






Parts & Process Change Notification (PCN)

PCN# - PCF-211014-02

EC# -

Title	5.0x3.2x1.5mm Stratum 3 Grade TCXO Material Change	<input type="checkbox"/> General <input checked="" type="checkbox"/> Urgent
Object	<input checked="" type="checkbox"/> Material change <input type="checkbox"/> Process change <input type="checkbox"/> Design change <input type="checkbox"/> Product change <input type="checkbox"/> Equipment change <input type="checkbox"/> software change <input type="checkbox"/> Document change <input type="checkbox"/> Other	Does customer have special change requirement? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
Reason for change	<input type="checkbox"/> To be connection with safety and/or legislation. <input type="checkbox"/> Qualification <input type="checkbox"/> Quality Improvement <input type="checkbox"/> Form <input type="checkbox"/> Fit <input type="checkbox"/> Function <input checked="" type="checkbox"/> Product/material end of life <input type="checkbox"/> Manufacturing Site change <input type="checkbox"/> Other _____	
<p>TXC Parts Affected : 5.0x3.2x1.5mm Stratum 3 Grade TCXO – 7P Series.</p> <p>Description of Change :</p> <ol style="list-style-type: none"> Due to IC provider have announced EOL to the current ASIC used on our 7P series. In order to provide continuous supply, TXC is planning to introduce an alternative ASIC as replacement part. The proposed replacement IC has been used at TXC 7N(7.0x5.0x2.0mm) for years. All the performance and reliability have no any issue in device level. <p>Estimated Effective Dates:</p> <ol style="list-style-type: none"> Sample will be available by request on October 2021. Delivery of new 7P parts will be started from March 2022. <div style="text-align: right; margin-top: 20px;">  </div>		
Attachment	<input type="checkbox"/> No. <input checked="" type="checkbox"/> Yes: <u> 2 </u> Attachments	
QA Approval	 PM Manager	 Supervisor
Customer:	Dept.	Approval Signature
Customer comment : 		

7P series Product Change Description

Reason: Due to current IC model will EOL so we will have product design change on 7P series in the near future.

We explain the main change in below description:

1.Product Dimensions:

Product thickness change from 1.5mm Max. to 2.1mm Max.

2.Pad Function:

- a. Solder pad will change from 6 pads to 10 pads
- b. New design will support Tri-state function at pin3

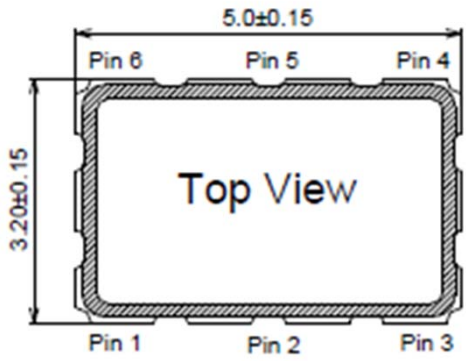
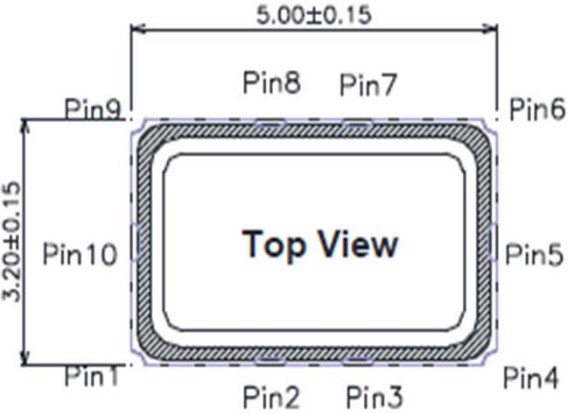

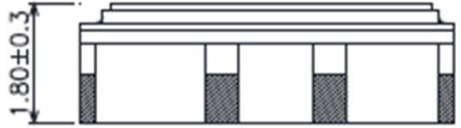
3.Land Pattern:

Land pattern will change from 4 or 6 pads to 10 pads

4.Power Supply Voltage

New type design can't support over 3.63V Power Supply Voltage.

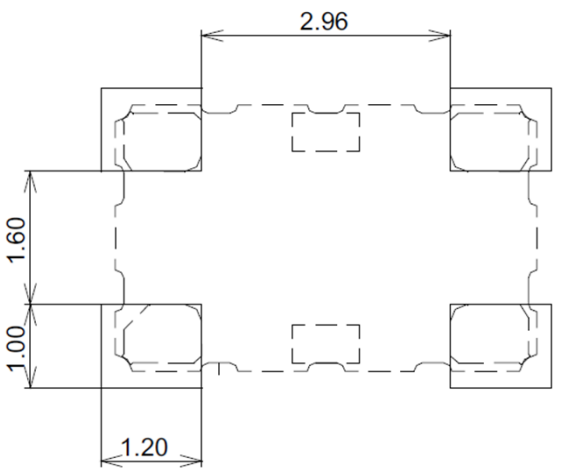
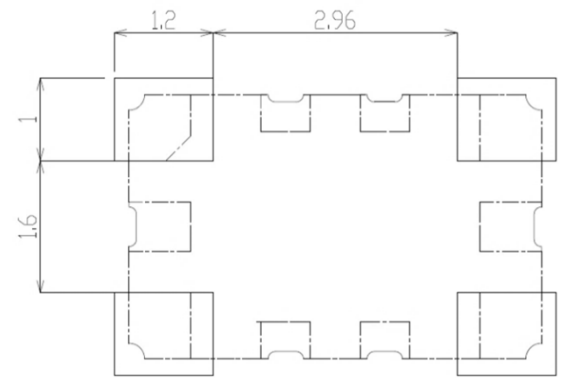
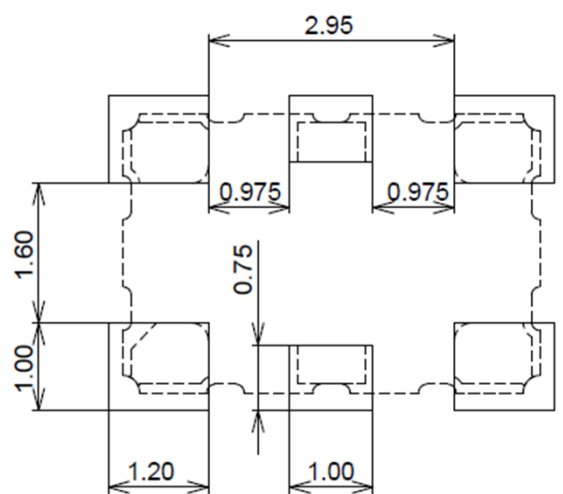
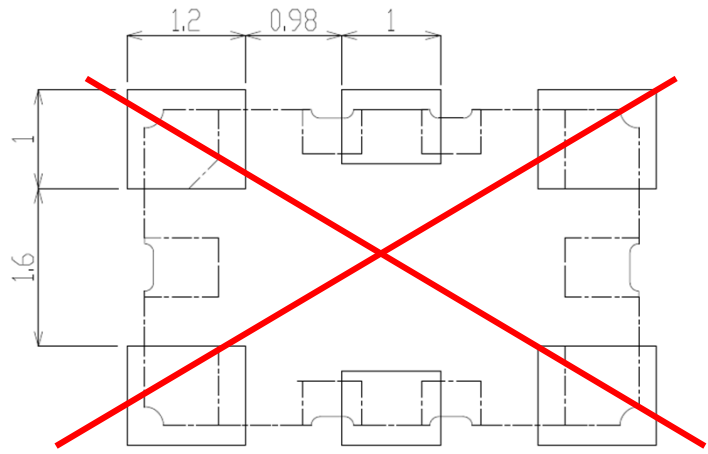
Product Dimension

	Origin Type	New Type
Size	<p>Size: 5.0x3.2mm</p> 	<p>Size: 5.0x3.2mm</p> 
Height	<p>Height: 1.5mm Max.</p> 	<p>Height: 2.1mm Max.</p> 

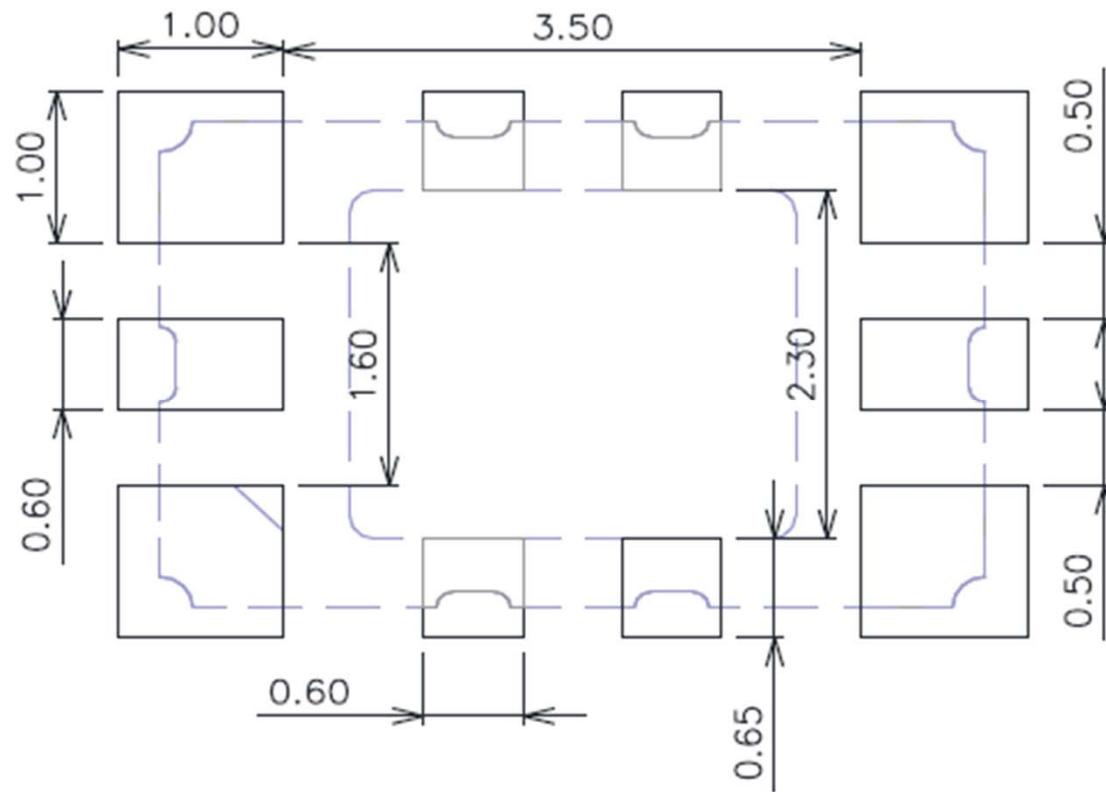
Pad Function

	Origin Type	New Type																																				
<p>Pad Size/Location</p>		<p>New design will support Tri-state function at pin3, pin3 could support floating</p>																																				
<p>Pad Function</p>	<p>Pin Connection</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>Pin 1</td> <td>AFC</td> </tr> <tr> <td>Pin 2</td> <td>NC</td> </tr> <tr> <td>Pin 3</td> <td>GND</td> </tr> <tr> <td>Pin 4</td> <td>OUTPUT</td> </tr> <tr> <td>Pin 5</td> <td>NC</td> </tr> <tr> <td>Pin 6</td> <td>VCC</td> </tr> </tbody> </table>	Name	Function	Pin 1	AFC	Pin 2	NC	Pin 3	GND	Pin 4	OUTPUT	Pin 5	NC	Pin 6	VCC	<p>Pin Connection</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>Pin 1</td> <td>AFC</td> </tr> <tr> <td>Pin 2</td> <td>Do not connection</td> </tr> <tr> <td>Pin 3</td> <td>Tri-State</td> </tr> <tr> <td>Pin 4</td> <td>GND</td> </tr> <tr> <td>Pin 5</td> <td>Do not connection</td> </tr> <tr> <td>Pin 6</td> <td>Output</td> </tr> <tr> <td>Pin 7</td> <td>Do not connection</td> </tr> <tr> <td>Pin 8</td> <td>Do not connection</td> </tr> <tr> <td>Pin 9</td> <td>VCC</td> </tr> <tr> <td>Pin 10</td> <td>Do not connection</td> </tr> </tbody> </table>	Name	Function	Pin 1	AFC	Pin 2	Do not connection	Pin 3	Tri-State	Pin 4	GND	Pin 5	Do not connection	Pin 6	Output	Pin 7	Do not connection	Pin 8	Do not connection	Pin 9	VCC	Pin 10	Do not connection
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Land Pattern

	Origin	New Device SMT Simulation
4 Pad	 <p>Diagram of the original 4 Pad land pattern. It shows a central rectangular area with four pads. Dimensions include a total width of 2.96, a total height of 1.60, a central width of 1.20, and a central height of 1.00.</p>	<p data-bbox="1198 311 1960 430">New design can place on original 4 pads design</p>  <p>Diagram of the new device SMT simulation for the 4 Pad design. It shows the same layout as the origin, but with a central width of 1.2 and a total height of 1.6.</p>
6 Pad	 <p>Diagram of the original 6 Pad land pattern. It shows a central rectangular area with six pads. Dimensions include a total width of 2.95, a total height of 1.60, a central width of 1.20, a central height of 1.00, and two side pads with a width of 0.975 and a height of 0.75.</p>	<p data-bbox="1198 861 1960 981">New design can't place on original 6 pad land pattern design</p>  <p>Diagram of the new device SMT simulation for the 6 Pad design. It shows the same layout as the origin, but with a central width of 1.2, a side pad width of 0.98, and a side pad height of 1. The diagram is crossed out with a large red X.</p>

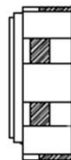
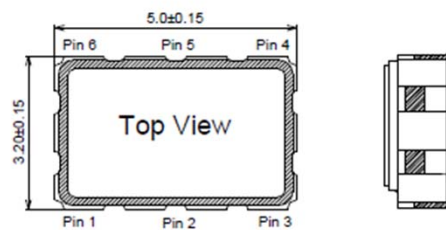
Location of New Product Recommended Land Pattern



Power Supply Voltage

	Origin Type	New Type
Power Supply Voltage	2.7V ~ 5.5V	New type design can not support 5V Power Supply Voltage. 2.3V ~ 3.63V

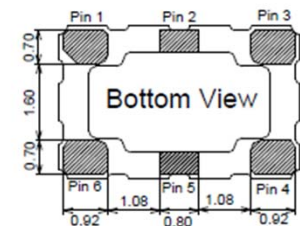
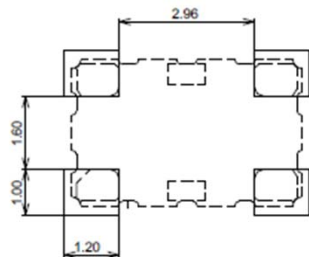
■ DIMENSIONS



Pin Connection

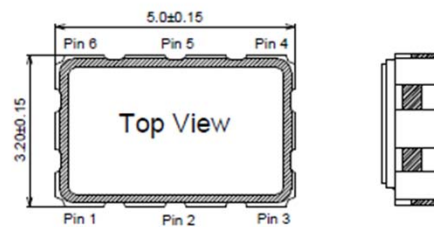
Name	Function
Pin 1	AFC
Pin 2	NC
Pin 3	GND
Pin 4	OUTPUT
Pin 5	NC
Pin 6	VCC

Recommended Land Pattern



Unit : mm

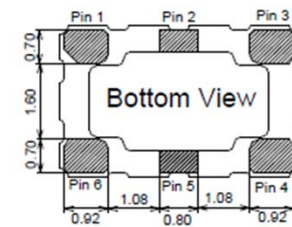
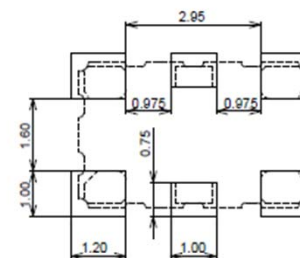
■ DIMENSIONS



Pin Connection

Name	Function
Pin 1	AFC
Pin 2	NC
Pin 3	GND
Pin 4	OUTPUT
Pin 5	NC
Pin 6	VCC

Recommended Land Pattern



Unit : mm

7P25071001

New 5032 TCXO vs Old 5032 TCXO electrical performance report

Prepared by: RD\TCXO Team

Date: 2021/9/14

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1. Summary

2. Measured Results

- 2.1 Current***
- 2.2 Frequency Tolerance***
- 2.3 Circuit Frequency Stability vs. Supply Voltage***
- 2.4 RF Output Level***
- 2.5 Thermal Frequency Stability***
- 2.6 Phase Noise***

1. Summary

Product Type: New 5032 TCXO vs Old 5032 TCXO electrical performance rep
Description: Summary

Responsibility: RD\TCXC
Date : 2021-09-14

1. Common Condition

	Parameter	Minimum	Nominal	Maximum	Unit	Notes
1	Normal frequency	25			MHz	
2	DC Supply Voltage (Vcc)	3.14	3.30	3.47	V	
3	Operating Temp Range	-40	+25	+85	°C	
4	Capacitance (Cp)	13.5	15	16.5	pF	Capacitance load range presented to the 7050 TCXO CMOS output
5	Centre Frequency		25		MHz	

2. Measurement Result

	Parameter	Suggested Specification			Measured Results			Unit	Notes
		Minimum	Nominal	Maximum	New	Old	TXC Comment		
1	DC Supply Current			6.00	3.99	3.26	In spec	mA	Vcc= 3.3 V,Cp= 15 pF
2	Frequency Tolerance Relative to Nominal Centre Frequency			± 1.0	-0.20	0.24	In spec	ppm	After 2 times reflow (Referenced to:25°C ± 2°C)
3	Circuit Frequency Stability vs. Supply Voltage			± 0.2	-0.001	-0.039	Better	ppm	VDD ±5%
					-0.001	-0.073	Better	ppm	
4	VOH	2.97			3.21	3.35	In Spec	ns	
5	VOL			0.33	0.04	0.11	In Spec	ns	
6	Rise time			6	3.88	4.17	In Spec	V	
7	Fall time			6	3.98	4.88	In Spec	V	
8	Duty cycle	45		55	51.02	52.45	In Spec		
9	vs. Temperature Referenced (Fmax+Fmin)/2			±280	70.30	189.27	Better	ppb	Temperature range of -40°C to +85°C
	vs. Temperature Change			±50	16.00	34.93	Better	ppb/°C	Temperature range of -40°C to +85°C



1. Summary

Product Type: New 5032 TCXO vs Old 5032 TCXO electrical performance rep
Description: Summary

Responsibility: RD\TCXC
Date : 2021-09-14

2. Measurement Result (cont.)

	Parameter	Suggested Specification			Measured Results			Unit	Notes
		Minimum	Nominal	Maximum	New	Old	TXC Comment		
10	Phase Noise								
	1 Hz offset				-65.59	-60.89	Better	dBc/Hz	25°C ± 5°C
	10 Hz offset		-85		-100.84	-90.44	Better	dBc/Hz	
	100 Hz offset		-110		-127.27	-115.34	Better	dBc/Hz	
	1k Hz offset		-138		-149.00	-136.44	Better	dBc/Hz	
	10 kHz offset		-153		-158.92	-152.23	Better	dBc/Hz	
	100 kHz offset		-155		-160.74	-155.74	Better	dBc/Hz	
	1 MHz offset				-161.02	-156.42	Better	dBc/Hz	

The performance of New 5032 TCXO is better than original

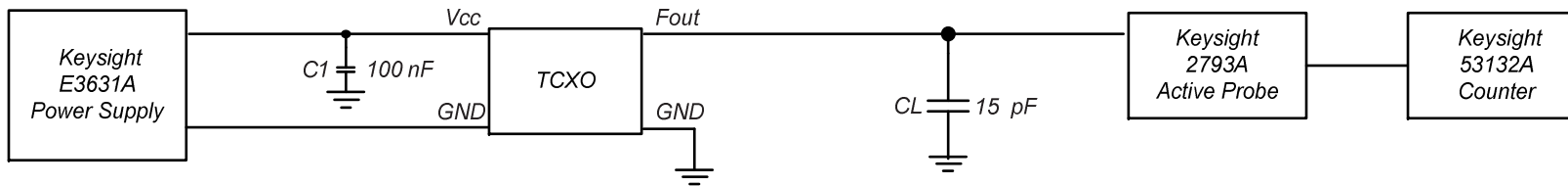
Product Type: New 5032 TCXO vs Old 5032 TCXO electrical performance report
Description: Current

Responsibility: RD\TCXO Team
Date : 2021-09-14

1. Electrical Specification and Test Condition

#	Parameter	Minimum	Nominal	Maximum	New	Old	Unit	Notes
1	DC Supply Current			6	3.989	3.264	mA	Vcc= 3.3 V,Cp=15 pF

2. Measurement Block Diagram



3. Measurement Result

New

DUT \ IDC	Current(mA)
No.1	3.989
No.2	3.949
No.3	3.954
No.4	3.984
No.5	3.285

Old

DUT \ IDC	Current(mA)
No.1	3.246
No.2	3.251
No.3	3.241
No.4	3.256
No.5	3.259

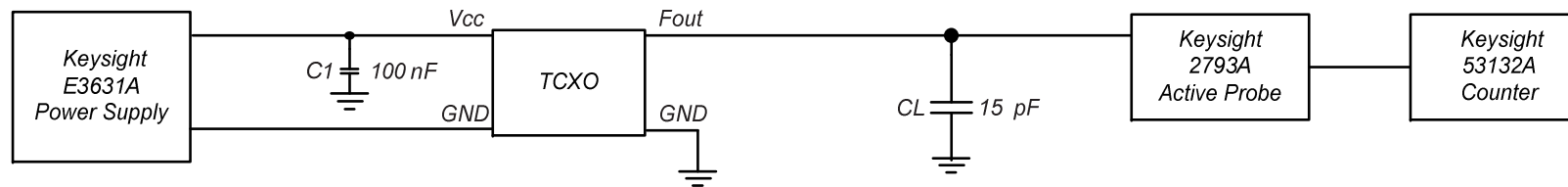
Product Type: New 5032 TCXO vs Old 5032 TCXO electrical performance report
Description: Frequency Tolerance Relative to Nominal Centre Frequency

Responsibility: RD\TCXO Team
Date : 2021-09-14

1. Electrical Specification and Test Condition

#	Parameter	Minimum	Nominal	Maximum	New	Old	Unit	Notes
2	Frequency Tolerance Relative to Nominal Centre Frequency			± 1.0	-0.2	0.24	ppm	After reflow (Referenced to: 25°C ± 2°C)

2. Measurement Block Diagram



3. Measurement Result

DUT \ F0	Freq.(Hz)	Freq.(ppm)
No.1	24999995.06	-0.20
No.2	24999994.30	-0.23
No.3	24999996.77	-0.13
No.4	24999994.99	-0.20
No.5	24999993.52	-0.26

DUT \ F0	Freq.(Hz)	Freq.(ppm)
No.1	25000006.80	0.27
No.2	25000004.72	0.19
No.3	25000007.55	0.30
No.4	25000005.87	0.23
No.5	25000004.44	0.18

2.3 - Circuit Frequency Stability vs. Supply Voltage

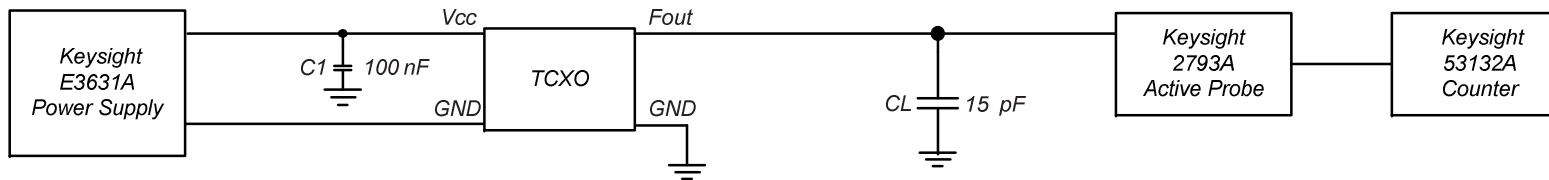
Product Type: New 5032 TCXO vs Old 5032 TCXO electrical performance report
 Description: Circuit Frequency Stability vs. Supply Voltage

Responsibility: RD\TCXO Team
 Date : 2021-09-14

1. Electrical Specification and Test Condition

#	Parameter	Minimum	Nominal	Maximum	New	Old	Unit	Notes
3	Circuit Frequency Stability vs. Supply Voltage			±0.2	-0.0011 -0.0013	-0.0387 -0.0726	ppm	3.3 V ±5%

2. Measurement Block Diagram



3. Measurement Result

New

DUT \ Vcc	Absolute Frequency Deviation(Hz)		
	VCC=3.14 V	VCC=3.3 V	VCC=3.47 V
No.1	24999995.06	24999995.18	24999994.97
No.2	24999994.30	24999994.37	24999994.25
No.3	24999996.77	24999996.79	24999996.79
No.4	24999994.99	24999994.88	24999995.13
No.5	24999993.52	24999993.56	24999993.48



DUT \ Vcc	Relative Sensitivity(PPM)		
	VCC=3.14 V	VCC=3.3 V	VCC=3.47 V
No.1	-0.005	0.00	-0.008
No.2	-0.003	0.00	-0.005
No.3	-0.001	0.00	0.000
No.4	0.005	0.00	0.010
No.5	-0.002	0.00	-0.003

Old

DUT \ Vcc	Absolute Frequency Deviation(Hz)		
	VCC=3.14 V	VCC=3.3 V	VCC=3.47 V
No.1	25000002.29	25000003.10	25000001.39
No.2	25000002.43	25000003.48	25000001.60
No.3	25000000.10	25000001.08	24999999.33
No.4	25000001.05	25000001.99	25000000.24
No.5	25000000.87	25000001.93	24999999.95



DUT \ Vcc	Relative Sensitivity(PPM)		
	VCC=3.14 V	VCC=3.3 V	VCC=3.47 V
No.1	-0.032	0.00	-0.068
No.2	-0.042	0.00	-0.075
No.3	-0.039	0.00	-0.070
No.4	-0.038	0.00	-0.070
No.5	-0.042	0.00	-0.079

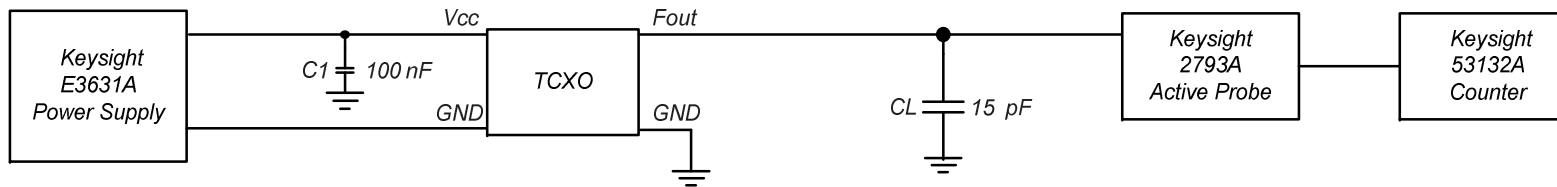
Product Type: New 5032 TCXO vs Old 5032 TCXO electrical performance report
 Description: RF Output (into ZL)

Responsibility: RD\TCXO Team
 Date : 2021-09-14

1. Electrical Specification and Test Condition

	Parameter	Minimum	Nominal	Maximum	New	Old	Unit	Notes
4	Rise time			6	3.88	4.17	ns	
5	Fall time			6	3.98	4.88	ns	
6	VOH	2.97			3.21	3.35	V	
7	VOL			0.33	0.04	0.11	V	
8	Duty cycle	45		55	51.02	52.45	%	

2. Measurement Block Diagram



3. Measurement Result

New

DUT	Item	Rise time	Fall time	VOH	VOL	Duty cycle
		ns	ns	V	V	%
	No.1	3.90	4.10	3.20	0.08	51.10
	No.2	3.90	3.90	3.20	0.03	50.90
	No.3	3.90	3.90	3.22	0.03	51.00
	No.4	3.80	4.00	3.20	0.02	50.80
	No.5	3.90	4.00	3.20	0.03	51.30

Old

DUT	Item	Rise time	Fall time	VOH	VOL	Duty cycle
		ns	ns	V	V	%
	No.1	4.10	5.05	3.40	0.33	52.75
	No.2	4.20	5.00	3.33	0.06	53.13
	No.3	4.10	4.80	3.36	0.03	52.50
	No.4	4.15	5.05	3.36	0.08	53.07
	No.5	4.30	4.50	3.31	0.03	50.80

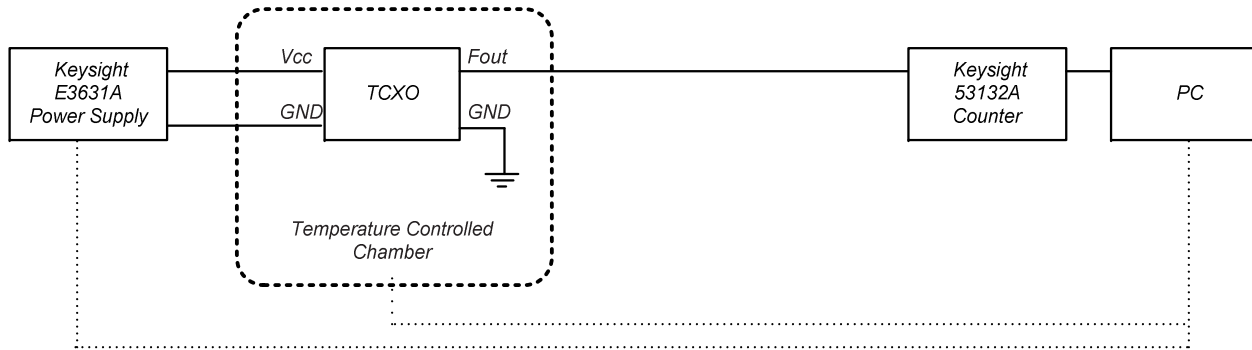
Product Type: New 5032 TCXO vs Old 5032 TCXO electrical performance report
Description: Thermal Frequency Stability

Responsibility: RD\TCXO Team
Date : 2021-09-14

1. Electrical Specification and Test Condition

#	Parameter	Minimum	Nominal	Maximum	New	Old	Unit	Notes
9	Thermal Frequency Stability							V _{cc} = 3.3 V
	vs. Temperature Referenced (F _{max} +F _{min})/2			±280	70.3	189.3	ppb	Temperature range of -40°C to +85°C
	vs. Temperature Change			±50	16.0	34.9	ppb/°C	Temperature range of -40°C to +85°C

2. Measurement Block Diagram



Note: Refer the Frequency of $(F_{max}+F_{min})/2$

3. Measurement Result

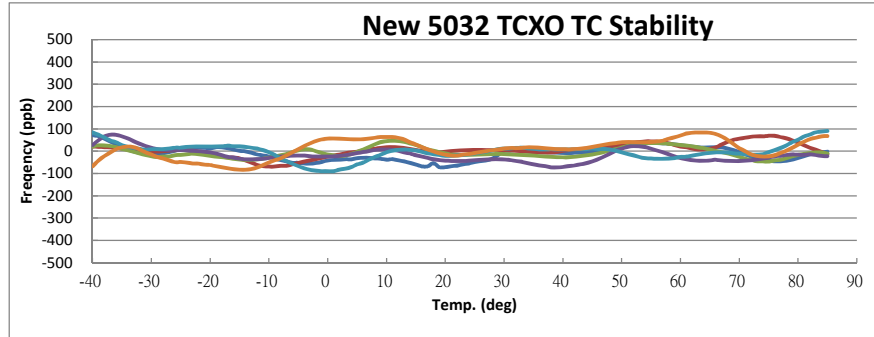
New

DUT \ Item	vs. Temperature- (ppb)	vs. Temperature Change (ppb/°C)
	-40°C to +85°C	-40°C to +85°C
No.1	72.0	18.0
No.2	69.0	13.0
No.3	46.5	13.0
No.4	73.5	21.0
No.5	90.5	15.0

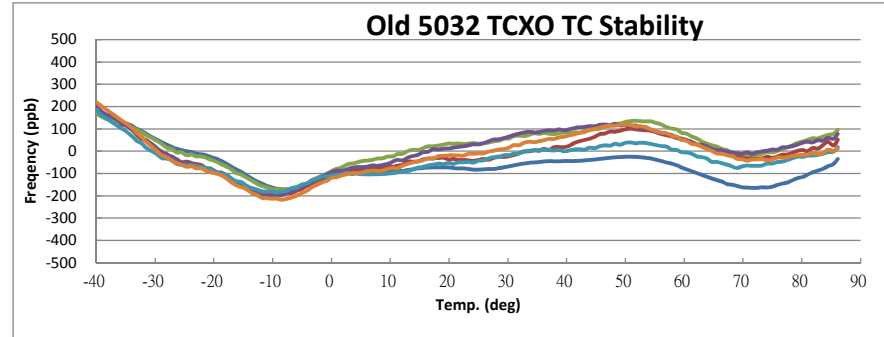
Old

DUT \ Item	vs. Temperature- (ppb)	vs. Temperature Change (ppb/°C)
	-40°C to +85°C	-40°C to +85°C
No.1	171.2	30.7
No.2	195.7	37.8
No.3	174.6	28.8
No.4	202.4	39.3
No.5	202.4	38.1

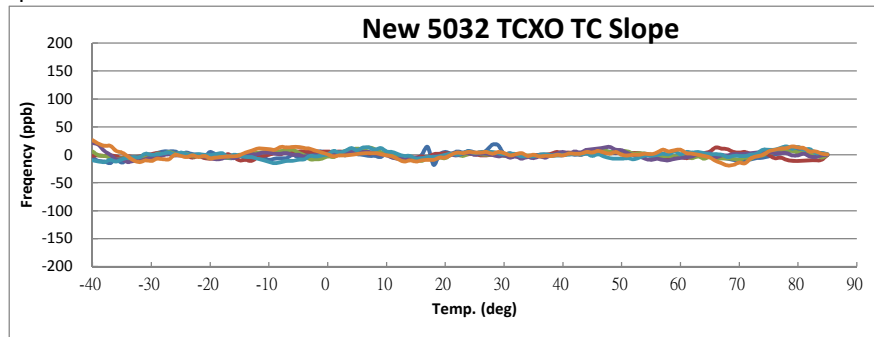
TC



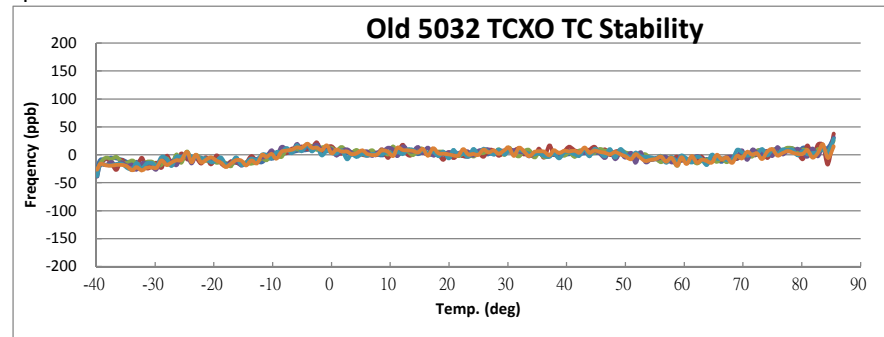
TC



Slope



Slope



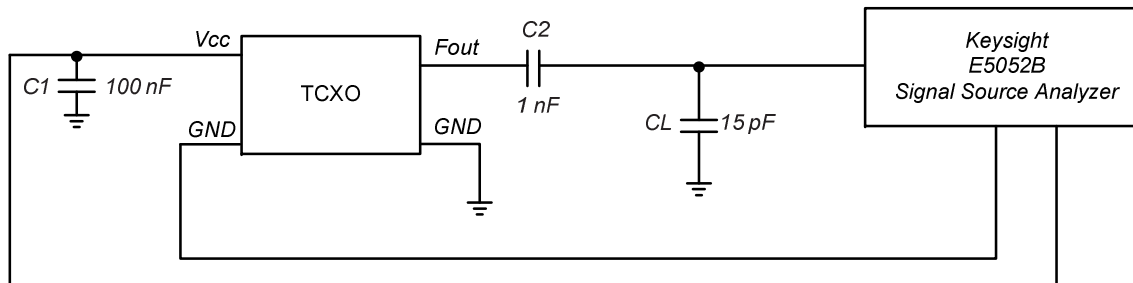
Product Type: New 5032 TCXO vs Old 5032 TCXO electrical performance report
Description: Phase Noise & RMS Jitter

Responsibility: RD\TCXO Team
Date : 2021-09-14

1. Electrical Specification and Test Condition

	Parameter	Minimum	Nominal	Maximum	New	Old	Unit	Notes
	Phase Noise							
10	1 Hz offset				-65.59	-60.89	dBc/Hz	25°C ± 5°C
	10 Hz offset		-85		-100.84	-90.44	dBc/Hz	
	100 Hz offset		-110		-127.27	-115.34	dBc/Hz	
	1 kHz offset		-138		-149.00	-136.44	dBc/Hz	
	10 kHz offset		-153		-158.92	-152.23	dBc/Hz	
	100 kHz offset		-155		-160.74	-155.74	dBc/Hz	
	1 MHz offset				-161.02	-156.42	dBc/Hz	

2. Measurement Block Diagram



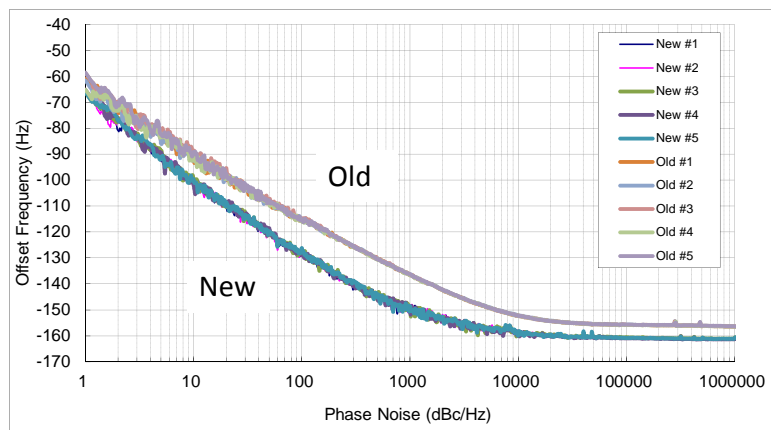
Product Type: New 5032 TCXO vs Old 5032 TCXO electrical performance report
 Description: Phase Noise & RMS Jitter

Responsibility: RD\TCXO Team
 Date : 2021-09-14

3. Measurement Result

DUT \ Freq.	1 Hz offset	10 Hz offset	100 Hz offset	1 kHz offset	10 kHz offset	100 kHz offset	1 MHz offset
	dBc / Hz	dBc / Hz	dBc / Hz	dBc / Hz	dBc / Hz	dBc / Hz	dBc / Hz
New #1	-66.10	-100.88	-127.91	-148.85	-158.57	-160.71	-160.96
New #2	-64.68	-101.89	-128.26	-148.92	-159.03	-160.59	-160.83
New #1	-65.94	-100.22	-127.64	-149.40	-158.41	-160.52	-160.99
New #1	-65.17	-101.70	-126.37	-149.26	-158.59	-160.96	-161.27
New ASIC #5	-66.05	-99.51	-126.15	-148.60	-159.97	-160.90	-161.06

DUT \ Freq.	1 Hz offset	10 Hz offset	100 Hz offset	1 kHz offset	10 kHz offset	100 kHz offset	1 MHz offset
	dBc / Hz	dBc / Hz	dBc / Hz	dBc / Hz	dBc / Hz	dBc / Hz	dBc / Hz
Old #1	-60.83	-91.59	-115.73	-136.65	-152.22	-155.76	-156.46
Old #2	-61.51	-92.52	-114.70	-136.19	-152.12	-155.72	-156.39
Old #3	-58.58	-89.51	-115.33	-136.39	-152.22	-155.76	-156.42
Old #4	-65.05	-89.47	-115.82	-136.66	-152.34	-155.79	-156.46
Old #5	-58.48	-89.12	-115.13	-136.32	-155.68	-155.68	-156.35



Vendor Part Number

7P-38.400MBP-T

7P-26.000MBP-T

7P-25.000MBP-T

7P-19.200MBP-T

7P-40.000MBP-T

7P-30.720MBP-T

7P-10.000MBP-T