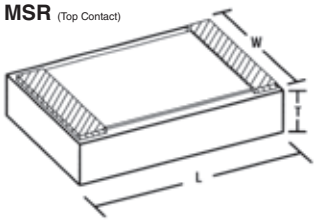
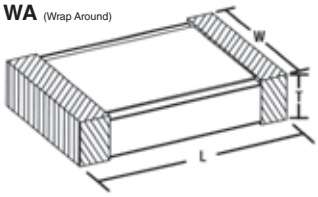
QPL Precision Resistors

MINI-SYSTEMS, INC.

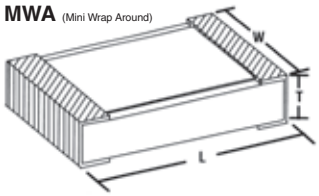
MSR (Top Contact)



WA (Wrap Around)



MWA (Mini Wrap Around)



QPL PART NUMBER DESIGNATION

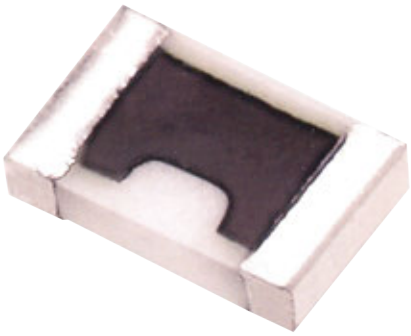
EXAMPLE: M55342M01W10E0S

Per MIL-PRF-55342, TCR ±300ppm, 0502 case size, Top Contact, Gold base metal, 10KΩ, 1% tol., "S" Life Failure Rate

MIL-PRF-55342:	M55342	D = For /07 series only M = all other series Military Spec. Indicating MIL=PRF-55342
Characteristic:	M	K = ±100ppm M = ±300ppm *70 °C Max. ambient temperature at rated wattage*
QPL Size:	01	See Tables on pages 16 & 17
Termination: Material: *Base Metal*	W	W = Gold *Top Contact* T = Platinum Gold *Top Contact* D = Palladium Silver *Top Contact* B = Nickel Barrier, Solder Coated *Wrap Around* G = Nickel Barrier, Gold Plated *Wrap Around* C = Palladium Silver *Wrap Around* U = Platinum Gold *Wrap Around*
Value and: Tollerance	10E0	10KΩ, 1% *See pgs. 14 & 15 for tables III & IV Of MIL-PRF-55342*
Life Failure: Rate *Product Level*	S	C = Non-ER M = 1.0% / 1000 Hrs. P = 0.1% / 1000 Hrs. R = 0.01% / 1999 Hrs. S = 0.001% / 1000 Hrs. T = Space Level

Packaged in chip trays if not specified.

QPL thick film resistors are printed and fired on 96% Alumina. All case sizes are offered to fit a variety of Hi-Rel hybrid microelectronic applications. Advanced processing techniques and, Hi-Rel Construction assure optimum performance where TCR, VCR and operating power are critical factors. All styles meet and exceed the qualification requirements of MIL-PRF-55342.



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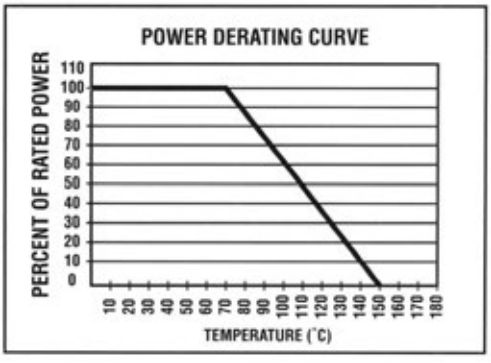
QPL SIZE	QPL STYLE Case Size	TERMINATION	CHAR.	RESISTANCE MIN.	RESISTANCE MAX.	TOLERANCE %	POWER (WATTS)	VOLTAGE (VOLTS DC)	MSI SIMILAR STYLE/ TYPE
01	RM0502	W, T, D B, G, C, U	K, L, M	1 Ω	22 MΩ	0.1, 0.25, 0.5, 1, 2, 5, 10	0.050	40	MSR81 WA81
02	RM0505	W, T, D B, G, C, U	K, L, M	1 Ω	22 MΩ	0.1, 0.25, 0.5, 1, 2, 5, 10	0.125	40	MSR82 WA82
03	RM1005	W, T, D B, G, C, U	K, L, M	1 Ω	22 MΩ	0.1, 0.25, 0.5, 1, 2, 5, 10	0.200	75	MSR83 WA83
04	RM1505	W, T, D B, G, C, U	K, L, M	1 Ω	22 MΩ	0.1, 0.25, 0.5, 1, 2, 5, 10	0.150	125	MSR80 WA80
05	RM2208	W, T, D B, G, C, U	K, L, M	1 Ω	22 MΩ	0.1, 0.25, 0.5, 1, 2, 5, 10	0.225	175	MSR85 WA85
06	RM0705	W, T, D B, G, C, U	K, L, M	1 Ω	22 MΩ	0.1, 0.25, 0.5, 1, 2, 5, 10	0.150	50	MSR86 WA86
07	RM1206	W, T, D B, G, C, U	K, L, M	1 Ω	22 MΩ	0.1, 0.25, 0.5, 1, 2, 5, 10	0.250	100	MSR92 WA87
08	RM2010	W, T, D B, C, U	K, L, M	1 Ω	22 MΩ	0.1, 0.25, 0.5, 1, 2, 5, 10	0.800[1]	150	MSR88 WA88
09	RM2512	W, T, D B, C, U	K, L, M	1 Ω	22 MΩ	0.1, 0.25, 0.5, 1, 2, 5, 10	1.000[1]	200	MSR89 WA89
10	RM1010	W, T, D B, G, C, U	K, L, M	1 Ω	22 MΩ	0.1, 0.25, 0.5, 1, 2, 5, 10	0.500[1]	75	MSR90 WA90
11	RM0402	W, T, D B, G, C, U	K, L, M	1 Ω	22 MΩ	0.1, 0.25, 0.5, 1, 2, 5, 10	0.050	30	MSR20 WA20
12	RM0603	W, T, D B, G, C, U	K, L, M	1 Ω	22 MΩ	0.1, 0.25, 0.5, 1, 2, 5, 10	0.100	50	MSR93 WA93
13	RM0302	W, T, D B, G, C, U	K, L, M	1 Ω	22 MΩ	0.1, 0.25, 0.5, 1, 2, 5, 10	0.040	15	MSR 98 MWA98

1. Mounted to a ceramic board.

Electrical Performance Characteristics

MIL-PRF-55342	MIL-PRF-55342 Requirement	MSI Typical
Short Term Overload	±0.25%	±0.03%
High Temperature Exposure	±0.50%	±0.05%
Thermal Shock	±0.50%	±0.07%
Low Temperature Operation	±0.25%	±0.05%
Resistance to Bonding Expopsure / Soldering Heat	±0.25%	±0.09%
Moisture Resistance	±0.50%	±0.06%
Stability (Life 70°C 2,000Hrs)	±0.50%	±0.04%
Stability (Life 70°C 10,000Hrs)	±2.00%	±0.07%

Operating temperature range from -55°C to +150°C



Power rating at 70°C derated linearly to 0% power at 150°C (P=E²/R)

MINI-SYSTEMS, INC.

MIL-PRF-55342

TABLE III. Designator or resistance values for resistance tolerances

	Designator for 1 percent tolerance	Resistance Ohms			
Ohms	1D00 to 9D76 inclusive 10D0 to 97D6 inclusive 100D to 976D inclusive	1.00 10.0 100	to to to	9.76 97.6 976	inclusive inclusive inclusive
Kohms	1E00 to 9E76 inclusive 10E0 to 97E6 inclusive 100E to 976E inclusive	1,000 10,000 100,000	to to to	9,760 97,600 976,000	inclusive Inclusive inclusive
Mohms	1F00 to 9F76 inclusive 10F0	1,000,000 10,000,000	to	9,760,000	inclusive
	Designator for 2 percent tolerance	**Resistance Ohms**			
Ohms	1G00 to 9G10 inclusive 10G0 to 91G0 inclusive 100G to 910G inclusive	1.00 10.0 100	to to to	9.10 91.0 910	inclusive inclusive inclusive
Kohms	1H00 to 9H10 inclusive 10H0 to 91H0 inclusive 100H to 910H inclusive	1,000 10,000 100,000	to to to	9,100 91,000 910,000	inclusive inclusive inclusive
Mohms	1T00 to 9T10 inclusive 10T0	1,000,000 10,000,000	to	9,100,000	inclusive
	Designator for 5 percent tolerance	**Resistance Ohms**			
Ohms	1J00 to 9J10 inclusive 10J0 to 91J0 inclusive 100J to 910J inclusive	1.00 10.0 100	to to to	9.10 91.0 910	inclusive inclusive inclusive
Kohms	1K00 to 9K10 inclusive 10K0 to 91K0 inclusive 100K to 910K inclusive	1,000 10,000 100,000	to to to	9,100 91,000 910,000	inclusive inclusive inclusive
Mohms	1L00 to 9L10 inclusive 10L0	1,000,000 10,000,000	to	9,100,000	inclusive
	Designator for 10 percent tolerance	**Resistance Ohms**			
Ohms	1M00 to 8M20 inclusive 10M0 to 82M0 inclusive 100M to 820M inclusive	1.00 10.0 100	to to to	8.20 82.0 820	inclusive inclusive inclusive
Kohms	1N00 to 8N20 inclusive 10N0 to 82N0 inclusive 100N to 820N inclusive	1,000 10,000 100,000	to to to	8,200 82,000 820,000	inclusive inclusive inclusive
Mohms	1P00 to 8P20 inclusive 10P0	1,000,000 10,000,000	to	8,200,000	inclusive

MIL-PRF-55342

TABLE IV. Standard resistance values for the 10 to 100 decade

1%	2% & 5%	10%	1%	2% & 5%	10%	1%	2% & 5%	10%
10.00	10.00	10.00	21.50	22.00	22.00	46.40	47.00	47.00
10.20			22.10			47.50		
10.50			22.60			48.70		
10.70			23.20			49.90	51.00	51.00
11.00	11.00		23.70	24.00		51.10		
11.30			24.30			52.30		
11.50			24.90			53.60		
11.80	12.00	12.00	25.50			54.90	56.00	56.00
12.10			26.10			56.20		
12.40			26.70	27.00	27.00	57.60		
12.70			27.40			59.00		
13.00	13.00		28.00			60.40		
13.30			28.70			61.90	62.00	
13.70			29.40	30.00		63.40		
14.00			30.10			64.90		
14.30			30.90			66.50		
14.70			31.60			68.10	68.00	68.00
15.00	15.00	15.00	32.40	33.00	33.00	69.80		
15.40			33.20			71.50		
15.80	16.00		34.00			73.20		
16.20			34.80			75.00	75.00	75.00
16.50			35.70	36.00		76.80		
16.90			36.50			78.70		
17.40			37.40			80.60	82.00	82.00
17.80	18.00	18.00	38.30	39.00	39.00	82.50		
18.20			39.20			84.50		
18.70			40.20			86.60		
19.10			41.20			88.70		
19.60			42.20	43.00		90.90	91.00	
20.00	20.00		43.20			93.10		
20.50			44.20			95.30		
21.00			45.30			97.60		

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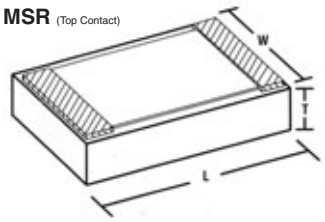

QPL SIZE	QPL STYLE Case Size	Length Inches (mm)	Width Inches (mm)	Pad Width Inches (mm)
01	RM0502	0.050 ±0.005 (1.270 ±0.127)	0.025 ±0.005 (0.635 ±0.127)	0.010 ±0.005 (0.254 ±0.127)
02	RM0505	0.050 ±0.005 (1.270 ±0.127)	0.050 ±0.005 (1.270 ±0.127)	0.010 ±0.005 (0.254 ±0.127)
03	RM1005	0.100 ±0.005 (2.540 ±0.127)	0.050 ±0.005 (1.270 ±0.127)	0.015 ±0.005 (0.381 ±0.127)
04	RM1505	0.150 ±0.005 (3.810 ±0.127)	0.050 ±0.005 (1.270 ±0.127)	0.015 ±0.005 (0.381 ±0.127)
05	RM2208	0.225 ±0.005 (5.715 ±0.127)	0.075 ±0.005 (1.905 ±0.127)	0.015 ±0.005 (0.381 ±0.127)
06	RM0705	0.075 ±0.005 (1.905 ±0.127)	0.050 ±0.005 (1.270 ±0.127)	0.015 ±0.005 (0.381 ±0.127)
07	RM1206	0.126 ±0.005 (3.200 ±0.127)	0.063 ±0.005 (1.600 ±0.127)	0.018 ±0.007 (0.457 ±0.178)
08	RM2010	0.206 ±0.005 (5.232 ±0.127)	0.098 ±0.005 (2.489 ±0.127)	0.015 ±0.005 (0.381 ±0.127)
09	RM2512	0.248 ±0.005 (6.299 ±0.127)	0.124 ±0.005 (3.150 ±0.127)	0.015 ±0.005 (0.381 ±0.127)
10	RM1010	0.100 ±0.005 (2.540 ±0.127)	0.100 ±0.005 (2.540 ±0.127)	0.015 ±0.005 (0.381 ±0.127)
11	RM0402	0.041 ±0.006 (1.041 ±0.152)	0.022 ±0.005 (0.559 ±0.127)	0.010 ±0.005 (0.254 ±0.127)
12	RM0603	0.060 ±0.005 (1.524 ±0.127)	0.032 ±0.005 (0.813 ±0.127)	0.010 ±0.005 (0.254 ±0.127)
13	RM0302	0.032 ±0.004 (0.813 ±0.102)	0.022 ±0.005 (0.559 ±0.127)	0.008 ±0.005 (0.203 ±0.127)

Max Thickness 0.033 in. (0838mm)

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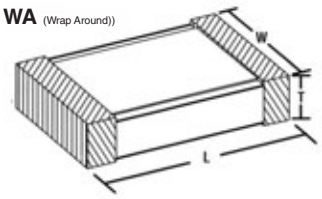
WA (Wrap Around))



QPL SIZE	QPL STYLE Case Size	Length Inches (mm)	Width Inches (mm)	Pad Width Inches (mm)
01	RM0502	0.055 ±0.006 (1.397 ±0.152)	0.025 ±0.005 (0.635 ±0.127)	0.015 ±0.005[1] (0.381 ±0.127)
02	RM0505	0.055 ±0.006 (1.397 ±0.152)	0.050 ±0.005 (1.270 ±0.127)	0.015 ±0.005[1] (0.381 ±0.127)
03	RM1005	0.105 ±0.007 (2.667 ±0.178)	0.050 ±0.005 (1.270 ±0.127)	0.015 ±0.005 (0.381 ±0.127)
04	RM1505	0.155 ±0.007 (3.937 ±0.178)	0.050 ±0.005 (1.270 ±0.127)	0.015 ±0.005 (0.381 ±0.127)
05	RM2208	0.230 ±0.007 (5.842 ±0.178)	0.075 ±0.005 (1.905 ±0.127)	0.020 ±0.005 (0.508 ±0.127)
06	RM0705	0.080 ±0.006 (2.032 ±0.152)	0.050 ±0.005 (1.270 ±0.127)	0.015 ±0.005 (0.381 ±0.127)
07	RM1206	0.126 ±0.008 (3.200 ±0.203)	0.063 ±0.005 (1.600 ±0.127)	0.018 ±0.007[1] (0.457 ±0.178)
08	RM2010	0.209 ±0.009 (5.309 ±0.229)	0.098 ±0.005 (2.489 ±0.127)	0.020 ±0.005 (0.508 ±0.127)
09	RM2512	0.256 ±0.012 (6.502 ±0.305)	0.124 ±0.005 (3.150 ±0.127)	0.020 ±0.005 (0.508 ±0.127)
10	RM1010	0.105 ±0.007 (2.667 ±0.178)	0.100 ±0.005 (2.540 ±0.127)	0.015 ±0.005 (0.381 ±0.127)
11	RM0402	0.042 ±0.008 (1.067 ±0.203)	0.022 ±0.005 (0.559 ±0.127)	0.010 ±0.005 (0.254 ±0.127)
12	RM0603	0.064 ±0.006 (1.626 ±0.152)	0.032 ±0.005 (0.813 ±0.127)	0.015 ±0.005[1] (0.381 ±0.127)
13	RM0302	0.034 ±0.004 (0.864±0.102)	0.022 ±0.005 (0.559 ±0.127)	0.008 ±0.005[1] (0.203 ±0.127)

Max Thickness 0.033 in. (0838mm)
1. Dimensions are for back terminations only.