

PECL and LVDS Low Phase Noise XO (for 65-130MHz Output)

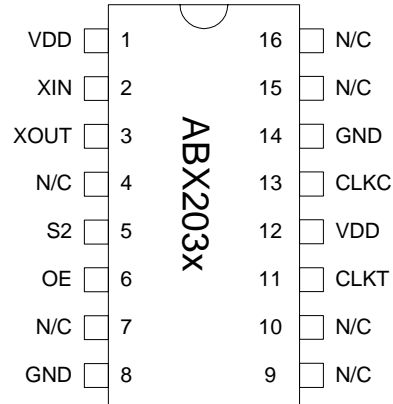
FEATURES

- 65MHz to 130MHz Crystal input.
- Output range: 32.5MHz – 130MHz (no PLL).
- Low Injection Power for crystal, 50uW.
- PECL (ABX2038) or LVDS output (ABX2039).
- Supports 2.5V or 3.3V-Power Supply.
- Available in 16-Pin TSSOP.

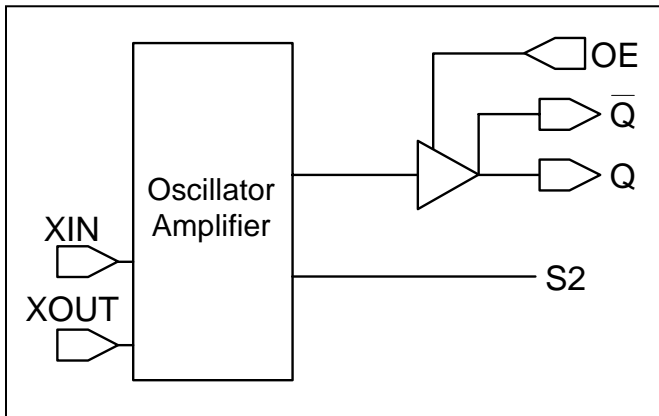
DESCRIPTION

The ABX2038/39 is a family of XO IC's specifically designed to work with high frequency fundamental or 3rd OT crystals from 65MHz to 130MHz, with selectable PECL or LVDS outputs. They achieve very low current into the crystal resulting in better overall stability. Their very low jitter makes them ideal for the most demanding timing requirements.

PIN CONFIGURATION



BLOCK DIAGRAM



OUTPUT ENABLE LOGICAL LEVELS

Part #	OE	State
ABX2038	0 (Default)	Output enabled
	1	Tri-state
ABX2039	0	Tri-state
	1 (Default)	Output enabled

OE input: Logical states defined by PECL levels for ABX2038
 Logical states defined by CMOS levels for ABX2039

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PIN DESCRIPTIONS

Name	Number	Type	Description
XIN	2	I	Crystal input. See Crystal Specifications on page 2.
XOUT	3	I	Crystal output. See Crystal Specifications on page 2.
S2	5	I	When pulled low the output is equal to the input divided by 2. Internal pull up.
OE	6	I	Output enable. See Output Enable Logic table on page 1.
GND	8, 14	P	Ground.
CLKT	11	O	True output PECL (ABX2038) or LVDS (ABX2039).
CLKC	13	O	Complementary output PECL (ABX2038) or LVDS (ABX2039).
N/C	4,7,9,10,15,16	-	Not connected.
VDD	1, 12	P	Power supply.

ELECTRICAL SPECIFICATIONS

1. Absolute Maximum Ratings

PARAMETERS	SYMBOL	MIN.	MAX.	UNITS
Supply Voltage	V_{DD}		4.6	V
Input Voltage, dc	V_I	-0.5	$V_{DD}+0.5$	V
Output Voltage, dc	V_O	-0.5	$V_{DD}+0.5$	V
Storage Temperature	T_S	-65	150	°C
Ambient Operating Temperature*	T_A	-40	85	°C
Junction Temperature	T_J		125	°C
Lead Temperature (soldering, 10s)			260	°C
ESD Protection, Human Body Model			2	kV

Exposure of the device under conditions beyond the limits specified by Maximum Ratings for extended periods may cause permanent damage to the device and affect product reliability. These conditions represent a stress rating only, and functional operations of the device at these or any other conditions above the operational limits noted in this specification is not implied.

* Note: Operating Temperature is guaranteed by design for all parts (COMMERCIAL and INDUSTRIAL), but tested for COMMERCIAL grade only.

2. Crystal Specifications

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Oscillation Frequency	OF	Fund	65		130	MHz
Crystal Load	CL			8.5		pF
Inter-electrode capacitance	C_0			2.6		

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3. General Electrical Specifications

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Supply Current (Loaded Outputs)	I _{DD}	PECL/LVDS			100/80	mA
Operating Voltage	V _{DD}		2.97		3.63	V
Output Clock Duty Cycle		@ 1.25V (LVDS) @ V _{DD} - 1.3V (PECL)	45 45	50 50	55 55	%
Short Circuit Current				±50		mA

4. Jitter Specifications

PARAMETERS	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Period jitter RMS	77.76MHz		2.5		ps
Period jitter peak-to-peak	77.76MHz		18.5		ps
Integrated jitter RMS	Integrated 12kHz to 20MHz at 77.76MHz		0.5		ps

5. Phase Noise Specifications

PARAMETERS	FREQUENCY	@10Hz	@100Hz	@1kHz	@10kHz	@100kHz	UNITS
Phase Noise relative to carrier	77.76MHz	-75	-95	-125	-145	-155	dBc/Hz

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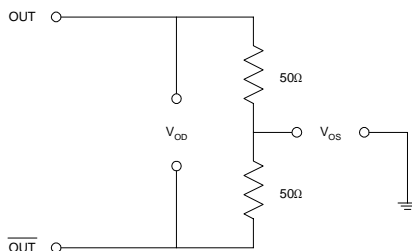
6. LVDS Electrical Characteristics

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Output Differential Voltage	V_{OD}	$R_L = 100\ \Omega$ (see figure)	247	355	454	mV
V_{DD} Magnitude Change	ΔV_{OD}		-50		50	mV
Output High Voltage	V_{OH}			1.4	1.6	V
Output Low Voltage	V_{OL}		0.9	1.1		V
Offset Voltage	V_{OS}		1.125	1.2	1.375	V
Offset Magnitude Change	ΔV_{OS}		0	3	25	mV
Power-off Leakage	I_{OXD}	$V_{out} = V_{DD}$ or GND $V_{DD} = 0V$		± 1	± 10	μA
Output Short Circuit Current	I_{OSD}			-5.7	-8	mA

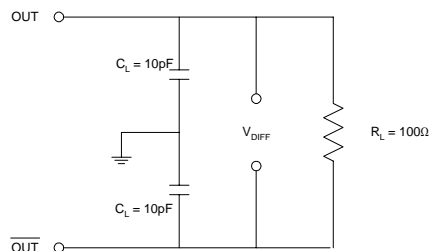
7. LVDS Switching Characteristics

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Differential Clock Rise Time	t_r	$R_L = 100\ \Omega$ $C_L = 10\ pF$ (see figure)	0.2	0.7	1.0	ns
Differential Clock Fall Time	t_f		0.2	0.7	1.0	ns

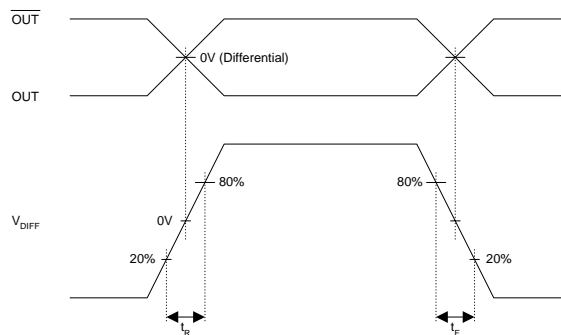
LVDS Levels Test Circuit



LVDS Switching Test Circuit



LVDS Transition Time Waveform



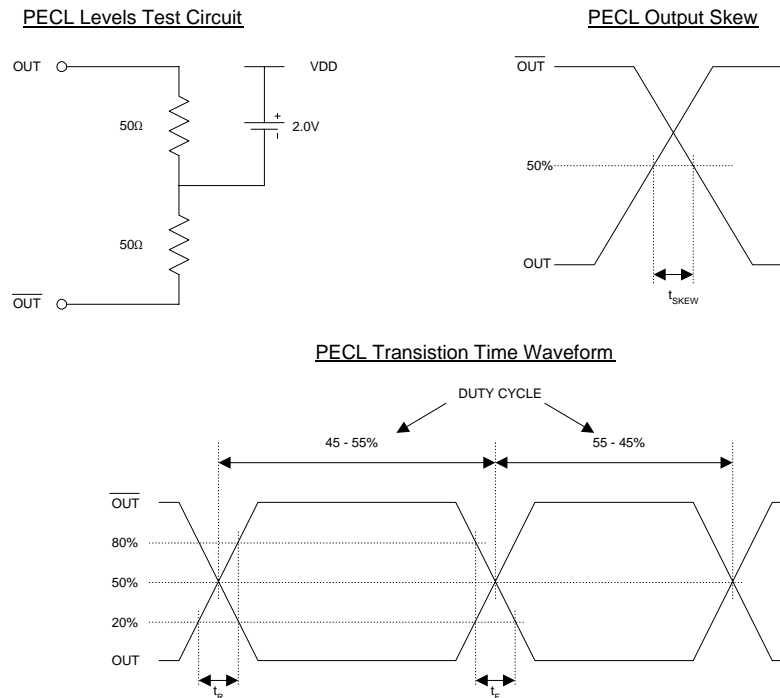
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8. PECL Electrical Characteristics

PARAMETERS	SYMBOL	CONDITIONS	MIN.	MAX.	UNITS
Output High Voltage	V_{OH}	$R_L = 50 \Omega$ to $(V_{DD} - 2V)$ (see figure)	$V_{DD} - 1.025$		V
Output Low Voltage	V_{OL}			$V_{DD} - 1.620$	V

9. PECL Switching Characteristics

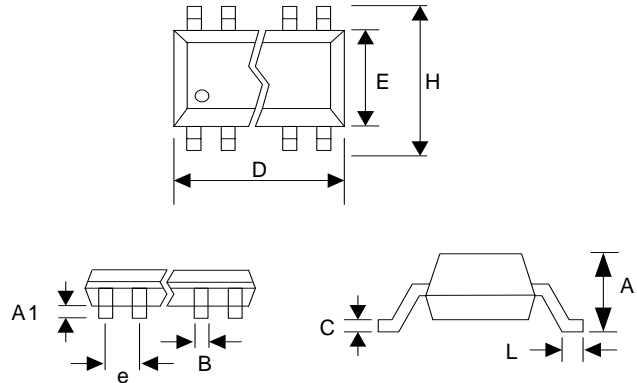
PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Clock Rise Time	t_r	@20/80% - PECL		0.6	1.5	ns
Clock Fall Time	t_f	@80/20% - PECL		0.5	1.5	ns



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PACKAGE INFORMATION

16 PIN TSSOP (mm)		
Symbol	Min.	Max.
A	-	1.20
A1	0.05	0.15
B	0.19	0.30
C	0.09	0.20
D	4.90	5.10
E	4.30	4.50
H	6.40 BSC	
L	0.45	0.75
e	0.65 BSC	



ORDERING INFORMATION

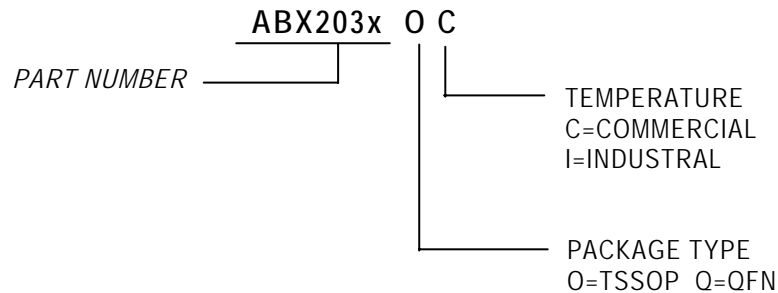
For part ordering, please contact our Sales Department:

30332 Esperanza., Rancho Santa Margarita, Ca 92688

Ph: 949-546-8000 Fax: 949-546-8001

PART NUMBER

The order number for this device is a combination of the following:
Device number, Package type and Operating temperature range



<u>Order Number</u>	<u>Marking</u>	<u>Package Option</u>
ABX2038OC	ABX2038OC	TSSOP - Tube
ABX2038OC-T	ABX2038OC	TSSOP - Tape & Reel
ABX2039OC	ABX2039OC	TSSOP - Tube
ABX2039OC-T	ABX2039OC	TSSOP - Tape & Reel

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