Crystal Oscillator

YSO212PLL

General Description（概述）

YSO212PLL is a programmable, low-jitter differential crystal oscillator. Output frequency is factory programmed as per customer requirements between **200 kHz to 1.5 GHz**. YSO212PLL is a low Noise PLL with Integrated XTAL which provides clocks with Jitter of **69 fs**.

With on chip NVM and factory programming, we can service customer

Features（产品特性）

- h any frequency from 200 kHz to 1.5 GHz
- fs@156.25MHz Typ Irms 12 kHz – 20 MHz
- Irms 12 kHz – 20 MHz with 4 MHz HPF
- Fractional N fully integrated PLL
- 3.3 V, 2.5 V and 1.8 V VDD supply operation
- Programmable performance for jitter
- LVPECL, HCSL, LP-LVDS, LVDS, Rapid-LVDS, AC-Coupled CML output options available
- differential output pads.
- HCSL, LP-LVDS Output Power type frequency support from 200 kHz to 500MHz
- ±50 ppm stability (-40°C to 85°C)
- *1.6mm
- Package Options:Available in 6pin Plastic Package : 3.2*2.5mm,2.5*2.0mm,2.0*
- Available wit
- Low Jitter: 69
- 26fs Typ

Applications（应用领域）

- 100G/200G/400G OTN, coherent optics
- 10G/40G/100G optical ethernet
- 3G-SDI/12G-SDI/24G-SDI broadcast video
- Datacenter
- Test and measurement
- Clock and data recovery
- FPGA/ASIC clocking

List

1 Specifications（规格参数）

Table-1 Electrical Characteristic

Item/Type	Min	Typ	Max	Remarks
Output Frequency Range 标准频率范围				200K ~ 1.5GHz
Supply Voltage 电源电压	1.89V	1.71V	1.8V	
	2.625V	2.375V	2.5V	
	3.465V	3.135V	3.3V	
Current Consumption 消耗电流	LVPECL		74mA	
	LVDS		53mA	
	Fout=156.25M			
	66mA		HCSL	
	50mA		HCSL-LP	
OE terminal	VIH=70% VDD Min VIL=30%VDD Max		Input Voltage 输入电压	
$F_{CLK} \geq 10$MHz	1us + 3clock Cycles-us	2-us + 3clock Cycles-us	Output Disable Time 输出禁用时间	
	1us + 3clock Cycles-us	2 us + 3clock Cycles-us	Output Enable Time 输出启用时间	
	-40~+85°C or specify		Operating Temperature Range 工作温度	
Total stability includes frequency tolerance(initial frequency tolerance, temperature stability, load change, voltage change, 10 year aging at 25°C)			Total Stability 总频率稳定度	
Start-up time 启动时间		10mS		

Table-2 Absolute Maximum Ratings

Item/Type	Min	Typ	Max	Remarks
Core Supply Voltage 核心工作电压	-0.5V		3.63V	
Voltage range（All inputs） 输入引脚电压范围	-0.5V		3.63V	Relative to GND
Maximum Junction Temperature in Operation 最大工作温度			+125℃	
Storage Temperature Range 储存温度	-55℃		+150℃	
Programming Voltage 编程电压	2.375V	2.5V	2.625V	
Latch Up 闩锁效应				100 mA Max
ESD 静电防护				Human body model：2000V Max
				Charged device model：500V Max

Notes:
1. Exceeding maximum ratings may shorten the useful life of the device.
2. Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or at any other conditions beyond those indicated under the DC Electrical Characteristics is not implied. Exposure to Absolute Maximum Rated conditions for extended periods may affect device reliability.

Table 3 Output Clock Specifications

Parameter	Symbol	Min	Typ	Max	Units
LVDS Outputs					
Common Mode Output Voltage	VOS	1.125		1.375	V
Voltage	Vsem				
0.85				0.75	
0.2				1.6	
	Fout	1500			MHz
时钟输出频率					
Output Rise/Fall Time	Trf	350			ps
上升下降时间					
400					
@156.25M					
Output differential peak	VP	250		500	mV
输出差分峰值					
≤700M		250		500	
>700M&≤1500M					
LVDS-Boost Outputs					
Fout				1500	MHz
Trf				350	ps
Clock Output Frequency					
时钟输出频率					
Output Rise/Fall Time					
上升下降时间					
@156.25M		800			
Output differential peak	VP	700M		600	950
输出差分峰值					mV
		>700M&≤1500M			
LVPECL Outputs					
Output High Voltage	VOH	VDD-1.165		VDD-0.8	V
输出高电压					
Output Low Voltage	VOL	VDD-2		VDD-1.65	
输出低电压					
Clock Output Frequency	Fout	0.2		1500	MHz
时钟输出频率					
Output Rise/Fall Time	Trf			350	ps
上升下降时间					
@156.25M			78		
Output differential peak	VP	≤700M		500	850
输出差分峰值		>700M&≤1500M		400	800

HCSL Outputs

Output High Voltage	VOH	0.65	0.83	1	V
输出高电压					
Output Low Voltage	VOL	-0.1	0	0.1	
输出低电压					
Clock Output Frequency	Fout	0.2		1500	MHz
时钟输出频率					
Output Rise/Fall Time	Trf			350	ps
上升下降时间					
Far End Termination	@156.25M			800	mV
Output differential peak	VP				
输出差分峰值	≤700M	400		1050	

Table-3 (Continued)

HCSL-LP Outputs						
Output High Voltage 输出高电压		VOH	0.7		0.8	
Output Low Voltage 输出低电压	VDD=1.8V/2.5V/3.3V	VOL	-0.3		0	0.1
Clock Output Frequency 时钟输出频率		Fout	0.2			50
Output Rise/Fall Time 上升下降时间		TR/TF				350
Output differential peak 输出差分峰值	@156.25M	VP		720		
	≤500M		500			900

1.1 Phase Jitter（相噪抖动）

Table-4 Output RMS-Jitter and Phase Noise

Remarks	Item/Type	Value
	RMS Jitter[12KHz~20MHz]	69fs rms typ
	RMS Jitter for 12KHz~20MHz Integration Bandwidth with 4MHz High Pass Filter	261fs rms typ
@156.25MHz	Phase Noise	-135dBc/Hz@1kHz -146dBc/Hz@100kHz -150dBc/Hz@1MHz -161dBc/Hz@10MHz

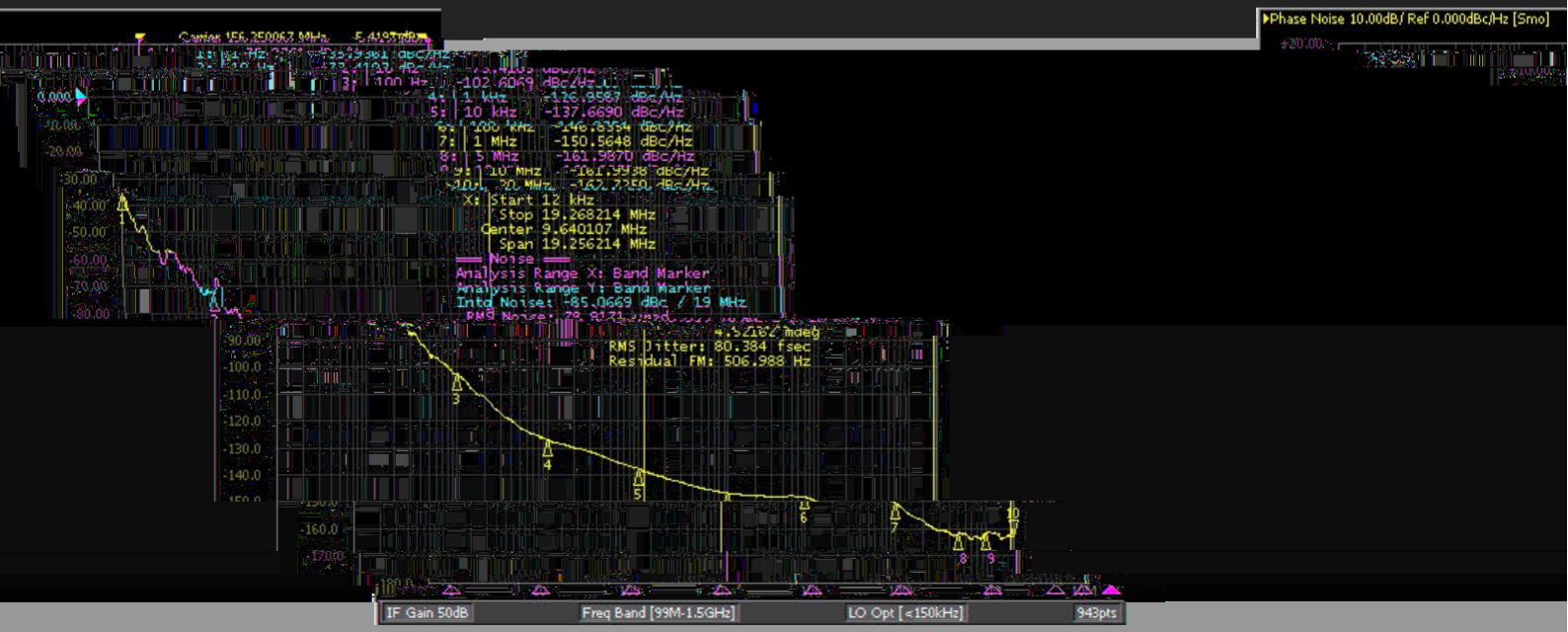


Figure 1 Representative Phase Noise Measurement @156.25M

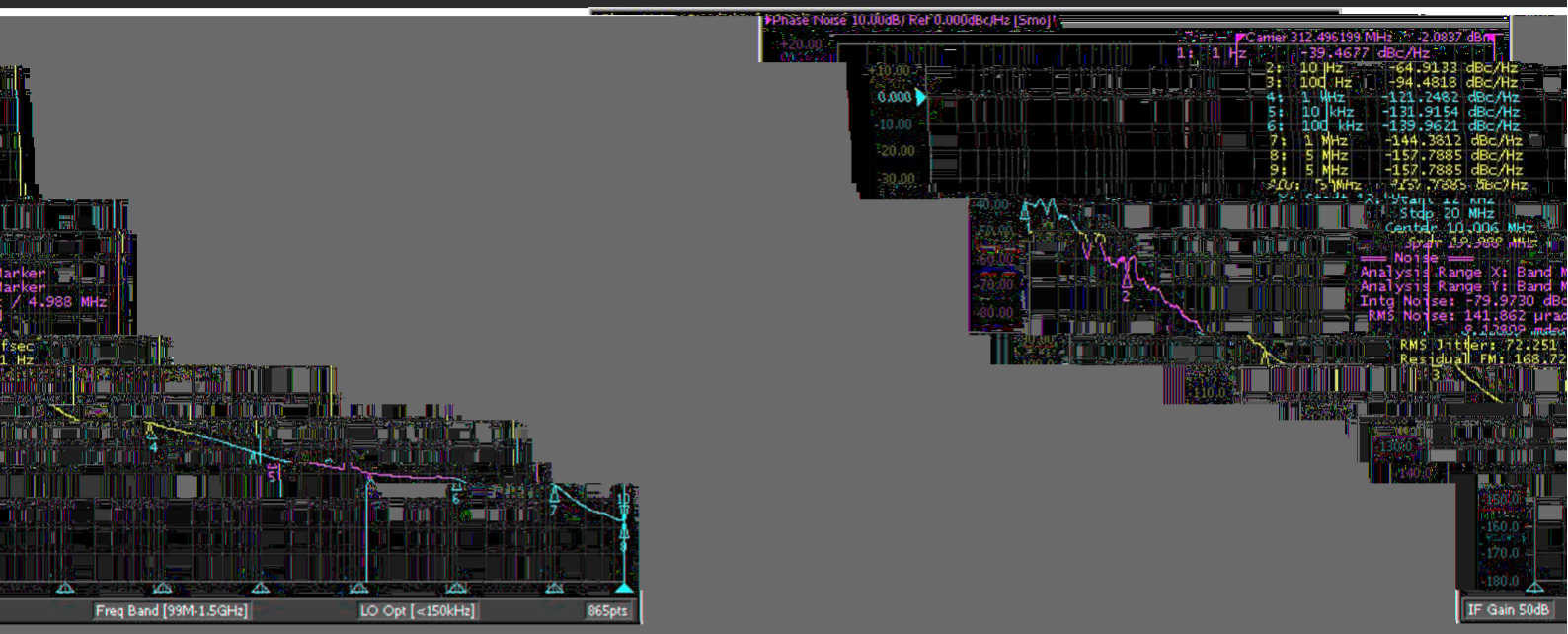
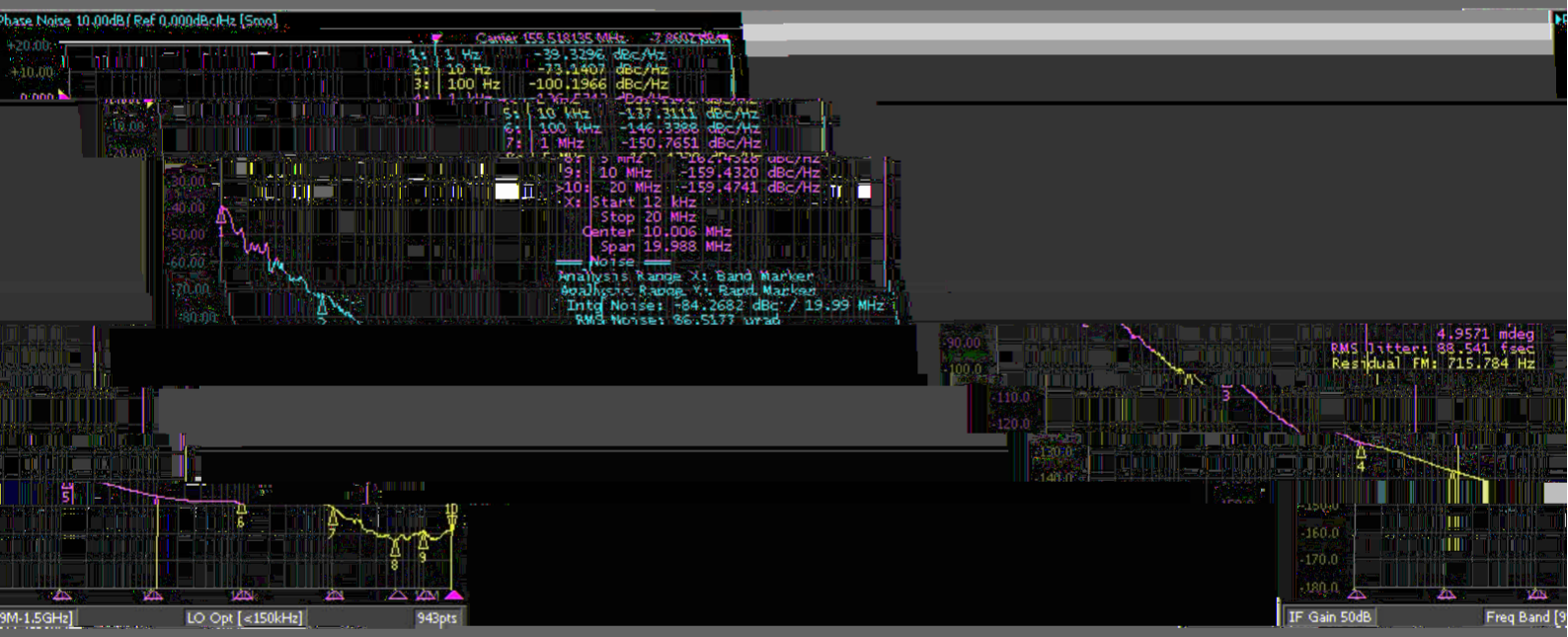


Figure 2 Representative Phase Noise Measurement@312.5M



oise Measurement@155.52M

Figure 3Representative Phase N

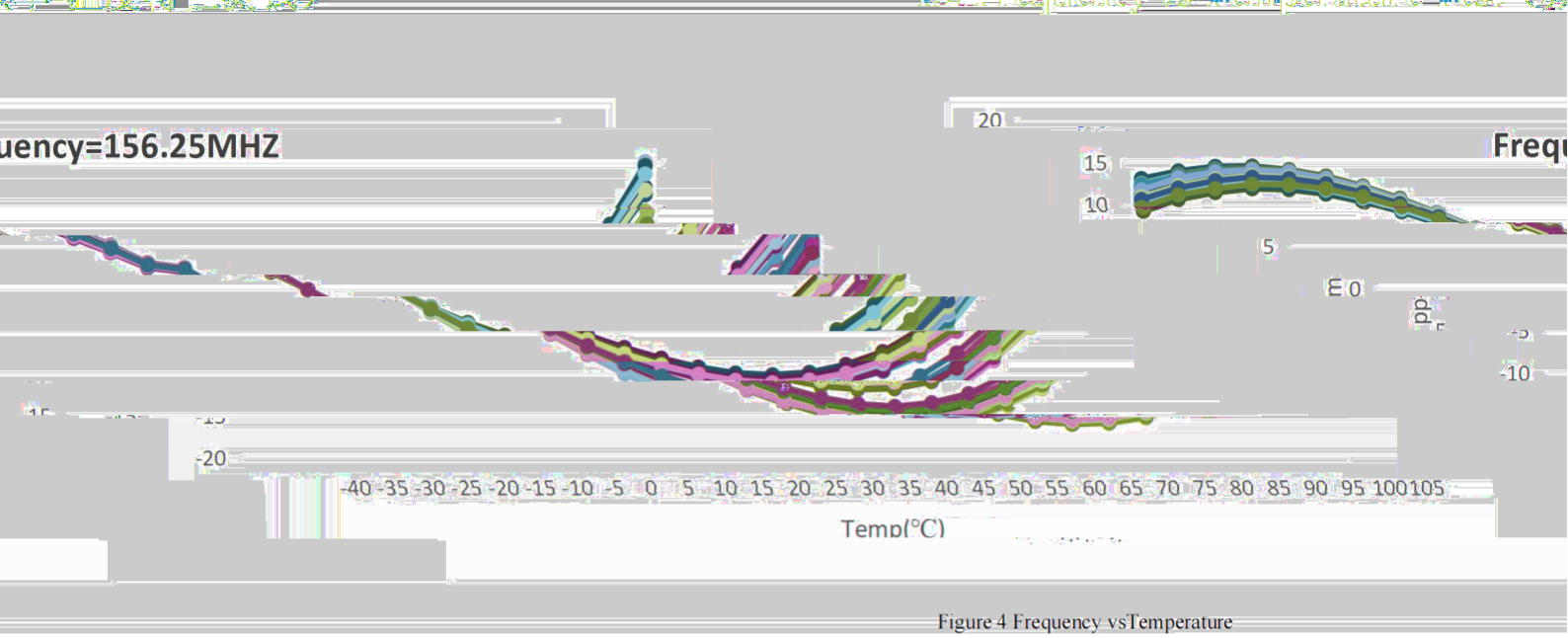
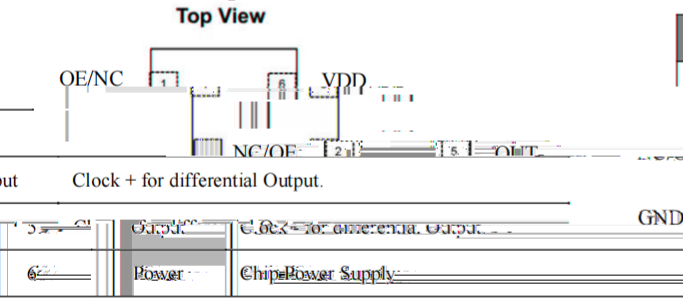


Figure 4 Frequency vsTemperature

2 Pin Dimension（脚位尺寸）

Table 5 Pin Description

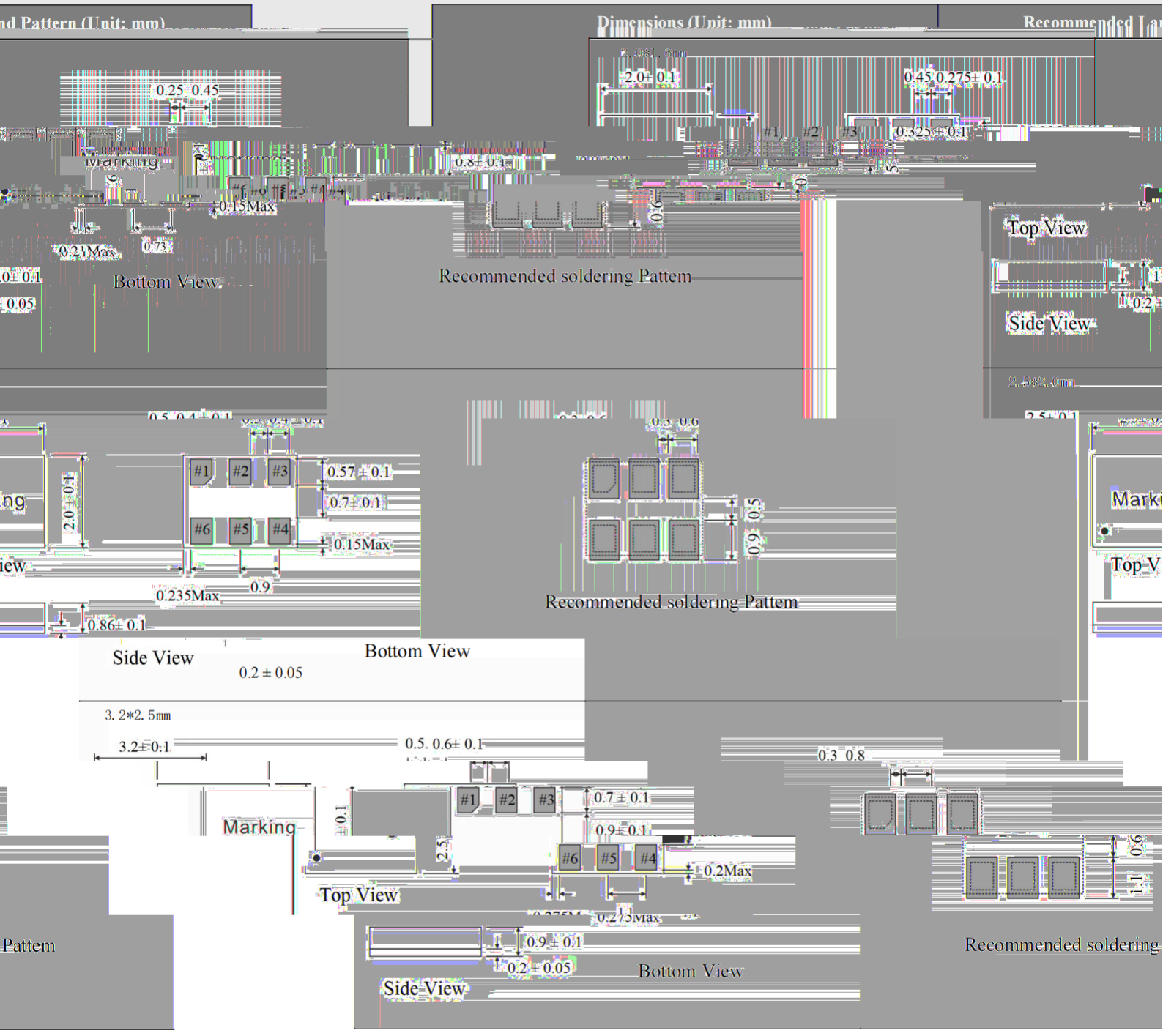


Pin Name	Pin No.	I/O Type	Description
OE/NC	1	Input	Selectable by Ordering Information OE = Output Enable ; NC = No connect
GND	3	GND	GND
OUT+	4	Output	Clock + for differential Output.
OUT-	5	Output	Clock - for differential Output.
VDD	6	Power	Chip Power Supply

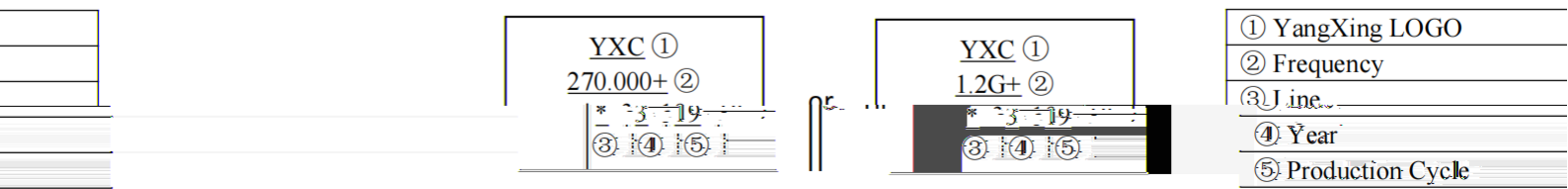
Figure 5 Pin Assignments

Note: Pin 1 can be configured as Active High or Low based on the customer requirement.

3 Dimensions and Recommended Land Pattern (外型尺寸及推荐焊盘)

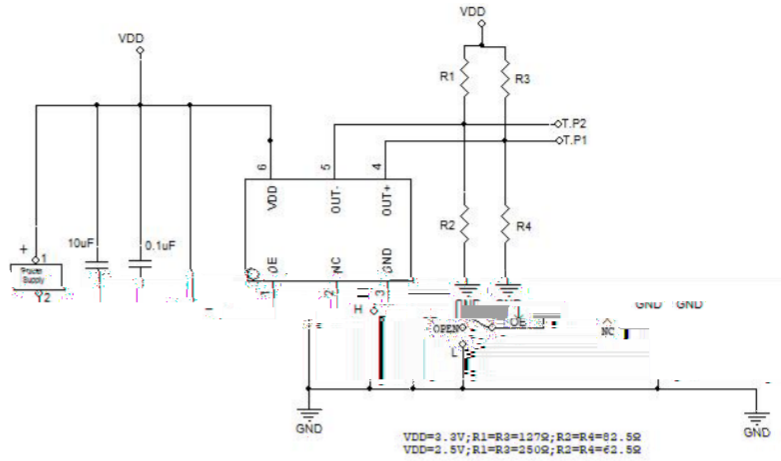


4 Marking information (丝印说明)

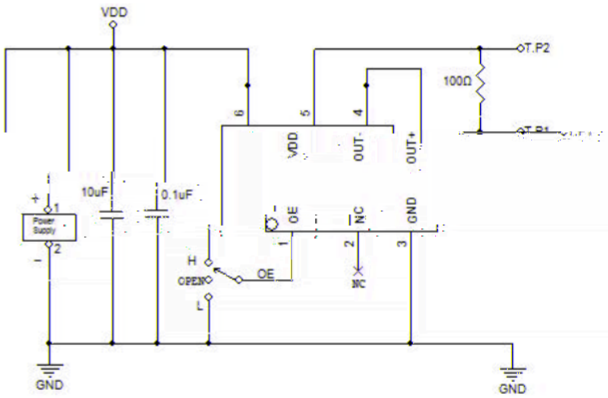


5 Test Circuit（测试电路）

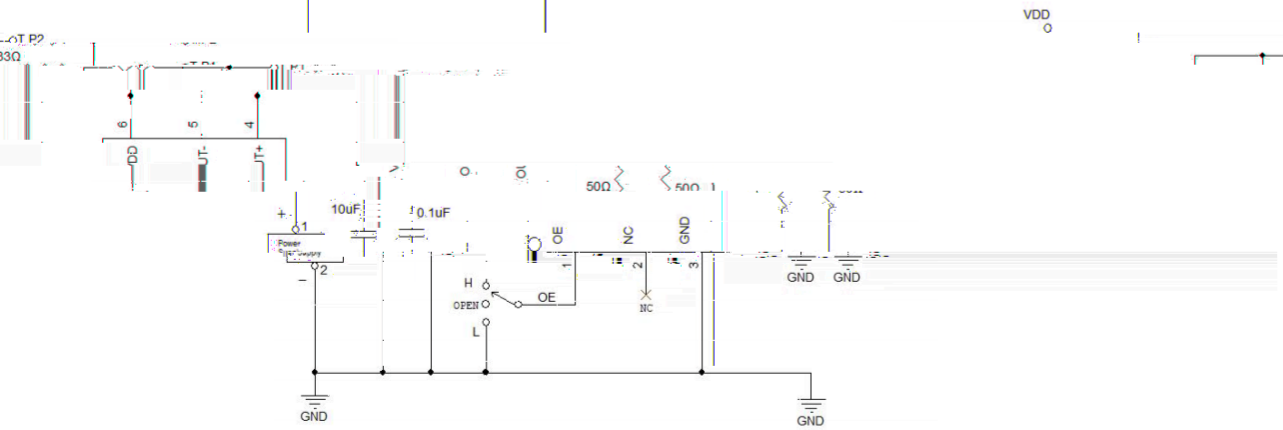
LVPECL

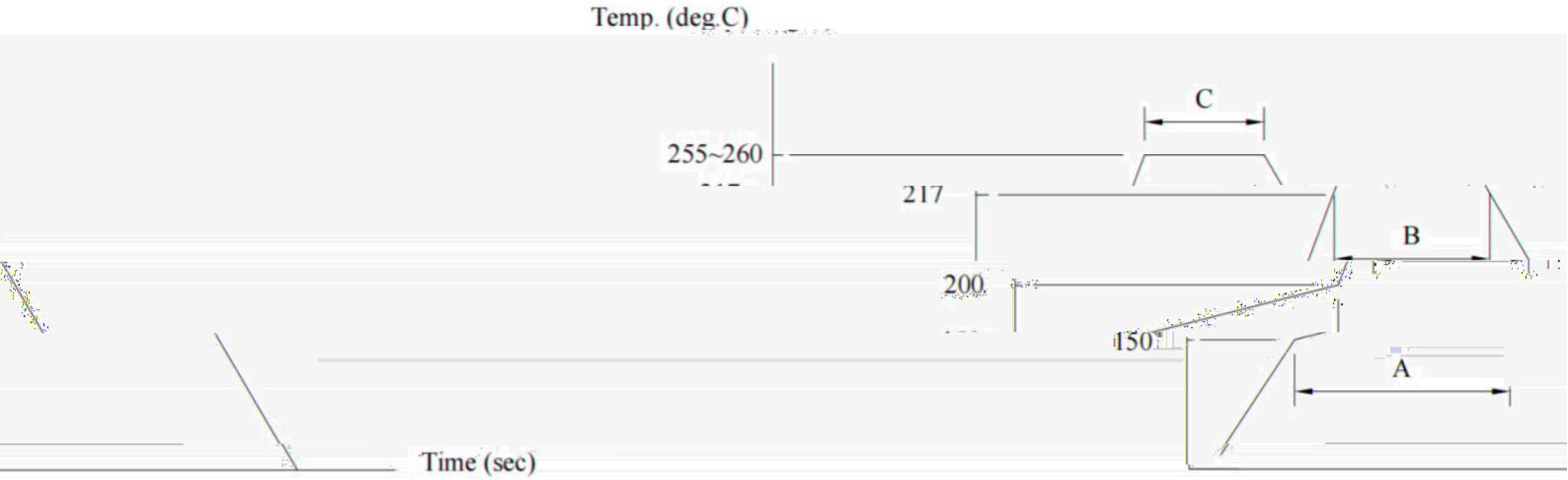


LVDS/LVDS-Boost



HCSL/HCSL-LP



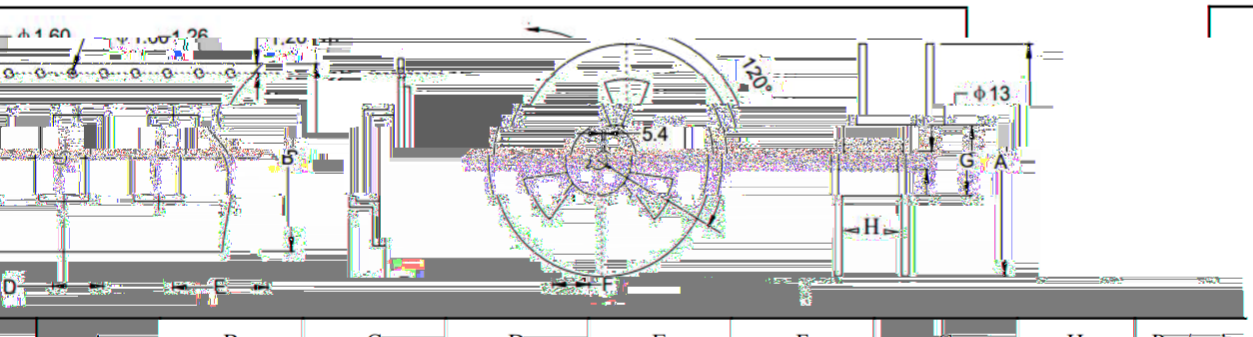


6. Reflow Profile

Figure 6

50~200°C, 60~120sec.
ea (A)→Preheating area : 1
(B)→Soaking ar
erature : 255~260°C, 30sec. Max.
(C)→Peak temp
17→260°C) : 3°C/sec. Max.
Ramp-up rate (2
(260→217°C) : 6°C/sec. Max.
Ramp-down rate
0°C : 480sec. Max.
Time 25°C→26

7. Taping Specification (Unit: mm)



Size	A	B	C	D	E	F	G	H	Pcs/reel
SMD-2016	180±2.0	8.0±0.3	2.30±0.1	1.90±0.1	4.0±0.1	0.65±0.1	61.0±1.0	9.5±0.5	3000
SMD-2520	180±2.0	8.0±0.3	2.70±0.1	2.25±0.1	4.0±0.1	1.45±0.1	61.0±1.0	9.5±0.5	3000
SMD-3225	180±2.0	8.0±0.3	3.40±0.1	2.70±0.1	4.0±0.1	1.40±0.1	61.0±1.0	9.5±0.5	3000

8 Notice（注意）

包装 PACKING

包装方式应符合运输和装卸要求，特殊包装须经双方认可。

Packing must prevent damage during transportation and handing. Specific method will be settled by mutual Agreeme

对环境影响 INFLUENCE TO ENVIRONMENT

本产品在生产过程中不使用 ODS I 类对臭氧层有破坏

This product doesn't use the class I ODS at any of production process.

生产厂家 MANUFACTURER

公司名称 深圳市扬兴科技有限公司

Shenzhen YangXing Technology Co., Ltd

其它 OTHERS

如果你对本公司产品规格书有疑问或

We guarantee that quartz crystal unit satisfies this specification. If you need the data, we will provide it.

3.如需应用于超声波环境下，请与我们联系。

For application in ultrasonic environment, please contact us.

4.修改与通知 (MODIFY AND CONTACT)

当产品的设计、工艺、供应商、生产地点、设备、材料、作业员工发生变更时，我们将先提供修改后的产品给您确认，并取得您的认可后，方可大批量供货。

When the quality is changed due to the changes of the design, technology, material, manufacture place, main equipment and workers, we will first supply the modified products and obtain approval from you, then start to supply mass production.

5.售前售后服务（AFTER SALE SERVICE）

若在生产过程中发现不良品，本公司负责退换，并及时提交不良品的分析及改进措施报告给您确认。

If the defective product was found in the production process, we will exchange and provide the improvement measures in time.

此规格书仅供参考，若有需要，请与我方索要正式承认书作为物料承认及质量判定依据。

This specification is for reference only. If needed, please request a formal letter of acknowledgment from our side to serve as the basis for material acknowledgment and quality judgment.