3Z Series 3.2 x 2.5 mm SMD Differential Output Crystal Oscillator

3 : 3.2×2.5×0.9 mm | SMD3225-6P Z : Differential Output Crystal Oscillator(SPXO)

Feature

- Output Types:LVPECL/LVDS/HCSL
- Tri-state function available
- Low Phase Jitter :0.5pSec max.
- Pb-free/RoHS Compliant

Applications

- Networking and communications
- Gigabit Ethernet
- Fibre Channel
- SONET/SDH

Frequency Stability & Operating Temperature Range

FT / Temp.	±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.

Electrical Specifications

Item		Symb.	Min.	Typ.	Max.	Unit	Notes
Frequency Range		Freq.	90.000		200.000	MHz	
Standard Frequency		Freq.	100.000 ,106.250 ,125.000 148.500 ,150.000 ,155.520 156.250			MHz	Contact SCTF for frequencies not listed
Output			LVPECL				
Operating Temperature		T_use	-20		+70	°C	
			-40		+85	°C	
StorageTemperature Range		T_stg	-55		+125	°C	
Supply Voltage		Vdd	1.8 / 2.5 / 3.3			V	±5% max.
Output Load		L_PECL		50		Ω	Vdd - 2.0 V
Current Consumption		Icc			50	mA	90MHz ⩽ Freq. < 125MHz
					75		125MHz ⩽ Freq. ⩽ 200MHz
Duty Cycle		SYM	45		55	%	
Rise / Fall Time		T_R / T_F			1	nS	20% Vdd to 80% Level
Start-up Time		T_str			10	mS	To 90% of Final Amplitude
High output voltage		V_{OH}	Vdd-1.025			V	
Low output voltage		V_{OL}			Vdd-1.62	V	
Enable Voltage High (Logic 1)		V_{IH}	0.7Vdd			V	Pin 1 Tri-state Outputs will be enable if OE is Logic 1 or open; Outputs will be disable if OE is Logic 0.
Enable Voltage Low (Logic 0)		V_{IL}			0.3Vdd	V	
RMS Phase Jitter		T_{RPJ}			0.5	pSec	Period Jitter(12KHz-20MHz)
Phase Noise@156.25MHz	100 Hz			-90		dBc/Hz	
	1 KHz			-120		dBc/Hz	
	10 KHz			-140		dBc/Hz	
Aging		f_age			3	ppm	1st. Year at 25°C

3Z Series 3.2 x 2.5 mm SMD Differential Output Crystal Oscillator

3 : 3.2×2.5×0.9 mm | SMD3225-6P Z : Differential Output Crystal Oscillator(SPXO)

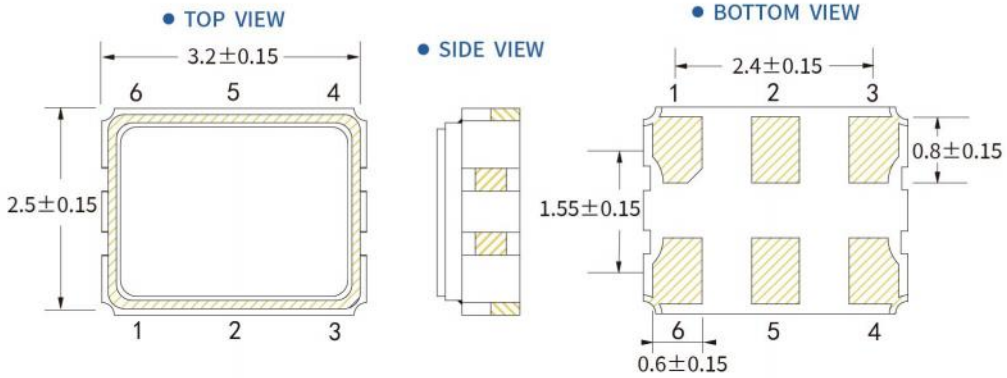
Item	Symb.	Min.	Typ.	Max.	Unit	Notes
Frequency Range	Freq.	90.000		200.000	MHz	
Standard Frequency	Freq.	100.000 ,106.250 ,125.000 148.500 ,150.000 ,155.520 156.250			MHz	Contact SCTF for frequencies not listed
Output		LVDS				
Operating Temperature	T_use	-20		+70	°C	
		-40		+85	°C	
StorageTemperature Range	T_stg	-55		+125	°C	
Supply Voltage	Vdd	1.8 / 2.5 / 3.3			V	±5% max.
Output Load	L_LVDS		100		Ω	
Current Consumption	Icc			30	mA	90MHz ⩽ Freq. < 125MHz
				40		125MHz ⩽ Freq. ⩽ 200MHz
Duty Cycle	SYM	45		55	%	
Rise / Fall Time	T_R / T_F			1	nS	20% Vdd to 80% Level
Start-up Time	T_str			10	mS	To 90% of Final Amplitude
High output voltage	V_{OH}			1.6	V	
Low output voltage	V_{OL}	0.9			V	
Enable Voltage High (Logic 1)	V_{IH}	0.7Vdd			V	Pin 1 Tri-state Outputs will be enable if OE is Logic 1 or open; Outputs will be disable if OE is Logic 0.
Enable Voltage Low (Logic 0)	V_{IL}			0.3Vdd	V	
RMS Phase Jitter	T_{RPJ}			0.5	pSec	Period Jitter(12KHz-20MHz)
Phase Noise@156.25MHz 100 Hz				-90	dBc/Hz	
1 KHz				-120	dBc/Hz	
10 KHz				-140	dBc/Hz	
Aging	f_age			3	ppm	1st. Year at 25°C

Item	Symb.	Min.	Typ.	Max.	Unit	Notes
Frequency Range	Freq.	90.000		200.000	MHz	
Standard Frequency	Freq.	100.000 ,106.250 ,125.000 148.500 ,150.000 ,155.520 156.250			MHz	Contact SCTF for frequencies not listed
Output		HCSL				
Operating Temperature	T_use	-20		+70	°C	
		-40		+85	°C	
StorageTemperature Range	T_stg	-55		+125	°C	
Supply Voltage	Vdd	1.8 / 2.5 / 3.3			V	±5% max.
Output Load	L_HCSL	R_S=33 , R_L=50			Ω	
Current Consumption	Icc			35	mA	90MHz ⩽ Freq. < 125MHz
				40		125MHz ⩽ Freq. ⩽ 200MHz
Duty Cycle	SYM	45		55	%	
Rise / Fall Time	T_R / T_F			1	nS	20% Vdd to 80% Level
Start-up Time	T_str			10	mS	To 90% of Final Amplitude
High output voltage	V_{OH}	0.66			V	
Low output voltage	V_{OL}			0.15	V	
Enable Voltage High (Logic 1)	V_{IH}	0.7Vdd			V	Pin 1 Tri-state Outputs will be enable if OE is Logic 1 or open; Outputs will be disable if OE is Logic 0.
Enable Voltage Low (Logic 0)	V_{IL}			0.3Vdd	V	
RMS Phase Jitter	T_{RPJ}			0.5	pSec	Period Jitter(12KHz-20MHz)
Phase Noise@156.25MHz 100 Hz				-90	dBc/Hz	
1 KHz				-120	dBc/Hz	
10 KHz				-140	dBc/Hz	
Aging	f_age			3	ppm	1st. Year at 25°C

3Z Series 3.2 x 2.5 mm SMD Differential Output Crystal Oscillator

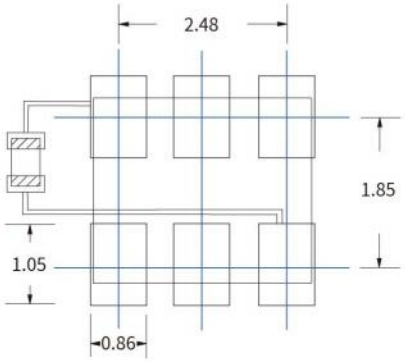
3 : 3.2×2.5×0.9 mm | SMD3225-6P Z : Differential Output Crystal Oscillator(SPXO)

Dimensions (UNIT:mm)



Pin	Function
1	Tri-State
2	NC
3	GND
4	Output
5	Comp.Output
6	Vdd

Solder pad layout (UNIT:mm)



To ensure optimal oscillator performance,place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.

Options and Part Identification : Example SX3DF100.000B20F30DNN

Company	Ceramic Package	Frequency Code [MHZ]	Supply Voltage	Frequency Tolerance	Operating Temperature	Frequency Drift	Output	Current Consumption	Phase Noise
SX	3DF	X.XXX	B	20	F	30	D	N	N

Code	Company
SX	SCTF

Frequency
100.000

Code	Frequency Tolerance
10	±10ppm
20	±20ppm

Code	Frequency Drift
15	±15ppm
20	±20ppm
30	±30ppm

Code	Current
N	Standard

Code	Phase Noise
N	Standard

Code	Ceramic Package
7DF	7.0×5.0×1.6mm
5DF	5.0×3.2×1.25mm
3DF	3.2×2.5×0.9mm

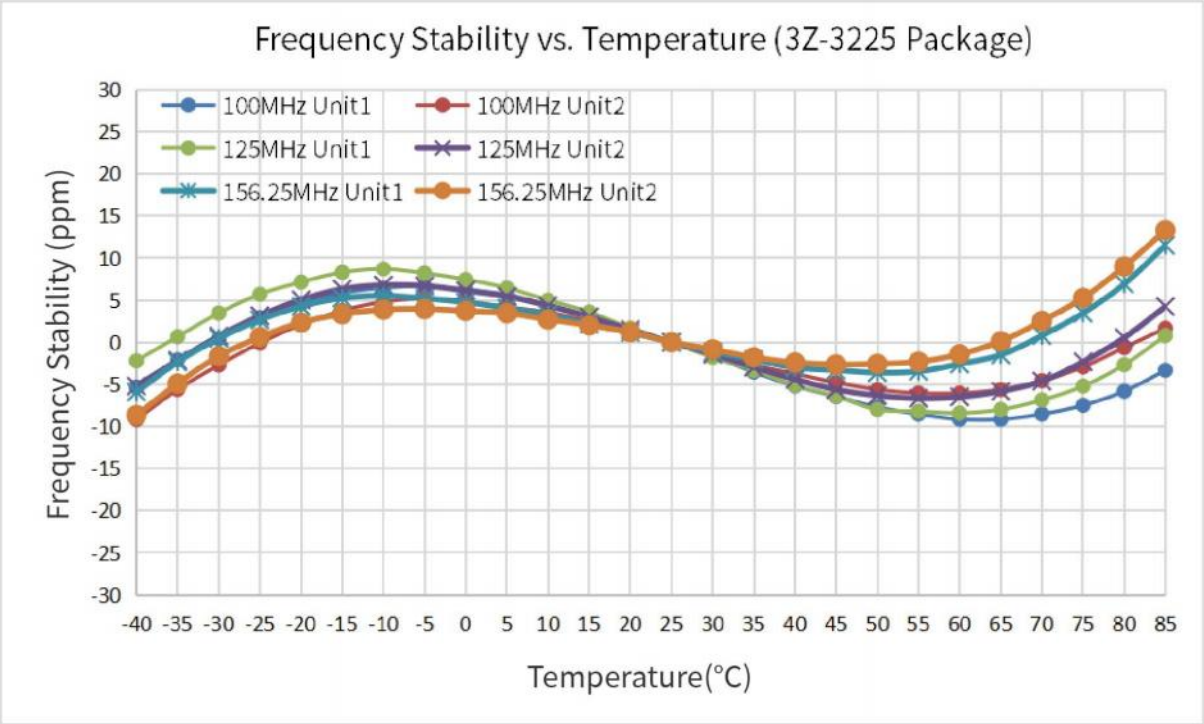
Code	Voltage
D	1.8V
H	2.5V
B	3.3V

Code	Operating Temperature
E	-20°C ~ +70°C
F	-40°C ~ +85°C

Code	Output
P	LVPECL
D	LVDS
H	HCSL

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

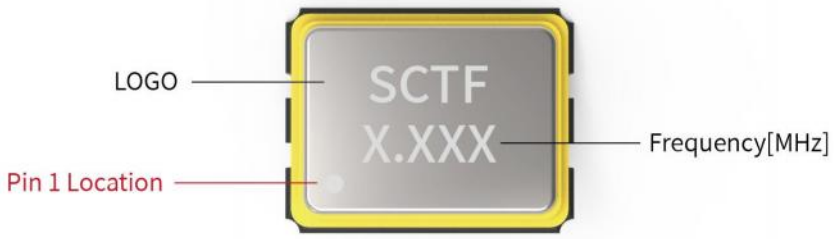
Frequency Temperature Characteristics



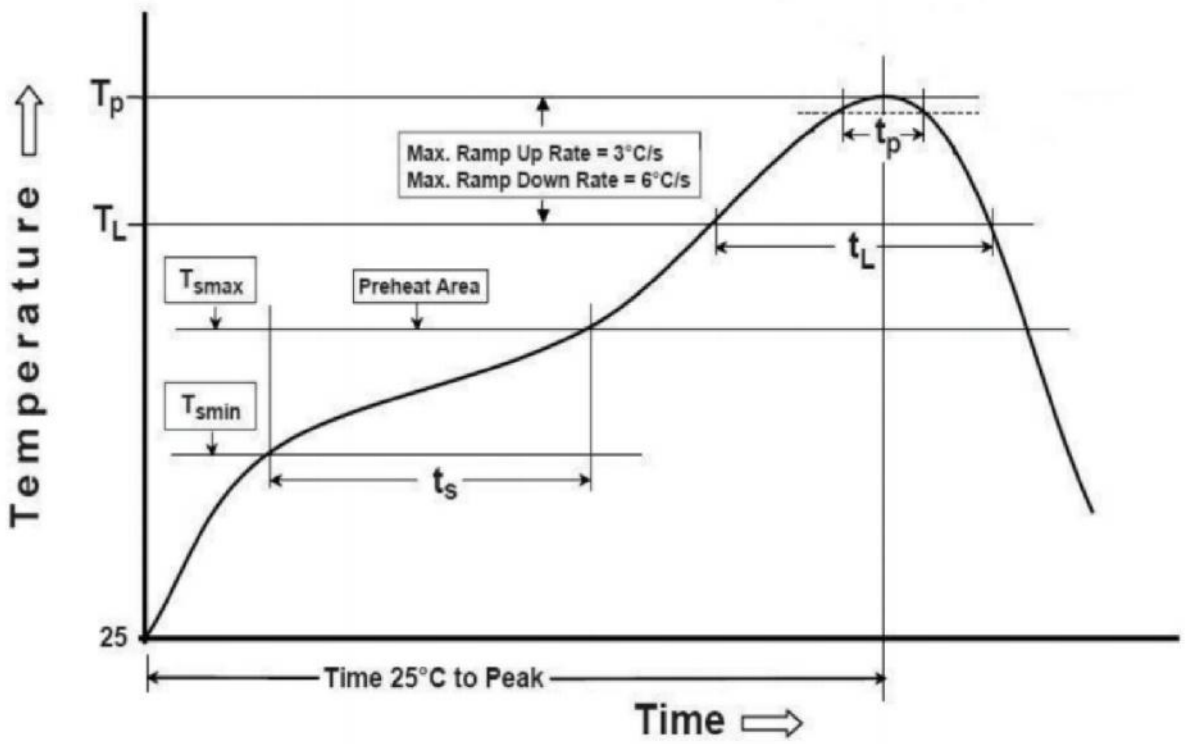
Product Structure&Marking Information

- Product Structure

- Marking Information



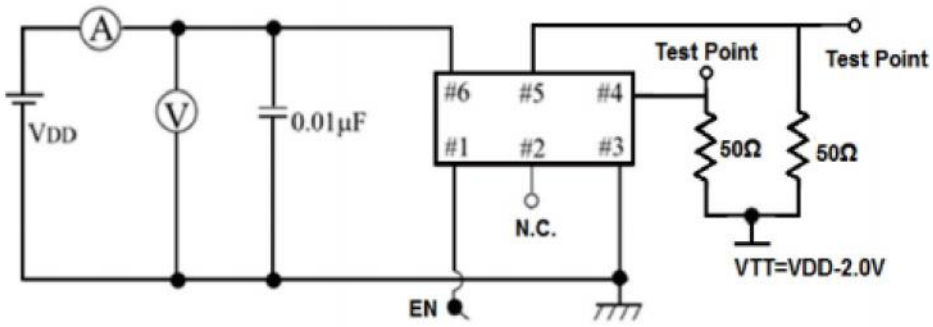
Suggested Reflow Profile



Profile Feature	Sn - Pb Eutectic Assembly	Preheat / Soak
Preheat / Soak ● Temperature Min (Ts min) ● Temperature Max (Ts max) ● Time (Ts min to Ts max)	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 ● Liquidous temperature (TL) ● Time (tL) maintained above TL	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.
Suggust reflow times	**2 Times max.**	

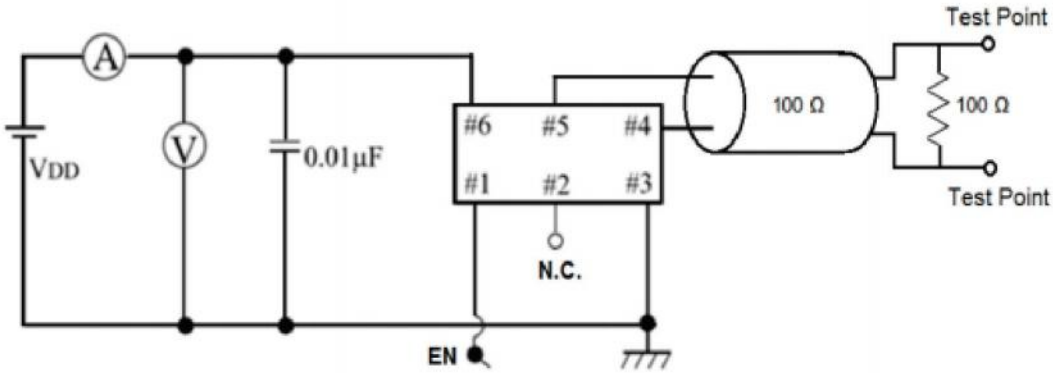
Testing Circuit

- LVPECL



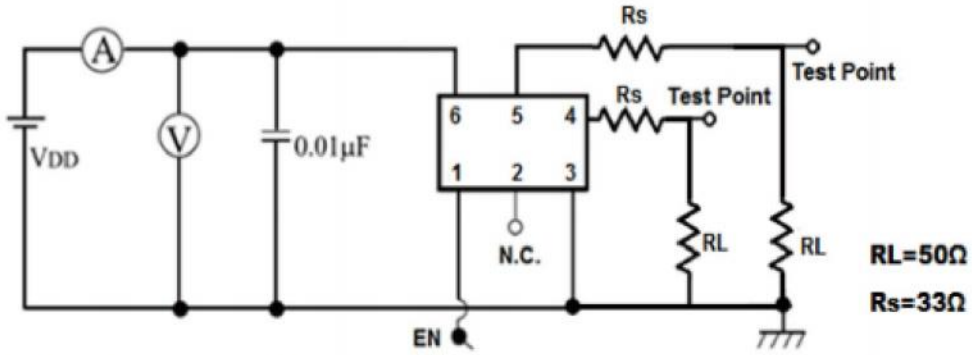
※ Notes: PIN 1 connected to Vdd or floating, the product is working properly;connected to GND,stops working.

- LVDS



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

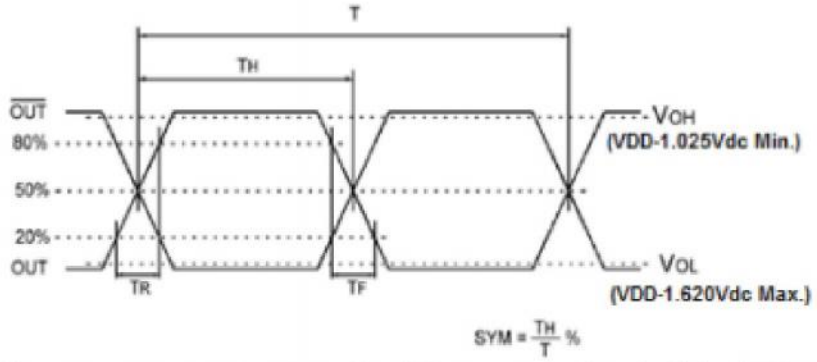
- HCSL



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

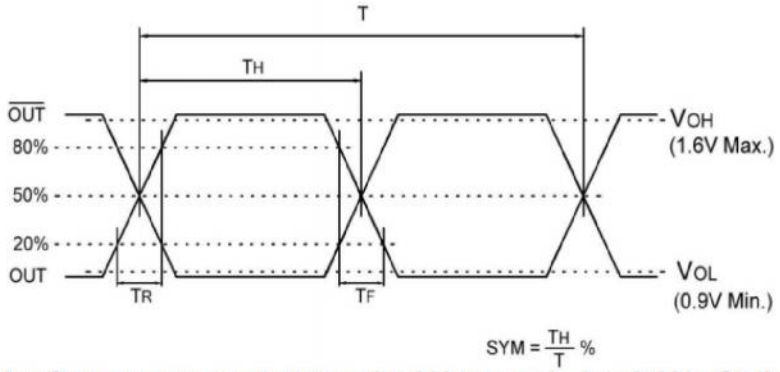
Waveform Conditions

- LVPECL



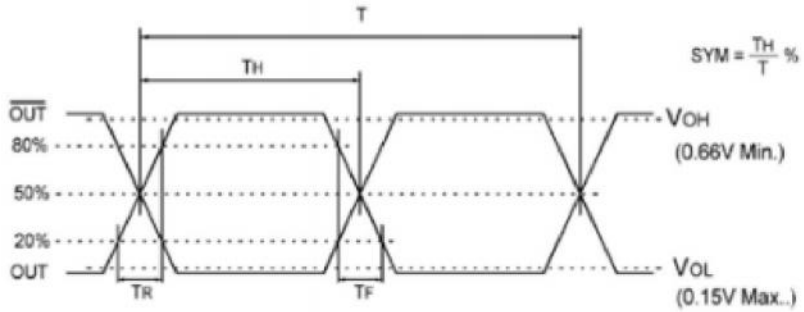
Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.

- LVDS



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

- HCSL



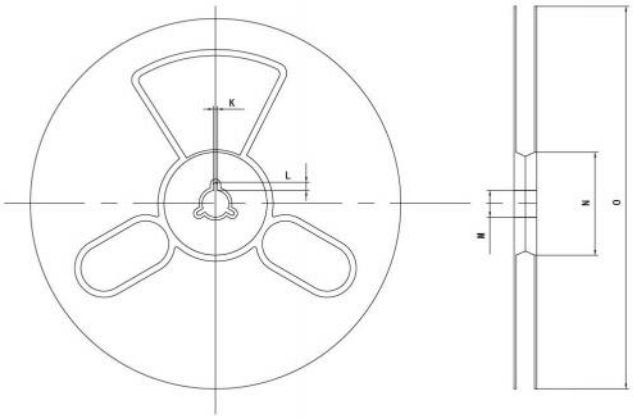
Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.

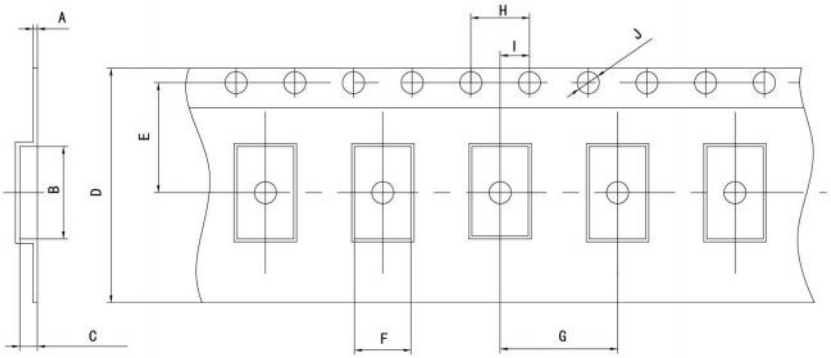
3Z Series 3.2 x 2.5 mm SMD Differential Output Crystal Oscillator

3：3.2×2.5×0.9 mm | SMD3225-6P　　Z：Differential Output Crystal Oscillator(SPXO)

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
3Z	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

3Z Series				
100.000	106.250	125.000	148.500	150.000
155.520	156.250			