

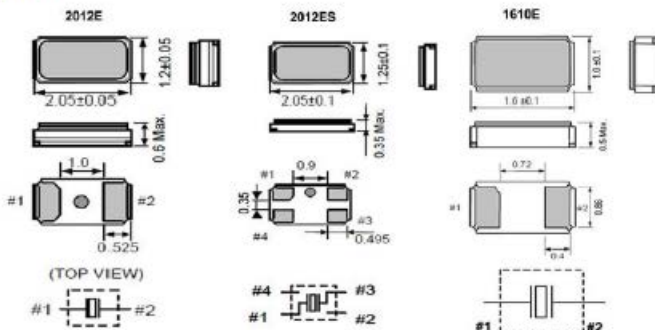
2012E, 2012ES, 1610E: Tuning Fork Cylinder Quartz Crystal

32.768 KHz

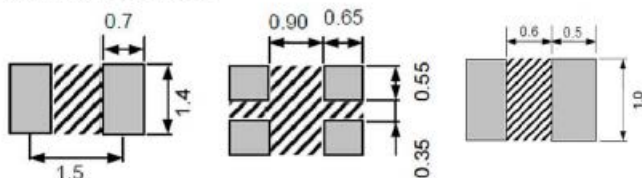
● SPECIFICATION

Type	2012E	2012ES	1610E
Frequency Range	32.768 KHz		
Load Capacitance	12.5 pF, specify	7 pF, 9 pF, 12.5 pF, specify	9 pF, 12.5 pF, specify
Drive Level	0.5 μ W (max)	0.25 μ W (max)	0.5 μ W (max)
Frequency Tolerance	± 20 ppm	± 20 ppm	± 20 ppm
Series Resistance	90 K Ω (max)	75 K Ω (max)	90 K Ω (max)
Turnover Temperature	25°C $\pm$ 5°C	25°C $\pm$ 5°C	25°C $\pm$ 5°C
Temperature Coefficient	-0.04 $\pm$ 0.01ppm/C ²	-0.04 $\pm$ 0.01ppm/C ²	-0.04 $\pm$ 0.01ppm/C ²
Operating Temperature Range	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
Storage Temperature Range	-55°C ~ +125°C	-55°C ~ +125°C	-55°C ~ +125°C
Motional Capacitance	6.4 fF (typ)	3.7 fF (typ)	6.0 fF (typ)
Shunt Capacitance	1.3 pF (typ)	0.8 pF (typ)	1.2 pF (typ)
Capacitance Ratio	500 (typ)	500 (typ)	500 (typ)
Aging	± 5 ppm (max)	± 5 ppm (max)	± 5 ppm (max)

● DIMENSIONS (mm)



● RECOMMENDED LAND PATTERN



• MHz Crystals :

	M		P			/		-		/		
Frequency in MHz	Load Capacitance	Operation Temp.	Vibration Mode	Package Code	Tolerance at 25℃	Stability over Operation Temp.	Custom Speci.					
	00 : Series	1 : -10 ~ + 60℃	Blank : AT- Fund.	49U	5 : ± 5PPM	5 : ± 5PPM	*					
	6 : 6pf	Blank : -10 ~ + 70℃	A3 : AT- 3rd.	49T	10 : ± 10PPM	10 : ± 10PPM						
	7 : 7pf	2 : -20 ~ + 70℃	A5 : AT- 5th.	49US	15 : ± 15PPM	15 : ± 15PPM						
	8 : 8pf	27 : -20 ~ + 75℃	A7 : AT- 7th.	49SL	20 : ± 20PPM	20 : ± 20PPM						
	9 : 9pf	28 : -20 ~ + 85℃	BF : BT- Fund.	49SMT	Blank : ± 30PPM	Blank : ± 30PPM						
	10 : 10pf	37 : -30 ~ + 75℃		49SLMT	50 : ± 50PPM	50 : ± 50PPM						
	12 : 12pf	3 : -30 ~ + 80℃		50U	100 : ± 100PPM	100 : ± 100PPM						
	16 : 16pf	38 : -30 ~ + 85℃		51U	:	150 : ± 150PPM						
	18 : 18pf	I : -40 ~ + 85℃		UM1	:	:						
	20 : 20pf	A : -40 ~ + 105℃		UM5		:						
	22 : 22pf	B : -40 ~ + 125℃		AT26								
	30 : 30pf	C : -55 ~ + 125℃		SMAT26B								
	33 : 33pf	D : -40 ~ + 150℃		SMAT26BSP								
	:	X : Custom		AT38								
	:			SMAT38A								
				AT39								
				SMAT39A								
				AT310								
				SMAT310A								
				MA406								
				XT754								
				XT634								
				XT632								
				XT534								
				XT532								
				XT532G								
				XT324								
				XT324G								
				XT224								
				XT214								
				XT114								

• KHz Crystals :

	K		P		/		-		
Frequency in KHz		Load Capacitance		Operation Temp.		Package Code		Tolerance at 25℃	Custom Speci.
		6 : 6pf		1 : -10 ~ + 60℃		DT15		5 : ± 5PPM	*
		7 : 7pf		Blank : -10 ~ + 70℃		DT26		8 : ± 8PPM	
		8 : 8pf		2 : -20 ~ + 70℃		DT38		10 : ± 10PPM	
		9 : 9pf		27 : -20 ~ + 75℃		SM26BRC		15 : ± 15PPM	
		12.5 : 12.5pf		28 : -20 ~ + 85℃		SM26BSPRC		Blank : ± 20PPM	
		:		37 : -30 ~ + 75℃		SM38ARC		30 : ± 30PPM	
		:		3 : -30 ~ + 80℃		MC306		50 : ± 50PPM	
				38 : -30 ~ + 85℃		6914E		100 : ± 100PPM	
				I : -40 ~ + 85℃		3215E		:	
				A : -40 ~ + 105℃		2012E		:	
				B : -40 ~ + 125℃		2012ES			
				C : -55 ~ + 125℃		1610E			
				D : -40 ~ + 150℃					
				X : Custom					

