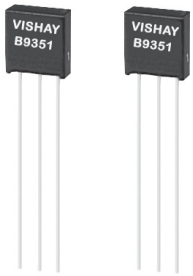
Bulk Metal® Foil Technology Industrial Grade Miniature Voltage Divider with TCR Tracking of 1.5 ppm/°C and Ratio Stability of 0.001 % (10 ppm)



The VSR144 is an industrial version of the 300144. This device has the stability that is inherent in foil but does not offer the tight match, TCR, or TCR tracking of the 300144. This product is quite satisfactory for most industrial purposes and should be considered when the total performance of the 300144 is not necessary.

FEATURES

Pb-free Available

RoHS* COMPLIANT

- Temperature coefficient of resistance (TCR):
  absolute: ± 4 ppm/°C (0 °C to + 60 °C)
  ± 8 ppm/°C (- 55 °C to + 125 °C, + 25 °C ref.)
  tracking: 1.5 ppm/°C
- Tolerance: absolute and matching to ± 0.01 %
- Resistance range: 100R to 20K per resistive element
- Vishay Foil resistors are not restricted to standard values/ratios; specific “as requested” values/ratios can be supplied at no extra cost or delivery (e.g. 1K2345 vs. 1K)
- Power rating: 0.2 W at 70 °C, for the entire resistive element R_1 and R_2, divided proportionally between the two elements
- Load life ratio stability: < 0.001 % (10 ppm) 0.2 W at 70 °C for 2000 h
- Maximum working voltage: 200 V
- Electrostatic discharge (ESD) up to 25 000 V
- Non-inductive, non-capacitive design
- Rise time: 1.0 ns effectively no ringing
- Current noise: 0.010 μV_{RMS}/V of applied voltage (< - 40 dB)
- Thermal EMF: 0.05 µV/°C typical
- Thermal stabilization time < 1 s (nominal value achieved within 10 ppm of steady state value)
- Voltage coefficient: < 0.1 ppm/V
- Non-inductive: < 0.08 µH
- Non hot spot design
- Terminal finish: lead (Pb)-free or tin/lead alloy
- Compliant to RoHS directive 2002/95/EC
- Prototype quantities available in just 5 working days or sooner. For more information, please contact foil@vishaypg.com
- For better performances, please see 300144 and 300144Z datasheets

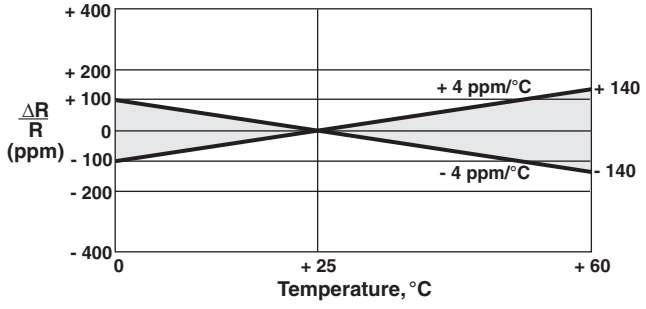
TABLE 1A - MODEL VSR144 SPECIFICATIONS

RESISTANCE VALUES	ABSOLUTE TOLERANCE	ABSOLUTE TCR (- 55 °C to + 125 °C, + 25 °C ref.) TYPICAL AND MAX. SPREAD
≥ 500 Ω to 20 kΩ	± 0.01 %	± 2 ppm/°C ± 3 ppm/°C
100 Ω to < 500 Ω	± 0.02 %	

TABLE 1B - MODEL VSR144 SPECIFICATIONS

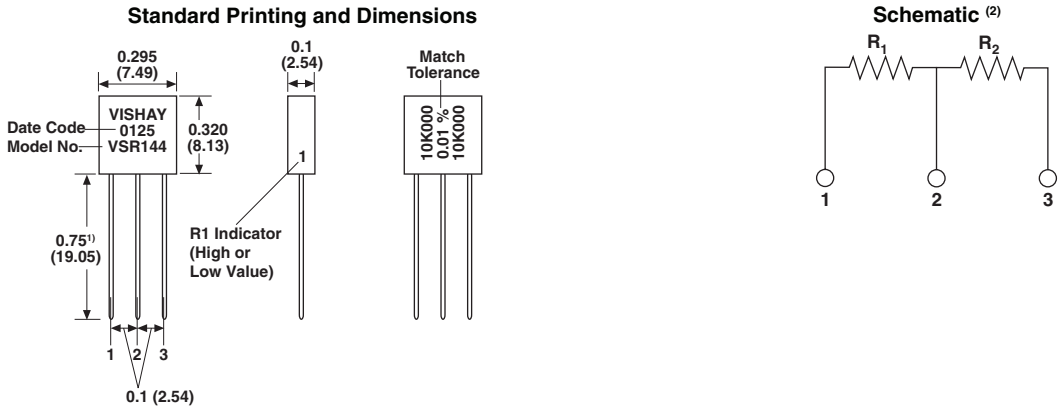
RESISTANCE RATIO	TOLERANCE MATCH	TCR TRACKING MAX.
1:1	± 0.01 %	0.5 ppm/°C
> 1:1 to 4:1		1.0 ppm/°C
> 4:1 to 10:1	± 0.02 %	1.5 ppm/°C
> 10:1		2.0 ppm/°C

FIGURE 1 - TEMPERATURE COEFFICIENT OF RESISTANCE



* Pb containing terminations are not RoHS compliant, exemptions may apply

FIGURE 2 - MODEL VSR144 STANDARD PRINTING AND DIMENSIONS in inches (millimeters)



Notes

- Tolerance: ± 0.010"

(1) Lead wires: #22 AWG solder coated copper, 0.75" minimum length

(2) Each resistor contains 1 chip of two resistive elements

TABLE 2 - MODELS VSR144 SPECIFICATIONS

VISHAY MODEL	POWER RATING (1)(2)	STANDARD RESISTANCE TOLERANCE		TCR TRACKING AVAILABLE TO
		ABSOLUTE AVAILABLE TO	RATIO MATCH AVAILABLE TO	
VSR144	0.2 W at + 70 °C (for the entire resistive element R_1 and R_2) divided proportionally between the two values	± 0.02 %	± 0.02 %	< ± 1.5 ppm/°C for like values < ± 2.0 ppm/°C standard

Note

(1) Power is divided proportionally between the 2 values

.

TABLE 3 - EXAMPLES OF VCODES FOR POPULAR VALUES (other values available on request)					
VSR144 RATIOS					
VCODES	**R_1**	**R_2**	**VCODES**	**R_1**	**R_2**
V0009	20K	20K	V0058	2K	20K
V0010	20K	10K	V0030	2K	18K
V0100	20K	2K	V0029	2K	4K
V0055	19K4	9K7	V0059	2K	2K
V0223	17K5	20K	V0103	2K	3K
V0097	15K	15K	V0154	1K5	3K
V0001	10K	10K	V0032	1K	16K
V0042	10K	8K323	V0121	1K	2K
V0006	10K	2K	V0004	1K	1K
V0166	10K	15K	V0379	1K	7K
V0226	9K	10K	V0374	800R	800R
V0003	9K	1K	V0022	511R	16K2
V0013	8K	16K	V0091	500R	500R
V0107	6K	20K	V0162	500R	15K
V0014	6K	7K	V0378	500R	4K5
V0160	6K	6K	V0061	300R	300R
V0159	5K5	7K7	V0088	100R	100R
V0005	5K	10K	V0380	100R	15K
V0002	5K	5K	V0375	100R	12K3
V0373	4K	12K	V0381	100R	50R
V0026	3K	19K2	V0377	50R	28K
V0156	3K	6K	V0376	35R	20K
V0158	2K7	10K	-	-	-

Note

• A combination of these values are available in reverse order and in values up to 5 digits

TABLE 4 - GLOBAL PART NUMBER INFORMATION (1)

NEW GLOBAL PART NUMBER: Y0094V0107QQ9L (preferred part number format)

DENOTES PRECISION	RESISTANCE VALUE CODE	TOLERANCE MATCH	PACKAGING
Y	**VCODE**	**Q** = 0.02 % **A** = 0.05 % **B** = 0.1 % **D** = 0.5 % **F** = 1.0 %	**L** = bulk pack

Y	0	0	9	4	V	0	1	0	7	Q	Q	9	L

PRODUCT CODE	RESISTANCE TOLERANCE	CHARACTERISTICS
0094 = VSR144	**Q** = ± 0.02 % **A** = ± 0.05 % **B** = ± 0.1 % **D** = ± 0.5 % **F** = ± 1.0 %	**0** = standard **9** = lead (Pb)-free **1 to 999** = custom

FOR EXAMPLE: ABOVE GLOBAL ORDER Y0094 V0107 Q Q 9 L:
TYPE: VSR144
VALUE: 6K/20K
ABSOLUTE TOLERANCE: ± 0.02 %
TOLERANCE MATCH: ± 0.02 %
TERMINATION: lead (Pb)-free
PACKAGING: bulk pack

HISTORICAL PART NUMBER: VSR144T 6K/20K TCR2 Q Q B (will continue to be used)

VSR144	T	6K/20K	TCR2	Q	Q	B
MODEL	TERMINATION	OHMIC VALUE	TCR Characteristic	ABSOLUTE TOLERANCE	TOLERANCE MATCH	PACKAGING
VSR144	**T** = lead (Pb)-free **None** = tin/lead alloy	**R1** = 6.0 kΩ **R2** = 20.0 kΩ		**Q** = ± 0.02 % **A** = ± 0.05 % **B** = ± 0.1 % **D** = ± 0.5 % **F** = ± 1.0 %	**Q** = 0.02 % **A** = 0.05 % **B** = 0.1 % **D** = 0.5 % **F** = 1.0 %	**B** = bulk pack

Note

(1) For non-standard requests, please contact application engineering

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