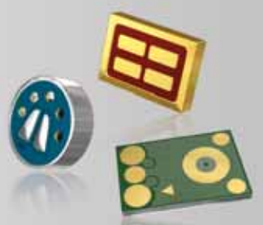
BSE BEST SOUND ELECTRONICS

MICROPHONE



BSE

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Quick Selection Guide For ECM & MEMS Microphone

INDEX OF MODEL NAME

SOB-413S42-RC3310®

- SOB: SMD MIC (Omnidirectional)
- 4: DIAMETER (mm)
- 13: THICKNESS OF MIC. (mm)
- S: CONNECTION METHOD TO P.C.B
  - L : Lead wire type
  - S : Solderless type
  - P : Pin type
- 42: SENSITIVITY (dB)
- RC: R : RESISTOR, C : CAPACITOR
- 3310: CAPACITANCE
  - ex) 10:10pF
  - 33:33pF
  - 1033:10pF+33pF

DMOE-D100TM26-C1033-3P-31

- D: D : Digital, N/A : Analog
- MO: M : MEMS MIC., O : Omini-directional
- E: E : EMI, N/A : EMI
- D: A : 6.15 × 3.76, B : 4.72 × 3.76 (Mini), C : 3.76 × 2.95 (Ultra mini), D : 4.00 × 3.00, E : 3.35 × 2.50
- 100: Thickness(mm)
- T: T : Top Port type, R : Bottom Port type
- M: M : Mesh, N/A : W/O Mesh
- 26: Sensitivity
- C: C : Capacitor, R : Resistor
- 1033: Capacitance
- 3P: Pad
- 31: Internal

DSMO-431-5P-25

- D: Digital
- SM: SMD MIC(Omnidirectional)
- O: Directivity : Omni
- 431: Dimension(mm)
- 5P: Pad
- 25: Sensitivity : -25dB

INDEX OF MODEL NAME

OBE-415L42-RC3310®

- OBE: EMI / ESD ECM (Omnidirectional)
- 4: DIAMETER (mm)
- 15: THICKNESS OF MIC. (mm)
- L: CONNECTION METHOD TO P.C.B
  - L : Lead wire type
  - S : Solderless type
  - P : Pin type
- 42: SENSITIVITY (dB)
- RC: R : RESISTOR, C : CAPACITOR
- 3310: CAPACITANCE
  - ex) 10:10pF
  - 33:33pF
  - 1033:10pF+33pF

BGO-415L30-C1033®

- BGO: Built-in Gain ECM (Omnidirectional)
- 4: DIAMETER (mm)
- 15: THICKNESS OF MIC. (mm)
- L: CONNECTION METHOD TO P.C.B
  - L : Lead wire type
  - S : Solderless type
  - P : Pin type
- 30: SENSITIVITY (dB)
- C: CAPACITOR
- 1033: CAPACITANCE
  - ex) 10:10pF
  - 33:33pF
  - 1033:10pF+33pF

OB-27L44-C33

- O: DIRECTIVITY
  - O : Omnidirectional
  - N : Noise cancelling
  - U : Unidirectional
- B: ELECTRET CHARGING METHOD
  - B : Back Type
  - F : Front Type
- 27: THICKNESS OF MIC. (mm)
- L: CONNECTION METHOD TO P.C.B
  - L : Lead wire type
  - S : Solderless type
  - P : Pin type
- 44: SENSITIVITY (dB)
- C: CAPACITOR
- 33: CAPACITANCE
  - ex) 10:10pF
  - 33:33pF
  - 1033:10pF+33pF

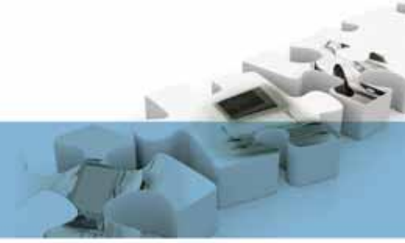
Quick Selection Guide For ECM & MEMS Microphone

NO	Specifications / Model	Diameter (mm)	Height (mm)	Sensitivity (dB)	Maximum Impedance (KΩ)	Standard Power Supply (Vdc)	Current Consumption (mA)	External Resistor (KΩ)	Electret Type	Page Number
1	MO-C110(T,R)	3.76×2.95	1.1	-35 ~ -45	0.3	2.0	0.075	N/A	N/A	7
2	MO-B125(T,R)	4.72×3.76	1.25	-35 ~ -45	0.3	2.0	0.075	N/A	N/A	7
3	DMO-B125T	4.72×3.76	1.25	-23 ~ -29	N/A	3.3	0.075	N/A	N/A	8
4	DMO-D100R	4.0×3.0	1.0	-23 ~ -29	N/A	1.8	0.7	N/A	back	9
5	DSMO-431	4.0×3.0	1.0	-23 ~ -29	N/A	1.8	0.7	N/A	back	11
6	SOB-313S	3.0	1.3	-39 ~ -47	2.2	2.0	0.3	2.2	back	13
7	SOB-410S	4.0	1.0	-39 ~ -47	2.2	2.0	0.3	2.2	back	13
8	SOB-413(S,R)	4.0	1.3	-39 ~ -47	2.2	2.0	0.3	2.2	back	13
9	SOB-15S	6.0	1.5	-39 ~ -47	2.2	2.0	0.3	2.2	back	13
10	OBE-410L	4.0	1.0	-40 ~ -50	2.2	2.0	0.5	2.2	back	14
11	OBE-412PA	4.0	1.2	-40 ~ -50	2.2	2.0	0.5	2.2	back	14
12	OBE-415(L,S,PA)	4.0	1.5	-38 ~ -50	2.2	2.0	0.5	2.2	back	14
13	OBE-22SA	6.0	2.2	-38 ~ -50	2.2	2.0	0.5	2.2	back	14
14	OBE-27PH	6.0	2.7	-38 ~ -50	2.2	2.0	0.5	2.2	back	14
15	OBE-45(L,P)	9.5	4.5	-38 ~ -50	2.2	2.0	0.5	2.2	back	14
16	OBM-311L	3.0	1.1	-40 ~ -50	2.2	2.0	0.5	2.2	back	15
17	OBM-410L	4.0	1.0	-40 ~ -50	2.2	2.0	0.5	2.2	back	15
18	OBM-415L	4.0	1.5	-38 ~ -50	2.2	2.0	0.5	2.2	back	15
19	OB-311L	3.0	1.1	-40 ~ -50	2.2	2.0	0.5	2.2	back	16

NO	Specifications / Model	Diameter (mm)	Height (mm)	Sensitivity (dB)	Maximum Impedance (KΩ)	Standard Power Supply (Vdc)	Current Consumption (mA)	External Resistor (KΩ)	Electret Type	Page Number
20	OB-410L	4.0	1.0	-40 ~ -50	2.2	2.0	0.5	2.2	back	16
21	OB-412(L,PA)	4.0	1.2	-40 ~ -50	2.2	2.0	0.5	2.2	back	16
22	OB-415(L,PA)	4.0	1.5	-38 ~ -50	2.2	2.0	0.5	2.2	back	16
23	OB-22(L,P,S)	6.0	2.2	-38 ~ -50	2.2	2.0	0.5	2.2	back	16
24	OB-27(L,P)	6.0	2.7	-38 ~ -50	2.2	2.0	0.5	2.2	back	16
25	OB-45(L,P)	9.7	4.5	-38 ~ -50	2.2	4.5	0.5	2.2	back	16
26	BGO-410L	4.0	1.0	-27 ~ -38	2.2	2.0	0.3	2.2	back	17
27	BGO-415(L,PA)	4.0	1.5	-27 ~ -38	2.2	2.0	0.3	2.2	back	17
28	BGO-15(L,PA)	6.0	1.5	-27 ~ -38	2.2	2.0	0.3	2.2	back	17
29	BGO-27L	6.0	2.7	-27 ~ -38	2.2	2.0	0.3	2.2	back	17
30	BGE-27PH	6.0	2.7	-27 ~ -38	2.2	2.0	0.3	2.2	back	17
31	CMS	6.0	3.6	-38 ~ -50	2.2	2.0	0.5	2.2	foil	18
32	CMT-45,CMP-45	9.7	4.5	-38 ~ -50	2.2	4.5	0.8	2.2	foil	18
33	CMT-50,CMP-50	9.7	5.0	-38 ~ -50	2.2	4.5	0.8	2.2	foil	19
34	CMT-7,CMP-7	9.7	6.5	-38 ~ -50	2.2	4.5	0.8	2.2	foil	19
35	CMT,CMP	9.4	6.5	-38 ~ -50	1.0	4.5	0.8	1.0	foil	20
36	UB-22L	6.0	2.2	-47 ~ -51	2.2	2.0	0.5	2.2	back	23
37	UB-45L	9.7	4.5	-34 ~ -51	0.68	1.5	0.5	0.68	back	23
38	NB-27L	6.0	2.7	-47 ~ -51	2.2	2.0	0.5	2.2	back	25

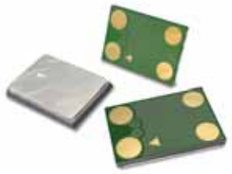
Analog MEMS Microphone

Omnidirectional MEMS Microphone

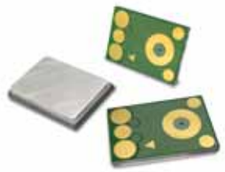


Model

MO-C110T-K1	MO-C110R-K1
MO-B125T-K1	MO-B125R-K1
MOE-C110T-K1	MOE-C110R-K1
MOE-B125T-K1	MOE-B125R-K1



MOE-C110T42-K1



MOE-C110R38-K1

Features

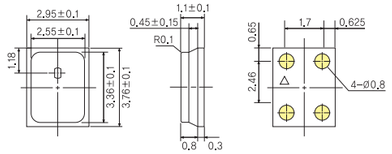
- Provide a stable electro-acoustic properties after reflow process
- Maintain superior reliability for high temperature
- Excellent Signal to Noise Ratio

Specifications

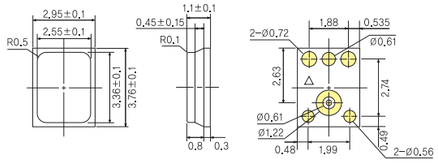
Parameter	Conditions	Limits Min	Limits Center	Limits Max	Units
Sensitivity	V_{DD} = 2.0V, f = 1㎑, S.P.L = 1Pa, 0dB = 1V/Pa	−45	−42	−39	dB
Output impedance	V_{DD} = 2.0V			300	Ω
Current consumption	V_{DD} = 2.0V	50		250	㎂
Signal to Noise Ratio	A-weighting at 1㎑ 1Pa	55	59		dB
Sensitivity Change across Voltage	Vdd = 1.5V ~ 3.6V		No Change		dB
Operating Voltage		1.5	2.0	3.6	V
Total Harmonic Distortion	At 100dB SPL			1	%
	At 115dB SPL			10	%

Parameter	Conditions	Limits Min	Limits Center	Limits Max	Units
Sensitivity	V_{DD} = 2.0V, f = 1㎑, S.P.L = 1Pa, 0dB = 1V/Pa	−41	−38	−35	dB
Output impedance	V_{DD} = 2.0V			300	Ω
Current consumption	V_{DD} = 2.0V	50		250	㎂
Signal to Noise Ratio	A-weighting at 1㎑ 1Pa		62		dB
Sensitivity Change across Voltage	Vdd = 1.5V ~ 3.6V		No Change		dB
Operating Voltage		1.5	2.0	3.6	V
Total Harmonic Distortion	At 100dB SPL			1	%
	At 115dB SPL			10	%

Dimensions

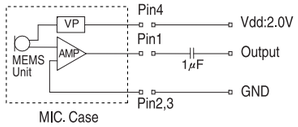


MOE-C110T42-K1

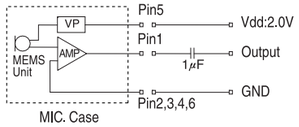


MOE-C110R38-K1

Measurement Circuit

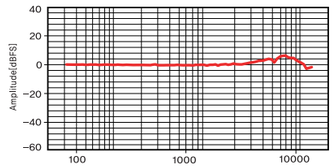


MOE-C110T42-K1

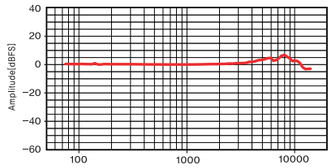


MOE-C110R38-K1

Frequency Response



MOE-C110T42-K1



MOE-C110R38-K1

Digital MEMS Microphone

Omnidirectional MEMS Microphone

Model

DMO-B125T-CO100-6P

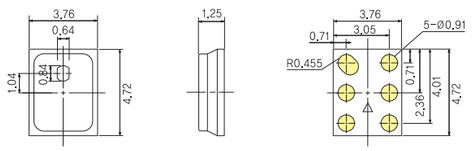
Features

- Significant RF noise reduction for all applications (Especially GSM mobile condition)
- Excellent Signal to Noise Ratio
- High sensitivity & Extremely low distortion at high input level condition
- Maintain the high SNR and Low distortion after signal processing

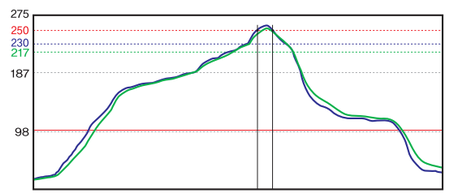
Specifications

Parameter	Conditions	Min	Typ	Max	Units
Sensitivity	f = 1㎑, S.P.L = 1Pa, 0㏈ = 1V/Pa	-29	-26	-23	dBFS
Acoustic Overload Point	At THD = 10%			117	dBSPL
Current Consumption	V_{DD} = 3.3V, Clock = 2.048㎒		750	1000	㎂
Signal to Noise Ratio	f = 1㎑, S.P.L = 1Pa (A-Weighted Curve)	56			dB
Digital Noise Floor	A-weighted		-82		dBFS
Noise Floor (IRN)	A-weighted			38	dBSPL
Standby Current				10	㎂
PSR	217Hz square wave with ripple signal			-65	dBFS

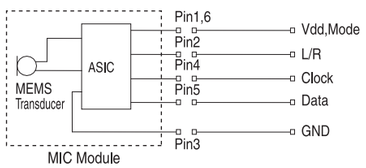
Dimensions



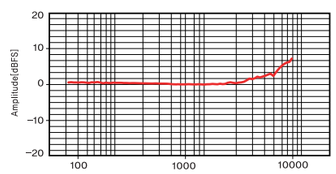
Reflow Soldering Profile



Measurement Circuit



Frequency Response



Digital MEMS Microphone

Omnidirectional MEMS Microphone

Model

DMO-D100R-K1

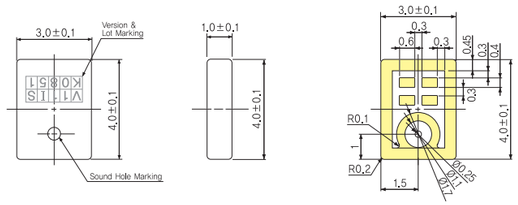
Features

- Significant RF noise reduction for all applications (Especially GSM mobile condition)
- Excellent Signal to Noise Ratio
- High sensitivity & Extremely low distortion at high input level condition
- Maintain the high SNR and Low distortion after signal processing

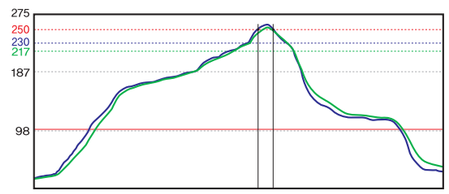
Specifications

Parameter	Conditions	Min	Typ	Max	Units
Sensitivity	f = 1㎑, 1Pa (94dBSPL)	-29	-26	-23	dBFS
Acoustic Overload Point	THD < 10%	120			dBSPL
Signal to Noise Ratio	A-Weighted 1㎑ 1Pa	60.5			dB (A)
Digital Noise Floor	Integrated, f = 100Hz to 8㎑, A-weighted		-86.5		dBFS
Analog Noise Floor				33.5	dBSPL
Supply Current	Normal operation		400	500	㎂
PSR	Measured with 217Hz square wave and broad band noise, both 100mVpp			-70	dBFS
Short circuit current		1		10	mA

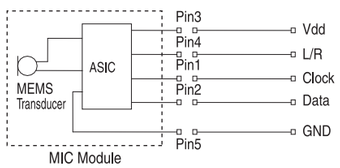
Dimensions



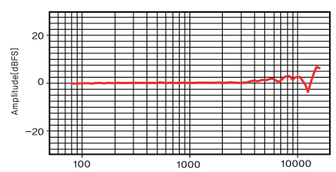
Reflow Soldering Profile



Measurement Circuit



Frequency Response



MICROPHONE PRODUCTS RANGE

DIGITAL SMD MICROPHONE

Digital SMD Microphone

Omnidirectional Electret Condenser Microphone

Model

DSMO-431-5P-26
(S)DSMO-431-5P-26

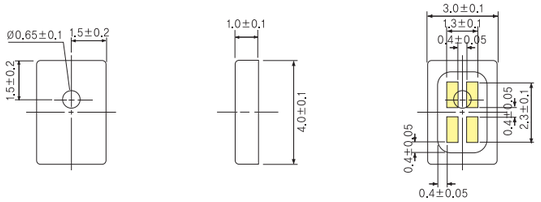
Features

- Significant RF noise reduction for all applications (Especially GSM mobile condition)
- Excellent Signal to Noise Ratio
- High sensitivity & Extremely low distortion at high input level condition
- Maintain the high SNR and Low distortion after signal processing

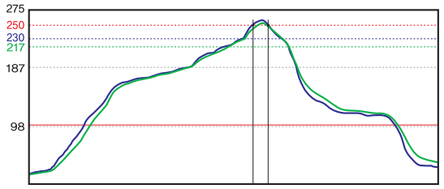
Specifications

Parameter	Conditions	Min	Typ	Max	Units
Sensitivity	f = 1㎑, 1Pa(94dBSPL)	-29	-26	-23	dBFS
Acoustic Overload Point	THD < 10%	120			dBSPL
Signal to Noise Ratio	f = 1㎑, A-Weighted		60.5		dB
Digital Noise Floor	Integrated, f = 100Hz to 8㎑, A-weighted		-86.5		dBFS
Analog Noise Floor				33.5	dBSPL
Supply Current	Normal operation		400	500	μA
PSR	Measured with 217Hz square wave and broadband noise, both 100mVpp			-70	dBFS
Short circuit current		1		10	mA

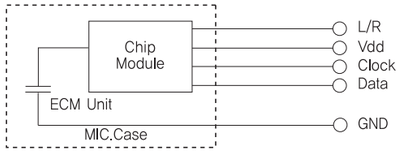
Dimensions



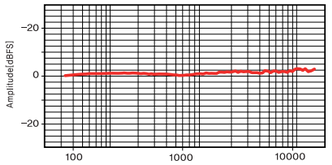
Reflow Soldering Profile



Measurement Circuit



Frequency Response



MICROPHONE PRODUCTS RANGE

OMNIDIRECTIONAL ELECTRET CONDENSER MICROPHONE

SMD Microphone

Omnidirectional Electret Condenser Microphone

BSE patented SMD microphone can be mounted by automatic SMT machine and reflow soldering which is significantly contributed to production cost reduction.

Model

SOB-312S SOB-313S
SOB-410S SOB-413S SOB-413R
SOB-15S

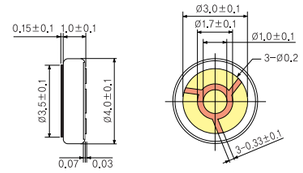
Features

- Maintain superior reliability for high temperature
- Provide a stable sensitivity characteristics and consistent frequency response curve after reflow process.
- Integrate RF filtering Function.
- All materials are halogen free.

Specifications

Parameter	Conditions	Typical value	Unit
Sensitivity	f = 1㎑, S.P.L = 1Pa, 0㏈ = 1V/Pa, V_{DD} = 2.0V	−42+/−3, −44+/−3	dB
Output impedance	f = 1㎑	2.2	㎏Ω
Current Consumption	V_{DD} = 2.0V, R_L = 2.2㎏Ω	300	μA
Signal to Noise Ratio	f = 1㎑, S.P.L = 1Pa (A-Weighted Curve)	〉58	dB
Decreasing Voltage	V_{CC} = 2.0V to 1.5V	− 3	dB

Dimensions



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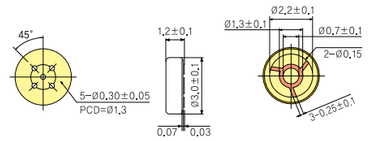
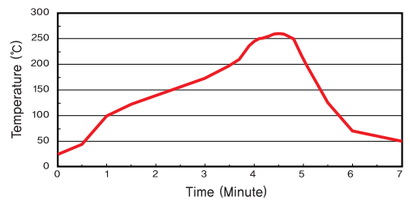


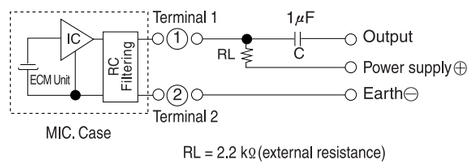
ø3.0 × 1.2㎜

Reflow Soldering Profile

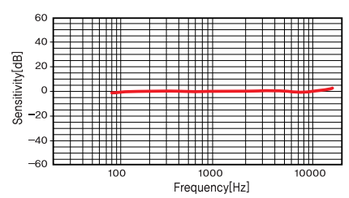
As illustrated in the graph of reflow profile, BSE SMD Microphone enables customers to proceed standardized SMT process with the conventional lead-free SMT conditions.



Measurement Circuit



Frequency Response



EMI / ESD Microphone

Omnidirectional Electret Condenser Microphone

Model

OBE-410L OBE-412PA
OBE-415L OBE-415S OBE-415PA
OBE-22SA OBE-27PH OBE-45L OBE-45P

Features

- Functional integration for EMI filtering and ESD protection
- Significant RF noise reduction for GSM mobile phone
- Excellent filtering range over 47㎑

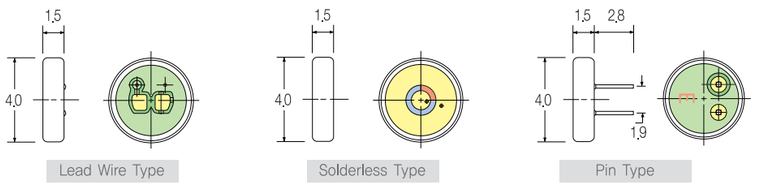
Specifications

Sensitivity	See Model No. Table
Impedance	Max. 2.2 KΩ
Standard power supply	2.0 V DC
Current consumption	Max. 0.5 mA

Sensitivity reduction	Within-3dB at 1.5V
S/N ratio	More than 58dB
Directivity	Omnidirectional

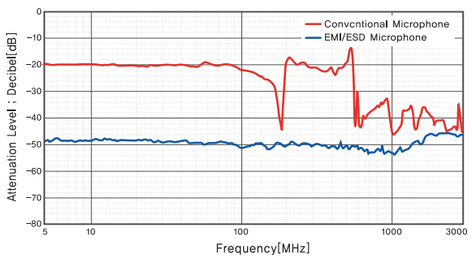
Sensitivity (0dB=1V/Pa at 1KHz)	Model No. Table					
	4×1.0	4×1.2	4×1.5	6×2.2	6×2.7	9×4.5
-46+-3dB	OBE-410L46	OBE-412PA46	OBE-415(L/PA/S)46	OBE-22SA46	OBE-27PH46	OBE-45P46
-44+-3dB	OBE-410L44	OBE-412PA44	OBE-415(L/PA/S)44	OBE-22SA44	OBE-27PH44	OBE-45P44
-42+-3dB	OBE-410L42	OBE-412PA42	OBE-415(L/PA/S)42	OBE-22SA42	OBE-27PH42	OBE-45P42
-40+-3dB	OBE-410L40	OBE-412PA40	OBE-415(L/PA/S)40	OBE-22SA40	OBE-27PH40	OBE-45P40

Dimensions

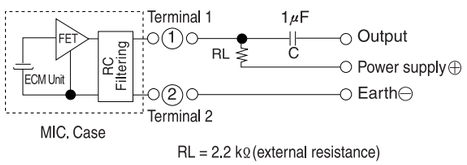


※Further drawings are shown at page 27.

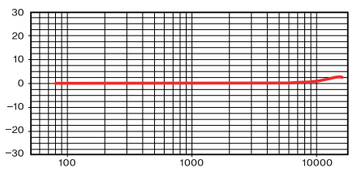
RFI Characteristic Graph



Measurement Circuit



Frequency Response



OBM Microphone

Omnidirectional Electret Condenser Microphone

Model

OBM-311L
OBM-410L
OBM-415L

Features

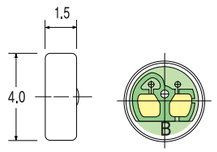
- Excellent Signal-to-Noise ratio(larger than 60dB).
- Application : Bluetooth Head-set, PDA, ear microphone, mobile products, etc.
- Function available Multi-PCB.
- Function available EMI/ESD.

Specifications

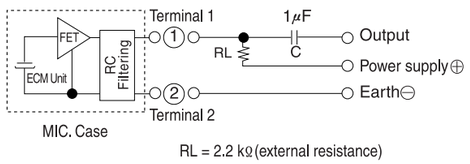
Parameter	Conditions	Typical value	Unit
Sensitivity	f = 1㎑, S.P.L = 1Pa, 0dB = 1V/Pa, V_{DD} = 2.0V	See the table	dB
Output impedance	f = 1㎑	2.2	KΩ
Current Consumption	V_{CC} = 2.0V, R_L = 2.2KΩ	300	μA
Signal to Noise Ratio	f = 1㎑, S.P.L = 1Pa (A-Weighted Curve)	〉60	dB
Decreasing Voltage	V_{CC} = 2.0V to 1.5V	- 3	dB

Sensitivity (0dB=1V/Pa at 1KHz)	Model No. Table		
	3×1.1	4×1.0	4×1.5
-46+-3dB	OBM-311L46	OBM-410L46	OBM-415L46
-44+-3dB	OBM-311L44	OBM-410L44	OBM-415L44
-42+-3dB	OBM-311L42	OBM-410L42	OBM-415L42
-40+-3dB	OBM-311L40	OBM-410L40	OBM-415L40
-38+-3dB	OBM-311L38	OBM-410L38	OBM-415L38

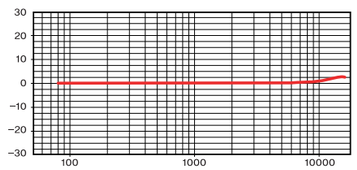
Dimensions



Measurement Circuit



Frequency Response



OB Microphone

Omnidirectional Electret Condenser Microphone

Model

OB-311L
OB-410L OB-412L OB-412PA
OB-415L OB-415PA
OB-22L OB-22P OB-22S
OB-27L OB-27P
OB-45P OB-45L

Lead Wire Type 

Solderless Type 

Pin Type 

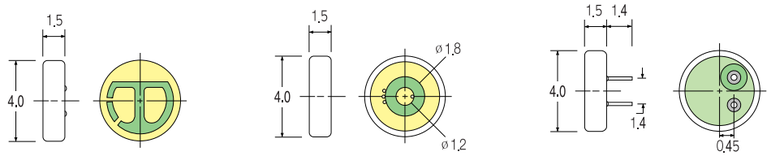
Specifications

Sensitivity	See Model No. Table
Impedance	Max. 2.2 KΩ
Standard power supply	2.0 V DC
Current consumption	Max. 0.5 mA

Sensitivity reduction	Within-3dB at 1.5V
S/N ratio	More than 58dB
Directivity	Omnidirectional

Sensitivity (0dB=1V/Pa at 1KHz)	Model No. Table						
	3×1.1	4×1.0	4×1.2	4×1.5	6×2.2	6×2.7	9×4.5
-46+-3dB	OB-311L46	OB-410L46	OB-412(L/PA)46	OB-415(L/P)46	OB-22(L/P/S)46	OB-27(L/P)46	OB-45(L/P)46
-44+-3dB	OB-311L44	OB-410L44	OB-412(L/PA)44	OB-415(L/P)44	OB-22(L/P/S)44	OB-27(L/P)44	OB-45(L/P)44
-42+-3dB	OB-311L42	OB-410L42	OB-412(L/PA)42	OB-415(L/P)42	OB-22(L/P/S)42	OB-27(L/P)42	OB-45(L/P)42
-40+-3dB	OB-311L40	OB-410L40	OB-412(L/PA)40	OB-415(L/P)40	OB-22(L/P/S)40	OB-27(L/P)40	OB-45(L/P)40
-38+-3dB	OB-311L38	OB-410L38	OB-412(L/PA)38	OB-415(L/P)38	OB-22(L/P/S)38	OB-27(L/P)38	OB-45(L/P)38

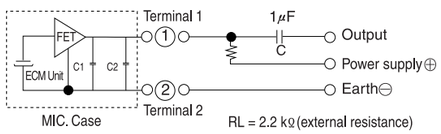
Dimensions



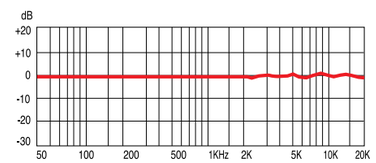
Lead Wire Type Solderless Type Pin Type

※Further drawings are shown at page 28,29.

Measurement Circuit



Frequency Response



BIG Microphone

Omnidirectional Electret Condenser Microphone

Model

BGO-410L
BGO-415L BGO-415PA
BGO-15L BGO-15PA
BGO-27L BGE-27PH

Features

- High sensitivity(-27±3dB).
- Application : Camcoder phone, mobile phone, PDA, ear microphone, etc.
- Alternative gain can be set upon the request.
- Excellent Signal-to-Noise ratio. (larger than 60dB)

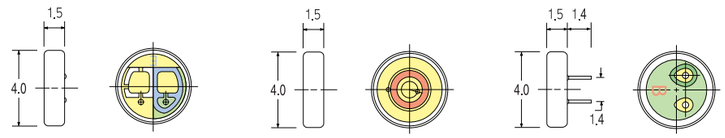
Specifications

Sensitivity	See Model No. Table
Impedance	Max. 2.2 KΩ
Standard power supply	2.0 V DC
Current consumption	Max. 0.3 mA

Sensitivity reduction	Within-3dB at 1.5V
S/N ratio	More than 60dB
Directivity	Omnidirectional

Sensitivity (0dB=1V/Pa at 1KHz)	Model No. Table			
	4×1.0	4×1.5	6×1.5	6×2.7
-38+-3dB	BGO-410L38	BGO-415(L/PA)38	BGO-15(L/PA)38	BGO-27(L/PH)38
-35+-3dB	BGO-410L35	BGO-415(L/PA)35	BGO-15(L/PA)35	BGO-27(L/PH)35
-33+-3dB	BGO-410L33	BGO-415(L/PA)33	BGO-15(L/PA)33	BGO-27(L/PH)33
-30+-3dB	BGO-410L30	BGO-415(L/PA)30	BGO-15(L/PA)30	BGO-27(L/PH)30
-27+-3dB			BGO-15(L/PA)27	BGO-27(L/PH)27

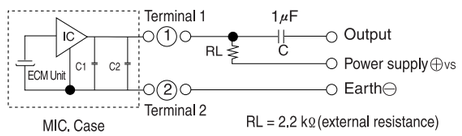
Dimensions



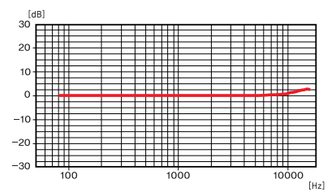
Lead Wire Type Solderless Type Pin Type

※Further drawings are shown at page 27,28.

Measurement Circuit



Frequency Response



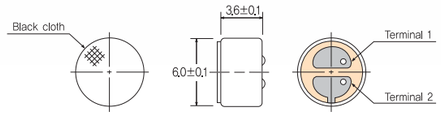
OF Microphone (6.0×3.6, 9.7×4.5)

Omnidirectional Electret Condenser Microphone

Model

CMS-58 ~ 70

Dimensions



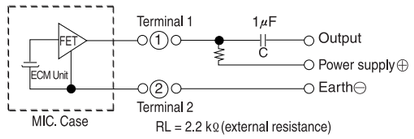
Lead Wire Type CMS-60

Specifications

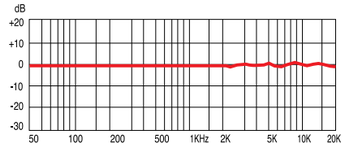
Sensitivity	See Model No. Table
Impedance	Max. 2.2 KΩ
Standard power supply	2.0 V DC
Current consumption	Max. 0.5 mA
Sensitivity reduction	Within-3dB at 1.5V
S/N ratio	More than 58dB
Directivity	Omnidirectional

Sensitivity (0dB=1V/Pa at 1KHz)	Model No. Table
-50 ± 3dB	CMS-70
-48 ± 3dB	CMS-68
-46 ± 3dB	CMS-66
-44 ± 3dB	CMS-64
-42 ± 3dB	CMS-62
-40 ± 3dB	CMS-60
-38 ± 3dB	CMS-58

Measurement Circuit



Frequency Response



OF Microphone (9.7×6.5, 9.7×5.0)

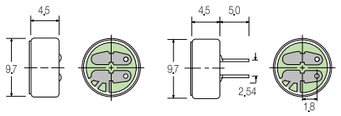
Omnidirectional Electret Condenser Microphone

Model

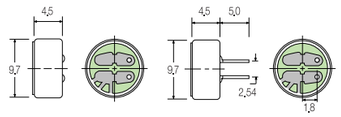
CMT-4536 ~ 4546
CMT-45H40 ~ 45H50

CMP-4536 ~ 4546
CMP-45H40 ~ 45H50

Dimensions



Lead Wire Type CMT-45 | Pin Type CMP-45



Lead Wire Type CMT-45H | Pin Type CMP-45H

Specifications

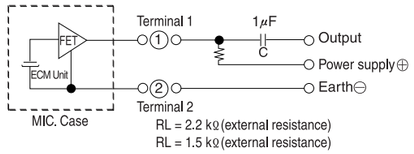
Sensitivity	See Model No. Table
Impedance	Max. 2.2 KΩ
Standard power supply	2.0 V DC
Current consumption	Max. 0.5 mA
Sensitivity reduction	Within-3dB at 1.5V
S/N ratio	More than 58dB
Directivity	Omnidirectional

Sensitivity	See Model No. Table
Impedance	Max. 1.5 KΩ
Standard power supply	1.5 V DC
Current consumption	Max. 0.5 mA
Sensitivity reduction	Within-3dB at 1.0V
S/N ratio	More than 60dB
Directivity	Omnidirectional

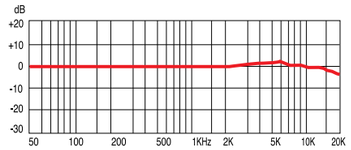
Sensitivity (0dB=1V/Pa at 1KHz)	Model No. Table	
	Lead Wire Type	Pin Type
-46 ± 2dB	CMT-4546	CMP-4546
-44 ± 2dB	CMT-4544	CMP-4544
-42 ± 2dB	CMT-4542	CMP-4542
-40 ± 2dB	CMT-4540	CMP-4540
-38 ± 2dB	CMT-4538	CMP-4538
-36 ± 2dB	CMT-4536	CMP-4536

Sensitivity (0dB=1V/Pa at 1KHz)	Model No. Table	
	Lead Wire Type	Pin Type
-50 ± 2dB	CMT-45H50	CMP-45H50
-48 ± 2dB	CMT-45H48	CMP-45H48
-46 ± 2dB	CMT-45H46	CMP-45H46
-44 ± 2dB	CMT-45H44	CMP-45H44
-42 ± 2dB	CMT-45H42	CMP-45H42
-40 ± 2dB	CMT-45H40	CMP-45H40

Measurement Circuit



Frequency Response



Model

CMT-756 ~ 766
CMP-756 ~ 766
CMT-7H58 ~ 7H70
CMP-7H58 ~ 7H70

CMT-5036 ~ 5046
CMP-5036 ~ 5046

Specifications

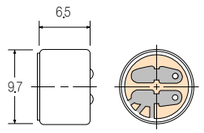
Sensitivity	See Model No. Table
Impedance	Max. 2.2 KΩ
Standard power supply	4.5 V DC
Current consumption	Max. 0.8 mA
Sensitivity reduction	Within-3dB at 3.0V
S/N ratio	More than 60dB
Directivity	Omnidirectional

Sensitivity	See Model No. Table
Impedance	Max. 1.5 KΩ
Standard power supply	1.5 V DC
Current consumption	Max. 0.5 mA
Sensitivity reduction	Within-3dB at 1.0V
S/N ratio	More than 60dB
Directivity	Omnidirectional

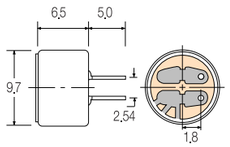
Sensitivity (0dB=1V/Pa at 1KHz)	Model No. Table	
	Lead Wire Type	Pin Type
-46 ± 2dB	CMT-766	CMP-766
-44 ± 2dB	CMT-764	CMP-764
-42 ± 2dB	CMT-762	CMP-762
-40 ± 2dB	CMT-760	CMP-760
-38 ± 2dB	CMT-758	CMP-758
-36 ± 2dB	CMT-756	CMP-756

Sensitivity (0dB=1V/Pa at 1KHz)	Model No. Table	
	Lead Wire Type	Pin Type
-50 ± 2dB	CMT-7H70	CMP-7H70
-48 ± 2dB	CMT-7H68	CMP-7H68
-46 ± 2dB	CMT-7H66	CMP-7H66
-44 ± 2dB	CMT-7H64	CMP-7H64
-42 ± 2dB	CMT-7H62	CMP-7H62
-40 ± 2dB	CMT-7H60	CMP-7H60
-38 ± 2dB	CMT-7H58	CMP-7H58

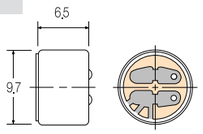
Dimensions



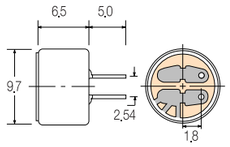
Lead Wire Type CMT-7



Pin Type CMP-7

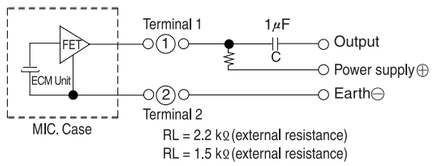


Lead Wire Type CMT-7H

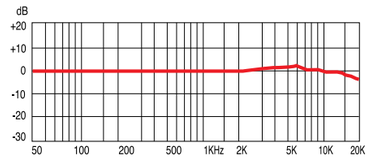


Pin Type CMP-7H

Measurement Circuit



Frequency Response



OF Microphone (9.4×6.5)

Omnidirectional Electret Condenser Microphone

Model

CMT-58 ~ 70 CMP-58 ~ 70
CMT-58H ~ 68H CMP-58H ~ 68H

Specifications

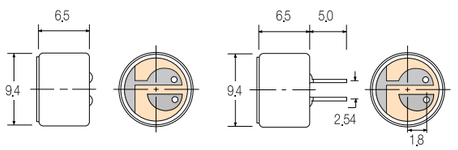
Sensitivity	See Model No. Table
Impedance	Max. 1.0 KΩ
Standard power supply	4.5 V DC
Current consumption	Max. 0.8 mA
Sensitivity reduction	Within-3dB at 3.0V
S/N ratio	More than 60dB
Directivity	Omnidirectional

Sensitivity (0dB=1V/Pa at 1KHz)	Model No. Table	
	Lead Wire Type	Pin Type
-50 ± 2dB	CMT-70	CMP-70
-48 ± 2dB	CMT-68	CMP-68
-46 ± 2dB	CMT-66	CMP-66
-44 ± 2dB	CMT-64	CMP-64
-42 ± 2dB	CMT-62	CMP-62
-40 ± 2dB	CMT-60	CMP-60
-38 ± 2dB	CMT-58	CMP-58

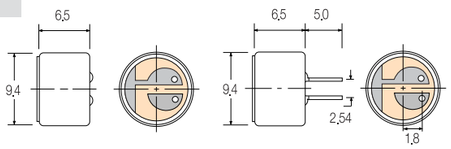
Sensitivity	See Model No. Table
Impedance	Max. 1.0 KΩ
Standard power supply	1.5 V DC
Current consumption	Max. 0.5 mA
Sensitivity reduction	Within-3dB at 1.0V
S/N ratio	More than 60dB
Directivity	Omnidirectional

Sensitivity (0dB=1V/Pa at 1KHz)	Model No. Table	
	Lead Wire Type	Pin Type
-50 ± 2dB	CMT-70H	CMP-70H
-48 ± 2dB	CMT-68H	CMP-68H
-46 ± 2dB	CMT-66H	CMP-66H
-44 ± 2dB	CMT-64H	CMP-64H
-42 ± 2dB	CMT-62H	CMP-62H
-40 ± 2dB	CMT-60H	CMP-60H
-38 ± 2dB	CMT-58H	CMP-58H

Dimensions

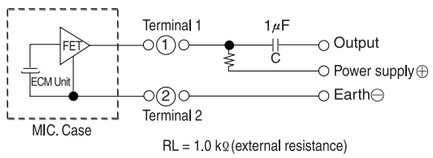


Lead Wire Type CMT Pin Type CMP

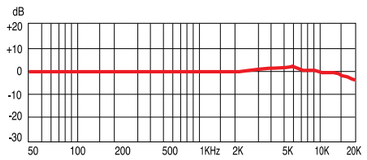


Lead Wire Type CMT-H Pin Type CMP-H

Measurement Circuit



Frequency Response



ECM Module Application

ECM connectors have been widely used for matching ECM to the customer application in order to obtain a better sensitivity.

BSE provides the best mechanical solution and technology for designing ECM Module :

- ECM Module design capability
- Technological excellence for Modeling and FEA Simulation
- Total mechanical solution provider for ECM module customization

BSE continues to challenge the total solution provider for developing the connecting methods and standardizing EMC connectors.

TYPES OF ECM CONNECTORS

Coil Spring Type

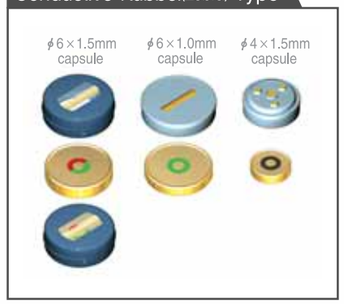
Coil Spring Type

Panel Spring Type

SMD Type

Lead wire connector

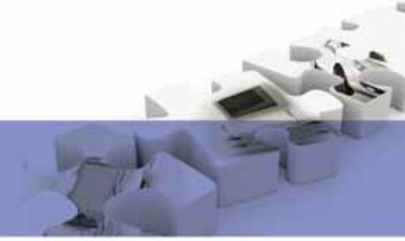
Conductive Rubber(Zebra) Type



FPCB connector

MICROPHONE PRODUCTS RANGE

UNIDIRECTIONAL ELECTRET CONDENSER MICROPHONE



UB Microphone

Unidirectional Electret Condenser Microphone

Model

UB-45L-RC33
UB-45L
UB-22L

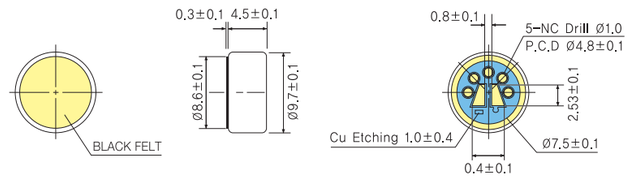
Features

- Provide High sensitivity and flat frequency response (compare other directional microphone)
- Provide highly stable directional pattern and frequency response
- Excellent Signal to Noise Ratio (Over 70 dB)

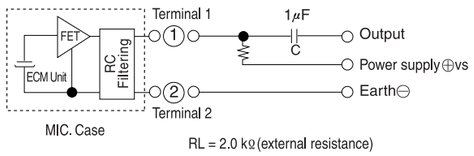
Specifications

Parameter	Conditions	Limits			Units
		Min	Center	Max	
Sensitivity	f = 1㎑, S.P.L = 1Pa, 0dB = 1V/Pa	−40	−37	−34	dB
Output impedance	f = 1㎑			2.0	KΩ
Current Consumption	V_{CC} = 1.5V, RL = 2.0㎏			500	μA
Signal to Noise Ratio	f = 1㎑, S.P.L = 1Pa (A-Weighted Curve)	70			dB
Decreasing Voltage	V_{CC} = 1.5V to 1.0V			−3	dB
Operating Voltage		1		10	V
Maximum input S.P.L.				110	dB
Front to Rear Ratio	f = 1㎑	15			dB

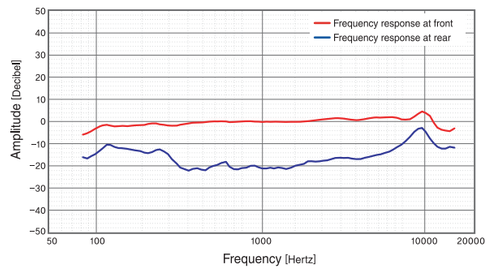
Dimensions



Measurement Circuit

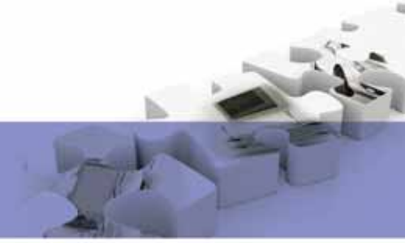


Frequency Response



MICROPHONE PRODUCTS RANGE

BIDIRECTIONAL ELECTRET CONDENSER MICROPHONE



NB Microphone (Noise Cancelling)

Bidirectional Electret Condenser Microphone

Model

NB-22L
NB-27L
NB-45L

Lead Wire Type

Lead Wire Type

Lead Wire Type

Specifications

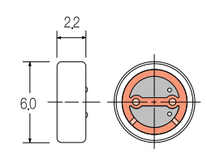
Sensitivity	See Model No. Table
Impedance	Max. 2.2 KΩ
Standard power supply	2.0 V DC
Current consumption	Max. 0.5 mA
Sensitivity reduction	Within-3dB at 1.5V
S/N ratio	More than 50dB
Directivity	Omnidirectional

Sensitivity (0dB=1V/Pa at 1KHz)	Model No. Table	
	6×2.2	6×2.7
-51 ± 4dB	NB-22L51	NB-27L51
-47 ± 4dB	NB-22L47	NB-27L47

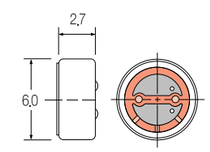
Sensitivity	See Model No. Table
Impedance	Max. 680Ω
Standard power supply	1.5 V DC
Current consumption	Max. 0.5 mA
Sensitivity reduction	Within-3dB at 1.0V
S/N ratio	More than 50dB
Directivity	Bidirectional

Sensitivity (0dB=1V/Pa at 1KHz)	Model No. Table
	9.7×4.5
-51 ± 4dB	NB-45L51
-47 ± 4dB	NB-45L47

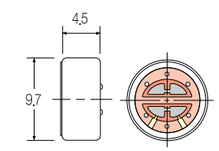
Dimensions



Lead Wire Type NB-22L

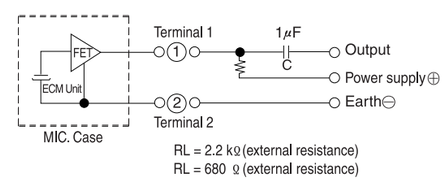


Lead Wire Type NB-27L

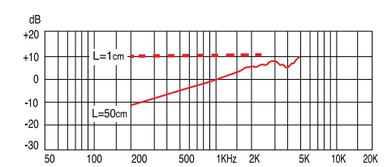


Lead Wire Type NB-45L

Measurement Circuit

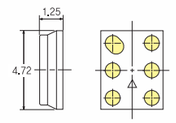
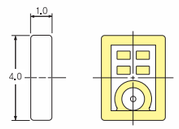
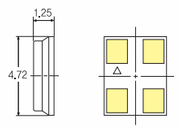
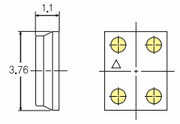
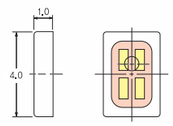
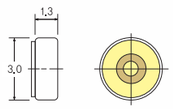
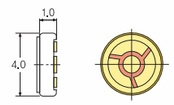
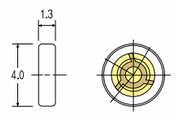
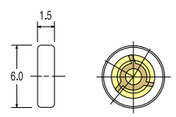


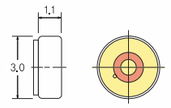
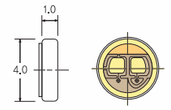
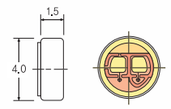
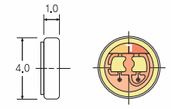
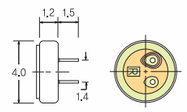
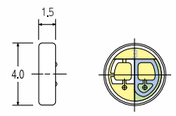
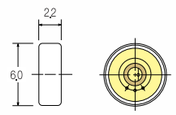
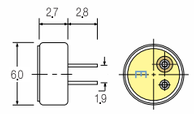
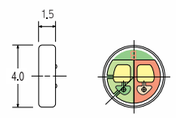
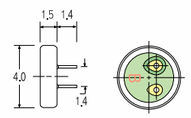
Frequency Response



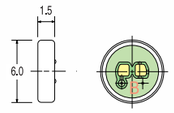
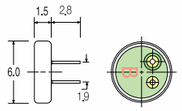
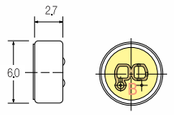
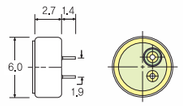
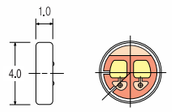
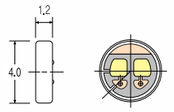
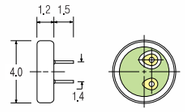
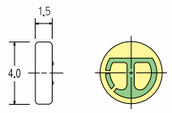
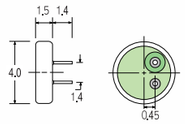
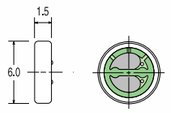
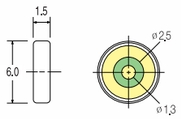
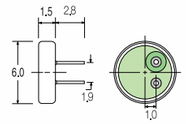
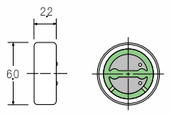
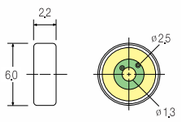
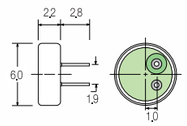
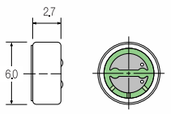
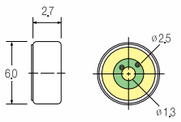
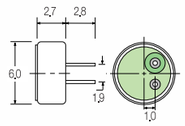
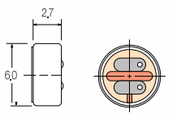
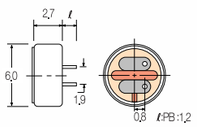
Dimensional Drawing

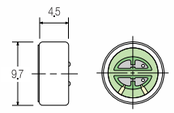
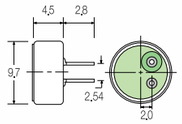
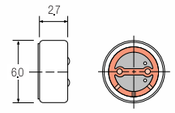
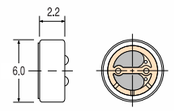
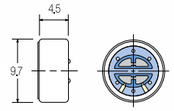
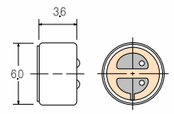
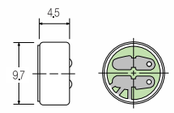
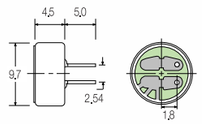
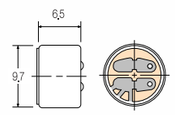
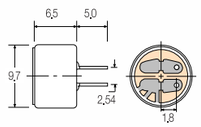
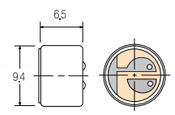
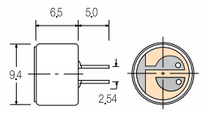
(Terminal 1 : plus Terminal 2 : minus) Unit : mm

NO	Type		Lead wire Type	Solderless Type	Pin Type
1	3.76 × 4.72	DMO-B125T (SMD Type)			
2	4.0 × 3.0	DMO-D100R			
3	3.76 × 4.72	MO-B125T MO-B125R (SMD Type)			
4	2.95 × 3.76	MO-C110T MO-C110R (SMD Type)			
5	4.0 × 3.0	DSMO-431-5P (SMD Type)			
6	3.0 × 1.3	SOB-313S (SMD Type)			
7	4.0 × 1.0	SOB-410S (SMD Type)			
8	4.0 × 1.3	SOB-413S (SMD Type)			
9	6.0 × 1.5	SOB-15S (SMD Type)			

NO	Type		Lead wire Type	Solderless Type	Pin Type
10	3.0 × 1.1	OBM-311L			
11	4.0 × 1.0	OBM-410L			
12	4.0 × 1.5	OBM-415L			
13	4.0 × 1.0	OBE-410L			
14	4.0 × 1.2	OBE-412PA			
15	4.0 × 1.5	OBE-415L			
16	6.0 × 2.2	OBE-22SA			
17	6.0 × 2.7	OBE-27PH			
18	4.0 × 1.5	BGO-415L BGO-415P			

Dimensional Drawing

NO	Type		Lead wire Type	Solderless Type	Pin Type
19	6.0 × 1.5	BGO-15L BGO-15P			
20	6.0 × 2.7	BGO-27L BGO-27PH			
21	4.0 × 1.0	OB-410L			
22	4.0 × 1.2	OB-412L OB-412P			
23	4.0 × 1.5	OB-415L OB-415P			
24	6.0 × 1.5	OB-15L OB-15S OB-15P			
25	6.0 × 2.2	OB-22L OB-22S OB-22P			
26	6.0 × 2.7	OB-27L OB-27S OB-27P			
27	6.0 × 2.7	OB-27LB OB-27PB			

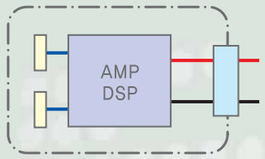
NO	Type		Lead wire Type	Solderless Type	Pin Type
28	9.7 × 4.5	OB-45L OB-45P			
29	6.0 × 2.7	NB-27L			
30	6.0 × 2.2	UB-22L			
31	9.7 × 4.5	UB-45L			
32	6.0 × 3.6	CMS			
33	9.7 × 4.5	CMT-45 CMP-45			
34	9.7 × 6.5	CMT-7 CMP-7			
35	9.4 × 6.5	CMT- CMP-			

Remarks

1. MLCC (Multi Layer Chip Capacitor) can be built in for CDMA, PCS, PHS, GSM, dual-band GSM and etc. upon your request.
2. The wire harness assembly form and rubber holder can be provided upon your request.
   (Object components – wire, connector, capacitor, output flag, rubber holder, etc.)
3. Solderless type can be also provided together with connector and holder during assembly process upon your request.
4. Gold metalized housing is available for the RF&HF noise protection.
5. In case of solderless type, PCB pattern can be changed upon your request.

Module & Software solution

High SNR & Low distortion microphone module



Additional Software solution can be integrated

Directivity	Omni or Uni or directivity switching
Sensitivity	Over 38 dB
High SNR	Over 66dBA
Low distortion	〈 3% at 115dBSPL
Output	Single or Differential
Connection	Defined by customer
Package	Defined by customer (Acoustic design was done by BSE)

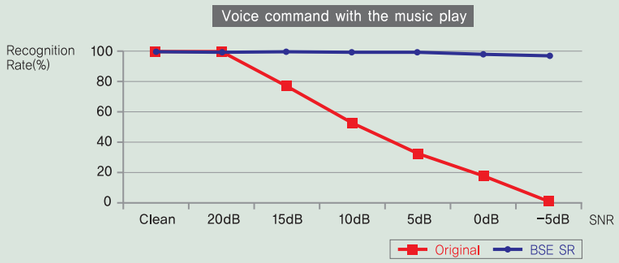
Echo cancellation

- Echo Return Loss Enhancement : 45dB or greater
- Work at near distance with SPK. : 1~2 ㎝, Full duplex

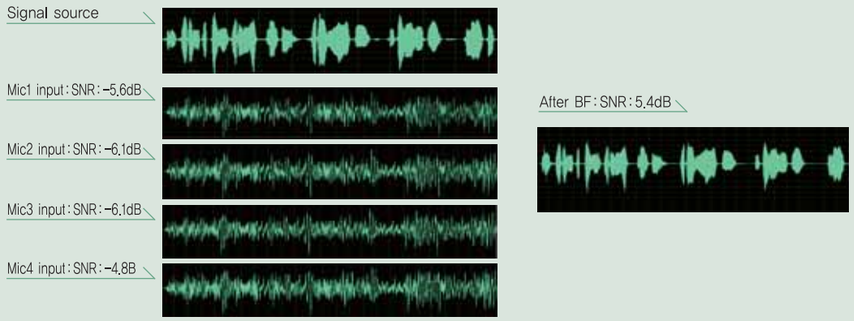
Noise reduction (SSR, Beam forming)

- Non stationary noise : up to 33 dB
- Stationary noise : up to 37 dB

Speech Recognition with 2 Microphones



Multi beam forming (4 Microphones) Module for TV



TERMINOLOGY

Decibel (dB)

The decibel (dB) is a unit measuring the sound level and indicating a ratio of two pressures, two voltages, two currents etc. The difference in sound pressure level between two sounds with p1 and p2 is therefore :

dB = 20 log (p2 / p1) P1 : Standard reference pressure (20㎛Pa)
P2 : Input sound pressure level

As dB described above, the scale of dB changes logarithmically.

Sound Pressure Level (SPL)

SPL is the force that moves acoustic sound waves to air particles.
The term 'dB SPL' is a unit of measurement for sound pressure level. The threshold of human hearing is 0 dB SPL with corresponding to 20㎛Pa.

Reference : 94dB-SPL ⇒ 1 pascal = 10㎛bar = 10 dynes/cm^2

The reference level in SPL measurement is 20㎛Pa.
94dB-SPL is the reference of sound field pressure for measuring microphone sensitivity in this catalogue.

Sensitivity

Sensitivity is defined as the response of a microphone to sound pressure.
It is the output level of microphone with a specified sound pressure, resistive load and supply voltage. It is expressed in dB. Decibel output ratings show negative numbers such as −40dB, −42dB, or −50dB, etc. The minus sign indicates the degree of the output signal for the microphone in comparison with the reference voltage or power.

In this catalogue, the sensitivity is measured at the following conditions :
Frequency = 1㎑, SPL = 1Pa, 0dB = 1V/Pa

Output Impedance

Impedance is generally defined as the resistance to the flow of current. It is measured in Ohm. The output impedance indicates the internal electric resistance within a microphone from the viewpoint of the side of output terminals of microphone. The load resistance mainly determines the value of output impedance. Thus, output impedance can be made higher or lower in response to the variation of the value of load resistance.

Frequency Response

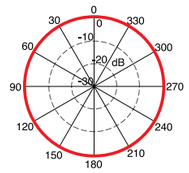
Frequency response represents the changes in the sensitivity of microphone with frequency. It also shows the frequency range as 50Hz – 20kHz. A flat frequency response indicates that microphone detects signals of all frequencies in the same way.

Directivity

Directivity represents the directional characteristics of a microphone corresponding to the sound source along the different incident angle.

Omnidirectional Microphone

An omnidirectional microphone has a flat response at audio frequency range. It responds to sound from all directions. Omnidirectional ECM is commonly used in audio consumer and communication application.



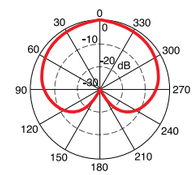
Polar pattern

Directional Microphone

The directional microphone shows relatively better response from one direction than others. Its output is proportional to the deviation of air pressure between the front and rear of the diaphragm. It is categorized into unidirectional and bidirectional (noise cancelling) microphone.

Unidirectional Microphone

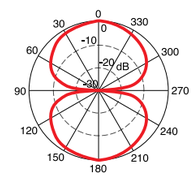
It is also called the cardioid pattern because of its heart-shaped appearance. The unidirectional microphone has a response over a wide front angle but its sensitivity is less at the back. In other words, It has better Signal-to-Noise (S/N) ratio at the front side in comparison with omnidirectional microphone. The unidirectional microphone can be used for lecturer or performer who want to minimize the noise of audience in the rear side.



Polar pattern

Bidirectional (Noise Cancelling) Microphone

The bidirectional microphone has a dual pattern in the front and rear. Thus, the front and rear directions are interchangeable. The bidirectional microphone is useful for a pair of conversationalists who face each other at the table due to the optimum pickup of both talkers and minimum sound pickup from the side.



Polar pattern