

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.

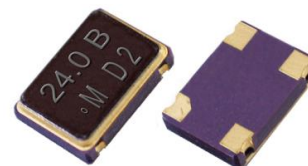
25 KHz

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_{DD}= 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		1.2 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		3.3 V
			5.0 V		5.0 V		5.0 V		5.0 V
-----	5.0 V	1.75 MHz ~ 50 MHz	5.0 V	0.375 MHz ~ 100 MHz	5.0 V	0.375 MHz ~ 100 MHz	5.0 V	0.375 MHz ~ 100 MHz	

Supply Voltage (V _{DD})		+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 _{DD} 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 _{DD} 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.)	5 mA (max.)
	25 ~ 50 MHz	5 mA (max.)	5 mA (max.)	8 mA (max.)	10 mA (max.)	12 mA (max.)	15 mA (max.)
	50 ~ 100 MHz	---	---	10 mA (max.)	15 mA (max.)	30 mA (max.)	40 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 _{DD})
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 _{DD} (min.) to enable output.
	30% of V _{DD} (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

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

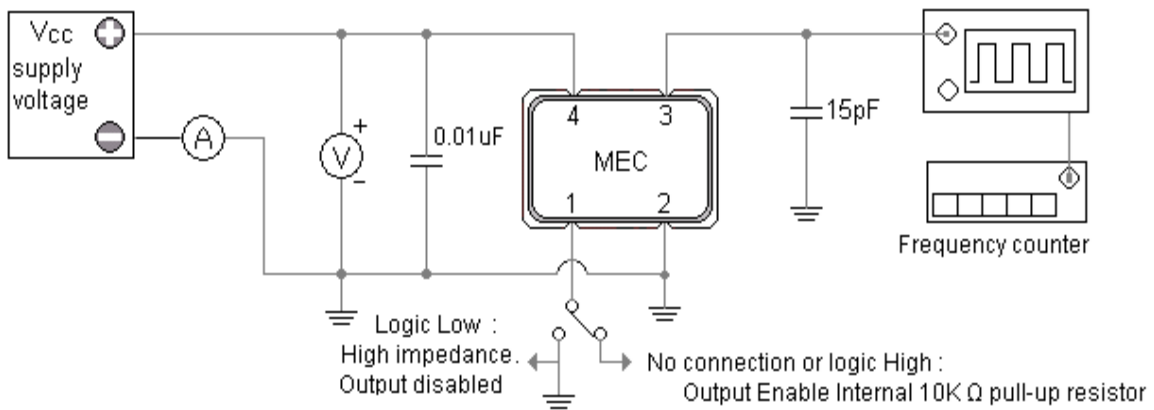
Ex (1) : 18SWO - AT - 125.000 - S [1.8V , SWO type , ±25ppm from -10°C to 70°C , Output Enable , 125.000 MHz

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

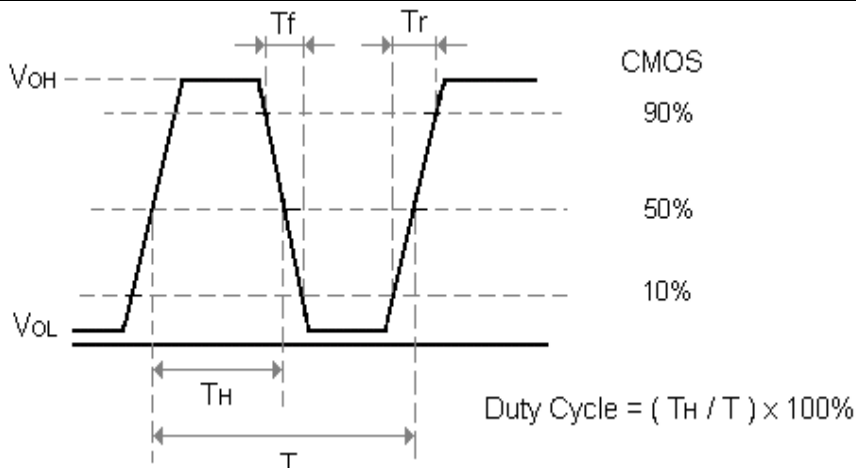
Ex (3) : 1H22 - ET - 8.000 [1.0V , H22 type , ±50ppm from -40°C to 85°C , Output Enable , 8.000 MHz]

[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

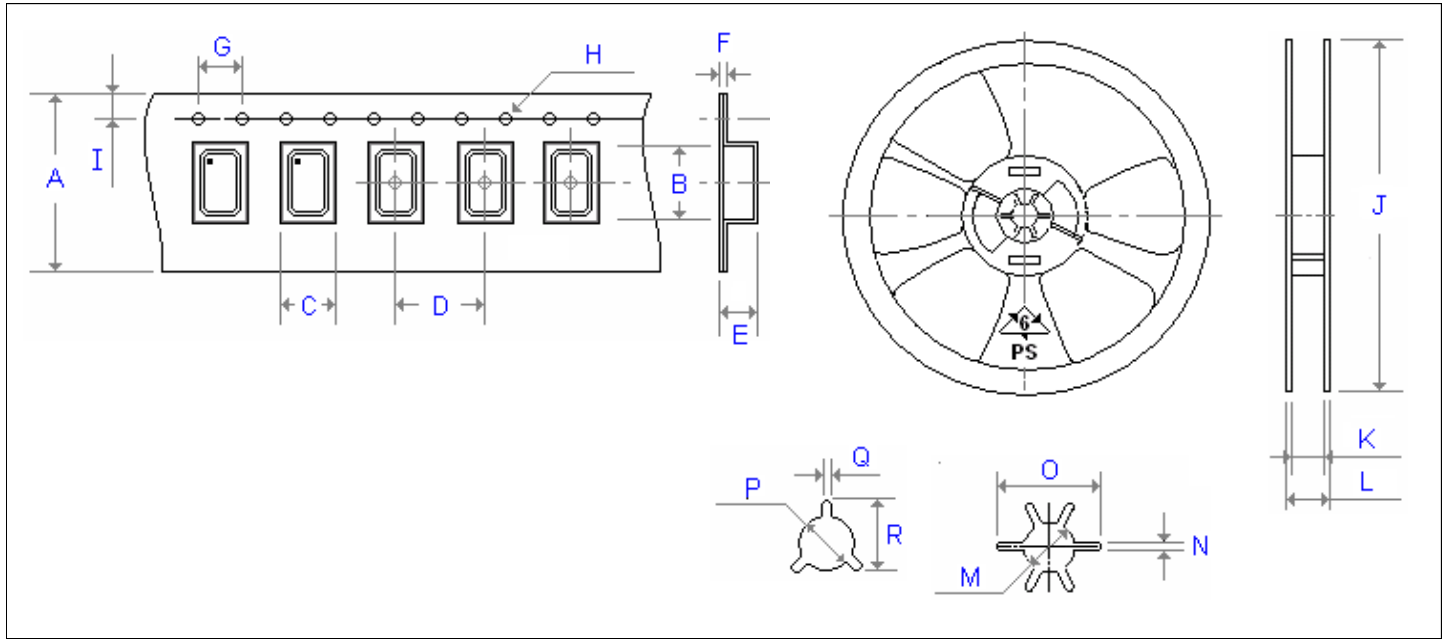


CMOS Output Waveform



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