



## ES2AF THRU ES2KF

VOLTAGE RANGE 50 to 800 Volts  
CURRENT 2.0 Ampere



## Features

- Glass passivated chip: 60mil
- Plastic package has underwrites laboratory flammability
- Classification 94V-0
- For surface mounted applications
- Low profile package
- Built-in strain relief, ideal for automated placement
- Glass Passivated chip junction
- High temperature soldering: 250°C/10 second at terminals



## Mechanical Data

- Case: JEDED DO-214AA molded plastic over glass passivated chip
- Terminals: Solder plated, Solderable per MIL-STD-750, method 2026
- Polarity: Color band denotes cathode end
- Weight: 0.002ounce, 0.057 gram

## Maximum Ratings and Electrical Characteristics

- Ratings at 25°C ambient temperature unless otherwise specified.
- Single phase, half wave, 60Hz, resistive or inductive load.
- For capacitive load derate current by 20%.

TYPE NUMBER	SYMBOL	ES 2AF	ES 2BF	ES 2CF	ES 2DF	ES 2EF	ES 2GF	ES 2JF	ES 2KF	UNIT
Maximum Repetitive Peak Reverse Voltage	$V_{RRM}$	50	100	150	200	300	400	600	800	Volts
Maximum RMS Voltage	$V_{RMS}$	35	70	105	140	210	280	420	560	Volts
Maximum DC Blocking Voltage	$V_{DC}$	50	100	150	200	300	400	600	800	Volts
Maximum Average Forward Rectified Current At $T_A=100^\circ\text{C}$ (NOTE 1)	$I_{(AV)}$	2.0								Amps
Peak Forward Surge Current 8.3ms single half sine wave superimposed on rated load (JEDEC Method)	$I_{FSM}$	50								Amps
Maximum Instantaneous Forward Voltage at 2.0A	$V_F$	0.95			1.25		1.70	1.95		Volts
Maximum DC Reverse Current at rated DC blocking voltage at	$T_A = 25^\circ\text{C}$	5.0								$\mu\text{A}$
	$T_A = 125^\circ\text{C}$	100								
Maximum Reverse Recovery Time (NOTE 3)	$T_{RR}$	35						50		nS
Typical Junction Capacitance (NOTE 2)	$C_J$	28								pF
Typical Thermal Resistance (NOTE 1)	$R_{\theta JA}$	60								$^\circ\text{C/W}$
	$R_{\theta JL}$	18								
Operating Junction Temperature	$T_J$	-55 to +150								$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to +150								$^\circ\text{C}$

## Notes:

1. Thermal resistance from Junction to ambient and from junction to lead mounted on P.C.B. with 0.3×0.3" (8.0 × 8.0mm) copper pad areas.
2. Measured at 1.0MHz and applied reverse voltage of 4.0V
3. Test conditions  $I_F = 0.5\text{A}$ ,  $I_R = 1.0\text{A}$ ,  $I_{RR} = 0.25\text{A}$



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Ratings and Characteristic Curves (TA=25°C unless otherwise noted)

FIG.1-TYPICAL FORWARD CURRENT DERATING CURVE

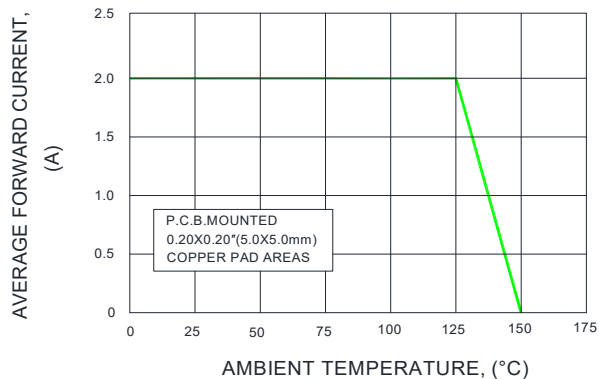


FIG.2-MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

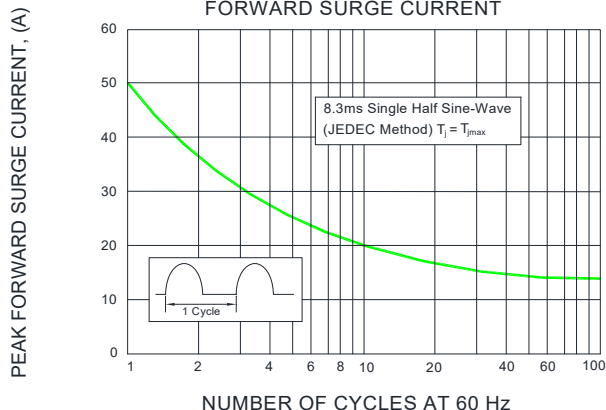


FIG.3-TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

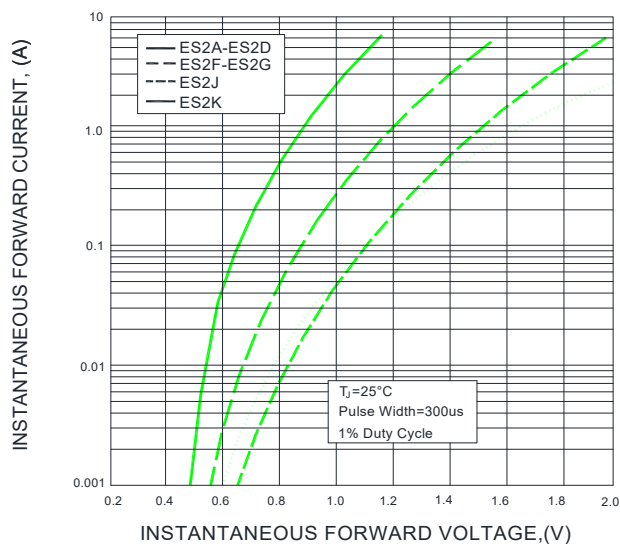


FIG.4-TYPICAL REVERSE CHARACTERISTICS

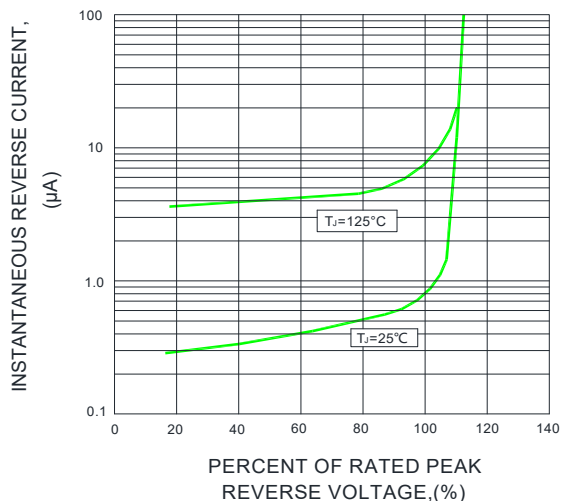


FIG.5-TYPICAL JUNCTION CAPACITANCE

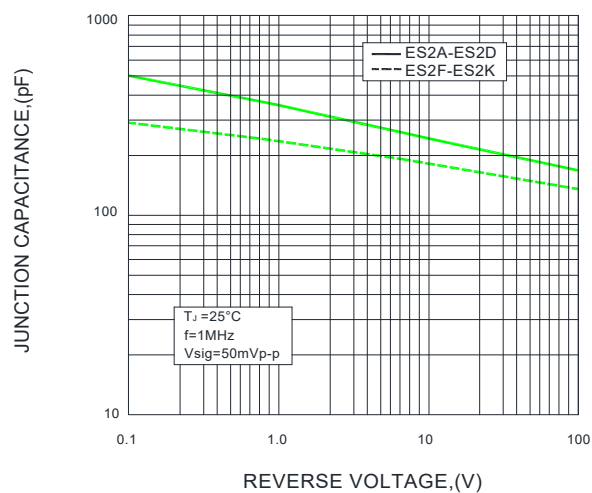
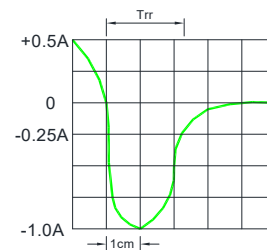
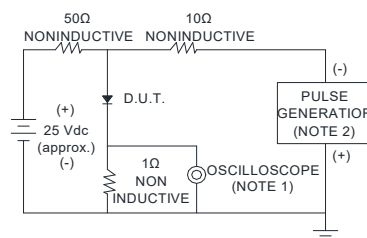


FIG.6-TEST CIRCUIT DIAGRAM AND REVERSE RECOVERY TIME CHARACTERISTIC

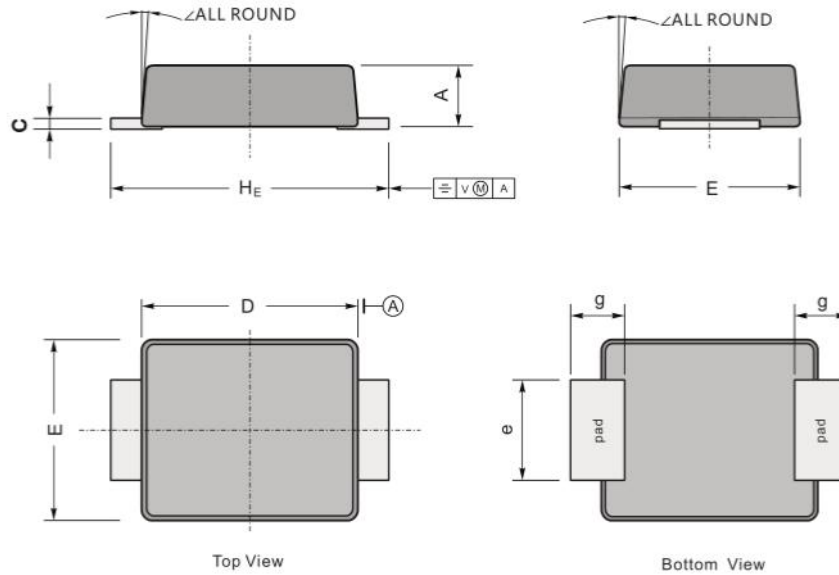


NOTES: 1. Rise Time=7ns max. Input Impedance= 1 magohm. 22pF
2. Rise time=10ns max. Source Impedance= 50 ohms

SET TIME BASE FOR 50/100ns/cm



Package Outline Dimensions in inches (millimeters)



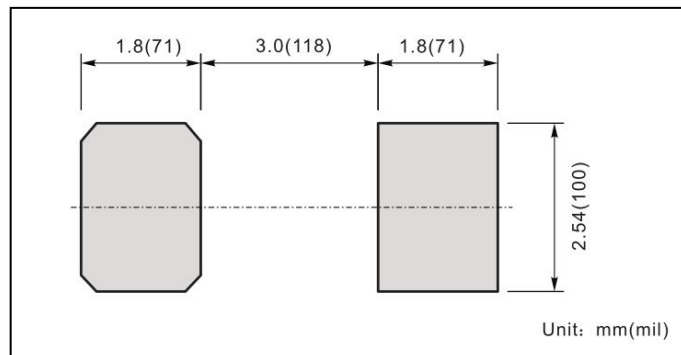
UNIT		A	C	D	E	e	g	H <sub>E</sub>	∠
mm	max	1.30	0.26	4.40	3.70	2.20	1.20	5.50	5-9°
	min	1.10	0.18	4.20	3.50	1.90	0.80	5.10	
mil	max	51	10	173	146	86	47	216	
	min	43	7	1650	138	75	31	200	

The Recommended Mounting Pad Size

Marking

Type number	Marking code
ES2AF	ES2A
ES2BF	ES2B
ES2CF	ES2C
ES2DF	ES2D
ES2EF	ES2E
ES2GF	ES2G
ES2JF	ES2J
ES2KF	ES2K

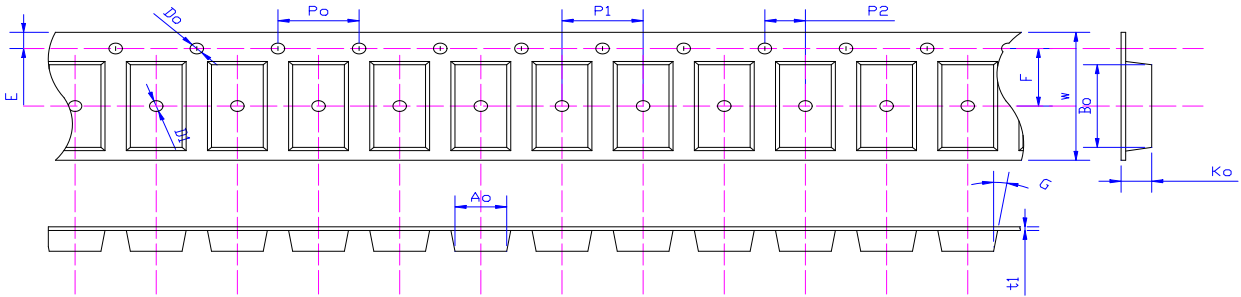
The recommended mounting pad size





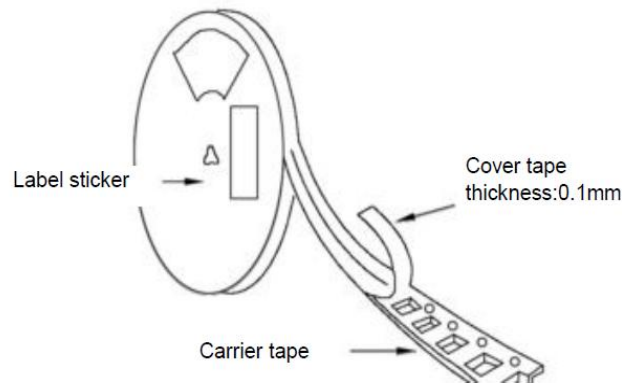
Packing Requirments

- PS black anti-static carrier tape packing



Specifications	Ao	Bo	Ko	Po	W	t1
SMBFL	3.81±0.05	5.74±0.05	1.45±0.2	4.00±0.1	12.0±0.05	0.25±0.02

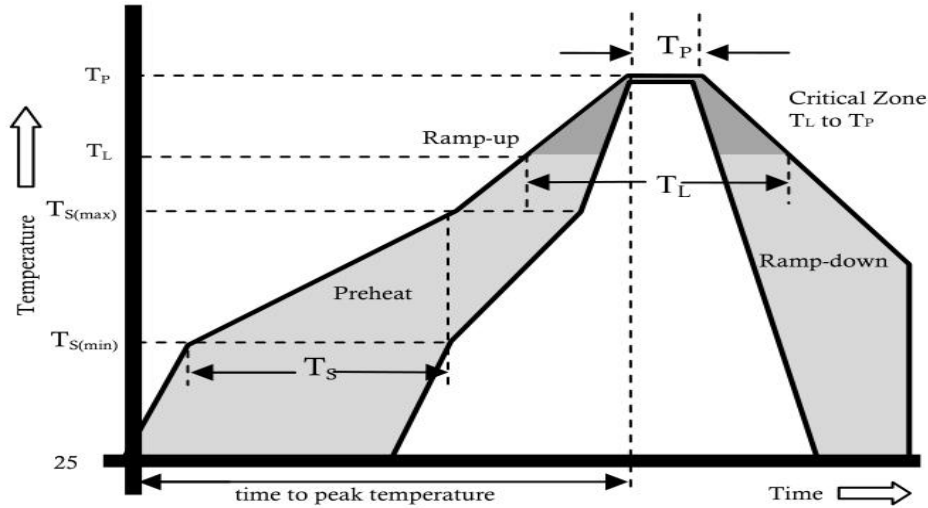
- 13" antistatic plastic reel



DEVICE TYPE	13" Reel			
	Q'TY/REEL(pcs)	REEL/BOX	BOX/CARTOON	Q'TY/CARTON(pcs)
SMBFL	6000	2	8	96000



Reflow Profile



Reflow Condition		Pb-Free Assembly
Pre Heat	Temperature Min.	+150°C
	Temperature Max.	+200°C
	Time(Min to Max)	60-180 secs.
Average ramp up rate(Liquidus Temp(T <sub>L</sub> ) to peak)		3°C/sec. Max.
T <sub>S</sub> (max) to T <sub>L</sub> - Ramp-up Rate		3°C/sec. Max.
Reflow	Temperature (T <sub>L</sub> )(Liquidus)	+217°C
	Temperature (T <sub>L</sub> )	60-150 secs.
Peak Temp (T <sub>P</sub> )		+(260+0/-5) °C
Time within 5°C of actual Peak Temp (T <sub>P</sub> )		25 secs.
Ramp-down Rate		6°C/sec. Max.
Time 25°C to peak Temp (T <sub>P</sub> )		8 min. Max.
Do not exceed		+260°C

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## Disclaimer

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