XC2141 Series

ICs for use with Crystal Oscillators

◆**CMOS : Low Supply Current**
◆**Oscillator Frequency : 20MHz ~ 58MHz**
◆**Divider Ratio : fo/1, fo/2, fo/4, fo/8**
◆**3-State Output**
◆**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

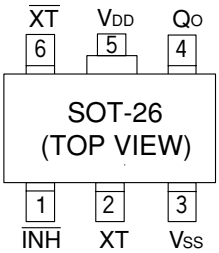
■General Description

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 ~ 58MHz
Divider Ratio : Selectable from f0/1, f0/2, f0/4, f0/8
Output : 3-State
Operating Voltage Range : 3.5V ±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, Qo Pin Function

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

"H" = High Level
"L" = Low Level

■Product Classification

●Ordering Information

X C 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=f0/1, 2=f0/2, 4=f0/4, 8=f0/8
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 (VDD/2) & TTL C = CMOS (VDD/2) T = TTL	g	Package : M = SOT-26
d	2	h	Device Orientation : R= Embossed Tape (Standard Feed) L= Embossed Tape (Reverse Feed)

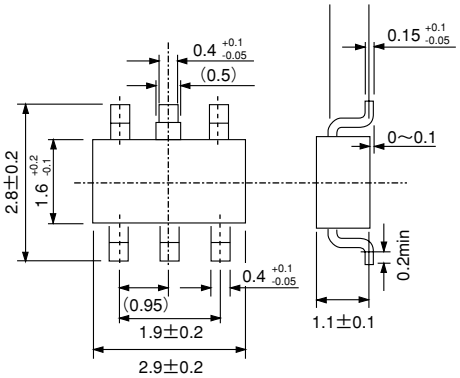
■Standard Parts

PART No.	DUTY LEVEL	DIVIDER	Rf	Cg. Cd
XC2141C21A	CMOS (VDD/2)	f0/1	External	External
XC2141C22A	CMOS (VDD/2)	f0/2	External	External
XC2141C24A	CMOS (VDD/2)	f0/4	External	External
XC2141C28A	CMOS (VDD/2)	f0/8	External	External

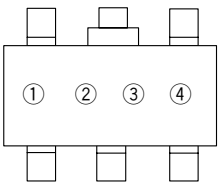
Cg, Cd : Add a 2pF capacitor between VDD & XT and/or VDD & XT/. As the parasitic capacitance, Cg and Cd's capacitance is equivalent of 2pF.

■Packaging Information

●SOT-26



■Marking



SOT-26
(TOP VIEW)

① Represents the Divider Ratio

MARK	RATIO	MARK	RATIO
E	f0/1	H	f0/4
F	f0/2	K	f0/8

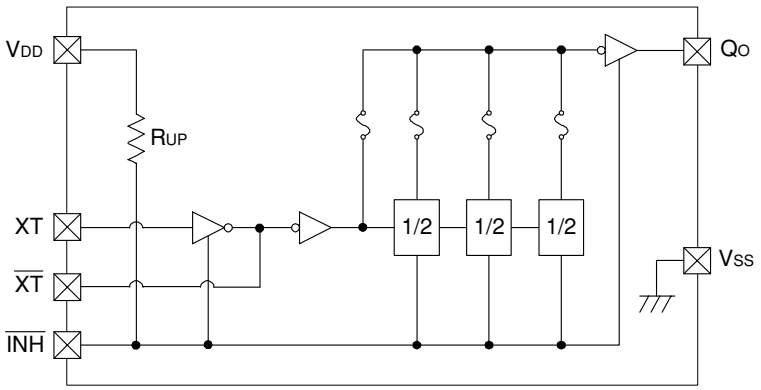
② Represents the Duty Level

MARK	DUTY LEVEL
2	CMOS (VDD/2)

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

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

■Block Diagram



■Absolute Maximum Ratings

PARAMETER	SYMBOL	CONDITIONS	UNITS
Supply Voltage	V_{DD}	V_{SS} - 0.3 ~ V_{SS} + 7.0	V
Input Voltage	V_{IN}	V_{SS} - 0.3 ~ V_{DD} + 0.3	V
Power Dissipation	Pd	150	mW
Operating Ambient Temp.	Topr	-30 ~ +75	°C
Storage Temp.	Tstg	-55 ~ +125	°C

■Electrical Characteristics

XC2141C21AMR (overtone) f0/1

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	TST			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	RUP	/ INH = 3.15V	50		200	kΩ
Output Disable Leakage Current	IOZ	/ INH = "L"			10	μA

XC2141C22AMR (overtone) f0/2

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			9.5	mA
Supply Current 2	I_{DD2}	/ INH = "L", Rf=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=7.5kΩ			520	μA
Input Pull-Up Resistance	R_{UP}	/ INH = 3.15V	50		200	kΩ
Output Disable Leakage Current	I_{OZ}	/ INH = "L"			10	μA

XC2141C28AMR (overtone) f0/8

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

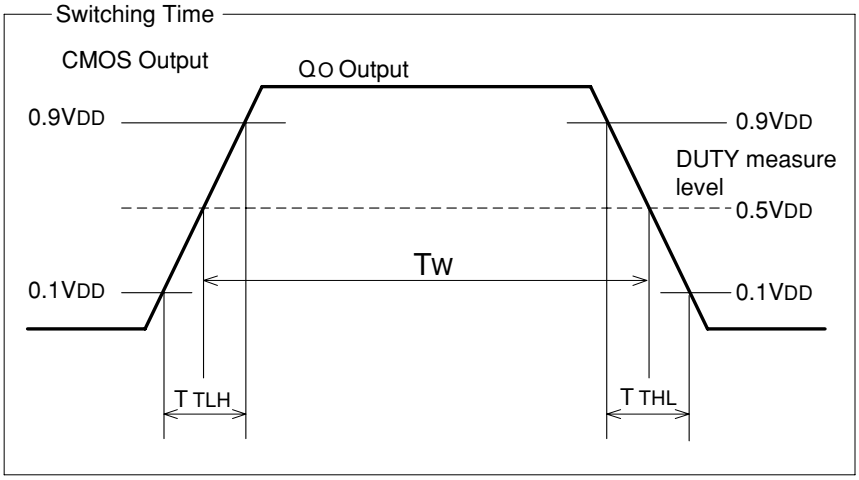
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Operating Supply Voltage	V_{DD}		3.15	3.50	3.85	V
Oscillation Start-Up Time	T_{ST}			5.00		msec
Input Voltage 'High'	V_{IH}		2.4			V
Input Voltage 'Low'	V_{IL}				0.4	V
Output Current 'High'	I_{OH}	V_{OH} = 3.15V		- 8		mA
Output Current 'Low'	I_{OL}	V_{OL} = 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=7.5kΩ			520	μA
Input Pull-Up Resistance	R_{UP}	/ INH = 3.15V	50		200	kΩ
Output Disable Leakage Current	I_{OZ}	/ INH = "L"			10	μA

■Switching Characteristics

CMOS Duty, V_{DD}=3.5V, Load = 15pF, Ta = 25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Rise Time	T_{TLH}	0.1V_{DD} ⟶ 0.9V_{DD}			9	nsec
Output Fall Time	T_{THL}	0.9V_{DD} ⟶ 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 Time



Duty Cycle