

# ESD Protection Diode : TEUST14050R9U

## SOT143 package ultra-low capacitance type



### ■ Features

1. RoHS compliant and halogen-free
2. Working voltage: 5V
3. Ultra-low capacitance: 0.9pF
4. Low clamping voltage
5. Low leakage current
6. IEC 61000-4-2 (ESD) ±15KV (air), ±8KV (contact)



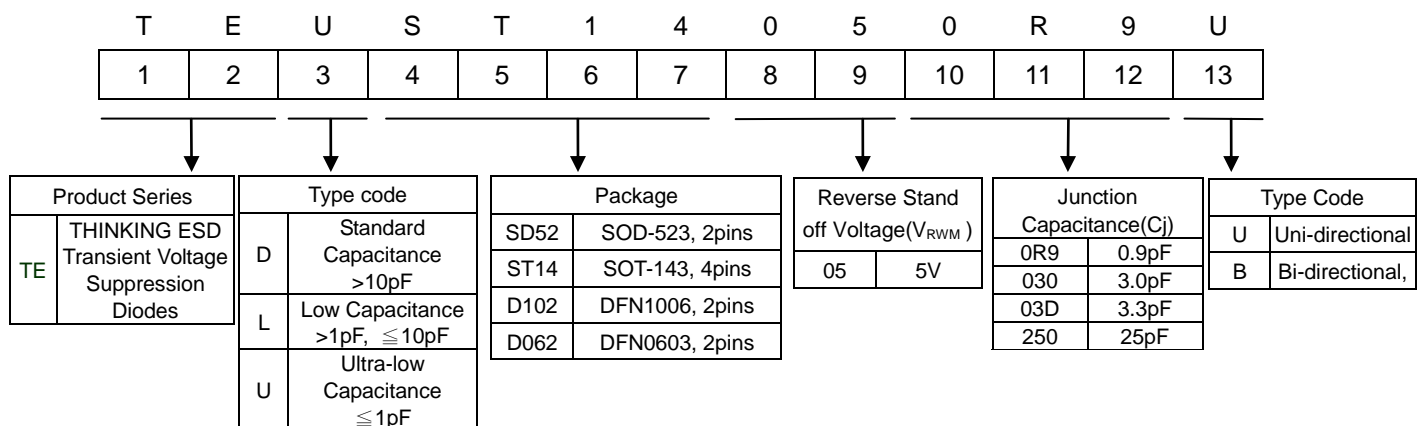
### ■ Recommended Applications

1. USB 1.1/2.0/OTG
2. IEEE 1394 Firewire Ports
3. Projection TV Monitors and Flat Panel Displays
4. Set Top Box, Projection TV

### ■ Mechanical Data

1. Case: SOT-143, molded plastic meets UL flammability rating 94V-0
2. Terminals : Au plated, solderable per MIL-STD-750, method 2026
3. Meets MSL level 1, per J-STD-020

### ■ Part Number Code



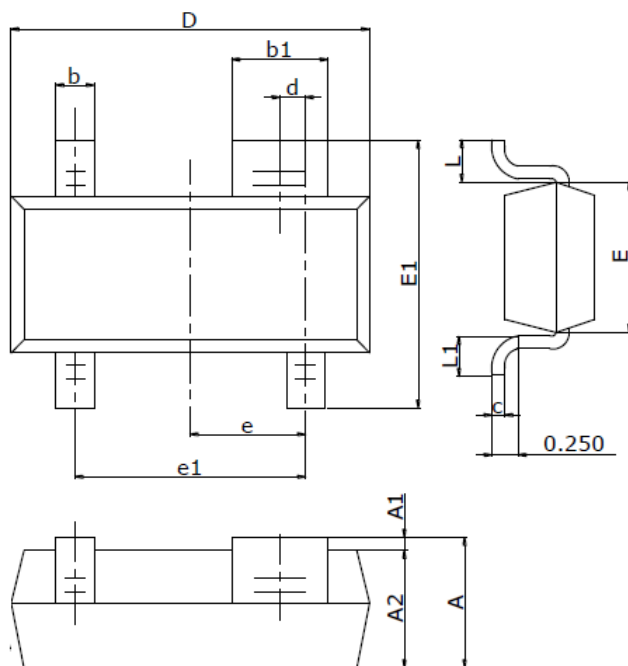
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### Structures and Dimensions

#### SOT-143



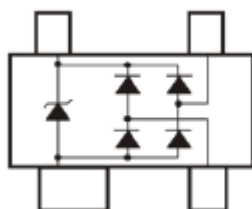
Code	Unit: mm		Unit: inch	
	Min.	Max.	Min.	Max.
A	0.90	1.15	0.035	0.045
A1	0.00	0.10	0.000	0.004
A2	0.90	1.05	0.035	0.041
b	0.30	0.50	0.012	0.020
b1	0.75	0.90	0.030	0.035
c	0.08	1.15	0.003	0.006
D	2.80	3.00	0.110	0.118
d	0.20TYP.		0.008TYP.	
E	1.20	1.40	0.047	0.055
E1	2.25	2.55	0.089	0.100
e	0.95TYP.		0.037TYP.	
e1	1.80	2.00	0.071	0.079
L	0.55REF.		0.022REF.	
L1	0.30	0.50	0.012	0.020

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### ■ Schematic & PIN Configuration



### ■ Maximum Rating (Rating at 25°C ambient temperature unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power (tp= 8/20μs waveform)	P <sub>PPM</sub>	150	W
Peak Pulse Current (tp= 8/20μs waveform)	I <sub>PP</sub>	5	A
ESD per IEC61000-4-2 (Air) ESD per IEC61000-4-2 (Contact)	V <sub>ESD</sub>	±15 ±8	KV
Operating junction temperature	T <sub>J</sub>	-55~+125	°C
Storage temperature range	T <sub>STG</sub>	-55~+150	°C

### ■ Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

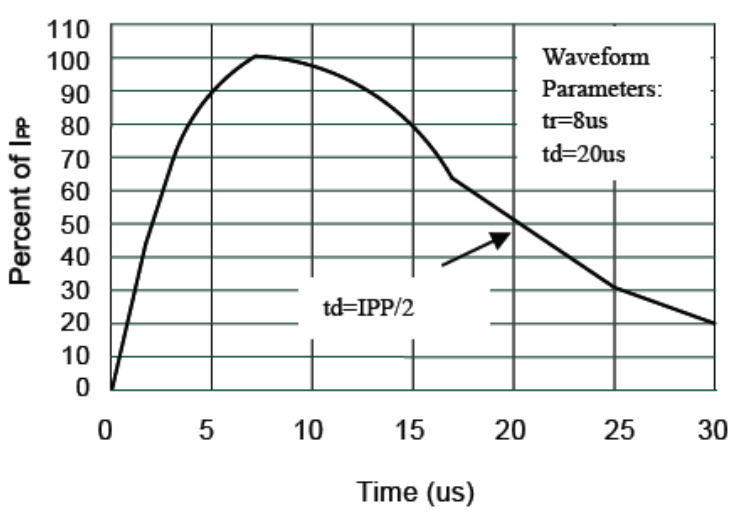
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse Stand-off Voltage	V <sub>RWM</sub>	-			5	V
Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> =1mA	6.0			V
Reverse Leakage Current	I <sub>R</sub>	V <sub>RWM</sub> =5V			1	μA
Clamping Voltage	V <sub>c</sub>	I <sub>pp</sub> =1A, tp= 8/20μs I <sub>PP</sub> =5A, tp = 8/20μs			15.5 30	V
Junction Capacitance	C <sub>j</sub>	VR = 0V, f = 1MHz Between I/O pins; VR = 0V, f = 1MHz Any I/O pin to Ground		0.45 0.9	0.6 1.2	pF

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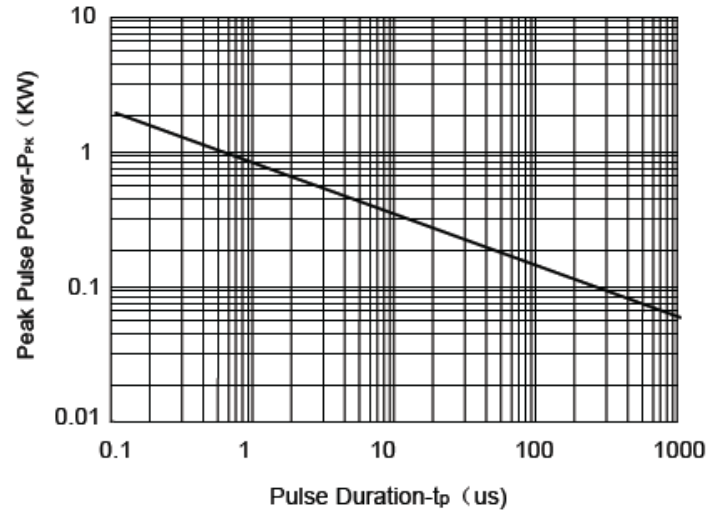
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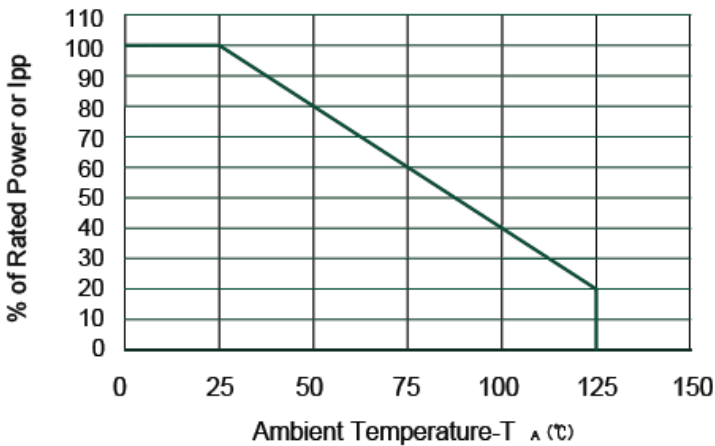
### Rate and Characteristic Curve ( $T_A=25^\circ\text{C}$ unless otherwise noted)



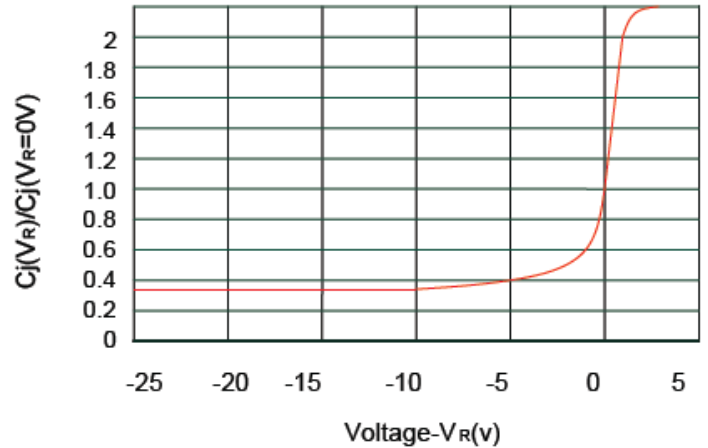
**Pulse Waveform**



**Non-Repetitive Peak Pulse Power vs. Pulse Time**



**Power Derating Curve**



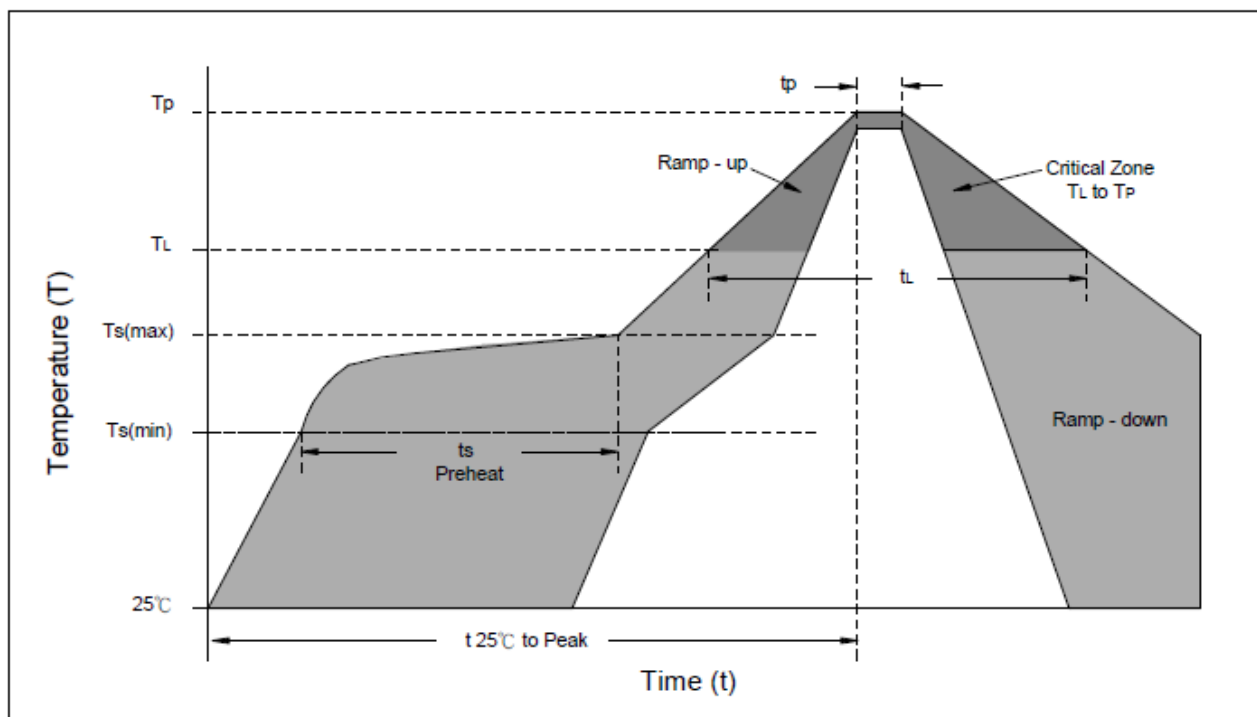
**Junction Capacitance vs. Reverse Voltage**

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### ■ Soldering Recommendation



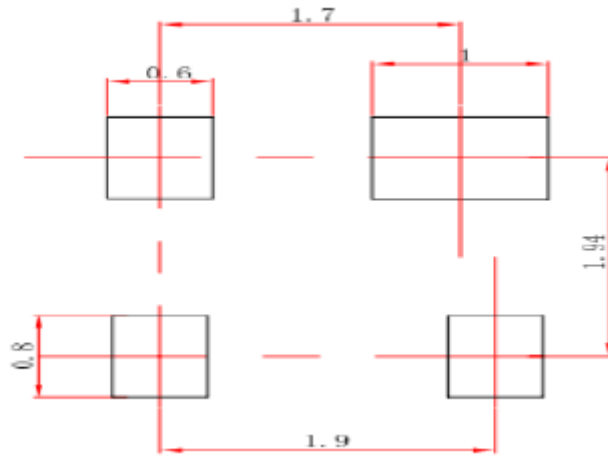
Reflow Condition	Lead-free assembly
<b>Preheat</b> -Temperature Min(Ts min) -Temperature Min(Ts max) -Time (min to max) (ts)	150°C 200°C 60 – 180 seconds
<b>Average ramp up rate</b> -Temperature Liquidus (TL) to peak	3°C/second max
<b>Ts(max) to TL</b> -Ramp-up Rate	3°C/second max.
<b>Reflow</b> -Temperature Liquidus (TL) -Time (tL)	217°C 60 – 150 seconds
<b>Peak Temperature (TP)</b>	260°C
<b>Time within 5°C of actual peak Temperature(TP)</b>	20 – 40 seconds
<b>Ramp-down Rate</b>	6°C/second max.
<b>Time 25°C to peak Temperature(TP)</b>	8 minutes max.
<b>Do not exceed</b>	260°C

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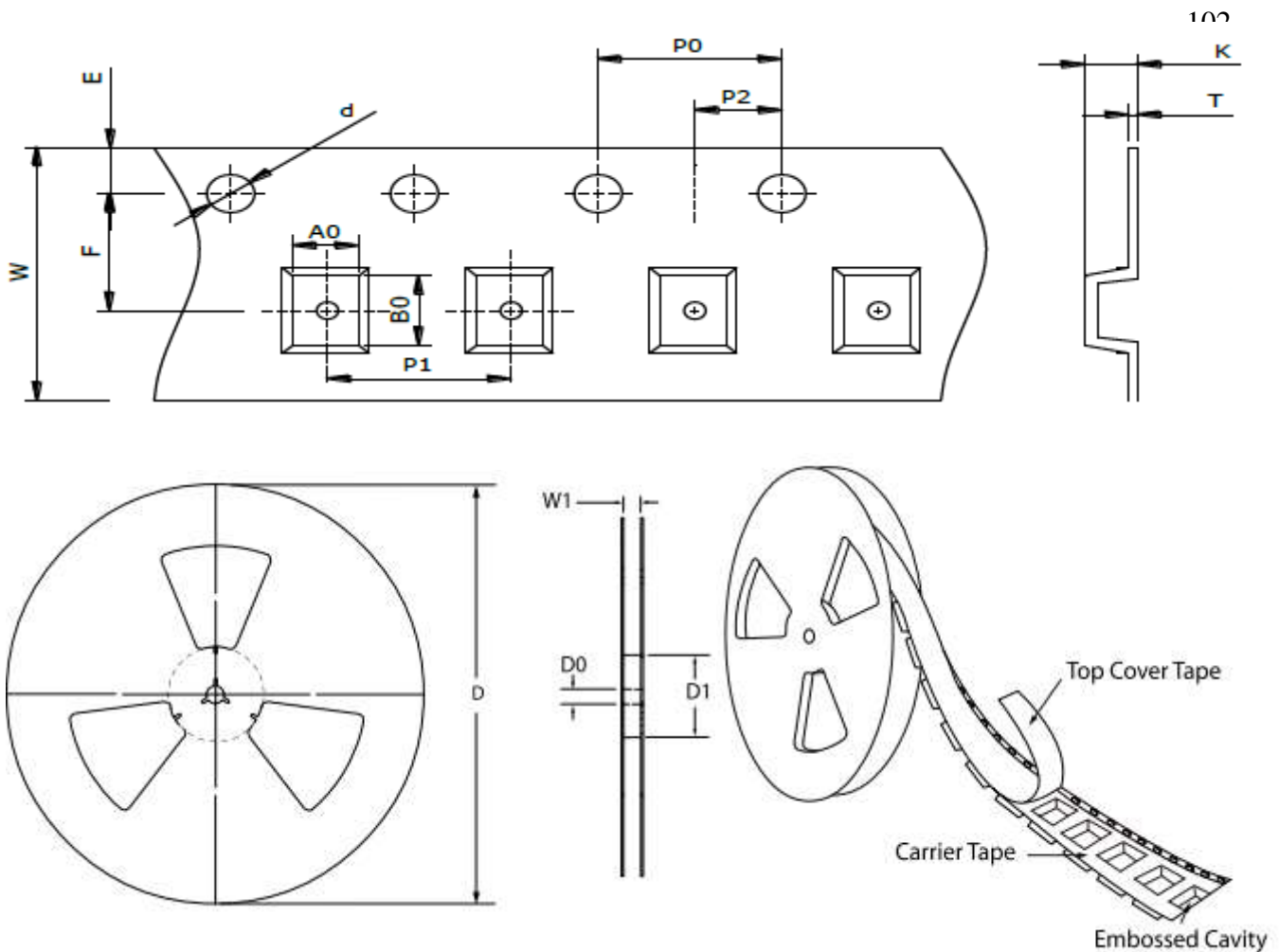


### Recommended Soldering Pad Dimensions



Unit: mm

### Packaging



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Item	Symbol	SOT-143 (Unit: mm)
Carrier width	A0	2.60 ± 0.10
Carrier length	B0	3.05 ± 0.10
Carrier length	K	1.00 ± 0.10
Sprocket hole	d	1.50 ± 0.10
Reel outside diameter	D	178.00 ± 2.00
Feed hole width	D0	13.00 ± 0.20
Reel inner diameter	D1	MIN. 54.00
Sprocket hole position	E	1.75 ± 0.10
Punch hole position	F	3.50 ± 0.10
Sprocket hole pitch	P0	4.00 ± 0.10
Punch hole pitch	P1	4.00 ± 0.10
Embossment center	P2	2.00 ± 0.10
Overall tape thickness	T	0.20 ± 0.05
Tape width	W	8.00 ± 0.20
Reel width	W1	MAX. 13.50

### ■ Quantity

Package Type	Marking Code	Reel Size (inch)	Reel (Kpcs)
SOT-143	R05	7	3

### ■ Warehouse Storage Conditions of product

- Storage condition:
  - 1.Storage Temperature: -10℃~+40℃
  - 2.Relative Humidity: ≤75%RH
  - 3.Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year.