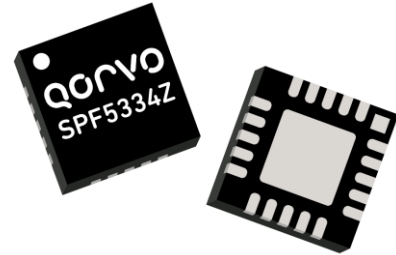


### Product Description

The SPF5344Z is a high performance 2-Stage pHEMT MMIC LNA designed for use from 0.8GHz to 4GHz. It offers low noise figure and high linearity in a gain block configuration. Its single-supply operation and integrated matching networks make implementation remarkably simple. The off-chip interstage choke and DC block allow for optimum performance tuning.



20-pin 4 mm x 4 mm QFN Package

### Key Features

- Low Noise Figure = 0.80 dB at 2.0 GHz
- Gain = 24.5 dB at 2.0 GHz
- OIP3 = 39 dBm at 2.0 GHz
- Excellent Return Loss: S11 > 20 dB, S22 > 20 dB at 2.0 GHz
- P<sub>1dB</sub> = 22.4 dBm at 2.0 GHz
- Single - Supply Operation: 5 V at I<sub>DQ</sub> = 120 mA
- Flexible Biasing Options: 3 – 5 V, Adjustable Current
- Broadband Internal Matching

### Applications

- Cellular, PCS, W-CDMA, ISM, WiMAX Receivers
- PA Driver Amplifier
- Low Noise, High Linearity Gain Block Applications

### Ordering Information

Part No.	Description
SPF5344Z	800–4000 MHz Dual LNA
SPF5344ZPCK1	1700–2200 MHz Evaluation Board

Standard T/R size = 3000 pieces on a 13" reel

## Absolute Maximum Ratings

Parameter <sup>(1)</sup>	Rating
Storage Temperature	-65 to 150°C
Drain Voltage (V <sub>d</sub> )	+5.5 V
Device Current (I <sub>d</sub> ) <sup>(2)</sup>	220 mA
Input Power (CW) <sup>(3)</sup>	+24 dBm
Dissipated Power	1200 mW
Junction Temperature	150°C

**Notes:**

- Operation of this device outside the parameter ranges given above may cause permanent damage. For reliable continuous operation, the device voltage and current must not exceed the maximum operating values specified in the table on page one. Bias Conditions should also satisfy the following expression:  
 $I_D V_D < (T_J - T_L) / R_{TH, j-l}$  and  $T_L = \text{Source Lead Temperature}$ .
- 100mA 1st Stage, 120mA 2nd Stage.
- Load condition 1:  $Z_L = 50\Omega$ , Load Condition 2:  $Z_L = 10:1$  VSWR

## Recommended Operating Conditions

Parameter	Min	Typ	Max	Units
V <sub>d</sub>	+3		+5	V
Operating Temp. Range	-40		+85	°C

Electrical specifications are measured at specified test conditions. Specifications are not guaranteed over all recommended operating conditions.

## Electrical Specifications

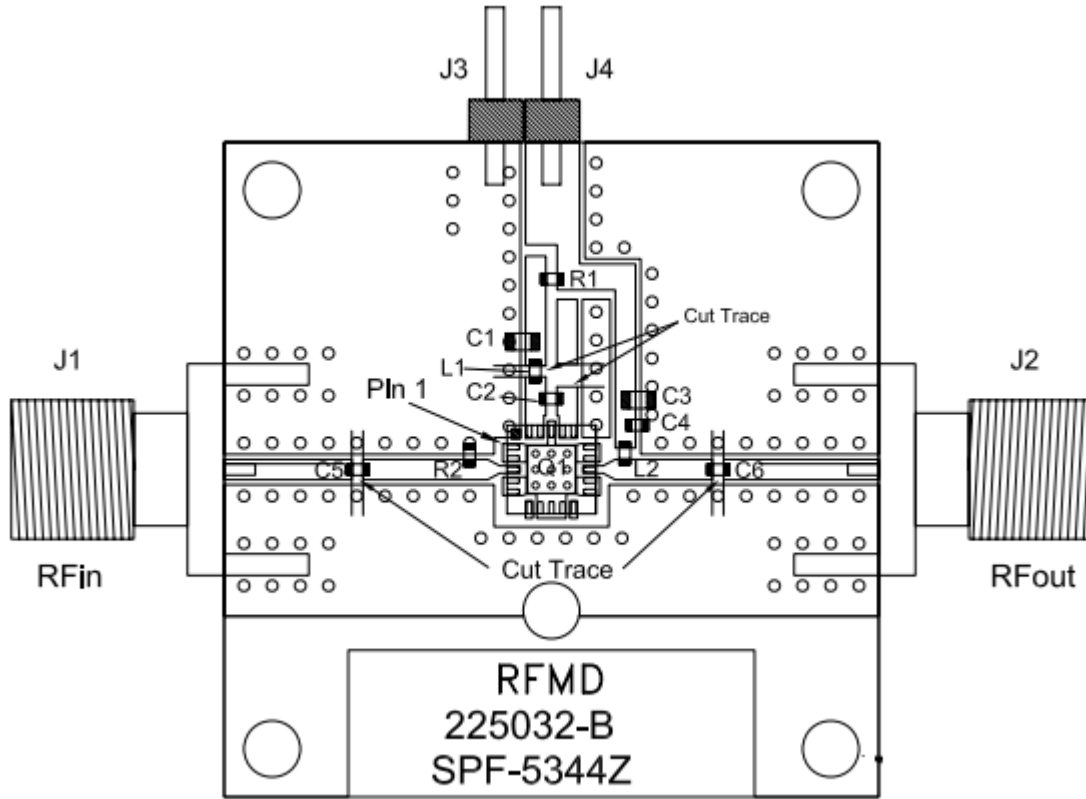
Parameter	Conditions <sup>(1)</sup>	Min	Typ	Max	Units
Operational Frequency Range		800		4000	MHz
Gain	At 900 MHz		34.5		dB
Gain	At 2000 MHz	22.1	24.5	26.9	dB
Gain	At 2200 MHz		22.5		dB
Input Return Loss			25.0		dB
Output Return Loss			25.0		dB
Reverse Isolation			32.5		dB
Output P1dB	At 900 MHz		+21.8		dBm
Output P1dB	At 2000 MHz		+22.4		dBm
Output P1dB	At 2200 MHz		+22.7		dBm
Output IP3	At 900 MHz, P <sub>out</sub> =+0 dBm/tone, Δf=1 MHz		+35.5		dBm
Output IP3	At 2000 MHz, P <sub>out</sub> =+0 dBm/tone, Δf=1 MHz	+35	+39.0		dBm
Output IP3	At 2200 MHz, P <sub>out</sub> =+0 dBm/tone, Δf=1 MHz		+39.0		dBm
Noise Figure <sup>(2)</sup>	At 900 MHz		0.7		dB
Noise Figure <sup>(2)</sup>	At 2000 MHz		0.8		dB
Noise Figure <sup>(2)</sup>	At 2200 MHz		0.9		dB
Device Current, I <sub>d</sub>		100	120	160	mA
Thermal Resistance, θ <sub>jc</sub>	Junction to Lead, 1st stage		65		°C/W
Thermal Resistance, θ <sub>jc</sub>	Junction to Lead, 2nd stage		65		°C/W

**Notes:**

- Test conditions unless otherwise noted: V<sub>d</sub> = +5.0V, Temp.=+25°C, 50Ω system.
- The Noise Figure value includes evaluation board losses.



**SPF5344ZPCK1 – Evaluation Board**



- Notes:
1. Pin 6 and 10 used internally. Do not connect externally.

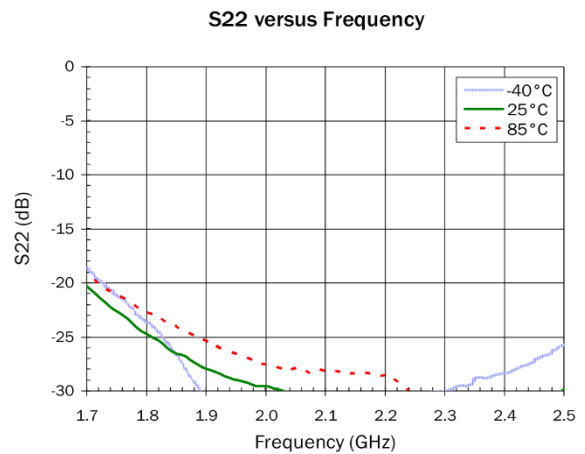
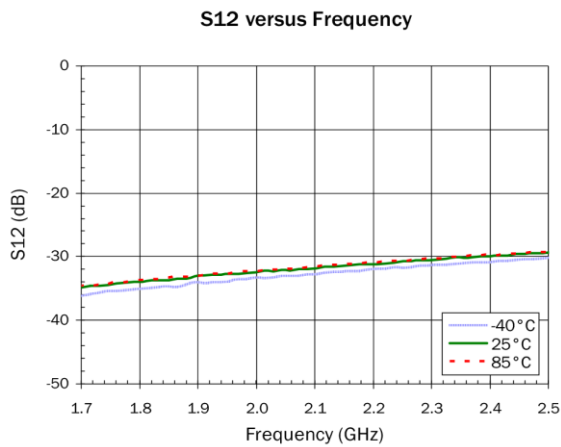
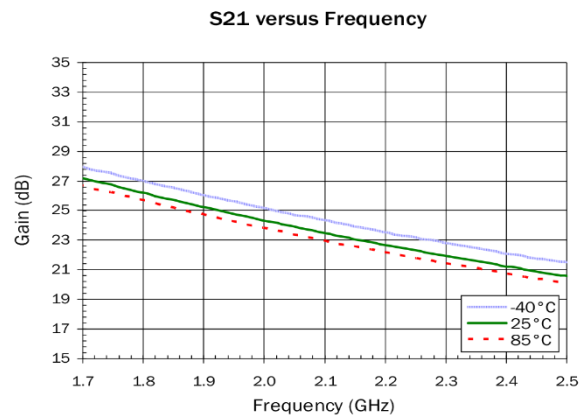
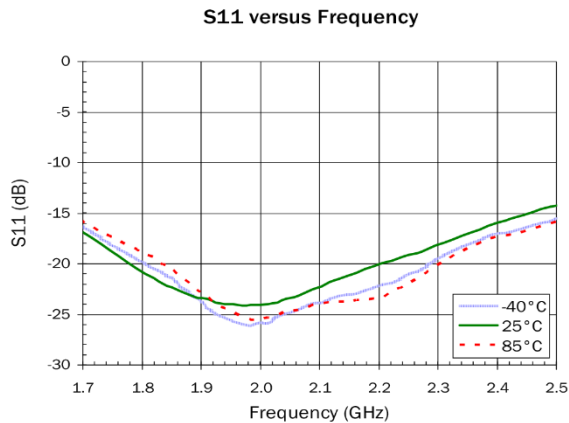
## Typical Performance

Parameter	Typical Value <sup>(1)</sup>									Units
	800	850	900	1800	1900	2000	2100	2200	2500	
Frequency	800	850	900	1800	1900	2000	2100	2200	2500	MHz
Gain	36.5	35.5	34.5	26.0	25.5	24.5	23.5	22.5	20.5	dB
Noise Figure <sup>(2)</sup>	0.6	0.7	0.7	0.8	0.8	0.8	0.9	0.9	1.1	dB
Input Return Loss	17.0	22.0	25.0	22.5	25.0	25.0	23.0	22.7	22.6	dB
Output Return Loss	15.0	19.5	23.5	25.0	25.0	25.0	25.0	25.0	25.0	dB
Output P1dB	21.5	21.6	21.8	22.6	23.1	22.4	23.0	22.7	22.6	dBm
OIP3 (P <sub>out</sub> /tone=0 dBm, Δf = 1 MHz)	35.0	35.5	35.6	39.0	39.0	39.0	39.5	39.0	39.0	dBm
Reverse Isolation	44.0	43.5	43.5	34.0	33.0	32.5	32.0	31.0	29.5	dB

Notes:

1. Test conditions unless otherwise noted: V<sub>d</sub>=+5.0 V, I<sub>d</sub>=120 mA, Temp=+25°C, 50 Ohm system.
2. The Noise Figure value includes evaluation board losses.

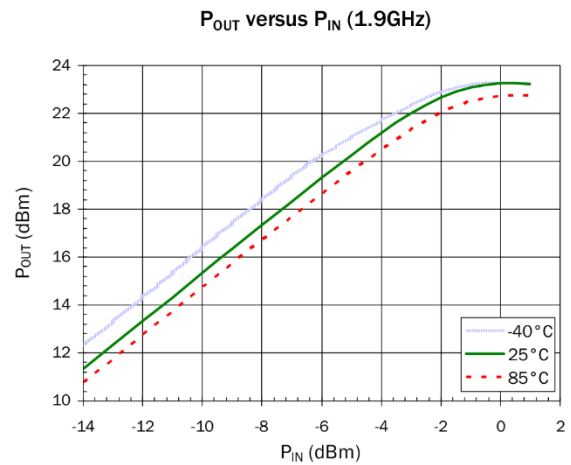
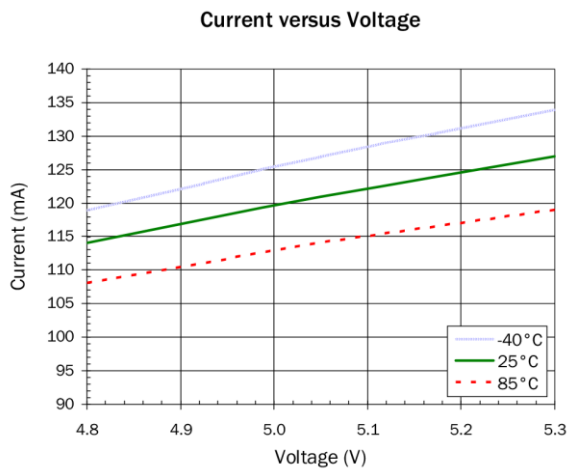
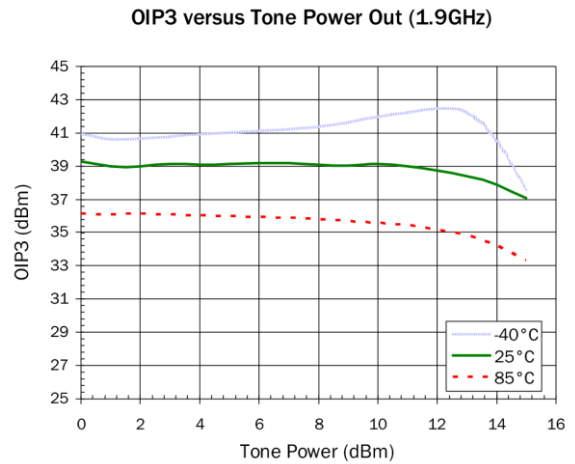
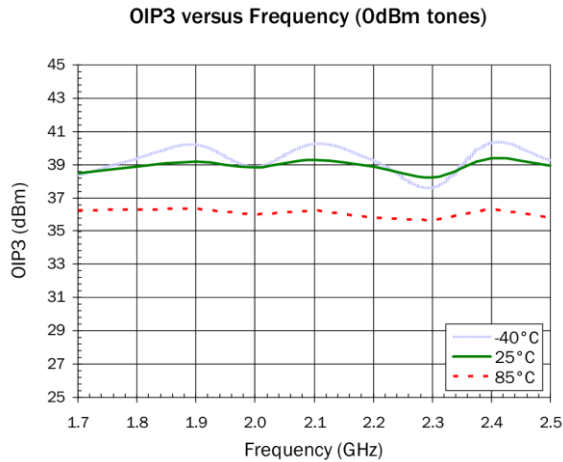
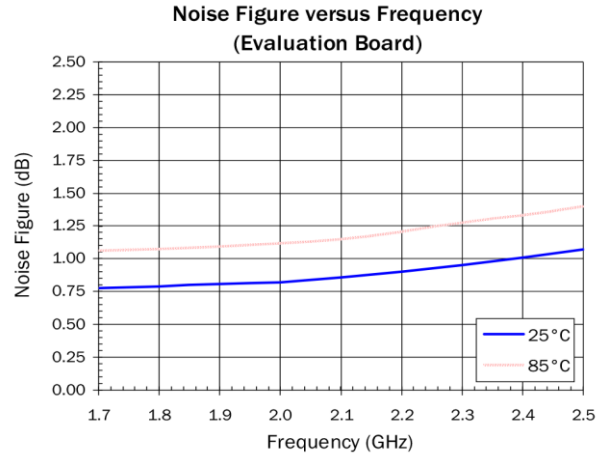
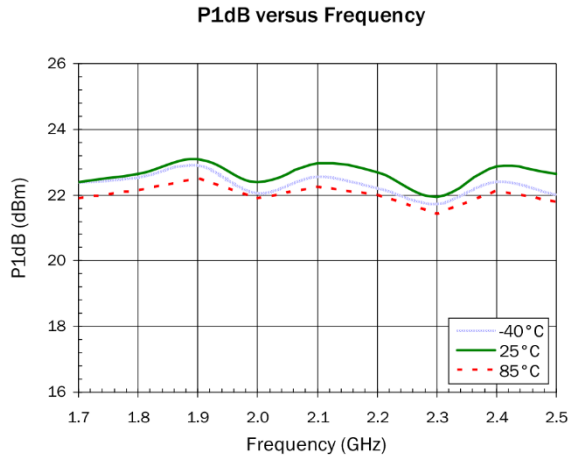
## Performance Plots



Notes:

1. Test conditions unless otherwise noted: V<sub>DD</sub>=+4.35 V, I<sub>DD</sub>=57 mA, Temp=+25°C, 50 Ohm system.

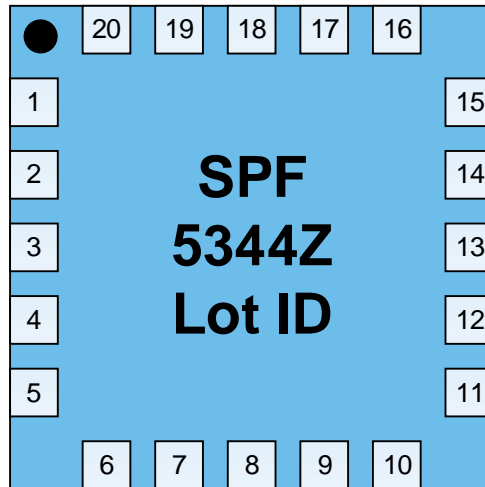
Performance Plots (Continued)



Notes:

1. Test conditions unless otherwise noted:  $V_{DD}=+4.35$  V,  $I_{DD}=57$  mA, Temp= $+25^{\circ}\text{C}$ , 50 Ohm system.

## Pad Configuration and Description



Top View

Pad No.	Label	Description
1, 2, 4, 5, 7, 8, 9, 11, 12, 14, 15, 16, 18, 20	N/A	Ground or No-Connect. No connection internal
3	RF <sub>IN</sub>	RF Input, V <sub>G1</sub> applied through this pin.
6	RF / DC	Connected internally to RF <sub>IN</sub> (V <sub>G1</sub> ). External No-Connect required.
10	RF / DC	Connected internally to RF <sub>OUT</sub> (V <sub>D2</sub> ). External No-Connect required.
13	RF <sub>OUT</sub>	RF Output, V <sub>D2</sub> applied through this pin.
17	RF / V <sub>G2</sub>	RF/DC input of stage 2, V <sub>G2</sub> applied through this pin.
19	RF / V <sub>D1</sub>	RF/DC output of stage 1, V <sub>D1</sub> applied through this pin.

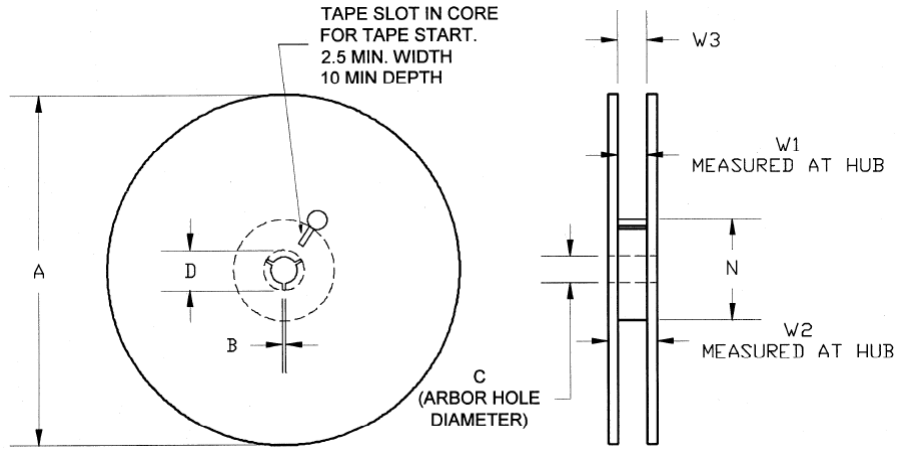






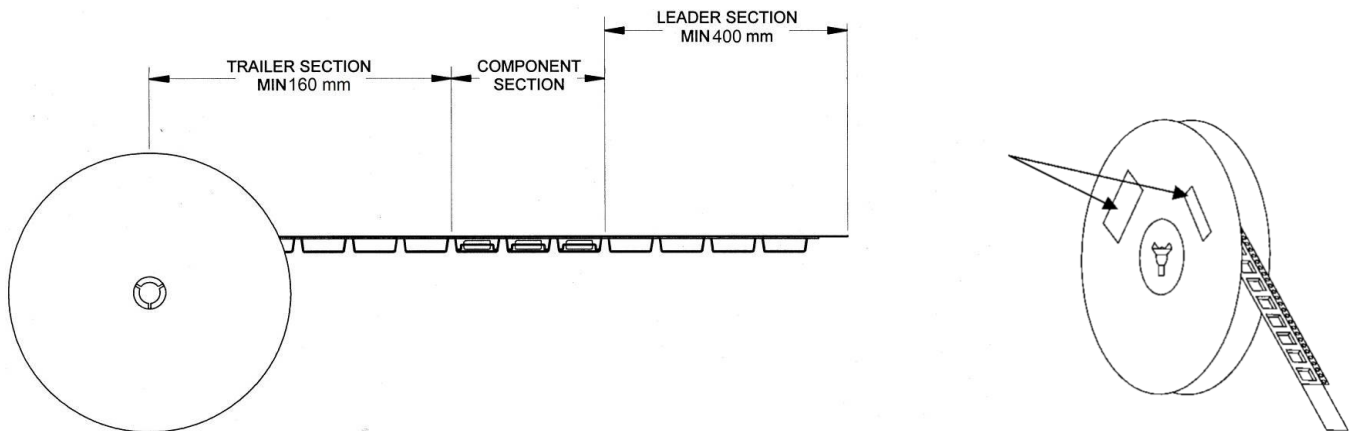
**Tape and Reel Information – Reel Dimensions**

Standard T/R size = 3000 pieces on a 13" reel.



Feature	Measure	Symbol	Size (in)	Size (mm)
Flange	Diameter	A	12.992	330
	Thickness	W2	0.717	18.2
	Space Between Flange	W1	0.504	12.8
Hub	Outer Diameter	N	4.016	102.0
	Arbor Hole Diameter	C	0.512	13.0
	Key Slit Width	B	0.079	2.0
	Key Slit Diameter	D	0.795	20.2

**Tape and Reel Information – Tape Length and Label Placement**



- Notes:
1. Empty part cavities at the trailing and leading ends are sealed with cover tape. See EIA 481-1-A.
  2. Labels are placed on the flange opposite the sprockets in the carrier tape.

## Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1B	ESDA / JEDEC JESD22-A114
MSL – Moisture Sensitivity Level	Level 2	IPC/JEDEC J-STD-020



Caution!  
ESD-Sensitive Device

## Solderability

Compatible with both lead-free (260°C max. reflow temp.) and tin/lead (245°C max. reflow temp.) soldering processes. Solder profiles available upon request.

Contact plating: Matte Sn (*Plating thickness: Sn 8 μm to 20 μm*)

## RoHS Compliance

This part is compliant with 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment) as amended by Directive 2015/863/EU.

This product also has the following attributes:

- Lead Free
- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A (C<sub>15</sub>H<sub>12</sub>Br<sub>4</sub>O<sub>2</sub>) Free
- PFOS Free
- SVHC Free



## Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations:

**Web:** [www.qorvo.com](http://www.qorvo.com)

**Tel:** 1-844-890-8163

**Email:** [customer.support@qorvo.com](mailto:customer.support@qorvo.com)

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