THE SPECIALISTS

FOR FREQUENCY CONTROL AND BATTERY TECHNOLOGY

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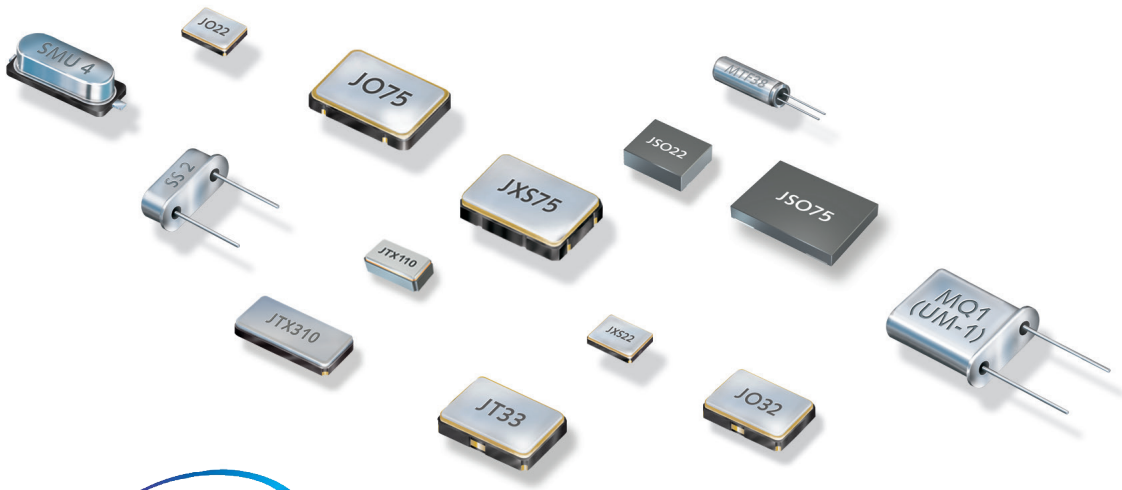

BCE. ELECTRONICS

FREQUENCY CONTROL PRODUCTS

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The Specialist
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components in stock

Flexibility and Reliability
by our own international
production facilities

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Index

actual size

Automotive SMD Crystal · JXS22P4

4 Pad Version · 2.5 x 2.0 mm

- seam sealed ceramic/metal package
- all versions are AEC-Q200 qualified
- HMR version with extended shock & vibration immunity
- reflow soldering temperature: 260 °C max.

RoHS 2011/65/EC compliant

Pb free: pins / pads

General Data

type	JXS22P4	
frequency range	12.0 ~ 40.0 MHz	(fund. AT-cut)
frequency tolerance at 25 °C	± 10 ppm, ± 20 ppm, ± 30 ppm	
load capacitance C_L	12 pF standard	(option: 8 pF ~ 30.0 pF / series)
shunt capacitance C_o	< 5 pF	
storage temperature	-40 °C ~ +125 °C	
shock resistance	> 100 g	(half sine pulse, 6.0 ms)*
drive level max.	100 µW	(10 µW recommended)
aging	< ± 3 ppm first year	(< ± 1 ppm for tol. ± 10 ppm)

* optional HMR version: 3000G / half sine pulse / 0.3 ms

ESR (series resistance Rs)

frequency in MHz	vibration mode	ESR max. in Ω	ESR typ. in Ω
12.0 ~ 12.999	fund. - AT	150	120
13.0 ~ 15.999	fund. - AT	150	100
16.0 ~ 17.999	fund. - AT	80	50
18.0 ~ 19.999	fund. - AT	80	40
20.0 ~ 24.999	fund. - AT	60	35
25.0 ~ 29.999	fund. - AT	60	30
30.0 ~ 34.999	fund. - AT	50	25
35.0 ~ 40.000	fund. - AT	40	20

Frequency Stability vs. Temperature

		± 15 ppm	± 20 ppm	± 30 ppm	± 50 ppm	± 100 ppm
-20 °C ~ +70 °C		D	D	D	D	D
-40 °C ~ +85 °C	T1	D	○	○	○	○
-40 °C ~ +105 °C	T2				D	○
-40 °C ~ +125 °C	T3				D	○

○ available
D ask if available

Marking

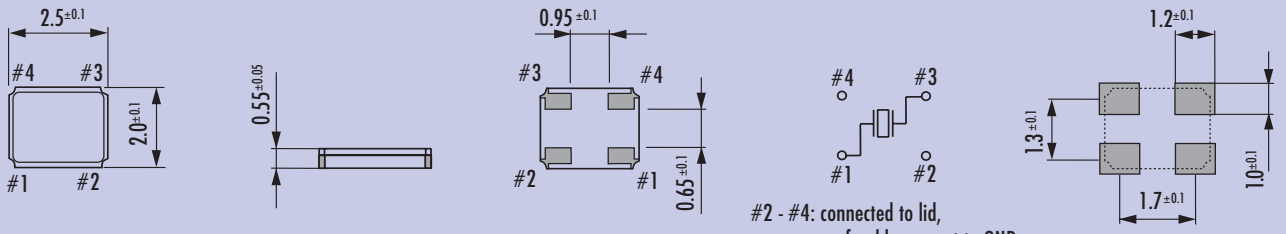
frequency with load capacitance code
company code / date code / internal code

date code: year/month
example: 6A = 2016 January

Jan.	Febr.	Mar.	Apr.	May	June
A	B	C	D	E	F

July	Aug.	Sept.	Oct.	Nov.	Dec.
G	H	J	K	L	M

Dimensions



#2 - #4: connected to lid, preferably connect to GND

top view | side view | bottom view | crystal connection | pad layout | in mm

Order Information

Q	frequency	type	load capacitance	stability at 25 °C	/ stability vs. temp. range	option 1	option 2
Quartz	12.0 ~ 40.0 MHz	JXS22	12 pF standard 10 pF ~ 30 pF S for series	10 = ± 10 ppm 30 = ± 30 ppm 50 = ± 50 ppm	see table	blank = -20 °C ~ +70 °C T (-30/+85) = -30 °C ~ +85 °C T1 = -40 °C ~ +85 °C T2 = -40 °C ~ +105 °C T3 = -40 °C ~ +125 °C FU = for fundamental frequencies ≥ 20 MHz	AEC = AEC-Q200 qualified HMR = high mechanical reliability (3000g/half sine wave/0.3ms)

Example: Q 30.0-JXS22P4-12-30/50-T2-FU-AEC-LF (Suffix LF = RoHS compliant / Pb free pads)

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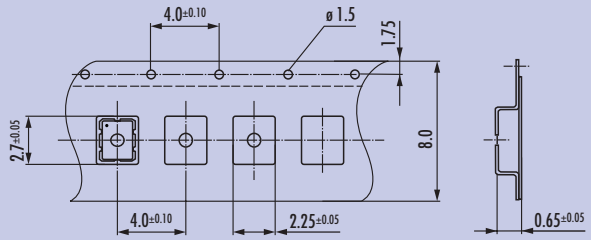
full data can be found under: www.jauch.de / www.jauch.co.uk / www.jauch.fr / www.jauchusa.com

Automotive SMD Crystal · JXS22P4

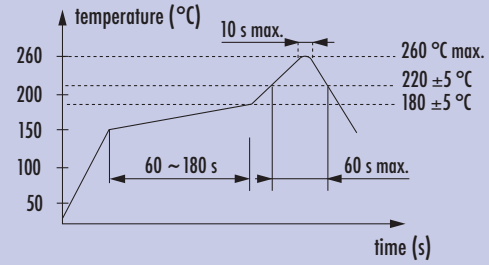
Taping Specification



1000 pcs per reel

in mm

Reflow Soldering Profile



note: parts are also suitable for soldering systems with lead (Pb) content

Load Capacitance Codes

8 pF: k	14 pF: x	22 pF: g	series: s
9 pF: n	15 pF: j	24 pF: d	T: 3rd OT
10 pF: h	16 pF: b	25 pF: r	
11 pF: l	17 pF: t	27 pF: w	
12 pF: a	18 pF: f	30 pF: .	
13 pF: v	20 pF: c		

example 20.0 MHz / 12 pF: 20a00

actual size

Automotive SMD Crystal · JXS32P4

4 Pad Version · 3.2 x 2.5 mm

- seam sealed ceramic/metal package
- all versions are AEC-Q200 qualified
- HMR version with extended shock & vibration immunity
- reflow soldering temperature: 260 °C max.

RoHS 2002/95/EC — RoHS compliant

Pb free: pins / pads

General Data

type	JXS32P4
frequency range	10.0 ~ 54.0 MHz (fund. AT-cut)
frequency tolerance at 25 °C	± 10 ppm, ± 30 ppm, ± 50 ppm
load capacitance C_L	12 pF standard (option: 10 pF ~ 30.0 pF / series)
shunt capacitance C_o	< 5 pF
storage temperature	-40 °C ~ +125 °C
shock resistance	> 100 g (half sine pulse, 6.0 ms)*
drive level max.	100 µW (10 µW recommended)
aging	< ± 3 ppm first year

* optional HMR version: 3000G / half sine pulse / 0.3 ms

ESR (series resistance Rs) at max. temp. range

frequency in MHz	vibration mode	ESR max. in Ω	ESR typ. in Ω
10.0 ~ 11.999	fund.-AT	300	150
12.0 ~ 12.999	fund.-AT	100	50
13.0 ~ 15.999	fund.-AT	100	40
16.0 ~ 18.999	fund.-AT	80	40
19.0 ~ 21.999	fund.-AT	70	30
22.0 ~ 29.999	fund.-AT	70	25
30.0 ~ 54.000	fund.-AT	50	20

Frequency Stability vs. Temperature

		± 15 ppm	± 20 ppm	± 30 ppm	± 50 ppm	± 100 ppm
-20 °C ~ +70 °C	STD.	○*	○	○	○	○
-30 °C ~ +85 °C	T (-30/+85)	□				
-40 °C ~ +85 °C	T1	◇	○	○*	○	○
-40 °C ~ +105 °C	T2				○	○
-40 °C ~ +125 °C	T3				○	○

○ available ◇ for frequencies > 20 MHz, ask if available < 20 MHz □ for frequencies < 20 MHz

* best value for frequencies < 12.0 MHz

Marking

frequency with load capacitance code

company code / date code / internal code

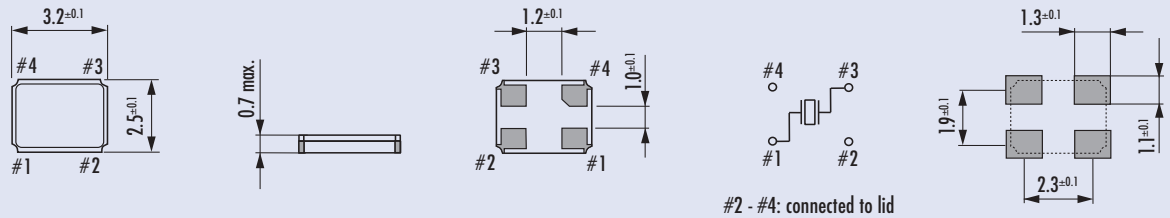
date code: year/month

example: 2A = 2012 January

Jan.	Febr.	Mar.	Apr.	May	June
A	B	C	D	E	F

July	Aug.	Sept.	Oct.	Nov.	Dec.
G	H	J	K	L	M

Dimensions



in mm

Order Information

Q	frequency	type	load capacitance	stability at 25 °C	stability vs. temp. range	option 1	option 2
Quartz	10.0 ~ 54.0 MHz	JXS32P4	12 pF standard 10 pF ~ 30 pF S for series	10 = ± 10 ppm 30 = ± 30 ppm 50 = ± 50 ppm	15 = ± 15 ppm 20 = ± 20 ppm 30 = ± 30 ppm 50 = ± 50 ppm 100 = ± 100 ppm	blank = -20 °C ~ +70 °C T (-30/+85) = -30 °C ~ +85 °C T1 = -40 °C ~ +85 °C T2 = -40 °C ~ +105 °C T3 = -40 °C ~ +125 °C FU = for fundamental frequencies ≥ 20 MHz	AEC = AEC-Q200 qualified HMR = high mechanical reliability (3000g/half sine wave/0.3ms)

Example: Q 28.0-JXS32P4-12-30/30-FU-AEC-LF (Suffix LF = RoHS compliant / Pb free pads)

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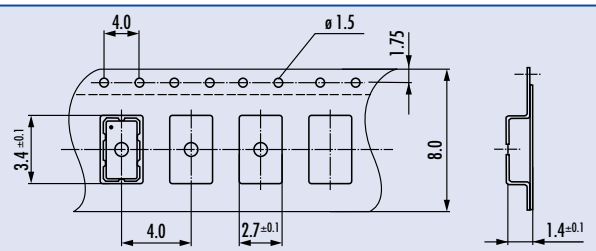
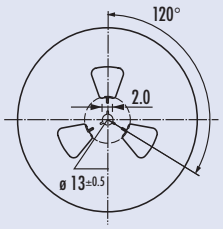
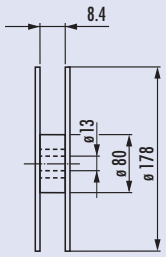
full data can be found under: www.jauch.de / www.jauch.co.uk / www.jauch.fr / www.jauchusa.com

Taping Specification





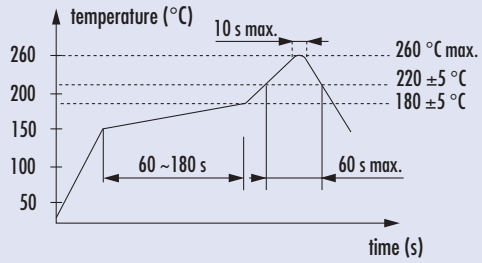


1000 pcs per reel

Feeding

in mm

Reflow Soldering Profile



note: parts are also suitable for soldering systems with lead (Pb) content

Load Capacitance Codes

8 pF: k	14 pF: x	22 pF: g	series: s
9 pF: n	15 pF: j	24 pF: d	T: 3rd OT
10 pF: h	16 pF: b	25 pF: r	
11 pF: l	17 pF: t	27 pF: w	
12 pF: a	18 pF: f	30 pF: .	
13 pF: v	20 pF: c		

example 20.0 MHz / 12 pF: 20a00

actual size

Automotive SMD Crystal · JXS53P4

4 Pad Version · 5.0 x 3.2 mm

- seam sealed ceramic/metal package
- all versions are AEC-Q200 qualified
- HMR version with extended shock & vibration immunity
- reflow soldering temperature: 260 °C max.

RoHS 2002/95/EC — RoHS compliant

Pb free: pins / pads

General Data

type	JXS53P4	
frequency range	8.0 ~ 56.0 MHz	(fund. AT-cut)
frequency tolerance at 25 °C	± 10 ppm, ± 30 ppm, ± 50 ppm	
load capacitance C_L	12 pF standard	(option: 8 pF ~ 30.0 pF / series)
shunt capacitance C_o	< 7 pF	
storage temperature	-40 °C ~ +125 °C	
shock resistance	> 100 g	(half sine pulse, 6.0 ms)*
drive level max.	100 µW	(10 µW recommended)
aging	< ± 3 ppm first year	

* optional HMR version: 3000G / half sine pulse / 0.3 ms

ESR (series resistance Rs) at max. temp. range

frequency in MHz	vibration mode	ESR max. in Ω	ESR typ. in Ω
8.0 ~ 9.999	fund.-AT	100	50
10.0 ~ 10.999	fund.-AT	50	30
11.0 ~ 11.999	fund.-AT	40	25
12.0 ~ 21.999	fund.-AT	40	20
22.0 ~ 24.999	fund.-AT	40	15
25.0 ~ 49.999	fund.-AT	30	15
50.0 ~ 56.000	fund.-AT	40	20

Frequency Stability vs. Temperature

		± 15 ppm	± 20 ppm	± 30 ppm	± 50 ppm	± 100 ppm
-20 °C ~ +70 °C	STD.	○	○	○	○	○
-40 °C ~ +85 °C	T1	○	○	○	○	○
-40 °C ~ +105 °C	T2				○	○
-40 °C ~ +125 °C	T3					○

○ available

Marking

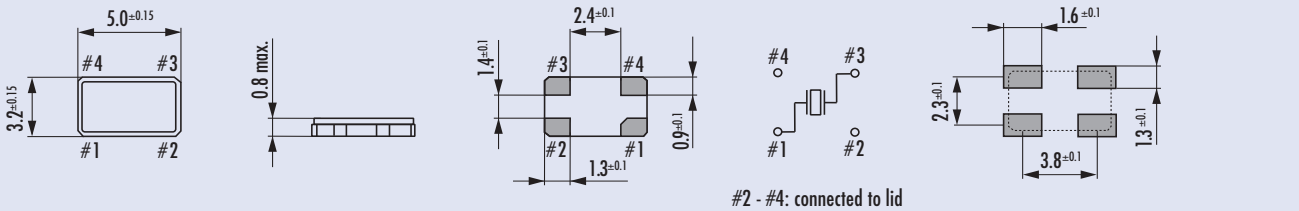
frequency with load capacitance code
company code / date code / internal code

date code: year/month
example: 2A = 2012 January

Jan.	Febr.	Mar.	Apr.	May	June
A	B	C	D	E	F

July	Aug.	Sept.	Oct.	Nov.	Dec.
G	H	J	K	L	M

Dimensions



in mm

Order Information

Q — frequency — type — load capacitance — stability at 25 °C / stability vs. temp. range — option 1 — option 2

- Q: Quartz
- frequency: 8.0 ~ 56.0 MHz
- type: JXS53P4
- load capacitance: 12 pF standard; 8 pF ~ 30 pF; S for series
- stability at 25 °C: 10 = ± 10 ppm; 30 = ± 30 ppm; 50 = ± 50 ppm
- stability vs. temp. range: 15 = ± 15 ppm; 20 = ± 20 ppm; 30 = ± 30 ppm; 50 = ± 50 ppm; 100 = ± 100 ppm
- option 1: blank = -20 °C ~ +70 °C; T1 = -40 °C ~ +85 °C; T2 = -40 °C ~ +105 °C; T3 = -40 °C ~ +125 °C; FU = for fundamental frequencies ≥ 20 MHz
- option 2: AEC = AEC-Q200 qualified; HMR = high mechanical reliability (3000g/half sine wave/0.3ms)

Example: Q 30.0-JXS53P4-12-30/50-FU-AEC-LF (Suffix LF = RoHS compliant / Pb free pads)

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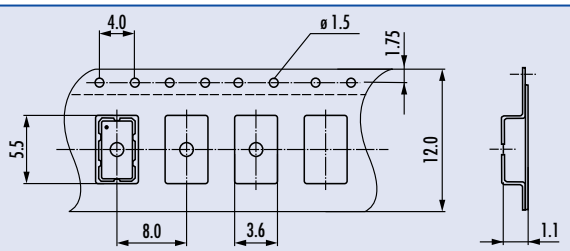
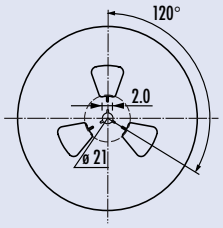
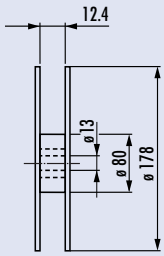
Automotive SMD Crystal · JXS53P4

Taping Specification





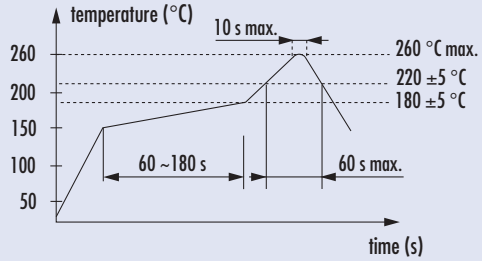


1000 pcs per reel

Feeding

in mm

Reflow Soldering Profile



note: parts are also suitable for soldering systems with lead (Pb) content

Load Capacitance Codes

8 pF: k	14 pF: x	22 pF: g	series: s
9 pF: n	15 pF: j	24 pF: d	T: 3rd OT
10 pF: h	16 pF: b	25 pF: r	
11 pF: l	17 pF: t	27 pF: w	
12 pF: a	18 pF: f	30 pF: .	
13 pF: v	20 pF: c		

example 20.0 MHz / 12 pF: 20a00

actual size

Automotive SMD Crystal · JXG32P4

4 Pad Version · 3.2 x 2.5 mm

- glass sealed ceramic package
- all versions are AEC-Q200 qualified
- HMR version with extended shock & vibration immunity
- RKE version withstands 100x drop test from 150 cm

RoHS 2002/95/EC — RoHS compliant

Pb free: pins / pads

General Data

type	JXG32P4	
frequency range	12.0 ~ 50.0 MHz	(fund. AT-cut) ask for availability of lower frequencies
frequency stability at 25 °C	± 30 ppm, ± 50 ppm	
load capacitance C_L	12 pF standard	(option: 10 pF ~ 30.0 pF / series)
shunt capacitance C_o	< 7 pF	
storage temperature	-40 °C ~ +125 °C	
shock resistance	> 100 g	(half sine pulse, 6.0 ms)*
drive level max.	100 µW	(10 µW recommended)
aging	< ± 3 ppm first year	

* optional HMR version: 3000G / half sine pulse / 0.3 ms

ESR (series resistance Rs)

frequency in MHz	vibration mode	ESR max. in Ω	ESR typ. in Ω
12.0 ~ 12.999	fund.-AT	200	90
13.0 ~ 13.999	fund.-AT	150	70
14.0 ~ 15.999	fund.-AT	100	40
16.0 ~ 18.999	fund.-AT	80	35
19.0 ~ 21.999	fund.-AT	70	30
22.0 ~ 29.999	fund.-AT	70	25
30.0 ~ 50.000	fund.-AT	50	20

Frequency Stability vs. Temperature

		± 30 ppm	± 50 ppm	± 100 ppm		
-20 °C ~ +70 °C	STD.	○	○	○		
-40 °C ~ +85 °C	T1	○	○	○		
-40 °C ~ +105 °C	T2		○	○		
-40 °C ~ +125 °C	T3			○		

○ available

Marking

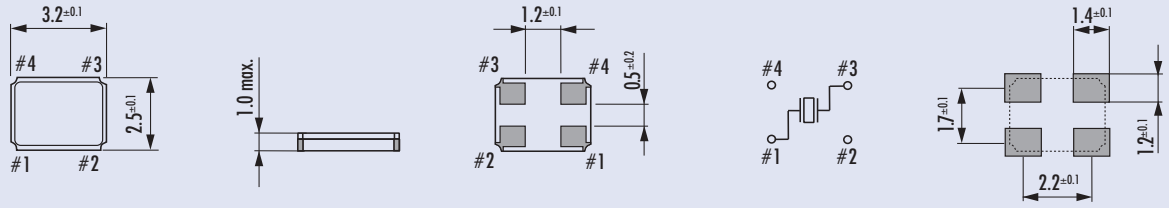
frequency with load capacitance code
company code / date code / internal code

date code: year/month
example: 2A = 2012 January

Jan.	Febr.	Mar.	Apr.	May	June
A	B	C	D	E	F

July	Aug.	Sept.	Oct.	Nov.	Dec.
G	H	J	K	L	M

Dimensions



in mm

Order Information

Q	frequency	type	load capacitance	stability at 25 °C	/ stability vs. temp. range	option 1	option 2
Quartz	12.0 ~ 50.0 MHz	JXG32P4	12 pF standard 10 pF ~ 30 pF S for series	30 = ± 30 ppm 50 = ± 50 ppm	30 = ± 30 ppm 50 = ± 50 ppm 100 = ± 100 ppm	blank = -20 °C ~ +70 °C T1 = -40 °C ~ +85 °C T2 = -40 °C ~ +105 °C T3 = -40 °C ~ +125 °C FU = for fundamental frequencies ≥ 20 MHz	AEC = AEC-Q200 qualified HMR = high mechanical reliability (3000g/half sine wave/0.3ms) RKE = for remote keyless entry (drop 100x / 150 cm)

Example: Q 28.0-JXG32P4-12-30/30-T1-FU-AEC-LF (Suffix LF = RoHS compliant / Pb free pads)

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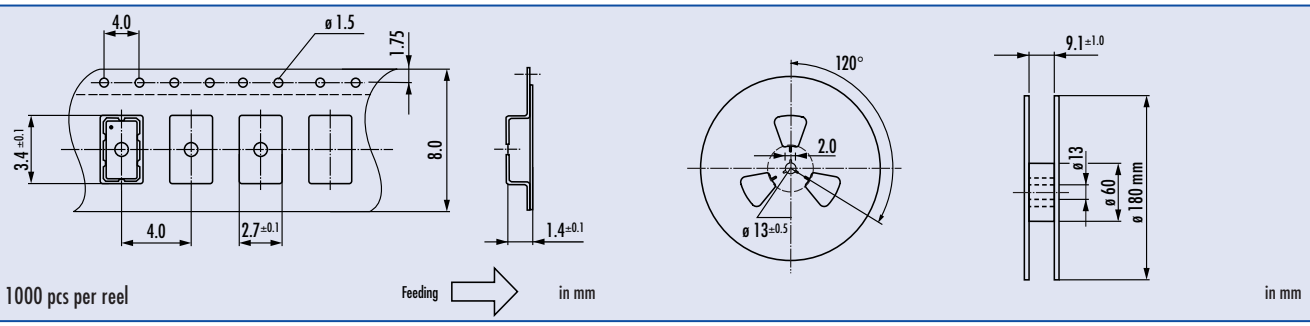
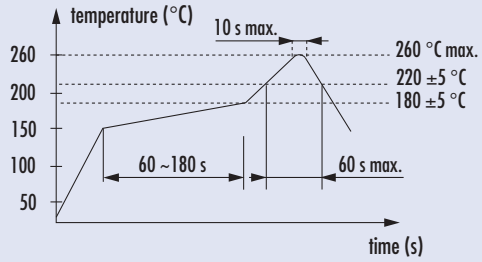
full data can be found under: www.jauch.de / www.jauch.co.uk / www.jauch.fr / www.jauchusa.com

Automotive SMD Crystal · JXG32P4

Taping Specification



Reflow Soldering Profile



note: parts are also suitable for soldering systems with lead (Pb) content

Load Capacitance Codes

8 pF: k	14 pF: x	22 pF: g	series: s
9 pF: n	15 pF: j	24 pF: d	T: 3rd OT
10 pF: h	16 pF: b	25 pF: r	
11 pF: l	17 pF: t	27 pF: w	
12 pF: a	18 pF: f	30 pF: .	
13 pF: v	20 pF: c		

example 20.0 MHz / 12 pF: 20a00

actual size

Automotive SMD Crystal · JXG53P2

2 Pad Version · 5.0 x 3.2 mm

- glass sealed ceramic package
- all versions are AEC-Q200 qualified
- HMR version with extended shock & vibration immunity
- RKE version withstands 100x drop test from 150 cm

RoHS 2002/95/EC
RoHS compliant

Pb free: pins / pads

General Data

type	JXG53P2		
frequency range	8.0 ~ 50.0 MHz	(fund. AT-cut)	ask for availability of lower frequencies
	45.0 ~ 60.0 MHz	(3rd OT AT-cut)	
frequency stability at 25 °C	± 30 ppm, ± 50 ppm		
load capacitance C_L	12 pF standard	(option: 10 pF ~ 30.0 pF / series)	
shunt capacitance C_o	< 7 pF		
storage temperature	-40 °C ~ +125 °C		
shock resistance	> 100 g	(half sine pulse, 6.0 ms)*	
drive level max.	100 µW	(10 µW recommended)	
aging	< ± 3 ppm first year		

* optional HMR version: 3000G / half sine pulse / 0.3 ms

ESR (series resistance Rs)

frequency in MHz	vibration mode	ESR max. in Ω	ESR typ. in Ω
8.0 ~ 8.999	fund.-AT	300	120
9.0 ~ 9.999	fund.-AT	250	100
10.0 ~ 11.999	fund.-AT	60	35
12.0 ~ 15.999	fund.-AT	60	25
16.0 ~ 21.999	fund.-AT	50	20
22.0 ~ 24.999	fund.-AT	40	20
25.0 ~ 50.000	fund.-AT	30	20
45.0 ~ 60.000	3rd OT-AT	90	65

Frequency Stability vs. Temperature

		± 30 ppm	± 50 ppm	± 100 ppm		
-20 °C ~ +70 °C	STD.	○	○	○		
-40 °C ~ +85 °C	T1	○	○	○		
-40 °C ~ +105 °C	T2		○	○		
-40 °C ~ +125 °C	T3			○		

○ available

Marking

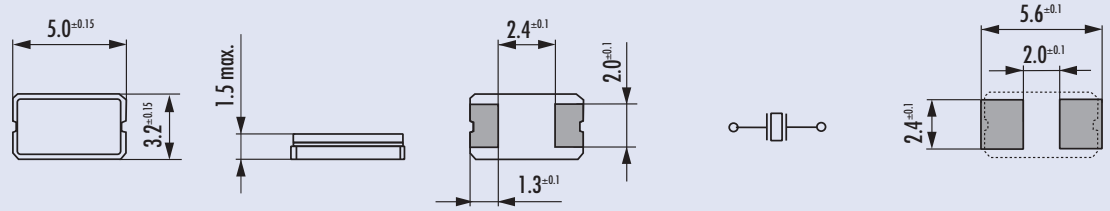
frequency with load capacitance code
company code / date code / internal code

date code: year/month
example: 2A = 2012 January

Jan.	Febr.	Mar.	Apr.	May	June
A	B	C	D	E	F

July	Aug.	Sept.	Oct.	Nov.	Dec.
G	H	J	K	L	M

Dimensions



top view | side view | bottom view | crystal connection | pad layout | in mm

Order Information

Q – frequency – type – load capacitance – stability at 25 °C / stability vs. temp. range – option 1 – option 2

- Q: Quartz
- frequency: 8.0 ~ 60.0 MHz
- type: JXG53P2
- load capacitance: 12 pF standard; 10 pF ~ 30 pF; S for series
- stability at 25 °C: 30 = ± 30 ppm; 50 = ± 50 ppm
- stability vs. temp. range: 30 = ± 30 ppm; 50 = ± 50 ppm; 100 = ± 100 ppm
- option 1: blank = -20 °C ~ +70 °C; T1 = -40 °C ~ +85 °C; T2 = -40 °C ~ +105 °C; T3 = -40 °C ~ +125 °C; FU = for fundamental frequencies ≥ 20 MHz; 30T = 3rd overtone
- option 2: AEC = AEC-Q200 qualified; HMR = high mechanical reliability (3000g/half sine wave/0.3ms); RKE = for remote keyless entry (drop 100x / 150 cm)

Example: Q 28.0-JXG53P2-12-30/30-T1-FU-AEC-LF (Suffix LF = RoHS compliant / Pb free pads)

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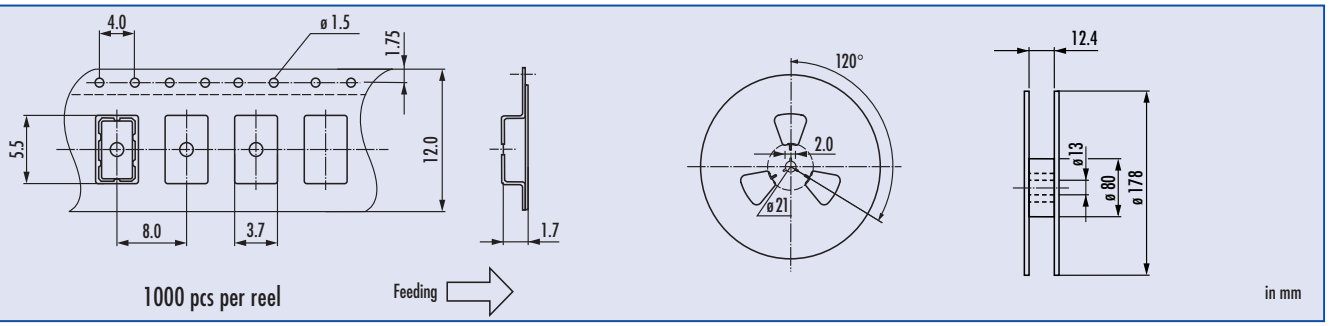
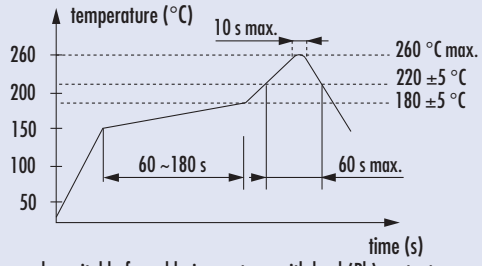
full data can be found under: www.jauch.de / www.jauch.co.uk / www.jauch.fr / www.jauchusa.com

Automotive SMD Crystal · JXG53P2

Taping Specification



Reflow Soldering Profile



note: parts are also suitable for soldering systems with lead (Pb) content

Load Capacitance Codes

8 pF: k	14 pF: x	22 pF: g	series: s
9 pF: n	15 pF: j	24 pF: d	T: 3rd OT
10 pF: h	16 pF: b	25 pF: r	
11 pF: l	17 pF: t	27 pF: w	
12 pF: a	18 pF: f	30 pF: .	
13 pF: v	20 pF: c		

example 12.0 MHz / 12 pF: 12a00

actual size

Automotive SMD Crystal · JXG53P4

4 Pad Version · 5.0 x 3.2 mm

- glass sealed ceramic package
- all versions are AEC-Q200 qualified
- HMR version with extended shock & vibration immunity
- RKE version withstands 100x drop test from 150 cm

RoHS 2002/95/EC — RoHS compliant

Pb free: pins / pads

General Data

type	JXG53P4		
frequency range	8.0 ~ 50.0 MHz	(fund. AT-cut)	ask for availability of lower frequencies
	45.0 ~ 60.0 MHz	(3rd OT AT-cut)	
frequency stability at 25 °C	± 30 ppm, ± 50 ppm		
load capacitance C_L	12 pF standard	(option: 10 pF ~ 30.0 pF / series)	
shunt capacitance C_o	< 7 pF		
storage temperature	-40 °C ~ +125 °C		
shock resistance	> 100 g	(half sine pulse, 6.0 ms)*	
drive level max.	100 µW	(10 µW recommended)	
aging	< ± 3 ppm first year		

* optional HMR version: 3000G / half sine pulse / 0.3 ms

ESR (series resistance Rs)

frequency in MHz	vibration mode	ESR max. in Ω	ESR typ. in Ω
8.0 ~ 8.999	fund.-AT	300	120
9.0 ~ 9.999	fund.-AT	250	100
10.0 ~ 11.999	fund.-AT	60	35
12.0 ~ 15.999	fund.-AT	60	25
16.0 ~ 21.999	fund.-AT	50	20
22.0 ~ 24.999	fund.-AT	40	20
25.0 ~ 50.000	fund.-AT	30	20
45.0 ~ 60.000	3rd OT-AT	90	65

Frequency Stability vs. Temperature

		± 30 ppm	± 50 ppm	± 100 ppm		
-20 °C ~ +70 °C	STD.	○	○	○		
-40 °C ~ +85 °C	T1	○	○	○		
-40 °C ~ +105 °C	T2		○	○		
-40 °C ~ +125 °C	T3			○		

○ available

Marking

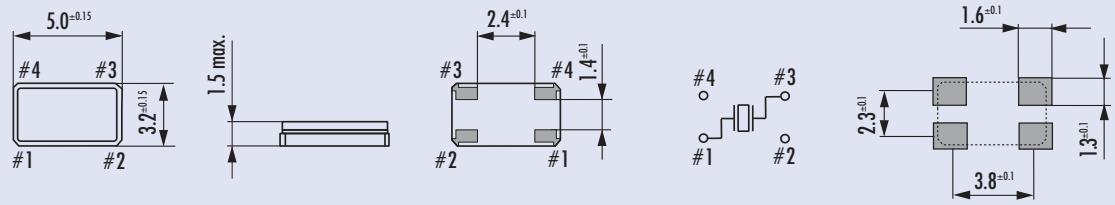
frequency with load capacitance code
company code / date code / internal code

date code: year/month
example: 2A = 2012 January

Jan.	Febr.	Mar.	Apr.	May	June
A	B	C	D	E	F

July	Aug.	Sept.	Oct.	Nov.	Dec.
G	H	J	K	L	M

Dimensions



top view — side view — bottom view — crystal connection — pad layout — in mm

Order Information

Q – frequency – type – load capacitance – stability at 25 °C / stability vs. temp. range – option 1 – option 2

Quartz	8.0 ~ 60.0 MHz	JXG53P4	12 pF standard 10 pF ~ 30 pF S for series	30 = ± 30 ppm 50 = ± 50 ppm	30 = ± 30 ppm 50 = ± 50 ppm 100 = ± 100 ppm	blank = -20 °C ~ +70 °C T1 = -40 °C ~ +85 °C T2 = -40 °C ~ +105 °C T3 = -40 °C ~ +125 °C FU = for fundamental frequencies ≥ 20 MHz 30T = 3rd overtone	AEC = AEC-Q200 qualified HMR = high mechanical reliability (3000g/half sine wave/0.3ms) RKE = for remote keyless entry (drop 100x / 150 cm)

Example: Q 28.0-JXG53P4-12-30/30-T1-FU-AEC-LF (Suffix LF = RoHS compliant / Pb free pads)

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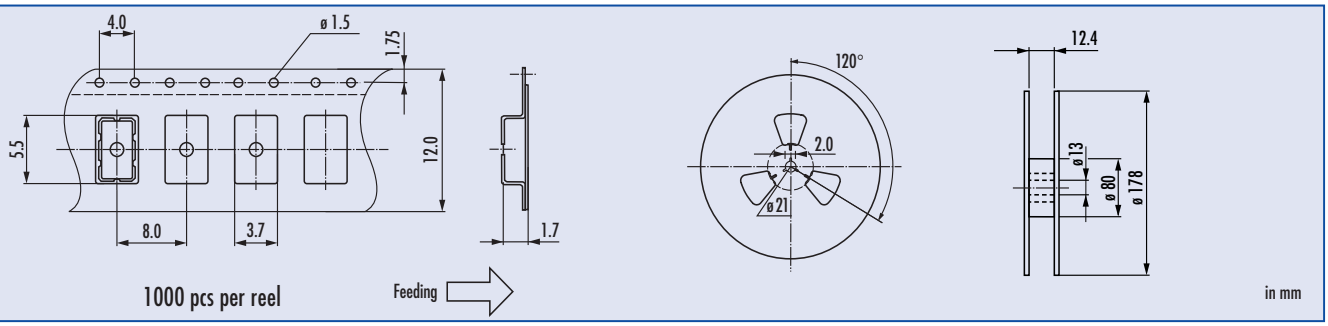
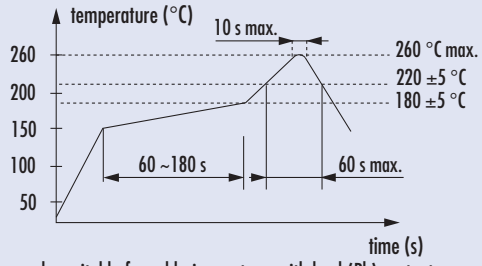
full data can be found under: www.jauch.de / www.jauch.co.uk / www.jauch.fr / www.jauchusa.com

Automotive SMD Crystal · JXG53P4

Taping Specification



Reflow Soldering Profile



note: parts are also suitable for soldering systems with lead (Pb) content

Load Capacitance Codes

8 pF: k	14 pF: x	22 pF: g	series: s
9 pF: n	15 pF: j	24 pF: d	T: 3rd OT
10 pF: h	16 pF: b	25 pF: r	
11 pF: l	17 pF: t	27 pF: w	
12 pF: a	18 pF: f	30 pF: .	
13 pF: v	20 pF: c		

example 12.0 MHz / 12 pF: 12a00

actual size

Automotive SMD Crystal · JXG75P2

2 Pad Version · 7.0 x 5.0 mm

- glass sealed ceramic package
- all versions are AEC-Q200 qualified
- HMR version with extended shock & vibration immunity
- RKE version withstands 100x drop test from 150 cm

RoHS 2002/95/EC — RoHS compliant

Pb free: pins / pads

General Data

type	JXG75P2	
frequency range	5.0 ~ 50.0 MHz	(fund. AT-cut)
	30.0 ~ 70.0 MHz	(3rd OT AT-cut)
frequency stability at 25 °C	± 30 ppm, ± 50 ppm	
load capacitance C_L	12 pF standard	(option: 10 pF ~ 30.0 pF / series)
shunt capacitance C_o	< 7 pF	
storage temperature	-40 °C ~ +125 °C	
shock resistance	> 100 g	(half sine pulse, 6.0 ms)*
drive level max.	100 µW	(10 µW recommended)
aging	< ± 3 ppm first year	

* optional HMR version: 3000G / half sine pulse / 0.3 ms

ESR (series resistance Rs)

frequency in MHz	vibration mode	ESR max. in Ω	ESR typ. in Ω
5.0 ~ 5.999	fund.-AT	200	130
6.0 ~ 6.999	fund.-AT	100	70
7.0 ~ 9.999	fund.-AT	80	35
10.0 ~ 15.999	fund.-AT	60	25
16.0 ~ 21.999	fund.-AT	50	20
22.0 ~ 24.999	fund.-AT	40	20
25.0 ~ 50.000	fund.-AT	30	15
30.0 ~ 44.999	3rd OT-AT	80	60
45.0 ~ 70.000	3rd OT-AT	70	55

Frequency Stability vs. Temperature

		± 30 ppm	± 50 ppm	± 100 ppm		
-20 °C ~ +70 °C	STD.	○	○	○		
-40 °C ~ +85 °C	T1	○	○	○		
-40 °C ~ +105 °C	T2		○	○		
-40 °C ~ +125 °C	T3			○		

○ available

Marking

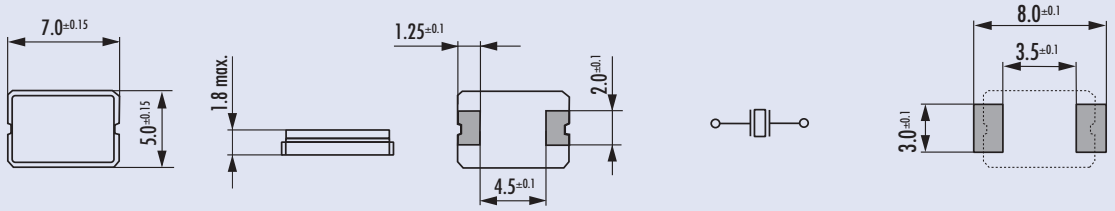
frequency with load capacitance code
company code / date code / internal code

date code: year/month
example: 2A = 2012 January

Jan.	Febr.	Mar.	Apr.	May	June
A	B	C	D	E	F

July	Aug.	Sept.	Oct.	Nov.	Dec.
G	H	J	K	L	M

Dimensions



top view — side view — bottom view — crystal connection — pad layout — in mm

Order Information

Q – frequency – type – load capacitance – stability at 25 °C / stability vs. temp. range – option 1 – option 2

- Q: Quartz
- frequency: 5.0 ~ 70.0 MHz
- type: JXG75P2
- load capacitance: 12 pF standard; 10 pF ~ 30 pF; S for series
- stability at 25 °C: 30 = ± 30 ppm; 50 = ± 50 ppm
- stability vs. temp. range: 30 = ± 30 ppm; 50 = ± 50 ppm; 100 = ± 100 ppm
- option 1: blank = -20 °C ~ +70 °C; T1 = -40 °C ~ +85 °C; T2 = -40 °C ~ +105 °C; T3 = -40 °C ~ +125 °C; FU = for fundamental frequencies ≥ 20 MHz; 30T = 3rd overtone
- option 2: AEC = AEC-Q200 qualified; HMR = high mechanical reliability (3000g/half sine wave/0.3ms); RKE = for remote keyless entry (drop 100x / 150 cm)

Example: Q 28.0-JXG75P2-12-30/30-T1-FU-AEC-LF (Suffix LF = RoHS compliant / Pb free pads)

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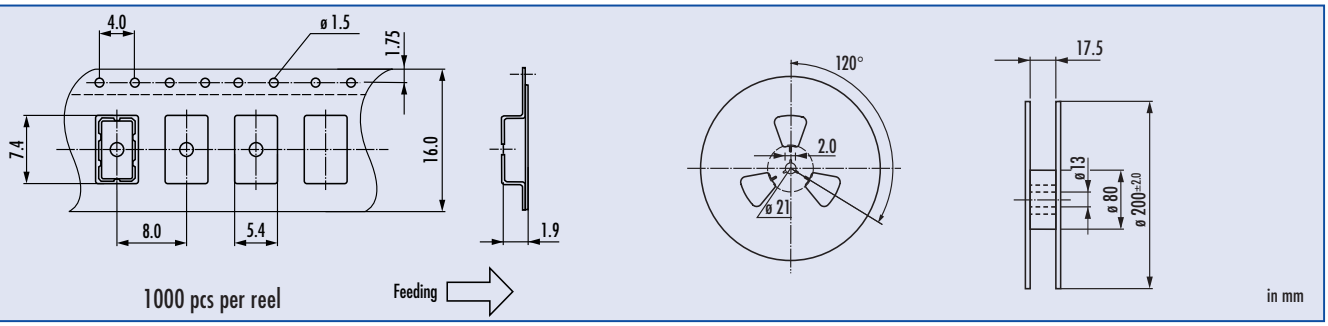
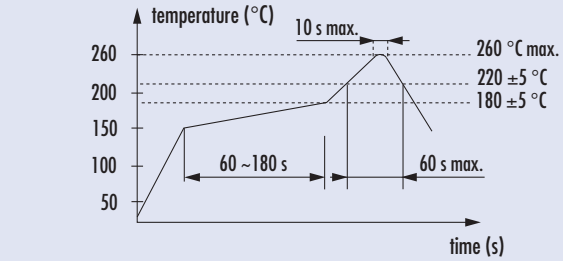
full data can be found under: www.jauch.de / www.jauch.co.uk / www.jauch.fr / www.jauchusa.com

Automotive SMD Crystal · JXG75P2

Taping Specification



Reflow Soldering Profile



note: parts are also suitable for soldering systems with lead (Pb) content

Load Capacitance Codes

8 pF: k	14 pF: x	22 pF: g	series: s
9 pF: n	15 pF: j	24 pF: d	T: 3rd OT
10 pF: h	16 pF: b	25 pF: r	
11 pF: l	17 pF: t	27 pF: w	
12 pF: a	18 pF: f	30 pF: .	
13 pF: v	20 pF: c		

example 8.0 MHz / 12 pF: 8a000

actual size

Automotive SMD Crystal · JXG75P4

4 Pad Version · 7.0 x 5.0 mm

- glass sealed ceramic package
- all versions are AEC-Q200 qualified
- HMR version with extended shock & vibration immunity
- RKE version withstands 100x drop test from 150 cm

RoHS 2002/95/EC — RoHS compliant

Pb free: pins / pads

General Data

type	JXG75P4	
frequency range	5.0 ~ 50.0 MHz	(fund. AT-cut)
	30.0 ~ 70.0 MHz	(3rd OT AT-cut)
frequency stability at 25 °C	± 30 ppm, ± 50 ppm	
load capacitance C_L	12 pF standard	(option: 10 pF ~ 30.0 pF / series)
shunt capacitance C_o	< 7 pF	
storage temperature	-40 °C ~ +125 °C	
shock resistance	> 100 g	(half sine pulse, 6.0 ms)*
drive level max.	100 µW	(10 µW recommended)
aging	< ± 3 ppm first year	

* optional HMR version: 3000G / half sine pulse / 0.3 ms

ESR (series resistance Rs)

frequency in MHz	vibration mode	ESR max. in Ω	ESR typ. in Ω
5.0 ~ 5.999	fund.-AT	200	130
6.0 ~ 6.999	fund.-AT	100	70
7.0 ~ 9.999	fund.-AT	80	35
10.0 ~ 15.999	fund.-AT	60	25
16.0 ~ 21.999	fund.-AT	50	20
22.0 ~ 24.999	fund.-AT	40	20
25.0 ~ 50.000	fund.-AT	30	15
30.0 ~ 44.999	3rd OT-AT	80	60
45.0 ~ 70.000	3rd OT-AT	70	55

Frequency Stability vs. Temperature

		± 30 ppm	± 50 ppm	± 100 ppm		
-20 °C ~ +70 °C	STD.	○	○	○		
-40 °C ~ +85 °C	T1	○	○	○		
-40 °C ~ +105 °C	T2		○	○		
-40 °C ~ +125 °C	T3			○		

○ available

Marking

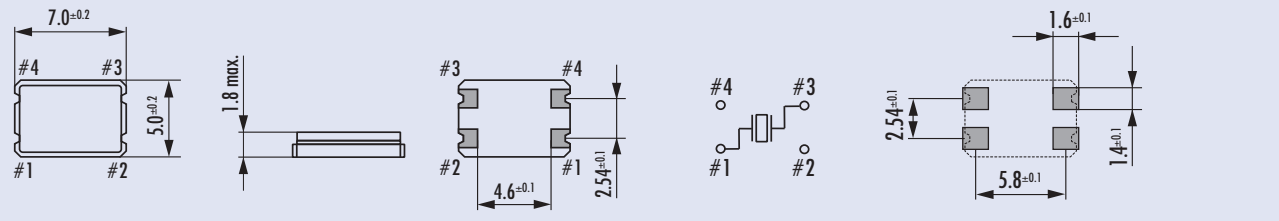
frequency with load capacitance code
company code / date code / internal code

date code: year/month
example: 2A = 2012 January

Jan.	Febr.	Mar.	Apr.	May	June
A	B	C	D	E	F

July	Aug.	Sept.	Oct.	Nov.	Dec.
G	H	J	K	L	M

Dimensions



top view — side view — bottom view — crystal connection — pad layout — in mm

Order Information

Q – frequency – type – load capacitance – stability at 25 °C / stability vs. temp. range – option 1 – option 2

- Q: Quartz
- frequency: 5.0 ~ 70.0 MHz
- type: JXG75P4
- load capacitance: 12 pF standard; 10 pF ~ 30 pF; S for series
- stability at 25 °C: 30 = ± 30 ppm; 50 = ± 50 ppm
- stability vs. temp. range: 30 = ± 30 ppm; 50 = ± 50 ppm; 100 = ± 100 ppm
- option 1: blank = -20 °C ~ +70 °C; T1 = -40 °C ~ +85 °C; T2 = -40 °C ~ +105 °C; T3 = -40 °C ~ +125 °C; FU = for fundamental frequencies ≥ 20 MHz; 30T = 3rd overtone
- option 2: AEC = AEC-Q200 qualified; HMR = high mechanical reliability (3000g/half sine wave/0.3ms); RKE = for remote keyless entry (drop 100x / 150 cm)

Example: Q 28.0-JXG75P4-12-30/30-T1-FU-AEC-LF (Suffix LF = RoHS compliant / Pb free pads)

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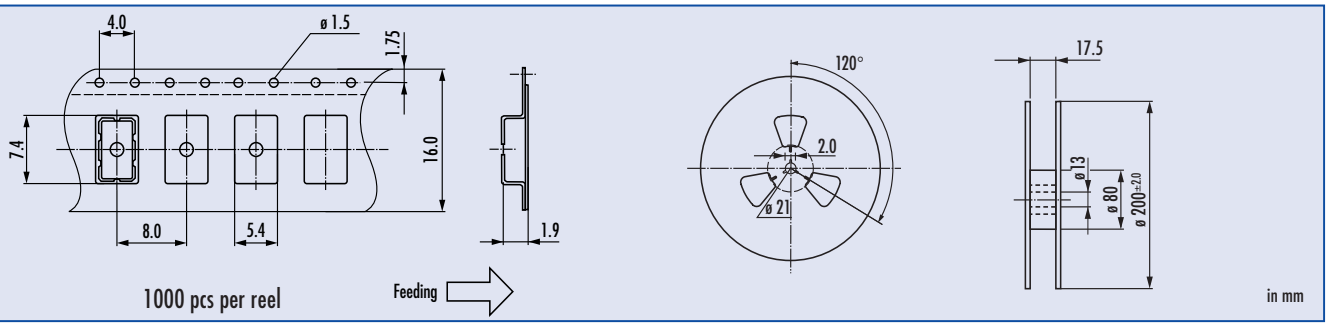
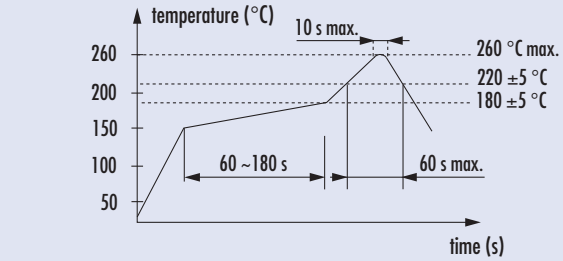
full data can be found under: www.jauch.de / www.jauch.co.uk / www.jauch.fr / www.jauchusa.com

Automotive SMD Crystal · JXG75P4

Taping Specification



Reflow Soldering Profile



note: parts are also suitable for soldering systems with lead (Pb) content

Load Capacitance Codes

8 pF: k	14 pF: x	22 pF: g	series: s
9 pF: n	15 pF: j	24 pF: d	T: 3rd OT
10 pF: h	16 pF: b	25 pF: r	
11 pF: l	17 pF: t	27 pF: w	
12 pF: a	18 pF: f	30 pF: .	
13 pF: v	20 pF: c		

example 8.0 MHz / 12 pF: 8a000

actual size

SMU2 · AEC-Q200

2 Pad Version · 11.5 x 4.8 mm

- AEC-Q200 qualified
- recommended for automotive applications
- reflow soldering temperature: 260 °C max.
- package height 3.0 mm max.

RoHS 2002/95/EC — RoHS compliant

Pb free: pins / pads

General Data

type	SMU2	
frequency range	4.0 ~ 33.0 MHz	(fund. AT-cut)
	27.0 ~ 60.0 MHz	(3rd OT AT-cut)
frequency tolerance at 25 °C	± 20 ppm / ± 30 ppm / ± 50 ppm	
load capacitance C_L	12 pF ~ 32 pF or series	
shunt capacitance C_o	< 5 pF	
storage temperature	-40 °C ~ +125 °C	
shock resistance	> 100 g	(half sine pulse, 6.0 ms)
drive level max.	500 µW	(100 µW recommended)
aging	< ± 5 ppm first year	

ESR (series resistance Rs)

frequency in MHz	vibration mode	ESR max. in Ω	ESR typ. in Ω
4.0 ~ 5.999	fund.-AT	80	60
6.0 ~ 6.999	fund.-AT	70	35
7.0 ~ 7.999	fund.-AT	50	25
8.0 ~ 8.999	fund.-AT	50	25
9.0 ~ 13.999	fund.-AT	35	15
14.0 ~ 33.000	fund.-AT	30	10
27.0 ~ 60.000	3rd OT-AT	100	60

Frequency Stability vs. Temperature

		± 30 ppm	± 50 ppm	± 100 ppm	± 150 ppm	
-20 °C ~ +70 °C	STD.	○	●			
-40 °C ~ +85 °C	T1	○	○	●		
-40 °C ~ +105 °C	T2		○	○		
-40 °C ~ +125 °C	T3				○	

● standard

○ available

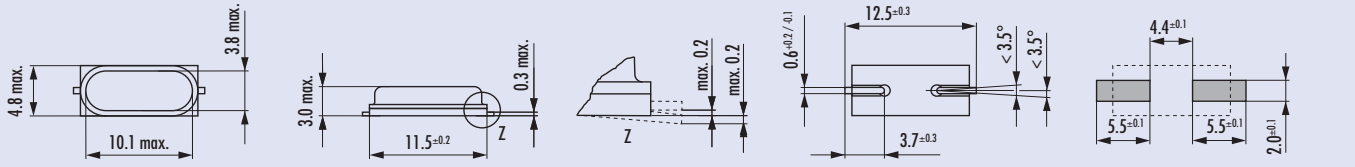
Marking

frequency with load capacitance code

company code / date code / internal code

	Jan.	Febr.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2012	n	p	q	r	s	t	u	v	w	x	y	z
2013	A	B	C	D	E	F	G	H	J	K	L	M
2014	N	P	Q	R	S	T	U	V	W	X	Y	Z
2015	a	b	c	d	e	f	g	h	j	k	l	m

Dimensions



top view — side view — side view — bottom view — pad layout — in mm

Order Information

Q — frequency — type — load capacitance — stability at 25 °C / stability vs. temp. range — option

Quartz

4.0 ~ 60.0 MHz

SMU2

12 pF ~ 32 pF
S for series

20 = ± 20 ppm
30 = ± 30 ppm
50 = ± 50 ppm

30 = ± 30 ppm
50 = ± 50 ppm
100 = ± 100 ppm
150 = ± 150 ppm

blank = -20 °C ~ +70 °C
T1 = -40 °C ~ +85 °C
T2 = -40 °C ~ +105 °C
T3 = -40 °C ~ +125 °C
FU = for fundamental frequencies ≥ 20 MHz
3OT = 3rd overtone
AEC = AEC-Q200 qualified

Example: Q 25.0-SMU2-30-30/50-T2-FU-AEC-LF (Suffix LF = RoHS compliant / Pb free pins or pads)

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full data can be found under: www.jauch.de / www.jauch.co.uk / www.jauch.fr / www.jauchusa.com

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actual size

SMU3 · AEC-Q200

2 Pad Version · 11.5 x 4.8 mm

- AEC-Q200 qualified
- recommended for automotive applications
- reflow soldering temperature: 260 °C max.
- package height 4.0 mm max.

RoHS 2002/95/EC — RoHS compliant

Pb free: pins / pads

General Data

type	SMU3	
frequency range	3.2768 ~ 33.0 MHz	(fund. AT-cut)
	27.0 ~ 60.0 MHz	(3rd OT AT-cut)
frequency tolerance at 25 °C	± 20 ppm / ± 30 ppm / ± 50 ppm	
load capacitance C_L	12 pF ~ 32 pF or series	
shunt capacitance C_0	< 5 pF	
storage temperature	-40 °C ~ +125 °C	
shock resistance	> 100 g	(half sine pulse, 6.0 ms)
drive level max.	300 µW	(100 µW recommended)
aging	< ± 5 ppm first year	

ESR (series resistance Rs)

frequency in MHz	vibration mode	ESR max. in Ω	ESR typ. in Ω
3.276 ~ 3.499	fund.-AT	200	100
3.579 ~ 3.999	fund.-AT	120	80
4.000 ~ 5.999	fund.-AT	80	60
6.000 ~ 6.999	fund.-AT	70	35
7.000 ~ 8.999	fund.-AT	50	25
9.000 ~ 13.99	fund.-AT	35	15
14.00 ~ 33.00	fund.-AT	30	10
27.00 ~ 60.00	3rd OT-AT	100	60

Frequency Stability vs. Temperature

		± 20 ppm	± 30 ppm	± 50 ppm	± 100 ppm	± 150 ppm
-20 °C ~ +70 °C	STD.	○	○	●		
-40 °C ~ +85 °C	T1			○	●	
-40 °C ~ +105 °C	T2			○	○	
-40 °C ~ +125 °C	T3					○

● standard

○ available

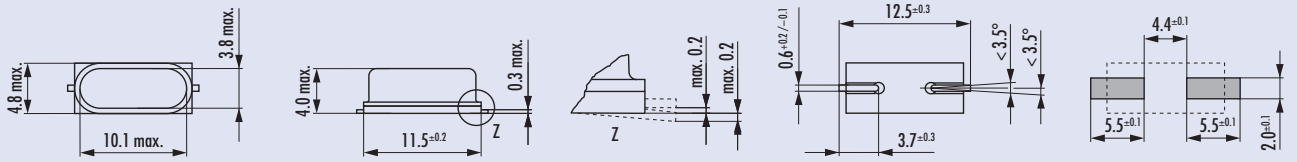
Marking

frequency with load capacitance code

company code / date code / internal code

	Jan.	Febr.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2012	n	p	q	r	s	t	u	v	w	x	y	z
2013	A	B	C	D	E	F	G	H	J	K	L	M
2014	N	P	Q	R	S	T	U	V	W	X	Y	Z
2015	a	b	c	d	e	f	g	h	j	k	l	m

Dimensions



top view — side view — side view — bottom view — pad layout — in mm

Order Information

Q – frequency – type – load capacitance – stability at 25 °C / stability vs. temp. range – option

Q	frequency	type	load capacitance	stability at 25 °C	stability vs. temp. range	option
Quartz	3.2768 ~ 60.0 MHz	SMU3	12 pF ~ 32 pF S for series	20 = ± 20 ppm 30 = ± 30 ppm 50 = ± 50 ppm	20 = ± 20 ppm 30 = ± 30 ppm 50 = ± 50 ppm 100 = ± 100 ppm 150 = ± 150 ppm	blank = -20 °C ~ +70 °C T1 = -40 °C ~ +85 °C T2 = -40 °C ~ +105 °C T3 = -40 °C ~ +125 °C FU = for fundamental frequencies ≥ 20 MHz 3OT = 3rd overtone AEC = AEC-Q200 qualified

Example: Q 30.0-SMU3-30-30/50-T2-FU-AEC-LF (Suffix LF = RoHS compliant / Pb free pins or pads)

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full data can be found under: www.jauch.de / www.jauch.co.uk / www.jauch.fr / www.jauchusa.com

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actual size

Automotive SMD Crystal · JTX310

SMD Tuning Fork Crystal · 3.2 x 1.5 mm

- all versions are AEC-Q200 qualified
- optional extra shock proof versions available
- reflow soldering temperature: 260 °C max.
- package height 0.9 mm max.

RoHS 2002/95/EC
RoHS compliant

Pb free

General Data

type	JTX310
frequency	32.768 kHz
frequency tolerance at 25 °C ± 5 °C	± 20 ppm / ± 30 ppm
load capacitance C_L	12.5 pF std. (7 pF, 9 pF ask)
temperature constant (T_C)	T_C = -0.04 · 10^{-6} / °C^2 max. T_C = -0.034 · 10^{-6} / °C^2 typical
frequency temperature characteristic	f (ppm) = T_C · (25 °C - T)^2 T = requested temperature
operating temperature range	refer to frequency stability table
shunt capacitance C_0	1.15 pF typical
series resistance max. (ESR)	70 kΩ (80 kΩ for temperature range T2 and T3)
storage temperature	-55 °C ~ +125 °C
drive level max.	0.5 µW
aging first year	< ± 3 ppm

Frequency Stability vs. Temperature

		-80 ppm	-160 ppm	-250 ppm	-400 ppm
-20 °C ~ +70 °C	STD.	●			
-40 °C ~ +85 °C	T1		●		
-40 °C ~ +105 °C	T2			○	
-40 °C ~ +125 °C	T3				○

● standard ○ available

Marking

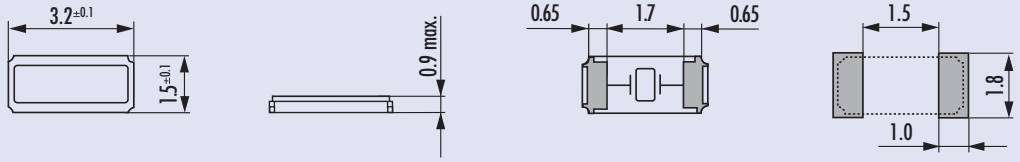
company code
date code / production code

Mechanical Endurance Options

AEC (according AEC-Q200): 100 g, half sine pulse, 6.0 ms
HMR (high mechanical reliability): 3000 g, half sine pulse, 0.3 ms

note: all versions are AEC-Q200 qualified

Dimensions



top view | side view | bottom view | pad layout

in mm

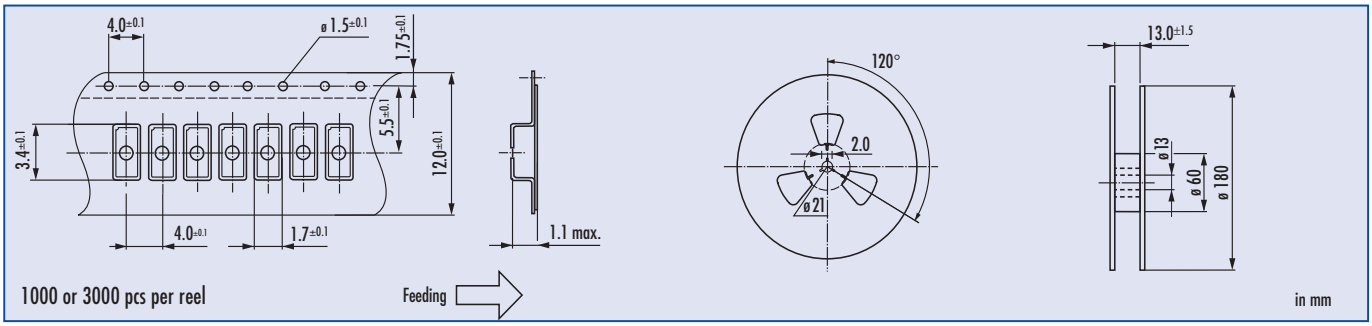
Order Information

Q	frequency	type	load capacitance	stability at 25 °C	option 1	option 2
Quartz	0.032768 MHz	JTX310	12.5 pF 7 pF, 9 pF (ask)	20 = ± 20 ppm 30 = ± 30 ppm	blank = -20 °C ~ +70 °C T1 = -40 °C ~ +85 °C T2 = -40 °C ~ +105 °C T3 = -40 °C ~ +125 °C	AEC = AEC-Q200 qualified HMR = high mechanical reliability

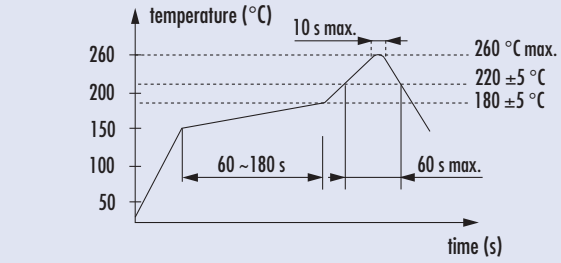
Example: Q 0.032768-JTX310-12.5-20-T1-AEC-LF (Suffix LF = RoHS compliant / Pb free pads)

Jauch Quartz GmbH • e-mail: info@jauch.de
full data can be found under: www.jauch.de / www.jauch.co.uk / www.jauch.fr / www.jauchusa.com

Taping Specification



Reflow Soldering Profile



note: parts are also suitable for soldering systems with lead (Pb) content

Jauch
THE PULSE OF PROGRESS

THE SPECIALIST FOR FREQUENCY CONTROL PRODUCTS

JAUCH QUARTZ...

...A COMPANY ON THE PULSE OF PROGRESS

Quartz – a material with fascinating properties. The most important one is piezoelectricity. What began at Jauch decades ago with the first quartz crystals for electronic clockworks has until today remained the core competence and most important product of our globally active, independent technology firm.

Availability – in today's production world it's a key concept that cannot be overstated. Products not only have to be manufactured but also available 'just in time' – in every corner of the world. And at Jauch Quartz we do a lot to make sure that happens.

In Europe, with Jauch Quartz Germany and Jauch Quartz France, we have our own distribution centers for important markets. And in the US, Jauch Quartz America maintains our continuous presence in the North and South American markets.

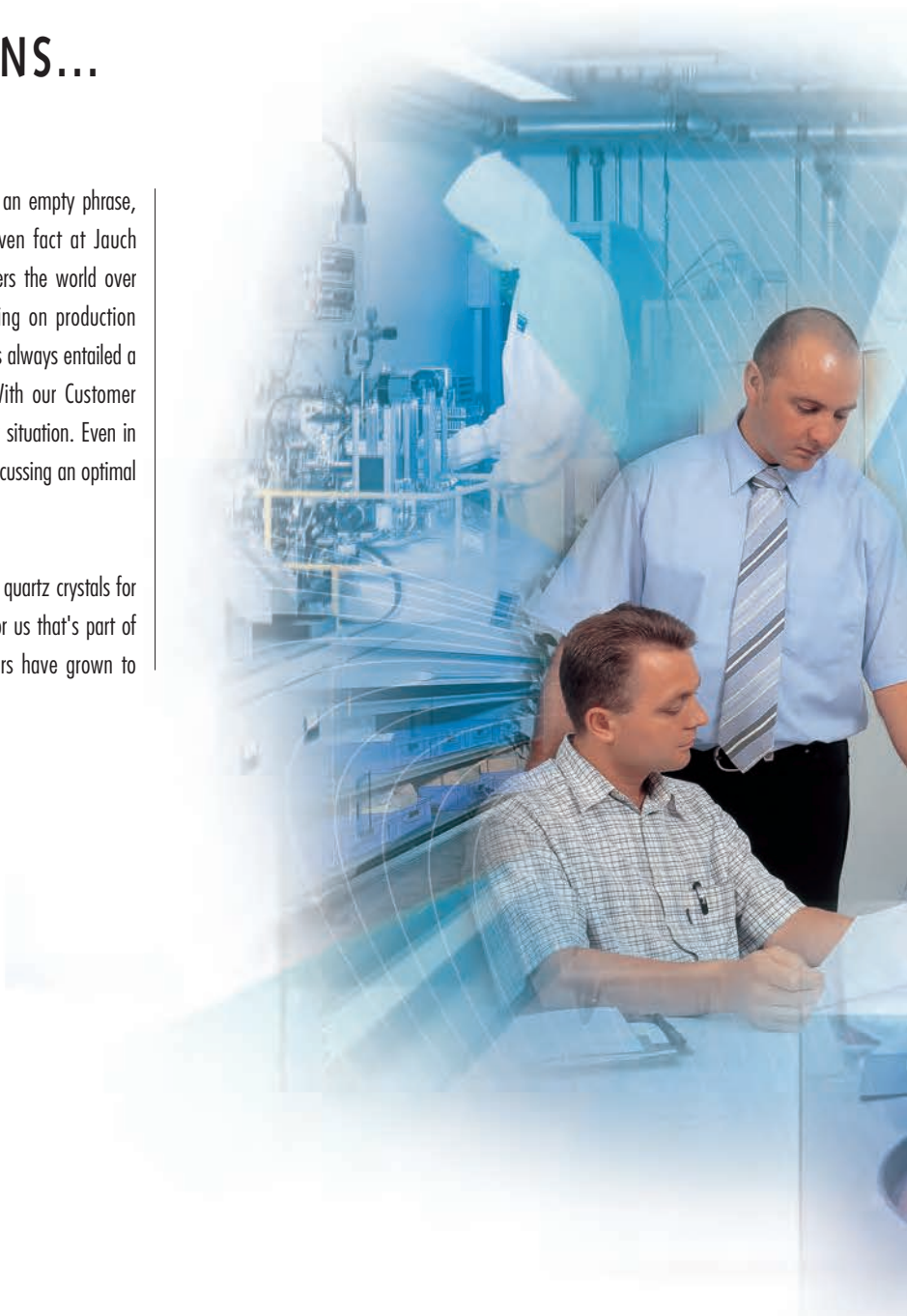
A comprehensive network of distribution bases all over the world is ready to supply customers worldwide with Jauch-quality quartz crystals. Because we don't regard our products as mere components that are bought and forgotten: what's important to us is a sustainable relationship with the customer, from careful consulting before a decision to order processing, logistics and long-term field observation. We've noticed again and again that Jauch Quartz customers are customers who stay with us. Because they know what they're getting – wherever they happen to be.

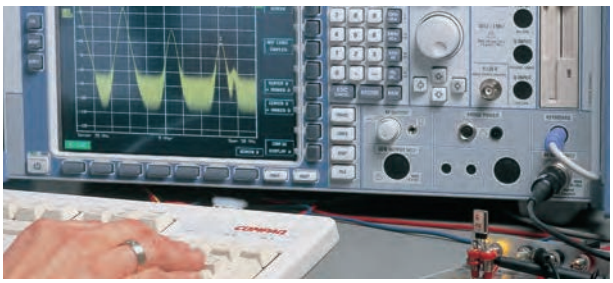
FINDING SOLUTIONS...

...AND IMPLEMENTING THEM

At Jauch Quartz, customer satisfaction is not just an empty phrase, but a living reality. Delivery reliability is a proven fact at Jauch Quartz. Constant deliveries to renowned customers the world over prove that relying on Jauch Quartz means relying on production security. Because for us, overall product quality has always entailed a great deal more than just the product alone. With our Customer Support Center we offer active cooperation in any situation. Even in the concept phase of a development, it's worth discussing an optimal solution with us.

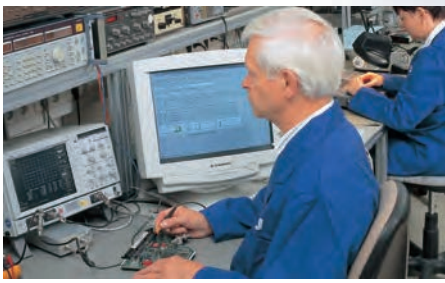
Or do you need a few hundred or a few thousand quartz crystals for your pilot run? We're the quartz specialists, so for us that's part of customer care. It's something that our customers have grown to appreciate.





Safety from high-quality measuring technology:
Special measuring systems, e.g. for analyzing the frequency spectrum and noise conditions, guarantee that our customers can rely one hundred percent on the parameters set.

Application service via know-how:
Our development and service department supports our customers in all questions of circuit design and – on request – takes a closer look at application scenarios.

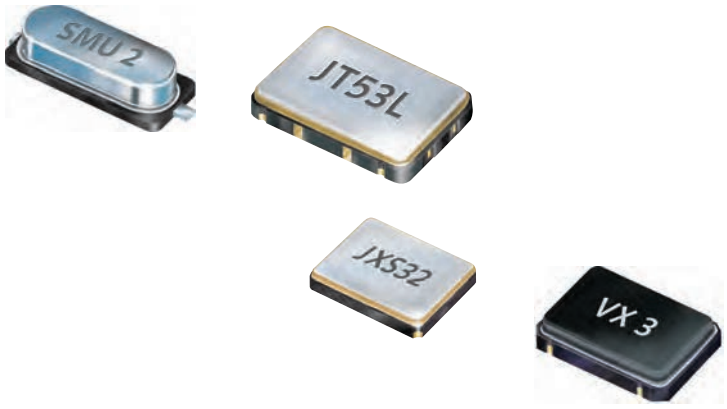


Technical service from specialists:
At Jauch, developers find competent contacts who support them in switch design just as much as with special measuring technology requirements.

- Our own quartz product **development center**
- **Consulting and care** by specialists for quartz products
- **Check-up service:** switching tests with special test devices
- **Fast service** with programmable oscillators for pilot runs and with quartz products in standard frequencies

THE SPECIALIST FOR FREQUENCY CONTROL PRODUCTS

- **Worldwide presence**
- **High availability** for standard frequencies, with over 20 million components off the shelf



PRODUCTION WORLDWIDE...

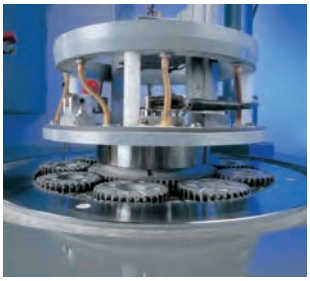
...FOR WORLD-FAMOUS BRANDS

Jauch – the world brand for quartz technology. With our own production facilities, we're present in important electronics centers all over the globe. And everywhere we are bound to the same basic principles: high efficiency, reliable delivery, value for money, and highest quality. Because we know how exacting our customers are. And we also know why.

International production, guaranteed by universal quality standards

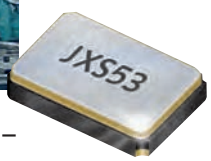
From raw quartz crystal production to special short runs to mass production in the millions in ever-constant quality, Jauch Quartz has a lot of performance to offer – and that applies just as much to large groups of companies as to smaller specialists. High flexibility in product design and production amounts enables us to cover a broad customer and business spectrum and thus maintain our independence.

Technology that makes quality possible: Ultrasound purification of quartz blanks for perfect surfaces.



Grinding of quartz blanks: The right surface for the right clock rate.

Jauch has production facilities at many locations around the world – from Europe to Asia. However different the people at these sites are, they all have one thing in common: they all work according to the same system of values. They all belong to the same corporate culture. That is the only way to produce on different continents and retain a uniform standard. Because wherever Jauch products are on the pulse of progress, the rhythm has to be just right.



The entire quartz crystal processing chain: from raw quartz production...

...component production using semi- or fully-automatic production technology depending on the run size...

...to series-oriented quality assurance and automated 100-percent testing.

Certificate DIN EN ISO 9001:2008

SGS

Certificate DE05/53347

The management system of

JAUCH QUARTZ GmbH

In der Lache 24
DE-78056 VS-Schwenningen

has been assessed and certified as meeting the requirements of

ISO 9001:2008

For the following activities

Design, production and sale of freyuency control products, battery technology and electronic components

Further clarifications regarding the scope of this certificate and the applicability of ISO 9001:2008 requirements may be obtained by consulting the organization

This certificate is valid from 22/04/2014 until 21/04/2017
Issue 6. Certified since 02/11/1998

Authorised by

Mark Piekereit
Managing Director

Christian Rathje
Head Of Certification Body

DAkkS
Deutsche Akkreditierungsstelle
D-ZM-16090-01-00

SGS-International Certification Services GmbH
Rödingsmarkt 16 D-20459 Hamburg (Germany)
t +49 (0)40 30.101.361 f +49 (0)40 33.04.08 www.de.sgs.com

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Jauch
THE PULSE OF PROGRESS

THE SPECIALIST FOR FREQUENCY CONTROL PRODUCTS

B.C.E. S.r.l. - Via Regina Pacis, 54/c - I 41049 Sassuolo (MO), Italy
Tel: (+39) 0536 811616 Fax: (+39) 0536 811500 E-mail: bce@bce.it Web: www.bce.it