

Crystal Oscillators [Quick - turn Clock Oscillators , 10 ~ 1500 MHz]



HTQF
CMOS waveform

HPQF
PECL Differential

HDQF
LVDS Differential

2.5 V **3.3 V**

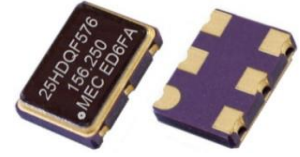
Min.
10 MHz

Max.
1,500 MHz

Features

0.8 ps Phase Jitter (typical)

- The HTQF, HPQF and HDQF Series are members of Mercury's Q-Family Quick-Turn crystal oscillators
- Output frequency range : 10 MHz to 1500 MHz
- Low RMS jitter 0.8 ps typical (12kHz to 20MHz)
- Package size : 3.2x2.5mm , 5.0x3.2mm , 7.0x5.0mm
- Next-day samples for prototypes



General specifications , at Ta=+25°C

Model	HTQF	HPQF				HDQF		
Output Logic	CMOS	PECL				LVDS		
Supply Voltage V _{DD} (code)	+ 2.5 V ± 5% (voltage code " 25 ") + 3.3 V ± 10% (voltage code " 3 ")	+ 2.5 V ± 5% (voltage code " 25 ") + 3.3 V ± 10% (voltage code " 3 ")				+ 2.5 V ± 5% (voltage code " 25 ") + 3.3 V ± 10% (voltage code " 3 ")		
Available Frequency Range	10 ~ 250 MHz	10 ~ 1,500 MHz				10 ~ 1,500 MHz		
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 Typical , 1.6 V max.		
Output Logic " Low " , " 0 "	10 % V _{DD}	V _{DD} - 1.85 (min.) , V _{DD} - 1.6 (max.)				1.1 V Typical , 0.9 V min.		
Current with Output Disable	16 mA (typ.)	16 mA (typ.)				16 mA (typ.)		
Current Consumption (Max.) (V _{DD} = + 3.3V)	10 ~ 50 MHz : 30 mA	10 ~ 250 MHz : 50 mA				10 ~ 250 MHz : 30 mA		
	51 ~ 150 MHz : 38 mA	251 ~ 750 MHz : 55 mA				251 ~ 750 MHz : 34 mA		
	151 ~ 250 MHz : 48 mA	751 ~ 1,500 MHz : 60 mA				751 ~ 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.) , 0.4 nsec. (max.) Tr / Tf : 20% → 80% waveform		
Duty Cycle	50 % ± 5%							
Start-up Time	10 msec. (max.)							
Aging at Ta = +25°C	± 2 ppm (max.) first year ; ± 10 ppm (max.) over 10 years							
Storage Temperature	-55°C to + 150°C							
RMS Jitter (12 KHz to 20 MHz)	0.8 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 " I " represents . 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			
Output Enable Function								
OE Control on Pad 1	70% of V _{DD} (min.) to enable output. (Open connection prohibit.)							
	30% of V _{DD} (max.) to disable output.							
Output Enable Time / Disable Time	200 nsec.(max.) / 50 nsec.(max.)							

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Q family
F series

SMD

Part Number Format and Example

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

Example	(1)	25	HPQF576	1	-	D	-	622.080
	(2)	3	HDQF326	1	-	A	-	100.000

Ex (1) : **25HPQF5761 - D - 622.080** [+2.5V , H_ 576 type , PECL output , QF series ,OE on pad # 1 , ±25 ppm from -40°C to 85°C , 622.080MHz]

Ex (2) : **3HDQF3261 - A - 100.000** [+3.3V , H_ 326 type , LVDS output , QF series ,OE on pad # 1 , ±25 ppm from -10°C to 70°C , 100.000MHz]

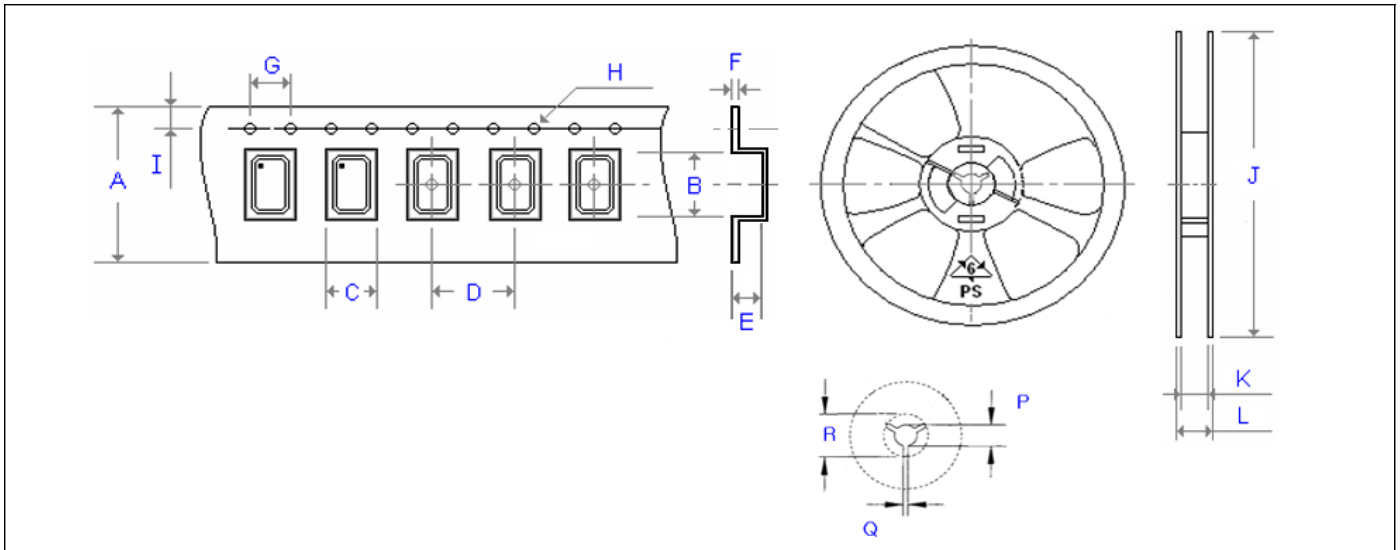
[1]	Supply voltage , " 25 " for +2.5V ; " 3 " for +3.3V		
[2]	Holder Type		
[3]	" 1 " : OE function on pad # 1 , " 2 " : OE function on pad # 2		
[4]	-10°C ~ 70 °C	" A " ± 25ppm ; " B " ± 50ppm ; " C " ± 100ppm ; If non-standard please enter the desired stability after " C " , for example " C15 " : represents ±15ppm over -10 to +70°C	
	-40°C ~ 85 °C	" D " ± 25ppm ; " E " ± 50ppm ; " F " ± 100ppm ; If non-standard please enter the desired stability after " I " , for example " I30 " : represents ± 30ppm over -40 to +85°C	
[5]	Frequency in MHz		

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

<p style="text-align: center;">[H_QF326]</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Top View</p> </div> <div style="text-align: center;"> <p>Bottom View</p> </div> <div style="text-align: center;"> <p>Land Pattern</p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="text-align: center;"> <p>Side View</p> </div> <div style="width: 60%;"> <p>Pad Connections :</p> <p>Pad 1 : OE Pad 2 : No Connection Pad 3 : Ground</p> <p>Pad 4 : Output Pad 5 : Complementary Pad 6 : Supply Voltage</p> </div> </div>	<p style="text-align: center;">[H_QF536]</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Top View</p> </div> <div style="text-align: center;"> <p>Bottom View</p> </div> <div style="text-align: center;"> <p>Land Pattern</p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="text-align: center;"> <p>Side View</p> </div> <div style="width: 60%;"> <p>Pad Connections :</p> <p>Pad 1 : OE Pad 2 : No Connection Pad 3 : Ground</p> <p>Pad 4 : Output Pad 5 : Complementary Pad 6 : Supply Voltage</p> </div> </div>
<p style="text-align: center;">[H_QF576]</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Top View</p> </div> <div style="text-align: center;"> <p>Bottom View</p> </div> <div style="text-align: center;"> <p>Land pattern</p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="text-align: center;"> <p>Side View</p> </div> <div style="width: 60%;"> <p>Pad Connections :</p> <p>Pad 1 : OE Pad 2 : No Connection Pad 3 : Ground</p> <p>Pad 4 : Output Pad 5 : Complementary Pad 6 : Supply Voltage</p> </div> </div>	<p style="text-align: center;">LVPECL Test Circuit</p> <p style="font-size: small; text-align: center;">V_{DD} = 3.3V ; R₁ = R₃ = 127 Ω ; R₂ = R₄ = 82.5 Ω V_{DD} = 2.5V ; R₁ = R₃ = 250 Ω ; R₂ = R₄ = 62.5 Ω</p>
<p style="text-align: center;">CMOS Test Circuit</p>	<p style="text-align: center;">LVDS Test Circuit</p>

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