

50MHz VCXO IC

■GENERAL DESCRIPTION

The NJU6343 is a single chip C-MOS IC for VCXO that consists of an oscillation amplifier and 3-state output buffer. The NJU6343 integrates all components used in VCXO module, and there is no need for completing VCXO module to prepare any external components except a quartz crystal.

It can vary its output frequency by controlling voltage at V_C terminal.

The oscillation amplifier is realized very low stand-by current using NAND circuit.

The 3-state output buffer is C-MOS compatible.

■PACKAGE OUTLINE



NJU6343C

■FEATURES

- Operating Voltage 2.7 to 3.6V
- Maximum Oscillation Frequency 50MHz(T.B.D.)
- Frequency Pulling Range $\pm 100\text{ppm}$
- Low Operating Current
- High Fan-out $I_{OH}/I_{OL} = \text{T.B.D. @3.0V}$
- Oscillation Stop and Output Stand-by Function
- 3-State Output Buffer
- A Variable Capacitor on-chip
- Package Outline Chip
- C-MOS Technology

■PAD LOCATION

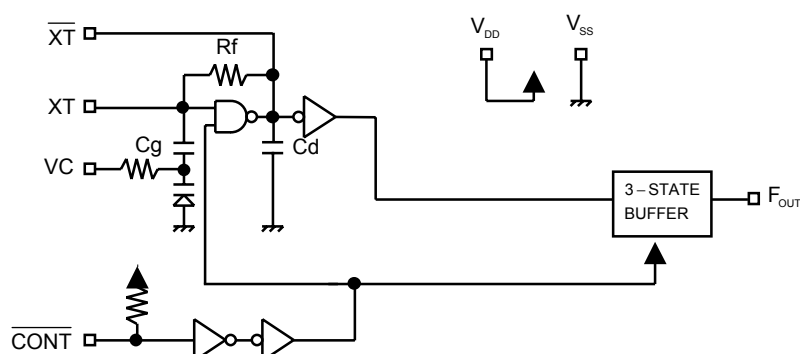


■COORDINATES

No	Pad Name	X	Y
1	$\overline{\text{CONT}}$		
2	XT		
3	$\overline{\text{XT}}$		
4	V_{SS}		
	F_{OUT}		
	V_C		
	V_{DD}		

Starting Point: Chip Center Unit[μm]
 Chip Size: 1.6x1.6mm
 Thin-Chip Thickness: $260 \pm 20\mu\text{m}$
 Pad Size: 90x90 μm

■BLOCK DIAGRAM



■TERMINAL DESCRIPTION

SYMBOL	FUNCTION	
$\overline{\text{CONT}}$	Oscillation and 3-state Output Buffer Control	
	$\overline{\text{CONT}}$	F_{OUT}
	H or OPEN	Frequency Output corresponding to Control Voltage.
	L	Oscillation Stop and High impedance Output
XT $\overline{\text{XT}}$	Quartz Crystal Connecting Terminals	
V_{SS}	$V_{\text{SS}}=0\text{V}$	
F_{OUT}	Frequency Output	
V_{C}	Frequency Control	
V_{DD}	$V_{\text{DD}}=3.0\text{V}$	

■ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V_{DD}	-0.5 to +7.0	V
Control Voltage	V_{C}	$V_{\text{SS}}-0.5$ to $V_{\text{DD}}+0.5$	V
Input Voltage	V_{IN}	$V_{\text{SS}}-0.5$ to $V_{\text{DD}}+0.5$	V
Output Voltage	V_{O}	-0.5 to $V_{\text{DD}}+0.5$	V
Input Current	I_{IN}	± 10	mA
Output Current	I_{O}	± 25	mA
Operating Temperature Range	T_{opr}	-40 to +85	°C
Storage Temperature Range	T_{stg}	-55 to +125	°C

Note1) If the supply voltage(V_{DD}) is less than 7.0V, the input voltage must not over the V_{DD} level though 7.0V is limit specified.

Note2) Decoupling capacitor should be connected between V_{DD} and V_{SS} due to the stabilized operation for the circuit.

■ELECTRICAL CHARACTERISTICS

(Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V_{DD}		2.7		3.6	V

■ELECTRICAL CHARACTERISTICS

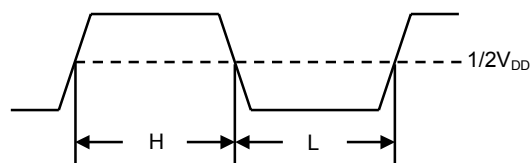
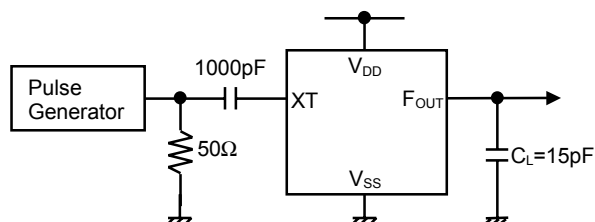
(V_{DD}=3.0, V_C=V_{DD}/2, Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	I_{DD}	fosc=16MHz, V _C =V _{DD} /2, C _L =15pF		T.B.D		mA
Oscillation Stopping Current	I_{STB}	$\overline{CONT} = V_{SS}$, V _C =V _{DD} /2, No load		2	5	uA
Stand-by Current	I_{st}	$\overline{CONT} XT = V_{SS}$, V _C =V _{DD} /2, No load Note3)			1	uA
Input Voltage	V_{IH}		2.4		3.0	V
	V_{IL}		0		0.6	V
Output Current	I_{OH}	V _{OH} =2.7V	T.B.D			mA
	I_{OL}	V _{OL} =0.3V	T.B.D			mA
Input Current	I_{IN}	$\overline{CONT} = 0.8V_{DD}$		10	15	uA
		$\overline{CONT} = 0.2V_{DD}$		1.8	3.0	uA
3-state Off Leakage Current	I_{OZ}	$\overline{CONT} = V_{SS}$, V _C =V _{DD} /2, F _{OUT} = V _{DD} or V _{SS}			±0.1	uA
Feedback Resistance	R _f	Preliminary		T.B.D		kΩ
Internal Capacitor	C _g /C _d	fosc=16MHz		T.B.D		pF
Control Voltage	V _C		0		V _{DD}	V
Frequency Pulling Range	Δf _C	V _C =0 to V _{DD}	-100		+100	ppm
Maximum Oscillation Frequency	F _{MAX}		50			MHz
Output Signal Symmetry	SYM	C _L =15pF, V _C =V _{DD} /2, @V _{DD} /2	45	50	55	%
		C _L =30pF, V _C =V _{DD} /2, @V _{DD} /2	45	50	55	
Output Signal Rise Time	tr	C _L =15pF, V _C =V _{DD} /2, 10% to 90%		3	6	ns
		C _L =30pF, V _C =V _{DD} /2, 10% to 90%		3	6	
Output Signal Fall Time	tf	C _L =15pF, V _C =V _{DD} /2, 90% to 10%		3	6	ns
		C _L =30pF, V _C =V _{DD} /2, 90% to 10%		3	6	
Output Disable time	T _{PLZ}	C _L =15pF, V _C =V _{DD} /2, R _{UP} =10kΩ			200	ns
Output Enable Time	T _{PZL}	C _L =15pF, V _C =V _{DD} /2, R _{UP} =10kΩ			200	ns

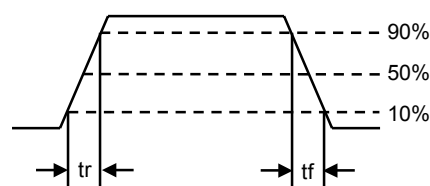
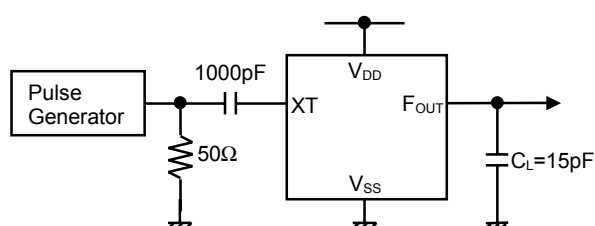
Note3) Excluding input current on $\overline{CONT}$ Terminal.

MEASUREMENT CIRCUITS

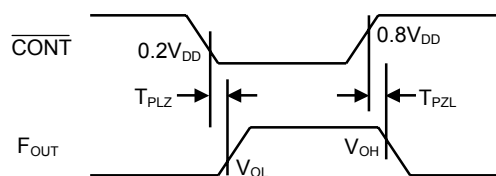
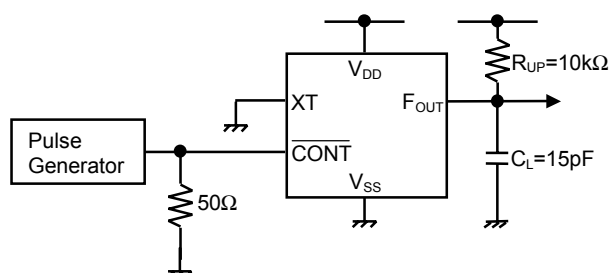
(1) Output Signal Symmetry ($C_L=15\text{pF}$, $V_C=1/2V_{DD}$)



(2) Output Signal Rise/Fall Time ($C_L=15\text{pF}$, $V_C=1/2V_{DD}$)



(3) Output Disable/Enable Time ($C_L=15\text{pF}$, $R_{UP}=10\text{k}\Omega$, $V_C=1/2V_{DD}$)



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