

SPECIFICATION FOR APPROVAL

<p>CUSTOMER'S APPROVAL CHOP</p> <p>Approval's Condition: _____</p> <p>Approved Date: _____</p>
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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: _____

EP13

Semitel'S MODEL NO. : _____

EP13-079

VERSION: _____

G

DATE: _____

2013-7-30

Attachments:

- Product Specification
- Sample Qty. :
- Test Data

Prepared By	Checked By	Approved By
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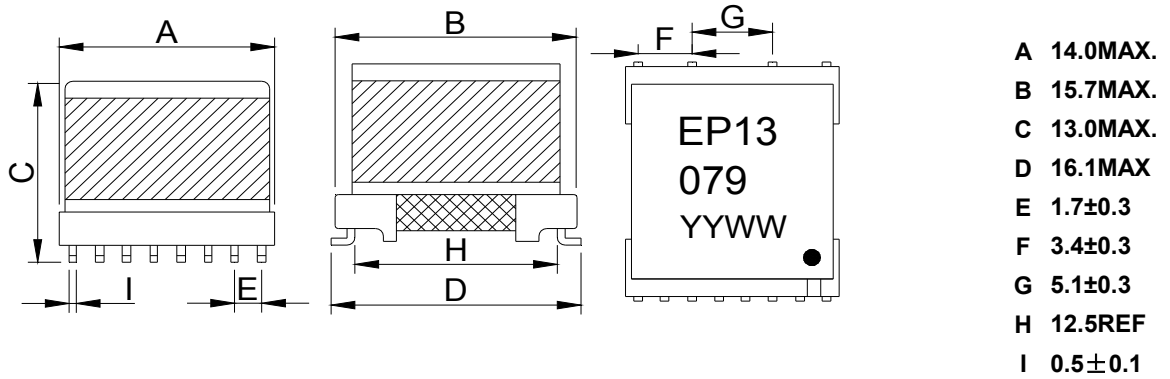
Revision Record

Version	Revision Date	Revision For Items	Revision For Items
A	2012-8-15	New Revision	-
B	2013-1-16	1, THD PIN(16-9)-(1-4)(PIN11-14,PIN2-3 Short) changes from -95dB MAX to -95dB TYP 2, THD PIN(16-9)-(5-8)(PIN11-14,PIN6-7 Short) changes from -93dBMAX to -93dB TYP	Change according to the measured sample data
C	2013-6-19	1, Add LK(16-9)tie(11-14,1-2-3-4) test ,14~25uH 2, Add LK(16-9)tie(11-14,5-6-7-8) test,3~11uH 3, Add LK(1-4)tie(2-3,5-6-7-8) test,20uH Max 4, Add LCL test. 90dB Ref at 250KHz . 5, Add LCL test. 84dB Ref at 500KHz . 6, Add LCL test. 78dB Ref at 1MHz . 7, Add LCL test. 72dB Ref at 2MHz . 8, Turns ratio change from (16-9):(5-8)tie(11-14,6-7),5±1%:1 to (5-7):(6-8):(16-11):(14-9), 1:1:5:5±1% 9, Turns ratio change from (16-9):(1-4)tie(11-14,2-3),1±1%:1 to (1-3):(2-4):(16-11):(14-9),1:1:1:1±1%	Customer Request
D	2013-6-21	1, THD PIN(16-9)-(1-4)(PIN11-14,PIN2-3 Short) changes from -95dB TYP to -95dB MAX 2, THD PIN(16-9)-(5-8)(PIN11-14,PIN6-7 Short) changes from -93dB TYP to -93dB MAX	Customer Request
E	2013-6-27	1, Add Interwinding Capacitance test : PIN(1-16)tie 2+3,11+14 <20 pF 2, Add Interwinding Capacitance test : PIN(8-9) tie6+7,11+14 <50 Pf	Customer Request
F	2013-7-10	Add impedance Xin PIN(16-9)(tie 2+3,6+7,11+14):1.9kOhm<Xin<3.2kOhm, at 1MHz,100mV	Customer Request
		Marking changes from inkjet printing to laser printing	Change of marking printing
		Adhesive tape of 3M need to add 3M logo on the tape	3M adds the logo to identify their own products
G	2013-7-30	Add the structure of products	Customer Request
		Add the tape supplier information	

Semitel'S MODEL NO. :	EP13-079	CUSTOMER'S MODEL NO. :	
VERSION:	G	CUSTOMER'S PART NO. :	
DATE:	2013-7-30		

Product Specification

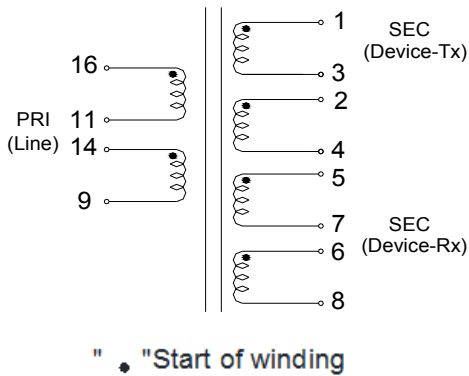
1. Physical Dimensions (Unit:mm)



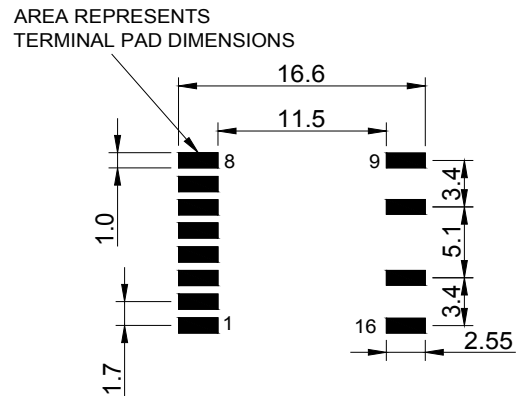
Notes:

- *Marking type is laser printing
- *YY: Year Code; WW: Week Code
- *Size D not including soldering tags
- *Coplanarity Requirement: Less than 0.15mm

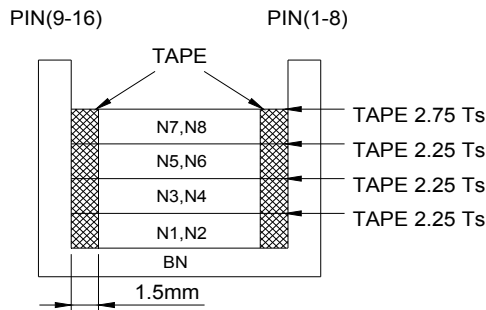
2. Connection



3. Recommended Pad Layout (Unit:mm)



4. Structure of Products



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Product Specification

5. Electrical Characteristics

*Designed to meet UL 60950-A and EN60950-1 requirements for supplementary insulation

*Electrical specifications at 25°C unless otherwise noted:

*Operation temperature: -40°C ~ +85°C

Items	Winding	Specifications	Test Conditions
Inductance	L(16-9) tie(11+14)	Main Inductance 16-9 (tie 2+3, 6+7, 11+14; 10kHz; 100mV): Lh = 1.4mH +/- 10%	at 10KHz, 0.1Vrms
LK-Inductance	LK(16-9) (tie (11+14, 7+6, 5+8))	TX winding Ls_tx (tie 11+14, 7+6, 5+8; 1MHz; 100mV): 3µH < Ls < 11µH	at 1MHz, 0.1Vrms
	LK(16-9) tie(11+14, 2+3, 1+4)	RX winding Ls_rx (tie 11+14, 2+3, 1+4; 1MHz; 100mV): 14µH < Ls < 25µH, target value = 22µH.	
LK-Inductance	LK(1-4) tie(7+6, 5+8, 2+3)	RX2TX winding Ls_rx2tx (tie 7+6, 5+8, 2+3; 1MHz; 100mV): 0.73 * Ls_rx < Ls_rx2tx < 0.93 * Ls_rx	at 1MHz, 0.1Vrms
DCR	R(16-9) tie(11+14)	2.6Ω ±15%	at 25°C
	R(5-8) tie(6+7)	270mΩ ±15%	
	R(1-4) tie(2+3)	3.2Ω ±15%	
Turns Ratio	(5-7):(6-8):(16-11):(14-9)	1:1:5:5±1%	at 100KHz, 0.1Vrms
	(1-3):(2-4):(16-11):(14-9)	1:1:1:1±1%	
Hi-Pot	Pri-Sec	3750V	1mA, 1SEC.
THD	PIN(16-9)-(1-4) (PIN11-14, PIN2-3 Short)	-95dB MAX	30KHz, 4V
	PIN(16-9)-(5-8) (PIN11-14, PIN6-7 Short)	-93dB MAX	
LCL		70 dB Min, 90dB typ	@ 250KHz
		60 dB Min, 84dB typ	@ 500KHz
		58 dB Min, 78dB typ	@ 1MHz
		52 dB Min, 72dB typ	@ 2MHz
Impedance Xin	PIN(16-9)(tie 2+3, 6+7, 11+14)	1.9kOhm < Xin < 3.2kOhm	at 1MHz, 100mV
Interwinding Capacitance	PIN(1-16)tie 2+3, 11+14	<20 pF	at 100KHz, 0.1Vrms
	PIN(8-9) tie6+7, 11+14	<50 pF	
Operating Temperature		-40°C ~ 125°C	includes core temp. rise
Storage Temperature		-40°C ~ 125°C	includes core temp.
Reflow Temperature		x3, 260C @ 15 Seconds 10 min. cool-down Ea.	
Terminal		Cu6%, Ag2%, Sn92%	
RoHS Compliant	This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.		

6. Bill of Material

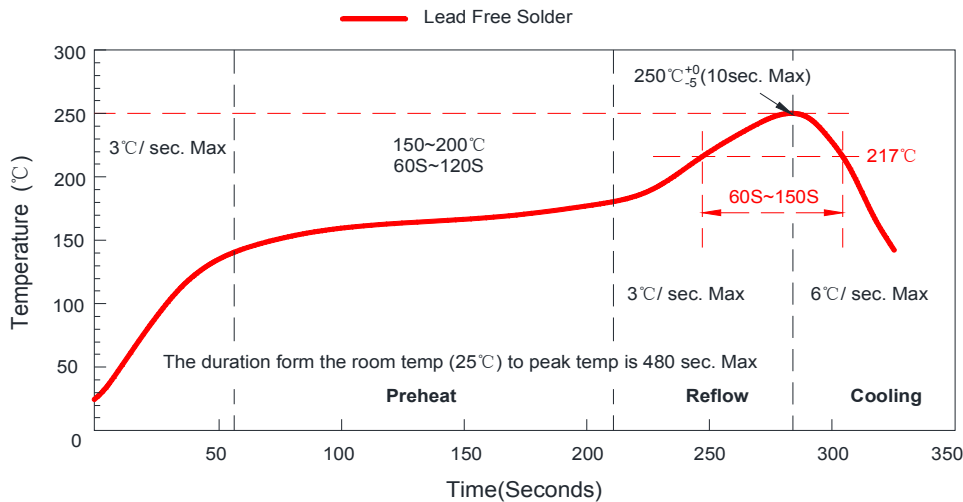
No	Item	Material Name	Manufacturer	UL File No	SGS File No
1	Core	MnZn ferrite core	ACME or Equivalent	NIL	CE/2012/30115
2	Bobbin	PM9630	SumiDurez or Equivalent	E41429	10290364(1)
3	Terminal	Copper metal sheet	XINXING or Equivalent	NIL	CANEC1302382606
4	Copper Wire	Polyurethane wire	ELEKTRISOLA or Equivalent	E258243	CE/2013/45010
5	Insulation tape	1350F-1 TAPE (INSULATION TAPE)	3M or Equivalent	E17385	CE/2013/A5108
6	Margin Tape	WF-2902 TAPE (MARGIN TAPE)	YAHUA or Equivalent	NIL	CANEC1217398704
7	EPOXY	TH320	TIANHUAN or Equivalent	NIL	CANEC1213544101
8	Solder	Lead free solder	HONGTAIZHOU or Equivalent	NIL	GZ1004042354/CHEM

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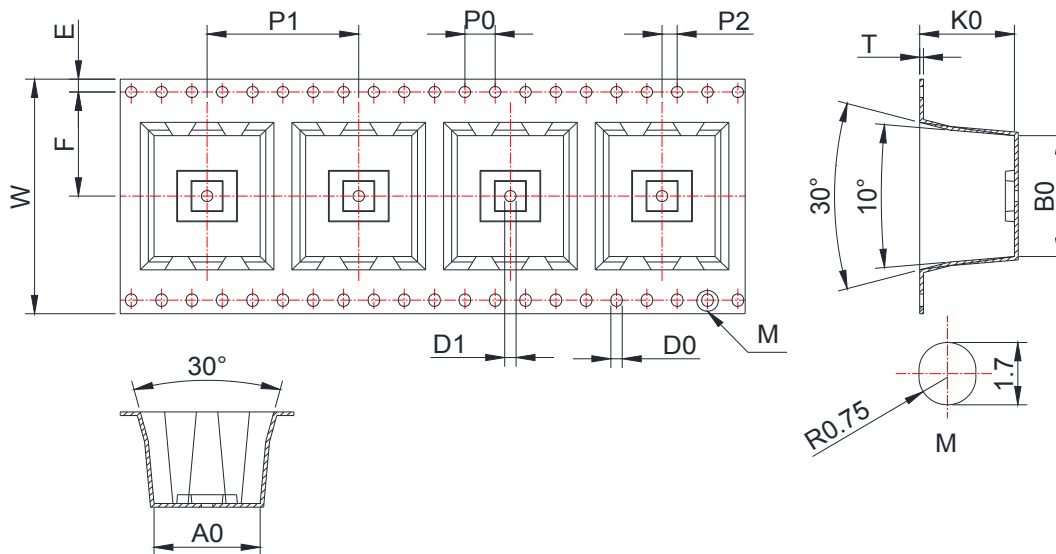
Product Specification

7.Recommended Temperature Conditions of Air Reflow Soldering

Test Solderability Temperature Profile



8.Tape Dimensions (Unit:mm)



symbol	A0	B0	K0	P0	P1	P2
spec	14.0±0.3	16.5±0.3	12.5±0.3	4.0±0.1	24.0±0.15	2±0.1
symbol	W	T	E	F	D0	D1
spec	32.0±0.3	0.5±0.05	1.75±0.1	14.2±0.1	∅ 1.5 ^{+0.1} ₀	∅ 2.0±0.1

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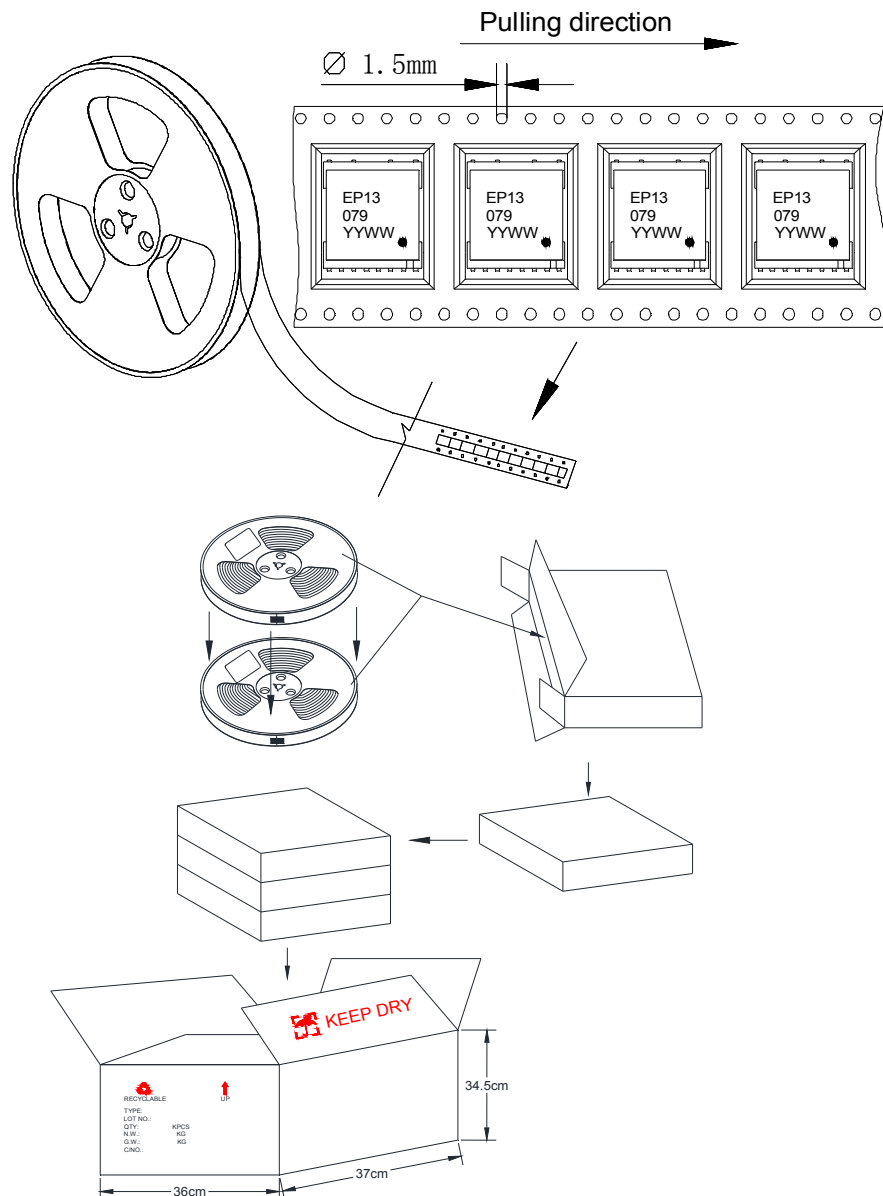
Product Specification

9.Packing Request

- *32 mm pearl cotton to the inner part of the carrier tape for two rounds. (please see the figure 1)
- *32 mm cartoon paper for one round at the outer part of the carrier tape. (please see the figure 1)
- *Every roll of the carrier tape can contain 200pcs products.
- *Every small packing box contains two rolls of carrier tape. Total quantity: 400pcs.
- *Every cartoon box contains 3 small packing boxes. Total quantity: 1200pcs.



figure 1



Semitel'S MODEL NO. :	EP13-079	CUSTOMER'S MODEL NO. :	
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Test Report

Test Instruments																										
LCR METER 1062					3250										DCR METER 131								CS2670A			
NO	Inductance		LK-Inductance			THD		Turns Ratio								DCR			LCL				Interwinding Capacitance		Impedance Xin	Hi-Pot
	at 10KHz,0.1Vrms		at 1MHz,0.1Vrms			30KHz, 4V		at 100KHz,0.1Vrms								at 25°C			@ 250KHz	@ 500KHz	@ 1MHz	@ 2MHz	at 100KHz,0.1Vrms		at 1MHz,100mV	1mA.1SEC.
	L(16-9) tie(11+14)	LK(16-9) tie(11+14,2+3,1+4)	LK(16-9) tie(11+14,2+3,1+4)	LK(1-4) tie(7+6,5+8,2+3)	PIN(16-9)-(1-4) (PIN11-14,PIN2-3 Short)	PIN(16-9)-(5-8) (PIN11-14,PIN6-7 Short)	(5-7):(6-8):(16-11):(14-9)				(1-3):(2-4):(16-11):(14-9)				R(16-9) tie(11+14)	R(1-4) tie(2+3)	R(5-8) tie(6+7)					PIN(1-16)tie 2+3,11+14	PIN(8-9) tie6+7,11+14	PIN(16-9)(tie 2+3,6+7,11+14)	Pri-Sec	
	1.4mH ±10%	14~25uH	3~11uH	12.88-22uH	-95dB MAX	-93dB MAX	1:1:5:5±1%				1:1:1:1±1%				2.6Ω ±15%	3.2Ω ±15%	270mΩ ±15%	90dB Ref	84dB Ref	78dB Ref	72dB Ref	<20 pF	<50 pF	1.9kOhm< Xin<3.2kOhm	3750V	
1	1.431	22.3	8.15	18.37	-95.3	-93.90	1.001	1.000	4.967	4.976	1.001	1.000	1.001	1.000	2.350	2.943	253.8	-81.35	-74.38	-66.63	-60.06	11.6	22.1	2638.9	No breakdown	
2	1.401	21.9	7.43	17.25	-96.2	-95.00	1.001	1.000	4.983	4.991	1.000	1.001	1.000	1.001	2.360	2.945	258.4	-84.3	-79.89	-67.64	-61.76	11.1	21.0	2636.0	No breakdown	
3	1.434	21.0	7.95	17.11	-95.6	-94.70	1.001	1.000	4.982	4.978	1.001	1.001	1.000	1.000	2.350	2.948	254.6	-79.82	-81.78	-67.21	-60.13	11.3	21.2	2638.4	No breakdown	
4	1.380	21.6	7.58	17.58	-96.1	-93.40	1.000	1.001	4.978	4.979	1.001	1.001	1.001	1.001	2.350	2.943	257.2	-81.43	-78.45	-65.05	-59.16	11.5	22.8	2637.5	No breakdown	
5	1.364	20.8	7.66	16.52	-95.5	-94.60	1.000	1.001	4.977	4.985	1.001	1.001	1.001	1.001	2.360	2.947	256.4	-81.78	-77.07	-63.85	-57.76	10.8	21.6	2636.8	No breakdown	
6	1.384	22.1	7.60	17.97	-95.2	-93.80	1.000	1.000	4.984	4.989	1.000	1.000	1.000	1.000	2.350	2.943	253.2	-81.46	-78.6	-63.1	-57.04	11.0	22.2	2635.0	No breakdown	
7	1.359	20.6	7.24	16.11	-95.5	-94.20	1.000	1.000	4.979	4.983	1.000	1.001	1.001	1.001	2.360	2.945	258.4	-84.3	-78.53	-67.54	-61.34	11.2	22.1	2638.0	No breakdown	
8	1.399	22.1	8.73	17.61	-96.1	-93.70	1.000	1.001	4.974	4.984	1.001	1.001	1.001	1.001	2.350	2.948	254.3	-78.55	-81.44	-67.23	-60.03	11.8	22.3	2637.0	No breakdown	
9	1.404	21.1	7.68	16.73	-95.6	-93.80	1.000	1.001	4.976	4.979	1.001	1.001	1.001	1.001	2.350	2.943	257.8	-79.52	-77.92	-66.73	-60.41	11.6	22.8	2639.4	No breakdown	
10	1.447	21.7	7.39	16.55	-95.9	-93.50	1.000	1.000	4.991	4.983	1.000	1.000	1.000	1.000	2.360	2.947	256.3	-93.99	-85.88	-65.87	-60.23	11.4	21.9	2638.7	No breakdown	
MIN.	1.359	20.620	7.240	16.11	-96.2	-95.0	1.000	1.000	4.967	4.976	1.000	1.000	1.000	1.000	2.350	2.943	253.2	-93.99	-85.88	-67.64	-61.76	10.8	21.0	2635.0		
MAX.	1.447	22.250	8.730	18.37	-95.2	-93.4	1.001	1.001	4.991	4.991	1.001	1.001	1.001	1.001	2.360	2.948	258.4	-78.55	-74.38	-63.10	-57.04	11.8	22.8	2639.4		
AVG.	1.400	21.525	7.741	17.18	-95.7	-94.06	1.000	1.000	4.979	4.983	1.001	1.001	1.001	1.001	2.354	2.945	256.0	-82.65	-79.39	-66.09	-59.79	11.3	22.0	2637.6		
Result	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed
Semitel'S MODEL NO. :	EP13-079						CUSTOMER'S MODEL NO. :																			
VERSION:	G						CUSTOMER'S PART NO. :																			
DATE:	2013-7-30																									

Test Report

Overall Dimensions Test

Measurement Tools: Caliper (Unit:mm)

NO	A	B	C	D	E	F	G	H	I
	14.0MAX.	15.7MAX.	13.0MAX.	16.1MAX	1.7±0.3	3.4±0.3	5.1±0.3	5.1±0.3	0.5±0.1
1	13.59	15.40	12.24	15.76	1.69	3.42	5.07	12.43	0.51
2	13.61	15.43	12.22	15.74	1.69	3.41	5.05	12.41	0.50
3	13.60	15.39	12.30	15.79	1.68	3.42	5.08	12.42	0.49
4	13.59	15.42	12.26	15.75	1.67	3.39	5.06	12.43	0.48
5	13.60	15.41	12.23	15.77	1.69	3.40	5.09	12.41	0.50
6	13.57	15.38	12.22	15.74	1.67	3.40	5.05	12.41	0.53
7	13.59	15.41	12.20	15.72	1.67	3.39	5.03	12.39	0.52
8	13.58	15.37	12.28	15.77	1.66	3.40	5.06	12.40	0.51
9	13.57	15.40	12.24	15.73	1.65	3.37	5.04	12.41	0.50
10	13.58	15.39	12.21	15.75	1.67	3.38	5.07	12.39	0.52
MIN.	13.57	15.37	12.20	15.72	1.65	3.37	5.03	12.39	0.48
MAX.	13.61	15.43	12.30	15.79	1.69	3.42	5.09	12.43	0.53
AVG.	13.59	15.40	12.24	15.75	1.67	3.40	5.06	12.41	0.51
Result	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed	Passed

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Semitel International Ltd.,

079 LB CPK DATA

LOT NO.:	Type																	
SAMPLE SIZE:	10	DWG VER.	A															
DATE:	12-05-12																	
REMARK:																		
PARAMETER:	LB																	
CONDITION:	0.03MHz	0.06MHz	0.1MHz	0.2MHz	0.3MHz	0.5MHz	0.6MHz	0.8MHz	1MHz	1.1MHz	2.0MHz	3.1MHz	5MHz	8MHz	12MHz	17MHz	20MHz	30MHz
PIN NO.:																		
UNIT:	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB
MAX SPEC.:	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-41.00	-41.00	-36.00	-36.00	-31.00	-31.00	-25.00	-25.00
MIN SPEC.:																		
AVERAGE =	-67.941	-75.133	-80.412	-80.990	-76.829	-71.895	-70.419	-67.974	-66.086	-65.340	-59.792	-51.854	-52.939	-50.080	-49.807	-50.134	-47.636	-37.721
STD DEV =	0.835	0.781	1.175	1.123	1.716	1.439	1.652	1.523	1.511	1.424	1.384	16.451	2.371	3.986	4.406	8.481	8.122	10.126
MAX =	-66.23	-73.72	-78.27	-78.98	-73.88	-68.92	-67.26	-64.95	-63.10	-62.55	-57.04	0.00	-47.62	-41.11	-43.78	-39.28	-34.38	-21.22
MIN =	-69.58	-76.28	-81.96	-82.67	-79.46	-73.94	-72.57	-69.43	-67.64	-66.80	-61.76	-59.43	-55.91	-54.08	-55.91	-67.02	-60.07	-58.54
Max spec for 1.33 Cpk	-64.61	-72.02	-75.73	-76.51	-69.98	-66.15	-63.83	-61.90	-60.06	-59.66	-54.27	13.78	-43.48	-34.18	-32.23	-16.30	-15.23	2.68
Min spec for 1.33 Cpk																		
Cpk for Max spec	7.159	10.727	8.631	9.198	5.210	5.071	4.120	3.935	3.550	3.590	4.526	0.220	2.382	1.178	1.423	0.752	0.929	0.419
Cpk for Min spec																		
DATA -----																		
1	-67.76	-74.83	-79.85	-82.67	-78.87	-72.35	-70.79	-68.80	-66.63	-65.86	-60.06	-57.10	-52.30	-47.82	-44.78	-44.16	-44.76	-58.54
2	-68.28	-76.28	-81.21	-82.60	-76.40	-72.70	-71.65	-68.95	-67.64	-66.80	-61.76	-59.43	-55.91	-52.90	-51.30	-53.95	-58.98	-40.73
3	-68.18	-74.91	-78.97	-81.15	-79.46	-73.94	-72.57	-69.43	-67.21	-66.59	-60.13	-56.20	-47.62	-41.11	-47.36	-51.40	-54.09	-43.37
4	-66.23	-74.80	-81.67	-79.60	-75.88	-71.07	-68.85	-66.78	-65.05	-64.27	-59.16	-57.13	-54.63	-54.08	-55.28	-44.28	-36.98	-37.81
5	-67.88	-75.44	-81.96	-78.98	-74.62	-70.08	-68.33	-65.80	-63.85	-63.23	-57.76	-55.41	-52.49	-51.06	-47.51	-39.28	-34.38	-21.22
6	-68.24	-76.02	-79.82	-80.16	-73.88	-68.92	-67.26	-64.95	-63.10	-62.55	-57.04	-54.57	-51.86	-51.28	-50.83	-45.79	-42.91	-33.19
7	-69.58	-73.72	-81.62	-80.83	-78.15	-73.24	-71.76	-69.18	-67.54	-66.46	-61.34	-58.75	-55.41	-53.78	-55.63	-67.02	-50.74	-44.11
8	-68.39	-74.07	-78.27	-81.67	-77.79	-72.81	-71.77	-69.38	-67.23	-66.49	-60.03	-56.47	-51.08	-46.18	-43.78	-47.34	-48.03	-23.00
9	-67.86	-75.53	-80.81	-81.12	-77.31	-72.26	-71.09	-68.74	-66.73	-65.94	-60.41	-57.53	-52.96	-48.54	-45.71	-44.78	-45.41	-38.07
10	-67.01	-75.73	-79.94	-81.12	-75.93	-71.58	-70.12	-67.74	-65.87	-65.21	-60.23	-57.79	-55.13	-54.05	-55.91	-63.35	-60.07	-37.18