

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_use | -20 | | +70 | °C | |
| | | -40 | | +85 | °C | |
| Storage Temperature 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 | |
| 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} | | | 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_age | | | 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 _{use} | -20 | | +70 | °C | |
| | | -40 | | +85 | °C | |
| Storage Temperature Range | T _{stg} | -55 | | +125 | °C | |
| Supply Voltage | V _{dd} | 1.8 / 2.5 / 3.3 | | | V | ±5% max. |
| Output Load | L _{LVDS} | | 100 | | Ω | |
| Current Consumption | I _{cc} | | | 50 | mA | |
| Duty Cycle | SYM | 45 | | 55 | % | |
| Rise / Fall Time | T _R / T _F | | | 1 | nS | 20% V _{dd} 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} | 0.7V _{dd} | | | 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} | | | 0.3V _{dd} | V | |
| RMS Phase Jitter | T _{RPJ} | | | 1.5 | pSec | Period Jitter(12KHz-20MHz) |
| Phase Noise@156.25MHz | 100 Hz | | -80 | | dBc/Hz | |
| | 1 KHz | | -100 | | 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 _{use} | -20 | | +70 | °C | |
| | | -40 | | +85 | °C | |
| Storage Temperature Range | T _{stg} | -55 | | +125 | °C | |
| Supply Voltage | V _{dd} | 1.8 / 2.5 / 3.3 | | | V | ±5% max. |
| Output Load | L _{HCSL} | | R _S =33 , R _L =50 | | Ω | |
| Current Consumption | I _{cc} | | | 50 | mA | |
| Duty Cycle | SYM | 45 | | 55 | % | |
| Rise / Fall Time | T _R / T _F | | | 1 | nS | 20% V _{dd} 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} | 0.7V _{dd} | | | 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} | | | 0.3V _{dd} | V | |
| RMS Phase Jitter | T _{RPJ} | | | 1.5 | pSec | Period Jitter(12KHz-20MHz) |
| Phase Noise@156.25MHz | 100 Hz | | -80 | | dBc/Hz | |
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| Aging | f _{age} | | | 3 | ppm | 1st. Year at 25°C |

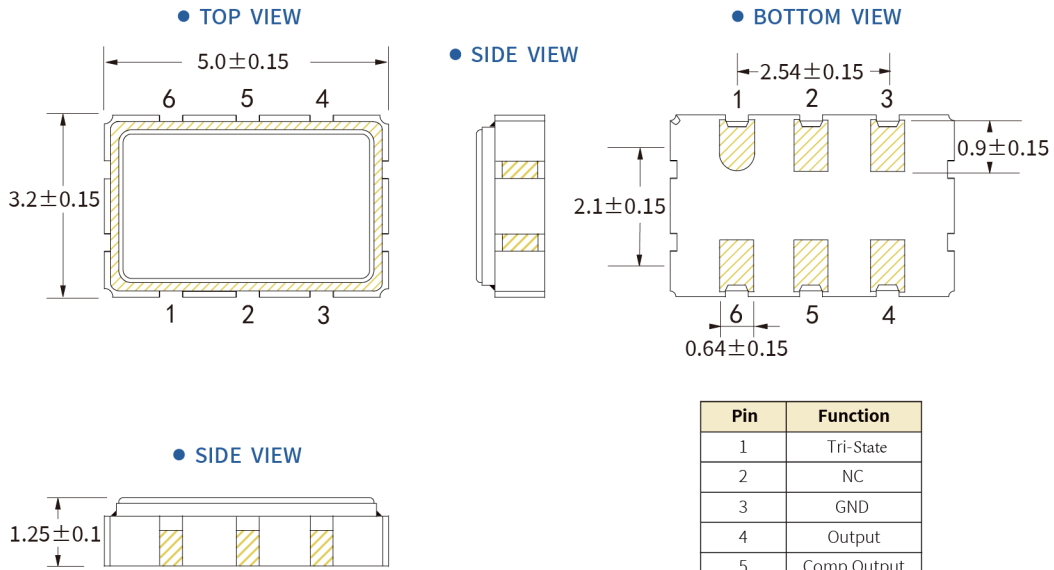
更新日期：2024年4月10日

5ZQ Series Programmable Differential Output Crystal Oscillator

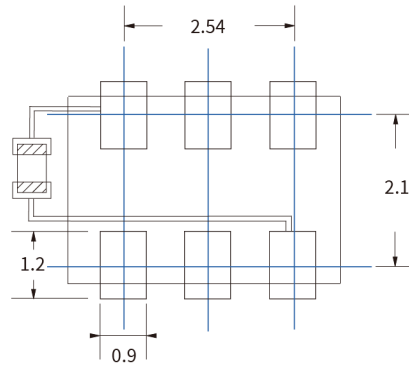
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ZQ : Differential Output Crystal Oscillator(Programmable)

Dimensions (UNIT:mm)



Solder pad layout (UNIT:mm)



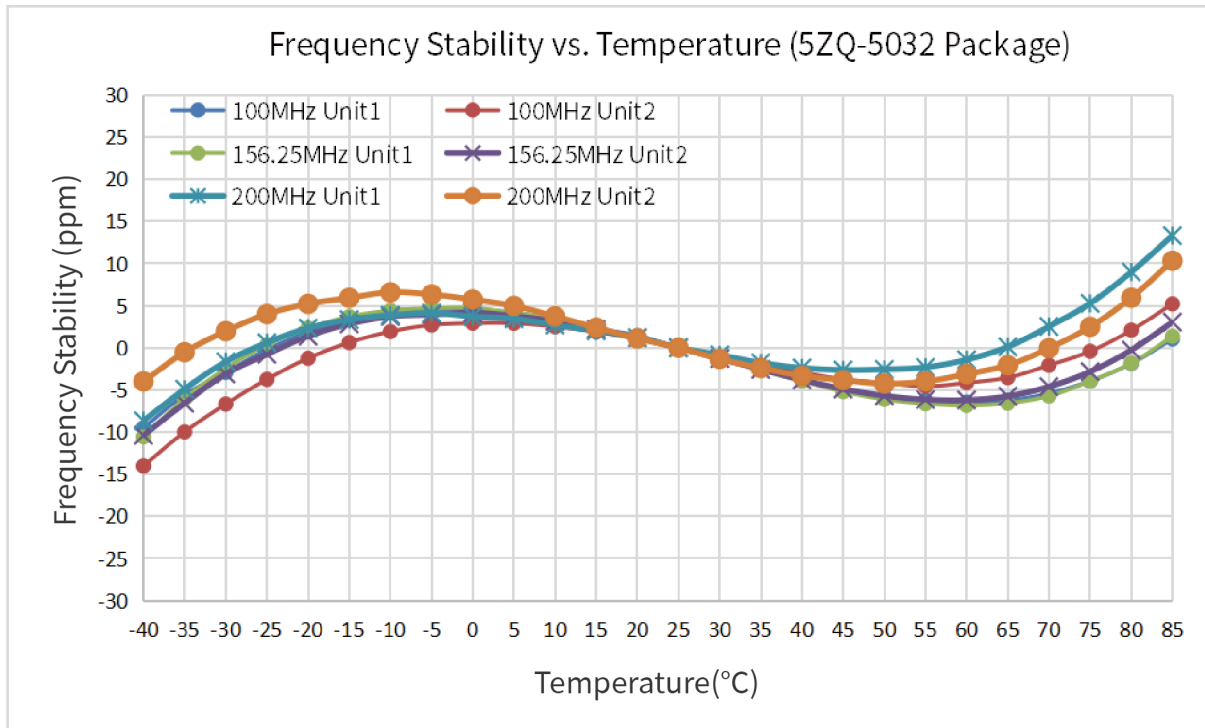
To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.

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 7.0×5.0×1.45mm 5DF 5.0×3.2×1.25mm 3DF 3.2×2.5×0.9mm | | D 1.8V H 2.5V B 3.3V | | E -20°C ~ +70°C F -40°C ~ +85°C | | P LVPECL D LVDS H HCSSL | | N Standard |

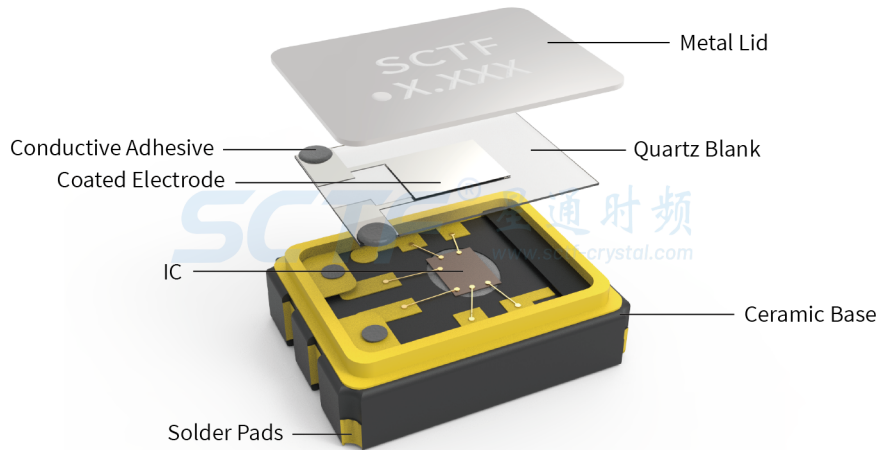
If you have other parameter requirements, you can contact **SCTF** at any time.

Frequency Temperature Characteristics

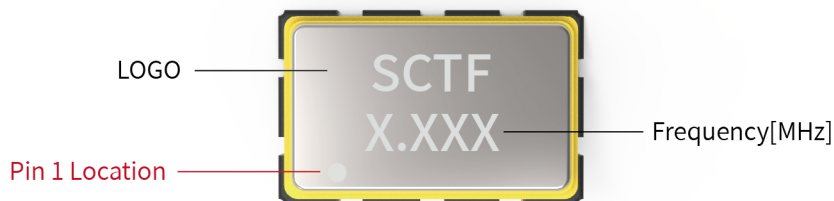


Product Structure & Marking Information

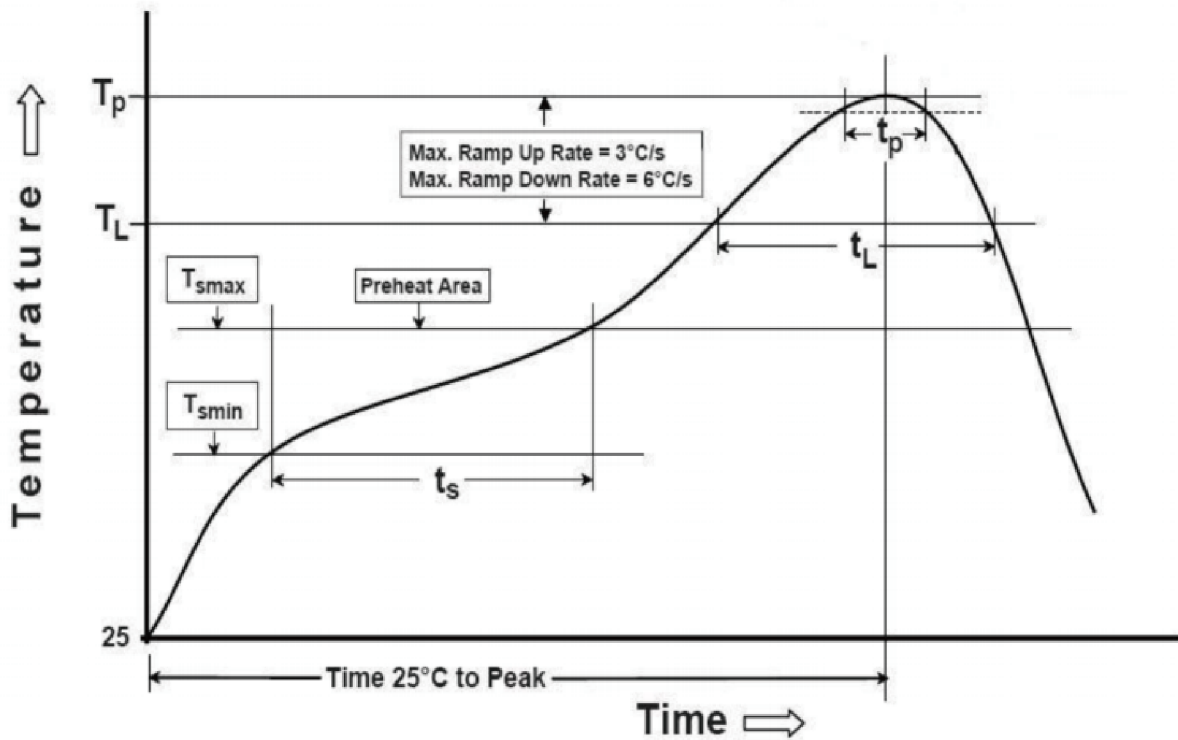
Product Structure



Marking Information



Suggested Reflow Profile



| Profile Feature | Sn - Pb Eutectic Assembly | Preheat / Soak |
|--|----------------------------------|----------------------------------|
| Preheat / Soak <ul style="list-style-type: none"> ● Temperature Min (T_s min) ● Temperature Max (T_s max) ● Time (T_s min to T_s max) | 100°C 150°C 60-120 seconds | 150°C 200°C 60-120 seconds |
| Ramp - up rate (T _L to T _p) | 3°C/ second max. | 3°C/ second max. |
| Time maintained above <ul style="list-style-type: none"> ● Liquidous temperature (T_L) ● Time (t_L) maintained above T_L | 183°C 60-150 seconds | 217°C 60-150 seconds |
| Peak package body temperature (T _p) | 235°C | 260°C |
| Time within 5° C of the specified classification temperature (T _p) | 20 seconds | 30 seconds |
| Ramp - down rate (T _p to T _L) | 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. | |

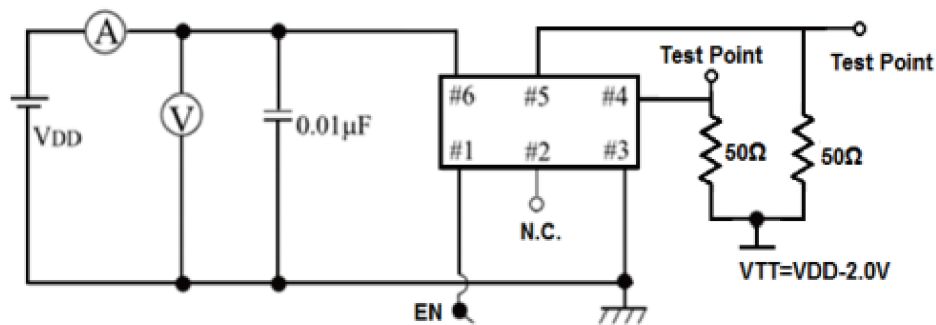
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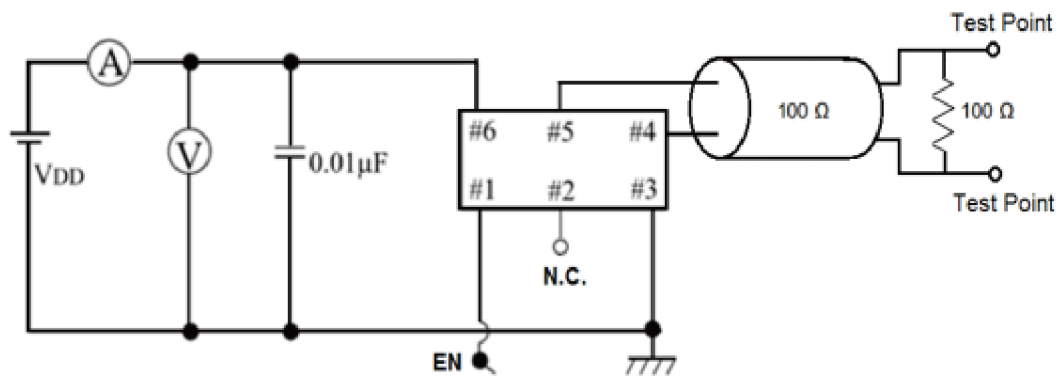
Testing Circuit

- LVPECL



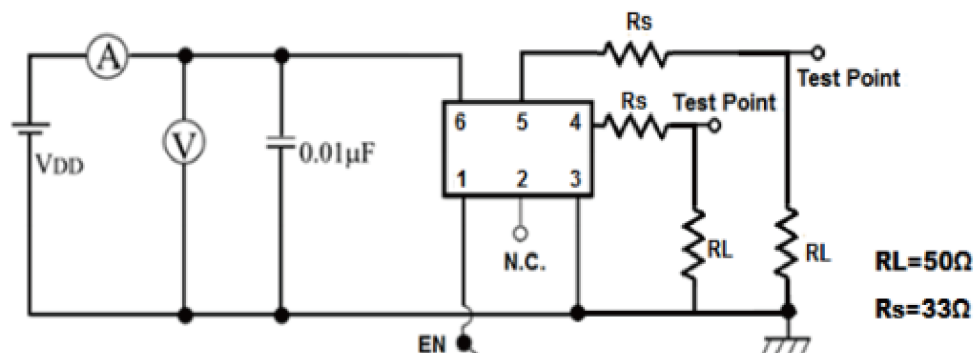
※ Notes: PIN 1 connected to Vdd or floating, the product is working properly;connected to GND,stops working.

- LVDS



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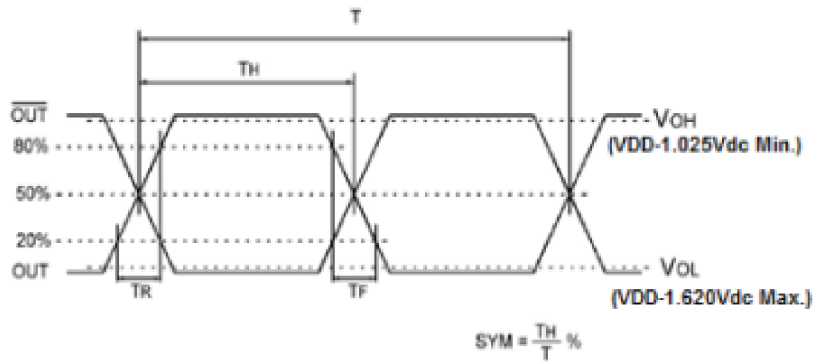
- HCSL



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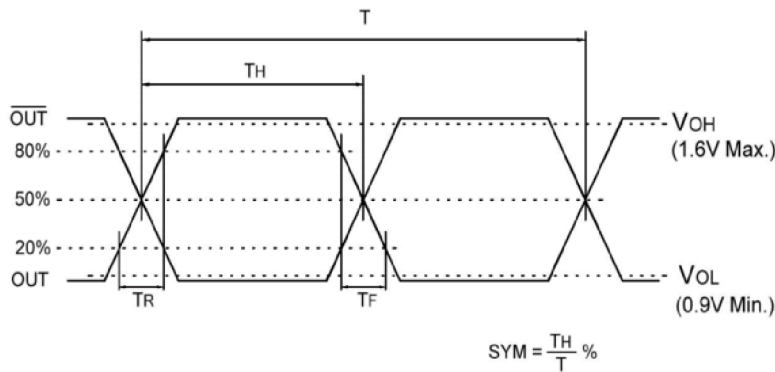
Waveform Conditions

- LVPECL



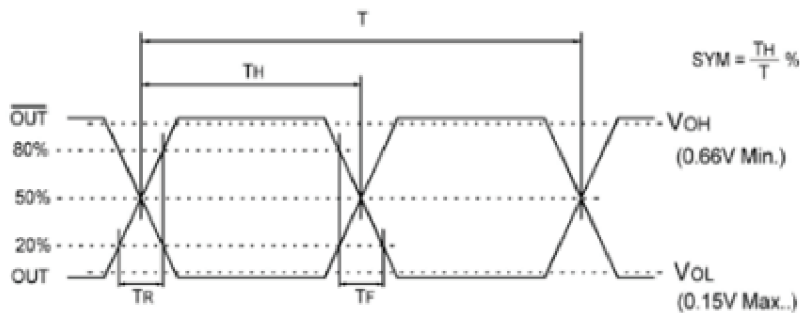
Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.

- LVDS



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

- HCSL



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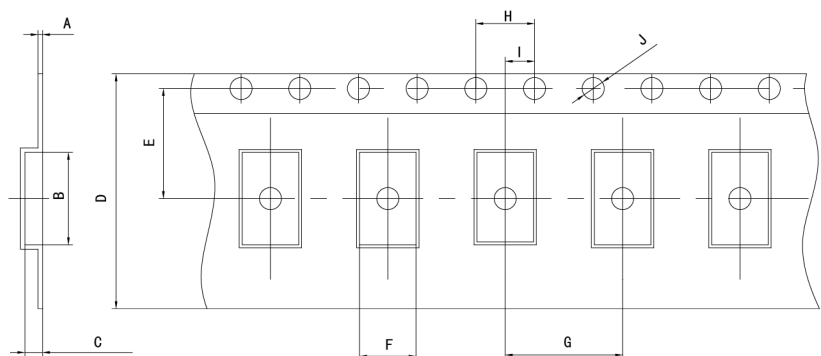
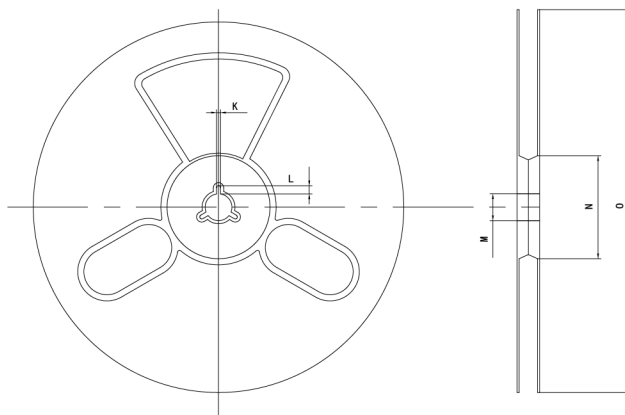
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Packaging Information

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 | | |