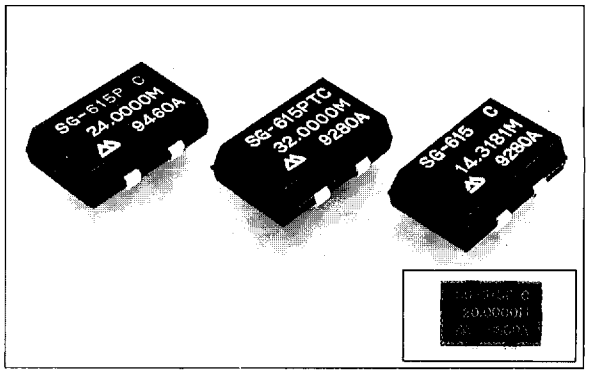
SMD TYPE HIGH FREQUENCY CRYSTAL OSCILLATOR
SG-615 series



Actual size

■Specifications (characteristics)

Item		Symbol	SG-615/615P	SG-615T/615PT	SG-615PTJ	Remark
			Specification			
Output frequency range		fo	1.0250MHz to 26.0000MHz	26.0001MHz to 36.0000MHZ	36.0001MHz to 66.6667MHz	
Power source voltage	Max.supply voltage	V_{DD}-GND	−0.3V to +70.V	−0.3V to +7.0V	−0.3V to +7.0V	
	Operating voltage	V_{DD}	5.0V±0.5V	5.0V±0.5V	5.0V±0.5V	
Temperature range	Storage temperature	T_{STG}	−55℃ to +125℃	−55℃ to +125℃	−55℃ to +125℃	Stored without Tape & Reel
	Operating temperature	T_{OPR}	−10℃ to +70 (−40℃ to +85℃)			−40℃ to +85℃ : custom order
Soldering condition (lead part)		T_{SOL}	Under 260℃ within 10sec.×2 times or under 230℃ within 3min.			
frequency stability		Δf/fo	B: ±50ppm C: ±100ppm	B: ±50ppm C: ±100ppm	(B: ±50ppm) C: ±100ppm	−10℃ to +70℃ B-type is possible, please consult us.
Current consumption		Iop	25mA MAX.	35mA MAX.	35mA MAX.	No load condition
Duty		Tw/T	40% to 60% * (45% to 55% ※1)	40% to 60% ** (45% to 55% ※1)	40% to 60% ** (45% to 55% ※1)	* : 1.4V or 1/2V_{DD} level **: 1.4V level
Output voltage		V_{OH}	V_{DD}-0.4V MIN.	V_{DD}-0.4V MIN.	2.4V MIN.	I_{OH} = −400μA
		V_{OL}	0.4V MAX. *	0.4V MAX. *	0.5V MAX. **	*: I_{OL} =16mA **: I_{OL} =8mA
Output load condition(Fan out)	TTL	N	10TTL MAX.	10TTL(30pF) MAX.	5TTL(15pF) MAX.	
	C-MOS	CL	50pF MAX.			
Output enable/standby input voltage		V_{IH}	2.0V MIN.	2.0V MIN.	3.5V MIN.	
		V_{IL}	0.8V MAX.	0.8V MAX.	1.5V MAX.	
Output disable current		I_{OE}	12mA MAX.	20mA MAX.	28mA MAX.	OE terminal = GND
Output rise time		t_{TLH}	8nsec. MAX. *	10nsec. MAX. *	5nsec. MAX.	*: Refer to output waveform chart (page 9)
Output fall time		t_{THL}	8nsec. MAX. *	8nsec. MAX. *	5nsec. MAX.	
Oscillation start time		t_{OSC}	4msec. MAX.	10msec. MAX.	10msec. MAX	More than for 1mS., until V_{DD} = 0V→4.5V. Time at 4.5V to be 0sec.
Aging		fa	±5ppm/year MAX.	±5ppm/year MAX.	±5ppm/year MAX.	Ta=25℃, V_{DD}=5V, first year
Shock resistance		S.R.	±20ppm MAX.	±20ppm MAX.	±20ppm MAX.	3-times of drop test on a hard board from 75cm height or excitation test with 3000G × 0.3mS × 1/2sine wave in 3-directions

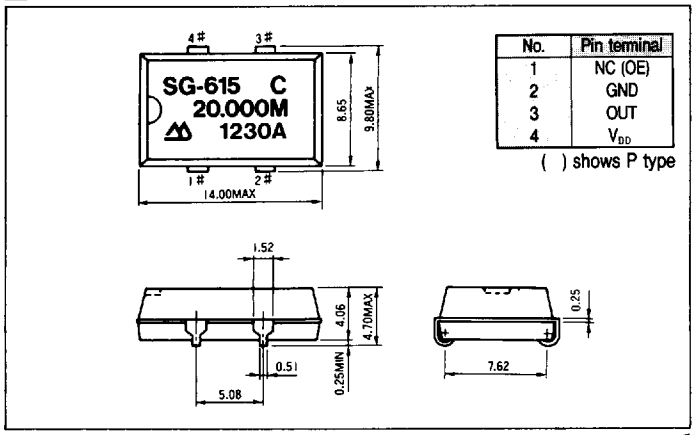
Note: · Unless otherwise stated, characteristics (specifications) shown in the above table are based on the rated operating temperature and voltage condition.
·SG-615H : on a request. External by-pass capacitior is recommended.

■Frequency correspondence table

Model \ Frequency	1MHz	26MHz	36MHz	66.67MHz
SG-615/615P	▼	▼		
SG-615T/615PT		▼	▼	
SG-615PTJ			▼	▼
SG-615YH/615PH		▼		▼

■External Dimensions

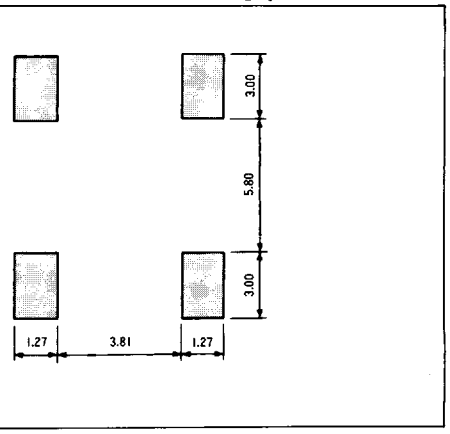
(Unit : mm)



No.	Pin terminal
1	NC (OE)
2	GND
3	OUT
4	V_{DD}

( ) shows P type

■View of recommended soldering pattern (Unit : mm)



■Features

- High density mounting type SMD
- Designed for universal purpose with heat-resisting cylindrical type AT cut quartz crystal and allowing almost the same temperature soldering as SMD IC
- Possible with 386 CPU
- Cylindrical type AT cut quartz crystal built-in, thus assuring high reliability
- Provided with output enable function
- Use of C-MOS IC enables reduction of current consumption

Item		Symbol	SG-615PH/615YH	
			Specification	Remark
Output frequency range		fo	26.0001MHz to 66.6667MHz	
Power source voltage	Max.supply voltage	V_{DD}-GND	−0.3V to +7.0V	
	Operating voltage	V_{DD}	5.0V ±0.5V ※2	
Temperature range	Storage temperature	T_{STG}	−55°C to +125°C	Stored without tape & Reel
	Operating temperature	T_{OPR}	−10°C to +70°C (−40°C to +85°C)	−40°C to + 85°C : custom order
Soldering condition (lead part)		T_{SOL}	Under 260°C within 10sec.×2 times or under 230°C within 3 min.	
Frequency stability		Δf/fo	(B : ±50ppm) C : ±100ppm	−10°C to +70°C
Current consumption		Iop	35mA MAX.	No load condition. Up to 45MHz : 21mA MAX.
Duty		Tw/T	40% to 60%	
Output voltage		V_{OH}	V_{DD}−0.4V MIN.	I_{OH} = −4mA
		V_{OL}	0.4V MAX.	I_{OL} = 4mA
Output load condition(Fan out)	TTL	N		
	C-MOS	CL	50pF MAX.	
Output enable/standby input voltage		V_{IH}	2.0V MIN.	
		V_{IL}	0.8V MAX.	
Output disable current		I_{OE}	20mA MAX.	OE terminal=GND
Output rise time		t_{TLH}	7nsec. MAX. ※1	Refer to output waveform chart (page 9)
Output fall time		t_{THL}	7nsec. MAX. ※2	Over 45MHz : 5nS.
Oscillation start time		t_{OSC}	10msec. MAX	More than for 1mS. Until V_{DD} = 0V→4.5V. Time at 4.5V to be 0sec.
Aging		fa	±5ppm/year MAX.	Ta=25°C, V_{DD}=5V, first year
Shock resistance		S.R.	±20ppm MAX.	3-times of drop test on a hard board from 75cm height or excitation test with 3000G×0.3mS×1/2sine wave in 3-directions

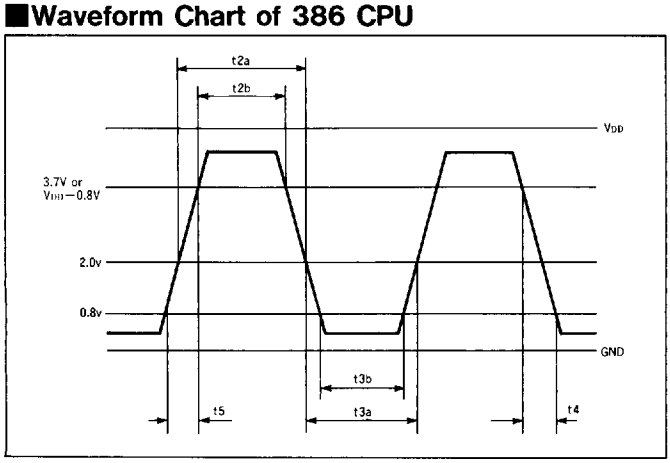
※1 It is possible depending on condition, reference data (page 22).

※2 AC characteristics of 386 cpu.

(V_{DD}=5V ±0.25V, Load : CL≦50pF, Ta=−10 to +70°C, Refer to output waveform chart of 386 CPU).

Output frequency		26.001MHz to 36.000MHz		40.000MHz		45.000MHz to 50.000MHz		50.001MHz to 66.667MHz		Unit	Remarks
Item	Symbol	Mim.	Max.	Max.	Min.	Mim.	Max.	Min.	Max.		
CLK high time	t2a	9		8		7		6.25		ns	2V level
CLK high time	t2b	5		5		4		4.5		ns	Under 45MHz : V_{DD} −0.8V level Over 45MHz : 3.7V level
CLK low time	t3a	9		8		7		6.25		ns	2V level
CLK low time	t3b	7		6		5		4.5		ns	2v level
CLK fall time	t4		8		8		7		4	ns	Under 45MHz : V_{DD} −0.8V to 0.8V Over 45MHz : 3.7V to 0.8V
CLK rise time	t5		9		9		7		4	ns	Under 45MHz : 0.8V to V_{DD} −0.8V Over 45MHz : 0.8V to 3.7V

■Waveform Chart of 386 CPU



■Waveform Chart of SG-615PTJ