

# SAW Bandpass Filter F4337



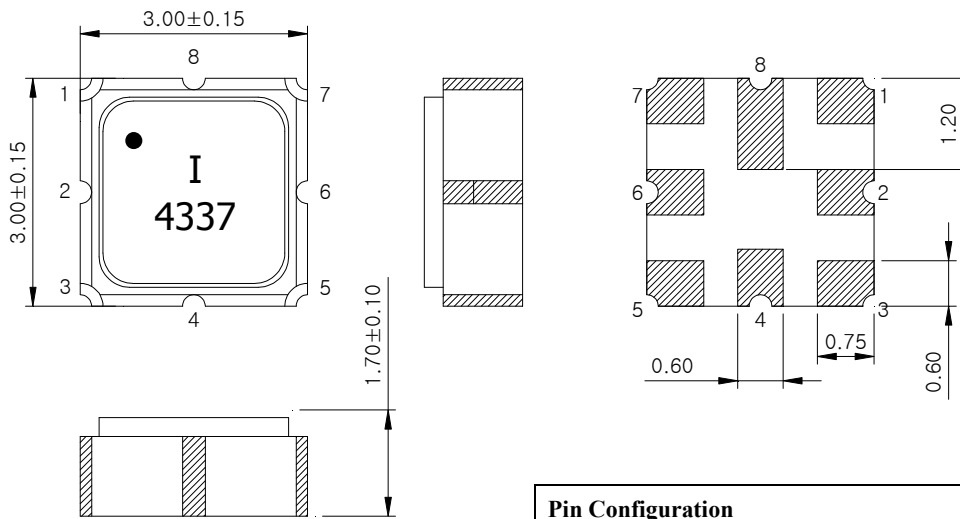
## Features

- RF bandpass filter for Remote Keyless Entry systems.
- Balanced or unbalance operation
- Ceramic Surface Mounted Device Package ( 3.0 mm × 3.0 mm )
- RoHS Compliant
- AEC-Q200 qualified component family
- Electrostatic Sensitive Device (ESD)

**RoHS Compliant**

Tested by SGS Testing Korea

## Package dimensions



Dimensions shown are nominal in millimeters  
 Body : Al<sub>2</sub>O<sub>3</sub> Ceramic  
 Lid : Kovar, Ni Plated  
 Terminations : Au plating 0.3 ~ 1.0 um,  
 Over a 1.27 ~ 8.89 um Ni Plating

Pin Configuration	
1	Input (recommended) or input ground
2	Input ground (recommended) or input
5	Output (recommended) or output ground
6	Output ground (recommended) or output
3, 4, 5, 6	To be grounded

## Maximum ratings

Parameter	Unit	Minimum	Typical	Maximum
Operalbe temperature range	℃	-45	25	120
Storage temperature range	℃	-45	25	120
DC voltage	V	-	-	6
Power handling capability	dBm	-	-	10

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		Rev. Date	2016-08-23	
		Rev.	PS 01	1/9

# SAW Bandpass Filter F4337



## Specifications

Fc = 433.92 MHz


Operating Temperature Range : -45°C to +95°C

Typical Specification at 25°C

		Minimum	Typical	Maximum
Center frequency ( Fc )	MHz	-	433.92	-
Minimum insertion loss (Matching elements Q = 47)	dB	-	2.4	3.0
Pass band (relative to $\alpha_{min}$ ) 433.77 ~ 434.07 MHz 433.74 ~ 434.10 MHz 433.70 ~ 434.14 MHz	dB	-	0.6	2.0
		-	0.8	3.0
		-	1.2	6.0
3dB Bandwidth	MHz	0.66	0.72	0.78
Relative attenuation 10.00 ~ 414.00 MHz 414.00 ~ 426.00 MHz 426.00 ~ 430.50 MHz 430.50 ~ 431.72 MHz 431.72 ~ 431.97 MHz 431.97 ~ 432.07 MHz 432.07 ~ 432.12 MHz 432.12 ~ 433.10 MHz 434.92 ~ 444.00 MHz 444.00 ~ 500.00 MHz 500.00 ~ 810.00 MHz 810.00 ~ 1500.00 MHz 1500.00 ~ 2500.00 MHz	dBc	55	60	-
		48	53	-
		24	28	-
		30	35	-
		40	52	-
		30	52	-
		25	52	-
		15	18	-
		15	20	-
		40	45	-
		50	55	-
		60	65	-
		53	58	-
Impedance for pass band matching Input : $Z_{IN} = R_{IN} \parallel C_{IN}$ Output : $Z_{OUT} = R_{OUT} \parallel C_{OUT}$	$\Omega \parallel pF$	-	290 $\parallel$ 1.8	-
	$\Omega \parallel pF$	-	290 $\parallel$ 1.8	-

### Notes :

- 1) All specifications are based on the matching schematic shown below, measured by Agilent Network analyzer and full-2 port calibration.
- 2) Electrical margin has been built into the design to account for the variations due to temperature drift and manufacturing tolerances

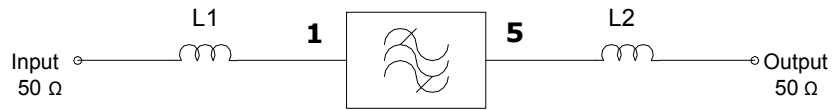
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		Rev. Date	2016-08-23	
		Rev.	PS 01	2/9

# SAW Bandpass Filter F4337



## Matching schematic

(Actual matching values may vary due to PCB layout and parasitic)



$$L1 = L2 = 39 \text{ nH}$$

(\* Note : 0805 Coilcraft CS series used for inductor )

## Marking configuration

1)  
●  
I<sup>2)</sup>  
F4337<sup>3)</sup>

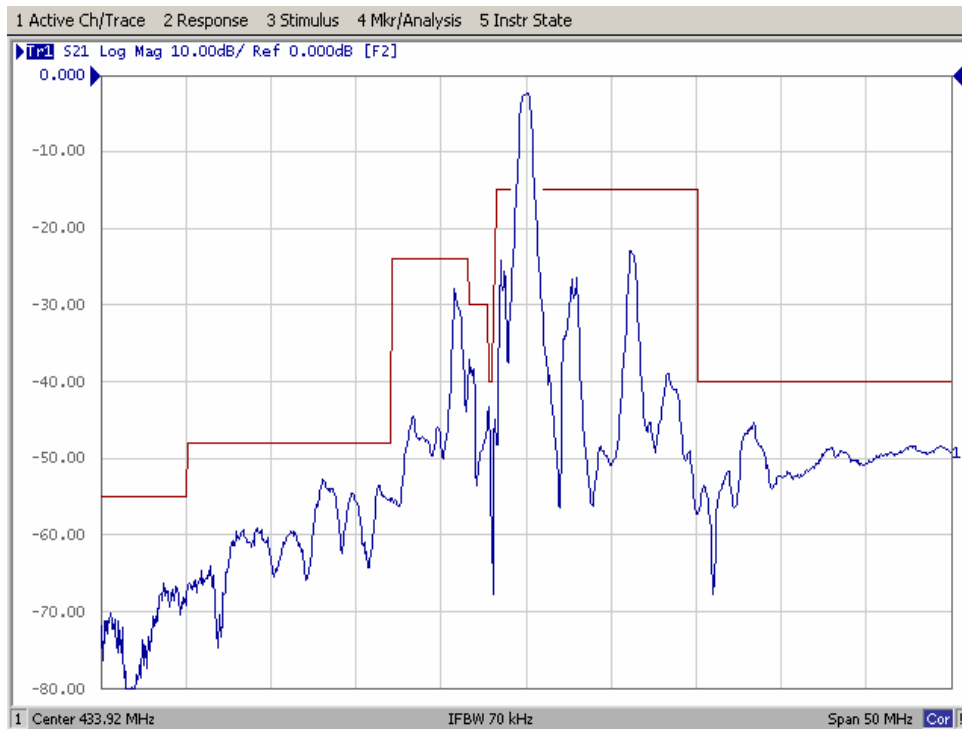
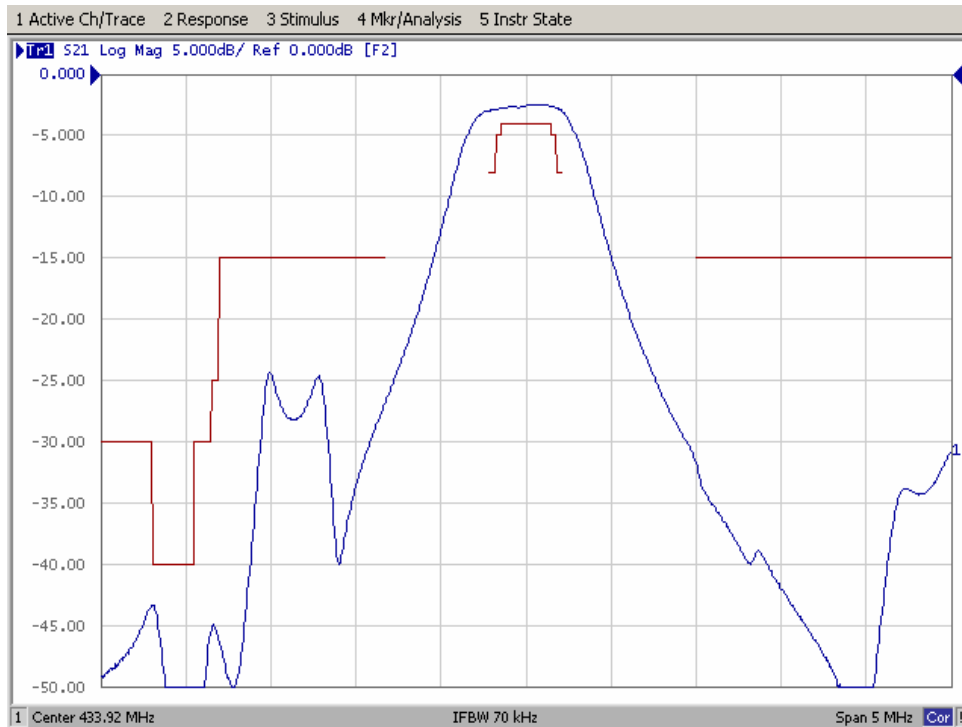
1) Pad Number 1 index
2) Manufacturer name
3) Marking


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		Rev. Date	2016-08-23	
		Rev.	PS 01	3/9

# SAW Bandpass Filter F4337



## Frequency response ( at 25°C )

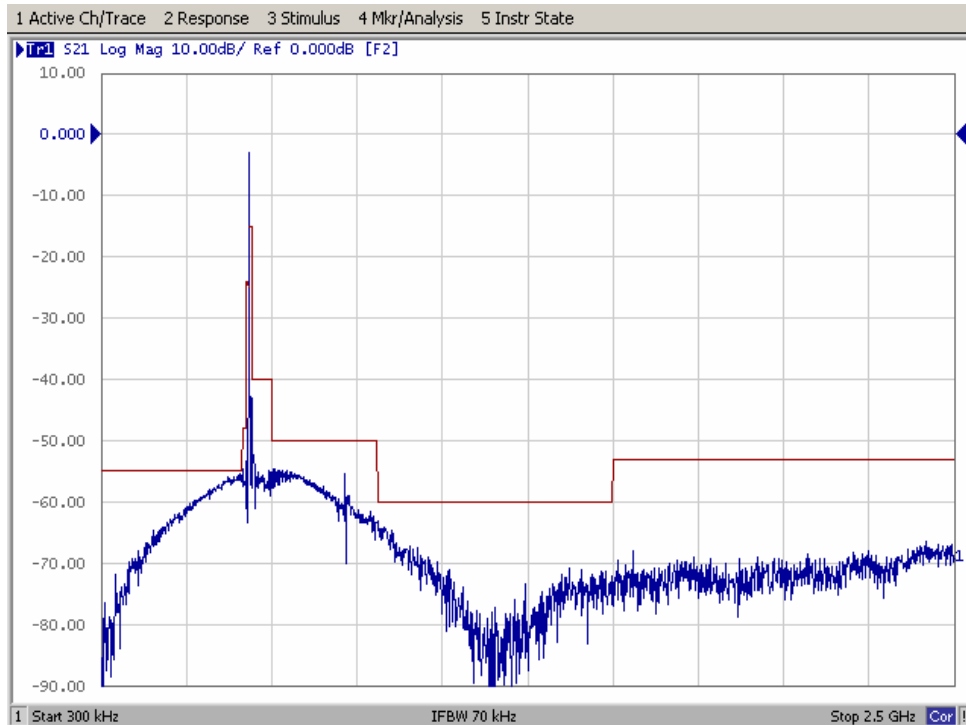


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		Rev. Date	2016-08-23	
		Rev.	PS 01	4/9

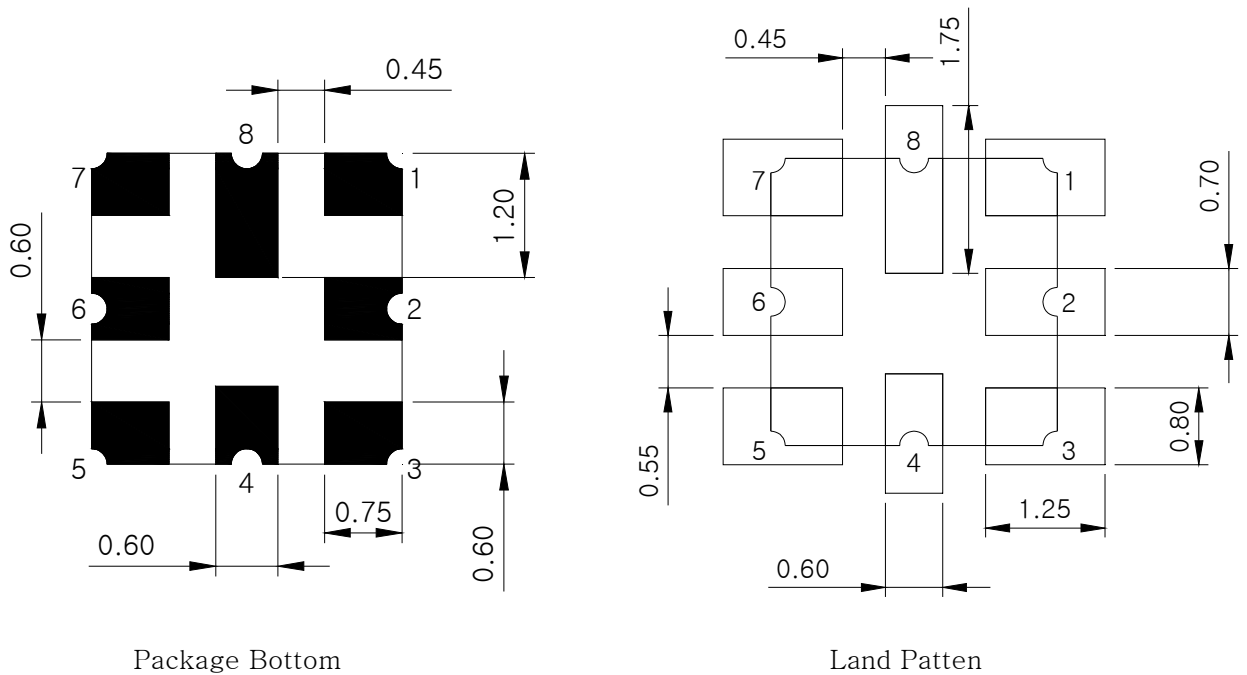
# SAW Bandpass Filter F4337



## Frequency response ( wideband at 25°C )



## Recommend Land Patten



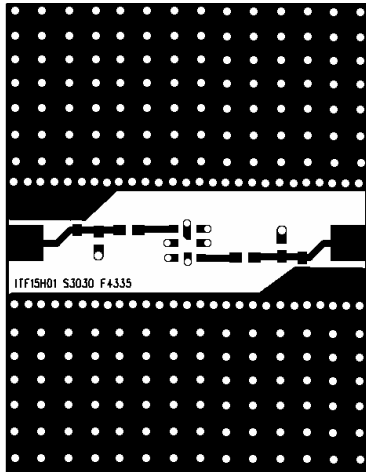
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		Rev. Date	2016-08-23	
		Rev.	PS 01	5/9

# SAW Bandpass Filter F4337



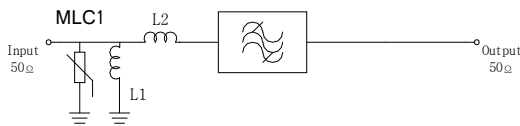
## PCB Layout recommend

1. ITF PCB Layout for F4335 package. ( pin number 1, 5 )
2. For ultimate rejection is necessary to place enough via holes.

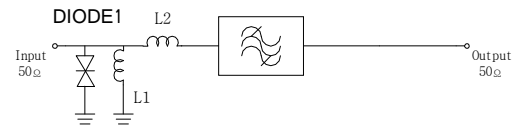


## ESD protection of SAW filters

1. SAW filters are weak to Electric Static Discharge
2. Generally, to overcome damages of ESD, recommend suitable matching structure. (Depending input impedance)

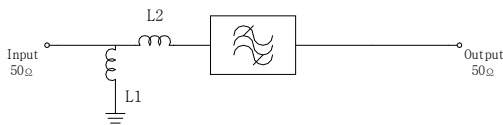


( Case A : MLC varistor used ESD matching structure )

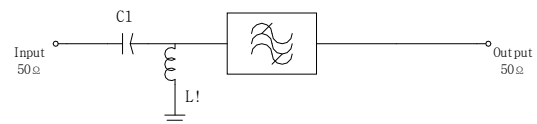


( Case B : Diode used ESD matching structure )

3. In case weak ESD used simple L-C component matching structure. (Depending input impedance)



( Case C : Shunt L // Series L matching structure )



( Case D : Series C // Shunt L matching structure )

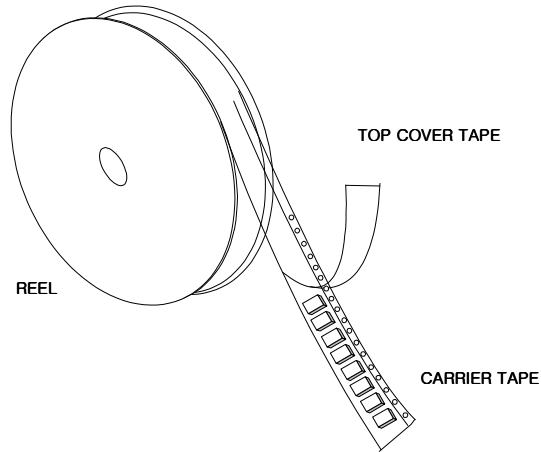
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		Rev.	PS 01	6/9

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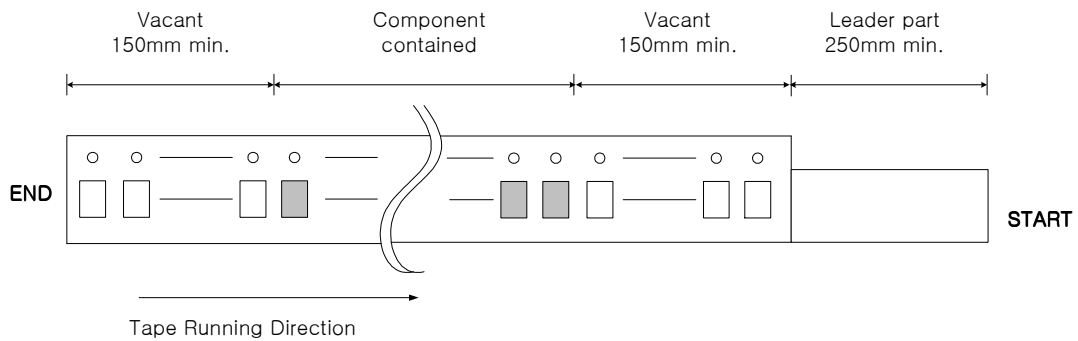
## Packing specification

1. Reeling Quantity : 3000 pcs / 7" reel
2. Taping Structure : The tape shall be wound around the reel in the direction shown below.



## Tape specification

1. Leader part and vacant position specification

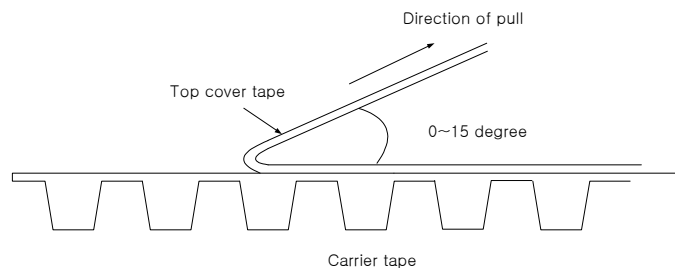


2. Tensile strength of carrier tape

4.4N/mm width

3. Top cover tape adhesion

- 1) pull off angle : 0~15°
- 2) speed : 300mm/min
- 3) force : 20~70g

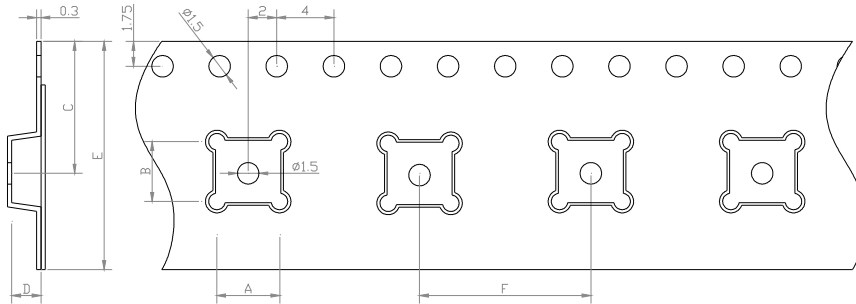


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		Rev.	PS 01	7/9

# SAW Bandpass Filter F4337

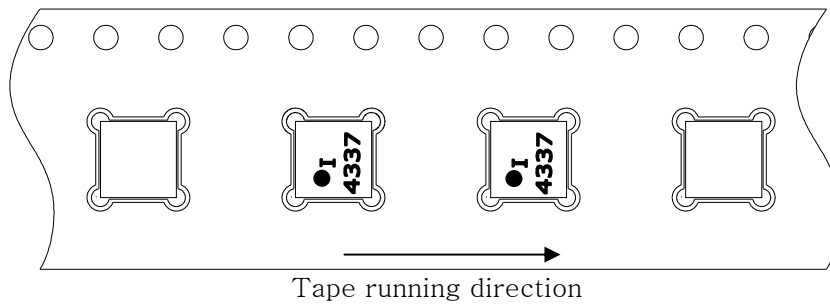


## Carrier tape dimensions [unit : mm]

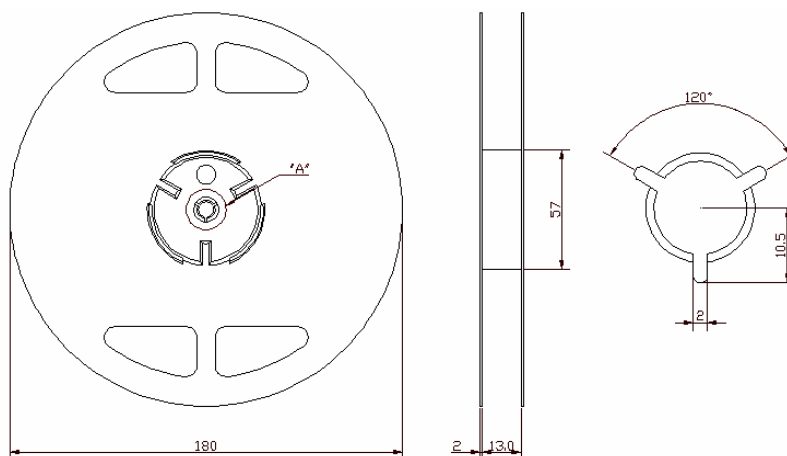


A	3.40 ± 0.1
B	3.40 ± 0.1
C	7.25 ± 0.1
D	1.70 ± 0.1
E	12.00 ± 0.1
F	8.00 ± 0.1

## Part direction



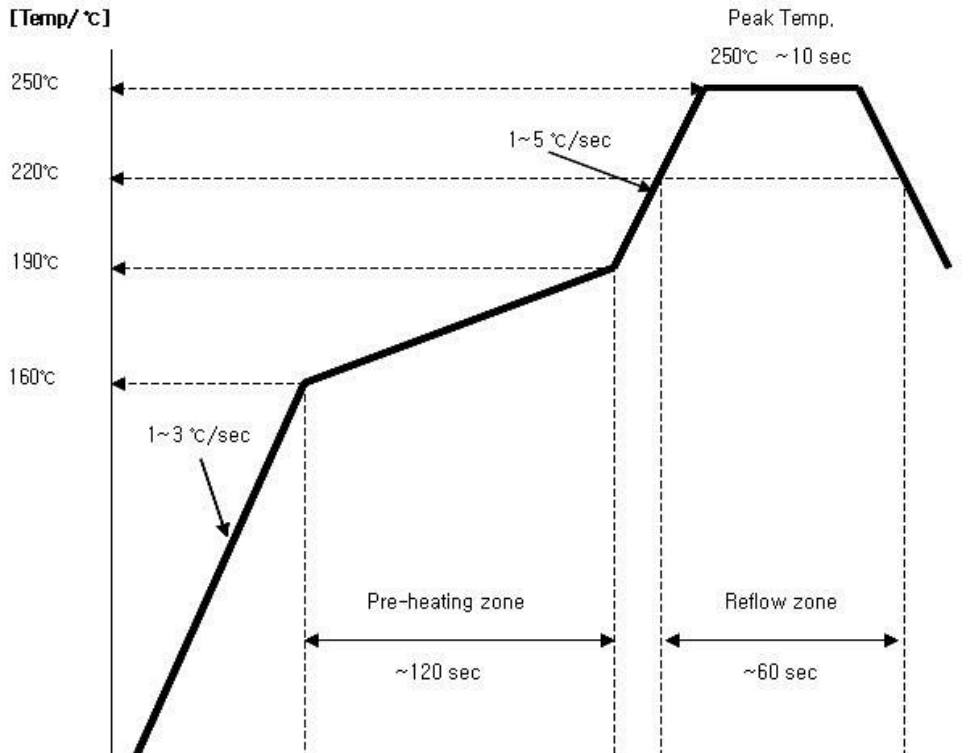
## Reel dimensions [unit : mm]



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		Rev. Date	2016-08-23	
		Rev.	PS 01	8/9




## Reflow condition



Comment) The quality is guaranteed under this temperature conditions on 2 times solder reflows

## Cautions

1. This is a hermetic device.  
MSL (Moisture Sensitive Level) is the 1st level
2. This is an electrostatic sensitive device. Please avoid static voltage during operation and storage.  
ESD (Electrostatic Discharge ) Rating is class 0. (Test : HBM-Human Body Model)
3. Ultrasonic cleaning shall be avoided.
4. This device should not be used in any type of fluid such as water, oil, organic solvent, etc.

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		Rev.	PS 01	9/9