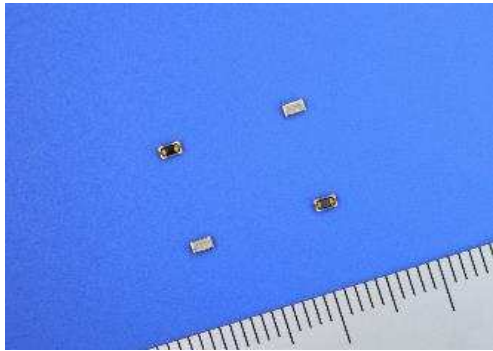


Low power crystal oscillator 32.768kHz SN-20S



Features

- The world's smallest low current consumption for crystal built-in oscillator. 0.35 μ A typ.(V_{DD}=1.8V)
- Small size package (2.0 \times 1.2mm)
- Pb-free RoHS compliant
- Built-in crystal resonator processed by high reliable photo-lithographic technology.

Applications

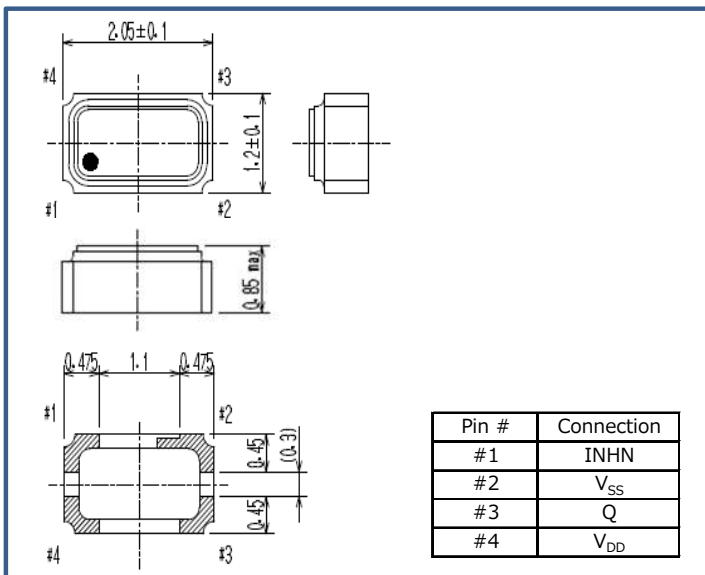
- Wearable, Module, Sub-clock function for a variety of Microcontroller, etc.

Specifications

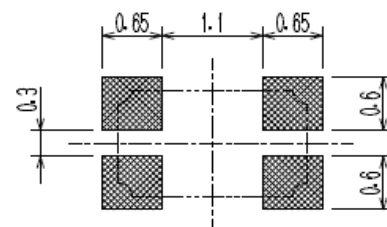
Item	Symbol	Specifications	Unit	Conditions Note
Nominal Frequency	f _{nom}	32.768	kHz	
Frequency tolerance	f _{tol}	± 20	$\times 10^{-6}$	
Supply Voltage	V _{DD}	1.2~5.5	V	
Storage temperature	T _{stg}	-55~+125	$^{\circ}$ C	
Operating temperature	T _{use}	-40~+85	$^{\circ}$ C	
Turnover Temperature	T _i	25 \pm 5	$^{\circ}$ C	
Frequency temperature coefficient	β	-0.030 \pm 10%	$\times 10^{-6}/^{\circ}$ C ²	
Frequency / voltage coefficient	f _{0_VDD}	± 1	$\times 10^{-6}/V$	V _{DD} =1.2 to 5.5 V
Current consumption	I _{DD}	0.35 typ. / 0.65 max.	μ A	V _{DD} =1.8V, No load condition
		0.50 typ. / 0.80 max.	μ A	V _{DD} =3.3V, No load condition
Sleep current	I _{DD2}	0.25 typ. / 0.60 max.	μ A	V _{DD} =1.2 to 5.5V, No load condition
Symmetry	SYM	50 \pm 10	%	Load: 15pF
Rise time / Fall time	tr/tf	200 max.	ns	Load: 15pF output level 10 to 90%
Input voltage	V _{IL}	0.2V _{DD} max.	V	INH terminal
	V _{IH}	0.8V _{DD} min.	V	INH terminal
Output voltage	V _{OL}	0.4 max.	V	Q terminal
	V _{OH}	V _{DD} -0.4 min.	V	Q terminal
Output load condition (CMOS)	CLOUT	15 max.	pF	CMOS Loading
Start-up time	t _{str}	0.15 Typ. / 0.50 max.	sec	V _{DD} =1.2 to 5.5V
Frequency aging	f _{aging}	± 3	$\times 10^{-6}$	First year

Unless otherwise stated, characteristics (specifications) shown in the above table are based on the T_a=+25 $^{\circ}$ C, V_{DD}=3.3V condition.

Dimensions



Recommended PAD Lay-out



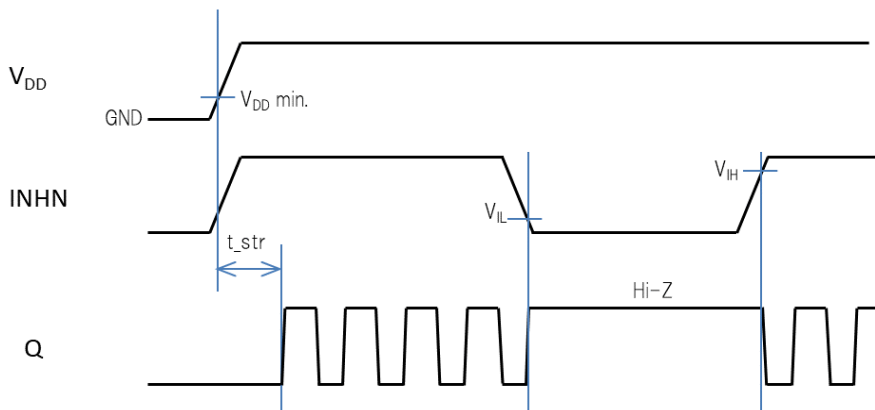
It is recommended that a bypass capacitor (0.01 μ F to 0.1 μ F) between V_{DD} and GND be mounted as close as possible to the power supply pins.

Low power crystal oscillator 32.768kHz SN-20S

Maximum Rating

Item	Symbol	Conditions	Rated value	Unit
Supply voltage range	V_{DD}	$V_{DD}-V_{SS}$	-0.3~+4.5	V
Input voltage range	V_{in}	input terminal (INH/N)	-0.3~ $V_{DD}+0.3$	V
Output voltage range	V_{out}	Output terminal (Q)	-0.3~ $V_{DD}+0.3$	V
output current	I_{out}	Output terminal (Q)	± 10	mA
Operating ambient temperature	T_{opt}		-40~+105	°C
Storage ambient temperature	T_{stg}		-55~+125	°C

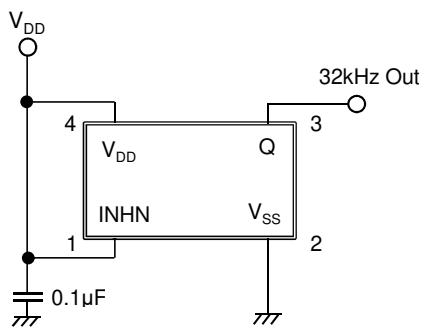
Maximum Rating



Circuit connection with MCU

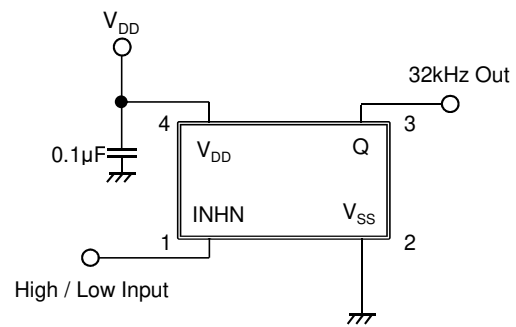
Connection example 1

Connect the V_{DD} pin and the INHN pin if the 32kHz output ON/OFF operation is not to be performed.



Connection example 2

Input High/Low to the INHN pin to turn ON/OFF the 32kHz output.



It is recommended that a bypass capacitor (0.01µF to 0.1µF) between V_{DD} and GND be mounted as close as possible to the V_{DD} pins.

Q terminal output setting

Terminal Q	Terminal INHN		remarks
32kHzOutput	High	$0.8V_{DD}$ min.	—
Hi-Z	Low	$0.2V_{DD}$ max.	—
—	OPEN	—	Do not use

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HIGH GRADE

This mark means that the product complies with SII's own environmental standards.