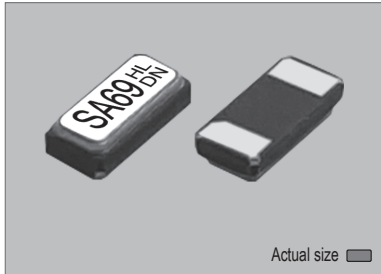
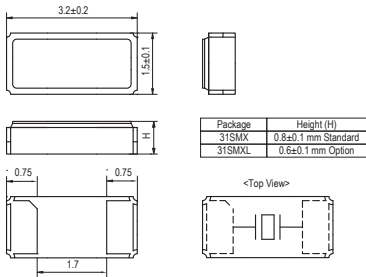


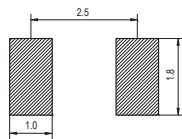
31SMX



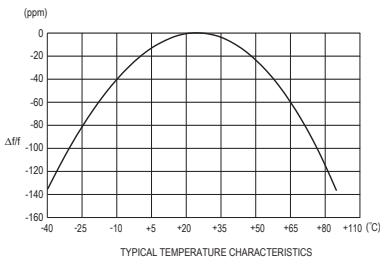
31SMX



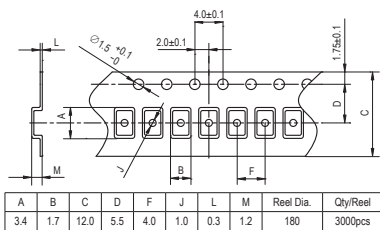
SOLDERING PATTERN



XY-CUT



TAPE SPECIFICATIONS



STANDARD SPECIFICATIONS

Item	Symbol	Specifications
Part number	P/N	31M327*
Package Type		31SMX
Nominal frequency	F	32.768 kHz
Frequency tolerance (at +25°C)	$\Delta f/F$	AAA : $\pm 5$ ppm AA : $\pm 10$ ppm A : $\pm 15$ ppm B : $\pm 20$ ppm C : $\pm 30$ ppm (Standard)
Load capacitance	CL	12.5 pF : 31M327 (Standard) 9.0 pF : 31M327-9 7.0 pF : 31M327-7 6.0 pF : 31M327-6
Equivalent series resistance	ESR	70k $\Omega$ max. (To : -40°C to +85°C) (Standard) 80k $\Omega$ max. (To : -40°C to +105°C) (Option) 80k $\Omega$ max. (To : -40°C to +125°C) (Option) 50k $\Omega$ max. (To : -40°C to +85°C) (R = Option)
Drive level	P	0.1 $\mu$ W (0.5 $\mu$ W max.)
Turnover temperature	Tt	+25°C $\pm 5$ °C
Temperature coefficient	$\beta$	-0.034 ppm / °C <sup>2</sup> , Typical
Quality factor	Q	20000 min.
Shunt capacitance	C0	1.05 pF, max.
Motional capacitance	C1	0.0038 pF, Typical
Capacitance ratio	$\gamma$	273, Typical
Aging (for first year)	$\Delta f/F$	$\pm 3$ ppm max. at +25°C $\pm 3$ °C
Insulation resistance	Ri	500 M $\Omega$ min. at 100V DC $\pm 15$ V
Cut		XY-Cut
Operating temperature range	To	-40°C to +85°C (Standard) -40°C to +105°C (W = Option) -40°C to +125°C (WW = Option)
Storage temperature range	Ts	-55°C to +125°C
Shock resistance	$\Delta f/F$	$\pm 5$ ppm max.
Vibration resistance	$\Delta f/F$	$\pm 5$ ppm max.
IR reflow resistance	$\Delta f/F$	$\pm 10$ ppm max.
Reflow condition		10 seconds max. at +250°C $\pm 10$ °C

(\* ) Formely 31M327(C)  
(\* ) No pattern path underneath the 31SMX

PACKAGE DATA

Item	Package	31SMX
Lid		Metal
Base		Ceramic
Sealing		Seam
Terminal		Tungsten (metalized)
Terminal plating		Gold / Nickel (surface) / (under)
RoHS		Compliant (Pb-free)