

# 3CN Series 3.2 x 2.5 mm SMD Crystal Oscillator

3 : 3.2×2.5×0.95 mm | SMD3225-4P      CN : Low Phase Noise Crystal Oscillator

## Feature

- Ceramic surface mount with Metal Lid
- CMOS compatible logic levels
- Tri-state function available
- RMS Phase Jitter:0.3pSec max.
- RoHS Compliant / Pb Free

## Applications

- Wireless Devices
- Internet of Things (IoT) devices
- Fibre Channel
- Ethernet/Gigabit Ethernet
- Portable Electronics



## Electrical Specifications

Item	Symb.	Min.	Typ.	Max.	Unit	Notes
Frequency Range	Freq.	1.000		54.000	MHz	
Operating Temperature	T <sub>use</sub>	-20		+70	°C	
		-40		+85	°C	
StorageTemperature Range	T <sub>stg</sub>	-55		+125	°C	
Supply Voltage	V <sub>dd</sub>	1.8		3.3	V	
Output Load	L <sub>CMOS</sub>		15		pF	
Current Consumption	I <sub>cc</sub>			10	mA	1MHz ≤ Freq. < 40MHz
				20		40MHz ≤ Freq. ≤ 54MHz
Duty Cycle	SYM	45		55	%	50 % V <sub>dd</sub> level, L <sub>CMOS</sub> ≤ 15 pF
Rise / Fall Time	T <sub>R</sub> / T <sub>F</sub>			5	nS	10% V <sub>dd</sub> to 90% Level
Start-up Time	T <sub>str</sub>			5	mS	To 90% of Final Amplitude
High output voltage	V <sub>OH</sub>	0.9V <sub>dd</sub>			V	
Low output voltage	V <sub>OL</sub>			0.1V <sub>dd</sub>	V	
Enable Voltage High(Logic 1)	V <sub>IH</sub>	0.7V <sub>dd</sub>			V	Output will be disable if OE is Logic 0 Output will be enable if OE is Logic 1 or open
Enable Voltage Low(Logic 0)	V <sub>IL</sub>			0.3V <sub>dd</sub>	V	
Enable Time	T <sub>PLZ</sub>			150	uS	
RMS Phase Jitter	T <sub>RPJ</sub>			0.3	pSec	Integrated 12KHz to 20MHz
Phase Noise @27MHz 3.3V 10 Hz	T <sub>PN</sub>	-100			dBc/Hz	
100 Hz		-125			dBc/Hz	
1 KHz		-150			dBc/Hz	
10 KHz		-160			dBc/Hz	
Aging	f <sub>age</sub>			3	ppm	1st. Year at 25°C

## Frequency Stability & Operating Temperature Range

Temp. \ FT	±20ppm	±25ppm	±30ppm	±50ppm
-20°C to +70°C	△	★	★	★
-40°C to +85°C		△	★	★

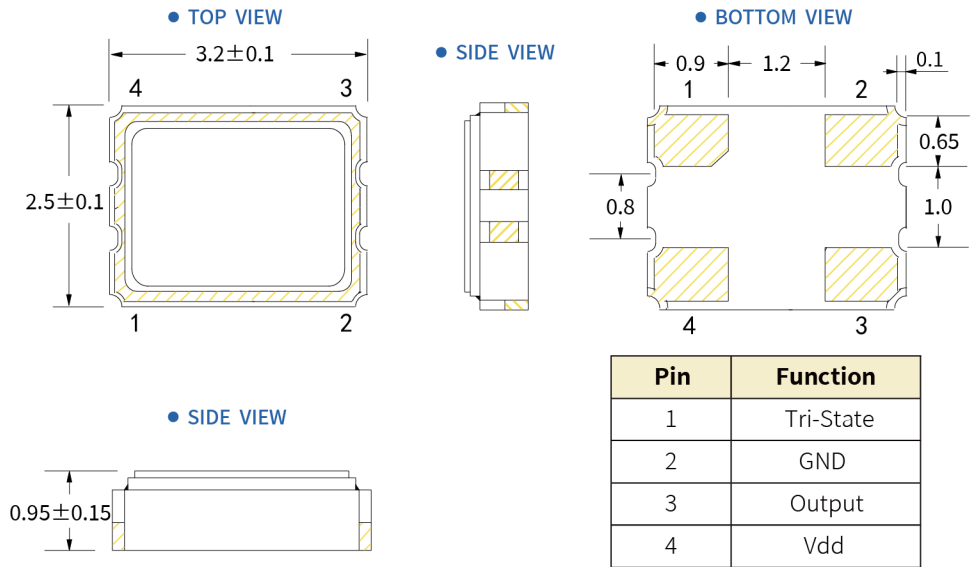
★: Available      △: Conditional

All condition: Include 25°C tolerance, operating temperature range , input voltage change, aging, load change.

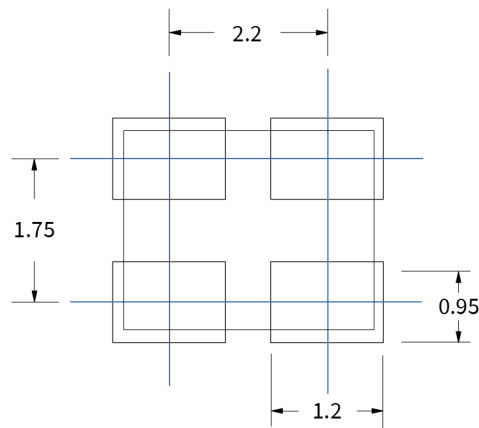
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## Dimensions (UNIT:mm)



## Solder pad layout (UNIT:mm)



## Options and Part Identification : Example SX3M11.2896B20F30TNF

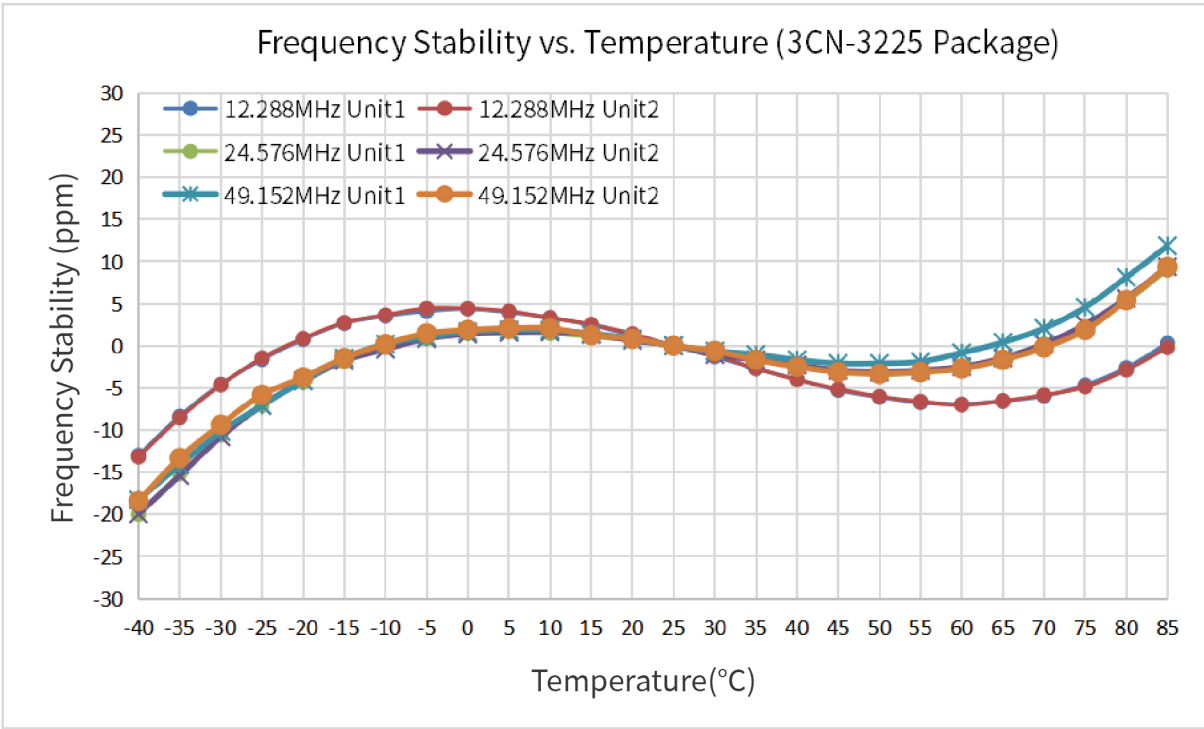
Company	Ceramic Package	Frequency Code [MHz]	Supply Voltage	Frequency Tolerance	Operating Temperature	Frequency Drift	Output	Current Consumption	Phase Noise
SX	3M	X.XXX	B	20	F	30	T	N	F
Code Company		Frequency		Code Frequency Tolerance		Code Frequency Drift		Code Current	
SX SCTF		11.2896 19.200 25.000 49.152		10 ±10ppm 20 ±20ppm		15 ±15ppm 20 ±20ppm 30 ±30ppm		N Standard	
			Code Voltage		Code Frequency Tolerance		Code Output		Code Phase Noise
	7M 7.0×5.0×1.3mm 5M 5.0×3.2×1.2mm 3M 3.2×2.5×0.95mm 2M 2.5×2.0×0.81mm 1M 2.0×1.6×0.75mm		D 1.8V H 2.5V B 3.3V		E -20°C ~ +70°C F -40°C ~ +85°C		T Squarewave		F -145dBc/Hz 1KHz offset G -150dBc/Hz 1KHz offset H -155dBc/Hz 1KHz offset

If you have other parameter requirements, you can contact **SCTF** at any time.

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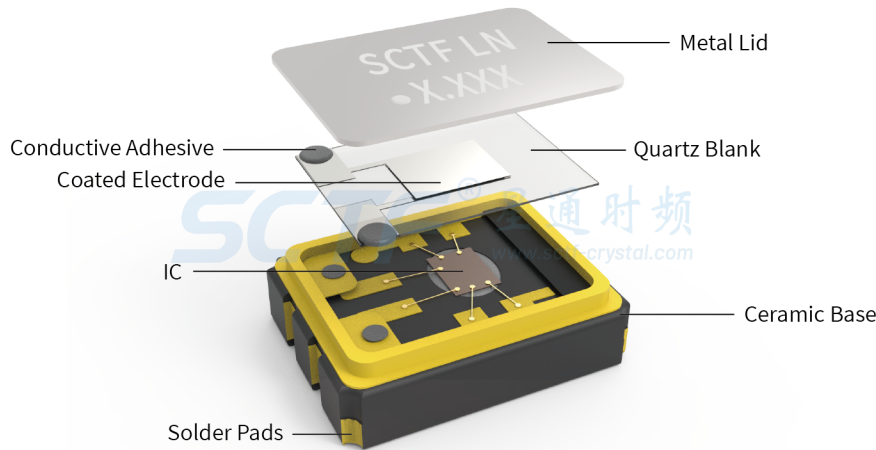
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## Frequency Temperature Characteristics

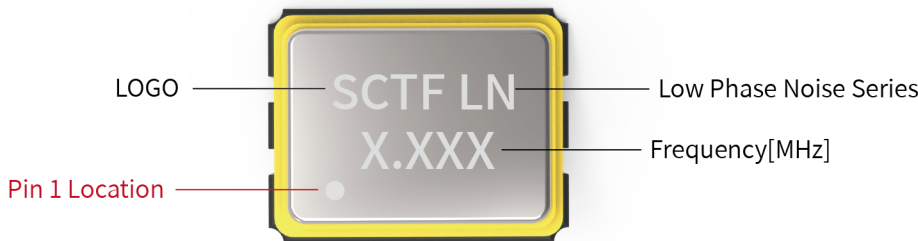


## Product Structure&Marking Information

### Product Structure



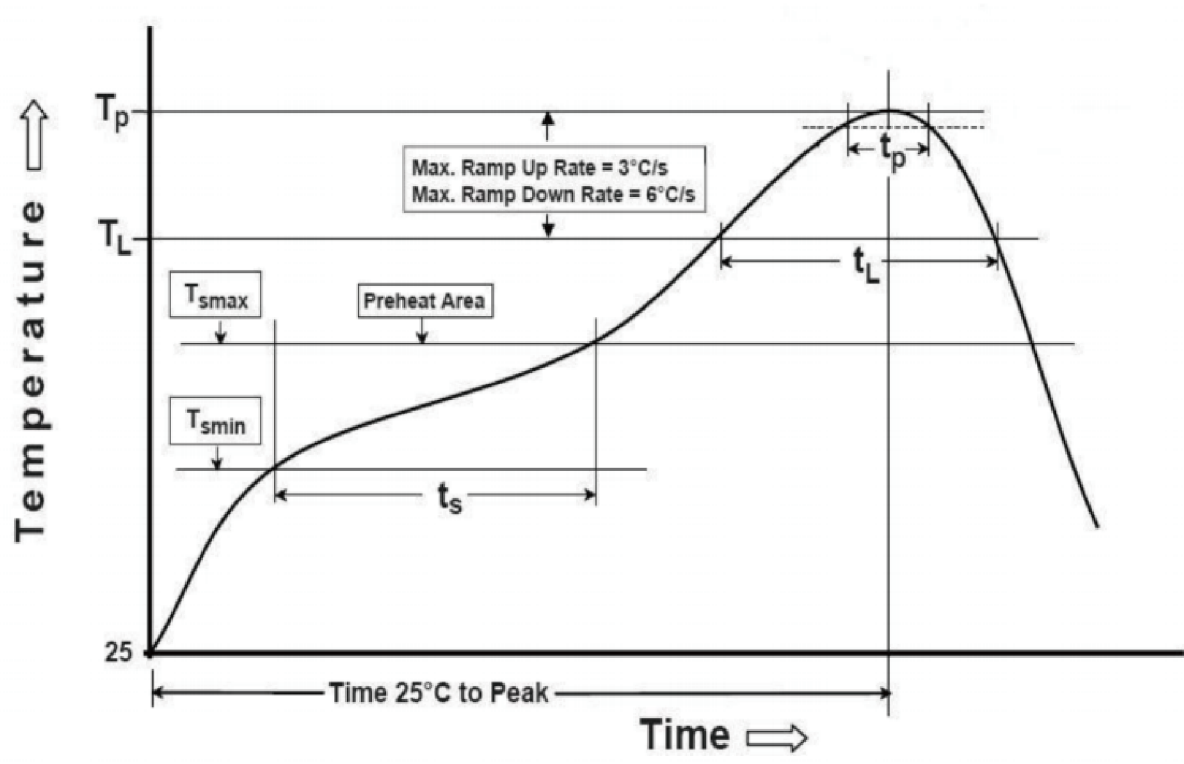
### Marking Information



# 3CN Series 3.2 x 2.5 mm SMD Crystal Oscillator

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## Suggested Reflow Profile



Profile Feature	Sn - Pb Eutectic Assembly	Preheat / Soak
Preheat / Soak <ul style="list-style-type: none"><li>● Temperature Min ( Ts min )</li><li>● Temperature Max ( Ts max )</li><li>● Time ( Ts min to Ts max )</li></ul>	100°C 150°C 60-120 seconds	150°C 200°C 60-120 seconds
Ramp - up rate ( TL to Tp )	3°C/ second max.	3°C/ second max.
Time maintained above <ul style="list-style-type: none"><li>● Liquidous temperature ( TL )</li><li>● Time ( tL ) maintained above TL</li></ul>	183°C 60-150 seconds	217°C 60-150 seconds
Peak package body temperature ( Tp )	235°C	260°C
Time within 5° C of the specified classification temperature ( Tp )	20 seconds	30 seconds
Ramp - down rate ( Tp to TL )	6°C/ second max.	6°C/ second max.
Time 25° C to peak temperature	6 minutes max.	8 minutes max.
Suggest reflow times	2 Times max.	

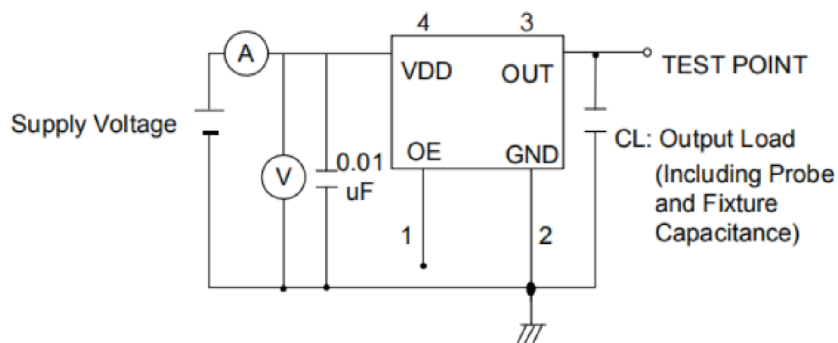


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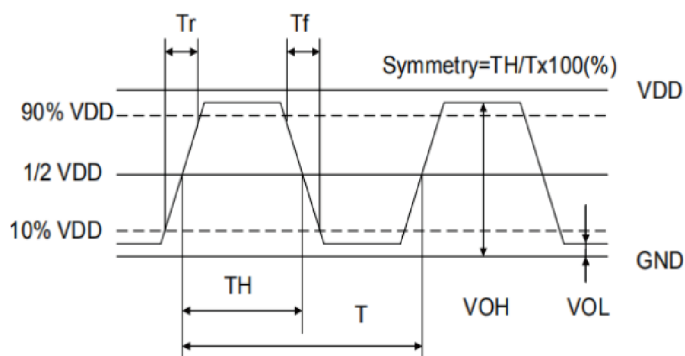
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## Testing Circuit



※ Notes: PIN 1 connected to Vdd or floating, the product is working properly; connected to GND, stops working.

## Waveform Conditions



Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.

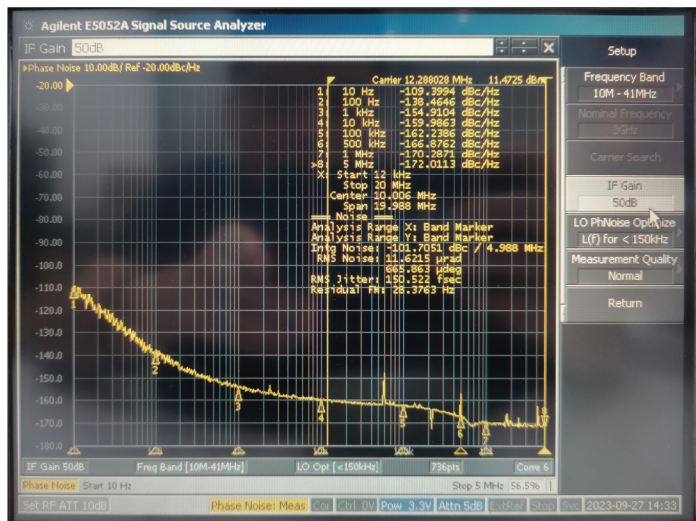
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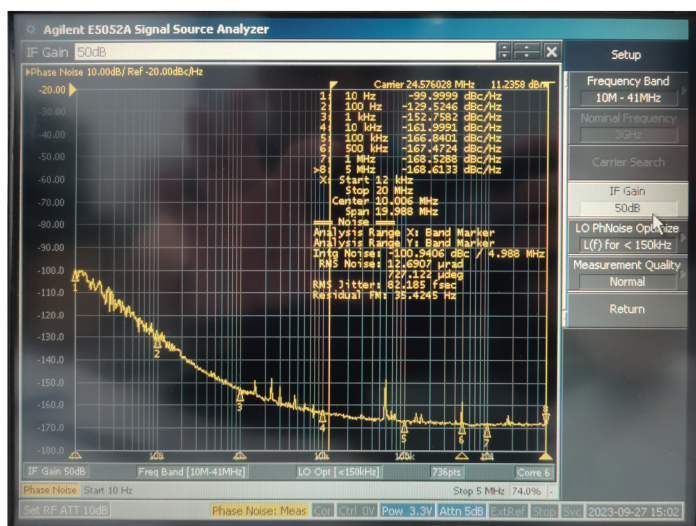
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## Representative Phase Noise Plots @ +25°C

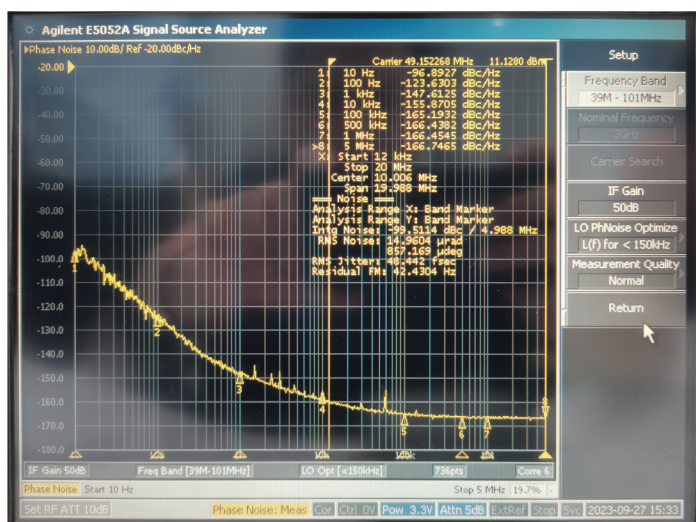
- F=12.288 MHz Vdd=3.3V CMOS Output RMS Phase Jitter=150.522 fsec



- F=24.576 MHz Vdd=3.3V CMOS Output RMS Phase Jitter=82.185 fsec



- F=49.152 MHz Vdd=3.3V CMOS Output RMS Phase Jitter=48.442 fsec



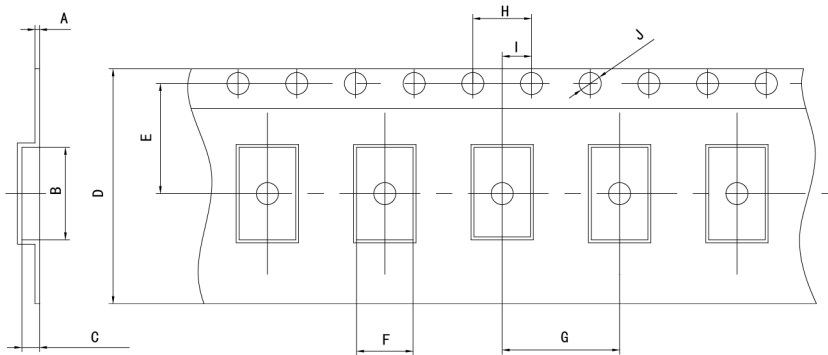
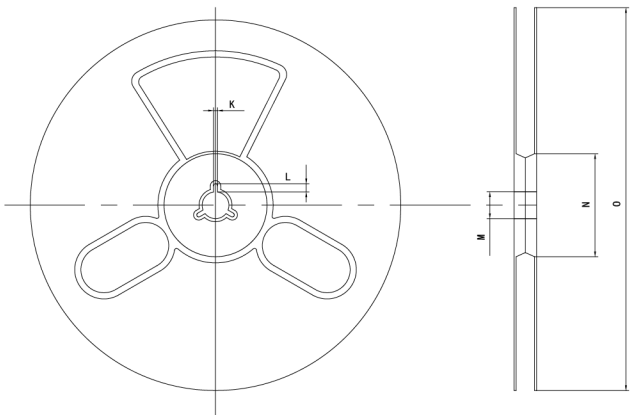
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# 3CN Series 3.2 x 2.5 mm SMD Crystal Oscillator

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## Packaging Information

T=Tape and reel (3,000pcs/reel)



Pocket Tape Dimensions(mm)

Series	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
3CN	0.25±0.05	3.5±0.1	1.4±0.1	8.0±0.1	3.5±0.1	2.70±0.1	4.0±0.1	4.0±0.1	2.0±0.1	φ1.5±0.1	2.0±0.2	4.0±1.0	φ13±0.5	φ60±1	φ180±1

## Common Frequencies – MHz

3CN Series				
1.000	1.024	1.8432	2.000	2.048
3.6864	4.000	4.096	4.9152	6.144
7.3728	8.0000	8.192	10.000	11.0592
11.2896	12.000	12.288	13.000	14.31818
14.7456	16.000	16.384	18.432	20.000
22.5792	24.000	24.576	25.000	26.000
27.000	30.000	32.000	32.768	33.000
33.333	33.3333	40.000	45.1584	48.000
49.152	50.000			