

Voltage Controlled Crystal Oscillators



GTQF
CMOS waveform

GPQF
PECL Differential

GDQF
LVDS Differential

2.5 V 3.3 V

Min.
10 MHz

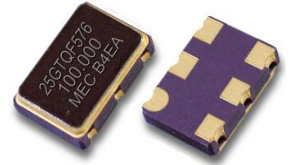
Max.
1,500 MHz

Features

Quick - turn Clock Oscillators

1.2 pS Phase Jitter (typical)

The GTQF, GPQF and GDQF Series are members of Mercury's Q-Family Quick-Turn crystal oscillators that can be delivered within days. With low current consumption (54 mA for PECL 622.080 MHz at 3.3V) and an integrated phase jitter performance of 1.0 pS RMS, they have gained its precision frequency control market position by providing engineers with next-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, highfrequency, fundamental crystal and a noisy PLL multiplier circuit



General specifications , at Ta=+25°C

Model	GTQF		GPQF		GDQF			
Output Logic	CMOS		PECL		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 ± 5% (voltage code " 3 ")		+ 3.3 V ± 5% (voltage code " 3 ")		+ 3.3 V ± 5% (voltage code " 3 ")			
Available Frequency Range	10 ~ 250 MHz		10 ~ 1,500 MHz		10 ~ 1,500 MHz			
Output Load	15 pF		50 Ω into V _{DD} - 2V or Thevenin equivalent		100 Ω between OUT and OUTN			
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 (V _{DD} = + 3.3V)	150 MHz : 38 mA (max.)		750 MHz : 74 mA (max.)		750 MHz : 49 mA (max.)			
	200 MHz : 43 mA (max.)		1000 MHz : 78 mA (max.)		1000 MHz : 53 mA (max.)			
	250 MHz : 47 mA (max.)		1350 MHz : 82 mA (max.)		1350 MHz : 57 mA (max.)			
Rise Time / Fall Time	1.5 nsec. (Typ.) , 3.0 nsec. (max.)		0.2 nsec. (Typ.) , 0.5 nsec. (max.)		0.2 nsec. (Typ.) , 0.4 nsec. (max.)			
	Tr / Tf : 10% → 90% waveform		Tr / Tf : 20% → 80% waveform		Tr / Tf : 20% → 80% waveform			
Duty Cycle	50 % ± 5%							
Start-up Time	10 m sec. (max.)							
Aging at Ta = +25°C	± 2 ppm (max.) first year at 25°C ; ± 10 ppm (max.) over 10 years							
Storage Temperature	-55°C to + 150°C							
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 .		
	Commercial (-10°C to +70°C)		A	B	C	For example : " C20 " ± 20 ppm over -10°C to +70°C ;		
	Industrial (-40°C to +85°C)		D	E	F	" I20 " ± 20 ppm over -40°C to +85°C		
RMS Jitter [12 kHz ~ 20 MHz]	1.2 psec (typ.)							
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
	491.52 MHz	-61	-86	-100	-105	-105	-126	-137
Control Voltage Function on Pad 1								
Supply Voltage	V _{DD} = +2.5 V ; Vcon Center = +1.25V				V _{DD} = +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.)			
	Up to ± 200 ppm (min.) is also available. Please contact Mercury.							
Linearity	± 5% (typ.) ±10% (max.)							
Transfer Function	Positive Transfer							
Input Impedance	1 MΩ (typ.)							
Bandwidth	10 KHz (min.) Measured at -3 dB							
Output Enable Function on Pad 2								
OE Control on Pad 2	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.)							

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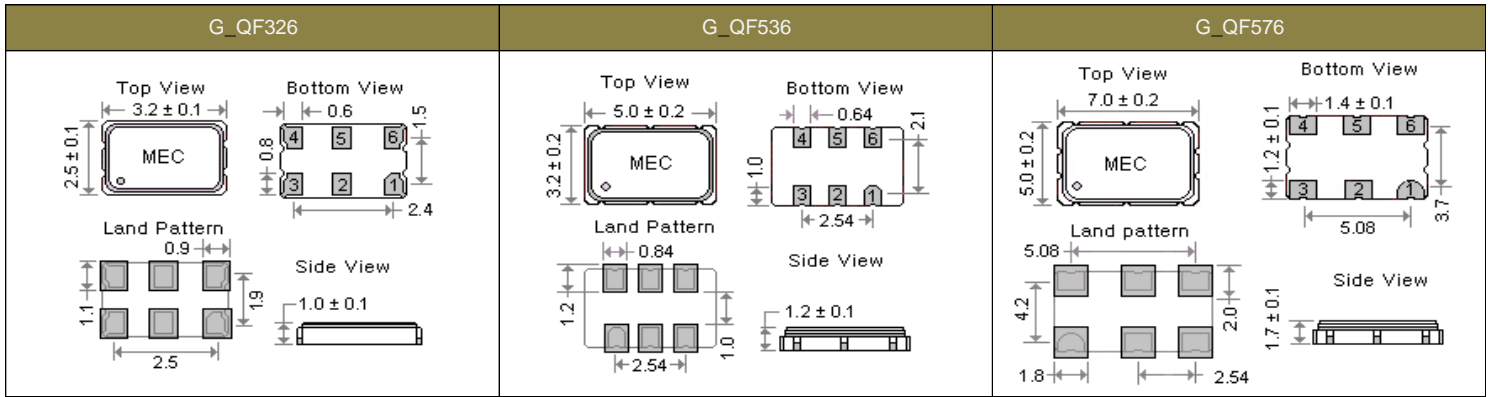
Max.
1,500 MHz

Part Number Format and Example

Example : 3GPQN576 - E - 100N - 622.080

3	GPQF	576	-	E	-	100N	-	622.080
Supply Voltage	GTQF : CMOS " 3 " for 3.3V " 25 " for 2.5V	Package Size " 576 " : 7.0 * 5.0 mm " 536 " : 5.0 * 3.2 mm " 326 " : 3.2 * 2.5 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)

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

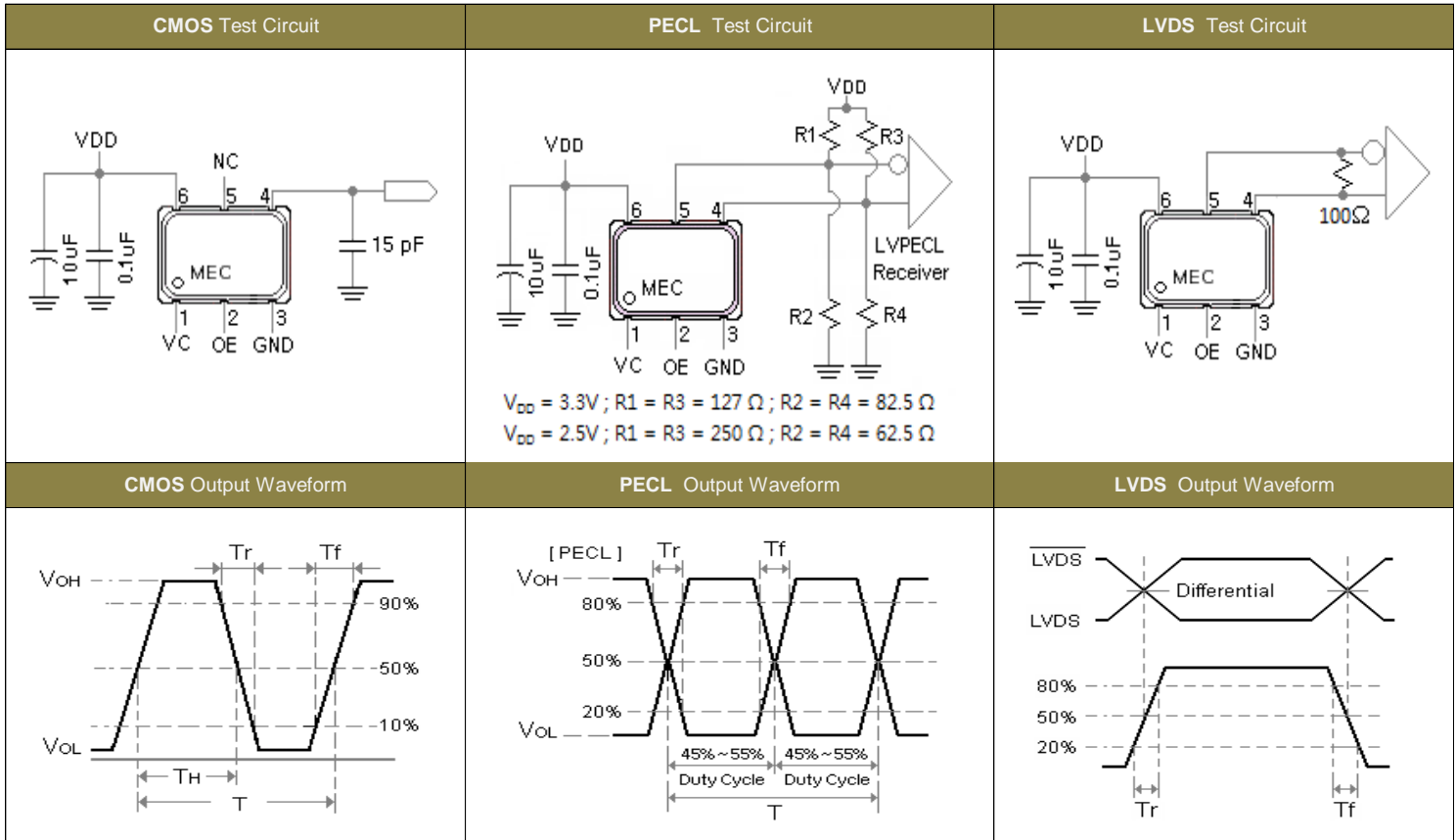


Pad Connections :

Pad 1 : VCXO ; **Pad 2 :** OE: High Enable ; **Pad 3 :** Ground

Pad 4 : [CMOS : Output , PECL or LVDS : Differential] ; **Pad 5 :** [CMOS : NC , PECL or LVDS : Complementary] ; **Pad 6 :** Supply Voltage

Test Circuits and Output Waveforms



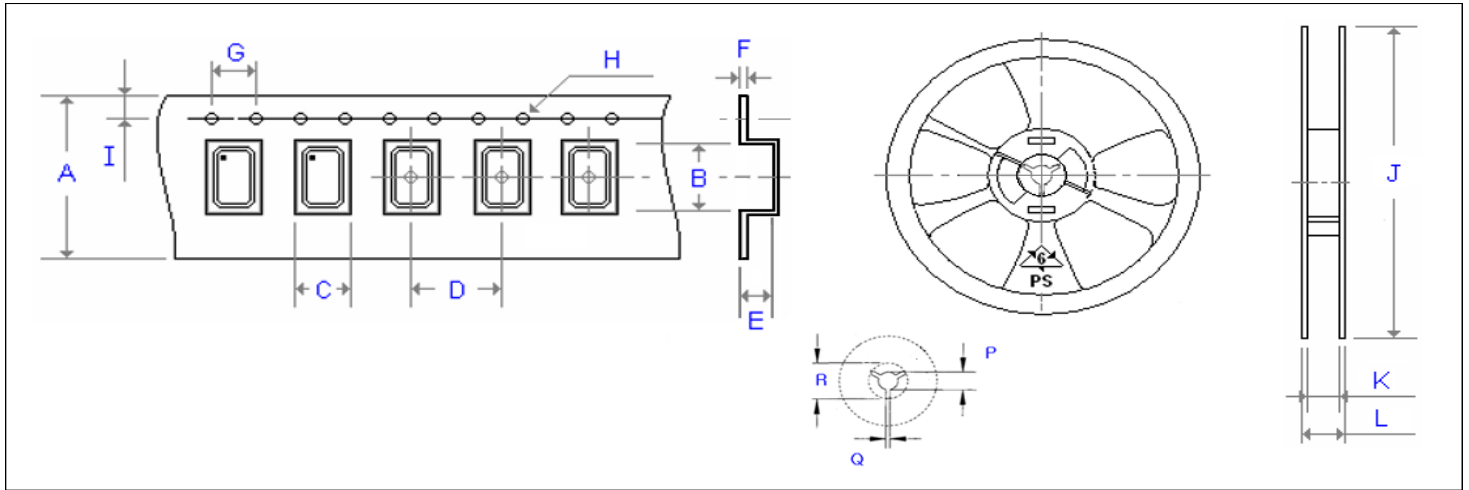
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■ USA : Tel: (1)-909-466-0427 / sales-us@mercury-crystal.com ■ China : Tel: (86)-512-5763-8100 / sales-cn@mercury-crystal.com

Emboss Taping and Reel Specifications

[VCXO]

[(VC)TCXO]



Carrier Type Dimensions (unit : mm) ±0.3mm

	A	B	C	D	E	F	G	H	I	pcs / reel
G_226	8.00	2.80	2.25	4.00	1.10	0.30	4.00	Ø 1.50	1.75	3000
G_326	8.00	3.40	2.70	4.00	1.40	0.25	4.00	Ø 1.50	1.75	3000
G_534	12.00	5.30	3.60	8.00	1.40	0.30	4.00	Ø 1.50	1.75	1000
G_576	16.00	7.30	5.30	8.00	1.90	0.32	4.00	Ø 1.50	1.75	1000
G_43	24.00	11.80	10.00	16.00	5.00	0.30	4.00	Ø 1.50	1.75	500
G_63	24.00	11.80	10.00	16.00	5.00	0.30	4.00	Ø 1.50	1.75	500
G_JF538	12.00	5.30	3.60	8.00	1.40	0.30	4.00	Ø 1.50	1.75	1000
G_JF578	16.00	7.30	5.30	8.00	1.90	0.32	4.00	Ø 1.50	1.75	1000
(V)M21	8.00	2.30	1.90	4.00	0.90	0.25	4.00	Ø 1.50	1.75	3000
(V)ME21	8.00	2.30	1.50	4.00	1.35	0.25	4.00	Ø 1.50	1.75	3000
(V)M22	8.00	2.80	2.25	4.00	1.10	0.30	4.00	Ø 1.50	1.75	3000
(V)M_32	8.00	3.71	2.80	4.00	1.75	0.25	4.00	Ø 1.50	1.75	3000
(V)MQ_326	12.00	3.60	2.90	4.00	1.70	0.30	4.00	Ø 1.50	1.75	3000
(V)M_53	12.00	5.30	3.60	8.00	1.40	0.30	4.00	Ø 1.50	1.75	1000
(V)M_57(2)	16.00	7.40	5.50	8.00	2.80	0.35	4.00	Ø 1.50	1.75	500
(V)M_43 (63)	24.00	11.80	10.00	16.00	5.00	0.30	4.00	Ø 1.50	1.75	500

Reel Dimensions (unit : mm) ±2mm

	J	K	L	P	Q	R	pcs / reel
G_226	180.00	8.40	11.40	13.00	2.50	20.20	3000
G_326	180.00	9.00	12.00	13.00	2.50	20.20	3000
G_534	180.00	13.00	16.00	13.00	2.50	20.20	1000
G_576	180.00	17.20	19.30	13.00	2.50	20.20	1000
G_43	330.00	24.50	29.10	13.00	2.50	20.20	500
G_63	330.00	24.50	29.10	13.00	2.50	20.20	500
G_JF538	180.00	13.00	16.00	13.00	2.50	20.20	1000
G_JF578	180.00	17.20	19.30	13.00	2.50	20.20	1000
(V)M21	180.00	8.40	11.40	13.00	2.50	20.20	3000
(V)ME21	180.00	9.00	12.00	13.00	2.50	20.20	3000
(V)M22	180.00	8.40	11.40	13.00	2.50	20.20	3000
(V)M_32	180.00	9.00	11.40	13.00	2.50	20.20	3000
(V)MQ_326	180.00	13.00	16.00	13.00	2.50	20.20	3000
(V)M_53	180.00	13.00	16.00	13.00	2.50	20.20	1000
(V)M_57(2)	180.00	17.20	19.30	13.00	2.50	20.20	500
(V)M_43 (63)	330.00	24.50	29.10	13.00	2.50	20.20	500

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