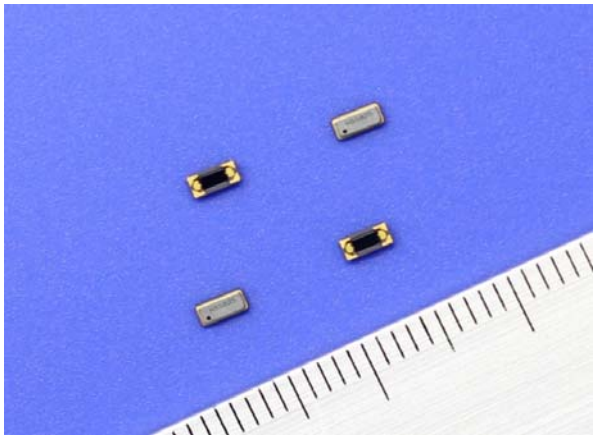
High accuracy Crystal Oscillator 32.768kHz SH-32S



Features

- Excellent frequency accuracy and Temperature characteristics
- Low current consumption
- Complete Pb-free
- Incorporated highly reliable photolithographic crystal resonator

Applications

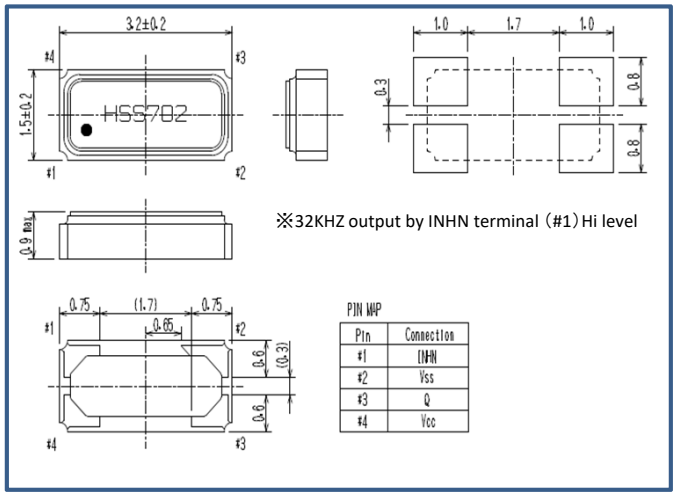
Smart Meter, IoT,Wearable device,
Industry device,High precision timing device,
Event data recorder, etc

Specifications

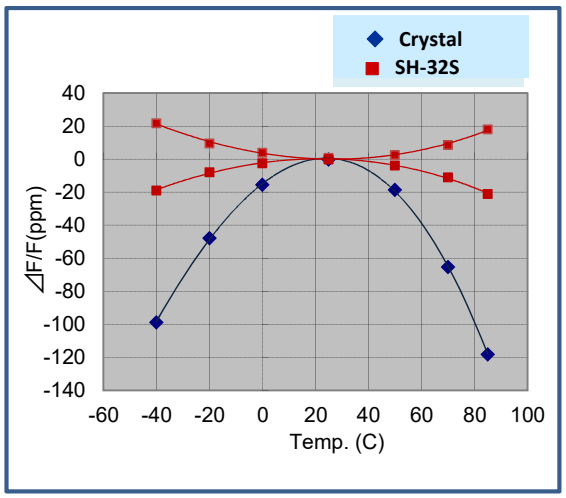
Item	Symbol	Specifications	Unit	Conditions Note
Nominal Frequency	f_nom	32.768	kHz	
Supply Voltage	Vcc	1.3~5.5	V	(*1)
Temperature Compensated Voltage	VTEM	2.0~5.5	V	
Storage temperature	T_stg	-55~+125	℃	
Operating temperature	T_use	-40~+85	℃	
Frequency tolerance	f_tol	±3	$\times10^{-6}$	+25℃,VCC=3.3 V
Frequency temperature coefficient	f0_Tc	±50	$\times10^{-6}$	-40~+85℃(+25℃ is reference)
Frequency / voltage coefficient	f0_Vcc	±1	$\times10^{-6}$/V	
Current consumption	Icc	1.0 Typ.	μA	3.3V,No load condition
		2.0 Max.	μA	
Symmetry	SYM	50±10	%	Load:15pF
Rise time / Fall time	tr/tf	50 Max.	ns	Load:15pF output level 20~80%
Input voltage	VIL	20% Vcc Max.	V	INHN terminal
	VIH	80% Vcc Min.	V	INHN terminal
Output voltage	VOL	0.4 Max.	V	
	VOH	Vcc-0.4 Min.	V	
Output load condition (CMOS)	CLOUT	15 Max.	pF	CMOS Loading
Start-up time	t_str	0.5 Max.	sec	+25℃
Frequency aging	f_aging	±3	$\times10^{-6}$	+25℃,Vcc=3.3V,First year

Unless otherwise stated, characteristics (specifications) shown in the above table are based on the rated operating temperature and voltage condition.
(*1) When the supply voltage becomes below 2V, the frequency temperature compensation operation is inactivated.

Dimensions



Temperature characteristic



Absolute maximum rating

Item	Symbol	Condition	Rated	Unit
Power Supply & Voltage range	Vcc	Between Vcc-Vss	-0.3～+6.5	V
Input Voltage range	Vin	Input terminal(INHN)	-0.3～Vcc+0.3	V
Output Voltage range	Vout	Output terminal(Q)	-0.3～Vcc+0.3	V
Output Power supply	Iout	Output terminal(Q)	±10	mA

※In order to run SH-32 stability, please be mounted Ceramic･Chip Condensor by more than 0.1μF near SH-32 between Vcc-Vss.

Power consumption characteristics

Item	Symbol	Condition	MIN	TYP	MAX	Unit
Power consumption of starting (Temperature compensation interval in 2sec)	Icc	INHN=Vcc=3.3V,CLOUT=0pF Ta=-40℃～+85℃	—	1.0	2.0	μA
		INHN=Vcc=5.0V,CLOUT=0pF Ta=-40℃～+85℃	—	1.5	3.0	μA
Power consumption of booting	IBOOT	INHN=Vcc=3.3V,CLOUT=0pF Ta=-40℃～+85℃	—	1.5	2.5	μA
Power consumption of Disable	IDIS	INHN=Vss=0V,CLOUT=0pF Ta=-40℃～+85℃	—	0.6	1.5	μA

※In order to be short for oscillation starting time(t_str), It is the power consumption booting when increased the oscillation drive capability. Booting circuit works until 0.5sec(t_str+0.5s) from the power supply starting to oscillation starting.

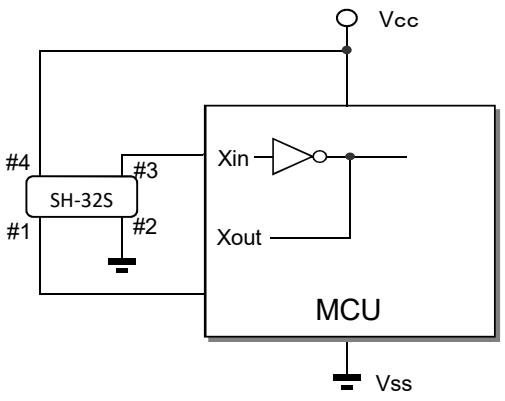
The function for INHN terminal

Input terminal(INHN)	Output terminal(Q)	Oscillation	Notes
"H" Level	32.768kHz output	Oscillation	—
"L" Level	Hi-Z	Oscillation	—
OPEN	—	—	Unavailable

Frequency torelance and Temperature characteristics

Temperature range(℃)	Frequency Tolerance ($\times 10^{-6}$)
0～+50	±20
-10～+60	±30
-20～+70	±40
-40～+85	±50

The example for Circuit connection with MCU



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