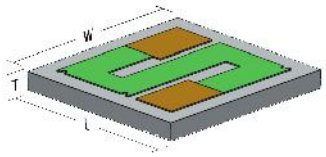
WIRE BONDABLE CHIP RESISTORS



Mini-Systems Inc. **Wire Bondable Chip Resistor** series offers the design engineer a wide variety of styles with **high stability, low TCR** and **low noise** of Thin Film materials to meet the demands of cutting edge design requirements. Electrical connection to associated circuitry is accomplished through wire bonding to terminations located on the top side of the chip. Suitable die attachment methods are epoxy or eutectic attach.

GENERAL CHARACTERISTICS

Resistance Range	1Ω to 70MΩ
Resistance Tolerance	±0.01% to ±10%
Termination Material	Gold (Standard), Aluminum (Optional)
Termination Size	0.0035" Square Min. - Value Dependent
Backing Material	Bare Substrate (Standard), Gold (Optional)
Operating/Storage Temp.	-55°C to +150°C/-65°C to +150°C
Thickness	MSTF101,21: 0.006"
Voltage Rating	100VDC Max
Operating Frequency	DC to 500MHz

SUBSTRATE CHARACTERISTICS

SUBSTRATE MATERIAL	Available Thickness	Dielectric Constant @ 1MHz	Thermal Conductivity W/m• K	Current Noise		Lowest Tolerance Available
				101Ω to 250kΩ	≤ 100Ω > 250kΩ	
99.6% Alumina (Al_2O_3)	0.005" - 0.025"	9.9	28	-35 dB	-30 dB	0.05%
Silicon (Si) (with 12kÅ SiO_2)	0.005" - 0.015"	N/A (SiO_2 3.9)	149 (SiO_2 1.38)	-40 dB	-30 dB	0.01%
Quartz	0.005" - 0.010"	3.75	1.3	-40 dB	-30 dB	0.01%
Beryllium Oxide (BeO)	0.010" - 0.025"	6.7	300	-30 dB	-20 dB	0.1%
Aluminum Nitride (AlN)	0.010" - 0.025"	9.0	140 - 177	-30 dB	-20 dB	0.1%

RESISTOR CHARACTERISTICS

RESISTOR FILM	Passivation	Standard TCR	TCR Optional To (Si,Quartz, Al_2O_3, Only)
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

MSTF — 110 — A N — 10001 F — GB

STYLE
MSTF

TYPE
See Table

SUBSTRATE
A = Alumina
S = Silicon
Q = Quartz
B = BeO
N = AlN

RESISTOR FILM
T = Tantalum Nitride
N = NiChrome

OHMIC VALUE
5-Digit Number:
1st 4 digits are significant with "R" as decimal point when required. 5th digit represents number of zeros.

TOLERANCE
S = ±0.01%
Q = ±0.05%
B = ±0.1%
D = ±0.5%
F = ±1%
G = ±2%
J = ±5%
K = ±10%

OPTION
D = ±5ppm/°C
C = ±10ppm/°C
B = ±25ppm/°C
A = ±50ppm/°C
F = ±100ppm/°C
E = Aluminum Pads
G = Gold Bond Pads
GB = Gold Back
TR = Tape & Reel

EXAMPLE: MSTF-110 AN - 10001F - GB
MSTF-110 Series, Alumina, NiChrome, 10kΩ, ±1% Tol., ±25ppm/°C, Gold Backside

MINI SYSTEMS INC.
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SINCE 1968

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RoHS Compliant

WIRE BONDABLE CHIP RESISTORS

CASE SIZE	TYPE	DIMENSIONS		RESISTANCE RANGE			POWER RATING [1]			
		L (±0.003") [±0.076mm]	W (±0.003") [±0.076mm]	Low Values (Std. TCR Only) (Tol.≥0.50%)	NiCr or [TaN] on Si or Quartz	NiCr or [TaN] on Al_2O_3, BeO or AlN	Quartz	Si Al_2O_3	AlN	BeO
0101	101	0.012" [0.305]	0.009" [0.229]	1Ω < 4Ω	4Ω - 200kΩ [300kΩ]	4Ω -20kΩ [25kΩ]	10mW	50mW	200mW	400mW
0201	21	0.020" [0.508]	0.010" [0.254]	1Ω < 3Ω	3Ω - 350kΩ [500kΩ]	3Ω - 55kΩ [71.5kΩ]	10mW	50mW	200mW	400mW
0202	1	0.015" [0.381]	0.015" [0.381]	1Ω < 2Ω	2Ω - 700kΩ [1MΩ]	2Ω - 60kΩ [75kΩ]	10mW	50mW	200mW	400mW
0202	122	0.020" [0.508]	0.016" [0.406]	1Ω < 3Ω	3Ω - 1MΩ [1.3MΩ]	3Ω - 75kΩ [97.5kΩ]	25mW	125mW	500mW	1W
0202	2	0.020" [0.508]	0.020" [0.508]	1Ω < 3Ω	3Ω - 1.2MΩ [1.6MΩ]	3Ω - 130kΩ [169kΩ]	50mW	250mW	1W	2W
0302	32	0.030" [0.762]	0.020" [0.508]	1Ω < 3Ω	3Ω - 1.5MΩ [2MΩ]	3Ω - 200kΩ [250kΩ]	50mW	250mW	1W	2W
0303	33	0.030" [0.762]	0.030" [0.762]	1Ω <2Ω	2Ω - 2.5MΩ [4MΩ]	2Ω - 250kΩ [325kΩ]	50mW	250mW	1W	2W
0402	110	0.037" [0.940]	0.017" [0.432]	1Ω < 3Ω	3Ω - 2MΩ [3MΩ]	3Ω - 200kΩ [250kΩ]	25mW	125mW	500mW	1W
0404	35	0.035" [0.889]	0.035" [0.889]	----------	1Ω - 4.5MΩ [6.5MΩ]	1Ω - 325kΩ [420kΩ]	50mW	250mW	1W	2W
0404	4	0.040" [1.016]	0.040" [1.016]	----------	1Ω - 7.5MΩ [11MΩ]	1Ω - 500kΩ [650kΩ]	70mW	350mW	1.4W	2.8W
0502	53	0.045" [1.143]	0.030" [0.762]	1Ω < 3Ω	3Ω -4.5MΩ [6.5MΩ]	3Ω - 325kΩ [420kΩ]	100mW	500mW	2W	4W
0502	115	0.050" [1.270]	0.025" [0.635]	1Ω < 3Ω	3Ω -4.5MΩ [6.5MΩ]	3Ω - 325kΩ [420kΩ]	50mW	250mW	1W	2W
0505	112	0.050" [1.270]	0.050" [1.270]	----------	1Ω - 10MΩ [14MΩ]	1Ω - 750kΩ [975kΩ]	100mW	500mW	2W	4W
0603	63	0.060" [1.524]	0.030" [0.762]	1Ω < 3Ω	3Ω - 7.5MΩ [11MΩ]	3Ω - 500kΩ [650kΩ]	100mW	500mW	2W	4W
0606	6	0.060" [1.524]	0.060" [1.524]	----------	1Ω - 30MΩ [40MΩ]	1Ω - 2.5MΩ [3.25MΩ]	100mW	500mW	2W	4W
0805	85	0.075" [1.905]	0.050" [1.270]	----------	1Ω - 30MΩ [40MΩ]	1Ω - 2.5MΩ [3.25MΩ]	100mW	500mW	2W	4W
1005	120	0.100" [2.540]	0.050" [1.270]	----------	1Ω - 35MΩ [45MΩ]	1Ω - 3MΩ [3.9MΩ]	100mW	500mW	2W	4W
1010	121	0.100" [2.540]	0.100" [2.540]	----------	1Ω - 60MΩ [70MΩ]	1Ω - 4MΩ [5MΩ]	150mW	750mW	3W	6W
1206	126	0.126" [3.200]	0.063" [1.524]	----------	1Ω - 40MΩ [50MΩ]	1Ω - 3.5MΩ [4.5MΩ]	150mW	750mW	3W	6W

MSTF 118 will continue to be available, size and characteristics similar to MSTF 122
MSPR 1 will continue to be available, size and characteristics same as MSTF 53
MSMR 1 will continue to be available, size and characteristics same as MSTF 101
[1] Power Rating at 70°C derated linearly to 0% at 150°C

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