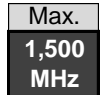
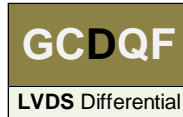
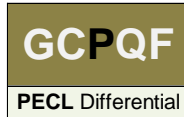


# Switchable output Crystal Oscillators



## Features

## Frequency Switchable

- 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	PECL	LVDS		
Supply Voltage V <sub>DD</sub> ( code )	+ 2.5 V ± 5% ( voltage code " 25 " ) + 3.3 V ± 5% ( voltage code " 3 " )	+ 2.5 V ± 5% ( voltage code " 25 " ) + 3.3 V ± 5% ( voltage code " 3 " )	+ 2.5 V ± 5% ( voltage code " 25 " ) + 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 <sub>cc</sub> - 2V or Thevenin equivalent	100 Ω between output and complimentary output		
Output Logic " High " , " 1 "	90 % V <sub>DD</sub>	V <sub>DD</sub> - 1.03 ( min. ) , V <sub>DD</sub> - 0.6 ( max. )	1.4 V ( Typ. ) , 1.6 V ( max. )		
Output Logic " Low " , " 0 "	10 % V <sub>DD</sub>	V <sub>DD</sub> - 1.85 ( min. ) , V <sub>DD</sub> - 1.6 ( max. )	1.1 V ( Typ. ) , 0.9 V ( min. )		
Current Consumption ( V <sub>DD</sub> : + 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 <sub>DD</sub> : + 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 " 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	
<b>Control Voltage Function on Pad 1</b>					
Supply Voltage	V <sub>DD</sub> = +2.5 V ; V <sub>con</sub> Center = +1.25V		V <sub>DD</sub> = +3.3 V ; V <sub>con</sub> Center = +1.65V		
V <sub>control</sub> 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				
<b>Frequency Selection Function on Pad 2</b>					
FSEL on pad2	70% of V <sub>DD</sub> ( min. ) For FSEL = 1 , Output frequency is Freq.2 ( f2 )				
	30% of V <sub>DD</sub> ( max. ) For FSEL = 0 , Output frequency is Freq.1 ( f1 )				
	Default FSEL pin has internal pull-up resistor .				
	Frequency switching time : 60 us ( typ. )				

# Switchable output Crystal Oscillators



**GCTQF**  
CMOS waveform

**GCPQF**  
PECL Differential

**GCDQF**  
LVDS Differential

SMD

2.5 V 3.3 V

Min.  
10  
MHz

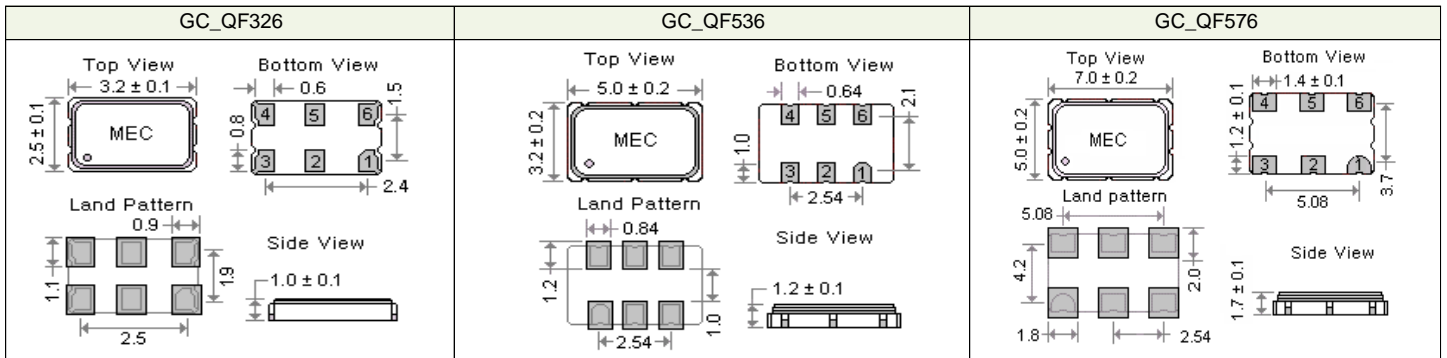
Max.  
1,500  
MHz

## Part Number Format and Example

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 : 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.	-	±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

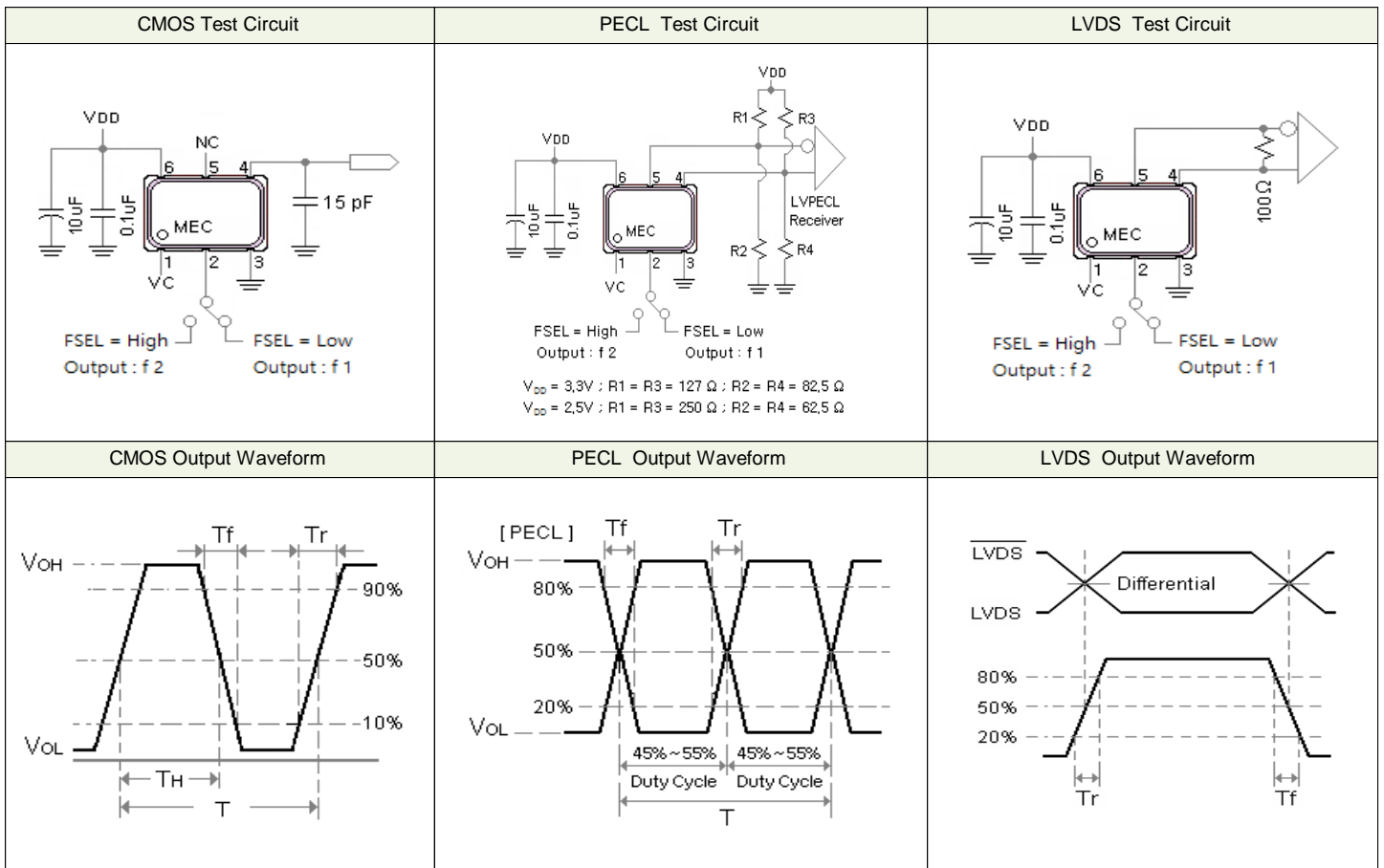


### Pad Connections :

**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

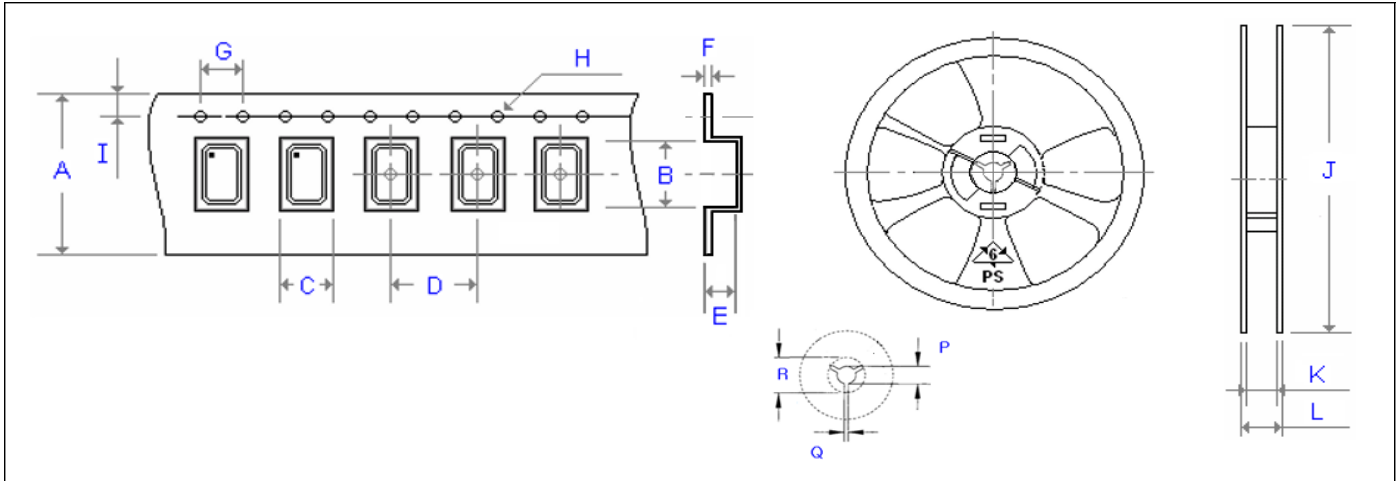
## Test Circuits and Output Waveforms



## 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_536	12.00	5.30	3.60	8.00	1.40	0.30	4.00	∅ 1.55	1.75	1000
G_576	16.00	7.30	5.30	8.00	1.90	0.30	4.00	∅ 1.50	1.75	1000
G_538	12.00	5.40	3.60	8.00	1.70	0.30	4.00	∅ 1.55	1.75	1000
G_578	16.00	7.30	5.30	8.00	1.90	0.30	4.00	∅ 1.50	1.75	1000
(V)M21	8.00	2.30	1.90	4.00	0.90	0.25	4.00	∅ 1.55	1.75	3000
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)M_326	12.00	3.60	2.90	4.00	1.70	0.30	4.00	∅ 1.50	1.75	1000
(V)M_53	12.00	5.30	3.60	8.00	1.40	0.30	4.00	∅ 1.50	1.75	1000
(V)M_538	12.00	5.40	3.60	8.00	1.70	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	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