Features

- Operating Frequency: 0MHz~200 MHz
- Crystal input - 10~60MHz
- Low noise:<50fsrms
- low skew: < 50ps
- Fast rise/fall time: 1.0ns typ.
- Propagation delay: 2.5ns typ.
- Industrial temperature (–40°C to 85°C)
- 3.3V/2.5V/1.8V power supply
- Packaging (Pb-free & Green available)

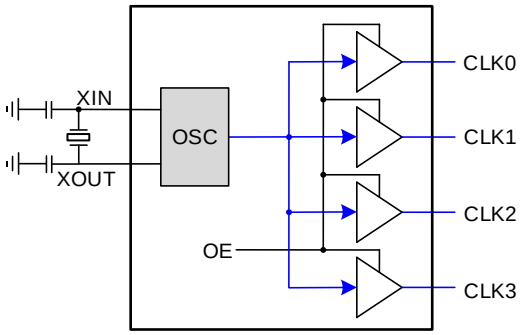
Applications

- Multi-output Crystal Oscillator
- 1:4 Clock Buffer(0~200MHz)

Description

Raystar's RS0804 are low-skew, low- noise, high speed clock buffers and are ideal for computing, networking, and communication applications. Application examples include PCI(X) clock buffers in servers and workstations, PCI(X) Storage Area Network (SAN), and RAID controllers. They are used for networking and communications applications requiring 80 MHz for 10/100 Mbps Ethernet and 125 MHz for Gigabit networking clocks. To reduce EMI emission and power consumption, all outputs can be disabled to Low-state by asserting a low signal to the OE (Output Enable) pin. RS0804 output impedance is 25-ohms.

Block Diagram



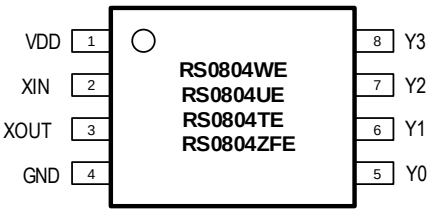
Order Information

Part Number	Package	Description
RS0804WE	SOP8	4.9mmx6mm
RS0804UE	MSOP8	3.2mmx5.15mm
RS0804TE	TSSOP8	3mmx6.4mm
RS0804CE	3225-6L	3.2mmx2.5mm
RS0804ZFE	DFN8	1.5mmx1.5mm

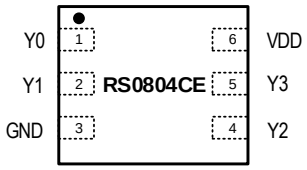
Notes:

[1] E = Pb-free and Green

Pin Configuration



(Top View)



(Top View)

Pin Description

Pin No.	Pin No. (3225-6L)	Symbol	Type	Description
2		XIN	Input	Crystal input
3		XOUT	Output	Crystal Output
5,6,7,8	1,2,4,5	Y[0:3]	Output	LVCMOS level outputs
4	3	GND	Ground	Ground
1	6	VDD	Power	3.3V/2.5V/1.8V Power Supply

Absolute Maximum Ratings

(Above which the useful life may be impaired. For user guidelines, not tested)

Supply Voltage (V_{DD})	–0.0V to +6.5V
Input Voltage	–0.5V to V_{DD}+0.5V
Industrial Operating Temperature	–40°C to +85°C
Storage Temperature	–65°C to +150°C
Junction Temperature	150°C
Input ESD MIL- 883, method 3015, human body model	2KV

Recommended Operating Conditions

Symbol	Description	MIN	MAX	Unit
V_{DD}	I/O Supply, Analog Core Supply	1.62	3.63	V
T_A	Industrial Ambient Temperature	–40	+85	° C

DC Characteristics

(T_A = –40~85°C,V_{CC} = 3.3V ±10% 2.5V±10% 1.8V±10%)

Symbol	Parameter	Conditions	MIN	TYP	MAX	Unit
V_{IL}	Low Input Voltage				0.25VCC	V
V_{IH}	High Input Voltage		0.4VCC	VCC/2		
I_{IL}	Low Input Current	VIN = 0V			–5	μA
I_{IH}	High Input Current	VIN = VCC			5	
V_{OL}	Low Output Voltage	VCC = 3.0V, IOL = 12mA			0.25VCC	V
V_{OH}	High Output Voltage	VCC = 3.0V, IOH = – 12mA	0.7VCC			
C_O	Output Capacitance			3	7	pF
C_I	Input Capacitance			3	5	
I_{DD}	Supply Current	CL = 10pF/50MHz,VCC=1.8V		10		mA
		CL = 10pF/50MHz,VCC=2.5V		15		
		CL = 10pF/50MHz,VCC=3.3V		21		
		CL = 33pF/50MHz,VCC=1.8V		19		
		CL = 33pF/50MHz,VCC=2.5V		26		
		CL = 33pF/50MHz,VCC=3.3V		36		
Z_O	Output Impedance	VDD=1.8V		50		Ω
		VDD=2.5V		30		
		VDD=3.3V		25		
L	Pin Inductance				7	nH

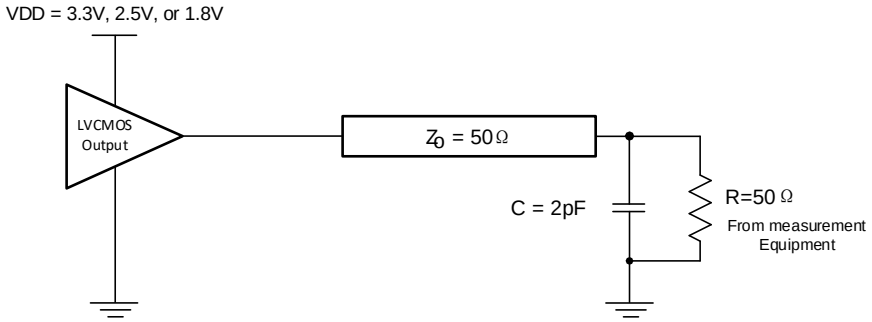
AC Characteristics

(T_A = –40~85°C,V_{CC} = 3.3V ±10% 2.5V±10% 1.8V±10%, 33pF/66MHz and 10pF/160MHz)

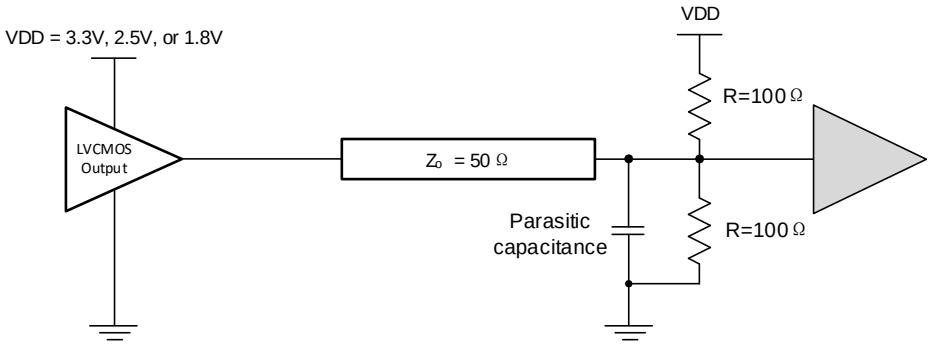
Symbol	Parameter	Conditions	MIN	TYP	MAX	Unit
F_{IN}	Input frequency		0		200	MHz
T_{PLH}	Low-to-high propagation delay	CLK_IN to Y[0-3] rising edges @ 1.5V	1.0	1.7	3.0	ns
		CLK_IN to Y[0-3] rising edges @ 1.25V	1.0	2.0	3.2	
		CLK_IN to Y[0-3] rising edges @ 0.9V	1.0	2.5	3.5	
T_{PHL}	High-to-low propagation delay	CLK_IN to Y[0-3] falling edges @ 1.5V	1.0	1.7	3.0	
		CLK_IN to Y[0-3] falling edges @ 1.25V	1.0	2.0	3.2	
		CLK_IN to Y[0-3] falling edges @ 0.9V	1.0	2.5	3.5	
$T_{SK(O)}$	Output skew	@ VDD/2			150	ps
$T_{SK(P)}$	Pulse skew	@ VDD/2			300	
$T_{SK(T)}$	Package skew(1)	@ VDD/2			500	
T_R,T_F	Rise, Fall time	20%~80% VDD=3.3V		0.7	1.4	ns
		20%~80% VDD=2.5V		1	2	
		20%~80% VDD=1.8V		1.5	3	
T_{EN}	Output enable time				5	
T_{DIS}	Output disable time				10	
T_{DC}	Output duty cycle	t_{DC} = t_H/t_C Y, t_H = High Pulse Width	45		55	%

Note:
1. Identical traces, loads, power supply.
2. Maximum Output Skew is 100ps when frequency is below 125MHz with 10pF loading.

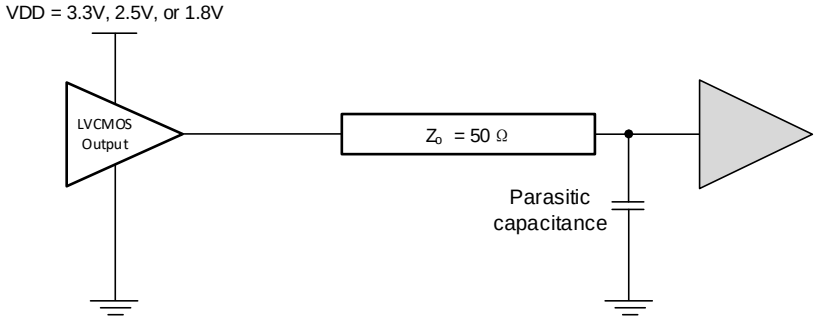
Parameter Measurement Information



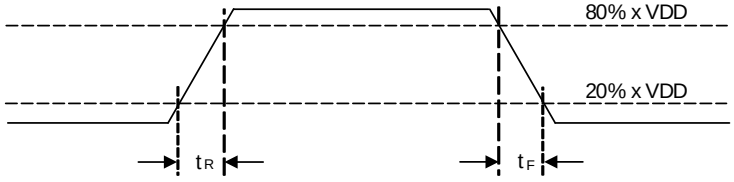
Test Load Circuit



Application Load With 50-Ω Termination



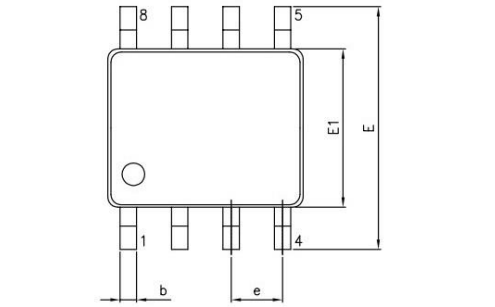
Application Load With Termination

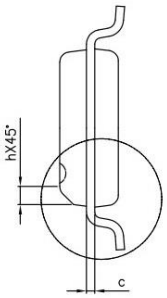


Rise and Fall Time

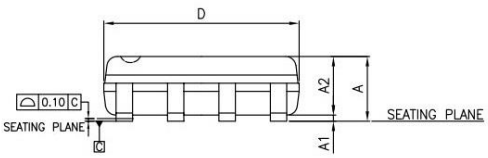
Package Information

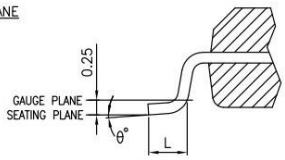
SOP8 (W)

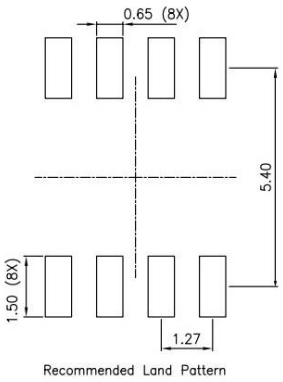




SYMBOLS	MIN.	NOM.	MAX.
A	—	—	1.75
A1	0.10	—	0.25
A2	1.25	—	—
b	0.31	—	0.51
c	0.10	—	0.25
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.27 BSC		
L	0.40	—	1.27
h	0.25	—	0.50
θ°	0	—	8







Note:

1.All dimensions are in mm. Angels in degrees.

2.Dimensions exclude burrs, mold flash or protrusions.

3.Refer Jedec MS-012

4. Recommended land pattern is for reference only.

SOP08 POD

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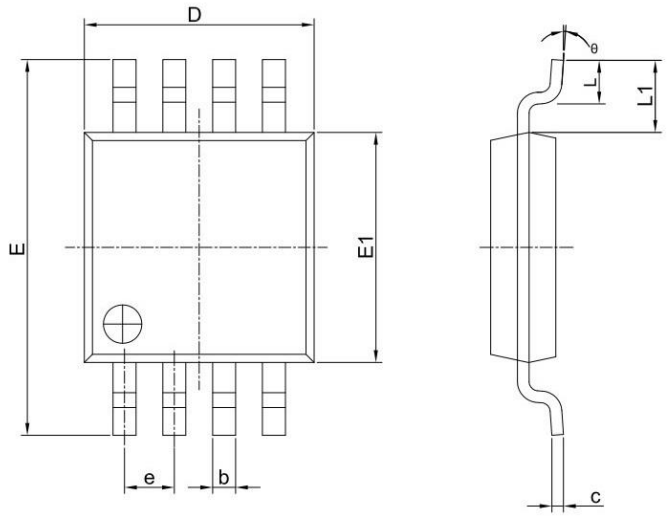
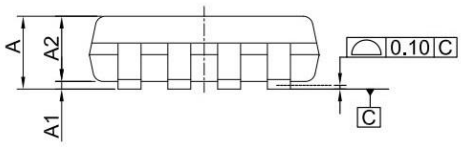
MSOP8 (U)



PKG DIMENSIONS(MM)		
SYMBOL	Min.	Max.
A	--	1.10
A1	0.00	0.15
A2	0.75	0.95
b	0.22	0.38
c	0.08	0.23
D	2.80	3.20
E	4.65	5.15
E1	2.80	3.20
e	0.65 BSC	
L	0.40	0.80
L1	0.95 REF	
θ	0°	8°

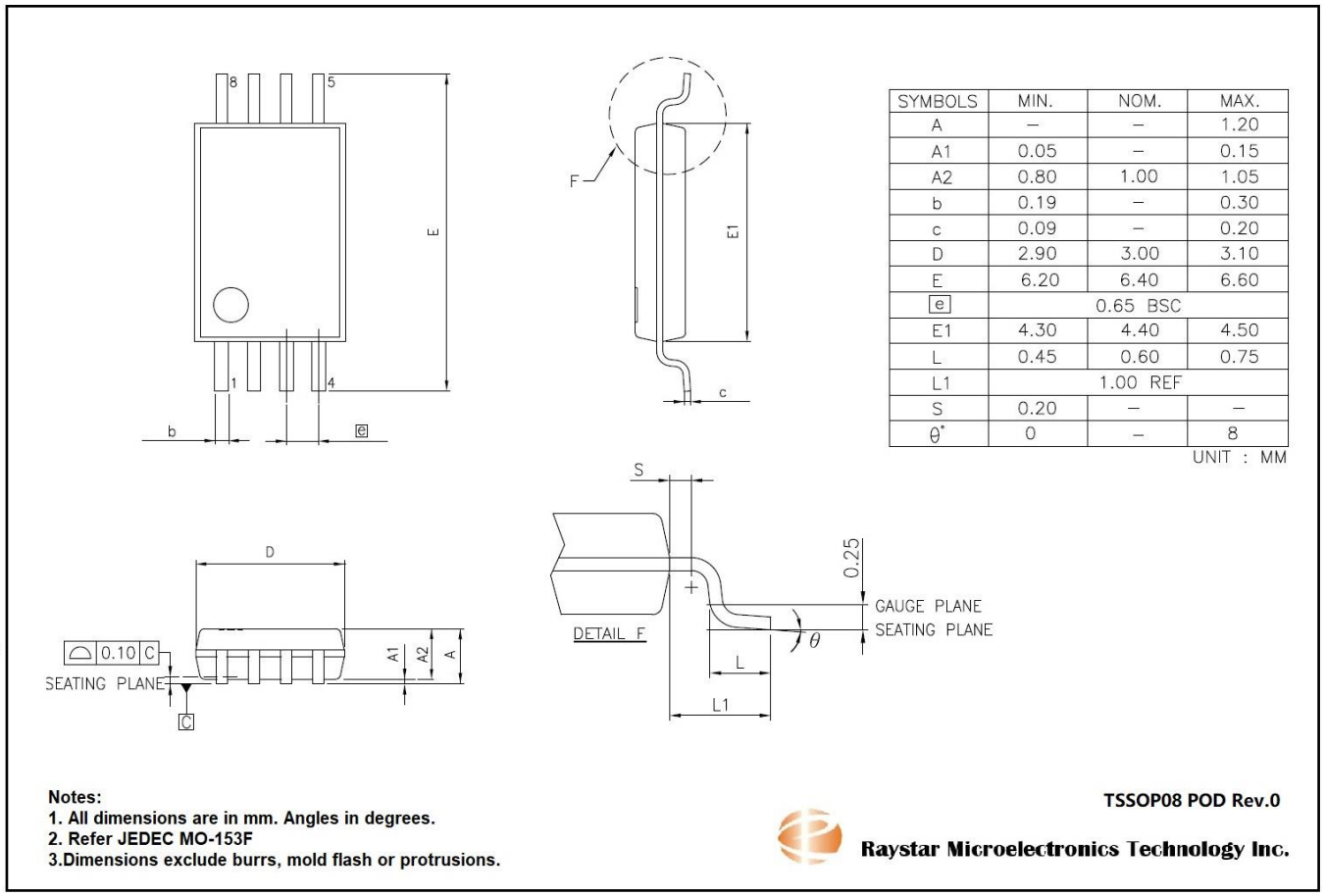


Note:
1.All dimensions are in mm. Angels in degrees.
2.Refer Jedec MO-187
3.Dimensions exclude burrs, mold flash or protrusions.

MSOP08 POD Rev.0

Raystar Microelectronics Technology Inc.

TSSOP8 (T)



SYMBOLS	MIN.	NOM.	MAX.
A	–	–	1.20
A1	0.05	–	0.15
A2	0.80	1.00	1.05
b	0.19	–	0.30
c	0.09	–	0.20
D	2.90	3.00	3.10
E	6.20	6.40	6.60
e	0.65 BSC		
E1	4.30	4.40	4.50
L	0.45	0.60	0.75
L1	1.00 REF		
S	0.20	–	–
θ°	0	–	8

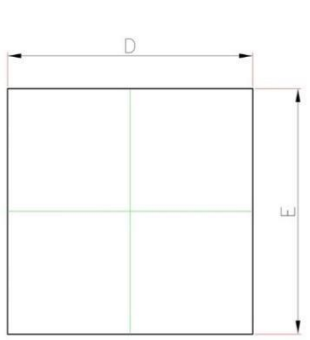
UNIT : MM

Notes:
1. All dimensions are in mm. Angles in degrees.
2. Refer JEDEC MO-153F
3.Dimensions exclude burrs, mold flash or protrusions.

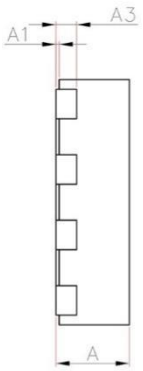
TSSOP08 POD Rev.0

Raystar Microelectronics Technology Inc.

8-Pin DFN8 (ZF)

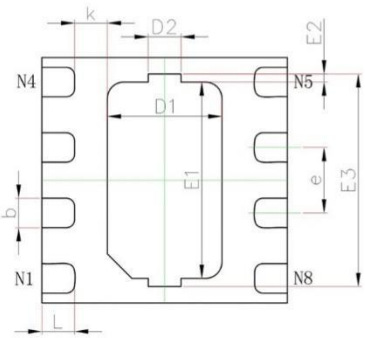


TOP VIEW



SIDE VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.400	0.500	0.016	0.020
A1	0.000	0.050	0.000	0.002
A3	0.127REF.		0.005REF.	
D	1.450	1.550	0.057	0.061
E	1.450	1.550	0.057	0.061
D1	0.600	0.800	0.024	0.031
D2	0.200REF.		0.008REF.	
E1	1.100	1.300	0.043	0.051
E2	0.050REF.		0.002REF.	
E3	1.200	1.400	0.047	0.055
k	0.200REF.		0.008REF.	
b	0.150	0.250	0.006	0.010
e	0.400BSC.		0.016BSC.	
L	0.150	0.250	0.006	0.010



BOTTOM VIEW

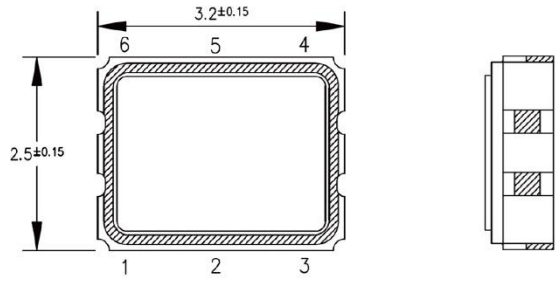
Note:
1. All dimensions are in mm. angle in degrees.
2. Refer JEDEC MO-229.
3. demensions exclude burrs, mold flash or protrusions.

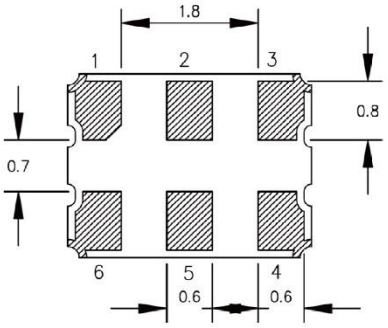
DFN 1.5X1.5X0.45 8L(ZF08) POD Rev.A

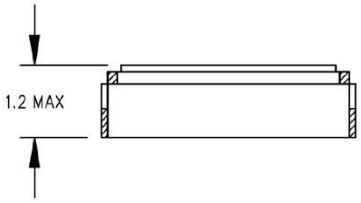
Raystar Microelectronics Technology Inc.

3225-6L(Ceramic Package)

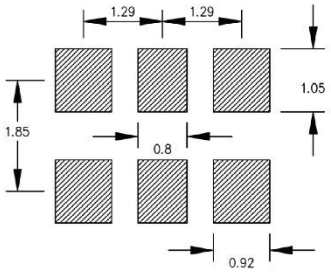
- **External dimensions**







- **Recommended soldering pattern**



NOTES:

1. All dimensions are in mm.
2. The small metal pad on the short side of he ceramic package are used to test the crystal.
3. When assmenling the part, please be careful not to connect or short circuit this pad.
3. please avoid short circuit between these metal parts by dew condensation or particle adhesion.

3225 6L(C06) POD

Raystar Microelectronics technology Inc.

Revision History

Revision	Description	Date
V1.1	1. Delete X: Tape Reel description 2. Apply new datasheet template 3. Change TSSOP8,SOP8,MSOP8 package figure	2023/6/16
V1.2	1. Add 3225-6L package	2025/05/06
V1.3	1. Add RS0804ZFE DFN8 1.5x1.5mm package	2025/12/17
V1.4	1. Modify block diagram，add match capacitor for Crystal.	2025/12/29