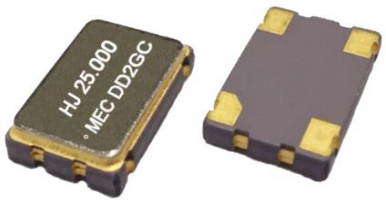
Crystal Oscillators [20.0 ~ 50.0 MHz]

CMOS output

HJ _ _	Ultra low phase noise RMS Phase Jitter 48 fsec	SMD	CMOS	1.8 V	2.5 V	3.3 V	Min. 20 MHz	Max. 50 MHz

Features

- The HJ series is ultra low phase noise crystal oscillators.
- Compared with standard oscillator, Mercury's HJ series has much better phase noise and jitter. HJ series with output frequency 49.152MHz has phase jitter 48 fsec (RMS, 12 KHz to 20 MHz) when V_{DD} at 3.3V.



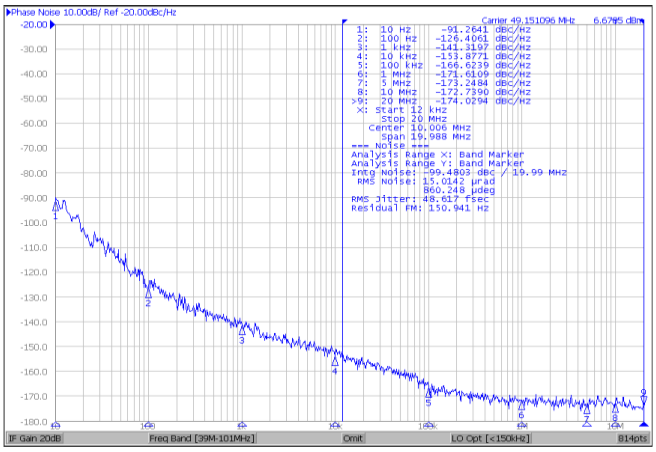
General specifications of all available packages , at Ta=+25°C , CL=15pF

Model [Output Logic]	" HJ " series [CMOS]			
Type	HJ22	HJ32	HJ53	HJ57
Dimemsions	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
Frequency Range	20.0 ~ 50.0 MHz	20.0 ~ 50.0 MHz	20.0 ~ 50.0 MHz	20.0 ~ 50.0 MHz

Supply Voltage	1.8 V ± 5%	+2.5 V ± 10%	+3.3 V ± 10%
	Voltage code is " 18 "	Voltage code is " 25 "	Voltage code is " 3 "
Current Consumption	3 mA (typ.) ; 5 mA (max.)	5 mA (typ.) ; 7 mA (max.)	7 mA (typ.) ; 10 mA (max.)
Current With Output Disable	3 uA (typ.) ; 25 uA (max.)	5 uA (typ.) ; 30 uA (max.)	9 uA (typ.) ; 35 uA (max.)
Output Logic " High " , " 1 "	1.62 V (min.)	2.25 V (min.)	2.97 V (min.)
Output Logic " Low " , " 0 "	0.18 V (max.)	0.25 V (max.)	0.33 V (max.)
Rise Time (Tr) / Fall Time (Tf)	5.0 nsec. (typ.) ; 10.0 nsec. (max.)	2.0 nsec. (typ.) ; 5.0 nsec. (max.)	1.5 nsec. (typ.) ; 5.0 nsec. (max.)
	Measured between 10 % ⟷ 90 % of V_{DD}		

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	

Supply Voltage vs Freq. Sensitivity	± 1.0 ppm (max.)
Output Load	15 pF
Start-up Time	0.8 msec (typ.) ; 5.0 msec (max.)
Duty Cycle	50% ± 5%
Output Enable / Disable Function on pin1	70% of V_{DD} (min.) to enable output.
	30% of V_{DD} (max.) to disable output.
Enable / Disable Time	Enable : 1.0 msec. (max.)
	Disable : 200 nsec. (max.)
Storage Temperature	-55°C to + 150°C
Aging at Ta=+25ºC	± 3 ppm (max.) first year
RMS Jitter [12 kHz ~ 20 MHz]	48 fsec (typ.) ; 300 fsec (max.)



SSB Phase Noise	Offset	10 Hz	100 Hz	1 KHz	10 KHz	100 KHz	1 MHz	5 MHz	20 MHz
25.000MHz [3.3V]	dBc/Hz (typ.)	-68	-102	-139	-157	-170	-166	-168	---
49.152MHz [3.3V]	dBc/Hz (typ.)	-91	-126	-141	-153	-166	-171	-172	-174

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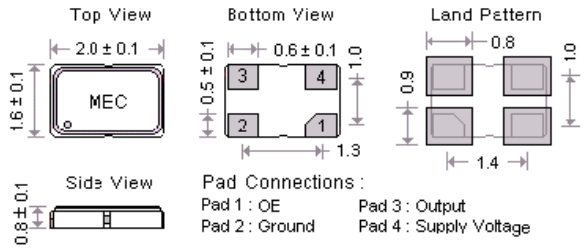
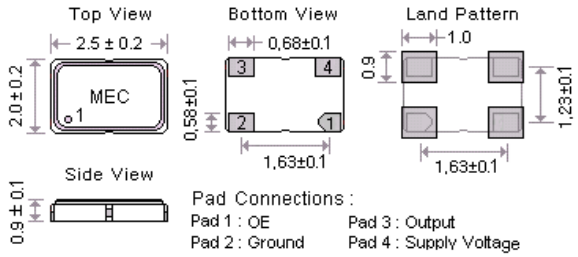
■USA : Tel: (+1)-909-466-0427 / sales-us@mercury-crystal.com ■China : Tel: (+86)-512-5763-8100 / sales-cn@mercury-crystal.com

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

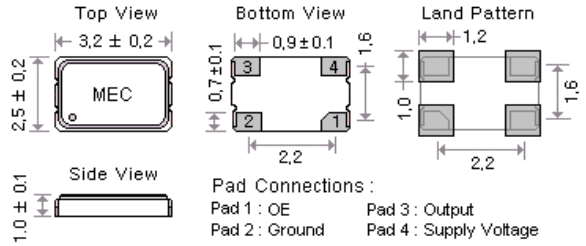
[H21]



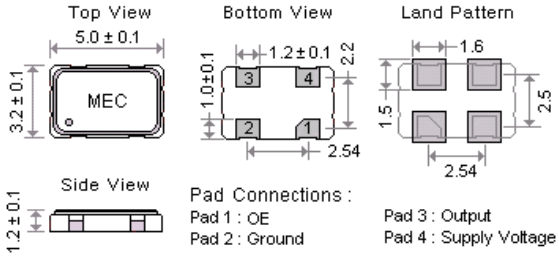
[H22 ; H_22]



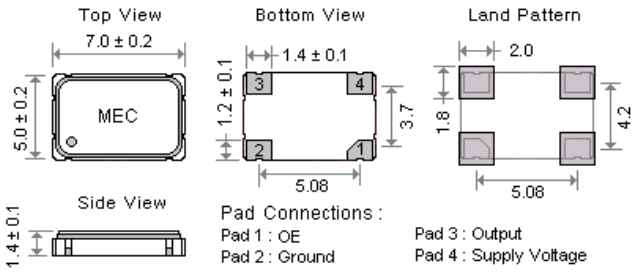
[H32 ; H_32]



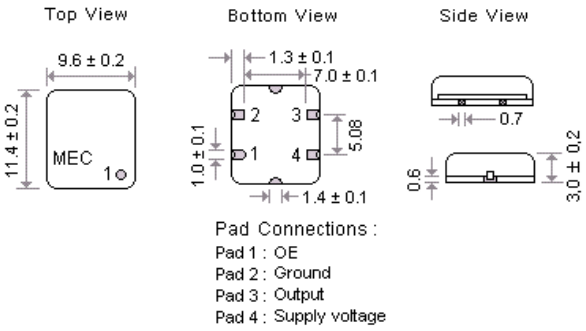
[H53 , H_53]



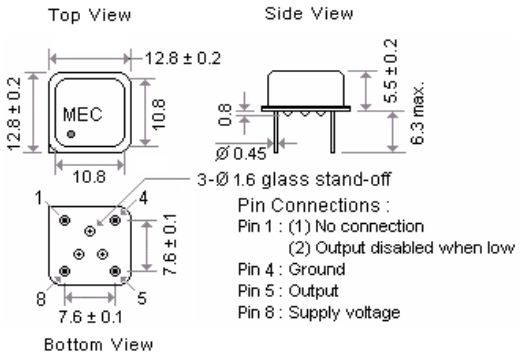
[SWO , H_57]



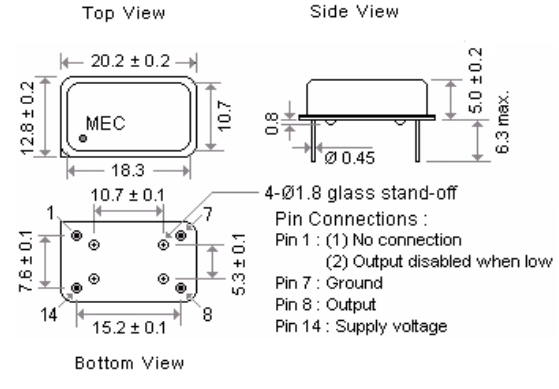
[H_43]



[H_8]



[H_14]



Part Number Format and Examples

	[1] Supply Voltage	[2] Holder Type	-	[3] Frequency Stability	[4] OE Function	-	[5] Center Frequency
Examples (1)	3	SWO	-	D	T	-	25.000
(2)	3	HY32	-	K50	T	-	24.000
(3)	3	HA32	-	B	T	-	32.768K
(4)	18	HJ22	-	E	T	-	49.152

Ex (1) : 3SWO - DT - 25.000 [3.3V , SWO 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]

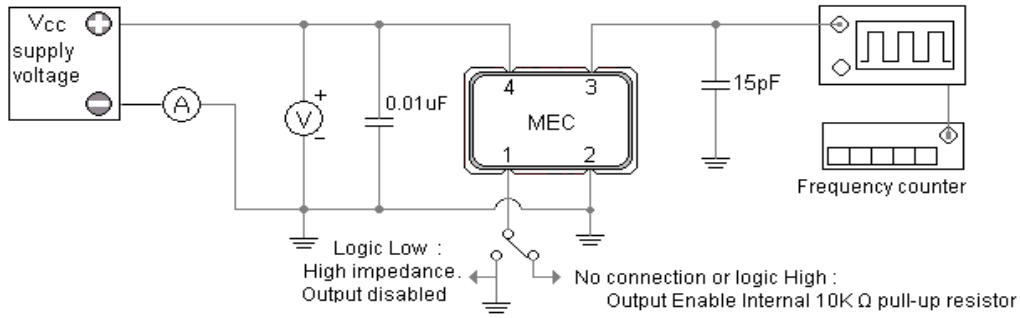
Ex (3) : 18HA32 - BT - 32.768K [1.8V , HA 3225 type , ±50ppm from -10°C to 70°C , Output Enable , 32.768KHz]

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

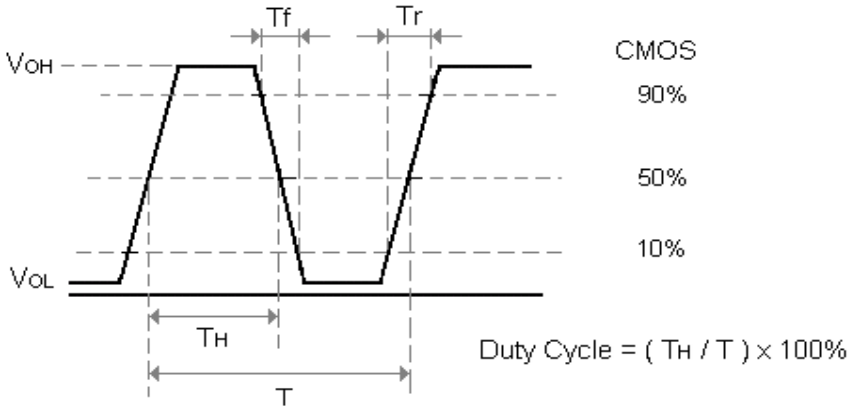
[1]	Supply voltage " 18 " for +1.8V ; " 25 " for +2.5V ; " 3 " for +3.3V ; " 5 " for +5.0V	
[2]	Holder Type	
[3]	-10°C ~ 70 °C	" A " ± 25ppm ; " B " ± 50ppm ; " C " ± 100ppm ;
		If non-standard please enter the desired stability after " C " , example " C15 " : represents ±15ppm over -10 to +70°C
	-40°C ~ 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

HA - series SMD Type Test Circuit

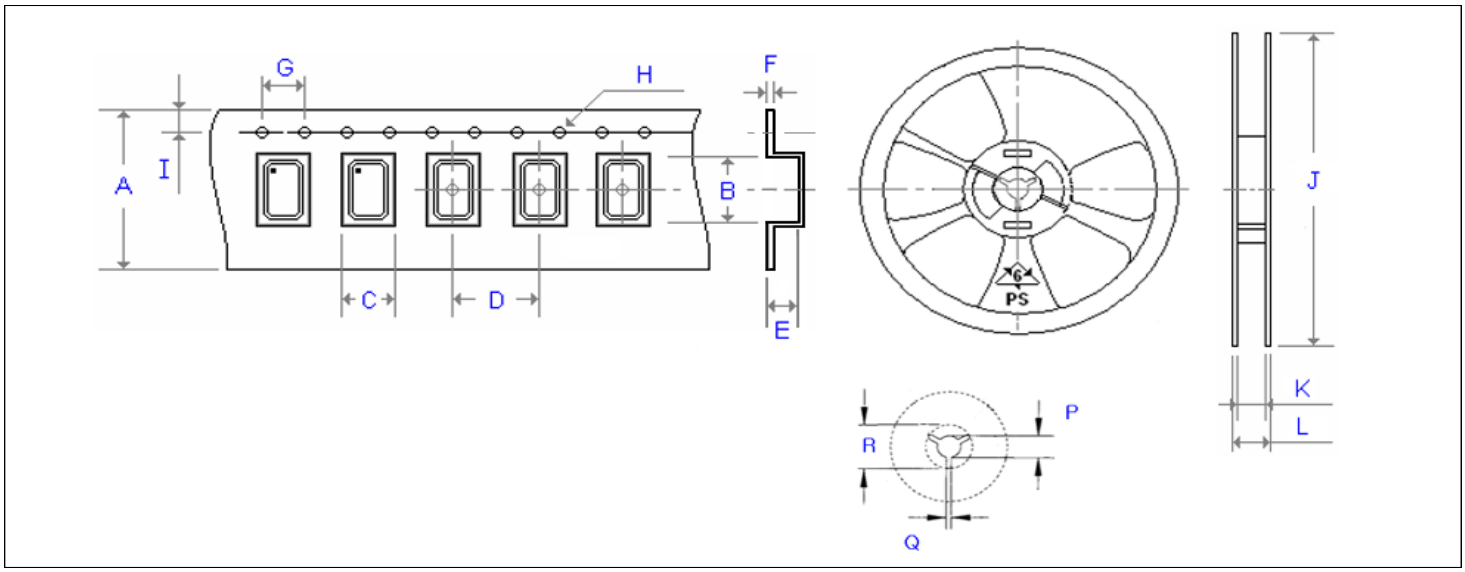


CMOS Output Waveform



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 _ JF328	8.00	3.40	2.70	4.00	1.40	0.25	4.00	Ø 1.50	1.75	3000
H _ JF538	12.00	5.30	3.60	8.00	1.40	0.30	4.00	Ø 1.50	1.75	1000
H _ JF578	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	12.000	13.00	2.50	20.20	3000
H_22	180.00	8.40	11.400	13.00	2.50	20.20	3000
H_32	180.00	9.00	12.000	13.00	2.50	20.20	3000
H_53	180.00	13.00	16.000	13.00	2.50	20.20	1000
H_57	180.00	17.20	19.300	13.00	2.50	20.20	1000
SWO	180.00	17.20	19.300	13.00	2.50	20.20	1000
H_226	180.00	8.40	11.400	13.00	2.50	20.20	3000
H_326	180.00	9.00	12.000	13.00	2.50	20.20	3000
H_536	180.00	13.00	16.000	13.00	2.50	20.20	1000
H _ 576	180.00	17.20	19.300	13.00	2.50	20.20	1000
H _ JF328	180.00	8.00	12.000	13.00	2.50	20.20	3000
H _ JF538	180.00	13.00	16.000	13.00	2.50	20.20	1000
H _ JF578	180.00	17.20	19.300	13.00	2.50	20.20	1000
H_43	330.00	24.50	29.100	13.00	2.50	20.20	500