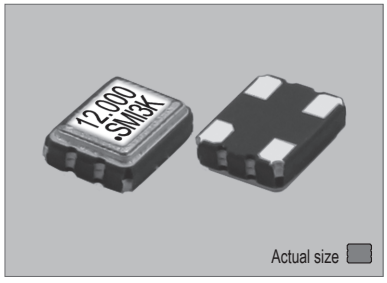
32SMO (+1.8V, +2.5V, +3.0V or +3.3V FIXED MODELS) 3.2x2.5 mm

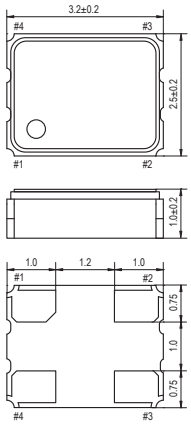
STANDARD SMD CLOCK OSCILLATORS

32SMO



0.025gm (wt.)

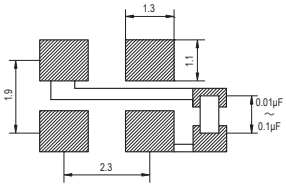
32SMO



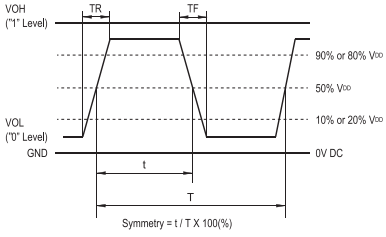
PIN	CONNECTION	
1	"L"	OPEN or "H"
2	GND	
3	Z	OUTPUT
4	V_{DD}	

Z : high impedance

SOLDERING PATTERN

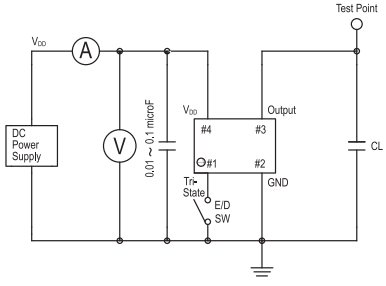


OUTPUT WAVEFORM



Symmetry = t / T X 100(%)

TEST CIRCUIT



CL : including fixture and probe capacitance.

STANDARD SPECIFICATIONS

- WIDE FREQUENCY RANGE
- CMOS OUTPUT
- PACKAGE SIZE 3.2x2.5 mm

Item		Specifications	
General part number		32SMO*1	
Frequency range		1.500 MHz to 135.000 MHz	133.000 MHz to 170.000 MHz
Frequency stability (over all conditions)		32SMO(A) : ±100 ppm over −20°C to +70°C 32SMO(B) : ±50 ppm over −20°C to +70°C 32SMO(C) : ±30 ppm over −20°C to +70°C 32SMO(D) : ±25 ppm over −20°C to +70°C 32SMO(E) : ±20 ppm over −20°C to +70°C 32SMO(AW) : ±100 ppm over −40°C to +85°C 32SMO(BW) : ±50 ppm over −40°C to +85°C 32SMO(CW) : ±30 ppm over −40°C to +85°C 32SMO(DW) : ±25 ppm over −40°C to +85°C	
Operating Conditions	Operating temperature	−20°C to +70°C (Standard) −40°C to +85°C (W = Option) −40°C to +105°C (WW = Option) 1.500 MHz to 80.000 MHz −40°C to +125°C (WWW = Option) 1.500 MHz to 80.000 MHz	
	Supply voltage (V_{DD})	+1.8V, +2.5V, +3.0V or +3.3V DC ±5%	+2.5V, +3.0V or +3.3V DC ±5%
	Stand−by control voltage (Pin#1)	V_{IH} : 70% V_{DD} min. V_{IL} : 30% V_{DD} max.*2	
Absolute Max. Ratings	Supply voltage	−0.3V to +4.0V DC	
	Storage temperature	−55°C to +125°C	
Input current (max. mA) (Pin#1 = Open or V_{IH}) No load			
Stand−by current*2		10 μA max. (Pin#1 = V_{IL}) ··· −40°C to +85°C 20 μA max. (Pin#1 = V_{IL}) ··· −40°C to +105°C / +125°C	
Output (−40°C to +85°C)	Symmetry	45% to 55% at 1/2 V_{DD} level	
	Rise and fall times	6 ns max. (10% V_{DD} to 90% V_{DD} level)	3 ns max. (10% V_{DD} to 90% V_{DD} level)
	"0" Level	V_{OL} : 10% V_{DD} max.	
	"1" Level	V_{OH} : 90% V_{DD} min.	
	Load	15 pF max. (CMOS)	
Disable delay time		200 ns max.	
Enable delay time		10 ms max.	
Start−up time		10 ms max.	
SSB phase noise (at V_{DD} = +3.3V & 133.000 MHz)		−135 dBc / Hz, Typical at 1 kHz offset −158 dBc / Hz, Typical at 1 MHz offset	
RMS jitter (12 kHz to 20.000 MHz band)		500 fs max. (80 fs, Typical at 133.000 MHz)	
Aging		±5 ppm max. at +25°C ±3°C for first year	
Reflow condition		+250°C ±10°C for 10 seconds +170°C ±10°C for 1 to 2 minutes (preheating)	

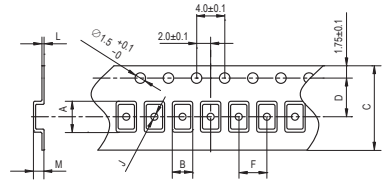
V_{DD}	Frequency						
	1.0M+	10M+	40M+	75M+	85M+	101M+	135M+
+1.8V	1.5	2.0	5.0	7.0	7.5	10	n.a.
+2.5V	2.0	2.3	6.0	8.0	8.5	12	25.5
+3.3V	2.4	3.5	7.0	9.0	10.5	15	29.5

(*1) Final part number to be assigned with package type, input voltage, frequency stability, operating temperature and frequency.
e.g. 32SMO(1.8VD) 24.000MHz
(*2) Internal crystal oscillation to be halted (Pin#1 = V_{IL})

PACKAGE DATA

Item \ Package	32SMO
Lid	Metal
Base	Ceramic
Sealing	Seam
Terminal	Tungsten (metalized)
Terminal plating	Gold / Nickel (surface) / (under)
RoHS	Compliant (Pb−free)

TAPE SPECIFICATIONS



A	B	C	D	F	J	L	M	Reel Dia.	Qty/Reel
3.5	2.8	8.0	3.5	4.0	1.0	0.25	1.4	180	1000pcs 2000pcs