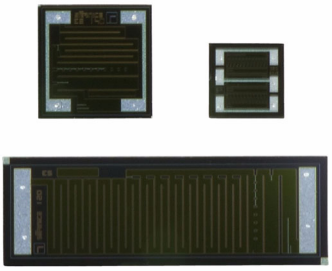
High Temperature (215 °C) Wirebondable Chip Resistors and Resistor Networks



FEATURES

- Operating temperature range: - 55 °C; + 215 °C
- Storage temperature: - 55 °C; + 230 °C
- Wirebondable (aluminum pads)
- Large selection of sizes available
- Custom networks available on request (CNHT)
- Temperature coefficient down to 25 ppm (- 55 °C; + 215 °C)
- Tolerance down to 0.05 %
- Compliant to RoHS directive 2002/95/EC

Pb-free
RoHS COMPLIANT
GREEN (5-2008)**

INTRODUCTION

For applications such as down hole applications, the need for parts able to withstand very severe conditions (temperature as high as 215 °C powered or up to 230 °C un-powered) has leaded Vishay Sfernice to push out the limit of the thin film technology.

Designers might read the application note “Power Dissipation Considerations in High Precision Vishay Sfernice Thin Film Chip Resistors and Arrays (P, PRA etc…) (High Temperature Application) www.vishay.com/doc?53047 in conjunction with this datasheet to help them to properly design their PCBs and get the best performances of the RMKHT.

Vishay Sfernice research and development engineers will be willing to support any customer design considerations.

TYPICAL PERFORMANCE

	ABS	TRACKING (1)
TCR	25 ppm/°C	2 ppm/°C
	ABS	RATIO (1)
TOL.	0.05 %	0.02 %

Note

(1) When applicable (networks only)

MECHANICAL SPECIFICATIONS	
Resistive element	Nichrome (NiCr)
Substrate material	Silicon (size 22, 33, 55, 515) - alumina (other sizes)
Bonding pads	Aluminum (Al)
Passivation	Silicon nitride (Si_3N_4)
Back metallization (1)	Gold on nickel barrier

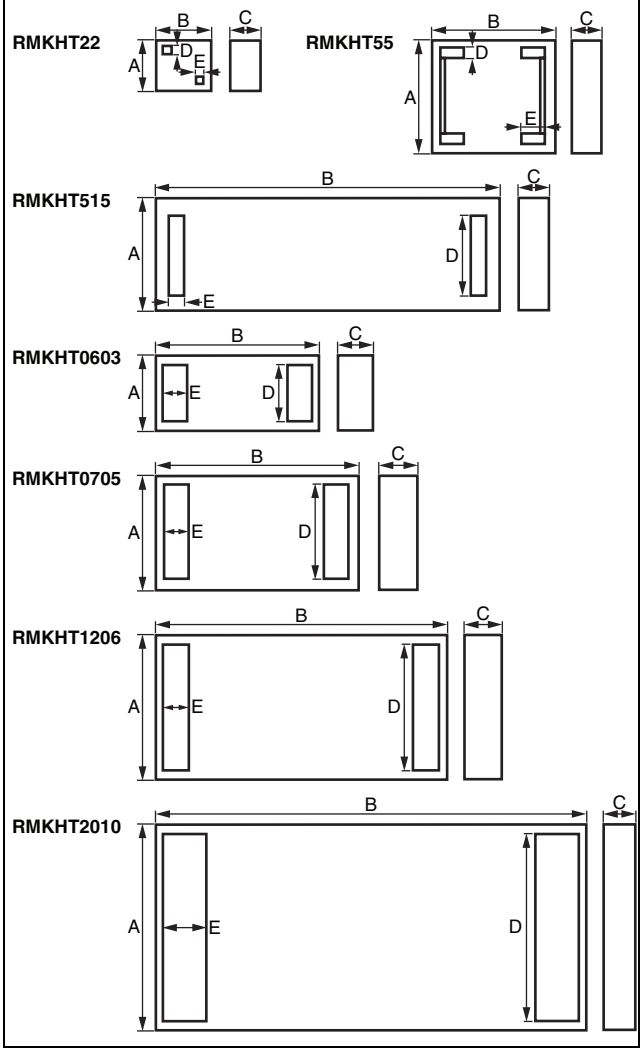
Note

(1) When applicable (only on alumina substrate)

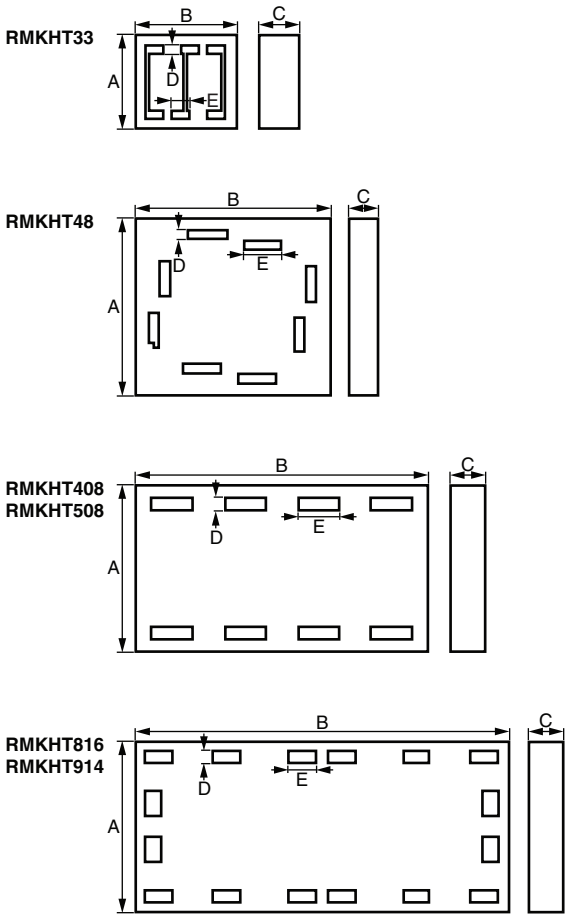
** Please see document “Vishay Material Category Policy”: www.vishay.com/doc?99902

SCHEMATIC AND PATTERN

WIREBONDABLE CHIP RESISTORS



WIREBONDABLE RESISTORS NETWORKS



DIMENSIONS in millimeters

SERIES	A ± 0.1	B ± 0.1	C	D	E
RMKHT22	0.61	0.61	0.4 max.	0.08	0.08
RMKHT55	1.345	1.345	0.4 max.	0.11	0.26
RMKHT515	1.345	3.775	0.4 max.	0.96	0.16
RMKHT0603	0.9	1.8	0.4 max.	0.68	0.265
RMKHT0805	1.25	2.05	0.4 max.	1.03	0.265
RMKHT1206	1.725	3.2	0.4 max.	1.505	0.29
RMKHT2010	2.64	5.23	0.4 max.	2.42	0.518

DIMENSIONS in millimeters

SERIES	A ± 0.1	B ± 0.1	C	D	E
RMKHT33	0.855	0.855	0.4 max.	0.08	0.16
RMKHT48	2	2	0.4 max.	0.1	0.39
RMKHT408	1.6	2.6	0.4 max.	0.11	0.36
RMKHT508					
RMKHT816	1.7	3.4	0.4 max.	0.13	0.25
RMKHT914					

STANDARD ELECTRICAL SPECIFICATIONS - Bare Resistors Chips		
TEST	**SPECIFICATIONS**	**CONDITIONS**
Series	**22, 55, 515, 0603, 0805, 1206, 2010**	
Ohmic range	10R to 6M (depending on series)	
Temperature coefficient (3)	25 ppm/°C, 50 ppm/°C	- 55 °C; + 215 °C
Tolerance	0.05 %, 0.1 %, 0.5 %, 1 %	
Power rating (Pn) (2)	22 = 5 mW, 55 = 25 mW, 515 = 50 mW 0603 = 12.5 mW, 0805 = 20 mW, 1206 = 33 mW, 2010 = 100 mW	215 °C
Limiting Voltage	From 75 V to 300 V (depending on size) (1)	
Operating temperature range	- 55 °C; + 215 °C	
Max. temperature resistive element	220 °C	
Max. substrate temperature	230 °C	
Load life stability	0.50 %	1000 h/215 °C (ambient) at Pn
Storage temperature range	- 55 °C; + 230 °C	
Shelf life stability	0.35 % typ. (0.5 % max.)	4000 h/230 °C

Note

(1) See table page 4

STANDARD ELECTRICAL SPECIFICATIONS - Bare Resistors Networks		
TEST	**SPECIFICATIONS**	**CONDITIONS**
Series	**33, 48, 408, 508, 816, 914**	
Ohmic range	10R to 1M (depending on series)	
Absolute temperature coefficient	25 ppm/°C, 50 ppm/°C	- 55 °C; + 215 °C
Ratio TCR	2 ppm/°C, 5 ppm/°C	- 55 °C; + 215 °C
Absolute tolerance	0.05 %, 0.1 %, 0.5 %, 1 %	
Ratio tolerance	0.02 %, 0.05 %, 0.2 %, 0.1 %	
Power rating (Pn) (3)	10 mW per resistor	215 °C
Limiting Voltage	100 V	
Operating temperature range	- 55 °C; + 215 °C	
Max. temperature resistive element	220 °C	
Max. substrate temperature	230 °C	
Load life stability	0.50 %	1000 h/215 °C (ambient) at Pn
Load life stability on ratio	0.5 %	1000 h/215 °C (ambient) at Pn
Storage temperature range	- 55 °C; + 230 °C	
Shelf life stability	0.35 % typ. (0.5 % max.)	4000 h/230 °C

Notes

(2) Pn is intended with no back side metallized. For power handling improvement, please refer to application note 53047: Power Dissipation Cosiderations in High Precision Vishay Sfernice Thin Film Chip Resistors and Arrays (High Temperature Applications) www.vishay.com/doc?53047 and consult Vishay Sfernice

(3) **Temperature Coefficient**

Bare Resistors Chips

Y	10 ppm/°C 25 ppm/°C	- 55 °C; + 155 °C - 55 °C; + 215 °C
E	25 ppm/°C 50 ppm/°C	- 55 °C; + 155 °C - 55 °C; + 215 °C

Bare Resistors Networks

Y	10 ppm/°C abs.	1 ppm/°C tracking	- 55 °C; + 155 °C
	25 ppm/°C abs.	2 ppm/°C tracking	- 55 °C; + 215 °C
E	25 ppm/°C abs.	2 ppm/°C tracking	- 55 °C; + 155 °C
	50 ppm/°C abs.	5 ppm/°C tracking	- 55 °C; + 215 °C

SERIES	**OHMIC RANGE**			
	CT: Y		**CT: E**	
	MIN.	**MAX.**	**MIN.**	**MAX.**
22	50 Ω	300 kΩ	10 Ω	500 kΩ
55	1 kΩ	750 kΩ	10 Ω	2 MΩ
515	1 kΩ	2 MΩ	20 Ω	5 MΩ
0603	39 Ω	320 kΩ	10 Ω	320 kΩ
0805	39 Ω	511 kΩ	10 Ω	725 kΩ
1206	39 Ω	1.8 MΩ	10 Ω	2.7 MΩ
2010	39 Ω	3 MΩ	10 Ω	6 MΩ

SERIES	**OHMIC RANGE**			
	CT: Y		**CT: E**	
	MIN.	**MAX.**	**MIN.**	**MAX.**
33	1 kΩ	250 kΩ	100 Ω	1 MΩ
48	1 kΩ	200 kΩ	100 Ω	800 kΩ
408	1 kΩ	200 kΩ	100 Ω	400 kΩ
508	1 kΩ	200 kΩ	500 Ω	400 kΩ
816	1 kΩ	200 kΩ	100 Ω	400 kΩ
914	1 kΩ	200 kΩ	100 Ω	200 kΩ

SIZE	Limiting Voltage (in V)
22	100 V
55	100 V
515	100 V
0603	75 V
0805	150 V
1206	200 V
2010	300 V

POPULAR OPTION

Back side metalized
Option to order: 06 (not available for sizes 22, 33, 55, 515)
Please refer to Application Note 53047 "Power Considerations in High Precision Vishay Sfernice Thin Film Chip Resistors and Arrays (High Temperature Applications) www.vishay.com/doc?53047 to evaluate performances improvement depending on process (brazing or gluing). Choice of PCB will be determinant.

GLOBAL PART NUMBERING INFORMATION - Bare Resistors Chips

Bare Chip Resistors

R	M	K	H	T	0	6	0	3	Y	1	0	0	1	B	A	0	6

GLOBAL MODEL	SIZE	TCR	VALUE	TOLERANCE	PADS	OPTION
RMKHT	**22** **55** **515** **0603** **0805** **1206** **2010**	**Y** **E**	The first 3 digits are significant figures and the last digit specifies the number of zeros to follow. R designates decimal point **10R0** = 10 Ω **3901** = 3900 Ω **1004** = 1 MΩ	**W** = 0.05 % **B** = 0.1 % **D** = 0.5 % **F** = 1 %	**A**: Aluminum	**Blank** = No option **06** = Back side metallized

GLOBAL PART NUMBERING INFORMATION - Bare Resistors Networks

Bare Resistors Networks

R	M	K	H	T	8	1	6	E	1	0	0	1	B	W	A	0	6

GLOBAL MODEL	SIZE	TCR	VALUE	ABS. TOLERANCE	TOLERANCE RATIO	PADS	OPTION
RMKHT	**33** **48** **408** **508** **816** **914**	**Y** **E**	The first 3 digits are significant figures and the last digit specifies the number of zeros to follow. R designates decimal point **10R0** = 10 Ω **3901** = 3900 Ω **1004** = 1 MΩ	**W** = 0.05 % **B** = 0.1 % **D** = 0.5 % **F** = 1 %	**P** = 0.02 % **W** = 0.05 % **D** = 0.5 % **B** = 0.1 %	**A**: Aluminum	**Blank** = No option **06** = Back side metallized

GLOBAL PART NUMBERING INFORMATION - Bare Custom Networks

Custom Networks

C	N	H	T	9	9	9	9

GLOBAL MODEL	REFERENCE
CNHT	**9999**

Note

- A specific reference number is assigned by Vishay Sfernice

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