



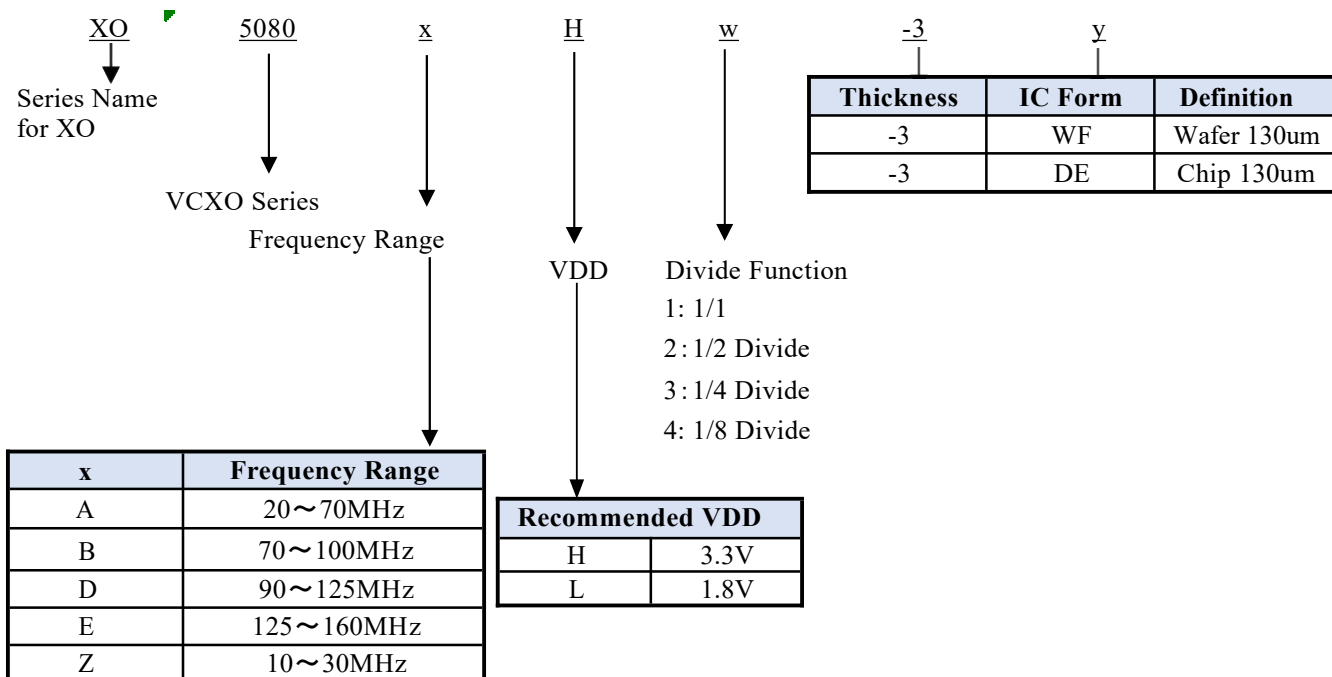
Features

- Operation temperature range: -40~125°C
- Power supply voltage: 2.5V,3.3V
- Vc Input impedance: 5MΩ
- Standby function: Oscillation stop
- Crystal frequency: 10~160MHz
- Output : CMOS
- Divide function: 1/2, 1/4 ,1/8
- Small chip size: 0.65mm × 0.70mm
- Pull ability: ±100ppm minimum / Vc=1.65±1.65V
- Duty cycle: Within 50±5%
- AEC-Q100 qualified. PPAP capable, and manufactured in IATF 16949 certified facilities.

Description

The 5080xx-V series are CMOS output VCXO ICs that provide a wide frequency pulling range. They employ BiCMOS oscillator circuit and special varicap diode fabrication process that provides a low phase noise characteristic and a wide frequency pulling range without any external components. The 5080xx-V series are ideal for wide pulling range, low phase noise, VCXO modules.

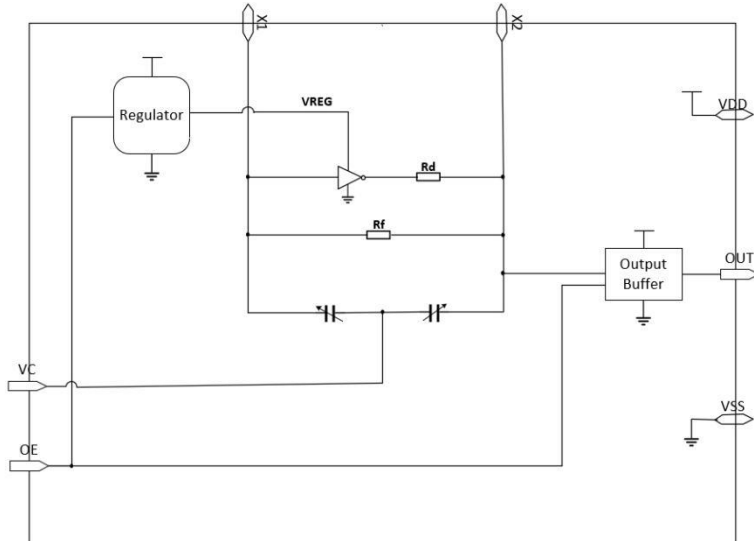
Order Information



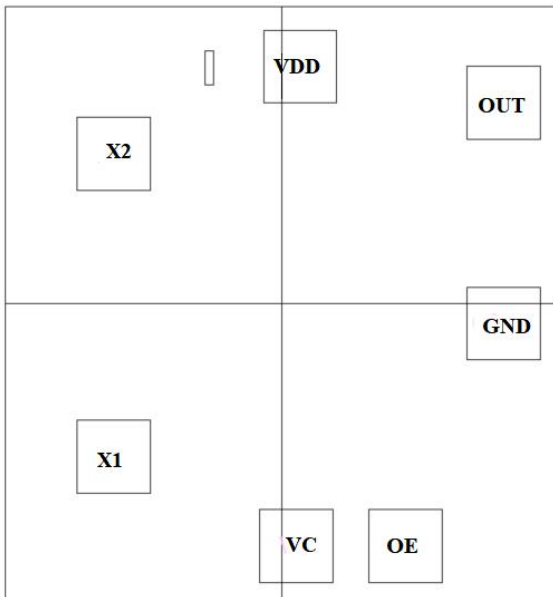
Note: Power supply voltage of XO5080AHx-V is 2.5V/3.3V.



Function Block Diagram



Pad Configuration



Pad Location					
Pad Name	X Coordinate	Y Coordinate	Pad Name	X Coordinate	Y Coordinate
X2	-197.490	176.550	GND	260.375	-23.115
X1	-197.490	-179.660	OUT	260.375	237.365
VC	16.980	-285.350	VDD	21.620	279.470
OE	145.240	-285.350			

Note:
Die Size: 650 μm * 700 μm , No include Scribe Line (60 μm)
Pad Size: 80 μm * 80 μm



Pad Definition

Pad Name	Function	Location (μm)	
		x	y
VDD	Power Supply(P)	21.62	279.47
X1	Crystal Feedback(I)	-197.49	-179.66
X2	Crystal Drive(O)	-197.49	176.55
VC	Frequency Control Input	16.98	-285.35
OE	OSC Enable/Disable(I)	145.24	-285.35
GND	Ground(P)	260.375	-23.115
OUT	Frequency Output(O)	260.37	237.365
Chip Center	-	0	0

Selection Table

Part Number	Output Frequency (MHz)		Divide	Remarks
	Min.	Max.		
XO5080AH1-V	20.0	70.0	1/1	2.5V,3.3V Operation
XO5080AH2-V	10.0	35.0	1/2	
XO5080AH3-V	5.0	17.5	1/4	
XO5080AH4-V	2.5	8.75	1/8	
XO5080BH1-V	70	90.0	1/1	3.3V Operation
XO5080DH1-V	90.0	125.0	1/1	
XO5080EH1-V	125.0	160.0	1/1	
XO5080ZH1-V	10.0	30.0	1/1	
XO5080ZH2-V	5.0	15.0	1/2	
XO5080ZH3-V	2.5	7.5	1/4	
XO5080ZH4-V	1.25	3.25	1/8	



Absolute Maximum Ratings

Parameter	Symbol	Condition	Ratings		Unit
			Min	Max	
Supply Voltage	V _{DD}	-	V _{SS} -0.5	5	V
Input Voltage	V _{IN}	All Input Pin	V _{SS} -0.5	V _{DD} +0.5	V
Output Voltage	V _{OUT}	-	V _{SS} -0.5	V _{DD} +0.5	V
Output Current	I _{OUT}	-	-	25	mA
Junction Temperature	T _j	-	-55	150	°C
Storage Temperature	T _{stg}	-	-55	125	°C

Recommended Operating Condition

V_{SS}=0V, Ta=-40°C~+125°C

Parameter	Symbol	Condition	Datasheet			Unit
			Min	Typ.	Max	
Supply Voltage	V _{DD}	-	2.25	-	3.63	V
“H” Input Voltage	V _{IH}	OE pin	V _{DD} ×0.7	-	-	V
“L” Input Voltage	V _{IL}	OE pin	-	-	V _{DD} ×0.3	V
Input Voltage	V _{IN}	OE pin	V _{SS}	-	V _{DD}	V
Control Voltage	V _C	V _C pin	0	-	V _{DD}	V
Output Load Capacitance	C _L	CMOS	-	-	15	pF
Ambient Temperature	T _{opt}	-	-40	-	125	°C



Electrical Specification

Unless otherwise stated, $V_{DD}=2.25\sim 3.63V$, $V_{SS}=0V$, $T_a=-40\sim 125^{\circ}C$

XO5080AH1-V

(20~70MHz)

Parameter	Symbol	Condition	Datasheet			Unit
			Min	Typ.	Max	
“H” input current	I_{IH}	$V_{IN}=V_{DD}$	-	-	10	μA
“L” input current	I_{IL}	$V_{IN}=V_{SS}$	-	-	1	μA
“H” output voltage	V_{OH}	$I_{OH}=-5mA$	$V_{DD}-0.4$	-	-	V
“L” output voltage	V_{OL}	$I_{OL}=5mA$	-	-	$V_{SS}+0.4$	V
Current consumption	I_{DD}	$C_L=15pF$, $V_{DD}=2.75V$, $OE \geq V_{DD}-0.3V$, $F_0=27MHz$	-	-	8	mA
		$C_L=15pF$, $V_{DD}=3.63V$, $OE \geq V_{DD}-0.3V$, $F_0=27MHz$	-	-	10	mA
Output off leak at osc. stop	I_z	$OE \leq 0.3V$	-	-	10	μA
Output Duty Ratio	Duty	$C_L=15pF$, $V_c=1/2V_{DD}$	45	-	55	%
Pull Range	Fcptr	$V_c=1.25\pm 1.25V$ 27MHz, Crystal *1	± 80	± 120	-	ppm
		$V_c=1.65\pm 1.65V$ 27MHz, Crystal *1	± 100	± 150	-	ppm
Rise time	Tr	$C_L=15pF$, 10~90% V_{DD}	-	-	5.0	ns
Fall time	Tf	$C_L=15pF$, 10~90% V_{DD}	-	-	5.0	ns
Output Enable Time	Tpe	-	-	-	2	ms
Output Disable Time	Tpd	-	-	-	100	ns
Modulation Band Width	Fc	$V_c=1.35\sin\omega t+1.65V$, -3dB	15	20	-	KHz

Note:

1. Equivalent Parameter of Crystal is $\gamma=C_0/C_1<250$

Phase Noise: Frequency =27MHz, $V_{DD}=3.3V$, $V_c=1.65V$

Phase Jitter 【12KHz~5MHz】< 0.5ps

Offset	Phase Noise (dBc)
1KHz	-130
10KHz	-150
100KHz	-158



Unless otherwise stated, $V_{DD}=2.25\sim 3.63V$, $V_{SS}=0V$, $T_a=-40\sim 125^{\circ}C$

XO5080AHx-V 【x=2, 3】

(10~35MHz, 5~17.5MHz)

Parameter		Symbol	Condition	Datasheet			Unit
				Min	Typ.	Max	
“H” input current		I_{IH}	$V_{IN}=V_{DD}$	-	-	10	μA
“L” input current		I_{IL}	$V_{IN}=V_{SS}$	-	-	1	μA
“H” output voltage		V_{OH}	$I_{OH}=-5mA$	$V_{DD}-0.4$	-	-	V
“L” output voltage		V_{OL}	$I_{OL}=5mA$	-	-	$V_{SS}+0.4$	V
Current consump.	XO5080AH2-V	I_{DD}	$C_L=15pF$, $V_{DD}=2.75V$, $OE \cong V_{DD}-0.3V$, Crystal $f=27MHz$	-	-	7	mA
	XO5080AH3-V			-	-	5	
	XO5080AH2-V		$C_L=15pF$, $V_{DD}=3.63V$, $OE \cong V_{DD}-0.3V$, Crystal $f=27MHz$	-	-	8	mA
	XO5080AH3-V			-	-	6	
Output off leak at osc. stop		I_z	$OE \cong 0.3V$	-	-	10	μA
Output Duty Ratio		Duty	$C_L=15pF$, $V_c=1/2V_{DD}$	45	-	55	%
Pull Range		F_{cntr}	$V_c=+1.25\pm 1.25V$ 27MHz Crystal *1	± 80	± 120	-	ppm
			$V_c=+1.65\pm 1.65V$ 27MHz Crystal *1	± 100	± 150	-	ppm
Rise time		T_r	$C_L=15pF$, 10~90% V_{DD}	-	-	5.0	ns
Fall time		T_f	$C_L=15pF$, 90~10% V_{DD}	-	-	5.0	ns
Output Enable Time		T_{pe}	-	-	-	2	ms
Output Disable Time		T_{pd}	-	-	-	100	ns
Modulation Band Width		F_c	$V_c=1.35\sin\omega t+1.65V$, -3dB	15	20	-	KHz

Note:

1. Equivalent Parameter of Crystal is $\gamma=C_0/C_1<300$

Phase Noise: XO5080AH2-V, Crystal Frequency =27MHz, $V_{DD}=3.3V$, $V_c=1.65V$

Phase Jitter【12KHz~5MHz】< 0.8ps

Offset	Phase Noise (dBc)
1KHz	-135
10KHz	-145
100KHz	-150

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XO5080xx-V

Voltage Control Crystal Oscillator IC

Unless otherwise stated, $V_{DD}=2.97\sim 3.63V$, $V_{SS}=0V$, $T_a=-40\sim 125^{\circ}C$ **XO5080BH1-V**

(70~100MHz)

Parameter	Symbol	Condition	Datasheet			Unit
			Min	Typ.	Max	
“H” input current	I_{IH}	$V_{IN}=V_{DD}$	-	-	10	μA
“L” input current	I_{IL}	$V_{IN}=V_{SS}$	-	-	1	μA
“H” output voltage	V_{OH}	$I_{OH}=-5mA$	$V_{DD}-0.4$	-	-	V
“L” output voltage	V_{OL}	$I_{OL}=5mA$	-	-	$V_{SS}+0.4$	V
Current consumption	I_{DD}	$C_L=15pF$, $V_{DD}=3.63V$, $OE \cong V_{DD}-0.3V$, $F_0=80MHz$	-	-	14	mA
Output off leak at osc. stop	I_z	$OE \leq 0.3V$	-	-	10	μA
Output Duty Ratio	Duty	$C_L=15pF$, $V_c=1/2 V_{DD}$	45	-	55	%
Pull Range	Fctr	$V_c=1.65 \pm 1.65V$ 80MHz Crystal *1	± 110	-	-	ppm
Rise time	T_r	$C_L=15pF$, $10 \sim 90\% V_{DD}$	-	-	5.0	ns
Fall time	T_f	$C_L=15pF$, $90 \sim 10\% V_{DD}$	-	-	5.0	ns
Output Enable Time	T_{pe}	-	-	-	2	ms
Output Disable Time	T_{pd}	-	-	-	100	ns
Modulation Band Width	F_c	$V_c=1.35\sin\omega t+1.65V$, -3dB	15	20	-	KHz

Note:

1. Equivalent Parameter of Crystal is $\gamma=C_0/C_1 < 270$

Phase Noise: Frequency =80MHz, $V_{DD}=3.3V$, $V_c=1.65V$

Phase Jitter【12KHz~20MHz】< 0.3ps

Offset	Phase Noise (dBc)
1KHz	-130
10KHz	-150
100KHz	-160



Unless otherwise stated, $V_{DD}=2.97\sim 3.63V$, $V_{SS}=0V$, $T_a=-40\sim 125^{\circ}C$

XO5080DH1-V

(90~125MHz)

Parameter	Symbol	Condition	Datasheet			Unit
			Min	Typ.	Max	
“H” input current	I_{IH}	$V_{IN}=V_{DD}$	-	-	10	μA
“L” input current	I_{IL}	$V_{IN}=V_{SS}$	-	-	1	μA
“H” output voltage	V_{OH}	$I_{OH}=-5mA$	$V_{DD}-0.4$	-	-	V
“L” output voltage	V_{OL}	$I_{OL}=5mA$	-	-	$V_{SS}+0.4$	V
Current consumption	I_{DD}	$C_L=15pF$, $V_{DD}=3.63V$, $OE \equiv V_{DD}-0.3V$, $F_0=122.88MHz$	-	-	24	mA
Current consumption at oscillation stop	I_{DDD}	$C_L=15pF$, $V_{DD}=3.63V$, $OE \equiv 0.3V$	-	-	3	mA
Output off leak at osc. stop	I_z	$OE \equiv 0.3V$	-	-	10	μA
Output Duty Ratio	Duty	$C_L=15pF$, $V_c=1/2V_{DD}$	45	-	55	%
Pull Range	Fcntr	$V_c=1.65\pm 1.65V$ 122.88MHz, Crystal *1	± 90	± 120	-	ppm
Rise time	T_r	$C_L=15pF$, $10\sim 90\% V_{DD}$	-	-	3.0	ns
Fall time	T_f	$C_L=15pF$, $90\sim 10\% V_{DD}$	-	-	3.0	ns
Output Enable Time	T_{pe}	-	-	-	2	ms
Output Disable Time	T_{pd}	-	-	-	100	ns
Modulation Band Width	F_c	$V_c=1.35\sin\omega t+1.65V$, -3dB	15	20	-	KHz

Note:

1. Equivalent Parameter of Crystal is $\gamma=C_0/C_1<300$

Phase Noise: Frequency =122.88MHz, $V_{DD}=3.3V$, $V_c=1.65V$

Phase Jitter 【12KHz~20MHz】< 0.12ps

Offset	Phase Noise (dBc)
1KHz	-123
10KHz	-145
100KHz	-159



Unless otherwise stated, $V_{DD} = 2.97 \sim 3.63V$, $V_{SS} = 0V$, $T_a = -40 \sim 125^\circ C$

XO5080EH1-V

(125~160MHz)

Parameter	Symbol	Condition	Datasheet			Unit
			Min	Typ.	Max	
“H” input current	I_{IH}	$V_{IN} = V_{DD}$	-	-	10	μA
“L” input current	I_{IL}	$V_{IN} = V_{SS}$	-	-	1	μA
“H” output voltage	V_{OH}	$I_{OH} = -5mA$	$V_{DD} - 0.4$	-	-	V
“L” output voltage	V_{OL}	$I_{OL} = 5mA$	-	-	$V_{SS} + 0.4$	V
Current consumption	I_{DD}	$C_L = 15pF$, $V_{DD} = 3.63V$, $OE \cong V_{DD} - 0.3V$, $F_0 = 125MHz$	-	-	24	mA
Current consumption at oscillation stop	I_{DDD}	$C_L = 15pF$, $V_{DD} = 3.63V$, $OE \cong 0.3V$	-	-	3	mA
Output off leak at osc. stop	I_z	$OE \cong 0.3V$	-	-	10	μA
Output Duty Ratio	Duty	$C_L = 15pF$, $V_c = 1/2V_{DD}$	45	-	55	%
Pull Range	Fcntr	$V_c = 1.65 \pm 1.65V$ 125MHz Crystal *1	± 90	± 120	-	ppm
Rise time	T_r	$C_L = 15pF$, $10 \sim 90\% V_{DD}$	-	-	3.0	ns
Fall time	T_f	$C_L = 15pF$, $90 \sim 10\% V_{DD}$	-	-	3.0	ns
Output Enable Time	T_{pe}	-	-	-	2	ms
Output Disable Time	T_{pd}	-	-	-	100	ns
Modulation Band Width	F_c	$V_c = 1.35\sin\omega t + 1.65V$, -3dB	15	20	-	KHz

Note:

1. Equivalent Parameter of Crystal is $\gamma = C_0/C_1 < 300$

Phase Noise: Frequency = 125MHz, $V_{DD} = 3.3V$, $V_c = 1.65V$

Phase Jitter 【12KHz~20MHz】< 0.12ps

Offset	Phase Noise (dBc)
1KHz	-123
10KHz	-145
100KHz	-159



Unless otherwise stated, $V_{DD}=2.97\sim 3.63V$, $V_{SS}=0V$, $T_a=-40\sim 125^{\circ}C$

XO5080ZH1-V

(10~30MHz)

Parameter	Symbol	Condition	Datasheet			Unit
			Min	Typ.	Max	
“H” input current	I_{IH}	$V_{IN}=V_{DD}$	-	-	10	μA
“L” input current	I_{IL}	$V_{IN}=V_{SS}$	-	-	1	μA
“H” output voltage	V_{OH}	$I_{OH}=-5mA$	$V_{DD}-0.4$	-	-	V
“L” output voltage	V_{OL}	$I_{OL}=5mA$	-	-	$V_{SS}+0.4$	V
Current consumption	I_{DD}	$C_L=15pF$, $V_{DD}=3.63V$, $OE \cong V_{DD}-0.3V$, $F_0=27MHz$	-	-	8	mA
Output off leak at osc. stop	I_z	$OE \leq 0.3V$	-	-	10	μA
Output Duty Ratio	Duty	$C_L=15pF$, $V_c=1/2V_{DD}$	45	-	55	%
Pull Range	Fcntr	$V_c=1.65 \pm 1.65V$ 27MHz Crystal *1	± 100	± 150	-	ppm
Rise time	T_r	$C_L=15pF$, 10~90% V_{DD}	-	-	5.0	ns
Fall time	T_f	$C_L=15pF$, 10~90% V_{DD}	-	-	5.0	ns
Output Enable Time	T_{pe}	-	-	-	2	ms
Output Disable Time	T_{pd}	-	-	-	100	ns
Modulation Band Width	Fc	$V_c=1.35\sin\omega t+1.65V$, -3dB	15	20	-	KHz

Note:

1. Equivalent Parameter of Crystal is $\gamma=C_0/C_1<250$

Phase Noise: Frequency =27MHz, $V_{DD}=3.3V$, $V_c=1.65V$

Phase Jitter 【12KHz~5MHz】< 0.5ps

Offset	Phase Noise (dBc)
1KHz	-137
10KHz	-154
100KHz	-158



Unless otherwise stated, $V_{DD}=2.97\sim 3.63V$, $V_{SS}=0V$, $T_a=-40\sim 125^{\circ}C$

XO5080ZHx-V 【x=2, 3, 4】

(5~15MHz, 2.5~7.5MHz, 1.25MHz~3.75MHz)

Parameter		Symbol	Condition	Datasheet			Unit
				Min	Typ.	Max	
“H” input current		I_{IH}	$V_{IN}=V_{DD}$	-	-	10	μA
“L” input current		I_{IL}	$V_{IN}=V_{SS}$	-	-	1	μA
“H” output voltage		V_{OH}	$I_{OH}=-5mA$	$V_{DD}-0.4$	-	-	V
“L” output voltage		V_{OL}	$I_{OL}=5mA$	-	-	$V_{SS}+0.4$	V
Current consump.	XO5080ZH2-V	I_{DD}	$C_L=15pF$, $V_{DD}=3.63V$, $OE \cong V_{DD}-0.3V$, Crystal $f=27MHz$	-	-	7	mA
	XO5080ZH3-V			-	-	7	
	XO5080ZH4-V			-	-	6	
Output off leak at osc. stop		I_Z	$OE \cong 0.3V$	-	-	10	μA
Output Duty Ratio		Duty	$C_L=15pF$, $V_C=1/2V_{DD}$	45	-	55	%
Pull Range		F_{cntr}	$V_C=+1.65\pm 1.65V$ 27MHz Crystal *1	± 100	± 150	-	ppm
Rise time		T_r	$C_L=15pF$, $10\sim 90\% V_{DD}$	-	-	5.0	ns
Fall time		T_f	$C_L=15pF$, $90\sim 10\% V_{DD}$	-	-	5.0	ns
Output Enable Time		T_{pe}	-	-	-	2	ms
Output Disable Time		T_{pd}	-	-	-	100	ns
Modulation Band Width		F_c	$V_C=1.35\sin\omega t+1.65V$, -3dB	15	20	-	KHz

Note:

1. Equivalent Parameter of Crystal is $\gamma=C_0/C_1<300$

Phase Noise: XO5080ZH2-V, Crystal Frequency =27MHz, $V_{DD}=3.3V$, $V_C=1.65V$

Phase Jitter【12KHz~5MHz】<0.8ps

Offset	Phase Noise (dBc)
1KHz	-135
10KHz	-145
100KHz	-150

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XO5080xx-V

Voltage Control Crystal Oscillator IC

Circuit Parameters of Oscillator (Reference Data for Circuit Design)

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Feedback Resistor	Rf	XO5080ZHx-V	-	100	-	KΩ
		XO5080A/BHx-V	-	62.5	-	
		XO5080D/EH1-V	-	50	-	
Driving Resistor	Rd	XO5080A/B/ZHx-V	-	500	-	Ω
		XO5080D/EH1-V	-	340	-	
Frequency deviation by IC	$\Delta fc/fc$	Crystal fixed	-	-	25	ppm

*The above values are the design values and are not guaranteed by test.

Output Waveform

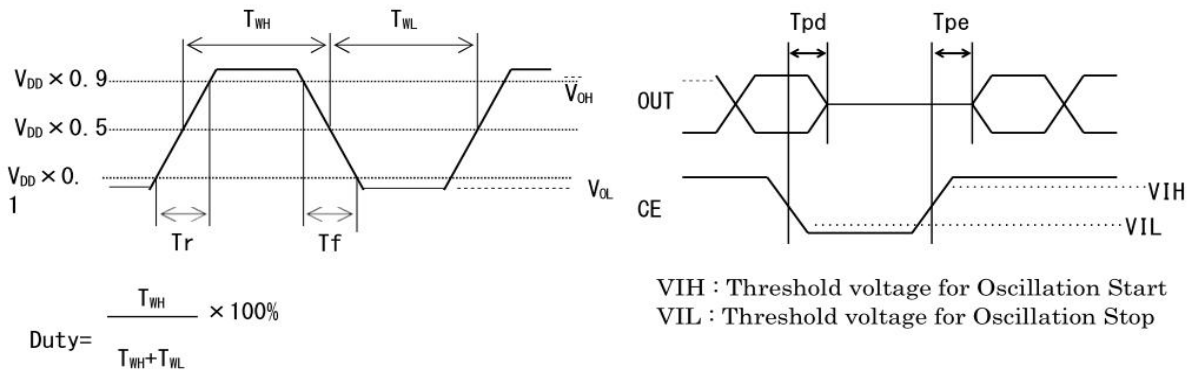
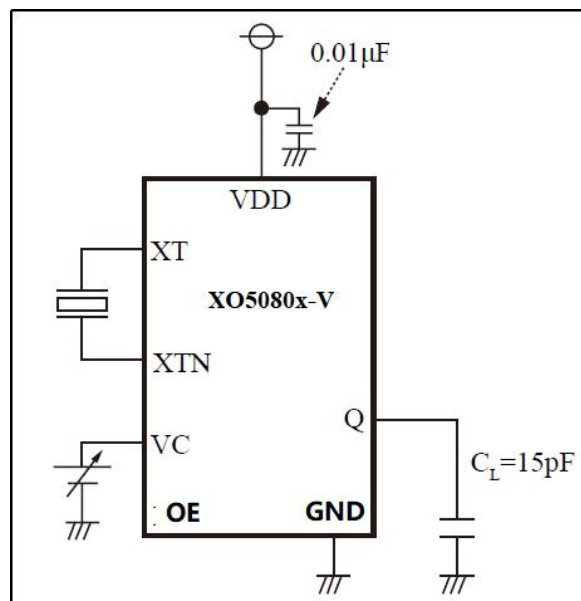
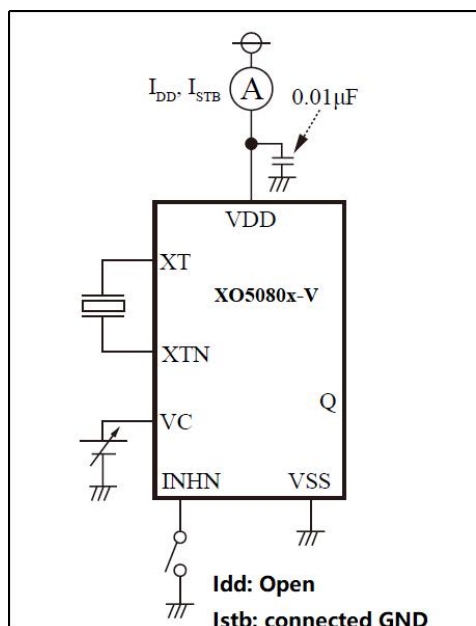


Fig. Output Wave Form (Duty, Tr, Tf, Tpd, Tpe)

Measurement Circuits





Revision History:

Revision	Description	Date
V1.0	Official release	2025/12/22