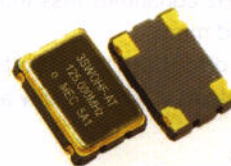


## Applications :

- CPU , Graphics , Multimedia A / V clocks
- MPEG / DVD / HDTV clocks
- Laser engine pixel / set - top clocks
- OC-3 , OC-12 , OC-48 and OC-192 clocks
- SONET / SDH / ATM clocks
- Fast Ethernet and Gigabit Ethernet clocks
- NTSC / PAL encoder / decoder clocks
- PLL / synthesizer clocks
- Fibre channel and ADSL clocks



RoHS Compliance



## General Specifications

T<sub>A</sub> = +25°C , V<sub>DD</sub> = at specified voltage , Load : 15 pF

| Model                                                                         | " SWO " ; " H53 " and " H32 " series                                                                                                                                                                                                                                                   |                                                           |                                                           |                                                           |
|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|
|                                                                               | Overall Frequency Range                                                                                                                                                                                                                                                                | Supply Voltage Choices                                    | Output Logic                                              | Package Dimensions                                        |
| " SWO " series                                                                | 0.3125 ~ 125 MHz                                                                                                                                                                                                                                                                       | 1.8 V ; 2.5 V ; 3.3 V or 5.0 V                            | CMOS                                                      | 5.0 x 7.0 x 1.4 mm                                        |
| " H53 " series                                                                | 1.0 ~ 125 MHz                                                                                                                                                                                                                                                                          | 1.8 V ; 2.5 V ; 3.3 V or 5.0 V                            | CMOS                                                      | 3.2 x 5.0 x 1.2 mm                                        |
| " H32 " series                                                                | 1.0 ~ 54 MHz                                                                                                                                                                                                                                                                           | 1.8 V ; 2.5 V ; 3.3 V or 5.0 V                            | CMOS                                                      | 2.5 x 3.2 x 1.0 mm                                        |
| Supply Voltage ( V <sub>DD</sub> )                                            | V <sub>DD</sub> = +1.8V D.C.±5%<br>Voltage code is " 18 "                                                                                                                                                                                                                              | V <sub>DD</sub> = +2.5V D.C.±5%<br>Voltage code is " 25 " | V <sub>DD</sub> = +3.3 V D.C.±5%<br>Voltage code is " 3 " | V <sub>DD</sub> = +5.0V D.C.±10%<br>Voltage code is " 5 " |
| Available Frequency Range by V <sub>DD</sub>                                  | 1.0 ~ 60.0 MHz                                                                                                                                                                                                                                                                         | 0.3 ~ 125.0 MHz                                           | 0.3 ~ 125.0 MHz                                           | 0.5 ~ 125.0 MHz                                           |
| Output Logic High "1" ( 90% of V <sub>DD</sub> min. )                         | 1.62 V min.                                                                                                                                                                                                                                                                            | 2.25 V min.                                               | 2.97 V min.                                               | 4.5 V min.                                                |
| Output Logic Low "0" ( 10% of V <sub>DD</sub> max. )                          | 0.18 V max.                                                                                                                                                                                                                                                                            | 0.25 V max.                                               | 0.33 V max.                                               | 0.5 V max.                                                |
| Current Consumption                                                           | 1.0 ~ 1.5MHz : 5 mA max.                                                                                                                                                                                                                                                               | 0.3 ~ 1.5MHz : 5 mA max.                                  | 0.3 ~ 1.5MHz : 5 mA max.                                  | 0.3 ~ 1.5MHz : 5 mA max.                                  |
|                                                                               | 1.5 ~ 20MHz : 8 mA max.                                                                                                                                                                                                                                                                | 1.5 ~ 20MHz : 8 mA max.                                   | 1.5 ~ 20MHz : 8 mA max.                                   | 1.5 ~ 20MHz : 10 mA max.                                  |
|                                                                               | 20 ~ 50MHz : 15 mA max.                                                                                                                                                                                                                                                                | 20 ~ 50MHz : 15 mA max.                                   | 20 ~ 50MHz : 15 mA max.                                   | 20 ~ 50MHz : 25 mA max.                                   |
|                                                                               | 50 ~ 60MHz : 22 mA max.                                                                                                                                                                                                                                                                | 50 ~ 125MHz : 25 mA max.                                  | 50 ~ 125MHz : 35 mA max.                                  | 50 ~ 125MHz : 40 mA max.                                  |
| Frequency Stability <sup>(1)</sup> Codes                                      | Frequency Stability over<br>Operating Temperature Range                                                                                                                                                                                                                                | ± 25 ppm                                                  | ± 50 ppm                                                  | ± 100 ppm                                                 |
|                                                                               | Commercial ( -10°C to +70°C )                                                                                                                                                                                                                                                          | A                                                         | B                                                         | C                                                         |
|                                                                               | Industrial ( -40°C to +85°C )                                                                                                                                                                                                                                                          | D                                                         | E                                                         | F                                                         |
| Load                                                                          | 15 pF max. ; ( 30 pF and 50 pF load are also available for +3.3V and +5.0V V <sub>DD</sub> )                                                                                                                                                                                           |                                                           |                                                           |                                                           |
| Duty Cycle ( at 50% of wave form )                                            | Standard: 50% ± 10%; Option: 50% ± 5%. Please add "-S" at the end of the part number for ± 5% .                                                                                                                                                                                        |                                                           |                                                           |                                                           |
| Start-up Time ( T <sub>s</sub> )                                              | 1.0 ~ 32.0 MHz : 5 m sec. ( max. ) ; 32.0 ~ 125.0 MHz : 10 m sec. ( max. )                                                                                                                                                                                                             |                                                           |                                                           |                                                           |
| Rise Time ( T <sub>r</sub> ) / Fall Time ( T <sub>f</sub> )                   | 5 n sec. ( max. )                                                                                                                                                                                                                                                                      | 7 n sec. ( max. )                                         | 10 n sec. ( max. )                                        | 10 n sec. ( max. )                                        |
|                                                                               | Measured between 10% ↔ 90% of wave form ( CL = 15pF )                                                                                                                                                                                                                                  |                                                           |                                                           |                                                           |
| Storage Temperature                                                           | - 50°C to 100°C                                                                                                                                                                                                                                                                        |                                                           |                                                           |                                                           |
| Aging                                                                         | ± 5 ppm per year ( max. )                                                                                                                                                                                                                                                              |                                                           |                                                           |                                                           |
| Tri-state Function on pad No. 1<br>[ For SWO , H53 , H32 is standard series ] | Note: Pad No. 1 is Tri-State by default for all SWO series. That is:<br>The output ( pad No. 3 ) is active if no connection or voltage of 2.2V<br>The output ( pad No. 3 ) is high impedance when voltage of 0.8V or Disable time is 150 n sec. max.;<br>Enable time is 10 m sec. max. |                                                           |                                                           |                                                           |

Note : <sup>(1)</sup> Inclusive of 25°C tolerance , operating temperature range , ±10% input voltage variation , load change , aging , shock and vibration.



## Part Number Format and Examples :

|                  |                     |                    |                        |                        |                         |
|------------------|---------------------|--------------------|------------------------|------------------------|-------------------------|
| [ 1 ]<br>Voltage | [ 2 ]<br>Type G --- | [ 3 ]<br>Stability | [ 4 ]<br>Tri-state --- | [ 5 ]<br>Frequency --- | [ 6 ]<br>Customer spec. |
|------------------|---------------------|--------------------|------------------------|------------------------|-------------------------|

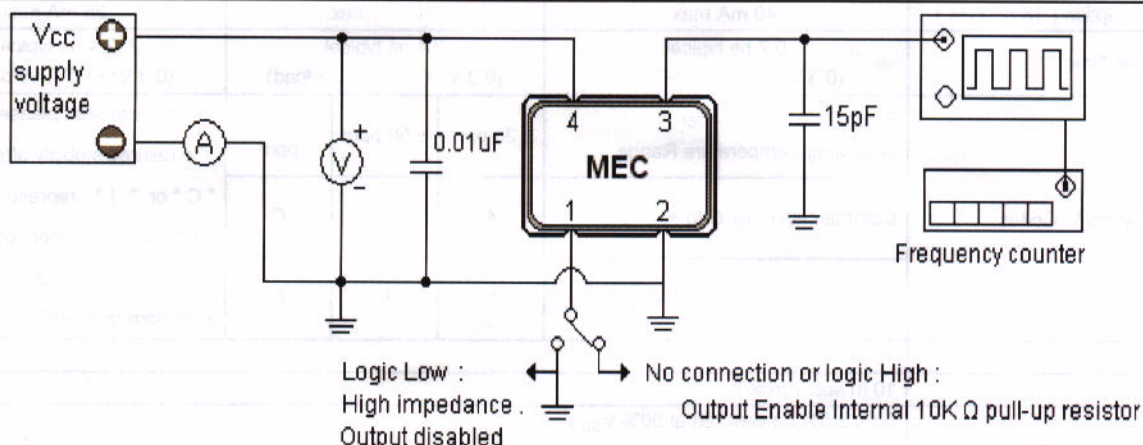
|     |                                                                                                                                                         |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1] | Supply voltage , " 18 " for +1.8V ; " 25 " for +2.5V ; " 28 " for +2.8V ; " 3 " for +3.3V ; " 5 " for +5.0V                                             |
| [2] | Please add " G " after the " package type code " for RoHS compliance (SWO , H53 , H32 , H_576_ , H_53 , H_32 are RoHS compliant and lead-free products) |
| [3] | Frequency Stability : please see previous page for the stability code [ Frequency Stability <sup>(1)</sup> ]                                            |
| [4] | " T " for Tri-state. Omit "T" if Tri-State is not required                                                                                              |
| [5] | Frequency in MHz or KHz .                                                                                                                               |
| [6] | Option or custom spec. code : " S " for 50%± 5% duty cycle , "50P" for output load 50pF or "xxxxx" custom spec. code assigned by Mercury                |

Ex (1) : 3H14G - BT - 10.000 - S represents +3.3V input voltage , full size 4 pins ( dip type ) package, RoHS compliance .  
 $\pm 50$ ppm stability from 0°C to 70°C , Tri-state function on pin # 1 , 10.000MHz , 50%± 5% duty cycle

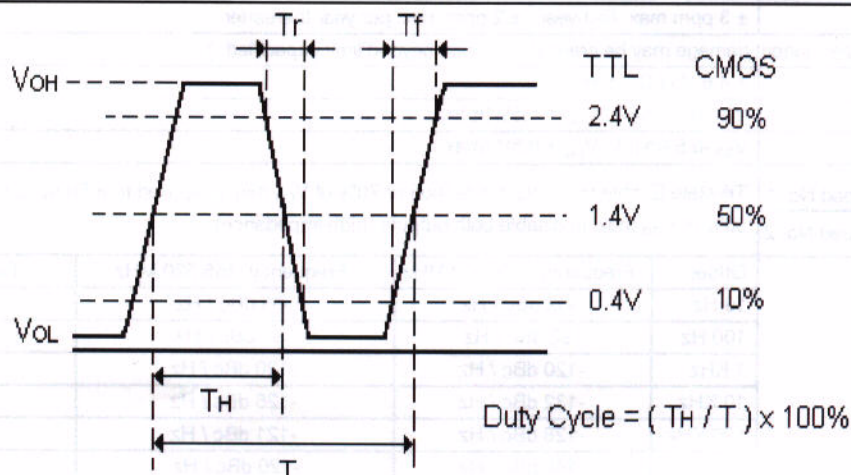
Ex (2) : 5H44G - A -20.000 - 2315 represents +5.0V input voltage , H44 package 4 pads SMD type , RoHS compliance ,  
 $\pm 25$ ppm from -10°C to 70°C , No Tri-state option , 20.000MHz , custom spec. No. 2315

Ex (3) : 18SWO - C10T - 40.000 / -20+70 represents +1.8V input voltage , SWO package 4 pads SMD type ,  $\pm 10$ ppm from -20°C to 70°C  
 Tri-state function on pad # 1 , 40.000MHz

TTL/HCMOS Square Wave Test Circuit



TTL/HCMOS Output Wave Form





Outline Dimensions ( Unit : mm ) , Suggested pad Layout for SMDs

| [ H32 ]                                                                                                                                                                                                                                                                                                                                                                                      | [ H_53 ]                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Land Pattern ( reference )</p> <p>Pad Connections :<br/>           Pad 1 : Enable / Disable<br/>           Pad 2 : Ground<br/>           Pad 3 : Output<br/>           Pad 4 : Supply Voltage</p>                                                                                                                                                                                         | <p>Land Pattern ( reference )</p> <p>Pad Connections :<br/>           Pad 1 : Enable / Disable<br/>           Pad 2 : Ground<br/>           Pad 3 : Output<br/>           Pad 4 : Supply Voltage</p>                                                                                                                                                                                         |
| [ SWO ] , [ H_57 ]                                                                                                                                                                                                                                                                                                                                                                           | [ H42 , HF42 , HW42 , HV42 ] , [ H44 , HF44 , HW44 , HV44 ]                                                                                                                                                                                                                                                                                                                                  |
| <p>Land Pattern ( reference )</p> <p>Pad Connections :<br/>           Pad 1 : Enable / Disable<br/>           Pad 2 : Ground<br/>           Pad 3 : Output<br/>           Pad 4 : Supply Voltage</p>                                                                                                                                                                                         | <p>MEC P/N H ( height )<br/>           H42 → 2.5 ± 0.2<br/>           H44 → 4.7 ± 0.2</p> <p>Pad Connections :<br/>           Pad 1 : No connection<br/>           Pad 2 : Ground<br/>           Pad 3 : Output<br/>           Pad 4 : Supply voltage</p>                                                                                                                                    |
| [ HF5761 , HW5761 ]                                                                                                                                                                                                                                                                                                                                                                          | [ HF5762 , HW5762 , HV5762 ]                                                                                                                                                                                                                                                                                                                                                                 |
| <p>Bottom View</p> <p>H = height<br/>           HF, HW: 1.9 mm max.<br/>           HV: 1.8 mm max.</p> <p>Pad Connections :<br/>           pad 1 : Tri - state ( H_ 5761 )<br/>           pad 2 : No connection<br/>           pad 3 : Ground<br/>           pad 4 : Output<br/>           pad 5 : No connection<br/>           pad 6 : Supply Voltage</p> <p>Land Pattern ( reference )</p> | <p>Bottom View</p> <p>H = height<br/>           HF, HW: 1.9 mm max.<br/>           HV: 1.8 mm max.</p> <p>Pad Connections :<br/>           pad 1 : No connection<br/>           pad 2 : Tri - state ( H_ 5762 )<br/>           pad 3 : Ground<br/>           pad 4 : Output<br/>           pad 5 : No connection<br/>           pad 6 : Supply Voltage</p> <p>Land Pattern ( reference )</p> |
| [ H14 , HF14 , HW14 , HV14 ]                                                                                                                                                                                                                                                                                                                                                                 | [ H8 , HF8 , HW8 , HV8 ]                                                                                                                                                                                                                                                                                                                                                                     |
| <p>4-Ø1.8 glass stand-off</p> <p>Pin Connections :<br/>           Pin 1 : (1) No connection<br/>                     (2) Output disabled when low<br/>           Pin 7 : Ground<br/>           Pin 8 : Output<br/>           Pin 14 : Supply voltage</p>                                                                                                                                     | <p>3-Ø1.6 glass stand-off</p> <p>Pin Connections :<br/>           Pin 1 : (1) No connection<br/>                     (2) Output disabled when low<br/>           Pin 4 : Ground<br/>           Pin 5 : Output<br/>           Pin 8 : Supply voltage</p>                                                                                                                                      |