



Product Change Notification



Products End Of Life (EOL) Notification

DESCRIPTION OF CHANGE: VPG Foil Resistor Division introduced new surface mount resistor families based on new generation Z1 foil technology.

CLASSIFICATION OF CHANGE: Product Obsolescence.

REASON FOR CHANGE: Implementation of new modern bonding & overcoat materials.

EXPECTED INFLUENCE ON QUALITY/RELIABILITY/PERFORMANCE:
See respective datasheets for new products.

PRODUCT CATEGORY: Resistor, Discrete.

PART NUMBERS/SERIES/FAMILIES AFFECTED:

VSMP Series: 0603, 0805, 1206, 1506, 2010, 2018, 2512 (Y1636, Y1624, Y1625, Y1627, Y1628).

VFCP Series: 0805, 1206, 1506, 2010, 2512 (Y1629, Y1630, Y1631, Y1632, Y1633).

V/N: 303133, 303134, 303135, 303136, 303137, 303138 and customer-oriented designs

New Products:

FRSM Series (0603, 0805, 1206, 1506, 2010, 2018, 2512)

FRFC Series (0805, 1206, 1506, 2010, 2512)

V/N: 303261, 303262, 303263, 303264, 303265, 303266 and customer-oriented designs

VPG BRAND(s): VPG Foil Resistors

TIME SCHEDULE:

Start Shipment Date: Immediately

Last-Time Buy Date: Sep 2025

Last Time Shipment Date: Jan 2026

SAMPLE AVAILABILITY: Available per request

PRODUCT IDENTIFICATION: Green Over-Coat

QUALIFICATION DATA: Available

ISSUED BY: Oded Bengom

For further information, please contact your regional VPG foil resistors office or Oded Bengom, Sr. QA Manager, VFR Oded.Bengom@vpqsensors.com

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Vishay Precision Group

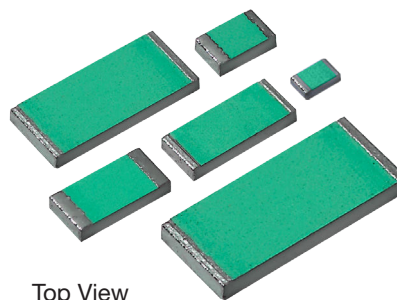
Corporate Headquarters: 3 Great Valley Parkway, suite 150* Malvern* PA 19355 U.S.A. Phone (484) 321-5300 Fax (484) 321-5301 www.vpqsensors.com

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

with TCR of ± 0.05 ppm/°C and
Improved Load-Life Stability of 0.0025% (25 ppm)

FEATURES

- Temperature coefficient of resistance (TCR):
 ± 0.05 ppm/°C typical (0°C to +60°C)
 ± 0.2 ppm/°C typical (-55°C to +125°C, +25°C ref.)
- Resistance tolerance: to $\pm 0.01\%$
- Power coefficient “ ΔR due to self heating”: 5 ppm at rated power
- Power rating: to 800 mW at +70°C
- Load life stability:
 $\pm 0.0025\%$ typical at 70°C, 2000 h at rated power
 $\pm 0.005\%$ typical at 70°C, 10,000 h at rated power
- Resistance range: 5 Ω to 240 k Ω (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



RoHS*
COMPLIANT

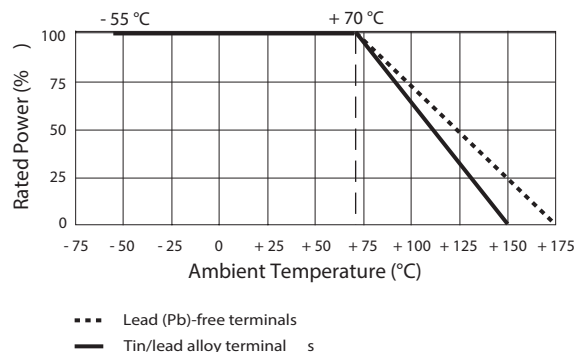
Tolerance vs. Resistance Value

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

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	$\pm 0.2 \pm 1.8$ ($\geq 100 \Omega$) $\pm 0.2 \pm 2.8$ (50 Ω to <100 Ω) $\pm 0.2 \pm 3.8$ (10 Ω to <50 Ω) $\pm 0.2 \pm 7.8$ (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

Power Derating Curve



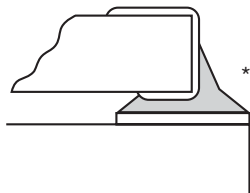
Performances

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

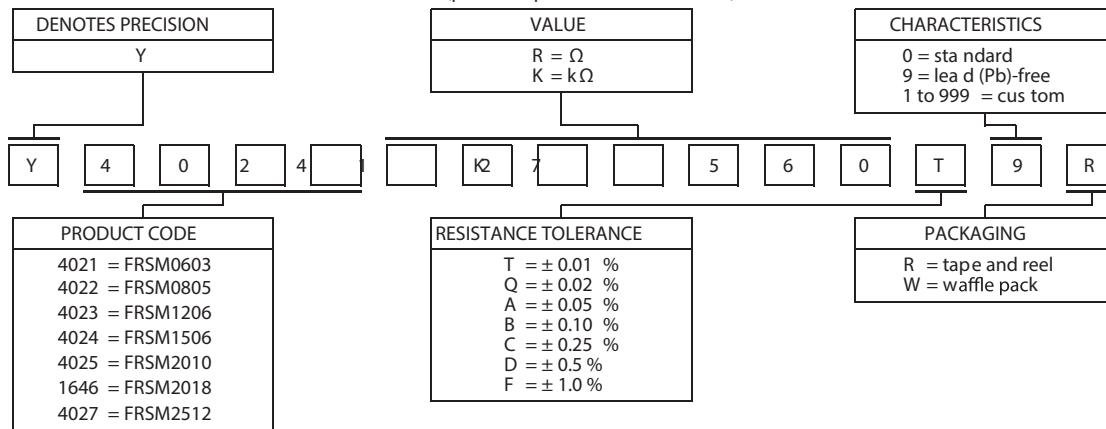
1. IR and vapor phase reflow are recommended.
2. Avoid the use of cleaning agents that attack epoxy resins, which form part of the resistor construction.
3. Vacuum pick up is recommended for handling.
4. If the use of a soldering iron becomes necessary, precautionary measures should be taken to avoid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

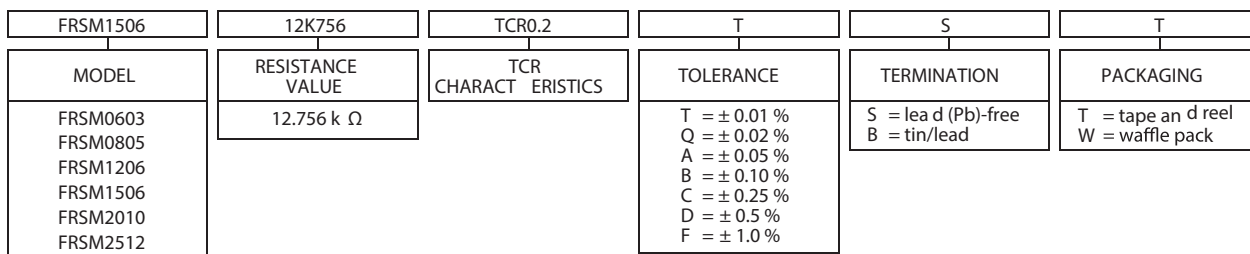
NEW GLOBAL PART NUMBER: Y402412K7560T9R (preferred part number format)



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

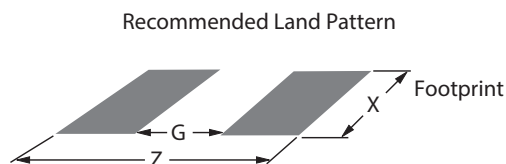
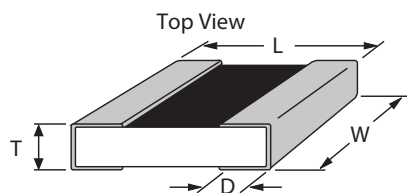
TYPE: FRSM1506
VALUES: 12.7560 k Ω
ABSOLUTE TOLERANCE: 0.01 %
TERMINATION: lead (Pb)-free
PACKAGING: tape and reel

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



Note

⁽¹⁾ For non-standard requests, please contact 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.

Series	VSMP	VFCP	VSM	FRSM	FRFC	RW-
Production Status	Obsolete	Obsolete	Active	Active	Active	Active
Foil type	Z Foil	BMF (Z-Foil)	BMF	BMF (Z1 Foil)	BMF (Z1-Foil)	BMF
Sizes	0603, 0805, 1206, 1506, 2010, 2512	0805, 1206, 1506, 2010, 2512	0805, 1206, 1506, 2010, 2512	0603, 0805, 1206, 1506, 2010, 2512	0805, 1206, 1506, 2010, 2512	0603(RWA), 0805(RWB), 1206(RBC)
Resistance Range (Ω)	5~125K	5~125K	10~125K	5~240K	5~125K	5~30K
Best TCR (ppm/ $^{\circ}$ C)	$\pm 0.2 \pm 1.8$ ppm/ $^{\circ}$ C	0.2 ± 1.6 ppm/ $^{\circ}$ C	$\pm 2 \pm 2$ ppm/ $^{\circ}$ C	$\pm 0.2 \pm 1.8$ ppm/ $^{\circ}$ C	0 ± 2 ppm/ $^{\circ}$ C	0 ± 1 ppm/ $^{\circ}$ C
Tightest Resistance Tolerance (%)	$\pm 0.01\%$	$\pm 0.01\%$ (T)	$\pm 0.01\%$ (T)	$\pm 0.01\%$ (T)	$\pm 0.01\%$ (T)	$\pm 0.01\%$ (T)
Max. Rated Power (W), at +70 $^{\circ}$ C	0.75W	0.1W - 0.6W	0.4W	0.1W - 0.8W	0.2W - 0.75W	0.1W-0.3W
Working Temp. Range	-55 $^{\circ}$ C~+150 $^{\circ}$ C	-55 $^{\circ}$ C~+150 $^{\circ}$ C	-55 $^{\circ}$ C~+125 $^{\circ}$ C	-55 $^{\circ}$ C~+175 $^{\circ}$ C	-65 $^{\circ}$ C~+155 $^{\circ}$ C	-65 $^{\circ}$ C~+155 $^{\circ}$ C
Min - Max. Working Voltage	220V	28V-220V	220V	438V	306V	95V
Thermal Shock, Typical	$\pm 0.005\%$	$\pm 0.005\%$	$\pm 0.005\%$	$\pm 0.005\%$	$\pm 0.003\%$	$\pm 0.01\%$
	-65 $^{\circ}$ C~150 $^{\circ}$ C	N/A	-65 $^{\circ}$ C~+150 $^{\circ}$ C	-65 $^{\circ}$ C~+150 $^{\circ}$ C	-65 $^{\circ}$ C~+150 $^{\circ}$ C	-65 $^{\circ}$ C~+150 $^{\circ}$ C
	100cyc.	N/A	100cyc.	100cyc.	100cyc.	100cyc.
Short Time Overload, Typical	$\pm 0.005\%$	$\pm 0.005\%$	$\pm 0.01\%$	$\pm 0.005\%$	$\pm 0.005\%$	$\pm 0.01\%$
High Temperature Exposure, Typical	$\pm 0.01\%$	$\pm 0.01\%$	$\pm 0.01\%$	$\pm 0.0025\%$	$\pm 0.005\%$	$\pm 0.02\%$
Resistance to Soldering Heat, Typical	$\pm 0.005\%$	$\pm 0.005\%$	$\pm 0.005\%$	$\pm 0.005\%$	$\pm 0.005\%$	$\pm 0.01\%$
Moisture Resistance, Typical	$\pm 0.005\%$	$\pm 0.005\%$	$\pm 0.005\%$	$\pm 0.003\%$	$\pm 0.005\%$	$\pm 0.02\%$
Load Life Stability, Typical	$\pm 0.005\%$ 70 $^{\circ}$ C 2000hrs.	$\pm 0.005\%$ 70 $^{\circ}$ C 2000hrs	$\pm 0.005\%$ 70 $^{\circ}$ C 2000hrs.,	$\pm 0.0025\%$ 70 $^{\circ}$ C 2000hrs., $\pm 0.005\%$ 70 $^{\circ}$ C 10000hrs.	$\pm 0.005\%$ 70 $^{\circ}$ C 2000hrs	$\pm 0.005\%$ 70 $^{\circ}$ C 2000hrs
AEC-Q200	N/A	N/A	N/A	comply	comply	comply

Part Vend	Y****	Part Number	PM Code
VFR	Y1624	Y1624350R000T9R	AA
VFR	Y1624	Y16244K64000T9R	AA
VFR	Y1624	Y162410K0000T9R	AA
VFR	Y1624	Y1624187R000Q9W	AA
VFR	Y1624	Y1624588R000T9W	AA
VFR	Y1624	Y16242K15000T9R	AA
VFR	Y1624	Y16245K49000T9R	AA
VFR	Y1624	Y16246K04000T9R	AA
VFR	Y1624	Y162411K8000T9R	AA
VFR	Y1624	Y1624100R000Q9R	AA
VFR	Y1624	Y1624147R000B0R	AA
VFR	Y1624	Y1624232R000Q9W	AA
VFR	Y1624	Y1624511R000B0W	AA
VFR	Y1624	Y16243K00000T9R	AA
VFR	Y1624	Y16245K62000T9W	AA
VFR	Y1625	Y162525K0000T9R	AA
VFR	Y1625	Y162520K0000Q27W	AA
VFR	Y1625	Y162525K0000Q28W	AA
VFR	Y1625	Y162530K0000Q28W	AA
VFR	Y1625	Y1625833R330A9R	AA
VFR	Y1625	Y162520R0000D0R	AA
VFR	Y1625	Y1625100R000T9R	AA
VFR	Y1625	Y1625800R000Q0R	AA
VFR	Y1625	Y16251K00000T9R	AA
VFR	Y1625	Y16251K50000T9R	AA
VFR	Y1625	Y16253K32000T9R	AA
VFR	Y1625	Y16255K38500Q0R	AA
VFR	Y1625	Y16257K50000T9R	AA
VFR	Y1625	Y162510K0000T9R	AA
VFR	Y1625	Y162513K0000Q0R	AA
VFR	Y1625	Y162518K0000T9W	AA
VFR	Y1625	Y162520K0000T9W	AA
VFR	Y1625	Y162524K9000T9W	AA
VFR	Y1627	Y162770K0000Q27W	AA
VFR	Y1629	Y16298K00000T9R	AA
VFR	Y1629	Y1629120R000T9R	AA
VFR	Y1629	Y16295K00000T9R	AA
VFR	Y1630	Y1630100R000B9R	AA
VFR	Y1630	Y1630100R000Q9R	AA
VFR	Y1630	Y1630110R000B9R	AA
VFR	Y1630	Y1630250R000T9R	AA
VFR	Y1630	Y1630350R000T9R	AA
VFR	Y1630	Y16301K00000T9R	AA
VFR	Y1630	Y16305K00000T9R	AA
VFR	Y1630	Y16305K11000F9R	AA
VFR	Y1630	Y163010K2000T0R	AA
VFR	Y1633	Y1633100R000Q9R	AA
VFR	Y1636	Y16361K00000B0R	AA
VFR	Y1636	Y16361K00000T9R	AA

VFR	Y1636	Y16362K74000T9R	AA	
VFR	Y1636	Y16363K00000T9R	AA	
VFR	Y1636	Y16364K75000A9R	AA	

Description	Info 1	Info 2	Class
350 OHM .01%	0805	VSMP0805T, Z-FOIL	109
4.64K OHM .01%	0805	VSMP0805T, Z-FOIL	109
10K OHM .01%	0805	VSMP0805T, Z-FOIL	109
187 OHM .02%	0805	VSMP0805T	109
588 OHM .01%	0805	VSMP0805T	109
2.15K OHM .01%	0805	VSMP0805T	109
5.49K OHM .01%	0805	VSMP0805 , Z-FOIL	109
6.04K OHM .01%	0805	VSMP0805 , Z-FOIL	109
11.8K OHM .01%	0805	VSMP0805 , Z-FOIL	109
100 OHM .02%	0805	VSMP0805	109
147 OHM .1%	0805	VSMP0805	109
232 OHM .02%	0805	VSMP0805	109
511 OHM .1%	0805	VSMP0805	109
3K OHM .01%	0805	VSMP0805	109
5.62K OHM .01%	0805	VSMP0805	109
25K OHM .01%	1206	VSMP1206T	109
20K OHM .02% V/N 321102	1206	VSMP1206, AER:157083	109
25K OHM .02% V/N 321102U	1206	VSMP1206, AER:157083	109
30K OHM .02% V/N 321102U	1206	VSMP1206, AER:157083	109
833.33 OHM .05%	1206	VSMP1206	109
20 OHM .5%	1206	VSMP1206	109
100 OHM .01%	1206	VSMP1206	109
800 OHM .02%	1206	VSMP1206	109
1K OHM .01%	1206	VSMP1206	109
1.5K OHM .01%	1206	VSMP1206	109
3.32K OHM .01%	1206	VSMP1206	109
5.385K OHM .02%	1206	VSMP1206	109
7.5K OHM .01%	1206	VSMP1206	109
10K OHM .01%	1206	VSMP1206	109
13K OHM .02%	1206	VSMP1206	109
18K OHM .01%	1206	VSMP1206	109
20K OHM .01%	1206	VSMP1206	109
24.9K OHM .01%	1206	VSMP1206	109
70K OHM .02% V/N 321103	2010	VSMP2010, AER:157083	109
8K OHM .01%	0805	VFCP0805T	109
120 OHM .01%	0805	VFCP0805,ULTRA H.P. Z-FOIL	109
5K OHM .01%	0805	VFCP0805,ULTRA H.P. Z-FOIL	109
100 OHM .1%	1206	VFCP1206	109
100 OHM .02%	1206	VFCP1206	109
110 OHM .1%	1206	VFCP1206	109
250 OHM .01%	1206	VFCP1206	109
350 OHM .01%	1206	VFCP1206	109
1K OHM .01%	1206	VFCP1206	109
5K OHM .01%	1206	VFCP1206	109
5.11K OHM 1%	1206	VFCP1206	109
10.2K OHM .01%	1206	VFCP1206	109
100 OHM .02%	2512	VSMP2512	109
1K OHM .01%	0603	VSMP0603	109
1K OHM .01%	0603	VSMP0603	109

2.74K OHM .01%	0603	VSMP0603	109
3K OHM .01%	0603	VSMP0603	109
4.75K OHM .05%	0603	VSMP0603	109

Life Cycle Ind.	Life Cycle Date	Mfg P/N
A	00.00.0000	Y1624350R000T9R
A	00.00.0000	Y16244K64000T9R
A	00.00.0000	Y162410K0000T9R
A	00.00.0000	Y1624187R000Q9W
A	00.00.0000	Y1624588R000T9W
A	00.00.0000	Y16242K15000T9R
A	00.00.0000	Y16245K49000T9R
A	00.00.0000	Y162410K0000T9R
A	00.00.0000	Y162411K8000T9R
A	00.00.0000	Y1624100R000Q9R
A	00.00.0000	Y1624147R000B0R
A	00.00.0000	Y1624232R000Q9W
A	00.00.0000	Y1624511R000B0W
A	00.00.0000	Y16243K00000T9R
A	00.00.0000	Y16245K62000T9W
A	00.00.0000	Y162525K0000T9R
A	00.00.0000	Y162520K0000Q27W
A	00.00.0000	Y162525K0000Q28W
A	00.00.0000	Y162530K0000Q28W
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A	00.00.0000	Y162520R0000D0R
A	00.00.0000	Y1625100R000T9R
A	00.00.0000	Y1625800R000Q0R
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A	00.00.0000	Y162510K0000T9R
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A	00.00.0000	Y162524K9000T9W
A	00.00.0000	Y162770K0000Q27W
A	00.00.0000	Y16298K00000T9R
A	00.00.0000	Y1629120R000T9R
A	00.00.0000	Y16295K00000T9R
A	00.00.0000	Y1630100R000B9R
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A	00.00.0000	Y163010K2000T0R
A	00.00.0000	Y1633100R000Q9R
A	00.00.0000	Y16361K00000B0R
A	00.00.0000	Y16361K00000T9R

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