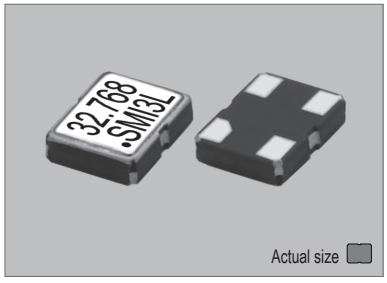
327SMO(E) & 327SMO(J) (+1.5V to +5.0V 32.768 kHz MODELS) 3.2x2.5 mm 3.2x1.5 mm

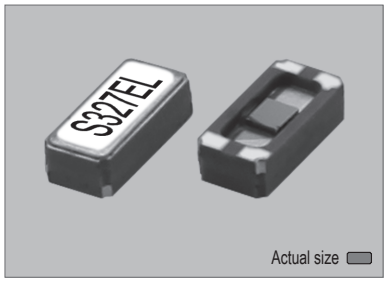
STANDARD SMD CLOCK OSCILLATORS

327SMO(E)



0.022 gm (wt.)

327SMO(J)



0.015 gm (wt.)

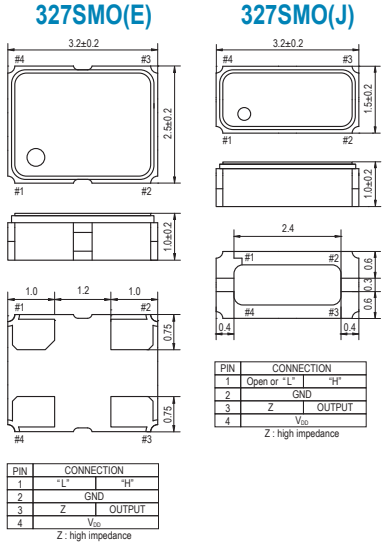
STANDARD SPECIFICATIONS

- 32.768 kHz CMOS OUTPUT
- LOW POWER CONSUMPTION
- TUNING FORK CRYSTAL BUILT-IN
- PACKAGE SIZE 3.2x2.5 & 3.2x1.5 mm

Item		Specifications	
General part number*1		327SMO(E)*1	327SMO(J)*1
Output frequency		32.768 kHz	
Frequency tolerance (at +25°C)		+30 ppm to −10 ppm (V_{DD} = +1.5V to +5.5V)	+28 ppm to −18 ppm (V_{DD} = +1.5V to +3.6V)
Frequency vs. supply voltage change		±0.5 ppm max. (V_{DD} = +1.5V to +5.5V)	±2.0 ppm max. (V_{DD} = +1.5V to +3.6V)
Temperature stability		A : +10 ppm to −120 ppm (−20°C to +70°C ref. to +25°C) B : +10 ppm to −150 ppm (−40°C to +85°C ref. to +25°C)	
Operating Conditions	Operating temperature	−40°C to +85°C (Standard)	
	Supply voltage (V_{DD})	+1.5V to +5.5V DC	+1.5V to +3.6V DC
	Stand-by control voltage (Pin#1)	V_{IH} : 90% V_{DD} min. V_{IL} : 10% V_{DD} max.*2	
Absolute Max. Ratings	Supply voltage	−0.3V to +7.0V DC	−0.3V to +4.0V DC
	Storage temperature	−55°C to +125°C	−55°C to +125°C
Input current (−40°C to +85°C)		1 µA, Typical (1.5 µA max.) at V_{DD} = +3.3V no load (Pin #1 = V_{IH})	0.8 µA, Typical (1.5 µA max.) at V_{DD} = +3.3V no load (Pin #1 = V_{IH})
Stand-by current*2		250 nA max. (no load)	0.35 µA, Typical (no load)
Output (−40°C to +85°C)	Symmetry (1/2 V_{DD} level)	40% to 60%	45% to 55%
	Rise and fall times (10% V_{DD} to 90% V_{DD} level)	200 ns max. (CL = 15 pF at +25°C)	100 ns max. (CL = 15 pF at +25°C)
	"0" Level (CL = 15 pF)	V_{OL} : 10% V_{DD} max.	
	"1" Level (CL = 15 pF)	V_{OH} : 90% V_{DD} min.	
	Load	15 pF max. (CMOS)	
Disable delay time		100 ns max.	
Enable delay time		1 sec max. (V_{DD} = +3.3V at +25°C)	
Start-up time (−40°C to +85°C)		1 sec max. (V_{DD} = +3.3V)	
Aging (at +25°C ±3°C for first year)		±5 ppm max.	±3 ppm max.
Reflow condition		+250°C ±10°C for 10 seconds +170°C ±10°C for 1 to 2 minutes (preheating)	

(*1) Final part number to be assigned with package type, input voltage and frequency stability.
e.g. 327SMO(1.8VE)A
(*2) Internal crystal oscillation to be halted (Pin#1 = V_{IL})

327SMO(E)



PIN	CONNECTION	
1	"L"	"H"
2	GND	
3	Z	OUTPUT
4	V_{DD}	

Z : high impedance

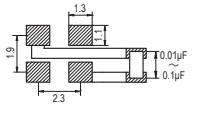
327SMO(J)

PIN	CONNECTION	
1	Open or "L"	"H"
2	GND	
3	Z	OUTPUT
4	V_{DD}	

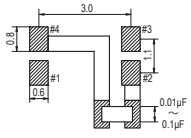
Z : high impedance

SOLDERING PATTERN

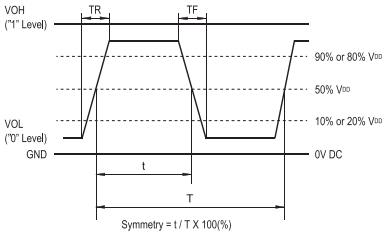
327SMO(E)



327SMO(J)



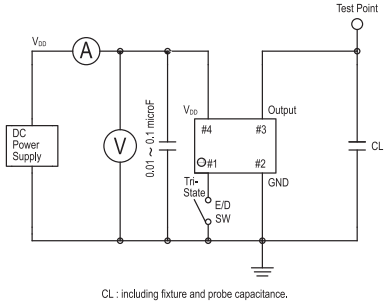
OUTPUT WAVEFORM



PACKAGE DATA

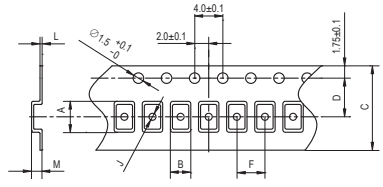
Item \ Package	327SMO(E) & 327SMO(J)
Lid	Metal
Base	Ceramic
Sealing	Seam
Terminal	Tungsten (metalized)
Terminal plating	Gold / Nickel (surface) / (under)
RoHS	Compliant (Pb-free)

TEST CIRCUIT



CL : including fixture and probe capacitance.

TAPE SPECIFICATIONS



327SMO(E)

A	B	C	D	F	J	L	M	Reel Dia.	Qty/Reel
3.4	2.7	8.0	3.5	4.0	1.0	0.25	1.4	178	1000pcs

327SMO(J)

A	B	C	D	F	J	L	M	Reel Dia.	Qty/Reel
3.4	1.7	8.0	3.5	4.0	1.0	0.25	1.4	180	3000pcs