

GPQN \_ \_

PECL  
Differential

0.6 ps  
RMS Jitter

SMD

2.5 V

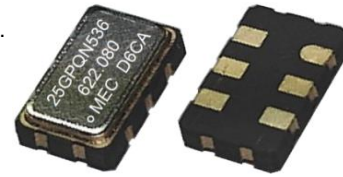
3.3 V

Min.  
10 MHz

Max.  
1,500 MHz

Features

Mercury's Low Jitter Differential VCXO, with low current consumption ( 54 mA for LVPECL 622.080 MHz at 3.3V ) & an integrated phase jitter performance of 0.6 ps RMS. Gaining its precision frequency control market position by providing engineers with few-day samples for prototypes and low cost, fast delivery for volume production. The perfect solution to replace traditional XO's & VCXO's that use a more expensive, high frequency, fundamental crystal and a noisy PLL multiplier circuit.



General specifications , at Ta=+25°C , CL=15pF

Model	GPQN									
Available Frequency Range	10 ~ 1,500 MHz									
Supply Voltage V <sub>DD</sub> ( code )	+ 2.5 V <sub>DD</sub> ± 5 % ( voltage code ' 25 ' )					+ 3.3 V <sub>DD</sub> ± 5 % ( voltage code ' 33 ' )				
Current with Output Disable	16 mA typical									
Current Consumption ( V <sub>DD</sub> = + 2.5 V )	100 MHz : 46 mA	250 MHz : 48 mA	500 MHz : 53 mA	750 MHz : 56 mA	1,000 MHz : 60 mA	1,350 MHz : 65 mA				
Current Consumption ( V <sub>DD</sub> = + 3.3 V )	100 MHz : 50 mA	250 MHz : 55 mA	500 MHz : 60 mA	750 MHz : 64 mA	1,000 MHz : 68 mA	1,350 MHz : 72 mA				
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 " I " represents . For example : " C20 " ± 20 ppm over -10°C to +70°C ; " I20 " ± 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					
Output Logic " High " , " 1 "	V <sub>DD</sub> - 1.03 ( min. ) , V <sub>DD</sub> - 0.6 ( max. )			Output Logic " Low " , " 0 "			V <sub>DD</sub> - 1.85 ( min. ) , V <sub>DD</sub> - 1.6 ( max. )			
Load	RL = 50 Ω to ( V <sub>DD</sub> -2.0V ). See test circuit below.			Rise Time / Fall Time			0.5 ns. ( max. ) [ 20% ↔ 80% waveform ]			
Duty Cycle	50 % ± 5%			Aging at Ta = +25°C			± 5 ppm max. for first year at 25°C			
Start-up Time	10 m sec. ( max. )			Storage Temperature			-55°C to + 150°C			
SSB Phase Noise [ dBc / Hz ( typical ) ]	Offset	77.76	122.88	125	156.25	212.5	491.52	622.08	1000	1250
	10 Hz	-74	-68	-69	-67	-53	-56	-51	-46	-32
	100 Hz	-104	-98	-97	-92	-86	-87	-77	-80	-68
	1 KHz	-121	-114	-114	-112	-109	-101	-99	-96	-94
	10 KHz	-130	-123	-124	-121	-118	-110	-109	-105	-103
	100 KHz	-134	-127	-129	-124	-121	-113	-114	-108	-105
	1 MHz	-140	-138	-136	-136	-133	-125	-121	-116	-117
10 MHz	-157	-155	-154	-153	-151	-143	-141	-135	-136	
Phase Jitter ( 12KHz ~ 20 MHz, RMS ) unit : ps.	0.5	0.6	0.5	0.6	0.6	0.6	0.5	0.7	0.6	
<b>Control Voltage Function on Pad 1</b>										
Supply Voltage ( V <sub>DD</sub> )	V <sub>DD</sub> = +2.5 V ; Vcon Center = +1.25V					V <sub>DD</sub> = +3.3 V ; Vcon Center = +1.65V				
Vcontrol Range	+ 0.2V ~ +2.3V					+ 0.3V ~ +3.0V				
Frequency Pulling Range	± 80 ppm ( min. )					± 80 ppm ( min. )				
Absolute Voltage	Up to ± 200 ppm ( min. ) is also available. Please contact Mercury.									
Absolute Voltage	2.8 V max. for 2.5V V <sub>DD</sub> ; 4.0 V max. for 3.3V V <sub>DD</sub>									
Linearity	± 5% typical. ±10% ( max. )					Input Impedance				
Transfer Function	Positive Transfer					Bandwidth				
						1 MΩ typical				
						10 KHz min. Measured at -3 dB				
<b>Output Enable Function</b>										
OE Control on Pad 2	70% of V <sub>DD</sub> ( min. ) to enable output. ( Open connection prohibit ) 30% of V <sub>DD</sub> ( max. ) to disable output.									
Output Enable Time / Disable Time	200 ns. Max. / 50 ns. Max.									

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

GPQN326	GPQN536	GPQN576
Pad Connections		
<b>Pad 1 :</b> VCXO ; <b>Pad 2 :</b> OE: High Enable ; <b>Pad 3 :</b> Ground <b>Pad 4 :</b> Differential ; <b>Pad 5 :</b> Complementary ; <b>Pad 6 :</b> Supply Voltage		

# Voltage Controlled Crystal Oscillators [ VCXO ]

**GTQN**

CMOS waveform

**GPQN**

PECL Differential

**GDQN**

LVDS Differential

**Q** family

**N** series

**SMD**

**2.5 V**

**3.3 V**

## Part Number Format and Example

Example : 3GPQN576 - E - 100N - 622.080

3	GPQN	576	-	E	-	100N	-	622.08
Supply Voltage " 3 " for 3.3V " 25 " for 2.5V	GTQN : CMOS GPQN : PECL GDQN : LVDS	Package Size " 576 " : 7x5 mm " 536 " : 5x3.2 mm		Frequency Stability Code " E " : ± 50 ppm over -40 to +85°C Other frequency stabilities are available.		±100 ppm ( min.) frequency pulling range		Frequency ( MHz )

## Test Circuits and Output Waveforms

CMOS Test Circuit	PECL Test Circuit	LVDS Test Circuit
	<p style="text-align: center;"> <math>V_{DD} = 3.3V; R1 = R3 = 127 \Omega; R2 = R4 = 82.5 \Omega</math>  <math>V_{DD} = 2.5V; R1 = R3 = 250 \Omega; R2 = R4 = 62.5 \Omega</math> </p>	
CMOS Output Wave Form	PECL Output Wave Form	LVDS Output Wave Form