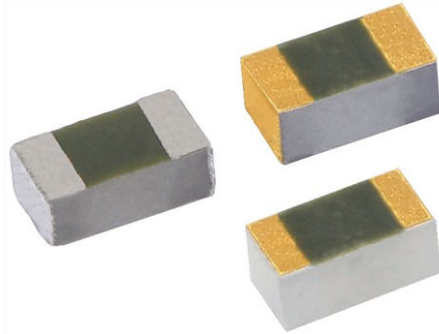


High Frequency 60 GHz High Power 1 W Thin Film Surface Mount Chip Resistor



LINKS TO ADDITIONAL RESOURCES



FCHP series chip resistors are designed with low internal reactance. They function as almost pure resistors on a very high range of frequencies. The specialized laser edge trimming allows for precision tolerances to 0.1 %.

Aluminum nitride substrate allows for higher power capability versus standard frequency chip resistor.

Modelithics and Vishay have partnered to offer free access of highly accurate, scalable advanced simulation models. Request the Modelithics Vishay model library: www.modelithics.com/mvp/vishay

FEATURES

- Thin film microwave resistors
- Operating frequency to 60 GHz
- Small standard case size (0402)
- High power (1 W)
- Small internal reactance (< 10 mΩ)
- Edge sense trimmed block resistors
- High thermal conductivity aluminum nitride substrate
- Ohmic range (50 Ω and 100 Ω)
- Low TCR (down to ± 25 ppm/°C)
- Epoxy bondable, wire bondable, and solderable termination styles
- Modelithics® library available
- Flame retardant per AEC-Q200-001
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Note

* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

APPLICATIONS

- 5G base stations and small cells
- RF and microwave test systems
- Connected car
- Internet of things (IoT)



RoHS*
Available

**HALOGEN
FREE**
Available

**GREEN
(5-2008)**
Available

STANDARD ELECTRICAL SPECIFICATIONS		
TEST	SPECIFICATIONS	TEST CONDITIONS
Material	Passivated nichrome	-
Resistance Range	50 Ω / 100 Ω	-
TCR: Absolute	± 25 ppm/°C to ± 100 ppm/°C	-55 °C to +125 °C
Tolerance: Absolute	± 0.1 % to ± 5.0 %	+25 °C
Stability: Absolute	ΔR ± 0.50 %	1000 h at 100 °C
Stability: Ratio	-	-
Voltage Coefficient	0.1 ppm/V	-
Working Voltage	30 V	-
Operating Temperature Range	-55 °C to +155 °C	-
Storage Temperature Range	-55 °C to +155 °C	-
Noise	< -35 dB	-
Shelf Life Stability: Absolute	ΔR ± 0.01 %	1 year at +25 °C



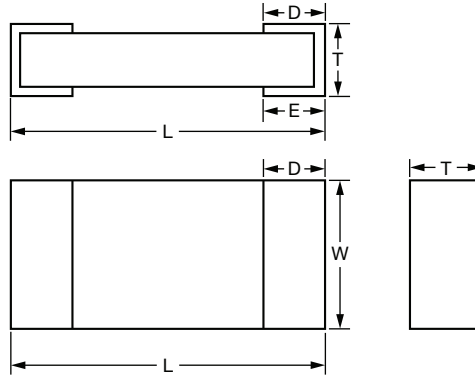
COMPONENT RATINGS

CASE SIZE	POWER RATING (mW)	WORKING VOLTAGE (V)	RESISTANCE RANGE (Ω)
0402	1000 ⁽¹⁾	30	50 / 100

Note

⁽¹⁾ Dependent on component mounting by user

DIMENSIONS in inches (millimeters)



CASE SIZE	LENGTH	WIDTH W (± 0.005)	THICKNESS T (± 0.0015)	TOP PAD D (± 0.005)	BOTTOM PAD E (± 0.005)
0402	0.042 \pm 0.008 (1.067 \pm 0.203)	0.022 (0.559)	0.015 (0.381)	0.010 (0.254)	0.010 (0.254)

MECHANICAL SPECIFICATIONS

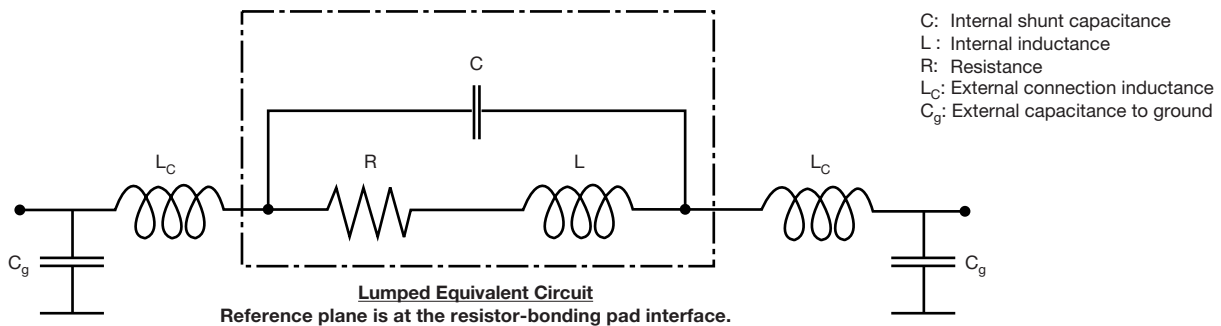
Resistive Element	Passivated nichrome
Substrate Material	Aluminum nitride
Terminations	Pre-soldered or gold
Lead (Pb)-free Option	100 % matte tin
Tin/Lead Option	Tin lead solder
Lead (Pb)-free Finish and Tin / Lead	Electroplated

GLOBAL PART NUMBER INFORMATION																
New Global Part Numbering: FCHP0402E1000BSTS																
F	C	H	P	0	4	0	2	E	1	0	0	0	B	S	T	S
GLOBAL MODEL	CASE SIZE	TCR CHARACTERISTIC		RESISTANCE	TOLERANCE	TERMINATION (1, 2, or 3 digits)		PACKAGING								
FCHP	0402	E = 25 ppm/°C H = 50 ppm/°C K = 100 ppm/°C		The first 3 digits are significant figures and the last digit specifies the number of zeros to follow. "R" designates the decimal point. Example: 10R0 = 10 Ω 1000 = 100 Ω	B = 0.1 % D = 0.5 % F = 1 % G = 2 % J = 5 %	T = top sided Au (gold) term Au over Ni epoxy bond only RoHS-compliant - e4 B = wraparound Sn/Pb solder nickel barrier G = wraparound Au over Ni (gold) termination epoxy bondable RoHS-compliant - e4 S = wraparound lead (Pb)-free solder RoHS-compliant - e3		BS = BULK 100 min., 1 mult. W0 = WAFFLE 100 min., 100 mult. WS = WAFFLE 100 min., 1 mult. W1 = 100 min., 1 mult. (item single lot date code) WP = 100 min., 1 mult. (package unit single lot date code) TAPE AND REEL T0 = 100 min., 100 mult. T1 = 1000 min., 1000 mult. ⁽¹⁾ T3 = 300 min., 300 mult. T5 = 500 min., 500 mult. TF = full reel TS = 100 min., 1 mult. TI = 100 min., 1 mult. (item single lot date code) TP = 100 min., 1 mult. (package unit single lot date code)								
Historical Part Number Example: FCHP0402E1000BST1 (for reference purposes only)																
FCHP	0402	E		1000	B	S		T								
SERIES	CASE SIZE	TCR CHARACTERISTIC		RESISTANCE	TOLERANCE	TERMINATION		PACKAGING								

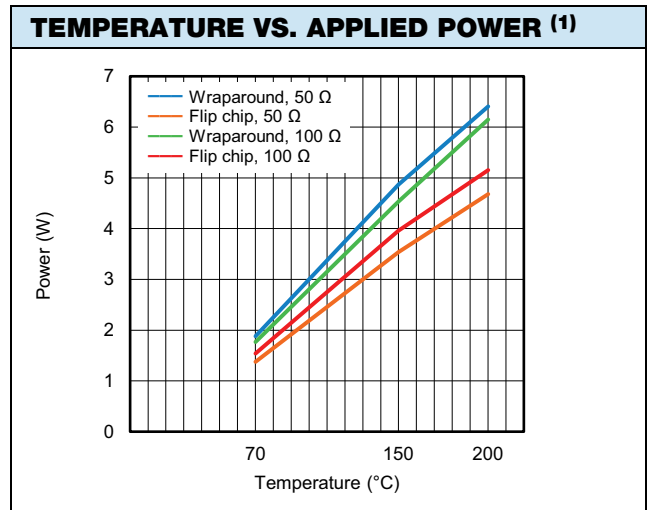
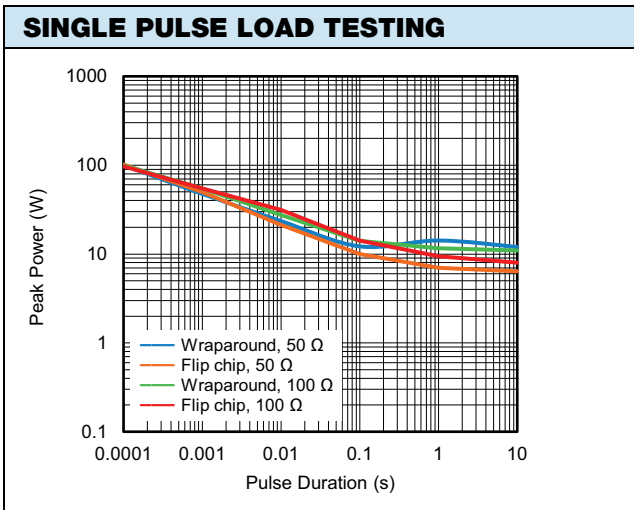
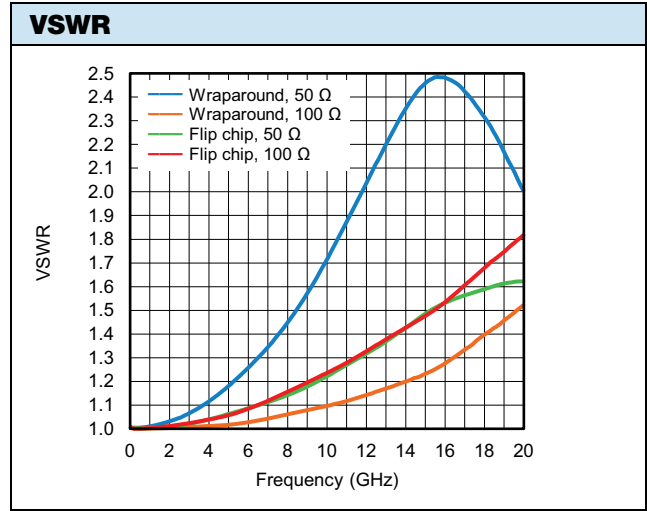
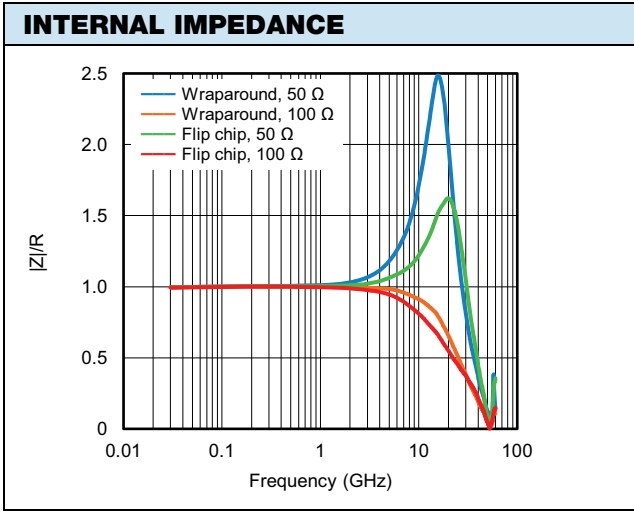
Note

(1) Preferred packaging code

TYPICAL HIGH FREQUENCY PERFORMANCE ELECTRICAL MODEL AND TESTING

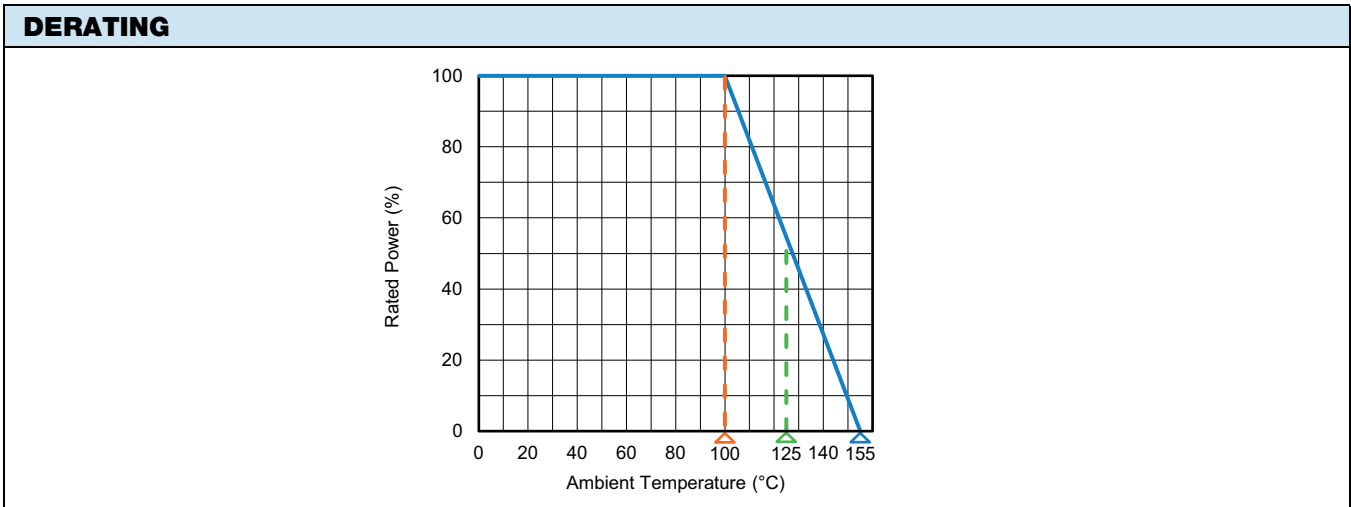


The lumped circuit above was used to model the data at the bonding pad-resistor reference plane. High frequency testing was performed by Modelithics, Inc. on parts mounted to quartz test boards. Quartz test boards were chosen to minimize the contribution of the board effects at high frequencies.



Note

(1) Chip surface temperature measured using FLIR SC645 thermal imaging system. Thermal imaging and load life testing conducted by mounting device to a 1.6" x 3.7" test card with 3.5 mil copper plating on both sides. Thermal vias on 50 mil centers were utilized for heat transfer between surfaces





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.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. 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.

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

 [View FCHP0402E50R0BTT1 on WIN SOURCE](#)

 [Vishay Information](#)

Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management