



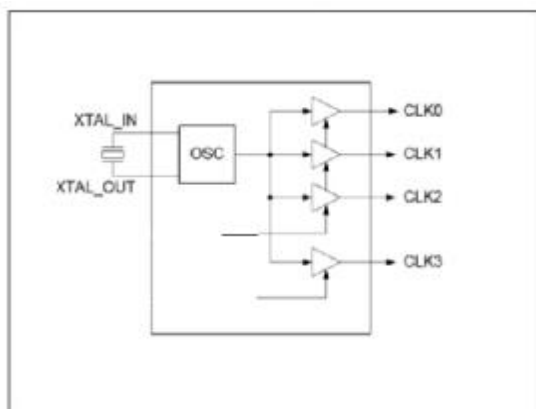
## Features

- 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)

## Block Diagram



## 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.

## Order Information

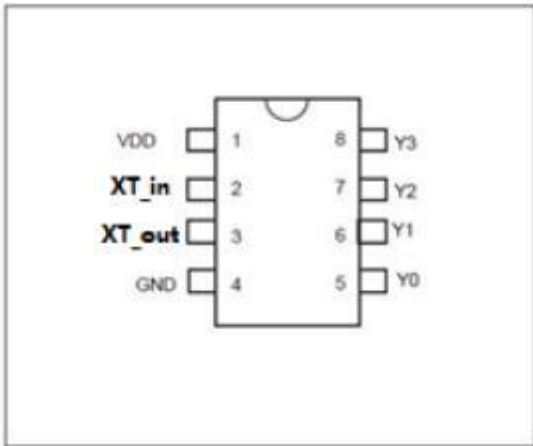
Part Number	Package
RS0804WE	Lead free and Green 8-Pin SOIC
RS0804UE	Lead free and Green 8-Pin MSOP
RS0804TE	Lead free and Green 8-Pin TSSOP

### Notes

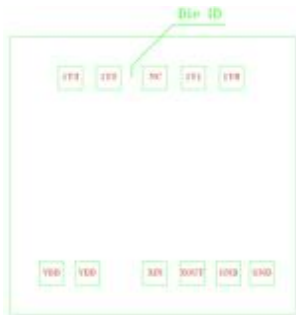
- [1] E = Pb-free and Green



## Pin Configuration



## Pad Location



1Y3	-275.05, 325.1	VDD	-340.15, -325.1
1Y2	- 148.3, 325.1	VDD	-219.55, -325.1
1Y1	132.95, 325.1	XIN	3.55, -325.1
1Y0	258.65, 325.1	XOUT	128.35, -325.1
GND	249.25, -325.1	GND	358.3, 325.1
Die Size: 890umX860um			

## Pin Description

Pin #	Symbol	Type	Description
2	XT_IN	Input	crystal input
3	XT_OUT	Output	Crystal Output
5,6,7,8	Y[0:3]	Output	LVC MOS level outputs
4	GND	Ground	Ground
1	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 (VDD)	-0.0V to +6.5V
Input Voltage	-0.5V to VDD+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
VDD	I/O Supply, Analog Core Supply	1.62	3.63	V
TA	Industrial Ambient Temperature	-40	+85	° C



## DC Characteristics

(TA = -40~85°C, VCC = 3.3V ±0.3V)

Symbol	Parameter	Conditions	MIN	TYP	MAX	Unit
VIL	Low Input Voltage			1.65	0.8	V
VIH	High Input Voltage		2.0			
IIL	Low Input Current	VIN = 0V			-5	μA
IIH	High Input Current	VIN = VCC			5	
VOL	Low Output Voltage	VCC = 3.0V, IOL = 12mA			0.4	V
VOH	High Output Voltage	VCC = 3.0V, IOH = -12mA	2.4			
CO	Output Capacitance			3	7	pF
CI	Input Capacitance			3	5	
IDD	Supply Current	CL = 33pF/33MHz		20		mA
		CL = 33pF/66MHz		40		
		CL = 22pF/80MHz		35		
		CL = 15pF/100MHz		32		
		CL = 10pF/125MHz		28		
		CL = 10pF/155MHz		41		
ZO	Output Impedance			25		Ω
L	Pin Inductance				7	nH

## AC Characteristics

(TA = -40~85°C, VCC = 3.3V ±0.3V, 33pF/66MHz and 10pF/160MHz)

Symbol	Parameter	Conditions	MIN	TYP	MAX	Unit
FIN	Input frequency		0		200	MHz
TPLH	Low-to-high propagation delay	CLK_IN to Y[0-3] rising edges @ 1.5V	1.0	1.7	3.0	ns
TPHL	High-to-low propagation delay	CLK_IN to Y[0-3] falling edges @ 1.5V	1.0	1.7	3.0	
TSK(O)	Output skew	@ 1.5V			150	ps
TSK(P)	Pulse skew	@ 1.5V			300	
TSK(T)	Package skew(1)	@ 1.5V			500	
TR,TF	Rise, Fall time	0.65V~2.65V		0.7	1.4	ns
TPZL,TPZH	Output enable time				5	
TPLZ,TPHZ	Output disable time				10	
TDC	Output duty cycle	tDC = tH/tC Y, tH = High Pulse Width,	45		55	%

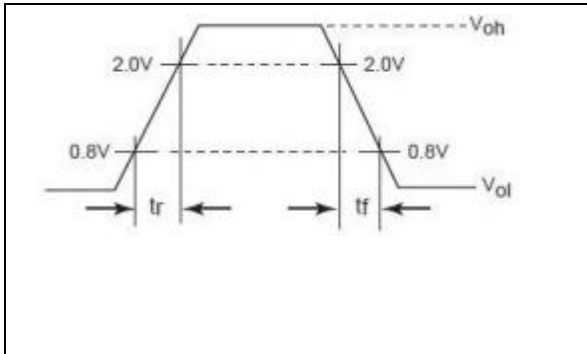
**Note:**

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

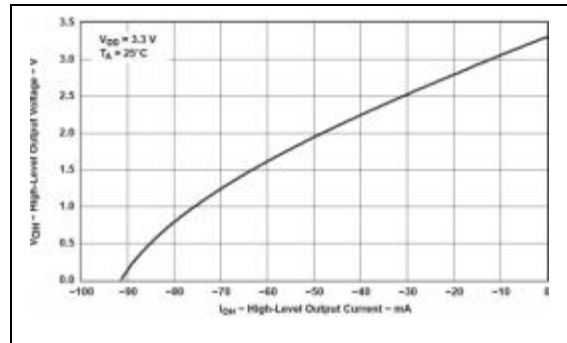


## Typical Characteristics

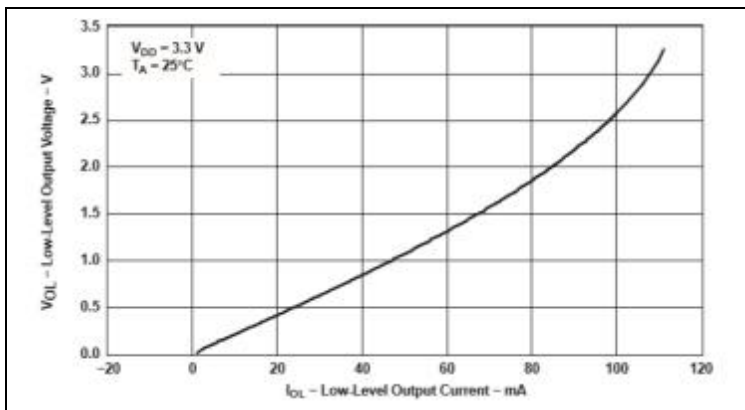
### Rise/Fall Time



### High-Level Output Voltage VS High-Level Output Current

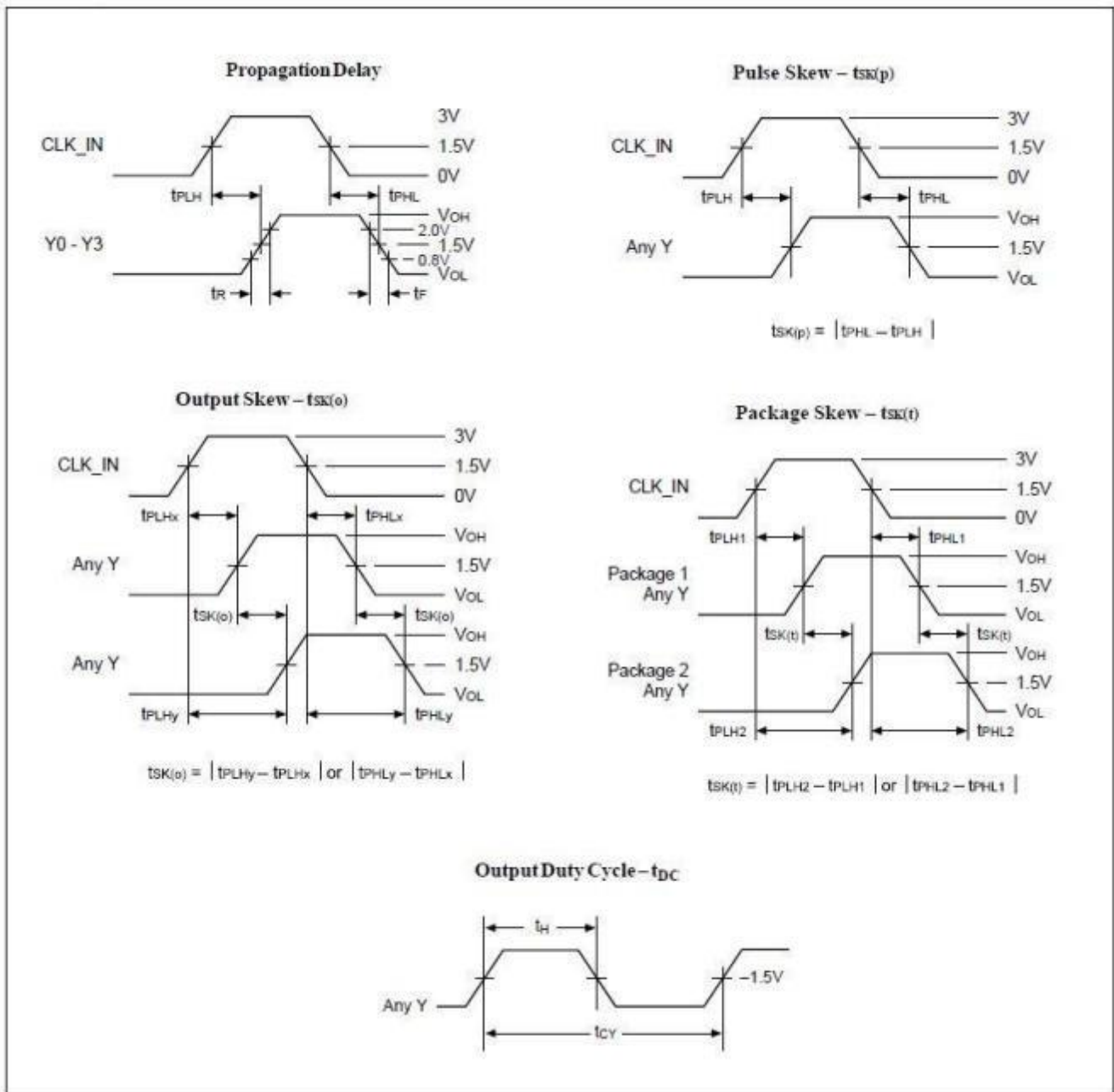


### Low-Level Output Voltage vs. Low-Level Output Current





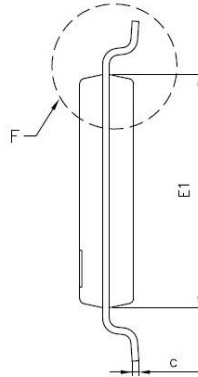
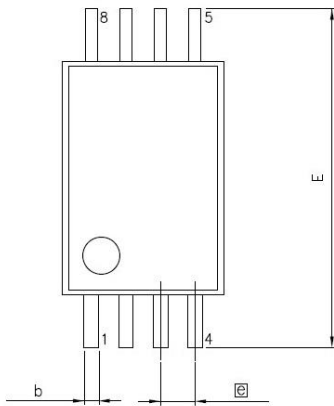
## Switching Waveforms





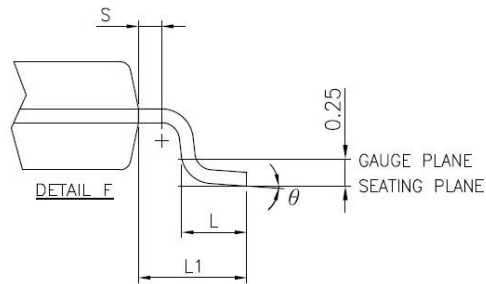
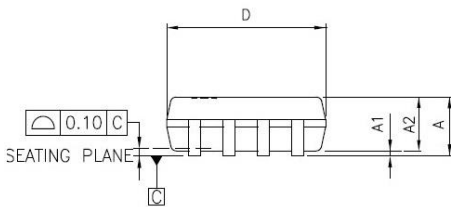
**Package Information**

**8-Pin TSSOP (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
$\square$ 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	–	–
$\theta^*$	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.

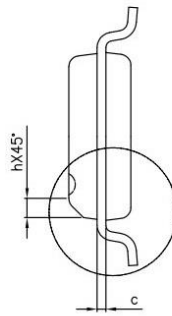
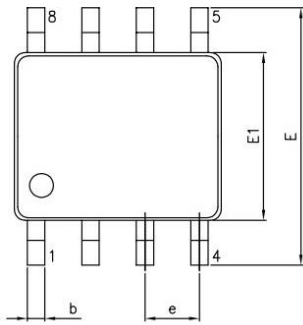
TSSOP08 POD Rev.0



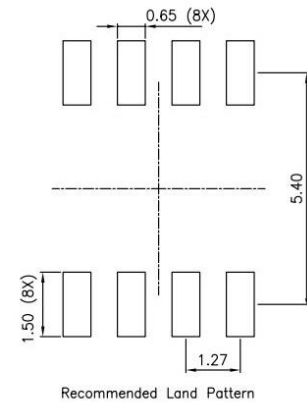
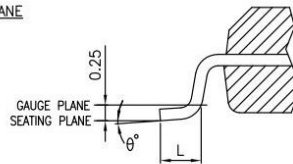
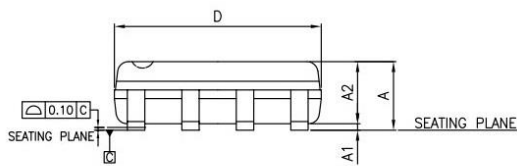
**Raystar Microelectronics Technology Inc.**



**8-Pin 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
$\theta^\circ$	0	—	8



**Note:**

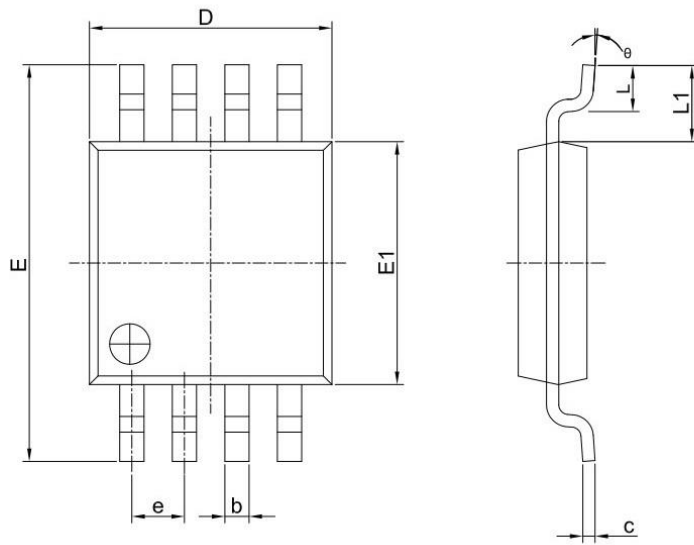
1. All dimensions are in mm. Angles in degrees.
2. Dimensions exclude burrs, mold flash or protrusions.
3. Refer Jecdec MS-012
4. Recommended land pattern is for reference only.



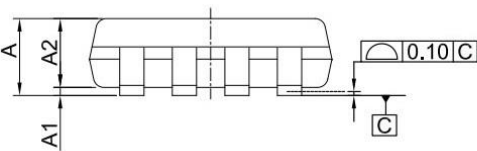




**8-Pin MSOP (U)**



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°



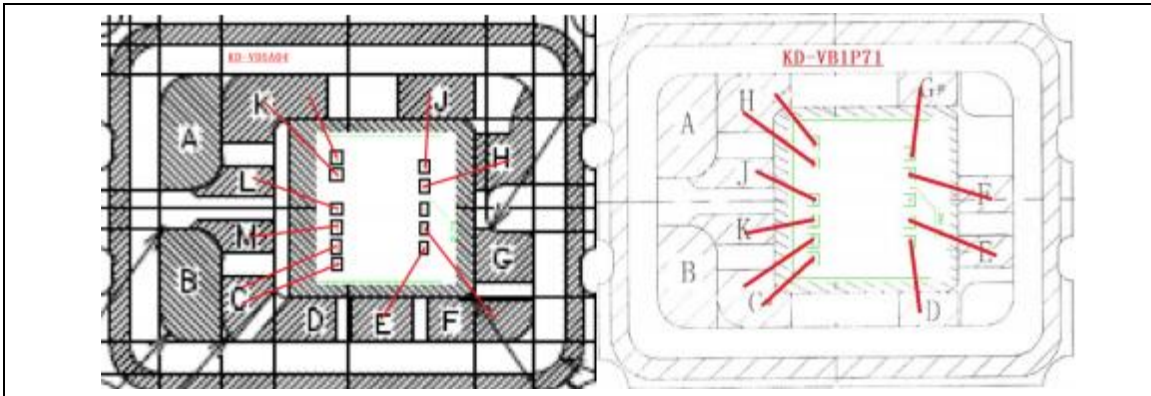
**Note:**

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

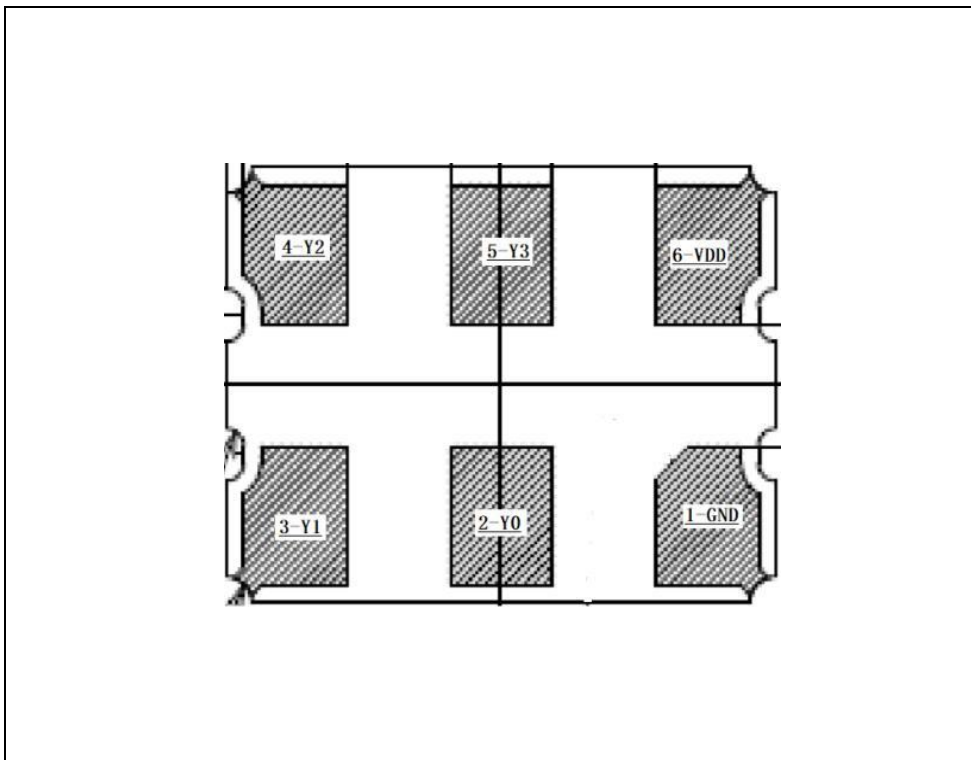




Ceramic Package 3225-6



Ceramic Package 3225-6 Pad Assignment





## Revision History

Revision	Description	Date
V1.1	<ol style="list-style-type: none"><li>1. Delete X: Tape Reel description</li><li>2. Apply new datasheet template</li><li>3. Change TSSOP8,SOP8,MSOP8 package figure</li></ol>	2023/6/16