

- ◆ CMOS Low Supply Current
- ◆ Oscillator Frequency : 20MHz to 58MHz
- ◆ 3 State Output : f0/1, f0/2, f0/4, f0/8
- ◆ Supply Voltage : 3.5V
- ◆ Mini Mold SOT-26 Package

Applications

- Crystal Oscillator Modules
- Communication Equipment
- Microcomputers
- Clock Units in Motor Control
- System Clocks on Boards
- Timers
- Palmtops

General Description

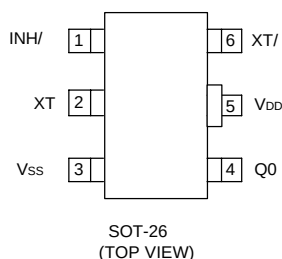
The XC2141 series are a group of high frequency, CMOS low power crystal oscillators with on-chip divider circuitry that operate from a supply voltage of 3.5V.

Output frequency can be selected from four frequencies :
Fundamental f0/1, Divided f0/2, f0/4, f0/8.

Features

Oscillator Frequency : 20MHz to 58MHz
Divider Ratio : Selectable from f0/1, f0/2, f0/4, f0/8
Output : 3 state
Operating Voltage Range : 3.5V $\pm$ 10%
Small Quiescent Current 10mA (Fosc=53MHz)
Stand-By Function
Ultra Small Package : SOT - 26 (150mW) mini mold

Pin Configuration



Pin Assignment

PIN NUMBER	PIN NAME	FUNCTION
1	INH/	Control *
2	XT	Oscillator Connection (Input)
3	VSS	GND
4	Q0	Output
5	VDD	Power Supply
6	XT/	Oscillator Connection (Output)

* Control pin has pull-up resistor built-in.

INH, Q0 Pin Function

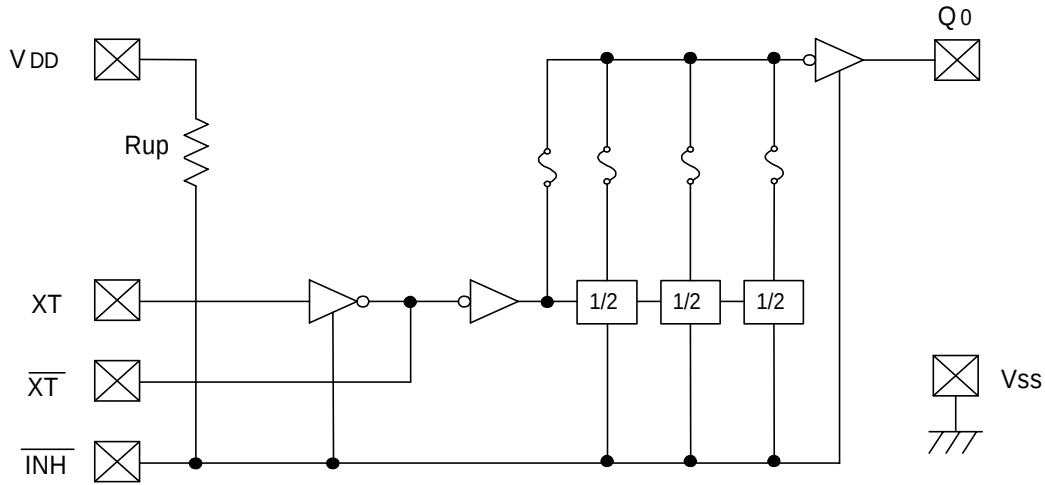
INH/	Q0
H	Output
open	Output
L	High Impedance (oscillator stopped)

H = High Level
L = Low Level

Absolute Maximum Ratings

PARAMETER	SYMBOL	CONDITIONS	UNITS
Supply Voltage	VDD	VSS - 0.3 to VSS + 7.0	V
Input Voltage	VIN	VSS - 0.3 to VDD + 0.3	V
Power Dissipation	Pd	150	mW
Operating Ambient Temp.	Topr	-30 to +75	°C
Storage Temp.	Tstg	-55 to +125	°C

■ Block Diagram



■ Electrical Characteristics

XC2141C21AMR (overtone) f0/1

V_{DD}=3.5V, F_{osc}=53MHz, R_f=7.5kΩ, No Load, T_a = 25 °C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Operating Supply Voltage	V _{DD}		3.15	3.50	3.85	V
Oscillation Start-Up Time	T _{ST}			5.00		msec
Input Voltage 'High'	V _{IH}		2.4			V
Input Voltage 'Low'	V _{IL}				0.4	V
Output Current 'High'	I _{OH}	V _{OH} = 3.15V		- 8		mA
Output Current 'Low'	I _{OL}	V _{OL} = 0.35V		12		mA
Supply Current 1	I _{DD1}	/ INH = OPEN, Q ₀ = OPEN			10	mA
Supply Current 2	I _{DD2}	/ INH = "L"			520	μA
Input Pull-Up Resistance	R _{UP}	/ INH = 3.15V	50		200	kΩ
Output Disable Leakage Current	I _{OZ}	/ INH = "L"			10	μA

XC2141C22AMR (overtone) f0/2

V_{DD}=3.5V, F_{osc}=53MHz, R_f=7.5kΩ, No Load, T_a = 25 °C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Operating Supply Voltage	V _{DD}		3.15	3.50	3.85	V
Oscillation Start-Up Time	T _{ST}			5.00		msec
Input Voltage 'High'	V _{IH}		2.4			V
Input Voltage 'Low'	V _{IL}				0.4	V
Output Current 'High'	I _{OH}	V _{OH} = 3.15V		- 8		mA
Output Current 'Low'	I _{OL}	V _{OL} = 0.35V		12		mA
Supply Current 1	I _{DD1}	/ INH = OPEN, Q ₀ = OPEN			9.5	mA
Supply Current 2	I _{DD2}	/ INH = "L", R _f =7.5kΩ			520	μA
Input Pull-Up Resistance	R _{UP}	/ INH = 3.15V	50		200	kΩ
Output Disable Leakage Current	I _{OZ}	/ INH = "L"			10	μA

XC2141C24AMR (overtone) f0/4

V_{DD}=3.5V, Fosc=53MHz, Rf=7.5kΩ, No Load, Ta = 25 °C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Operating Supply Voltage	V _{DD}		3.15	3.50	3.85	V
Oscillation Start-Up Time	T _{ST}			5.00		msec
Input Voltage 'High'	V _{IH}		2.4			V
Input Voltage 'Low'	V _{IL}				0.4	V
Output Current 'High'	I _{OH}	V _{OH} = 3.15V		- 8		mA
Output Current 'Low'	I _{OL}	V _{OL} = 0.35V		12		mA
Supply Current 1	I _{DD1}	/ INH = OPEN, Q ₀ = OPEN			9	mA
Supply Current 2	I _{DD2}	/ INH = "L", Rf=7.5k Ω			520	μA
Input Pull-Up Resistance	R _{UP}	/ INH = 3.15V	50		200	kΩ
Output Disable Leakage Current	I _{OZ}	/ INH = "L"			10	μA

XC2141C28AMR (overtone) f0/8

V_{DD}=3.5V, Fosc=53MHz, Rf=7.5kΩ, No Load, Ta = 25 °C

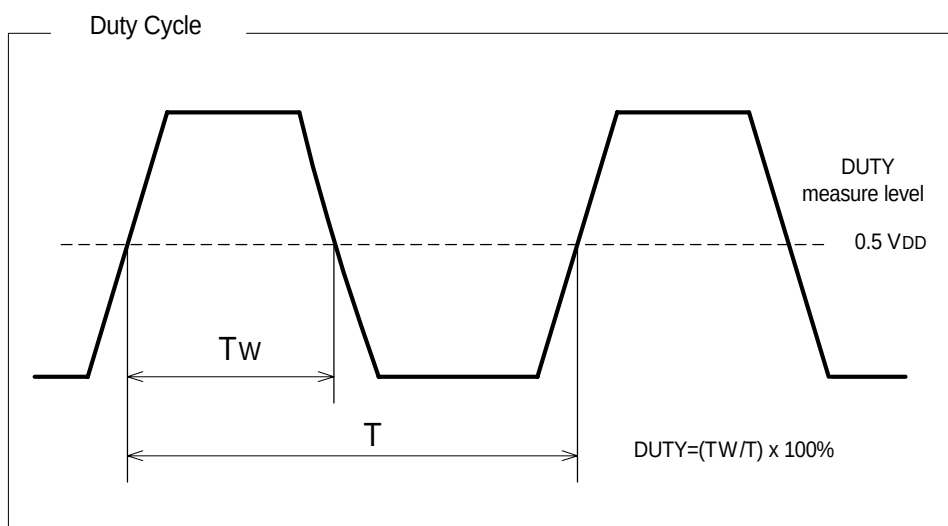
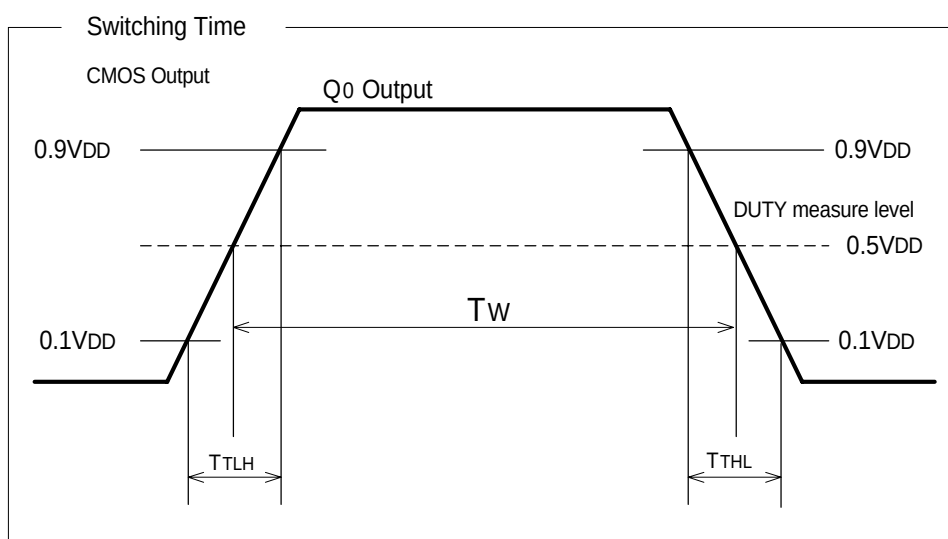
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Operating Supply Voltage	V _{DD}		3.15	3.50	3.85	V
Oscillation Start-Up Time	T _{ST}			5.00		msec
Input Voltage 'High'	V _{IH}		2.4			V
Input Voltage 'Low'	V _{IL}				0.4	V
Output Current 'High'	I _{OH}	V _{OH} = 3.15V		- 8		mA
Output Current 'Low'	I _{OL}	V _{OL} = 0.35V		12		mA
Supply Current 1	I _{DD1}	/ INH = OPEN, Q ₀ = OPEN			8.5	mA
Supply Current 2	I _{DD2}	/ INH = "L", Rf=7.5k Ω			520	μA
Input Pull-Up Resistance	R _{UP}	/ INH = 3.15V	50		200	kΩ
Output Disable Leakage Current	I _{OZ}	/ INH = "L"			10	μA

■ Switching Characteristics

CMOS Duty, $V_{DD}=3.5V$, Load = 15pF, $T_a = 25^\circ C$

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Rise Time	TTLH	$0.1V_{DD} \longrightarrow 0.9V_{DD}$			9	nsec
Output Fall Time	TTHL	$0.9V_{DD} \longrightarrow 0.1V_{DD}$			8	nsec
Duty Cycle 1	DUTY 1	at $V_{DD}/2$, f0/1 Output	40		60	%
Duty Cycle 2	DUTY 2	at $V_{DD}/2$, Divider Output	45		55	%

■ Switching Waveforms



Standard Parts

PART No.	DUTY LEVEL	DIVIDER	Rf	Cg, Cd
XC2141C21A	CMOS ($V_{DD}/2$)	$f_0/1$	External	External
XC2141C22A	CMOS ($V_{DD}/2$)	$f_0/2$	External	External
XC2141C24A	CMOS ($V_{DD}/2$)	$f_0/4$	External	External
XC2141C28A	CMOS ($V_{DD}/2$)	$f_0/8$	External	External

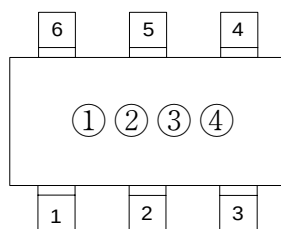
Cg, Cd : Add a 2pF capacitor between VDD & XT and/or VDD & XT/.

Ordering Information

XC 2 1 4 1 x x x x x x
 ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑
 a b c d e f g h

DESIGNATOR	DESCRIPTION	DESIGNATOR	DESCRIPTION
a	Supply Voltage : 4 = 3.5V	e	Divider Ratio : 1= $f_0/1$, 2= $f_0/2$, 4= $f_0/4$, 8= $f_0/8$
b	Product Series : 1 = Large output capability, fundamental & overtone	f	Fundamental / Overtone Rf, Cg, Cd : A = No Rf, Cg, Cd = 2pF
c	Duty Level : A = CMOS ($V_{DD}/2$) & TTL C = CMOS ($V_{DD}/2$) T = TTL	g	Package : M = SOT-26
d	2	h	Device Orientation : R = Embossed Tape (orientation of device : right) L = Embossed Tape (orientation of device : left)

Marking



SOT-26
(TOP VIEW)

① Represents the Divider Ratio

MARK	RATIO	MARK	RATIO
E	$f_0/1$	H	$f_0/4$
F	$f_0/2$	K	$f_0/8$

② Represents the Duty Level

MARK	DUTY LEVEL
2	CMOS ($V_{DD}/2$)

③ Represents 'A' which equals 'No Rf, Cg, Cd = 2pF'

④ Represents the Assembly Lot No. (based on internal standards)