

Switchable Output Crystal Oscillators

GCTQF

CMOS Waveform

GCPQF

LVPECL Differential

GCDQF

LVDS Differential

Frequency
Switchable

SMD

2.5 V

3.3 V

Min.

10 MHz

Max.

1,500 MHz

Features

Quick - Turn Clock Oscillators

- The GCTQF, GCPQF and GCDQF Series are members of Mercury's Q-Family Quick-Turn crystal oscillators
- Output frequency range : 10 MHz to 1500 MHz
- Package size : 3.2x2.5mm , 5.0x3.2mm , 7.0x5.0mm
- Next-day samples for prototypes



General specifications , at Ta = + 25°C

Model	GCTQF	GCPQF			GCDQF
Output Logic	CMOS	LVPECL			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 _{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)	10 ~ 100 MHz : 30 mA (max.) 101 ~ 250 MHz : 40 mA (max.)	10 ~ 600 MHz : 45 mA (max.) 601 ~ 1,500 MHz : 55 mA (max.)			10 ~ 600 MHz : 30 mA (max.) 601 ~ 1,500 MHz : 35 mA (max.)
Current Consumption (V _{DD} : + 3.3 V)	10 ~ 100 MHz : 35 mA (max.) 101 ~ 250 MHz : 40 mA (max.)	10 ~ 600 MHz : 50 mA (max.) 601 ~ 1,500 MHz : 60 mA (max.)			10 ~ 600 MHz : 35 mA (max.) 601 ~ 1,500 MHz : 40 mA (max.)
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 msec. (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 " F " represents . For example : " C20 " ± 20 ppm over -20°C to +70°C ; " F20 " ± 20 ppm over -40°C to +85°C
	Commercial (-20°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	+ 0.25V ~ +2.25V			+ 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 .				
	Frequency switching time : 60 us (typ.)				

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Part Number Format and Example

Quick - Turn Clock Oscillators

Example : 3GCTQF576 - E - 80N - 30.000 / 120.000

3	GCTQN	576	-	E	-	80N	-	30.000	/	120.000
Supply Voltage "3" for 3.3V "25" for 2.5V	GCTQF : CMOS GCPQF : LVPECL 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.	-	±80 ppm (min.) frequency pulling range.	-	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
Top View Bottom View Land Pattern Side View	Top View Bottom View Land Pattern Side View	Top View Bottom View Land pattern Side View

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 , LVPECL or LVDS : Differential] ; Pad 5 : [CMOS : NC , LVPECL or LVDS : Complementary] ; Pad 6 : Supply Voltage

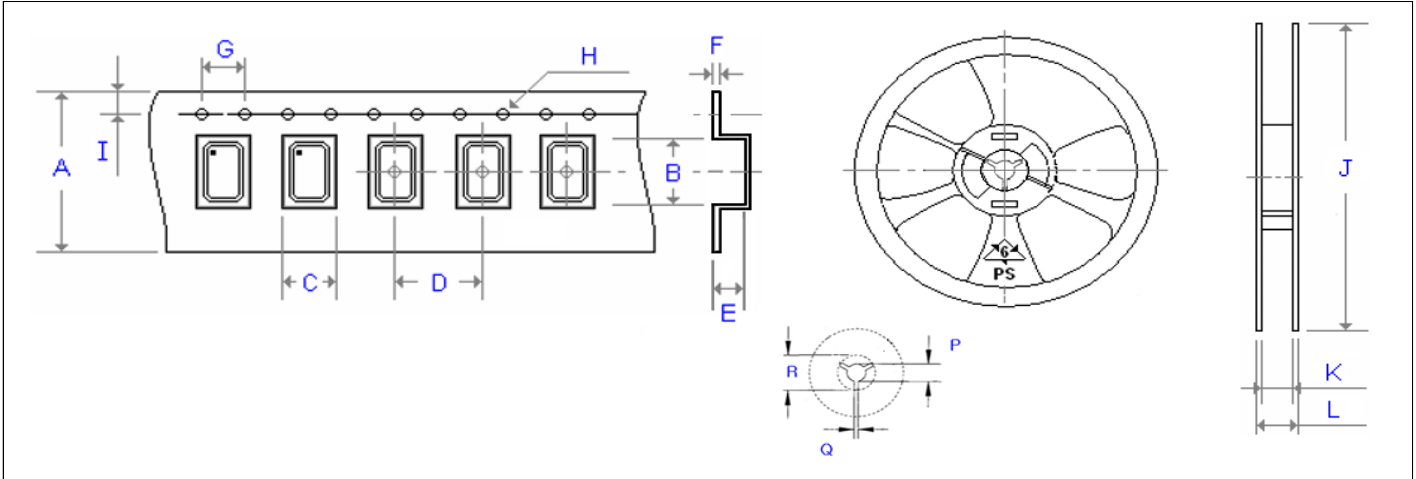
Test Circuits and Output Waveforms

CMOS Test Circuit	LVPECL Test Circuit	LVDS Test Circuit
FSEL = High Output : f 2 FSEL = Low Output : f 1	FSEL = High Output : f 2 FSEL = Low Output : f 1 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	FSEL = High Output : f 2 FSEL = Low Output : f 1
CMOS Output Waveform	LVPECL Output Waveform	LVDS Output Waveform
V_{OH} V_{OL} T_H T T_f T_r 90% 50% 10%	[PECL] V_{OH} V_{OL} T_H T T_f T_r 80% 50% 20% 45%~55% Duty Cycle 45%~55% Duty Cycle	LVDS LVDS Differential 80% 50% 20% T_r T_f

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_536	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	0.30	4.00	Ø 1.50	1.75	1000
G_538	12.00	5.40	3.60	8.00	1.70	0.30	4.00	Ø 1.50	1.75	1000
G_578	16.00	7.30	5.30	8.00	1.90	0.30	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
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)M_326	12.00	3.60	2.90	4.00	1.70	0.30	4.00	Ø 1.50	1.75	1000
(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_538	12.00	5.40	3.60	8.00	1.70	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) +2.0 / -0.0mm

	J	K	L	P	Q	R	pcs / reel
G_226	180.00	9.00	12.00	13.20	2.10	-	3000
G_326	180.00	9.00	12.00	13.20	2.10	-	3000
G_536	180.00	13.00	16.00	13.20	2.50	-	1000
G_576	180.00	17.20	19.30	13.30	2.20	22.00	1000
G_538	180.00	13.00	16.00	13.20	2.50	-	1000
G_578	180.00	17.20	19.30	13.30	2.20	22.00	1000
(V)M21	180.00	9.00	12.00	13.20	2.10	-	3000
ME21	180.00	9.00	12.00	13.20	2.10	-	3000
(V)M22	180.00	9.00	12.00	13.20	2.10	-	3000
(V)M_32	180.00	9.00	12.00	13.20	2.10	-	3000
(V)M_326	180.00	13.00	16.00	13.20	2.50	-	1000
(V)M_53	180.00	13.00	16.00	13.20	2.50	-	1000
(V)M_538	180.00	13.00	16.00	13.20	2.50	-	1000
(V)M_57(2)	180.00	17.20	19.30	13.30	2.20	22.00	500
(V)M_43 (63)	330.00	24.50	29.10	13.00	2.20	17.30	500