

Power Resistors Cooled by Auxiliary Heatsink (Not Supplied) Thick Film Technology



FEATURES

- System without external radiation
- High power / volume ratio
- Non-inductive
- M5 screw-on outputs
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

DESIGN SUPPORT TOOLS AVAILABLE



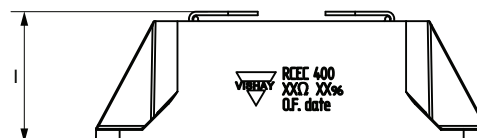
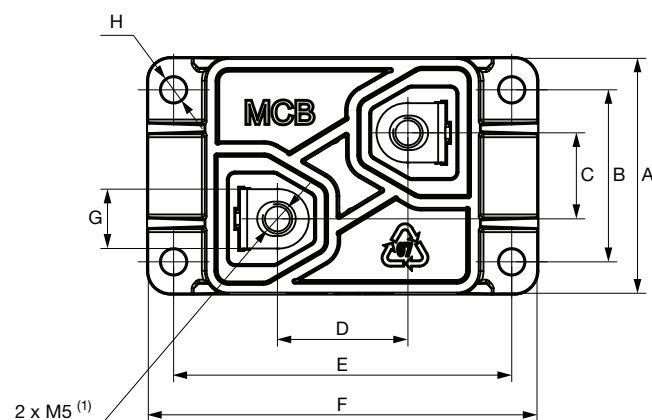
STANDARD ELECTRICAL SPECIFICATIONS					
MODEL	RESISTANCE RANGE Ω	MAX. RATED POWER $BC_{85}^{\circ C}$ W	TOLERANCE $\pm \%$	TEMPERATURE COEFFICIENT $\pm \text{ppm}/^{\circ C}$	E-SERIES OHMIC VALUES ⁽³⁾
RCEC 400 BS	0.15 ⁽²⁾ to 0.49	400	10, 5	700 (typical)	E 24
	0.5 to 3	400	10, 5 ⁽¹⁾	300 (typical)	E 24
	3.3 to 1M	400	10, 5 ⁽¹⁾	100 (typical)	E 24

Notes

- (1) $\pm 2 \%$ or $\pm 1 \%$ on special request for limited resistance value and with reduction of maximum power and pulse rating (contact us for details)
(2) Current limitation for 0.15 Ω : 30 A_{RMS} max.
(3) Other on request

MECHANICAL SPECIFICATIONS	
UL 94 flame classifications	Material complies with the standard UL 94 V-0
Resistive element	Cermet
Substrate	Alumina
Encapsulation	Resin filled in case

TECHNICAL SPECIFICATIONS	
PARAMETER	RCEC 400 BS
Operating temperature range	-55 $^{\circ C}$ to +155 $^{\circ C}$
Maximum operating voltage between terminals	5000 V _{DC}
Dielectric strength V _{RMS} (50 Hz / 1 min)	7000 V (other cases: contact us)
Creeping distance	> 42 mm
Clearance distance	> 12 mm
CTI index	> 600
Partial discharge	< 10 pC at 4000 V _{eff} (other case: contact us)
Capacitance / ground	120 pF (typical) / frequency 10 kHz
Self-inductance	< 40 nH (typical) / frequency 10 kHz
Insulation resistance	> 100 G Ω at 1000 V _{DC}
Weight (max.)	40 g

DIMENSIONS in millimeters


DIMENSION	MILLIMETER		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	39.5	40.5	1.555	1.594
B	28.5	29.5	1.122	1.161
C ⁽²⁾	14	15	0.551	0.591
D ⁽²⁾	21.5	22.5	0.846	0.886
E	56.5	57.5	2.224	2.264
F	65.5	66.5	2.579	2.618
G	9.5	10.5	0.374	0.413
H	4.1	4.3	0.161	0.169
I	21.5	22.5	0.846	0.886

Notes

⁽¹⁾ Screw length up to 8 mm

⁽²⁾ For information only

PERFORMANCES			
TESTS	CONDITIONS	REQUIREMENTS CEI 60115-4 STABILITY CLASS 1 % (TABLE II)	TYPICAL VALUES
Overload	600 W / 60 s with $\theta_{\text{bottom case}} = 85^{\circ}\text{C}$	$\pm (0.25 \% + 0.05 \Omega)$	$< 0.2 \%$
Lightening impulse	5 kV peak 1.2/50 μs 5 pulses/polarity (IEC 61000-4-5)	$\pm (0.25 \% + 0.05 \Omega)$	$< 0.2 \%$
Switching impulse	5 kV peak 250/2500 μs 5 pulses/polarity (IEC 60060-1)	$\pm (0.25 \% + 0.05 \Omega)$	$< 0.2 \%$
Damp heat	56 days 40 $^{\circ}\text{C}$ 93 % HR (IEC 60068-2-78)	$\pm (1 \% + 0.05 \Omega)$ Insul. $> 10^3 \text{ M}\Omega$	$< 0.2 \%$
Climatic sequence	Dry heat temperature during 16 h at: 125 $^{\circ}\text{C}$ Damp heat 24 h at: 55 $^{\circ}\text{C}$ / 95 % HR (± 5) Cold temperature during 2 h: -55 $^{\circ}\text{C}$ Damp heat 5 days at: 55 $^{\circ}\text{C}$ / 95 % HR (± 5) (IEC 60115-1-23)	$\pm (1 \% + 0.05 \Omega)$	$< 0.2 \%$
Shock	Half-sine. Amplitude: 390 m/s^2 / 11 ms Frequency: 1 bump per second Number of bumps: 4000 Tested axis: (Z) (IEC 60068-2-29)	$\pm (0.25 \% + 0.05 \Omega)$	$< 0.2 \%$
Vibrations	Random frequency range: From 10 Hz to 200 Hz / ASD: 0.0104 g^2/Hz From 200 Hz to 500 Hz / ASD: 0.00312 g^2/Hz Overall acceleration level: 1.87 g_{RMS} Axis tested: 3 (X, Y, and Z) / 150 min. per axis (IEC 60068-2-64)	$\pm (0.25 \% + 0.05 \Omega)$	$< 0.2 \%$
Terminal strength	2 Nm	$\pm (0.25 \% + 0.05 \Omega)$	$< 0.2 \%$
Endurance	1000 h Pn 90 min on / 30 min off with $\theta_{\text{bottom case}} = 85^{\circ}\text{C}$ (IEC 60115-1)	$\pm (1 \% + 0.05 \Omega)$	$< 0.2 \%$

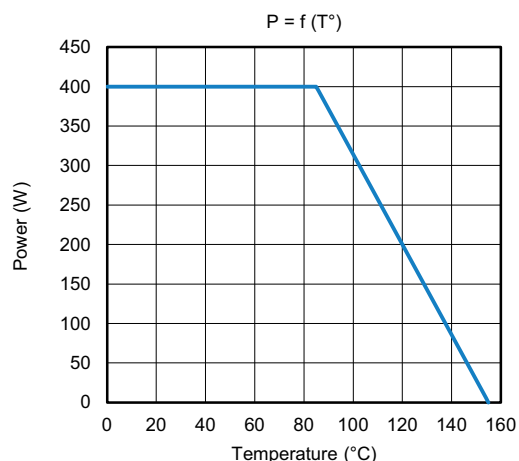
Note

- All tests were done in Vishay MCB laboratories conditions

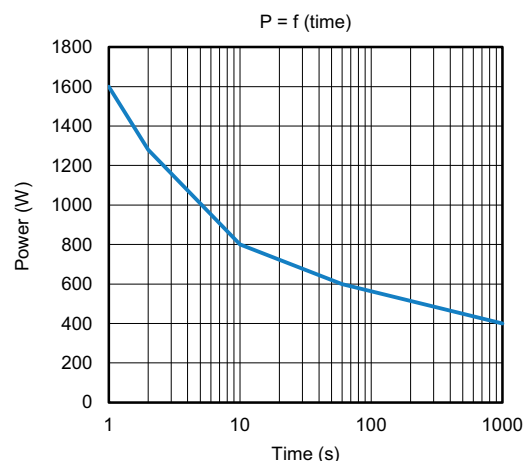
ENERGY ABSORPTION

Repetitive operation: 4.4 J, pulse $\tau = 50 \mu\text{s}$

Other τ values: consult us

DISSIPATION


Permanent Applicable Power (W) as a Function of Bottom Case Temperature (°C)

OVERLOAD


Intermittent Overload (Exceptional Operation) Bottom Case Temperature +85 °C

**ASSEMBLY**

Tightening torque for mechanical fixation: 1.8 Nm to 2 Nm

Tightening torque for electrical connections: 1.8 Nm to 2 Nm

COOLING

The temperature of the heatsink may be maintained at the specified values with:

- Forced air ventilation or internal circulation of a liquid cooling
- Heatsink contact surface: < Ra 6.3 µm
- Evenness defect: 0.05 mm max.
- Surface temperature gradient (isotherm): 20 °C max.
- Thermal compound not supplied (resistance < 0.025 °C / W / 0.05 mm preconized)
- Mounting recommendation www.vishay.com/doc?

Note

- The user must select the thermal resistance of the heatsink according to the power applied

ORDERING INFORMATION

RCEC	400	BS	100K	5 %	XXX	BO20
MODEL	STYLE	SINGLE	RESISTANCE VALUE	TOLERANCE	CUSTOM DESIGN	PACKAGING
				± 5 % ± 10 % Other on request	Optional On request: special value, tolerance, shape, etc.	

GLOBAL PART NUMBER INFORMATION

<div><div>R</div><div>C</div><div>E</div><div>C</div><div>4</div><div>0</div><div>0</div><div>B</div><div>S</div><div>2</div><div>R</div><div>7</div><div>0</div><div>J</div><div>B</div><div></div><div></div><div></div></div>	<div>1</div>	<div>2</div>	<div>3</div>	<div>4</div>	<div>5</div>	<div>6</div>
1	2	3	4	5	6	
GLOBAL MODEL	LEAD	OHMIC VALUE	TOLERANCE	PACKAGING	INDUSTRIALIZATION NUMBER	
RCEC 400	Single = BS	The first three digits are significant figures and the last specifies the number of zeros to follow, R designates decimal point. 4702 = 47 kΩ 47R0 = 47.0 Ω	J = 5 % K = 10 %	B = box	3 specific digits (if applicable)	



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