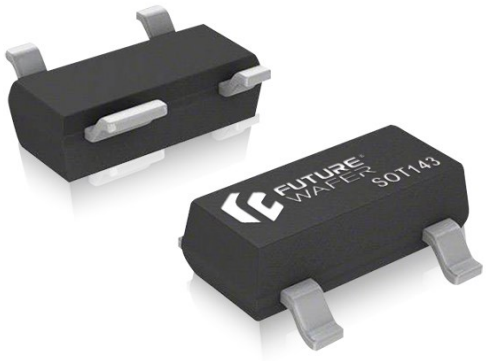
FutureWafer Evolution

FESD05V

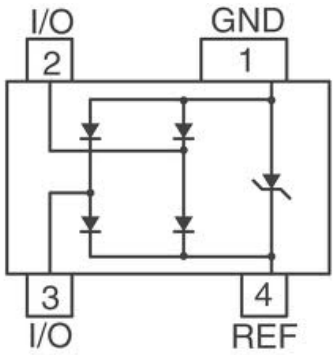
Extra Low Capacitance ESD Device

1. Product Description

The FESD05V is 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.
The Standard Package Allows For Easy PCB Layout And Matched Trace Lengths Necessary to Maintain Consistent Impedance Between High Speed Differential Lines Such as HDMI,DVI.



SOT143



2. Applications

- Firewire and USB
- Portable electronics
- Video/graphic cards
- High Speed Data Line
- Ethernet=10/100/1000 base T

3. Feature List

- Lead free as Standard
- ESD Protection:Level 4
- Low Clamping Voltage
- Protection one Power Line and Two Data Lines

4. IEC Compatibility

- EN61000-4
- 61000-4-2(ESD):Level4 ,Contact:±8KV,Air:±15KV
- 61000-4-4(EFT):40A-5/50ns
- 61000-4-5(Surge):5A,8/20us

5. Mechanical Characteristics

- Molded JEDEC SOT-143
- Flammability rating UL 94V-0
- Halogen Free

6. Absolute Maximum Ratings

Maximum Ratings@ TA = 25°C Unless Otherwise Specified

Parameter	Symbol	Test Condition	Value			Units
			Min.	Typ.	Max.	
Working Voltage	V_{RWM}	$R_{EF} – G_{ND}$	-	-	5.5	V
Peak Pulse Power	P_{PP}	8/20 us,	-	-	100	Watts
Peak Pulse Current	I_{PP}	Current Waveform	-	-	+5	A
Electrostatic Discharge	$V_{ESD (Contact)}$	R = 330Ω,C = 150pF	-8	-	+8	KV
	$V_{ESD (Air)}$		-15	-	+15	
Operating Temperature	T_{OP}		-55	-	+150	˚C
Storage Temperature	T_{STG}		-65	-	+150	

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7. Electrical Characteristics

DC Characteristics

Parameter	Symbol	Test Condition	Value			Units
			Min.	Typ.	Max.	
Breakdown Voltage	V_{BR}	I_t = 1mA , REF to GND	5.5	7.0	-	V
Forward Voltage	V_F	I_t = 1mA , GND to REF	-	-	0.95	
Leakage Current	I_L	V = 5.0V , REF to GND	-	-	1.0	uA

AC Characteristics

Parameter	Symbol	Test Condition	Value			Units
			Min.	Typ.	Max.	
Line Capacitance	C_L	V = 3.3V,f = 1MH$_Z$, I/O to I/O	-	0.30	0.40	pF
		V = 3.3V,f=1MH$_Z$, I/O to GND	-	0.60	0.80	

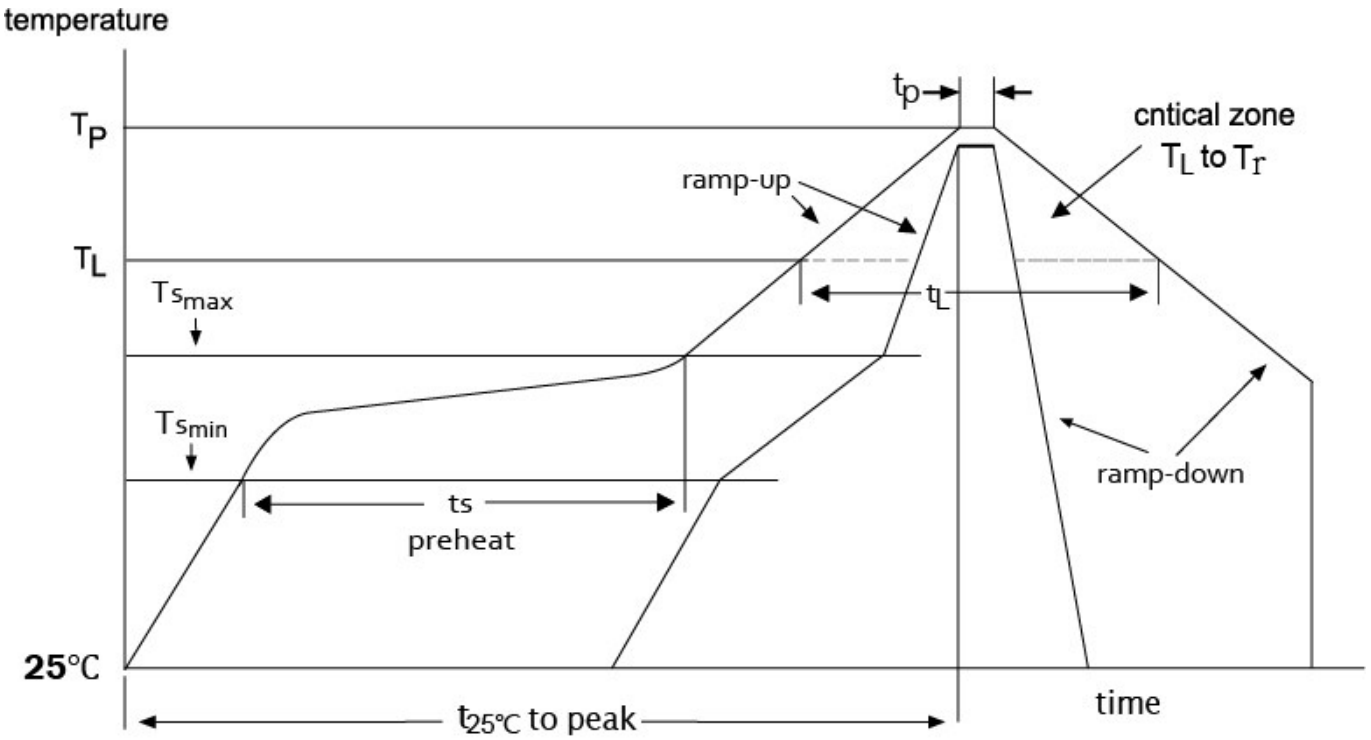
Protection Characteristics

Parameter	Symbol	Test Condition	Value			Units
			Min.	Typ.	Max.	
Clamping Voltage	$V_{CL,SURGE}$	I_{PP} = 1A,8/20us, I/O to GND	-	9.9	12	V
		I_{PP} = 5A,8/20us, I/O to GND	-	-	20	

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8. Soldering Parameters

Profile Feature	SnPb eutectic assembly	Pb-free assembly
Average ramp-up rate (Tsmax to Tp)	3 °C/s maximum	3 °C/s maximum
Preheat		
Temperature minimum (Tsmin)	100 °C	150 °C
Temperature maximum (Tsmax)	150 °C	200 °C
Time (tsmin to tsmax)	60 s to 120 s	60 s to 180 s
Time maintained above		
Temperature (TL)	183 °C	217 °C
Time (tL)	60 s to 150 s	60 s to 150 s
Peak/classificationtemperature(T)	235 °C	260 °C
Number of allowed reflow cycles	3	3
Time within 5 °C of actual peak temperature (tp)	10 s to 30 s	20 s to 40 s
Ramp-down rate	6 °C/s maximum	6 °C/s maximum
Time 25 °C to peak temperature	6 minutes maximum	8 minutes maximum



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9. Typical Characteristics Diagrams

Fig. 1 Non-repetitive Peak pulse power V.S pulse time

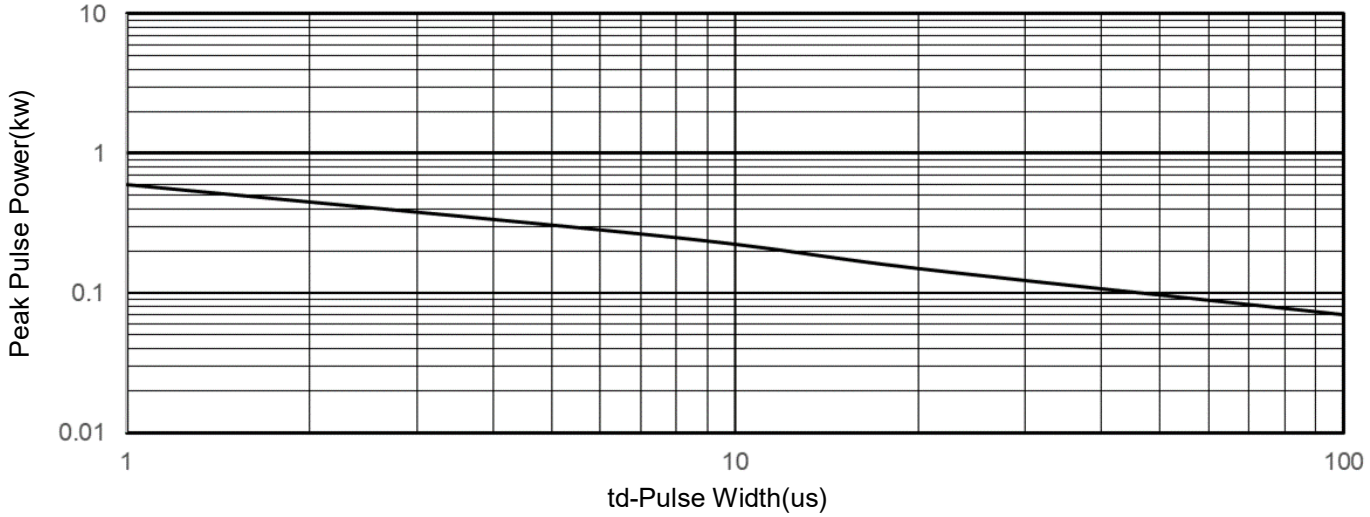


Fig. 2 Power Derating Curve

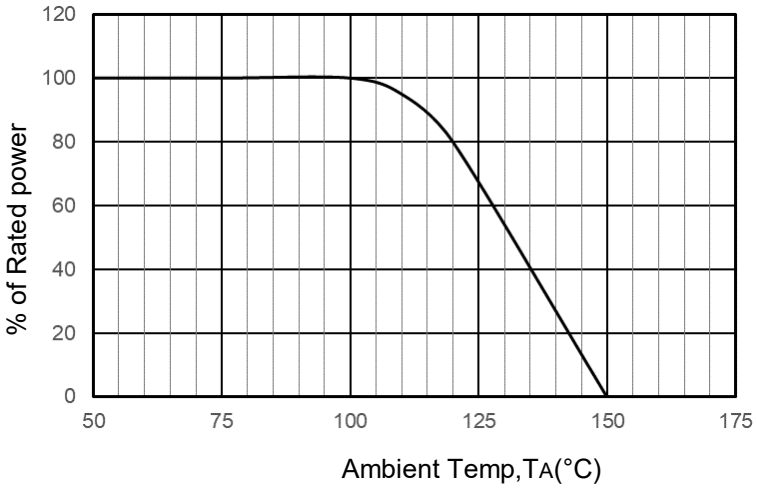


Fig. 3 Pulse Waveform

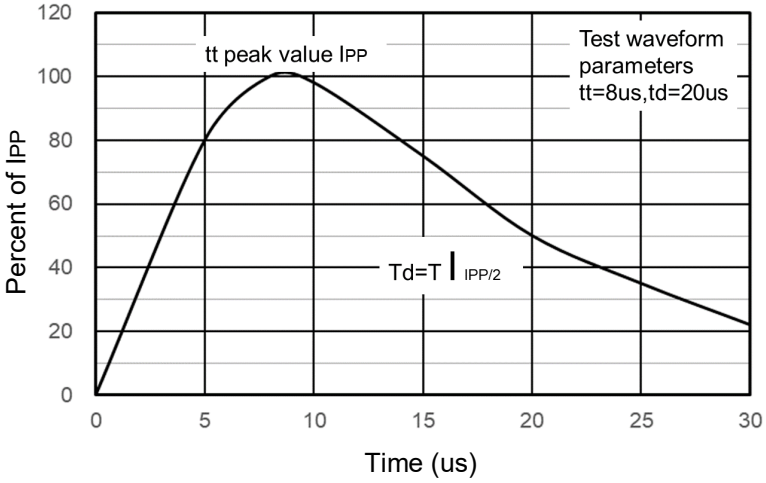


Fig. 4 V_C & I_{PP} Drawing

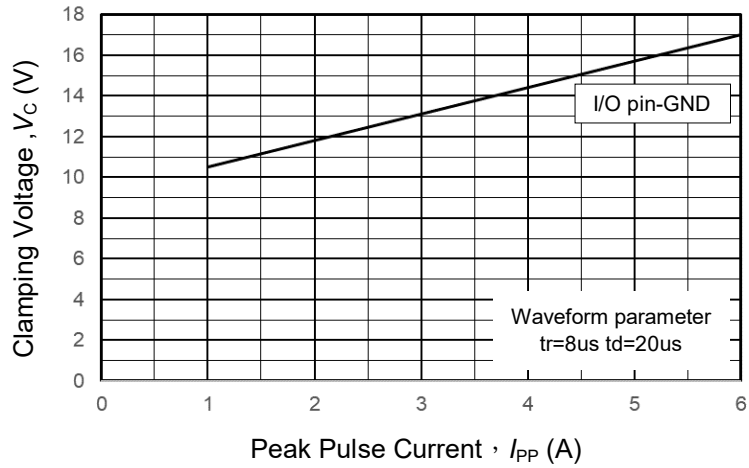
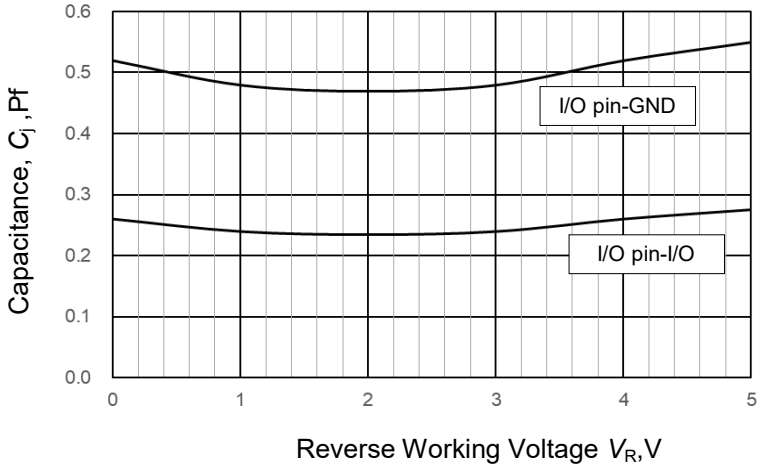
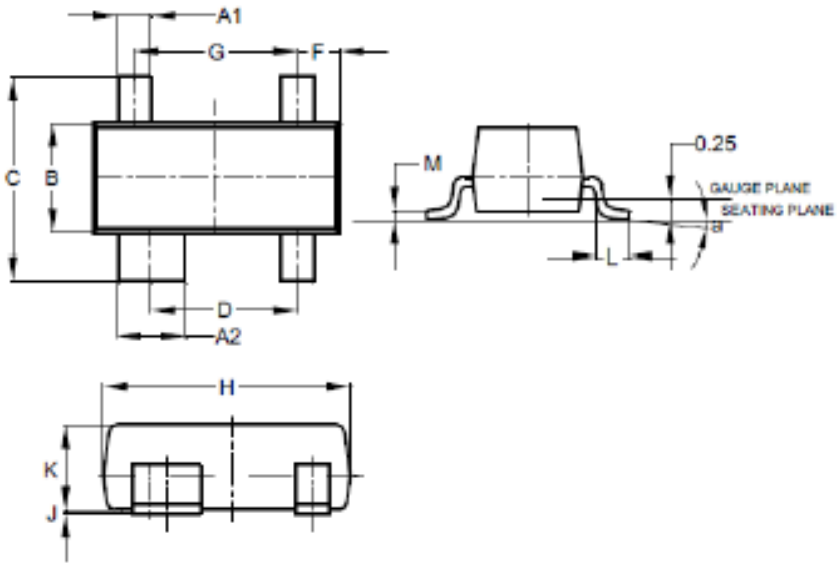


Fig. 5 Capacitance vs Reverse Voltage



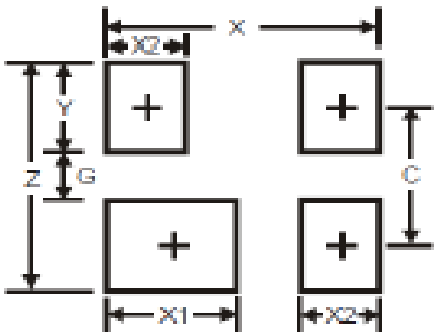
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10. Package Information



SOT-143			
Dim	**Min**	**Max**	**Typ**
A1	0.37	0.51	0.40
A2	0.77	0.93	0.80
B	1.20	1.40	1.30
C	2.28	2.48	2.38
D	1.58	1.83	1.72
F	0.45	0.60	0.49
G	1.78	2.03	1.92
H	2.80	3.00	2.90
J	0.013	0.1	-
K	0.89	1.00	-
L	0.46	0.60	0.50
M	0.085	0.18	0.11
a	0°	8°	
All dimension in mm			

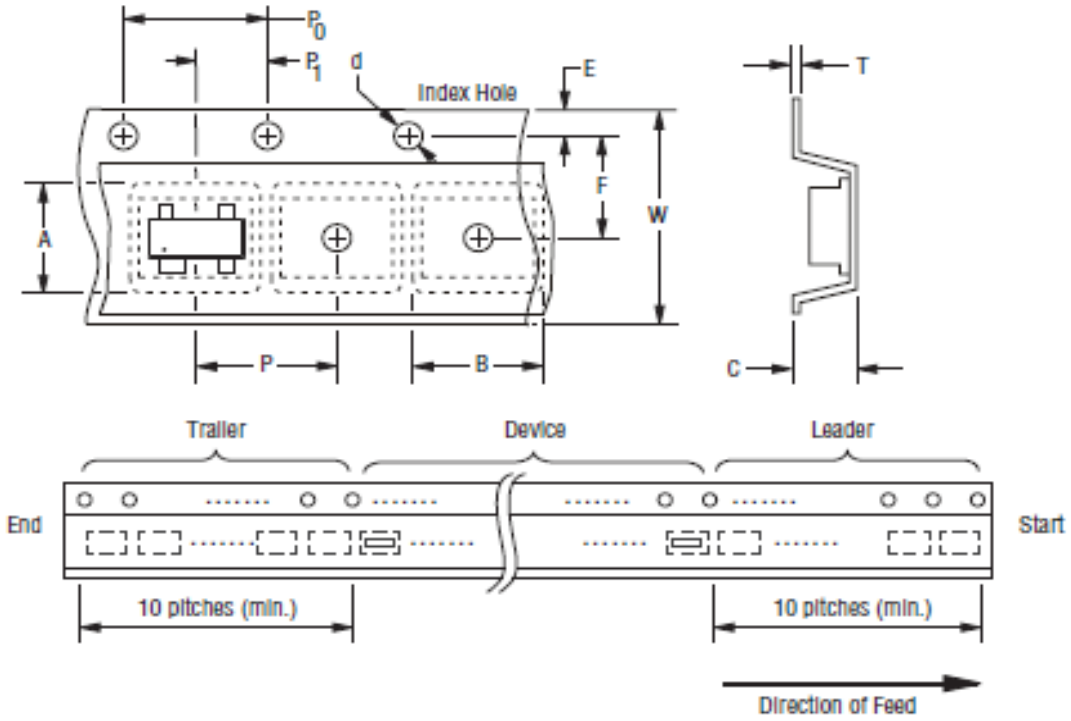
11. Pad Layout

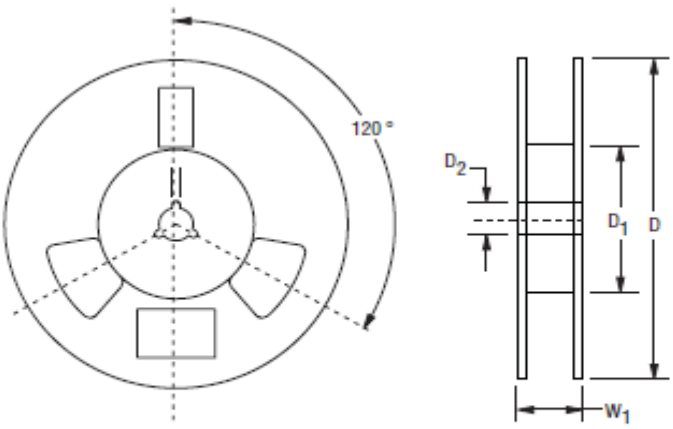


Dimensions	**Value(in mm)**
Z	2.70
G	1.30
X	2.50
X1	1.0
X2	0.60
Y	0.70
C	2.0

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12. Tape & Reel Information





DIMENSIONS: MM (INCHES)

Item	Symbol	SOT-143
Carrier Width	A	2.75 ±0.10 (0.108 - 0.004)
Carrier Length	B	3.30 ±0.10 (0.130 - 0.004)
Carrier Depth	C	1.25 ±0.10 (0.049 - 0.004)
Sprocket Hole	d	1.55 ±0.05 (0.061 - 0.002)
Reel Outside Diameter	D	178 (7.008)
Reel Inner Diameter	D_1	50.0 (1.969) Min.
Feed Hole Diameter	D_2	13.0 ±0.20 (0.512 - 0.008)
Sprocket Hole Position	E	1.75 ±0.10 (0.069 - 0.004)
Punch Hole Position	F	3.50 ±0.05 (0.138 - 0.002)
Punch Hole Pitch	P	4.00 ±0.10 (0.157 - 0.004)
Sprocket Hole Pitch	P_0	4.00 ±0.10 (0.157 - 0.004)
Embossment Center	P_1	2.00 ±0.05 (0.079 - 0.002)
Overall Tape Thickness	T	0.20 ±0.10 (0.008 - 0.004)
Tape Width	W	8.00 ±0.20 (0.315 - 0.008)
Reel Width	W_1	14.4 (0.567) Max.
Quantity per Reel	—	3,000

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13. Ordering Information

Part No.	Package	Marking	Reel size	MOQ/Reel
FESD05V	SOT-143	SL3	7 inch	3,000PCS/Reel

14. History

Version	Date	File No.	Recording	Basis
A	22-Jun-2017	F117301	New Create	Market
2.0	28-May-2021		Update Version	System

FUTURE WAFER

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