

Low Jitter Crystal Oscillators

HTQN

CMOS Waveform

HPQN

LVPECL Differential

HDQN

LVDS Differential

0.6 ps
RMS Jitter

SMD

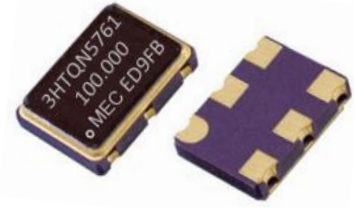
2.5 V 3.3 V

Min.
50 MHz

Max.
1,500 MHz

Features

- The HTQN, HPQN and HDQN Series are members of Mercury's Low Jitter Crystal Oscillators
- Output frequency range : 50 MHz to 1,500 MHz
- Low RMS Jitter 0.6 ps typical (12kHz to 20MHz)
- Package size : 3.2x2.5mm , 5.0x3.2mm , 7.0x5.0mm



General specifications , at Ta=+25°C

Model	HTQN		HPQN				HDQN		
Output Logic	CMOS		LVPECL				LVDS		
Supply Voltage V _{DD} (code)	+ 2.5 V ± 5% (voltage code " 25 ")		+ 2.5 V ± 5% (voltage code " 25 ")				+ 2.5 V ± 5% (voltage code " 25 ")		
	+ 3.3 V ± 10% (voltage code " 3 ")		+ 3.3 V ± 10% (voltage code " 3 ")				+ 3.3 V ± 10% (voltage code " 3 ")		
Available Frequency Range	50 ~ 250 MHz		50 ~ 1,500 MHz				50 ~ 1,500 MHz		
Output Load	15 pF		50 Ω into V _{cc} - 2V or Thevenin equivalent				100 Ω		
Output Logic " High " , " 1 "	90 % V _{DD}		V _{DD} - 1.03 (min.) , V _{DD} - 0.6 (max.)				1.4 V (typ.) , 1.6 V (max.)		
Output Logic " Low " , " 0 "	10 % V _{DD}		V _{DD} - 1.85 (min.) , V _{DD} - 1.6 (max.)				1.1 V (typ.) , 0.9 V (min.)		
Current with Output Disable	16 mA (typ.)		16 mA (typ.)				16 mA (typ.)		
Current Consumption (max.) (V _{DD} = + 3.3V)	50 ~ 100 MHz : 30 mA		150 ~ 250 MHz : 50 mA				150 ~ 250 MHz : 30 mA		
	101 ~ 150 MHz : 38 mA		251 ~ 750 MHz : 55 mA				251 ~ 750 MHz : 34 mA		
	151 ~ 200 MHz : 43 mA		751 ~ 1000 MHz : 57 mA				751 ~ 1,000 MHz : 38 mA		
	201 ~ 250 MHz : 48 mA		1001 ~ 1500 MHz : 60 mA				1001 ~ 1,500 MHz : 40 mA		
Rise Time / Fall Time	1.5 nsec. (typ.) , 3.0 nsec. (max.) Tr / Tf : 10% ↔ 90% waveform		0.2 nsec. (typ.) , 0.5 nsec. (max.) Tr / Tf : 20% ↔ 80% waveform				0.2 nsec. (Typ.) , 0.5 nsec. (max.) Tr / Tf : 20% ↔ 80% waveform		
Start-up Time	10 msec. (max.)		5.0 msec. (typ.) , 10 msec. (max.)				5.0 msec. (typ.) , 10 msec. (max.)		
Aging at Ta = +25°C	± 5 ppm (max.) for first year		± 3 ppm (max.) first year ; ± 2 ppm (max.) per year thereafter				± 3 ppm (max.) first year ; ± 2 ppm (max.) per year thereafter		
Duty Cycle	50% ± 5%								
Storage Temperature	-55°C to +150°C								
RMS Jitter (12 KHz to 20 MHz)	0.6 psec (typ.)								
SSB Phase Noise [dBc / Hz (typ.)]	Offset	10 Hz	100 Hz	1 KHz	10 KHz	100 KHz	1 MHz	10 MHz	
	156.250 MHz	-55	- 85	-109	-116	-118	-139	-146	
	622.08 MHz	-48	- 85	-101	-102	-103	-124	-133	
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 " represents . For example : " C20 " ± 20 ppm over -20°C to +70°C ; " F30 " ± 30 ppm over -40°C to +85°C			
	Commercial (-20°C to +70°C)		A	B	C				
	Industrial (-40°C to +85°C)		D	E	F				
Output Enable / Disable Function	Enable	When 70% (min.) of V _{DD} to Enable Output. Enable time : 200 nsec. (max.)							
	Disable	When 30% (max.) of V _{DD} to Disable Output. Disable current : 16 mA (max.) , Disable time : 50 nsec. (max.)							

Crystal Oscillators

HTQN [CMOS Waveform]

HPQN [LVPECL Differential]

HDQN [LVDS Differential]

Part Number Format and Example

	[1]	[2]	[3]		[4]		[5]
	Supply Voltage	Holder Type	1 or 2	-	Frequency Stability	-	Center Frequency
Example	(1) 25	HPQN576	2	-	D	-	622.080
	(2) 3	HDQN326	1	-	A	-	100.000

Ex (1) : **25HPQN5762 - D - 622.080** [+2.5V , H_ 576 type , LVPECL output , QN series , OE on pad # 2 , ± 25 ppm from -40°C to 85°C , 622.080MHz]

Ex (2) : **3HDQN3261 - A - 100.000** [+3.3V , H_ 326 type , LVDS output , QN series , OE on pad # 1 , ± 25 ppm from -20°C to 70°C , 100.000MHz]

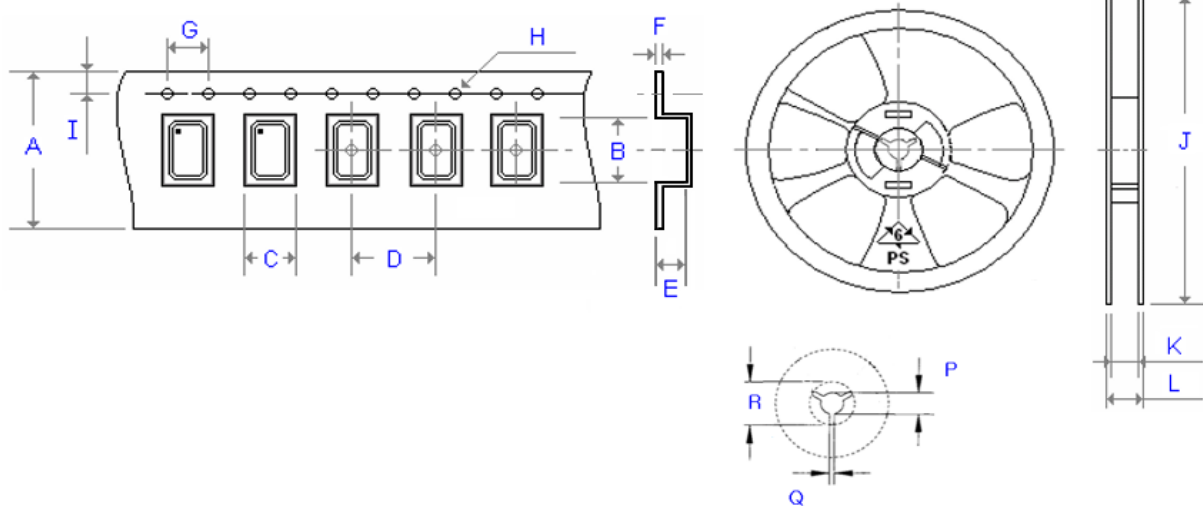
[1]	Supply voltage , " 2.5 " for +2.5V ; " 3 " for +3.3V	
[2]	Holder Type	
[3]	" 1 " : OE function on pad # 1 , " 2 " : OE function on pad # 2	
[4]	-20°C ~ 70°C	" A " ± 25ppm ; " B " ± 50ppm ; " C " ± 100ppm ; If non-standard please enter the desired stability after " C " , for example " C15 " : represents ±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 " , for example " F30 " : represents ± 30ppm over -40 to +85°C
[5]	Frequency in MHz	

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

H_QN326 		H_QN536 	
H_QN576 		Pad Connections : Pad 1 : Output Enable Pad 2 : No Connection Pad 3 : Ground Pad 4 : CMOS : Output , Differential : Output Pad 5 : CMOS : No Connection , Differential : Complementary Output Pad 6 : Supply Voltage	
CMOS Test Circuit 		LVPECL Test Circuit $V_{DD} = 3.3V ; R1 = R3 = 127 \Omega ; R2 = R4 = 82.5 \Omega$ $V_{DD} = 2.5V ; R1 = R3 = 250 \Omega ; R2 = R4 = 62.5 \Omega$	
LVDS Test Circuit 			

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	$\varnothing 1.50$	1.75	3000
H_22	8.00	2.80	2.25	4.00	1.10	0.30	4.00	$\varnothing 1.50$	1.75	3000
H_32	8.00	3.40	2.70	4.00	1.40	0.25	4.00	$\varnothing 1.50$	1.75	3000
H_53	12.00	5.30	3.60	8.00	1.40	0.30	4.00	$\varnothing 1.50$	1.75	1000
H_57	16.00	7.30	5.30	8.00	1.90	0.30	4.00	$\varnothing 1.50$	1.75	1000
SWO	16.00	7.20	5.40	8.00	1.80	0.30	4.00	$\varnothing 1.50$	1.75	1000
H_216	8.00	2.30	1.90	4.00	0.90	0.25	4.00	$\varnothing 1.50$	1.75	3000
H_226	8.00	2.80	2.25	4.00	1.10	0.30	4.00	$\varnothing 1.50$	1.75	3000
H_326	8.00	3.40	2.70	4.00	1.40	0.25	4.00	$\varnothing 1.50$	1.75	3000
H_536	12.00	5.30	3.60	8.00	1.40	0.30	4.00	$\varnothing 1.50$	1.75	1000
H_576	16.00	7.30	5.30	8.00	1.90	0.30	4.00	$\varnothing 1.50$	1.75	1000
H_328	8.00	3.40	2.70	4.00	1.40	0.25	4.00	$\varnothing 1.50$	1.75	3000
H_538	12.00	5.40	3.60	8.00	1.70	0.30	4.00	$\varnothing 1.50$	1.75	1000
H_578	16.00	7.30	5.30	8.00	1.90	0.30	4.00	$\varnothing 1.50$	1.75	1000
H_43	24.00	11.80	10.00	16.00	5.00	0.30	4.00	$\varnothing 1.50$	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