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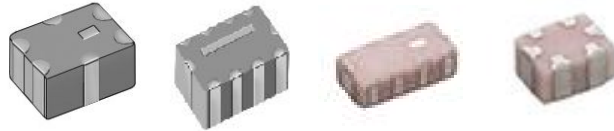
Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



1. This specification shall be applied to the ESD Protection Device.

LXES11DAA2-135
LXES21DAA4-136
LXES11DAA2-137
LXES21DAA4-138
LXES21DAA4-140
LXES18DAA4-167
LXES0NDAA2-172
LXES18DAA4-182
LXES0NDAA2-183
LXES18DAA4-184
LXES0NDAA2-185



2. Part Number Configuration

LXES 11 D AA 2 - 135
① ② ③ ④ ⑤ ⑥

- ① Product ID (LXES = ESD Protection device)
- ② Dimension Code

Unit : mm

Code	Dimension
11	1.25 x 1.0
21	2.0 x 1.25
0N	0.87 x 0.67
18	1.6 x 0.8

- ③ Type (D : Common mode ESD filter)
- ④ Control Code
- ⑤ Number of channel
- ⑥ Serial Number

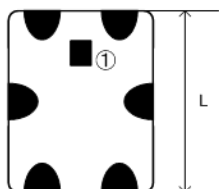
※RoHS Compliant
Halogen free
T/R only.

3.CONSTRUCTION, DIMENSIONS

3 - 1 DIMENSIONS

LXES11D series

Top View



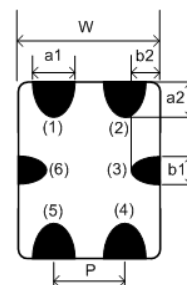
Side View 1



Side View 2



Bottom View



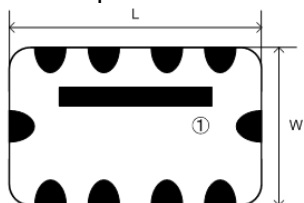
Unit : mm

Mark	Dimension
L	1.25 +/-0.1
W	1.0 +/-0.1
T	0.75 +/-0.1
a1	0.3 +/-0.1

Mark	Dimension
a2	0.25 +/-0.15
b1	0.2 +/-0.1
b2	0.2 +/-0.15
p	0.55 +/-0.05

LXES21Dseries

Top View



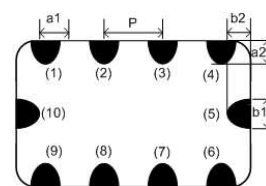
Side View 1



Side View 2



Bottom View

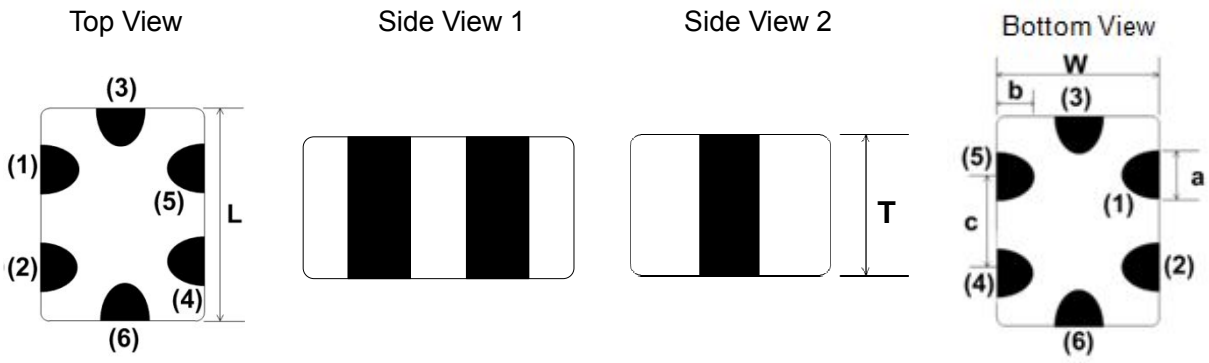


Unit : mm

Mark	Dimension
L	2.0 +/-0.1
W	1.25 +/-0.1
T	0.80 +0.1/-0.05
a1	0.25 +/-0.1

Mark	Dimension
a2	0.2 +/-0.15
b1	0.25 +/-0.1
b2	0.2 +/-0.15
p	0.5 +/-0.05

LXES0NDseries

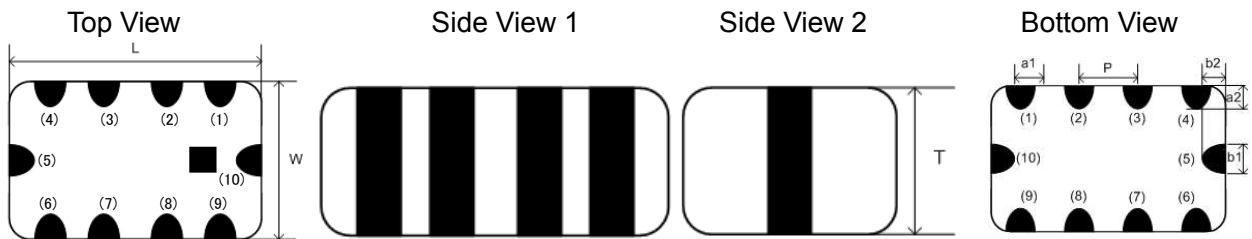


Unit : mm

Mark	Dimension
L	0.87 ± 0.05
W	0.67 ± 0.05
T	0.47 ± 0.05

Mark	Dimension
a	0.20 ± 0.05
b	0.15 ± 0.05
c	0.40 ± 0.05

LXES18Dseries

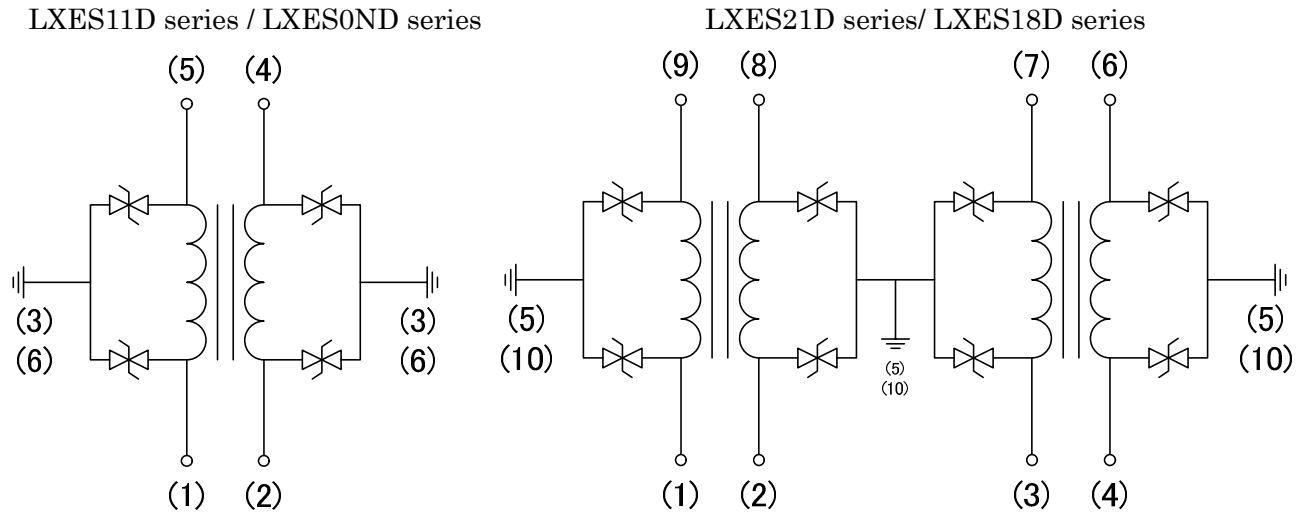


Unit : mm

Mark	Dimension
L	1.6 ± 0.1
W	0.8 ± 0.1
T	0.5 ± 0.05
a1	0.2 ± 0.1

Mark	Dimension
a2	0.15 ± 0.1
b1	0.2 ± 0.1
b2	0.15 ± 0.1
p	0.4 ± 0.05

3 - 2 Circuit Diagram



TERMINAL CONFIGURATION
This device is bi-directional.

3 - 3 Product Weight

P/N	Weight [mg]
LXES11D series	3.0
LXES21D series	7.1
LXES0ND series	1.0
LXES18D series	2.3

4.CHARACTERISTICS

4 - 1 Ratings

Parameter	Rating	Unit
Rated Voltage	5	V
Rated Current	60	mA
Operating Temperature	-40 to +85	°C
Storage Temperature	-40 to +85	°C

4 - 2 Electrical Characteristics (T=25°C)

P/N	Parameter	Conditions	MIN	TYP	MAX	Units
LXES11DAA2-135 LXES21DAA4-136	Common mode impedance	@100MHz		60		Ω
	DC Resistance			3		Ω
	Capacitance	1MHz、Vbias=0V		0.4		pF
	ESD per IEC 61000-4-2 (Air)		-15		15	kV
	ESD per IEC 61000-4-2 (Contact)		-15		15	kV

P/N	Parameter	Conditions	MIN	TYP	MAX	Units
LXES11DAA2-137 LXES21DAA4-138	Common mode impedance	@100MHz		35		Ω
	DC Resistance			2		Ω
	Capacitance	1MHz、Vbias=0V		0.4		pF
	ESD per IEC 61000-4-2 (Air)		-15		15	kV
	ESD per IEC 61000-4-2 (Contact)		-15		15	kV

P/N	Parameter	Conditions	MIN	TYP	MAX	Units
LXES21DAA4-140	Common mode impedance	@100MHz		90		Ω
	DC Resistance			4		Ω
	Capacitance	1MHz、Vbias=0V		0.4		pF
	ESD per IEC 61000-4-2 (Air)		-15		15	kV
	ESD per IEC 61000-4-2 (Contact)		-15		15	kV

P/N	Parameter	Conditions	MIN	TYP	MAX	Units
LXES18DAA4-167	Common mode impedance	@100MHz		90		Ω
	DC Resistance			5		Ω
	Capacitance	1MHz、Vbias=0V		0.4		pF
	ESD per IEC 61000-4-2 (Air)		-15		15	kV
	ESD per IEC 61000-4-2 (Contact)		-15		15	kV

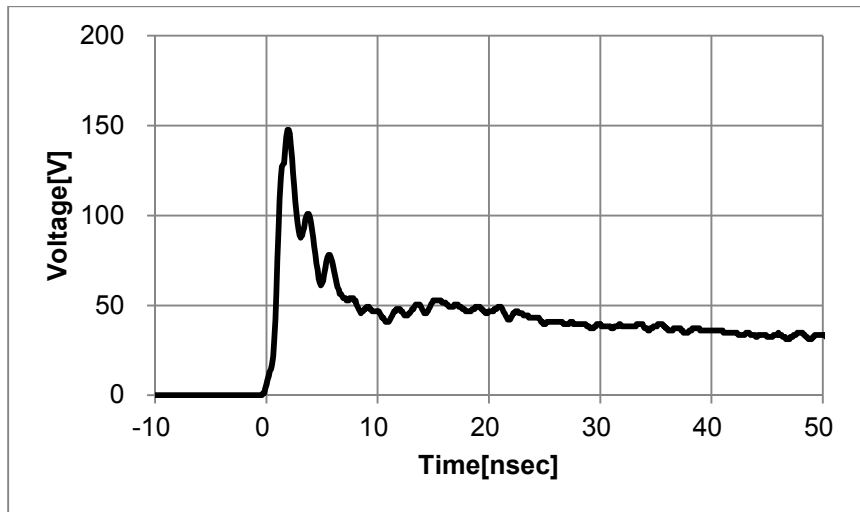
P/N	Parameter	Conditions	MIN	TYP	MAX	Units
LXES0NDAA2-172	Common mode impedance	@100MHz		75		Ω
	DC Resistance			5		Ω
	Capacitance	1MHz、Vbias=0V		0.4		pF
	ESD per IEC 61000-4-2 (Air)		-15		15	kV
	ESD per IEC 61000-4-2 (Contact)		-15		15	kV

P/N	Parameter	Conditions	MIN	TYP	MAX	Units
LXES18DAA4-182 LXES0NDAA2-183	Common mode impedance	@100MHz		25		Ω
	DC Resistance			4		Ω
	Capacitance	1MHz、Vbias=0V		0.4		pF
	ESD per IEC 61000-4-2 (Air)		-15		15	kV
	ESD per IEC 61000-4-2 (Contact)		-15		15	kV

P/N	Parameter	Conditions	MIN	TYP	MAX	Units
LXES18DAA4-184 LXES0NDAA2-185	Common mode impedance	@100MHz		50		Ω
	DC Resistance			5		Ω
	Capacitance	1MHz、Vbias=0V		0.4		pF
	ESD per IEC 61000-4-2 (Air)		-15		15	kV
	ESD per IEC 61000-4-2 (Contact)		-15		15	kV

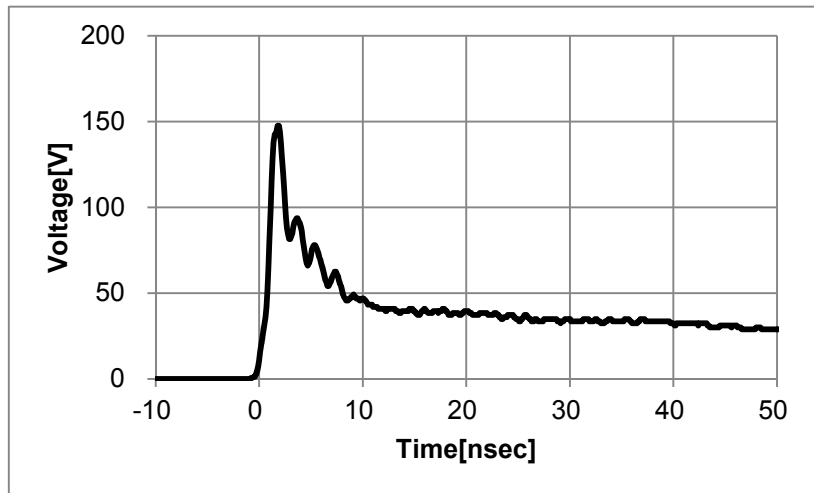
4 - 3 Typical Characteristic

LXES11DAA2-135



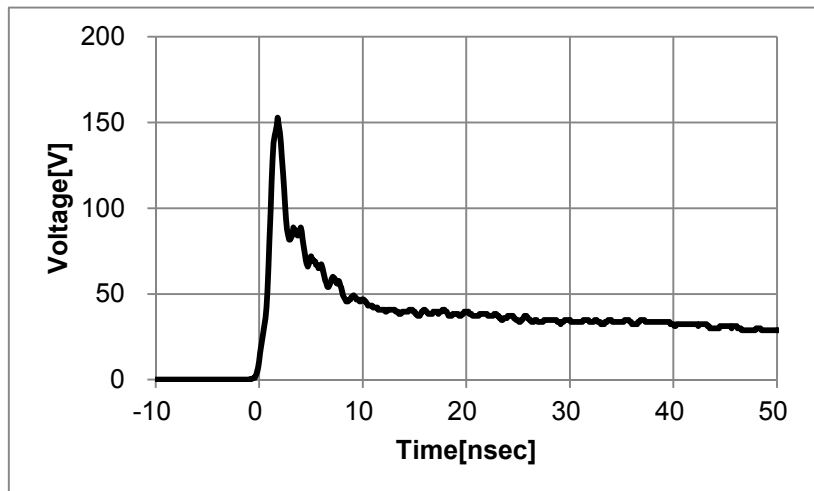
ESD Waveform (IEC61000-4-2: 8kV Contact)

LXES21DAA4-136



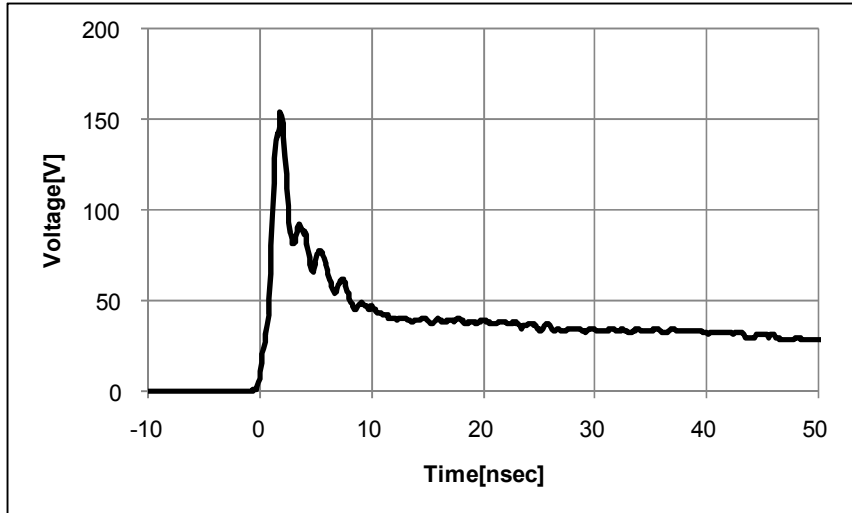
ESD Waveform (IEC61000-4-2: 8kV Contact)

LXES11DAA2-137



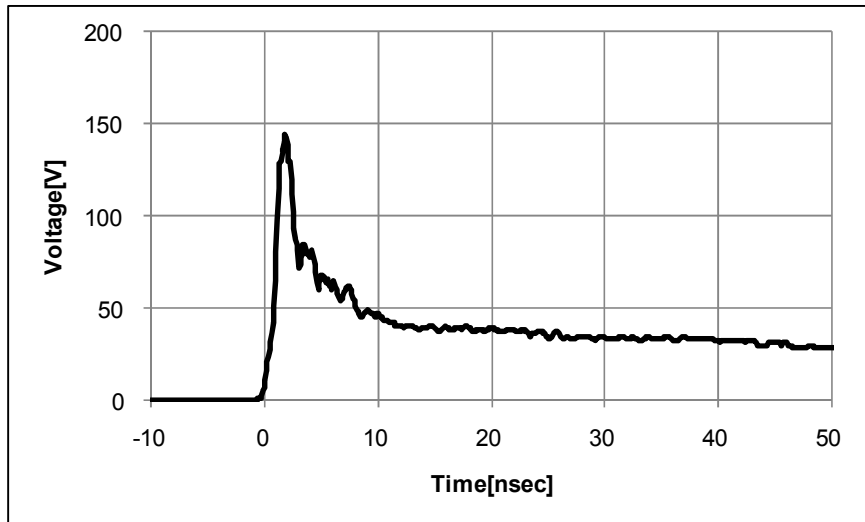
ESD Waveform (IEC61000-4-2: 8kV Contact)

LXES21DAA4-138



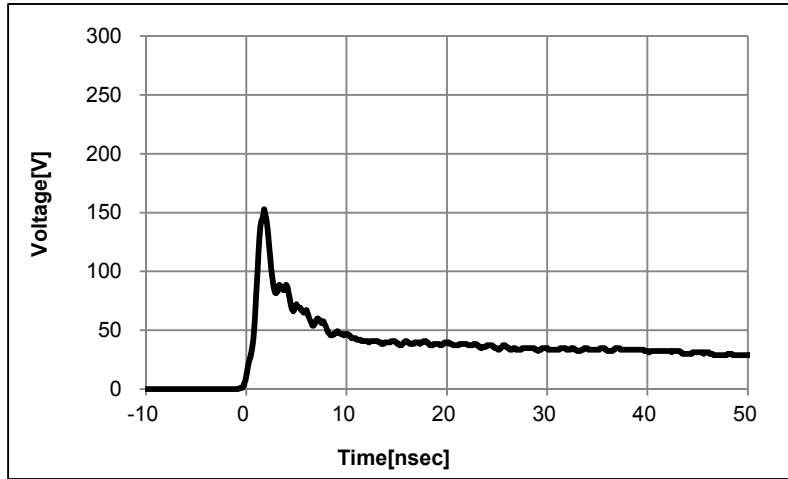
ESD Waveform (IEC61000-4-2:8kV Contact)

LXES21DAA4-140



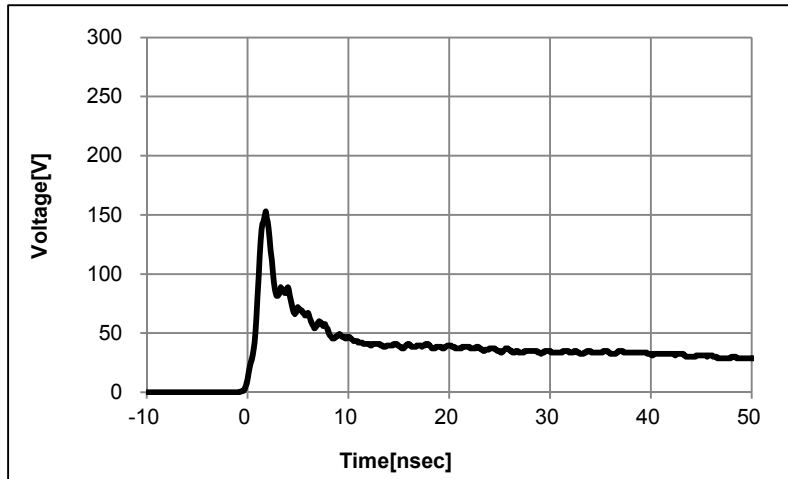
ESD Waveform (IEC61000-4-2:8kV Contact)

LXES18DAA4-167



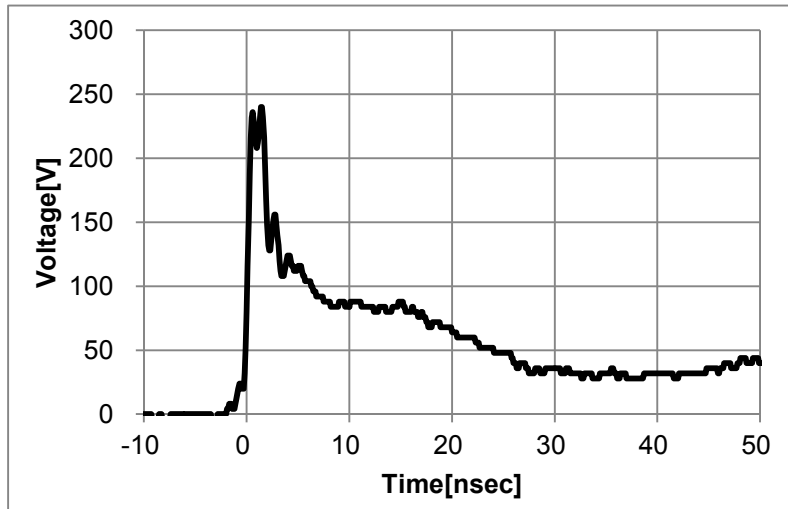
ESD Waveform (IEC61000-4-2: 8kV Contact)

LXES0NDAA2-172



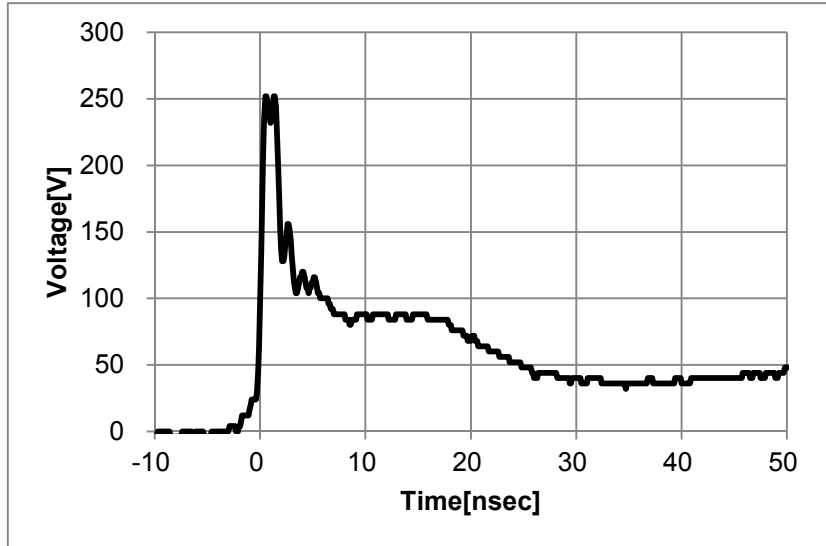
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LXES18DAA4-182



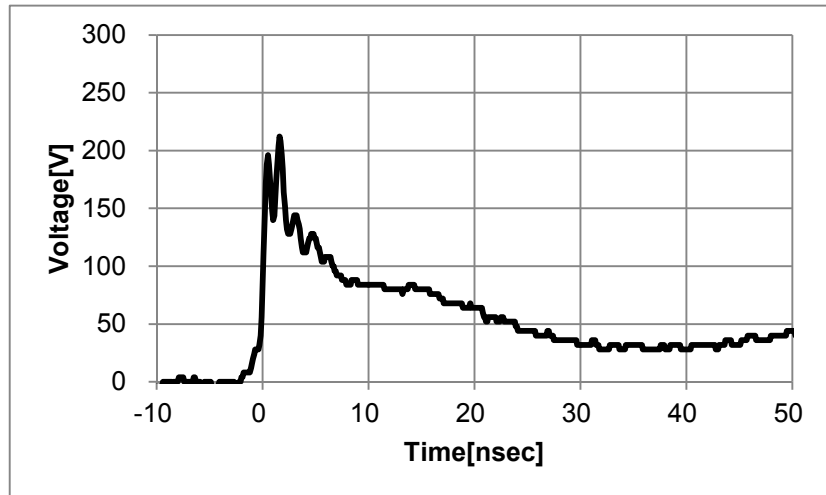
ESD Waveform (IEC61000-4-2: 8kV Contact)

LXES18DAA4-183



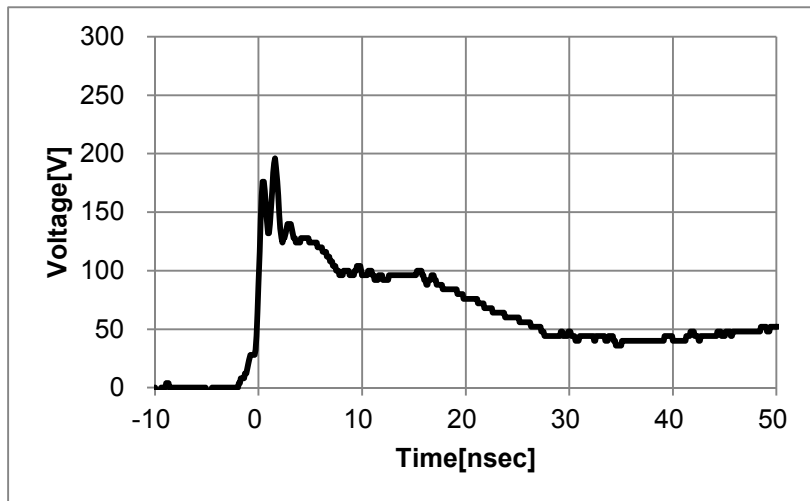
ESD Waveform (IEC61000-4-2: 8kV Contact)

LXES18DAA4-184



ESD Waveform (IEC61000-4-2: 8kV Contact)

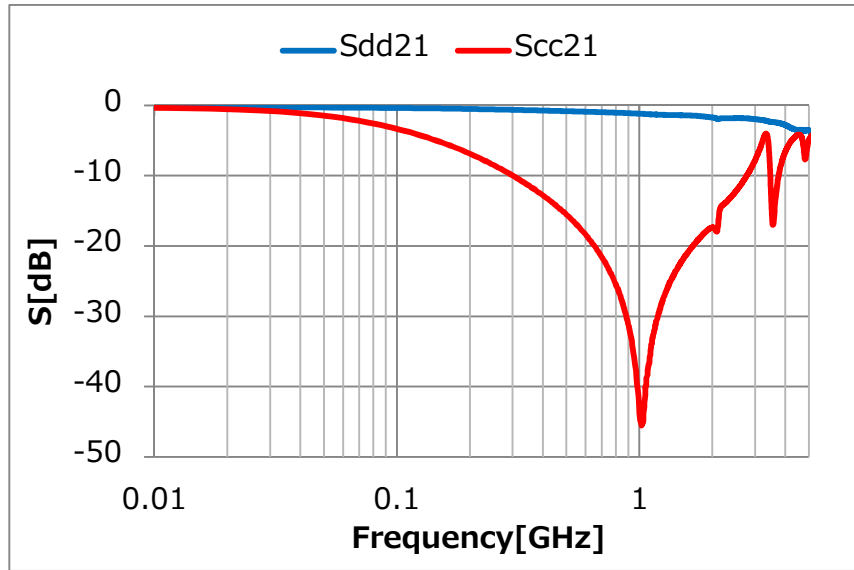
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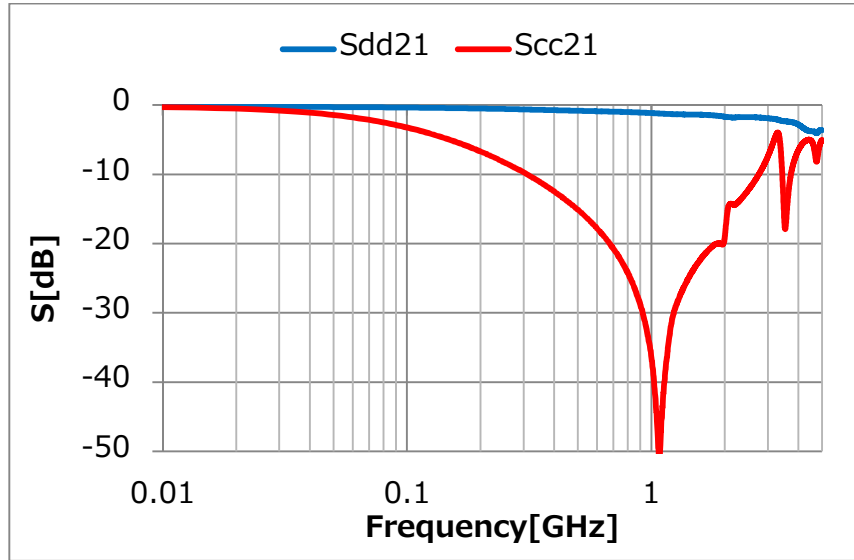
ESD Waveform (IEC61000-4-2: 8kV Contact)

S parameter

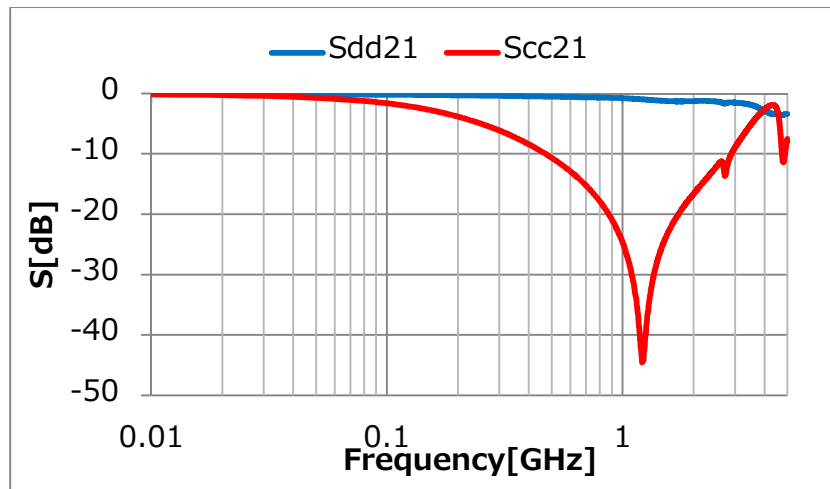
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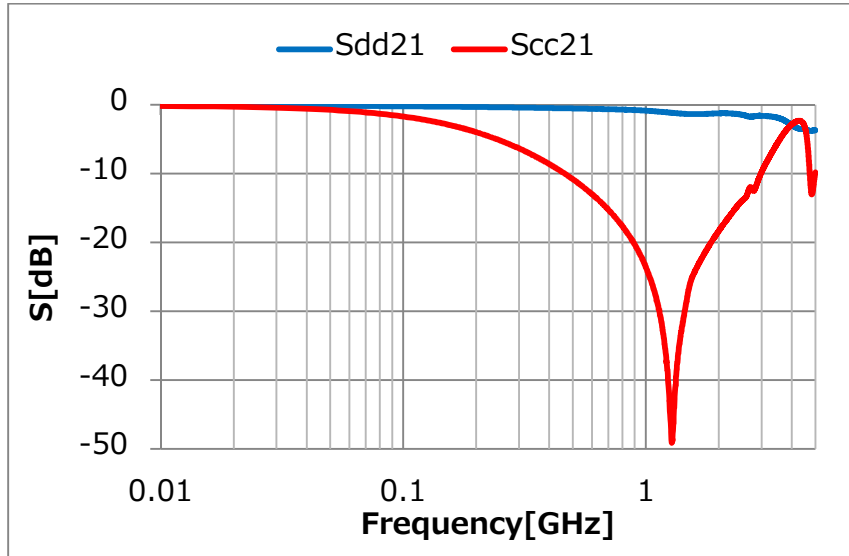
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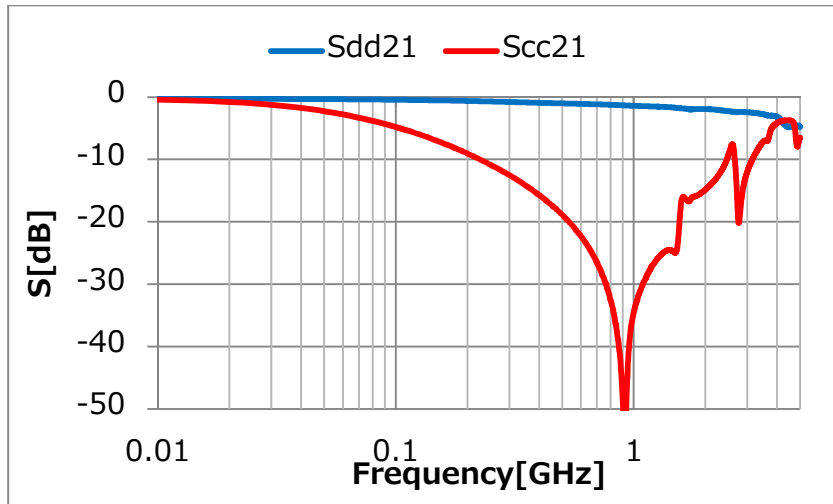
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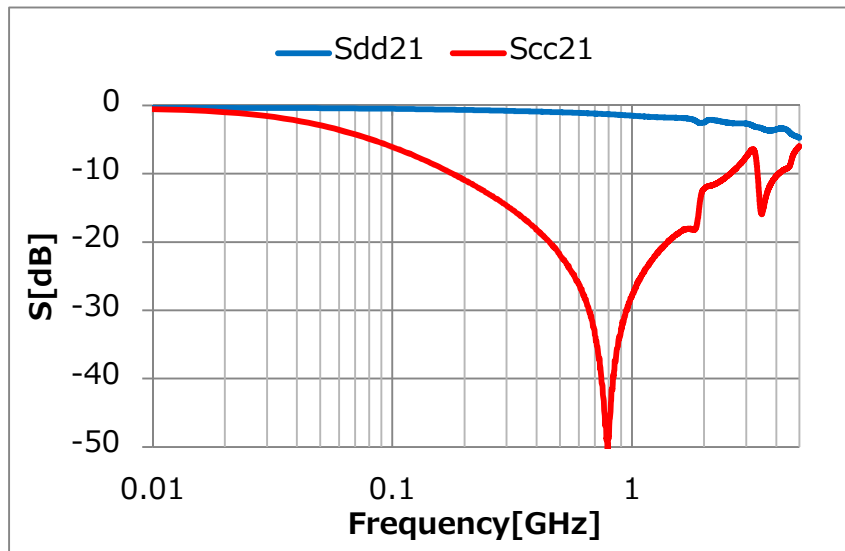
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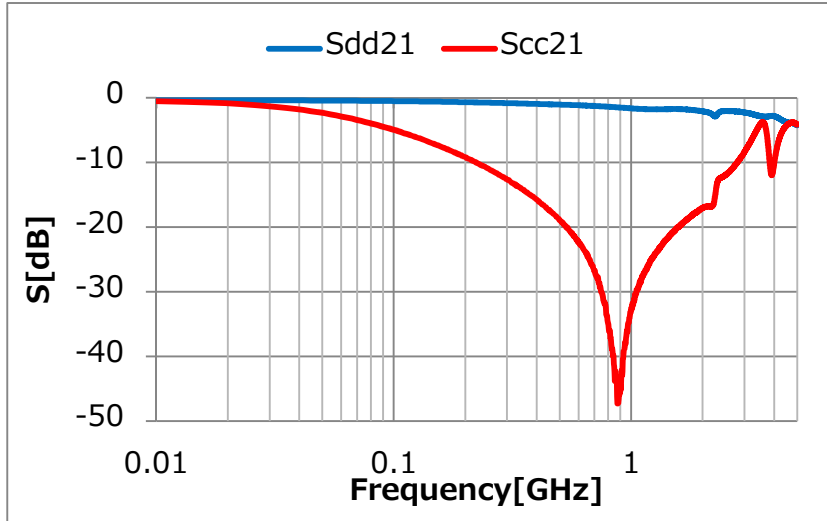
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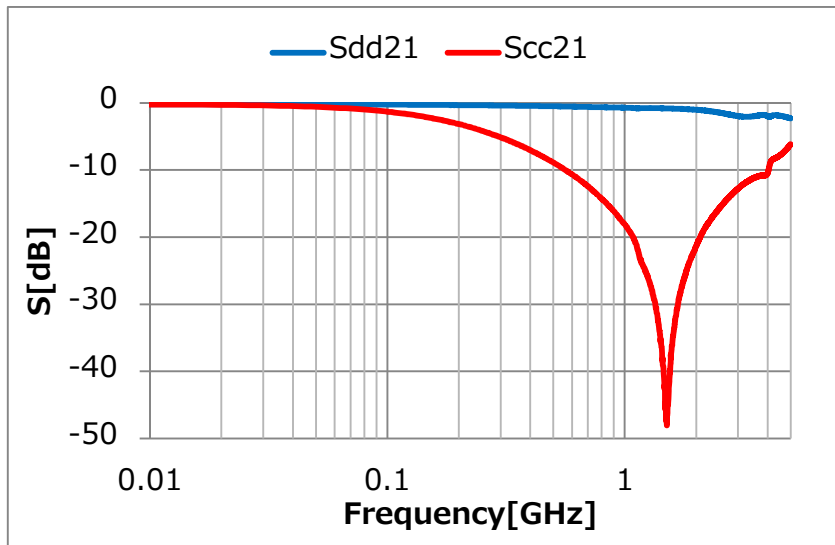
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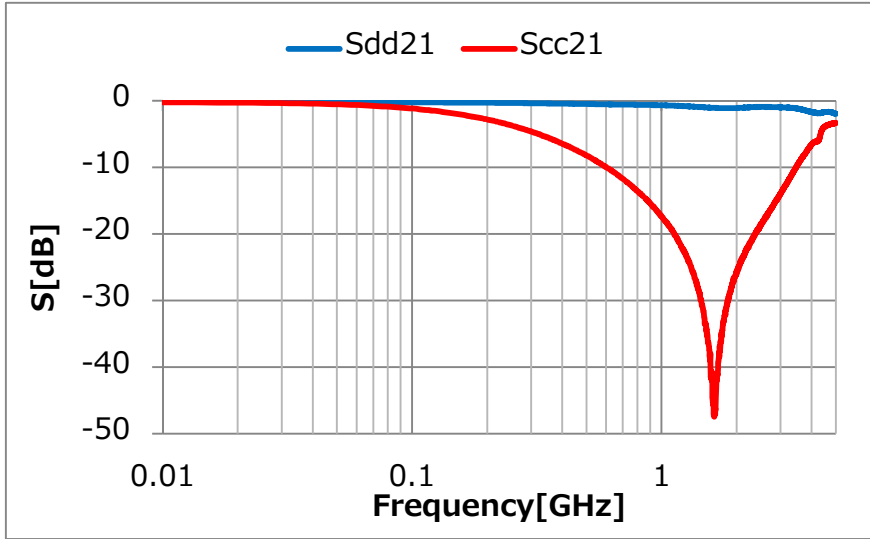
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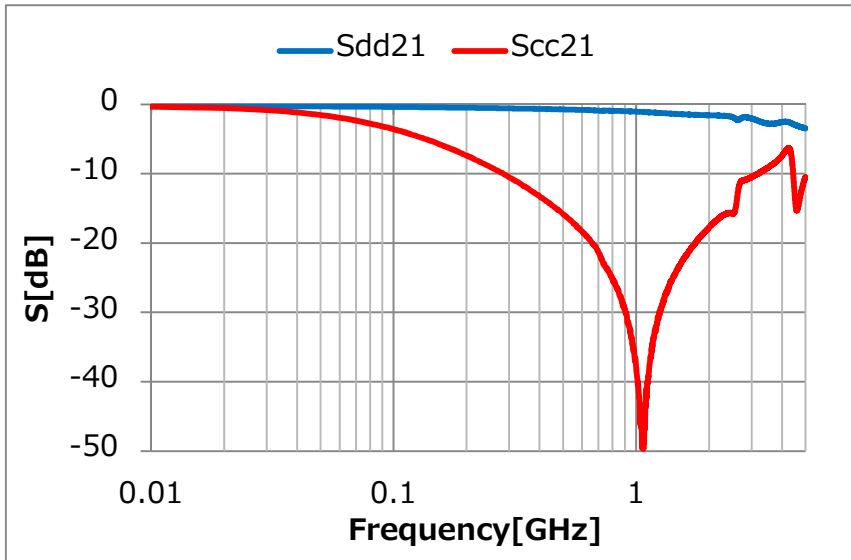
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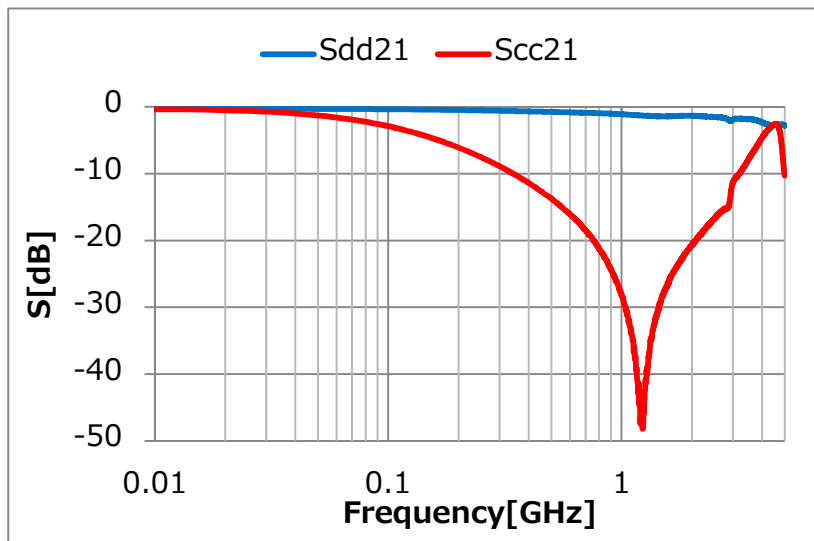
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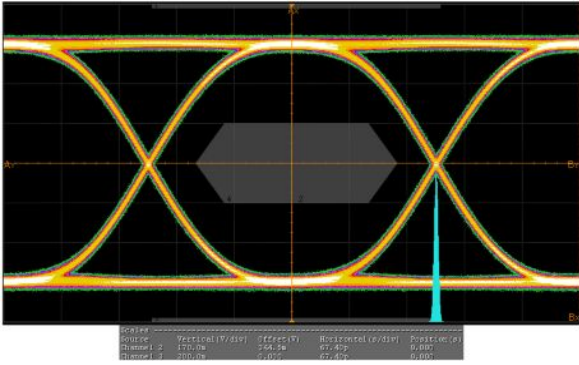
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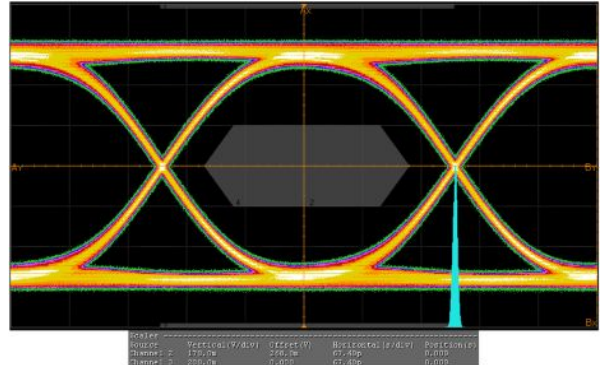
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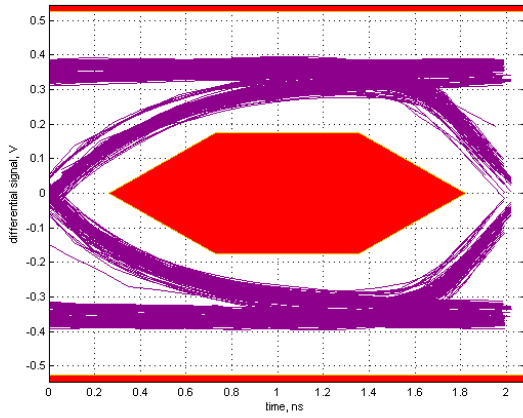
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0ohm



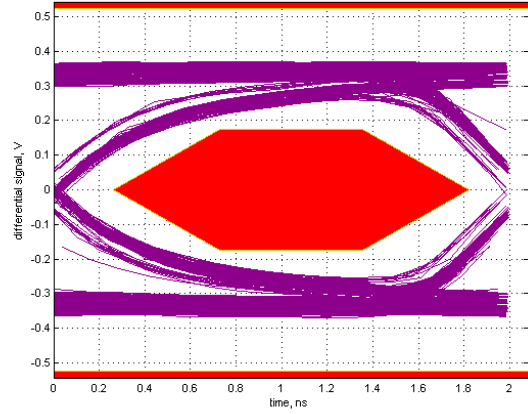
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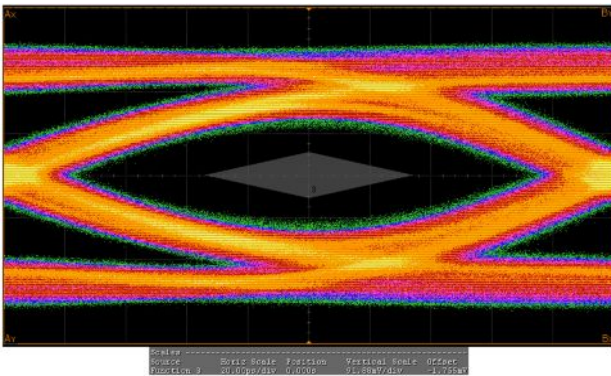
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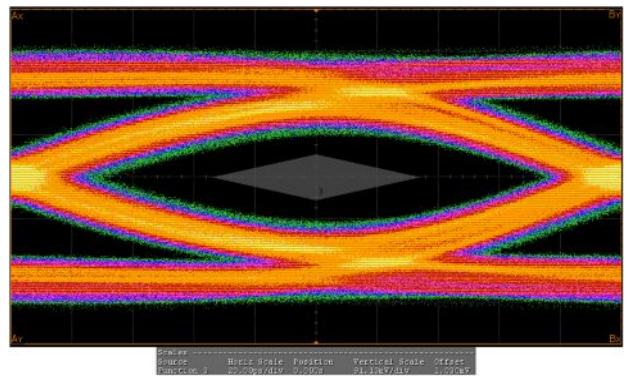
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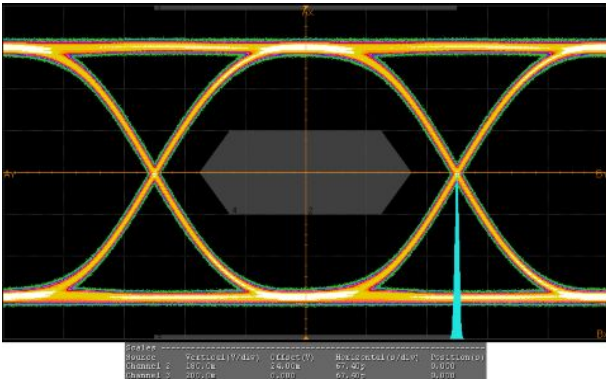
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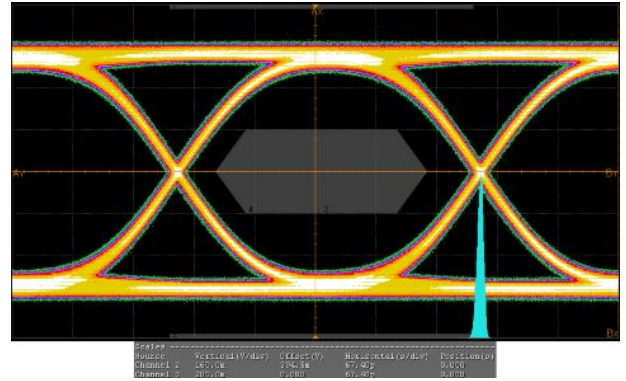
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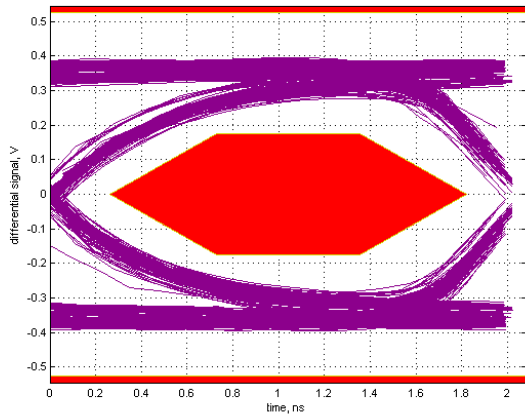
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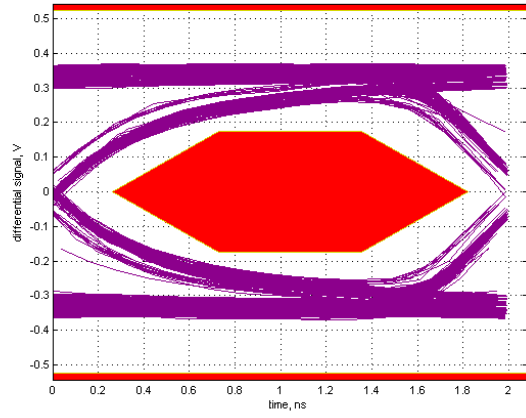
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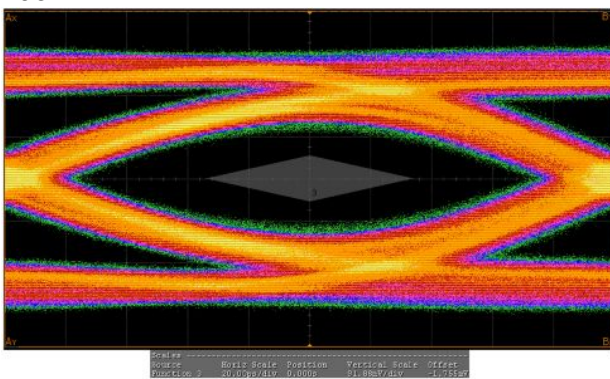
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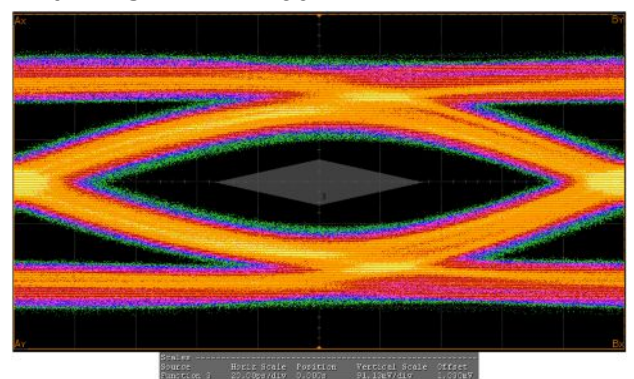
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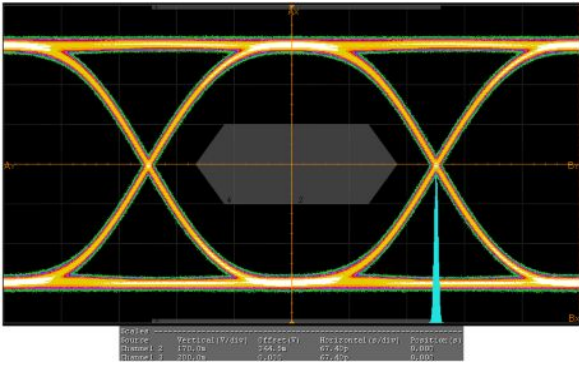
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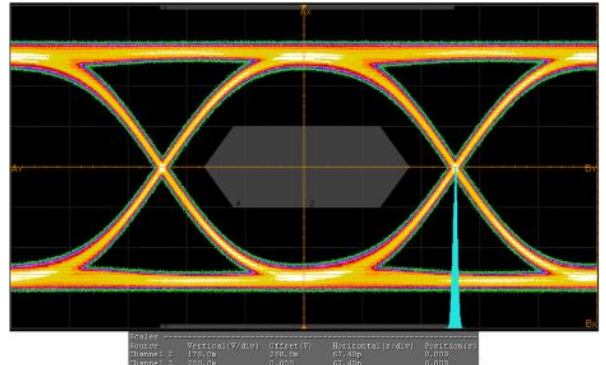
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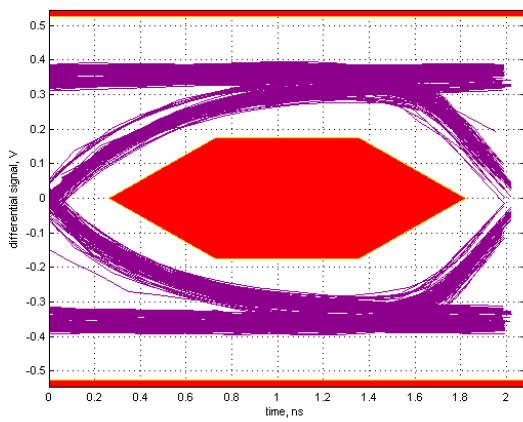
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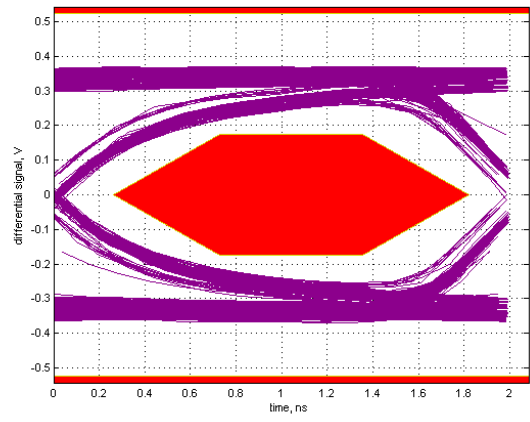
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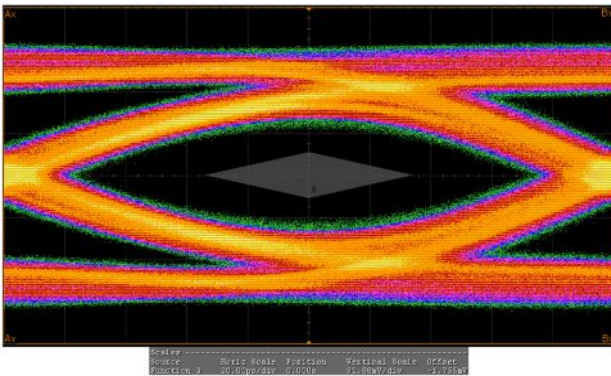
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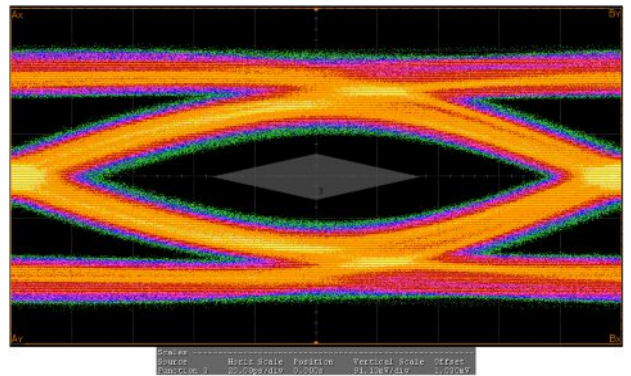
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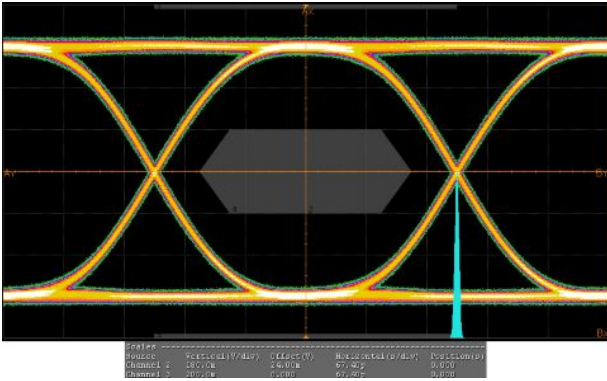
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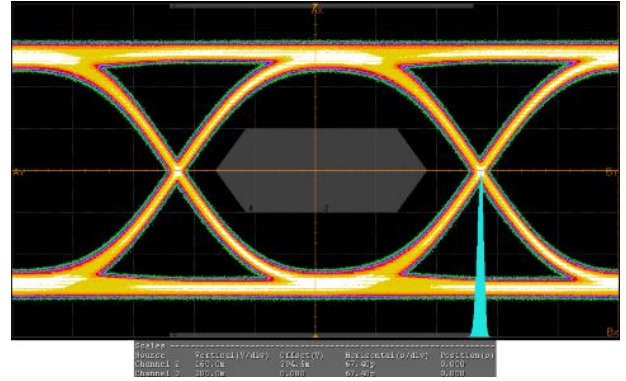
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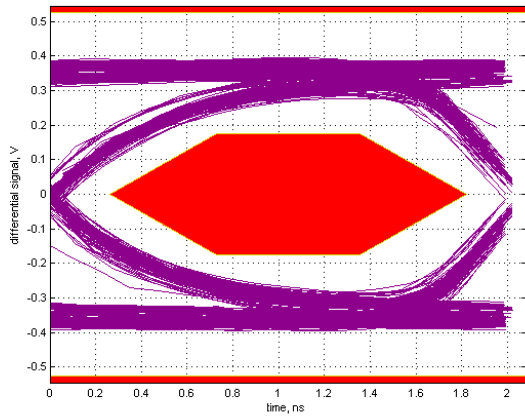
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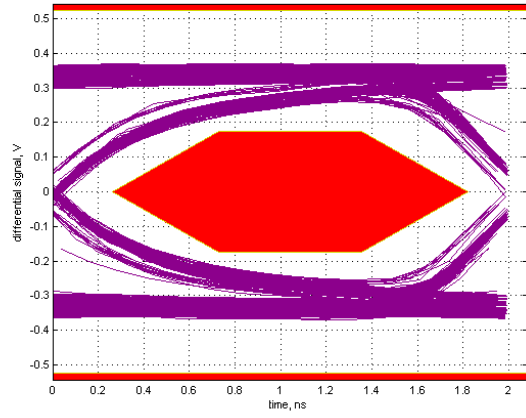
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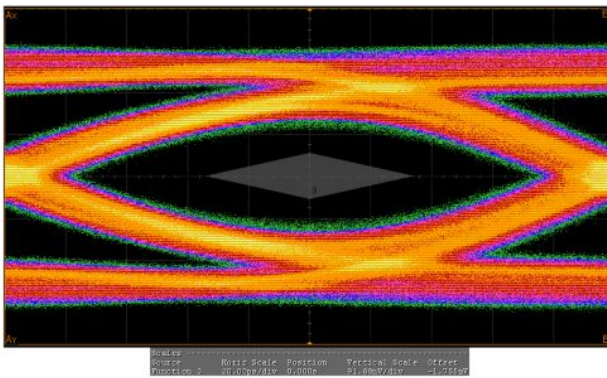
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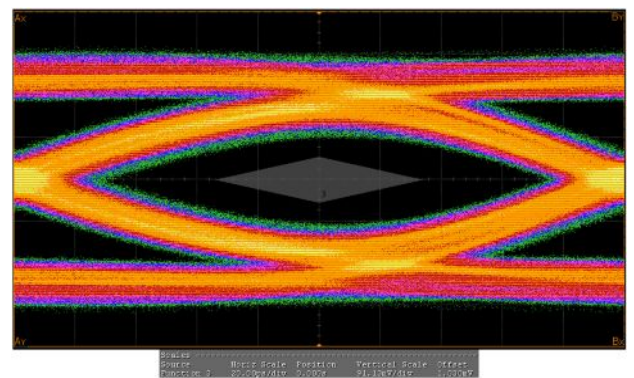
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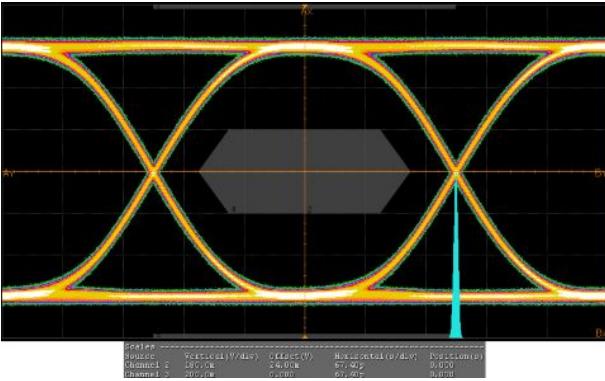
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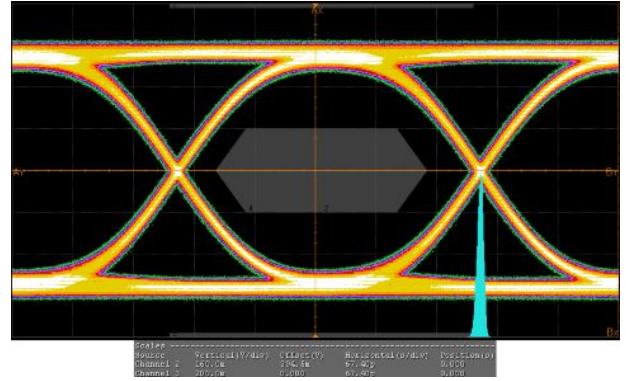
w/t LXES21DAA4-138



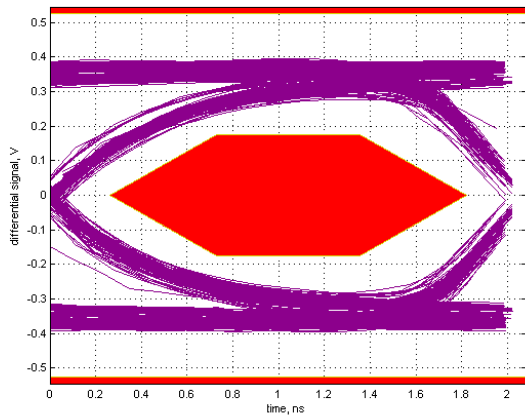
Signal Integrity HDMI 1080P 48bit
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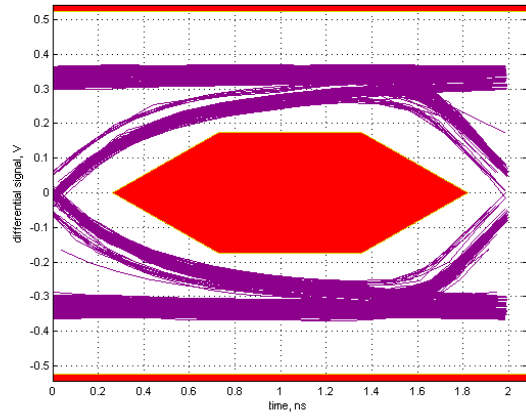
w/t LXES21DAA4-140



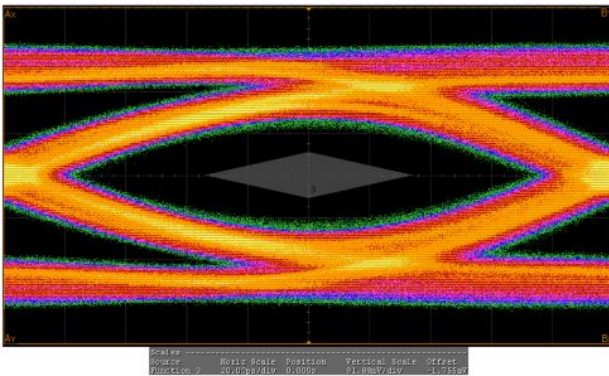
Signal Integrity USB2.0
0ohm



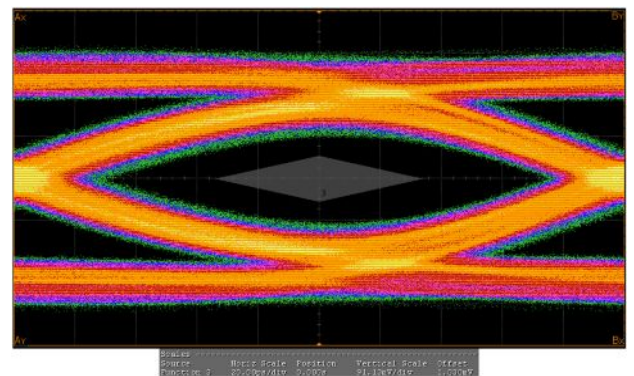
w/t LXES21DAA4-140



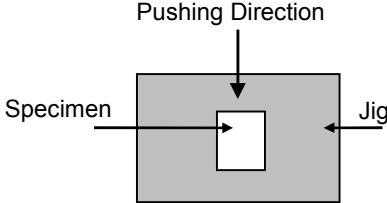
Signal Integrity USB3.0
0ohm



w/t LXES21DAA4-140



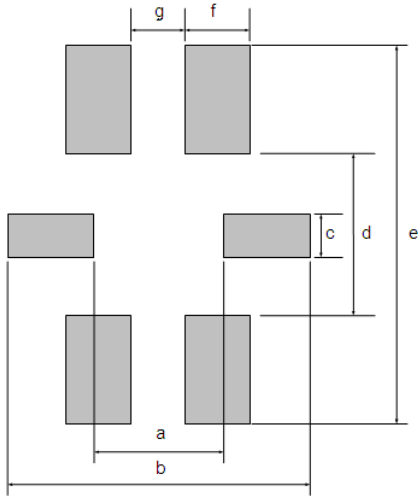
5. Reliability Test

No.	Items		Specifications	Test Methods	Number	Result (Fail)
1	Vibration Resistance		No severe damages Satisfy dimension specifications	Solder specimens on the testing jig (glass fluorine boards) shown in appended Fig.1 by a Pb free solder. The soldering shall be done either by iron or reflow and be conducted with care so that the soldering is uniform and free of defect such as by heat shock. Frequency : 10~2000 Hz Acceleration : 196 m/s ² Direction : X,Y,Z 3 axis Period : 2 h on each direction Total 6 h.	22	G (0)
2	Shock			Solder specimens on the testing jig (glass fluorine boards) shown in appended Fig.1 by a Pb free solder. The soldering shall be done either by iron or reflow and be conducted with care so that the soldering is uniform and free of defect such as by heat shock Acceleration : 14,700 m/s ² Period : 0.3 ms. Cycle : 3 times	22	G (0)
3	Deflection			Solder specimens on the testing jig (glass epoxy boards) shown in appended Fig.2 by a Pb free solder. The soldering shall be done either by iron or reflow and be conducted with care so that the soldering is uniform and free of defect such as by heat shock. No damage with 1.6mm deflection	22	G (0)
4	Soldering strength (Push Strength)		5N Minimum	Solder specimens onto test jig shown below. Apply pushing force at 0.5mm/s until electrode pads are peeled off or ceramics are broken. Pushing force is applied to longitudinal direction. 	22	G (0)
5	Solderability of Termination		95% of the terminations is to be soldered evenly and continuously.	Immerse specimens first an ethanol solution of rosin, then in a Pb free solder solution for 3±0.5 sec. at 245±5 °C. Preheat : 100-120 °C, 60 sec. Solder Paste : Sn-3.0Ag-0.5Cu Flux : Solution of ethanol and rosin (25 % rosin in weight proportion)	22	G (0)
6	Resistance to Soldering Heat (Reflow)	Appearance Electrical specifications	No severe damages Satisfy specifications listed in paragraph 4-2 over operational temperature range	Preheat Temperature : 150-200 °C Preheat Period : 120+/-60 s High Temperature : 217°C High Temp. Period : 105+/-45 s Peak Temperature : 260+0/-5 °C Specimens are soldered twice with the above condition, and then kept in room condition for 24 h before measurements.	22	G (0)

No.	Items		Specifications	Test Methods	Number	Result (Fail)									
7	High Temp. Exposure	Appearance	No severe damages	Temperature : 85±2/-0 °C Period : 1000+48/-0 h Room Condition : 2 ~ 24 h	22	G (0)									
8	Temperature Cycle	Electrical Specifications	Satisfy specifications listed in paragraph 4-2 over operational temperature range	Set the specimens to the supporting jig in the same manner and under the same conditions as Fig.1 and conduct the 100 cycles according to the temperatures and time shown in the following table. Set it for 2 to 24 h at room temperature, then measure.	22	G (0)									
				<table border="1"> <thead> <tr> <th>Step</th> <th>Temp(°C)</th> <th>Time(min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Min. Operating Temp.+0/-3</td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Max. Operating Temp.+3/-0</td> <td>30±3</td> </tr> </tbody> </table>			Step	Temp(°C)	Time(min)	1	Min. Operating Temp.+0/-3	30±3	2	Max. Operating Temp.+3/-0	30±3
Step	Temp(°C)			Time(min)											
1	Min. Operating Temp.+0/-3			30±3											
2	Max. Operating Temp.+3/-0	30±3													
9	Humidity (Steady State)	Temperature : 85±2 °C Humidity : 80~90 %RH Period : 1000+48/-0 h Room Condition : 2 ~ 24 h	22	G (0)											
10	Low Temp. Exposure	Temperature : -40±2 °C Period : 1000+48/-0 h Room Condition : 2 ~ 24 h	22	G (0)											

Fig. 1
Reference Land Pattern

LXES11D series



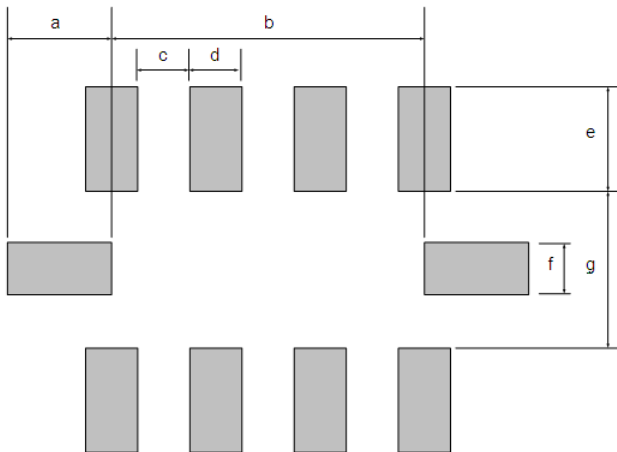
Unit : mm

Mark	Dimension
a	0.6
b	1.4
c	0.2
d	0.75

Mark	Dimension
e	1.75
f	0.3
g	0.25

Notes : this land layout is for reference purpose only.

LXES21D series



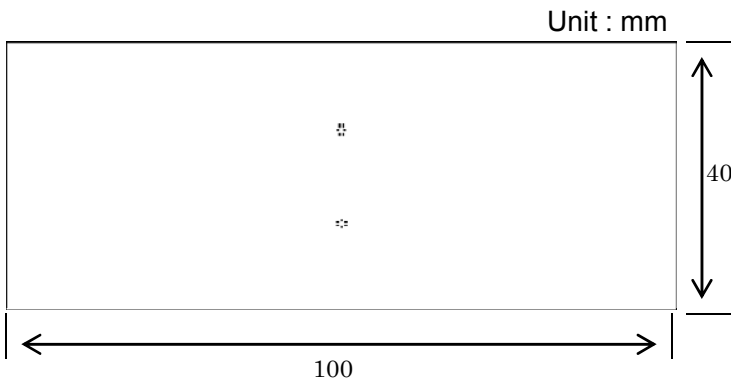
Unit : mm

Mark	Dimension
a	0.5
b	1.5
c	0.25
d	0.25

Mark	Dimension
e	0.5
f	0.25
g	0.75

Notes : this land layout is for reference purpose only.

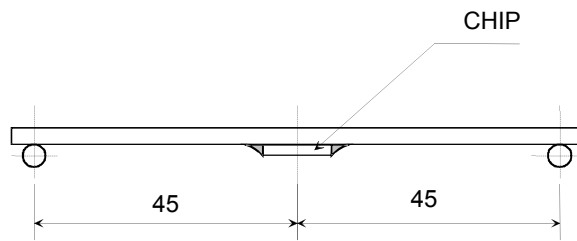
Fig. 2
Testing board



■ Land
Land pattern is same as figure1
Glass-fluorine board $t=1.6\text{mm}$
Copper thickness over $35\ \mu\text{m}$

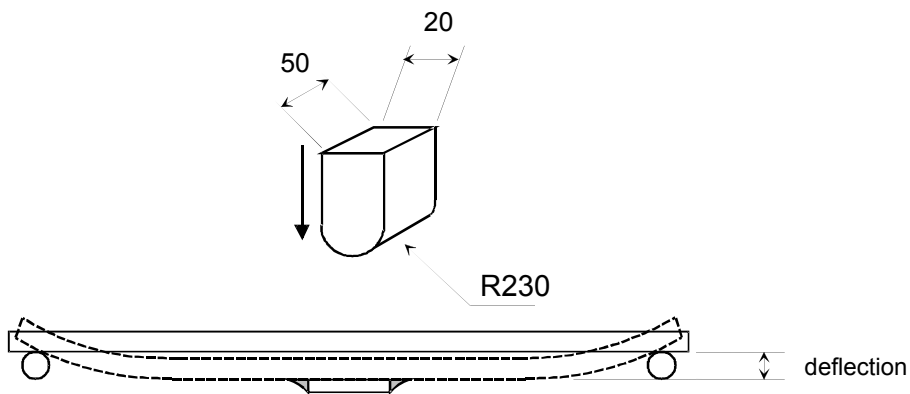
Mounted situation

(Unit : mm)



Test method

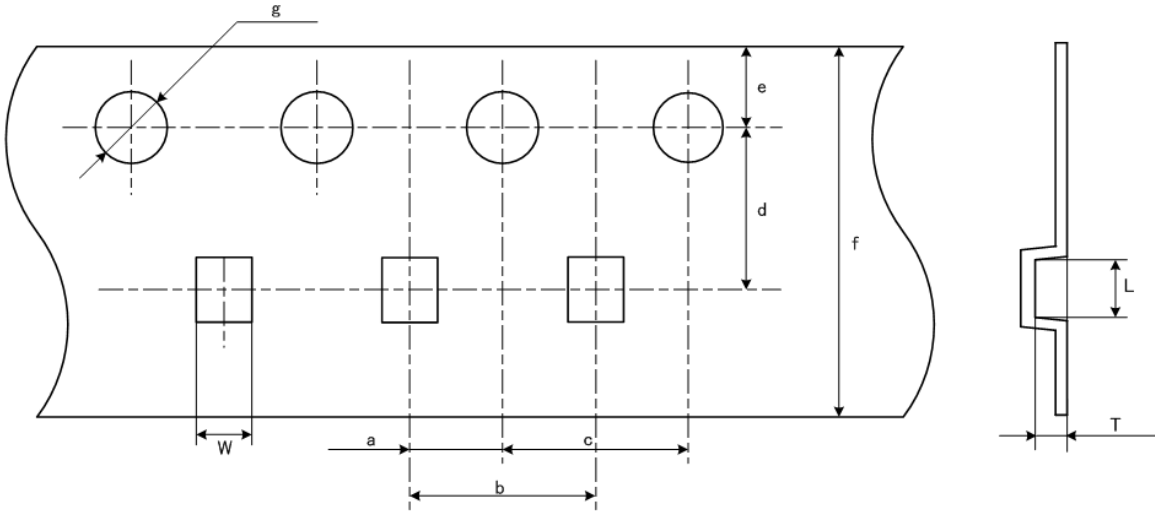
(Unit : mm)



6. Tape and Reel Packing

(1) LXES11D series

Dimensions of Tape



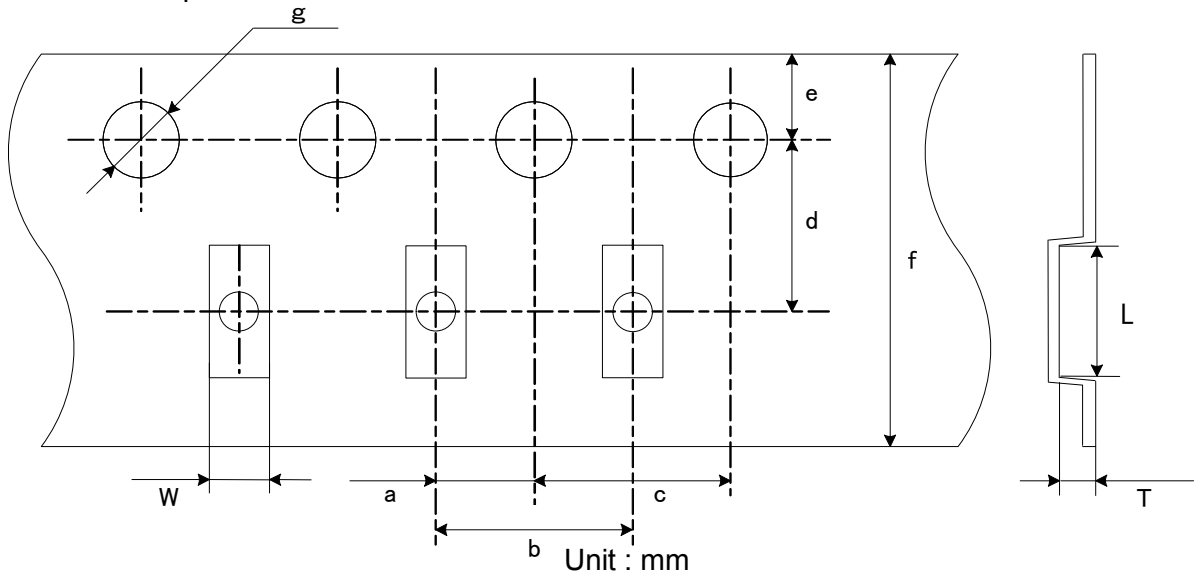
Unit : mm

Mark	Dimension
L	(1.40)
W	(1.20)
T	1.03 max
a	2.00 +/-0.05
b	4.00 +/-0.1

Mark	Dimension
c	4.00 +/-0.1
d	3.50 +/-0.05
e	1.75 +/-0.10
f	8.00 +/-0.2
g	φ1.55 +/-0.05

(2) LXES21D series

Dimensions of Tape



Unit : mm

Mark	Dimension
L	(2.25)
W	(1.45)
T	1.1 max
a	2.00 +/-0.05
b	4.00 +/-0.1

Mark	Dimension
c	4.00 +/-0.1
d	3.50 +/-0.05
e	1.75 +/-0.10
f	8.00 +/-0.2
g	φ1.55 +/-0.05