High Temperature High Stability Thin Film Chip Resistor

Resistive Product Solutions

Features:

- Excellent long-term stability
- Operating temperature up to 175°C
- Advanced sulfur resistance verified according to ASTM B 809
- RoHS compliant, REACH compliant, lead free, and halogen free
- AEC-Q200 compliant



Electrical Specifications											
Type/Code	Power Rating (W)	Maximum Working	Maximum Overload	TCR	Ohmic Range (Ω) and Tolerance						
	@ 70ºC	Voltage (V) (1)	Voltage (V)	(ppm/°C)	±0.05%	±0.1%	±0.25%	±0.5%	±1%		
	0.063	50	100	± 25	10.0 - 12K 10 - 220K			220K			
KNCL0402	0.003	50	100	± 50	49.9 - 121	10 - 220K					
	0.1	75	150	± 25	10.0 221	10 - 680K					
KINCE0003	0.1			± 50	49.9 - <u>3</u> 3N						
DNCE0905	0.125	150	200	± 25	40.0 F1K	10 - 1M					
RINCEU005	0.125	150	300	± 50	49.9 - DIK						
	0.25	200	400	± 25	10.0 1001						
RNCE1206	0.25			± 50	49.9 - 100K		10 -				
(1) Lesser of $\sqrt{(P^*R)}$ or maximum working voltage											

Operating temperature range is -55°C to +175°C

Mechanical Specifications											
Type/Code	L Body Length	W Body Width	H Body Height	I₁ Top Termination	I ₂ Bottom Termination	Unit					
	0.039 ± 0.004	0.020 ± 0.002	0.012 ± 0.002	0.008 ± 0.004	0.008 ± 0.004	inches					
RNCE0402	1.00 ± 0.10	0.50 ± 0.05	0.30 ± 0.05	0.20 ± 0.10	0.20 ± 0.10	mm					
	0.063 ± 0.006	0.031 ± 0.004	0.018 ± 0.004	0.012 ± 0.008	0.012 ± 0.008	inches					
RINCEU003	1.60 ± 0.15	0.80 ± 0.10	0.45 ± 0.10	0.30 ± 0.20	0.30 ± 0.20	mm					
	0.079 ± 0.006	0.049 ± 0.006	0.022 ± 0.004	0.014 ± 0.008	0.016 ± 0.008	inches					
RINGEUOUJ	2.00 ± 0.15	1.25 ± 0.15	0.55 ± 0.10	0.35 ± 0.20	0.40 ± 0.20	mm					
	0.122 ± 0.006	0.063 ± 0.006	0.022 ± 0.004	0.018 ± 0.008	0.020 ± 0.008	inches					

 0.55 ± 0.10

 3.10 ± 0.15

RNCE1206

 0.50 ± 0.20

mm

 0.45 ± 0.20

 1.60 ± 0.15

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Performance Specifications										
Test	Test Method	Test Specifications	Test Condition							
Temperature Coefficient of Resistance (TCR)	JIS-C-5201-1 4.8 IEC-60115-1 4.8	Refer to Electrical Specification table	At 25 / -55°C and 25°C / +125°C, 25°C is the reference temperature							
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	± (0.1% + 0.01Ω) No visual damage	2.5 times RCWV or max. overload voltage whichever is less for 5 seconds							
Leaching	JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1	>95% coverage No visual damage	260 ± 5°C for 30 seconds							
Resistance to Soldering Heat	JIS-C-5201-1 4.18 IEC-60115-1 4.18	± (0.1% + 0.01Ω) No visual damage	260 ± 5°C for 10 seconds							
Insulation Resistance	JIS-C-5201-1 4.6 IEC-60115-1 4.6	≥ 10GΩ	Apply 100VDC for 1 minute							
Temperature Cycling	JESD22 Method JA-104	± (0.1% + 0.01Ω) No visual damage	1000 cycles (-55°C to +155°C). Measurement at 24 ± 4 hours after test conclusion. 30 minutes maximum dwell time at each temperature extreme.							
Resistance to Solvent	MIL-STD-202 Method 215	± (0.1% + 0.01Ω) No visual damage	Add aqueous wash chemical - OKEM clean or equivalent							
Biased Humidity	MIL-STD-202 Method 103	± (0.1% + 0.01Ω)	1000 hours; 85°C / 85% RH, 10% of operating power. Measurement at 24 ± 4 hours after test conclusion.							
High Temperature Exposure (Storage)	MIL-STD-202 Method 108	@155°C standard temperature $\pm (0.1\% + 0.01\Omega)$ @175°C Advanced temperature $\pm (0.3\% + 0.01\Omega)$	1000 hours. Unpowered. Measurement at 24 ± 4 hours after test conclusion.							
Operation Life	MIL-STD-202 Method 108	$\begin{array}{c} @70^{\circ}\text{C standard temperature} \\ \pm (0.1\% + 0.01\Omega) \\ \\ @85^{\circ}\text{C Advanced temperature} \\ \pm (0.3\% + 0.01\Omega) \end{array}$	1000 hours; maximum specified operating temperature at 100% rated power without derating. Measurement at 24 ± 4 hours after test conclusion.							
External Visual	MIL-STD-883 Method 2009	No visual damage	Electrical test not required Inspect device construction, marking and workmanship.							
Mechanical Shock	MIL-STD-202 Method 213	± (0.1% + 0.01Ω)	Wave form: Tolerance for half sine shock pulse. Peak value is 100 g. Normal duration (D) is 6 ms.							
Vibration	MIL-STD-202 Method 204	± (0.1% + 0.01Ω)	5 g for 20 minutes, 12 cycles each of 3 orientations. Note: test from 10 - 2000 H							
ESD	AEC-Q200-002 or ISO/DIS 10605	± (0.5% + 0.01Ω)	Human body model 0402: 400 V, 0603: 1000 V 0805: 1500 V, 1206: 2000 V							

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Performance Specifications (cont.)										
Test	Test Method	Test Specifications	Test Condition							
Solderability	J-STD-002	>95% Coverage No visual damage	(1) 4 hours 155°C dry heat (2) 245 ± 5°C 3 seconds							
Terminal Strength (SMD)	AEC Q200-006	No breakage	Pressurizing force for 60 seconds 0402 / 0603: 8 N 0805 / 1206: 17.7 N							
Board Flex	AEC Q200-005	± (0.1% + 0.01Ω)	Bending once for 60 seconds. 3mm							
Sulfur Test (FoS)	ASTM B809-95 ANSI/FIA-977	± (1% + 0.01Ω)	105 ± 2°C, unpowered for 1000 hours							



Soldering Condition



The peak temperature of soldering heat is 260°C for 10 seconds.

- Rework temperature (hot air equipment): 350°C, 3 ~ 5 seconds
- Recommended reflow methods: •
 - IR, vapor phase oven, hot air oven. If reflow temperature exceed the recommended profile, devices may not meet the performance requirements.

Recommended Land Pattern



D										
Type/Code	A	В	C	Unit						
	0.020	0.063	0.028	inches						
RNCE0402	0.50	1.60	0.70	mm						
DNCE0602	0.031	0.094	0.039	inches						
RICE0003	0.80	2.40	1.00	mm						
RNCE0805	0.051	0.114	0.055	inches						
	1.30	2.90	1.40	mm						
	0.087	0.165	0.067	inches						
KNCE1206	2.20	4.20	1.70	mm						

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Reel Specifications											
Type/Code	5	Size	ØA	ØB	ØC	ØD	W	ØM	Unit		
0402	7"		0.079 ± 0.020	0.531 ± 0.039	0.827 ± 0.039	2.362 ± 0.039	0.453 ± 0.079	7.008 ± 0.079	inches		
0402	1"	TUK/Reel	2.00 ± 0.50	13.50 ± 1.00	21.00 ± 1.00	60.00 ± 1.00	11.50 ± 2.00	178.00 ± 2.00	mm		
0602/0805/1206	7"	EK/Dool	0.079 ± 0.020	0.531 ± 0.039	0.827 ± 0.039	2.362 ± 0.039	0.453 ± 0.079	7.008 ± 0.079	inches		
0003/0605/1206	1	SK/REEI	2.00 ± 0.50	13.50 ± 1.00	21.00 ± 1.00	60.00 ± 1.00	11.50 ± 2.00	178.00 ± 2.00	mm		

Paper Tape Specifications



Type/Code	А	В	W	E	F	Unit
	0.028 ± 0.004	0.047 ± 0.004	0.315 ± 0.008	0.069 ± 0.004	0.138 ± 0.002	inches
KINCE0402	0.70 ± 0.10	1.20 ± 0.10	8.00 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	mm
DNCE0602	0.041 ± 0.008	0.071 ± 0.008	0.315 ± 0.008	0.069 ± 0.004	0.138 ± 0.002	inches
KINCE0003	1.05 ± 0.20	1.80 ± 0.20	8.00 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	mm
DNCEOROE	0.061 ± 0.008	0.091 ± 0.008	0.315 ± 0.008	0.069 ± 0.004	0.138 ± 0.002	inches
RINCEU605	1.55 ± 0.20	2.30 ± 0.20	8.00 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	mm
DNCE1000	0.075 ± 0.008	0.138 ± 0.008	0.315 ± 0.008	0.069 ± 0.004	0.138 ± 0.002	inches
RINCE 1200	1.90 ± 0.20	3.50 ± 0.20	8.00 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	mm
Type/Code	G	Н	Т	ØD	Р	Unit
	0.157 ± 0.004	0.079 ± 0.002	0.018 ± 0.004	0.059 +0.004 / -0	0.079 ± 0.004	inches
KINCE0402	4.00 ± 0.10	2.00 ± 0.05	0.45 ± 0.10	1.50 +0.1 / -0	2.00 ± 0.10	mm
PNCE0602	0.157 ± 0.004	0.079 ± 0.002	0.024 ± 0.004	0.059 +0.004 / -0	0.157 ± 0.004	inches
KINCE0003	4.00 ± 0.10	2.00 ± 0.05	0.60 ± 0.10	1.50 +0.1 / -0	4.00 ± 0.10	mm
DNCEOROE	0.157 ± 0.004	0.079 ± 0.002	0.030 ± 0.004	0.059 +0.004 / -0	0.157 ± 0.004	inches
RINCEU005	4.00 ± 0.10	2.00 ± 0.05	0.75 ± 0.10	1.50 +0.1 / -0	4.00 ± 0.10	mm
BNCE1206	0.157 ± 0.004	0.079 ± 0.002	0.030 ± 0.004	0.059 +0.004 / -0	0.157 ± 0.004	inches
RNCE1206	4.00 ± 0.10	2.00 ± 0.05	0.75 ± 0.10	1.50 +0.1 / -0	4.00 ± 0.10	mm

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						Part N	/larking	3				
				E96	and E24	4 Value	s for 080)5 and	1206			
The	nominal re	esistand	e is marke	ed on the	surface	of the ove	ercoating	with the	use of		Aug.	
four	characte	er mark	ings.									1211
												1 21KO
					E2	4 Value	es for 06	03				1.2 11(22
The	nominal re	esistand	e is marke	ed on the	surface	of the over	ercoating	with the	use of			
thre	e charact	ter mar	kings.				0					A77
1. Va	alues that	are bot	h E24 and	E96 follo	ow E96 m	arking ru	les.					-+//
												477Ω
					E9	6 Value	es for 06	03				
wo cha	aracter nui	mber is	assigned t	o each s	tandard F	R-Value (E96) as sl	hown in	the chart b	below.		
	This	is follow	ved by one	e alpha c	haracter	which is u	used as a	multipli	er.		Assess	03X
		Each	letter from	"Y" - "F"	represen	ts a spec	ific multipl	lier.				USA
												10.5Ω
Chip	Marking		Va	lue			Alpha	h Chara	acter = Mu	ltiplier		
01Β 10.0 × 100 = 1 ΚΩ							$V_{-0.1}$		~			
	25.0	-	10.0 × 10	470			Y = 0.1		C =	= 1000		
	25C	1	7.8 x 1000) = 17.8	KΩ		Y = 0.1 X = 1		D =	1000 1000		
	25C 93D	1 [°] 90	7.8 x 1000).9 x 1000) = 17.8 0 = 909	ΚΩ ΚΩ		Y = 0.1 X = 1 A = 10		D = E = 1	1000 10000 100000		
	25C 93D	1 90	7.8 x 1000 0.9 x 1000	0 = 17.8 0 = 909	ΚΩ ΚΩ		X = 1 A = 10 B = 100		C = D = E = 1 F = 1	1000 10000 100000 000000		
	25C 93D	1 90	7.8 x 1000 0.9 x 1000	0 = 17.8 0 = 909	Κ <u>Ω</u> ΚΩ		Y = 0.1 X = 1 A = 10 B = 100		D = E = 1 F = 1	1000 10000 100000 000000		
	25C 93D	1 ⁻ 9(7.8 x 1000).9 x 1000	0 = 17.8 0 = 909	<u>KΩ</u> KΩ E	96	Y = 0.1 X = 1 A = 10 B = 100		D = E = 1 F = 1	± 1000 10000 100000 000000		I
#	25C 93D R-Value	1 90	R-Value	= 17.8 0 = 909	KΩ KΩ E R-Value	96	Y = 0.1 X = 1 A = 10 B = 100	#	E = 1 F = 1 R-Value	= 1000 10000 100000 000000	R-Value	
# 01	25C 93D R-Value 10.0	1 90 # 17	R-Value 14.7	# 33 24	KΩ KΩ KΩ E R-Value 21.5	96 # 49 50	Y = 0.1 X = 1 A = 10 B = 100 R-Value 31.6	#	C = D = E = 1 F = 1 R-Value 46.4	1000 10000 100000 000000 # 81 82	R-Value 68.1	
# 01 02 03	25C 93D R-Value 10.0 10.2 10.5	# 17 18 19	R-Value 14.7 15.0 15.4	# 33 34 35	KΩ KΩ E R-Value 21.5 22.1 22.6	96 # 49 50 51	Y = 0.1 X = 1 A = 10 B = 100 R-Value 31.6 32.4 33.2	# 65 66 67	C = D = E = 1 F = 1 R-Value 46.4 47.5 48.7	1000 10000 000000 # 81 82 83	R-Value 68.1 69.8 71.5	
# 01 02 03 04	25C 93D R-Value 10.0 10.2 10.5 10.7	# 17 17 18 19 20	R-Value 14.7 15.0 15.4 15.8	() = 17.8 () = 17.8 () = 909 () = 909 () = 909 () = 33 () = 33	KΩ KΩ KΩ E R-Value 21.5 22.1 22.6 23.2	96 # 49 50 51 52	Y = 0.1 X = 1 A = 10 B = 100 R-Value 31.6 32.4 33.2 34.0	# 65 66 67 68	C = D = E = 1 F = 1 R-Value 46.4 47.5 48.7 49.9	± 1000 10000 100000 000000 # 81 82 83 84	R-Value 68.1 69.8 71.5 73.2	-
# 01 02 03 04 05	25C 93D R-Value 10.0 10.2 10.5 10.7 11.0	# 17 17 18 19 20 21	R-Value 14.7 15.0 15.4 16.2	# 33 34 35 36 37	KΩ KΩ KΩ E R-Value 21.5 22.1 22.6 23.2 23.7	96 # 49 50 51 52 53	Y = 0.1 X = 1 A = 10 B = 100 R-Value 31.6 32.4 33.2 34.0 34.8	# 65 66 67 68 69	C = D = E = 1 F = 1 R-Value 46.4 47.5 48.7 49.9 51.1	± 1000 10000 100000 000000 # 81 82 83 84 85	R-Value 68.1 69.8 71.5 73.2 75.0	
# 01 02 03 04 05 06	25C 93D R-Value 10.0 10.2 10.5 10.7 11.0 11.3	# 17 17 18 19 20 21 22	R-Value 14.7 15.0 15.4 15.8 16.2 16.5	# 33 34 35 36 37 38	KΩ KΩ KΩ E R-Value 21.5 22.1 22.6 23.2 23.7 24.3	96 # 49 50 51 52 53 53 54	Y = 0.1 X = 1 A = 10 B = 100 R-Value 31.6 32.4 33.2 34.0 34.8 35.7	# 65 66 67 68 69 70	C = D = E = 1 F = 1 R-Value 46.4 47.5 48.7 49.9 51.1 52.3	± 1000 10000 100000 000000 # 81 82 83 84 85 86	R-Value 68.1 69.8 71.5 73.2 75.0 76.8	
# 01 02 03 04 05 06 07	25C 93D R-Value 10.0 10.2 10.5 10.7 11.0 11.3 11.5	# 17 90 # 17 18 19 20 21 22 23	R-Value 14.7 15.0 15.4 15.8 16.2 16.5 16.9	(0) = 17.8 (0) = 17.8 (0) = 909 (0) = 909 (1) = 333 (3) = 333 (3) = 335 (3) = 3355 (3) = 3355 (3) = 3355 (3) = 3355 (3) = 3355 (3) = 335	KΩ KΩ KΩ R-Value 21.5 22.1 22.6 23.2 23.7 24.3 24.9	96 # 49 50 51 52 53 54 55	Y = 0.1 X = 1 A = 10 B = 100 8 = 100 31.6 32.4 33.2 34.0 34.8 35.7 36.5	# 65 66 67 68 69 70 71	C = D = E = 1 F = 1 R-Value 46.4 47.5 48.7 49.9 51.1 52.3 53.6	± 1000 10000 100000 000000 # 81 82 83 84 85 86 87	R-Value 68.1 69.8 71.5 73.2 75.0 76.8 78.7	
# 01 02 03 04 05 06 07 08	25C 93D R-Value 10.0 10.2 10.5 10.7 11.0 11.3 11.5 11.8	# 17 90 17 18 19 20 21 22 23 24	R-Value 14.7 15.0 15.4 15.8 16.2 16.5 16.9 17.4	# 33 34 35 36 37 38 39 40	KΩ KΩ KΩ R-Value 21.5 22.1 22.6 23.2 23.7 24.3 24.9 25.5	96 # 49 50 51 52 53 54 55 55 56	Y = 0.1 X = 1 A = 10 B = 100 R-Value 31.6 32.4 33.2 34.0 34.8 35.7 36.5 37.4	# 65 66 67 68 69 70 71 71 72	C = D = E = 1 F = 1 R-Value 46.4 47.5 48.7 49.9 51.1 52.3 53.6 53.6 54.9	# 81 82 83 84 85 86 87 88	R-Value 68.1 69.8 71.5 73.2 75.0 76.8 78.7 80.6	
# 01 02 03 04 05 06 07 08 09	25C 93D R-Value 10.0 10.2 10.5 10.7 11.0 11.3 11.5 11.8 12.1	# 17 18 19 20 21 22 23 24 25	R-Value 14.7 15.0 15.4 15.8 16.2 16.5 16.9 17.4 17.8	# 33 34 35 36 37 38 39 40 41	KΩ KΩ KΩ R-Value 21.5 22.1 22.6 23.2 23.7 24.3 24.9 25.5 26.1	96 # 49 50 51 52 53 54 55 56 57	Y = 0.1 X = 1 A = 10 B = 100 R-Value 31.6 32.4 33.2 34.0 34.8 35.7 36.5 37.4 38.3	# 65 66 67 68 69 70 71 71 72 73	C = D = E = 1 F = 1 46.4 47.5 48.7 49.9 51.1 52.3 53.6 54.9 56.2	± 1000 10000 100000 000000 # 81 82 83 84 85 86 87 88 89	R-Value 68.1 69.8 71.5 73.2 75.0 76.8 78.7 80.6 82.5	
# 01 02 03 04 05 06 07 08 09 10	25C 93D R-Value 10.0 10.2 10.5 10.7 11.0 11.3 11.5 11.8 12.1 12.4	# 17 90 # 17 18 19 20 21 22 23 24 25 26	R-Value 14.7 15.0 15.4 15.8 16.2 16.5 16.9 17.4 17.8 18.2	# 33 34 35 36 37 38 39 40 41 42	KΩ KΩ KΩ R-Value 21.5 22.1 22.6 23.2 23.7 24.3 24.9 25.5 26.1 26.7	96 # 49 50 51 52 53 54 55 56 57 58	Y = 0.1 X = 1 A = 10 B = 100 R-Value 31.6 32.4 33.2 34.0 34.8 35.7 36.5 37.4 38.3 39.2	# 65 66 67 68 69 70 71 71 72 73 74	C = D = E = 1 F = 1 46.4 47.5 48.7 49.9 51.1 52.3 53.6 54.9 56.2 57.6	# 1000 100000 000000 # 81 82 83 84 85 86 87 88 89 90	R-Value 68.1 69.8 71.5 73.2 75.0 76.8 78.7 80.6 82.5 84.5	
# 01 02 03 04 05 06 07 08 09 10 11	25C 93D R-Value 10.0 10.2 10.5 10.7 11.0 11.3 11.5 11.8 12.1 12.4 12.7	# 17 90 7 18 19 20 21 22 23 24 25 26 27	R-Value 14.7 15.0 15.4 15.8 16.2 16.5 16.9 17.4 17.8 18.2 18.7	$ \begin{array}{c} # \\ $	KΩ KΩ KΩ KΩ R-Value 21.5 22.1 22.6 23.2 23.7 24.3 24.3 25.5 26.1 26.7 27.4	96 # 49 50 51 52 53 54 55 56 57 58 59	Y = 0.1 X = 1 A = 10 B = 100 R-Value 31.6 32.4 33.2 34.0 34.8 35.7 36.5 37.4 38.3 39.2 40.2	# 65 66 67 68 69 70 71 71 72 73 74 75	C = D = E = 1 F = 1 46.4 47.5 48.7 49.9 51.1 52.3 53.6 54.9 56.2 57.6 59.0	 1000 10000 100000 000000 000000 # 81 82 83 84 85 86 87 88 89 90 91 	R-Value 68.1 69.8 71.5 73.2 75.0 76.8 78.7 80.6 84.5 86.6	
# 01 02 03 04 05 06 07 08 09 10 11 12	25C 93D R-Value 10.0 10.2 10.5 10.7 11.0 11.3 11.5 11.8 12.1 12.4 12.7 13.0	# 17 18 19 20 21 22 23 24 25 26 27 28	R-Value 14.7 15.0 15.4 15.8 16.2 16.5 16.9 17.4 17.8 18.2 18.7 19.1	$ \begin{array}{c} # \\ $	KΩ KΩ KΩ KΩ R-Value 21.5 22.1 22.6 23.2 23.7 24.3 24.9 25.5 26.1 26.7 27.4 28.0	96 # 49 50 51 52 53 54 55 56 57 58 59 60	Y = 0.1 X = 1 A = 10 B = 100 R-Value 31.6 32.4 33.2 34.0 34.8 35.7 36.5 37.4 38.3 39.2 40.2 41.2	# 65 66 67 68 69 70 71 71 72 73 74 75 76	C = D = E = 1 F = 1 46.4 47.5 48.7 9.9 51.1 52.3 53.6 54.9 56.2 57.6 59.0 60.4	 1000 10000 100000 000000 000000 # 81 82 83 84 85 86 87 88 89 90 91 92 	R-Value 68.1 69.8 71.5 73.2 75.0 76.8 78.7 80.6 88.7 88.7	
# 01 02 03 04 05 06 07 08 09 10 11 11 12 13	25C 93D R-Value 10.0 10.2 10.5 10.7 11.0 11.3 11.5 11.8 12.1 12.4 12.7 13.0 13.3	# 17 18 19 20 21 22 23 24 25 26 27 28 29	R-Value 14.7 15.0 15.4 15.4 15.4 16.5 16.9 17.4 17.8 18.2 18.7 19.1 19.6	# 33 34 35 36 37 38 39 40 41 42 43 44 45	KΩ KΩ KΩ KΩ R-Value 21.5 22.1 22.6 23.2 23.7 24.3 24.9 25.5 26.1 26.7 27.4 28.0 28.7	96 # 49 50 51 52 53 54 55 56 57 58 59 60 61	Y = 0.1 X = 1 A = 10 B = 100 R-Value 31.6 32.4 33.2 34.0 34.8 35.7 36.5 37.4 38.3 39.2 40.2 41.2 42.2	# 65 66 67 68 69 70 71 71 72 73 74 75 76 77	C = D = E = 1 F = 1 48.7 49.9 51.1 52.3 53.6 54.9 56.2 57.6 59.0 60.4 61.9	 1000 10000 100000 000000 000000 # 81 82 83 84 85 86 87 88 89 90 91 92 93 	R-Value 68.1 69.8 71.5 73.2 75.0 76.8 78.7 80.6 82.5 84.5 84.5 84.5 86.6 88.7 90.9	
# 01 02 03 04 05 06 07 08 09 10 11 12 13 14	25C 93D R-Value 10.0 10.2 10.5 10.7 11.0 11.3 11.5 11.8 12.1 12.4 12.7 13.0 13.3 13.7	# 17 18 19 20 21 22 23 24 25 26 27 28 29 30	R-Value 14.7 15.0 15.4 15.4 15.8 16.2 16.5 16.9 17.4 17.8 18.2 18.7 19.1 19.6 20.0	$ \begin{array}{c} # \\ $	KΩ KΩ KΩ KΩ KΩ R-Value 21.5 22.1 22.6 23.2 23.7 24.3 24.9 25.5 26.1 26.7 27.4 28.0 28.7 29.4	96 # 49 50 51 52 53 54 55 56 57 58 59 60 61 61 62	Y = 0.1 X = 1 A = 10 B = 100 Image: state s	# 65 66 67 68 69 70 71 72 73 74 75 76 77 78	C = D = E = 1 F = 1 K-Value 46.4 47.5 48.7 49.9 51.1 52.3 53.6 53.6 54.9 56.2 57.6 59.0 60.4 61.9 63.4	 1000 10000 100000 000000 000000 # 81 82 83 84 85 86 87 88 89 90 91 92 93 94 	R-Value 68.1 69.8 71.5 73.2 75.0 76.8 78.7 80.6 82.5 84.5 86.6 88.7 90.9 93.1	
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Note: 0402 size is unmarked.

RoHS Compliance

Stackpole Electronics has joined the worldwide effort to reduce the amount of lead in electronic components and to meet the various regulatory requirements now prevalent, such as the European Union's directive regarding "Restrictions on Hazardous Substances" (RoHS 3). As part of this ongoing program, we periodically update this document with the status regarding the availability of our compliant components. All our standard part numbers are compliant to EU Directive 2011/65/EU of the European Parliament as amended by Directive (EU) 2015/863/EU as regards the list of restricted substances.

RoHS Compliance Status										
Standard Product Series	Description	Package / Termination Type	Standard Series RoHS Compliant	Lead-Free Termination Composition	Lead-Free Mfg. Effective Date (Std Product Series)	Lead-Free Effective Date Code (YY/WW)				
RNCE	High Temperature High Stability Thin Film Chip Resistor	SMD	YES	100% Matte Sn over Ni	Always	Always				

"Conflict Metals" Commitment

We at Stackpole Electronics, Inc. are joined with our industry in opposing the use of metals mined in the "conflict region" of the eastern Democratic Republic of the Congo (DRC) in our products. Recognizing that the supply chain for metals used in the electronics industry is very complex, we work closely with our own suppliers to verify to the extent possible that the materials and products we supply do not contain metals sourced from this conflict region. As such, we are in compliance with the requirements of Dodd-Frank Act regarding Conflict Minerals.

Compliance to "REACH"

We certify that all passive components supplied by Stackpole Electronics, Inc. are SVHC (Substances of Very High Concern) free and compliant with the requirements of EU Directive 1907/2006/EC, "The Registration, Evaluation, Authorization and Restriction of Chemicals", otherwise referred to as REACH. Contact us for complete list of REACH Substance Candidate List.

Environmental Policy

It is the policy of Stackpole Electronics, Inc. to protect the environment in all localities in which we operate. We continually strive to improve our effect on the environment. We observe all applicable laws and regulations regarding the protection of our environment and all requests related to the environment to which we have agreed. We are committed to the prevention of all forms of pollution.

How to Order

