



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

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

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



ESD8101, ESD8111

ESD Protection Diodes

Ultra Low Capacitance ESD Protection Diode for High Speed Data Line

The ESD81x1 Series ESD protection diodes are designed to protect high speed data lines from ESD. Ultra-low capacitance and low ESD clamping voltage make this device an ideal solution for protecting voltage sensitive high speed data lines.

Features

- Low Capacitance (0.20 pF Typ, I/O to GND)
- Protection for the Following IEC Standards:
IEC 61000-4-2 (Level 4)
- Low ESD Clamping Voltage
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

Typical Applications

- USB 3.0/3.1
- MHL 2.0
- eSATA

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Operating Junction Temperature Range	T _J	-55 to +150	°C
Storage Temperature Range	T _{stg}	-55 to +150	°C
Lead Solder Temperature – Maximum (10 Seconds)	T _L	260	°C
ESD8101: IEC 61000-4-2 Contact IEC 61000-4-2 Air	ESD	±23	kV
ESD8111: IEC 61000-4-2 Contact IEC 61000-4-2 Air		±30	kV

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

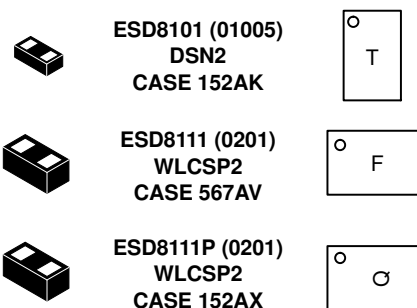
See Application Note AND8308/D for further description of survivability specs.



ON Semiconductor®

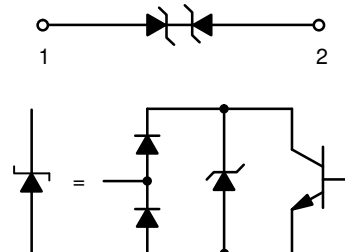
www.onsemi.com

MARKING DIAGRAMS



T, F, Q = Device Code

PIN CONFIGURATION AND SCHEMATIC



ORDERING INFORMATION

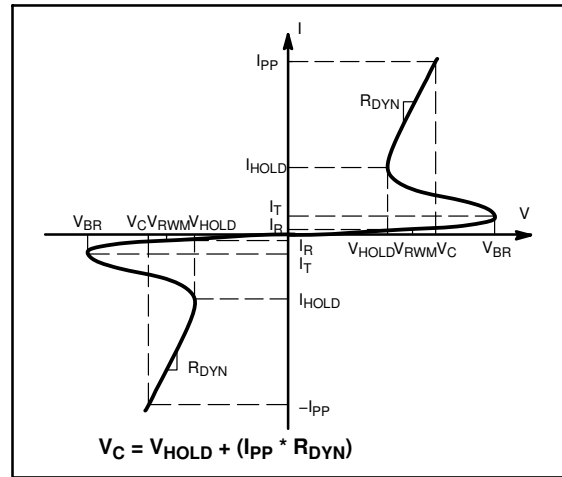
See detailed ordering and shipping information on page 2 of this data sheet.

ESD8101, ESD8111

ELECTRICAL CHARACTERISTICS

(T_A = 25°C unless otherwise noted)

Symbol	Parameter
V _{RWM}	Working Peak Voltage
I _R	Maximum Reverse Leakage Current @ V _{RWM}
V _{BR}	Breakdown Voltage @ I _T
I _T	Test Current
V _{HOLD}	Holding Reverse Voltage
I _{HOLD}	Holding Reverse Current
R _{DYN}	Dynamic Resistance
I _{PP}	Maximum Peak Pulse Current
V _C	Clamping Voltage @ I _{PP} V _C = V _{HOLD} + (I _{PP} * R _{DYN})



ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V _{RWM}	I/O Pin to GND			3.3	V
Breakdown Voltage	V _{BR}	I _T = 1 mA, I/O Pin to GND	5.5	7.9	8.6	V
Reverse Leakage Current	I _R	V _{RWM} = 3.3 V, I/O Pin to GND			1.0	μA
Reverse Holding Voltage	V _{HOLD}	I/O Pin to GND		2.1		V
Holding Reverse Current	I _{HOLD}	I/O Pin to GND		17		mA
ESD8111 Clamping Voltage	V _C	I _{PP} = 7.1 A, (8/20 μs pulse)			8.0	V
ESD8101, ESD8111 Clamping Voltage TLP (Note 1)	V _C	I _{PP} = 8 A } IEC 61000-4-2 Level 2 equivalent (±4 kV Contact, ±4 kV Air)		6.5		V
		I _{PP} = 16 A } IEC 61000-4-2 Level 2 equivalent (±8 kV Contact, ±15 kV Air)		10		V
Dynamic Resistance	R _{DYN}	I/O Pin to GND		0.46		Ω
Junction Capacitance	C _J	V _R = 0 V, f = 1 MHz		0.2	0.4	pF

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

1. ANSI/ESD STM5.5.1 – Electrostatic Discharge Sensitivity Testing using Transmission Line Pulse (TLP) Model.

TLP conditions: Z₀ = 50 Ω, t_p = 100 ns, t_r = 4 ns, averaging window; t₁ = 30 ns to t₂ = 60 ns.

ORDERING INFORMATION

Device	Package	Shipping†
ESD8101FCT5G	DSN2 (Pb-Free)	10,000 / Tape & Reel
ESD8111FCT5G	WLCSP2 (Pb-Free)	10,000 / Tape & Reel
ESD8111PFCT5G	WLCSP2 Side wall Isolated 0201 (Pb-Free)	10,000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

ESD8101, ESD8111

TYPICAL CHARACTERISTICS

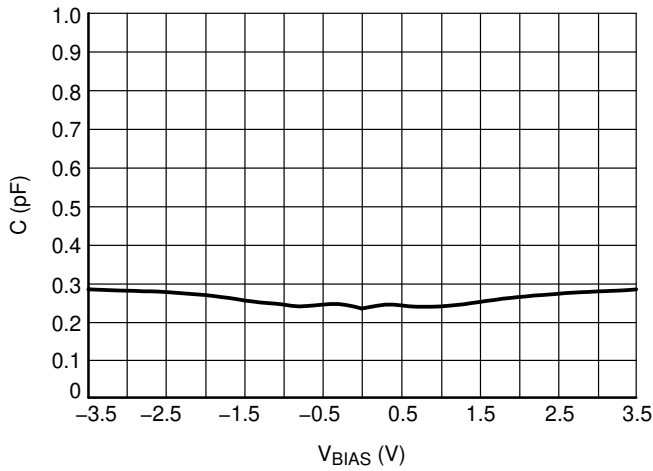


Figure 1. ESD8101 CV Characteristics

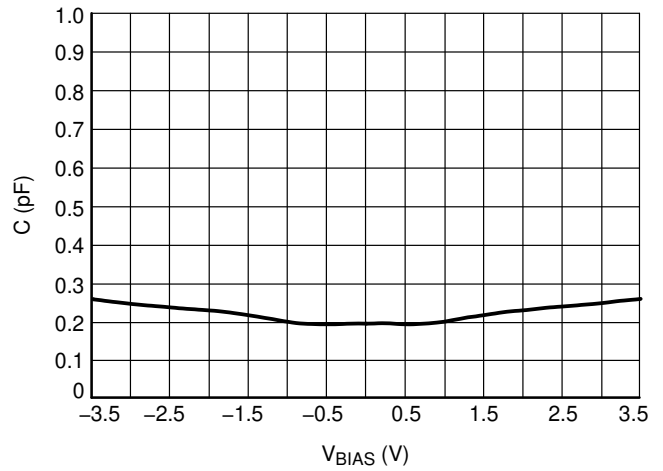


Figure 2. ESD8111 CV Characteristics

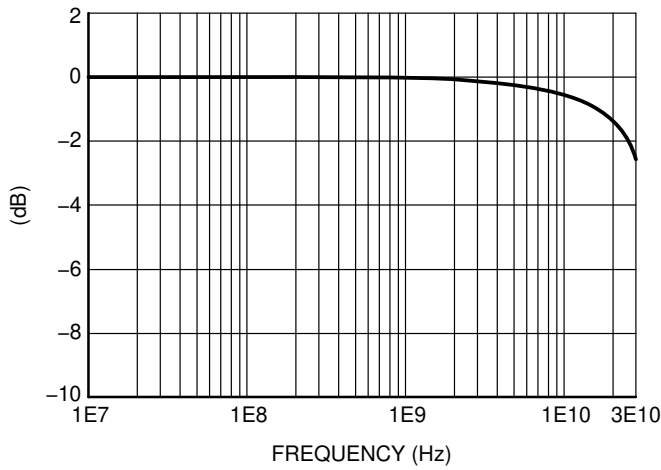


Figure 3. ESD8101 S21 Insertion Loss

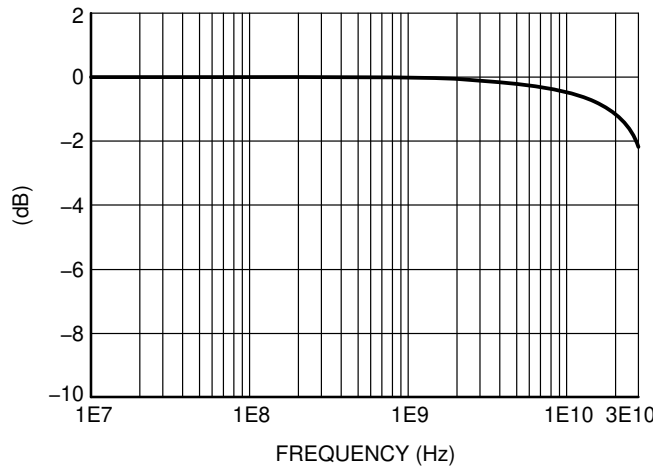


Figure 4. ESD8111 S21 Insertion Loss

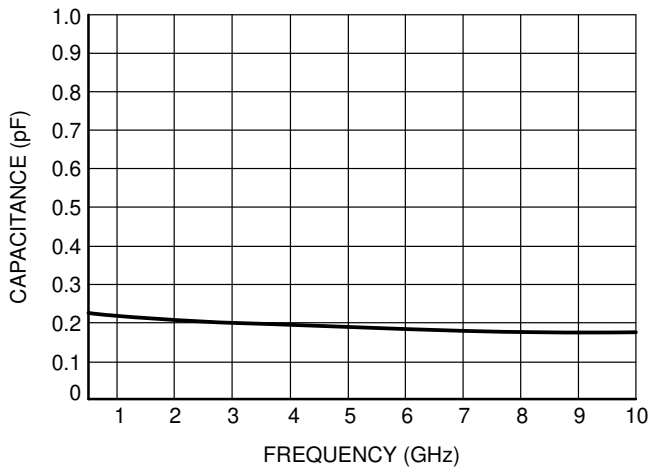


Figure 5. ESD8101 Capacitance over Frequency

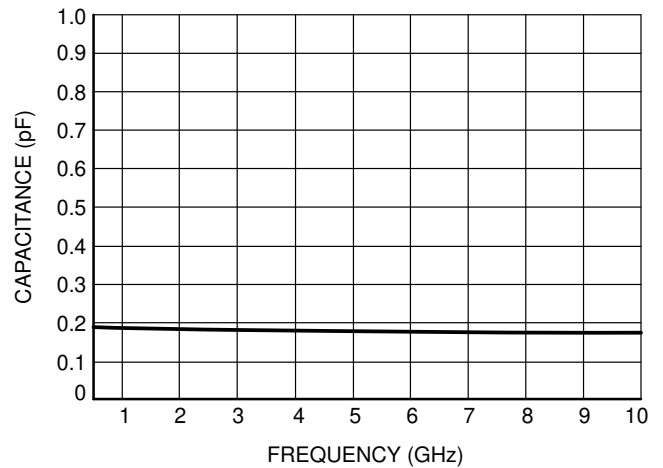


Figure 6. ESD8111 Capacitance over Frequency

ESD8101, ESD8111

TYPICAL CHARACTERISTICS

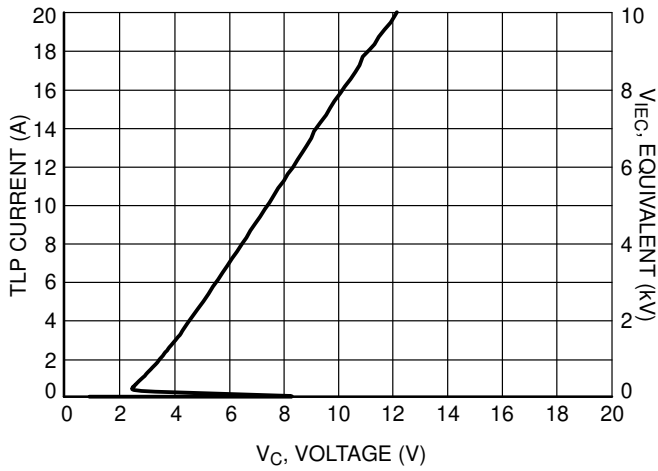


Figure 7. ESD8101 Positive TLP I-V Curve

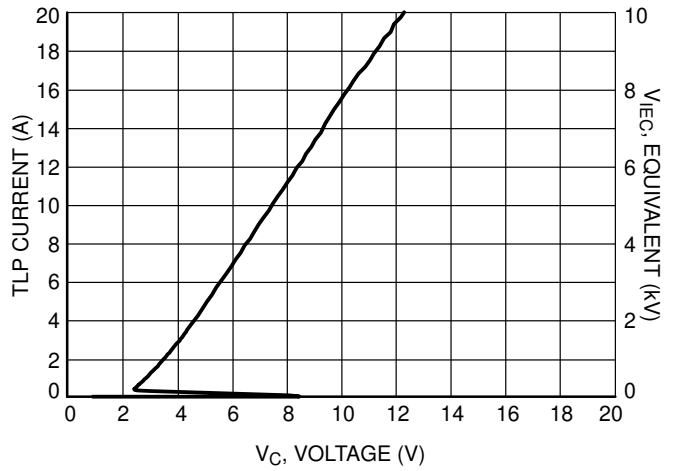


Figure 8. ESD8111 Positive TLP I-V Curve

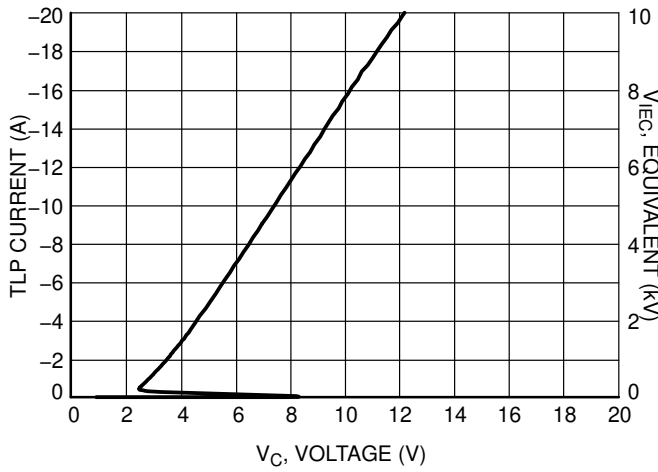


Figure 9. ESD8101 Negative TLP I-V Curve

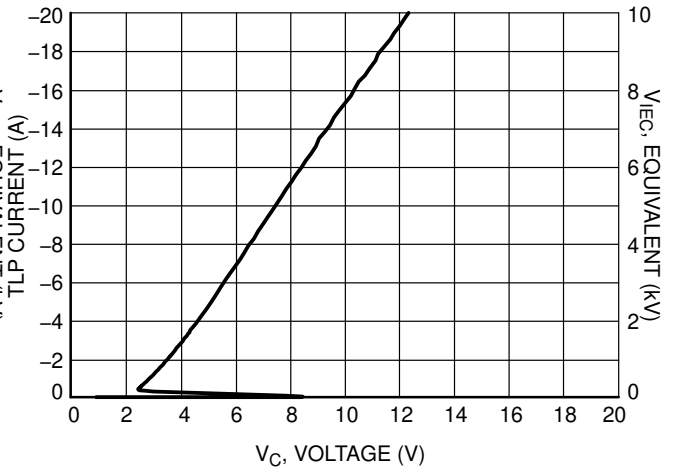


Figure 10. ESD8111 Negative TLP I-V Curve

ESD8101, ESD8111

IEC 61000-4-2 Spec.

Level	Test Voltage (kV)	First Peak Current (A)	Current at 30 ns (A)	Current at 60 ns (A)
1	2	7.5	4	2
2	4	15	8	4
3	6	22.5	12	6
4	8	30	16	8

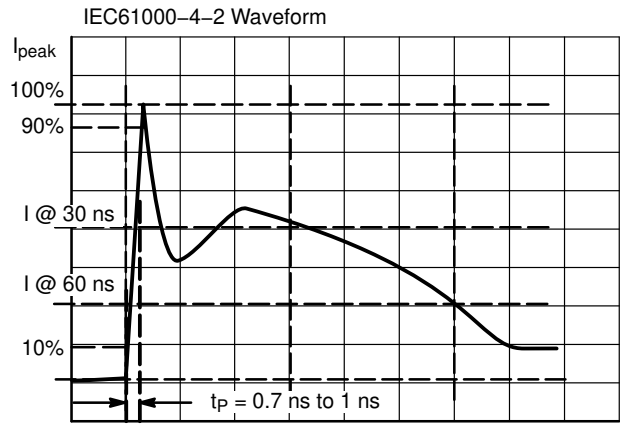


Figure 11. IEC61000-4-2 Spec

Transmission Line Pulse (TLP) Measurement

Transmission Line Pulse (TLP) provides current versus voltage (I-V) curves in which each data point is obtained from a 100 ns long rectangular pulse from a charged transmission line. A simplified schematic of a typical TLP system is shown in Figure 12. TLP I-V curves of ESD protection devices accurately demonstrate the product's ESD capability because the 10s of amps current levels and under 100 ns time scale match those of an ESD event. This is illustrated in Figure 13 where an 8 kV IEC 61000-4-2 current waveform is compared with TLP current pulses at 8 A and 16 A. A TLP I-V curve shows the voltage at which the device turns on as well as how well the device clamps voltage over a range of current levels.

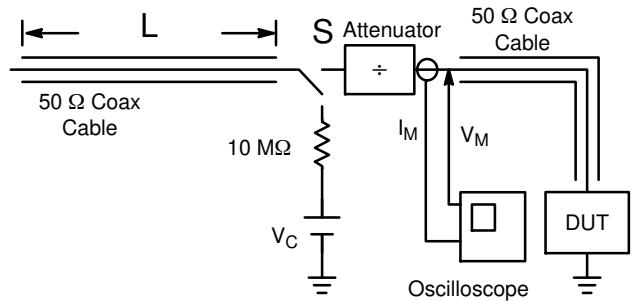


Figure 12. Simplified Schematic of a Typical TLP System

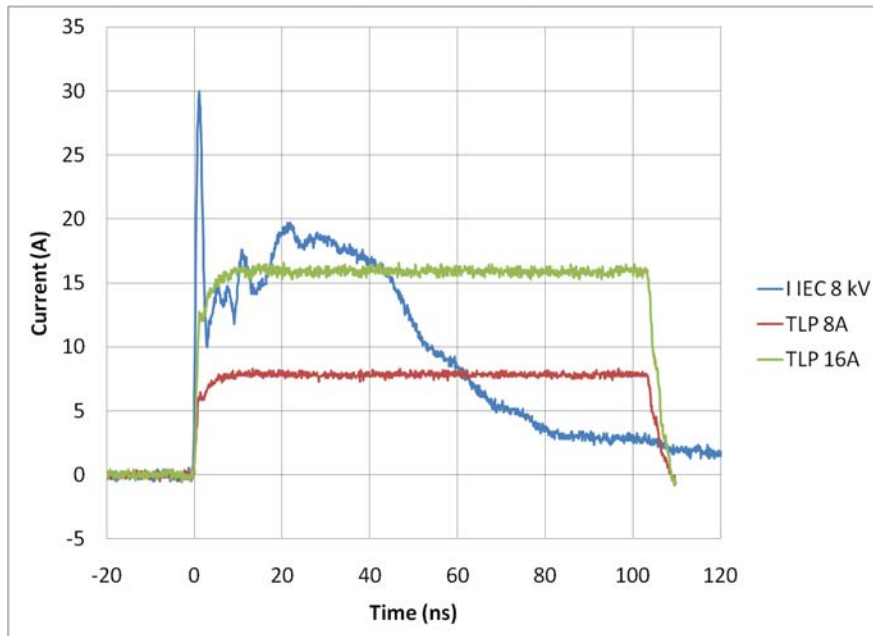
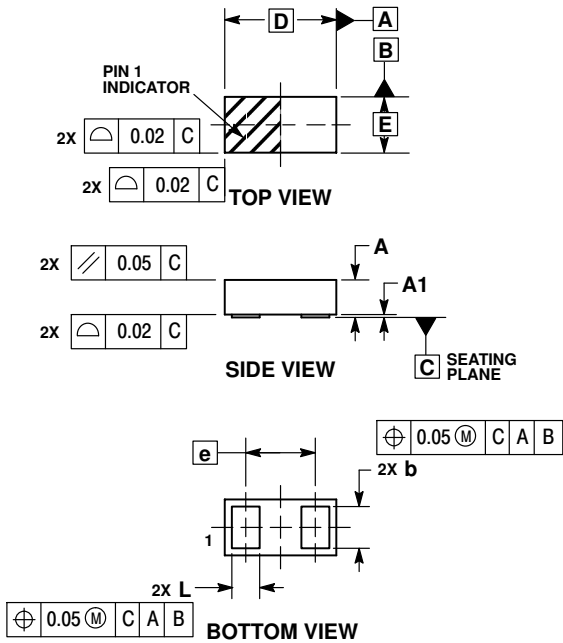


Figure 13. Comparison Between 8 kV IEC 61000-4-2 and 8 A and 16 A TLP Waveforms

ESD8101, ESD8111

PACKAGE DIMENSIONS – ESD8101 (01005)

DSN2, 0.435x0.23, 0.27P, (01005)
CASE 152AK
ISSUE A

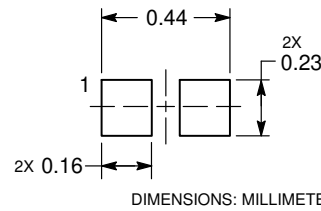


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.

MILLIMETERS		
DIM	MIN	MAX
A	0.165	0.195
A1	---	0.030
b	0.177	0.193
D	0.435 BSC	
E	0.230 BSC	
e	0.270 BSC	
L	0.112	0.128

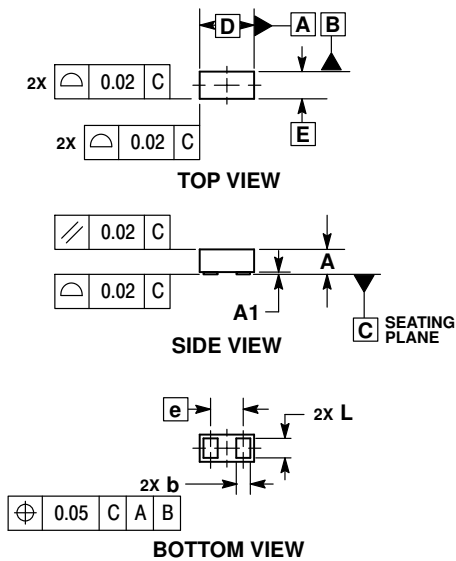
RECOMMENDED SOLDER FOOTPRINT*



*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PACKAGE DIMENSIONS – ESD8111 (0201)

WLCSP2, 0.6x0.3
CASE 567AV
ISSUE B

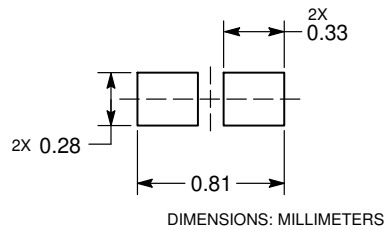


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.

MILLIMETERS			
DIM	MIN	NOM	MAX
A	0.250	0.275	0.300
A1	0.000	0.250	0.500
b	0.140	0.155	0.170
D	0.570	0.600	0.630
E	0.270	0.300	0.330
e	0.36 BSC		
L	0.190	0.215	0.240

RECOMMENDED SOLDER FOOTPRINT*

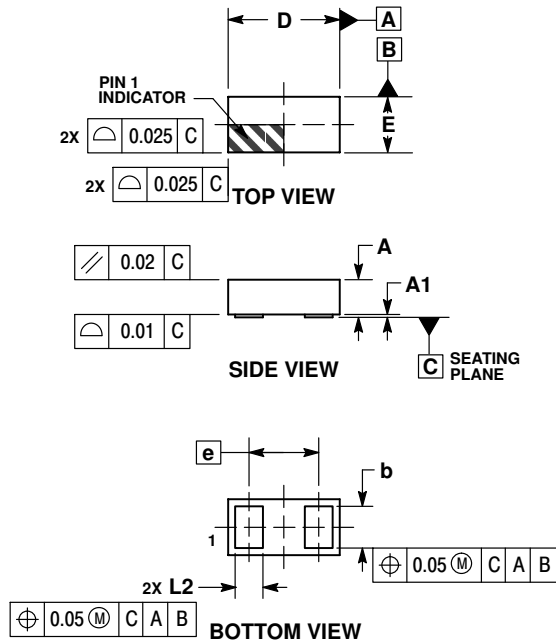


*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

ESD8101, ESD8111

PACKAGE DIMENSIONS – ESD8111P (0201)

DSN2, 0.60x0.30, 0.36P
CASE 152AX
ISSUE O

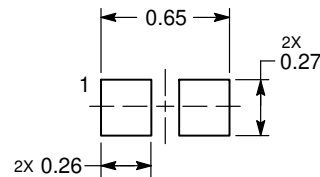


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.

MILLIMETERS		
DIM	MIN	MAX
A	0.175	0.225
A1	—	0.018
b	0.205	0.225
D	0.575	0.625
E	0.275	0.325
e	0.36	BSC
L	0.145	0.165

RECOMMENDED SOLDER FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

ON Semiconductor and are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
 19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
 USA/Canada
Europe, Middle East and Africa Technical Support:
 Phone: 421 33 790 2910
Japan Customer Focus Center
 Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com

Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative