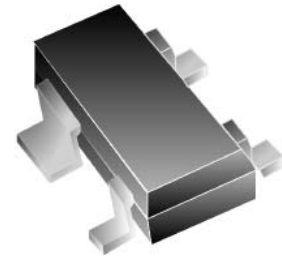




### FEATURES:

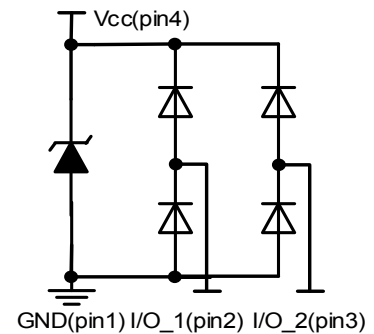
- ◇ 60 Watts peak pulse power per line ( $t_P=8/20\mu s$ )
- ◇ Protects two I/O lines
- ◇ Low clamping voltage
- ◇ Low operating voltage
- ◇ Low capacitance
- ◇ RoHS compliant



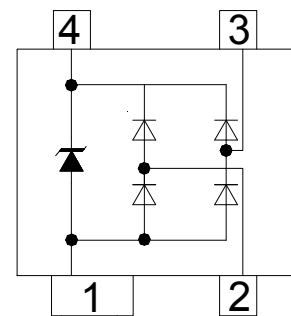
SOT-143

### MAIN APPLICATIONS

- ◇ Fire wire & USB
- ◇ Sensitive analog inputs
- ◇ Notebook computers
- ◇ Portable electronics
- ◇ LAN/WAN equipment
- ◇ Video line protection
- ◇ Microcontroller input protection



Pin configuration



Top view

### PROTECTION SOLUTION TO MEET

- ◇ IEC61000-4-2 (ESD)  $\pm 15kV$ (air), I/O to GND
- ◇ IEC61000-4-2 (ESD)  $\pm 15kV$ (contact), I/O to GND
- ◇ IEC61000-4-4 (EFT) 40A(5/50ns)
- ◇ IEC61000-4-5 (Lightning) 4.5A(8/20 $\mu s$ ), I/O to GND
- ◇ IEC61000-4-5 (Lightning) 17A(8/20 $\mu s$ ),  $V_{CC}$  to GND

### MECHANICAL CHARACTERISTICS

- ◇ JEDEC SOT-143 package
- ◇ Molding compound flammability rating: UL 94V-0
- ◇ Quantity per reel: 3, 000pcs
- ◇ Lead finish: lead free
- ◇ Marking code: E5R

**ABSOLUTE MAXIMUM RATINGS** ( $T_A=25^{\circ}\text{C}$ , RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation on 8/20 $\mu\text{s}$ waveform	$P_{PP}$	60	W
ESD per IEC 61000-4-2 (Air) I/O to GND ESD per IEC 61000-4-2 (Contact) I/O to GND	$V_{ESD}$	+/-15 +/-15	kV
Lead soldering temperature	$T_L$	260 (10 sec.)	$^{\circ}\text{C}$
Operating junction temperature range	$T_J$	-55 to +125	$^{\circ}\text{C}$
Storage temperature range	$T_{STG}$	-55 to +150	$^{\circ}\text{C}$

**ELECTRICAL CHARACTERISTICS** ( $T_A=25^{\circ}\text{C}$ )

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse working voltage	$V_{RWM}$				5.0	V
Reverse breakdown voltage	$V_{BR}$	$I_T=1\text{mA}$	6.0	7.2		V
Reverse leakage current (I/O pin to Ground)	$I_R$	$V_{RWM}=5\text{V}$			1	$\mu\text{A}$
Clamping voltage (I/O pin to Ground)	$V_C$	$I_{PP}=1\text{A}, t_P=8/20\mu\text{s}$		9.5	10.5	V
		$I_{PP}=4.5\text{A}, t_P=8/20\mu\text{s}$		13	15	V
Clamping voltage ( $V_{CC}$ to Ground)	$V_C$	$I_{PP}=8\text{A}, t_P=8/20\mu\text{s}$		12	15	V
		$I_{PP}=17\text{A}, t_P=8/20\mu\text{s}$		16.5	20	V
Junction capacitance	$C_J$	$V_{RWM}=0\text{V}, f=1\text{MHz}$ Any I/O pin to Ground		0.8	1.0	pF
		$V_{RWM}=0\text{V}, f=1\text{MHz}$ Between I/O pins		0.4	0.6	

RATINGS AND V-I CHARACTERISTICS CURVES ( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)

FIG.1:V- I curve characteristics (Uni-directional)

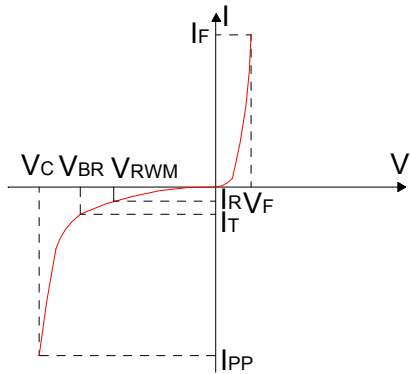


FIG.2: Pulse waveform (8/20 $\mu\text{s}$ )

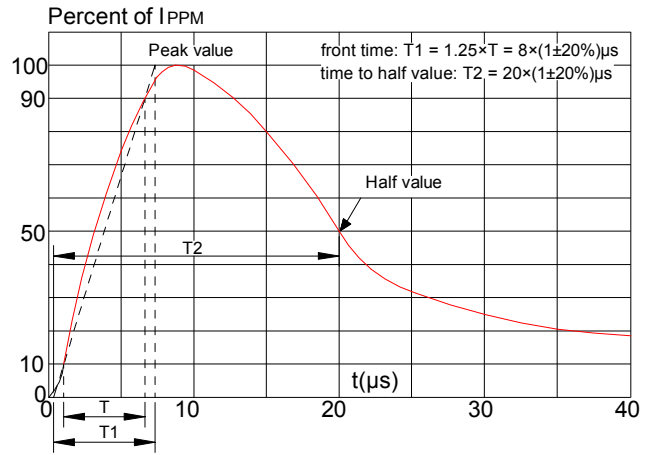


FIG.3: Pulse derating curve

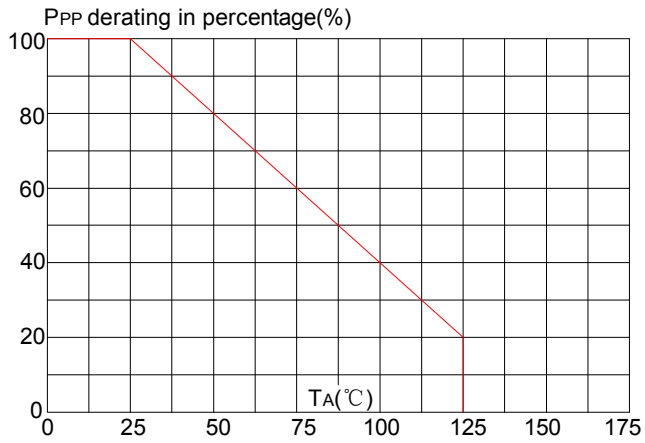
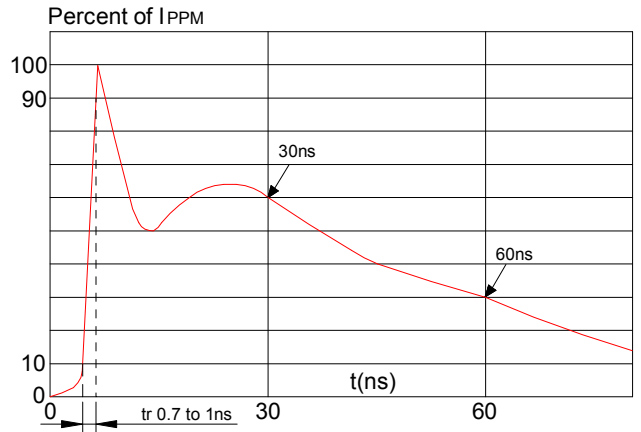
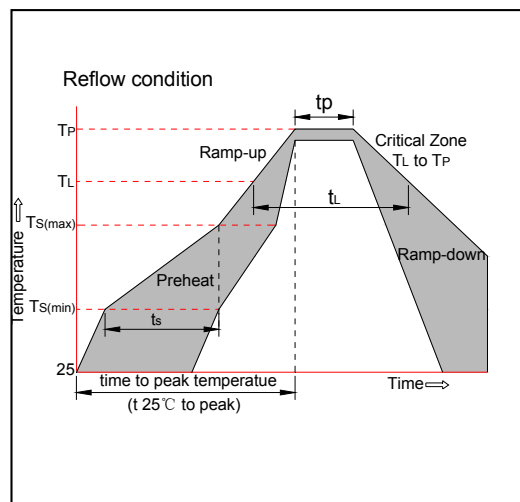


FIG.4: ESD clamping (15kV contact)

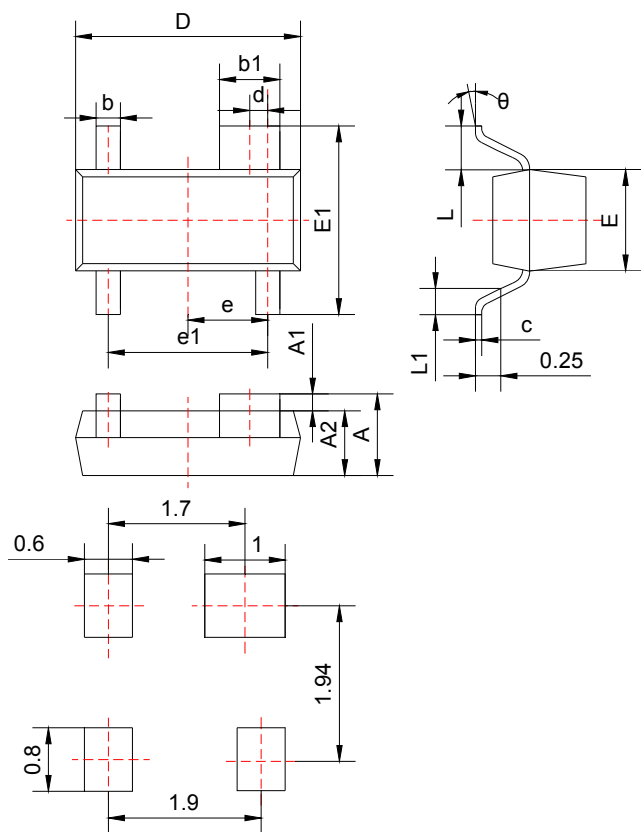


**SOLDERING PARAMETERS**

Reflow Condition		Pb-Free assembly (see figure at right)
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/sec. Max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature( $T_L$ )(Liquidus)	+217°C
	-Temperature( $t_L$ )	60-150 secs.
Peak Temp ( $T_P$ )		+260(+0/-5)°C
Time within 5°C of actual Peak Temp ( $t_p$ )		20-40secs.
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp ( $T_P$ )		8 min. Max
Do not exceed		+260°C



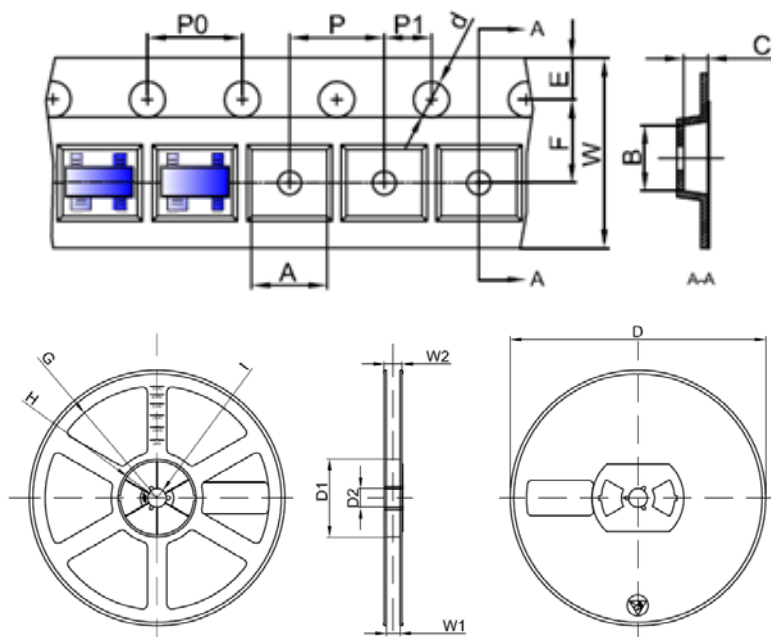
**PACKAGE MECHANICAL DATA**



Recommended Land Pattern

Symbol	Millimeter			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90	1.00	1.15	0.035	0.039	0.045
A1	0.00	0.065	0.10	0.000	0.003	0.004
A2	0.90	1.00	1.10	0.035	0.039	0.043
b	0.30	0.40	0.50	0.012	0.016	0.020
b1	0.75	0.81	0.90	0.030	0.032	0.035
c	0.05	0.10	0.15	0.002	0.004	0.006
D	2.70	2.90	3.10	0.106	0.114	0.122
d	0.20Typ.			0.008Typ.		
E	1.10	1.30	1.50	0.043	0.051	0.059
E1	2.20	2.40	2.60	0.087	0.094	0.102
e	0.95Typ.			0.037Typ.		
e1	1.80	1.90	2.00	0.071	0.075	0.079
L	0.55Typ.			0.022Typ.		
L1	0.30	0.40	0.50	0.012	0.016	0.020
θ	0°	-	8°	0°	-	8°

**TAPE AND REEL SPECIFICATION-SOT-143**



**Packaging description:**

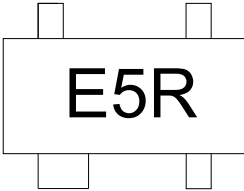
SOT-143 parts are shipped in tape. The carrier tape is made from a dissipative(carbon filled) polycarbonate resin. The cover tape is a multilayer film(heat activated adhesive in nature)primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and made of polystyrene plastic(anti-static coated).

Symbol	Millimeters	Inches
	Typ.	Typ.
A	3.10	0.122
B	2.80	0.110
C	1.30	0.051
d	Φ1.50	Φ0.059
E	1.75	0.069
F	3.50	0.138
P0	4.00	0.157
P	4.00	0.157
P1	2.00	0.079
W	8.00	0.315
D	Φ178	7.008
D1	54.40	2.142
D2	13.00	0.512
G	R78.00	3.071
H	R25.60	1.008
I	R6.50	0.256
W1	9.50	0.374
W2	12.30	0.484

**ORDERING INFORMATION**

PART No.	PACKAGE TYPE	QUANTITY(PCS) REEL	DESCRIPTION
JEU05UCR	SOT-143	3,000	7 inch reel pack

**MARKING CODE**

Part Number	Marking Code
JEU05UCR	

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