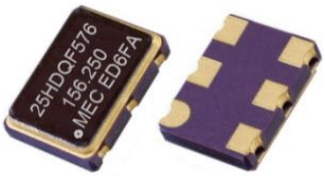
Crystal Oscillators [Quick - Turn Clock Oscillators , 10 ~ 1500 MHz]

HTQF	HPQF	HDQF	Q family / F series	SMD	2.5 V / 3.3 V	Min. 10 MHz	Max. 1,500 MHz
CMOS Waveform	LVPECL Differential	LVDS Differential					

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 Vcc - 2V or Thevenin equiralent	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.) 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 " 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 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.)

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

HTQF [CMOS Waveform]	HPQF [LVPECL Differential]	HDQF [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) 3	HTQF536	2	–	B	–	200.000
	(2) 3	HDQF326	1	–	A	–	100.000

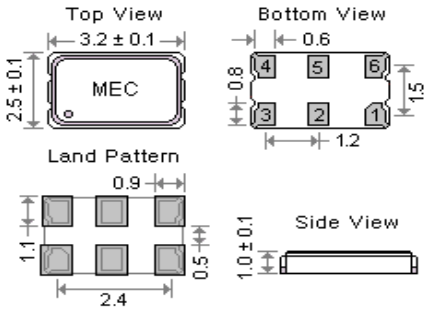
Ex (1) : 3HTQF5362 - B - 200.000 [+3.3V , H_ _ 536 type , CMOS output , QF series , OE on pad # 2 , ±50 ppm from -20°C to 70°C , 200.000MHz]

Ex (2) : 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]

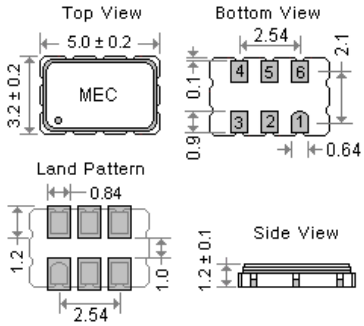
[1]	Supply voltage , " 25 " for +2.5V ; " 3 " for +3.3V	
[2]	Holder Type	
[3]	" 1 " : OE function on pad # 1 ; " 2 " : OE function on pad # 2	
[4]	-20°C ~ 70°C	" A " ± 25ppm ; " B " ± 50ppm ; " C " ± 100ppm ; If non-standard please enter the desired stability after " C " , for example " C15 " : represents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

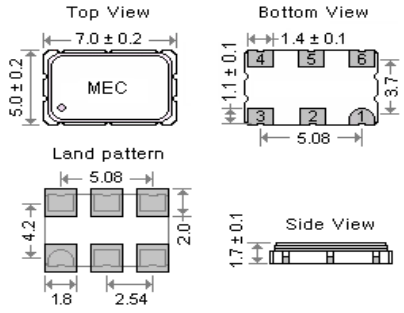
H_QF326



H_QF536



H_QF576



Pad Connections :

Pad 1 : Output Enable

Pad 2 : No Connection

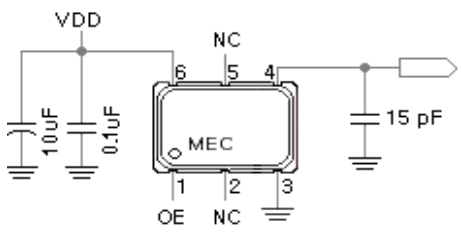
Pad 3 : Ground

Pad 4 : CMOS : Output , Differential : Output

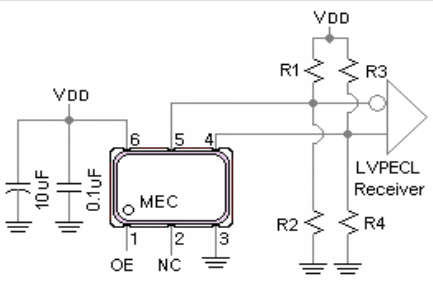
Pad 5 : CMOS : No Connection , Differential : Complementary Output

Pad 6 : Supply Voltage

CMOS Test Circuit



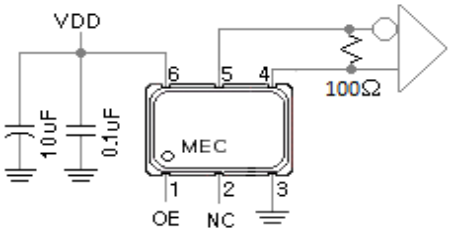
LVPECL Test Circuit



V_{DD} = 3.3V ; R1 = R3 = 127 Ω ; R2 = R4 = 82.5 Ω

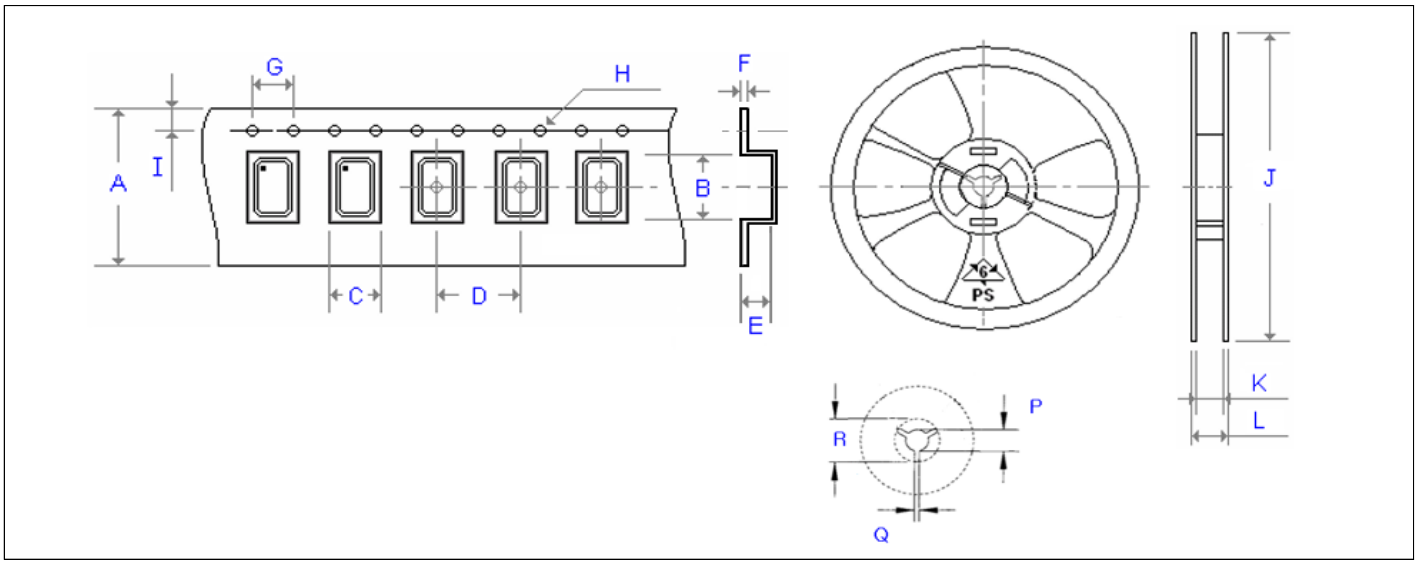
V_{DD} = 2.5V ; R1 = R3 = 250 Ω ; R2 = R4 = 62.5 Ω

LVDS Test Circuit



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	0.30	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 / -0.0mm

	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