Voltage Controlled Crystal Oscillators

CMOS Output

VCXO " G "	CMOS	Thru-Hole	SMD	1.8 V	3.3 V	Min. 1.25 MHz	Max. 50.0 MHz

Unlike regular clock oscillators that have a fixed output frequency, the output frequency of VCXOs (also known as " frequency modulators ") can be tuned ± 50 ~ ± 200ppm up or down from the nominal frequency, by varying the control voltage on the voltage control pin. A varactor and a voltage variable capacitance tuning diode, is used to achieve this function. Applications include (PLL) phase lock loop, SONET / ATM, set -top boxes, MPEG, audio -video modulations, video game consoles and HDTV sets, ONET, 10GbE, Fibre Channel, wireless repeaters, transponders, HDTV, FPGAs, data acquisition.

General Specifications of " G " series , [TA = +25°C , V_{DD}= at specified voltage , Load : 15 pF]

Model	" G " series		
Output Waveform	CMOS		
Type	SMD Type		Thru - Hole Type
Pads / Pins	6 pads		4 pins
Models (Dimensions) , Unit : mm	**G226** (2.5 * 2.0 * 1.0)	**G576** (7.0 * 5.0 * 1.7)	**G8** (12.8 * 12.8 * 6.3)
	G326 (3.2 * 2.5 * 1.0)	**G536** (5.0 * 3.2 * 1.2)	**G14** (20.2 * 12.8 * 6.8)

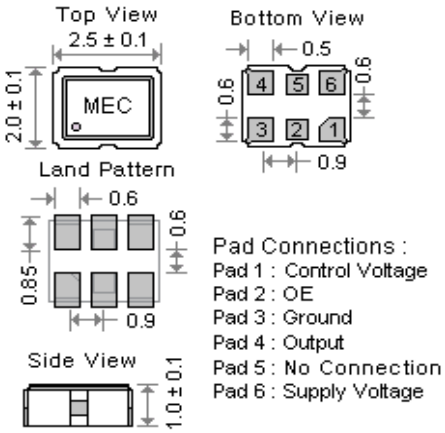
Supply Voltage (V_{DD})	+1.8V ± 5%	+3.3V ± 10%
Frequency Range	16.0 MHz ~ 50.0 MHz	1.25 MHz ~ 50.0 MHz
Initial Freq. Accuracy (at 25 °C)	with Vc = 0.9V	with Vc = 1.65V
Output Logic High " 1 "	1.62 V (min.)	2.97 V (min.)
Output Logic Low " 0 "	0.18 V (max.)	0.33 V (max.)
Frequency Deviation Range	Standard : ± 80 ppm (min.)	Standard : ± 80 ppm (min.)
Control Voltage Center and Range	0.9 V ± 0.9 V	1.65 V ± 1.35 V

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 "
	Commercial (*-20°C to +70°C*)	*A*	*B*	*C*	For example : " C20 " : ± 20 ppm over -20°C to +70°C ; " F30 " : ± 30 ppm over -40°C to +85°C
	Industrial (*-40°C to +85°C*)	*D*	*E*	*F*	

Output Load	15 pF						
Rise Time (Tr) / Fall Time (Tf)	4 nsec.(typ.) ; 6 nsec.(max.) Measured between 10% to 90% of waveform						
Duty Cycle	50% ± 10% (standard) , 50% ± 5% (optional, add " ***- S*** " as suffix to part number)						
RMS Jitter (12 KHz to 20 MHz)	1.0 psec (max.)						
Phase Noise / Offset	10 Hz	100 Hz	1K Hz	10K Hz	100K Hz	1 MHz	
[27MHz , 3.3V] / dBc/Hz (typ.)	-40 dBc/Hz	-104 dBc/Hz	-132 dBc/Hz	-147 dBc/Hz	-152 dBc/Hz	-150 dBc/Hz	
Start-up Time	10 msec. (max.)						
Current Consumption	10 ~ 45 mA (Frequency dependent). For 27 MHz: 10 mA (typ.) at +3.3 V_{DD}						
Linearity	6% (typ.) ; 10% (max.)						
Modulation Bandwidth	10 KHz (min.) Measured at -3 dB						
Input Impedance	5 MΩ (typ.)						
Slope Polarity (Transfer Function)	Monotonic and Positive : Increasing control voltage always increases output frequency ,						
Storage Temperature	-55°C to +125°C						
Aging at Ta = +25℃	± 3 ppm per year (max.)						
Output Enable / Disable Function	Enable	When 70% (min.) of V_{DD} to Enable Output. ; Enable time : 2 msec (max.)					
	Disable	When 30% (max.) of V_{DD} to Disable Output. ; Disable time : 100 nsec (max.)					

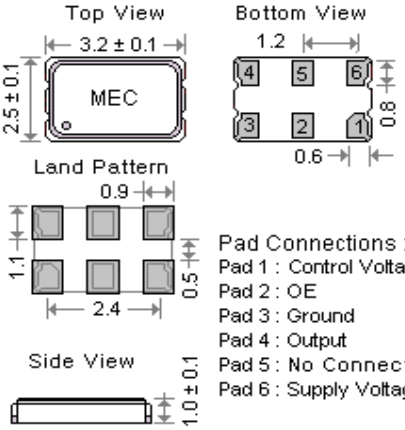
Outline Dimensions (Unit : mm) , Suggested pad Layout for SMDs

[G226]



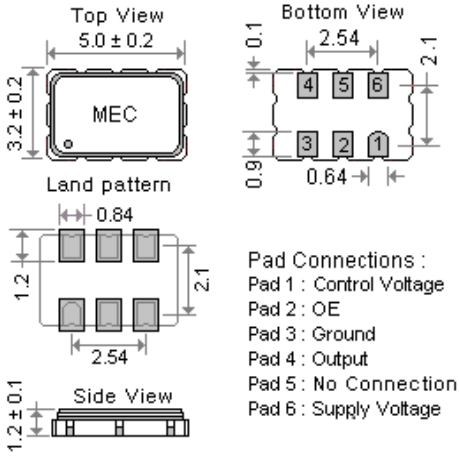
Pad Connections :
Pad 1 : Control Voltage
Pad 2 : OE
Pad 3 : Ground
Pad 4 : Output
Pad 5 : No Connection
Pad 6 : Supply Voltage

[G326]



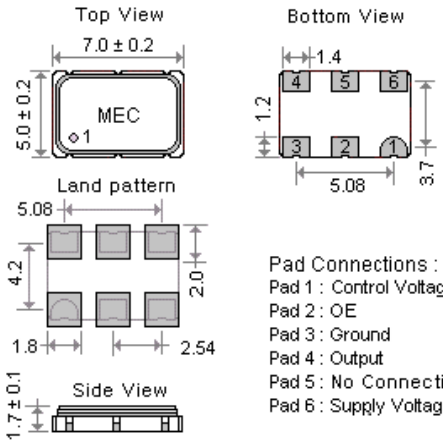
Pad Connections :
Pad 1 : Control Voltage
Pad 2 : OE
Pad 3 : Ground
Pad 4 : Output
Pad 5 : No Connection
Pad 6 : Supply Voltage

[G536]



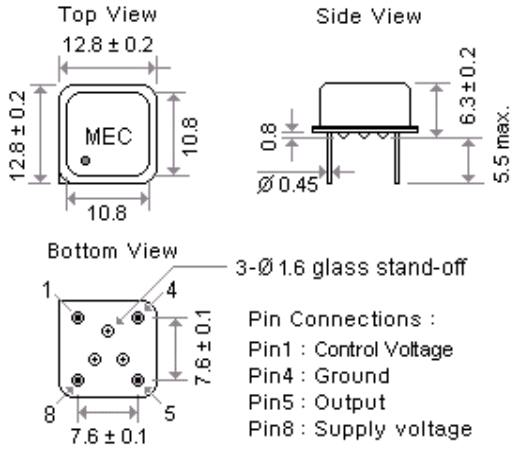
Pad Connections :
Pad 1 : Control Voltage
Pad 2 : OE
Pad 3 : Ground
Pad 4 : Output
Pad 5 : No Connection
Pad 6 : Supply Voltage

[G576]



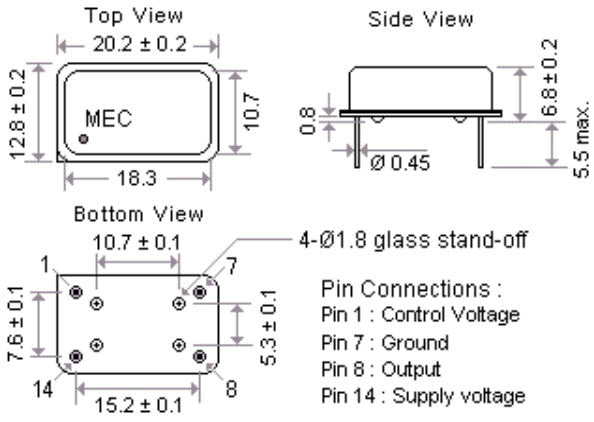
Pad Connections :
Pad 1 : Control Voltage
Pad 2 : OE
Pad 3 : Ground
Pad 4 : Output
Pad 5 : No Connection
Pad 6 : Supply Voltage

[G8]



Pin Connections :
Pin1 : Control Voltage
Pin4 : Ground
Pin5 : Output
Pin8 : Supply voltage

[G14]



Pin Connections :
Pin 1 : Control Voltage
Pin 7 : Ground
Pin 8 : Output
Pin 14 : Supply voltage

Part Number Format and Examples

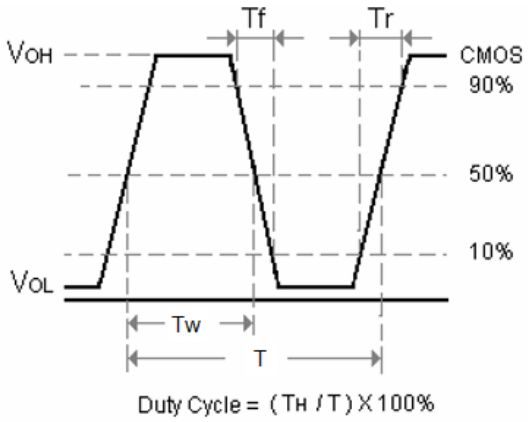
	[1]	[2]		[3]		[4]	[5]		[6]
	Supply Voltage	Holder Type	–	Frequency Stability	–	Pulling Range	Range Code	–	Center Frequency
Examples (1)	18	G14	–	B	–	100	N	–	35.328
Examples (2)	3	G576	–	D	–	80	T	–	27.000

Ex (1) : 18G14 - B - 100N - 35.328 [+1.8V , full size 4 pin Dip type , ±50ppm (-20°C to 70°C) , pulling : ±100 ppm (min.) , 35.328 MHz]

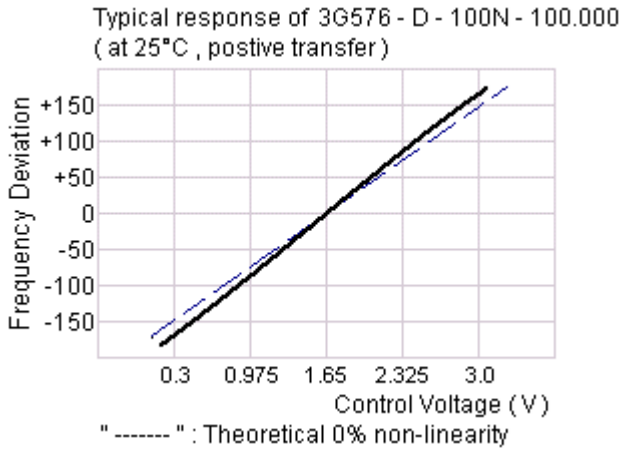
Ex (2) : 3G576 - D - 80T - 27.000 [+3.3V , G576 type , ±25ppm (-40°C to 85°C) , pulling : ±80 ppm (typ.) , 27.000 MHz]

[1]	Supply voltage , " 18 " for +1.8V ; " 3 " for +3.3V		
[2]	Holder Type		
[3]	-20°C ~ 70°C	" A " ± 25ppm ; " B " ± 50ppm ; " C " ± 100ppm ;	
		If non-standard please enter the desired stability after " C " , for example " C15 ": represents ±15ppm over -20 to +70°C	
	-40°C ~ 85°C	" D " ± 25ppm ; " E " ± 50ppm ; " F " ± 100ppm ;	
		If non-standard please enter the desired stability after " F " , for example " F20 ": represents ±20ppm over -40 to +85°C	
[4]	Freqency Pulling Range	3.3V	From ±30ppm ~ ±150ppm , control Voltage range : 0.3V ~ 3.0 ; control voltage center : ± 1.65 V
		5.0V	From ±70ppm ~ ±200ppm , control Voltage range : 0.5V ~ 4.5V ; control voltage center : ± 2.5 V
[5]	Pulling Range Code	" M " stands for maximum ; " N " stands for minimum ; " T " stands for typical (tolerance is ± 20%)	
[6]	Center Frequency in MHz		

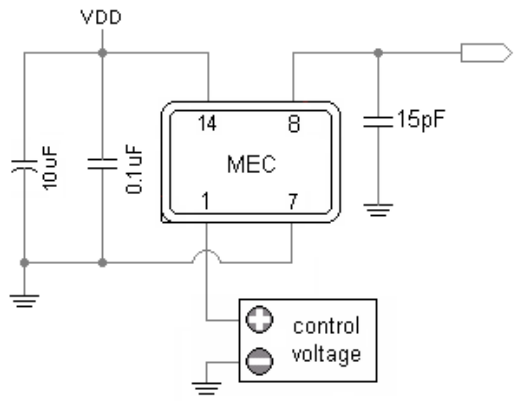
CMOS Output Waveform



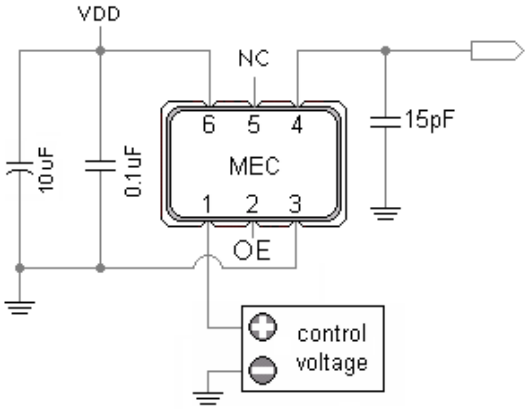
Transfer Function



[Thru - Hole Tpye] CMOS Square Wave Test Circuit

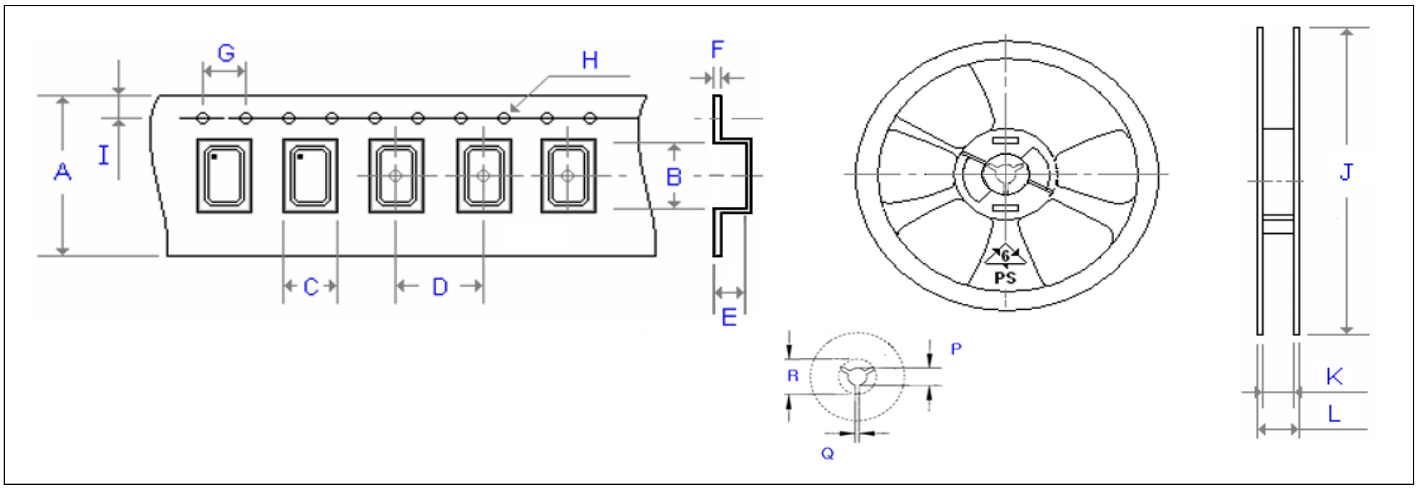


[SMD 6 pads] CMOS Square Wave Test Circuit



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