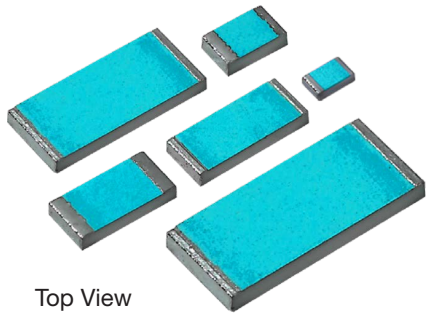
Ultra High-Precision FRSM Wrap-Around Chip Resistors, Z1 Foil Technology Configuration

with TCR of ±0.2 ppm/°C and Improved Load-Life Stability of 0.0025% (25 ppm)

FEATURES

- Temperature coefficient of resistance (TCR): ±0.2 ppm/°C typical (–55°C to +125°C, +25°C ref.)
- Resistance tolerance: to ±0.01%
- Power coefficient "ΔR due to self heating": 5 ppm at rated power
- Power rating: to 800 mW at +70°C
- Load life stability: ±0.0025% typical at 70°C, 2000 h at rated power ±0.005% typical at 70°C, 10,000 h at rated power
- Resistance range: 5 Ω to 240 kΩ (for higher and lower values, please contact us)
- AEC-Q200 qualified
- Screening in accordance with EEE-INST-002 and MIL-PRF-32663 available (see datasheet resistor models 303261 to 303266)



Top View

Pb-free Available

RoHS* COMPLIANT

Tolerance vs. Resistance Value

Resistance Value (Ω)	Tolerance (%)
250 to 240k	±0.01%
100 to <250	±0.02%
50 to <100	±0.05%
25 to <50	±0.1%
10 to <25	±0.25%
5 to <10	±0.5%

Specifications

Chip Size	Rated Power at +70°C (mW)	Max. Working Voltage ($\leq\sqrt{P \times R}$)	Resistance Range (Ω)	Typ. TCR and Spread, –55°C to +125°C, +25°C Ref. (ppm/°C)	Max. Weight (mg)
0603	150	47 V	100 to 15k	±0.2 ±1.8 (≥100 Ω) ±0.2 ±2.8 (50 Ω to <100 Ω) ±0.2 ±3.8 (10 Ω to <50 Ω) ±0.2 ±7.8 (5 Ω to <10 Ω)	4
0805	300	94 V	5 to 30k		6
1206	300	90 V	5 to 25k		11
1506	300	110 V	5 to 30k		12
2010	500	190 V	5 to 70k		27
2018	600	402 V	5 to 180k		48
2512	800	438 V	5 to 240k		40

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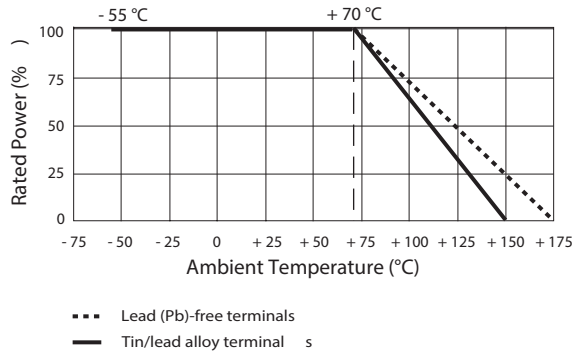
Power Derating Curve



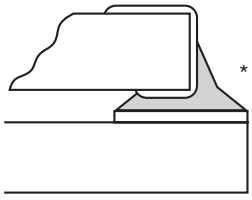
Performances

Test or Conditions	ΔR Limits of FRSM Series	
	Typical	Performance Limits(1)
Thermal Shock, 100 x (–65°C to +150°C)	±0.005% (50 ppm)	±0.01% (100 ppm)
Low Temperature Operation, –65°C, 45 min at P_{nom}	±0.0025% (25 ppm)	±0.005% (50 ppm)
Short Time Overload, 6.25 x Rated Power, 5 s	±0.005% (50 ppm)	±0.01% (100 ppm)
High Temperature Exposure, +150°C, 100 h	±0.0025% (25 ppm	±0.005% (50 ppm)
Resistance to Soldering Heat, +245°C for 5 s (SnPb), +245°C for 30 s (Pb Free)	±0.005% (50 ppm)	±0.01% (100 ppm)
Moisture Resistance	±0.003% (30 ppm)	±0.01% (100 ppm)
Load Life Stability, +70°C for 2000 h at Rated Power	±0.0025% (25 ppm)	±0.005% (50ppm
Load Life Stability, +70°C for 10,000 h at Rated Power	±0.005% (50 ppm)	±0.04% (400ppm)

(1) As shown +0.01 Ω to allow for measurement errors at low values.

Recommended Mounting

1. IR and vapor phase reflow are recommended.
2. Avoid the use of cleaning agents that attack epoxy resins, which form part of the resistor construction.
3. Vacuum pick up is recommended for handling.
4. If the use of a soldering iron becomes necessary, precautionary measures should be taken to avoid any possible damage/overheating of the resistor.



* Recommendation: The solder fillet profile should be such as to avoid running over the top metallization.

Part Number Information (1)

NEW GLOBAL PART NUMBER: Y402412K7560T9R (preferred part number format)

DENOTES PRECISION	VALUE	CHARACTERISTICS
Y	R = Ω K = kΩ	0 = sta ndard 9 = lea d (Pb)-free 1 to 999 = cus tom

Y	4	0	2	4	1	2	K	7	5	6	0	T	9	R

PRODUCT CODE	RESISTANCE TOLERANCE	PACKAGING
4021 = FRSM0603 4022 = FRSM0805 4023 = FRSM1206 4024 = FRSM1506 4025 = FRSM2010 1646 = FRSM2018 4027 = FRSM2512	T = ± 0.01 % Q = ± 0.02 % A = ± 0.05 % B = ± 0.10 % C = ± 0.25 % D = ± 0.5 % F = ± 1.0 %	R = tape and reel W = waffle pack

FOR EXAMPLE: ABOVE GLOBAL ORDER Y4024 12K7560 T 9 R:

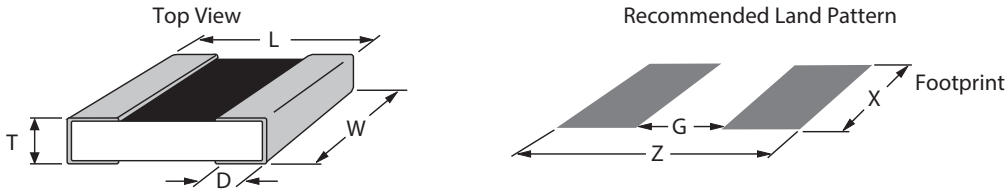
TYPE: FRSM1506
VALUES: 12.7560 k Ω
ABSOLUTE TOLERANCE: 0.01 %
TERMINATION: lead (Pb)-free
PACKAGING: tape and reel

HISTORICAL PART NUMBER : FRSM1506 12K756 TCR0.2 T S T (will continue to be used)

FRSM1506	12K756	TCR0.2	T	S	T
MODEL	RESISTANCE VALUE	TCR CHARACT ERISTICS	TOLERANCE	TERMINATION	PACKAGING
FRSM0603 FRSM0805 FRSM1206 FRSM1506 FRSM2010 FRSM2512	12.756 k Ω		T = ± 0.01 % Q = ± 0.02 % A = ± 0.05 % B = ± 0.10 % C = ± 0.25 % D = ± 0.5 % F = ± 1.0 %	S = lea d (Pb)-free B = tin/lead	T = tape an d reel W = waffle pack

Note
(1) For non-standard requests, please co ntact application engineering.

Dimensions in inches (millimeters)



Note: Recommended stencil thickness 0.2 mm/0.00787 inch minimum

Chip Size	L ±0.005 (0.13)	W ±0.005 (0.13)	Thickness Maximum	D ±0.005 (0.13)	Z [1]	G [1]	X [1]
0603	0.063 (1.60)	0.032 (0.81)	0.025 (0.64)	0.011 (0.28)	0.102 (2.59)	0.031 (0.78)	0.031(0.78)
0805	0.080 (2.03)	0.050 (1.27)		0.015 (0.38)	0.122 (3.10)	0.028 (0.71)	0.050 (1.27)
1206	0.126 (3.20)	0.062 (1.57)		0.020 (0.51)	0.175 (4.45)	0.059 (1.50)	0.071 (1.80)
1506	0.150 (3.81)	0.062 (1.57)		0.020 (0.51)	0.199 (5.05)	0.083 (2.11)	0.071 (1.80)
2010	0.198 (5.03)	0.097 (2.46)		0.025 (0.64)	0.247 (6.27)	0.115 (2.92)	0.103 (2.62)
2512	0.249 (6.32)	0.127 (3.23)		0.032 (0.81)	0.291 (7.39)	0.150 (3.81)	0.127 (3.23)

[1] Land Pattern Dimensions are per IPC-7351A.