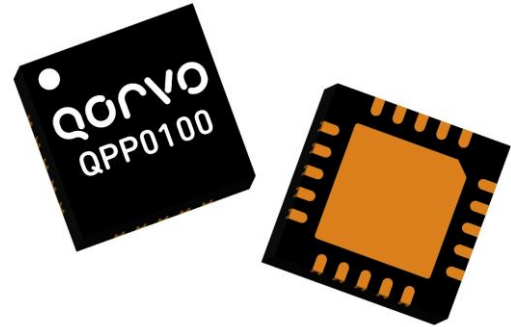


Product Overview

Qorvo's QPP0100 is a high power VPIN limiter with robustness to short-pulse input signals up to 100W. It offers exceptionally low insertion loss over a wide bandwidth and requires no DC bias. The QPP0100 is housed in a low-cost 4x4 mm plastic over-molded QFN package.

The QPP0100 is internally matched to 50 ohms and operates from 6 to 12 GHz with typical insertion loss less than 1.2dB and flat leakage below 21dBm. It is capable of withstanding 100W of incident power under short-pulse conditions. It is well suited for both commercial and defense related applications.



20L 4 x 4 mm OVM QFN Package

Key Features

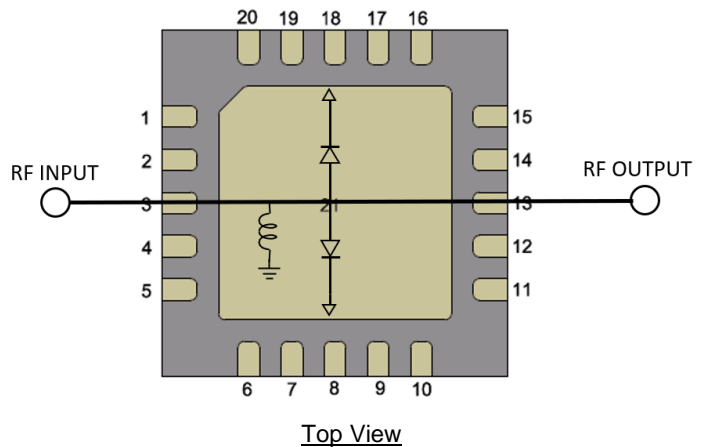
- Frequency Range: 6 to 12 GHz
- Insertion Loss: <1.2 dB
- Peak Power Handling: 100 W (pulsed)
- Flat Leakage: 21 dBm
- Spike Leakage: 22 dBm
- Passive (no DC bias required)
- Recovery time < 200 ns
- Package Dimensions: 4.00 x 4.00 x 0.85 mm

Performance is typical across frequency. Please reference electrical specification table and data plots for more details.

Applications

- Receive Chain Protection
- Commercial and Military Radar

Functional Block Diagram



Ordering Information

Part	Description
QPP0100	X-Band 100W VPIN Limiter, Waffle Pack, Qty 10
QPP0100SR	X-Band 100W VPIN Limiter, Tape & Reel 7-inch, Qty 100
QPP0100EVB01	Evaluation Board, Qty 1

Absolute Maximum Ratings

Parameter	Rating
Incident Power, Pulsed ¹ , 50 Ω, 85 °C	50 dBm
Incident Power, CW, 50 Ω, 85 °C	44 dBm
Mounting Temperature (30 s max)	260 °C
Storage Temperature	-55 to 150 °C

Note:

¹ Pulse conditions: PW = 100 us, Duty Cycle = 10%

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability.

Recommended Operating Conditions

Parameter	Min	Typ.	Max	Units
Passive – No Bias Required				
Temperature Range	-40	+25	+85	°C

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

Electrical Specifications

Parameter	Conditions ⁽¹⁾	Min	Typ.	Max	Units
Operational Frequency Range		6		12	GHz
Insertion Loss	6.0 GHz - 9.5 GHz	-	0.6	-	dB
	9.5 GHz - 10.5 GHz	-	0.75	-	
	10.5 GHz - 11.5 GHz	-	1.0	-	
	11.5 GHz - 12.0 GHz	-	1.2	-	
Input Return Loss			10		dB
Output Return Loss			12		dB
Flat Leakage			21.0		dBm
Power Handling	Pulsed, PW = 100μS, Duty Cycle = 10%, 85° C			50	dBm
Power Handling	CW, 85° C			44	dBm
Pulse Recovery Time				200	ns
Spike Leakage			22		dBm
Insertion Loss Temperature Coefficient			0.002		dB/ °C

Notes:

1. Test conditions unless otherwise noted: Data de-embedded to reference lines at package leads. Temp = +25 °C.

Thermal and Reliability Information

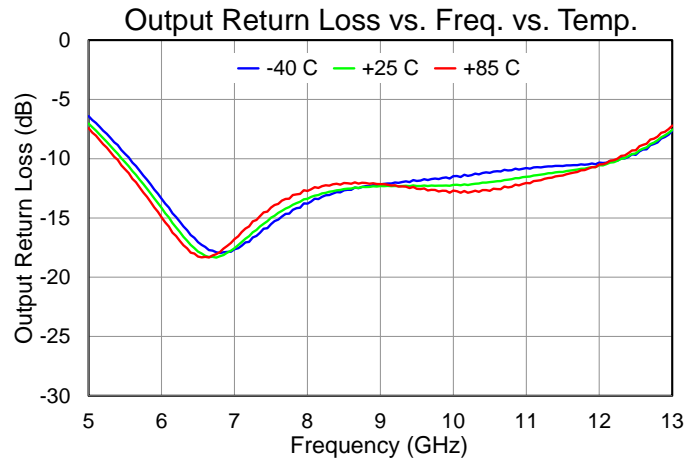
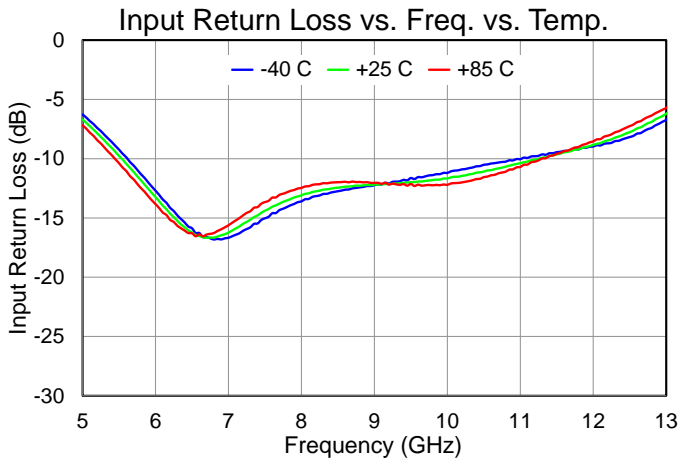
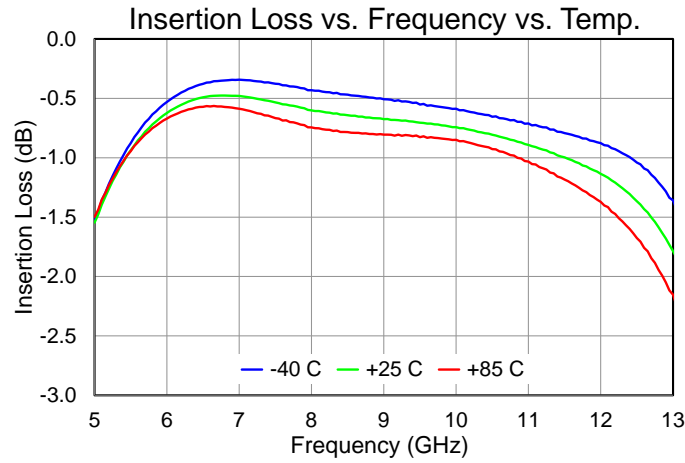
Parameter	Test Conditions	Value	Units
Incident Power (RF Operational Life Test ¹)	10 GHz Pulsed, PW=100 us, DC=10%, 50 Ω, 85 °C	49	dBm
Incident Power (RF Operational Life Test ¹)	10 GHz CW, 50 Ω, 85 °C	39	dBm

Notes:

1. Test terminated after 168 hours.

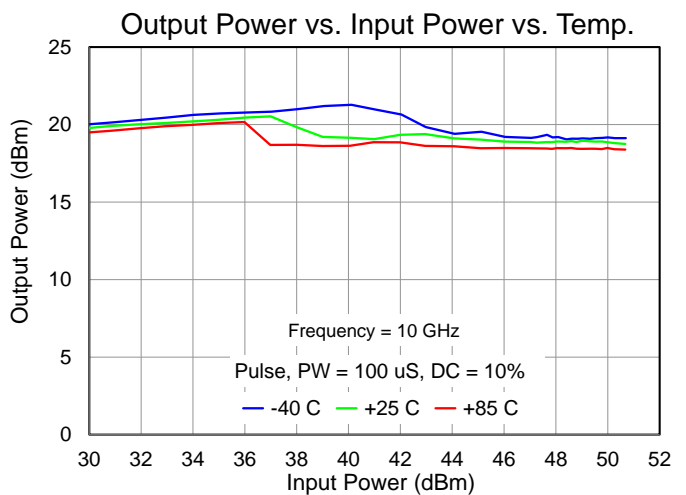
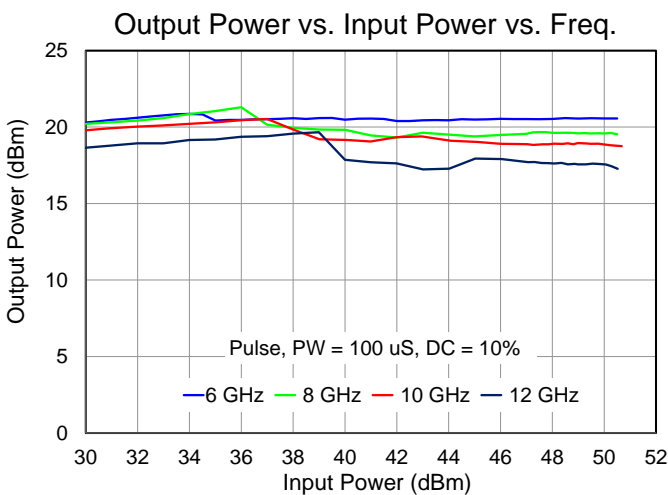
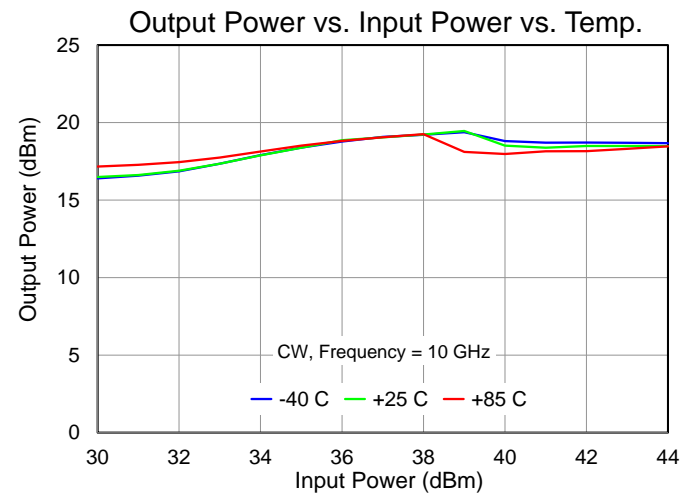
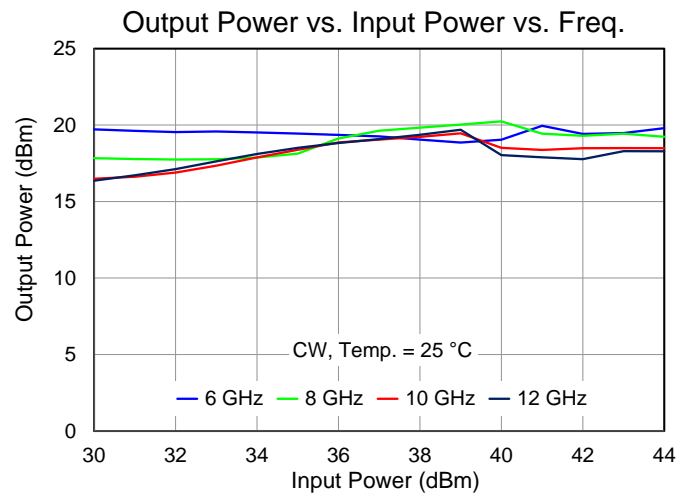
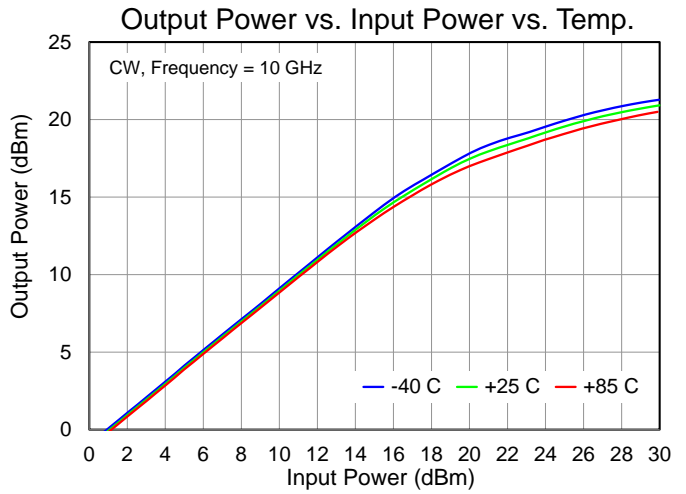
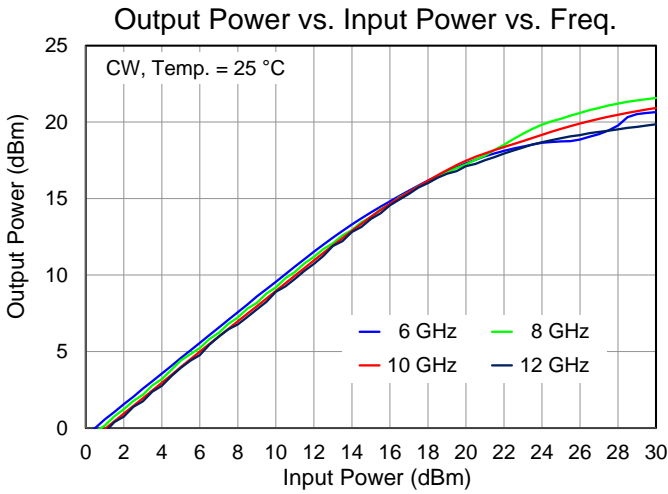
Performance Plots – Small Signal

Test conditions unless otherwise noted: Temp.=+25 °C

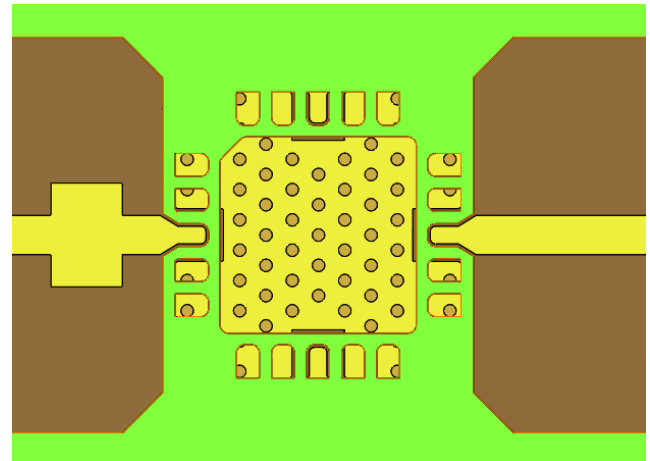
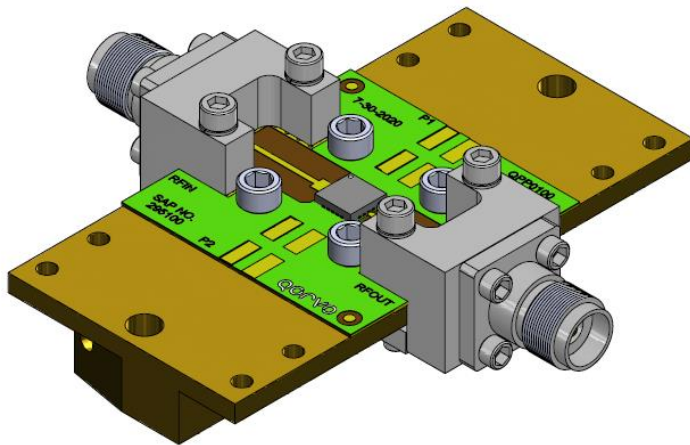


Performance Plots – Large Signal

Test conditions unless otherwise noted: Temp.=+25 °C








Evaluation Board and Mounting Details

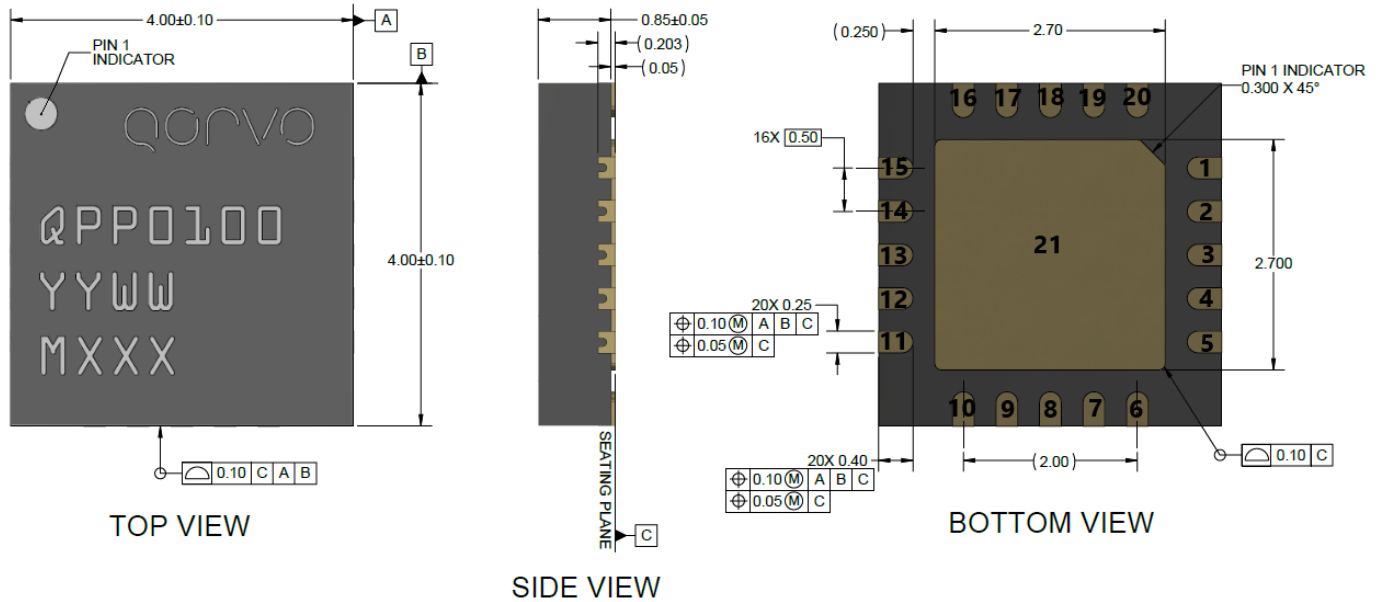


Evaluation Board PCB Information

LAYER STACK LEGEND_SEE NOTE 3 FOR MATERIAL (COPPER THICKNESS IS @ FINISHED THICKNESS)

	Material	Layer	Thickness	Dielectric Material	Type	Gerber
		SILKSCREEN_TOP			Legend	GTO
	Surface Material	SOLDERMASK_TOP	0.0004in	Solder Resist	Solder Mask	GTS
	Copper	METAL1_TOP	0.0018in		Signal	GTL
	Core		0.0100in	ROGERS 4350B	Dielectric	
	Copper	METAL2_BOT	0.0018in		Signal	GBL
Total thickness: 0.0140in						

Package Marking, Pad Configuration and Description



LASER MARK NOTES:

- 0100 IS PART#
- YY IS THE LAST TWO DIGITS OF THE CALENDAR YEAR
- WW IS THE WEEK NUMBER OF THE ASSEMBLY LOT START
- MXXX IS THE BATCH ID

MATERIALS:

- PACKAGE LEADS ARE GOLD PLATED
- PART IS MOLD ENCAPSULATED

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN mm

.XX = $\pm .25$
TOLERANCES .XXX = $\pm .127$ ANGLES = 0.5°

Pad No.	Label	Description
1, 2, 4-12, 14-20	NC	No connection; may be grounded if desired
3	RF Input	RF Input, matched to 50 Ohms, DC coupled
13	RF Output	RF Output, matched to 50 Ohms, DC coupled
21 (Slug)	GND	On PCB, multiple copper-filled vias should be employed under the center pad to minimize inductance and thermal resistance

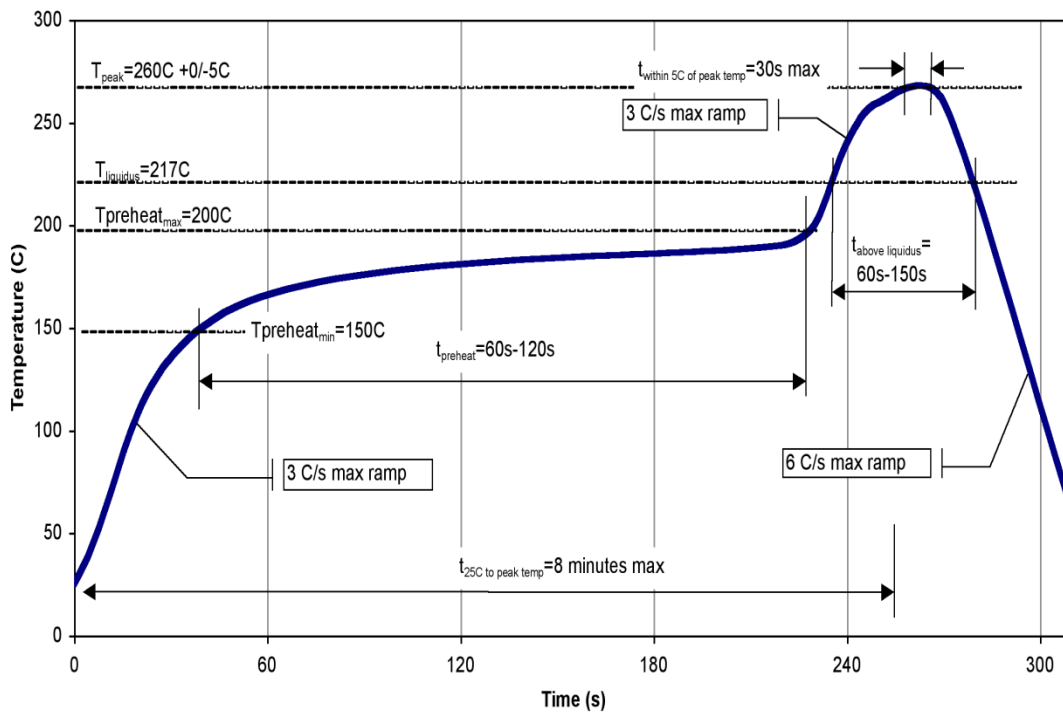
NOTE: The RF Input and RF Output ports are not interchangeable.

Assembly Notes

Compatible with lead-free soldering processes with 260°C peak reflow temperature.

Contact plating: Ni-Pd-Au.

Recommended Soldering Profile



Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1C	ANSI/ESDA / JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C3	ANSI/ESDA/JEDEC JS-002
MSL – Moisture Sensitivity Level	Level 3	IPC/JEDEC J-STD-020



Caution!
ESD-Sensitive Device

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 (C₁₅H₁₂Br₄O₂) Free
- PFOS Free
- SVHC Free

Contact Information

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

Web: www.qorvo.com

Tel: 1-844-890-8163

Email: customer.support@qorvo.com

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