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October 2014

# FESD05P30ZL

## 5 V, 30 pF Unidirectional ESD Protector

### Features

- IEC61000-4-2,  $\pm 30$  kV Contact,  $\pm 30$  kV Air
- IEC61000-4-5,  $I_{PP} = 5$  A (8/20  $\mu$ s)
- Expanded Working Voltage,  
 $V_{RWM} = 5.0$  V +10% =5.5 V
- Very Low Clamping Voltage,  
 $V_C = 8.8$  V at 5 A (Typical)
- Ultra Small SOD882 Package
- Fits Solder Pad of 0402 and DFN 2L
- RoHS Compliant and Halogen Free
- Qualified with IR Reflow and Wave Soldering

### Applications

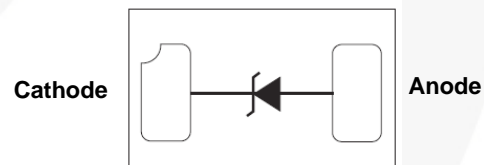
- Mobile and Portable Devices
- Space Constrained Systems
- USB 5 V Power Protections
- General-Purpose ESD Protection in 5 V Applications

### Description

The FESD05P30ZL ESD protector offers break through size and clamping performance. The device is capable of suppressing up to 50 W of 8 x 20  $\mu$ sec peak pulse power. It turns on at typical 6.5 V and clamp at 8.8 V in a 5 A surge. It responds fast and effective against to ESD/ Surge events.

The design has been specifically optimized for 5 V applications. It can be operated at 5 V with 10% tolerance. It is also RoHS compliant and Halogen Free.

All this capability is packed into a small, flat package, optimized for space constrained applications with similar XY dimensions to a industrial standard 0402 or SOD923. The FESDxZL family supports a max Z dimension of 0.5 mm. It is therefore specifically designed to support low clearance applications.



### Ordering Information

Part Number	Top Mark	Package	Packing Method
FESD05P30ZL	A	SOD882	Tape and Reel

FESD05P30ZL — 5 V, 30 pF Unidirectional ESD Protector

### Absolute Maximum Ratings<sup>(1)</sup>

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$P_D$	Total Power Dissipation	250	mW
ESD	Electrostatic Discharge Capability	IEC61000-4-2 Contact	$\pm 30$
		IEC61000-4-2 Air	$\pm 30$
$T_J$	Operating Junction Temperature Range	-55 to +150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to +150	$^\circ\text{C}$

**Note:**

- All tests conducted at  $T_A = T_J = 25^\circ\text{C}$  unless otherwise noted.

### Electrical Breakdown Characteristics<sup>(2), (3)</sup>

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{BR}$	Breakdown Voltage	$I_T = 1\text{ mA}$	6.2			V
$V_{RWM}$	Reverse Standoff Voltage	$I_T = 1\ \mu\text{A}$			5.5	V
$I_R$	Maximum Leakage	$V_R = 5.0\text{ V}$			0.5	$\mu\text{A}$

**Notes:**

- All tests conducted at  $T_A = T_J = 25^\circ\text{C}$  unless otherwise noted.
- $I_T = 300\ \mu\text{sec}$  square wave current pulse.

### Surge Response Characteristics<sup>(4)</sup>

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
<b>TLP Surge Response</b>						
$R_D$	Dynamic Resistance	TLP, $t_p = 100\text{ ns}$ , Cathode to Anode		0.31		$\Omega$
<b>8 x 20 <math>\mu\text{sec}</math> Exponential Current Surge Response</b>						
$I_{PP}$	Test Surge Current	IEC61000-4-5, 8 x 20 $\mu\text{sec}$ Current Surge		5		A
$V_C$	Clamping Voltage	$I_{PP} = 5\text{ A}$		8.8		V
$R_D$	Dynamic Resistance	Calculated at $I_{PP}$		0.47		$\Omega$
$P_{PPM}$	Peak Pulse Power	Calculated ( $I_{PPM} \times V_C$ )		50		W
$C_J$	Junction Capacitance	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$		31	38	pF

**Note:**

- All tests conducted at  $T_A = T_J = 25^\circ\text{C}$  unless otherwise noted.

## Typical Performance Characteristics

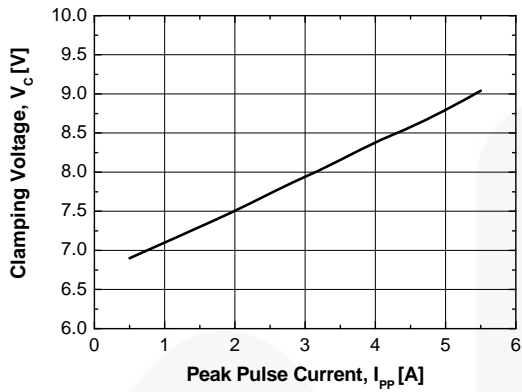


Figure 1. Clamping Voltage vs. Peak Pulse Current Power (8 x 20 $\mu$ s waveform)

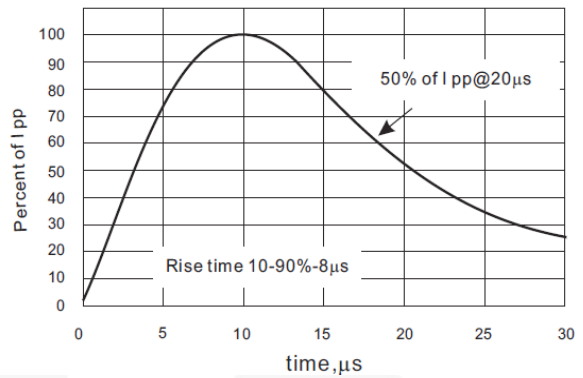


Figure 2. 8 x 20  $\mu$ sec Pulse Waveform

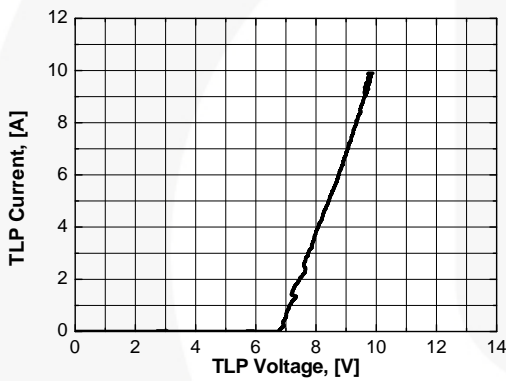


Figure 3. Transmission Line Pulsing (TLP) Plot

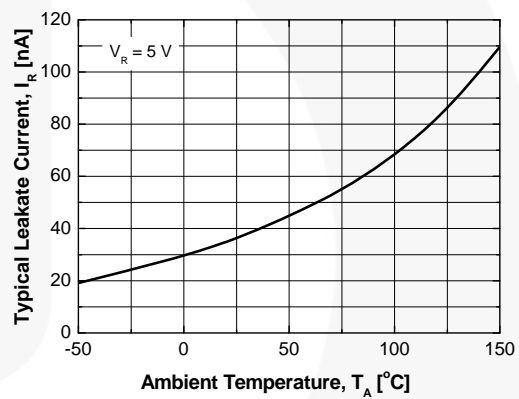


Figure 4. Leakage Current vs. Temperature

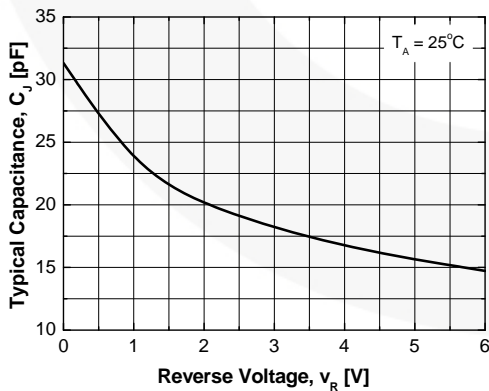
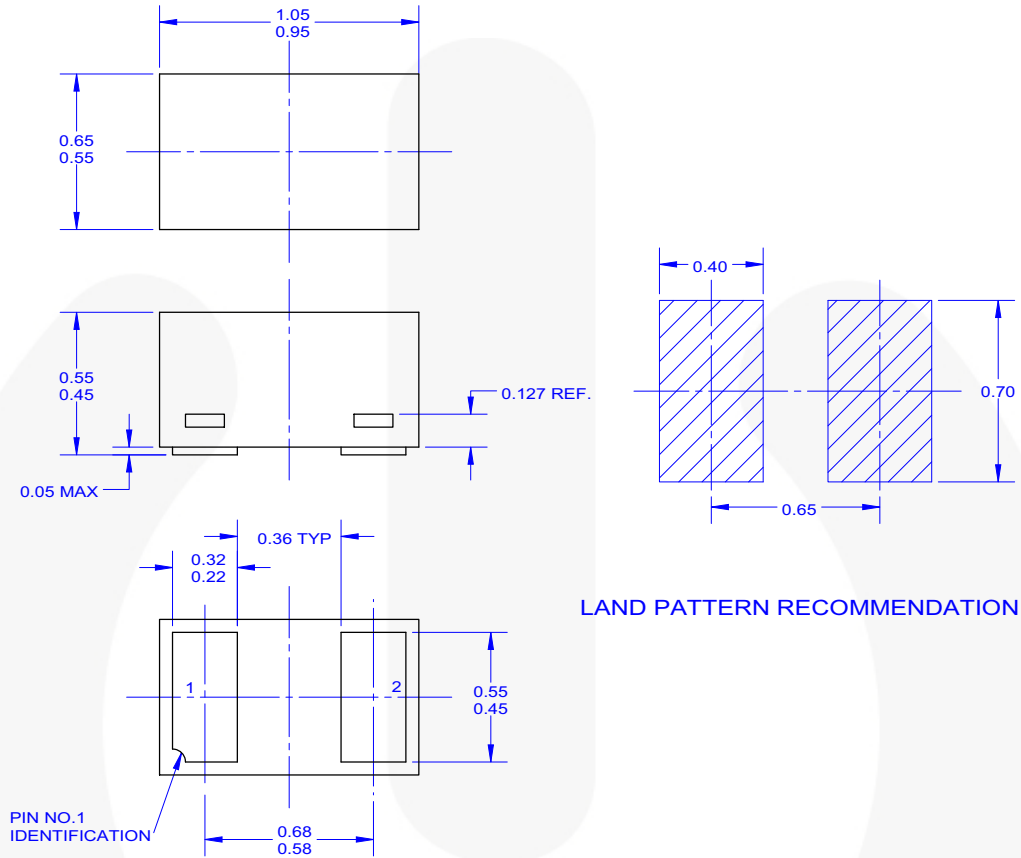


Figure 5. Typical Capacitance

Physical Dimension



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 D) FSC DERIVED LANDPATTERN RECOMMENDATION  
 E) DRAWING NUMBER AND REVISION: MKT-SOD88202A REV1.



Figure 6. 2-LEAD, SOD882, 0.60 x 1.00 MM BODY, 0.65 MM PITCH



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