

HY _ _

Wide Operating Temperature

Over -40°C to +125°C

SMD

CMOS

1.8V

2.5V

3.3V

Min.

1.25 MHz

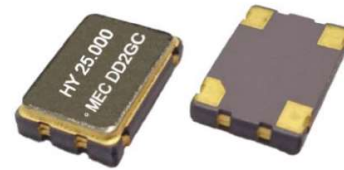
Max.

50.0 MHz

Features

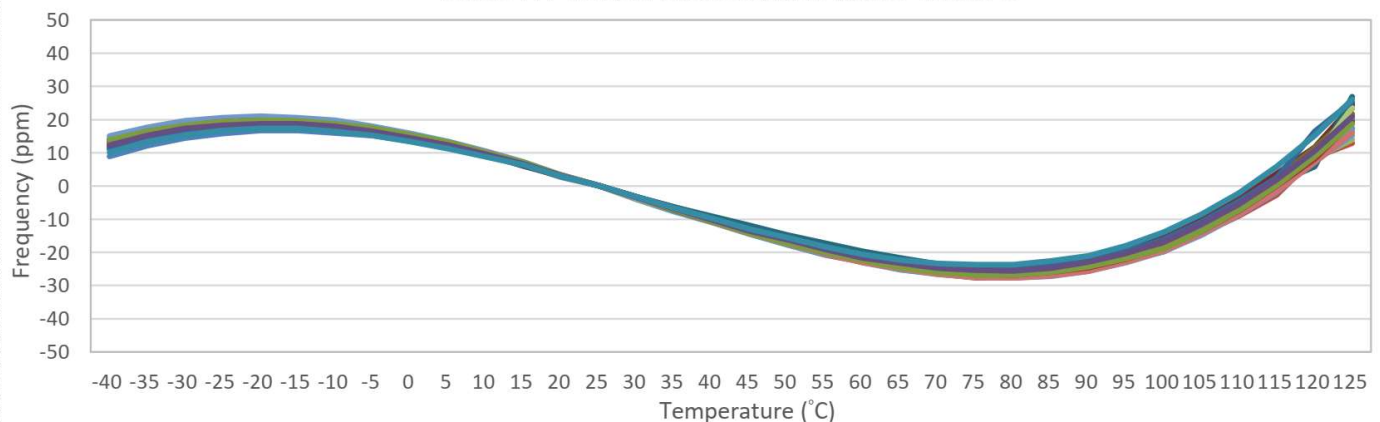
- Femto second RMS phase jitter. 150 fs typical (12 KHz ~ 20 MHz)
- Superior phase noise: -155 dBc/Hz at 10 KHz and -160 dBc/Hz at 100 KHz offset
- Wide Operating Temperature range from -40 °C to +125 °C

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

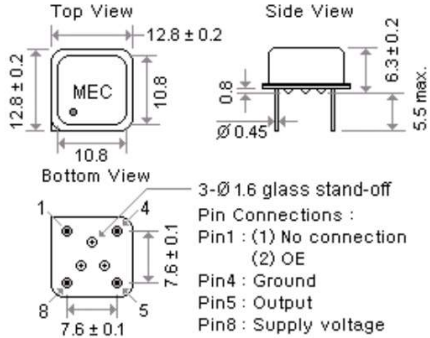
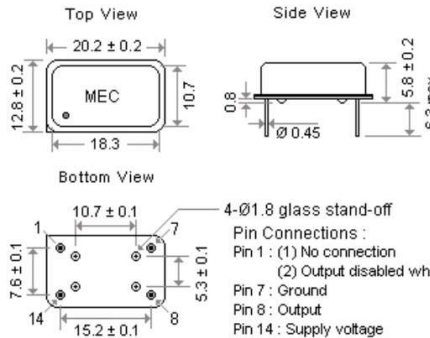
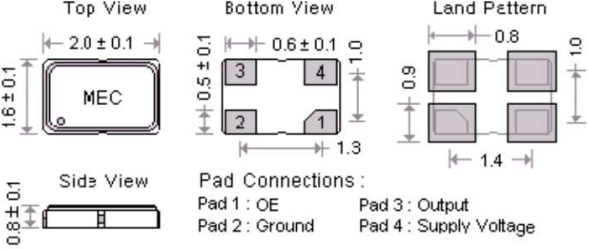
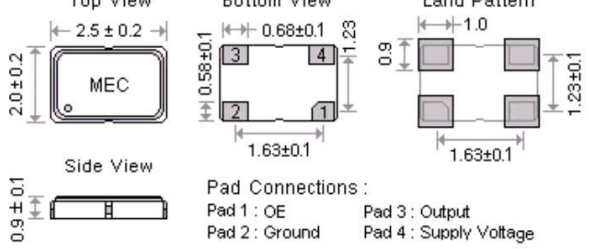
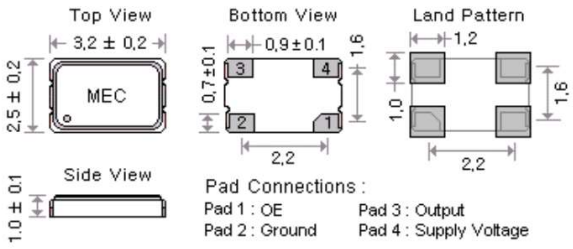
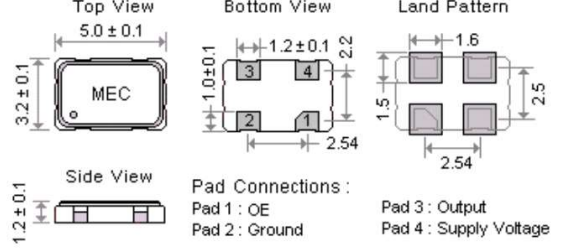
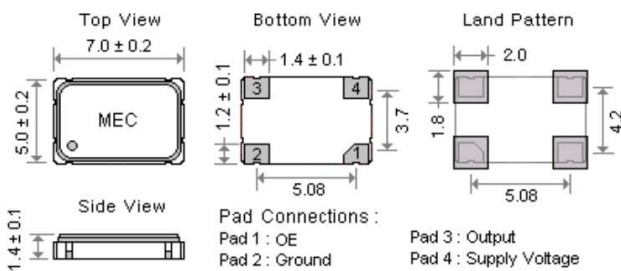


Model [Output Logic]		" HY " series [CMOS]							
Type		HY22		HY32		HY53		HY57	
Dimensions		2.5 * 2.0 * 0.9 mm		3.2 * 2.5 * 1.0 mm		5.0 * 3.2 * 1.2 mm		7.0 * 5.0 * 1.4 mm	
Available Frequency Range		1.25 ~ 50.0 MHz							
Supply Voltage (V _{DD})		+1.8 V ± 10%			+2.5 V ± 10%		+3.3 V ± 10%		
Supply Voltage 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 "		
		Car Grade (-40°C to +125°C)		---	K50	K100	For example : " K40 " ± 40 ppm over -40°C to +125°C		
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]
 Top View Side View Bottom View 3-Ø1.6 glass stand-off Pin Connections : Pin1 : (1) No connection (2) OE Pin4 : Ground Pin5 : Output Pin8 : Supply voltage	 Top View Side View Bottom View 4-Ø1.8 glass stand-off Pin Connections : Pin1 : (1) No connection (2) Output disabled when low Pin7 : Ground Pin8 : Output Pin14 : Supply voltage
[H21]	[H22 ; H_22]
 Top View Bottom View Land Pattern Side View Pad Connections : Pad1 : OE Pad2 : Ground Pad3 : Output Pad4 : Supply Voltage	 Top View Bottom View Land Pattern Side View Pad Connections : Pad1 : OE Pad2 : Ground Pad3 : Output Pad4 : Supply Voltage
[H32 ; H_32]	[H53 ; H_53]
 Top View Bottom View Land Pattern Side View Pad Connections : Pad1 : OE Pad2 : Ground Pad3 : Output Pad4 : Supply Voltage	 Top View Bottom View Land Pattern Side View Pad Connections : Pad1 : OE Pad2 : Ground Pad3 : Output Pad4 : Supply Voltage
[SWO ; H_57]	
 Top View Bottom View Land Pattern Side View Pad Connections : Pad1 : OE Pad2 : Ground Pad3 : Output Pad4 : Supply Voltage	

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, $\pm 25\text{ppm}$ from -40°C to $+85^{\circ}\text{C}$, OE Function, 25.000MHz]

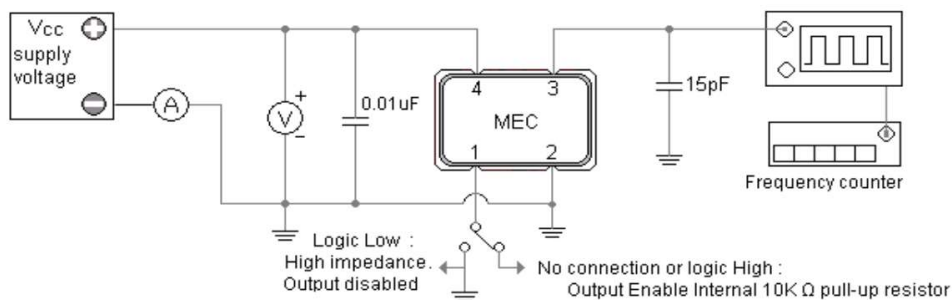
Ex (2): 3HY32 - K50T - 24.000 [3.3V, HY seires 3225 type, $\pm 50\text{ppm}$ from -40°C to $+125^{\circ}\text{C}$, OE Function, 24.000MHz]

Ex (3): 18HA32 - BT - 32.768K [1.8V, HA seires 3225 type, $\pm 50\text{ppm}$ from -10°C to $+70^{\circ}\text{C}$, OE Function, 32.768KHz]

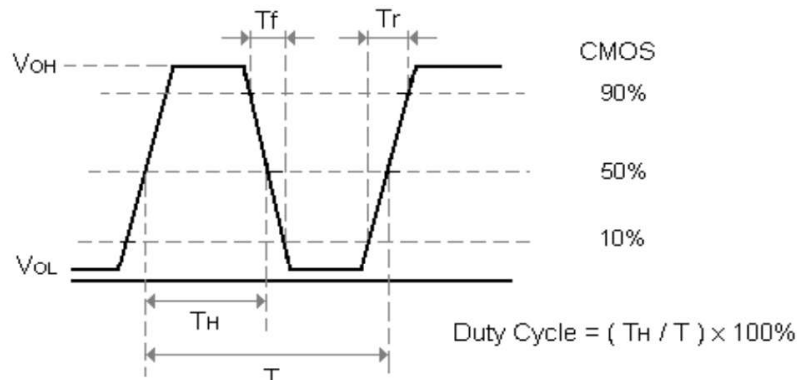
Ex (4): 3HJ22 - ET - 49.152 [3.3V, HJ seires 2520 type, $\pm 50\text{ppm}$ from -40°C to $+85^{\circ}\text{C}$, OE Function, 49.152 MHz]

[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]	$-10^{\circ}\text{C} \sim 70^{\circ}\text{C}$	"A" $\pm 25\text{ppm}$; "B" $\pm 50\text{ppm}$; "C" $\pm 100\text{ppm}$; If non-standard please enter the desired stability after "C", example "C15": represents $\pm 15\text{ppm}$ over -10 to $+70^{\circ}\text{C}$
	$-40^{\circ}\text{C} \sim 85^{\circ}\text{C}$	"D" $\pm 25\text{ppm}$; "E" $\pm 50\text{ppm}$; "F" $\pm 100\text{ppm}$; If non-standard please enter the desired stability after "I", example "I30": represents $\pm 30\text{ppm}$ over -40 to $+85^{\circ}\text{C}$
[4]	"T" for OE Function, Leave this space blank if no connection on pad 1.	
[5]	Frequency in MHz	

Test Circuit & Test Waveform

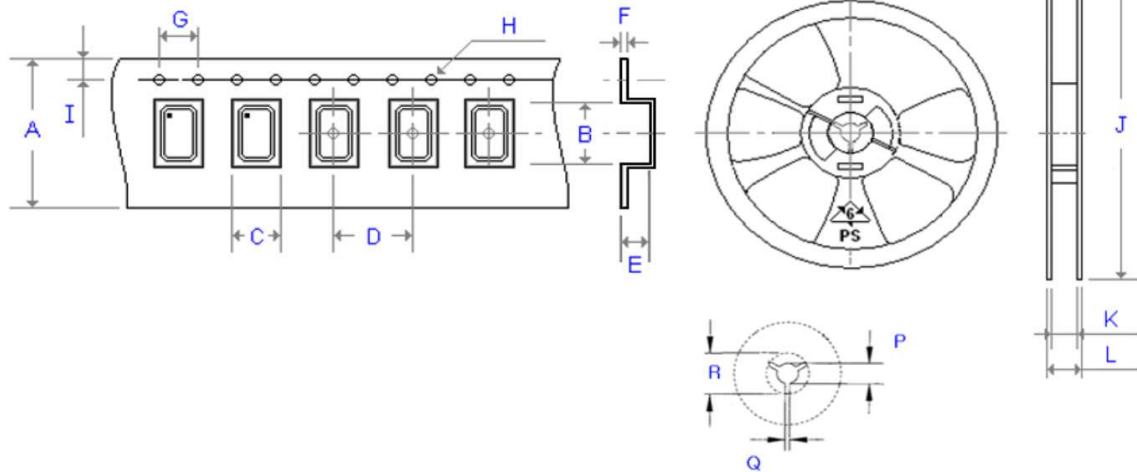
H ; H₋ - series CMOS Test Circuit

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	Ø 1.50	1.75	3000
H_22	8.00	2.80	2.25	4.00	1.10	0.30	4.00	Ø 1.50	1.75	3000
H_32	8.00	3.40	2.70	4.00	1.40	0.25	4.00	Ø 1.50	1.75	3000
H_53	12.00	5.30	3.60	8.00	1.40	0.30	4.00	Ø 1.50	1.75	1000
H_57	16.00	7.30	5.30	8.00	1.90	0.32	4.00	Ø 1.50	1.75	1000
SWO	16.00	7.20	5.40	8.00	1.80	0.32	4.00	Ø 1.50	1.75	1000
H_226	8.00	2.80	2.25	4.00	1.10	0.30	4.00	Ø 1.50	1.75	3000
H_326	8.00	3.40	2.70	4.00	1.40	0.25	4.00	Ø 1.50	1.75	3000
H_536	12.00	5.30	3.60	8.00	1.40	0.30	4.00	Ø 1.50	1.75	1000
H_576	16.00	7.30	5.30	8.00	1.90	0.32	4.00	Ø 1.50	1.75	1000
H_328	8.00	3.40	2.70	4.00	1.40	0.25	4.00	Ø 1.50	1.75	3000
H_538	12.00	5.40	3.60	8.00	1.70	0.30	4.00	Ø 1.50	1.75	1000
H_578	16.00	7.30	5.30	8.00	1.90	0.32	4.00	Ø 1.50	1.75	1000
H_43	24.00	11.80	10.00	16.00	5.00	0.30	4.00	Ø 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