QEN09

2.0 x 1.6 mm, SMD

Frequency and Electrical Characteristics

Parameter	Min.	Typ.	Max.	Unit	Test condition / Description
Nominal frequency[1] (Fn)	0.25		125	MHz	
Operating temperature range		-20 to +70	-55 to +125	°C	See 'Order Part Example'
Frequency stability over temperature[2]			±25 to ±100	ppm	Referenced to frequency reading at 25°C and the specified load cap.
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) 2.5V (M option) 3.3V (D option) 5.0V (A option)	 1.710 2.375 3.135 4.750	 1.8 2.5 3.3 5.0	 1.890 2.625 3.465 5.250	V_{DC}	See 'Order Part Example'
HCMOS output load			15	pF	
Output logic levels Output logic high (V_{OH}) Output logic low (V_{OL})	 90%Vcc		 10%Vcc	V_{DC}	With 15pF HCMOS load
Duty cycle[3]	40	50	60	%	See 'Order Part Example'
Rise & fall time			10	ns	10% V_{CC} ~ 90% V_{CC}
Start-up time			10	ms	
Input current					

Load capacitance	Frequency	V_{CC} = 5.0V	V_{CC} = 3.3V	V_{CC} = 2.5V	V_{CC} = 1.8V
C_L = 15 pF	1.000 to 24.999MHz	15 mA	10 mA	6 mA	4 mA
	25.00 to 39.999MHz	20 mA	15 mA	8 mA	6 mA
	40.00 to 59.999MHz	30 mA	20 mA	12 mA	10 mA
	60.00 to 125.00MHz	50 mA	40 mA	30 mA	25 mA

Phase Jitter [12Khz ~ 20MHz]			1.0	ps		

Order Part Example – QEN09BDA / 50.000MHZ

Parameter	Product family and package	Frequency stability (FvT)	Supply Voltage (Vcc)	Output	Output Symmetry	Nominal Frenquency (Fn. MHz)
Code	QEN09	B	D	A	R	50.000MHZ
Decode	QEN = XO 09 = SMD, 2.0x1.6 mm	A = ±100ppm vs -20 to +70°C B = ±50ppm vs -20 to +70°C C = ±25ppm vs -20 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 = 2.5V N = 1.8V	A = HCMOS, 15pF	Blank = 40/60% R = 45/55%	Please enter Fn

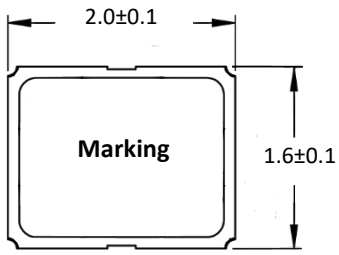
[1] For 1.8V version, maximum frequency is 50MHz only.

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

[3] Duty cycle 45/55% is available on option

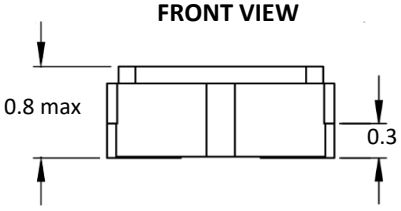
Model Outline, Recommended Pad Layout and Marking

TOP VIEW

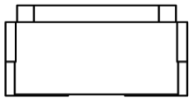


Marking		Example for QEN09BDA / 50.000 MHz
Line 1	1xxxxx	Product code (6 digits)
Line 2	YYWW-M	Date and Manufacuring code: 2340-G Year code (YY): 23 = 2023, Week code (WW): 40 = Week 46 of the year, G = Manufacturing code

FRONT VIEW

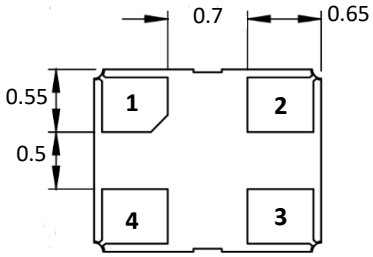


SIDE VIEW

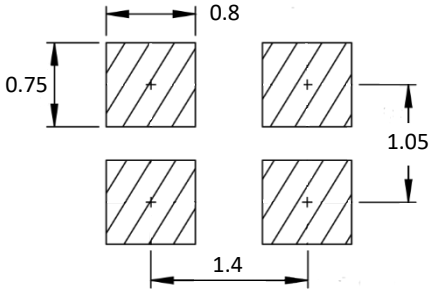


Pin	Connections
1	Tri-state (Open = Active, 1 = Active, 0 = High)
2	GND
3	Output
4	Vcc

BOTTOM VIEW



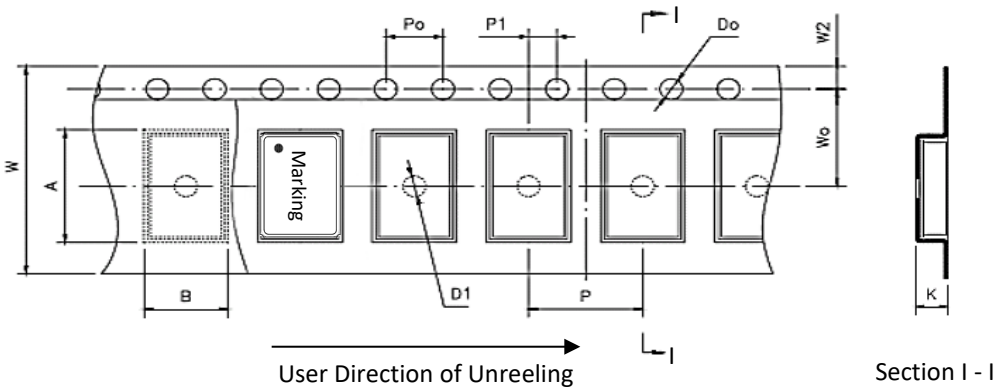
RECOMMENDED PAD LAYOUT



NOTE:
The dimension unit is in millimetre.

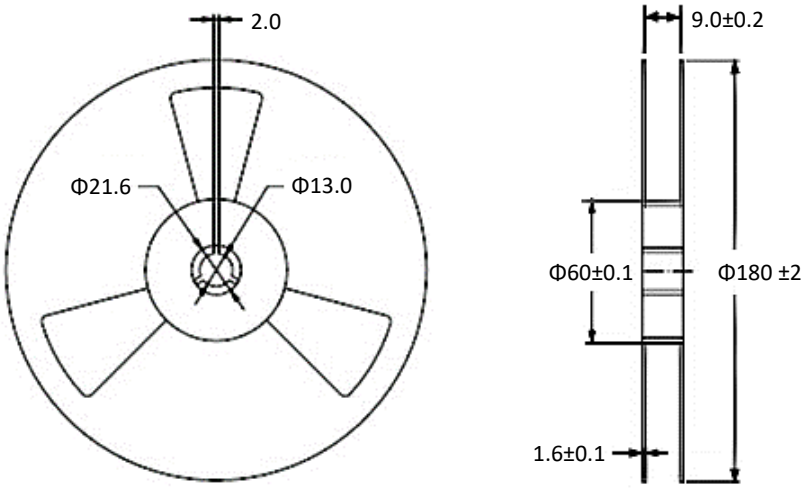
Packaging

TAPE DETAILS:



Parameter	Code	Dimension	Tolerance
Pitch of components	P	4.0	± 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	8.0	±0.3
Width of adhesive tape	W_0	3.5	± 0.1
Height of component pocket	A	2.4	± 0.1
Width of component pocket	B	2.0	± 0.1
Gap of hold down tape and carrier tape	W_2	1.75	± 0.1
Diameter of sprocket hole	D_0	Φ 1.0	± 0.05
Diameter of feed hole	D_1	Φ 1.5	± 0.25
Total of tape thickness	K	1.15	± 0.1

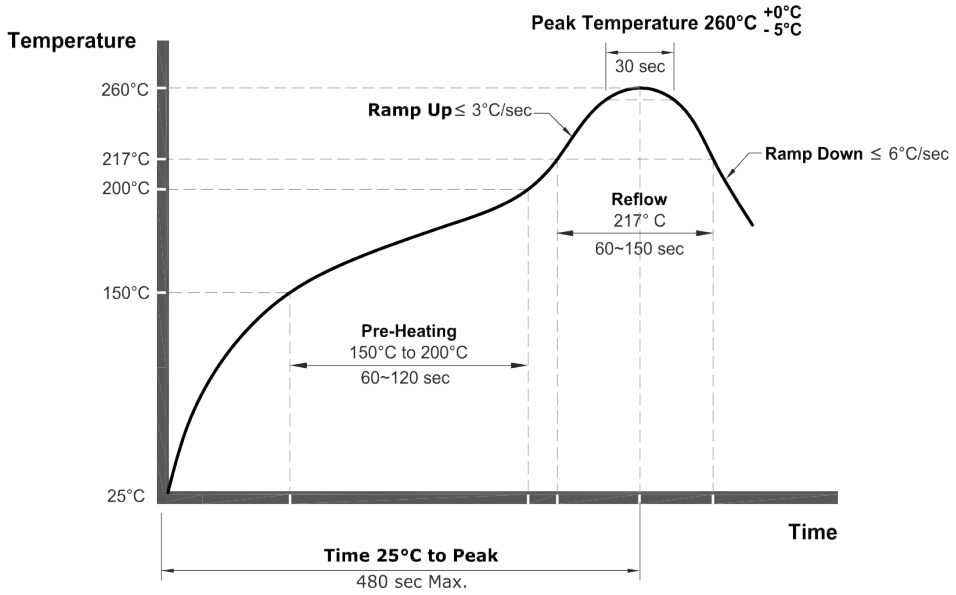
REEL DETAILS



NOTE:

- Standard Packing Quantity (SPQ): 3000 pcs/reel
- Unit: mm

Reflow soldering Profile



Referred to JEDEC J-STD-020E