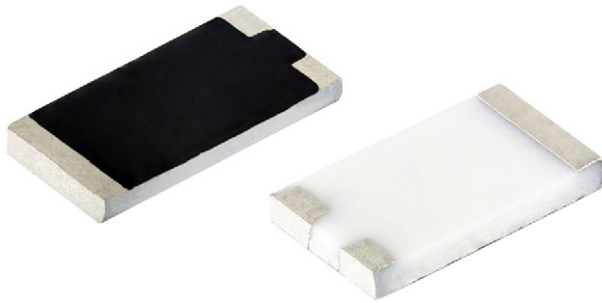


## Thick Film Chip Dividers, Medium Voltage



### FEATURES

- AEC-Q200 qualified
- Voltage up to 1415 V
- Precision to  $\pm 0.5\%$  with low TCR tracking to 10 ppm/ $^{\circ}\text{C}$  utilizing thick film technology
- Wide range of resistance value and ratios
- Termination style:  
3-sided wraparound termination
- Termination material:  
solder-coated nickel barrier
- Sulfur resistant verified by testing to EIA 977 test condition A
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

 AUTOMOTIVE  
GRADE

**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### LINKS TO ADDITIONAL RESOURCES



### APPLICATIONS

- Automotive:
  - EV charging for over voltage protection
  - Voltage dividers
  - On-board chargers
  - DC/DC converters
  - Battery management

### STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	CASE SIZE	POWER RATING $P_{70^{\circ}\text{C}}$ W	MAXIMUM WORKING VOLTAGE <sup>(1)</sup> V	RESISTANCE RANGE <sup>(2)</sup> $\Omega$	TOLERANCE <sup>(3)</sup> $\pm\%$	RATIO RANGE $(R_1 + R_2)/R_2$	TCR TRACKING ( $-55^{\circ}\text{C}$ to $+155^{\circ}\text{C}$ ) $\pm$ ppm/ $^{\circ}\text{C}$
CDMA	2512	1	1415	500K to 50M	0.5, 1, 2, 5, 10	100:1 to 600:1	10 to 50

#### Notes

- (1) Continuous working voltage shall be  $\sqrt{P \times R}$  or maximum working voltage, whichever is less
- (2) Resistance values are calibrated at 100 V<sub>DC</sub>. Calibration at other voltages available upon request
- (3) Contact factory for tighter tolerances

### GLOBAL PART NUMBER INFORMATION

 New Global Part Numbering: **CDMA20K0J1000GEB** (preferred part number format)

<b>C</b>	<b>D</b>	<b>M</b>	<b>A</b>	<b>2</b>	<b>0</b>	<b>K</b>	<b>0</b>	<b>J</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>G</b>	<b>E</b>	<b>B</b>		
GLOBAL MODEL	RESISTANCE VALUE ( $R_1$ )	TOLERANCE	RATIO $(R_1 + R_2) / R_2$	RATIO TOLERANCE	SOLDER TERMINATION	PACKAGING	SPECIAL										
<b>CDMA</b> = CDMA2512	K = k $\Omega$ M = M $\Omega$ <b>20K0</b> = 20 k $\Omega$ <b>800K</b> = 800 k $\Omega$ <b>1M00</b> = 1 M $\Omega$	<b>D</b> = $\pm 0.5\%$ <b>F</b> = $\pm 1\%$ <b>G</b> = $\pm 2\%$ <b>J</b> = $\pm 5\%$ <b>K</b> = $\pm 10\%$	3 digit significant figure, followed by a multiplier <b>1000</b> = 100:1 <b>2000</b> = 200:1	<b>D</b> = $\pm 0.5\%$ <b>F</b> = $\pm 1\%$ <b>G</b> = $\pm 2\%$ <b>H</b> = $\pm 3\%$ <b>J</b> = $\pm 5\%$	<b>E</b> = Sn100	<b>B</b> = bulk (250 pcs max.) <b>F</b> = T / R (full reel) <b>1</b> = T / R (1000 pcs) <b>5</b> = T / R (500 pcs) <b>T</b> = T / R (250 pcs min.)											

#### Note

- For additional information on packaging, refer to the "Surface-Mount Resistor Packaging" document ([www.vishay.com/doc?31543](http://www.vishay.com/doc?31543))

<b>VOLTAGE COEFFICIENTS AND RATIO TRACKING INFORMATION (Typical)</b>			
RESISTANCE ( $\Omega$ )	RATIO (MAXIMUM)	VCR (ppm/V)	TCR TRACKING (ppm/ $^{\circ}$ C) -55 $^{\circ}$ C to +155 $^{\circ}$ C
500K	100:1	-10	$\pm 20$
15M	250:1	-10	$\pm 10$
50M	600:1	-10	-50 to 0

**Note**

- Contact factory for other ratios

<b>MATERIAL SPECIFICATIONS</b>	
Resistive element	Ruthenium oxide
Encapsulation	Epoxy
Substrate	96 % alumina
Termination	Solder-coated nickel barrier terminations standard
Solder finish	Pure tin

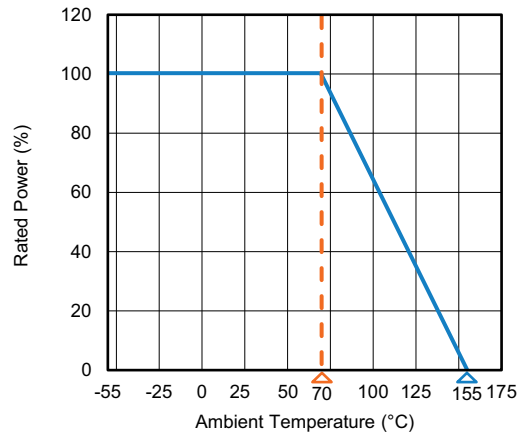
<b>ENVIRONMENTAL SPECIFICATIONS</b>	
Operating temperature	-55 $^{\circ}$ C to +155 $^{\circ}$ C
Life	Less than 0.5 % change when tested at full rated power

**Note**

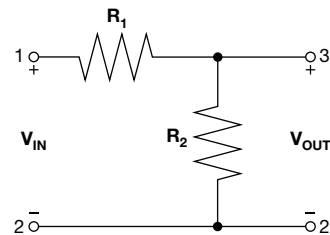
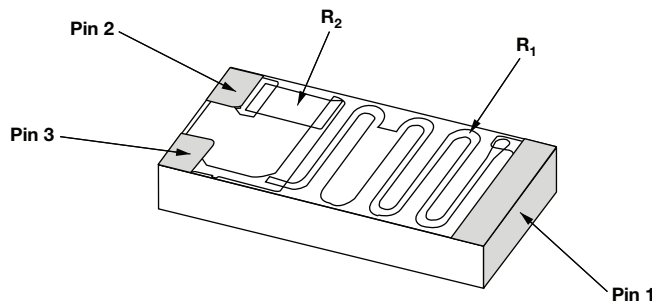
- Reference only: not for all values specified. Consult factory for your size and value

<b>DIMENSIONS</b> in inches (millimeters)							
TERMINATION	LENGTH (L) $\pm 0.006$ (0.152)	WIDTH (W) $\pm 0.006$ (0.152)	THICKNESS (T) $\pm 0.005$ (0.127)	A $\pm 0.005$	B $\pm 0.005$	C $\pm 0.005$	E $\pm 0.010$
Style A (3-sided wraparound)	0.250	0.126	0.025	0.025	0.025	0.040	0.046

<b>RECOMMENDED SOLDER PAD LAYOUT</b>							
MODEL	DIMENSIONS in inches (millimeters)						
	A	B	C	D1	D2	E	F
CDMA2512	0.275 (6.99)	0.126 (3.20)	0.190 (4.83)	0.050 (1.27)	0.035 (0.89)	0.040 (1.02)	0.046 (1.17)

**DERATING CURVE**

**Note**

- Reference only: not for all values specified. Consult factory for your specific value

**SCHEMATIC**

**PERFORMANCE**

TEST	CONDITIONS OF TEST	TEST LIMITS
High temperature exposure (storage)	MIL-STD-202, method 108, 2000 h at $T = 155\text{ }^{\circ}\text{C}$ at 0 % power	$\pm 1.0\%$
Thermal shock	JESD22 method JA-104, 2000 cycles ( $-55\text{ }^{\circ}\text{C}$ to $+150\text{ }^{\circ}\text{C}$ ), dwell time = 15 min, maximum transfer time = 20 s air to air	$\pm 1.0\%$
Moisture resistance	MIL-STD-202, method 106	$\pm 1.0\%$
Biased humidity	MIL-STD, method 103, 2000 h $85\text{ }^{\circ}\text{C} / 85\%$ RH Note: specified conditions: 10 % of rated voltage	$\pm 2.0\%$
Operational life	MIL-STD-202, method 108, 2000 h, $T_a = 125\text{ }^{\circ}\text{C}$ at rated power	$\pm 1.0\%$
Resistance to solvents	MIL-STD-202, method 215	No damage to parts
Mechanical shock	MIL-STD-202, method 213, figure 1, SMD, condition C	$\pm 0.5\%$
Vibration	MIL-STD-202, method 204, 5 $g$ 's for 20 minutes, 12 cycles each of 3 orientations	$\pm 0.5\%$
Resistance to solder heat	MIL-STD-202, method 210, condition J	$\pm 1.0\%$
Solderability	J-STD-002, method B1, 4 h at $155\text{ }^{\circ}\text{C}$ dry heat, solder at $245\text{ }^{\circ}\text{C}$ , magnification 50 x	> 95 % coverage
Flammability	UL 94	V-0
Board flex	AEC-Q200-005 2 mm min.	$\pm 1.0\%$
Terminal strength (SMD)	AEC-Q200-006 force of 1.8 kg for 60 s	$\pm 1.0\%$



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