

Features

- Operating Frequency: 0MHz~200 MHz
- Low noise,; <50fs rms
- 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

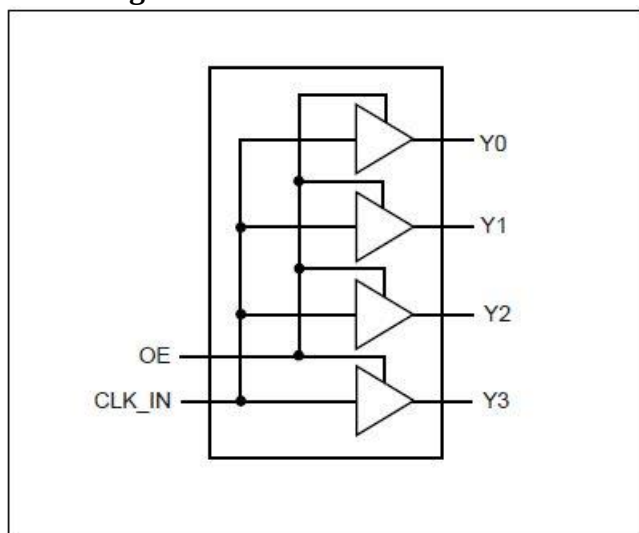
- 33 MHz PCI-to-133 MHz PCIX controllers
- 80 MHz for 10/100 Mbps Ethernet
- 125 MHz for Gigabit networking
- 155.52 MHz for Optical OC3/SDH/SONET

Order Information

Part Number	Package
RS1104WE	Lead free and Green 8-Pin SOIC
RS1104UE	Lead free and Green 8-Pin MSOP
RS1104LE	Lead free and Green 8-Pin TSSOP
RS1104ZAE	Lead free and Green 8-Pin DFN2*2

Note---E: Green Package

Block Diagram



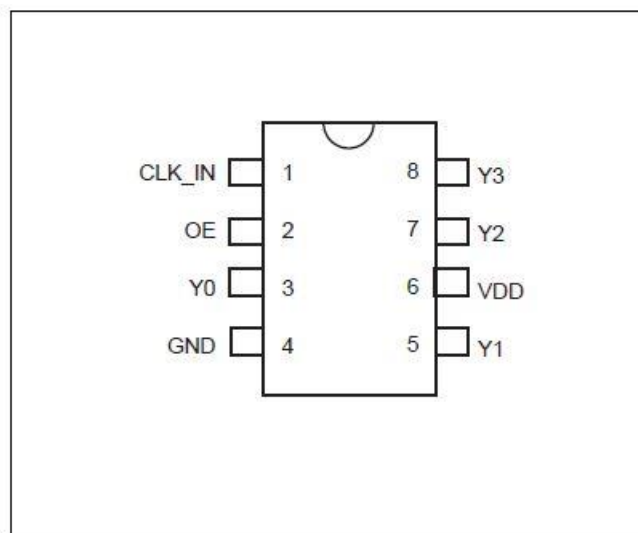
Description

Raystar's RS1104 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. RS1104 output impedance is 45-ohms@3.3V.

Function Table

Inputs		Output
CLK_IN	OE	Y[0:3]
X	L	L
L	H	L
H	H	H

Pin Configuration



Pin Description

Pin #	Symbol	Type	Qty	Description
1	CLK_IN	Input	1	Clock input
2	OE	Input	1	Active High Output Enable. Y[0-3] outputs will be Low Level when OE is low
3,5,7,8	Y[0-3]	Output	4	LVC MOS level outputs
4	GND	Ground	1	Ground
6	V _{DD}	Power	1	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

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

RS1104 DC Characteristics Over Operating Conditions(T_A = -40~85°C, V_{CC} = 3.3V ±0.3V)

Symbol	Parameter	Conditions	Min	Typ.	Max	Units
V _{IL}	Low Input Voltage				0.8	V
V _{IH}	High Input Voltage		2.4			
I _{IL}	Low Input Current	V _{IN} = 0V			-5	μA
I _{IH}	High Input Current	V _{IN} = V _{CC}			5	
V _{OL}	Low Output Voltage	V _{CC} = 3.0V, I _{OL} = 12mA			0.8	V
V _{OH}	High Output Voltage	V _{CC} = 3.0V, I _{OH} = -12mA	2.4			
C _O	Output Capacitance			3	7	pF
C _I	Input Capacitance			3	5	
I _{DD}	Supply Current	C _L = 33pF/33MHz		20		mA
		C _L = 33pF/66MHz		40		
		C _L = 22pF/80MHz		35		
		C _L = 15pF/100MHz		32		
		C _L = 10pF/125MHz		28		
		C _L = 10pF/155MHz		41		
Z _O	Output Impedance	V _{CC} =3.3V/2.5V		45/60		Ω
L	Pin Inductance				7	nH

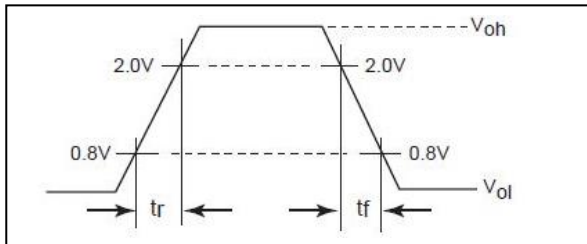
RS1104 AC Characteristics ($T_A = -40 \sim 85^\circ\text{C}$, $V_{CC} = 3.3\text{V} \pm 0.3\text{V}$, 33pF/66MHz and 10pF/160MHz)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
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
T_{PHL}	High-to-low propagation delay	CLK_IN to Y[0-3] falling edges @ 1.5V	1.0	1.7	3.0	
$T_{SK(O)}$	Output skew	@ 1.5V			150	ps
$T_{SK(P)}$	Pulse skew	@ 1.5V			300	
$T_{SK(T)}$	Package skew ⁽¹⁾	@ 1.5V			500	
T_R, T_F	Rise, Fall time	0.65V~2.65V		0.7	1.4	ns
T_{PZL}, T_{PZH}	Output enable time				5	
T_{PLZ}, T_{PHZ}	Output disable time				10	
T_{DC}	Output duty cycle	$t_{DC} = t_H/t_C$ Y, t_H = High Pulse Width,	45		55	%

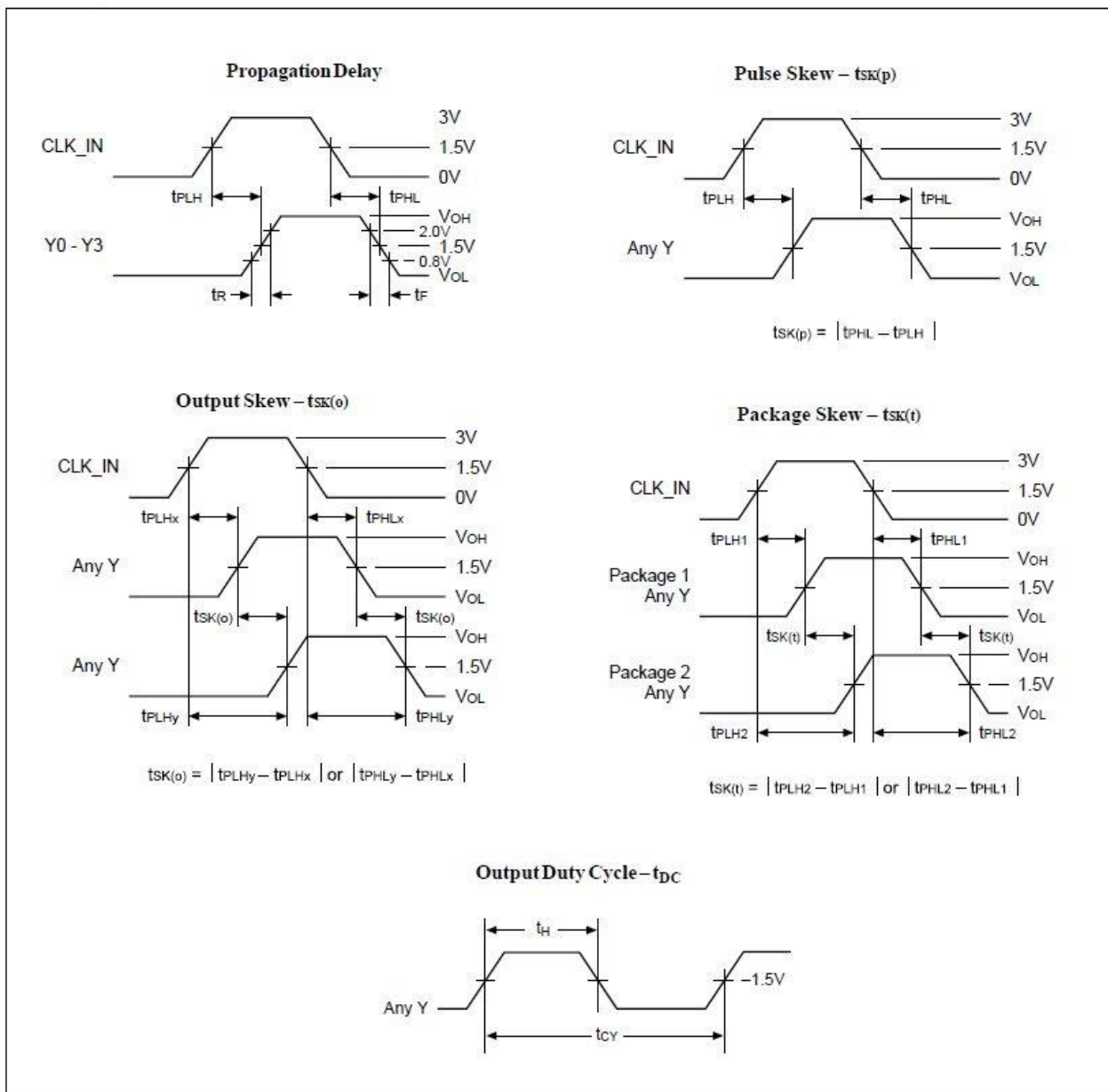
Note:

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

Typical Characteristics: Rise/Fall Time

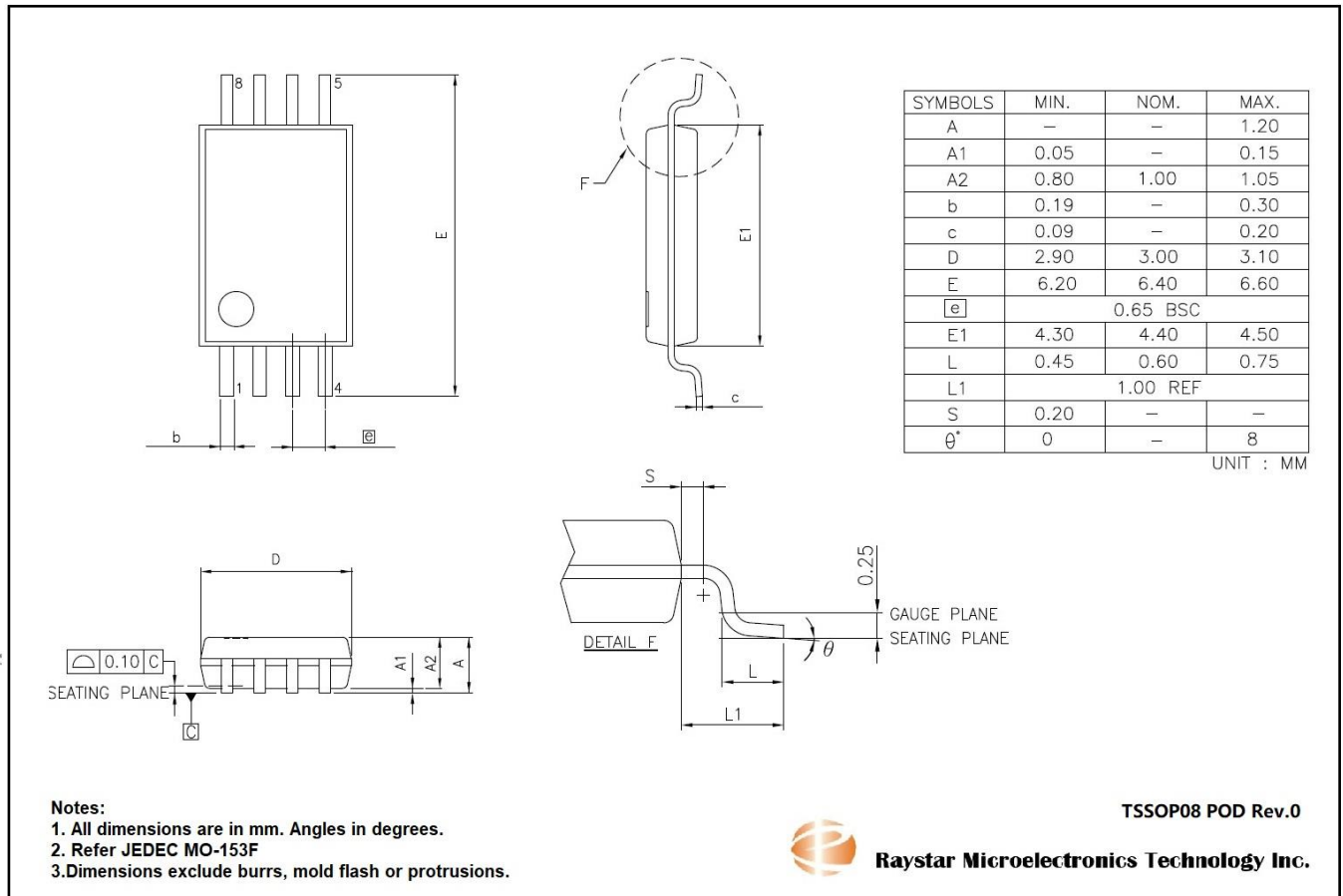


Switching Waveforms



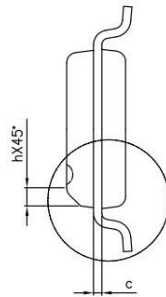
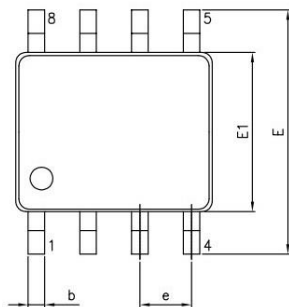


Packaging Mechanical: 8-Pin TSSOP (L)

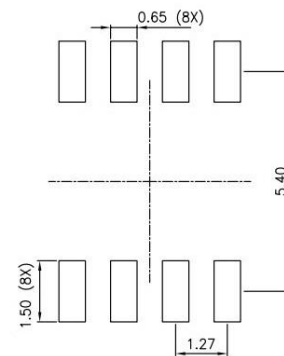
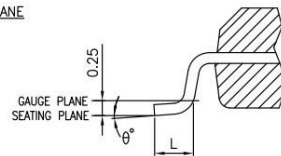
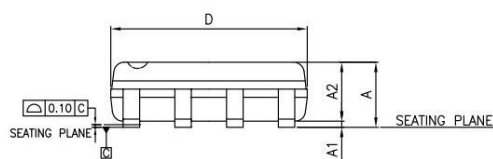




Packaging Mechanical: 8-Pin SOIC (W)



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



Recommended Land Pattern

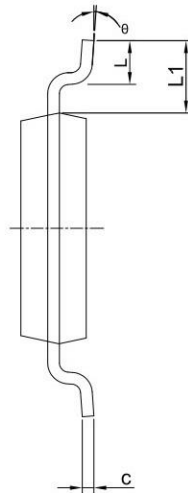
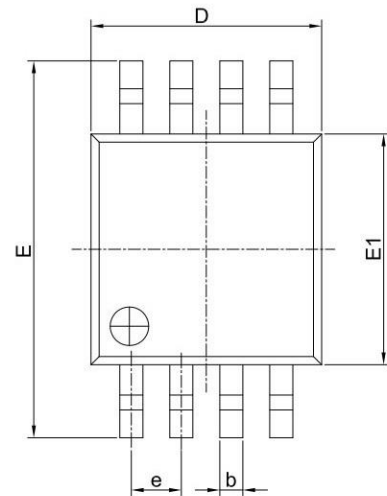
Note:

1. All dimensions are in mm. Angles in degrees.
2. Dimensions exclude burrs, mold flash or protrusions.
3. Refer Jeduc MS-012
4. Recommended land pattern is for reference only.

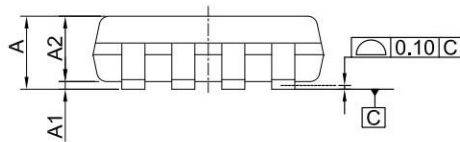


SOP08 POD Rev.0
Raystar Microelectronics Technology Inc.

Packaging Mechanical: 8-Pin MSOP (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:

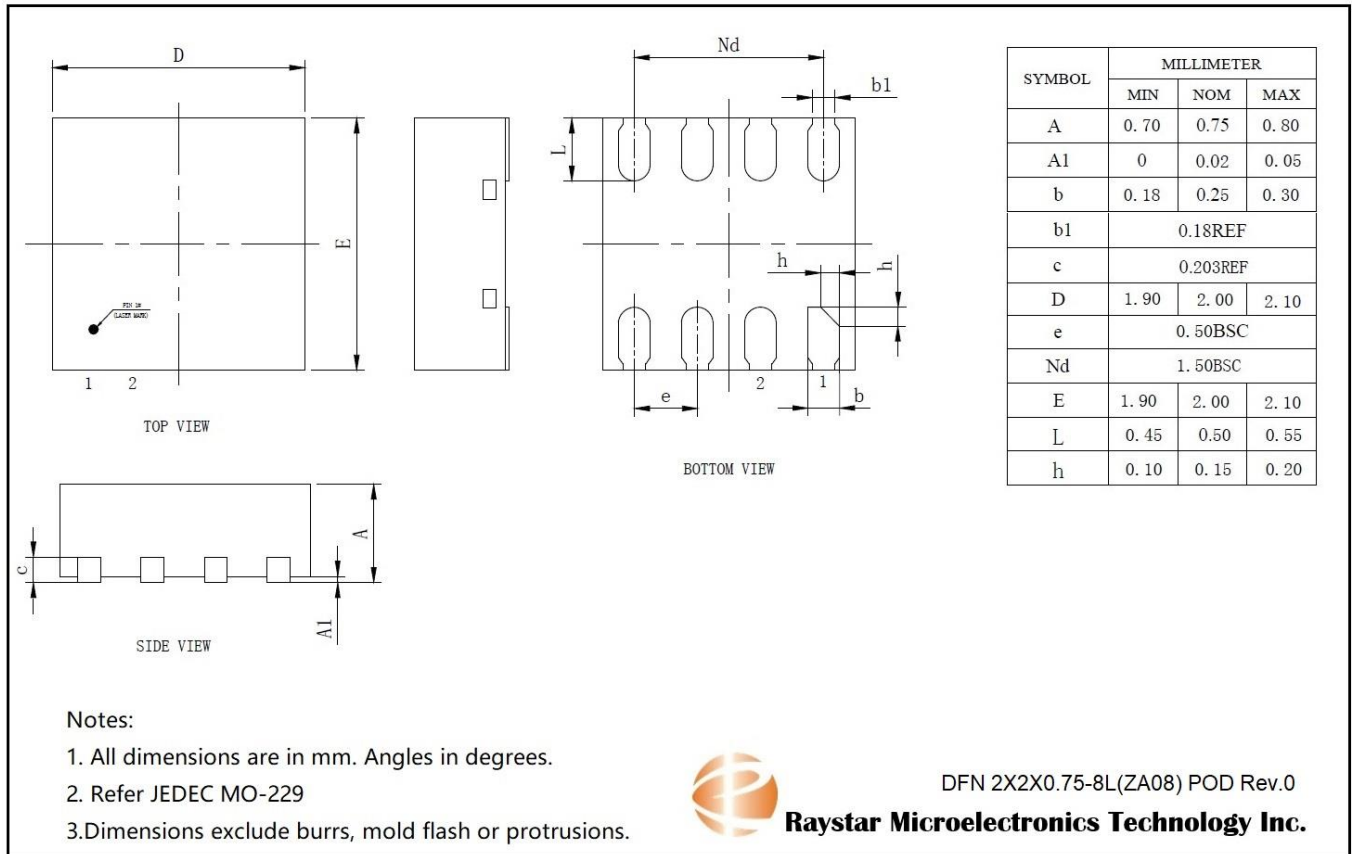
- 1.All dimensions are in mm. Angels in degrees.
- 2.Refer Jedec MO-187
- 3.Dimensions exclude burrs, mold flash or protrusions.



Raystar Microelectronics Technology Inc.

MSOP08 POD Rev.0

Packaging Mechanical: DFN2*2(ZA08)





History Log:

Rev #	DCN NO.	REVISION HISTORY	DATE
1.5	230007	Initial release	2023/1/29