, usefulness, and popularity. The VSGR is a stainless steel power resistor with high power capability up to 20 kW (higher values on demand) at 40°C and a high operating temperature range of – 25 °C to + 250 °C for applications in extreme environments. The VSGR provides IP00 to IP23 protection and is designed as a converter and brake resistor in windmill, solar, diesel generator, turbine, and railway applications. The device features a resistance range from 0.1 Ω to 75 Ω (with other values available on request), resistance tolerance of ± 5 % and ± 10 %, and a temperature coefficient (TCR) of 250 ppm/K. For more information please see: http://www.vishay.com/company/press/releases/2012/121203hotproducts
VJ Non-Magnetic Series MLCCs Win EDN China 2012 Innovation Awards

Our VJ Non-Magnetic Series MLCCs have won an EDN China 2012 Innovation Award. Presented at an award ceremony on Nov. 15 in Shanghai, the VJ Non Magnetic Series was honored with a Leading Product Award in the Passive Components and Sensors category. The EDN China Innovation Awards were introduced in 2005 to recognize achievements in the design of ICs and related products in the Chinese market. This year, 128 products from 71 companies entered the competition in nine technology categories. EDN China’s online readers nominated the short-listed products, with a group of technical experts and senior EDN editors selecting the final winners.

For more information please see: http://www.vishay.com/company/press/releases/2012/121119EDNChina/

Top-10 Power Product Awards 2012

Our WSK0612 4-terminal, 1 W surface-mount Power Metal Strip® resistor was chosen as a winner in Electronic Products China magazine’s Tenth Annual Top-10 Power Product Awards. The editors of Electronic Products China evaluated hundreds of products launched in the previous year on the basis of innovative design, significant advancement in technology or application, and substantial achievement in price and performance. Vishay’s WSK0612 resistor was selected because of its innovation and demonstrated success in current sensing, voltage division, and pulse applications.

For more information please see: http://www.vishay.com/company/press/releases/2012/121024metalstrip/

NEW – Super 12 2013

“Super 12” Featured Products for 2013: Innovative Components Offer Industry-Leading Specifications for a Variety of Applications

Each year, Vishay’s Super 12 collection showcases the company’s industry-leading capabilities in semiconductor and passive devices, providing design engineers with a shortcut to leading industry specs and a cross-section of Vishay’s very broad product portfolio. Some of the Super 12 products for 2013 are:

WSBM8518 Power Metal Strip® Battery Shunt Resistor — Features a molded enclosure with a 4-pin female connector for easy PCB connection to the shunt resistor assembly. With extremely low resistance of 100 µΩ, the device provides increased accuracy for battery management in automotive and industrial applications.

MCW 0406 AT Professional and Precision Series of Wide-Terminal Thin Film Chip Resistors — AEC-Q200-qualified devices combine high power ratings to 300 mW and advanced levels of precision – with tolerances to ± 0.1 %, TCR of ± 25 ppm/K, and ohmic values down to 1 Ω – for automotive and industrial electronics.

IHLP-6767GZ-5A IHLP® Low-Profile, High-Current Inductor — Vishay’s largest IHLP power inductor available, this device features + 155 °C continuous operation and high currents up to 53 A at 1.0 μH for automotive applications.

LPS 1100 Power Thick Film Resistor — For windmill turbines and braking systems, the device is the industry’s first power thick film resistor in a compact 57 mm by 60 mm package to offer a power rating of 1100 W at + 25 °C.

T16 Wet Tantalum Capacitor — A tantalum-cased device with a glass-to-tantalum hermetic seal, the T16 offers enhanced performance with a reverse voltage of 1.5 V at + 85 °C and a high-reliability design.

VJ HIFREQ Series of Surface-Mount Multilayer Ceramic Chip Capacitors (MLCC) — Available in 0402, 0603, and 0805 case sizes, the devices feature a high Q factor of > 2000 and a low dissipation factor of < 0.05 %.

More information about Vishay’s Super 12 products is available at http://www.vishay.com/landingpage/super12/2013
NEW - Engineer’s Toolbox Version 2.0
The NEW Engineer’s Toolbox website is now live. Enhancements include additional market segments (transportation, telecommunications, etc.) and a new format that covers 82 sub-applications and over 700 products with page links to datasheets. Also available are individual pdf files for each of the 25 sub-sections.

To access this program please visit: http://www.vishay.com/landingpage/et2/

Website Update
Improved web search
Vishay has improved its web search functionality which allows you to find the products that you are looking for faster than ever before. Once a part number or keyword search has been initiated, search results are then displayed in an organized, easy to read web table. You can then explore all of the available products from your search result. From the search results table you can access product datasheets, and supporting product materials like technical notes, app notes, SPICE models, packaging information, and more.

eNewsletters
Mandarin eNewsletter
This publication provides translated press releases on new product introductions, information on translated technical articles and application notes, and highlighting key Vishay products in target applications for the China market.

Asia eNewsletter
This publication provides press releases on new product introductions, and highlights key Vishay products in target applications for the Asian market.

India eNewsletter
This publication provides press releases on new product introductions, and highlights key Vishay products in target applications for the Indian market.

Current Literature/Sales Tools
On-Line Literature Library is Now Available
Vishay Intertechnology has created a web repository of all Company promotional materials available in PDF. These include selector guides, product sheets, product overviews, and more. The PDF documents have been divided into three main categories: Semiconductor Products, Passive Products, and Corporate. Each of these main categories is organized by product family (diodes, capacitors, etc.). To access this repository, go to www.vishay.com, expand the “Useful Links” section, and click on “On-line Literature Library” http://www.vishay.com/how/onlineliterature/promat/
To review the current listing of available printed Vishay literature, please visit [www.vishay.com/ref/literature](http://www.vishay.com/ref/literature).

**New/Updated Application and Technical Notes:**

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**Trade Shows - Recent**

**Techno Frontier: Jul 17 – 19, Tokyo, Japan**
Vishay exhibited its latest semiconductors and passive components at Power System Japan, a component solutions provider for connectivity, mobility, and sustainability. Vishay highlighted industry-leading innovations across all of its product lines that provide increased efficiency and reliability for a wide range of applications.

**CEF Summer Chengdu: Jun 20 – 22, Chengdu, China**
Vishay highlighted its latest industry-leading innovations, including passive components, diodes, power MOSFETs, power ICs, and optoelectronics.

**InterSolar: Jun 19 – 21, Munich, Germany**
Vishay showcased semiconductors and passive components for solar panel junction boxes, grid connected large-scale- and micro-inverters including components for high-efficiency energy conversion, smart grid, and energy management applications.

**IMS: Jun 2 – 7, Seattle, Washington**
Vishay showcased the company’s latest industry-leading multi-layer ceramic chip capacitors (MLCCs) and surface-mount and wire-bondable thin film products at the 2013 IEEE MTT International Microwave Symposium (IMS).

**PCIM Europe: May 14 – 16, Nuremberg, Germany**
Vishay highlighted its industry-leading power MOSFET, passive component, and diode technologies for a wide range of applications. Passive components from Vishay will consist of a wide variety of the Company’s latest capacitors, resistors, and inductors.

**Hannover Industrie Messe: Apr 8 – 12, Hannover, Germany**
At this year’s Hannover show, Vishay showcased the company’s latest industry-leading component solutions from its Vishay ESTA, Vishay Sfernice, Vishay Dale, Vishay HiRel Systems, and Vishay BCcomponents product portfolios.

**Trade Shows - Upcoming**

**Space Passive Components Days: Sep 24 – 26, Noordwijk, Netherlands**

Vishay Trade Shows 2013 Schedule

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Virtual Trade Shows
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Medical > http://www.vishay.com/landingpage/tradeshows/virtual/medical/
Power Management > http://www.vishay.com/landingpage/tradeshows/virtual/power/

Asset Bank
This library of product images is continuing to grow and in turn it is becoming a very useful tool for Product Marketing. You may want to note that any good quality images you may have can be sent to me for upload. Any photography of new products shot will enable us to further populate the image library.

Most of our recent tradeshow posters can be found and downloaded from the Asset Bank library: http://images.vishay.com/asset-bank/action/viewHome
If you’d like access to Asset Bank or to learn more about it, please contact either myself paul.harrison@vishay.com or Connie connie.kurzeknabe@vishay.com and information will be sent to you.

Published Articles
Several articles were published last year and a few of the more recent ones are listed below. Publishing articles is a great way to advertise Vishay and our offerings. However, as you may well know, we’re restricted from marketing a particular product but we can tout our product offerings for certain applications and technologies. Please keep an open mind when we in MarCom (including Bob Decker and Rae Morrow from Wall Street Communications) approach you for an article.

- **New Performance Requirements for Resistors in Aeronautics Applications**
- **Trends in Components for Solar and Wind Inverter Applications**
- **Increased Performance with Cost-Effective HDI Technology**
- **Increasing Accuracy in Feedback Circuits and Voltage Dividers**
- **Selecting capacitors for the energy buffer in solar inverters**
- **Using capacitors in medical electronic applications**
  by Pat Gormally, *Practical Electronic Design Circuits*, Jan 2012
- **Key Components for Wind Power Systems**
  by Dr. Bertram Schott, *Practical Electronic Design Circuits*, Dec 2011
- **Thin Film Chip Resistors and Arrays for High Temperature Applications Up to +230°C**
  by Dr. Claude Flassayer, *All-Electronics.de*, Oct 2011
- **The Cost of Miniaturization – Exploring overheating and prevention**
  by Dr. Kevin Raiber, *EE Times*, Sep 2011
- **Thermal Management in Surface-Mounted Resistor Applications**
  by Dr. Kevin Raiber, *Bodo’s Power Systems*, Jun 2011