

GP

LVPECL Differential

F group  
0.5 psW group  
4.0 ps

Thru-Hole

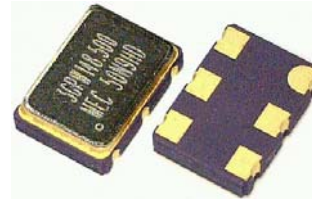
SMD

3.3V

Min.  
750KHzMax.  
800MHz

## Applications

- GPF and GPW uses high-Q fundamental crystals and low jitter multiplier circuits.
- GPF offers < 1 ps phase jitter at only a fraction of the cost of a high frequency fundamental crystal VCXO. GPW series has moderate jitter at a low cost.



## General specifications of GPF and GPW only , at Ta=+25°C , CL=15pF

Model	" GPF " series				" GPW " series	
Technology	High Q fundamental crystal + low jitter multiplier circuit				High Q fundamental crystal + multiplier circuit	
Output Logic	LVPECL Differential					
Available Frequency Range	38.0 MHz ~ 640.0 MHz				750 KHz ~ 800.0 MHz	
Supply Voltage V <sub>DD</sub>	+3.3 V <sub>DD</sub> ± 5%				+3.3 V <sub>DD</sub> ± 5%	
Supply Voltage Code	" 3 "				" 3 "	
Output Logic " High " , " 1 "	V <sub>DD</sub> -1.025 min. Termination: R <sub>L</sub> =50 Ω to (V <sub>DD</sub> -2.0V). See test circuit below.					
Output Logic " Low " , " 0 "	V <sub>DD</sub> -1.620 max. Termination: R <sub>L</sub> =50 Ω to (V <sub>DD</sub> -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 ]	
Period Jitter (RMS ; Decoupling capacitor between V <sub>DD</sub> and ground )	3.0 ps typical; 5 ps max. [ for 156.250 MHz ]				4.3 ps typical. [ for 155.520 MHz ]	
Period Jitter ( peak-to-peak ;Decoupling capacitor between V <sub>DD</sub> and ground )	20 ps typical; 30 ps max. [ for 156.250 MHz ]				27 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 max..				< 24 MHz ----- 25 mA max 24.01 MHz ~ 96 MHz ----- 65 mA max 96.01 MHz ~ 800 MHz ----- 100 mA max..	
Rise Time / Fall Time	0.55 ns max. ( 20%↔80% of the PECL wave form )				1.5 ns max. ( 20%↔80% of the PECL wave form )	
Frequency Stability <sup>(1)</sup> 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 " For example : " C20 " : ± 20 ppm over -10°C to +70°C ; " I20 " : ± 20 ppm over -40°C to +85°C	
	Commercial " C " ( -10°C to +70°C )	A	B	C		
	Industrial " I " ( -40°C to +85°C )	D	E	F		
Load	R <sub>L</sub> =50 Ω to (V <sub>DD</sub> -2.0V). See test circuit below.					
Start-up Time	10 m sec. ( max.)					
Duty Cycle	50% ± 5% ( measured at V <sub>DD</sub> -1.3V)					
Aging at Ta = +25°C	± 3 ppm max. first year ; ± 2 ppm max. per year thereafter					
Pad 1 Voltage Control Characteristics	Control Voltage Center , Range	+ 1.65 V , Vcon =+0.3V to +3.0V				
	Frequency Deviation Range	±80 ppm ( min. ) . Use " N " ( minimum ) , " M " ( maximum ) , " T " ( typical,±20% ) for the desired range . Example : " 100M " represents ±120ppm ( min. ) .				
	Linearity	6% typical ; 10% max.				
	Slope Polarity	Positive : Positive voltage for positive frequency shift				
	Modulation Bandwidth	25 KHz min. ( -3dB , 0V ≤ Vcontrol ≤ 3.3V )				
	Input Impedance	60 KΩ min.			2 MΩ min.	
Tri - State Function. on pad No. 2	No Connection	Differential PECL and complimentary PECL outputs .				
	Disable	Both outputs are disabled ( high impedance ) when pad No.2 is 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.)				
Phase Noise : Tested with Vcontrol pin connected to ground ( typical )	Offset	Frequency: 156.250 MHz			Frequency: 155.520 MHz	
	10 Hz	-62 dBc / Hz			-60 dBc / Hz	
	100 Hz	-92 dBc / Hz			-90 dBc / Hz	
	1 KHz	-120 dBc / Hz			-115 dBc / Hz	
	10 KHz	-132 dBc / Hz			-125 dBc / Hz	
	100 KHz	-128 dBc / Hz			-119 dBc / Hz	
	1 MHz	-140 dBc / Hz			-120 dBc / Hz	
	10 MHz	-150 dBc / Hz			-140 dBc / Hz	

<sup>(1)</sup> Inclusive of 25°C tolerance, operating temperature range, ±10% input voltage variation, load change, aging shock and vibration

Mercury [www.mercury-crystal.com](http://www.mercury-crystal.com)

■Taiwan : Tel (886)-2-2406-2779 / sales-tw@mercury-crystal.com ■U.S.A: Tel: (1)-909-466-0427 / sales-us@mercury-crystal.com ■China: Tel: (86)-512-5763-8100 / sales-cn@mecxtal.com

Part Number Format and Example

[ 1 ]	[ 2 ]	[ 3 ]	[ 4 ]	[ 5 ]	[ 6 ]	[ 7 ]
Supply Voltage	Holder Type Output Wave	G	Frequency Stability	Pulling Range	Range Code	Center Frequency

Examples	(1)	5	GPF14	G	B	100	N	35.328
	(2)	3	GV576		D	80	T	27.000

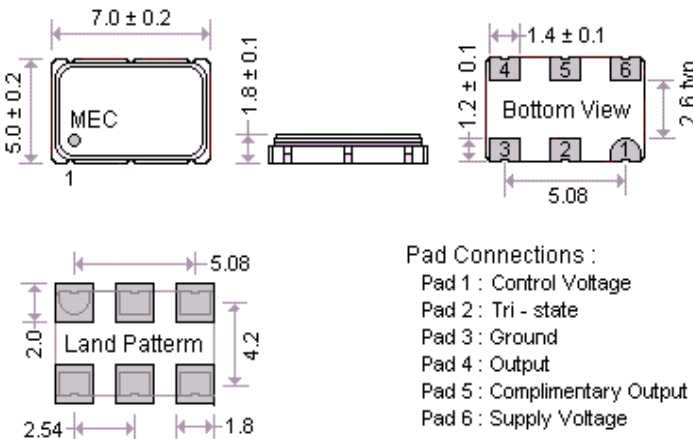
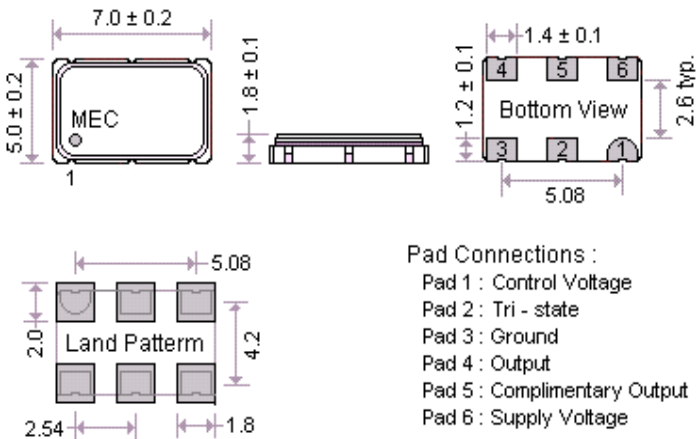
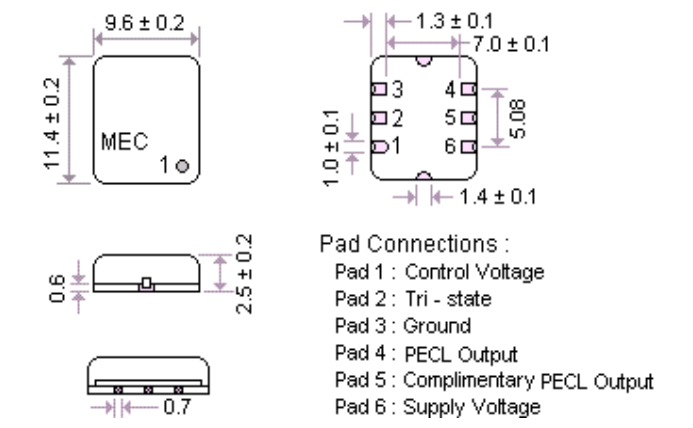
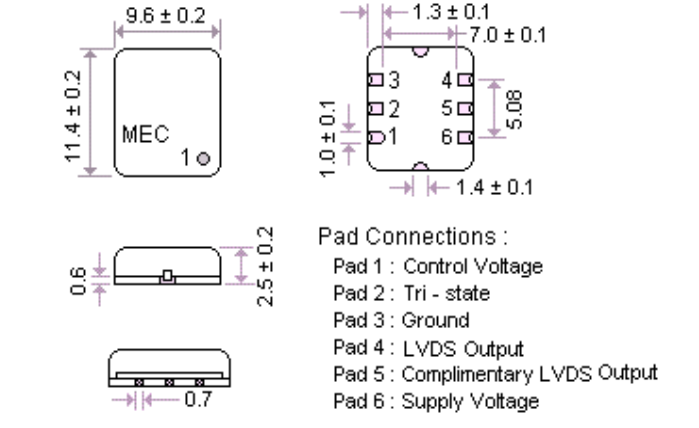
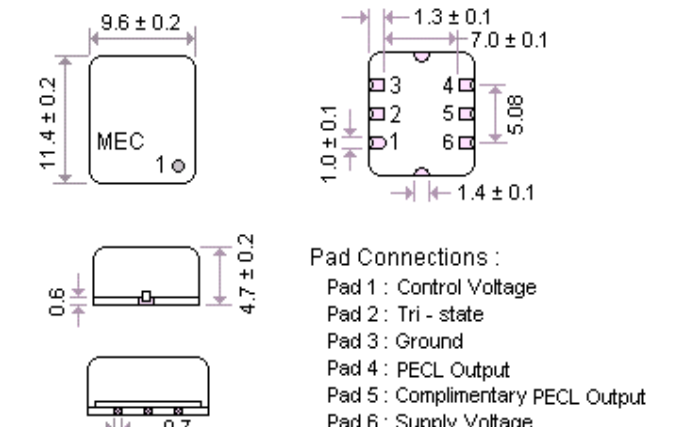
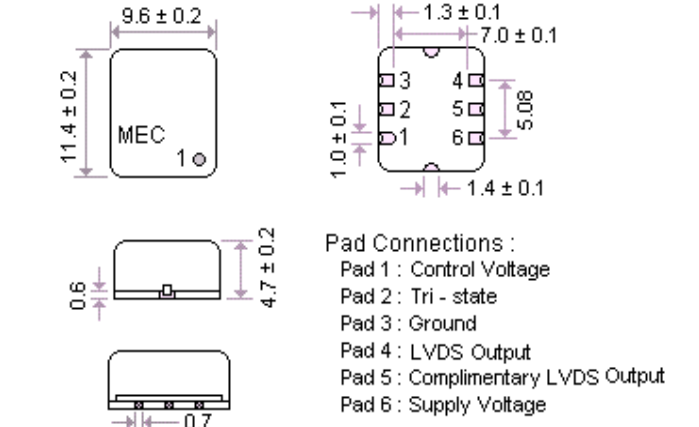
Ex (1) : 3GPF14GB - 100N - 155.520 [ +3.3V, G\_14 type ( F characteristics, PECL output ), RoHS, ±50ppm( -10°C to 70°C ), pulling : ±100 ppm ( min. ), 155.520 MHz ]

Ex (1) : 3GWD576D - 80T - 125.000 [ +3.3V, G\_576 type ( W characteristics, LVDS output ), ±25ppm( -40°C to 85°C ), pulling : ±80 ppm ( typical ), 125.000 MHz ]

[ 1 ]	Supply voltage , " 3 " for +3.3V	
[ 2 ]	Holder type and output wave [ " P " for PECL differential , " D " for LVDS differential ]	
[ 3 ]	Please add " G " after the " type code " for RoHS compliant equivalent ( Does not apply to G_576 series ) .	
[ 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 " I20 " : represents ±20ppm over -40 to +85°C
[ 5 ]	Frequency Pulling Range	3.3V From ±30ppm ~ ±150ppm , control Voltage range : 0.3V ~ 3.0 ; control voltage center : ± 1.65 V 5.0V From ±70ppm ~ ±200ppm , control Voltage range : 0.5V ~ 4.5V ; control voltage center : ± 2.5 V
	[ 6 ]	Pulling Range Code
[ 7 ]	Center Frequency in MHz	

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 for SMDs [ Please refer to page 5 for product series selections. ]

[ GPF576 , GPW576 ] --- PECL Differential Output	[ GDF576 , GDW576 ] --- LVDS Differential Output
 <p>Pad Connections :</p> <ul style="list-style-type: none"> <li>Pad 1 : Control Voltage</li> <li>Pad 2 : Tri - state</li> <li>Pad 3 : Ground</li> <li>Pad 4 : Output</li> <li>Pad 5 : Complimentary Output</li> <li>Pad 6 : Supply Voltage</li> </ul>	 <p>Pad Connections :</p> <ul style="list-style-type: none"> <li>Pad 1 : Control Voltage</li> <li>Pad 2 : Tri - state</li> <li>Pad 3 : Ground</li> <li>Pad 4 : Output</li> <li>Pad 5 : Complimentary Output</li> <li>Pad 6 : Supply Voltage</li> </ul>
[ GPF62 , GPW62 ] --- PECL Differential Output	[ GDF62 , GDW62 ] --- LVDS Differential Output
 <p>Pad Connections :</p> <ul style="list-style-type: none"> <li>Pad 1 : Control Voltage</li> <li>Pad 2 : Tri - state</li> <li>Pad 3 : Ground</li> <li>Pad 4 : PECL Output</li> <li>Pad 5 : Complimentary PECL Output</li> <li>Pad 6 : Supply Voltage</li> </ul>	 <p>Pad Connections :</p> <ul style="list-style-type: none"> <li>Pad 1 : Control Voltage</li> <li>Pad 2 : Tri - state</li> <li>Pad 3 : Ground</li> <li>Pad 4 : LVDS Output</li> <li>Pad 5 : Complimentary LVDS Output</li> <li>Pad 6 : Supply Voltage</li> </ul>
[ GPF64 , GPW64 ] --- PECL Differential Output	[ GDF64 , GDW64 ] --- LVDS Differential Output
 <p>Pad Connections :</p> <ul style="list-style-type: none"> <li>Pad 1 : Control Voltage</li> <li>Pad 2 : Tri - state</li> <li>Pad 3 : Ground</li> <li>Pad 4 : PECL Output</li> <li>Pad 5 : Complimentary PECL Output</li> <li>Pad 6 : Supply Voltage</li> </ul>	 <p>Pad Connections :</p> <ul style="list-style-type: none"> <li>Pad 1 : Control Voltage</li> <li>Pad 2 : Tri - state</li> <li>Pad 3 : Ground</li> <li>Pad 4 : LVDS Output</li> <li>Pad 5 : Complimentary LVDS Output</li> <li>Pad 6 : Supply Voltage</li> </ul>