

ON Semiconductor

Is Now

The logo for onsemi, featuring the word "onsemi" in a dark teal, lowercase, sans-serif font. The letter "i" is stylized with a white dot and a teal vertical bar. A small orange triangle is positioned above the top right of the "i". A trademark symbol (TM) is located to the right of the logo.

To learn more about onsemi™, please visit our website at
www.onsemi.com

onsemi and **onsemi** and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi** product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner. Other names and brands may be claimed as the property of others.

AX5043 Use with a TCXO Reference Clock



ON Semiconductor®

www.onsemi.com

APPLICATION NOTE

Introduction

This application note describes how to design an optimal connection between different TCXO types and AX5043.

If this connection is not designed in an optimal way, the AX5043 RF Synthesizer may produce higher phase noise than necessary, resulting in reduced selectivity in RX and lower attainable output power for a given regulatory regime in TX.

Connection of Clipped Sine Wave TCXOs

For TCXOs having clipped sine wave outputs an external circuitry consisting of two capacitors C1 and C2 as well as a resistor R are recommended. Component sizes as well as register settings are given in the tables.

The voltage at node V_p should be the TCXO output signal without significant additional distortion. The voltage at V_n should be a DC value equivalent to the mean value of the waveform at V_p .

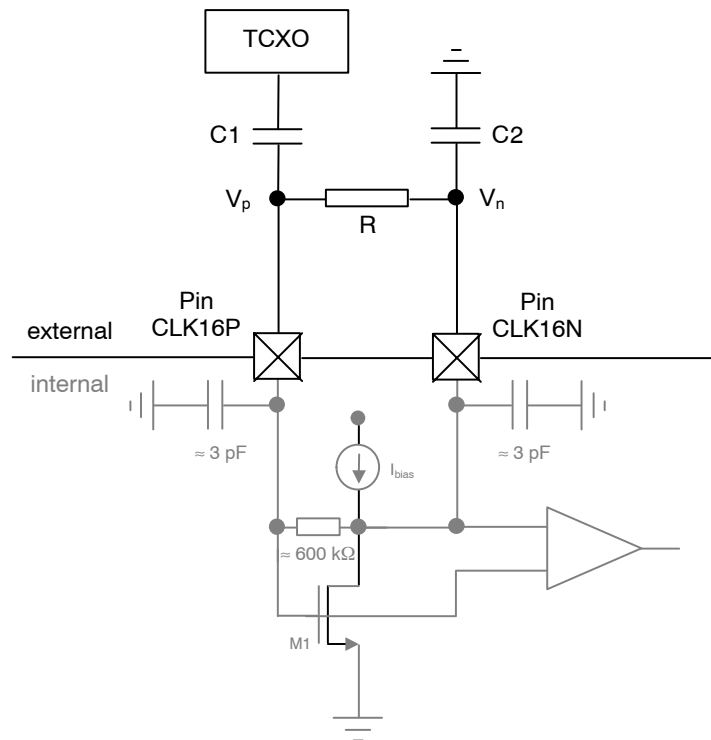


Figure 1. Configuration for a Clipped Sine Wave Output TCXO

Table 1. COMPONENT VALUES

Component	C1	C2	R
Value	1 nF	1 nF	1 kΩ

Table 2. REGISTER SETTINGS

Register	Analog Parameter	Value
0xF10	I_{bias}	0x04
0xF11	I_{bias} autoreg.	0x00
0x184	XTALCAP	0x00

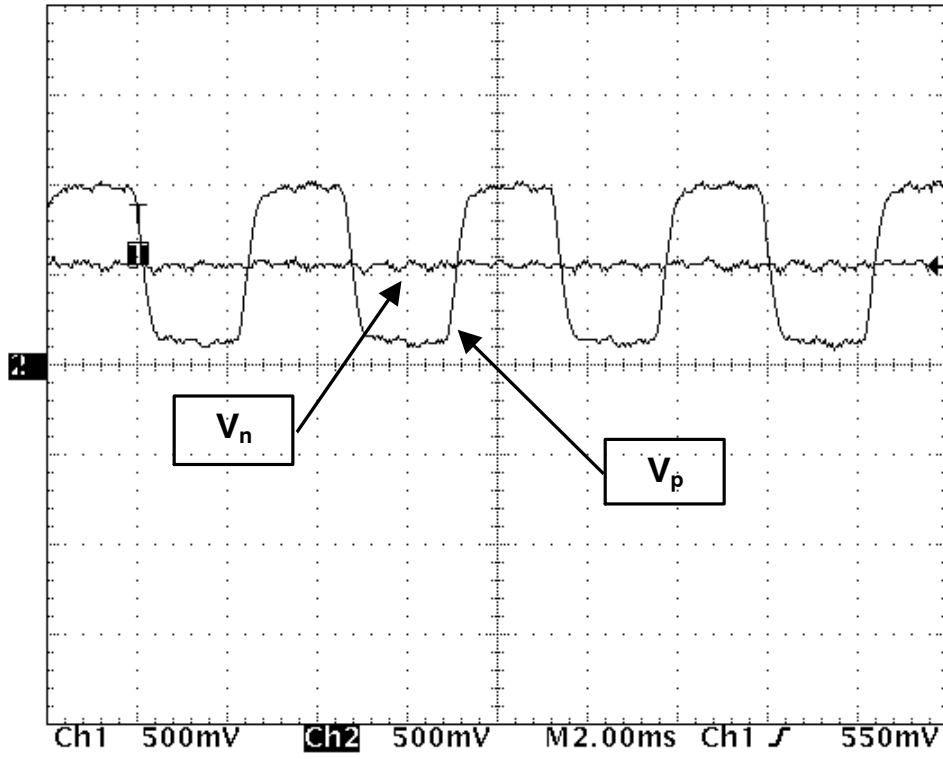


Figure 2. Voltages at Nodes V_p and V_n

AND9317/D

Connection of CMOS TCXOs

For TCXOs having CMOS outputs it is recommended to use a capacitive divider (C1 and C2) to reduce the signal swing at the input pin CLK16P to between 1.5 – 2 V peak-to-peak. Pin CLK16N should be left open, to allow the internal circuitry to work as a fast inverter. Component sizes as well as register settings are given in the tables.

The voltage at V_p should be the TCXO output signal without significant additional distortion and with a peak-to-peak swing no larger than 2 V. The voltage at V_n should be the inverted waveform.

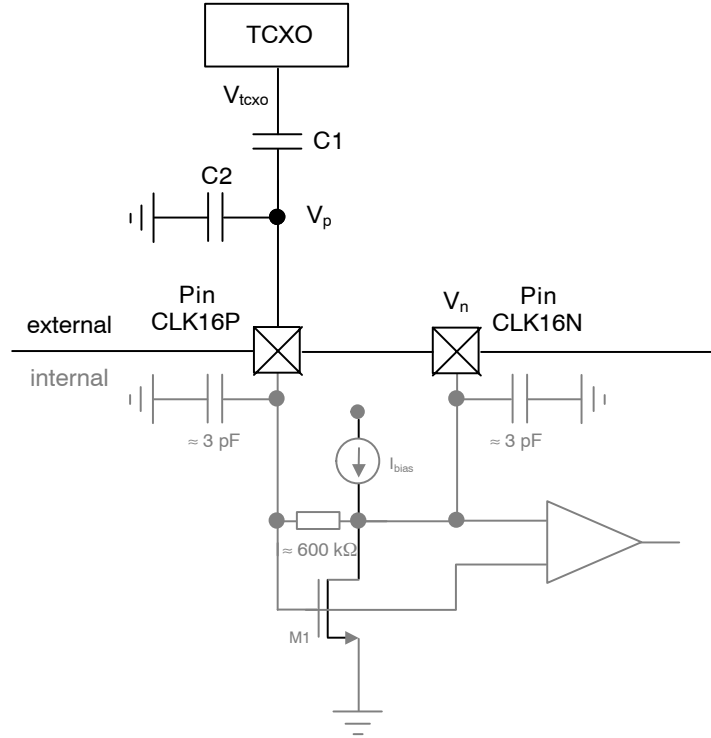


Figure 3. Configuration for a Clipped Sine Wave Output TCXO

Table 3. COMPONENT VALUES

Component	C1	C2
Value	10 pF	6.8 pF

Table 4. REGISTER SETTINGS

Register	Analog Parameter	Value
0xF10	I_{bias}	0x0F
0xF11	I_{bias} autoreg.	0x00
0x184	XTALCAP	0x00

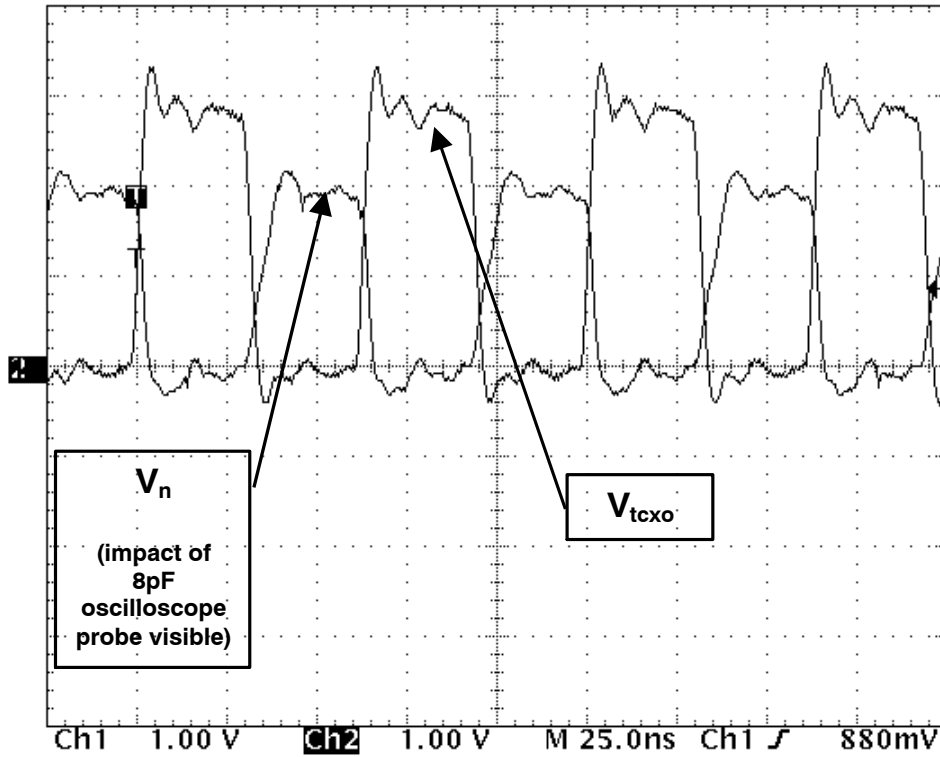


Figure 4. Voltages at Nodes V_{tcox0} and V_n

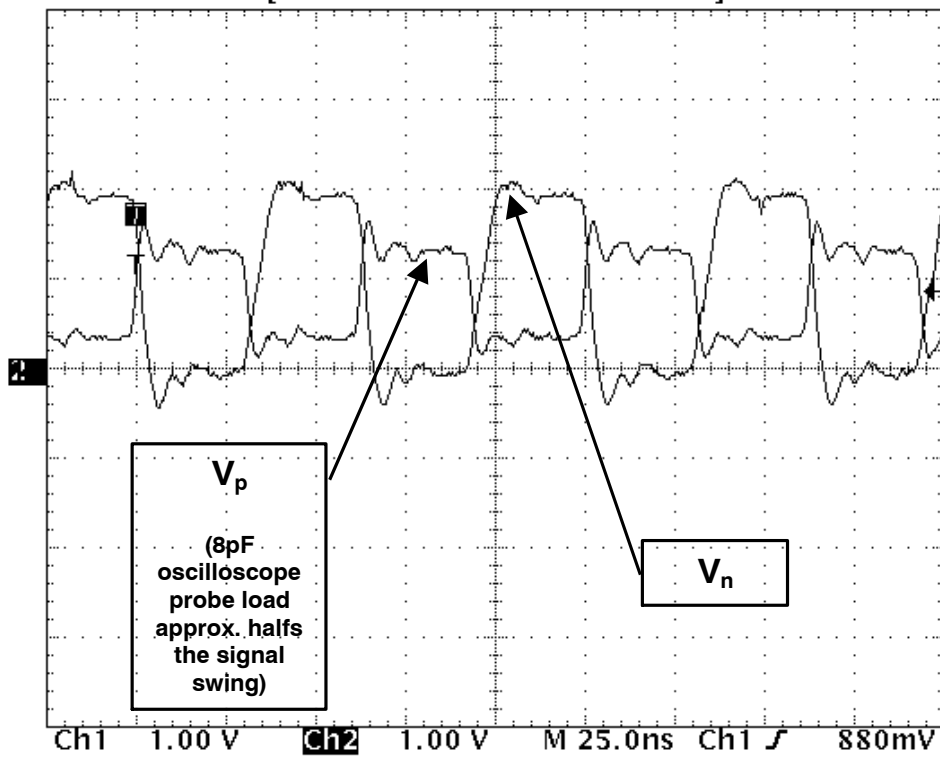



Figure 5. Voltages at Nodes V_p and V_n

ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>
For additional information, please contact your local
Sales Representative