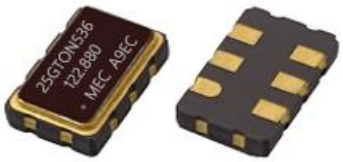
Low Jitter Voltage Controlled Crystal Oscillators — CMOS Output

GTQN	GPQN	GDQN	0.6 ps RMS Jitter	SMD	2.5 V	3.3 V	Min.	Max.
CMOS Waveform	**LVPECL** Differential	**LVDS** Differential					10 MHz	1,500 MHz

Features

- Output frequency range : 10 MHz to 1500 MHz
- Low RMS Jitter 0.6 ps typical (12KHz to 20MHz)
- Package size : 3.2x2.5mm , 5.0x3.2mm , 7.0x5.0mm
- If you need lower rms jitter, please refer to the "G_JFN" series (150 fsec typ. @ 12KHz to 20MHz)



General specifications , at Ta=+25°C , CL=15pF

Model	GTQN	GPQN	GDQN
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 " 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	RL = 50 Ω to (V_{DD}-2.0V). See test circuit below.	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	10 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
Duty Cycle	50% ± 5%		
Start-up Time	10 msec. (max.)		
Aging at Ta = +25°C	± 5 ppm (max.) for first year		
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*	

RMS Jitter [12 KHz ~ 20 MHz]	0.6 psec (typ.)

Phase Noise [dBc / Hz (typ.)]	Offset	10 Hz	100 Hz	1 KHz	10 KHz	100 KHz	1 MHz	10 MHz
	125 MHz	-63	-94	-113	-122	-126	-137	-156
	212.5 MHz	-55	-85	-108	-117	-120	-132	-156

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.)

Voltage Controlled Crystal Oscillators [VCXO]

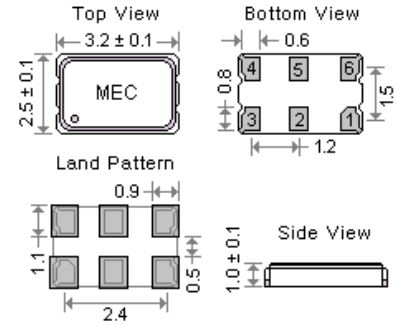
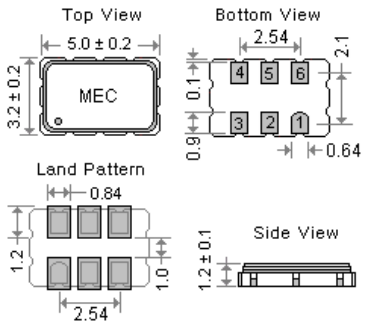
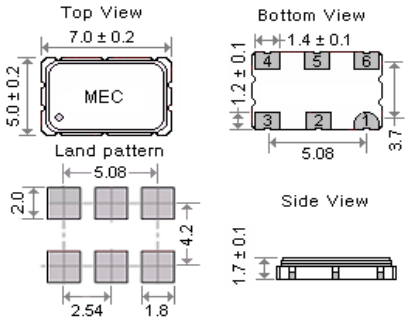
GTQN	GPQN	GDQN	Q family	SMD	2.5 V	3.3 V
CMOS Waveform	**LVPECL** Differential	**LVDS** Differential	N series			

Part Number Format and Example

Example : 3GPQN576 - E - 100N - 622.080

3	GPQN	576	-	E	-	100N	-	622.080
Supply Voltage " **3** " for 3.3V " **25** " for 2.5V	GTQN : CMOS GPQN : LVPECL GDQN : LVDS	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)

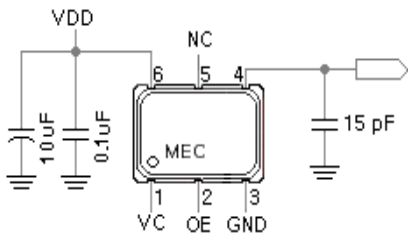
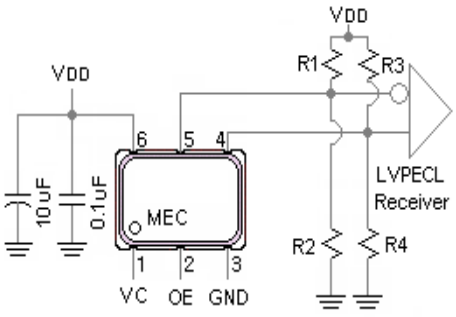
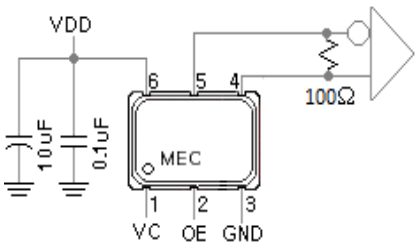
Outline Dimensions (Unit : mm) , Suggested pad Layout for SMDs

G_QN326	G_QN536	G_QN576
		

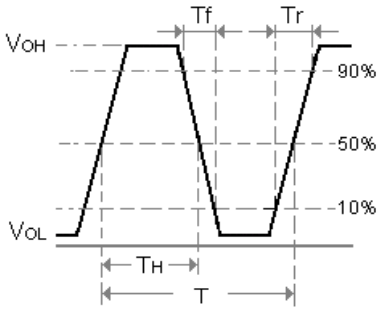
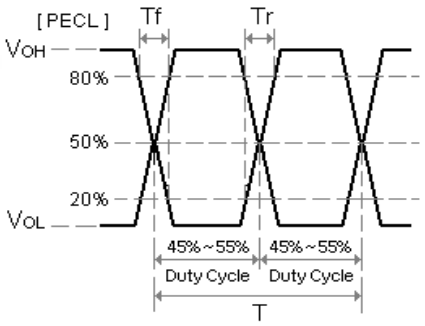
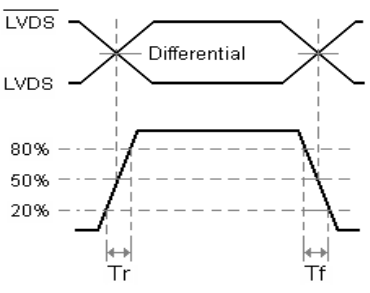
Pad Connections :

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

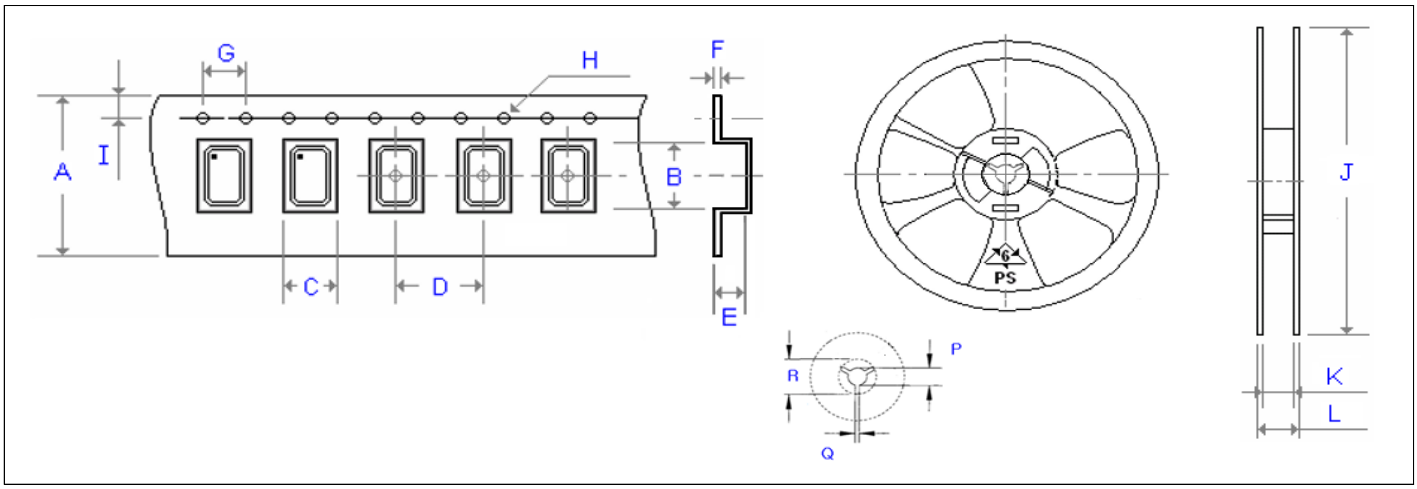
CMOS Test Circuit	**LVPECL** Test Circuit	**LVDS** Test Circuit
		

V_{DD} = 3.3V ; R1 = R3 = 127 Ω ; R2 = R4 = 82.5 Ω
V_{DD} = 2.5V ; R1 = R3 = 250 Ω ; R2 = R4 = 62.5 Ω

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