FULL-SIZE DIP HIGH-FREQUENCY CRYSTAL OSCILLATOR

SG-51 series

- Pin compatible with full-size metal can.

HALF-SIZE DIP HIGH-FREQUENCY CRYSTAL OSCILLATOR

SG-531 series

- Pin compatible with half-size metal can.

Common

- Cylindrical AT-cut crystal unit builtin, thus assuring high reliability.
- Use of C-MOS IC enables reduction of current consumption.

Specifications (characteristics)

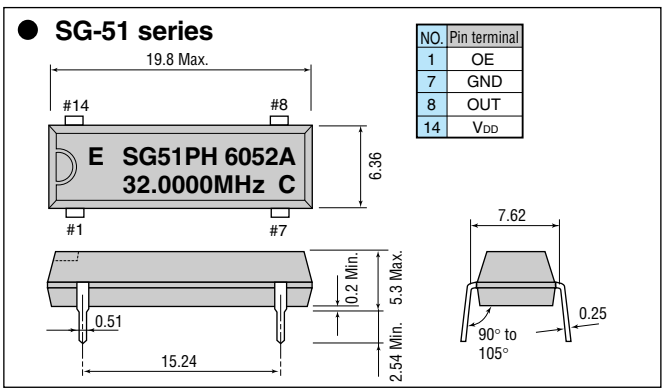
Item		Symbol	SG-51P/531P	SG-51PTJ/531PTJ	SG-51PH/531PH	Remarks
			Specifications			
Output frequency range		f_0	1.0250 MHz to 26.0000 MHz	26.0001 MHz to 66.6667 MHz		
Power source voltage	Max. supply voltage	V_{DD}-GND		-0.3 V to +7.0 V	-0.5 V to +7.0 V	
	Operating voltage	V_{DD}		5.0 V±0.5 V		
Temperature range	Storage temperature	T_{STG}		-55 °C to +125 °C		
	Operating temperature	T_{OPR}	-20 °C to +70 °C (-40 °C to +85 °C)			Please contact us on availability of -40 °C to +85 °C
Soldering condition (lead part)		T_{SOL}	Under +260 °C within 10 s			Don't heat the package at more than +150 °C
Frequency stability		$\Delta f/f_0$		B: ± 50 x 10^{-6} C: ±100 x 10^{-6}		B type is possible up to 55.0 MHz
Current consumption		Iop	23 mA Max.	35 mA Max.		No load condition
Duty	C-MOS level	t_w/t	40 % to 60 %	—	40 % to 60 %	1/2 V_{DD} level
	TTL level		45 % to 55 %		—	1.4 V level
Output voltage		V_{OH}	V_{DD}-0.4 V Min.	2.4 V Min.	V_{DD} -0.4 V Min.	
		(I_{OH})	-400 µA		-4 mA	
		V_{OL}		0.4 V Max.		
		(I_{OL})	16 mA	8 mA	4 mA	
Output load condition (fan out)	C-MOS	C_L	50 pF Max.	—	50 pF Max.	
	TTL	N	10 TTL Max.	5 TTL Max.	—	C_L≤15 pF
Output enable/disable input voltage		V_{IH}	2.0 V Min.	3.5 V Min.	2.0 V Min.	I_{IH}=1 µA Max. (OE=V_{DD})
		V_{IL}	0.8 V Max.	1.5 V Max.	0.8 V Max.	I_{IL}= -100 µA Min. (OE=GND), PTJ: -500 µA
Output disable current		I_{OE}	12 mA Max.	28 mA Max.	20 mA Max.	OE=GND
Output rise time	C-MOS level	t_{TLH}	8 ns Max.	—	7 ns Max.	C-MOS load: 20 %→80 % V_{DD}
	TTL level			5 ns Max.	—	TTL load: 0.4 V→2.4 V
Output fall time	C-MOS level	t_{THL}	8 ns Max.	—	7 ns Max.	C-MOS load: 80 %→20 % V_{DD}
	TTL level			5 ns Max.	—	TTL load: 2.4 V→0.4 V
Oscillation start up time		t_{OSC}	4 ms Max.	10 ms Max.		More than for 1 ms until V_{DD} =0 V→4.5 V Time at 4.5 V to be 0 s
Aging		fa		±5 x 10^{-6}/year Max.		Ta=+25 °C, V_{DD} =5 V,first year
Shock resistance		S.R.		±20 x 10^{-6} Max.		Three drops on a hard board from 750 mm or excitation test with 29400 m/s² x 0.3 ms x 1/2 sine 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.
• External by-pass capacitor is recommended.

External dimensions

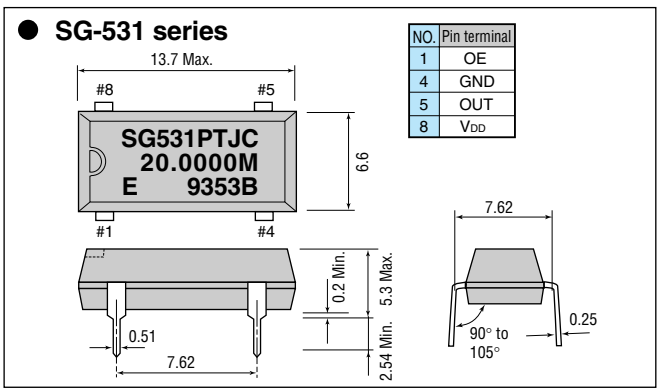
(Unit: mm)

SG-51 series

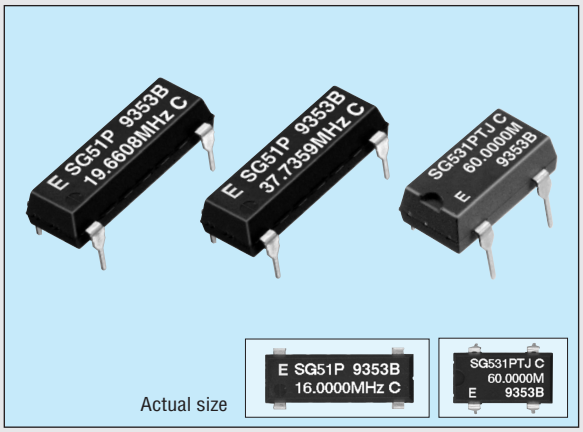


NO.	Pin terminal
1	OE
7	GND
8	OUT
14	V_{DD}

SG-531 series



NO.	Pin terminal
1	OE
4	GND
5	OUT
8	V_{DD}



Specifications (characteristics)

Item		Symbol	SG-531PTW/STW	SG-531PHW/SHW	SG-531PCW/SCW	Remarks
			Specifications			
Output frequency range		f_0	55.0001 MHz to 135.0000 MHz		26.0001 MHz to 135.0000 MHz	
Power source voltage	Max. supply voltage	V_{DD}-GND	-0.5 V to +7.0 V			
	Operating voltage	V_{DD}	5.0 V±0.5 V		3.3 V±0.3 V	
Temperature range	Storage temperature	T_{STG}	-55 °C to +125 °C			
	Operating temperature	T_{OPR}	-20 °C to +70 °C		-40 °C to +85 °C	
Soldering condition (lead part)		T_{SOL}	Under +260 °C within 10 s			Don't heat the package at more than +150 °C
Frequency stability		$\Delta f/f_0$	B: ±50 x 10^{-6} C: ±100 x 10^{-6}			-20 °C to +70 °C
			M: ±100 x 10^{-6}			-40 °C to +85 °C
Current consumption		Iop	45 mA Max.		28 mA Max.	No load condition
Output disable current		I_{OE}	30 mA Max.		16 mA Max.	OE=GND(P*W)
Output disable current		I_{ST}	50 µA Max.			ST=GND(S*W)
Duty	C-MOS level	tw/t	—	40 % to 60 %		C-MOS load: 1/2V_{DD}
	TTL level		40 % to 60 %		—	TTL load: 1.4 V
Output voltage		V_{OH}	V_{DD}-0.4 V Min.			I_{OH}= -16 mA (*TW/HW)/-8 mA(*CW)
		V_{OL}	0.4 V Max.			I_{OL}= -16 mA (*TW/HW)/8 mA(*CW)
Output load condition (fan out)		C_L	15 pF Max.			
Output enable disable input voltage		V_{IH}	2.0 V Min.		0.7 V_{DD} Min.	OE,ST
		V_{IL}	0.8 V Max.		0.2 V_{DD} Min.	OE,ST
Output rise time	C-MOS level	t_{TLH}	—	4 ns Max.	4 ns Max.	C-MOS load: 20 %→80 % V_{DD}
	TTL level		4 ns Max.	—	—	TTL load: 0.4 V→2.4 V
Output fall time	C-MOS level	t_{THL}	—	4 ns Max.	4 ns Max.	C-MOS load: 80 %→20 % V_{DD}
	TTL level		4 ns Max.	—	—	TTL load: 2.4 V→0.4 V
Oscillation start up time		t_{OSC}		10 ms Max.		Time at 4.5 V to be 0 s
Aging		fa		±5 x 10^{-6}/year Max.		Ta=+25 °C, V_{DD} =5 V
Shock resistance		S.R.		±20 x 10^{-6} Max.		Three drops on a hard board from 750 mm or excitation test with 29400 m/s² x 0.3 ms x 1/2 sine wave in 3 directions

Operating condition and Frequency band

Operating condition		1 MHz	50 MHz	100 MHz	150 MHz
5 V±0.5 V	Frequency stability:B (-20 to +70 °C)	1.025	26	55	135
		SG-51/531P	SG-51/531PTJ/PH	SG-531PTW/STW/PHW/SHW	
	Frequency stability:C (-20 to +70 °C)	1.025	26	66.6667	135
		SG-51/531P	SG-51/531PTJ/PH	SG-531PTW/STW/PHW/SHW	
3.3 V±0.3 V	Frequency stability:B (-20 to +70 °C)	26			135
		SG-531PCW/SCW			
	Frequency stability:C (-20 to +70 °C)	26			135
		SG-531PCW/SCW			
	Frequency stability:M (-40 to +85 °C)	26			135
		SG-531PCW/SCW			