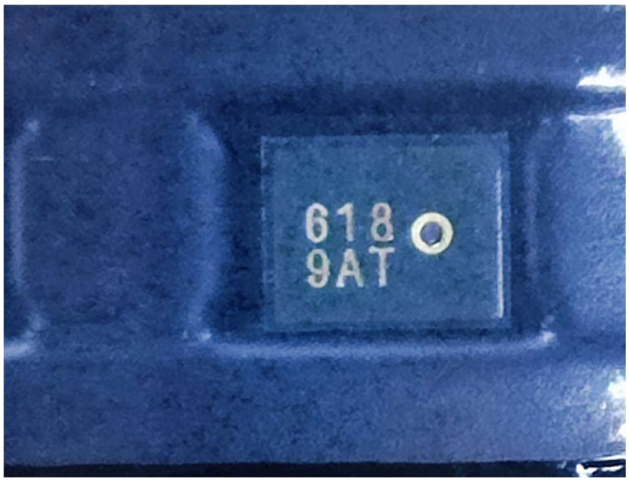


設計驗證
工程課
2025 -05- 07
發行

A Member of WPG Holdings

AIT group

詮鼎科技股份有限公司
台北市115南港區經貿二路189號13樓
Asian Information Technology Inc.
13F, No. 189, Jingmao 2nd Rd., Nangang Dist.
Taipei, Taiwan
Mobile: 0910088812

APPROVAL SHEET

CUSTOMER: 鈺緯科技開發股份有限公司

BRAND: **Zilltek**

PART NUMBER: **ZTS6211E**

CUSTOMER P/N: **3ZMIC000410**
(Z0339)

設計驗證
工程課
2025 -05- 07
發行
鈺緯科技開發股份有限公司

DATE: **2025/4/24**

零件承認	
核准	負責人
ASIAN INFORMATION TECHNOLOGY INC. 詮鼎科技股份有限公司	
承認日期	年　　月　　日

詮鼎科技股份有限公司
Asian Information Technology Inc.
業務人員：陳文豪　　手機：0910088812

Wideband MEMS Microphone with Top Port and Analog Output

DESCRIPTION

The ZTS6211E is a high quality, low cost, low power analog output top-ported omni-directional MEMS microphone. ZTS6211E consists of a MEMS microphone element and an preamplifier. ZTS6211E has a high SNR and flat wideband frequency response, resulting in natural sound with high intelligibility. Extra EMI filter for RF noise attenuation is built inside. Due to the built-in filter, ZTS6211E shows high immunity to EMI.

The ZTS6211E is available in a thin 3.76mm × 2.95mm × 1.1mm surface-mount package. It is reflow solder compatible with no sensitivity degradation. The ZTS6211E is Halogen and Lead free.

APPLICATIONS

- Mobile telephones
- PDAs
- Digital video cameras
- Portable media devices with audio input

ORDERING INFORMATION

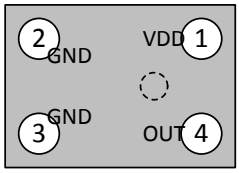
PART	RoHS	Ship, Quantity
ZTS6211E	Yes	Tape and Reel, 5.2K
ZTS6211E-M	Yes	Tape and Reel, 5.2K

FEATURES

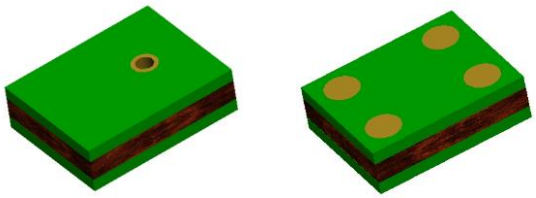
- 3.76mm×2.95mm×1.1mm surface-mount package
- Stable sensitivity over power supply range of 1.5V-3.6V
- SNR of 65dBA
- Sensitivity of −38dBV
- Low current consumption of <200μA
- Multi Chip Module (MCM) Package

Pins Configuration and Description

Bottom View



Top Metal Cover is GND.

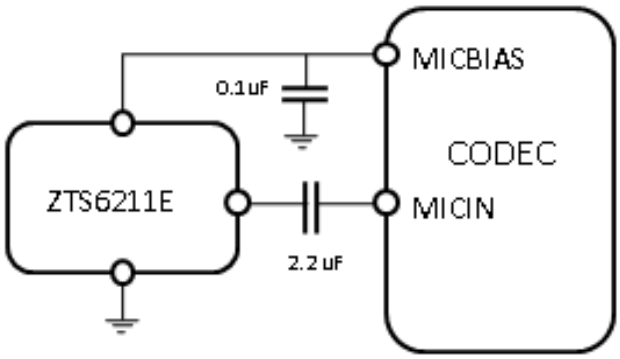


Top Bottom

Isometric Views of ZTS6211E Microphone Package

Typical Applications

The ZTS6211E output can be connected to a codec microphone input or to a high input impedance gain stage. A dc-blocking capacitor is required at the output of the microphone



Connect to Audio Codec

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Absolute Maximum Ratings

VDD to Ground ..... 1.5V to +3.6V
OUT to Ground ..... 1.5V to +3.6V
Operating Temperature Range ..... –40°C to +125°C
Storage Temperature Range ..... –40°C to +125°C

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

Electro-Static Discharge Sensitivity

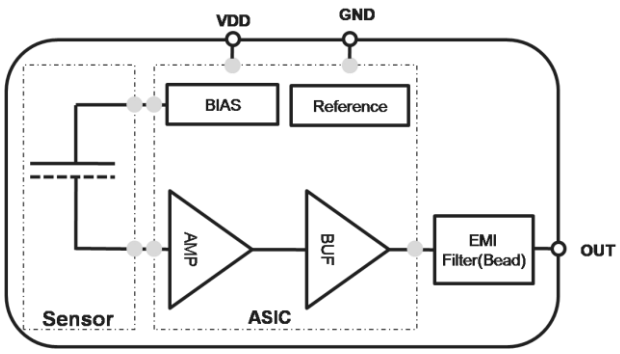


This integrated circuit can be damaged by ESD. It is recommended that all integrated circuits be handled with proper precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure.

Pins Description

Pin	Symbol	Description
1	VDD	Power Supply.
2,3	GND	Ground.
4	OUT	Analog output signal.

Functional Block Diagram



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Specifications

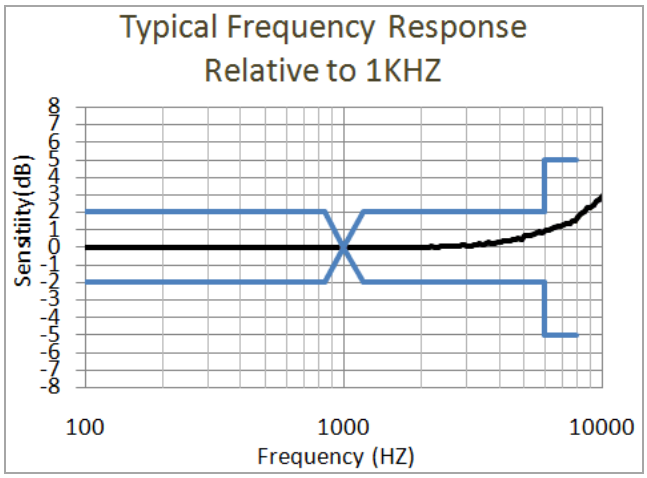
(T_A = +15°C ~+25°C, V_{DD} = +1.8V, unless otherwise noted.)

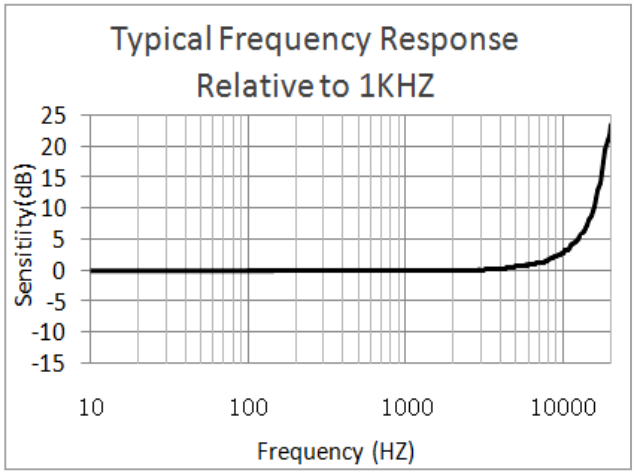
PARAMETER	Symbol	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Directivity				Omni		
Supply Voltage	V_{DD}		1.5		3.6	V
Current Consumption	I_{DD}			120	200	µA
Sensitivity		1kHz, 94dB SPL, TOLERANCE +/-1 dBV	−39	−38	−37	dBV
Signal-to-Noise-Ratio	SNR			65		dB
Equivalent Input Noise	EIN			29		dBA SPL
Total Harmonic Distortion	THD	110dB SPL			1	%
Acoustic Overload Point	AOP	10% THD @ 1KHz		132		dBSPL
Power Supply Rejection Ratio	PSRR	1KHz, 200mVpp, sine wave on V_{DD}		75		dBV/FS
Power Supply Rejection	PSR	217Hz, 100mVpp, square wave on VDD		-100		dBFS(A)
Output Impedance	Zout			200	350	Ω
Output DC Offset				0.75		V
Output Current Limit				90		µA
Polarity				Noninverting		

Note: Base on BK sound test system.

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Typical Performance Characteristics





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TDMA Disturbance Immunity

- 65 dB Max @500～2500MHz (Direct RF injection test according to set figure , this set figure is based on below block diagram.)

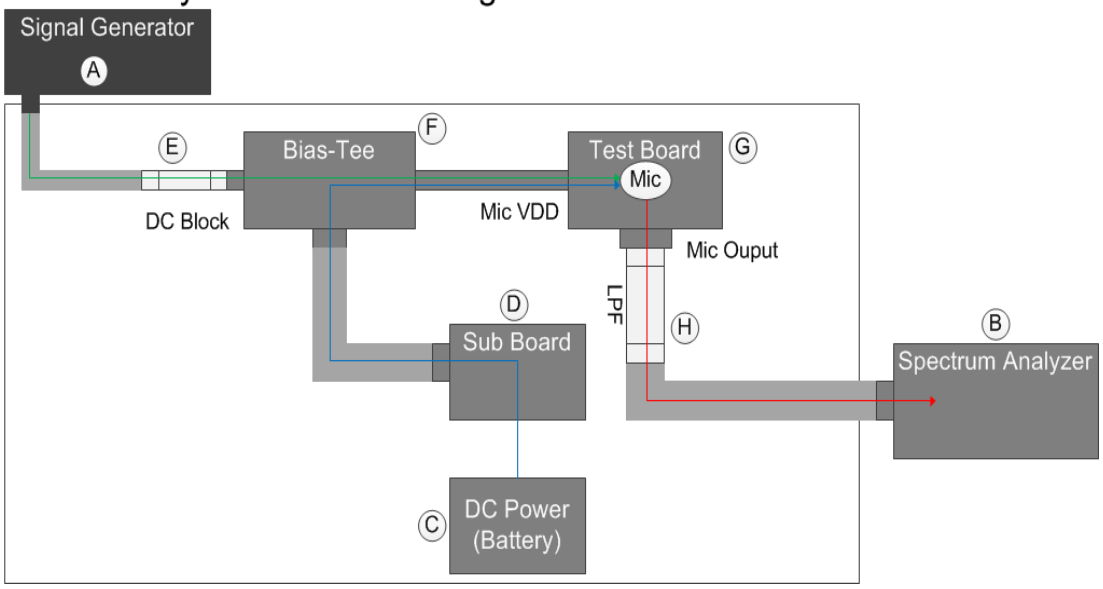
Instrument settings

Signal Generator

- modulation: 1 kHz, AM, depth 80%
- test frequency and amplitude from frequency/amplitude table

MHz	dBm	MHz	dBm	MHz	dBm	MHz	dBm	MHz	dBm
100	-4.08	600	-2.85	1100	-1.64	1600	-0.52	2100	0.05
200	-3.68	700	-2.61	1200	-1.33	1700	-0.29	2200	0.12
300	-3.31	800	-2.39	1300	-1.25	1800	-0.11	2300	0.27
400	-3.24	900	-2.11	1400	-1.08	1900	-0.04	2400	0.31
500	-3.09	1000	-1.84	1500	-0.86	2000	-0.01	2500	0.45

RF Immunity Measurement Diagram



A	Signal Generator	Rode & Schwarz SMIQ 03B
B	Spectrum Analyzer	Audio Precision APx525
C	DC Power	Battery 3V
D	Sub Board with RL & Capacitor	C: 0.1uF
E	DC block	Agilent 11742A
F	Bias-Tee	Mini-Circuits ZFBT-6GW
G	Test Board	ZTS6211E EVB
H	Low pass filter (Pass band 5M~2.5GHz)	Mini-Circuits SLP-2.5, SLP-5, SLP-150, SLP-450, SLP-1200,SLP-1650

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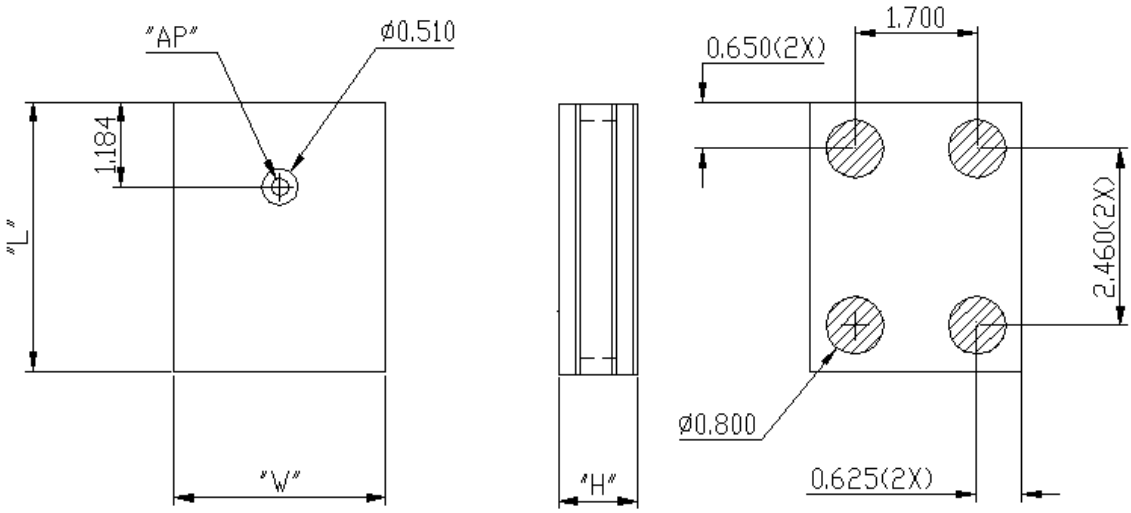
Reliability Tests

The microphone sensitivity after stress must deviate by no more than ±3dB from the initial value.

1. Heat Test, Operational	Temperature: 125±3 °C Duration: 500 hours Voltage: Applied
2. Cold Test, Operational	Temperature: -40±3°C Duration: 500hours Voltage: Applied
3. Heat Test, Non-Operational	Temperature: 125±3°C Duration: 500hrs. Voltage: Not Applied
4. Cold Test, Non-Operational	Temperature: -40±3°C Duration:500hrs. Voltage: Not Applied
5. Thermal Shock Test, Non-Operational	Temperature: -40±3°C and 125±3°C Duration: 30 minutes each, during 5 minutes ramp, 256 cycles Voltage: Not applied
6. Temperature humidity storage	Temperature: 85±3°C Humidity: 85±3%RH Duration: 500hrs.
	Temperature: 65±3°C Humidity: 95±3%RH Duration: 168 hours
7. Free Fall Test 1.5m	Placed inside test fixture and dropped on concrete from height 2m. 4 times by each surface and corner
8. Vibration	4 cycles of 20 to 2000 Hz sinusoidal sweep with 20G peak acceleration lasting 16minutes in X, Y, and Z directions
9. Mechanical Shock	5 pulses of 10000g in each of the ±X, ±Y, and ±Z directions
10. Electrostatic Discharge Test	Capacitance: 150pF Resistance: 330Ω Duration: 10 times Air Discharge: Level 4(+/-15kV) Direct contact discharge: Level 4 (+/-8kV)
11. Human Body Mode	±2000 Volt
12. Charged-Device Model	±200 Volt
13. Reflow	5 reflow cycles with peak temperature of 260℃
14. Solderability	245±5 °C ,5sec, 95% Tin on pad surface
15. Tumble test	300 tumbles from a height of 1m onto a steel base.
16. HAST	Temperature: 130±3°C Humidity: 85±3%RH Duration: 96 hours Voltage: Applied
17. Air Blow	0.45MPa, distance 3cm, time 10s

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MECHANICAL SPECIFICATIOPNS

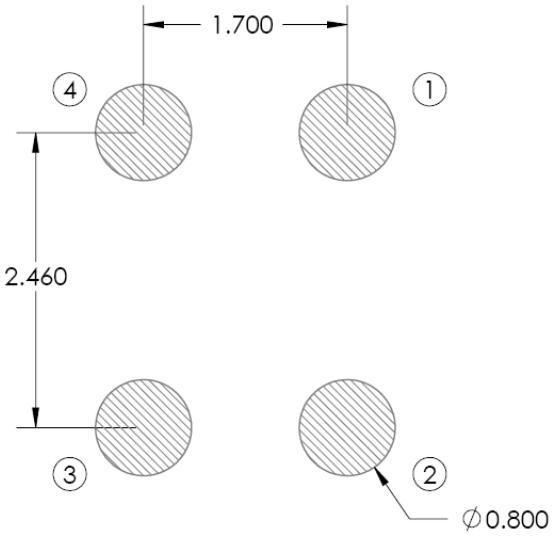


ITEM	DIMENSION	TOLERANCE	UNITS
Length (L)	3.760	±0.100	Mm
Width (W)	2.950	±0.100	Mm
Height (H)	1.100	±0.100	Mm
Acoustic Port (AP)	Ø0.3500	±0.050	Mm

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RECOMMENDED CUSTOMER LAND PATTERN

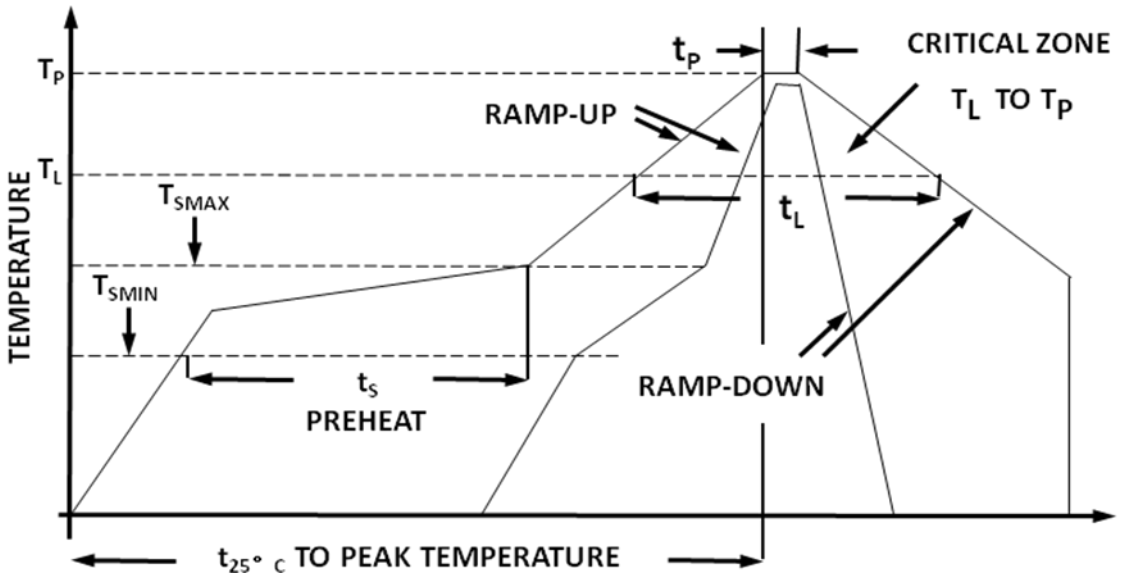
The recommended PCB land pattern for the ZTS6211E should have a 1:1 ratio to the solder pads on the microphone package. Care should be taken to avoid applying solder paste to the sound hole in PCB. The dimensions of suggested solder paste pattern refer to the land pattern **which should be shrunk by 0.025 per side**.



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SOLDER FLOW PROFILE

The reflow profile specified in this section describes expected maximum heat exposure of components during the reflow process of NMP product PWBs. Temperature is measured on top of component. All components have to tolerate at least this profile five times (5x) without affecting electrical performance, mechanical performance or reliability.

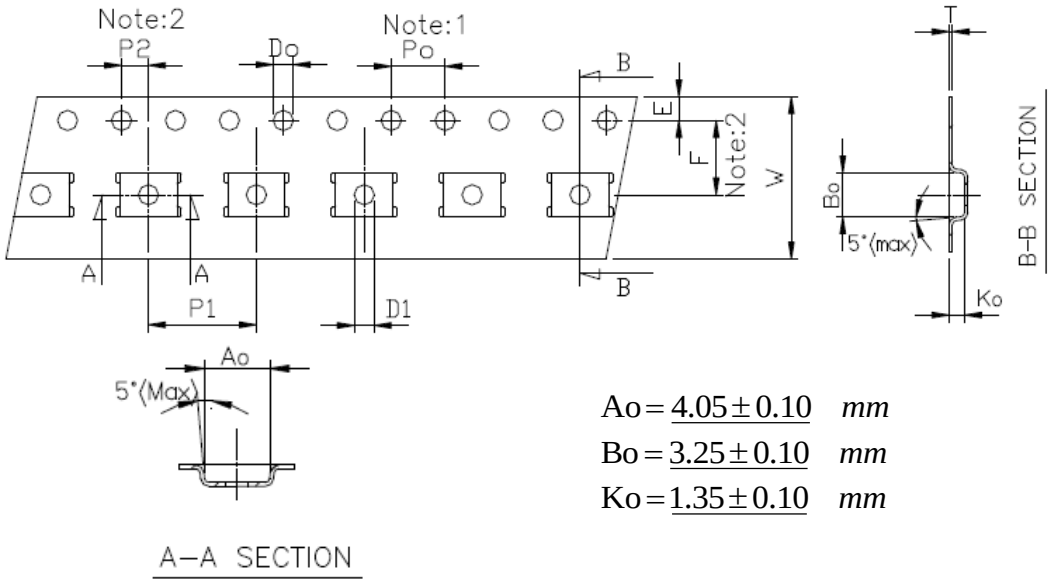


Pb-free and Sn63/Pb37 reflow profile requirements for soldering heat resistance:

Parameter		**Reference**	**Pb-Free**	**Sn63/Pb37**
Average Ramp Rate		T_L to T_P	1.25°C/sec max	1.25 °C /sec max
Prehear	Minimum Temperature	T_{SMIN}	100°C	100 °C
	Maximum Temperature	T_{SMAX}	200°C	150 °C
	Time	T_{SMIN} to T_{SMAX}	60sec to 120sec	60sec to 120sec
Ramp-Up Rate		T_{SMAX} to T_L	1.25°C/sec	1.25 °C /sec
Time Maintained Above Liquidous		t_L	60sec to 150sec	60sec to 150sec
Liquidous Temperature		T_L	217°C	183 °C
Peak Temperature		T_P	260°C +0°C/-5°C	215 °C +3 °C /-3 °C
Time Within +5°C of Actual Peak Temperature		t_P	20 sec to 30 sec	20 sec to 30 sec
Ramp-Down Rate		T_{peak}	6°C/sec max	6 °C /sec max
Time +25°C (t_{25OC}) to Peak Temperature			8 min max	6 min max

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PACKAGING



$$Ao = \underline{4.05 \pm 0.10} \quad mm$$
$$Bo = \underline{3.25 \pm 0.10} \quad mm$$
$$Ko = \underline{1.35 \pm 0.10} \quad mm$$

A–A SECTION

Unit：mm

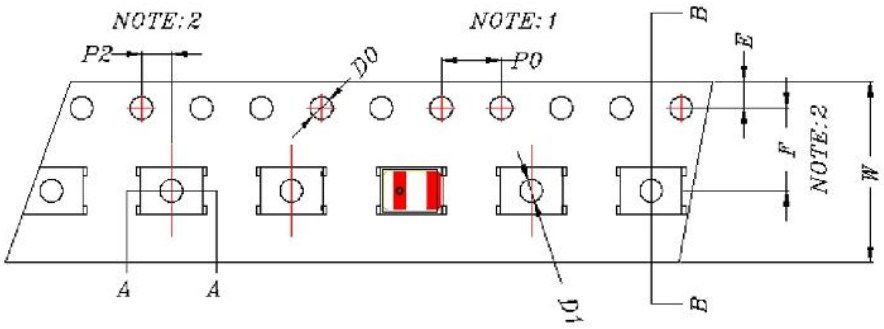
Symbol	Spec.
K1	-
P_O	4.0 ± 0.10
P1	8.0 ± 0.10
P2	2.0 ± 0.05
D_O	1.55 ± 0.05
D1	1.50 (MIN)
E	1.75 ± 0.10
F	5.50 ± 0.05
10P_O	40.0 ± 0.10
W	12.0 ± 0.20
T	0.30 ± 0.05

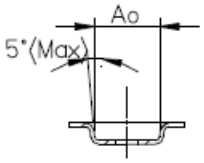
Notice：

1．10 Sprocket hole pitch cumulative tolerance is ± 0.1mm.
2．Pocket position relative to sprocket hole measured as true position of pocket not pocket hole.
3．A_O & B_O measured on a place 0.3mm above the bottom of the pocket to top surface of the carrier.
4．K_O measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
5．Carrier camber shall be not that 1mm per 100mm through a length of 250mm.

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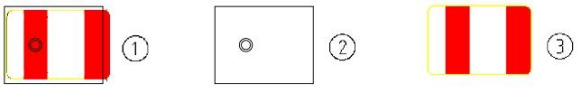
ZTS6211E-M PACKAGING





A–A SECTION

$$Ao = \underline{4.05 \pm 0.10} \quad mm$$
$$Bo = \underline{3.25 \pm 0.10} \quad mm$$
$$Ko = \underline{1.35 \pm 0.10} \quad mm$$



NOTE: ① Net Mylar microphone
② Mic
③ Mylar (Red part does not contain glue)

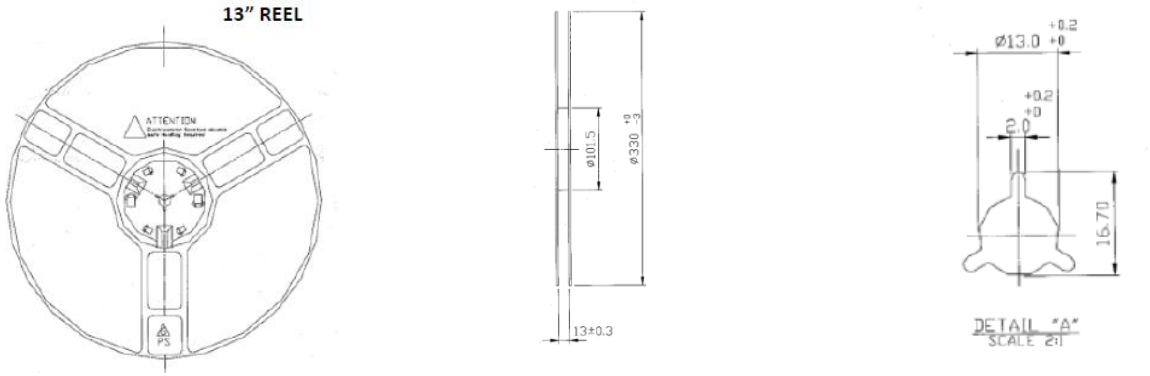
Unit：mm

Symbol	Spec.
K1	-
P_O	4.0 ± 0.10
P1	8.0 ± 0.10
P2	2.0 ± 0.05
D_O	1.55 ± 0.05
D1	1.50 (MIN)
E	1.75 ± 0.10
F	5.50 ± 0.05
$10P_O$	40.0 ± 0.10
W	12.0 ± 0.20
T	0.30 ± 0.05

Notice：

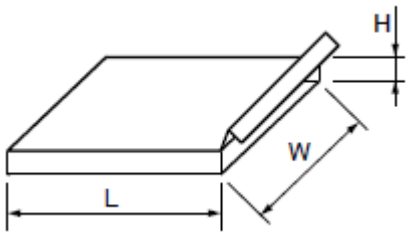
1．10 Sprocket hole pitch cumulative tolerance is ± 0.1mm.
2．Pocket position relative to sprocket hole measured as true position of pocket not pocket hole.
3．A_O & B_O measured on a place 0.3mm above the bottom of the pocket to top surface of the carrier.
4．K_O measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
5．Carrier camber shall be not that 1mm per 100mm through a length of 250mm.

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Part NO.	Reel Diameter	Quantity Per Reel	Quantity Per Inner Box	Quantity Per Outer Box
ZTS6211E	13"	5,200	5,200	46,800

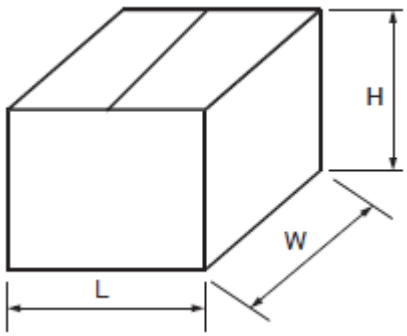
Dimensions for Inner Box



Unit：mm

L	W	H
335	339	45

Dimensions for Outer Box



Unit：mm

L	W	H
445	360	372

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