QEN05

5.0 x 3.2 mm, SMD

Frequency and Electrical Characteristics

Parameter	Min.	Typ.	Max.	Unit	Test condition / Description
Nominal frequency (Fn)	0.25		156.25	MHz	For option D (Vcc = 5.0V), the Fn maximum is limited to 100MHz
Operating temperature range		-10 to +70	-55 to +125	°C	See 'Order Part Example'
Frequency stability over temperature[1]	±25	±50	±100	ppm	See 'Order Part Example'
Storage temperature range	-55		+125	°C	
Long-term stability (Ageing)			±3	ppm	Frequency drift over 1 year at 25°C
Power supply voltage (V_{CC}) 1.8V (N option) 2.8V (M option) 3.3V (D option) 5.0V (A option)	 1.710 2.520 3.135 4.750	 1.8 2.8 3.3 5.0	 1.890 3.080 3.465 5.250	V_{DC}	See 'Order Part Example'
Output load		15	30	pF	HCMOS / TLL. See 'Order Part Example'
Output logic levels Output logic high (V_{OH}) Output logic low (V_{OL})	 90%Vcc		 10%Vcc	V_{DC}	
Duty cycle	40	50	60	%	
Start-up time			10	ms	
RMS phase jitter [12kHz ~ 20MHz]			1.0	ps	
Period jitter (pk-pk)			25	ps	

Input current

Frequency	V_{CC} = 5V	V_{CC} = 3.3V	V_{CC} = 2.8V	V_{CC} = 1.8V
1.000 to 9.999MHz	15 mA	8 mA	7 mA	6 mA
10.00 to 34.999MHz	20 mA	10 mA	8 mA	7 mA
35.00 to 49.999MHz	35 mA	25 mA	20 mA	15 mA
50.0 to 156.25MHz	40 mA	35mA	30 mA	25 mA

Rise & fall time

Condition	V_{CC} = 5V	V_{CC} = 3.3V	V_{CC} = 2.8V	V_{CC} = 1.8V
10%Vcc to 90% Vcc	6 ns	6 ns	7 ns	8 ns
90%Vcc to 10% Vcc	6 ns	6 ns	7 ns	8 ns

Environmental Specifications

Parameter	Test condition / Description
Mechanical vibration	10*g*, Frequency: 10Hz ~ 2KHz according to standard CEI 68-2-63
Shock	100*g*, 6ms according to standard CEI 68-2-27

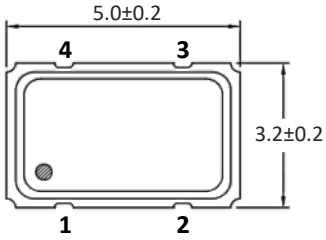
[1] Include 25°C tolerance, operating temperature range, input voltage change (V_{CC} ±5%), load change (15pF ±10%), first year ageing, shock and vibration.

Order Part Example – QEN05BDAR / 50.000MHZ

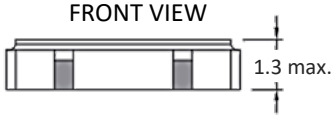
Parameter	Product family and package	Frequency stability (FvT)	Supply Voltage (Vcc)	Output	Output Symmetry Option	Nominal Frenquency (Fn. MHz)
Code	QEN05	B	D	A	R	50.000MHZ
Decode	QEN = XO 05 = 5 x 3.2 mm, SMD	A = ±100ppm vs -10 to +70°C B = ±50ppm vs -10 to +70°C C = ±25ppm vs -10 to +70°C D = ±100ppm vs -40 to +85°C F = ±50ppm vs -40 to +85°C G = ±25ppm vs -40 to +85°C J = ±100ppm vs -55 to +125°C K = ±50ppm vs -55 to +125°C	A = 5.0V D = 3.3V M = 2.8V N = 1.8V	A = HCMOS 15pF B = HCMOS 30pF	Blank = 40/60% R = 45/55%	Please enter Fn

Model Outline, Recommended Pad Layout and Marking

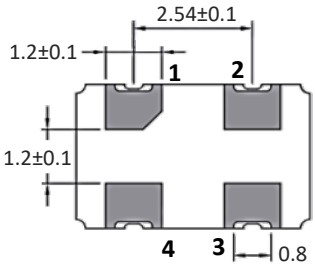
TOP VIEW



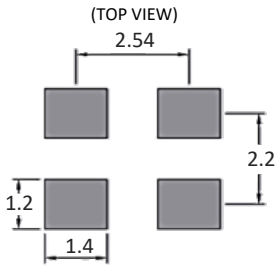
FRONT VIEW



BOTTOM VIEW



RECOMMENDED PAD LAYOUT



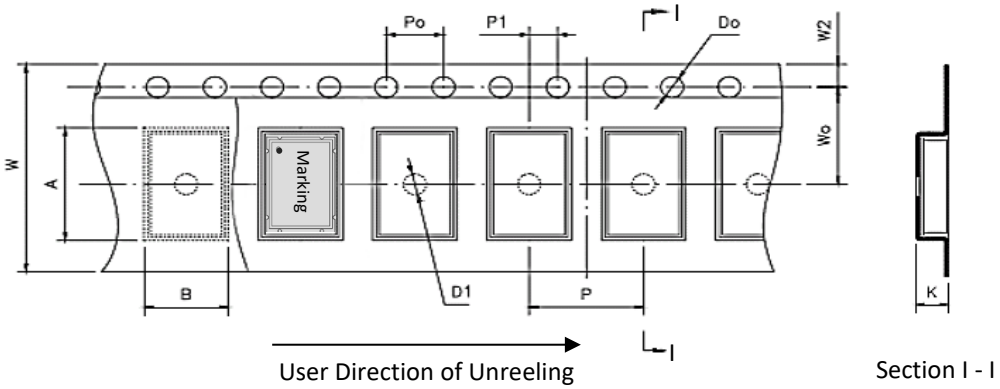
Marking		Note
Line 1	G05BDAR	G = Manufacturing code, 05 = 5x3.2 SMD XO, B = ±50ppm vs -10 to +70°C, D = Vcc 3.3V, A = HCMOS 15pF R = 45/55% output symmetry option
Line 2	50.000	Frequency in MHz (6 digits)
Line 3	2343	Year code (YY): 23 = 2023, Week code (WW): 43 = Week 43 of the year

Pin	Connections
1	Tri-state Open = Active, 1 = Active, 0 = High Z
2	GND
3	Output
4	Vcc

NOTE:
Dimension unit is in millimetre.

Packaging

TAPRE DETAILS:

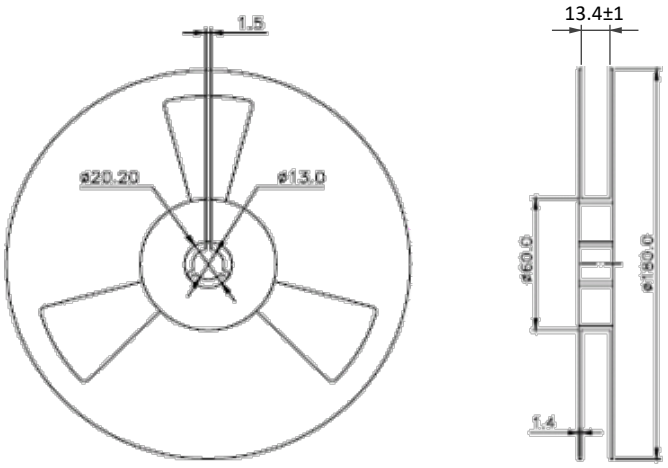


User Direction of Unreeling

Section I - I

Parameter	Code	Dimension	Tolerance
Pitch of components	P	8.0	± 0.1
Pitch of sprocket hole	P_0	4.0	± 0.1
Length from hole center to component center	P_1	2.0	± 0.1
Width of carrier tape	W	12.0	±0.3
Width of adhesive tape	W_0	5.5	± 0.1
Height of component pocket	A	5.7	± 0.1
Width of component pocket	B	3.7	± 0.1
Gap of hold down tape and carrier tape	W_2	1.75	± 0.1
Diameter of sprocket hole	D_0	Φ 1.5	± 0.05
Diameter of feed hole	D_1	Φ 1.5	± 0.25
Total of tape thickness	K	1.5	± 0.1

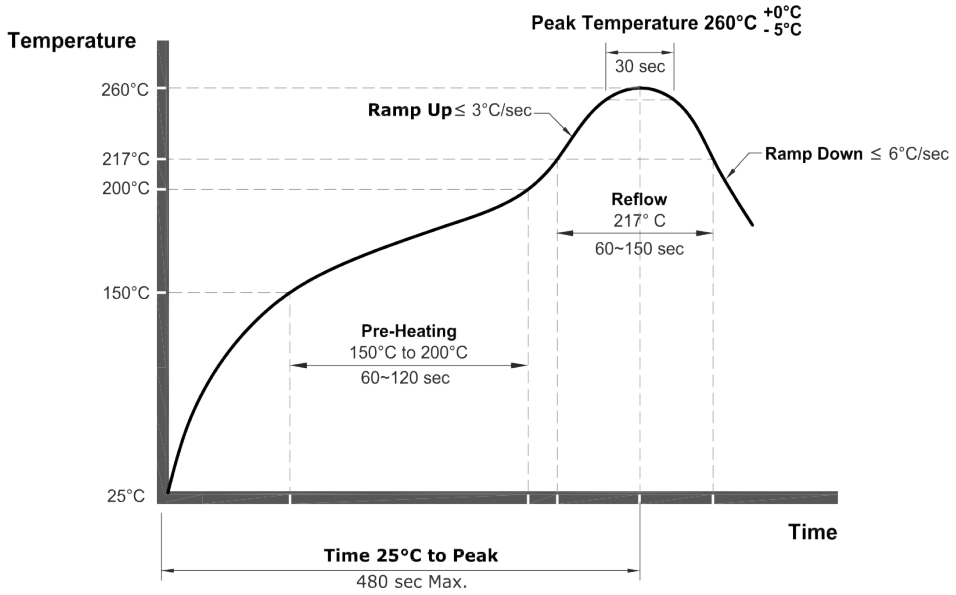
REEL DETAILS



NOTE:

- Standard Packing Quantity (SPQ): 1000 pcs/reel
- Unit: mm

Reflow soldering Profile



Referred to JEDEC J-STD-020E