Defferential PECL Crystal Clock Oscillators [PECL Outputs]

" HPF " series , F group characteristics
" HPW " series , W group characteristics
" HPA " series , A group characteristics

Mercury Since 1973

- HPA series (non-PLL) uses third overtone crystal to achieve ultra low jitter and phase noise
- HPF and HPW use high-Q fundamental crystal and low jitter multiplier circuit.
- HPA and HPF offer <1 ps phase jitter. "HPW" offers moderate jitter and low cost.

RoHS Compliance

General Specifications

Model	" ***HPF*** " series		" ***HPW*** " series			" ***HPA*** " series	
Technology	High Q fundamental crystal + low jitter multiplier circuit		High Q fundamental crystal + multiplier circuit			Third overtone crystal (non-PLL)	
Output Logic	LVPECL						
Available Frequency Range	38.0 MHz ~ 640.0 MHz		750 KHz ~ 800.0 MHz			60.0 MHz ~ 320.0 MHz	
Supply Voltage V_{DD}	+2.5 V_{DD} ± 5%	+3.3 V_{DD} ± 5%	+3.3 V_{DD} ± 5%			+2.5 V_{DD} ± 5%	+3.3 V_{DD} ± 5%
Supply Voltage Code	" 25 "	" 3 "	" 3 "			" 25 "	***" 3 "***
Output Logic " High " , " 1 "	V_{DD}-1.025 min. Termination: R_L=50 Ω to (V_{DD}-2.0V). See test circuit below.						
Output Logic " Low " , " 0 "	V_{DD}-1.620 max. Termination: R_L=50 Ω to (V_{DD}-2.0V). See test circuit below.						
Integrated Phase Jitter (12 KHz to 20 MHz)	0.4 ps typical; 0.5 ps max. For 156.250 MHz		2.6 ps typical; 4 ps max. For 155.520 MHz			0.25 ps typical; 4 ps max. For 155.520 MHz	
Period Jitter RMS ; Decoupling capacitor between V_{DD} and ground	3 ps typical ; 5 ps max. For 156.250 MHz		4.3 ps typical. For 155.520 MHz			2.5 ps typical. For 155.520 MHz	
Period Jitter (peak-to-peak ; Decoupling capacitor between V_{DD} and ground)	20 ps typical ; 30 ps max. For 156.250 MHz		27 ps typical. For 155.520 MHz			21 ps typical. For 155.520 MHz	
Current Consumption (15 pF load)	38 MHz ~ 100 MHz: 65 mA max 100.01 MHz ~ 320 MHz: 80 mA max. 320.01 MHz ~ 640 MHz: 90 mA		< 24 MHz: 25 mA max 24.01 MHz ~ 96 MHz: 65 mA max. 96.01 MHz~700 MHz: 100 mA			75 mA max. for 212.5 MHz	
Rise Time / Fall Time	0.4 ns typical , 0.55 ns max. (20%↔80% of the PECL wave form)		0.6 ns typical , 1.5 ns max. (20%↔80% of the PECL wave form			0.4 ns typical , 0.7 ns max. (20%↔80% of the PECL wave form)	
Frequency Stability [1] 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 (e.g. "C20" ±20 ppm over 0°C to +70°C ; " I20 " represents ± 20 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*		
Load	R_L=50 Ω to (V_{DD}-2.0V). See test circuit below.						
Start-up Time	10 m sec. (max.)						
Duty Cycle	50% ± 5% (measured at V_{DD} -1.3V)						
Input Static Discharge Protection	2 KV (min.)						
Storage Temperature	-55°C to + 150°C						
Aging at Ta = +25°C	± 3 ppm max. first year ; ± 2 ppm max. per year thereafter						
Supply Voltage V_{DD}	+ 4.6 V D.C. (max.)						
Input Voltage Vi	V_{SS} -0.5 (min.) ; V_{DD} + 0.5V (max.)						
Input Voltage Vo	V_{SS} -0.5 (min.) ; V_{DD} + 0.5V (max.)						
Absolute Maximum Rating (permanent damage may be created if operate beyond limits specified.)							
Tri - State Function. 5761 on pad No. 1 5762 on pad No. 2	No Connection	Differential PECL and compliantary PECL outputs .					
	Disable	Both outputs are disabled (high impedance) when the Tri-state pad taken below 0.45*Vcc referenced to ground (threshold) Oscillator is always On . Only buffer stage is disabled . Disable current : 50 uA max. (at 0.0V) , Disable time : 10 ns (max.)					
	Enable	At disabled mode , both outputs are enabled when Tri-state pad is taken above 0.45*Vcc referenced to ground (threshold) ; Enable time : 10ns + one period of the output frequency (max.)					
SSB Phase Noise (dBc / Hz)	Offset	Frequency: 156.250 MHz	Frequency: 155.520 MHz			Frequency: 212.500 MHz	
	10 Hz	-62 dBc / Hz	-62 dBc / Hz			-72 dBc / Hz	
	100 Hz	-92 dBc / Hz	-95 dBc / Hz			-100 dBc / Hz	
	1 KHz	-120 dBc / Hz	-120 dBc / Hz			-130 dBc / Hz	
	10 KHz	-132 dBc / Hz	-125 dBc / Hz			-140 dBc / Hz	
	100 KHz	-128 dBc / Hz	-121 dBc / Hz			-142 dBc / Hz	
	1 MHz	-140 dBc / Hz	-120 dBc / Hz			-147 dBc / Hz	
	10 MHz	-150 dBc / Hz	-140 dBc / Hz			-150 dBc / Hz	

[1] Inclusive of 25°C tolerance, operating temperature range, ±10% input voltage variation, load change, aging shock and vibration

Part Number Format and Examples :

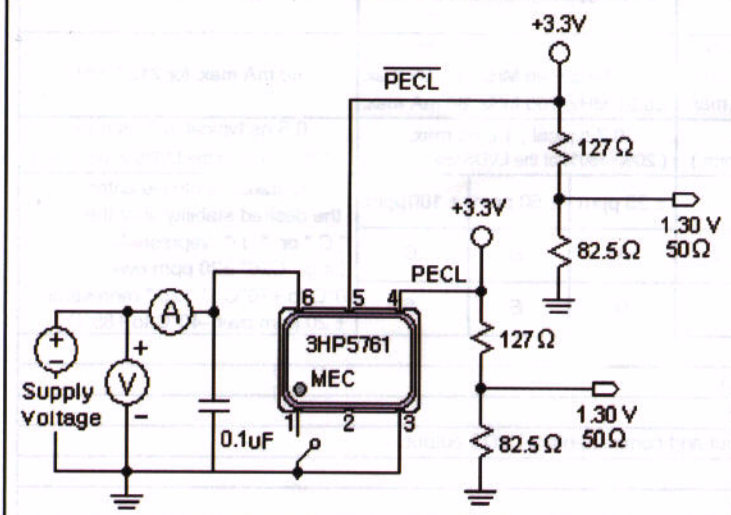
[1]	[2]	[3]	[4]	[5]	[6]
Voltage	Type **1** Type **2**	G ---	Stability ---	Frequency ---	Customer spec.

[1]	Supply voltage , " 25 " for +2.5V , " 3 " for +3.3V
[2]	" 1 " : Tri-state function on pad # 1 , " 2 " : Tri-state function on pad # 2
[3]	Please add " G " after the " type code " for RoHS compliance (H__576_ series are not included)
[4]	Frequency Stability Code: Please see previous page [Frequency Stability (1)]
[5]	Frequency in MHz
[6]	Assigned by Mercury if custom spec

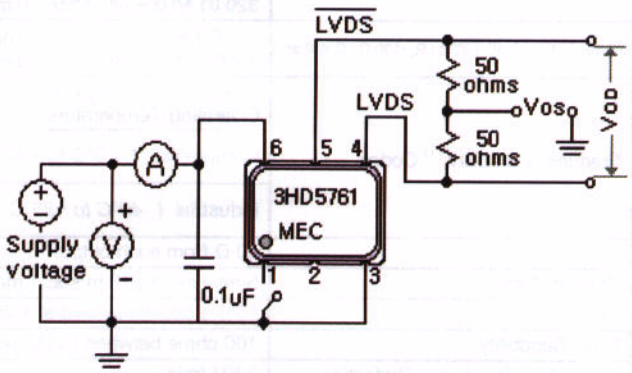
Ex (1) : 3HPA5762 - A - 100.000 represents +3.3V input voltage , LVPECL output wave , group A Characteristics , 100.000MHz 7.0*5.0*1.8mm package, 6 pads SMD type ,Tri-state function on pad # 2 , ±25 ppm from -10°C to 70°C ,

Ex (2) : 3HDW621G - E - 200.000 represents +3.3V input voltage , LVDS output wave , group W Characteristics , 200.000MHz , RoHS , 11.4*9.,6*2.5mm package, 6 pads SMD type ,Tri-state function on pad # 1, ±50 ppm from -40°C to 85°C ,

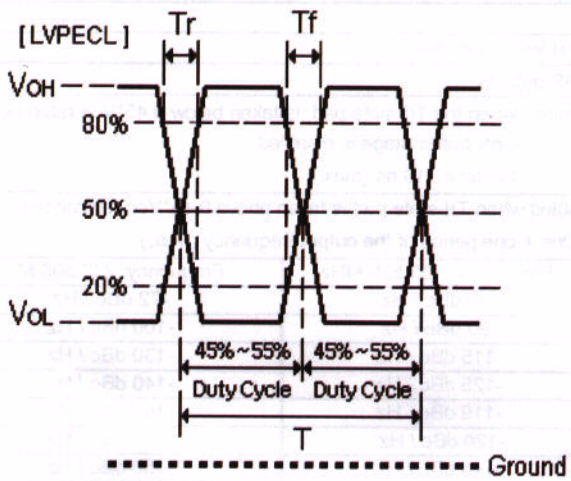
PECL Square Wave Test Circuit



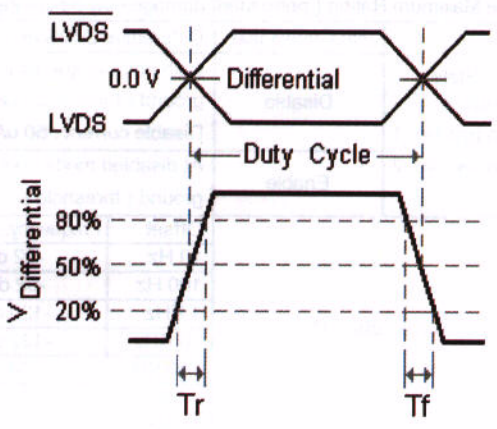
LVDS Square Wave Test Circuit



PECL Square Wave Output Wave Form

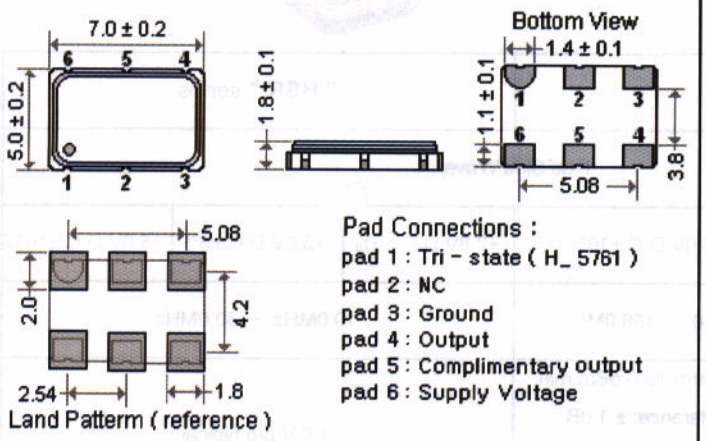


LVDS Square Wave Output Wave Form



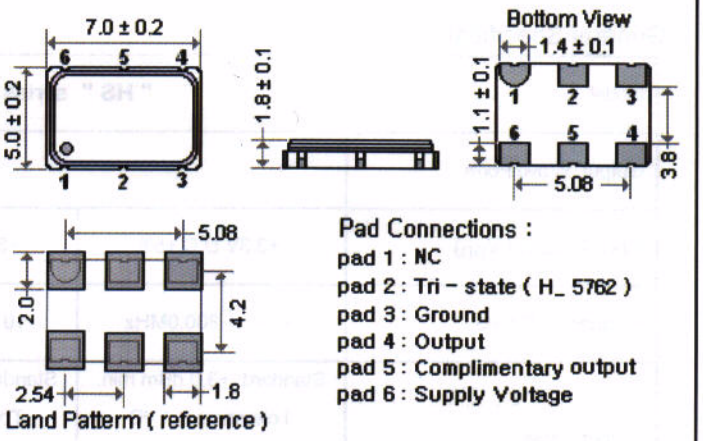
Outline Dimensions (Unit : mm) , Suggested Pad Layout

[HPF5761 , HPW5761 , HPA5761] , [HDF5761 , HDW5761 , HDA5761]



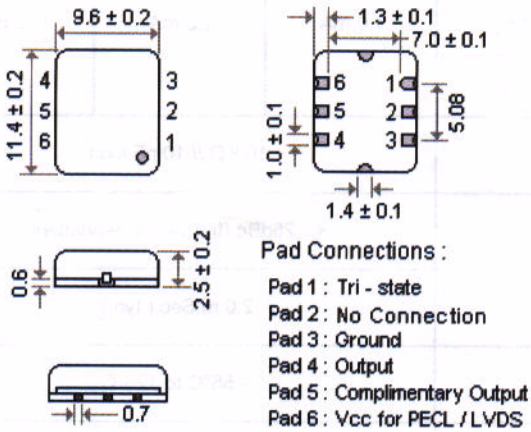
Pad Connections :
pad 1 : Tri - state (H_ 5761)
pad 2 : NC
pad 3 : Ground
pad 4 : Output
pad 5 : Complimentary output
pad 6 : Supply Voltage

[HPF5762 , HPW5762 , HPA5762] , [HDF5762 , HDW5762 , HDA5762]



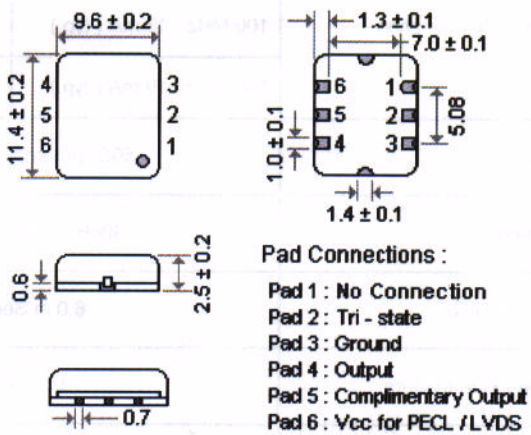
Pad Connections :
pad 1 : NC
pad 2 : Tri - state (H_ 5762)
pad 3 : Ground
pad 4 : Output
pad 5 : Complimentary output
pad 6 : Supply Voltage

[HPF621 , HPW621 , HPA621] , [HDF621 , HDW621 , HDA621]



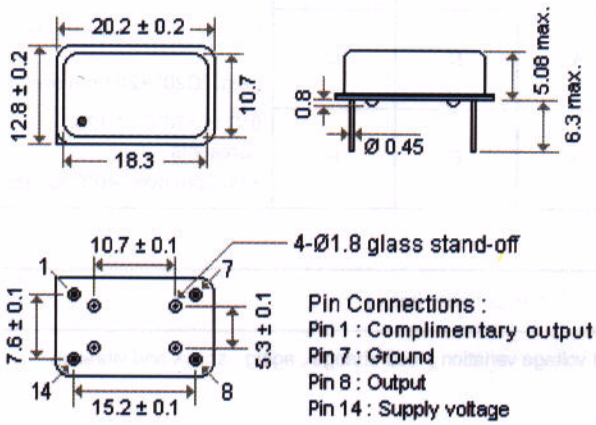
Pad Connections :
Pad 1 : Tri - state
Pad 2 : No Connection
Pad 3 : Ground
Pad 4 : Output
Pad 5 : Complimentary Output
Pad 6 : Vcc for PECL / LVDS

[HPF622 , HPW622 , HPA622] , [HDF622 , HDW622 , HDA622]



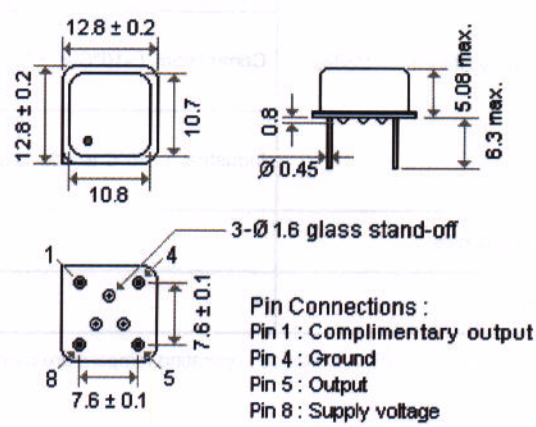
Pad Connections :
Pad 1 : No Connection
Pad 2 : Tri - state
Pad 3 : Ground
Pad 4 : Output
Pad 5 : Complimentary Output
Pad 6 : Vcc for PECL / LVDS

[HPF14 , HPW14 , HPA14] , [HDF14 , HDW14,HDA14]



Pin Connections :
Pin 1 : Complimentary output
Pin 7 : Ground
Pin 8 : Output
Pin 14 : Supply voltage

[HPF8 , HPW8 , HPA8] , [HDF8 , HDW8 , HDA8]



Pin Connections :
Pin 1 : Complimentary output
Pin 4 : Ground
Pin 5 : Output
Pin 8 : Supply voltage