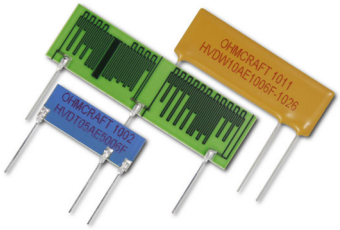
HVD SERIES

High Voltage Leaded Dividers

Advantages

Our patented Micropen® precision printing technology provides superior precision, thick-film resistors.



- **Voltage Ratings to 40,000 Volts**
- **Resistance Values to 2 TΩ**
- **Ratio Tolerances to 0.1%**
- **TCR to 25 ppm/°C**
- **TCR Tracking to 10 ppm/°C**
- **VCR to 0.05 ppm/V**
- **Very Low Noise**
- **Ultra High Stability**
- **Custom Configurations**

Electrical Specifications

Case Size Ratings	TCR (±ppm/°C)	Ratio Tolerance 0.10%	0.25%	0.50%	1%	2%	5%	10%	20%
04 500mW 4kV	25	10M-100M	10M-100M	10M-100M	10M-100M	10M-100M	10M-100M	10M-100M	10M-100M
	50	10M-100M	10M-100M	10M-1G	10 -1G	10M-1G	10 -1G	10M-1G	10 -1G
	100	10M-100M	10M-100M	10M-**10G**	-10G	10M-**10G**	-10G	10M-**10G**	-10G
	200	10M-100M	10M-100M	10M-**10G**	-50G	10M-**50G**	-50G	10M-**50G**	-50G
05 1W 5kV	25	10M-100M	10M-100M	10M-100M	10M-100M	10M-100M	10M-100M	10M-100M	10M-100M
	50	10M-100M	10M-100M	10M-1G	10 -1G	10M-1G	10 -1G	10M-1G	10 -1G
	100	10M-100M	10M-100M	10M-**10G**	-10G	10M-**10G**	-10G	10M-**10G**	-10G
	200	10M-100M	10M-100M	10M-**10G**	-50G	10M-**50G**	-50G	10M-**50G**	-50G
12 1W 10kV	25	10M-100M	10M-500M	10M-500M	10M-500M	10M-500M	10M-500M	10M-500M	10M-500M
	50	10M-100M	10M-500M	10M-1G	10 -1G	10M-1G	10 -1G	10M-1G	10 -1G
	100	10M-100M	10M-500M	10M-**10G**	-50G	10M-**50G**	-50G	10M-**50G**	-50G
	200	10M-100M	10M-500M	10M-**10G**	-50G	10M-**50G**	-100G	10M-**100G**	-100G
15 1.5W 15kV	25	10M-100M	10M-500M	10M-500M	10M-500M	10M-500M	10M-500M	10M-500M	10M-500M
	50	10M-100M	10M-500M	10M-1G	10 -1G	10M-1G	10 -1G	10M-1G	10 -1G
	100	10M-100M	10M-500M	10M-**10G**	-50G	10M-**50G**	-50G	10M-**50G**	-50G
	200	10M-100M	10M-500M	10M-**10G**	-50G	10M-**50G**	-100G	10M-**100G**	-100G
20 2W 20kV	25	10M-100M	10M-500M	10M-500M	10M-500M	10M-500M	10M-500M	10M-500M	10M-500M
	50	10M-100M	10M-500M	10M-1G	10 -1G	10M-1G	10 -1G	10M-1G	10 -1G
	100	10M-100M	10M-500M	10M-**10G**	-50G	10M-**50G**	-50G	10M-**50G**	-50G
	200	10M-100M	10M-500M	10M-**10G**	-50G	10M-**50G**	-100G	10M-**100G**	-100G
30 3W 30kV	25	10M-100M	10M-500M	10M-500M	10M-500M	10M-500M	10M-500M	10M-500M	10M-500M
	50	10M-100M	10M-500M	10M-1G	10 -1G	10M-1G	10 -1G	10M-1G	10 -1G
	100	10M-100M	10M-500M	10M-**10G**	-50G	10M-**50G**	-50G	10M-**50G**	-50G
	200	10M-100M	10M-500M	10M-**10G**	-50G	10M-**50G**	-100G	10M-**100G**	-100G
40 6W 40kV	25	10M-100M	10M-500M	10M-500M	10M-500M	10M-500M	10M-500M	10M-500M	10M-500M
	50	10M-100M	10M-500M	10M-1G	10 -1G	10M-1G	10 -1G	10M-1G	10 -1G
	100	10M-100M	10M-500M	10M-**10G**	-50G	10M-**50G**	-50G	10M-**50G**	-50G
	200	10M-100M	10M-500M	10M-**10G**	-50G	10M-**50G**	-100G	10M-**100G**	-100G

For custom sizes and configurations including resistance values greater than 100G, contact ohmcraftsales@exxelia.com.

How to Order

HVD + [ ] + [ ] + [ ] + [ ] + [ ] + [ ] + [ ]

Type

Leaded High Voltage Divider

Lead Style

T Spade Terminal, 100% Tin RoHS
S Spade Terminal, Sn60Pb40 solder
W Wire, 22AWG 100% Tin RoHS
B Wire, 22AWG Sn60Pb40 solder

Case Size

04
05
12
15
20
30
40

Ra. o

A 1000:1
B 100:1
C Other

TCR

Absolute
E ±25ppm/°C
H ±50ppm/°C
K ±100ppm/°C
L ±200ppm/°C
OR
Tracking
W ±10ppm/°C
X ±15ppm/°C
Y ±25ppm/°C
Z ±50ppm/°C

R Total Value

Resistance value expressed as a four-digit number—where the first three numbers are the significant value, and the fourth number is the number of zeros.

Ratio Tolerance

B ±0.1%
C ±0.25%
D ±0.5%
F ±1.0%
G ±2.0%
J ±5.0%
K ±10%
L ±20%

Coating

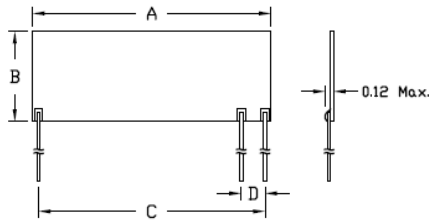
2 Bare
3 Powder Coa. ng
4 Single Surface Epoxy

Absolute tolerance is 15% (> 10GΩ 20%) unless otherwise specified.
Ratio = (R1+R2)/R2
When TCR Tracking is specified, the typical Absolute TCR is 100ppm/°C.

High Voltage Leaded Dividers

HVD SERIES

Resistor Dimensions



Wire Leads: 22AWG (0.025"), 1.3" typical length.

Spade Leads: 0.01" thick, 0.02" wide, 0.325" minimum length, standoff 0.04" max.

Case Size	A (Length)	B (Height)	C (Nominal)	D (Nominal)	Units
04	0.5 +0.08/-0.03 12.7 +2.03/-0.76	0.375 ±0.03 9.53 ±0.76	0.4 10.16	0.2 5.08	inches mm
05	1.0 +0.08/-0.03 25.4 +2.03/-0.76	0.375 ±0.03 9.53 ±0.76	0.9 22.86	0.2 5.08	inches mm
12	1.5 +0.08/-0.03 38.1 +2.03/-0.76	0.5 ±0.03 12.7 ±0.76	1.4 35.56	0.2 5.08	inches mm
15	2.0 +0.08/-0.03 50.8 +2.03/-0.76	0.5 ±0.03 12.7 ±0.76	1.9 48.26	0.2 5.08	inches mm
20	2.0 +0.08/-0.03 50.8 +2.03/-0.76	0.75 ±0.03 19.05 ±0.76	1.9 48.26	0.2 5.08	inches mm
30	3.0 +0.08/-0.03 76.2 +2.03/-0.76	0.75 ±0.03 19.05 ±0.76	2.9 73.66	0.2 5.08	inches mm
40	4.0 +0.08/-0.03 101.6 +2.03/-0.76	0.75 ±0.03 19.05 ±0.76	3.9 99.06	0.2 5.08	inches mm

For custom case sizes, contact ohmcraftsales@exxelia.com.

Typical Performance Characteristics

Test	Maximum ΔR
Short Time Overload	0.1%
Load Life	0.1%
Thermal Shock	0.1%
Shock	0.05%
Vibration	0.05%
Resistance to Soldering Heat	0.05%

Parameter	Typical
Operating Temperature	-55°C to 150°C
TCR	Measured from 25°C to 75°C
Resistance Value	Value > 10M are measured at 100 VDC For custom test voltages consult factory

Material Construction

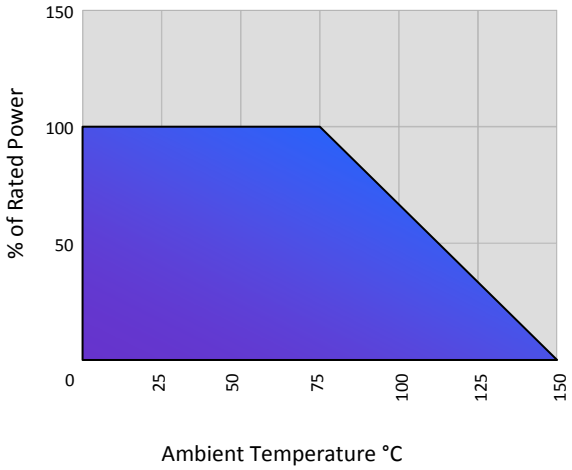
Substrate 96% Alumina

Coatings All resistors are glass encapsulated with optional single side epoxy or powder coating.

Custom Selections Available Upon Request

Please consult with our knowledgeable sales staff for help specifying custom parts to meet your needs:

Power Derating Curve



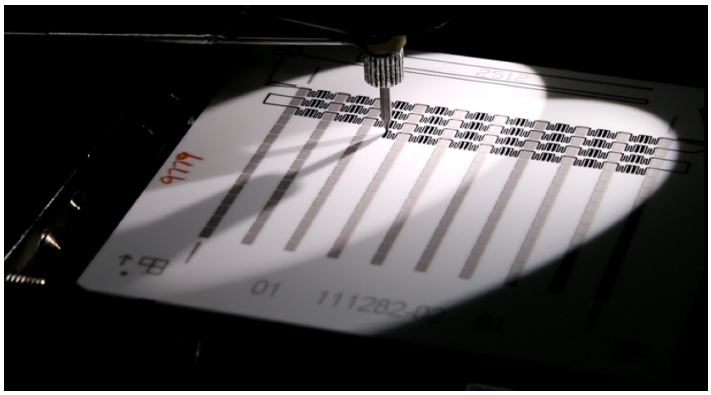
GENERAL INFORMATION

As a leading division of Exxelia, Ohmcraft specializes in the **design and manufacturing of high-performance custom resistors** for a diverse range of industries (Medical, Test & Measurement, Power supply, Defense & Aerospace). With unparalleled expertise and a commitment to excellence, we engineer solutions that power cutting-edge technologies worldwide.

The Exxelia Micropen electronic printing system is the core technology for the design and manufacture of Exxelia Ohmcraft's complete line of resistors – chip resistors, flat leaded resistors, axial leaded resistors and custom resistive product solutions.

Our Direct Write Micropenning printing process grants our resistors with unique benefits :

- **Fine line widths with smooth edge**
  Extremely low noise
- **Long length resistor**
  Low VCR & High voltage
- **Precise thickness control**
  Low TCR



Our dedication to quality and reliability is reflected in every resistor we produce, tailored to meet the unique requirements of our clients. Backed by decades of experience, state-of-the-art facilities, and a passion for advancement, Exxelia Ohmcraft stands as a trusted partner in your pursuit of technological excellence.

Exxelia Ohmcraft's high-performance resistors enable **medical product designers** to continue to improve the quality of life of patients around the world. Our resistors are designed for a variety of products to be used in medical diagnosis, treatment, and prevention. From small, implantable, and non-invasive devices, to large diagnostic imaging equipment, Exxelia Ohmcraft resistors are chosen by medical manufacturers because the operating environments are high voltage and magnetic fields where accuracy and stability are paramount.

Our precision resistors are also able to achieve the precision and repeatability required by modern measurement and detection equipment.

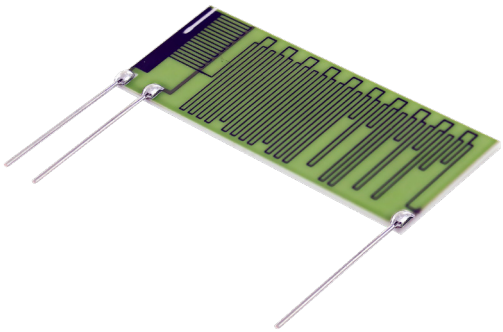
Our qualified engineering team works closely with industry leaders to produce the most advanced test equipment and instrumentation. Exxelia Ohmcraft's custom dividers, resistors, and networks provide a level of service and performance unmatched in the **instrumentation marke** .

Exxelia Ohmcraft has been committed to supporting the high-voltage and precision needed by the **power supply industry**. We provide many market leaders with standard and custom products. Our surface mount resistors can withstand voltages up to 10kV and our leaded resistors are designed to operate up to 40kV.

Exxelia Ohmcraft has served markets in **electronic warfare, weapons platforms, force protection, and intelligence programs** for over two decades, reliably supporting a wide range of products, programs, and applications. Our custom resistors are designed to support the rigorous specifications required by military suppliers who depend on the precision and reliability of our products.

Exxelia Ohmcraft has served markets in **intelligence and space programs** for over two decades, reliably supporting a wide range of products, programs, and applications. Our custom resistors are designed to support the rigorous specifications required by space suppliers who depend on the precision and reliability of our products. Exxelia Ohmcraft is able to screen and qualify our resistors to the following specifications: MIL-PRF-55342, MIL-PRF-49462, NASA EEE-INST-002 (Level 1 & 2).

Discover how our resistors can elevate your applications and propel your innovations forward. Explore the precision-driven world of Exxelia Ohmcraft today.



LOT ACCEPTANCE TESTING (LAT)

ADVANTAGES

Lot Acceptance Testing provides screening and qualification tests to enable the use of Exxelia Ohmcraft's standard parts in flight applications (Aerospace/Space). Exxelia Ohmcraft can screen and qualify its resistor products to MIL-PRF-55342, MIL-PRF-49462, NASA EEE-INST-002 (Level 1 or Level 2) or a custom test plan. LAT Testing includes but is not limited to:

- Thermal Shock
- Power Conditioning
- High Temperature Exposure
- Solderability
- TCR
- Load Life
- Short Term Overload
- Terminal Strength
- Resistance to Solvents

Electrical Specifi ation

Value R	R Ω	Resistance Value in kΩs, MΩs, GΩs, or TΩs
Tolerance	± X% at V	Resistance Tolerance measured at specified voltage
TCR	< [Ordering Coder TCR] ppm/°C (Hot to Tmax°C, Cold to Tmin°C) < 2*[Ordering Coder TCR] ppm/°C (Hot to 125°C, Cold to -55°C)	TCR referenced to 25°C
Working Voltage	V	Voltage across the resistor during application operation
Max Voltage Ratin	V	Maximum Voltage based on resistance value or case rating
Max Power Ratin	W	Maximum Wattage based on resistance value or case rating

Conformance Testin

Pre-Cap Visual Inspection

Prior to Conformance Test	13 pcs

Conformance Test – 100% Screening

Visual Inspectio Magnification: 30x to 60x	100%
Mechanical Inspection	3 pcs. (min.)
DC Resistance Per MIL-STD-202, Method 303 Measured at specified test voltage for resistance tolerance	100%
Thermal Shock Per-MIL-STD-202. Method 107, Test Condition B (modified) 5 cycles (MIL-PRF-55342), 10 cycles (NASA level 2) or 25 cycles (NASA level 1)	100%
High Temperature Exposure (SMT) 100 hours at 125°C	100%
Power Conditioning (Leaded 100 hours at Working Voltage at 25°C	100%
Final DC Resistance Measured at specified test voltage for resistance tolerance	100%

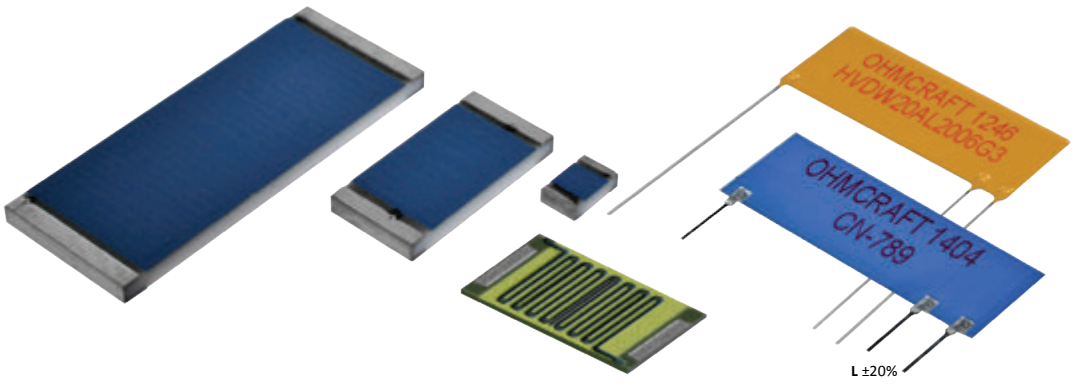
Conformance PDA: 5% (NASA Level 1 or MIL-PRF-55342), 10% (MIL-PRF-49462) or 15% (NASA Level 2)

LOT ACCEPTANCE TESTING (LAT)

Qualification testin

Group	NASA Sample Size (Level 1 / Level 2)
Group 1 Conformance Testing: Basic Screening	100%
Group 2 Solderability MIL-STD-202, Method 208 Resistance to Solvents (Leaded) MIL-STD-202, Method 215	3 pcs / 3 pcs
Group 3 Temperature Coefficient (TCR) Per MIL-STD-202, Method 304 Reference Temperature: 25°C Low Temperature Storage -65°C no load dwell for 24±4 hours +25°C ambient no load dwell for 2-8 hours Low Temperature Operation -65°C no load dwell for 1 hour Working Voltage for 54 minutes +25°C no load dwell for 24±4 hours Short Time Overload 2X Working Voltage for 5 seconds	10 pcs / 6 pcs
Group 4 Resistance to soldering heat MIL-STD-202, Method 210, Test Condition B (modified) 260°C for 20 seconds Terminal Strength (Leaded) MIL-STD-202, Method 211 Test Condition C 16 ounces ± 1 ounce for 10 seconds	9 pcs / 6 pcs

Group	NASA Sample Size (Level 1 / Level 2)
Group 5 Shock (Leaded) MIL-STD-202, Method 213B, Test Condition I Vibration (Leaded) Per MIL-STD-202, Method 204, Test Condition D	9 pcs / 6 pcs
Group 6 Load Life Per MIL-STD-202, Method 108 Working Voltage for 1000 or 2000 hours at 25°C	12 pcs / 9 pcs
Group 7 Resistance to Bonding Exposure (SMT) Solder mounted to a ceramic test plate 4-12 hours stabilization at 25°C	10 pcs / 5 pcs
Group 8 No Applicable Tests	–
Group 9 High Temperature Exposure 125°C for 100 hours	5 pcs

Custom Configurations Available Upon Request

Please consult with our knowledgeable sales staff f or help specifying custom parts to meet your needs.