

# RoHS Compliant SMD Buzzers & Transducers



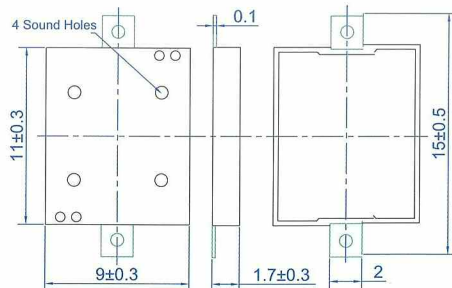
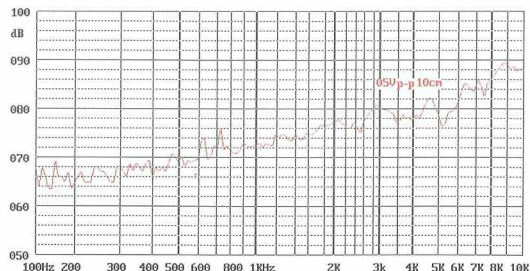
### CSPT11A



Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N42  
 Termination: Sn plated Brass

Part Number	<b>CSPT11A05-4.1F</b>	
Rated Voltage (Vp-p)	5	
Operating Voltage (Vp-p)	1~20	
*Rated Current (mA)	2mA max.	
Capacitance at 100Hz 1V (pF)	15000 ± 30%	
*Sound Output at 10cm (dB)	73 min.	
Resonant Frequency (Hz)	4100 ± 500	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	0.2	

\*Value applying at rated voltage, rated frequency



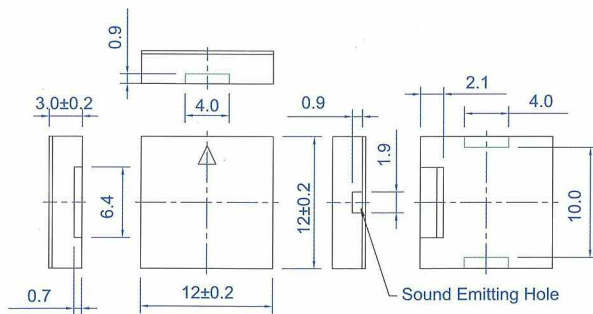
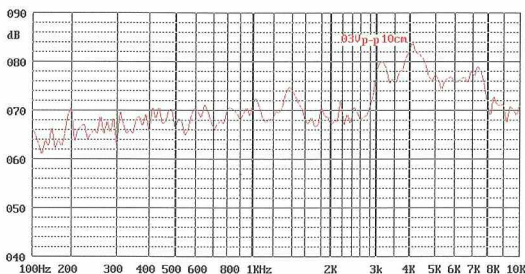
### CSPT12A



Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N42  
 Termination: Sn plated Brass

Part Number	<b>CSPT12A03-4.0F</b>	
Rated Voltage (Vp-p)	3	
Operating Voltage (Vp-p)	1~20	
*Rated Current (mA)	1 max.	
Capacitance at 100Hz 1V (pF)	15000 ± 30%	
*Sound Output at 10cm (dB)	76 min.	
Resonant Frequency (Hz)	4000 ± 500	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	0.8	

\*Value applying at rated voltage, rated frequency



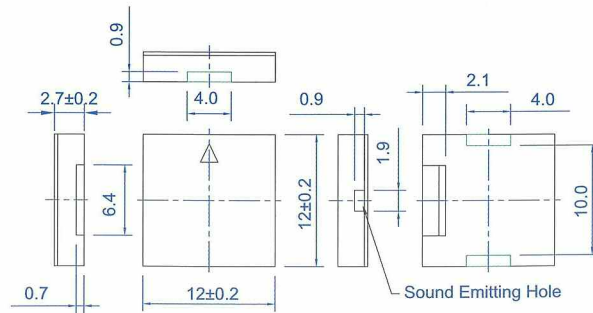
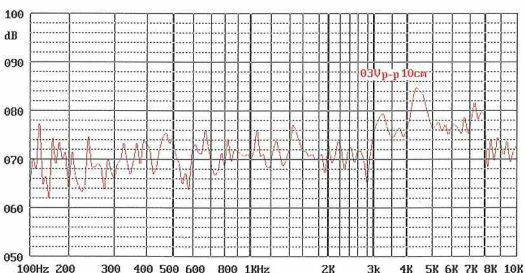
### CSPT12B



Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N42  
 Termination: Sn plated Brass

Part Number	<b>CSPT12B03-4.0F</b>	
Rated Voltage (Vp-p)	3	
Operating Voltage (Vp-p)	1~20	
*Rated Current (mA)	1 max.	
Capacitance at 100Hz 1V (pF)	15000 ± 30%	
*Sound Output at 10cm (dB)	73 min.	
Resonant Frequency (Hz)	4000 ± 500	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	0.8	

\*Value applying at rated voltage, rated frequency



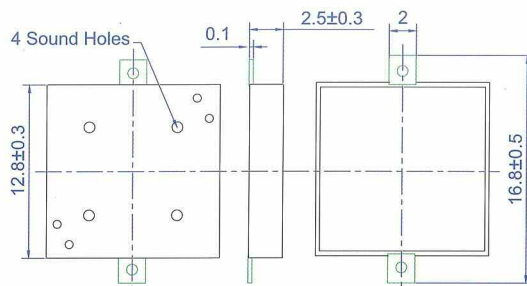
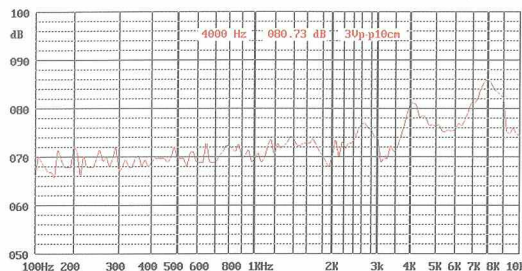
### CSPT13A

Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N42  
 Termination: Sn plated Brass



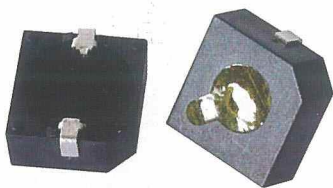
Part Number	<b>CSPT13A03-4.0F</b>	
Rated Voltage (Vp-p)	3	
Operating Voltage (Vp-p)	1~20	
*Rated Current (mA)	1 max.	
Capacitance at 100Hz 1V (pF)	15000 ± 30%	
*Sound Output at 10cm (dB)	75 min.	
Resonant Frequency (Hz)	4000 ± 500	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	0.9	

\*Value applying at rated voltage, rated frequency



### CSPT15A

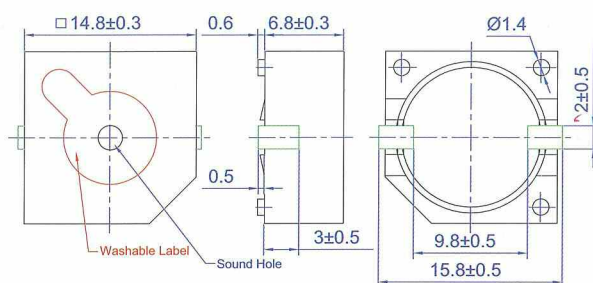
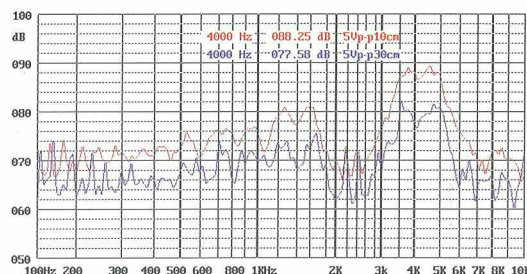
Case: PPS A7-03A  
 Vibrating Disc: Ni Alloy Disc N42  
 Termination: Sn plated Brass



**CSPT15A05-4.0-1F**  
 Washable sealed with label

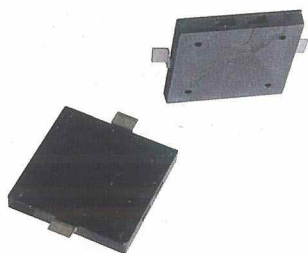
Part Number	<b>CSPT15A05-4.0F</b>	
Rated Voltage (Vp-p)	5	
Operating Voltage (Vp-p)	1~20	
*Rated Current (mA)	2 max.	
Capacitance at 100Hz 1V (pF)	15000 ± 30%	
*Sound Output at 10cm (dB)	80 min.	
Resonant Frequency (Hz)	4000 ± 500	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	1.95	

\*Value applying at rated voltage, rated frequency



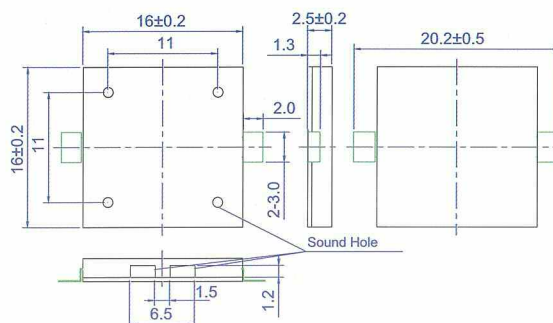
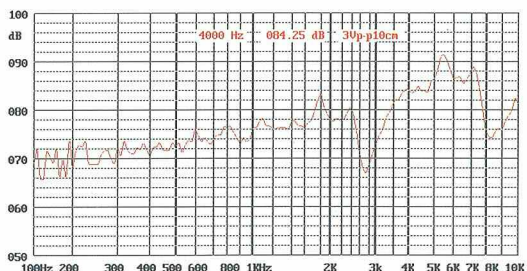
### CSPT16A

Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N42  
 Termination: Sn plated Ni Alloy



Part Number	<b>CSPT16A03-4.0F</b>	
Rated Voltage (Vp-p)	3	
Operating Voltage (Vp-p)	1~20	
*Rated Current (mA)	1 max.	
Capacitance at 100Hz 1V (pF)	15000 ± 30%	
*Sound Output at 10cm (dB)	80 min.	
Resonant Frequency (Hz)	4000 ± 500	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	1	

\*Value applying at rated voltage, rated frequency

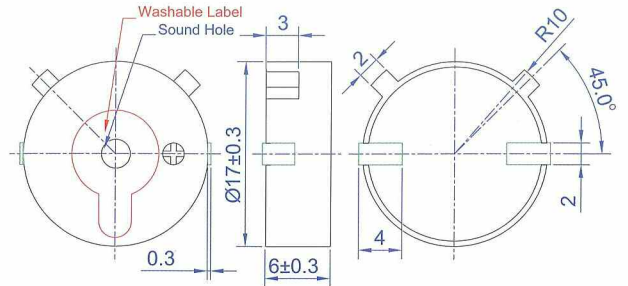
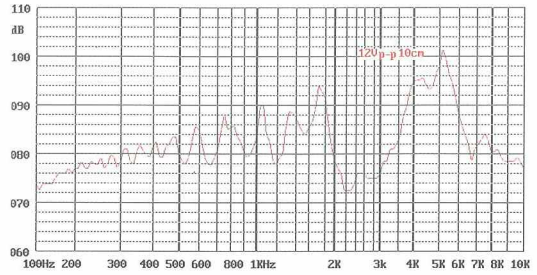


### CSPT17A



Case: PPS A7-03A  
 Vibrating Disc: Ni Alloy Disc N42  
 Termination: Sn plated Brass

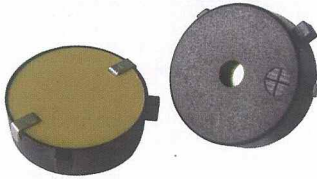
**CSPT17A12-4.0-1F**  
 Washable sealed with label



Part Number	CSPT17A12-4.0F	
Rated Voltage	(Vp-p)	12
Operating Voltage	(Vp-p)	1~25
*Rated Current	(mA)	5 max.
Capacitance at 100Hz 1V	(pF)	15000 ± 30%
*Sound Output at 10cm	(dB)	90 min.
Resonant Frequency	(Hz)	4000 ± 500
Operating Temperature	(°C)	-30~+85
Storage Temperature	(°C)	-40~+90
Weight	(g)	1.6

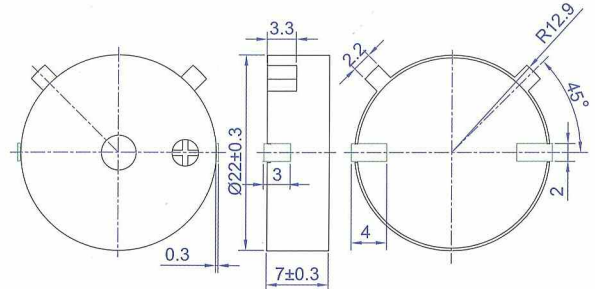
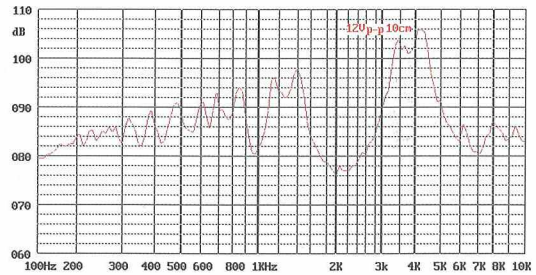
\*Value applying at rated voltage, rated frequency

### CSPT22A



Case: PPS A7-03A  
 Vibrating Disc: Ni Alloy Disc N42  
 Termination: Sn plated Brass

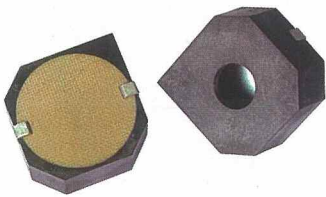
**CSPT22A12-4.0-1F**  
 Washable sealed with label



Part Number	CSPT22A12-4.0F	
Rated Voltage	(Vp-p)	12
Operating Voltage	(Vp-p)	1~30
*Rated Current	(mA)	3 max.
Capacitance at 100Hz 1V	(pF)	15000 ± 30%
*Sound Output at 10cm	(dB)	90 min.
Resonant Frequency	(Hz)	4000 ± 500
Operating Temperature	(°C)	-30~+85
Storage Temperature	(°C)	-40~+90
Weight	(g)	2.8

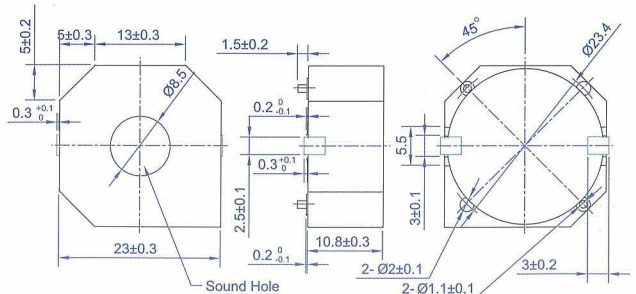
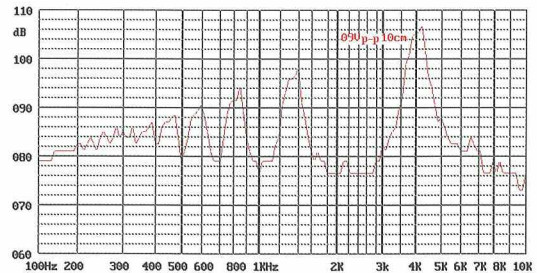
\*Value applying at rated voltage, rated frequency

### CSPT23A



Case: PPS A7-03A  
 Vibrating Disc: Ni Alloy Disc N42  
 Termination: Sn plated Brass

**CSPT23A09-4.0-1F**  
 Washable sealed with label

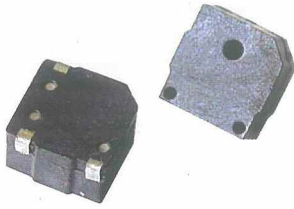


Part Number	CSPT23A09-4.0F	
Rated Voltage	(Vp-p)	9
Operating Voltage	(Vp-p)	1~25
*Rated Current	(mA)	5 max.
Capacitance at 100Hz 1V	(pF)	12000 ± 30%
*Sound Output at 10cm	(dB)	100 min.
Resonant Frequency	(Hz)	4000 ± 500
Operating Temperature	(°C)	-30~+85
Storage Temperature	(°C)	-40~+90
Weight	(g)	3

\*Value applying at rated voltage, rated frequency

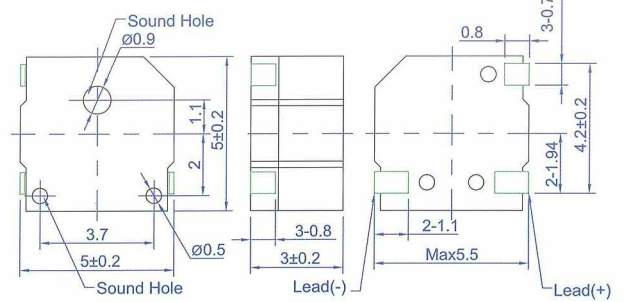
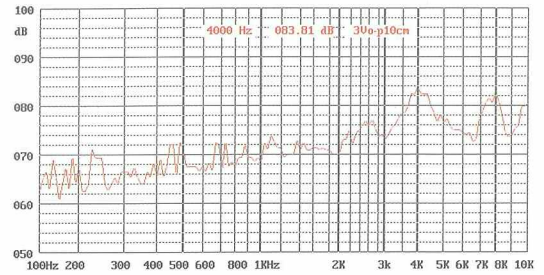
### CSET05A

Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N50  
 Termination: Sn plated Brass



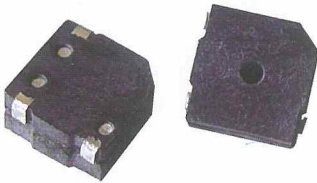
Part Number	CSET05A03-17-4.0F	
*Rated Voltage (Vo-p)	3	
Operating Voltage (Vo-p)	2~4	
◆ Rated Current (mA)	90 max.	
Coil Resistance (ohm)	17 ± 3	
◆ Sound Output at 10cm (dB)	75 min.	
Resonant Frequency (Hz)	4000	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	0.5	

\*Other Rated Voltage is available ◆ Value applying at rated voltage, rated frequency



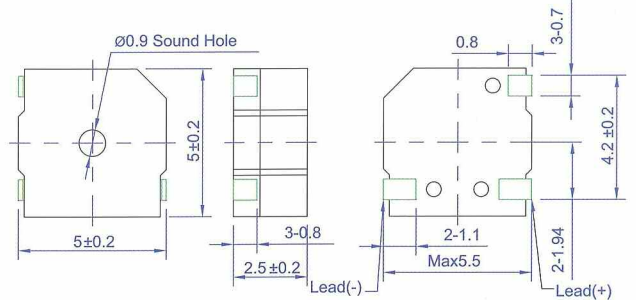
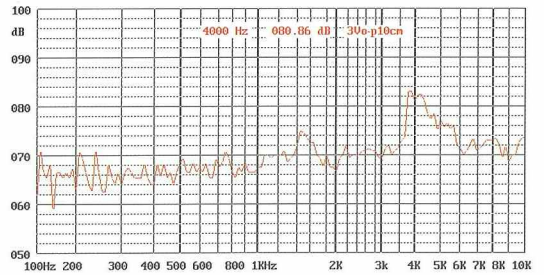
### CSET05B

Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N50  
 Termination: Sn plated Brass



Part Number	CSET05B03-17-4.0F	
*Rated Voltage (Vo-p)	3	
Operating Voltage (Vo-p)	2~4	
◆ Rated Current (mA)	90 max.	
Coil Resistance (ohm)	17 ± 3	
◆ Sound Output at 10cm (dB)	75 min.	
Resonant Frequency (Hz)	4000	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	0.5	

\*Other Rated Voltage is available ◆ Value applying at rated voltage, rated frequency



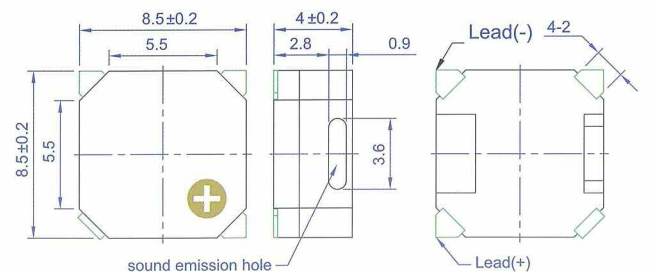
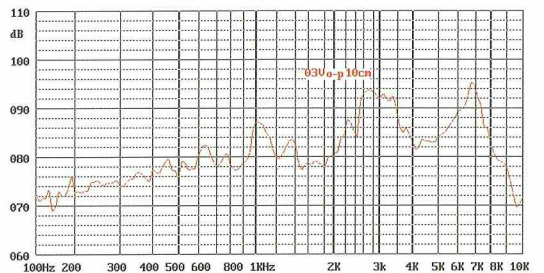
### CSET8.5A

Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N50  
 Termination: Sn plated Brass



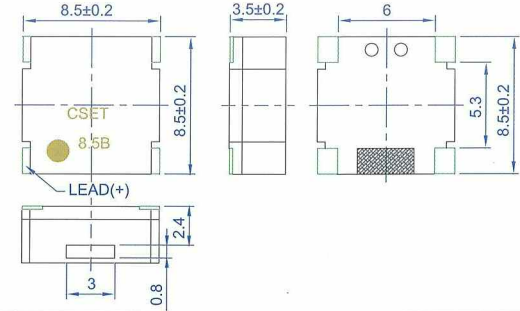
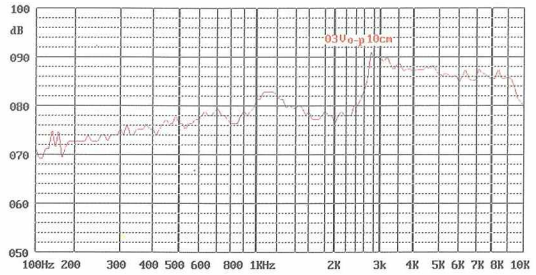
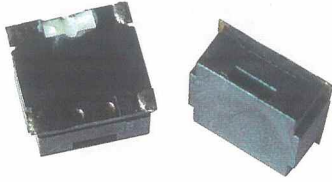
Part Number	CSET8.5A3.6-16-2.7F	CSET8.5A05-40-2.7F
*Rated Voltage (Vo-p)	3.6	5
Operating Voltage (Vo-p)	2~4	4~7
◆ Rated Current (mA)	90 max.	80 max.
Coil Resistance (ohm)	16 ± 2	40 ± 4
◆ Sound Output at 10cm (dB)	88 min.	
Resonant Frequency (Hz)	2731	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	0.6	

\*Other Rated Voltage is available ◆ Value applying at rated voltage, rated frequency



### CSET8.5B

Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N50  
 Termination: Sn plated Brass

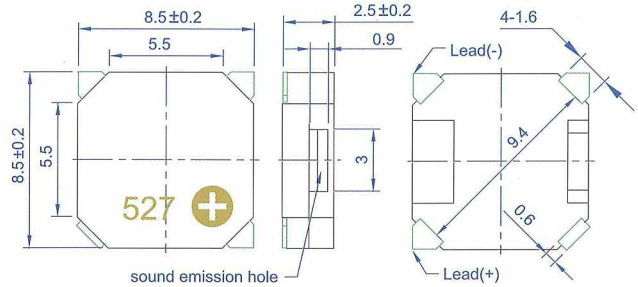
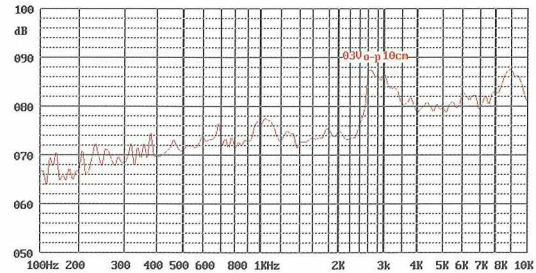
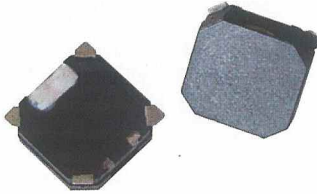


Part Number	<b>CSET8.5B03-15-2.7F</b>	
*Rated Voltage (Vo-p)		3
Operating Voltage (Vo-p)		2~4
◆ Rated Current (mA)		80 max.
Coil Resistance (ohm)		15±2
◆ Sound Output at 10cm (dB)		85 min.
Resonant Frequency (Hz)		2731
Operating Temperature (°C)		-30~+85
Storage Temperature (°C)		-40~+90
Weight (g)		0.6

\*Other Rated Voltage is available ◆Value applying at rated voltage, rated frequency

### CSET8.5C

Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N50  
 Termination: Sn plated Brass

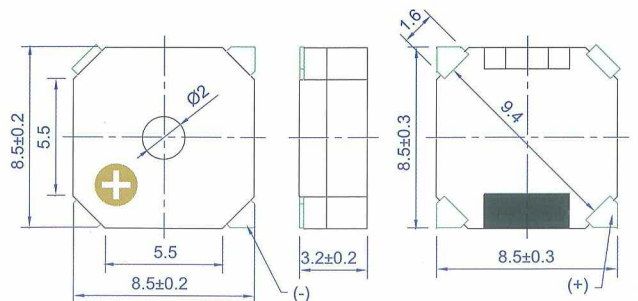
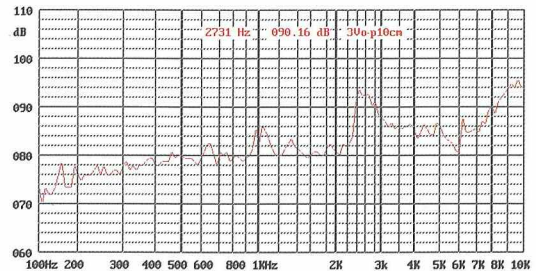
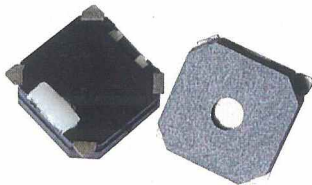


Part Number	<b>CSET8.5C1.5-5.5-2.7F</b>	<b>CSET8.5C03-15-2.7F</b>
*Rated Voltage (Vo-p)	1.5	3
Operating Voltage (Vo-p)	1.2~2.5	2~4
◆ Rated Current (mA)	80 max.	80 max.
Coil Resistance (ohm)	5.5±1	15±2
◆ Sound Output at 10cm (dB)	80 min.	
Resonant Frequency (Hz)	2731	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	0.6	

\*Other Rated Voltage is available ◆Value applying at rated voltage, rated frequency

### CSET8.5D

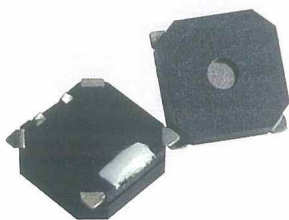
Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N50  
 Termination: Sn plated Brass



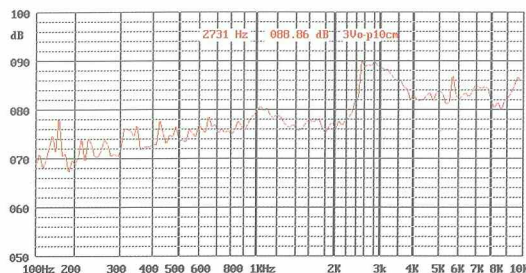
Part Number	<b>CSET8.5D03-15-2.7F</b>	
*Rated Voltage (Vo-p)		3
Operating Voltage (Vo-p)		2~4
◆ Rated Current (mA)		80 max.
Coil Resistance (ohm)		15±2
◆ Sound Output at 10cm (dB)		85 min.
Resonant Frequency (Hz)		2731
Operating Temperature (°C)		-30~+85
Storage Temperature (°C)		-40~+90
Weight (g)		0.6

\*Other Rated Voltage is available ◆Value applying at rated voltage, rated frequency

### CSET8.5E

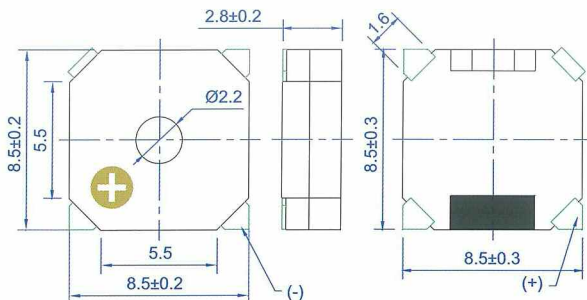


Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N50  
 Termination: Sn plated Brass



Part Number	<b>CSET8.5E03-15-2.7F</b>	
*Rated Voltage (Vo-p)	3	
Operating Voltage (Vo-p)	2~4	
◆ Rated Current (mA)	80 max.	
Coil Resistance (ohm)	15 ± 2	
◆ Sound Output at 10cm (dB)	82 min.	
Resonant Frequency (Hz)	2731	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	0.6	

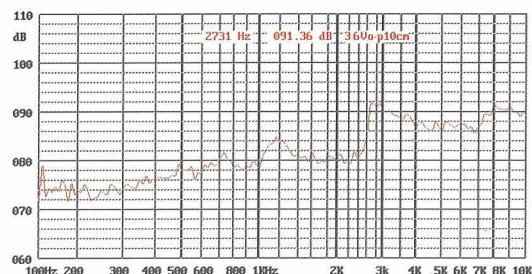
\*Other Rated Voltage is available ◆ Value applying at rated voltage, rated frequency



### CSET8.5F

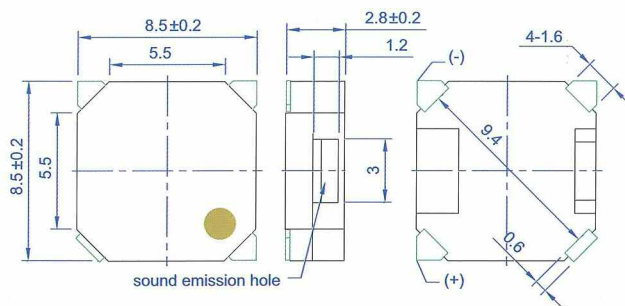


Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N50  
 Termination: Sn plated Brass



Part Number	<b>CSET8.5F03-20-2.66F</b>	<b>CSET8.5F3.6-15-2.7F</b>
*Rated Voltage (Vo-p)	3	3.6
Operating Voltage (Vo-p)	2~4	2~4
◆ Rated Current (mA)	80 max.	90 max.
Coil Resistance (ohm)	20 ± 3	15 ± 2
◆ Sound Output at 10cm (dB)	85 min.	
Resonant Frequency (Hz)	2660	2731
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	0.6	

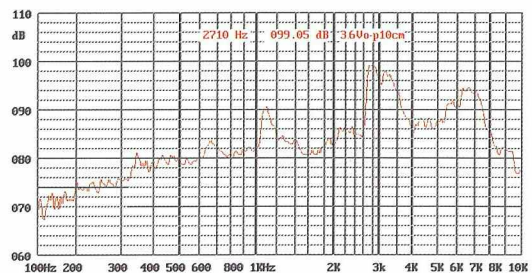
\*Other Rated Voltage is available ◆ Value applying at rated voltage, rated frequency



### CSET8.5G

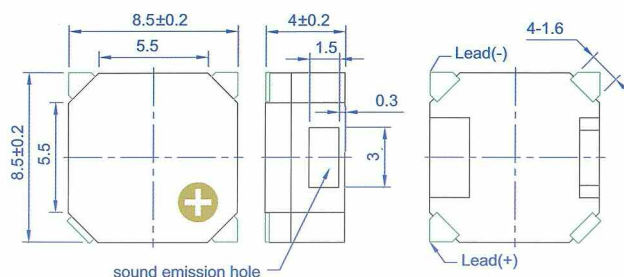


Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N50  
 Termination: Sn plated Brass



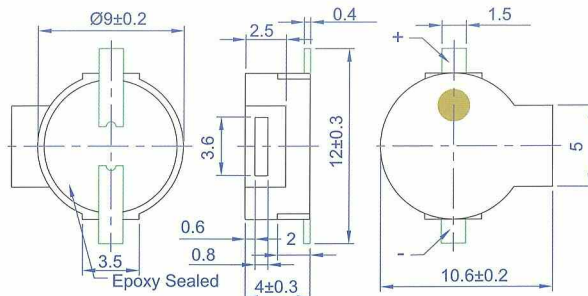
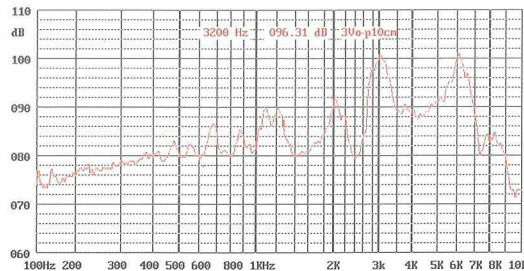
Part Number	<b>CSET8.5G3.6-17-2.7F</b>	
*Rated Voltage (Vo-p)	3.6	
Operating Voltage (Vo-p)	1~4.5	
◆ Rated Current (mA)	100 max.	
Coil Resistance (ohm)	17 ± 3	
◆ Sound Output at 10cm (dB)	94 min.	
Resonant Frequency (Hz)	2710	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	0.6	

\*Other Rated Voltage is available ◆ Value applying at rated voltage, rated frequency



### CSET09A

Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N50  
 Termination: Sn plated Brass



Part Number	CSET09A03-16-2.7F	CSET09A03-10-3.2F
*Rated Voltage (Vo-p)	3	3
Operating Voltage (Vo-p)	1.5~4	1.5~4
◆ Rated Current (mA)	80 max.	100 max.
Coil Resistance (ohm)	16±2	10±2
◆ Sound Output at 10cm (dB)	85 min.	
Resonant Frequency (Hz)	2731	3200
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	0.7	

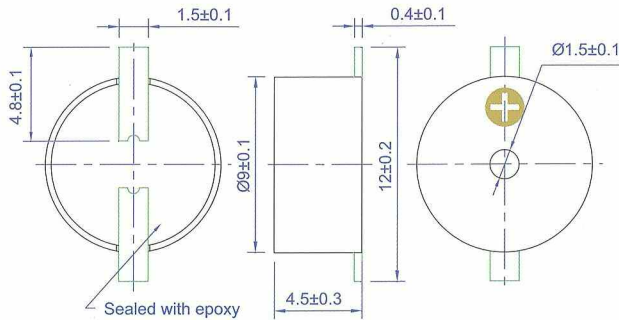
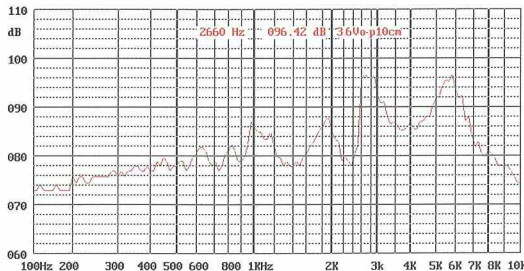
\*Other Rated Voltage is available ◆ Value applying at rated voltage, rated frequency

### CSET09B

Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N50  
 Termination: Sn plated Brass



CSET09B3.6-15-2.66-1F  
 CSET09B05-25-2.7-1F  
 Washable sealed with label

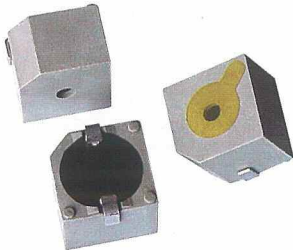


Part Number	CSET09B3.6-15-2.66F	CSET09B05-25-2.7F
*Rated Voltage (Vo-p)	3.6	5
Operating Voltage (Vo-p)	2~4	4~7
◆ Rated Current (mA)	80 max.	90 max.
Coil Resistance (ohm)	15±3	25±5
◆ Sound Output at 10cm (dB)	90 min.	85 min.
Resonant Frequency (Hz)	2660	2731
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	0.6	

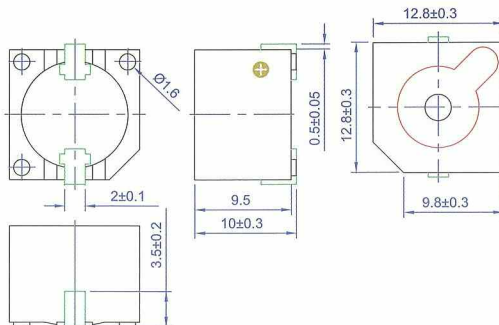
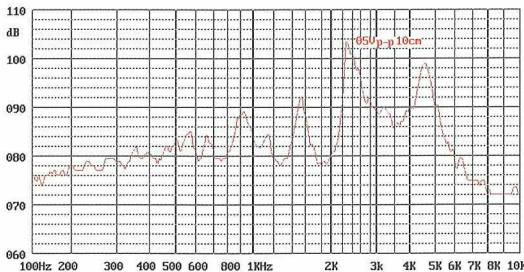
\*Other Rated Voltage is available ◆ Value applying at rated voltage, rated frequency

### CSET13A

Case: PPS A7-03A  
 Vibrating Disc: Ni Alloy Disc N50  
 Termination: Sn plated Brass



CSET13A03-25-2.4-1F  
 CSET13A05-41-2.4-1F  
 Washable sealed with label



Part Number	CSET13A03-25-2.4F	CSET13A05-41-2.4F
*Rated Voltage (Vo-p)	3	5
Operating Voltage (Vo-p)	2~5	4~7
◆ Rated Current (mA)	60 max.	60 max.
Coil Resistance (ohm)	25±3	41±4
◆ Sound Output at 10cm (dB)	90 min.	90 min.
Resonant Frequency (Hz)	2400	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	2.5	

\*Other Rated Voltage is available ◆ Value applying at rated voltage, rated frequency

### CSET13B

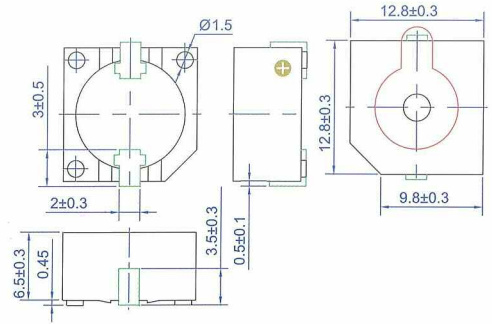
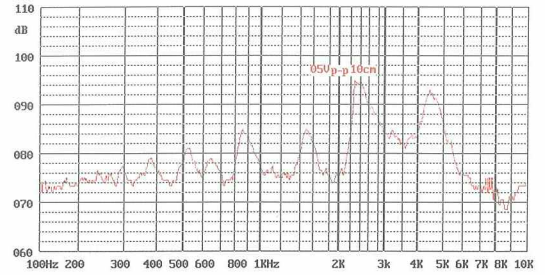


Case: PPS A7-03A  
 Vibrating Disc: Ni Alloy Disc N50  
 Termination: Sn plated Brass

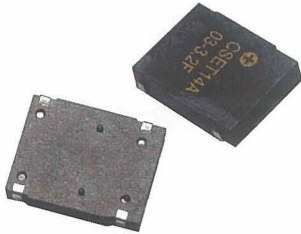
**CSET13B05-50-2.4-1F**  
 Washable sealed with label

Part Number	<b>CSET13B05-50-2.4F</b>	
*Rated Voltage (Vo-p)	5	
Operating Voltage (Vo-p)	4~7	
◆ Rated Current (mA)	60 max.	
Coil Resistance (ohm)	50 ± 5	
◆ Sound Output at 10cm (dB)	85 min.	
Resonant Frequency (Hz)	2400	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	2.4	

\*Other Rated Voltage is available ◆ Value applying at rated voltage, rated frequency



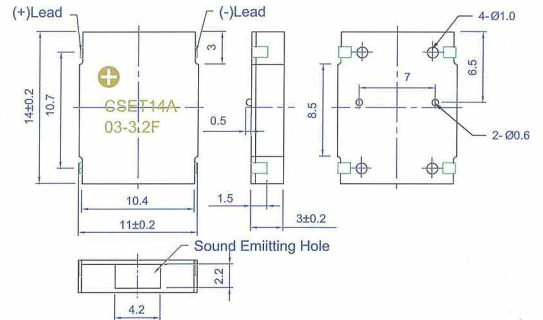
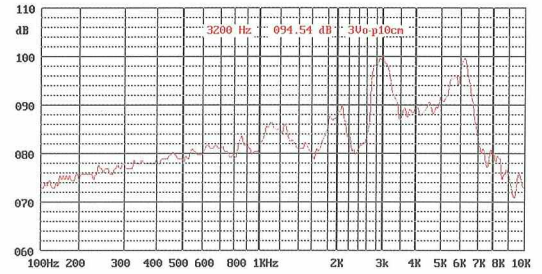
### CSET14A



Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N50  
 Termination: Sn plated Brass

Part Number	<b>CSET14A1.5-9-3.2F</b>	<b>CSET14A03-18-3.2F</b>
*Rated Voltage (Vo-p)	1.5	3
Operating Voltage (Vo-p)	1.2~2	2~4
◆ Rated Current (mA)	80 max.	80 max.
Coil Resistance (ohm)	9 ± 1	18 ± 3
◆ Sound Output at 10cm (dB)	87 min.	87 min.
Resonant Frequency (Hz)	3200	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	1	

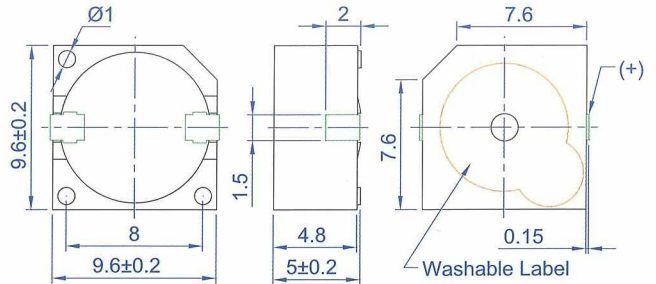
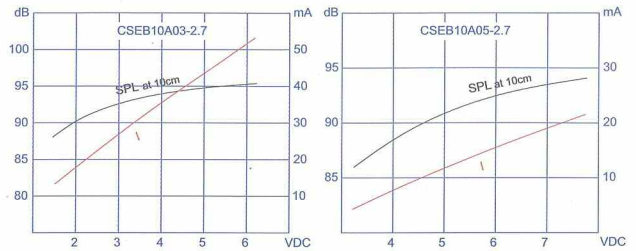
\*Other Rated Voltage is available ◆ Value applying at rated voltage, rated frequency



### CSEB10A

Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N50  
 Termination: Sn plated Brass  
 Self-driving Circuit inside

**CSEB10A03-2.7-1F**  
**CSEB10A05-2.7-1F**  
 Washable sealed with label



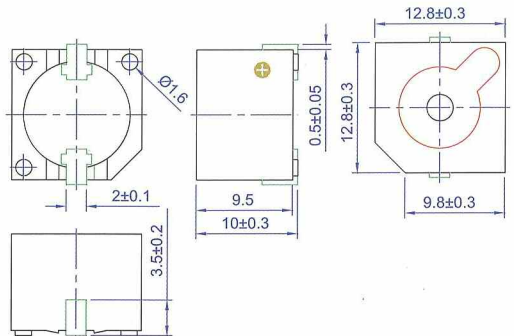
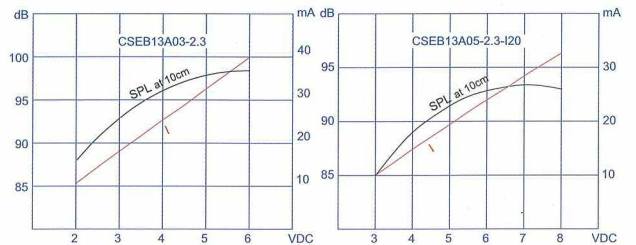
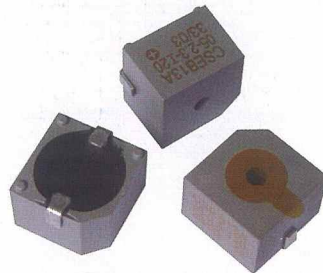
Part Number	CSEB10A03-2.7F	CSEB10A05-2.7F
*Rated Voltage (VDC)	3	5
Operating Voltage (VDC)	2~5	4~7
◆Rated Current (mA)	30 max.	
◆Sound Output at 10cm (dB)	85 min.	
Resonant Frequency (Hz)	2700	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	1	

\*Other Rated Voltage is available ◆Value applying at rated voltage

### CSEB13A

Case: PPS A7-03A  
 Vibrating Disc: Ni Alloy Disc N50  
 Termination: Sn plated Brass  
 Self-driving Circuit inside

**CSEB13A03-2.3-1F**  
**CSEB13A05-2.3-I20-1F**  
 Washable sealed with label



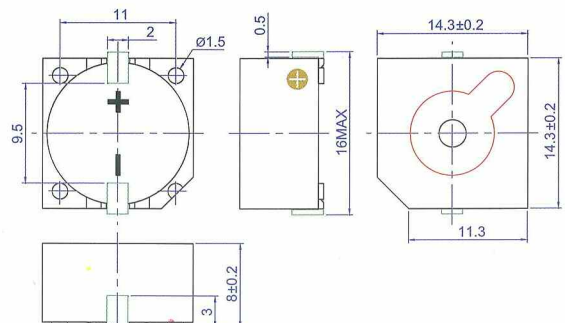
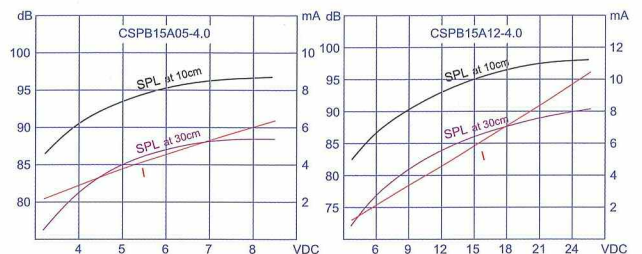
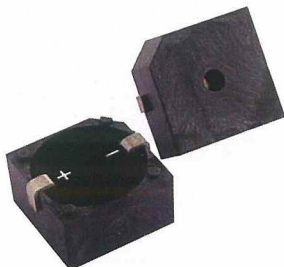
Part Number	CSEB13A03-2.3F	CSEB13A05-2.3-I20F
*Rated Voltage (VDC)	3	5
Operating Voltage (VDC)	2~5	4~7
◆Rated Current (mA)	30 max.	20 max.
◆Sound Output at 10cm (dB)	85 min.	
Resonant Frequency (Hz)	2300	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	2.9	

\*Other Rated Voltage is available ◆Value applying at rated voltage

### CSPB15A

Case: LCP Vectra E130i  
 Vibrating Disc: Ni Alloy Disc N42  
 Termination: Sn plated Brass  
 Self-driving Circuit inside

**CSPB15A05-4.0-1F**  
**CSPB15A12-4.0-1F**  
 Washable sealed with label

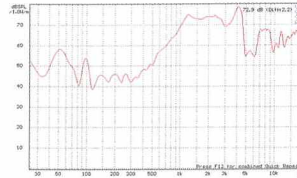


Part Number	CSPB15A05-4.0F	CSPB15A12-4.0F
*Rated Voltage (VDC)	5	12
Operating Voltage (VDC)	3~9	5~16
◆Rated Current (mA)	8 max.	
◆Sound Output at 10cm (dB)	88 min.	
Resonant Frequency (Hz)	4000	
Operating Temperature (°C)	-30~+85	
Storage Temperature (°C)	-40~+90	
Weight (g)	1.6	

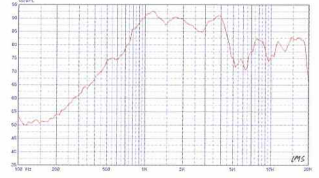
\*Other Rated Voltage is available ◆Value applying at rated voltage

### CSMS15A

Case: PPS A7-03A  
 Vibrating Disc: polyimide diaphragm  
 Termination: PCB



Tested by DAAS

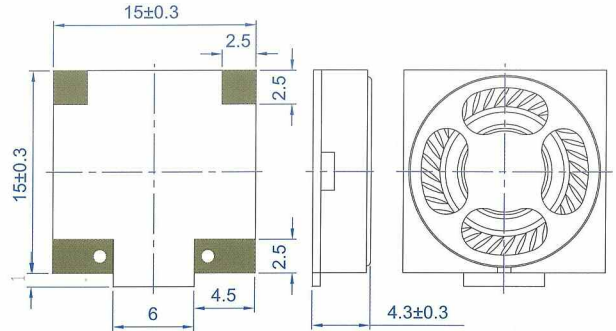


Tested by LMS at 0.3W 0.1m



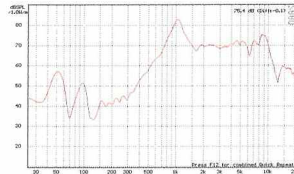
Part Number	<b>CSMS15SA.3-8S0.3-P900</b>	
Rated Impedance	(ohm)	8 ± 15%
Rated (Max.) Power	(W)	0.3(0.5)
Resonance Frequency	(Hz)	900 ± 20%
Rated Frequency Range	(Hz)	fo~20000
◆Sound Pressure Level	(dB)	89 ± 3 at 0.1m0.3W
Operating Temperature	(°C)	-30~+85
Storage Temperature	(°C)	-40~+90
Weight	(g)	2.4

◆ Average of SPL values at 800, 1000, 1200 & 1500 Hz

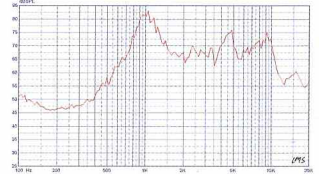


### CSMS20A

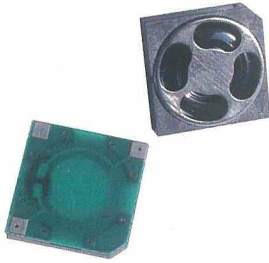
Case: PPS A7-03A  
 Vibrating Disc: polyimide diaphragm  
 Termination: PCB



Tested by DAAS

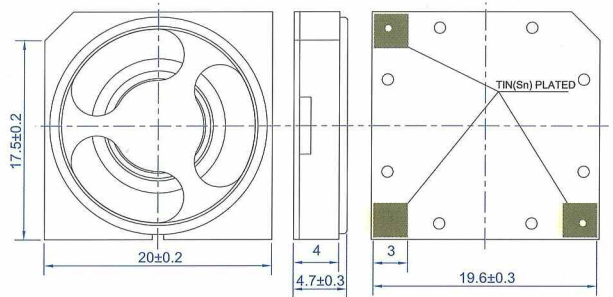


Tested by LMS at 0.1W 0.5m



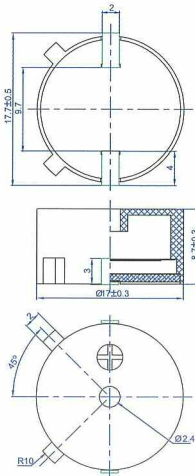
Part Number	<b>CSMS20SA.7-8S0.1-B1000</b>	
Rated Impedance	(ohm)	8 ± 15%
Rated (Max.) Power	(W)	0.1(0.2)
Resonance Frequency	(Hz)	1000 ± 20%
Rated Frequency Range	(Hz)	fo~11000
◆Sound Pressure Level	(dB)	75 ± 3 at 0.5m0.1W
Operating Temperature	(°C)	-30~+80
Storage Temperature	(°C)	-40~+90
Weight	(g)	3.2

◆ Average of SPL values at 800, 1000, 1200 & 1500 Hz



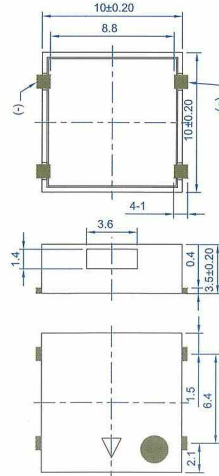
**Below 3 SMD Parts will be finished in November, 2005**

#### SMD Piezo Transducer CSPT17C03-2.0F



Sound Pressure: 75dB min. at 3Vp-p 10cm 2.0KHz

#### SMD Electro-magnetic Transducer CSET10B3.6-18-2.83

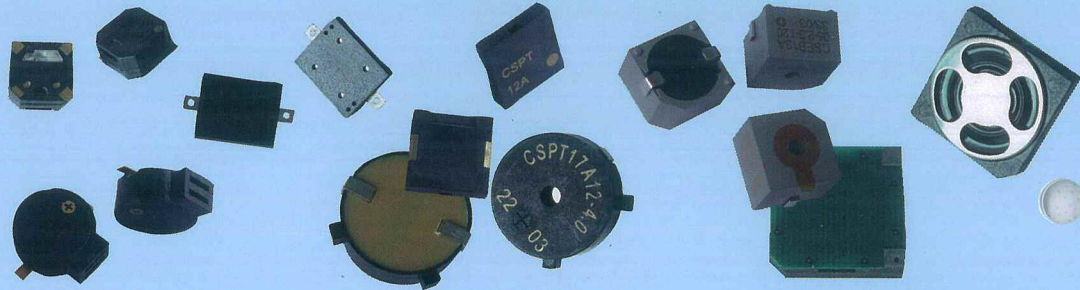


Sound Pressure: 93dB min. at 3.6Vo-p 10cm 2.83KHz

#### SMD Electro-magnetic Transducer CSET10C3.6-16-2.67



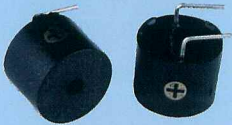
Sound Pressure: 90dB min. at 3.6Vp-p 10cm 2.67KHz



Motorised Bell



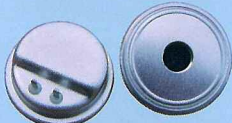
Piezo Buzzer & Transducer



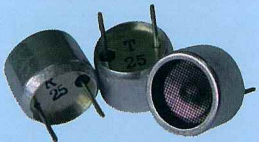
Electro-magnetic Buzzer & Transducer



Mechanical Buzzer



Rocking Armature Transducer



Ultrasonic Transmitter & Receiver



Mylar Speaker



Plastic Frame Speaker



Siren & Horn



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