

PRODUCT CODIFICATION

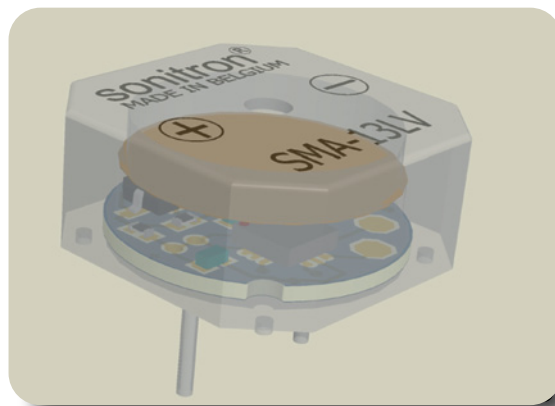
SMA ↓ Sonitron Multi- Application	I ↓ Intermittent	- 13 17 21 24 30 ↓ Square diameter (mm)	L LV ↓ L: Loud LV: Low voltage	C T ↓ C: C-MOS T: Transistor	P7.5 P10 P15 P17.5 P20.32 S ↓ P: Pin distance (in mm) S: SMD terminals
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LIST OF AVAILABLE PRODUCT TYPES

Version	Standard (°°)	Loud (L)	Transistor (LT)	Low Current (LC)	Intermittent (I) (*)	Low Voltage (LV)
SMA-13 series	SMA-13 P7.5 SMA-13 P10 SMA-13 S		SMA-13LT P7.5 SMA-13LT P10 SMA-13LT S	SMA-13LC P7.5 SMA-13LC P10 SMA-13LC S		SMA-13LV P7.5 SMA-13LV P10 SMA-13LV S
SMA-17 series	SMA-17 P7.5 SMA-17 P10 SMA-17 S	SMA-17L P7.5 SMA-17L P10 SMA-17L S	SMA-17LT P7.5 SMA-17LT P10 SMA-17LT S	SMA-17LC P7.5 SMA-17LC P10 SMA-17LC S		
SMA-21 series	SMA-21 P10 SMA-21 P15 SMA-21 P17.5 SMA-21 S	SMA-21L P10 SMA-21L P15 SMA-21L P17.5 SMA-21L S	SMA-21LT P10 SMA-21LT P15 SMA-21LT P17.5 SMA-21LT S	SMA-21LC P10 SMA-21LC P15 SMA-21LC P17.5 SMA-21LC S		SMA-21LV P10 SMA-21LV P15 SMA-21LV S
SMA-24 series	SMA-24 P10 SMA-24 P15 SMA-24 P17.5 SMA-24 P20.32 SMA-24 S	SMA-24L P10 SMA-24L P15 SMA-24L P17.5 SMA-24L P20.32 SMA-24L S			SMAI-24 P10 SMAI-24 P15 SMAI-24 P17.5 SMAI-24 P20.32 SMAI-24 S	
SMA-30 series	SMA-30 P15 SMA-30 P17.5 SMA-30 P20.32 SMA-30 S	SMA-30L P15 SMA-30L P17.5 SMA-30L P20.32 SMA-30L S				

* When the third pin of SMAI-24 is left open, the audible signal is intermittent. When the third pin is connected to the (-), the audible signal is continuous. When the third pin is connected to the (+), there is no sound (=stop).

Order options and packaging information see page 52, 53.





SMAT SERIES

The SMAT transducers are specifically developed to meet various requirements, such as loud sound pressure level, mounting methods, connection possibilities and dimensions. The transducers do not have a built-in oscillator. The drive frequency must be generated with electronics outside the transducer. Recommended drive circuits are described in this catalogue. Our transducers produce a highly reliable audible tone signal, giving either an extremely clear and penetrating tone or a soft sound for non-aggressive signals. They are available in five sizes: 13mm, 17mm, 21mm, 24mm and 30mm.

ADVANTAGES & APPLICATIONS

ADVANTAGES :

- Octagonal form
- Models with different pin pitches
- Light but solid construction
- Not fixed working frequency
- Easily mountable
- SMAT-13 and SMAT-17 for limited space applications
- SMD models with heat resistant labels for protection during re-flow soldering
- Automatic pick & place

APPLICATIONS :

- Alarms
- Gas & metal detectors
- Measuring & weighing equipment
- Medical instrumentation
- Timers & clocks
- Instrumentation & control systems
- Copiers
- Automobiles & trucks
- Games & toys
- Cash registers

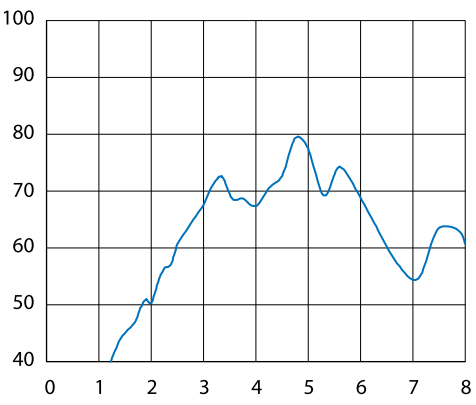
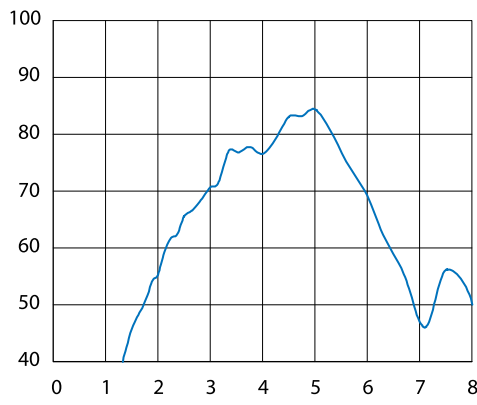
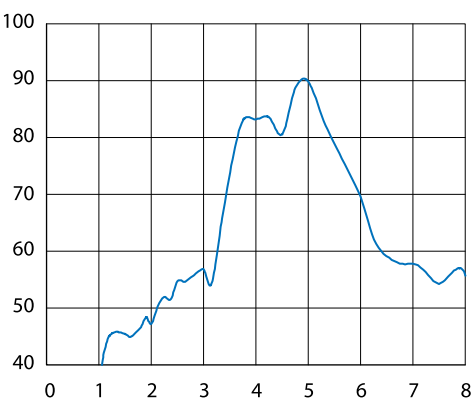
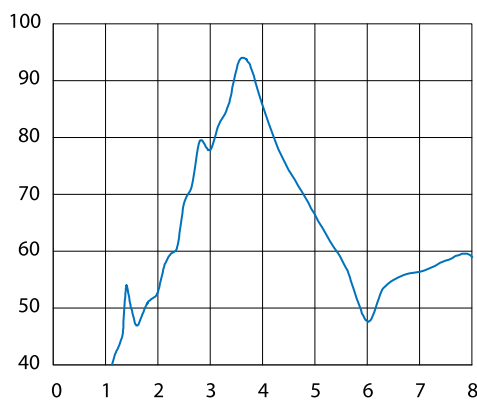
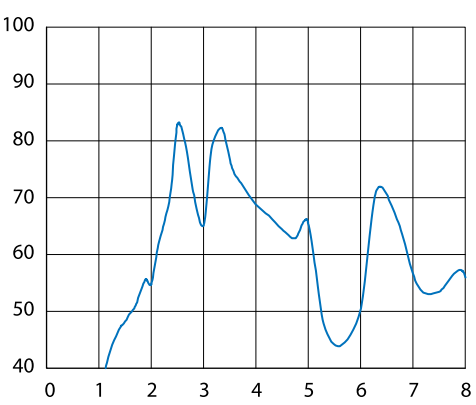
SPECIFICATIONS

Model	SPL * (dB(A))	Frequency Range (Hz)	Capacitance (+/-30%) nF)	Operating voltage (VAC pp)	Weight (g)
SMAT-13	See graph	800-5000	7.8	0 to 30	1
SMAT-17	See graph	800-5000	17.5	0 to 30	2
SMAT-21	See graph	600-5000	12.4	0 to 30	2.5
SMAT-24	See graph	400-5000	18.6	0 to 30	4
SMAT-30	See graph	300-5000	25	0 to 30	5

Operating temperature	-20°C to +70°C
Storage temperature	-40°C to +85°C
Life time (@ 21°C)	@12Vpp continuous use at resonance frequency, tested on maximum sound pressure (eg. SMAT-21 @ 3.75 kHz). Life expectations: min.1000 hours. All tests are made @ 20°C mounted on PCB (expected life time curve in addendum).
Case material	ABS (UL rating: 94 HB) for pin-versions, SMAT-13/21/30 PBT (UL rating: 94 HB) for pin versions, SMAT-17/24 PPS (UL rating: 94 V0/5V) for SMD-versions, SMAT-13/17/21/24/30
Standard colour of case	Grey

* All measurements are made in free air @ 21°C @ 30 cm @10 Vpp (square wave). The test buzzer is soldered on a pcb board with dimensions of 24 cm x 11 cm.

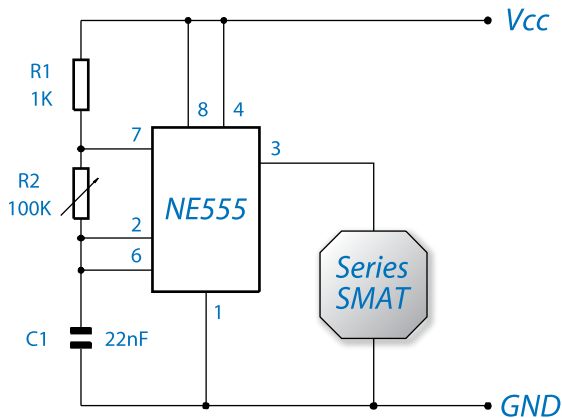
ELECTRICAL PARAMETERS

Model	SMAT-13	SMAT-17
Sound pressure vs. frequency	dB (A)  kHz	dB (A)  kHz
Model	SMAT-21	SMAT-24
Sound pressure vs. frequency	dB (A)  kHz	dB (A)  kHz
Model	SMAT-30	Peak hold frequency sweep from 1 to 8kHz with a square wave signal of 10Vpp. (precision of frequency: +/- 15%)
Sound pressure vs. frequency	dB (A)  kHz	

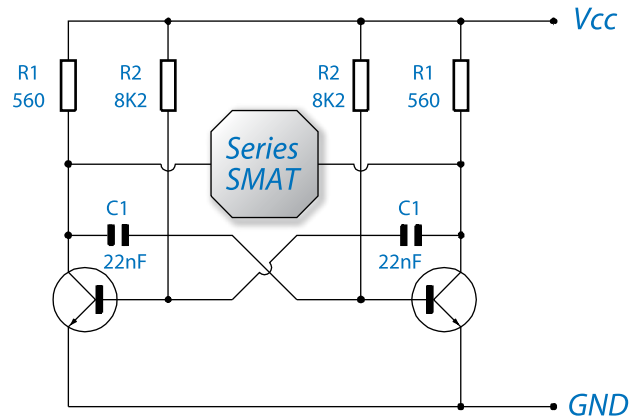
All measurements are made @ 30 cm in free air @ 21°C.

DRIVE CIRCUITS (typical circuits)

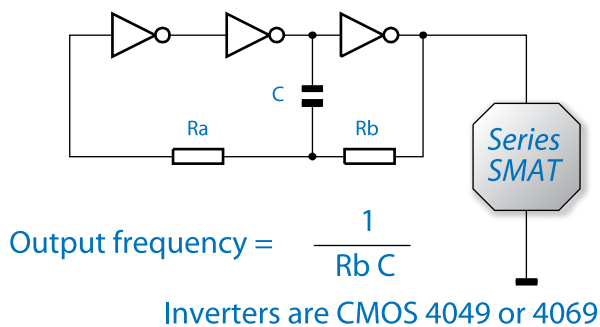
IC Oscillation Circuit



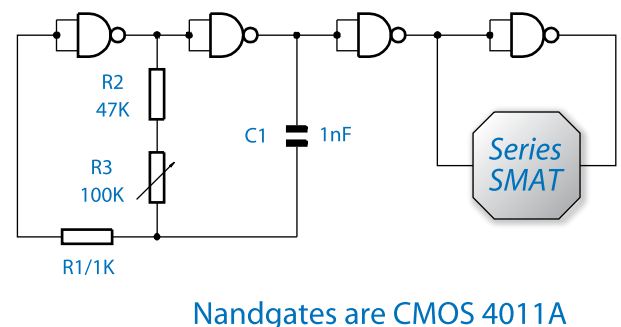
Multivibrator Circuit



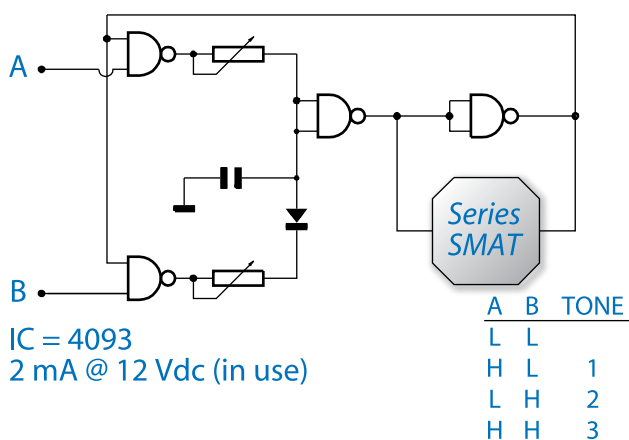
Inverter Oscillator



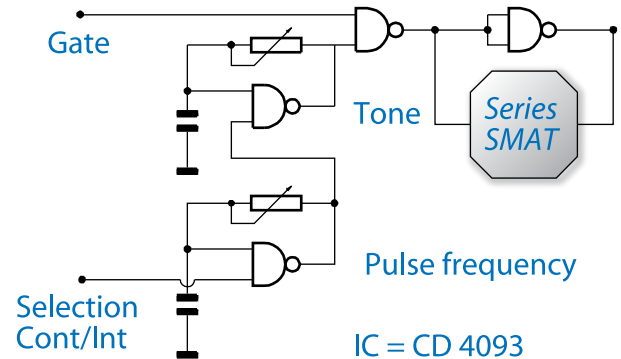
Nandgate Oscillator



5 Nandgate Oscillator - 3 tones



Tone Generator - CMOS - Gate Multifunction



When the transducers are used in a drive circuit at one single frequency, the designer should bear in mind that the precision of the frequency, as mentioned on the graph "sound pressure vs. Frequency" is +/- 15%. We therefore recommend to test the sound pressure level with the transducer connected to the final drive circuit.

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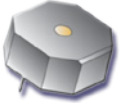
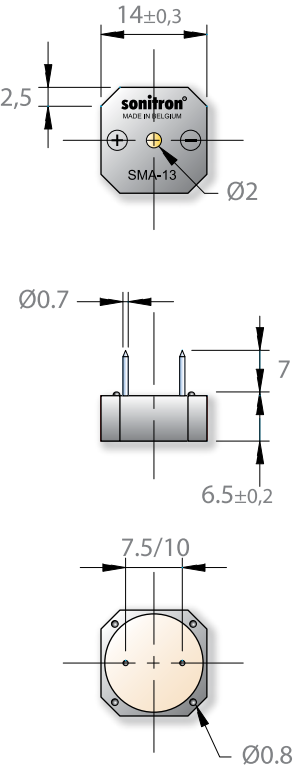
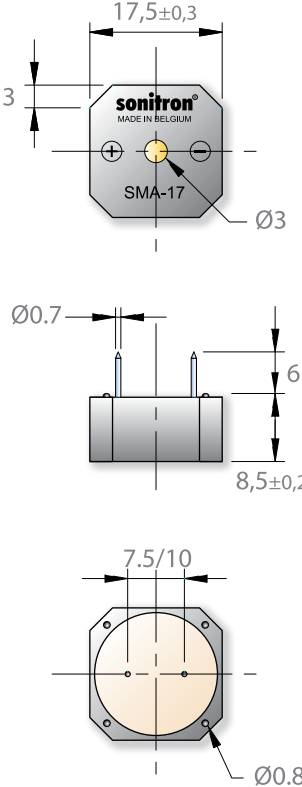
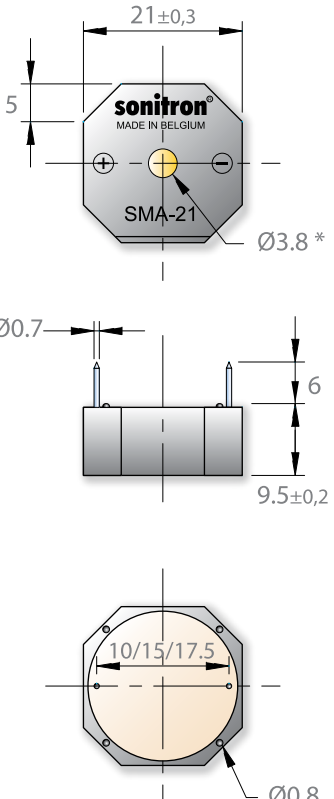

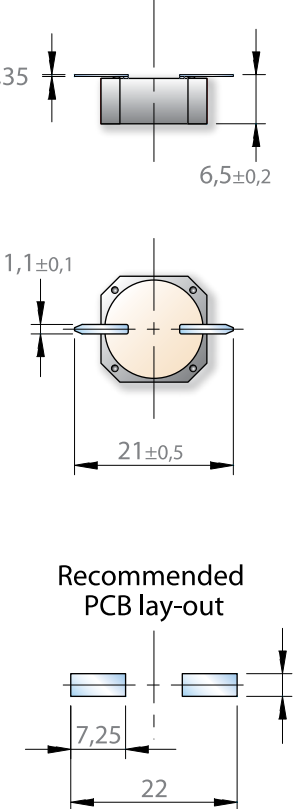
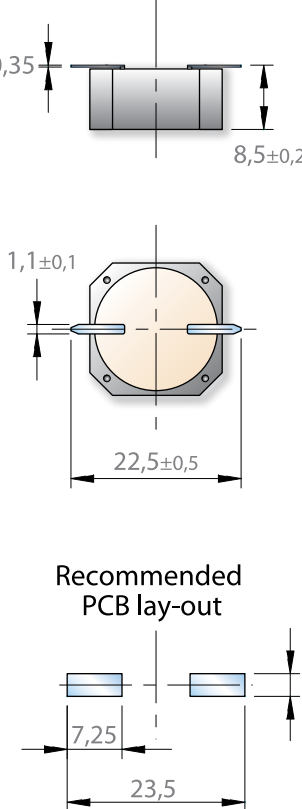
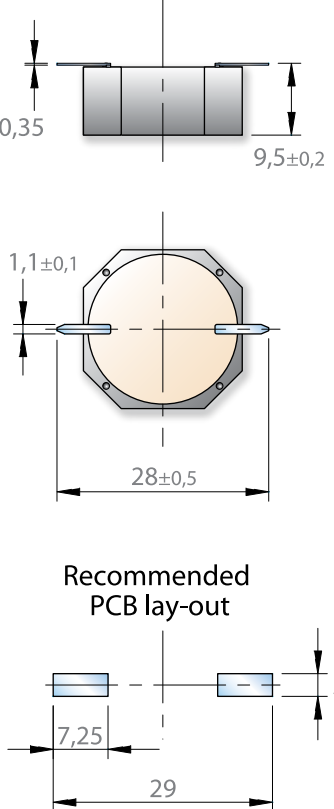
<p>SMA</p> <p>↓</p> <p>Sonitron Multi- Application</p>	<p>T</p> <p>↓</p> <p>Transducer</p>	<p>13 17 21 24 30</p> <p>↓</p> <p>Square diameter (mm)</p>	<p>P7.5 P10 P15 P17.5 P20.32 S</p> <p>↓</p> <p>P: Pin distance (in mm) S: SMD terminals</p>
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LIST OF AVAILABLE PRODUCT TYPES

<p>SMAT-13 P7.5 SMAT-13 P10 SMAT-13 S</p>	<p>SMAT-17 P7.5 SMAT-17 P10 SMAT-17 S</p>	<p>SMAT-21 P10 SMAT-21 P15 SMAT-21 P17.5 SMAT-21 S</p>	<p>SMAT-24 P10 SMAT-24 P15 SMAT-24 P17.5 SMAT-24 P20.32 SMAT-24 S</p>	<p>SMAT-30 P15 SMAT-30 P17.5 SMAT-30 P20.32 SMAT-30 S</p>
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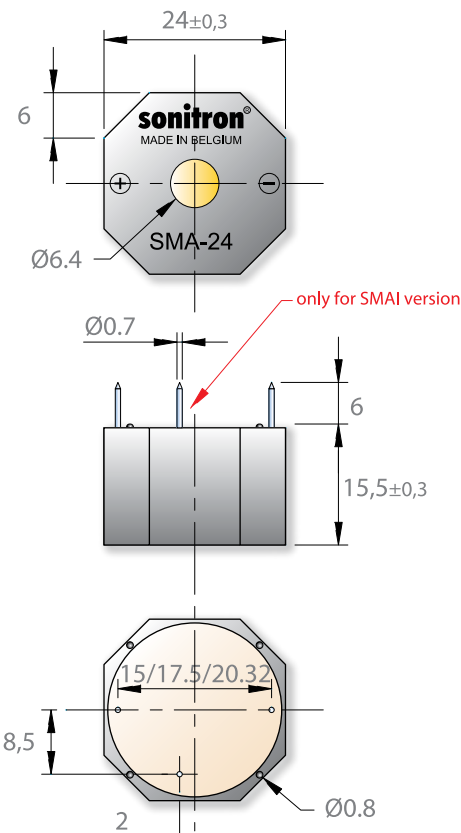
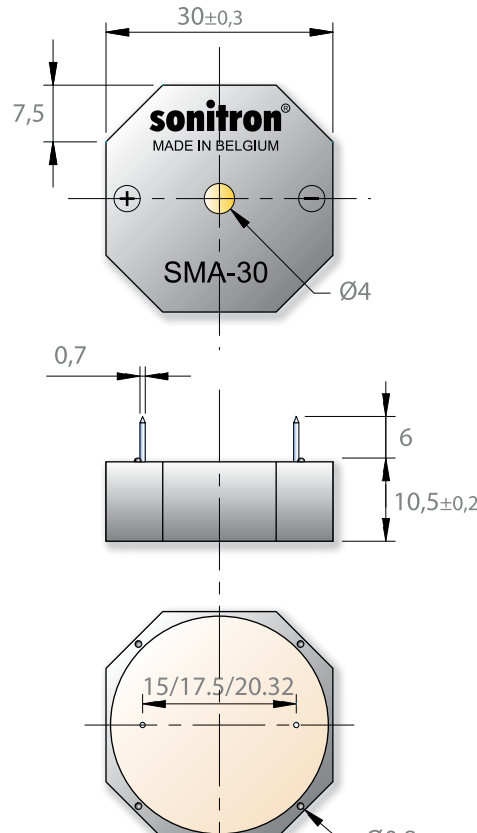

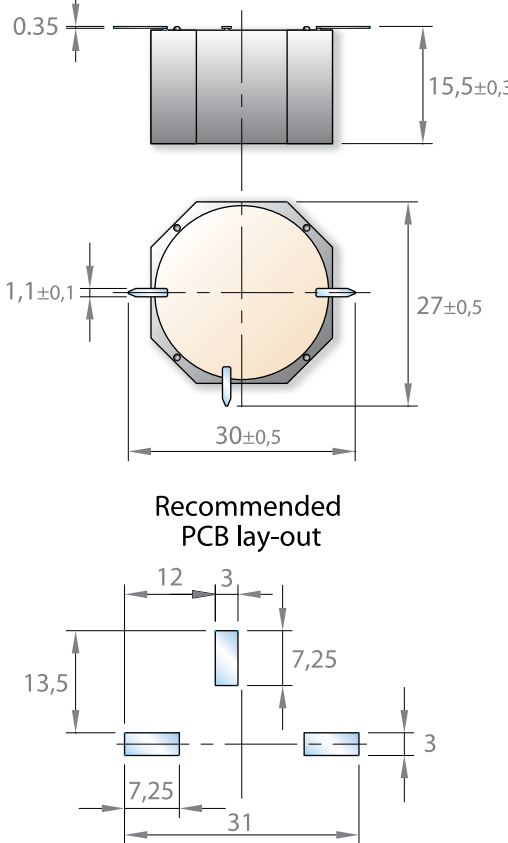
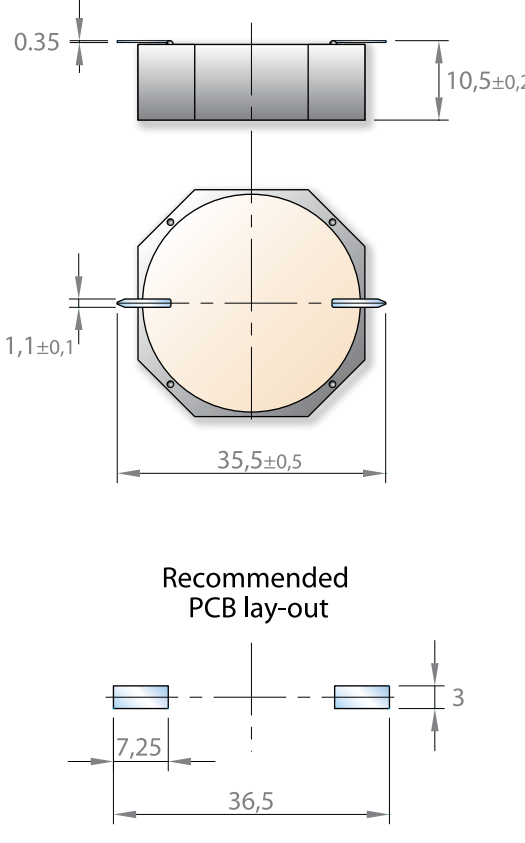


DIMENSIONS SMA & SMAT-SERIES (All dimensions are in mm)

<p>Pin version</p> 	<p>SMA(T)-13</p> 	<p>SMA(T)-17</p> 	<p>SMA(T)-21</p> 
<p>SMD version</p> 	<p>SMA(T)-13</p> 	<p>SMA(T)-17</p> 	<p>SMA(T)-21</p> 

* The sound hole of SMA-21 LV has a diameter of 3 mm, whereas the other SMA-21 types have a 3,8 mm sound hole.

(All dimensions are in mm)

<p>Pin version</p> 	<p>SMA(T)-24</p> 	<p>SMA(T)-30</p> 
<p>SMD version</p> 	<p>SMA(T)-24</p>  <p>Recommended PCB lay-out</p>	<p>SMA(T)-30</p>  <p>Recommended PCB lay-out</p>