

DB Products Limited

Approval Sheet

Model Number: UM1515IA085008LFMP

Reference Number: 5-001

Date: 19 Apr 2018

Prepared by: Nelson Lee

Approved by: Joey Lin

Approval by

Company Name:

Sign by:

Title:

Date:

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Reference Number: 5-001

1. Purpose and the scope

This document contains the specific specifications (electrical and mechanical), inspection standard and the reliability standard for the purpose of the customer's approval.

2. Description

SMD Mylar Speaker.

3. Applications

Feature Telephone, Cordless Phone, Computer, Instrument etc.

4. Product origin

In China

5. Test conditions

Test should be made under the conditions of room temperature ($20 \pm 10^\circ\text{C}$) normal humidity ($60 \pm 20\%$) and normal atmospheric pressure. In the case, however, that the judgment is questionable the test conditions are to be changed to room temperature $20 \pm 2^\circ\text{C}$, relative humidity 60 ~ 70 % and normal atmospheric pressure..

6. Ozone guarantee

Certificate on the elimination of ozone layer destroying substances such as Freon.

7. Quality protection

The specifications of the mentioned model are based on this document. Other specifications outside than this document must be discussed with us before we insert into this approval document. It means that we will not guarantee the specifications outside than this approval document.

8. Warranty.

The warranty period will commence upon the date of the receipt of the parts from db products limited. In the event that the warranty is not specified on the purchasing order, the warranty period shall be half year from the date of delivery.

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9. Soldering conditions

The speaker by db products limited should not be exposed to extremely high temperatures for prolonged period of time. As excessive heat will degrade the internal structure of the unit, soldering should be conducted as quickly as possible.

Recommended temperature and time for soldering

Hand soldering (for ABS, Hi-Temp ABS, FR ABS, Nylon)

300 ° C Thermal iron 2 seconds

10. Washing conditions

The products mentioned with “ remove after washing “ could be washed by our recommended solvent.

11. Flux removing solvents

In the view of the recent requirement for total elimination of ozone-depleting chemicals, we have decided to recommend our customers to use deionized water for their cleaning process at the condition given below, instead of “CFC” that was conventionally used.

Cleaning solvent : deionized water

Solvent temperature : 55 ± 5 ° C

Immersion time : 5 ± 0.5 minutes

12. Signal input polarity

When a positive dc voltage is applied to the terminal marked (+) or red the diaphragm should move to the front..

13. Operation test

Must be normal at program source same as the power rating.

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14. Specification

Items	Specifications	Conditions
Size	15.0 x 15.0 x 4.0 (mm)	
Rated Input Power	0.5 W	
Maximum Input Power	0.8 W	
Impedance	8.0 Ω	\pm 15.0 % at 2000.0 Hz
Resonant Frequency (f_0)	850.0 Hz	\pm 20.0 % at 1.0 V
Sound Pressure Level	87.0 dB	\pm 3.0 dB / 0.5 W power / measuring distance at 1000.0 , 1600.0 , 2000.0 , 3200.0 Hz average
Measuring Distance	10.0 cm	
Frequency Range	$f_0 \sim$ 20.0 KHz	Output S.P.L. -10.0 dB
Distortion	< 5.0 %	At 2000.0 Hz input 0.5 W
Magnet	\varnothing 6.5 x1.0 mm	SMCO
Housing Material	LCP	
Diaphragm Material	Mylar	PI
Weight	1.5 g	
Operating Temperature	- 40.0 \sim + 85.0 $^{\circ}$ C	
Storage Temperature	- 40.0 \sim + 105.0 $^{\circ}$ C	
Buzz, Rattle, etc.	2.0 V	Must be normal at sine wave between $F_0 \sim$ 5.0 K Hz
Polarity	Cone will move forward with positive dc current to “ + ” terminal	

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15. Inspection Standard

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Item tested	Sym	Standard	AQL	Level	Inspection by means of	Remarks
Sound Pressure Level		Should be within 87.0 ± 3.0 dB	1	II	Audio analyzer	0.5 W power / measuring distance at 1000.0 , 1600.0 , 2000.0 , 3200.0 Hz average
Impedance		8.0 Ω	0.65	I	Impedance Meter	± 15.0 % measured at 2000.0 Hz
Outer Diameter		15.0 x 15.0 ± 0.5 (mm)	1.5	S-3	Electronic Calipers	To be measured at the maximum dia.
Height		4.0 ± 0.5 (mm)	1.5	S-3	Electronic Calipers	To be measured at the maximum height on the body only.
Rust			1	II	Visual	Any rust should not be accepted.
Stain			1.5	II	Visual	There should be no remarkable stains.
Adhesion			1.5	II	Visual	Adhesion should be made sufficiently and there should be no outflow of adhesive agent.
Other Appearance			1.5	II	Visual	

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16. Reliability Test



Reliability Test Performance	After any following test, parts should conform to original performance within ± 3.0 dB tested with Rated Power, after 6.0 hours of recovery period
High Temperature Test	96.0 hours at $+85.0 \pm 3.0$ °C
Low Temperature Test	96.0 hours at -40.0 ± 3.0 °C
Humidity Test	96.0 hours at $+30.0 \pm 3.0$ °C , 92.0 – 95.0 % RH
Temperature / Humidity Cycle	<p>The part shall be subjected 5.0 cycles. One cycle shall be 6.0 hours and consist of 90 ~ 95 % RH</p>
Vibration	<p>Frequency : 10.0 ~ 55.0 ~ 10.0 Hz Oct/min Amplitude : 1.5 mm</p> <p>Duration : 2.0 hours each of 3.0 perpendicular directions</p>
Drop Test	Drop the speaker contained in normal box onto the surface of 40.0 mm thick board 10.0 times from the height of 75.0 cm
Operation Life Test	Must perform normal with program White-Noise source at Rated Power for 96.0 Hours
Terminal Strength	<p>Apply 3.0 N (0.306 kg) to each terminal in horizontal direction for 30.0 seconds.</p> <p>Apply 2.0 N (0.204 kg) to each terminal in vertical direction for 30.0 seconds.</p>

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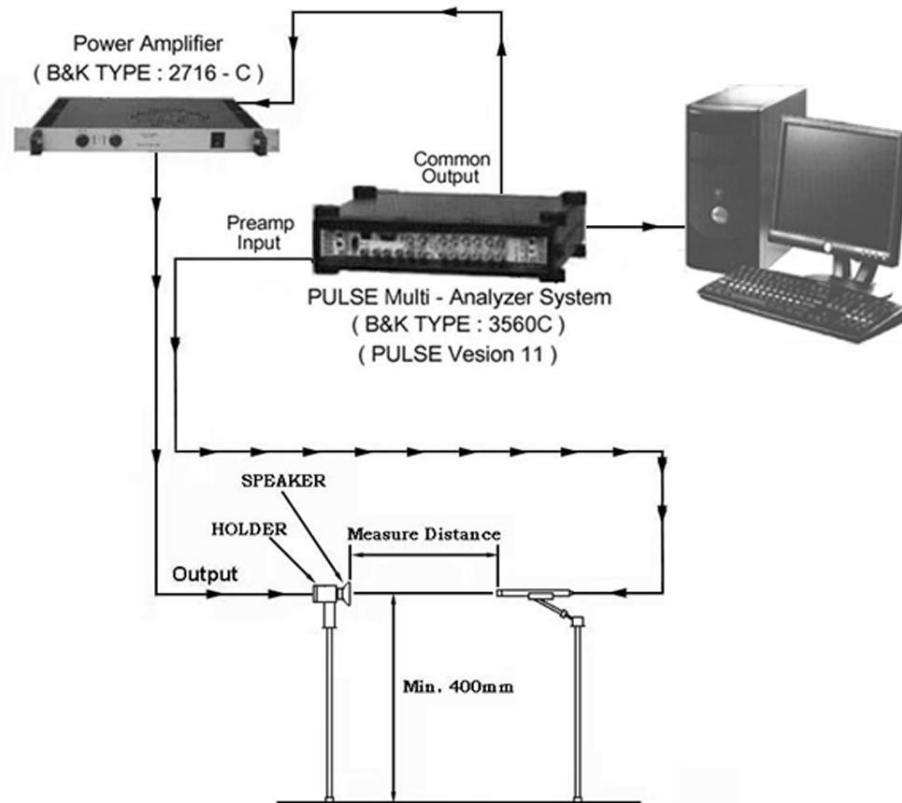
Reference Number: 5-001

17 . Equipment List

Name	Model
Audio Analyzer	Bruel & kjaer
Acoustic Chamber	Bruel & kjaer
Audio Calibrator	Bruel & kjaer
Amplifier	Bruel & kjaer



Fig.1 Measuring Method

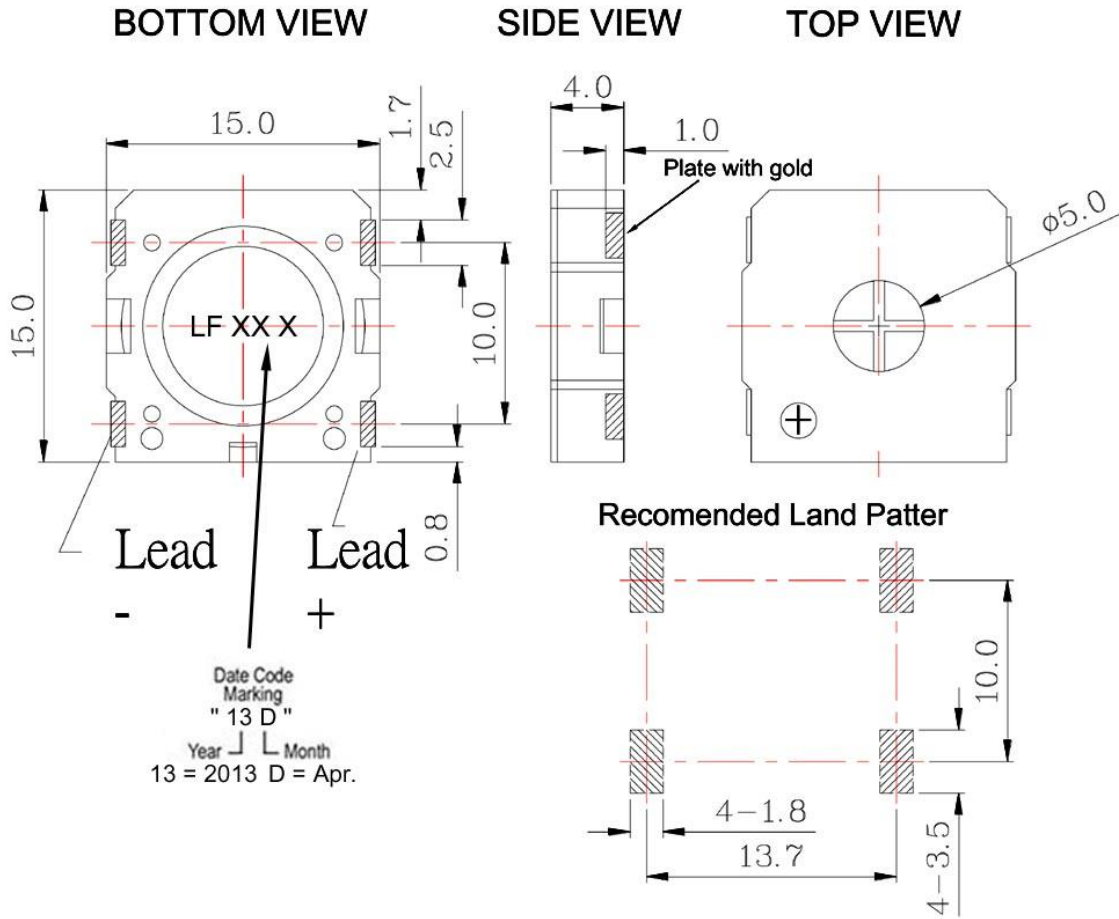


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18. Mechanical Draw



Date Code Marking
" 13 D "
Year | Month
13 = 2013 D = Apr.

Unit : mm

Tolerance : ± 0.5 mm

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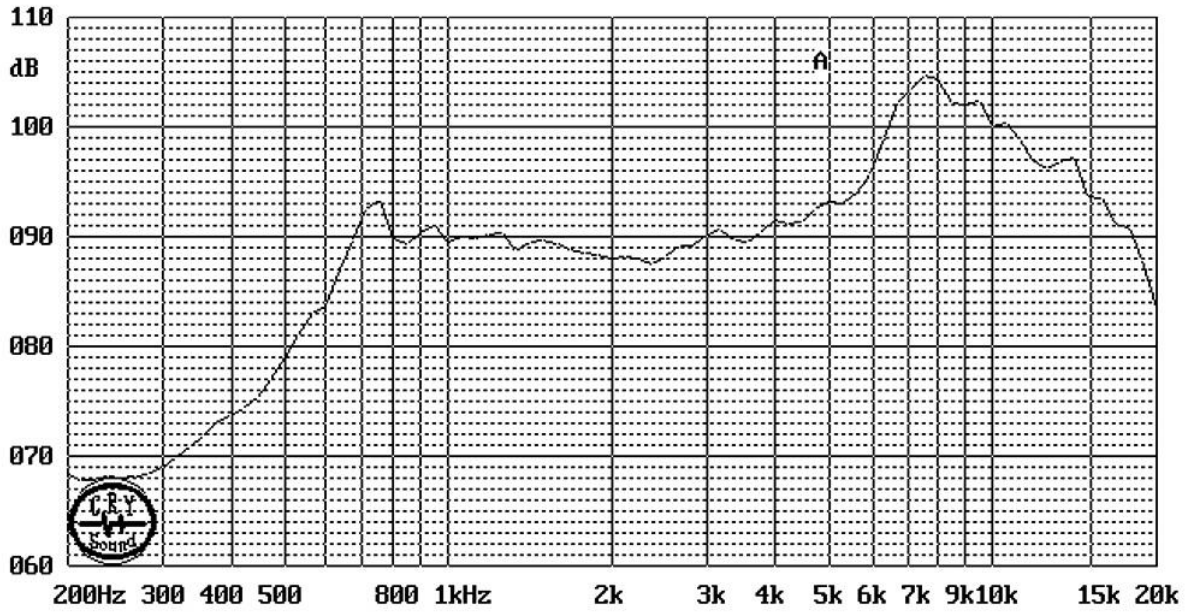
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19. Frequency Response



Test Condition : 0.5 W / 10.0 cm



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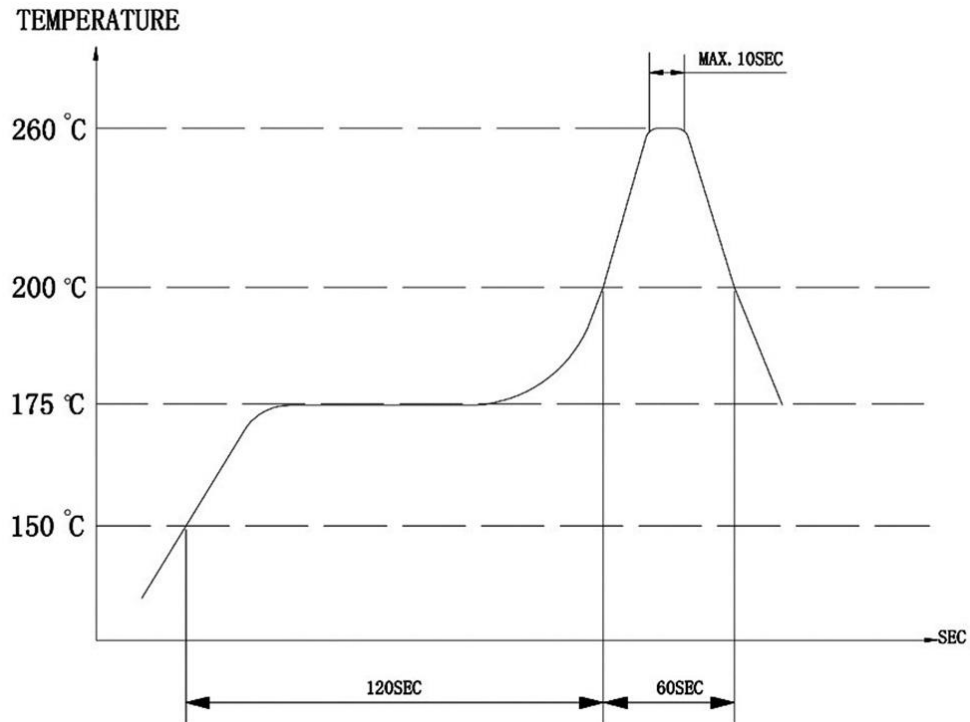
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20. Soldering Condition

(1) Recommended reflow soldering condition is as follows (Reflow soldering is twice)

Note: It is requested that reflow soldering should be executed after heat of product goes down to normal



Heat resistant line (Used when heat resistant reliability test is performed)

(2) Manual soldering

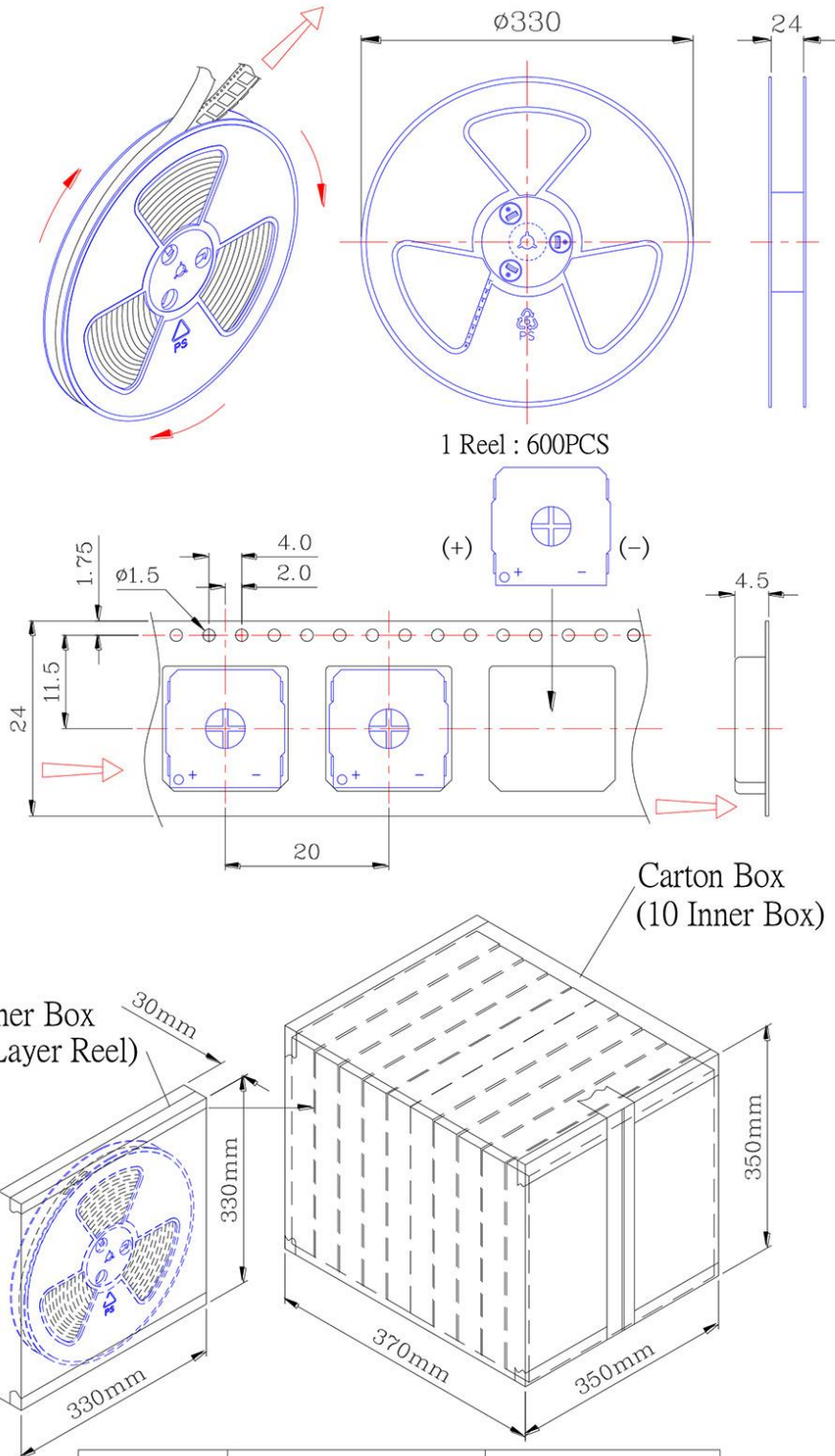
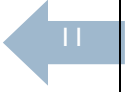
Manual soldering temperature 350.0 °C within 5.0 seconds.

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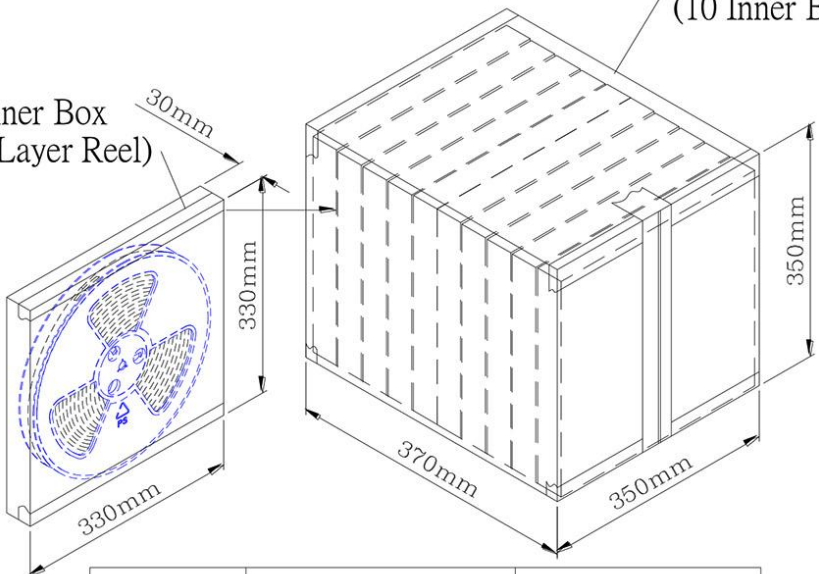
21. Packing Information



1 Reel : 600PCS

Carton Box
(10 Inner Box)

Inner Box
(1 Layer Reel)



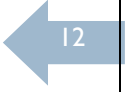
Inner Box	330mmx330mmx30mm	1x600PCS=600PCS
Carton Box	350mmx350mmx370mm	10x600PCS=6,000PCS

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22. Change History



Version	Date	Description	Approved
5-001	19 Apr 2018	1) Impedance : $8 \Omega \pm 15 \%$ at 1000 Hz 1 V change to at 2000 Hz. 2) Modify Distortion Information. 3) Magnet Size : $\varnothing 6.7 \times 1.1$ mm change to $\varnothing 6.7 \times 1$ mm. 4) Operating Temperature : $-30 \sim +85$ °C change to $-40 \sim +85$ °C. 5) Modify Buzz, Rattle, etc. information. 6) Add "Polarity " information. 7) Modify" 16. Reliability Test " information. 8) Modify "19. Frequency Response " Draw.	JL