



# TQQ7303

## 1747.5 MHz LTE Band 3 Uplink BAW Filter

### Product Overview

The TQQ7303 is an exceptionally high-performance uplink BAW filter for LTE Band 3. This filter is housed in a compact 3 x 3 x 1.02 mm package for base station applications.

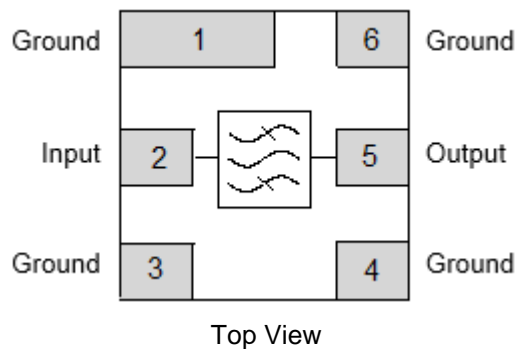
Low insertion loss, coupled with high attenuation makes this filter an ideal choice for uplink RF filtering needs.

The TQQ7303 is part of Qorvo's extensive portfolio of RF Baw and SAW filters.



6 Pin 3 x 3 mm leadless SMT Package

### Functional Block Diagram



### Pin Configuration - Single Ended

Pin No.	Label
2	Input
5	Output
1, 3, 4, 6	Ground

### Key Features

- 75 MHz Bandwidth
- High Attenuation
- Low Loss
- Single-ended Operation
- Small Size: 3.00 x 3.00 x 1.02 mm
- Surface Mount Device
- RoHS Compliant, Pb-Free

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

### Applications

- LTE Band 3 Uplink Infrastructure
- Base Station Infrastructure
- General Purpose Wireless

### Ordering Information

Part No.	Description
TQQ7303	1747.5 LTE Band 3 UL BAW Filter
TQQ7303-EVB	Evaluation Board

Standard T/R size = 2500 pieces on a 13" reel

## Absolute Maximum Ratings

Parameter	Rating
Storage Temperature	-40 to +95°C
RF Input Power (CW, +55°C for 10,000 hours)	+30 dBm
(CW, +105°C for 100,000 hours)	+24 dBm

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
T <sub>CASE</sub>	-40		+85	°C

Electrical specifications are measured at specified test conditions.

## Electrical Specifications <sup>(1,2,3)</sup>

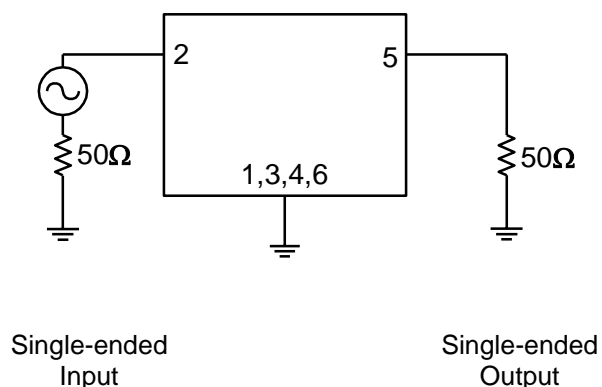
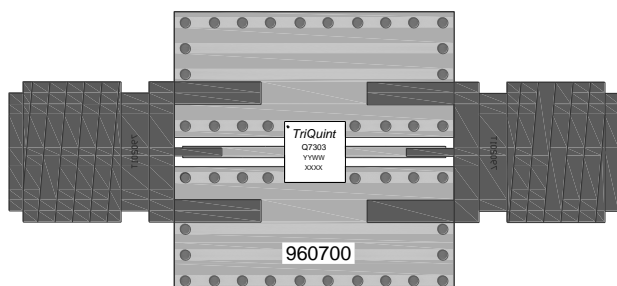
Test conditions unless otherwise noted: Temperature Range = -40 °C to +85 °C, 50 Ω system

Parameter	Conditions	Min	Typical <sup>(4)</sup>	Max	Units
Passband Frequency		1710	-	1785	MHz
Center Frequency		-	1747.5	-	MHz
3.0 dB Bandwidth		-	81	-	MHz
Insertion Loss	1710 - 1785 MHz (+25 °C)	-	2.4	3.0	dB
	1710 - 1785 MHz	-	3.0	3.5	
Passband Ripple <sup>(5)(6)</sup>	1710 - 1785 MHz (+25 °C)	-	1.0	1.8	dB (p-p)
	1710 - 1785 MHz	-	1.6	2.4	
Group Delay Variation	1710 - 1785 MHz (+25 °C)	-	20	40	ns (p-p)
	1710 - 1785 MHz	-	38	55	
Group Delay Variation	Any 5 MHz band in passband (+25 °C)	-	7	18	ns (p-p)
	Any 5 MHz band in passband	-	14	30	
Input/Output VSWR	1710 - 1785 MHz	-	1.9:1	2.4:1	Ratio
Stopband Attenuation (Relative to 0 dB)	0.9 - 720 MHz	30	32	-	dB
	720 - 1670 MHz	28	32	-	
	1670 - 1690 MHz	10	20	-	
	1805 - 1825 MHz (-40 to -10 °C)	38	46	-	
	1825 - 1880 MHz	44	52	-	
	1880 - 1920 MHz	30	44	-	
	1920 - 2110 MHz	40	42	-	
	2110 - 2170 MHz	40	44	-	
	2170 - 2660 MHz	24	28	-	
	2660 - 2690 MHz	22	26	-	
	2690 - 3800 MHz	10	17	-	
	3800 - 5000 MHz	5	11	-	
Source / Load Impedance <sup>(7)</sup>	Single Ended	-	50	-	Ω

### Notes:

- All specifications are based on the Qorvo schematics for the reference designs shown in page 3.
- In production, devices will be tested at room temperature to a guard banded specification to ensure electrical compliance over temperature.
- Electrical margin has been built into the design to account for the variations due to temperature drift and manufacture tolerances.
- Typical values are based on average measurements at room temperature on pcb. (25 °C ±5 °C)
- This is defined as the difference between the maximum and minimum insertion loss within the specified band.
- This is defined as the worst difference between a peak and adjacent valley within defined frequency points.
- Optimum impedance to achieve the performance shown.

## Evaluation Board and Schematic – TQQ7303-EVB



## Bill of Material – TQQ7303-EVB

Reference Des.	Value	Description	Manuf.	Part Number
U1	n/a	1747.5 MHz Band 3 Uplink BAW Filter	Qorvo	TQQ7303
n/a	n/a	Printed Circuit Board	Qorvo	960700
n/a	n/a	SMA Edge Connector	Radiall	9602-1111-018

## Evaluation Board PCB Information

Top, middle & bottom layers: 1 oz copper

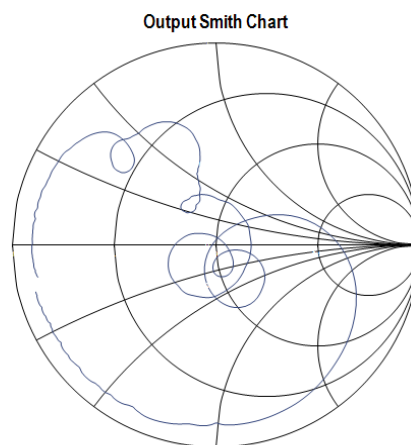
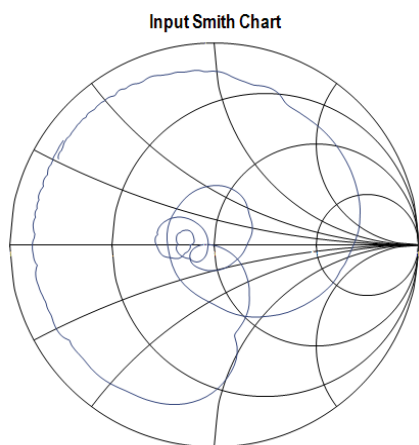
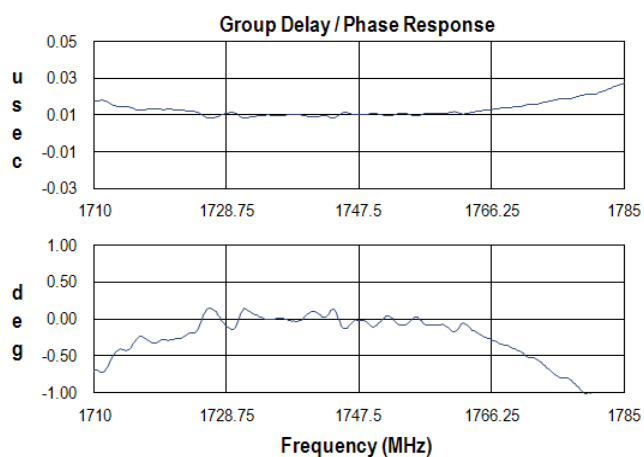
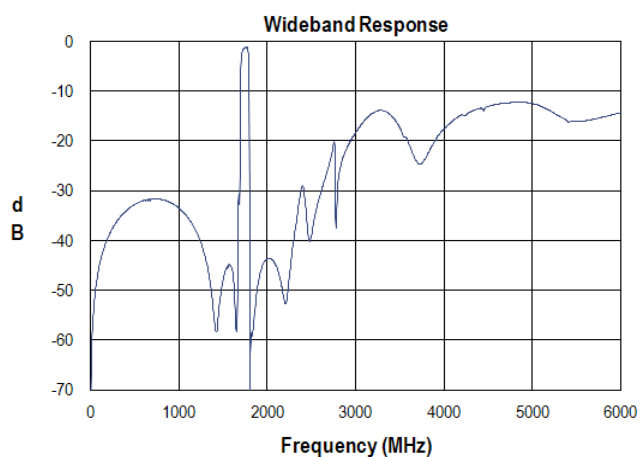
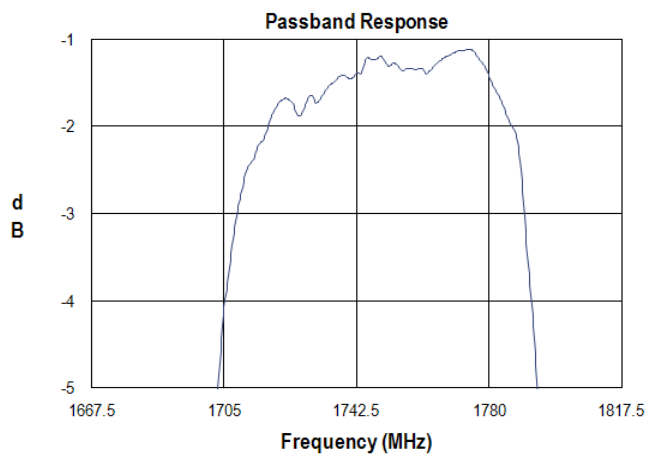
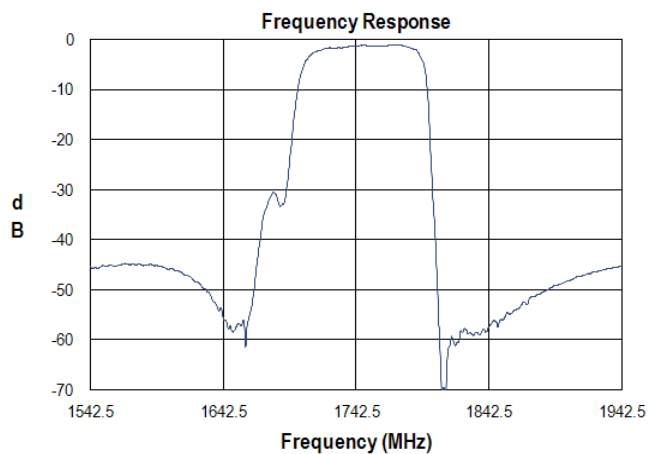
Substrates: FR4 dielectric, 0.031" thick

Finish plating: Nickel: 3-8μm thick, Gold: 0.03-0.2μm thick

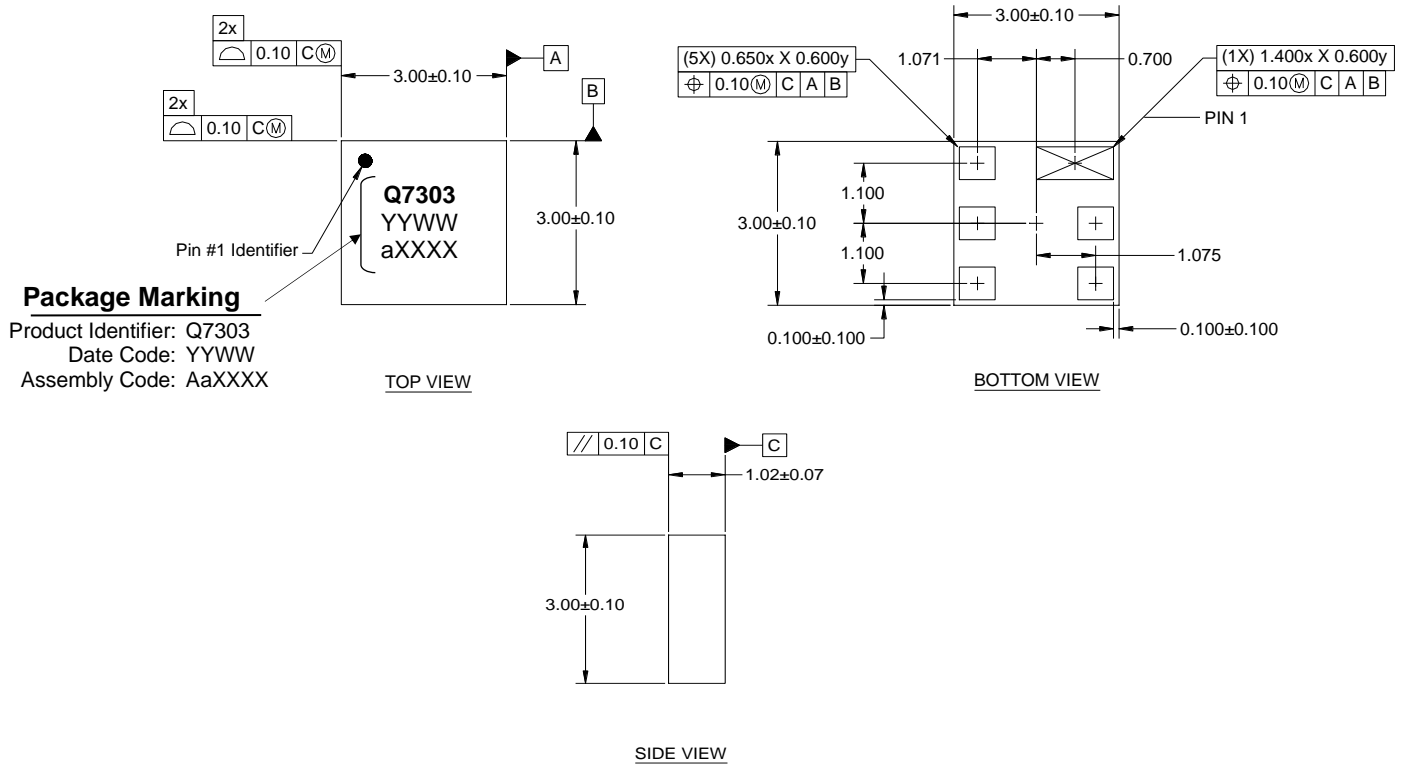
Hole plating: Copper min. 0.0008μm thick

## Typical Performances

Test conditions unless otherwise noted: Temp = +25 °C, 50  $\Omega$  system



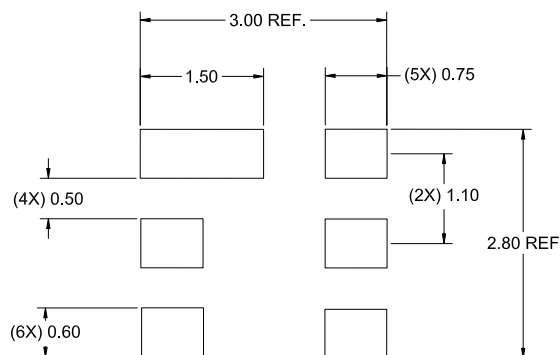
## Package Marking and Dimensions



### Notes:

1. All dimensions are in millimeters
2. All tolerances are ±0.15 mm except overall length and width ±0.10 mm
3. Contact plating: ENIG (Electroless Nickel Immersion Gold)
4. Terminations: 0.5 – 1.0 µm Au plating, over a 2 – 6 µm Ni plating

## PCB Mounting Pattern

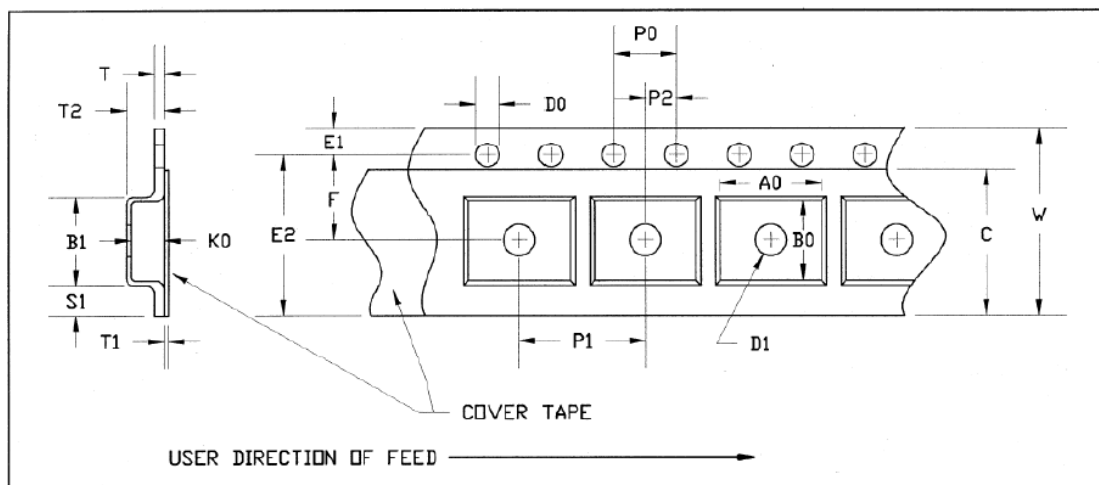


### Notes:

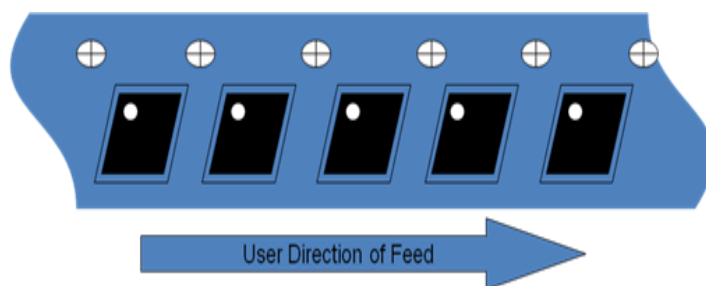
1. All dimensions are in millimeters. Angles are in degrees.
2. Use 1 oz. copper minimum for top and bottom layer metal.

## Tape and Reel Information – Carrier and Cover Tape Dimensions

Tape and reel specifications for this part are also available on the Qorvo website.  
Standard T/R size = 2500 pieces on a 13" reel.

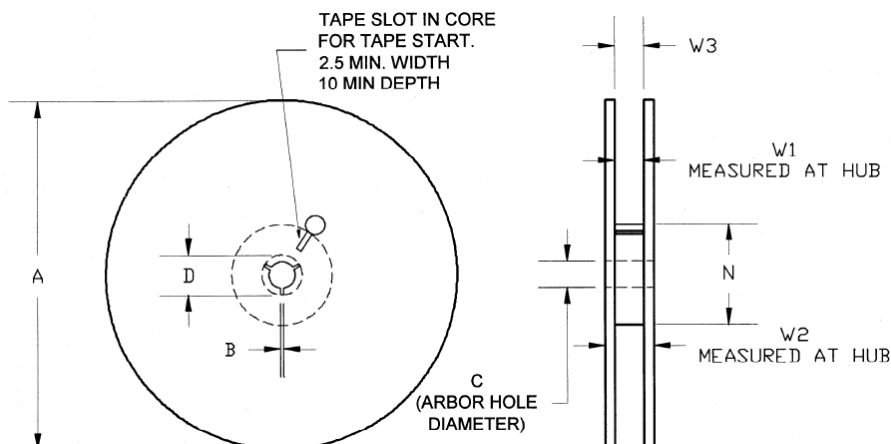


Feature	Measure	Symbol	Size (in)	Size (mm)
Cavity	Length	A0	0.126	3.20
	Width	B0	0.126	3.20
	Depth	K0	0.047	1.20
	Pitch	P1	0.157	4.00
Centerline Distance	Cavity to Perforation - Length Direction	P2	0.079	2.00
	Cavity to Perforation - Width Direction	F	0.217	5.50
Cover Tape	Width	C	0.362	9.20
Carrier Tape	Width	W	0.472	12.0



## Tape and Reel Information – Reel Dimensions

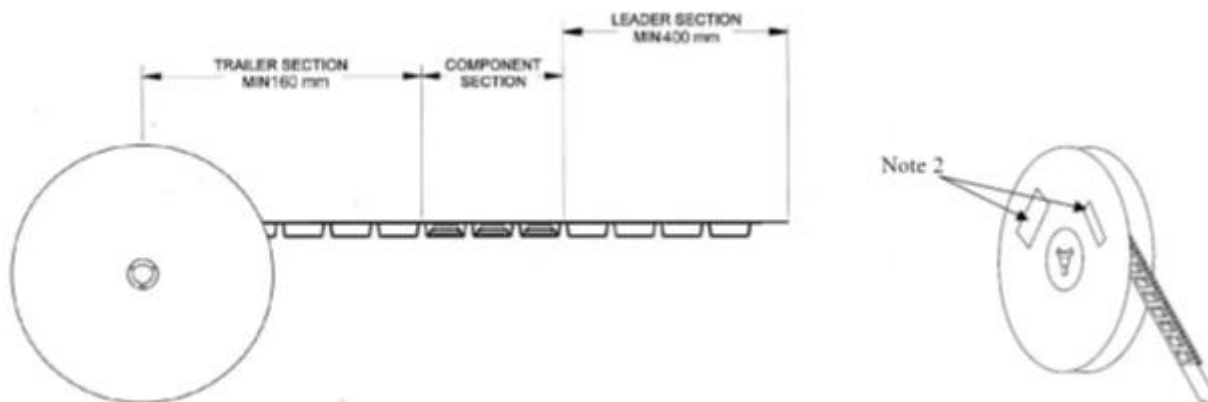
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Standard T/R size = 2500 pieces on a 13" reel.



Feature	Measure	Symbol	Size (in)	Size (mm)
Flange	Diameter	A	12.992	330.0
	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

Standard T/R size = 2500 pieces on a 13" reel.



### Notes:

1. Empty part cavities at the trailing and leading ends are sealed with cover tape. See EIA 481.
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 0B	ESDA / JEDEC JS-001-2012
ESD – Machine Model (MM)	Class B	ESDA / JEDEC JESD22-A115F
MSL – Moisture Sensitivity Level	Level 3	IPC/JEDEC J-STD-020



Caution!  
ESD-Sensitive Device

## Solderability

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

Contact Plating: ENIG (Electroless Nickel Immersion Gold)

## 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



## Contact Information

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

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