

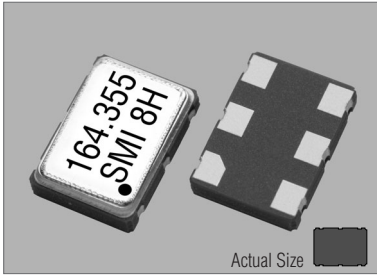
# Low Voltage Differential Signaling Oscillators

87SMO & 88SMO (+3.3V LVDS MODELS)

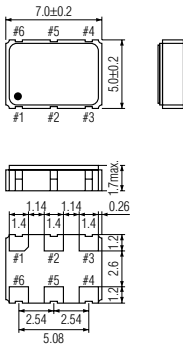
STANDARD SMD CLOCK OSCILLATORS

CLK OSC

## 87SMO & 88SMO



## 87SMO & 88SMO



### 87SMO

PIN	CONNECTION
1	"L" OPEN or "H"
2	N.C.
3	GND
4	Z OUTPUT
5	Z C-OUTPUT
6	V <sub>DD</sub>

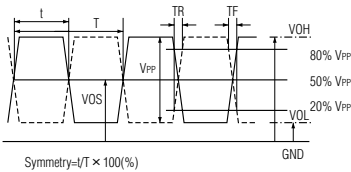
Z : high impedance

### 88SMO

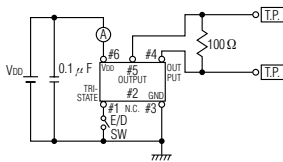
PIN	CONNECTION
1	N.C.
2	"L" OPEN or "H"
3	GND
4	Z OUTPUT
5	Z C-OUTPUT
6	V <sub>DD</sub>

Z : high impedance

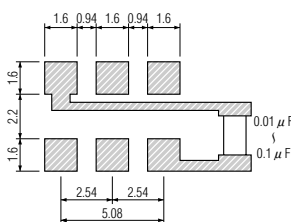
## OUTPUT WAVEFORM



## TEST CIRCUIT



## SOLDERING PATTERN



## STANDARD SPECIFICATIONS

LVDS

Item	Specifications	Condition
Generic part number	87SMO or 88SMO*1	
Frequency range	10.9000 MHz to 670.000 MHz	
Frequency stability	87SMO(B) : ±50 ppm 88SMO(B) : ±50 ppm 87SMO(C) : ±30 ppm 88SMO(C) : ±30 ppm 87SMO(D) : ±25 ppm 88SMO(D) : ±25 ppm 87SMO(E) : ±20 ppm 88SMO(E) : ±20 ppm	• For all supply voltages, load changes, shock, vibration and temperature.
Operating Conditions		
Operating temperature	-10°C to +70°C -40°C to +85°C (W)	• Standard temperature range • Extended temperature range
Input voltage(V <sub>DD</sub> )	+3.3V DC ±10%	
Stand-by control voltage	V <sub>IH</sub> : +2.0V min. V <sub>IL</sub> : +0.8V max.	• Referenced to Ground • Referenced to Ground
Absolute Max. Ratings		
Supply voltage	-0.5V to +5.0V	
Storage temperature	-55°C to +125°C	
Input current	80 mA max.	
Stand-by current*2	20 μA max.	
Output		
Symmetry	47% to 53%	• Referenced to 50% of amplitude or crossing point
Rise and fall times	230 pS max.	
"0" level	V <sub>OL</sub> : +0.90V min.	
"1" level	V <sub>OH</sub> : +1.60V max.	
Load	100 Ω (OUT-OUTN)	
Waveform	LVDS	• V <sub>th</sub> is 20% and 80% of wave form
Differential output voltage	250 to 450 mV	
Output offset voltage	1.125 to 1.375 V	
Differential output Error	50 mV max.	
Enable time	10 nS max.	• Time for output to reach a logic state
Disable time	10 nS max.	• Time for output to reach a high Z state
Startup time	5 mS max.	• Measured from the time V <sub>DD</sub> = 3.0V
Enable/Disable Internal Pull-up	50 KΩ min.	• To V <sub>DD</sub>
Output short circuit current	-20 mA max.	• V <sub>out</sub> = 0.0V
RMS jitter	0.6 pS max. 2.8 pS max.	• 12 kHz to 20 MHz from F <sub>nominal</sub> • 10 Hz to 20 MHz from F <sub>nominal</sub>
Aging	±5 ppm max.	at +25°C ±3°C for first year
Reflow condition		+260°C ±10°C for 10 seconds +175°C ±10°C for 1 to 2 minutes (preheating)

(※1)Final exact part number to be determined with frequency, frequency stability, operating temperature and input voltage.

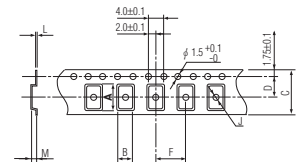
e.g. 87SMO(3.3VE) 139.264 MHz

(※2) Internal crystal oscillation to be halted.

## PACKAGE DATA

Item	Package	87SMO & 88SMO
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
7.5	5.5	16.0	7.5	8.0	2.0	0.3	2.2	245	1000pcs