INNOCHIPS TECHNOLOGY

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Preliminary

Product Specification

ESD Suppressor

ITEM
ULCE1005A015FR

Innochips Technology CO., LTD.

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SCOPE

☆ **This specification applies to chip (named ESD Suppressor) for use in RF electronic equipment.**

It can be possible to change the specification under document agreement between design engineers of each party.

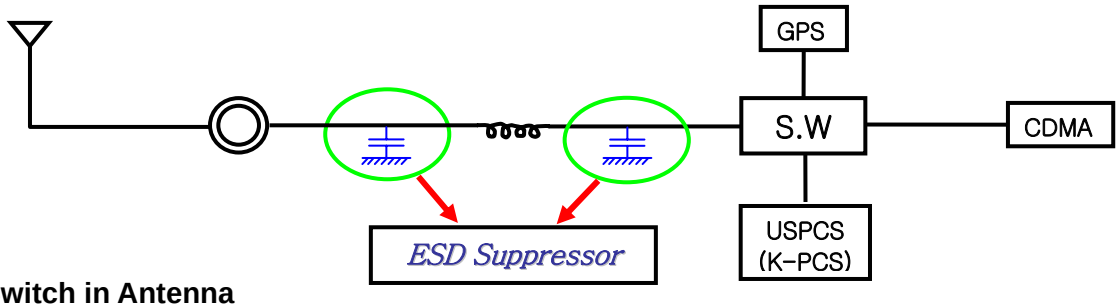
FEATURES

☆ The ICT ESD Suppressor provide excellent application reliability as a result of their fine ceramic process and terminal electrodes with Sn electroplating(Pb free).

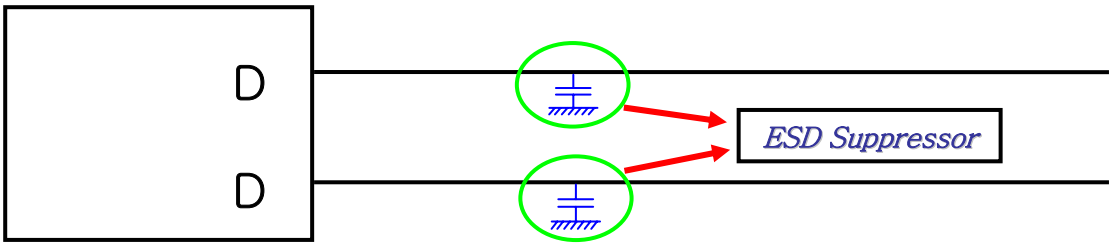
☆ Very fast response time to ESD impulse which is included in RF signal due to very low capacitance (< 0. 5pF) and low ESL (Equivalent Series Inductance)

Application

☆ Antenna port
☆ USB port
☆ High speed data transmission line.

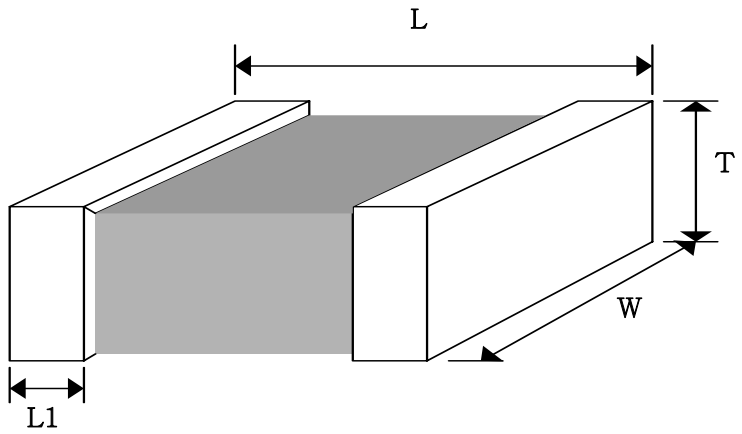


- Switch in Antenna



- USB 2.0

CONFIGURATION and DIMENSIONS



CODE	DIMENSION (㎜)			
	L	W	T	L1
05	1.0±0.05	0.5±0.05	0.5±0.05	0.2+ 0.15/-0.1
10	1.6±0.1	0.8±0.1	0.8±0.1	0.3±0.2
21	2.0±0.1	1.25±0.1	1.35 MAX	0.5+ 0.2/-0.3

PART NUMBER CODE

ULCE	10	05	A	015	F	R
①	②	③	④	⑤	⑥	⑦

① SERIES NAME

CODE	Product Name
ULCE	Ultra Low Capacitance ESD Suppressor

② SIZE DESIGNATOR

CODE	SIZE (mm)
05	1.0 * 0.5
10	**1.6 * 0.8**
21	2.0 * 1.25

③ WORKING VOLTAGE

CODE	VOLTAGH (VDC)
05	**5.0**
12	12.0
24	24.0

④ TRIGGER VOLTAGE

CODE	VOLTAGH (V)
A	**300**
B	500
C	1000

⑤ CAPACITANCE

CODE	Capacitance (pF, Typ.)@MHz
015	**0.15**
030	0.30
050	0.50
100	1.00

⑥ TERMINATION TYPE

CODE	TYPE
S	Solderable(Ag/Pd/Pt)
P	Electroplate(Ni-Sn/Pb)
F	**Electroplate(Pb-free)**

⑦ PACKAGING TYPE

CODE	TYPE
B	Bulk pack
R	**Tape & Reel pack**
E	Embossed tape pack

SPECIFICATIONS

ESD Suppressor (ULCE)

- Ultra Low capacitance(<0.5pF) is required for very high-speed data transmission or Antenna port.
- Low leakage current(I_L) is necessary for battery operated equipment

Characteristics	Unit	Typical	Max.
Clamping Voltage (Vc)	V	30	100
Capacitance, @1MHz (Cp)	pF	0.15	0.5
Response time	ns	0.6	1
ESD voltage capability, Contact discharge mode	kV	8	15
ESD voltage capability, Air discharge mode	kV	15	25
RF-Power testing, 0-2GHz	dBm		35
Insertion loss, 0-2GHz	dB		0.05
ESD pulse withstand	pulses	100	
Continuous operating voltage	V	5	
Leakage current (I_L)	uA	0.05	10
Trigger voltage (V_T)	V	1000	

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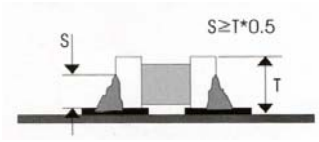
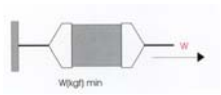
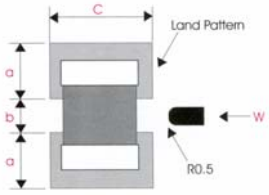
- **V_c** : Per IEC 61000-4-2, 30A@8kV, level 4, clamp measurement made 30ns after initiation of pulse, all test in contact discharge mode.

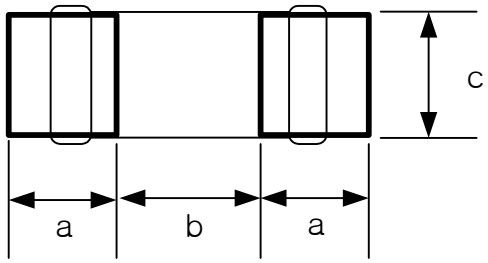
- **C_p** : Device capacitance measured with zero volt bias 1Vrms and 1MHz

Reliability test

ITEM	REQUIREMENTS	TEST CONDITION
Operating temperature range	-25℃ ~ +85℃	-
Storage temp. & humidity range	-25℃ ~ +85℃, 70% RH max.	-
Reflow soldering	1. More then 50% of the terminal electrode shall be covered with new solder. 	Preheat temperature : 165~185℃ preheat time : 110±10sec max Solder temperature : 260℃ soldering time : 10 sec.max (Reflow soldering profile)
Tensile strength (terminal strength)	1. No mechanical damage	
W	1.0 kgf	
Adhesion of terminal electrode (Flexure strength)	1. No mechanical damage	
a	1.0 mm	
b	0.8 mm	
c	1.3 mm	
W	2.0 kgf	
Thermal shock (Temperature cycle)	1. No mechanical damage 2. Leakage current : within 10㎂	Step 1. -40±3℃ 30±3min. Step 2. 85±3℃ 30±3min. Number of cycle : 100 times
Heat load resistance	1. No mechanical damage 2. Leakage current : within 10㎂	Temperature : 85±2℃ Applied Voltage : working voltage Time : 1,000 hours Measured at room ambient temperature after placing for 24 hours
Humidity load resistance	1. No mechanical damage 2. Leakage current : within 10㎂	Temperature : 40±2℃ Humidity : 90~95%RH Applied voltage :Working Voltage Time : 500 hours Measured at room ambient temperature after placing for 24 hours

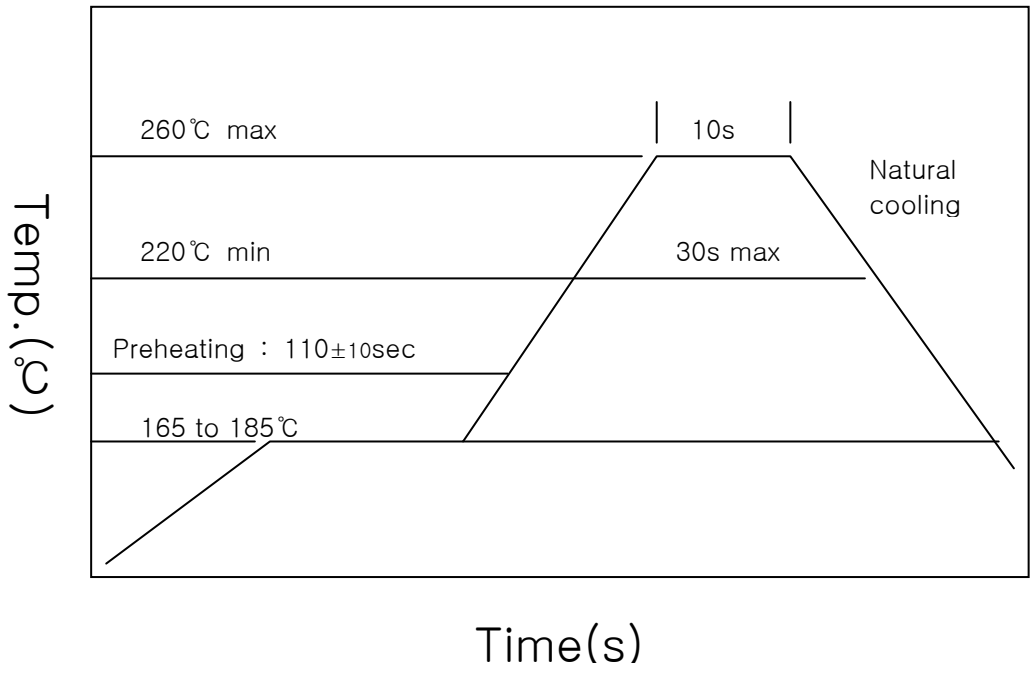
LAND PATTERN & REFLOW SOLDERING

Land Pattern



Size	a	b	c
1608	0.7~0.9	0.7~0.8	0.6~0.8

Reflow Soldering Profile



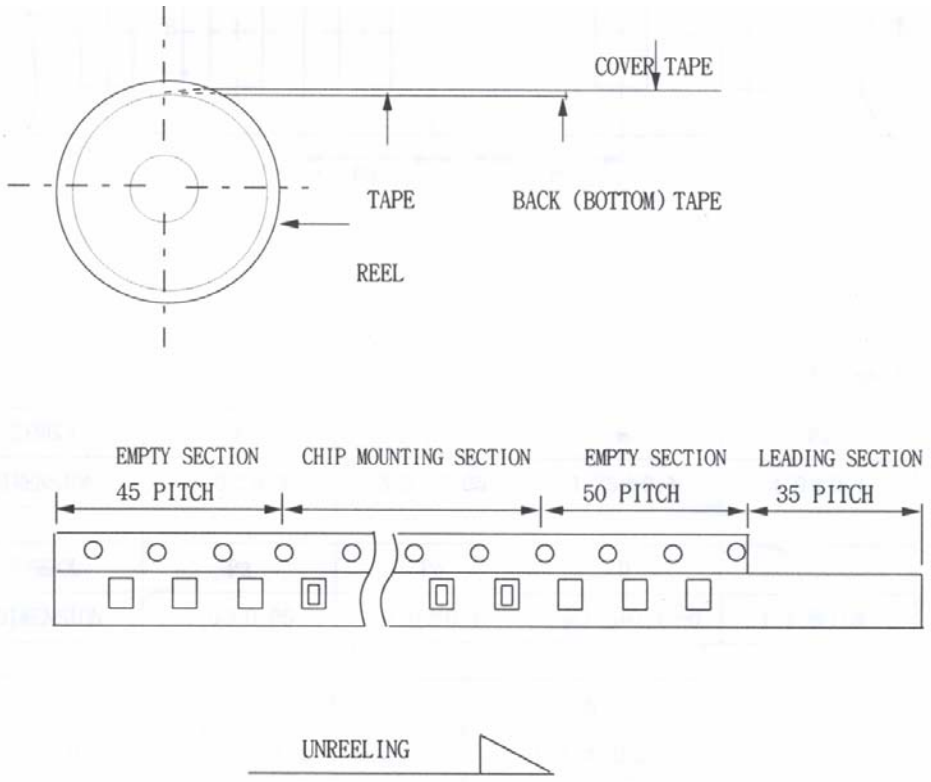
Taping

Scope

This specification applies to taping of chip varistor

It can be possible to change the specification under document agreement between design engineers of each party.

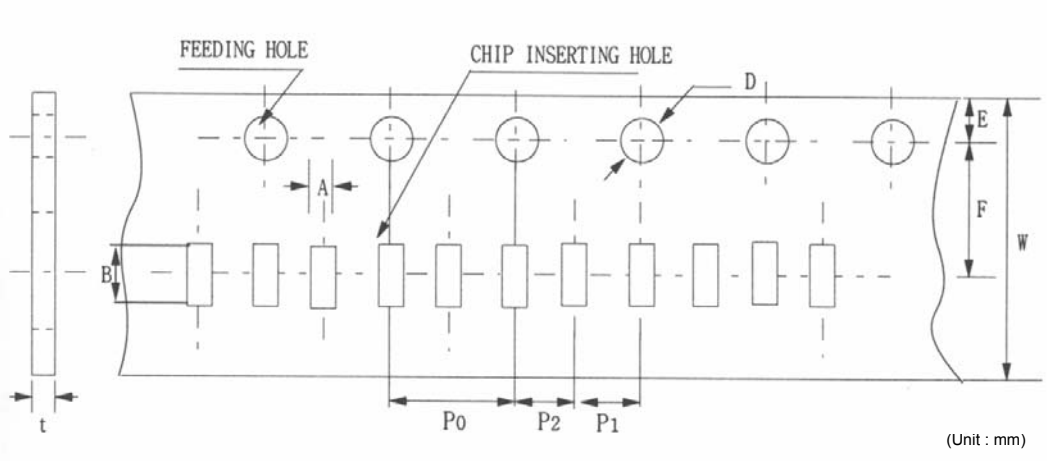
Taping Figure



Material and Quantity

Material \ Type	1005	1608	2012
Paper	10,000 pcs/reel	4,000 pcs/reel	4000 pcs/reel

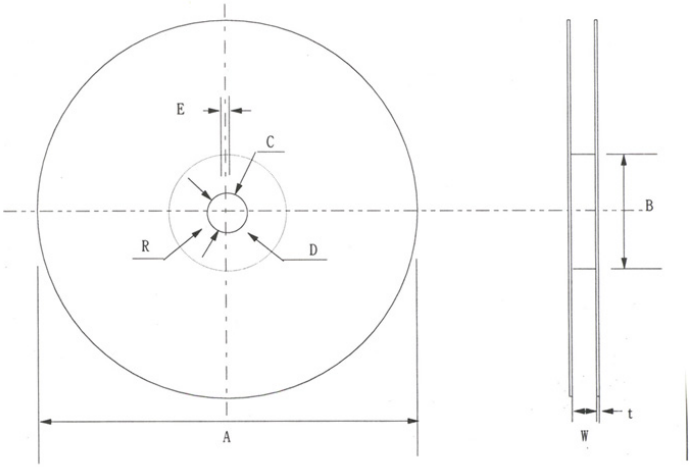
Carrier Tape Dimensions



(Unit : mm)

Symbol		A	B	W	F	E	P_1	P_2	P_0	D	t
Dimension	05	0.65 +0.05 -0.10	1.15 +0.05 -0.10	8.0 ±0.3	3.5 ±0.05	1.75 ±0.1	2.0 ±0.05	2.0 ±0.05	4.0 ±0.1	1.5 ±0.1 -0	1.1 below
	10	1.10 ±0.2	1.90 ±0.2				4.0 ±0.1				
	21	1.65 ±0.2	2.4 ±0.2								

Reel Dimensions



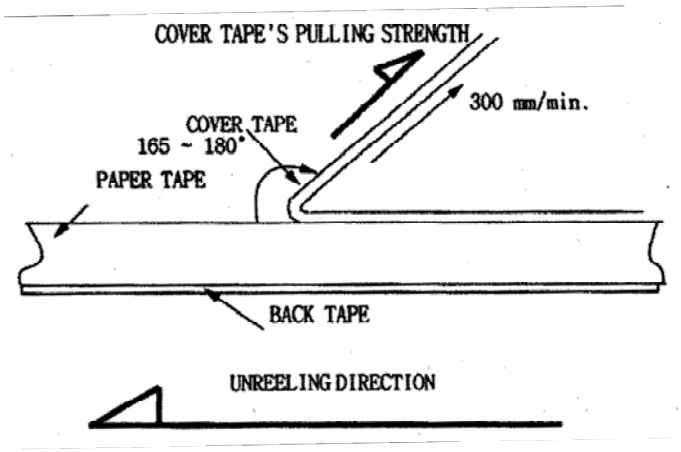
(UNIT :mm)

Code	A	B	C	D	E	W	t	R
Dimension	ϕ178±2	Min. ϕ50	ϕ13±0.5	ϕ21±0.8	2.0±0.5	10±1.5	0.8±0.2	1.0

COVER TAPE REEL-OFF FORCE

- **PEEL-OFF FORCE**
  5 g.f ≤peel-off force ≤ 70 g.f

MEASURING METHOD



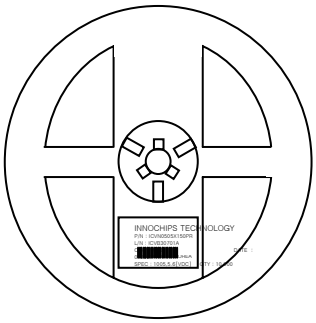
TAPING PACKING SPECIFICATION

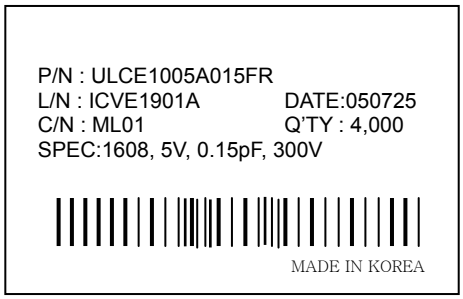
- MINIMUM BENDING RADIUS OF TAPING TAPE
  There is no chip-out or paper broken, etc. until the 15mm of taping tape's bending radius.

- ADHESION TO THE TAPE
  There is no adhesion between the chips and the tapes (bottom & top tape).

- CHIP HOLE'S CLEARANCE, ETC.
  When it's time to peel-off the tape, there is no hindrance which is occurred by chip clearance, dirt and debris.
  Also, mounting M/C's nozzle should not choked up by the paper's debris.

- Reel material : Polystyrene
- Label

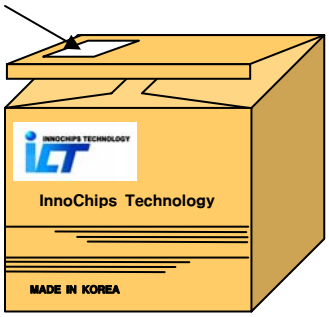




P/N : Part Number
L/N : Lot Number
C/N : Company Number
SPEC : Size & Working Voltage & Capacitance & Trigger Voltage
DATE : Date code
Q'TY : Quantity

Reel Packaging

Part Number / Company Name



<SPQ Box>

<PQ Box>

(1) Product box material : Card board
(2) 5 Reels in each SPQ Box
(3) PQ Box contains 5 SPQ Boxes (25 Reels)