

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

HTQF
CMOS Waveform

HPQF
LVPECL Differential

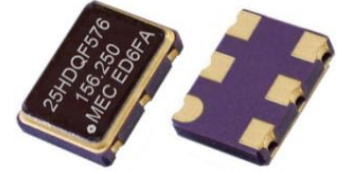
HDQF
LVDS Differential

Q family

F series

SMD
2.5 V
3.3 V
Min.
10 MHz
Max.
1,500 MHz
Features
Quick - Turn Clock Oscillators
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 1,500 MHz
- Package size : 3.2 x 2.5mm , 5.0 x 3.2mm , 7.0 x 5.0mm
- Next-day samples for prototypes

General specifications , at Ta=+25°C


Model	HTQF			HPQF			HDQF		
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	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 (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)	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.)			0.2 nsec. (typ.) , 0.5 nsec. (max.)			0.2 nsec. (typ.) , 0.4 nsec. (max.)		
	Tr / Tf : 10% ↔ 90% waveform			Tr / Tf : 20% ↔ 80% waveform			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	$\pm$ 25 ppm	$\pm$ 50 ppm	$\pm$ 100 ppm	If non-standard , please enter the desired stability after the " C " or " F " represents . For example : " C20 " $\pm$ 20 ppm over -20°C to +70°C ; " F30 " $\pm$ 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 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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HTQF	HPQF	HDQF	Q family	SMD	Min.	Max.
CMOS Waveform	LVPECL Differential	LVDS Differential	F series		10 MHz	1,500 MHz

Part Number Format and Example

Quick - Turn Clock Oscillators

0.8 ps Phase Jitter (typical)

	[1]	[2]	[3]	-	[4]	-	[5]
	Supply Voltage	Holder Type	1 or 2		Frequency Stability		Center Frequency
Example	(1) 3	HTQF536	1	-	B	-	200.000
	(2) 25	HPQF576	1	-	D	-	622.080
	(3) 3	HDQF326	1	-	A	-	100.000

Ex (1) : **3HTQF5361 - B - 200.000** [+3.3V , H_ 536 type , CMOS output , QF series , OE on pad # 1 , ±50 ppm from -20°C to 70°C , 200.000MHz]

Ex (2) : **25HPQF5761 - D - 622.080** [+2.5V , H_ 576 type , LVPECL output , QF series , OE on pad # 1 , ±25 ppm from -40°C to 85°C , 622.080MHz]

Ex (3) : **3HDQF3261 - A - 100.000** [+3.3V , H_ 326 type , LVDS output , QF series , OE on pad # 1 , ±25 ppm from -20°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]	-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_QF576 Pad Connections : Pad 1 : OE Pad 2 : No Connection Pad 3 : Ground Pad 4 : Output Pad 5 : Complementary Pad 6 : Supply Voltage			H_QF536 Pad Connections : Pad 1 : OE Pad 2 : No Connection Pad 3 : Ground Pad 4 : Output Pad 5 : Complementary Pad 6 : Supply Voltage		
H_QF326 Pad Connections : Pad 1 : OE Pad 2 : No Connection Pad 3 : Ground Pad 4 : Output Pad 5 : Complementary Pad 6 : Supply Voltage					

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LVPECL Differential

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Q family

F series

SMD

Min.

10 MHz

Max.

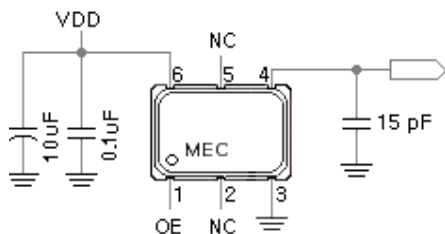
1,500 MHz

Test Circuits

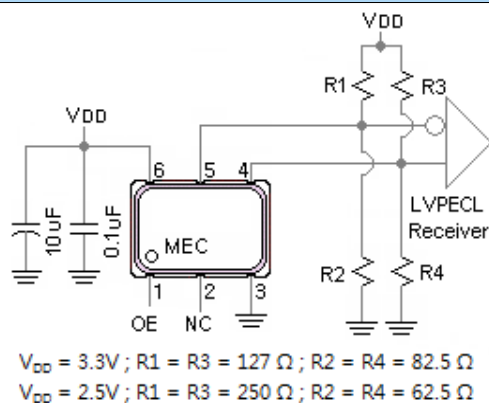
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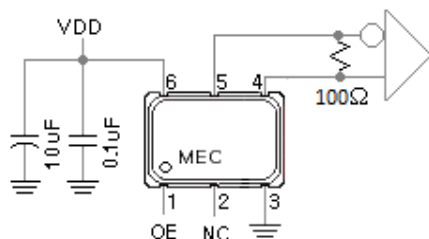
CMOS Test Circuit



LVPECL Test Circuit

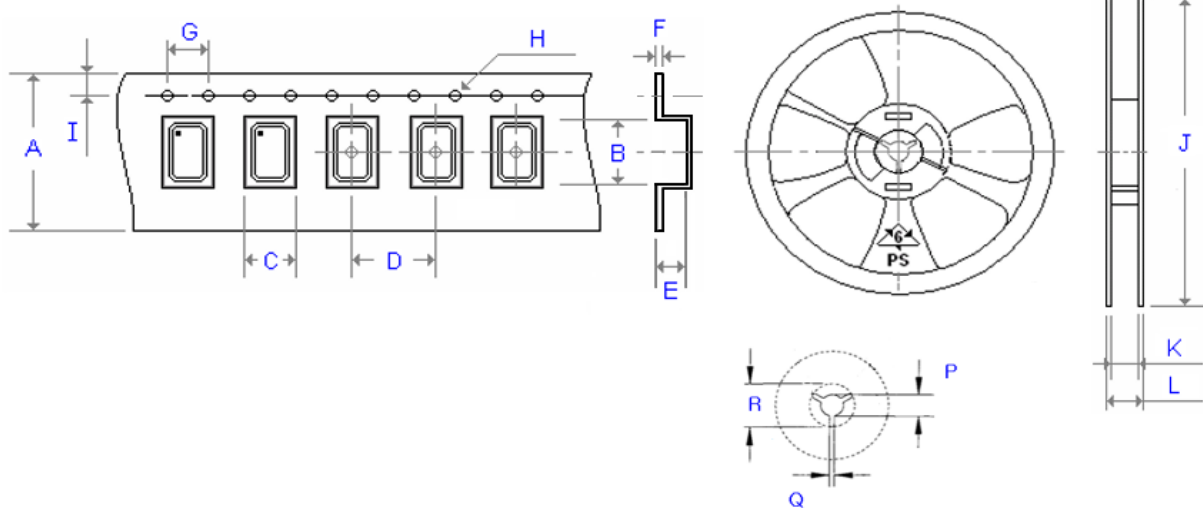


LVDS Test Circuit



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