SPK S. P. K. ELECTRONICS CO., LTD.
10F, NO. 510, SEC. 5, CHUNG HSIAO E. RD.,
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兆福企業有限公司
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TEL: 886-2-2346-2323
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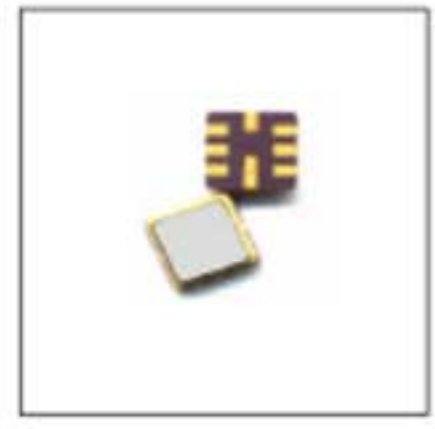
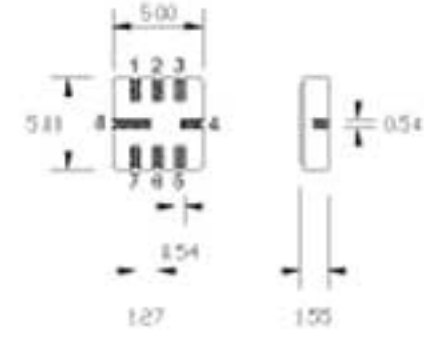
433.92 MHz SAW Resonator



■ Features

- One Port Resonator
- Low Series Resistance
- Quartz Stability
- Small Sizes



Pin Configuration

2 : Input
6 : Output
4,8 : Case Ground

■ Absolute Maximum Ratings

Rating	Value	Units
CW RF Power Dissipation	0	dBm
DC voltage Between Terminals	10	VDC
Operating Temperature Range	-40 / +85	°C
Storage Temperature Range	-40 / +85	°C
Soldering Temperature	+250	°C

Electrostatic Sensitive Device (**ESD**)

Ordering code	Part symbol	Marking
SPK-B-433D92-OF		

■ Electrical Characteristics

Ambient temperature Ta = 25 °C
Source impedance Zs = 50 Ω
Load impedance ZL = 50 Ω

Characteristic		Sym	Min.	Typ.	Max.	Units
Center Frequency		fc	433.845	433.920	433.995	MHz
	Tolerance	Äfc	-----	-----	±75	KHz
Insertion Loss		IL	-----	1.5	2.0	dB
Quality Factor						
	Unloaded Q	Qu	-----	12280	-----	
	50Ù Loaded Q	QL	-----	2250	-----	
RF Equivalent RLC Model						
	Motional Resistance	R1	-----	18	28	Ω
	Motional Capacitance	C1	-----	1.62	-----	fF
	Motional Inductance	L1	-----	86.2	-----	ì H
	Parallel Capacitance	C0	-----	2.5	-----	pF
Temperature Stability						
	Turnover Temperature	To	10	25	40	°C
	Temperature Coefficient	FTC	-----	0.033	-----	ppm/°C²
Aging of fc				10	50	ppm/yr

1. Temperature dependance of fc : fc (Ta) = fc (To) (1- FTC (Ta - To) ²)

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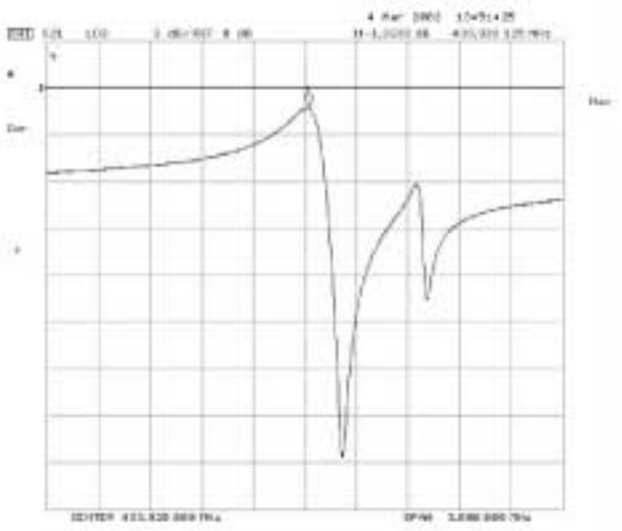
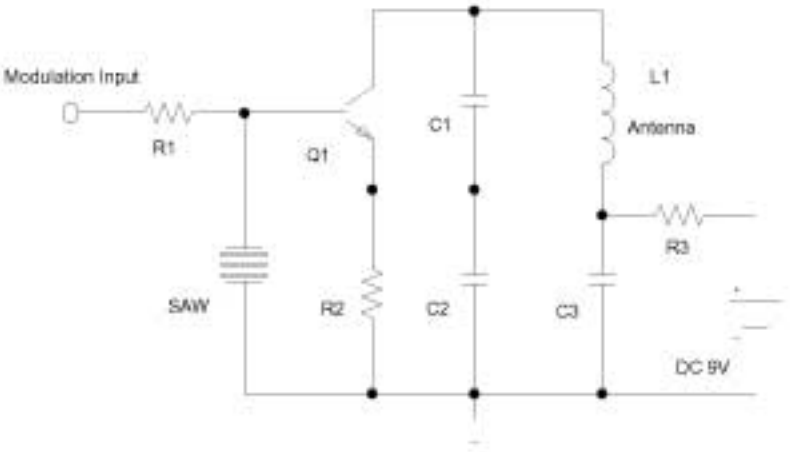
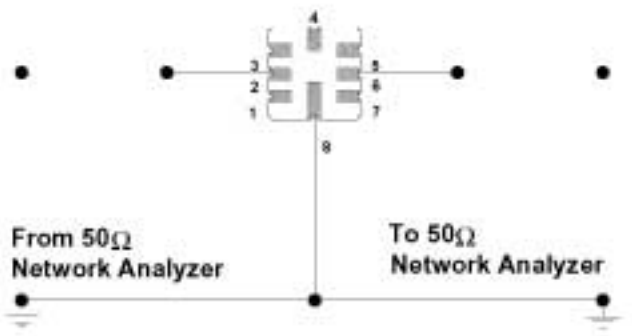
■ Typical SAW Resonator Response:



■ Typical Application Circuit:



■ RF Test Circuit:



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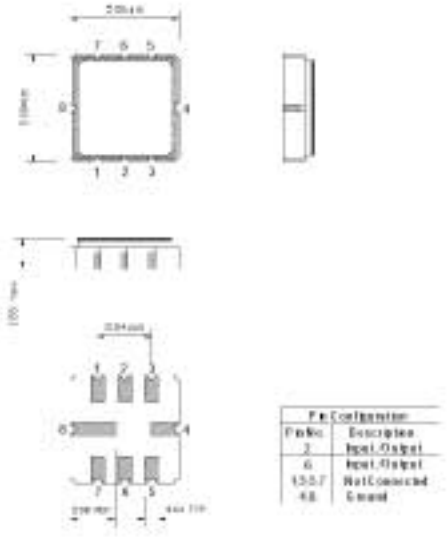
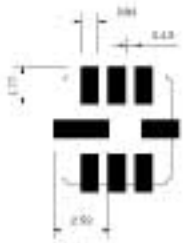
■ Package Dimension

SMD 5x5 PACKAGE



Pin Configuration	
Pin No.	Description
2	Input / Output
6	Input / Output
1,3,5,7	Not Connected
4,8	Ground

RECOMMENDED LAND PATTERN



-All Dimensions in Millimeters-

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■ Date Code Reference Sheet

Year / Week	Y2001	Y2002	Y2003	Y2004	Y2005	Y2006	Y2007	Y2008	Y2009	Y2010
W1	1A	2A	3A	4A	5A	6A	7A	8A	9A	0A
W2	1B	2B	3B	4B	5B	6B	7B	8B	9B	0B
W3	1C	2C	3C	4C	5C	6C	7C	8C	9C	0C
W4	1D	2D	3D	4D	5D	6D	7D	8D	9D	0D
W5	1E	2E	3E	4E	5E	6E	7E	8E	9E	0E
W6	1F	2F	3F	4F	5F	6F	7F	8F	9F	0F
W7	1G	2G	3G	4G	5G	6G	7G	8G	9G	0G
W8	1H	2H	3H	4H	5H	6H	7H	8H	9H	0H
W9	1I	2I	3I	4I	5I	6I	7I	8I	9I	0I
W10	1J	2J	3J	4J	5J	6J	7J	8J	9J	0J
W11	1K	2K	3K	4K	5K	6K	7K	8K	9K	0K
W12	1L	2L	3L	4L	5L	6L	7L	8L	9L	0L
W13	1M	2M	3M	4M	5M	6M	7M	8M	9M	0M
W14	1N	2N	3N	4N	5N	6N	7N	8N	9N	0N
W15	1O	2O	3O	4O	5O	6O	7O	8O	9O	0O
W16	1P	2P	3P	4P	5P	6P	7P	8P	9P	0P
W17	1Q	2Q	3Q	4Q	5Q	6Q	7Q	8Q	9Q	0Q
W18	1R	2R	3R	4R	5R	6R	7R	8R	9R	0R
W19	1S	2S	3S	4S	5S	6S	7S	8S	9S	0S
W20	1T	2T	3T	4T	5T	6T	7T	8T	9T	0T
W21	1U	2U	3U	4U	5U	6U	7U	8U	9U	0U
W22	1V	2V	3V	4V	5V	6V	7V	8V	9V	0V
W23	1W	2W	3W	4W	5W	6W	7W	8W	9W	0W
W24	1X	2X	3X	4X	5X	6X	7X	8X	9X	0X
W25	1Y	2Y	3Y	4Y	5Y	6Y	7Y	8Y	9Y	0Y
W26	1Z	2Z	3Z	4Z	5Z	6Z	7Z	8Z	9Z	0Z
W27	1a	2a	3a	4a	5a	6a	7a	8a	9a	0a
W28	1b	2b	3b	4b	5b	6b	7b	8b	9b	0b
W29	1c	2c	3c	4c	5c	6c	7c	8c	9c	0c
W30	1d	2d	3d	4d	5d	6d	7d	8d	9d	0d
W31	1e	2e	3e	4e	5e	6e	7e	8e	9e	0e
W32	1f	2f	3f	4f	5f	6f	7f	8f	9f	0f
W33	1g	2g	3g	4g	5g	6g	7g	8g	9g	0g
W34	1h	2h	3h	4h	5h	6h	7h	8h	9h	0h
W35	1i	2i	3i	4i	5i	6i	7i	8i	9i	0i
W36	1j	2j	3j	4j	5j	6j	7j	8j	9j	0j
W37	1k	2k	3k	4k	5k	6k	7k	8k	9k	0k
W38	1l	2l	3l	4l	5l	6l	7l	8l	9l	0l
W39	1m	2m	3m	4m	5m	6m	7m	8m	9m	0m
W40	1n	2n	3n	4n	5n	6n	7n	8n	9n	0n
W41	1o	2o	3o	4o	5o	6o	7o	8o	9o	0o
W42	1p	2p	3p	4p	5p	6p	7p	8p	9p	0p
W43	1q	2q	3q	4q	5q	6q	7q	8q	9q	0q
W44	1r	2r	3r	4r	5r	6r	7r	8r	9r	0r
W45	1s	2s	3s	4s	5s	6s	7s	8s	9s	0s
W46	1t	2t	3t	4t	5t	6t	7t	8t	9t	0t
W47	1u	2u	3u	4u	5u	6u	7u	8u	9u	0u
W48	1v	2v	3v	4v	5v	6v	7v	8v	9v	0v
W49	1w	2w	3w	4w	5w	6w	7w	8w	9w	0w
W50	1x	2x	3x	4x	5x	6x	7x	8x	9x	0x
W51	1y	2y	3y	4y	5y	6y	7y	8y	9y	0y
W52	1z	2z	3z	4z	5z	6z	7z	8z	9z	0z
W53	19	29	39	49	59	69	79	89	99	09

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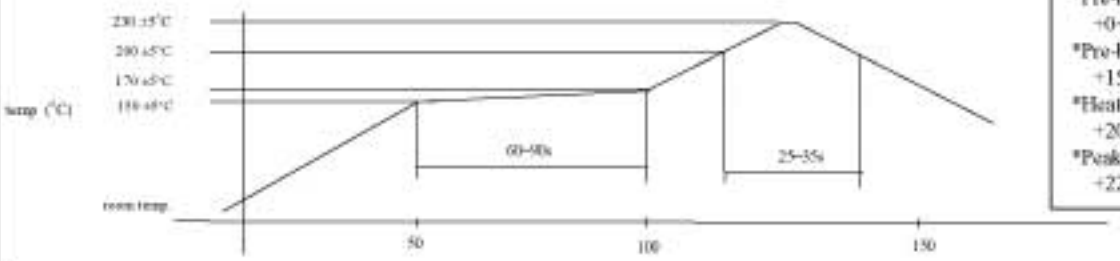
■ Mechanical & Environmental Characteristics:

NO	Item	Test Condition	Comments
Environmental Characteristics			
1	**Mechanical shock (Drop test)**	Shock height: 100cm, Freq.: 3times along x,y,z axes, Target: hard wood plate(thickness 30mm)	After kept in the room temp. and normal humidity for 2 hrs. Oscillation Frequency Shift: | △f | ≤75 KHz
2	**Vibration**	10~55~10Hz/min., Amplitude 1.5mm, x, y, z, directions for 2 hr each.	After kept in the room temp. and normal humidity for 2 hrs. Oscillation Frequency Shift: | △f | ≤75 KHz
Mechanical Characteristics			
3	**Solderability**	Dipped in the solder flux at 245 °C ± 5 °C for 5 ± 1 sec. (MIL-STD-883E METHOD 2003.7)	More than 95% of terminal surface should be covered smooth solder.
4	**Resistance to solder heat**	As following fig.	After kept in the room temp. and normal humidity for 2 hrs. Oscillation Frequency Shift: | △f | ≤75 KHz
		*Pre-heat temperature: +0~150°C 30sec. Min *Pre-heat +150~170°C 60~90sec. *Heat +200°C 25~35sec. *Peak temperature +225°C min,235°C max	
5	**High Temperature Storage**	85 °C ± 3 °C for 720 ± 12 hrs (non-operated)	After kept in the room temp. and normal humidity for 2 hrs. Oscillation Frequency Shift: | △f | ≤75 KHz
6	**Low Temperature Storage**	(-40°C) for 250 hours (non-operated)	After kept in the room temp. and normal humidity for 2 hrs. Oscillation Frequency Shift: | △f | ≤75 KHz
7	**Temperature cycling**	Heat cycle conditions, (-55°C) 30min., (25°C) 5min., (85°C) 30min., for 25cycles	After kept in the room temp. and normal humidity for 2 hrs. Oscillation Frequency Shift: | △f | ≤75 KHz
8	**Humidity Test**	Ambient 70°C, and 90~95% R.H. for 240hrs, then kept at room temp. and normal humidity for 4hrs.	After kept in the room temp. and normal humidity for 2 hrs. Oscillation Frequency Shift: | △f | ≤75 KHz
9	**Sealing**	(MIL-STD-883E METHOD 1014.9)	Gross Leak Test: ≤ ($1x10^{-5}$PA m^3/s) Fine Leak Test: ≤ ($1x10^{-8}$ PA m^3/s)

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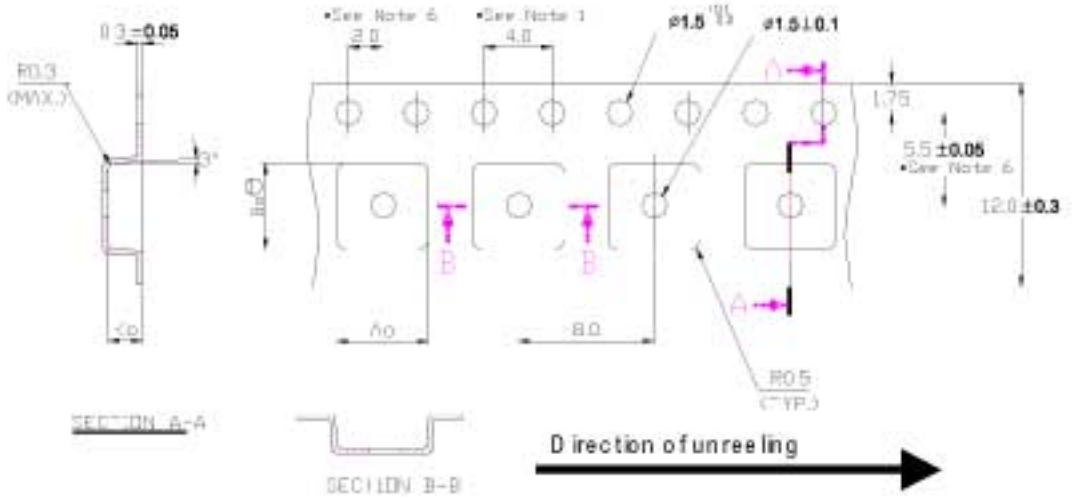
■ Remarks

1. Static voltage
   Static voltage between signal load & ground may cause deterioration & deterioration of the component. Please avoid static voltage.
2. Ultrasonic cleaning
   Ultrasonic cleaning may cause deterioration & deterioration of the component.. Please avoid ultrasonic cleaning.
3. Soldering
   Only leads of component may be soldered. Please avoid soldering another part of component.

■ Packing

1. Dimensions
   (1) Carrier Tape: Figure 1
   (2) Reel: 7" (Figure 2) or 13" (Figure 3).
   (3) The product shall be packed properly and not to be damaged during transportation and storage.

Fig.1 Carrier Tape Dimensions



Notes:

1. 10 sprocket hole pitch cumulative tolerance ±0.2
2. Camber not to exceed 1mm in 100mm
3. Material: Anti-Static Black Polystyrene
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Ao=5.30±0.1mm
Bo=5.30 +0.2/-0.0
Ko=2.00±0.1mm

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■ Reel Dimensions

Fig.2 7" Reel

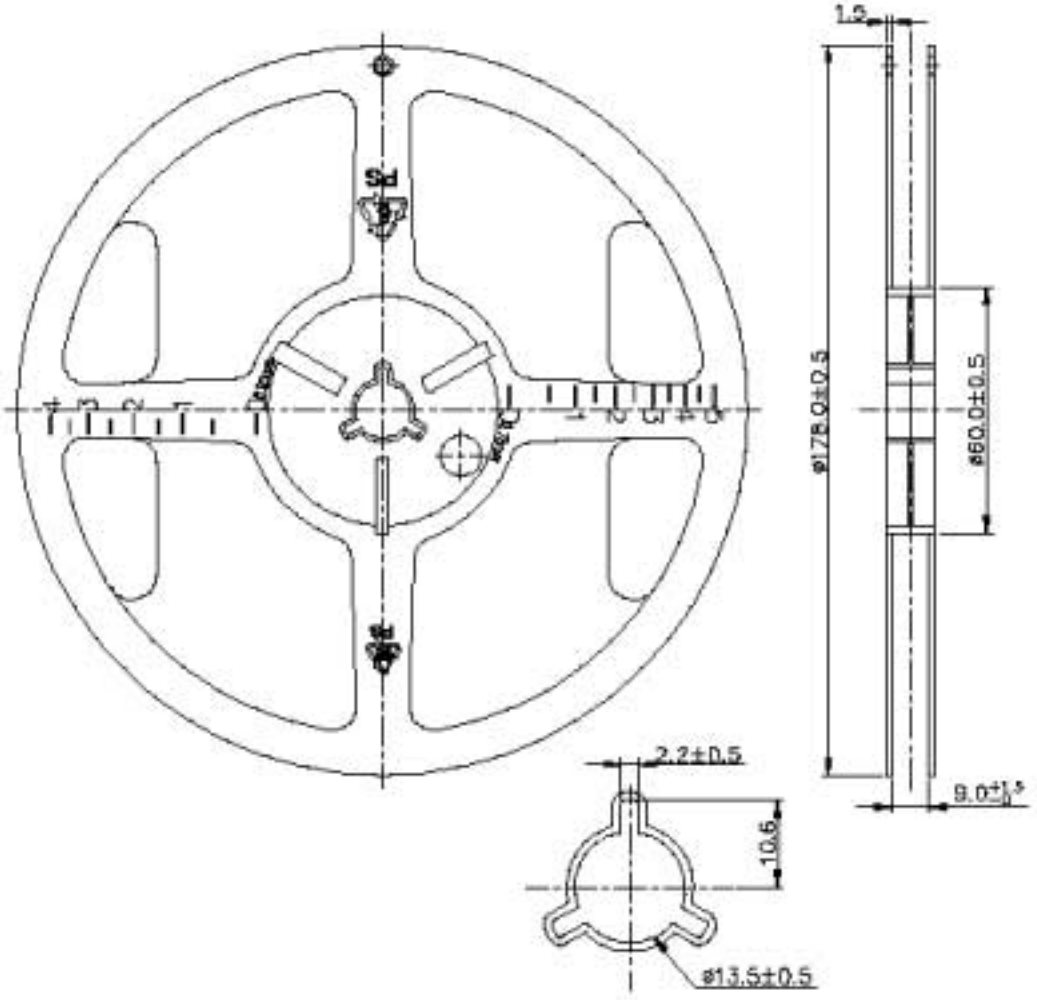

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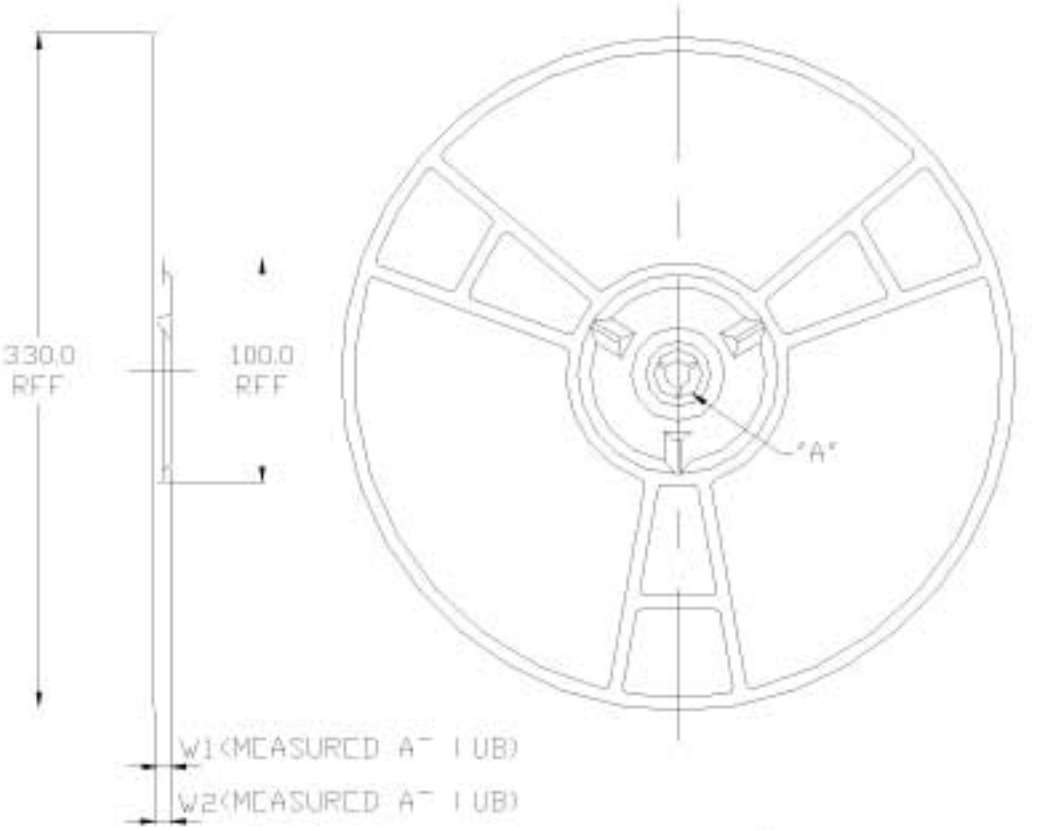
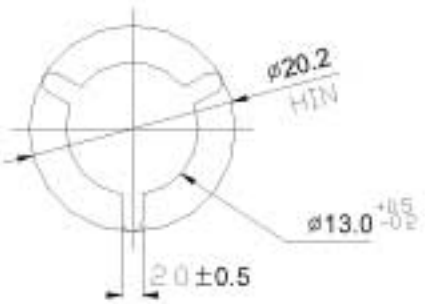
Fig.3 13" Reel





PartNumber	Nominal Hub Width	W1 +0.3mm -0.2mm	W2 MAX
RD330845W	4mm	4.4mm	7.1mm
RD330845W-BL	4mm	4.4mm	7.1mm
RD330885W	8mm	8.4mm	11.1mm
RD330885W-BL	8mm	8.4mm	11.1mm
RD330165W	16mm	16.4mm	19.1mm
RD330165W-BL	16mm	16.4mm	19.1mm
RD330285W	28mm	28.4mm	31.1mm
RD330285W-BL	28mm	28.4mm	31.1mm

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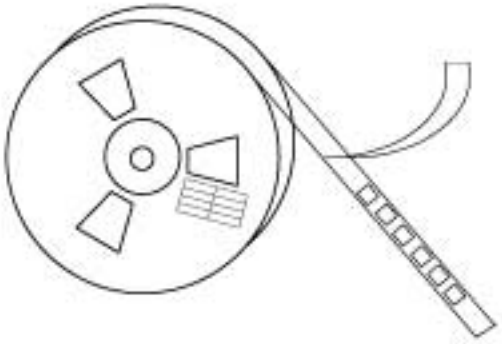
2. Reeling Quantity

7" reel for 1,000 pcs/reel, 13" reel for 2,000 pcs/reel and up.

3. Taping Structure

(1) The tape shall be wound around the reel in the direction shown below.



(2) Label

Part No:	Date:
Frequency:	Rank:
Lot No:	Tape No:
Quantity:	QC:
Serial No:	

■ Tape Specifications

1. Tensile Strength of Carrier Tape: 4.4N/mm width

2. Top Cover Tape Adhesion (See the below figure)

(1) Pull off angle: 0~15°

(2) Speed: 300mm/min.

(3) Force: 20~80g