



**Data Sheet**

telephone  
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BACK

Product Category: SMD Quartz Crystal

Series Number	Package	Description	Last Modified
228	4.1 x 1.5 Chip Type	SMD Quartz Crystal	Nov. 17, 2011

**FEATURES**

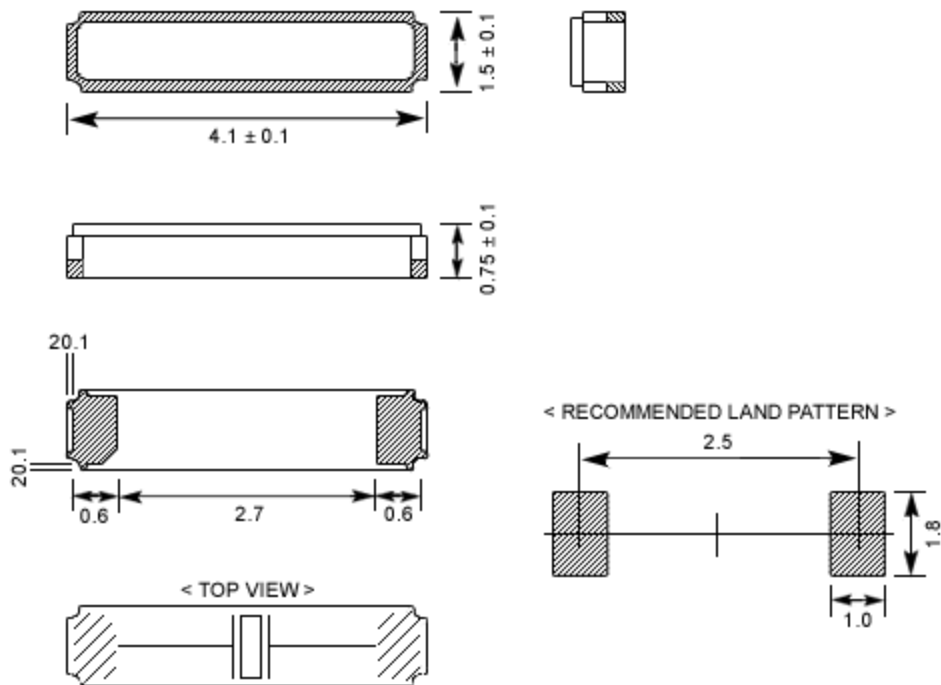
- 4.1x1.5mm ceramic package tuning for crystal resonator type quartz crystal
- Suitable for telecommunications and other applications.
- Low profile of 0.75mm
- Tight stability / High reliability
- Cost Efficient
- Tape and Reel
- RoHS / Lead Free compliant



**OPERATING CONDITIONS / ELECTRICAL CHARACTERISTICS**

PARAMETERS	SYMBOL	CONDITION	MINIMUM	TYPICAL	MAXIMUM	UNITS
Frequency Range	Fo	-	-	32.768	-	KHz
Frequency Tolerance	$\Delta F/Fo$	@ 25°C	±10	±20	±100	ppm
Temperature Coefficient	K	REFTO25°C	-	-	-0.042	ppm( $\Delta$ °C)
Operating Temperature	TORP	-	-40	-	+85	°C
Storage Temperature	TSTG	-	-40	-	+85	°C
Shunt Capacitance	Co	-	-	1.5	2	pF
Motional Capacitance	C1	-	-	2	4	fF
Load Capacitance	CL	-	6	12.5	Series	pF
Insulation Resistance	IR	100VDC	500	-	-	M
Drive Level	DL	-	-	-	1	μ W
Aging (First Year)	Fa	@25°C±30°C	-5.0	-	+5.0	Ppm
Equivalent Series Resistance (ESR)	RS	-	-	-	50	K Ω

**PACKAGE DIMENSIONS**



**PART NUMBER GUIDE**

Example: **228-32.768K-SR-20-W-TR**

(All fields separated by a dash "-")

Series Number	Frequency	Load Capacitance	Tolerance @ +25°C	Operating Temp ( °C )	Packaging**
<b>228</b>	<b>32.768K</b>	<b>SR</b>	<b>20</b>	<b>W</b>	<b>TR</b>
Oscilent 4.1 x 1.5 SMD	Enter desired frequency. Avail. = 32.768KHz	Enter desired capacitance here. Avail. = 6 ~ 12.5pF * SR for series	Blank * = ±30 PPM 10 = ±10 PPM 15 = ±15 PPM 20 = ±20 PPM 25 = ±25 PPM 50 = ±50 PPM <b>Avail. = ±10 ~ ±100</b>	P = 0~+50 R = -10~+60 S = -20~+70 T = -30~+80 W = -40~+85	Blank* = Bulk TR = Tape/Reel
<p><b>NOTE:</b> Deviations on all parameters available. Please consult Oscilent for details.</p> <p><b>DEFINITIONS:</b> Click on the characteristic names above for definitions of that particular characteristic.</p> <p><b>*STANDARDS:</b> "Blank" part number selections indicate standard variables for that particular characteristic.</p> <p><b>**PACKAGING:</b> Click on the packaging name above for tape/reel specifications</p>					

**Oscilent Corporation** - CALL **1.949.252.0522**

**Series No.:** **228**

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