

# 5ZQ Series Programmable Differential Output Crystal Oscillator

5 : 5.0×3.2×1.25 mm | SMD5032-6P

ZQ : Differential Output Crystal Oscillator(Programmable)

## Feature

- PLL technology to enable setting any output frequency
- Output Types: LVPECL/LVDS/HCSL
- Tri-state function available
- RMS Phase Jitter :1.5pSec max.
- Pb-free/RoHS Compliant

## Applications

- Networking and communications
- Gigabit Ethernet
- Fibre Channel
- SONET/SDH
- RF systems, base stations (BTS)



## Frequency Stability & Operating Temperature Range

Temp. \ FT	±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 ,200.000			MHz	Contact SCTF for frequencies not listed
Output		LVPECL				
Operating Temperature	T <sub>use</sub>	-20		+70	°C	
		-40		+85	°C	
Storage Temperature Range	T <sub>stg</sub>	-55		+125	°C	
Supply Voltage	V <sub>dd</sub>	1.8 / 2.5 / 3.3			V	±5% max.
Output Load	L <sub>PECL</sub>		50		Ω	V <sub>dd</sub> - 2.0 V
Current Consumption	I <sub>cc</sub>			50	mA	
Duty Cycle	SYM	45		55	%	
Rise / Fall Time	T <sub>R</sub> / T <sub>F</sub>			1	nS	20% V <sub>dd</sub> to 80% Level
Start-up Time	T <sub>str</sub>			10	mS	To 90% of Final Amplitude
High output voltage	V <sub>OH</sub>	V <sub>dd</sub> -1.025			V	
Low output voltage	V <sub>OL</sub>			V <sub>dd</sub> -1.62	V	
Enable Voltage High (Logic 1)	V <sub>IH</sub>	0.7V <sub>dd</sub>			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 <sub>IL</sub>			0.3V <sub>dd</sub>	V	
RMS Phase Jitter	T <sub>RPJ</sub>			1.5	pSec	Period Jitter(12KHz-20MHz)
Phase Noise@156.25MHz	100 Hz		-80		dBc/Hz	
	1 KHz		-100		dBc/Hz	
	10 KHz		-110		dBc/Hz	
Aging	f <sub>age</sub>			3	ppm	1st. Year at 25°C

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Standard Frequency	Freq.	100.000 ,106.250 ,125.000 148.500 ,150.000 ,155.520 156.250 ,200.000			MHz	Contact SCTF for frequencies not listed
Output		LVDS				
Operating Temperature	T <sub>use</sub>	-20		+70	°C	
		-40		+85	°C	
Storage Temperature Range	T <sub>stg</sub>	-55		+125	°C	
Supply Voltage	V <sub>dd</sub>	1.8 / 2.5 / 3.3			V	± 5% max.
Output Load	L <sub>LVDS</sub>		100		Ω	
Current Consumption	I <sub>cc</sub>			50	mA	
Duty Cycle	SYM	45		55	%	
Rise / Fall Time	T <sub>R</sub> / T <sub>F</sub>			1	nS	20% V <sub>dd</sub> to 80% Level
Start-up Time	T <sub>str</sub>			10	mS	To 90% of Final Amplitude
High output voltage	V <sub>OH</sub>			1.6	V	
Low output voltage	V <sub>OL</sub>	0.9			V	
Enable Voltage High (Logic 1)	V <sub>IH</sub>	0.7V <sub>dd</sub>			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 <sub>IL</sub>			0.3V <sub>dd</sub>	V	
RMS Phase Jitter	T <sub>RPJ</sub>			1.5	pSec	Period Jitter(12KHz-20MHz)
Phase Noise@156.25MHz	100 Hz		-80		dBc/Hz	
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Standard Frequency	Freq.	100.000 ,106.250 ,125.000 148.500 ,150.000 ,155.520 156.250 ,200.000			MHz	Contact SCTF for frequencies not listed
Output		HCSL				
Operating Temperature	T <sub>use</sub>	-20		+70	°C	
		-40		+85	°C	
Storage Temperature Range	T <sub>stg</sub>	-55		+125	°C	
Supply Voltage	V <sub>dd</sub>	1.8 / 2.5 / 3.3			V	± 5% max.
Output Load	L <sub>HCSL</sub>	R <sub>s</sub> =33 , R <sub>L</sub> =50			Ω	
Current Consumption	I <sub>cc</sub>			50	mA	
Duty Cycle	SYM	45		55	%	
Rise / Fall Time	T <sub>R</sub> / T <sub>F</sub>			1	nS	20% V <sub>dd</sub> to 80% Level
Start-up Time	T <sub>str</sub>			10	mS	To 90% of Final Amplitude
High output voltage	V <sub>OH</sub>	0.66			V	
Low output voltage	V <sub>OL</sub>			0.15	V	
Enable Voltage High (Logic 1)	V <sub>IH</sub>	0.7V <sub>dd</sub>			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 <sub>IL</sub>			0.3V <sub>dd</sub>	V	
RMS Phase Jitter	T <sub>RPJ</sub>			1.5	pSec	Period Jitter(12KHz-20MHz)
Phase Noise@156.25MHz	100 Hz		-80		dBc/Hz	
	1 KHz		-100		dBc/Hz	
	10 KHz		-110		dBc/Hz	
Aging	f <sub>age</sub>			3	ppm	1st. Year at 25°C

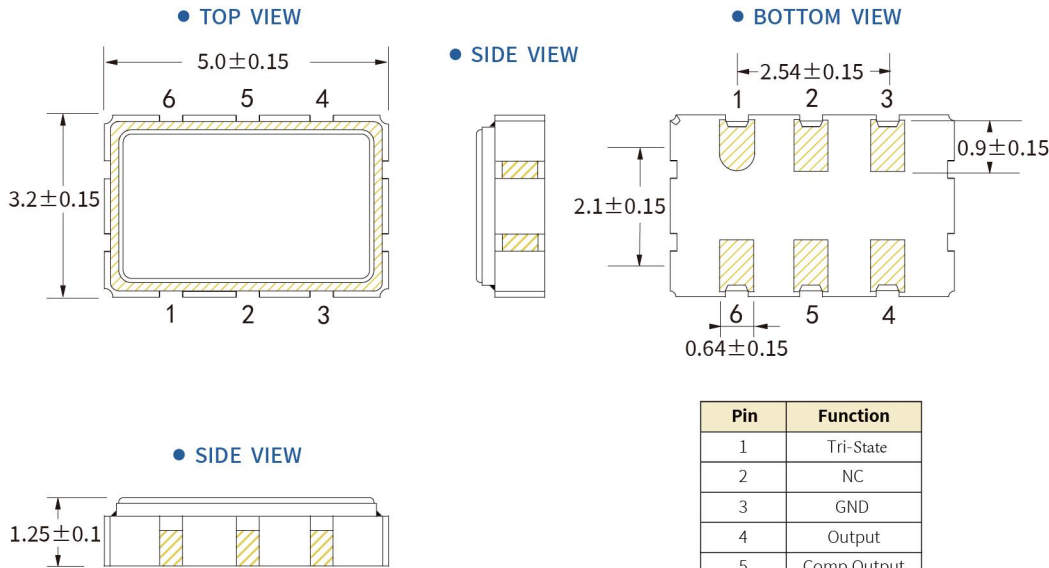
更新日期：2024年4月10日

# 5ZQ Series      Programmable Differential Output Crystal Oscillator

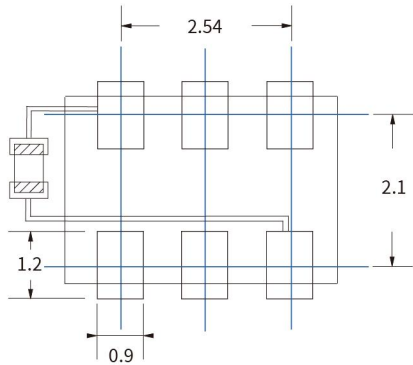
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ZQ : Differential Output Crystal Oscillator(Programmable)

## Dimensions (UNIT:mm)



## 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 SXQP5DF100.000B20F30DNN

Company	Technology	Ceramic Package	Frequency Code [MHZ]	Supply Voltage	Frequency Tolerance	Operating Temperature	Frequency Drift	Output	Current Consumption	Phase Noise
SX	QP	5DF	X.XXX	B	20	F	30	D	N	N
Code Company			Frequency		Code Frequency Tolerance		Code Frequency Drift		Code Current	
SX SCTF			100.000		10 ±10ppm 20 ±20ppm		15 ±15ppm 20 ±20ppm 30 ±30ppm		N Standard	
	Code Technology									
	QP Q-MEMS									
		Code Ceramic Package		Code Voltage		Code Operating Temperature		Code Output		Code Phase Noise
		7DF 7.0×5.0×1.6mm		D 1.8V		E -20°C ~ +70°C		P LVPECL		N Standard
		5DF 5.0×3.2×1.25mm		H 2.5V		F -40°C ~ +85°C		D LVDS		
		3DF 3.2×2.5×0.9mm		B 3.3V				H HCSL		

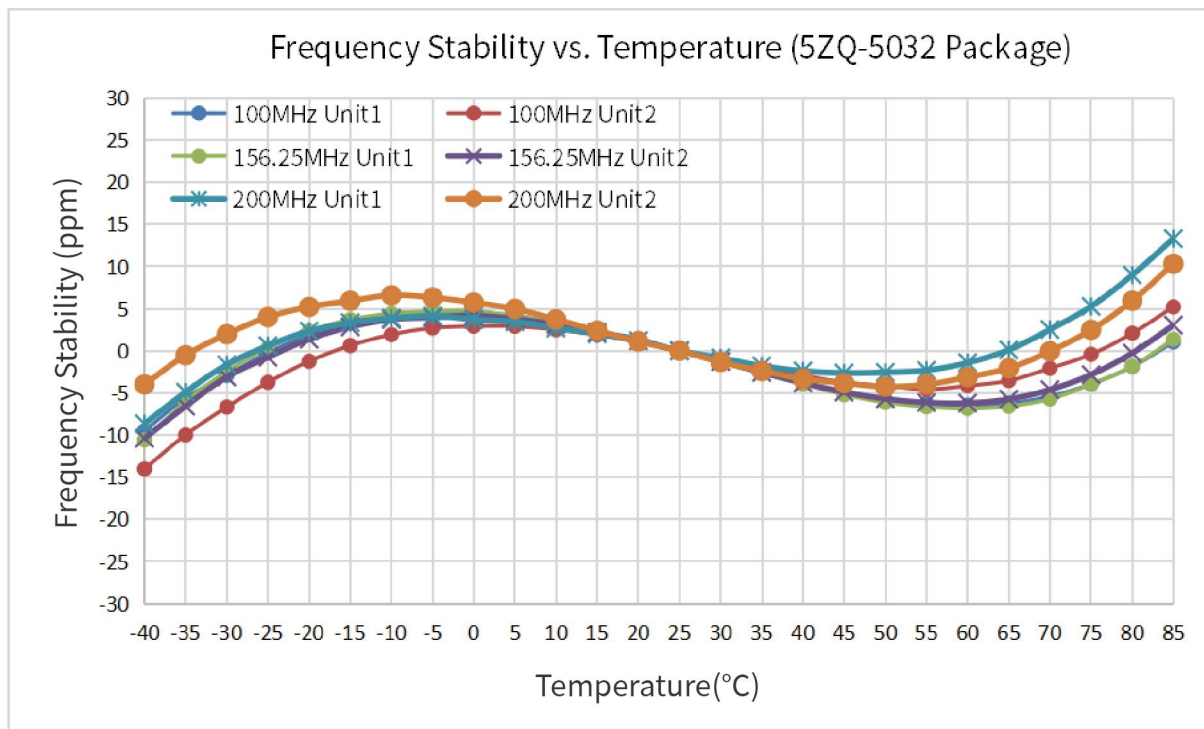
If you have other parameter requirements, you can contact **SCTF** at any time.

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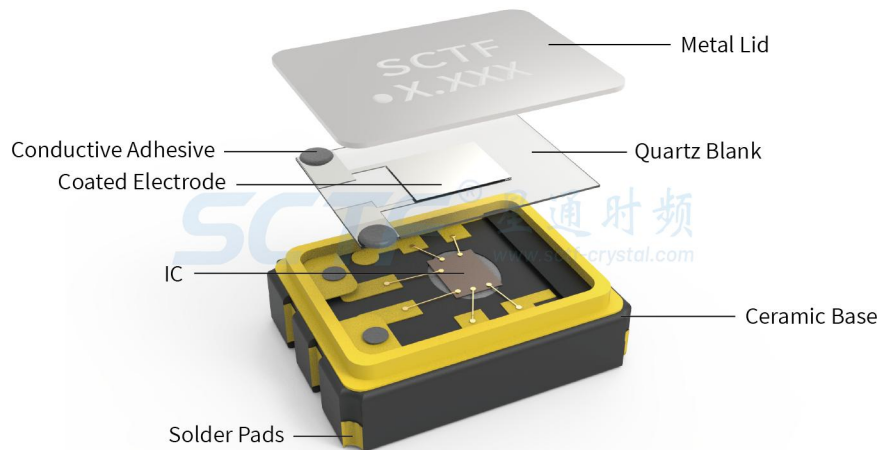
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## Frequency Temperature Characteristics

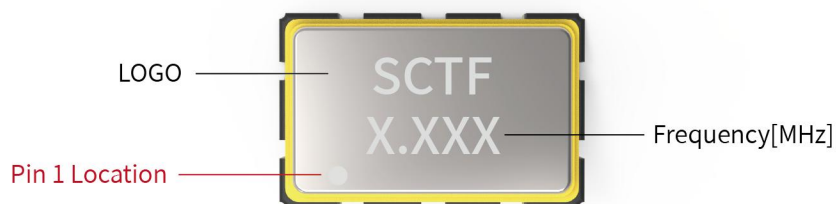


## Product Structure&Marking Information

### Product Structure

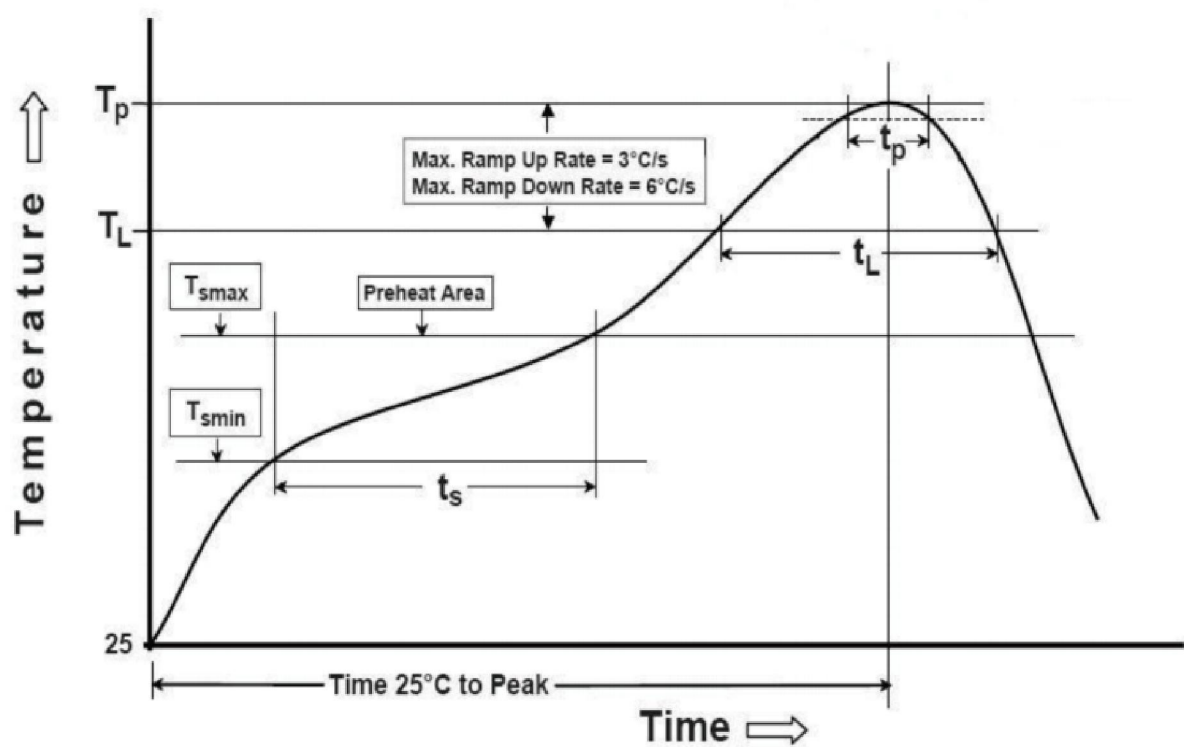


### Marking Information





Suggested Reflow Profile



Profile Feature	Sn - Pb Eutectic Assembly	Preheat / Soak
Preheat / Soak <ul style="list-style-type: none"><li>● Temperature Min ( Ts min )</li><li>● Temperature Max ( Ts max )</li><li>● Time ( Ts min to Ts max )</li></ul>	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 <ul style="list-style-type: none"><li>● Liquidous temperature ( TL )</li><li>● Time ( tL ) maintained above TL</li></ul>	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.
Suggest reflow times	2 Times max.	

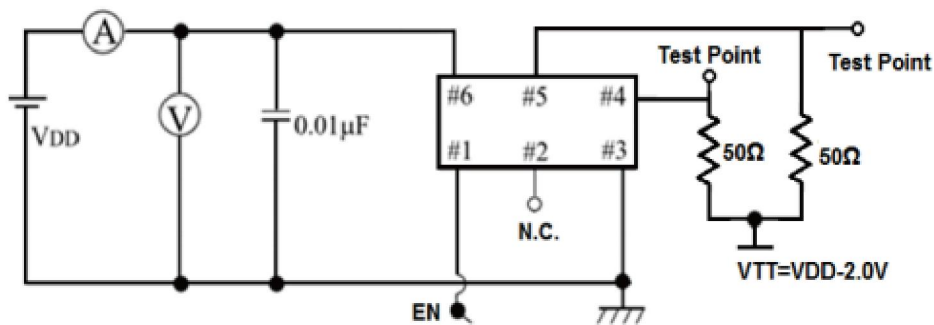
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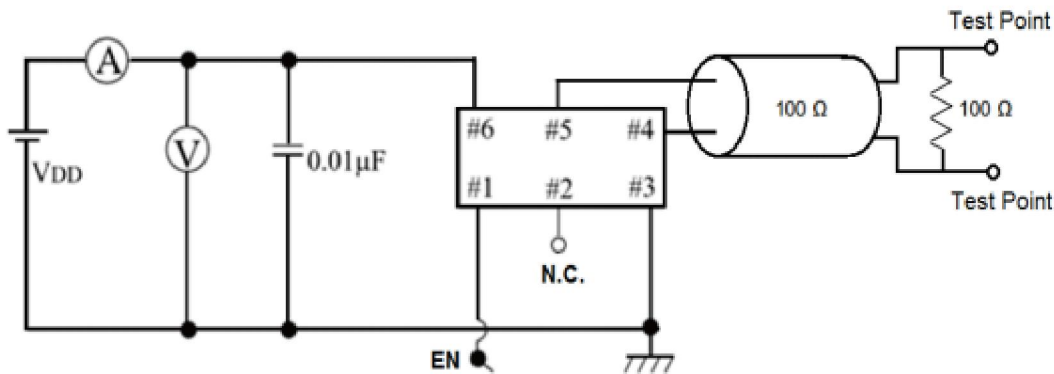
## Testing Circuit

### • LVPECL



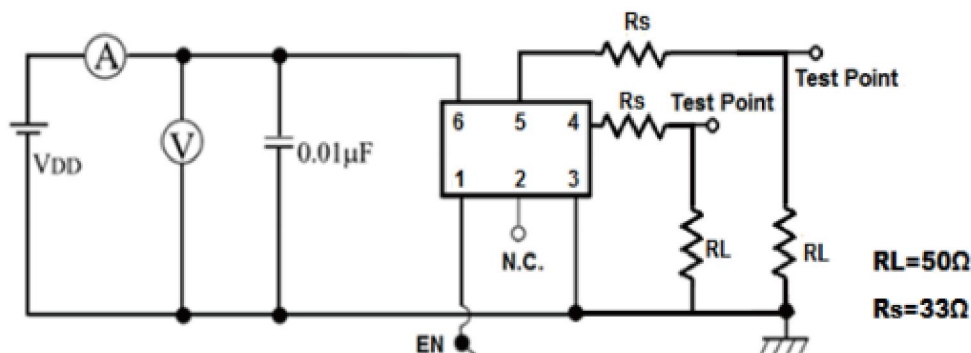
※ Notes: PIN 1 connected to  $V_{DD}$  or floating, the product is working properly; connected to GND, stops working.

### • LVDS



※ Notes: PIN 1 connected to  $V_{DD}$  or floating, the product is working properly; connected to GND, stops working.

### • HCSL



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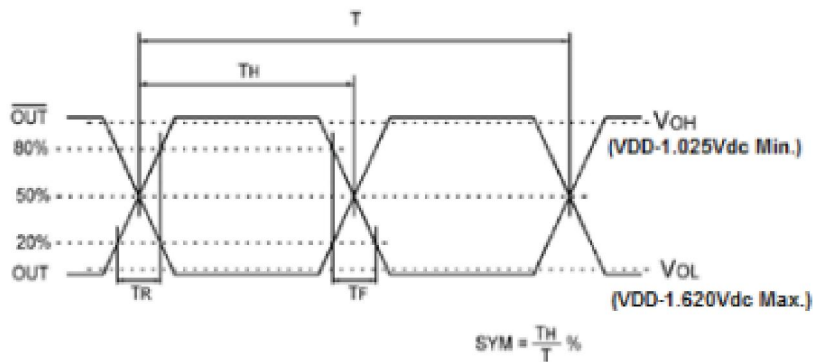
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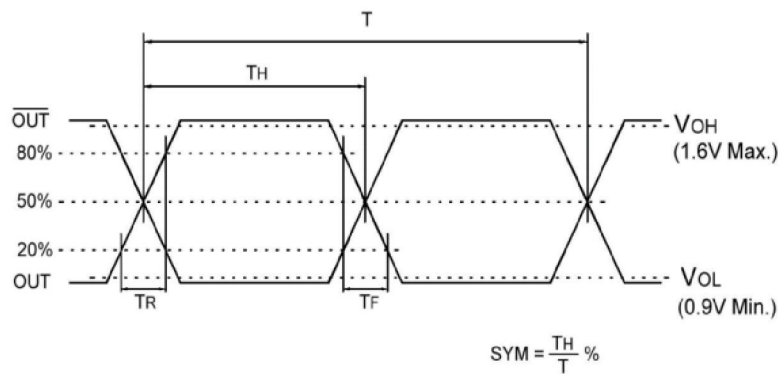
## Waveform Conditions

- LVPECL



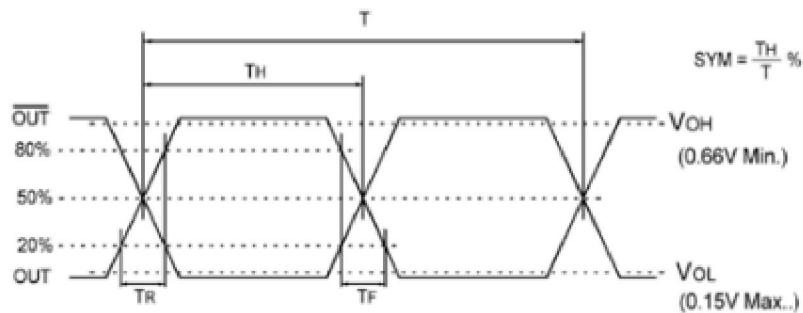
Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.

- LVDS



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

- HCSL



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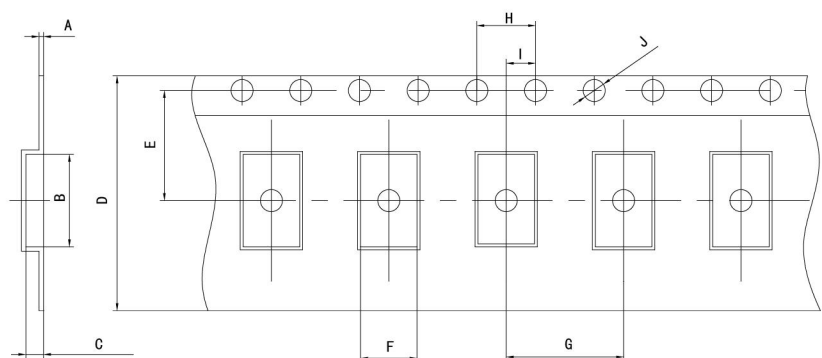
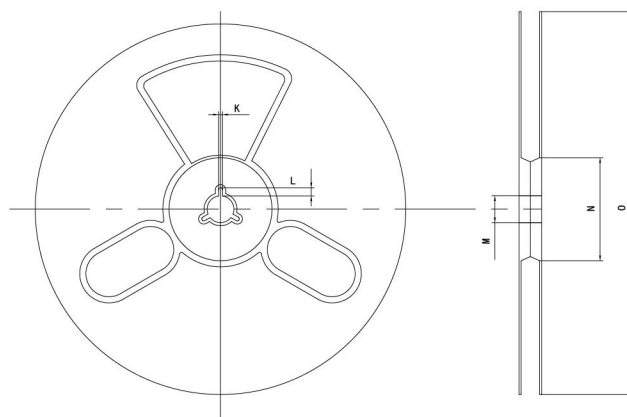
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## Packaging Information

T=Tape and reel (1,000pcs/reel)



Pocket Tape Dimensions(mm)

Series	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5ZQ	0.3±0.05	5.5±0.1	1.25±0.1	12±0.1	5.5±0.1	3.6±0.1	8.0±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

5ZQ Series				
100.000	106.250	108.000	114.000	114.285
120.000	122.880	125.000	128.000	133.000
135.000	148.350	148.500	149.875	150.000
153.600	155.520	156.250	160.000	166.000
175.000	187.500	200.000		