Ultra Low Jitter Differential Oscillator

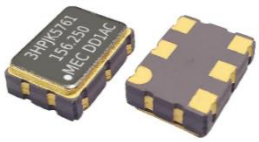
Differential

HPJK	HDJK	HCJK	SMD	1.8 V	2.5 V	3.3 V	2.5 V ~ 3.3 V	Min.	Max.
LVPECL	LVDS	HCSL						100 MHz	250 MHz

Features

Jitter 50 fsec (typical)

- Femtosecond integrated phase jitter (50 fs typical , 12 KHz to 20 MHz)
- Superior phase noise (-157 dBc/Hz at 100 KHz and -164 dBc/Hz at 10 MHz offset)
- Small size for 2.5 x 2.0 mm package



General specifications , at Ta=+25°C

Model		HPJK	HDJK	HCJK
Output Logic		LVPECL	LVDS	HCSL
Available Frequency Range by Supply Voltage (V_{DD}) ±10%	1.8V ± 5%	--	100 MHz ~ 175 MHz	100 MHz ~ 175 MHz
	2.5V	100 MHz ~ 250 MHz	100 MHz ~ 250 MHz	100 MHz ~ 175 MHz
	3.3V	100 MHz ~ 250 MHz	100 MHz ~ 250 MHz	100 MHz ~ 175 MHz
	+2.5V ~ +3.3V	100 MHz ~ 250 MHz	100 MHz ~ 250 MHz	100 MHz ~ 175 MHz
	If you have frequency requirements below 100MHz, please contact Mercury.			
Output Load		50 Ω into V_{DD} - 2.0V or Thevenin equivalent	100 Ω between output and complimentary output	50 Ω to ground on each output
Rise Time / Fall Time (20%↔80% of waveform)		0.15 nsec (typ.) 0.4 nsec (max.)	0.15 nsec (typ.) 0.3 nsec (max.)	0.2 nsec (typ.) 0.6 nsec (max.)
Current Consumption		52 mA (typ.) , 65 mA (max.)	22 mA (typ.) , 30 mA (max.)	38 mA (typ.) , 48 mA (max.)
Output Logic " High " , " 1 "		V_{DD} - 1.085 (min.) , V_{DD} - 0.86 (max.)	1.4 V (typ.) , 1.6 V (max.)	0.55 V (min.) , 1.0 V (max.)
Output Logic " Low " , " 0 "		V_{DD} - 1.81 (min.) , V_{DD} - 1.62 (max.)	0.9 V (min.) , 1.1 V (typ.)	- 0.15 V (min.) , 0.15 V (max.)
Output Swing (single-end)		400 mV (min.)	200 mV (min.)	450 mV (min.)

Frequency Stability Codes	Frequency Stability over Operating Temperature Range	± 25 ppm	± 50 ppm	± 100 ppm
	Commercial (*-20°C to +70°C*)	*A*	*B*	*C*
	Industrial (*-40°C to +85°C*)	*D*	*E*	*F*
	Extended Industrial (*-40* °C to *+105* °C)	*G*	*H*	*J*

If non-standard , please enter the desired stability after the " C " ; " F " ; " J " represents .
For example :
" C20 " ± 20 ppm over -20°C to +70°C ;
" F30 " ± 30 ppm over -40°C to +85°C
" J40 " ± 40 ppm over -40°C to +105°C

Start-up Time	1.0 msec. (typ.) , 5.0 msec. (max.)						
Duty Cycle	50% ± 5%						
Storage Temperature	-55°C to +150°C						
Aging at Ta = +25°C	± 3 ppm (max.) first year ; ± 2 ppm (max.) per year thereafter						
RMS Jitter (12 KHz to 20 MHz)	50 fsec (typ.) , 300 fsec (max.) [For 156.250 MHz , LVDS , 3.3V]						
Phase Noise [dBc / Hz (typ.)]	Offset	100 Hz	1 KHz	10 KHz	100 KHz	1 MHz	10 MHz
	125.0 MHz	-114	-135	-147	-157	-163	-164
	156.250 MHz	-108	-132	-141	-152	-160	-161
Output Enable / Disable Function	Enable	70% (min.) of V_{DD} to enable output. Enable time : 10 msec (max.)					
	Disable	30% (max.) of V_{DD} to disable output. Disable current : 30 uA (max.) [OE = GND] , Disable time : 0.2 usec (max.)					

Crystal Oscillators

HP_ [LVPECL DIfferential]	HD_ [LVDS Differential]	HC_ [HCSL Differential]	HCL_ [LPHCSL Differential]

Part Number Format and Example

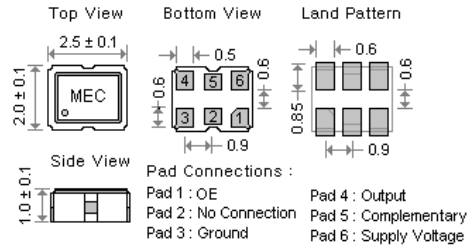
[1] Supply Voltage	[2] Holder Type	[3] 1 or 2	–	[4] Frequency Stability	–	[5] Center Frequency
Example (1) 25	HCK536	1	–	C15	–	125.000
(2) 25V3	HDEK326	1	–	H	–	50.000
(3) 18	HDJK576	2	–	D	–	156.250

Ex (1) : 25HCK5361 - C15 - 125.000 [+2.5V , HCK type , HCSL output , 5.0 x 3.2mm size , OE on pad 1 , ±15ppm from -20°C to 70°C , 125.000MHz]
Ex (2) : 25V3HDEK3261 - H - 50.000 [+2.5V ~ +3.3V , HDEK type , LVDS output , 3.2 x 2.5mm size , OE on pad 1 , ±50ppm from -40°C to 105°C , 50.000MHz]
Ex (3) : 18HDJK5762 - D - 156.250 [+1.8V , HDJK type , LVDS output , 7.0 x 5.0mm size , OE on pad 2 , ±25ppm from -40°C to 85°C , 156.250MHz]

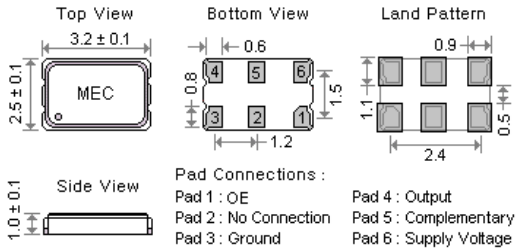
[1]	Supply Voltage , " 18 " for +1.8V ; " 25 " for +2.5V ; " 3 " for +3.3V ; " 25V3 " for +2.5V ~ +3.3V ±10%	
[2]	Holder Type	
[3]	" 1 " : OE function on pad # 1 , " 2 " : OE function on pad # 2	
[4]	-20°C ~ 70°C	" A " ± 25ppm ; " B " ± 50ppm ; " C " ± 100ppm ; If non-standard please enter the desired 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
	-40°C ~ 105°C	" G " ± 25ppm ; " H " ± 50ppm ; " J " ± 100ppm ; If non-standard please enter the desired stability after " J " , for example " J40 " : represents ±40ppm over -40 to +105°C
[5]	Frequency in MHz	

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

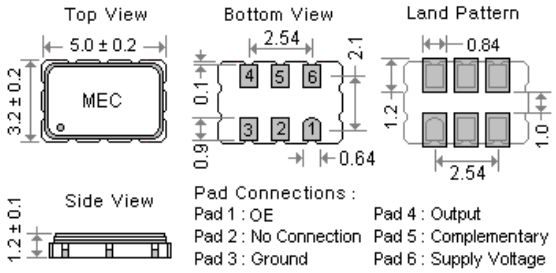
H__K226



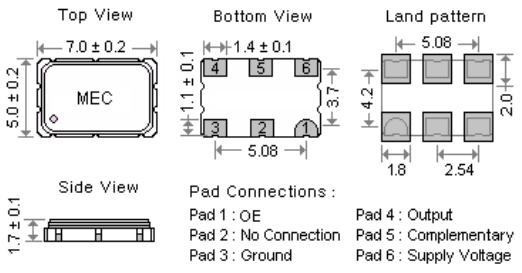
H__K326



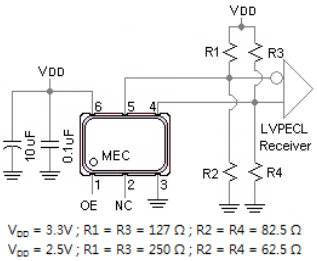
H__K536



H__K576

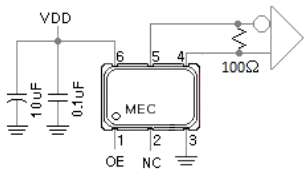


LVPECL Test Circuit

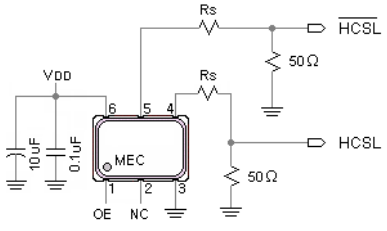


V_{DD} = 3.3V ; R1 = R3 = 127 Ω ; R2 = R4 = 82.5 Ω
V_{DD} = 2.5V ; R1 = R3 = 250 Ω ; R2 = R4 = 62.5 Ω

LVDS Test Circuit

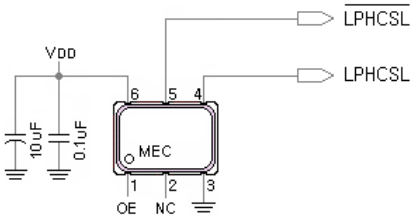


HCSL Test Circuit



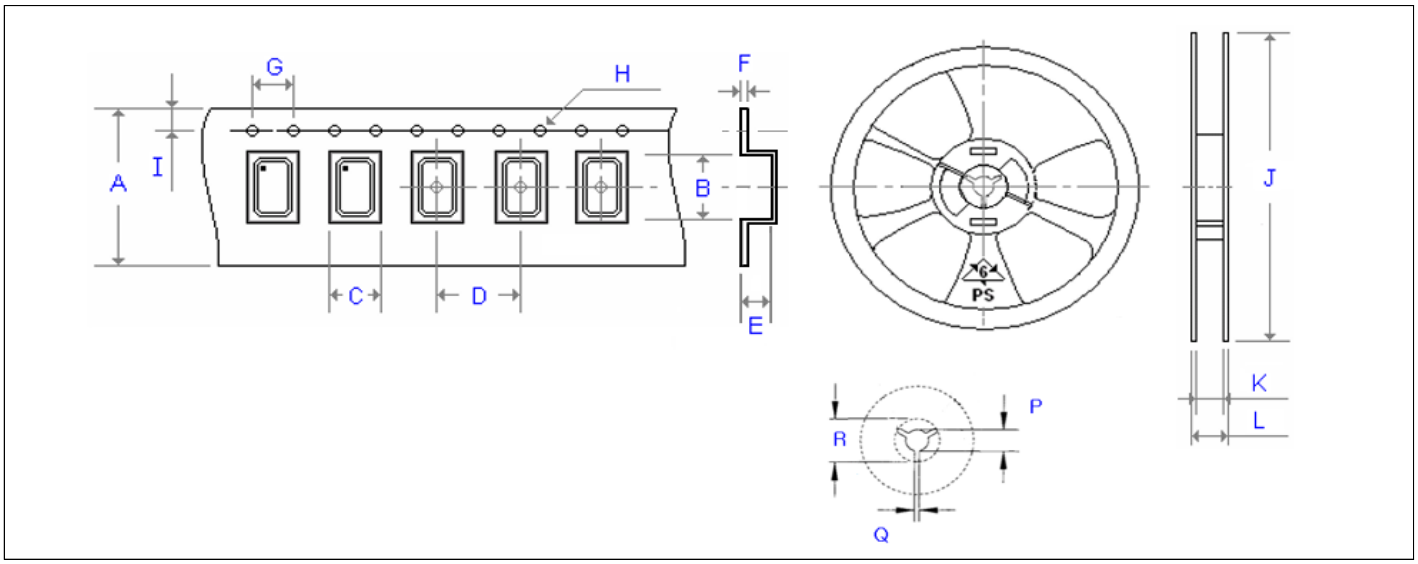
Rs = 0 to 33Ω to minmize ringing in application.

LPHCSL Test Circuit for HCLK only



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

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