

### Surface Mount type

H22	H32	H53	SWO
2.5 * 2.0 * 0.9	3.2 * 2.5 * 1.0	5.0 * 3.2 * 1.2	7.0 * 5.0 * 1.4

CMOS

1.0 V	1.8 V	3.3 V
1.2 V	2.5 V	5.0 V

Min.

25 KHz

Max.

160 MHz

### Applications

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



General Specifications [ TA = +25°C , V<sub>DD</sub> = at specified voltage , Load : 15 pF ]

Model	" H22 " ; " H32 " ; " H53 " and " SWO " series [ Output Logic : CMOS ]							
	" H22 " series		" H32 " series		" H53 " series		" SWO " series	
Dimensions	2.5 x 2.0 x 0.9 mm		3.2 x 2.5 x 1.0 mm		5.0 x 3.2 x 1.2 mm		7.0 x 5.0 x 1.4 mm	
Available Frequency Range by Voltage	1.0 V	0.75 MHz ~ 50 MHz	1.0 V	0.25 MHz ~ 50 MHz	1.0 V	0.25 MHz ~ 50 MHz	1.0 V	0.25 MHz ~ 50 MHz
	1.2 V		1.2 V		1.2 V			
	1.8 V	0.156 MHz ~ 80 MHz	1.8 V	32.768 KHz	1.8 V	32.768 KHz	1.8 V	32.768 KHz
	2.5 V		2.5 V		2.5 V		2.5 V	
	3.3 V		3.3 V		3.3 V		3.3 V	
	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	
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Supply Voltage ( V <sub>DD</sub> )	+1.0 V ± 5%	+1.2 V ± 5%	+1.8 V ± 5%	+2.5 V ± 5%	+3.3 V ± 10%	+5.0 V ± 10%
code is " 10 "	code is " 12 "	code is " 18 "	code is " 25 "	code is " 3 "	code is " 5 "	
High "1" ( 90% of V <sub>DD</sub> min. )	0.9 V ( min. )	1.08 V ( min. )	1.62 V ( min. )	2.25 V ( min. )	2.97 V ( min. )	4.5 V ( min. )
Logic Low "0" ( 10% of V <sub>DD</sub> max. )	0.1 V ( max. )	0.12 V ( max. )	0.18 V ( max. )	0.25 V ( max. )	0.33 V ( max. )	0.5 V ( max. )
Current Consumption	1 ~ 25 MHz	4 mA ( max. )	4 mA ( max. )	5 mA ( max. )	5 mA ( max. )	5 mA ( max. )
	25 ~ 50 MHz	5 mA ( max. )	5 mA ( max. )	8 mA ( max. )	10 mA ( max. )	12 mA ( max. )
	50 ~ 100 MHz	---	---	10 mA ( max. )	15 mA ( max. )	30 mA ( max. )
	100 ~ 160 MHz	---	---	15 mA ( max. )	20 mA ( max. )	35 mA ( max. )
Rise Time ( Tr ) / Fall Time ( Tf )	6 n sec. ( max. )	6 n sec. ( max. )	7 n sec. ( max. )	7 n sec. ( max. )	10 n sec. ( max. )	10 n sec. ( max. )
	Measured between 10% ↔ 90% of wave form ( CL = 15pF )					

Frequency Stability Codes	Frequency Stability over Operating Temperature Range	± 25 ppm	± 50 ppm	± 100 ppm	If non-standard , please enter the desired stability after the " C " or " I " For example : " C20 " ±20 ppm over -10°C to +70°C ; " I30 " ± 30 ppm over -40°C to +85°C
	Commercial ( -10°C to +70°C )	A	B	C	
	Industrial ( -40°C to +85°C )	D	E	F	

Load	15 pF ; ( 30 pF and 50 pF load are also available for +3.3V and +5.0V V <sub>DD</sub> )
Duty Cycle	Standard: 50% ± 10%; Option: 50% ± 5%. Please add "-S" at the end of the part number for ± 5% .
Start -up Time ( Ts )	1.0 ~ 32.0 MHz : 5 m sec. ( max. ) ; 32.0 ~ 160.0 MHz : 10 m sec. ( max. )
Storage Temperature	- 50°C to 100°C
Aging	± 3 ppm per year ( max. )
Output Enable / Disable Function	70% of V <sub>DD</sub> ( min. ) to enable output.
	30% of V <sub>DD</sub> ( max. ) to disable output.
	Disable current : 10 uA max. for OE ≤ 0.3V

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

<p>[ H22 ]</p> <p>MEC</p> <p>Pad Connections :                  Pad 1 : OE      Pad 3 : Output                  Pad 2 : Ground      Pad 4 : Supply Voltage</p>	<p>[ H32 ]</p> <p>MEC</p> <p>Pad Connections :                  Pad 1 : OE      Pad 3 : Output                  Pad 2 : Ground      Pad 4 : Supply Voltage</p>
<p>[ H_53 ]</p> <p>MEC</p> <p>Pad Connections :                  Pad 1 : OE                  Pad 2 : Ground      Pad 3 : Output                  Pad 4 : Supply Voltage</p>	<p>[ SWO ]</p> <p>MEC</p> <p>Pad Connections :                  Pad 1 : OE                  Pad 2 : Ground      Pad 3 : Output                  Pad 4 : Supply Voltage</p>
<p>[ H43 ]</p> <p>MEC</p> <p>Pad Connections :                  Pad 1 : OE                  Pad 2 : Ground                  Pad 3 : Output                  Pad 4 : Supply voltage</p>	<p>[ H8 ]</p> <p>MEC</p> <p>3-∅1.6 glass stand-off</p> <p>Pin Connections :                  Pin 1 : (1) No connection                            (2) Output disabled when low                  Pin 4 : Ground                  Pin 5 : Output                  Pin 8 : Supply voltage</p>
<p>[ H14 ]</p> <p>MEC</p> <p>4-∅1.8 glass stand-off</p> <p>Pin Connections :                  Pin 1 : (1) No connection                            (2) Output disabled when low                  Pin 7 : Ground                  Pin 8 : Output                  Pin 14 : Supply voltage</p>	

### Part Number Format and Examples

	[ 1 ]	[ 2 ]		[ 3 ]	[ 4 ]		[ 5 ]		[ 6 ]
	Supply Voltage	Holder Type	-	Frequency Stability	T	-	Center Frequency	-	Customer Spec

<b>Examples</b>	(1)	18	SWO	-	A	T	-	125.000	-	S
	(2)	5	H14	-	C30		-	20.000	-	50P
	(3)	1	H22	-	E	T	-	8.000	-	

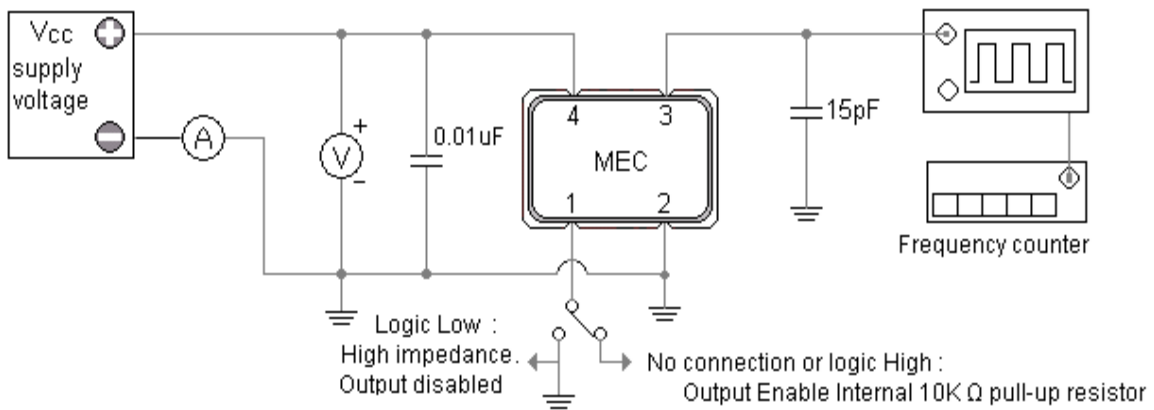
**Ex (1) : 18SWO - AT - 125.000 - S** [ 1.8V , SWO type , ±25ppm from -10°C to 70°C , Output Enable , 125.000 MHz

**Ex (2) : 5H14 - I30 - 20.000 - 50P** [ 5.0V , H14 type , ±30ppm from -40°C to 85°C , 20.000 MHz , Output load 50pF

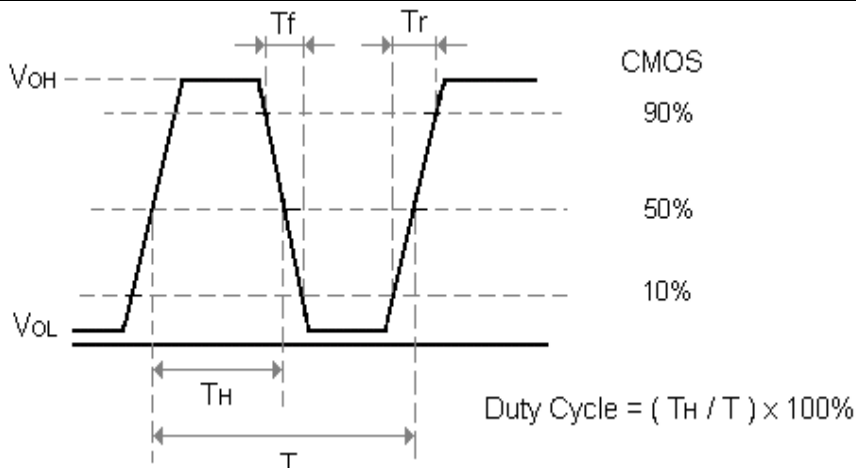
**Ex (3) : 1H22 - ET - 8.000** [ 1.0V , H22 type , ±50ppm from -40°C to 85°C , Output Enable , 8.000 MHz ]

[1]	Supply voltage , " 1 " for +1.0V ; " 12 " for +1.2V ; " 18 " for +1.8V ; " 25 " for +2.5V ; " 3 " for +3.3V ; " 5 " for +5.0V	
[2]	Holder Type	
[3]	-10°C ~ 70 °C	" A " ± 25ppm ; " B " ± 50ppm ; " C " ± 100ppm ; If non-standard please enter the desired stability after " C " , example " C15 " : represents ±15ppm over -10 to +70°C
	-40°C ~ 85 °C	" D " ± 25ppm ; " E " ± 50ppm ; " F " ± 100ppm ; If non-standard please enter the desired stability after " I " , example " I30 " : represents ± 30ppm over -40 to +85°C
[4]	" T " for Output Enable , Leave this space blank if no connection pad1 or on pin 1	
[5]	Frequency in MHz	
[5]	Assigned by Mercury if customer spec , (1) : S ---- duty cycle ± 5% , ex : " - S " ; (2) : 50p ---- output load 50pF , ex : " - 50p "	

### CMOS Square Wave Test Circuit

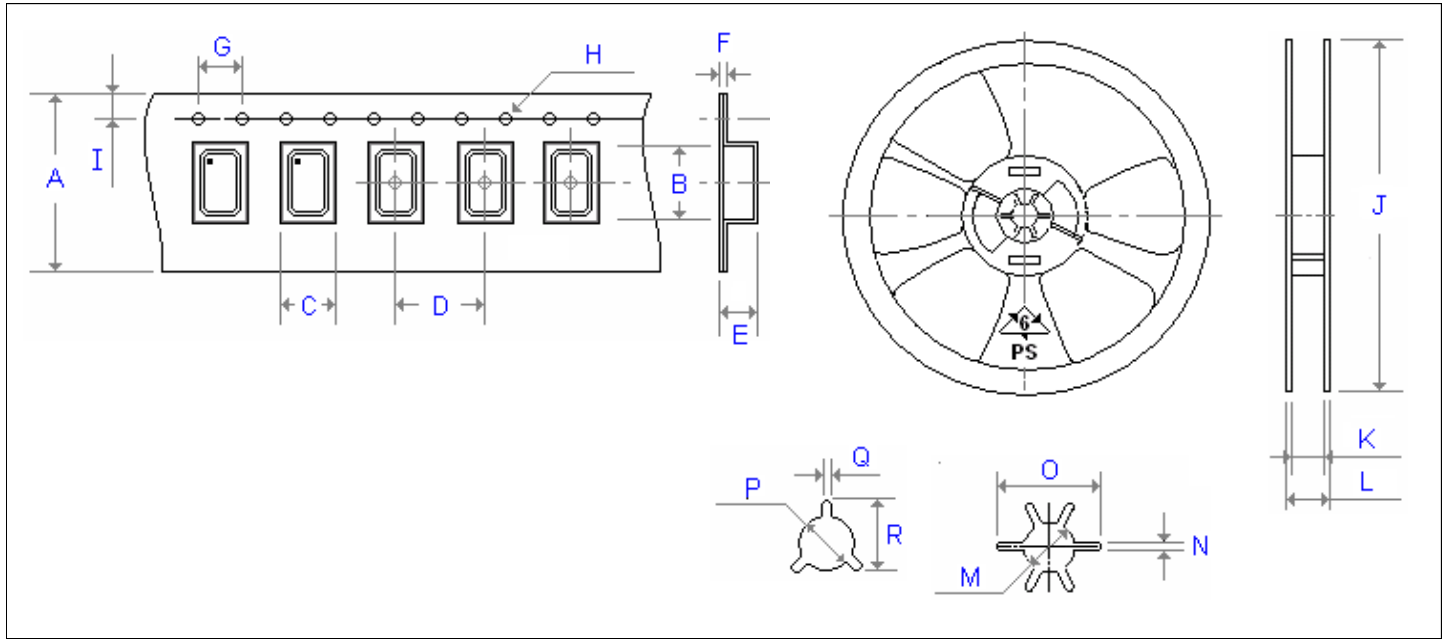


### CMOS Output Waveform



# Emboss Taping and Reel Specifications

[ Crystal Oscillator Units ]



Carrier Type Dimensions ( unit : mm )

	A	B	C	D	E	F	G	H	I	pcs / reel
H_22	8.0	2.8	2.3	4.0	1.1	0.3	4.0	∅ 1.50	1.75	3000
H_32	8.0	3.4	2.7	4.0	1.4	0.3	4.0	∅ 1.50	1.75	3000
H_53	12.0	5.3	3.6	8.0	1.4	0.3	4.0	∅ 1.55	1.75	1000
H_57	16.0	7.3	5.3	8.0	1.9	0.3	4.0	∅ 1.55	1.75	1000
SWO	16.0	7.2	5.4	8.0	1.8	0.3	4.0	∅ 1.55	1.75	1000
H_576	16.0	7.2	5.4	8.0	1.8	0.3	4.0	∅ 1.55	1.75	1000
HP_576	16.0	7.2	5.4	8.0	1.8	0.3	4.0	∅ 1.55	1.75	1000
HD_576	16.0	7.2	5.4	8.0	1.8	0.3	4.0	∅ 1.55	1.75	1000
H_42	24.0	12.4	10.3	16.0	5.1	0.3	4.0	∅ 1.55	1.75	500
H_43	24.0	12.4	10.3	16.0	5.1	0.3	4.0	∅ 1.55	1.75	500

Reel Dimensions ( unit : mm )

	J	K	L	M	N	O	P	Q	R	pcs / reel
H_22	180.0	9.0	12.0	-	-	-	13.2	2.1	-	3000
H_32	180.0	9.0	12.0	-	-	-	13.2	2.1	-	3000
H_53	180.0	13.0	16.0	-	-	-	13.2	2.5	-	1000
H_57	180.0	17.2	19.3	-	-	-	13.3	2.2	22.0	1000
SWO	180.0	17.2	19.3	-	-	-	13.3	2.2	22.0	1000
H_576	180.0	17.2	19.3	-	-	-	13.3	2.2	22.0	1000
HP_576	180.0	17.2	19.3	-	-	-	13.3	2.2	22.0	1000
HD_576	180.0	17.2	19.3	-	-	-	13.3	2.2	22.0	1000
H_42	330.0	30.0	25.0	-	-	-	13.4	2.5	19.5	500
H_43	330.0	30.0	25.0	-	-	-	13.4	2.5	19.5	500