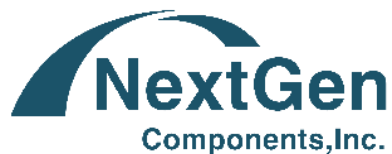


DATA SHEET 2022

- QUARTZ CRYSTALS



- **MHZ SMD CRYSTAL**
- **MHZ THRU HOLE CRYSTAL**
- **KHZ SMD CRYSTAL**
- **KHZ THRU HOLE CRYSTAL**



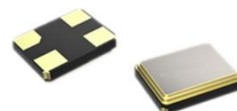
MHZ SMD CRYSTAL

MAIN FEATURE

- Ultra-small SMD Package, Seam Sealed Ceramic-Metal, 4pads
- High precision & High frequency stability

RFQ

Request For Quotation

NEW


APPLICATION

- Small Bluetooth & wireless device • IoT, Health care equipment



L1.2*W1.0*H0.33mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	26.00		96.00	MHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±50		ppm@25 °C	See p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	See p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance(CL)	-	18	-	pF	See p/n guide for more option
Frequency Stability	-	±50	-	ppm	See p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@26.000 ~ 32.0MHz
			80		@32.001~40.00MHz
			60		@40.001~96.00MHz
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

PART NUMBER GUIDE

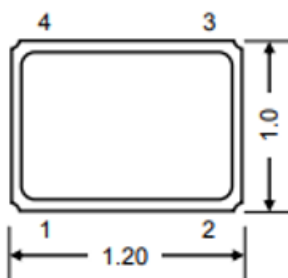
Example: CM12 48M0A50-18-50-40-80 TLF

CM12	48M0	A	50	-18	-50	-40	-80	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11

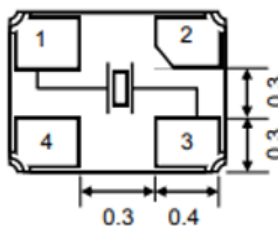
- 1) CM12: MHz SMD Crystal,4 pads, L1.2*W1.0*H0.33mm
- 2) 48M0: Frequency Range 48.000MHz or specify frequency range
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 5) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify CL value
- 6) 50: Frequency Stability, 50: +/-50ppm;10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 7) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify value
- 8) 80: Equivalent Series Resistance (ESR), 80: 80 ohm Max.
- 9) T: Package in Tape/Reel, 5000pcs/Reel
- 10) LF: RoHS Compliant
- 11) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

DIMENSION (Unit: mm)

Top View



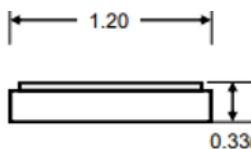
Bottom View



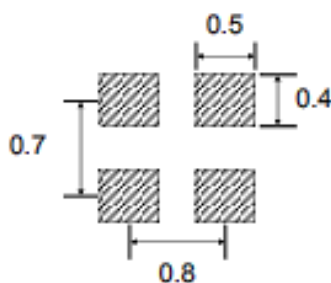
Connection

- #1 Crystal
- #2 Ground
- #3 Crystal
- #4 Ground

Side View



Solder Pattern



MHZ SMD CRYSTAL

MAIN FEATURE

- Ultra-small SMD Package, Seam Sealed Ceramic-Metal, 4pads
- High precision & High frequency stability

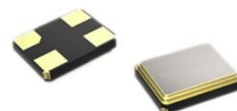
APPLICATION

- Small Bluetooth & wireless device • IoT, Health care equipment

STANDARD SPECIFICATION

RFQ

Request For Quotation

NEW


L1.6*W1.2*H0.40mm

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	24.00		96.00	MHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±50		ppm@25 °C	See p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	See p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance(CL)	-	18	-	pF	See p/n guide for more option
Frequency Stability	-	±50	-	ppm	See p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@24.000 ~ 32.0MHz
			100		@32.001~38.00MHz
			80		@38.001~96.00MHz
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

PART NUMBER GUIDE

Example: CM11 48M0A50-18-50-40-80 TLF

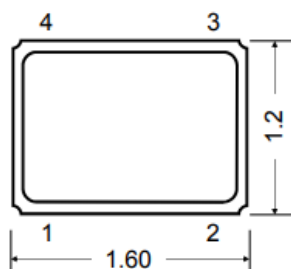
CM11	48M0	A	50	-18	-50	-40	-80	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11

- 1) CM11: MHz SMD Crystal,4 pads, L1.6*W1.2*H0.40mm
- 2) 48M0: Frequency Range 48.000MHz or specify frequency range
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 5) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify CL value
- 6) 50: Frequency Stability, 50: +/-50ppm;10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 7) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify value
- 8) 80: Equivalent Series Resistance (ESR), 80: 80 ohm Max.
- 9) T: Package in Tape/Reel, 3000pcs/Reel
- 10) LF: RoHS Compliant
- 11) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

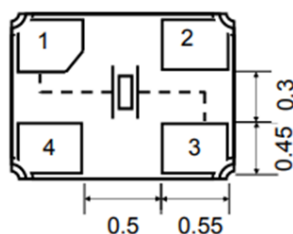
MHZ SMD CRYSTAL

DIMENSION (Unit: mm)

Top View



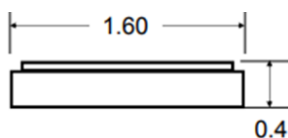
Bottom View



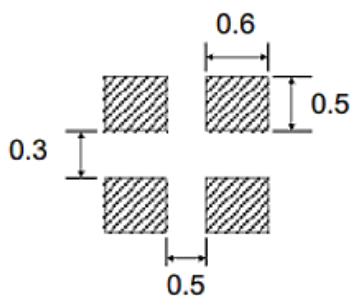
Connection

- #1 Crystal
- #2 Ground
- #3 Crystal
- #4 Ground

Side View



Solder Pattern



MHZ SMD CRYSTAL

MAIN FEATURE

- Ultra-small SMD Package, Seam Sealed Ceramic-Metal, 4pads
- High precision & High frequency stability

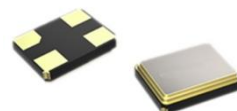
APPLICATION

- Small Bluetooth & wireless device • IoT, Health care equipment

STANDARD SPECIFICATION

RFQ

Request For Quotation

NEW


L2.0*W1.6*H0.46mm

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	16.000		54.000	MHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance(CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@16.000 ~ 20.000MHz
			100		@20.001~30.000MHz
			80		@30.001~36.000MHz
			60		@36.001~54.000MHz
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

PART NUMBER GUIDE

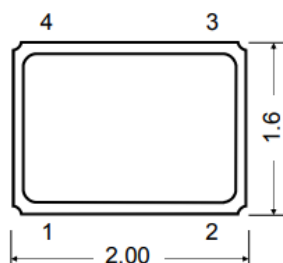
Example: CM21 26M0A50-18-50-40-100 TLF

CM21	26M0	A	50	-18	-50	-40	-100	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11

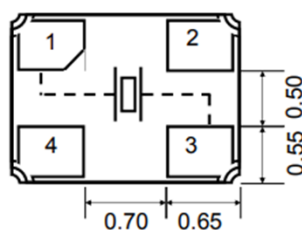
- 1) CM21: MHz SMD Crystal,4 pads, L2.0*W1.6*H0.46mm
- 2) 26M0: Frequency Range 26.000MHz or specify frequency range
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 5) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify CL value
- 6) 50: Frequency Stability, 50: +/-50ppm;10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 7) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify value
- 8) 100: Equivalent Series Resistance (ESR), 100: 100 ohm Max.
- 9) T: Package in Tape/Reel, 3000pcs/Reel
- 10) LF: RoHS Compliant
- 11) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

DIMENSION (Unit: mm)

Top View



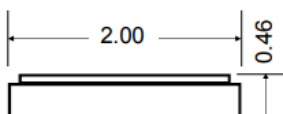
Bottom View



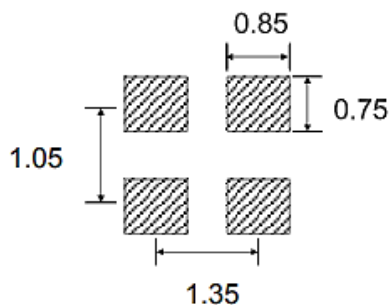
Connection

- #1 Crystal
- #2 Ground
- #3 Crystal
- #4 Ground

Side View



Solder Pattern



MHZ SMD CRYSTAL

MAIN FEATURE

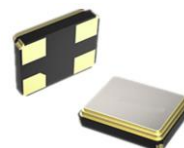
- Ultra-small SMD Package, Seam Sealed Ceramic-Metal, 4pads
- High precision & High frequency stability

APPLICATION

- Small Bluetooth & wireless device • IoT, Health care equipment

RFQ

Request For Quotation



L2.5*W2.0*H0.55mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	12.00		66.000	MHz	
Oscillation Mode	AT Fund.				3 rd Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			200	ohm	@12.000 ~ 13.000MHz
			150		@13.001~16.000MHz
			80		@16.001~20.000MHz
			60		@20.001~30.000MHz
			50		@30.001~35.000MHz
			40		@35.001~66.000MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

PART NUMBER GUIDE

Example: CM22 24M0A50-18-50-40-60 TLF

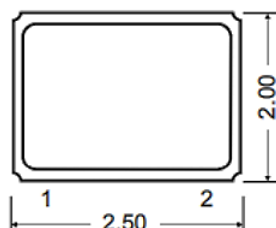
CM22	24M0	A	50	-18	-50	-40	-60	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11

- 1) CM22: MHz SMD Crystal, 4 pads, L2.5*W2.0*H0.55mm
- 2) 24M0: Frequency Range 24.000MHz or specify frequency range
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 5) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify CL value
- 6) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 7) 40: Operating Temp. Range, 40: -40°C ~ +85°C; 10: -10°C ~ +60°C; 20: -20°C ~ +70°C; or Specify value
- 8) 60: Equivalent Series Resistance (ESR), 60: 60 ohm Max.
- 9) T: Package in Tape/Reel, 3000pcs/Reel
- 10) LF: RoHS Compliant
- 11) XX: Internal Control Code, 2 letter or digits; Blank: N/A

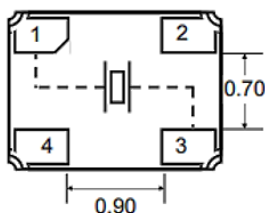
MHZ SMD CRYSTAL

DIMENSION (Unit: mm)

Top View



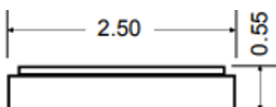
Bottom View



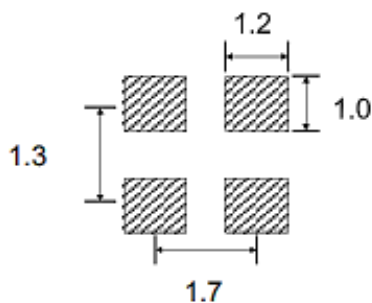
Connection

- #1 Crystal
- #2 Ground
- #3 Crystal
- #4 Ground

Side View



Solder Pattern



MHZ SMD CRYSTAL

MAIN FEATURE

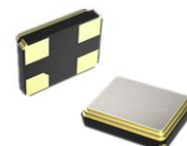
- Ultra-small SMD Package, Seam Sealed Ceramic-Metal, 4pads
- High precision & High frequency stability

APPLICATION

- Small Bluetooth & wireless device • IoT, Health care equipment

RFQ

Request For Quotation



L3.2*W2.5*H0.70mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	8.000		125.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			350	ohm	@8.000 ~ 10.000MHz
			100		@10.001~16.000MHz
			80		@16.001~19.000MHz
			60		@19.001~30.000MHz
			40		@30.001~54.000MHz
			100		@54.001~125.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

PART NUMBER GUIDE

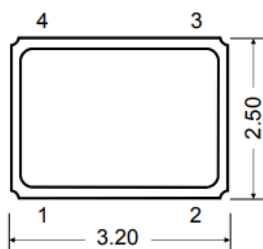
Example: CM32 24M0A50-18-50-40-60 TLF

CM32	24M0	A	50	-18	-50	-40	-60	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11

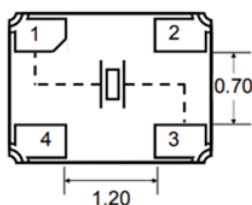
- 1) CM32: MHz SMD Crystal, 4 pads, L3.2*W2.5*H0.70mm
- 2) 24M0: Frequency Range 24.000MHz or specify frequency range
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 5) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify CL value
- 6) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 7) 40: Operating Temp. Range, 40: -40°C ~ +85°C; 10: -10°C ~ +60°C; 20: -20°C ~ +70°C; or Specify value
- 8) 60: Equivalent Series Resistance (ESR), 60: 60 ohm Max.
- 9) T: Package in Tape/Reel, 3000pcs/Reel
- 10) LF: RoHS Compliant
- 11) XX: Internal Control Code, 2 letter or digits; Blank: N/A

DIMENSION (Unit: mm)

Top View



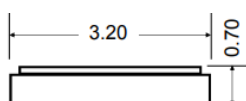
Bottom View



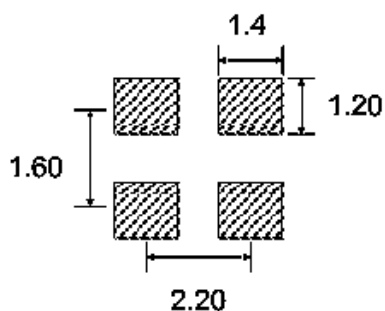
Connection

- #1 Crystal
- #2 Ground
- #3 Crystal
- #4 Ground

Side View



Solder Pattern



MHZ SMD CRYSTAL

MAIN FEATURE

- Ultra-small SMD Package, Seam Sealed Ceramic-Metal, 4pads
- High precision & High frequency stability

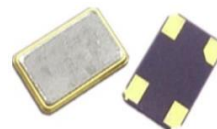
APPLICATION

- Small Bluetooth & wireless device • IoT, Health care equipment

STANDARD SPECIFICATION

RFQ

Request For Quotation



L5.0*W3.2*H1.0mm

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	8.000		150.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@8.000 ~ 10.000MHz
			100		@10.001~15.000MHz
			50		@15.001~40.000MHz
			40		@40.001~52.000MHz
			100		@40.001~80.000MHz, 3 rd OT
			80		@80.001~150.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

PART NUMBER GUIDE

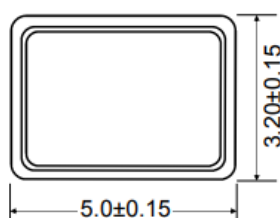
Example: CM53 24M0A50-18-50-40-50 TLF

CM53	24M0	A	50	-18	-50	-40	-50	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11

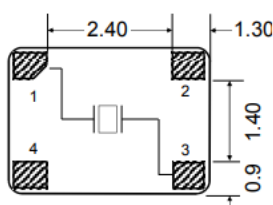
- 1) CM53: MHz SMD Crystal, 4 pads, L5.0*W3.2*H1.0mm
- 2) 24M0: Frequency Range 24.000MHz or specify frequency range
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 5) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify CL value
- 6) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 7) 40: Operating Temp. Range, 40: -40°C ~ +85°C; 10: -10°C ~ +60°C; 20: -20°C ~ +70°C; or Specify value
- 8) 50: Equivalent Series Resistance (ESR), 60: 60 ohm Max.
- 9) T: Package in Tape/Reel, 1000pcs/Reel
- 10) LF: RoHS Compliant
- 11) XX: Internal Control Code, 2 letter or digits; Blank: N/A

DIMENSION (Unit: mm)

Top View



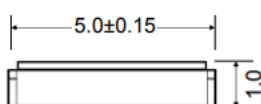
Bottom View



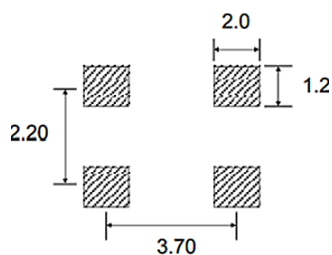
Connection

- #1 Crystal
- #2 Ground
- #3 Crystal
- #4 Ground

Side View



Solder Pattern



MHZ SMD CRYSTAL

MAIN FEATURE

- Ultra-small SMD Package, Seam Sealed Ceramic-Metal, 4pads
- High precision & High frequency stability

APPLICATION

- Small Bluetooth & wireless device • IoT, Health care equipment

RFQ

Request For Quotation



L6.0*W3.5*H1.0mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	7.000		50.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			100	ohm	@7.000 ~ 8.000MHz
			60		@8.001~10.000MHz
			50		@10.001~14.000MHz
			40		@14.001~20.000MHz
			30		@20.001~50.000MHz
			80		@40.001~50.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

PART NUMBER GUIDE

Example: CM63 24M0A50-18-50-40-30 TLF

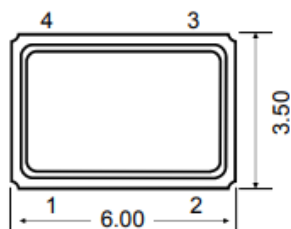
CM63	24M0	A	50	-18	-50	-40	-30	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11

- 1) CM63: MHz SMD Crystal, 4 pads, L6.0*W3.5*H1.0mm
- 2) 24M0: Frequency Range 24.000MHz or specify frequency range
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 5) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify CL value
- 6) 50: Frequency Stability, 50: +/-50ppm;10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 7) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify value
- 8) 30: Equivalent Series Resistance (ESR), 30: 30 ohm Max.
- 9) T: Package in Tape/Reel, 1000pcs/Reel
- 10) LF: RoHS Compliant
- 11) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

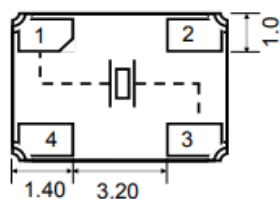
MHZ SMD CRYSTAL

DIMENSION (Unit: mm, Tole: +/-0.2mm)

Top View

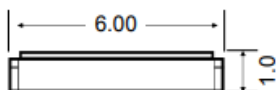


Bottom View

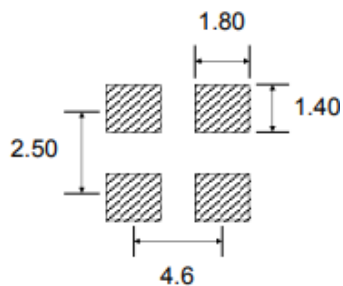


Connection
#1 Crystal
#2 Ground
#3 Crystal
#4 Ground

Side View



Solder Pattern



MHZ SMD CRYSTAL

MAIN FEATURE

- Low cost and short lead time • Wide Frequency Range

RFQ

Request For Quotation



APPLICATION

- PC, TV and all kind of consumer electronics products



L11.5*W4.75*H4.0mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	3.000		150.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@3.000 ~ 4.000MHz
			120		@4.001 ~ 6.000MHz
			80		@6.001 ~ 10.000MHz
			60		@10.001 ~ 54.000MHz
			80		@30.001 ~ 40.000MHz, 3 rd OT
			70		@40.001 ~ 150.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

PART NUMBER GUIDE

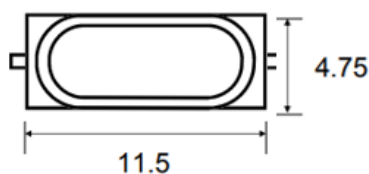
Example: CSM2 4M0A50-18-50-40-150 TLF

CSM2	4M0	A	50	-18	-50	-40	-150	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11

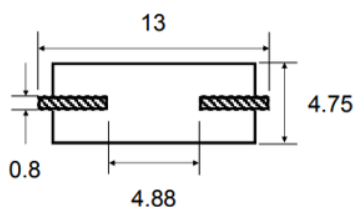
- 1) CSM2: MHz SMD Crystal, 2 pads, L11.5*W4.75*H4.0mm
- 2) 4M0: Frequency Range 4.000MHz or specify frequency range
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 5) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify CL value
- 6) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 7) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify value
- 8) 150: Equivalent Series Resistance (ESR), 150: 150 ohm Max.
- 9) T: Package in Tape/Reel, 1000pcs/Reel
- 10) LF: RoHS Compliant
- 11) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

DIMENSION (Unit: mm, Tol.: +/-0.2mm)

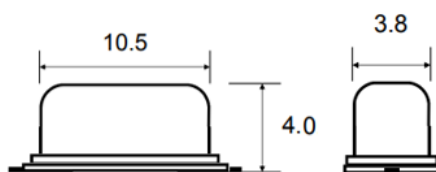
Top View



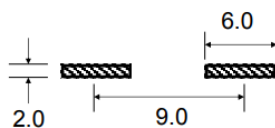
Bottom View



Side View



Solder Pattern



MHZ SMD CRYSTAL

MAIN FEATURE

- Low cost and short lead time • Wide Frequency Range

RFQ

Request For Quotation



APPLICATION

- PC, TV and all kind of consumer electronics products



L11.5*W4.75*H3.0mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	3.000		150.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@3.000 ~ 4.000MHz
			120		@4.001 ~ 6.000MHz
			80		@6.001 ~ 10.000MHz
			60		@10.001 ~ 54.000MHz
			80		@30.001 ~ 40.000MHz, 3 rd OT
			70		@40.001 ~ 150.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

PART NUMBER GUIDE

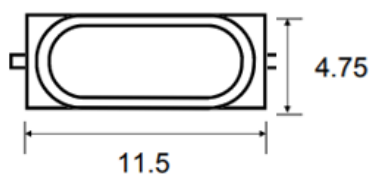
Example: CSSM2 16M0A50-18-50-40-60 TLF

CSSM2	16M0	A	50	-18	-50	-40	-60	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11

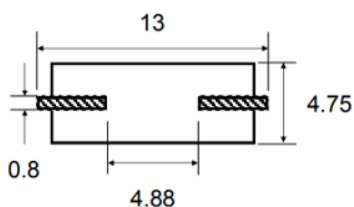
- 1) CSSM2: MHz SMD Crystal, 2 pads, L11.5*W4.75*H3.0mm
- 2) 16M0: Frequency Range 16.000MHz or specify frequency range
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 5) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify CL value
- 6) 50: Frequency Stability, 50: +/-50ppm;10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 7) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify value
- 8) 60: Equivalent Series Resistance (ESR), 60: 60 ohm Max.
- 9) T: Package in Tape/Reel, 1000pcs/Reel
- 10) LF: RoHS Compliant
- 11) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

DIMENSION (Unit: mm, Tol.: +/-0.2mm)

Top View



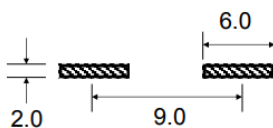
Bottom View



Side View



Solder Pattern



MHZ SMD CRYSTAL

MAIN FEATURE

- Low cost and short lead time • Wide Frequency Range

RFQ
[Request For Quotation](#)


APPLICATION

- PC, TV and all kind of consumer electronics products



L11.5*W4.70*H2.6mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	3.000		150.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@3.000 ~ 4.000MHz
			120		@4.001 ~ 6.000MHz
			80		@6.001 ~ 10.000MHz
			60		@10.001 ~ 54.000MHz
			80		@30.001 ~ 40.000MHz, 3 rd OT
			70		@40.001 ~ 150.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

PART NUMBER GUIDE

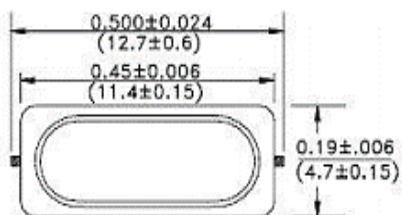
Example: CSSM5 16M0A50-18-50-40-60 TLF

CSSM5	16M0	A	50	-18	-50	-40	-60	T	LF	XX
1	2	3	4	5	6	7	8	9	10	11

- 1) CSSM5: MHz SMD Crystal, 2 pads, L11.5*W4.70*H2.6mm
- 2) 16M0: Frequency Range 16.000MHz or specify frequency range
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 5) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify CL value
- 6) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 7) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify value
- 8) 60: Equivalent Series Resistance (ESR), 60: 60 ohm Max.
- 9) T: Package in Tape/Reel, 1000pcs/Reel
- 10) LF: RoHS Compliant
- 11) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

DIMENSION (Unit: Inch/mm)

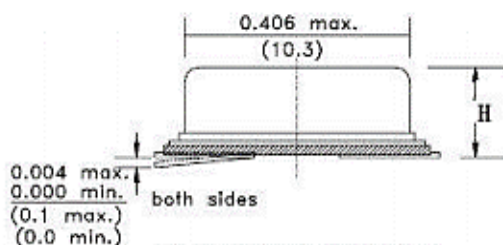
Top View



Marking

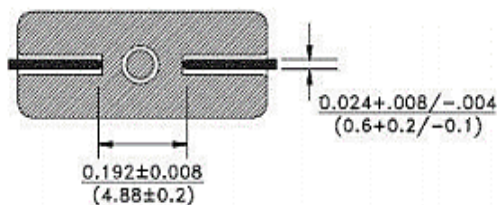
Line 1: Frequency Range

Side View

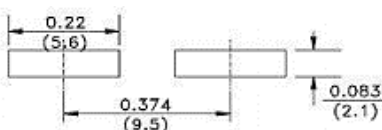


H: 2.6 Max.

Bottom View



**Recommend
Pad Layout**



MHZ SMD CRYSTAL

MAIN FEATURE

- Low cost and short lead time • Wide Frequency Range

RFQ

Request For Quotation

APPLICATION

- PC, TV and all kind of consumer electronics products

RoHS3 Compliant
RoHS Annex III lead Exemption
(exempt per RoHS EU 2015/863)



L12.5*W4.6*H3.7mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	3.570		70.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@3.5700 ~ 5.000MHz
			120		@5.001 ~ 10.000MHz
			80		@6.001 ~ 16.000MHz
			40		@16.001 ~ 36.00MHz
			100		@30.001 ~ 36.00MHz, 3 rd OT
			80		@40.001 ~ 70.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±5		ppm	@25 °C

PART NUMBER GUIDE

Example: CCME 16M0A50-18-50-40-80 TLH

CCME	16M0	A	50	-18	-50	-40	-80	T	LH	XX
1	2	3	4	5	6	7	8	9	10	11

- 1) CCME: MHz SMD Crystal, 4 pads, L12.5*W4.6*H3.7mm
- 2) 16M0: Frequency Range 16.000MHz or specify frequency range
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 5) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify CL value
- 6) 50: Frequency Stability, 50: +/-50ppm;10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 7) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify value
- 8) 80: Equivalent Series Resistance (ESR), 80: 80 ohm Max.
- 9) T: Package in Tape/Reel, 1000pcs/Reel
- 10) LH: RoHS Compliant, RoHS Annex III lead Exemption (exempt per RoHS EU 2015/863)
- 11) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

MHZ SMD CRYSTAL

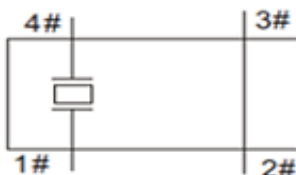
DIMENSION (Unit: mm, Tol.: +/-0.2mm)

Top View

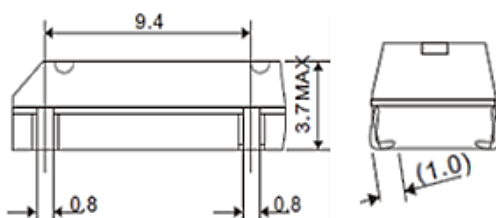


Connection
#1 Crystal
#2 Ground
#3 Crystal
#4 Ground

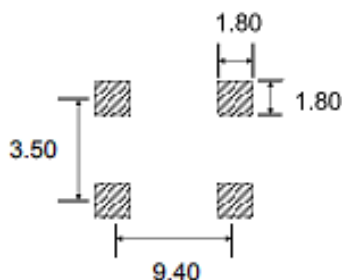
Bottom View



Side View



Solder Pattern



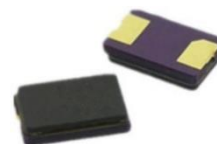
MHZ SMD CRYSTAL

MAIN FEATURE

- Low cost and short lead time
- Glass seal, 2 pads

RFQ

Request For Quotation



L5.0*W3.2*H1.2mm

APPLICATION

- PC, TV and all kind of consumer electronics products

RoHS3 Compliant
RoHS Annex III lead Exemption
(exempt per RoHS EU 2015/863)

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	8.0		80.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			80	ohm	@8.000 ~ 12.00MHz
			70		@12.001 ~ 20.00MHz
			60		@20.001 ~ 40.000MHz
			50		@40.001 ~ 50.00MHz
			120		@40.000 ~ 60.00MHz, 3 rd OT
			100		@60.001 ~ 80.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

PART NUMBER GUIDE

Example: CMG532 16M0A50-18-50-40-70 TLH

CMG532	16M0	A	50	-18	-50	-40	-70	T	LH	XX
1	2	3	4	5	6	7	8	9	10	11

1) CMG532: MHz SMD Crystal, Glass Seal, L5.0*W3.2*H1.2mm, 2 pads

2) 16M0: Frequency Range 16.000MHz or specify frequency range

3) A: Oscillation Mode, A: AT Fund.

4) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value

5) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify CL value

6) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value

7) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify value

8) 70: Equivalent Series Resistance (ESR), 70: 70 ohm Max.

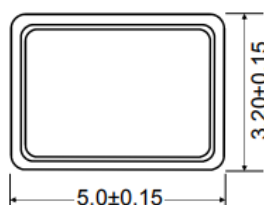
9) T: Package in Tape/Reel, 1000pcs/Reel

10) LH: RoHS Compliant, RoHS Annex III lead Exemption (exempt per RoHS EU 2015/863)

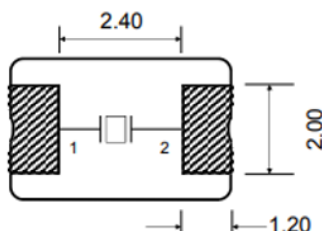
11) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

DIMENSION (Unit: mm, Tol.: +/-0.15mm)

Top View



Bottom View



Connection

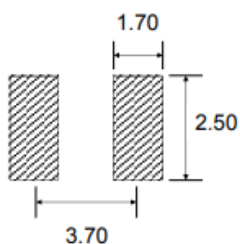
#1 Crystal

#2 Crystal

Side View



Solder Pattern



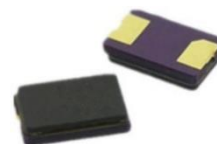
MHZ SMD CRYSTAL

MAIN FEATURE

- Low cost and short lead time
- Glass seal, 2 pads

RFQ

Request For Quotation



APPLICATION

- PC, TV and all kind of consumer electronics products

RoHS3 Compliant
RoHS Annex III lead Exemption
(exempt per RoHS EU 2015/863)



L6.0*W3.5*H1.2mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	8.0		100.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			80	ohm	@8.000 ~ 12.00MHz
			70		@12.001 ~ 20.00MHz
			60		@20.001 ~ 40.000MHz
			50		@40.001 ~ 50.00MHz
			120		@40.000 ~ 60.00MHz, 3 rd OT
			100		@60.001 ~ 80.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

PART NUMBER GUIDE

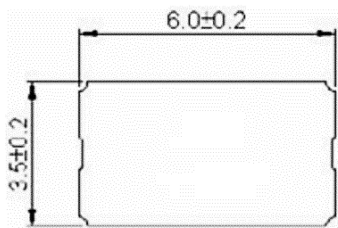
Example: CMG632 16M0A50-18-50-40-70 TLH

CMG632	16M0	A	50	-18	-50	-40	-70	T	LH	XX
1	2	3	4	5	6	7	8	9	10	11

- 1) CMG632: MHz SMD Crystal, Glass Seal, L6.0*W3.5*H1.2mm, 2 pads
- 2) 16M0: Frequency Range 16.000MHz or specify frequency range
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 5) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify CL value
- 6) 50: Frequency Stability, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 7) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify value
- 8) 70: Equivalent Series Resistance (ESR), 70: 70 ohm Max.
- 9) T: Package in Tape/Reel, 1000pcs/Reel
- 10) LH: RoHS Compliant, RoHS Annex III lead Exemption (exempt per RoHS EU 2015/863)
- 11) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

DIMENSION (Unit: mm, +/-0.2mm)

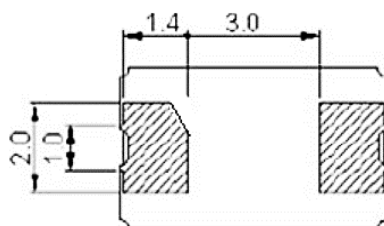
Top View



Marking

Frequency Range
or Internal control
code

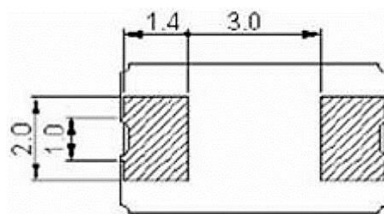
**Bottom type 1
View**



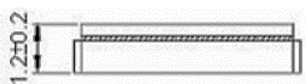
OR

Pin Configuration
#1 Crystal
#2 Crystal

**Bottom Type 2
View**



Side View



MHZ THRU- HOLE CRYSTAL

MAIN FEATURE

- Low cost and short lead time • Wide Frequency Range

RFQ

Request For Quotation



APPLICATION

- PC, TV and all kind of consumer electronics products



Ø2.0*H6.0mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	4.0		60.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@4.000 ~ 5.00MHz
			120		@5.001 ~ 7.00MHz
			80		@7.001 ~ 10.000MHz
			60		@10.001 ~ 12.00MHz
			40		@12.001 ~ 30.00MHz
			80		@30.000 ~ 60.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

PART NUMBER GUIDE

Example: CCC 8M0A50-18-50-40-80 BLF

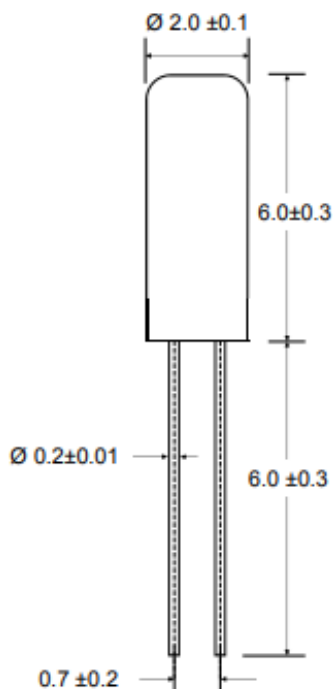
CCC	8M0	A	50	-18	-50	-40	-80	B	LF	XX
1	2	3	4	5	6	7	8	9	10	11

- 1) CCC: MHz SMD Crystal, 2 pins, Ø2.0*H6.0mm
- 2) 8M0: Frequency Range 8.000MHz or specify frequency range
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 5) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify CL value
- 6) 50: Frequency Stability, 50: +/-50ppm;10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 7) 40: Operating Temp. Range, 40: -40°C~+85°C; 10: -10°C~+60°C; 20: -20°C~+70°C; or Specify value
- 8) 80: Equivalent Series Resistance (ESR), 80: 80 ohm Max.
- 9) B: Package in bulk
- 10) LF: RoHS Compliant
- 11) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

MHZ THRU- HOLE CRYSTAL

DIMENSION (Unit: mm)

Side View



MHZ THRU- HOLE CRYSTAL

MAIN FEATURE

- Low cost and short lead time • Wide Frequency Range

RFQ

Request For Quotation



APPLICATION

- PC, TV and all kind of consumer electronics products



Ø3.1*H8.3mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	4.0		60.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			150	ohm	@4.000 ~ 5.00MHz
			120		@5.001 ~ 7.00MHz
			80		@7.001 ~ 10.000MHz
			60		@10.001 ~ 12.00MHz
			40		@12.001 ~ 30.00MHz
			80		@30.000 ~ 60.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

PART NUMBER GUIDE

Example: CCD 8M0A50-18-50-40-80 BLF

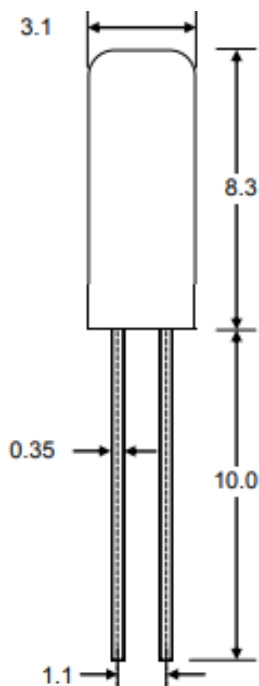
CCD	8M0	A	50	-18	-50	-40	-80	B	LF	XX
1	2	3	4	5	6	7	8	9	10	11

- 1) CCD: MHz SMD Crystal, 2 pins, Ø3.1*H8.3mm
- 2) 8M0: Frequency Range 8.000MHz or specify frequency range
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 5) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify CL value
- 6) 50: Frequency Stability, 50: +/-50ppm;10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 7) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify value
- 8) 80: Equivalent Series Resistance (ESR), 80: 80 ohm Max.
- 9) B: Package in bulk
- 10) LF: RoHS Compliant
- 11) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

MHZ THRU- HOLE CRYSTAL

DIMENSION (Unit: mm, Tol. : +/-0.20mm)

Side View



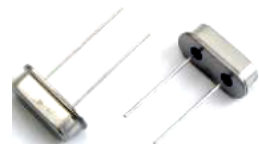
MHZ THRU- HOLE CRYSTAL

MAIN FEATURE

- Low cost and short lead time • Wide Frequency Range

RFQ

Request For Quotation



APPLICATION

- PC, TV and all kind of consumer electronics products



L11.05*W4.7*H4.0mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	3.0		100.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			200	ohm	@3.000 ~ 5.0000MHz
			80		@5.001 ~ 10.000MHz
			60		@10.001 ~ 20.000MHz
			40		@20.001 ~ 36.00MHz
			100		@27.001 ~ 50.00MHz, 3 rd OT
			80		@50.01 ~ 100.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

PART NUMBER GUIDE

Example: CS 8M0A50-18-50-40-80 BLF

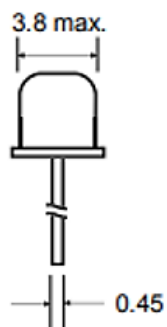
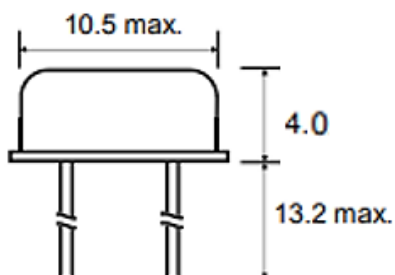
CS	8M0	A	50	-18	-50	-40	-80	B	LF	XX
1	2	3	4	5	6	7	8	9	10	11

- 1) CS: MHz SMD Crystal, 2 pins, L11.05*W4.7*H4.0mm
- 2) 8M0: Frequency Range 8.000MHz or specify frequency range
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 5) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify CL value
- 6) 50: Frequency Stability, 50: +/-50ppm;10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value
- 7) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify value
- 8) 80: Equivalent Series Resistance (ESR), 80: 80 ohm Max.
- 9) B: Package in bulk
- 10) LF: RoHS Compliant
- 11) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

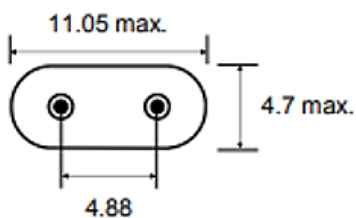
MHZ THRU- HOLE CRYSTAL

DIMENSION (Unit: mm))

Side View



Bottom View



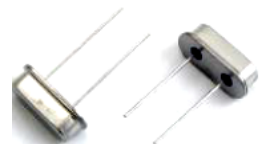
MHZ THRU- HOLE CRYSTAL

MAIN FEATURE

- Low cost and short lead time • Wide Frequency Range

RFQ

Request For Quotation



APPLICATION

- PC, TV and all kind of consumer electronics products



L11.05*W4.7*H3.0mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	3.0		100.00	MHz	
Oscillation Mode	AT Fund.				3 RD Overtone Option
Frequency Tolerance	-	±50		ppm@25 °C	see p/n guide for more option
Operating Temp. Range	-40	-	+85	°C	see p/n guide for more option
Storage Temp. Range	-55	-	+125	°C	
Load Capacitance (CL)	-	18	-	pF	see p/n guide for more option
Frequency Stability	-	±50	-	ppm	see p/n guide for more option
Equivalent Series Resistance (ESR)			200	ohm	@3.000 ~ 5.0000MHz
			80		@5.001 ~ 10.000MHz
			60		@10.001 ~ 20.000MHz
			40		@20.001 ~ 36.00MHz
			100		@27.001 ~ 50.00MHz, 3 rd OT
			80		@50.01 ~ 100.00MHz, 3 rd OT
Drive Level	-	-	100	μW	
Shunt Capacitance	-	-	7.0	pF	
Insulation Resistance	500	-		mW	DC/100V +-10%
Aging per year	-	±3		ppm	@25 °C

PART NUMBER GUIDE

Example: CSS 8M0A50-18-50-40-80 BLF

CSS	8M0	A	50	-18	-50	-40	-80	B	LF	XX
1	2	3	4	5	6	7	8	9	10	11

1) CSS: MHz SMD Crystal, 2 pins, L11.05*W4.7*H3.0mm

2) 8M0: Frequency Range 8.000MHz or specify frequency range

3) A: Oscillation Mode, A: AT Fund.

4) 50: Freq. tolerance, 50: +/-50ppm; 10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value

5) 18: Load Capacitance(CL), 15: 15pF; 18: 18pF; 20: 20pF; 30: 30pF or Specify CL value

6) 50: Frequency Stability, 50: +/-50ppm;10: +/-10ppm; 20: +/-20ppm; 30: +/-30ppm or Specify value

7) 40: Operating Temp. Range, 40: -40°C ~+85°C; 10: -10°C ~+60°C; 20: -20°C ~+70°C; or Specify value

8) 80: Equivalent Series Resistance (ESR), 80: 80 ohm Max.

9) B: Package in bulk

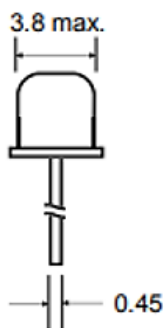
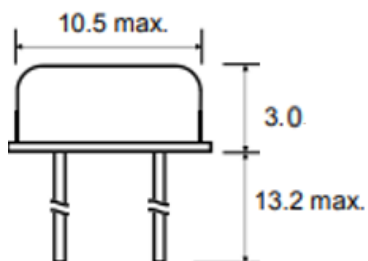
10) LF: RoHS Compliant

11) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

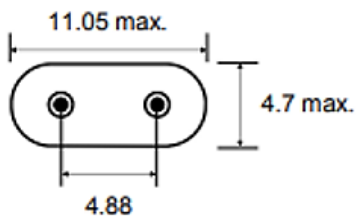
MHZ THRU- HOLE CRYSTAL

DIMENSION (Unit: mm))

Side View



Bottom View



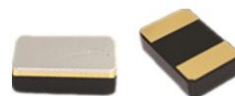
KHZ SMD CRYSTAL

MAIN FEATURE

- 32.768KHz • Ultra-Small Package • 2 Pads

RFQ

Request For Quotation



APPLICATION

- Smart phone and mobile communication and more



L1.6*W1.0*H0.5mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	-	32.768	-	KHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	
Operating Temperature Range	-40	-	+85	°C	CL: 7.0, 9.0pF or Specify
Storage Temperature Range	-55	-	+125	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	-0.04	-0.03	-0.02	ppm/C ²	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	90	Kohm	
Drive Level	-	0.1	0.5	μW	
Shunt Capacitance		1.4	7.0	pF	
Dynamic Capacitance	-	-	6.0	Ff	
Quality Factor		10000			
Capacitance Ratio	-	450	-		
Aging per year	-	±3		ppm/year	
Insulation Resistance	500	-	-	Mohm	@ 100Vdc ± 15V

PART NUMBER GUIDE

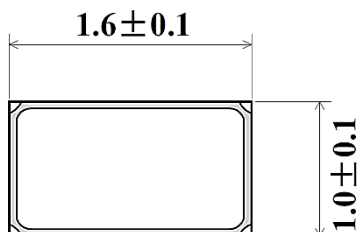
Example: CCMV 32K768A20-12.5-40-90 TLF

CCMV	32K768	A	20	-12.5	-40	-90	T	LF	XX
1	2	3	4	5	6	7	8	9	10

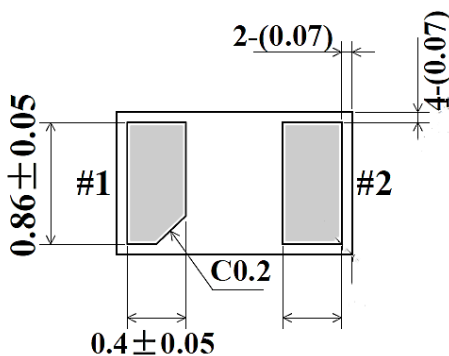
- 1) CCMV: KHz SMD Crystal, L1.6*W1.0*H0.5mm
- 2) 32K768: Frequency Range 32.768KHz
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 20: Freq. tolerance, 20: +/-20ppm
- 5) 12.5: Load Capacitance(CL), 12.5: 12.5pF or Specify CL value
- 6) 40: Operating Temp. Range, 40: -40°C ~+85°C
- 7) 90: Equivalent Series Resistance (ESR), 90: 90 Kohm Max.
- 8) T: Package in Tape/Reel, 5000pcs/Reel
- 9) LF: RoHS Compliant
- 10) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

DIMENSION (Unit: mm)

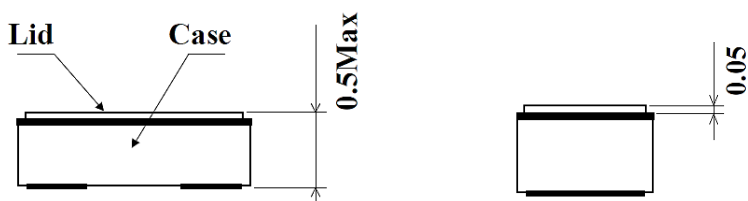
Top View



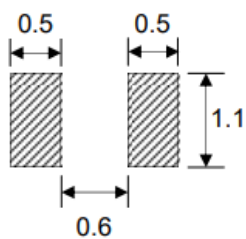
Bottom View



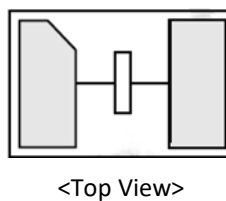
Side View



Solder Pattern



Internal Connection



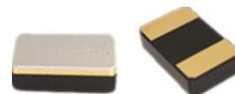
KHZ SMD CRYSTAL

MAIN FEATURE

- 32.768KHz • Ultra-Small Package • 2 Pads

RFQ

Request For Quotation



APPLICATION

- Smart phone and mobile communication and more



L2.0*W1.2*H0.6mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	-	32.768	-	KHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	
Operating Temperature Range	-40	-	+85	°C	CL: 7.0pF, 9.0pF or Specify
Storage Temperature Range	-55	-	+125	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	0.028	0.034	0.04	ppm/C ²	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	90	Kohm	
Drive Level	-	-	0.5	μW	
Shunt Capacitance	0.9	1.3	2.0	pF	
Dynamic Capacitance	-	5.0	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		
Aging per year	-	±3		ppm/year	
Insulation Resistance	500	-	-	Mohm	@ 100Vdc ± 15V

PART NUMBER GUIDE

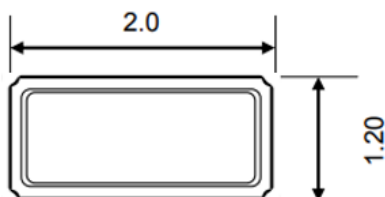
Example: CCMS 32K768A20-12.5-40-90 TLF

CCMS	32K768	A	20	-12.5	-40	-90	T	LF	XX
1	2	3	4	5	6	7	8	9	10

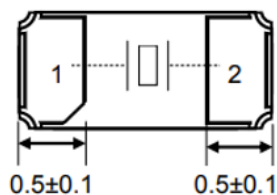
- 1) CCMS: KHz SMD Crystals L2.0*W1.2*H0.6mm
- 2) 32K768: Frequency Range 32.768KHz
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 20: Freq. tolerance, 20: +/-20ppm
- 5) 12.5: Load Capacitance(CL), 12.5: 12.5pF or Specify CL value
- 6) 40: Operating Temp. Range, 40: -40°C ~+85°C
- 7) 90: Equivalent Series Resistance (ESR), 90: 90 Kohm Max.
- 8) T: Package in Tape/Reel, 5000pcs/Reel
- 9) LF: RoHS Compliant
- 10) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

DIMENSION (Unit: mm)

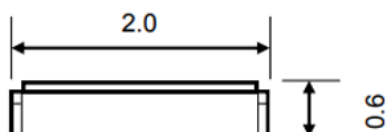
Top View



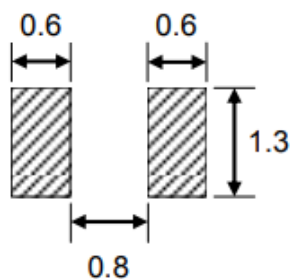
Bottom View



Side View



Solder Pattern



KHZ SMD CRYSTAL

MAIN FEATURE

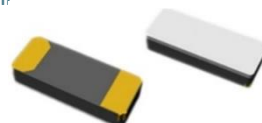
- 32.768KHz • Ultra-Small Package • 2 Pads

RFQ

Request For Quotation

APPLICATION

- Smart phone and mobile communication and more



STANDARD SPECIFICATION

L3.2*W1.5*H0.80mm

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	-	32.768	-	KHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	
Operating Temperature Range	-40	-	+85	°C	CL: 6.0pF, 7.0pF, 9.0pF, available or Specify
Storage Temperature Range	-55	-	+125	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	-	-	0.04	ppm/C ²	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	70	Kohm	
Drive Level	-	-	0.5	μW	
Shunt Capacitance		1.1	2.0	pF	
Dynamic Capacitance	-	4.1	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		
Aging per year	-	±3		ppm/year	
Insulation Resistance	500	-	-	Mohm	@ 100Vdc ± 15V

PART NUMBER GUIDE

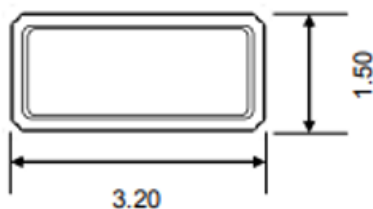
Example: CCMM 32K768A20-12.5-40-70 TLF

CCMV	32K768	A	20	-12.5	-40	-90	T	LF	XX
1	2	3	4	5	6	7	8	9	10

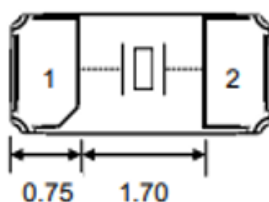
- 1) CCMM: KHz SMD Crystals L3.2*W1.5*H0.80mm
- 2) 32K768: Frequency Range 32.768KHz
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 20: Freq. tolerance, 20: +/-20ppm
- 5) 12.5: Load Capacitance(CL), 12.5: 12.5pF or Specify CL value
- 6) 40: Operating Temp. Range, 40: -40°C ~+85°C
- 7) 70: Equivalent Series Resistance (ESR), 70: 70 Kohm Max.
- 8) T: Package in Tape/Reel, 3000pcs/Reel
- 9) LF: RoHS Compliant
- 10) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

DIMENSION (Unit: mm, Tol.: +/-0.1mm)

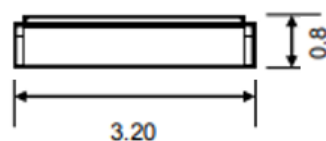
Top View



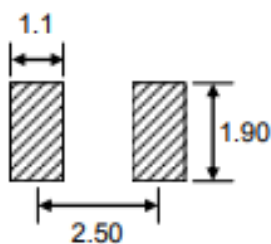
Bottom View



Side View



Solder Pattern



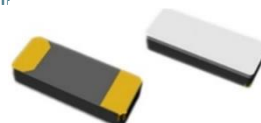
KHZ SMD CRYSTAL

MAIN FEATURE

- 32.768KHz • Ultra-Small Package • 2 Pads

RFQ

Request For Quotation



APPLICATION

- Smart phone and mobile communication and more



STANDARD SPECIFICATION

L4.1*W1.5*H0.90mm

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	-	32.768	-	KHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	
Operating Temperature Range	-40	-	+85	°C	@25 °C or Specify CL: 6.0pF, 7.0pF, 9.0pF available or Specify
Storage Temperature Range	-55	-	+125	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	-	-	0.04	ppm/°C	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	70	Kohm	
Drive Level	-	-	0.5	μW	
Shunt Capacitance	-	1.3	2.0	pF	
Dynamic Capacitance	-	2.1	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		
Aging per year	-	±3		ppm/year	
Insulation Resistance	500	-	-	Mohm	@ 100Vdc ± 15V

PART NUMBER GUIDE

Example: CCMJ 32K768A20-12.5-40-70 TLF

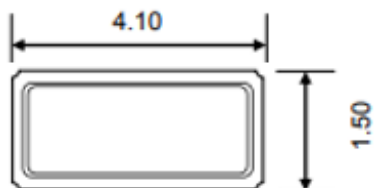
CCMJ	32K768	A	20	-12.5	-40	-70	T	LF	XX
1	2	3	4	5	6	7	8	9	10

- 1) CCMJ: KHz SMD Crystals L4.1*W1.5*H0.90mm
- 2) 32K768: Frequency Range 32.768KHz
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 20: Freq. tolerance, 20: +/-20ppm
- 5) 12.5: Load Capacitance(CL), 12.5: 12.5pF or Specify CL value
- 6) 40: Operating Temp. Range, 40: -40°C ~+85°C
- 7) 70: Equivalent Series Resistance (ESR), 70: 70 Kohm Max.
- 8) T: Package in Tape/Reel, 3000pcs/Reel
- 9) LF: RoHS Compliant
- 10) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

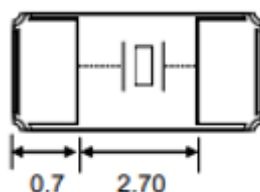
KHZ SMD CRYSTAL

DIMENSION (Unit: mm, Tol.: +/-0.1mm)

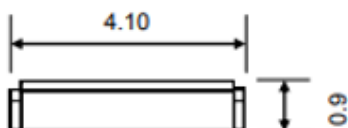
Top View



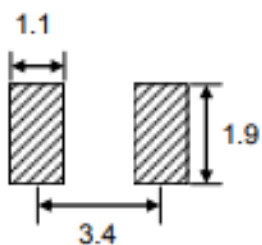
Bottom View



Side View



Solder Pattern



KHZ SMD CRYSTAL

MAIN FEATURE

- 32.768KHz • Plastic Package • High Precision & Reliability

RFQ

Request For Quotation



APPLICATION

- Notebook computer, TV, STB, LCDM and more

RoHS3 Compliant
RoHS Annex III lead Exemption
(exempt per RoHS EU 2015/863)



L8.0*W3.8*H2.4mm

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	30.00	32.768	200.00	KHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	
Operating Temperature Range	-40	-	+85	°C	CL: 6.0pF, 7.0pF, 9.0pF or Specify for option
Storage Temperature Range	-55	-	+125	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	0.028	0.034	0.04	ppm/C ²	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	50	Kohm	
Drive Level	-	-	1.0	μW	
Shunt Capacitance	-	-	2.0	pF	
Dynamic Capacitance	-	1.8	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		
Aging per year	-	±3		ppm/year	
Insulation Resistance	500	-	-	Mohm	@ 100Vdc ± 15V

PART NUMBER GUIDE

Example: CCMC 32K7680A20-12.5-40-50 TLH

CCMC	32K768	A	20	-12.5	-40	-50	T	LH	XX
1	2	3	4	5	6	7	8	9	10

1) CCMC: KHz SMD Crystals L8.0*W3.8*H2.4mm

2) 32K768: Frequency Range 32.768KHz

3) A: Oscillation Mode, A: AT Fund.

4) 20: Freq. tolerance, 20: +/-20ppm

5) 12.5: Load Capacitance(CL), 12.5: 12.5pF or Specify CL value

6) 40: Operating Temp. Range, 40: -40°C ~+85°C

7) 50: Equivalent Series Resistance (ESR), 50: 50 Kohm Max.

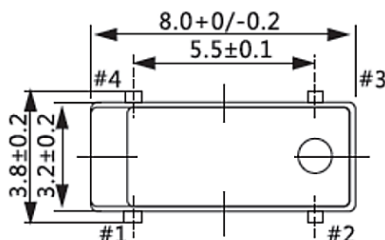
8) T: Package in Tape/Reel, 3000pcs/Reel

9) LH: LH: RoHS Compliant, RoHS Annex III lead Exemption (exempt per RoHS EU 2015/863)

10) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

DIMENSION (Unit: mm)

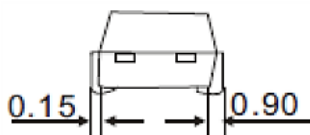
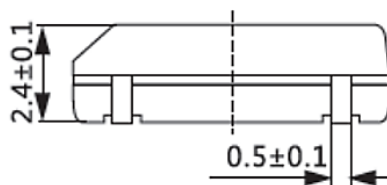
Top View



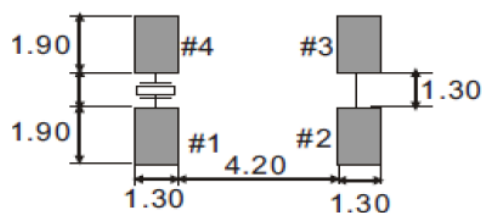
Note:

- Do not connect pad 2 and Pad 3 to external devices.
- Metal inside may be exposed on the top or bottom of plastic case
- It isn't Quality problem. This will not affect any quality, reliability and electrical specification when used

Side View



Solder Pattern



Connection
#1 Crystal
#2 Ground
#3 Ground
#4 Crystal

KHZ THRU- HOLE CRYSTAL

MAIN FEATURE

- 32.768KHz Std. and wide Frequency range

RFQ

Request For Quotation



Ø2.0*H6.0mm

APPLICATION

- Clock/Watch and more

STANDARD SPECIFICATION

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	30.00	32.768	200.00	KHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	
Operating Temperature Range	-10	-	+60	°C	CL: 7.0pF, 9.0pF or Specify Wide Operating Temp. range See Part number Guide for option
Storage Temperature Range	-40	-	+85	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	0.028	0.034	0.040	ppm/C ²	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	35	Kohm	
Drive Level	-	-	1.0	µW	
Shunt Capacitance	0.9	1.8	2.0	pF	
Dynamic Capacitance	-	2.1	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		
Aging per year	-	±5		ppm/year	
Insulation Resistance	500	-	-	Mohm	

PART NUMBER GUIDE

Example: CCA 32K768A20-12.5-10-35 BLF

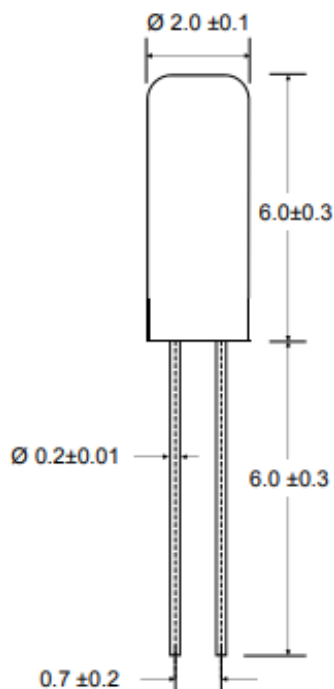
CCA	32K768	A	20	-12.5	-10	-35	B	LF	XX
1	2	3	4	5	6	7	8	9	10

- 1) CCA: KHz SMD Crystals Ø2.0*H6.0mm
- 2) 32K768: Frequency Range 32.768KHz
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 20: Freq. tolerance, 20: +/-20ppm
- 5) 12.5: Load Capacitance(CL), 12.5: 12.5pF or Specify CL value
- 6) 10: Operating Temp. Range, 10: -10°C ~+60°C
- 7) 35: Equivalent Series Resistance (ESR), 35: 35 Kohm Max.
- 10) B: Package in bulk
- 10) LF: RoHS Compliant
- 11) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

KHZ THRU- HOLE CRYSTAL

DIMENSION (Unit: mm)

Side View



KHZ THRU- HOLE CRYSTAL

MAIN FEATURE

- 32.768KHz Std. and wide Frequency range

RFQ

Request For Quotation



APPLICATION

- Clock/Watch and more



STANDARD SPECIFICATION

Ø3.1*H8.3mm

Parameter	Value			Unit	Condition
	Min.	Type	Max.		
Frequency Range	30.00	32.768	200.00	KHz	
Oscillation Mode	AT Fund.				
Frequency Tolerance	-	±20		ppm	
Operating Temperature Range	-10	-	+60	°C	CL: 7.0pF, 9.0pF or Specify Wide Operating Temp. range See Part number Guide for option
Storage Temperature Range	-40	-	+85	°C	
Load Capacitance (CL)	-	12.5	-	pF	
Frequency/Temp Coefficient	0.028	0.034	0.040	ppm/C ²	
Turnover Temp	+20	+25	+30	°C	
Equivalent Series Resistance		-	35	Kohm	
Drive Level	-	-	1.0	μW	
Shunt Capacitance	0.9	1.8	2.0	pF	
Dynamic Capacitance	-	2.1	-	Ff	
Quality Factor		60000			
Capacitance Ratio	-	450	-		
Aging per year	-	±5		ppm/year	
Insulation Resistance	500	-	-	Mohm	@ 100Vdc ± 15V

PART NUMBER GUIDE

Example: CCB 32K768A20-12.5-10-35 BLF

CCB	32K768	A	20	-12.5	-10	-35	B	LF	XX
1	2	3	4	5	6	7	8	9	10

- 1) CCB: KHz SMD Crystals Ø3.1*H8.3mm
- 2) 32K768: Frequency Range 32.768KHz
- 3) A: Oscillation Mode, A: AT Fund.
- 4) 20: Freq. tolerance, 20: +/-20ppm
- 5) 12.5: Load Capacitance(CL), 12.5: 12.5pF or Specify CL value
- 6) 10: Operating Temp. Range, 10: -10°C ~+60°C
- 7) 35: Equivalent Series Resistance (ESR), 35: 35 Kohm Max.
- 10) B: Package in bulk
- 10) LF: RoHS Compliant
- 11) XX: Intenal Control Code, 2 letter or digits; Blank: N/A

KHZ THRU- HOLE CRYSTAL

DIMENSION (Unit: mm, Tol.: +/-0.20mm)

Side View

