

Voltage Controlled Crystal Oscillators

GTQF

CMOS Waveform

GPQF

LVPECL Differential

GDQF

LVDS Differential

Q family

F series

SMD

2.5 V

3.3 V

Min.

10 MHz

Max.

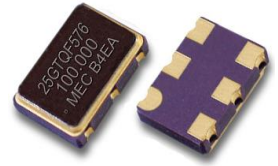
1,500 MHz

Features

- The GTQF, GPQF and GDQF Series are members of Mercury's Q-Family Quick-Turn crystal oscillators
- Output frequency range : 10 MHz to 1500 MHz
- Low RMS jitter 1.2 ps typical (12KHz to 20MHz)
- Package size : 3.2x2.5mm , 5.0x3.2mm , 7.0x5.0mm
- Next-day samples for prototypes

Quick - Turn Clock Oscillators

1.2 pS Phase Jitter (typical)



General specifications , at Ta=+25°C

Model	GTQF			GPQF			GDQF	
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 VDD - 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)	10 ~ 50 MHz : 30 mA			10 ~ 250 MHz : 50 mA			10 ~ 250 MHz : 30 mA	
	51 ~ 150 MHz : 38 mA			251 ~ 750 MHz : 55 mA			251 ~ 750 MHz : 34 mA	
	151 ~ 250 MHz : 48 mA			751 ~ 1,500 MHz : 60 mA			751 ~ 1,500 MHz : 40 mA	
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 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 .		
	Commercial (-20°C to +70°C)		A	B	C	For example : " C20 " ± 20 ppm over -20°C to +70°C ; " F20 " ± 20 ppm over -40°C to +85°C		
	Industrial (-40°C to +85°C)		D	E	F			
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	+ 0.25V ~ +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							
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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Part Number Format and Example

Example : 3GPQF576 - E - 100N - 622.080

3	GPQF	576	-	E	-	100N	-	622.080
Supply Voltage	GTQF : CMOS	Package Size		Frequency Stability Code "E":		±100 ppm (min.)		Frequency
"3" for 3.3V	GPQF : LVPECL	"576" : 7.0 * 5.0 mm		± 50 ppm over -40 to +85°C.		Frequency pulling range.		(MHz)
"25" for 2.5V	GDQF : LVDS	"536" : 5.0 * 3.2 mm		Other frequency stabilities are available.				
		"326" : 3.2 * 2.5 mm						

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

G_QF326	G_QF536	G_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 : VCXO

Pad 2 : OE: High Enable

Pad 3 : Ground

Pad 4 : [CMOS : Output , LVPECL or LVDS : Differential]

Pad 5 : [CMOS : NC , LVPECL or LVDS : Complementary]

Pad 6 : Supply Voltage

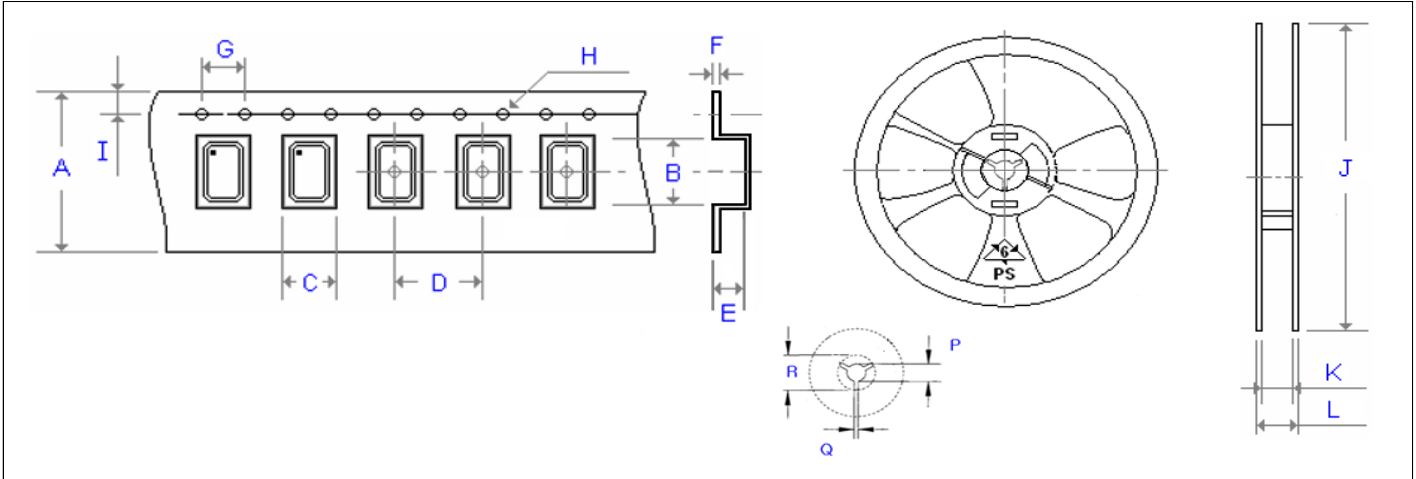
Test Circuits and Output Waveforms

CMOS Test Circuit	LVPECL Test Circuit	LVDS Test Circuit
	$V_{DD} = 3.3V$; $R1 = R3 = 127 \Omega$; $R2 = R4 = 82.5 \Omega$ $V_{DD} = 2.5V$; $R1 = R3 = 250 \Omega$; $R2 = R4 = 62.5 \Omega$	
CMOS Output Waveform	LVPECL 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	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