muRata

Messrs.:

Specification No. JELMC0-0133A

Konka Group Co., Ltd.

Product Specification

Issued Date: Sep. 16. 2005

Part Description: SWITCHPLEXER™

Customer Part No.:

MURATA Part No.: LMSP43CA-309

Acknowledgement of reception We have received the attached specification Date: Company: Dept.:	
Representative (Signature) (Type)	Received by (Signature) (Type)

Sales office

(Signature)
(Type)

(Company name/Dept.)

Technical Dept.

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1. STYLE

MURATA P/N	CENTER FREQUENCY (NOMINAL)
LMSP43CA-309	GSM850 : 836.50 / 881.50 MHz GSM900 : 897.50 / 942.50 MHz GSM1800 : 1747.50 / 1842.50 MHz GSM1900 : 1880.00 / 1960.00 MHz

2. OPERATING TEMPERATURE

-30 °C ~ +85 °C

3. SPECIFICATIONS

According to Pages 3/16 ~ P8/16.

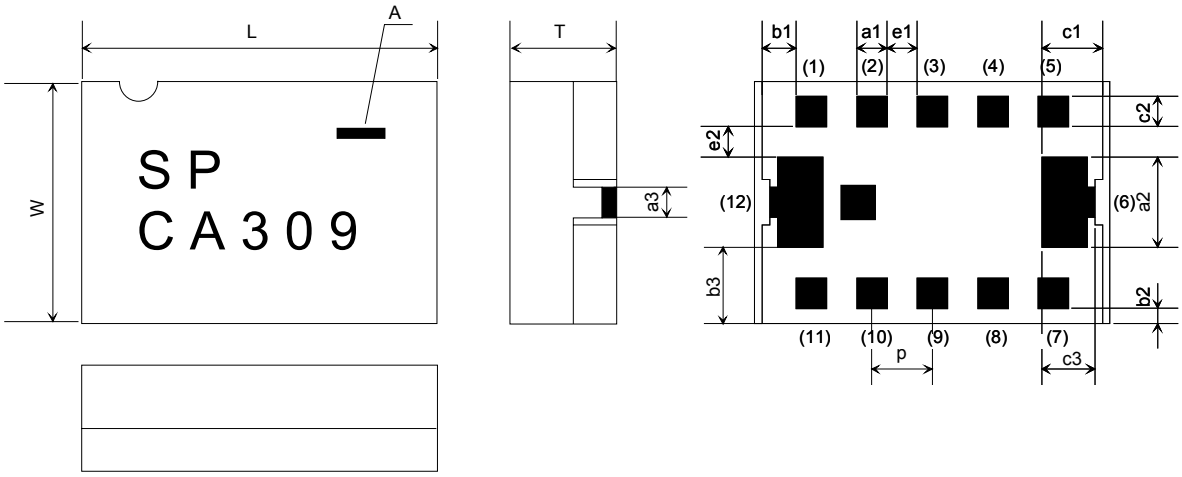
4. RoHS compliance

This component can meet with RoHS compliance*.

(RoHS specification is still draft format, not complete yet, at present (Jan/2005). So this component's RoHS compliance is judged by Murata own standard, which is based on current draft format.)

5. CONSTRUCTION, DIMENSIONS & MARKING

<Top View> <Bottom View>



Mark	Meaning
A	Pin 1 Mark

(in mm)

Mark	Dimensions	Mark	Dimensions
L	4.7 ± 0.2	b3	1.0 ± 0.2
W	3.2 ± 0.2	c1	0.7 ± 0.2
T	1.4 max.	c2	0.4 ± 0.1
a1	0.4 ± 0.1	c3	0.6 ± 0.2
a2	1.2 ± 0.1	e1	0.4 ± 0.1
a3	0.40 ± 0.15	e2	0.4 ± 0.1
b1	0.45 ± 0.20	p	0.8 ± 0.1
b2	0.2 ± 0.2	-	-

TERMINAL CONFIGURATION

Terminal No.	Terminal Name	Terminal No.	Terminal Name
(1)	GSM1800 Rx	(7)	GSM850/900 Tx
(2)	Vc1(GSM1800/1900 Tx, GSM1900 Rx)	(8)	GND
(3)	GSM1900 Rx	(9)	ANT
(4)	Vc2(GSM1800/1900 Tx)	(10)	Vc3(GSM850/900 Tx)
(5)	GSM1800/1900 Tx	(11)	GSM850/900 Rx
(6)	GND	(12)	GND

6. ELECTRICAL CHARACTERISTICS (-30 ~+85 °C)

<GSM850/900 Band>

Tx mode	Frerquency Range (MHz)	fatl	836.50 ± 12.50
		fgtl	897.50 ± 17.50
	Ripple(dB)	Tx-ANT	0.50max.
	Insertion Loss (dB)	Tx-ANT	1.30 max. (at 25 °C)
			1.45 max. (at -25 ~ +70 °C)
			1.50 max. (at -30 ~ +85 °C)
	Attenuation (Absolute value)(dB)	Tx-ANT	27.0 min. at 2 x fatl MHz
			24.0 min. at 3 x fatl MHz
			30.0 min. at 2 x fgtl MHz
			25.0 min. at 3 x fgtl MHz
	V.S.W.R.	Tx	2.00 max.
	Isolation (dB)	Tx-Rx	22.0 min.
		Tx-GSM1800 Rx	25.0 min.
		Tx-GSM1900 Rx	25.0 min.
	Current Consumption (mA)		10 max.
	Power Capacity (dBm)		35.0 max.
	Harmonics (dBc)	Tx-ANT	-70 max. at 2 x fatl MHz, 2 x fgtl MHz
			-70 max. at 3 x fatl MHz, 3 x fgtl MHz
Rx mode	Frequency Range (MHz)	farl	881.50 ± 12.50
		fgrl	942.50 ± 17.50
	Ripple(dB)	ANT-Rx	0.50max.
	Insertion Loss (dB)	ANT-Rx	1.00 max. (at 25 °C)
			1.15 max. (at –25 ~+70 °C)
			1.20 max. (at -30 ~+85 °C)
	V.S.W.R.	ANT	2.00 max.
	Isolation (dB)	Tx-ANT	20.0 min. at fatl MHz, fgtl MHz

<GSM1800/1900 Band>

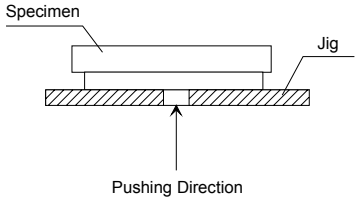
Tx mode	Frequency Range (MHz)	fdth	1747.50 ± 37.50
		fpth	1880.00 ± 30.00
	Ripple(dB)	Tx-ANT	0.50max.
	Insertion Loss (dB)	Tx-ANT	1.50 max. (at 25 °C)
			1.65 max. (at –25 ~+70 °C)
			1.70 max. (at –30 ~+85 °C)
	Attenuation (Absolute value)(dB)	Tx-ANT	30.0 min. at 2 x fdth MHz, 2 x fpth MHz
			28.0 min. at 3 x fdth MHz, 3 x fpth MHz
	V.S.W.R.	Tx	2.00 max.
	Isolation (dB)	1800 Tx-850/900 Rx	25.0 min
		1900 Tx-850/900 Rx	23.0 min.
		1800 Tx-1800 Rx	28.0 min
		1900 Tx-1800 Rx	28.0 min.
		1800 Tx-1900 Rx	20.0 min
		1900 Tx-1900 Rx	20.0 min.
	Current Consumption (mA)		10 max.
	Power Capacity (dBm)		33.0 max.
	Harmonics (dBc)	Tx-ANT	-67 max. at 2 x fdth MHz, 2 x fpth MHz
			-67 max. at 3 x fdth MHz, 3 x fpth MHz
GSM 1800 Rx mode	Frequency Range (MHz)	fdrh	1842.50 ± 37.50
	Ripple(dB)	ANT-1800 Rx	0.50max.
	Insertion Loss (dB)	ANT-GSM1800 Rx	1.50 max. (at 25 °C)
			1.65 max. (at –25 ~+70 °C)
			1.70 max. (at -30 ~+85 °C)
	V.S.W.R.	ANT	2.00 max.
	Isolation (dB)	GSM1800/1900 Tx-ANT	18.0 min. at fdth MHz
GSM 1900 Rx mode	Frequency Range (MHz)	fprh	1960.00 ± 30.00
	Ripple(dB)	ANT-GSM1900 Rx	0.50max.
	Insertion Loss (dB)	ANT-GSM1900 Rx	1.50 max. (at 25 °C)
			1.65 max. (at –25 ~+70 °C)
			1.70 max. (at -30 ~+85 °C)
	V.S.W.R.	ANT	2.00 max.
	Isolation (dB)	GSM1800/1900 Tx-ANT	16.0 min. at fpth MHz
	Current Consumption (mA)		1 max.

*Control Voltage Application

Mode	Vc1(GSM1800/1900 Tx ,GSM1900 Rx)	Vc2(GSM1800/1900 Tx)	Vc3(GSM850/900 Tx)
GSM850/900-Tx	0.0 ~ 0.1 V	0.0 ~ 0.1 V	2.3 ~ 3.0 V
GSM850/900-Rx	0.0 ~ 0.1 V	0.0 ~ 0.1 V	0.0 ~ 0.1 V
GSM1800/1900-Tx	2.3 ~ 3.0 V	2.3 ~ 3.0 V	0.0 ~ 0.1 V
GSM1800-Rx	0.0 ~ 0.1 V	0.0 ~ 0.1 V	0.0 ~ 0.1 V
GSM1900-Rx	2.3 ~ 3.0 V	0.0 ~ 0.1 V	0.0 ~ 0.1 V

NOTE : The above-mentioned values have been obtained according to our own measuring methods(testing jig : Fig.1,Zo=50 Ω) and may vary depending on the circuit, in which this component is actually incorporated.
You are, therefore, kindly requested to test the performance of this component incorporating in your set.

7. OTHER SPECIFICATION AND METHODS

No.	Items		Specifications	Test Methods
1	Vibration Resistance	Appearance	No severe damages	Solder specimens on the testing jig (glass-fluorine boards) shown in appended Fig.1 by an eutectic solder. The soldering shall be done either by iron or reflow and be conducted with care so that the soldering is uniform and free of defect such as by heat shock. Frequency : 10~2000~10 Hz Acceleration : 196 m/s^2 Direction : X,Y,Z 3 axis Period : 2 h on each direction Total 6 h.
		Electrical Specifications	Satisfy specifications listed in paragraph 6 over operational temperature range	
2	Shock	Appearance	No severe damages	Solder specimens on the testing jig (glass - fluorine boards) shown in appended Fig.1 by an eutectic solder. The soldering shall be done either by iron or reflow and be conducted with care so that the soldering is uniform and free of defect such as by heat shock. Acceleration : 980 m/s^2 Period : 6 ms. Cycle : 10 times
		Electrical Specifications	Satisfy specifications listed in pa ragraph 6 over operational temp erature range	
3	Deflection		No damage with 1mm deflection	Solder specimens on the testing jig (glass epoxy boards) shown in appended Fig.2 by an eutectic solder. The soldering shall be done either by iron or reflow and be conducted with care so that the soldering is uniform and free of defect such as by heat shock.
4	Soldering strength (Push Strength)		9.8 N Minimum	Solder specimens onto test jig shown below. Apply pushing force at 0.5 mm/s until electrode pads are pealed off or ceramics are broken. Pushing force is applied to longitudinal direction. 
5	Solderability of Termination		75% of the terminations is to be soldered evenly and continuously.	Immerse specimens first a ethanol (JIS-K-8101) solution of rosin (JIS-K-5902)(25% rosin in weight proportion), then in an eutectic solder solution for 2±0.5 s at 230±5 °C. Preheat : 100 ~ 120 °C、60 s Solder Paste : Sn-Ag-Cu Flux : Solution of ethanol and rosin (25 % rosin in weight proportion)

<table>
<tr><td>6</td><td>Resistance to Soldering Heat (Dipping)</td><td>Appearance</td><td>No severe damages</td><td>Immerse the chip in the eutectic solder solution of 270±5 °C for 20±0.5 s (flow soldering bath) after preheating for 1 min at 120 to 150 °C.
Then set it for 2 to 24 h at room temperature and measure.</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">Resistance to Soldering Heat (Reflow)</td><td>Appearance</td><td>No severe damages</td><td rowspan="2">Preheat Temperature : 150±10 °C
Preheat Period : 60 s. min.
Peak Temperature : 255±5 °C
Peak Temp. Period : 10 s.
Specimens are soldered twice with the above condition, then kept in room condition for 24 h before measurements.</td></tr>
<tr><td>Electrical specifications</td><td>Satisfy specifications listed in paragraph 6 over operational temperature range</td></tr>
<tr><td rowspan="2">8</td><td rowspan="2">Temperature Cycle</td><td>Appearance</td><td>No severe damages</td><td rowspan="2">Set the specimens to the supporting jig in the same manner and under the same conditions as Fig.1 and conduct the 100 cycles according to the temperatures and time shown in the following table. Set it for 2 to 24 h at room temperature, then measure.
<table><tr><td>Step</td><td>1</td><td>2</td></tr><tr><td>Temp.(°C)</td><td>Min. Operating Temp.+0/-3.</td><td>Max. Operating Temp.+3/-0.</td></tr><tr><td>Time(min)</td><td>30±3</td><td>30±3</td></tr></table></td></tr>
<tr><td>Electrical specifications</td><td>Satisfy specifications listed in paragraph 6 over operational temperature range</td></tr>
<tr><td rowspan="2">9</td><td rowspan="2">Humidity (with Load)</td><td>Appearance</td><td>No severe damages</td><td rowspan="2">Temperature : 85±2 °C
Humidity : 80 ~ 85 %RH
Period : 1000+48/-0 h
Room Condition : 2 ~ 24 h
Supply Voltage : maximum control voltage
Vc Terminal-On</td></tr>
<tr><td>Electrical specifications</td><td>Satisfy specifications listed in paragraph 6 over operational temperature range</td></tr>
<tr><td rowspan="2">10</td><td rowspan="2">High Temp. Load Life</td><td>Appearance</td><td>No severe damages</td><td rowspan="2">Temperature : 85±2 °C
Period : 1000+48/-0 h
Room Condition : 2 ~ 24 h
Supply Voltage : maximum control voltage
Vc Terminal-On</td></tr>
<tr><td>Electrical specifications</td><td>Satisfy specifications listed in paragraph 6 over operational temperature range</td></tr>
</table>

Excessive mechanical force or thermal stress may damage the products. Appropriate handling is required.

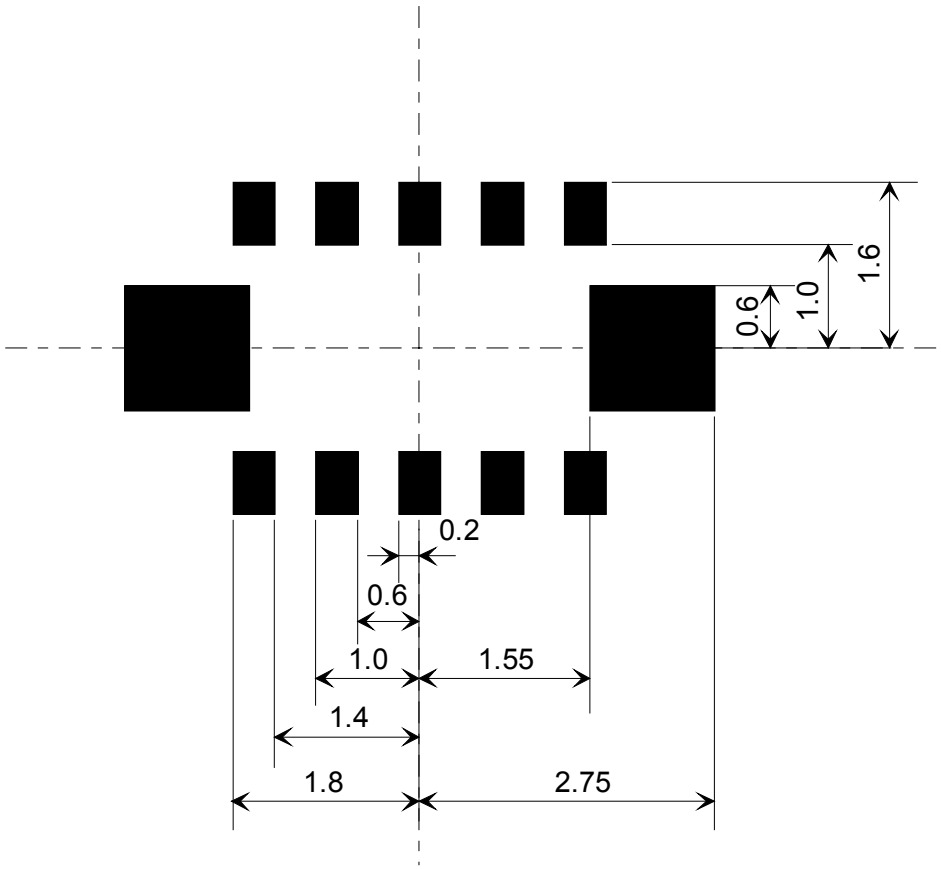
Production Site

FUKUI MURATA MFG.CO.,LTD.
OKAYAMA MURATA MFG.CO.,LTD.

Fig. 1

(in mm)

Land Pattern



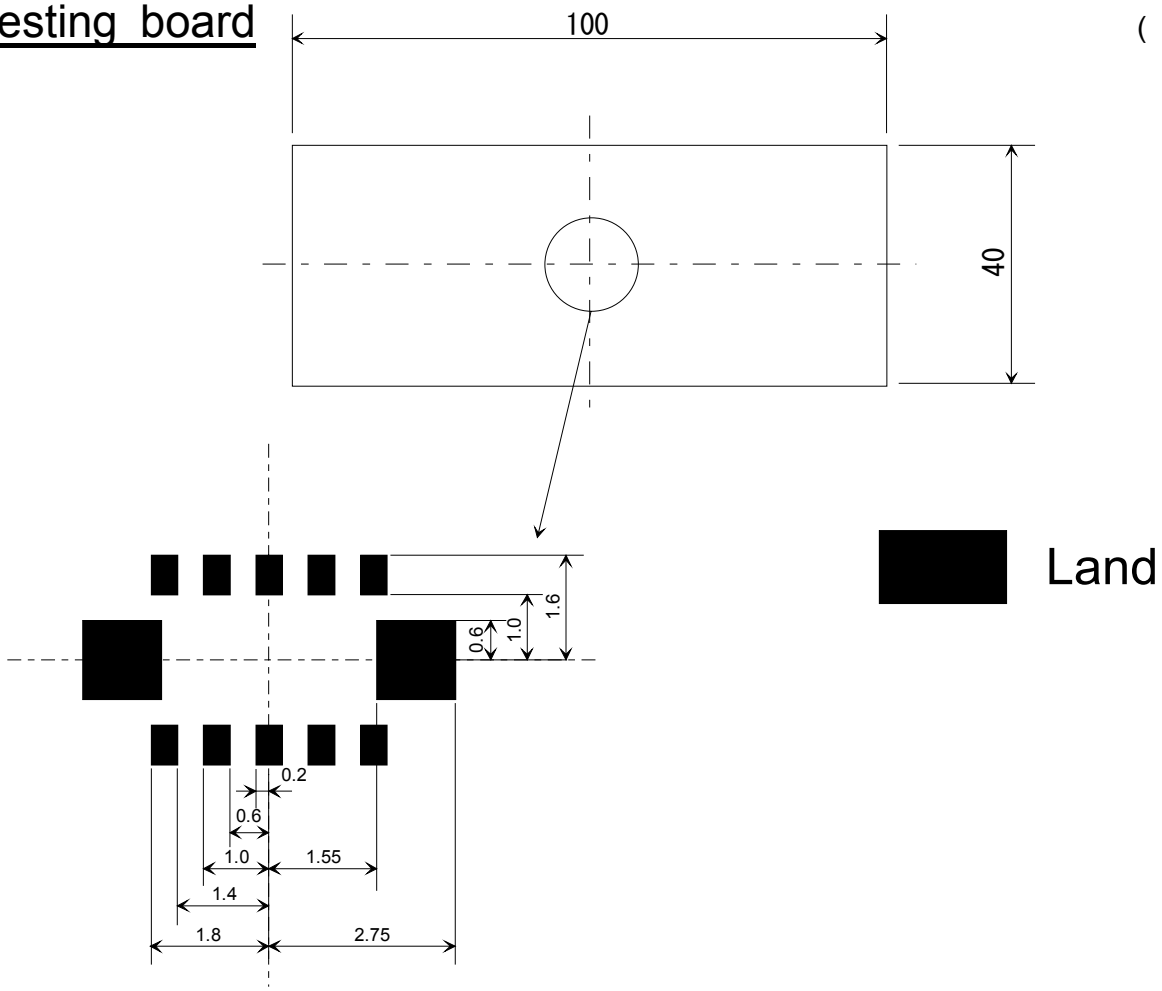
Land

Glass-fluorine board t=0.6mm
Copper thickness 35μm

Fig. 2-1

Testing board

(in mm)

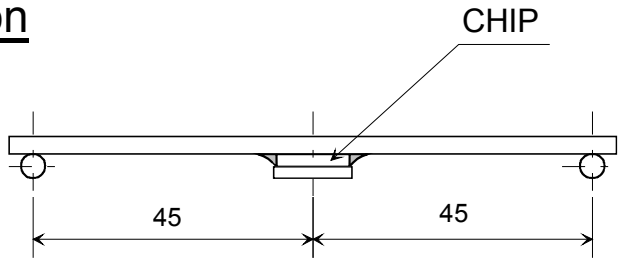


Glass epoxy board t=1.6mm
Copper thickness 35μm

Fig. 2-2

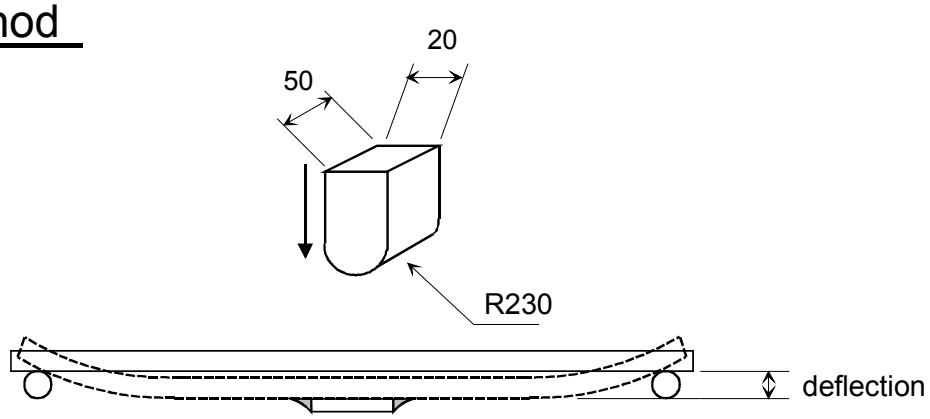
Mounted situation

(in mm)



Test method

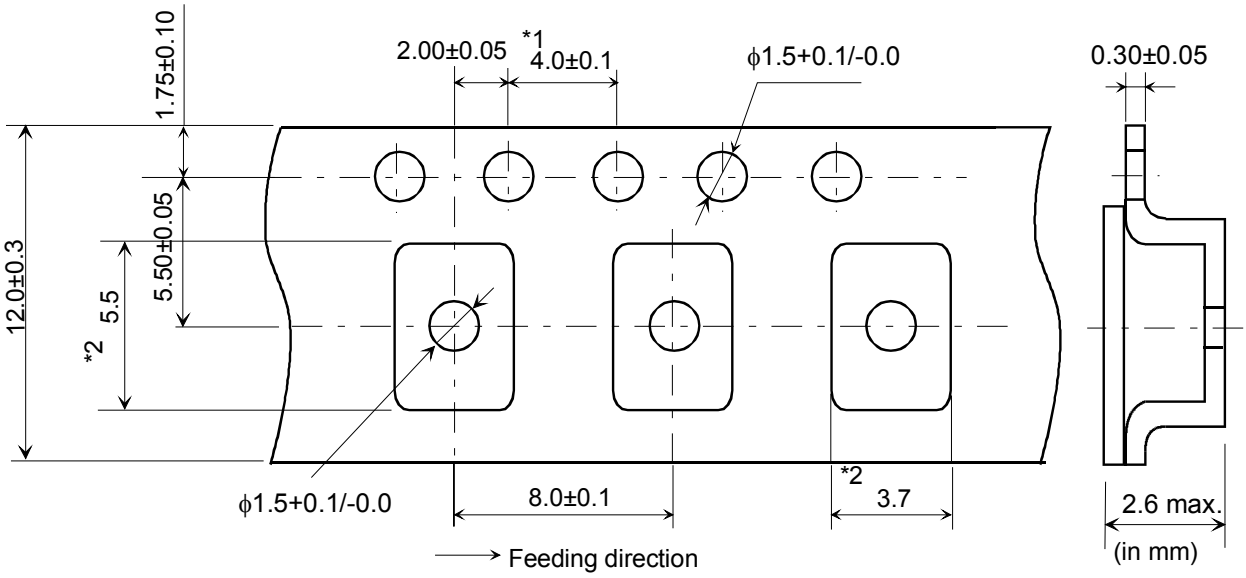
(in mm)



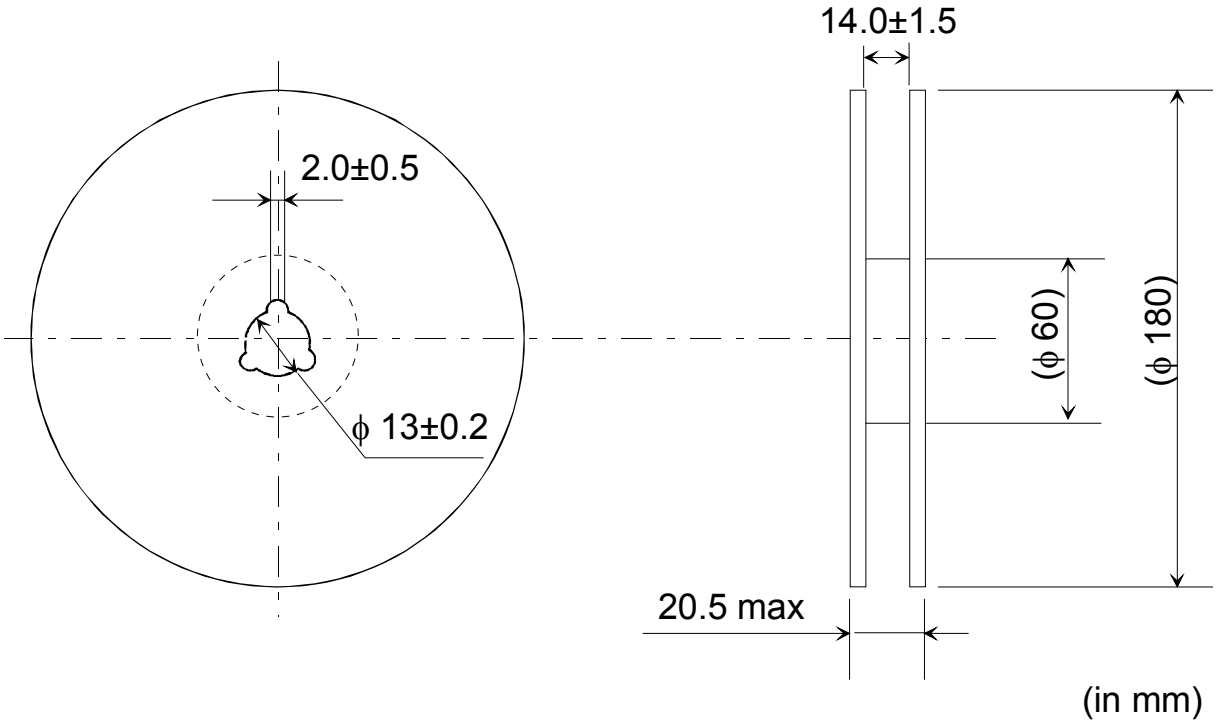
8.Tape and Reel Packing

(1) Dimensions of Tape (Plastic tape)

∗1 Cumulative tolerance of max. ± 0.3 every 10 pitches
∗2 Reference value



(2) Dimensions of Reel



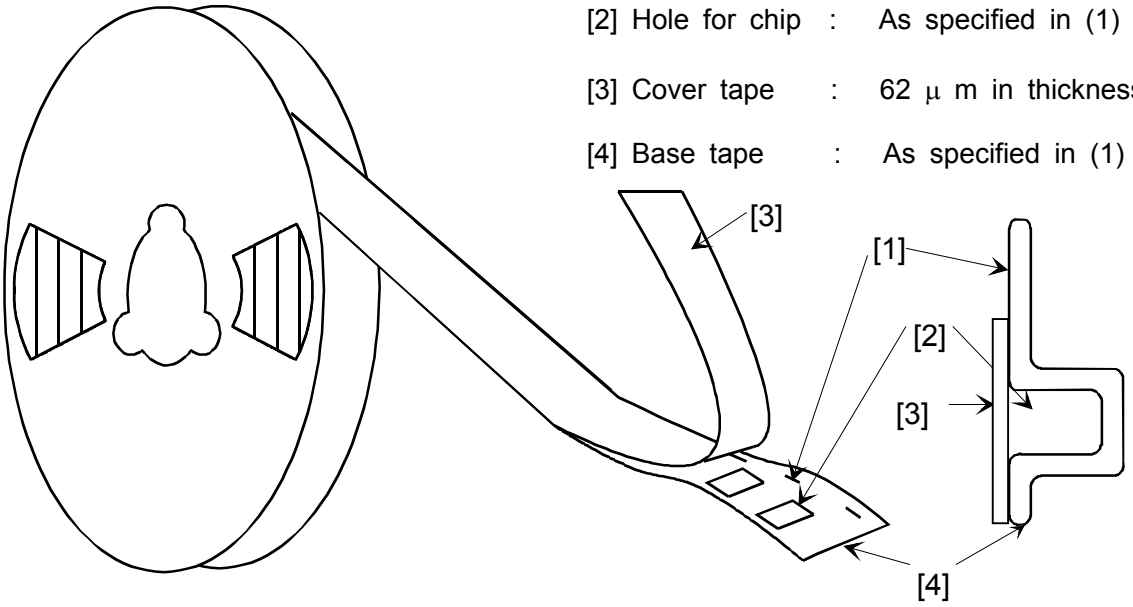
(3) Taping Diagrams

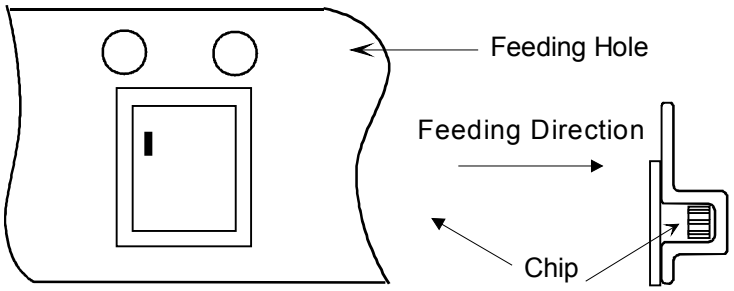
[1] Feeding Hole : As specified in (1)

[2] Hole for chip : As specified in (1)

[3] Cover tape : 62 μ m in thickness

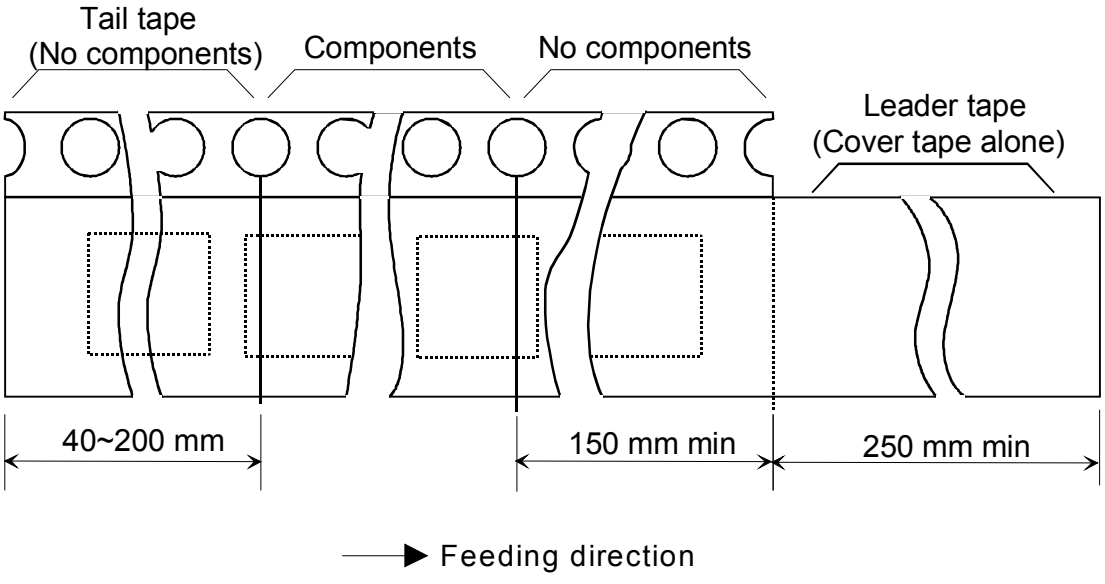
[4] Base tape : As specified in (1)





Package chips

(4) Leader and Tail tape



(5) The tape for chips are wound clockwise, the feeding holes to the right side as the tape is pulled toward the user.

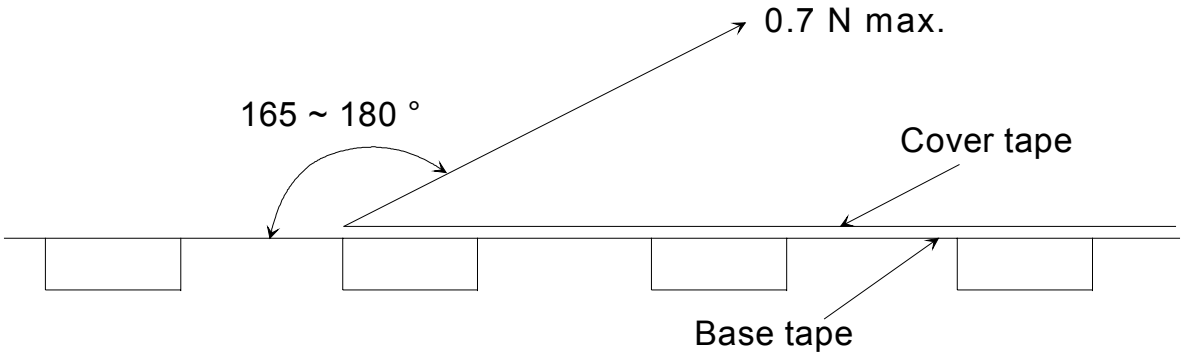
(6) The cover tape and base tape are not adhered at no components area for 250 mm min.

(7) Tear off strength against pulling of cover tape: 5 N min.

(8) Packaging unit: 1000 pcs./ reel

(9) Material : Base tape .....Plastic
Reel .....Plastic
Cover tape and cavity tape are made the anti-static processing.

(10) Peeling of force : 0.7 N max. in the direction of peeling as shown below.



NOTICE

1. Storage Conditions:

To avoid damaging the solderability of the external electrodes, be sure to observe the following points.

- Store products where the ambient temperature is 15 to 35 °C and humidity 45 to 75% RH. (Packing materials, In particular, may be deformed at the temperature over 40 °C.).

- Store products in non corrosive gas (Cl_2, NH_3,SO_2, No_x, etc.).

- Stored products should be used within 6 months of receipt. Solderability should be verified if this period is exceeded.

2. Handling Conditions:

Be careful in handling or transporting products because excessive stress or mechanical shock may break products due to the nature of ceramics structure.

Handle with care if products may have cracks or damages on their terminals, the characteristics of products may change. Do not touch products with bear hands that may result in poor solderability.

3. Standard PCB Design (Land Pattern and Dimensions):

All the ground terminals should be connected to the ground patterns. Furthermore, the ground pattern should be provided between IN and OUT terminals. Please refer to the specifications for the standard land dimensions.

The recommended land pattern and dimensions is as Murata's standard. The characteristics of products may vary depending on the pattern drawing method, grounding method, land dimensions, land forming method of the NC terminals and the PCB material and thickness. Therefore, be sure to verify the characteristics in the actual set. When using non-standard lands, contact Murata beforehand.

4. Notice for Chip Placer:

When placing products on the PCB, products may be stressed and broken by uneven forces from a worn-out chucking locating claw or a suction nozzle. To prevent products from damages, be sure to follow the specifications for the maintenance of the chip placer being used. For the positioning of products on the PCB, be aware that mechanical chucking may damage products.

5. Soldering Conditions:

Carefully perform preheating so that the temperature difference (ΔT) between the solder and products surface should be in the following range. When products are immersed in solvent after mounting, pay special attention to maintain the temperature difference within 100 °C. Soldering must be carried out by the above mentioned conditions to prevent products from damage. Contact Murata before use if concerning other soldering conditions.

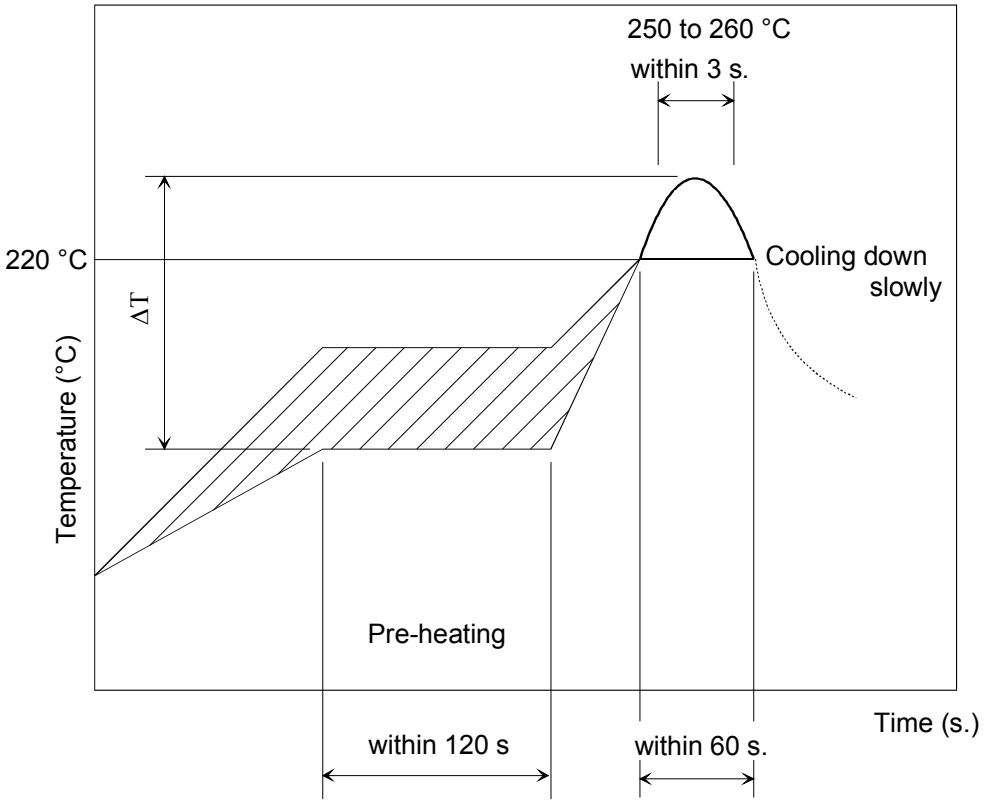
Soldering method	**Temperature**
Soldering iron method	ΔT<=130 °C
Reflow method	

- Soldering iron method conditions are indicated below.

Item \ Kind of iron	Ceramics heater
Soldering iron wattage	<=18 W
Temperature of iron-tip	<=350 °C
Iron contact time	within 3 s

- Diameter of iron-tip : φ3.0 mm max.
- Do not allow the iron-tip to directly touch the ceramic element.

Reflow soldering standard conditions(Example)

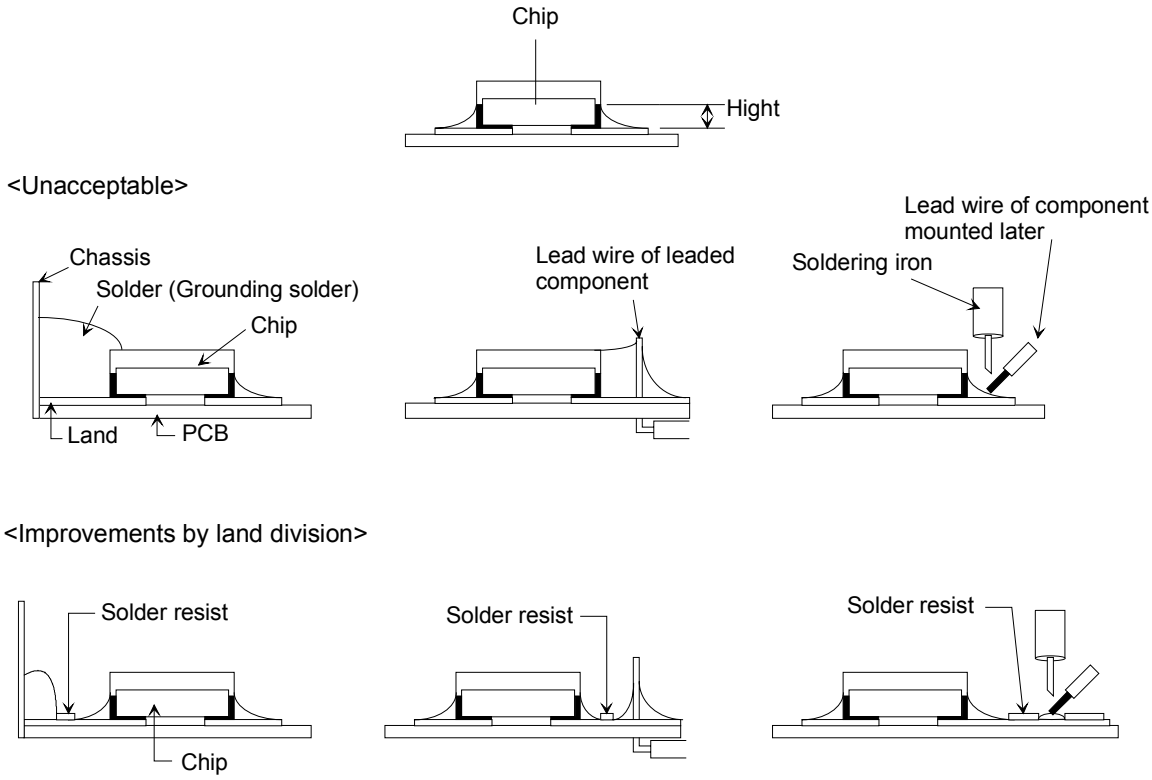


Use rosin type flux or weakly active flux with a chlorine content of 0.2 wt % or less.

Amount of Solder Paste:

- Ensure that solder is applied smoothly to a minimum height of 0.2 to 0.5 mm at the end surface of the external electrodes. If too much or little solder is applied, there is high possibility that the mechanical strength will be insufficient, creating the variation of characteristics.

Amount of solder paste



6. Cleaning Conditions:

The total cleaning time of soaking, ultrasonic and steam methods should be within 5 minutes.

Consult with Murata concerning the cleaning solvent. In order to totally abolish ODC (Freon, Trichrolethan), Murata has carried out testing on non-cleaning and water cleaning (water- soluble flux, water-soluble cream solder, water-based cleaning solvent). Therefore, be sure to contact Murata beforehand for details when applying any of the above mentioned cleaning fluid.

The ultrasonic cleaning conditions are indicated below :

Power	15 W per liter(1 cyc)(0.25 W per cm^2)
Frequency	28 ~ 29 kHz
Temperature	normal temperature

If the ultrasonic output power is too high, the PCB may resonate and products mounted on the PCB may be damaged. The ultrasonic cleaning conditions may change depending on the size of the vessel and the size of the PCB. Contact Murata regarding conditions other than those stated above.

Be sure to completely dry up products immediately after cleaning.

7. Operational Environment Conditions:

Products are designed to work for electronic products under normal environmental conditions (ambient temperature, humidity and pressure). Therefore, products have no problems to be used under the similar conditions to the above-mentioned. However, if products are used under the following circumstances, it may damage products and leakage of electricity and abnormal temperature may occur.

- In an atmosphere containing corrosive gas (Cl_2, NH_3, SO_x, NO_x etc.).
- In an atmosphere containing combustible and volatile gases.
- Dusty place.
- Direct sunlight place.
- Water splashing place.
- Humid place where water condenses.
- Freezing place.

If there are possibilities for products to be used under the preceding clause, consult with Murata before actual use.

8. Input Power Capacity:

Products shall be used in the input power capacity as specified in this specifications.
Inform Murata beforehand, in case that the components are used beyond such input power capacity range.

9. Limitation of Applications:

Please contact Murata before using products for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property.

- Aircraft equipment.
- Aerospace equipment.
- Undersea equipment.
- Medical equipment.
- Transportation equipment (vehicles, trains, ships, etc.).
- Traffic signal equipment.
- Disaster prevention / crime prevention equipment.
- Data-processing equipment
- Application of similar complexity and/ or reliability requirements to the applications listed in the above.

⚠ Note:

Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.

All the items and parameters in this product specification have been prescribed on the premise that our product is used for the purpose, under the condition and in the environment agreed upon between you and us. You are requested not to use our product deviating from such agreement.

We consider it not appropriate to include other terms and conditions for transaction warranty in product specifications, drawings or other technical documents. Therefore, even if your original part of this product specification includes such terms and conditions as warranty clause, product liability clause, or intellectual property infringement liability clause, we are not able to accept such terms and conditions in this product specification unless they are based on the governmental regulation or what we have agreed otherwise in a separate contact. We would like to suggest that you propose to discuss them under negotiation of contract.

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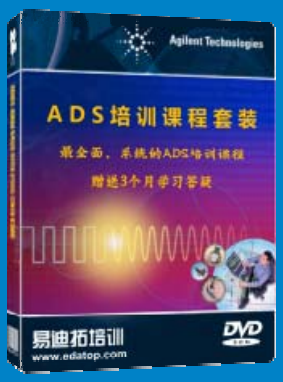
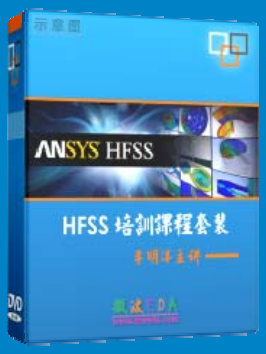
课程网址：http://www.edatop.com/peixun/rfe/110.html

ADS 学习培训课程套装



该套装是迄今国内最全面、最权威的 ADS 培训教程，共包含 10 门 ADS 学习培训课程。课程是由具有多年 ADS 使用经验的微波射频与通信系统设计领域资深专家讲解，并多结合设计实例，由浅入深、详细而又全面地讲解了 ADS 在微波射频电路设计、通信系统设计和电磁仿真设计方面的内容。能让您在最短的时间内学会使用 ADS，迅速提升个人技术能力，把 ADS 真正应用到实际研发工作中去，成为 ADS 设计专家...

课程网址： http://www.edatop.com/peixun/ads/13.html



HFSS 学习培训课程套装

该套课程套装包含了本站全部 HFSS 培训课程，是迄今国内最全面、最专业的 HFSS 培训教程套装，可以帮助您从零开始，全面深入学习 HFSS 的各项功能和在多个方面的工程应用。购买套装，更可超值赠送 3 个月免费学习答疑，随时解答您学习过程中遇到的棘手问题，让您的 HFSS 学习更加轻松顺畅…

课程网址：http://www.edatop.com/peixun/hfss/11.html

CST 学习培训课程套装

该培训套装由易迪拓培训联合微波 EDA 网共同推出，是最全面、系统、专业的 CST 微波工作室培训课程套装，所有课程都由经验丰富的专家授课，视频教学，可以帮助您从零开始，全面系统地学习 CST 微波工作的各项功能及其在微波射频、天线设计等领域的设计应用。且购买该套装，还可超值赠送 3 个月免费学习答疑…

课程网址：http://www.edatop.com/peixun/cst/24.html

HFSS 天线设计培训课程套装

套装包含 6 门视频课程和 1 本图书，课程从基础讲起，内容由浅入深，理论介绍和实际操作讲解相结合，全面系统的讲解了 HFSS 天线设计的全过程。是国内最全面、最专业的 HFSS 天线设计课程，可以帮助您快速学习掌握如何使用 HFSS 设计天线，让天线设计不再难…

课程网址：http://www.edatop.com/peixun/hfss/122.html

13.56MHz NFC/RFID 线圈天线设计培训课程套装

套装包含 4 门视频培训课程，培训将 13.56MHz 线圈天线设计原理和仿真设计实践相结合，全面系统地讲解了 13.56MHz 线圈天线的工作原理、设计方法、设计考量以及使用 HFSS 和 CST 仿真分析线圈天线的具体操作，同时还介绍了 13.56MHz 线圈天线匹配电路的设计和调试。通过该套课程的学习，可以帮助您快速学习掌握 13.56MHz 线圈天线及其匹配电路的原理、设计和调试…

详情浏览：http://www.edatop.com/peixun/antenna/116.html

我们的课程优势：

※ 成立于 2004 年，10 多年丰富的行业经验，

※ 一直致力并专注于微波射频和天线设计工程师的培养，更了解该行业对人才的要求

※ 经验丰富的一线资深工程师讲授，结合实际工程案例，直观、实用、易学

联系我们：

※ 易迪拓培训官网：http://www.edatop.com

※ 微波 EDA 网：http://www.mweda.com

※ 官方淘宝店：http://shop36920890.taobao.com