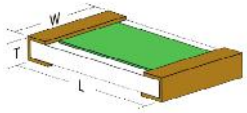
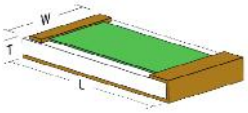
SURFACE MOUNT RESISTORS

Wrap Around (WATF)



Solderable gold with nickel barrier
OR Nickel barrier pre-soldered

Half-Wrap (HWTF)



Solderable gold with nickel barrier
OR Nickel barrier pre-soldered
Isolated pad is wire bondable

Mini-Systems, Inc. **Surface Mount Chip Resistors** are available in a wide range of case sizes, with each size offered in wrap around and half wrap termination styles. All solderable terminations have a nickel barrier for enhanced solder performance. This series is designed to be connected to associated circuitry through wire-bonding, conductive epoxy or soldering. Mini-Systems, Inc. time tested materials produce chip resistors with high stability, low noise and low TCR to provide the hybrid electronics industry resistor products with the highest standards available.

GENERAL CHARACTERISTICS

Resistance Range	1Ω to 6MΩ
Resistance Tolerance	±0.01% to ±10%
Termination Material	(NU) Solderable Gold with Nickel Barrier, (NT) Nickel with Solder
Operating Temperature	-55°C to +150°C
Storage Temperature	-65°C to +150°C
Operating Frequency	DC to 500 MHz

SUBSTRATE CHARACTERISTICS

SUBSTRATE MATERIAL	Available Thickness	Dielectric Constant @ 1MHz	Thermal Conductivity W/m• K	Current Noise	
				101Ω to 250kΩ	≤ 100Ω > 250kΩ
99.6% Alumina	0.010" - 0.025"	9.9	28	-35dB	-30dB
Beryllium Oxide	0.010" - 0.025"	6.7	300	-30dB	-20dB
Aluminum Nitride	0.010" - 0.025"	9.0	140 - 177	-30dB	-20dB

RESISTOR CHARACTERISTICS

RESISTOR FILM	Passivation	Standard TCR	TCR Optional To:
Tantalum Nitride	Ta_2O_5 (Self Passivating)	±150 ppm/°C	±10 ppm/°C
NiChrome	SiO_2	±25 ppm/°C	±5 ppm/°C

PART NUMBER DESIGNATION

WATF	—	5	—	A	T	—	100R0	F	—	NT3
STYLE		TYPE		SUBSTRATE	RESISTOR FILM		OHMIC VALUE	TOLERANCE		OPTION
WATF HWTF		SEE TABLE		A = Alumina B = BeO N = AlN	T = Tantalum Nitride N = NiChrome		**5-Digit Number:** 1st 4 digits are significant with "R" as decimal point when required. 5th digit represents number of zeros.	S = ±0.01% Q = ±0.05% B = ±0.1% D = ±0.5% F = ±1% G = ±2% J = ±5% K = ±10%		D = ±5ppm/°C C = ±10ppm/°C B = ±25ppm/°C A = ±50ppm/°C F = ±100ppm/°C NU = Soldereable Au w/ Ni barrier NT3 = Nickel w/ SAC305 Solder NT = Nickel w/ Sn62 Solder TR = Tape and Reel

EXAMPLE: WATF-5-AT-100R0F - NT3
WATF-5 Series, Alumina, Tantalum Nitride, 100Ω, ±1% Tol., Nickel w/ SAC305 Solder, RoHS Compliant

MINI SYSTEMS INC.
MADE IN AMERICA
SINCE 1968

THIN FILM DIVISION
ISO 9001 CERTIFIED
20 DAVID ROAD
NORTH ATTLEBORO, MA 02760
EMAIL: msithin@Mini-SystemsInc.com
WEB: www.Mini-SystemsInc.com
PHONE: 508-695-0203 FAX:508-695-6076

RoHS Compliant Available
Ask for Lead Free Solder

SURFACE MOUNT RESISTORS

CASE SIZE	TYPE	DIMENSIONS			RESISTANCE RANGE		POWER RATING [1]		
		L (±0.003") [±0.076mm]	W (±0.003") [±0.076mm]	T[2] (±0.003") [±0.076mm]	Low Values NiCr or TaN (Std. TCR Only) (Tol.≥0.5%)	Standard Values NiCr or [TaN]	Alumina	AlN	BeO
0201	21	0.020" [0.508]	0.010" [0.254]	0.006" [0.152]	1Ω < 3Ω	3Ω - 55kΩ [80kΩ]	50mW	200mW	400mW
0202	7	0.020" [0.508]	0.020" [0.508]	0.010" [0.254]	1Ω < 3Ω	3Ω - 130kΩ [190kΩ]	125mW	500mW	1W
0302	32	0.030" [0.762]	0.020" [0.508]	0.010" [0.254]	1Ω < 3Ω	3Ω - 200kΩ [300kΩ]	125mW	500mW	1W
0402	1	0.040" [1.016]	0.020" [0.508]	0.010" [0.254]	1Ω < 3Ω	3Ω - 200kΩ [300kΩ]	125mW	500mW	1W
0404	2	0.035" [0.889]	0.035" [0.889]	0.010" [0.254]	----------	1Ω - 325kΩ [500kΩ]	250mW	1W	2W
0502	8	0.055" [1.397]	0.025" [0.635]	0.010" [0.254]	1Ω < 3Ω	3Ω - 250kΩ [400kΩ]	250mW	1W	2W
0505	4	0.050" [1.270]	0.050" [1.270]	0.010" [0.254]	----------	1Ω - 750kΩ [1.25MΩ]	350mW	1.4W	2.8W
0603	63	0.060" [1.524]	0.030" [0.762]	0.010" [0.254]	1Ω < 3Ω	3Ω -300kΩ [500kΩ]	250mW	1W	2W
0805	3	0.075" [1.905]	0.050" [1.270]	0.010" [0.254]	----------	1Ω - 2.5MΩ [4MΩ]	500mW	2W	4W
1005	6	0.100" [2.54]	0.050" [1.270]	0.010" [0.254]	----------	1Ω - 3.5MΩ [5MΩ]	500mW	2W	4W
1206	5	0.126" [3.20]	0.063" [1.60]	0.010" [0.254]	----------	1Ω - 4MΩ [3.5MΩ]	750mW	3W	6W
1505	9	0.153" [3.886]	0.050" [1.270]	0.010" [0.254]	----------	1Ω - 4MΩ [6MΩ]	750mW	3W	6W

[1] Power Rating at 70°C derated linearly to 0% at 150°C
[2] Thickness does not include solder

PERFORMANCE SPECIFICATIONS

PROPERTY	TEST CONDITION	REQUIRED LIMITS	MSI TYPICAL LIMITS
SHORT TERM OVERLOAD	2.5xWVDC(6.25xRATED POWER)MIL-PRF-55342, +25°C, 5 SEC	±0.25 MAX ΔR/R	±0.10 MAX ΔR/R
HIGH TEMP EXPOSURE	+150°C, 100HRS	±0.20 MAX ΔR/R	±0.03 MAX ΔR/R
THERMAL SHOCK	MIL-STD 202, METHOD 107	±0.25 MAX ΔR/R	±0.10 MAX ΔR/R
MOISTURE RESISTANCE	MIL-STD 202, METHOD 106	±0.40 MAX ΔR/R	±0.10 MAX ΔR/R
STABILITY	MIL-STD 202 METHOD 108, 2000 HRS, +70°C, RATED POWER	±0.50 MAX ΔR/R	±0.10 MAX ΔR/R

All WATF, HWTF Series parts are produced on the same manufacturing line using the same materials and processes as parts manufactured to MIL-PRF-55342

MINI SYSTEMS INC.
MADE IN AMERICA
SINCE 1968

THIN FILM DIVISION
ISO 9001 CERTIFIED
20 DAVID ROAD
NORTH ATTLEBORO, MA 02760
EMAIL: msithin@Mini-SystemsInc.com
WEB: www.Mini-SystemsInc.com
PHONE: 508-695-0203 FAX:508-695-6076

RoHS Compliant Available
Ask for Lead Free Solder