

SESD Series

Enhanced ESD Diode Arrays

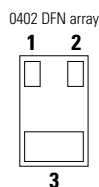


Web Resources



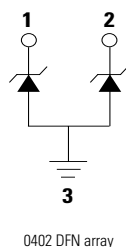
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Pinout



Bottom View

Functional Block Diagram



Description

The SESD Series Enhanced ESD Diode Arrays provides higher order ESD protection in signal-integrity-preserving unidirectional arrays for the world's most challenging high speed serial interfaces. Compelling packaging options include the standard 2.5mmx1.0mm and the SOD-883. Standard packages minimize trace layout complexity, save significant PCB space, and improve reusability of the footprints. The nominal capacitance makes the devices applicable to the worlds' fastest consumer serial interfaces.

Features & Benefits

- 0.30pF TYP capacitance
- ESD, IEC61000-4-2, ±22kV contact, ±22kV air
- Low clamping voltage of 13V @ IPP=2.2A (tP=8/20µs)
- Low profile 0402 DFN array packages
- Facilitates the preservation of signal integrity
- ELV Compliant
- RoHS Compliant and Lead Free
- Moisture Sensitivity Level (MSL Level-1)
- AEC-Q101 qualified
- PPAP capable

Applications

- Ultra-high speed data lines
- USB 3.1, 3.0, 2.0
- HDMI 2.0, 1.4a, 1.3
- DisplayPort(TM)
- V-by-One®
- Thunderbolt
- Consumer, mobile and portable electronics
- Tablet PC and external storage with high speed interfaces
- Applications requiring high ESD performance in small packages

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Absolute Maximum Ratings

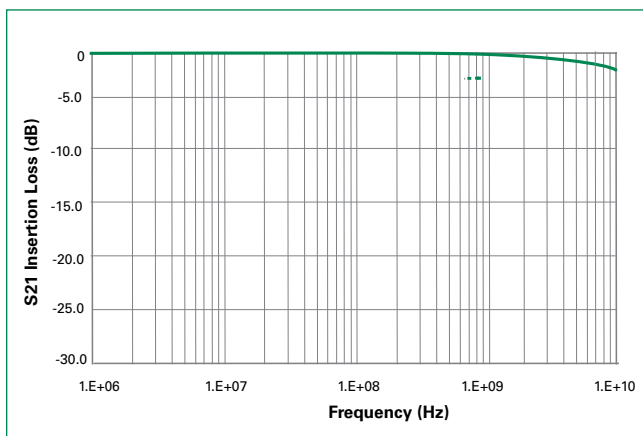
| Symbol | Parameter | Value | Units |
|------------|----------------------------------|------------|-------|
| I_{PP} | Peak Current ($t_p=8/20\mu s$) | 2.2 | A |
| T_{OP} | Operating Temperature | -55 to 125 | °C |
| T_{STOR} | Storage Temperature | -55 to 150 | °C |

Caution: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

0402 DFN Array Electrical Characteristics - ($T_{OP}=25^\circ C$)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|-------------------------|---------------|---------------------------------------|----------|------|-----|-------|
| Input Capacitance | $C_{I/O-GND}$ | Reverse Bias=0V, f=3 GHz | | 0.30 | | pF |
| Breakdown Voltage | V_{BR} | $I_R=1mA$ | | 8.80 | | V |
| Reverse Working Voltage | V_{RWM} | | | | 7.0 | V |
| Reverse Leakage Current | I_{LEAK} | $V_R=5V$, Any I/O to GND | | 25 | | nA |
| Clamping Voltage | V_C | $I_{PP}=2.2A$, $t_p=8/20\mu s$, Fwd | | 13.0 | | V |
| ESD Withstand Voltage | V_{ESD} | IEC61000-4-2 (Contact) | ± 22 | | | kV |
| | | IEC61000-4-2 (Air) | ± 22 | | | |

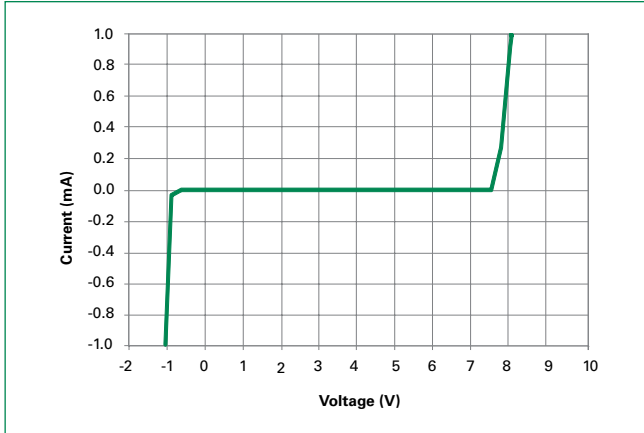
Insertion Loss Diagram - SESD0402Q2UG-0030-088



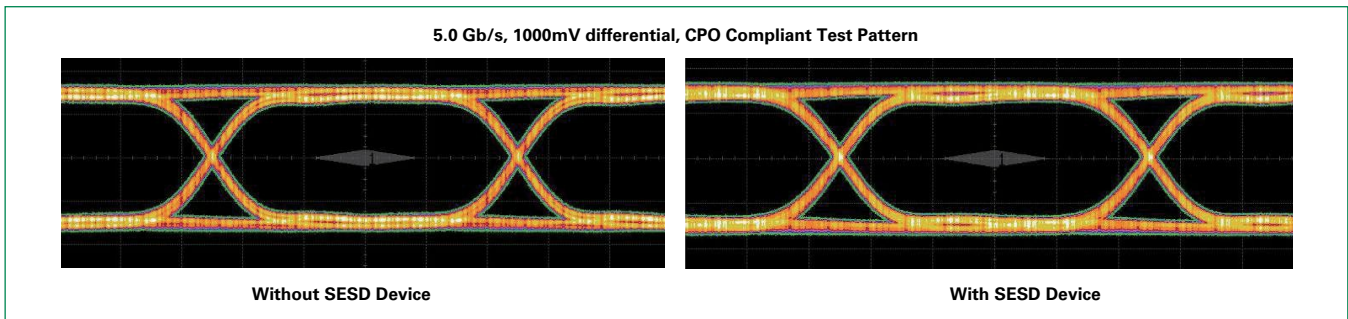
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Device IV Curve

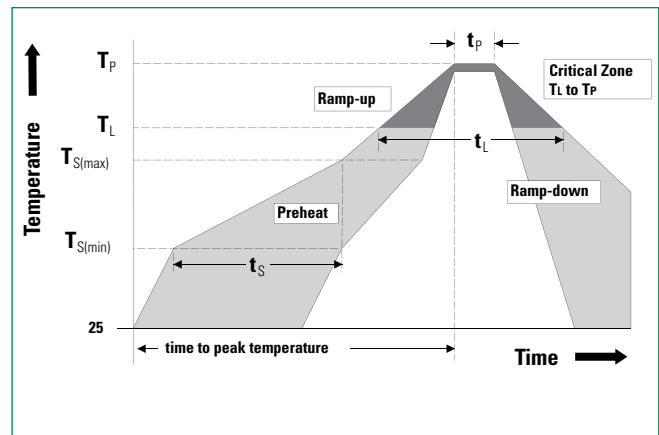


USB3.0 Eye Diagram



Soldering Parameters

| | | |
|--|------------------------------------|-------------------------|
| Reflow Condition | | Pb – Free assembly |
| Pre Heat | - Temperature Min ($T_{s(min)}$) | 150°C |
| | - Temperature Max ($T_{s(max)}$) | 200°C |
| | - Time (min to max) (t_s) | 60 – 180 secs |
| Average ramp up rate (Liquidus) Temp (T_L) to peak | | 3°C/second max |
| $T_{S(max)}$ to T_L - Ramp-up Rate | | 3°C/second max |
| Reflow | - Temperature (T_L) (Liquidus) | 217°C |
| | - Temperature (t_l) | 60 – 150 seconds |
| Peak Temperature (T_p) | | 260 ^{+0/-5} °C |
| Time within 5°C of actual peak Temperature (t_p) | | 20 – 40 seconds |
| Ramp-down Rate | | 6°C/second max |
| Time 25°C to peak Temperature (T_p) | | 8 minutes Max. |
| Do not exceed | | 260°C |



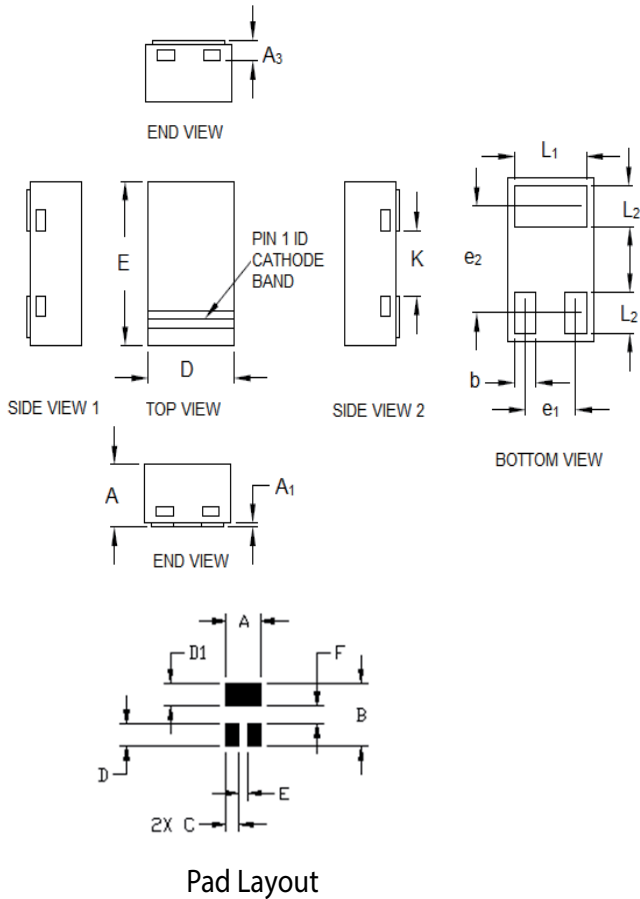
Product Characteristics of 0402 DFN Package

| | |
|---------------------------|---|
| Lead Plating | Pre-Plated Frame |
| Lead Material | Copper Alloy |
| Substrate material | Silicon |
| Body Material | UL Recognized compound meeting flammability rating V-0. |

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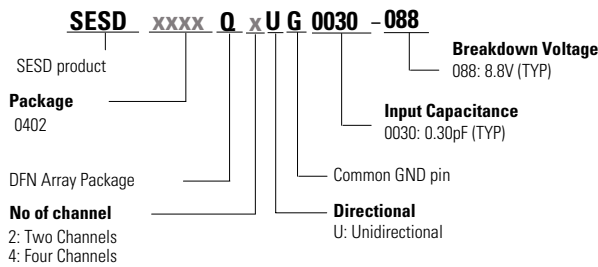
Package Dimensions — 0402 DFN Array



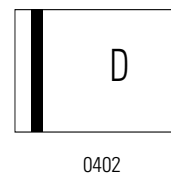
| Symbol | Millimeters | | | Inches | | |
|-----------|-------------|------|------|------------|-------|-------|
| | Min | Typ | Max | Min | Typ | Max |
| A | 0.33 | 0.38 | 0.43 | 0.013 | 0.015 | 0.017 |
| A1 | 0 | - | 0.05 | 0 | - | 0.002 |
| A3 | 0.13 ref. | | | 0.005 ref. | | |
| D | 0.55 | 0.60 | 0.65 | 0.022 | 0.024 | 0.026 |
| E | 0.95 | 1.00 | 1.05 | 0.037 | 0.039 | 0.041 |
| K | 0.35 | 0.40 | 0.45 | 0.014 | 0.016 | 0.018 |
| L1 | 0.45 | 0.50 | 0.55 | 0.018 | 0.020 | 0.022 |
| L2 | 0.20 | 0.25 | 0.30 | 0.008 | 0.010 | 0.012 |
| b | 0.14 | 0.19 | 0.24 | 0.006 | 0.007 | 0.009 |
| e1 | 0.35 BSC | | | 0.014 BSC | | |
| e2 | 0.65 BSC | | | 0.026 BSC | | |

| Symbol | Millimeters | Inches |
|-----------|-------------|--------|
| A | 0.60 | 0.024 |
| B | 1.00 | 0.039 |
| C | 0.23 | 0.009 |
| D | 0.35 | 0.014 |
| D1 | 0.35 | 0.014 |
| E | 0.15 | 0.006 |
| F | 0.30 | 0.012 |

Part Numbering System



Part Marking System



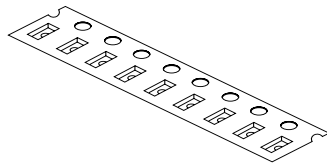
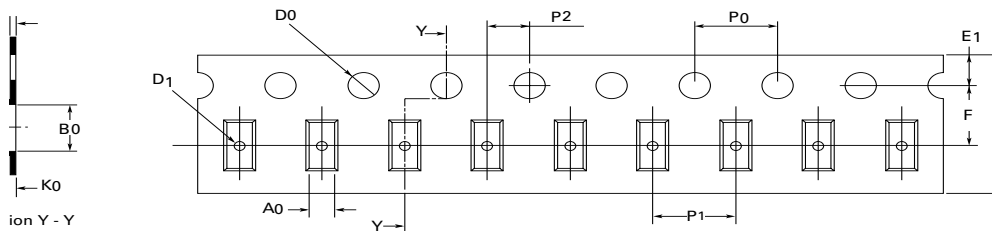
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Ordering Information

| Part Number | Package | Ordering Part Number | Minimum Order Quantity |
|-----------------------|----------------|----------------------|------------------------|
| SESD0402Q2UG-0030-088 | 0402 DFN Array | RF3925-000 | 50,000 |

Embossed Carrier Tape & Reel Specification – 0402 DFN Array



| Symbol | Millimeters |
|-----------|----------------|
| A0 | 0.70+/-0.05 |
| B0 | 1.15+/-0.05 |
| D0 | ø 1.55+ 0.05 |
| D1 | ø 0.40+/- 0.05 |
| E1 | 1.75+/-0.10 |
| F | 3.50+/-0.05 |
| K0 | 0.47+/-0.05 |
| P0 | 4.00+/-0.10 |
| P1 | 2.00+/-0.10 |
| P2 | 2.00+/-0.05 |
| W | 8.00+/-0.10 |
| T | 0.20+/-0.05 |

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