

HJN _ _

Ultra Low Jitter

SMD

CMOS

1.8 V

2.5 V

3.3 V

Min.

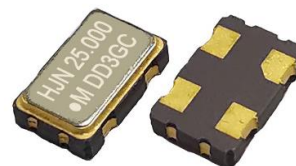
0.625 MHz

Max.

60 MHz

Features

- The HJN series is Low jitter crystal oscillators.
- Compared with standard oscillator, Mercury's HJN series has much better phase noise and jitter. HJN series with output frequency 49.152MHz has phase jitter 57 fsec (RMS, 12 KHz to 20 MHz) when V_{DD} at 3.3V.

General specifications of all available packages , at $T_a=+25^{\circ}\text{C}$, $CL=15\text{pF}$

Model [Output Logic]		" HJN " series [CMOS]							
Type		HJN22		HJN32		HJN53		HJN57	
Dimemnsions		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	
Supply Voltage (V _{DD})		1.8 V ± 10% Voltage code is " 18 "		2.5 V ± 10% Voltage code is " 25 "		3.3 V ± 10% Voltage code is " 3 "			
Frequency Range		0.625 ~ 50.0 MHz		0.625 ~ 60.0 MHz		0.625 ~ 60.0 MHz			
Current Consumption		2 mA (typ.) ; 5 mA (max.)		3 mA (typ.) ; 7 mA (max.)		5 mA (typ.) ; 10 mA (max.)			
Current With Output Disable		20 uA (max.)		20 uA (max.)		20 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) (10 % ↔ 90 % waveform)		2.0 nsec. (typ.) 5.0 nsec. (max.)		1.0 nsec. (typ.) 4.0 nsec. (max.)		1.0 nsec. (typ.) 3.0 nsec. (max.)			
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 " F "		
		Commercial (-20°C to +70°C)		A	B	C	For example : " C20 " ± 20 ppm over -20°C to +70°C ;		
		Industrial (-40°C to +85°C)		D	E	F	" F30 " ± 30 ppm over -40°C to +85°C		
Output Load		15 pF							
Start-up Time		0.4 msec (typ.) ; 1.0 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=+25°C		± 3 ppm (max.) first year							
RMS Jitter [12 kHz ~ 20 MHz]		57 fsec (typ.) @ 3.3V , 49.152MHz							
SSB Phase Noise	Offset	10 Hz	100 Hz	1 KHz	10 KHz	100 KHz	1 MHz	5 MHz	20 MHz
24.000MHz [3.3V]	dBc/Hz (typ.)	-78	-111	-142	-154	-167	-171	-171	---
49.152MHz [3.3V]	dBc/Hz (typ.)	-83	-113	-137	-151	-166	-171	-171	-171

Part Number Format and Examples

	[1]	[2]	-	[3]	[4]	-	[5]
	Supply Voltage	Holder Type		Frequency Stability	OE Function		Center Frequency
Examples	(1) 18	HJN57	-	D	T	-	25.000
	(2) 25	HJN32	-	A	T	-	24.000
	(3) 3	HJN22	-	E	T	-	32.000

Ex (1) : 18HJN57 - DT - 25.000 [1.8V , HJN seires 7050 type , $\pm 25\text{ppm}$ from -40°C to $+85^{\circ}\text{C}$, OE Function , 25.000MHz]

Ex (2) : 25HJN32 - AT - 24.000 [2.5V , HJN seires 3225 type , $\pm 25\text{ppm}$ from -20°C to $+70^{\circ}\text{C}$, OE Function , 24.000MHz]

Ex (3) : 3HJN22 - ET - 32.000 [3.3V , HJN seires 2520 type , $\pm 50\text{ppm}$ from -40°C to $+85^{\circ}\text{C}$, OE Function , 32.000MHz]

[1]	Supply voltage " 18 " for +1.8V ; " 25 " for +2.5V ; " 3 " for +3.3V		
[2]	Holder Type		
[3]	-20°C ~ 70 °C	" A " ± 25ppm ; " B " ± 50ppm ; " C " ± 100ppm ;	
		If non-standard please enter the desired stability after " C " , example " C15 " : represents ±15ppm over -20 to +70°C	
	-40°C ~ 85 °C	" D " ± 25ppm ; " E " ± 50ppm ; " F " ± 100ppm ;	
		If non-standard please enter the desired stability after " F " , example " F30 " : 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		

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

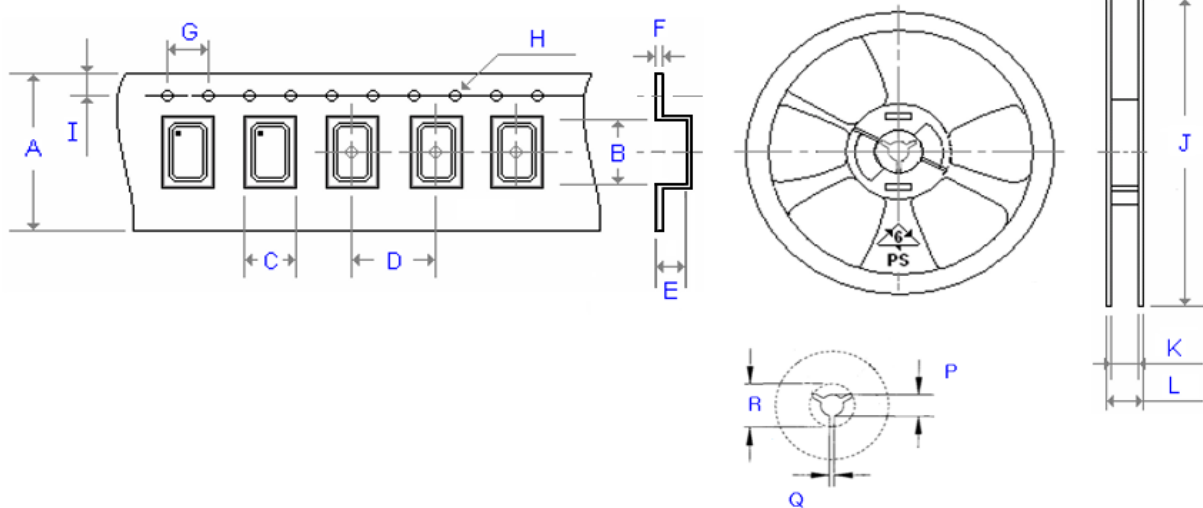
[HJN22]	[HJN32]
[HJN53]	[HJN57]

Test Circuit & Test Waveform

H ; H₋ - series CMOS Test Circuit Logic Low : High impedance . Output disabled No connection or logic High : Output Enable Internal 10KΩ pull-up resistor	CMOS Output Waveform Duty Cycle = $(T_H / T) \times 100\%$
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Emboss Taping and Reel Specifications

[Crystal Oscillator Units]



Carrier Type Dimensions (unit : mm) $\pm 0.3\text{mm}$

	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	0.30	4.00	Ø 1.50	1.75	1000
SWO	16.00	7.20	5.40	8.00	1.80	0.30	4.00	Ø 1.50	1.75	1000
H_216	8.00	2.30	1.90	4.00	0.90	0.25	4.00	Ø 1.50	1.75	3000
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	0.30	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	0.30	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) $+2.0 / -0.0\text{mm}$

	J	K	L	P	Q	R	pcs / reel
H21	180.00	9.00	12.00	13.20	2.10	-	3000
H_22	180.00	9.00	12.00	13.20	2.10	-	3000
H_32	180.00	9.00	12.00	13.20	2.10	-	3000
H_53	180.00	13.00	16.00	13.20	2.50	-	1000
H_57	180.00	17.20	19.30	13.30	2.20	22.00	1000
SWO	180.00	17.20	19.30	13.30	2.20	22.00	1000
H_216	178.00	8.40	11.40	13.30	2.50	20.50	3000
H_226	180.00	8.40	11.40	13.20	2.10	-	3000
H_326	180.00	9.00	12.00	13.20	2.10	-	3000
H_536	180.00	13.00	16.00	13.20	2.50	-	1000
H_576	180.00	17.20	19.30	13.30	2.20	22.00	1000
H_328	180.00	8.00	12.00	13.20	2.10	-	3000
H_538	180.00	13.00	16.00	13.20	2.50	-	1000
H_578	180.00	17.20	19.30	13.30	2.20	22.00	1000
H_43	330.00	24.50	29.10	13.00	2.20	17.30	500