

Switchable output Crystal Oscillators [10 ~ 1,500 MHz]

GCTQF

CMOS waveform

GCPQF

PECL Differential

GCDQF

LVDS Differential

Q family

F series

**Frequency
Switchable**

SMD

2.5 V

3.3 V

Min.

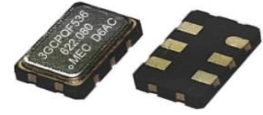
10
MHz

Max.

1,500
MHz

Features

Mercury's Q-Family crystal oscillators delivered in days. Low current consumption (44 mA for LVPECL 622.080 MHz at 3.3V) & an integrated phase jitter performance of 1.5 pS RMS. Gaining its precision frequency control market position by providing engineers with *next-day* samples for prototypes and low cost, fast delivery for volume production.



1.5 pS Phase Jitter (typical)

General specifications, at Ta = + 25°C

Model	GCTQF		GCPQF		GCDQF	
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 " 33 ")		+ 3.3 V ± 5% (voltage code " 33 ")		+ 3.3 V ± 5% (voltage code " 33 ")	
Available Frequency Range	10 ~ 250 MHz		10 ~ 1,500 MHz		10 ~ 1,500 MHz	
Output Load	15 pF		50 Ω into V _{CC} - 2V or Thevenin equivalent		100 Ω between output and complimentary output	
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 Consumption (V _{DD} : + 2.5 V)	100 MHz : 30 mA ; 250 MHz : 40 mA		600 MHz : 45 mA ; 1,500 MHz : 55 mA		600 MHz : 30 mA ; 1,500 MHz : 35 mA	
Current Consumption (V _{DD} : + 3.3 V)	100 MHz : 35 mA ; 250 MHz : 40 mA		600 MHz : 50 mA ; 1,500 MHz : 60 mA		600 MHz : 35 mA ; 1,500 MHz : 40 mA	
Current with Output Disabie	18 mA (Typ.)		18 mA (Typ.)		18 mA (Typ.)	
Rise Time / Fall Time	10.0 nsec. (max.) Tr / Tf : 10% ↔ 90% waveform		0.5 nsec. (max.) Tr / Tf : 20% ↔ 80% waveform		0.4 nsec. (max.) Tr / Tf : 20% ↔ 80% waveform	
RMS Jitter [12 kHz ~ 20 MHz]	1.5 psec (typ.)					
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 . 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		
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					
Frequency Selection Function on Pad 2						
FSEL on pad2	70% of V _{DD} (min.) For FSEL = 1, Output frequency is Freq.2 (f2)					
	30% of V _{DD} (max.) For FSEL = 0, Output frequency is Freq.1 (f1)					
	Default FSEL pin has internal pull-up resistor .					

Switchable output Crystal Oscillators [10 ~ 1,500 MHz]

GCTQF	GCPQF	GCDQF	Q family F series	Frequency Switchable	SMD	2.5 V 3.3 V	Min. 10 MHz	Max. 1,500 MHz
CMOS waveform	PECL Differential	LVDS Differential						

Part Number Format and Example

Example : 3GCTQF576 - E - 30.000 / 120.000

3	GCTQN	576	-	E	-	30	/	120
Supply Voltage "3" for 3.3V "25" for 2.5V	GCTQF : CMOS GCPQF : PECL GCDQF : LVDS	Package Size "576": 7 x 5 mm "536": 5 x 3.2 mm "326": 3 x 2.5 mm		Frequency Stability Code "E": ±50 ppm over -40 to +85°C. Other frequency stabilities are available.		Custom Frequency 1 FSEL = 0 (MHz)		Custom Frequency 2 FSEL = 1 (MHz)

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

GC_QF326	GC_QF536	GC_QF576

Pad Connections :

Pad 1 : Control Voltage ; **Pad 2** : Frequency Selection [FSEL = 0 (f 1) , FSEL = 1 (f 2)] ; **Pad 3** : Ground

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

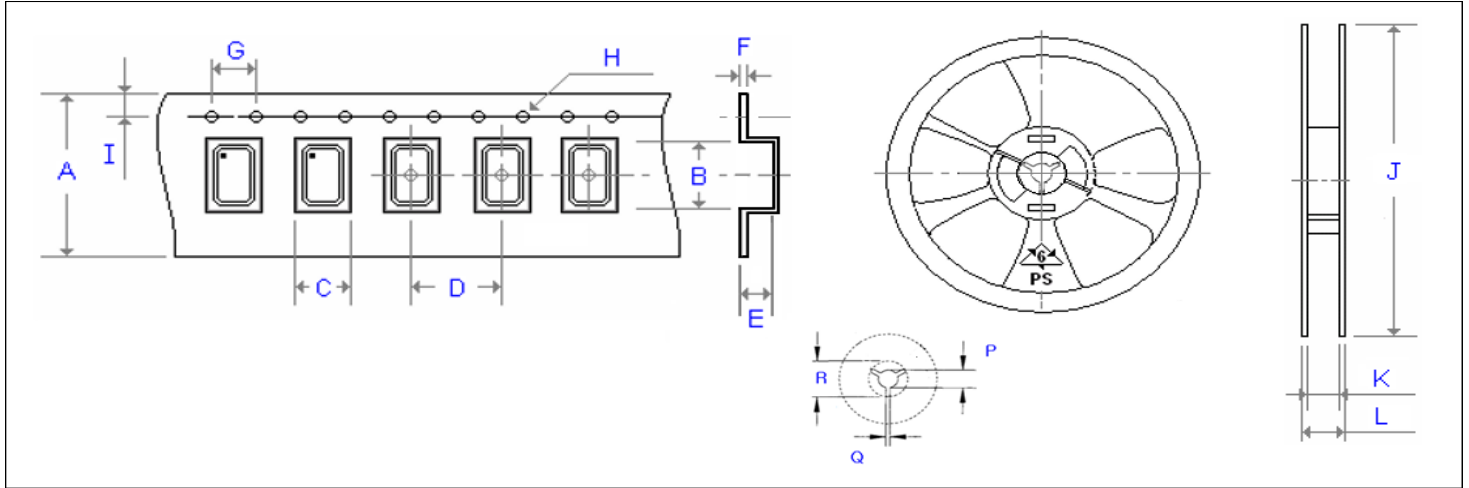
Test Circuits and Output Waveforms

CMOS Test Circuit	PECL Test Circuit	LVDS Test Circuit
<p>FSEL = High Output : f 2 FSEL = Low Output : f 1</p>	<p>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</p>	<p>FSEL = High Output : f 2 FSEL = Low Output : f 1</p>
CMOS Output Waveform	PECL Output Waveform	LVDS Output Waveform

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	∅ 1.50	1.75	3000
G_326	8.00	3.40	2.70	4.00	1.40	0.25	4.00	∅ 1.50	1.75	3000
G_534	12.00	5.30	3.60	8.00	1.40	0.30	4.00	∅ 1.50	1.75	1000
G_576	16.00	7.30	5.30	8.00	1.90	0.32	4.00	∅ 1.50	1.75	1000
G_43	24.00	11.80	10.00	16.00	5.00	0.30	4.00	∅ 1.50	1.75	500
G_63	24.00	11.80	10.00	16.00	5.00	0.30	4.00	∅ 1.50	1.75	500
G_JF538	12.00	5.30	3.60	8.00	1.40	0.30	4.00	∅ 1.50	1.75	1000
G_JF578	16.00	7.30	5.30	8.00	1.90	0.32	4.00	∅ 1.50	1.75	1000
(V)M21	8.00	2.30	1.90	4.00	0.90	0.25	4.00	∅ 1.50	1.75	3000
(V)ME21	8.00	2.30	1.50	4.00	1.35	0.25	4.00	∅ 1.50	1.75	3000
(V)M22	8.00	2.80	2.25	4.00	1.10	0.30	4.00	∅ 1.50	1.75	3000
(V)M_32	8.00	3.71	2.80	4.00	1.75	0.25	4.00	∅ 1.50	1.75	3000
(V)MQ_326	12.00	3.60	2.90	4.00	1.70	0.30	4.00	∅ 1.50	1.75	3000
(V)M_53	12.00	5.30	3.60	8.00	1.40	0.30	4.00	∅ 1.50	1.75	1000
(V)M_57(2)	16.00	7.40	5.50	8.00	2.80	0.35	4.00	∅ 1.50	1.75	500
(V)M_43 (63)	24.00	11.80	10.00	16.00	5.00	0.30	4.00	∅ 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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