

Crystal Oscillators [Wide Operating Temperature]

CMOS output

HY __

Wide Operating Temperature

Over -40°C to +125°C

SMD

CMOS

1.8V

2.5V

3.3V

Min.

1.25 MHz

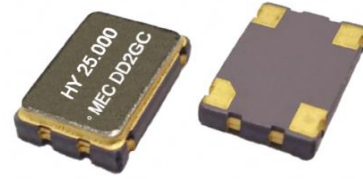
Max.

50.0 MHz

Features

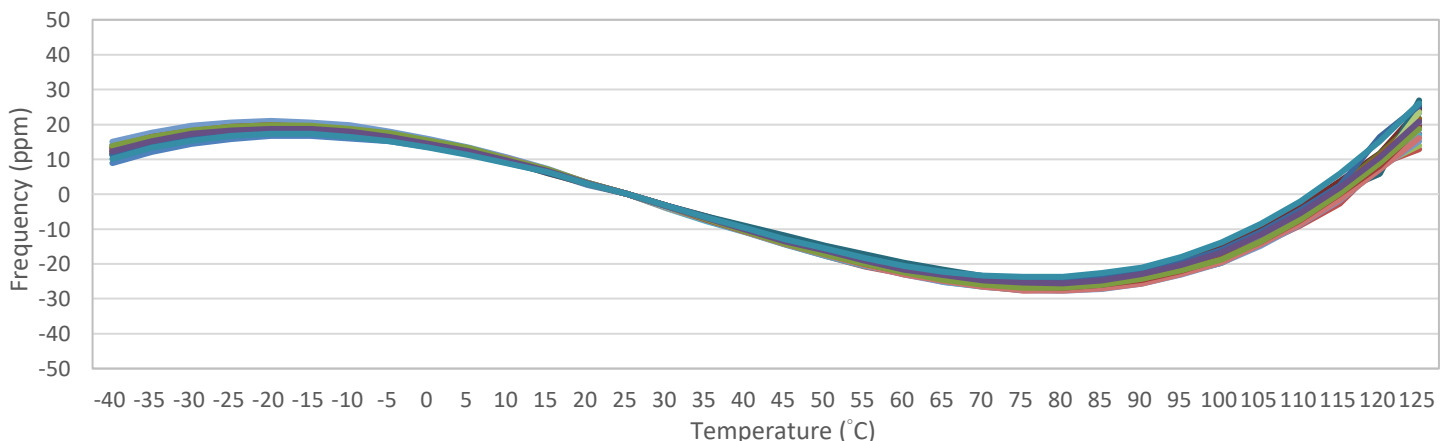
- Femto second RMS phase jitter. 150 fs typical (12 KHz ~ 20 MHz)
- Superior phase noise: -155 dBc/Hz at 10 KHz and -160 dBc/Hz at 100 KHz offset
- Wide Operating Temperature range from -40 °C to +125 °C

General specifications of all available packages , at Ta=+25°C , CL=15pF



Model [Output Logic]		" HY " series [CMOS]						
Type		HY22	HY32	HY53	HY57			
Dimensions		2.5 * 2.0 * 0.9 mm	3.2 * 2.5 * 1.0 mm	5.0 * 3.2 * 1.2 mm	7.0 * 5.0 * 1.4 mm			
Available Frequency Range		1.25 ~ 50.0 MHz						
Supply Voltage (V _{DD})		+1.8 V ± 10%	+2.5 V ± 10%			+3.3 V ± 10%		
Supply Voltage Code		" 18 "	" 25 "			" 3 "		
Current Consumption [15pF load]	1.25 ~ 19.99 MHz	2.0 mA (max.)	3.0 mA (max.)			4.0 mA (max.)		
	20.0 ~ 50.00 MHz	4.0 mA (max.)	5.0 mA (max.)			6.0 mA (max.)		
Frequency Stability Codes		Frequency Stability over	± 25 ppm	± 50 ppm	± 100 ppm	If non-standard , please enter the desired stability after the " K " For example : " K40 " ± 40 ppm over -40°C to +125°C		
		Car Grade (-40°C to +125°C)	---	K50	K100			
Rise Time (Tr) / Fall Time (Tf)		10 nsec. (max.)						
		Measured between 10% ~ 90% of waveform (CL = 15pF)						
Output Load		15 pF						
Start-up Time		5.0 msec. (max.)						
Duty Cycle		Standard: 50% ± 10%; Option: 50% ± 5%. Please add "-S" at the end of the part number for ± 5% .						
Output Enable / Disable Function		70% of V _{DD} (min.) to Enable Output.						
		30% of V _{DD} (max.) to Disable Output.						
Phase Jitter (RMS) [26 MHz , 3.3V]		150 fsec (typ.) [12 KHz to 20 MHz integrated]						
SSB Phase Noise [26 MHz , 3.3V]	Offset	10 Hz	100 Hz	1 KHz	10 KHz	100KHz	1 MHz	5 MHz
	dBc / Hz (typ.)	-94	-127	-142	-156	-161	-163	-163
Storage Temperature		-65°C to + 150°C						
Aging at Ta=+25°C		± 2 ppm (max.) for first year						

3225 HY-series 25.000MHz Refer at 25°C



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

[H8 ; H_8]	[H14 ; H_14]
<p>Top View: 12.8±0.2 x 10.8</p> <p>Side View: 6.3±0.2 max, 0.8, Ø0.45</p> <p>Bottom View: 7.6±0.1 x 7.6±0.1</p> <p>Pin Connections : Pin1 : (1) No connection (2) OE Pin4 : Ground Pin5 : Output Pin8 : Supply voltage</p> <p>3-Ø1.6 glass stand-off</p>	<p>Top View: 20.2±0.2 x 18.3</p> <p>Side View: 5.8±0.2 max, 0.8, Ø0.45</p> <p>Bottom View: 10.7±0.1 x 15.2±0.1</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> <p>4-Ø1.8 glass stand-off</p>
[H21]	[H22 ; H_22]
<p>Top View: 2.0±0.1 x 1.6±0.1</p> <p>Side View: 0.8±0.1</p> <p>Bottom View: 0.6±0.1 x 1.0</p> <p>Land Pattern: 0.8 x 1.0</p> <p>Pad Connections : Pad 1 : OE Pad 2 : Ground Pad 3 : Output Pad 4 : Supply Voltage</p>	<p>Top View: 2.5±0.2 x 2.0±0.2</p> <p>Side View: 0.9±0.1</p> <p>Bottom View: 0.68±0.1 x 1.23</p> <p>Land Pattern: 0.9 x 1.23</p> <p>Pad Connections : Pad 1 : OE Pad 2 : Ground Pad 3 : Output Pad 4 : Supply Voltage</p>
[H32 ; H_32]	[H53 ; H_53]
<p>Top View: 3.2±0.2 x 2.5±0.2</p> <p>Side View: 1.0±0.1</p> <p>Bottom View: 0.9±0.1 x 1.6</p> <p>Land Pattern: 1.2 x 1.6</p> <p>Pad Connections : Pad 1 : OE Pad 2 : Ground Pad 3 : Output Pad 4 : Supply Voltage</p>	<p>Top View: 5.0±0.1 x 3.2±0.1</p> <p>Side View: 1.2±0.1</p> <p>Bottom View: 1.2±0.1 x 2.2</p> <p>Land Pattern: 1.6 x 2.5</p> <p>Pad Connections : Pad 1 : OE Pad 2 : Ground Pad 3 : Output Pad 4 : Supply Voltage</p>
[SWO ; H_57]	
<p>Top View: 7.0±0.2 x 5.0±0.2</p> <p>Side View: 1.4±0.1</p> <p>Bottom View: 1.4±0.1 x 3.7</p> <p>Land Pattern: 2.0 x 4.2</p> <p>Pad Connections : Pad 1 : OE Pad 2 : Ground Pad 3 : Output Pad 4 : Supply Voltage</p>	

Part Number Format and Examples

	[1]	[2]	-	[3]	[4]	-	[5]
	Supply Voltage	Holder Type		Frequency Stability	OE Function		Center Frequency

Examples	(1)	3	SWO	-	D	T	-	25.000
	(2)	3	HY32	-	K50	T	-	24.000
	(3)	18	HA32	-	B	T	-	32.768K
	(4)	3	HJ22	-	E	T	-	49.152

Ex (1) : 3SWO - DT - 25.000 [3.3V , H seires 7050 type , ±25ppm from -40°C to +85°C , OE Function , 25.000MHz]

Ex (2) : 3HY32 - K50T - 24.000 [3.3V , HY seires 3225 type , ±50ppm from -40°C to +125°C , OE Function , 24.000MHz]

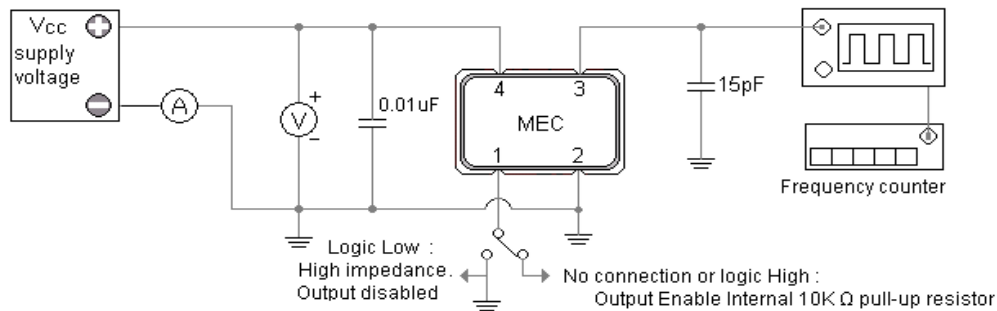
Ex (3) : 18HA32 - BT - 32.768K [1.8V , HA seires 3225 type , ±50ppm from -10°C to +70°C , OE Function , 32.768KHz]

Ex (4) : 3HJ22 - ET - 49.152 [3.3V , HJ seires 2520 type , ±50ppm from -40°C to +85°C , OE Function , 49.152 MHz]

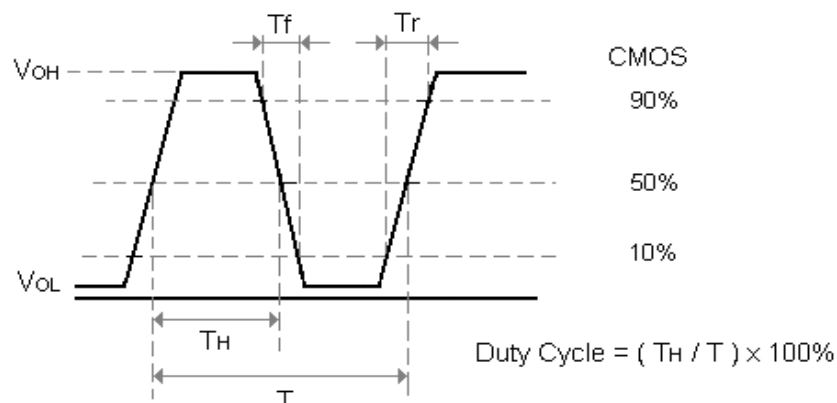
[1]	Supply voltage " 10 " for +1.0V ; " 12 " for +1.2V ; " 18 " for +1.8V ; " 25 " for +2.5V ; " 3 " for +3.3V ; " 5 " for +5.0V	
[2]	Holder Type	
[3]	-10°C ~ 70 °C	" A " ± 25ppm ; " B " ± 50ppm ; " C " ± 100ppm ; If non-standard please enter the desired stability after " C " , example " C15 " : represents ±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 OE Function , Leave this space blank if no connection on pad 1.	
[5]	Frequency in MHz	

Test Circuit & Test Waveform

H ; H_ - series CMOS Test Circuit

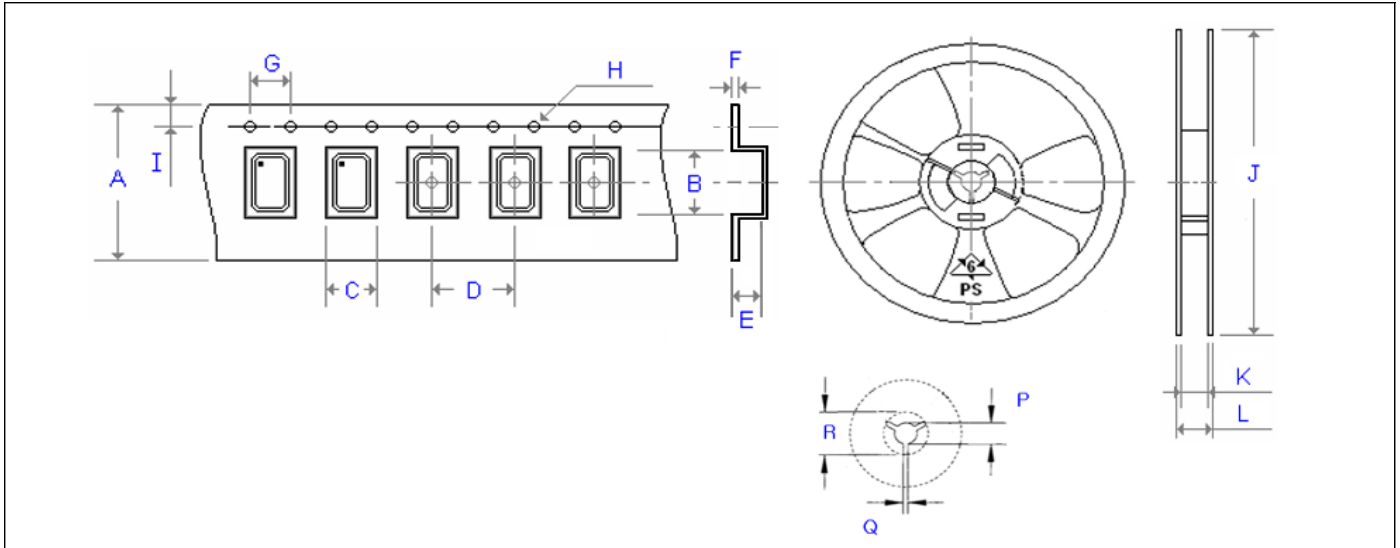


CMOS Output Waveform



Emboss Taping and Reel Specifications

[Crystal Oscillator Units]



Carrier Type Dimensions (unit : mm) ±0.3mm

	A	B	C	D	E	F	G	H	I	pcs / reel
H21	8.00	2.30	1.90	4.00	0.90	0.25	4.00	∅ 1.50	1.75	3000
H_22	8.00	2.80	2.25	4.00	1.10	0.30	4.00	∅ 1.50	1.75	3000
H_32	8.00	3.40	2.70	4.00	1.40	0.25	4.00	∅ 1.50	1.75	3000
H_53	12.00	5.30	3.60	8.00	1.40	0.30	4.00	∅ 1.50	1.75	1000
H_57	16.00	7.30	5.30	8.00	1.90	0.32	4.00	∅ 1.50	1.75	1000
SWO	16.00	7.20	5.40	8.00	1.80	0.32	4.00	∅ 1.50	1.75	1000
H_226	8.00	2.80	2.25	4.00	1.10	0.30	4.00	∅ 1.50	1.75	3000
H_326	8.00	3.40	2.70	4.00	1.40	0.25	4.00	∅ 1.50	1.75	3000
H_536	12.00	5.30	3.60	8.00	1.40	0.30	4.00	∅ 1.50	1.75	1000
H_576	16.00	7.30	5.30	8.00	1.90	0.32	4.00	∅ 1.50	1.75	1000
H_328	8.00	3.40	2.70	4.00	1.40	0.25	4.00	∅ 1.50	1.75	3000
H_538	12.00	5.40	3.60	8.00	1.70	0.30	4.00	∅ 1.50	1.75	1000
H_578	16.00	7.30	5.30	8.00	1.90	0.32	4.00	∅ 1.50	1.75	1000
H_43	24.00	11.80	10.00	16.00	5.00	0.30	4.00	∅ 1.50	1.75	500

Reel Dimensions (unit : mm) ±2mm

	J	K	L	P	Q	R	pcs / reel
H21	180.00	9.00	12.00	13.00	2.50	20.20	3000
H_22	180.00	8.40	11.40	13.00	2.50	20.20	3000
H_32	180.00	9.00	12.00	13.00	2.50	20.20	3000
H_53	180.00	13.00	16.00	13.00	2.50	20.20	1000
H_57	180.00	17.20	19.30	13.00	2.50	20.20	1000
SWO	180.00	17.20	19.30	13.00	2.50	20.20	1000
H_226	180.00	8.40	11.40	13.00	2.50	20.20	3000
H_326	180.00	9.00	12.00	13.00	2.50	20.20	3000
H_536	180.00	13.00	16.00	13.00	2.50	20.20	1000
H_576	180.00	17.20	19.30	13.00	2.50	20.20	1000
H_328	180.00	8.00	12.00	13.00	2.50	20.20	3000
H_538	180.00	13.00	16.00	13.00	2.50	20.20	1000
H_578	180.00	17.20	19.30	13.00	2.50	20.20	1000
H_43	330.00	24.50	29.10	13.00	2.50	20.20	500