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. (Vcc = 2.8V)
2. Low power supply operating voltage. Vcc = 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

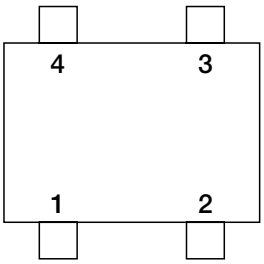
SC-82 (MM1424CUXX)
MCSP-4A (MM1424CCXX)
WLCSP-4A (MM1624CLXX)

Applications

1. Crystal oscillators
2. VCXO
3. TCXO

Pin Assignment

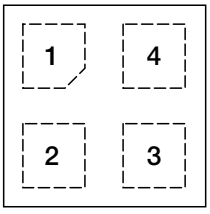
MM1424CUXX



SC-82
(TOP VIEW)

1	X'tal
2	GND
3	VOUT
4	VCC

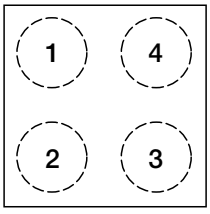
MM1424CCXX



MCSP-4A
(TOP VIEW)

1	GND
2	X'tal
3	VCC
4	VOUT

MM1624CLXX

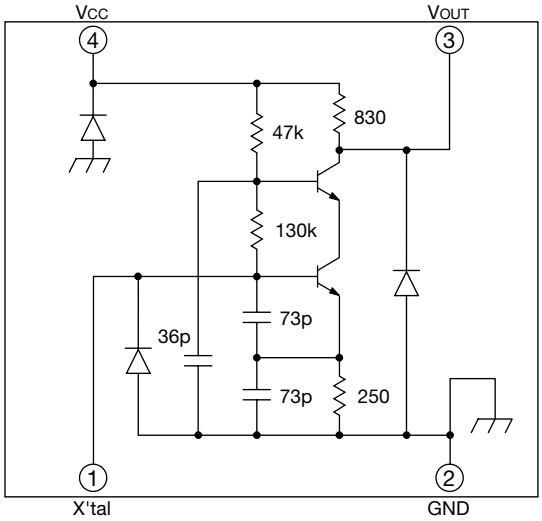


WLCSP-4A
(TOP VIEW)

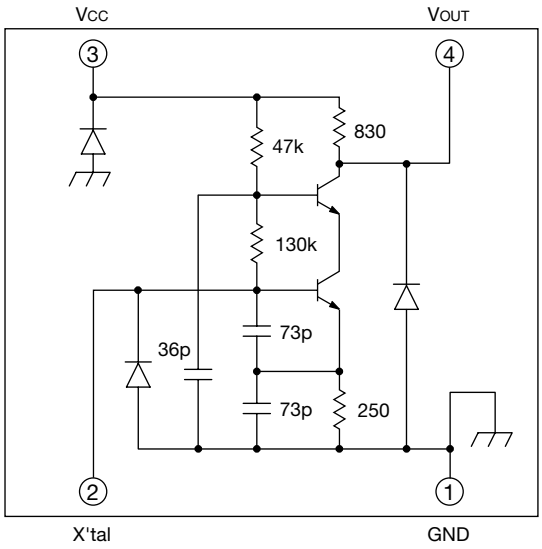
1	X'tal
2	GND
3	VOUT
4	VCC

Equivalent Circuit Diagram

MM1424CUXX



MM1424CCXX



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.	$0 \leqq V_{IN} \leqq V_{CC}$	V
Power dissipation	Pd	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.

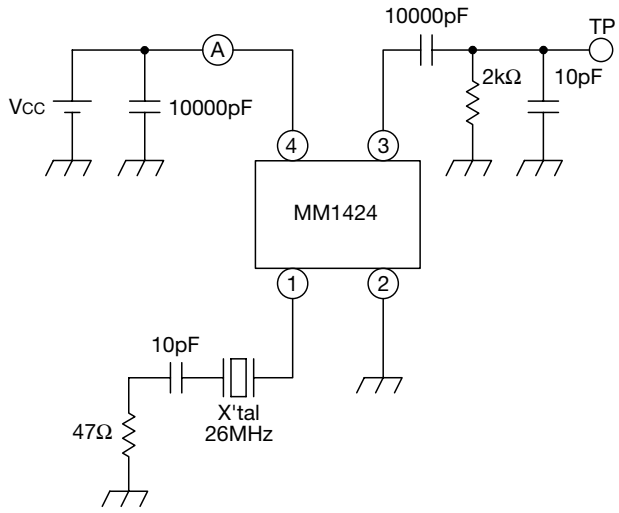
Electrical Characteristics (V_{CC}=2.7V, Ta=25±2°C, Load : 2kΩ // 10pF, fosc=26MHz unless otherwise specificd)

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Unit
Current consumption	Icc	V_{CC}=2.8V		1.3	1.5	mA
Output frequency	⊿Fo	＊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		60	%
Negative resistance＊3	R_N	V_{IN}=0.1Vrms, 26MHz	–100	–150		Ω
Frequency stability-supply voltage variation＊3	⊿f–Vcc	V_{CC}=2.7V±0.1V	–0.2	0	0.2	ppm
Frequency stability-load variation＊3	⊿f–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 Vp-p.
Note3 ＊3: The items of ＊3 are only guaranteed by the desigh of the circuit.

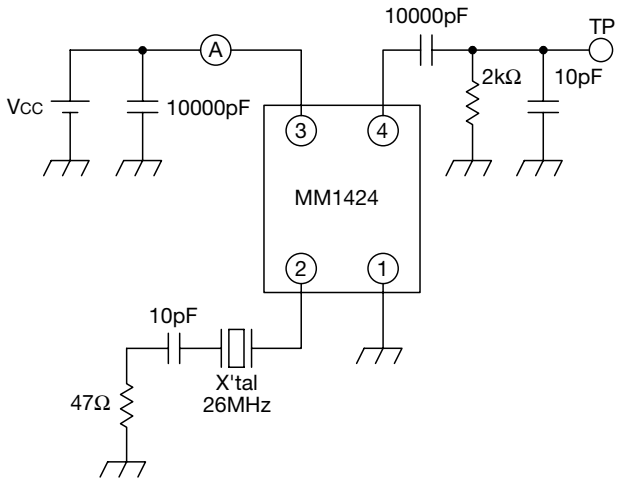
Measuring Circuit

MM1424CUXX



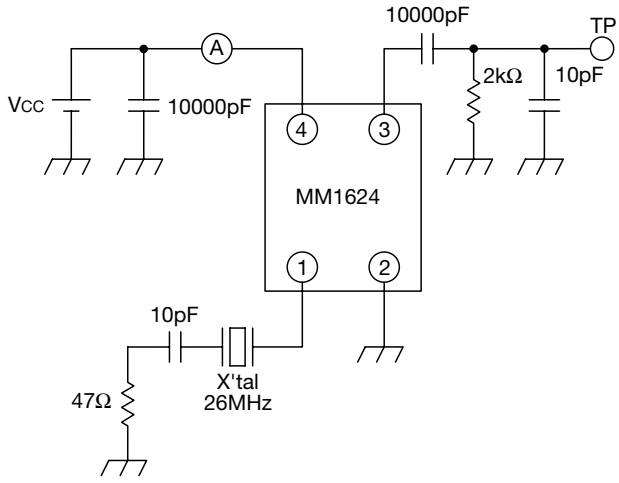
· This load capacity (10pF) contains a capacity of a probe.

MM1424CCXX



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

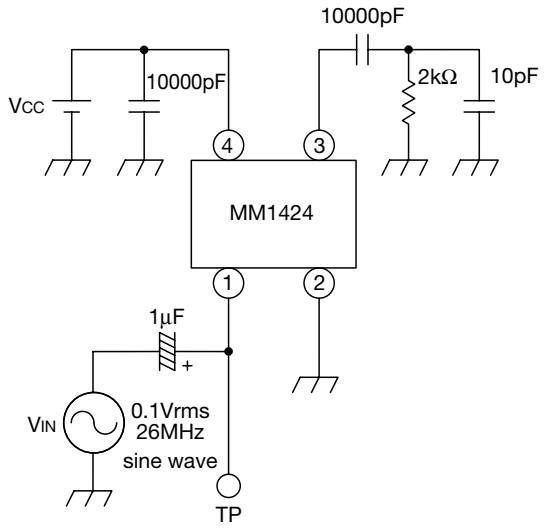
MM1624CLXX



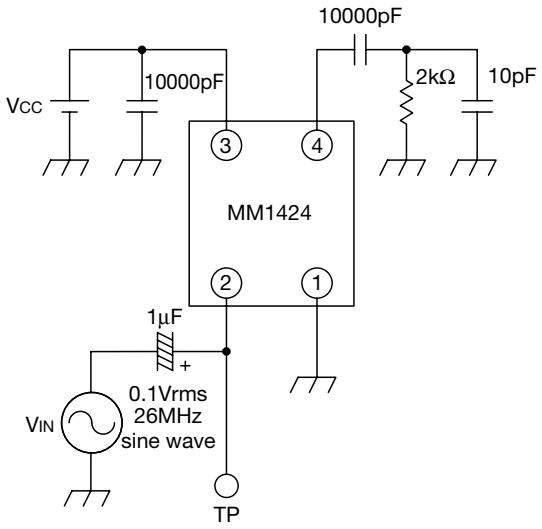
· This load capacity (10pF) contains a capacity of a probe.

Circuit diagram which is to measure the negative resistance.

MM1424CUXX



MM1424CCXX



MM1624CLXX