

IC for XO

Monolithic IC MM1424, MM1624 Series

Outline

This is a low current consumption, low operating voltage XO IC with Colpitz oscillation circuit. Smaller size is achieved by the on-chip bias circuit and Colpitz oscillation capacitor.

Features

1. Low current consumption. 1.5mA max. ($V_{cc} = 2.8V$)
2. Low power supply operating voltage. $V_{cc} = 2.3$ to $3.3V$
3. On-chip Colpitz oscillation capacitor · On-chip bias resistor.
4. Low phase noise. $-140dBc$ (@1kHz)
5. Ultra-small package type.

Package

SC-82 (MM1424CUXX)
 MCSP-4A (MM1424CCXX)
 WLCSP-4A (MM1624CLXX)

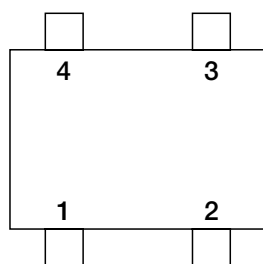
Applications

1. Crystal oscillators
2. VCXO
3. TCXO

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Pin Assignment

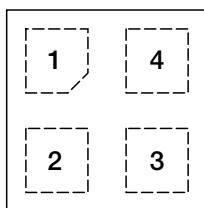
MM1424CUXX



SC-82
(TOP VIEW)

1	X'tal
2	GND
3	V _{OUT}
4	V _{CC}

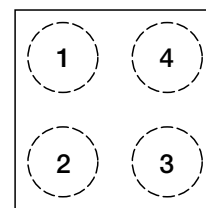
MM1424CCXX



MCSP-4A
(TOP VIEW)

1	GND
2	X'tal
3	V _{CC}
4	V _{OUT}

MM1624CLXX

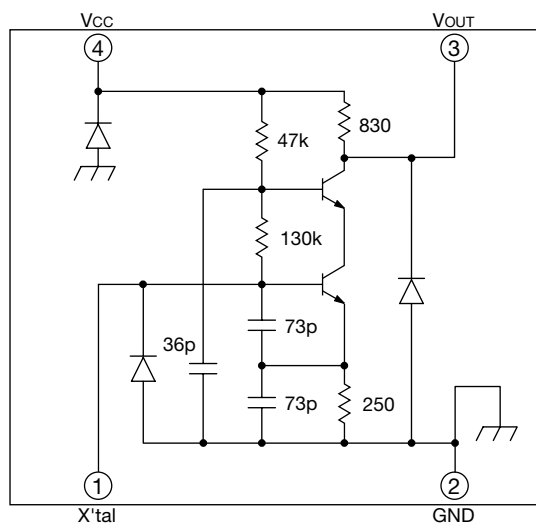


WLCSP-4A
(TOP VIEW)

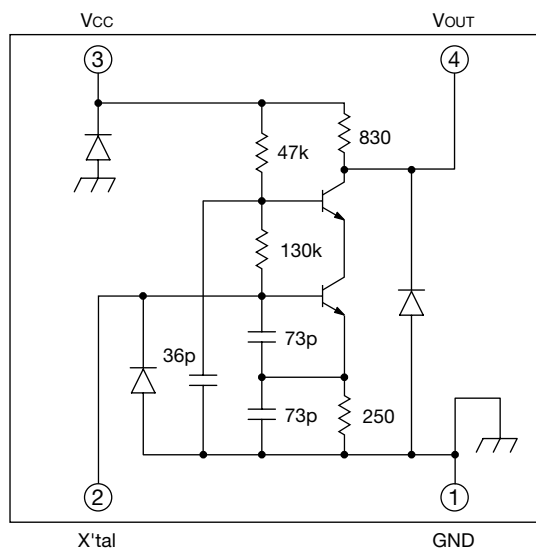
1	X'tal
2	GND
3	V _{OUT}
4	V _{CC}

Equivalent Circuit Diagram

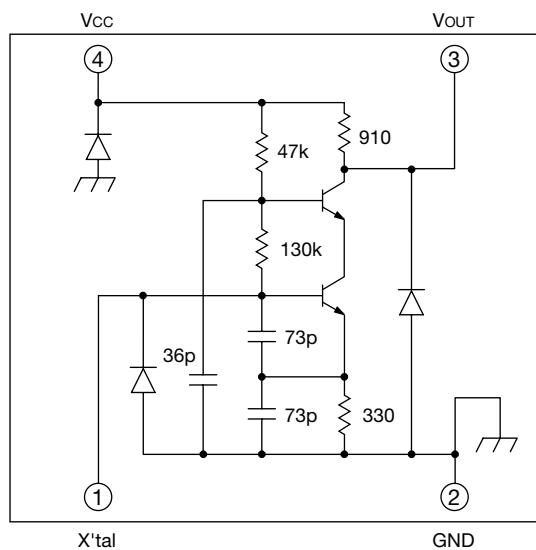
MM1424CUXX



MM1424CCXX



MM1624CL□□



Note : The component values in the schematic circuit diagram are typical.

Pin Description

Pin No			Pin name	Functions
MM1424CUXX	MM1424CCXX	MM1624CLXX		
1	2	1	X'tal	X'tal pin
2	1	2	GND	GND
3	4	3	V _{OUT}	Output pin
4	3	4	V _{CC}	Supply voltage

Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Ratings	Unit
Storage temperature	T _{STG}	-40~+125	°C
Operating temperature	T _{OPR}	-30~+80	°C
Supply voltage	V _{CC} max.	5.5	V
Input voltage	V _{IN} max.	0 ≤ V _{IN} ≤ V _{CC}	V
Power dissipation	P _d	150(MM1424CUXX) 180(MM1424CCXX) ★ 220(MM1624CLXX) ★	mW

Note *: Assembled on PC board.

Pc board dimensions : 80×20mm, t=0.8mm, (MM1424CCXX)

Material : Glass epoxy 110×40mm, t=0.8mm, 4 stratum (MM1624CLXX)

Recommended Operating Conditions

Item	Symbol	Ratings	Unit
Operating temperature	T _{OPR}	-30~+80	°C
Supply voltage	V _{OP}	2.3~3.3	V
Operating frequency	F _{OPR}	10~26	MHz

Note *: The definition of the operation at the recommended operating conditions is to oscillate.

Electrical Characteristics (V_{CC}=2.7V, Ta=25±2°C, Load : 2kΩ // 10pF, fosc=26MHz unless otherwise specified)

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Unit
Current consumption	I _{CC}	V _{CC} =2.8V		1.3	1.5	mA
Output frequency	Δf _o	★1	-30	0	30	ppm
Output voltage	V _{OUT}	V _{CC} =2.6V	0.8	1.05		V
Duty ratio	Duty	V _{CC} =2.6~2.8V ★2	40	50	60	%
Negative resistance★3	R _N	V _{IN} =0.1Vrms, 26MHz	-100	-150		Ω
Frequency stability-supply voltage variation★3	Δf-V _{CC}	V _{CC} =2.7V±0.1V	-0.2	0	0.2	ppm
Frequency stability-load variation★3	Δf-Lo	R _L =2kΩ±10% C _L =10pF±10%	-0.3	0	0.3	ppm

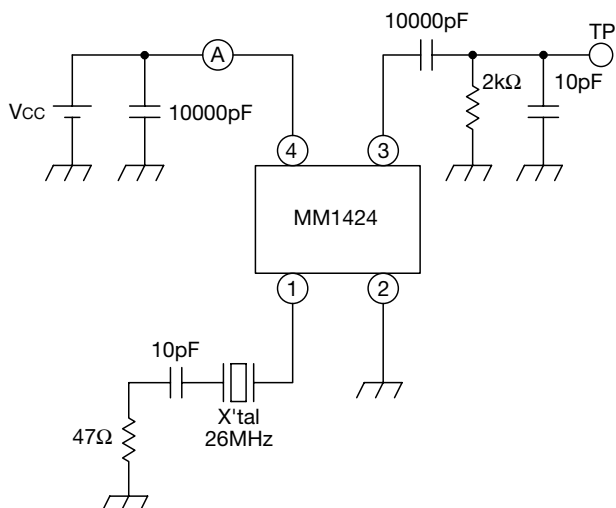
Note1 ★1: Output frequency satisfies the results measured by the correlation test boxes.

Note2 ★2: Duty ratio is measured at the center of V_p-p.

Note3 ★3: The items of ★3 are only guaranteed by the design of the circuit.

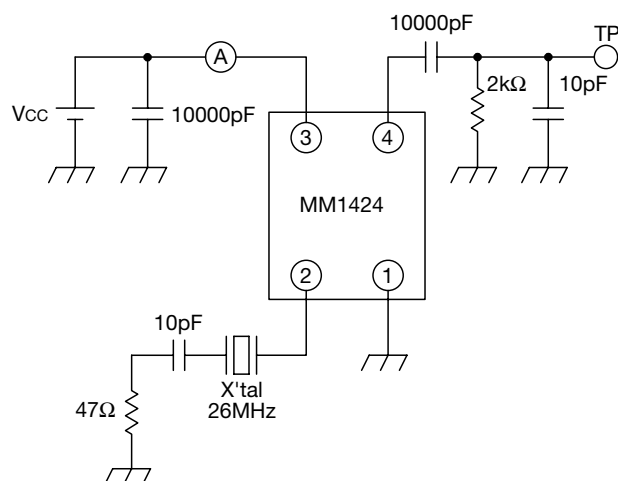
Measuring Circuit

MM1424CUXX



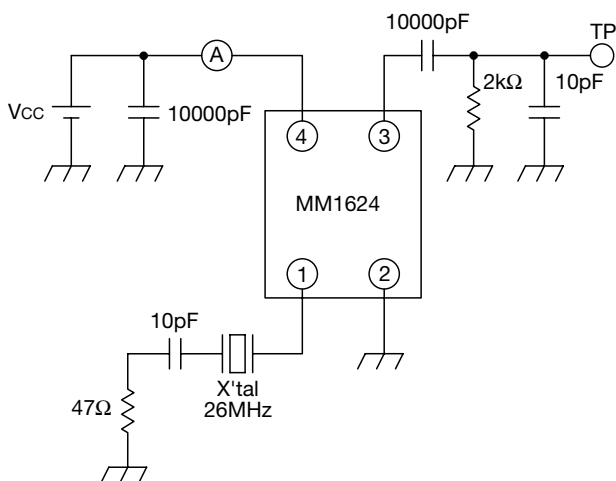
- This load capacity (10pF) contains a capacity of a probe.

MM1424CCXX



- This load capacity (10pF) contains a capacity of a probe.

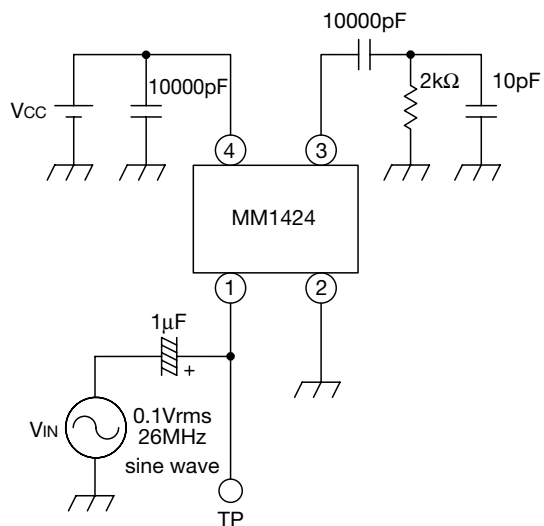
MM1624CLXX



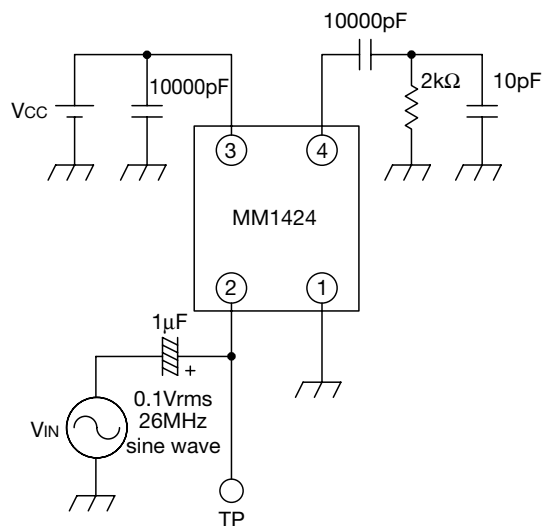
- This load capacity (10pF) contains a capacity of a probe.

Circuit diagram which is to measure the negative resistance.

■ MM1424CUXX



■ MM1424CCXX



■ MM1624CLXX

