Molded Thick Film Divider, High Voltage, High Precision, Surface-Mount

FEATURES

- High voltage up to 1500 V utilizing thick film technology
- Precision to ± 0.5 % with low TCR tracking to 10 ppm/°C utilizing thick film technology
- Sulfur resistant
- Automotive compliant terminations
- AEC-Q200 qualified
- Wide range of resistance value and ratios
- 12.5 mm creepage distance. Rated 1250 V per IEC 60664-1
- PATENT(S): www.vishay.com/patents
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

RoHS COMPLIANT

HALOGEN FREE

LINKS TO ADDITIONAL RESOURCES

3D Models

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	CASE SIZE	POWER RATING $P_{70\,°C}$ W	MAXIMUM WORKING VOLTAGE (1) V	RESISTANCE RANGE R_1 (2) Ω	TOLERANCE (3) R_1 ± %	RATIO RANGE (4) $(R_1 + R_2) / R_2$	RATIO TOL. ± %	TCR TRACKING (-55 °C to +155 °C) ± ppm/°C
CDMM	4527	1.5	1500	500K to 50M	0.5, 1, 2, 5, 10	100:1 to 500:1	0.5, 1, 2, 5	10 - 50

Notes

(1) Continuous working voltage shall be $\sqrt{P \times R}$ or maximum working voltage, whichever is less

(2) Resistance value is calibrated at 100 V_{DC}

(3) Contact factory for tighter tolerances

(4) Contact factory for other ratios

GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: CDMM20M0F2500FEF (preferred part number format)

C	D	M	M	2	0	M	0	F	2	5	0	0	F	E	F		

GLOBAL MODEL	RESISTANCE VALUE (R_1)	TOLERANCE	RATIO $(R_1 + R_2) / R_2$	RATIO TOLERANCE	SOLDER TERMINATION	PACKAGING	SPECIAL
(see Standard Electrical Specifications Global Model column for options)	**K** = kΩ **M** = MΩ **525K** = 525 kΩ **1M50** = 1.5 MΩ	**D** = ± 0.5 % **F** = ± 1 % **G** = ± 2 % **J** = ± 5 % **K** = ± 10 %	3 digit significant figure, followed by a multiplier **2500** = 250:1 **3000** = 300:1	**D** = ± 0.5 % **F** = ± 1 % **G** = ± 2 % **J** = ± 5 %	**E** = Sn100	**B** = bulk (250 pcs max.) **F** = T/R (1200 pcs) **1** = T/R (1000 pcs) **5** = T/R (500 pcs) **T** = T/R (250 pcs min.)	Blank = standard (dash number) (up to 2 digits) from **1** to **99** as applicable

Notes

- Contact factory for other ratios
- For additional information on packaging, refer to the Surface Mount Resistor Packaging document (www.vishay.com/doc?31543)

PATENT(S): www.vishay.com/patents

This Vishay product is protected by one or more United States and international patents.

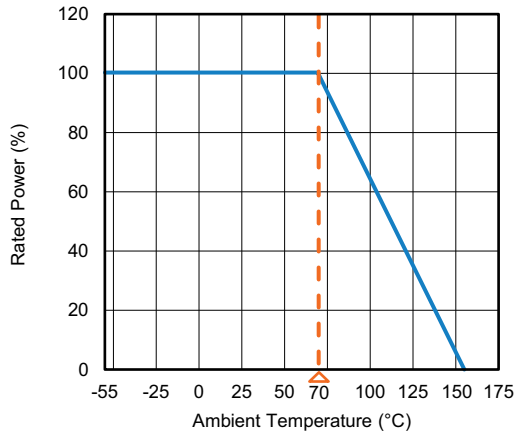
VOLTAGE AND TEMPERATURE COEFFICIENTS OF RESISTANCE CHART (TYPICAL)

GLOBAL MODEL	RESISTANCE Ω	RATIO (TYPICAL)	VCR ppm/V	RATIO TRACKING (-55 °C to +150 °C) ppm/°C
CDMM	500K	100:1	-10	± 20
	15M	250:1	-10	± 10
	50M	500:1	-10	-50 to 0

Note

- Contact factory for other ratios

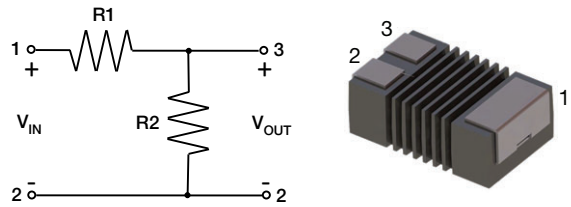
DERATING CURVE



ENVIRONMENTAL SPECIFICATIONS

Operating temperature	-55 °C to +155 °C

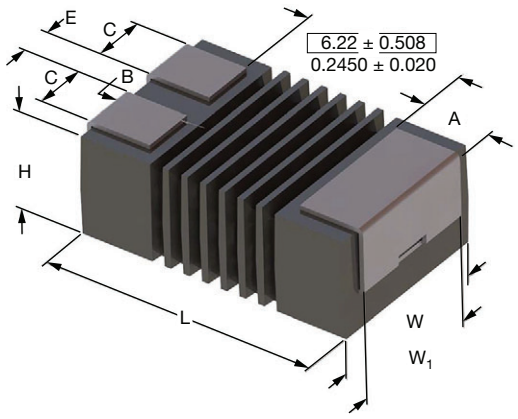
TYPICAL DC ELECTRICAL CIRCUIT

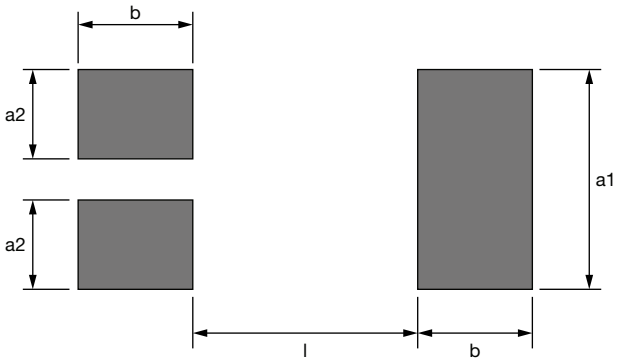


MECHANICAL SPECIFICATIONS

Resistive element	Ruthenium oxide (thick film)
Encapsulation	Molded thermoplastic
Substrate	Alumina
Termination	Solder-coated bronze

DIMENSIONS in inches (millimeters)





L (1)	H (1)	W	W_1	A	B	C	E	a1	a2	b	l
0.455 ± 0.020 (11.56 ± 0.508)	0.167 ± 0.010 (4.24 ± 0.254)	0.275 ± 0.005 (6.98 ± 0.127)	0.216 ± 0.005 (5.49 ± 0.127)	0.100 ± 0.010 (2.54 ± 0.254)	0.100 ± 0.010 (2.54 ± 0.254)	0.083 ± 0.005 (2.11 ± 0.127)	0.050 ± 0.005 (1.27 ± 0.127)	0.225 (5.72)	0.87 (2.21)	0.145 (3.68)	0.255 (6.48)

Note

(1) Dimensions includes the terminals

PERFORMANCE		
TEST	**CONDITIONS OF TEST**	**TEST LIMITS**
Thermal shock	-55 °C to +150 °C, 1000 cycles, 15 min at each extreme	± 1.0 % ΔR
High temperature exposure	1000 h at 155 °C	± 1.0 % ΔR
Biased humidity	+85 °C, 85 % RH, 10 % rated power [1], 1000 h	± 2.0 % ΔR
Mechanical shock	100 *g*'s for 11 ms, 5 pulses	± 0.5 % ΔR
Vibration	Frequency varied 10 Hz to 500 Hz in 1 min, 3 directions, 9 h	± 0.5 % ΔR
Load life	1000 h at rated power, +70 °C, 1.5 h "ON", 0.5h "OFF"	± 1.0 % ΔR
Resistance to solder heat	+260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence	± 1.0 % ΔR

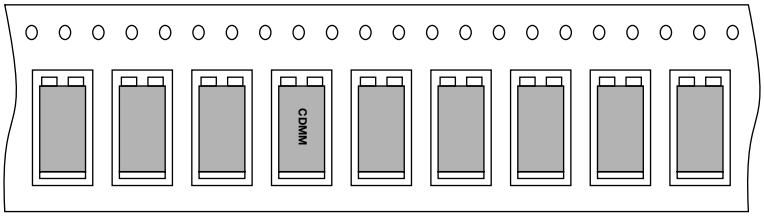
Note

[1] Applied voltage is based on the critical resistance value, not to exceed 500 V

PACKAGING				
MODEL	**TAPE WIDTH**	**DIAMETER**	**PIECES/REEL**	**CODE**
CDMM	24 mm / embossed plastic	330 mm / 13"	1200	EF
			1000	E1
			500	E5
			250	ET

Note

- Embossed carrier tape per EIA-481



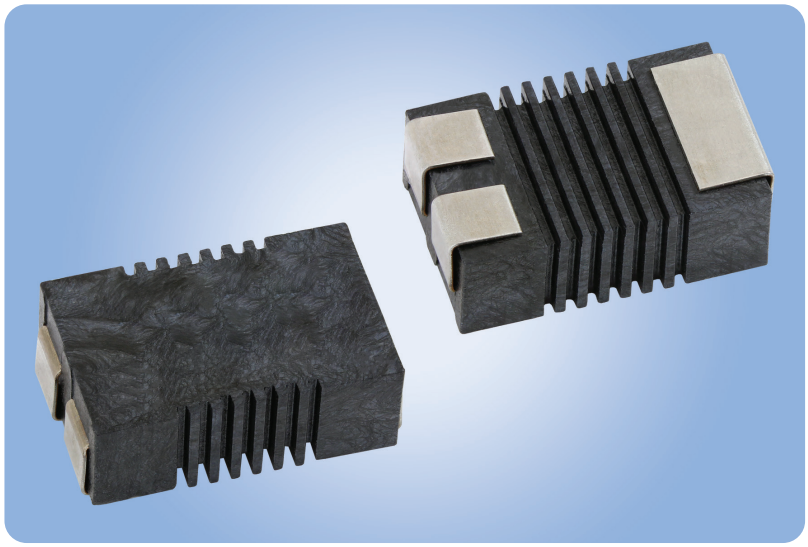
The above image shows the orientation of the parts in the reel

The DNA of tech.™

HIGH VOLTAGE MOLDED CHIP DIVIDER

CDMM

Molded Divider, High Voltage (Up to 1500 V), Surface-Mount



KEY BENEFITS

- AEC-Q200 qualified
- Up to 1500 V input voltage
- Compliant terminations
- High creepage distance
- Sulfur-resistant
- Good TCR tracking and ratio tolerances compared to individual components
- Wide resistance range and ratios

APPLICATIONS

- Automotive: hybrid vehicles (HV) and electric vehicles
- Industrial: voltage dividers, voltage management, DC/DC converters

RESOURCES

- Datasheet: CDMM - www.vishay.com/ppg?68041
- For technical questions contact te1resistors@vishay.com
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

The DNA of tech.™

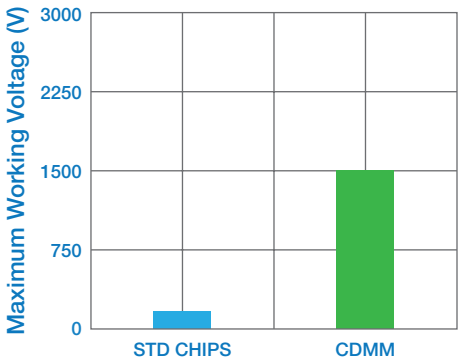
HIGH VOLTAGE MOLDED CHIP DIVIDER

CDMM

Molded Divider, High Voltage (Up to 1500 V), Surface-Mount

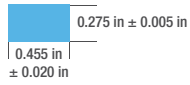
Vishay Dale released a high voltage, SMT molded chip divider for automotive and industrial applications. The main features are listed below:

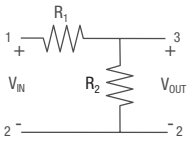
MAX. WORKING VOLTAGE

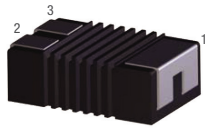


FOOTPRINT

Shown at actual size







STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	CASE SIZE	POWER RATING $P_{70\,°C}$ W	MAXIMUM WORKING VOLTAGE (1) V	RESISTANCE RANGE R_1	TOLERANCE (3) R_1 ± %	RATIO RANGE $(R_1 + R_2) / R_2$	RATIO TOL. ± %	TEMPERATURE COEFFICIENT (4) (-55 °C to +125 °C) ± ppm/°C	TCR TRACKING ± ppm/°C
CDMM	4527	1.5	1500	500K to 50M (2)	0.5, 1, 2, 5, 10	100:1 to 500:1	0.5, 1, 2, 5	100	10 - 50

Notes

(1) Continuous working voltage shall be $\sqrt{P \times R}$ or maximum working voltage, whichever is less

(2) Resistance value is calibrated at 100 V_{DC}

(3) Contact factory for tighter tolerances

(4) Reference only: Not for all values specified. Consult factory for your value

GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: CDMM20M0F2500FEF (preferred part number format)

C	D	M	M	2	0	M	0	F	2	5	0	0	F	E	F		

GLOBAL MODEL	RESISTANCE VALUE (R_1)	TOLERANCE	RATIO $(R_1 + R_2) / R_2$	RATIO TOLERANCE	SOLDER TERMINATION	PACKAGING	SPECIAL
(see Standard Electrical Specifications Global Model column for options)	**K** = kΩ **M** = MΩ **525K** = 525 kΩ **1M50** = 1.5 MΩ	**D** = ± 0.5 % **F** = ± 1 % **G** = ± 2 % **J** = ± 5 % **K** = ± 10 %	3 digit significant figure, followed by a multiplier **2500** = 250:1 **3000** = 300:1	**D** = ± 0.5 % **F** = ± 1 % **G** = ± 2 % **J** = ± 5 %	**E** = Sn100	**B** = bulk (250 pcs max.) **F** = T/R (1200 pcs) **1** = T/R (1000 pcs) **5** = T/R (500 pcs) **T** = T/R (250 pcs min.)	Blank = standard (dash number) (up to 2 digits) from **1** to **99** as applicable

Notes

- Contact factory for other ratios

VOLTAGE AND TEMPERATURE COEFFICIENTS OF RESISTANCE CHART (TYPICAL)

GLOBAL MODEL	RESISTANCE Ω	RATIO (TYPICAL)	VCR ppm/V	RATIO TRACKING (-55 °C to +150 °C) ppm/°C
CDMM	500K	100:1	-10	± 20
	15M	250:1	-10	± 10
	50M	500:1	-10	-50 to 0

Note

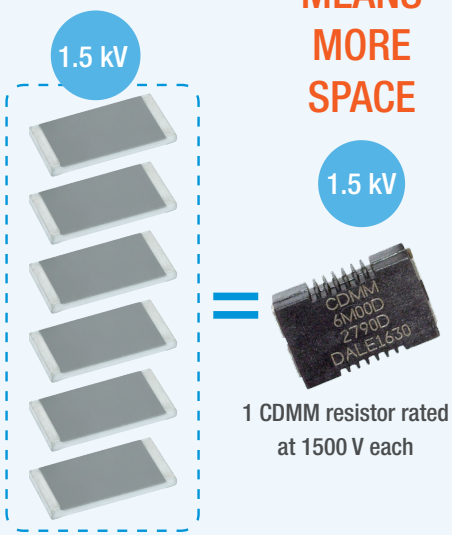
- Contact factory for other ratios

CDMM

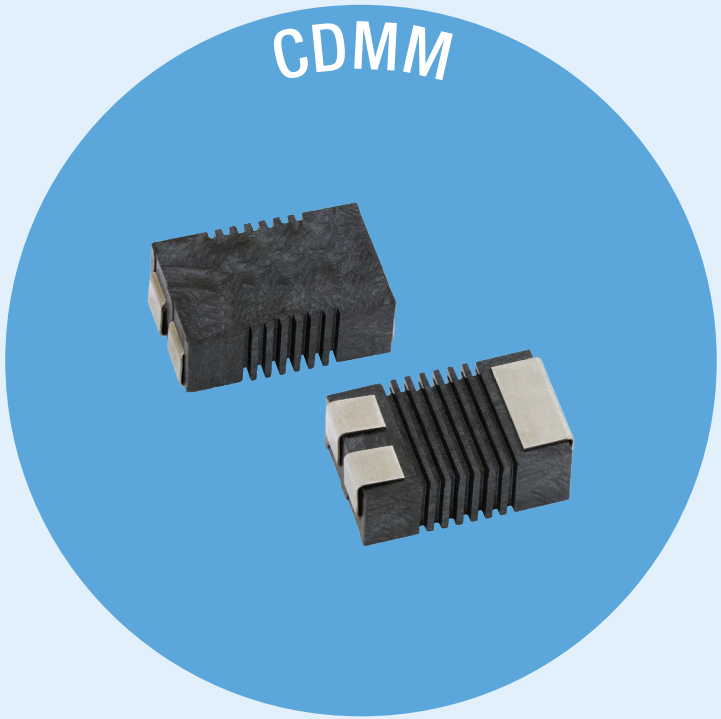
HIGH VOLTAGE MOLDED CHIP DIVIDER

IN A NUTSHELL

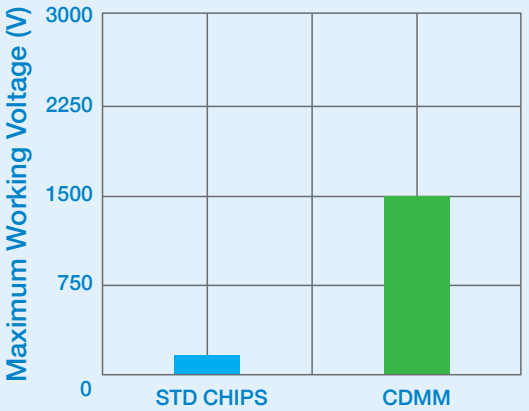
6 - 8 STANDARD RESISTORS = 1 CDMM MEANS MORE SPACE



1 CDMM resistor rated at 1500 V each

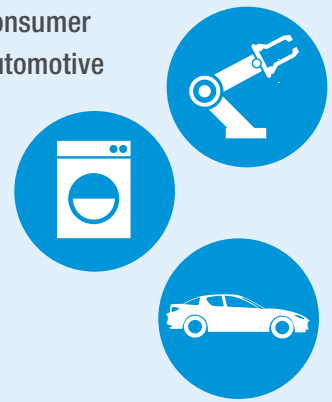


MAX. WORKING VOLTAGE



APPLICATIONS

- Industrial
- Consumer
- Automotive

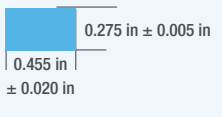


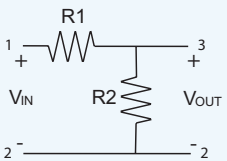
FEATURES

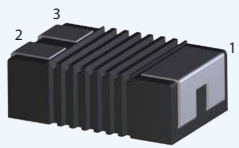
- Specifically designed for EV and HV automotive applications
- AEC-Q200 qualified
- Compliant terminations
- Sulfur-resistant
- High creepage distance
- Wide resistance values and ratios
- Good TCR tracking and ratio tolerances vs. individual components

FOOTPRINT

Shown at actual size







te1resistors@vishay.com

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.