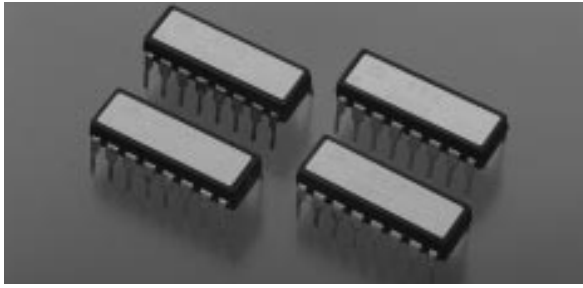


Crystal Oscillators - Programmable - Seiko Epson

SPG Series



Features

- Capable of selecting 57 varieties of frequency output
- Use of CMOS IC enables low current consumption
- Easy-to-mount DIP 16 pin type
- Most types held ex-stock

Specifications

| Item | Symbol | Specifications | | | | | | | | | | | Remarks | |
|-----------------------------------|---------------------|----------------------------|--------------|--------------|----------------------|--------|-------|-----------------------------|-----------|-------|-----------------------------|-----------|------------------------------------|-------------------------------------|
| Model name | | 8640AN | 8640BN | 8640CN | 8650A | 8650B | 8650C | 8650D | 8650E | 8651A | 8651B | 8651E | For output frequency, refer to the | |
| Oscillation source frequency | f_o | 600kHz | 1MHz | 769kHz | 60kHz | 100kHz | 96kHz | 153.6kHz | 32.768kHz | 60kHz | 100kHz | 32.768kHz | table on the next page | |
| Power source | Max. supply voltage | V_{DD-GND} | | | | | | | | | | | -0/3V ~ +7.0V | |
| voltage | Operating voltage | V_{DD} | | | | | | | | | | | 5.0V \pm 0.5V | |
| Temperature | Storage temp. | | | | | | | | | | | | -55°C ~ +125°C | |
| range | Operating temp. | | | | | | | | | | | | -10°C ~ +70°C | |
| Soldering condition (lead part) | T_{SOL} | Under 260°C within 10 sec. | | | | | | | | | | | Package should be less than 150°C | |
| Frequency tolerance | $\Delta f/f$ | ± 100 ppm | | | ± 50 ppm | | | ± 5 ppm (1*) | | | $V_{DD}=5V, T_a=25^\circ C$ | | | |
| Frequency/temp. characteristics | | | | | | | | | | | | | +10/-120ppm | $V_{DD}=5V, T_a=10 \sim 70^\circ C$ |
| Frequency Voltage characteristics | | ± 20 ppm | ± 10 ppm | ± 20 ppm | ± 10 ppm | | | ± 5 ppm | | | $V_{DD}=4.5 \sim 5.5V$ | | | |
| Aging | f_a | ± 5 ppm/year max. | | | ± 3 ppm/year max | | | $V_{DD}=5V, T_a=25^\circ C$ | | | | | | |
| Current consumption | I_{OP} | 1.0mA | 2.0mA | 1.5mA | 0.5mA | | | Max. No load condition | | | | | | |

(*1) Frequency tolerance of 8651 system shows the value guaranteed at the time of shipment

Electrical Characteristics $V_{DD}=5V \pm 0.5V, T_a=10 \sim 70^\circ C, C_L \leq 15pF$

| Item | Symbol | Min. | Typ. | Max. | Unit | Remarks |
|---|-----------|------------------------------|------|----------|---------|-----------------------------------|
| L input voltage | V_{IL} | 0 | | 0.8 | V | |
| H input voltage | V_{IH} | $V_{DD}-1.0$ | | V_{DD} | V | |
| L input current (Reset) | I_{RL} | -30 | | -5 | μA | Reset= V_{SS} |
| H input current (Reset) | I_{RH} | | | 0.5 | μA | Reset= V_{DD} |
| L input current (input terminal except for Reset) | I_{IL} | -0.5 | | | μA | |
| H input current (input terminal except for Reset) | I_{IH} | 5 | | 30 | μA | |
| L output voltage | V_{OL} | | | 0.4 | V | $I_{OL}=1.6mA$ |
| H output voltage | V_{OH} | $V_{DD}-1.0$ | | | V | $I_{OH}=40\mu A$ |
| L output current | I_{OL} | 1.6 | | | mA | $V_{OL}=0.4V$ |
| H output current | I_{OH} | | | -40 | μA | $V_{OH}=V_{DD}-1.0V$ |
| Output rise time | t_{rLH} | | 30 | 60 | nS | |
| Output fall time | t_{rHL} | | 25 | 50 | nS | |
| Duty | | 40 | | 60 | % | Except in the case of 1/3 and 1/5 |
| Min. reset pulse width | t_{RW} | 1.0 | | | μS | |
| Reset delay time | t_R | | | 1.0 | μS | |
| Reset release synchronous error | t_E | $t_w-1/2$ to (*1) t_w (*2) | | | | |
| External signal input frequency | F_{IN} | | | 1M | Hz | 8640N only |
| External signal input plus width | t_{IN} | 0.5 | | | μS | 8640N only |
| Oscillation startup time | t_{OSC} | | 0.2 | 1 | sec. | (*3) |

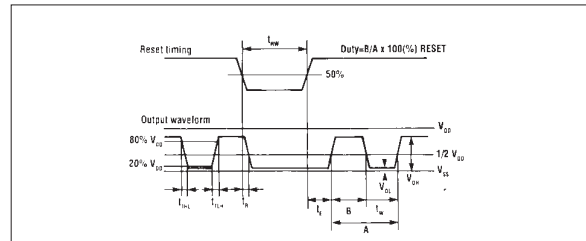
(*1) to-oscillation source cycle. (*2) $t_w-1/2$ cycle of preset frequency
 (*3) for more than 1mS until $V_{DD}=0.4.5V$. Time at 4.5V is to be zero

Divider IC (without quartz crystal)

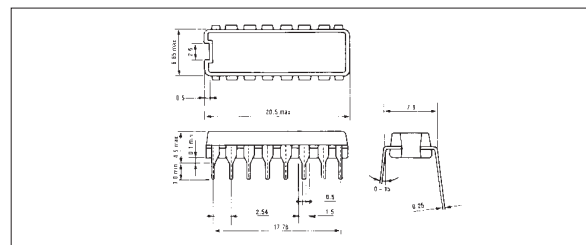
| Item | Symbol | Specifications | Remarks |
|-----------------------|----------|----------------|-------------------|
| Model name | | 8650 ? | |
| Input clock frequency | | 1MHz MAX | |
| Current consumption | I_{OP} | about 2mA | No load condition |



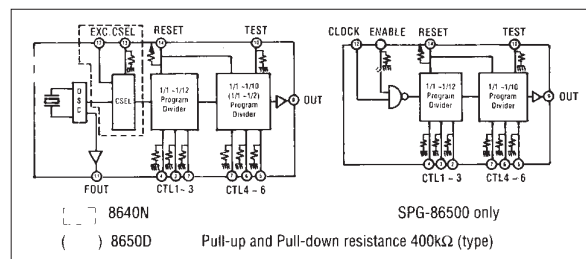
Reset Timing



Dimensions (mm)



Block Diagram



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