

SPECIFICATION FOR APPROVAL

<p>CUSTOMER'S APPROVAL CHOP</p> <p>Approval's condition: _____</p> <p>Approved date: _____</p>

KINDLY RETURN A SET WITH YOUR COMPANY'S OFFICIAL
STAMP ON APPROVAL OF THIS ITEM

CUSTOMER'S NAME: _____

CUSTOMER'S MODEL NO. : _____

CUSTOMER'S PART NO. : _____

DESCRIPTION: _____
EFD20

Semitel'S MODEL NO. : _____
EFD20-381

VERSION: _____
B

DATE: _____
2020/2/25

Attachments:

- Product specification
- Sample Qty.:
- Test data

Prepared By	Checked By	Approved By
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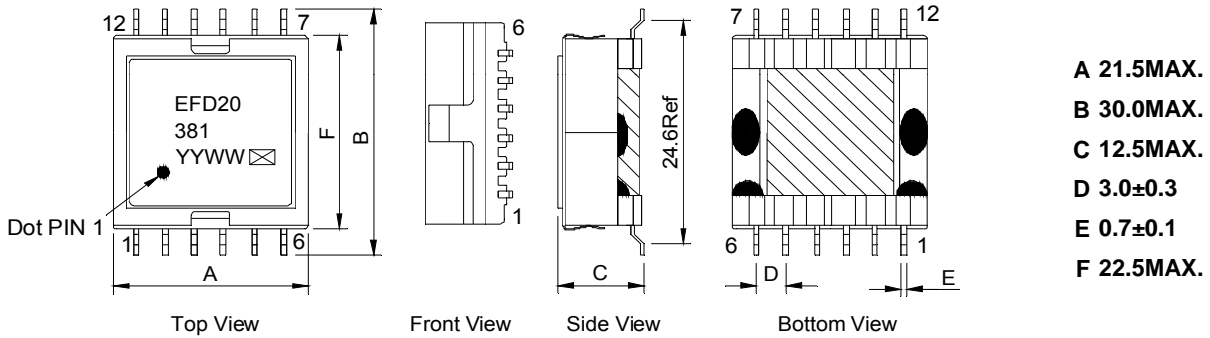
Revision Record

Version	Revision Date	Revision For Items	Reason For Revision																																																								
A	2019/9/16	New Revision	-																																																								
B	2020/2/25	No of turns change from <table border="1"> <thead> <tr> <th>No</th> <th>No of Pin</th> <th>Turns</th> <th>Wire Spec</th> </tr> </thead> <tbody> <tr> <td>N1</td> <td>2 -- 5</td> <td>12 Ts</td> <td>ø0.28mm*3P</td> </tr> <tr> <td>N2</td> <td>7 -- 10</td> <td>7 Ts</td> <td>ø0.30mm*3P</td> </tr> <tr> <td>N3</td> <td>8 -- 11</td> <td>7 Ts</td> <td>ø0.30mm*3P</td> </tr> <tr> <td>N4</td> <td>9 -- 12</td> <td>7 Ts</td> <td>ø0.30mm*3P</td> </tr> <tr> <td>N5</td> <td>2 -- 5</td> <td>12 Ts</td> <td>ø0.28mm*3P</td> </tr> <tr> <td>N6</td> <td>1 -- 6</td> <td>8 Ts</td> <td>ø0.28mm*1P</td> </tr> </tbody> </table> → <table border="1"> <thead> <tr> <th>No</th> <th>No of Pin</th> <th>Turns</th> <th>Wire Spec</th> </tr> </thead> <tbody> <tr> <td>N1</td> <td>2 -- 5</td> <td>12 Ts</td> <td>ø0.28mm*3P</td> </tr> <tr> <td>N2</td> <td>7 -- 10</td> <td>8 Ts</td> <td>ø0.30mm*3P</td> </tr> <tr> <td>N3</td> <td>8 -- 11</td> <td>8 Ts</td> <td>ø0.30mm*3P</td> </tr> <tr> <td>N4</td> <td>9 -- 12</td> <td>8 Ts</td> <td>ø0.30mm*3P</td> </tr> <tr> <td>N5</td> <td>2 -- 5</td> <td>12 Ts</td> <td>ø0.28mm*3P</td> </tr> <tr> <td>N6</td> <td>1 -- 6</td> <td>7 Ts</td> <td>ø0.28mm*1P</td> </tr> </tbody> </table>	No	No of Pin	Turns	Wire Spec	N1	2 -- 5	12 Ts	ø0.28mm*3P	N2	7 -- 10	7 Ts	ø0.30mm*3P	N3	8 -- 11	7 Ts	ø0.30mm*3P	N4	9 -- 12	7 Ts	ø0.30mm*3P	N5	2 -- 5	12 Ts	ø0.28mm*3P	N6	1 -- 6	8 Ts	ø0.28mm*1P	No	No of Pin	Turns	Wire Spec	N1	2 -- 5	12 Ts	ø0.28mm*3P	N2	7 -- 10	8 Ts	ø0.30mm*3P	N3	8 -- 11	8 Ts	ø0.30mm*3P	N4	9 -- 12	8 Ts	ø0.30mm*3P	N5	2 -- 5	12 Ts	ø0.28mm*3P	N6	1 -- 6	7 Ts	ø0.28mm*1P	Change according to customer's drawings
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Inductance change from 150uH MIN to 160uH MIN.			Change according to the measured sample data																																																								
DCR(9,8,7-10,11,12) change from 10mΩ Max to 14mΩ MAX																																																											
The hi-pot of win to core change from 1500VAC to 500VAC																																																											

Semitel'S MODEL NO. :	EFD20-381	CUSTOMER'S MODEL NO.:	
VERSION :	B	CUSTOMER'S PART NO. :	
DATE :	2020/2/25		

Product Specification

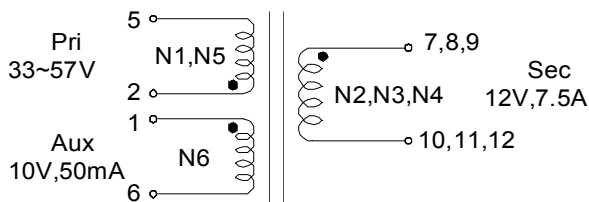
1. Physical Dimensions (Unit:mm)



Notes:

- *Marking type is laser printing
- *YY: Year Code; WW: Week Code
- *:When making samples, S is used to represent the product is a sample.
- *:Use different letters or numbers to represent the products are produced from different production lines .
- *Size B not including soldering tags
- *Coplanarity Requirement: Less than 0.10mm

2. Connection

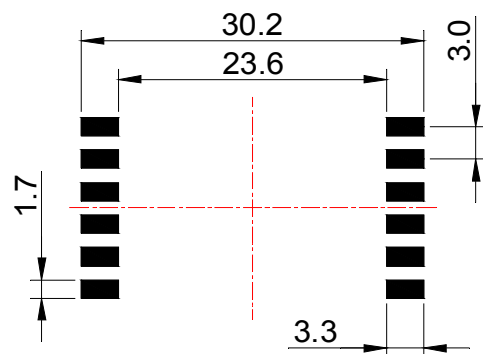


" "Start of winding

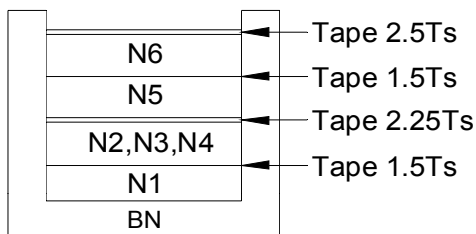
*Customer to tie terminals 7&8&9 and 10&11&12 on PC board.

*Application of the transformer allows for the leadwires between terminals 7&8&9 and 10&11&12 to solder bridge.

3.Recommended Pad Layout (Unit:mm)



4.Structure of Products



5.No of Turns & Wire Spec

No	No of Pin	Turns	Wire Spec
N1	2 -- 5	12 Ts	ø0.28mm*3P
N2	7 -- 10	8 Ts	ø0.30mm*3P
N3	8 -- 11	(B) 8 Ts	ø0.30mm*3P
N4	9 -- 12	8 Ts	ø0.30mm*3P
N5	2 -- 5	12 Ts	ø0.28mm*3P
N6	1 -- 6	(B) 7 Ts	ø0.28mm*1P

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6. Electrical Characteristics

*Operating temperature:-40°C~+125°C.

*Storage temperature range: -40°C to +125°C .

Items	Winding	Specifications	Test Conditions
Inductance	L(2-5)	160uH MIN. (B)	at 100kHz,0.1Vrms
LK-Inductance	LK(2-5) Tie other	0.45uH MAX.	at 100kHz,0.1Vrms
Interwinding Capacitance		250pF MAX.	at 100kHz,0.1Vrms
DCR	R(2-5)	25mΩ MAX	at 25°C
	R(1-6)	200mΩ MAX	
	R(7,8,9-10,11,12)	14mΩ MAX (B)	
Turn Ratio	(2-5):(1-6):(7,8,9-10,11,12)	1.5:0.875:1;±3%	at 100kHz,0.1Vrms
Hi-Pot	Pri&Aux to Sec	1500VAC	5 mA.3Sec
	Win to Core	500VAC (B)	5 mA.3Sec

7.Bill of Material

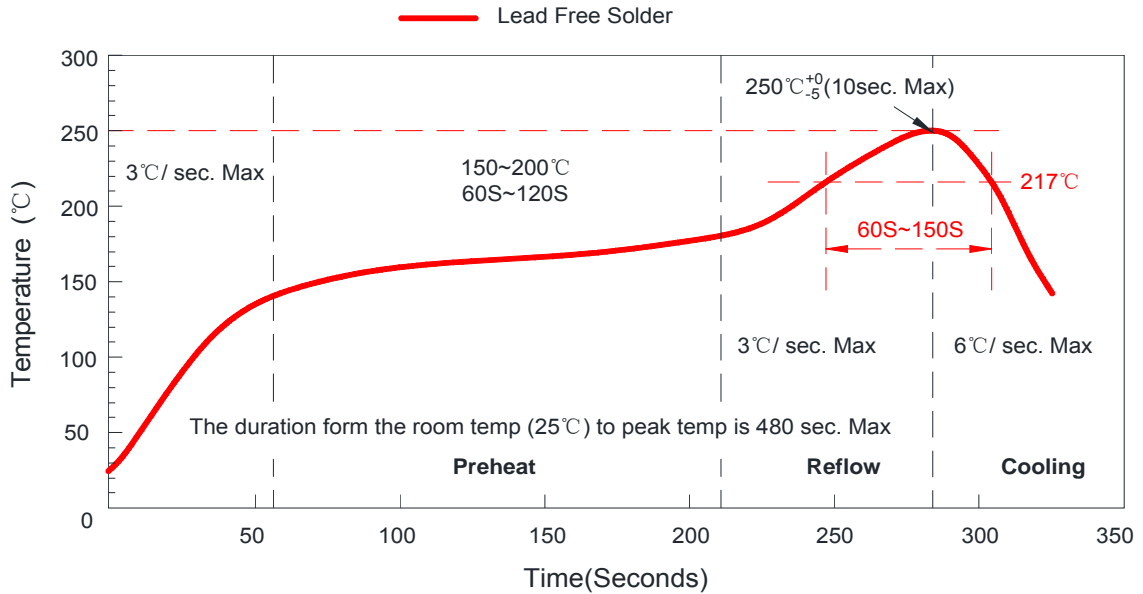
No	Items	Material Name	Manufacturer	UL File No	SGS File No
1	Core	FERRITE CORE JCP-95	FCRI or Equivalent	NIL	CANEC1813462601
OR	Core	FERRITE CORE HY95	HUAYUE or Equivalent	NIL	SHAEC1825833101
2	Bobbin	PM-9630	SUMITOMO (SumiDurez) or Equivalent	E41429	SHAEC1802754204
3	CLIP	SUS301	TONG FENG or Equivalent	NIL	SZXEC1801105401
4	Copper Wire	Polysol 180	ELEKTRISOLA or Equivalent	E258243	CE/2018/40393
OR	Copper Wire	UEWH/U	PACIFIC or Equivalent	E201757	A217005571810101E
5	Polyimide Tape	HN,HV,HL,HE NC 0.025mm V-0	RUNSEA (RAYITEK)or Equivalent	E339977	SZXEC1900617511
6	EPOXY	TH320	TIAN HUAN or Equivalent	E257593	CANEC1821553805
7	EPOXY	EB-360	CHANGFENG or Equivalent	NIL	SHAEC1826217301
8	Varnish	ZS-NJ-D938XX	ZHAOSHUN or Equivalent	E329120	CANEC1804050604
9	Solder	Lead free solder	HONGTAIZHOU or Equivalent	NIL	CANEC1812220901

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8.Recommended Temperature Conditions of Air Reflow Soldering

Test Solderability Temperature Profile



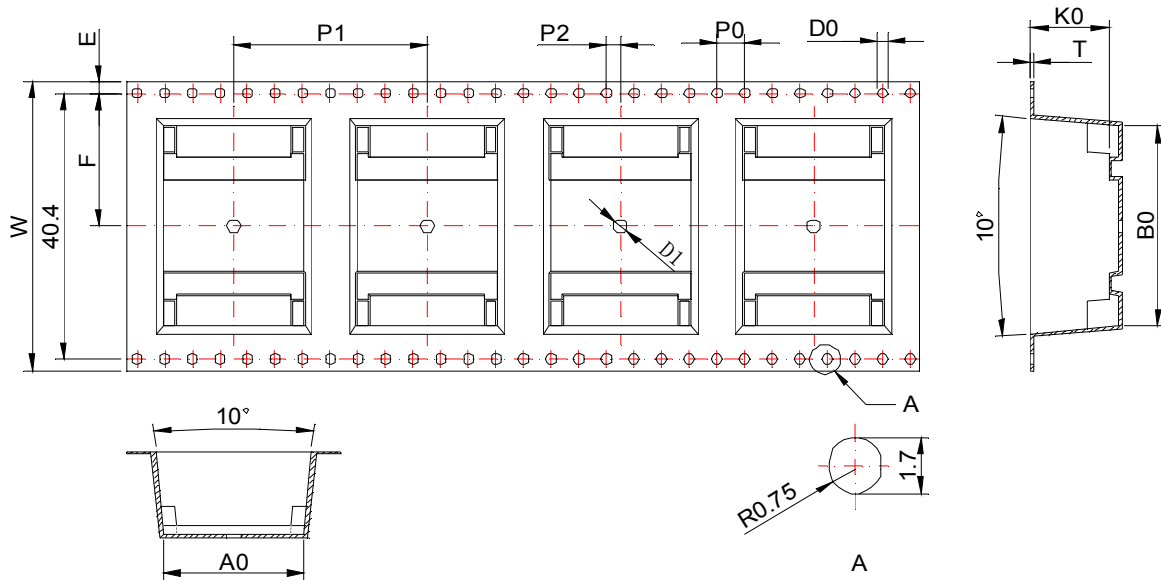
Profile Feature	
Average Ramp-Up Rate (T _{smax} to T _p)	3°C/Second Max.
Preheat	
-Temperature Min. (T _{smin})	150°C
-Temperature Max. (T _{smax})	200°C
-Time (T _{smin} to T _{smax})	60-120 Seconds
Time maintained above:	
-Temperature (TL)	217°C
-Time (TL)	60-150 Seconds
Peak/Classification Temperature (T _p)	250°C
Time within 5°C of actual PeakTemperature (T _p)	10 Seconds Max.
Ramp-Down Rate	6°C/Second Max.
Time 25°C to Peak Temperature	8 Minutes Max.

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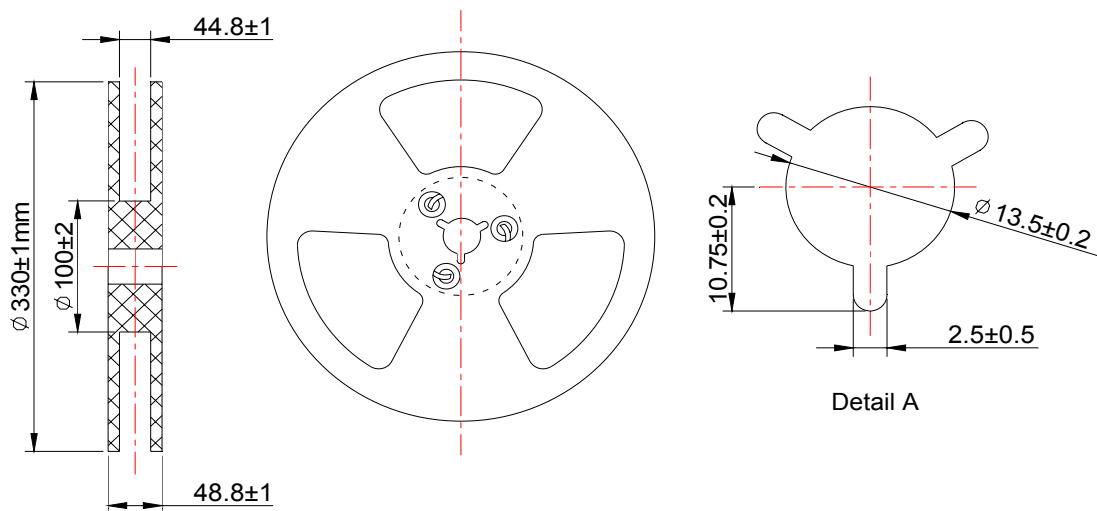
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9. Tape and Reel Dimensions (Unit: mm)

*Packing information is according with EIA-841 standard, When W=32mm and other wider tapes that should have elongated sprocket holds on the other side.



ITEM	A0	B0	K0	P0	P1	P2
DIM	20.3±0.3	30.5±0.3	11.3±0.3	4.0±0.1	28.0±0.1	2.0±0.15
ITEM	W	T	E	F	D0	D1
DIM	44.0±0.3	0.5±0.05	1.75±0.1	20.2±0.15	∅ 1.5±0.1	∅ 2.0±0.1

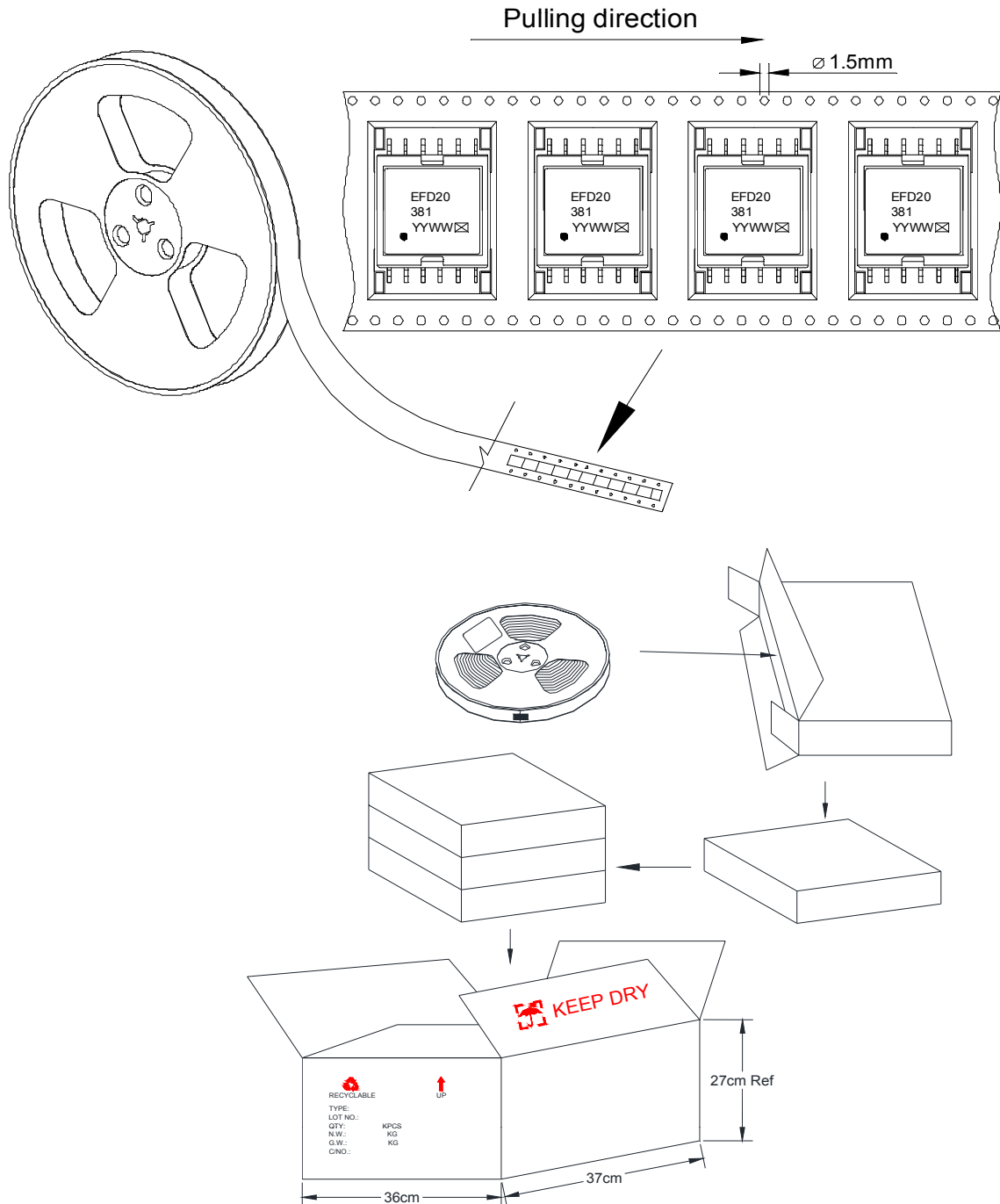


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10.Packing Request

- (1), Every roll of the carrier tape can contain 125pcs products.
- (2), Every small packing box contains one rolls of carrier tape. Total quantity: 125pcs.
- (3), Every cartoon box contains 3 small packing boxes. Total quantity: 375pcs.



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Test Report

NO	Test Instruments								
	HP4284A			DCR METER 131			HP4284A	CS2670A	
	Inductance	Inductance	Interwinding Capacitance	DCR			Turn Ratio	Hi-Pot	
	at 100kHz,0.1Vrms	at 100kHz,0.1Vrms	at 100kHz,0.1Vrms	at 25°C	at 25°C	at 25°C	at 100kHz,0.1Vrms	5 mA.3Sec	5 mA.3Sec
	L(2-5)	LK(2-5) Tie other		R(2-5)	R(1-6)	R(7,8,9-10,11,12)	(2-5):(1-6):(7,8,9-10,11,12)	Pri&Aux to Sec	Win to Core
	160uH MIN.	0.45uH MAX.	250pF MAX.	25mΩ MAX	200mΩ MAX	14mΩ MAX	1.5:0.875:1;±3%	1500VAC	500VAC
1	191.60	0.1056	89.00	21.60	86.60	11.20	PASS	PASS	PASS
2	183.90	0.1082	84.00	21.20	86.20	10.10	PASS	PASS	PASS
3	195.60	0.1136	86.00	21.40	86.10	10.50	PASS	PASS	PASS
4	191.20	0.0988	87.00	21.30	85.50	10.60	PASS	PASS	PASS
5	193.00	0.1092	80.00	21.50	86.40	10.70	PASS	PASS	PASS
MIN.	183.90	0.0988	80.00	21.20	85.50	10.10			
MAX.	195.60	0.1136	89.00	21.60	86.60	11.20			
AVG.	191.06	0.1071	85.20	21.40	86.16	10.62			
Result	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed

Overall Dimensions Test

Measurement tools: Caliper (Unit:mm)

NO	A	B	C	D	E	F			
	21.5MAX.	30.0MAX.	12.5MAX.	3.0±0.3	0.7±0.1	22.5MAX.			
1	20.40	28.20	12.10	3.10	0.72	22.10			
2	20.20	28.10	12.10	3.10	0.71	22.30			
3	20.60	28.40	12.10	3.10	0.75	22.40			
4	20.50	28.60	12.10	3.10	0.76	22.10			
5	20.70	28.50	12.10	3.10	0.74	22.10			
MIN.	20.20	28.10	12.10	3.10	0.71	22.10			
MAX.	20.70	28.60	12.10	3.10	0.76	22.40			
AVG.	20.48	28.36	12.10	3.10	0.74	22.20			
Result	Passed	Passed	Passed	Passed	Passed	Passed			

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