

ES52K1F05N-16.367667M TR
[Click part number to visit Part Number Details page](#)
REGULATORY COMPLIANCE (Data Sheet downloaded on Sep 2, 2016)
[Click badges to download compliance docs](#)

Regulatory Compliance standards are subject to updates by governing bodies. Click the badges to download the latest compliance docs for this part number directly from Ecliptek.

**ITEM DESCRIPTION**

Temperature Compensated Quartz Crystal Clock Oscillators TCXO (TCVCXO) Clipped Sinewave 3.0Vdc 4 Pad 2.5mm x 3.2mm Ceramic Surface Mount (SMD) 16.367667MHz ± 0.5 ppm Maximum -30°C to +85°C

ELECTRICAL SPECIFICATIONS

Nominal Frequency	16.367667MHz
Frequency Stability	± 0.5 ppm Maximum (Inclusive of Operating Temperature Range, at Vdd=3.0Vdc)
Frequency Stability vs. Frequency Tolerance	± 0.5 ppm Maximum (at 25°C $\pm 2^\circ\text{C}$, at Vdd=3.0Vdc)
Frequency Stability vs. Input Voltage	± 0.2 ppm Maximum ($\pm 5\%$)
Frequency Stability vs. Load	± 0.2 ppm Maximum ($\pm 1\text{k}\Omega$ / $\pm 1\text{pF}$)
Frequency Stability vs. Reflow	± 1.0 ppm Maximum (at 25°C, 1 hour after reflow, 2 times)
Frequency Stability vs. Aging	± 1 ppm/year Maximum (at 25°C)
Operating Temperature Range	-30°C to +85°C
Supply Voltage	3.0Vdc $\pm 5\%$
Input Current	2.0mA Maximum
Output Voltage	0.8Vp-p Clipped Sinewave Minimum (External DC-Cut capacitor required, 1000pF recommended)
Load Drive Capability	10kOhms//10pF
Output Logic Type	Clipped Sinewave
Control Voltage	None (No Connect on Pad 1)
Phase Noise	All Values are Typical -80dBc/Hz at 10Hz Offset -115dBc/Hz at 100Hz Offset -135dBc/Hz at 1kHz Offset -148dBc/Hz at 10kHz Offset
Start Up Time	5mSec Maximum
Storage Temperature Range	-55°C to +125°C

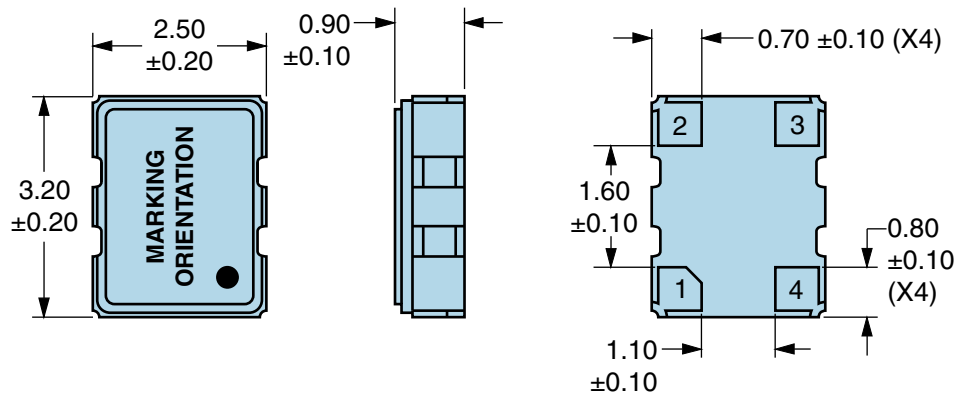
ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

Fine Leak Test	MIL-STD-883, Method 1014 Condition A
Gross Leak Test	MIL-STD-883, Method 1014 Condition C
Mechanical Shock	MIL-STD-202, Method 213 Condition C
Resistance to Soldering Heat	MIL-STD-202, Method 210
Resistance to Solvents	MIL-STD-202, Method 215
Solderability	MIL-STD-883, Method 2003
Temperature Cycling	MIL-STD-883, Method 1010
Vibration	MIL-STD-883, Method 2007 Condition A

ES52K1F05N-16.367667M TR [Click part number to visit Part Number Details page](#)



MECHANICAL DIMENSIONS (all dimensions in millimeters)

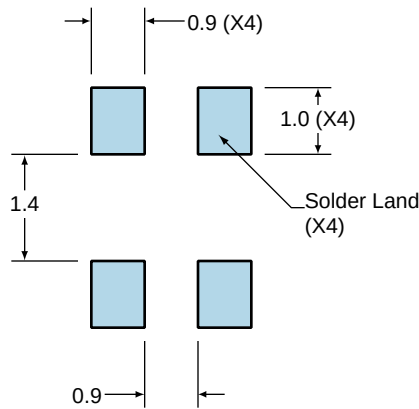


PIN	CONNECTION
1	No Connect
2	Case/Ground
3	Output
4	Supply Voltage

LINE	MARKING
1	EXX.XXX E=Ecliptek XX.XXX=Nominal Frequency in MHz (5 Digits + Decimal)
2	XXXXX XXXXX=Ecliptek Manufacturing Identifier

Suggested Solder Pad Layout

All Dimensions in Millimeters

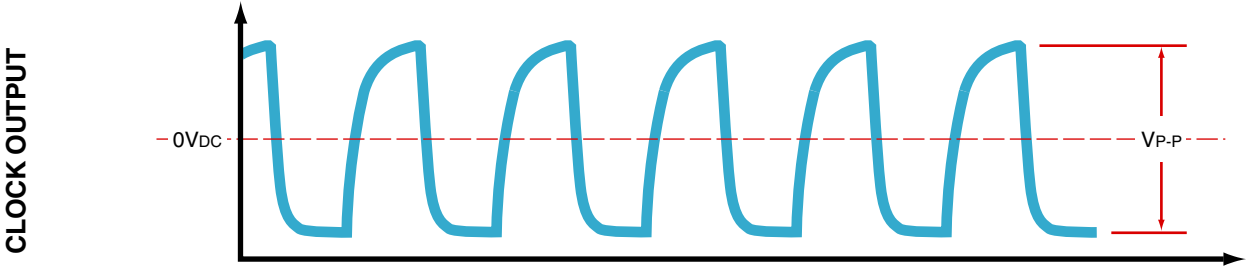


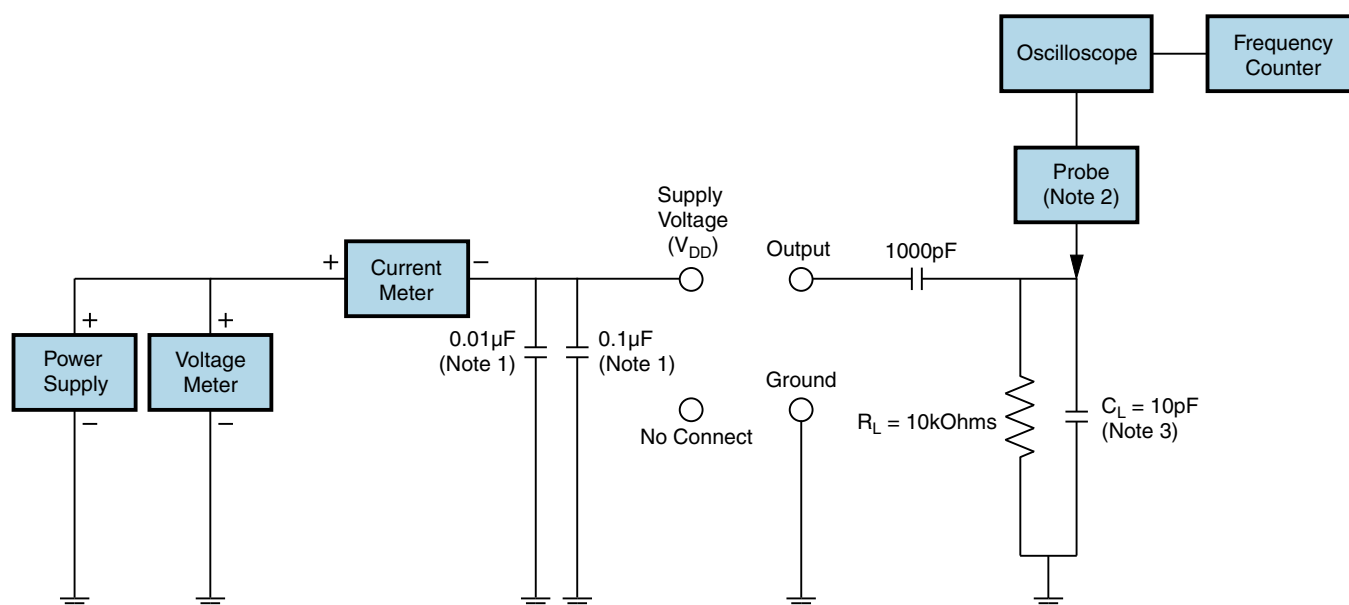
All Tolerances are ±0.1

ES52K1F05N-16.367667M TR [Click part number to visit Part Number Details page](#)



OUTPUT WAVEFORM



ES52K1F05N-16.367667M TR
[Click part number to visit Part Number Details page](#)
Test Circuit for No Connect Option

Note 1: An external $0.01\mu\text{F}$ bypass capacitor in parallel with a $0.1\mu\text{F}$ high frequency ceramic bypass capacitor close (less than 2mm) to the package ground and supply voltage pin is required.

Note 2: A low input capacitance ($<12\text{pF}$), 10X attenuation factor, high impedance ($>10\text{M}\Omega$), and high bandwidth ($>300\text{MHz}$) passive probe is recommended.

Note 3: Capacitance value C_L includes sum of all probe and fixture capacitance.

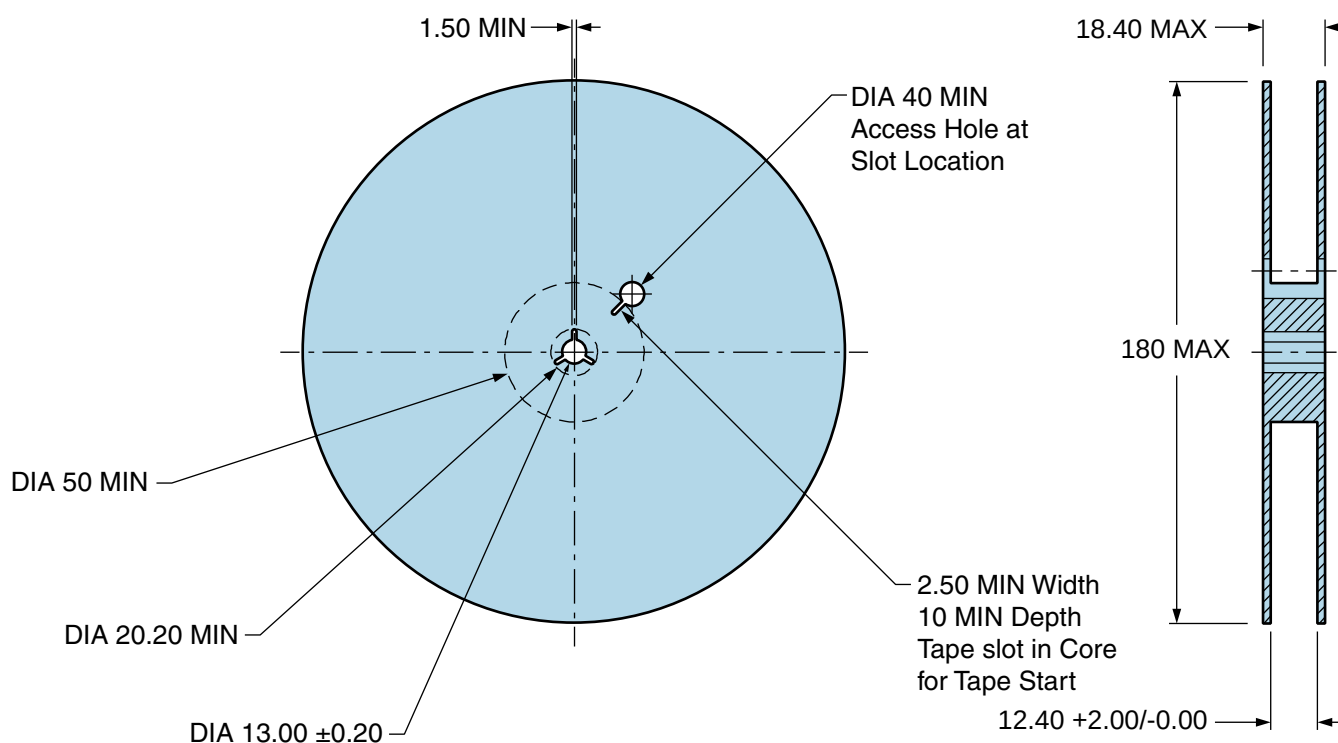
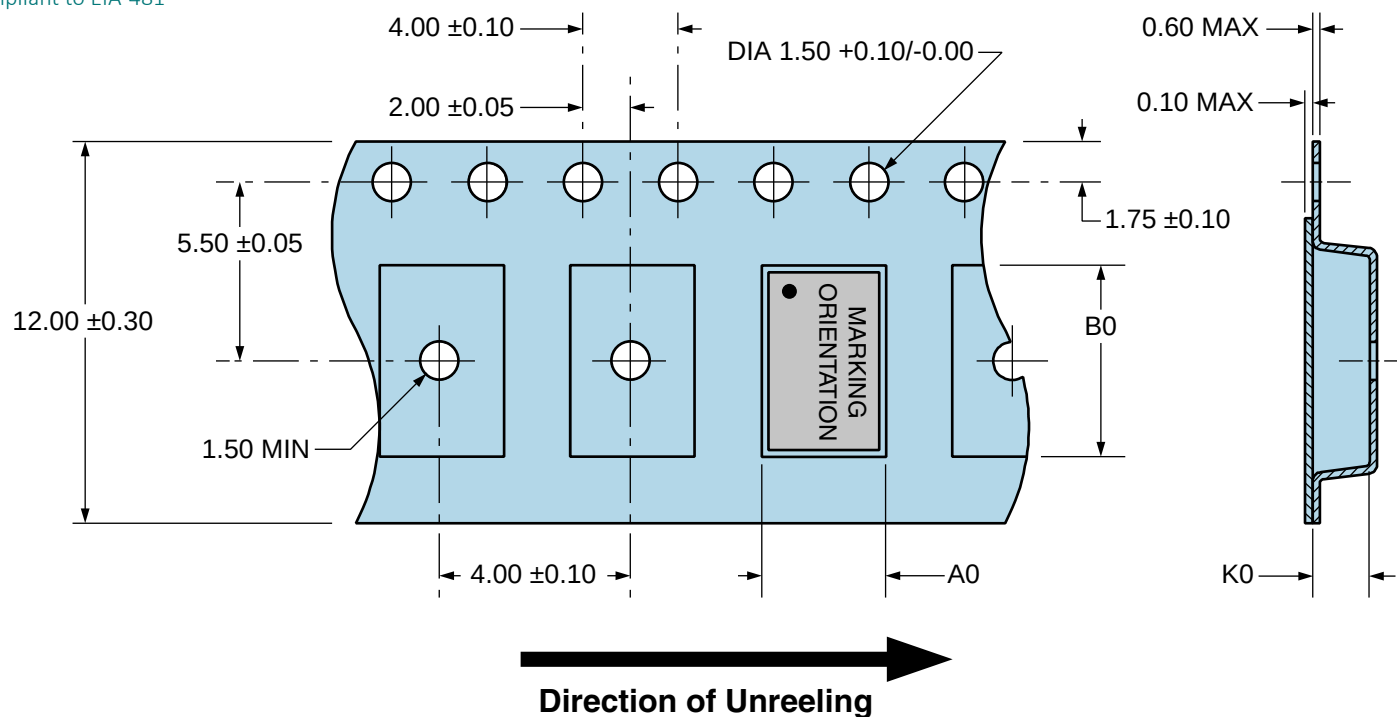
ES52K1F05N-16.367667M TR

Tape & Reel Dimensions

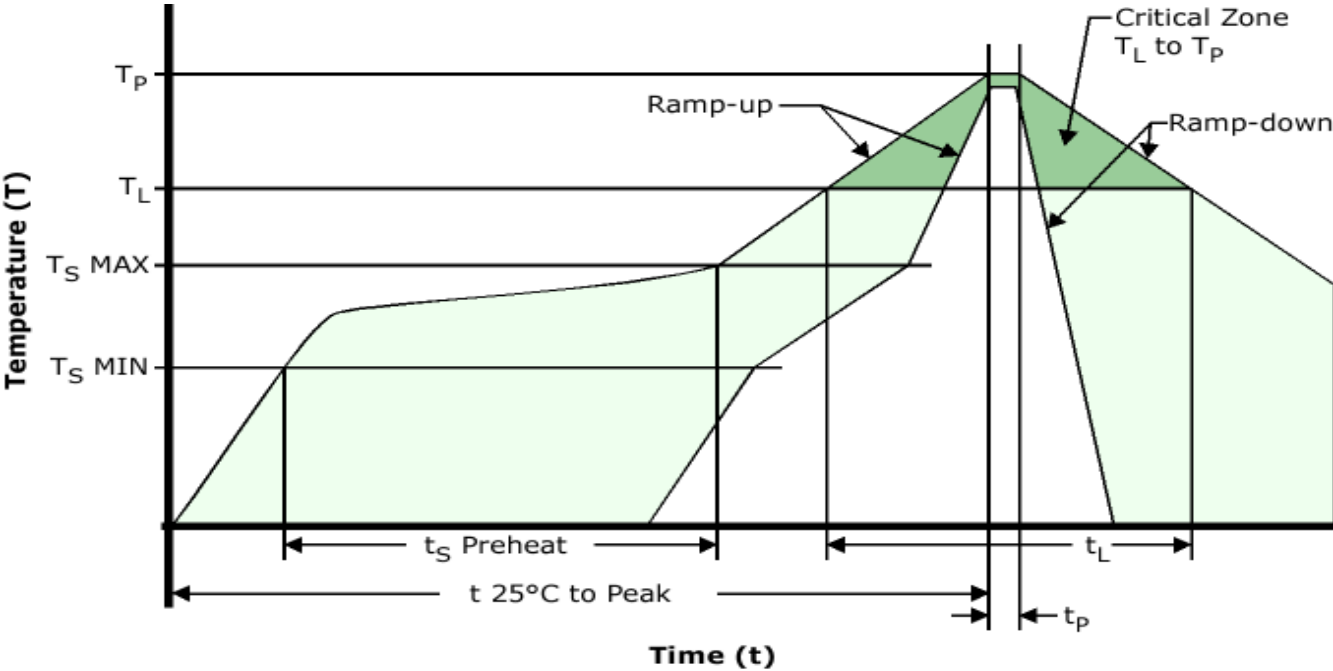
Quantity Per Reel: 1,000 units

All Dimensions in Millimeters

Compliant to EIA-481

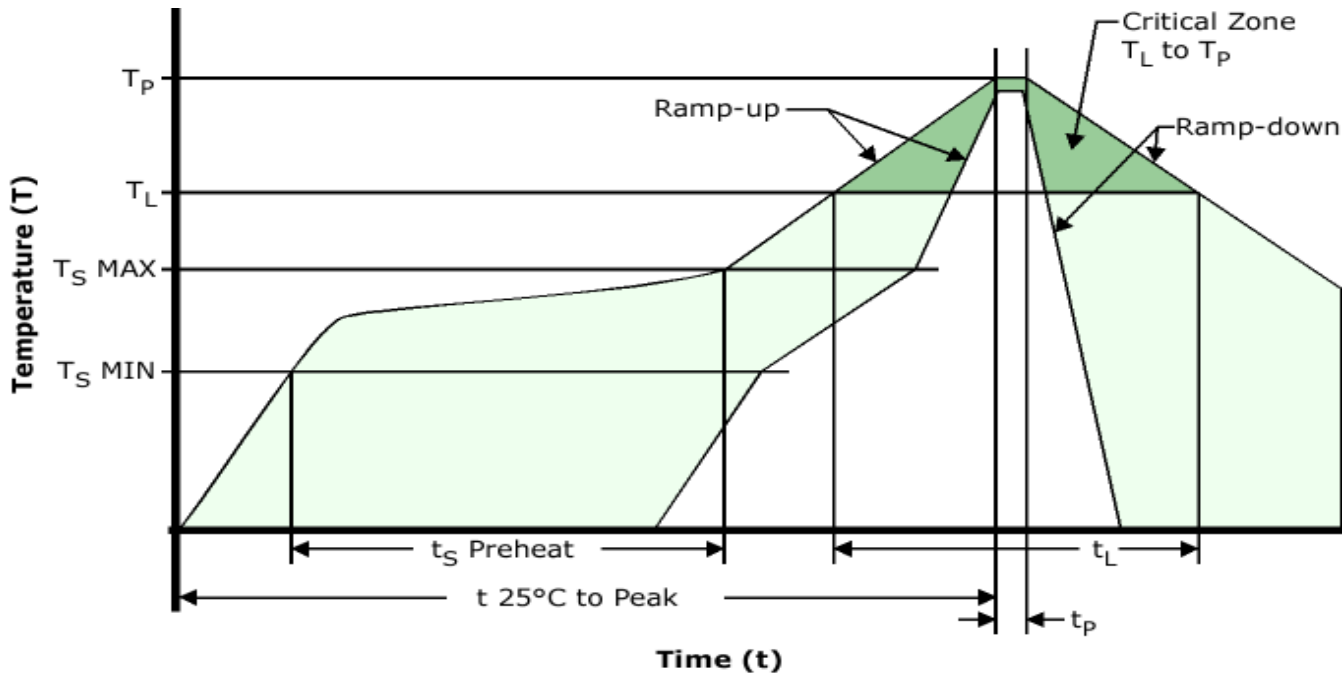


Recommended Solder Reflow Methods



High Temperature Infrared/Convection

Ts MAX to Tl (Ramp-up Rate)	3°C/Second Maximum
Preheat	
- Temperature Minimum (Ts MIN)	150°C
- Temperature Typical (Ts TYP)	175°C
- Temperature Maximum (Ts MAX)	200°C
- Time (ts MIN)	60 - 180 Seconds
Ramp-up Rate (Tl to Tp)	3°C/Second Maximum
Time Maintained Above:	
- Temperature (Tl)	217°C
- Time (tL)	60 - 150 Seconds
Peak Temperature (Tp)	260°C Maximum for 10 Seconds Maximum
Target Peak Temperature (Tp Target)	250°C +0/-5°C
Time within 5°C of actual peak (tp)	20 - 40 Seconds
Ramp-down Rate	6°C/Second Maximum
Time 25°C to Peak Temperature (t)	8 Minutes Maximum
Moisture Sensitivity Level	Level 1

ES52K1F05N-16.367667M TR
[Click part number to visit Part Number Details page](#)
Recommended Solder Reflow Methods**Low Temperature Infrared/Convection 240°C**

TS MAX to TL (Ramp-up Rate)	5°C/Second Maximum
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Preheat

- Temperature Minimum (TS MIN)	N/A
- Temperature Typical (TS TYP)	150°C
- Temperature Maximum (TS MAX)	N/A
- Time (ts MIN)	60 - 120 Seconds

Ramp-up Rate (TL to TP)	5°C/Second Maximum
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Time Maintained Above:

- Temperature (TL)	150°C
- Time (tL)	200 Seconds Maximum

Peak Temperature (TP)	240°C Maximum
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Target Peak Temperature (TP Target)	240°C Maximum 2 Times / 230°C Maximum 1 Time
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Time within 5°C of actual peak (tp)	10 Seconds Maximum 2 Times / 80 Seconds Maximum 1 Time
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Ramp-down Rate	5°C/Second Maximum
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Time 25°C to Peak Temperature (t)	N/A
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Moisture Sensitivity Level	Level 1
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Low Temperature Manual Soldering

185°C Maximum for 10 Seconds Maximum, 2 times Maximum.

High Temperature Manual Soldering

260°C Maximum for 5 Seconds Maximum, 2 times Maximum.