

SM5624N

Quartz Crystal Oscillator Module IC

range of quartz oscillator module ICs fabricated using NPC's original molyb-
dum. Each IC consists of a low-voltage, low-current oscillator circuit and
incorporate oscillation capacitors having excellent frequency characteristics, and
output of a quartz fundamental wave without connecting any external compo-

- Low current consumption
 - Built-in oscillation capacitors CG and CD
 - Output tristate function
 - Low current consumption
 - Standby function (Standby: oscillation stop, output high impedance).
- Supply voltage of
(range 2.7 to 5.5V)
inverter amplifier
construction

Function
Output high impedance, internal pull-up resistor (Pull-up at the standby current)

SM5624N

Output
fo
fo/2
fo/4
fo/8

fo: fundamental frequency

MAXIMUM RATINGS

(V_{SS} = 0V)

Symbol	Rating	Unit
V _{DD}	-0.5 to +7.0	V
V _{IN}	-0.5 to V _{DD} +0.5	V
V _{OUT}	-0.5 to V _{DD} +0.5	V
T _{STG}	-65 to +150	°C
I _{OUT}	25	mA

DC OPERATING CONDITIONS

(V_{SS} = 0V)

Symbol	MIN	TYP	MAX	Unit
V _{DD}	2.7		3.6	V
V _{IN}	V _{SS}		V _{DD}	V
T _{OP}	+20		+80	°C

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CHARACTERISTICS

(V_{DD} =2.7 to 5.5V, V_{SS} = 0 V and Ta= -20 to +80°C unless otherwise noted.)

SYMBOL	CONDITIONS		LIMITS			UNIT
			MIN	TYP	MAX	
V _{OH}	Q pin, Fig. 1	V _{DD} =4.5V, I _{OH} =16.0mA	4.0	4.2		V
		V _{DD} =2.7V, I _{OH} =8mA	2.2	2.4		
V _{OL}	Q pin, Fig. 1	V _{DD} =4.5V, I _{OL} =16.0mA		0.3	0.4	V
		V _{DD} =2.7V, I _{OL} =8mA		0.3	0.4	
V _{IH}	INH pin		0.7V _{DD}			V
V _{IL}	NH pin				0.3V _{DD}	V
I _{DD1}	Fig. 2 INH=OPEN C _L =15pF, f=30MHz, V _{DD} =3±0.3V	SM5624N1		6	12	mA
		SM5624N3		4	8	
		SM5624N5		3	6	
		SM5624N7		2	4	
	Fig. 2 INH=OPEN C _L =15pF, f=30MHz, V _{DD} =5±0.5V	SM5624N1		12	24	
		SM5624N3		8	16	
		SM5624N5		6	12	
		SM5624N7		5	10	
I _{ST}	Fig. 2, INH="L"	V _{DD} =3±0.3V		1.5	6	μA
		V _{DD} =5±0.5V		4	15	
R _{UP1}	Fig. 3	INH=V _{SS} , V _{DD} =3.6V	2		15	MΩ
R _{UP2}		INH=2.7V, V _{DD} =3.6V	50		300	kΩ
R _I	Fig. 4		1.0		10	MΩ
C _G	Design value		18	20	22	pF
C _D			18	20	22	

CHARACTERISTICS

V_{SS} =0V and Ta= -20 to +80°C unless otherwise noted.

SYMBOL	CONDITIONS		LIMITS			UNIT
			MIN	TYP	MAX	
T ₁	Fig. 5 to	V _{DD} =5±0.3V, C _L =15pF		2	4	ns
T ₂		V _{DD} =5±0.5V, C _L =15pF		1.5	3	
T ₃		V _{DD} =5±0.3V, C _L =30pF		3	6	
T ₄		V _{DD} =5±0.5V, C _L =50pF		4	8	
T ₁	Fig. 5 to	V _{DD} =5±0.3V, C _L =15pF		2	4	ns
T ₂		V _{DD} =5±0.5V, C _L =15pF		1.5	3	
T ₃		V _{DD} =5±0.3V, C _L =30pF		3	6	

CUIT

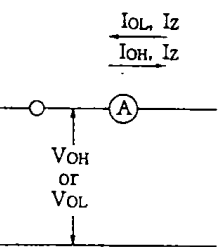


Figure 1

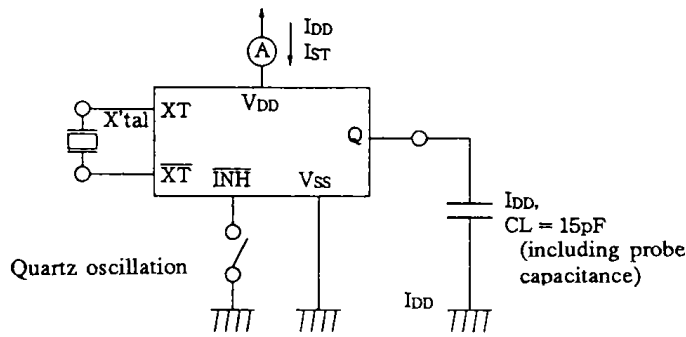


Figure 2

$$R_{UP1} = \frac{V_{DD}}{I_{PR}}$$

$$R_{UP2} = \frac{V_{DD} - V_{IH}}{I_{PR}}$$

PR

Figure 3

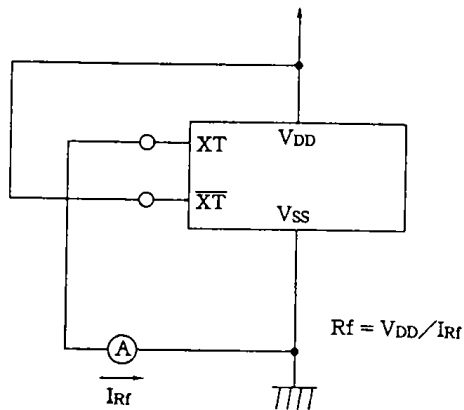
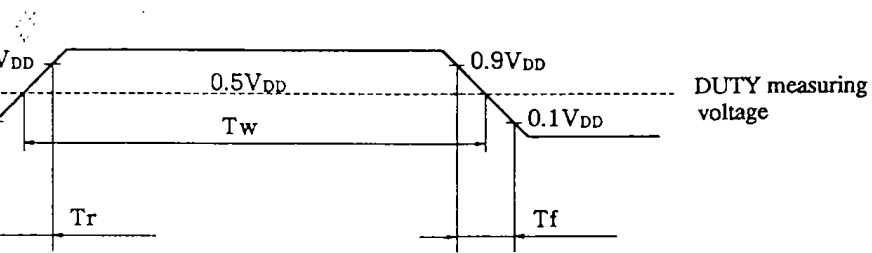


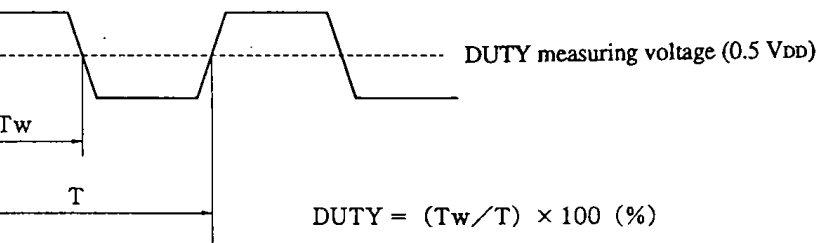
Figure 4

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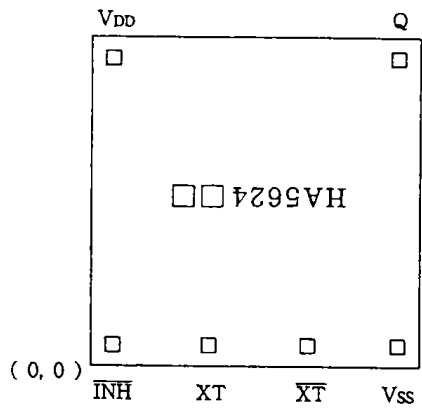
MEASURING WAVEFORM



PERIOD TIME



SM5624N



Chip size: 0.89 × 1.28mm

Chip thickness: 400±30 μm

Check back surface: V_{DD} level

* □ □ version name

Unit: μm)

Pin name	X	Y
INH	170	183
XT	360	183
XT	550	183
V _{SS}	740	183
Q	743	1133
V _{DD}	136	1133