

Super Fast Surface Mount Rectifiers

Reverse Voltage 50V to 1000V Forward Current 1.0A

ES1A thru ES1M

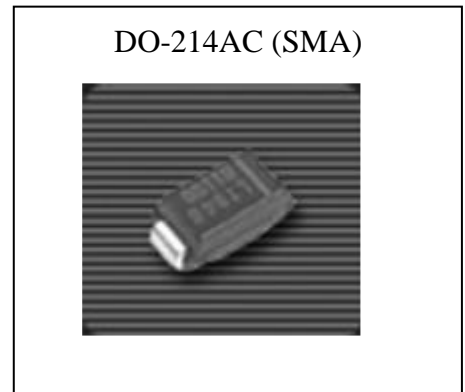
Features

- For surface mounted application
- Low profile package
- Built-in strain relief, ideal for automatic placement
- Easy pick and place
- Super fast recovery time for high efficiency
- Glass passivated junction chip
- High temperature soldering: 250° C/10 seconds at terminals
- Plastic material used carries UL flammability classification 94V-0

Mechanical Data

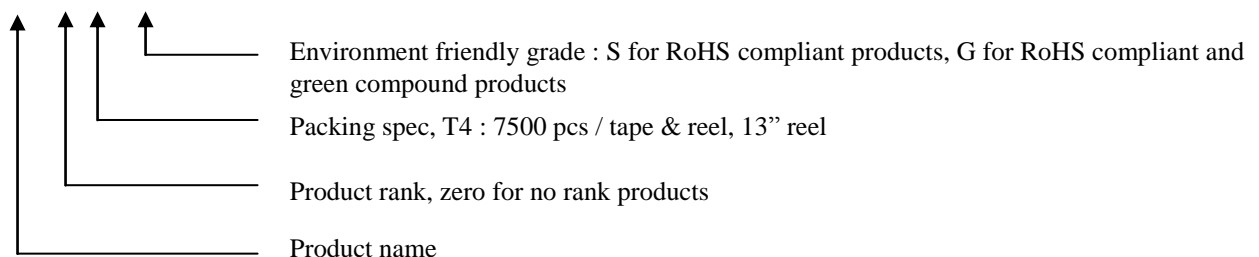
- Case: SMA/DO-214AC molded plastic
- Terminals: Pure tin plated, solderable per MIL-STD-750 method 2026
- Polarity: Indicated by cathode band
- Weight: 0.064 gram, 0.002 ounce

Outline



Ordering Information

Device	Package	Shipping	Marking
ES1A-0-T4-G	SMA (Pb-free lead plating and halogen-free package)	7500 pcs / Tape & Reel	ES1A
ES1B-0-T4-G			ES1B
ES1C-0-T4-G			ES1C
ES1D-0-T4-G			ES1D
ES1F-0-T4-G			ES1F
ES1G-0-T4-G			ES1G
ES1J-0-T4-G			ES1J
ES1K-0-T4-G			ES1K
ES1M-0-T4-G			ES1M



Maximum Ratings and Electrical Characteristics

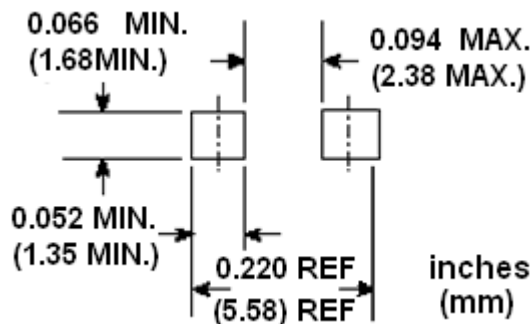
(Rating at 25°C ambient temperature unless otherwise specified. Single phase, half wave, 60Hz, resistive or inductive load. For capacitive load, derate current by 20%.)

Parameter	Symbol	Type									Units
		ES1A	ES1B	ES1C	ES1D	ES1F	ES1G	ES1J	ES1K	ES1M	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	300	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	210	280	420	560	700	V
Maximum DC blocking voltage	V_R	50	100	150	200	300	400	600	800	1000	V
Maximum instantaneous forward voltage, $I_F=1A$	V_F	0.95			1.3		1.7		2.5		V
Maximum average forward rectified current, see Fig. 1	$I_{F(AV)}$	1									A
Peak forward surge current @8.3ms single half sine wave superimposed on rated load (JEDEC method)	I_{FSM}	30									A
Maximum DC reverse current $V_R=V_{RRM}, T_A=25^\circ C$ $V_R=V_{RRM}, T_A=100^\circ C$	I_R	5 100									μA
Maximum reverse recovery time (Note 1)	t_{rr}	35									ns
Typical junction capacitance @ f=1MHz and applied 4V reverse voltage	C_J	10				8					pF
Typical thermal resistance (Note 2)	$R_{\theta JA}$ $R_{\theta JC}$	85 40									$^\circ C/W$
Power dissipation	$T_A=25^\circ C$ (Note 2)	1.5 3.1									W
	$T_C=25^\circ C$										
Storage temperature range	T_{STG}	-55 ~ +150									$^\circ C$
Operating junction temperature range	T_J	-55 ~ +150									$^\circ C$

Note: 1.Reverse recovery test conditions : $I_F=0.5A$, $I_R=1A$, $I_{RR}=0.25A$

2.P.C.B. mounted on 0.2"×0.2"(5.0mm×5.0mm) copper pad area.

Recommended soldering footprint



Characteristic Curves

FIG.1- MAXIMUM FORWARD CURRENT DERATING CURVE

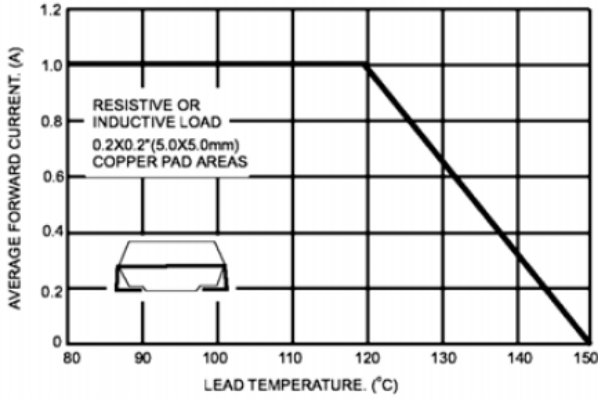


FIG.2- MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

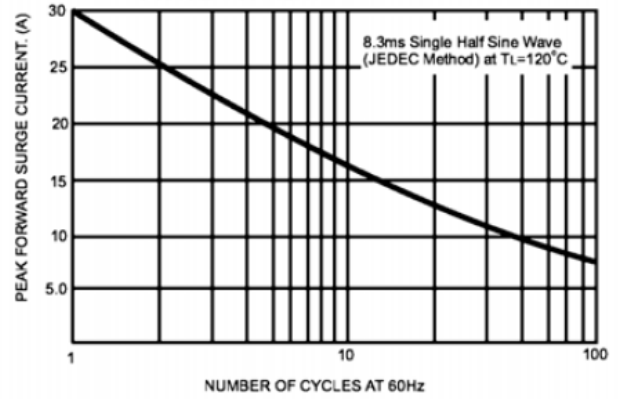


FIG.3- TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

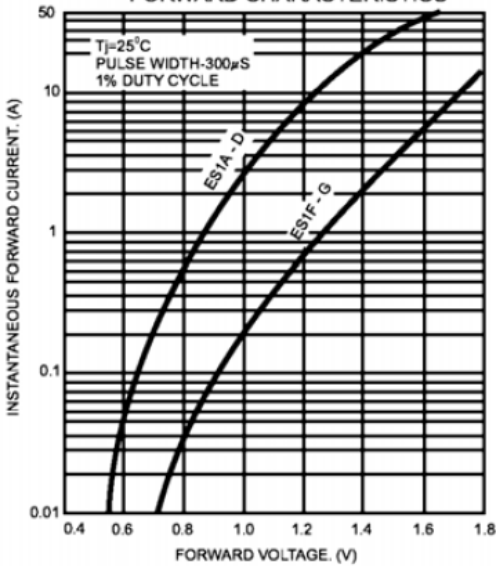


FIG.4- TYPICAL REVERSE CHARACTERISTICS

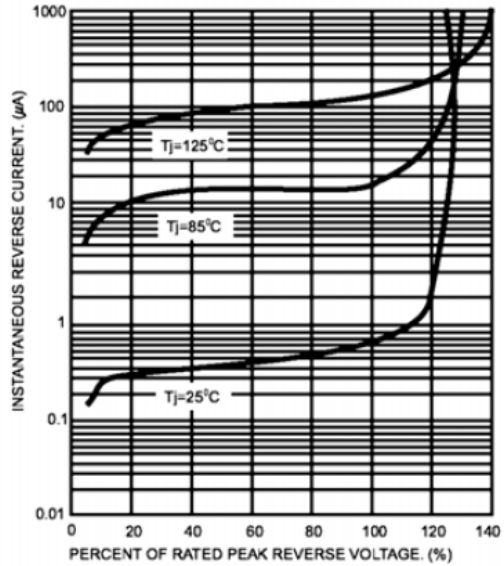
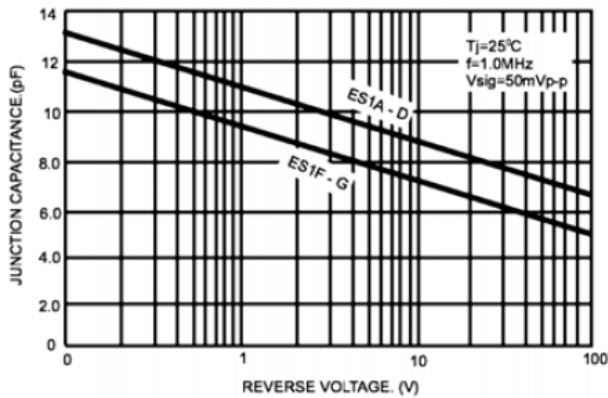
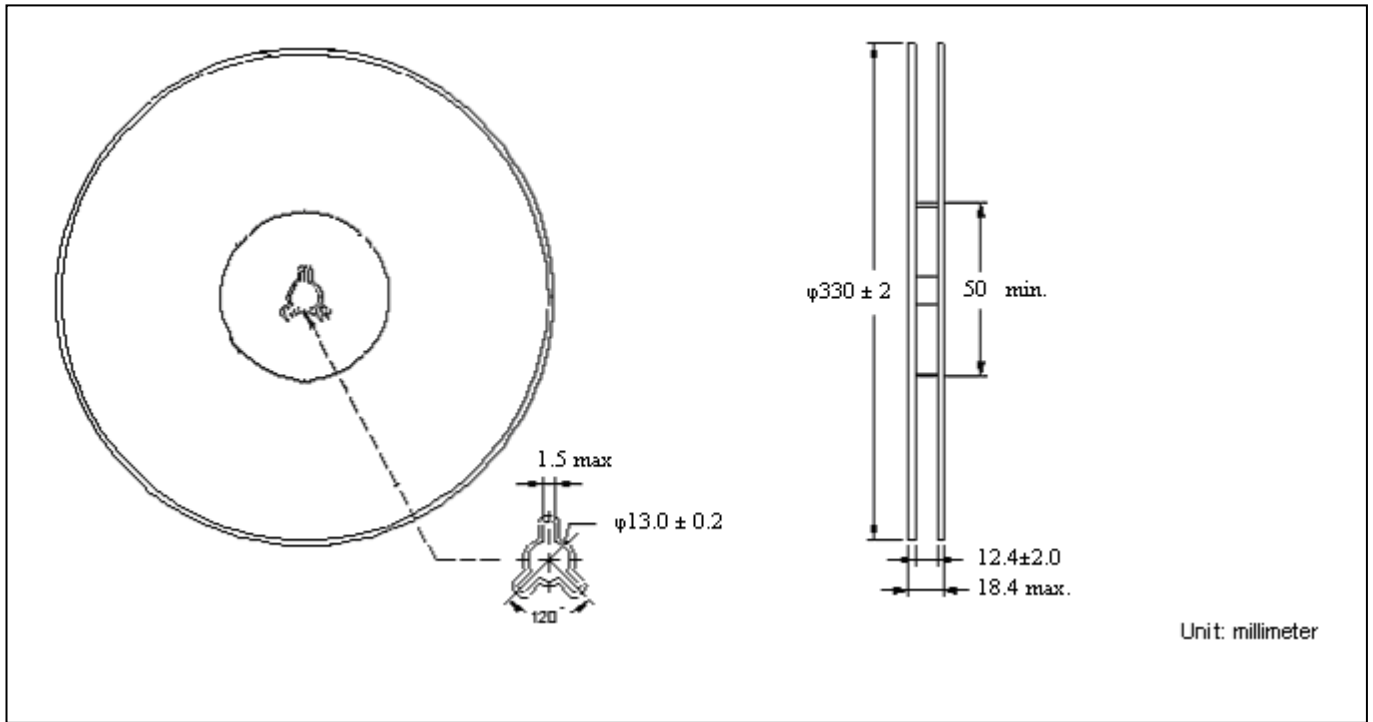


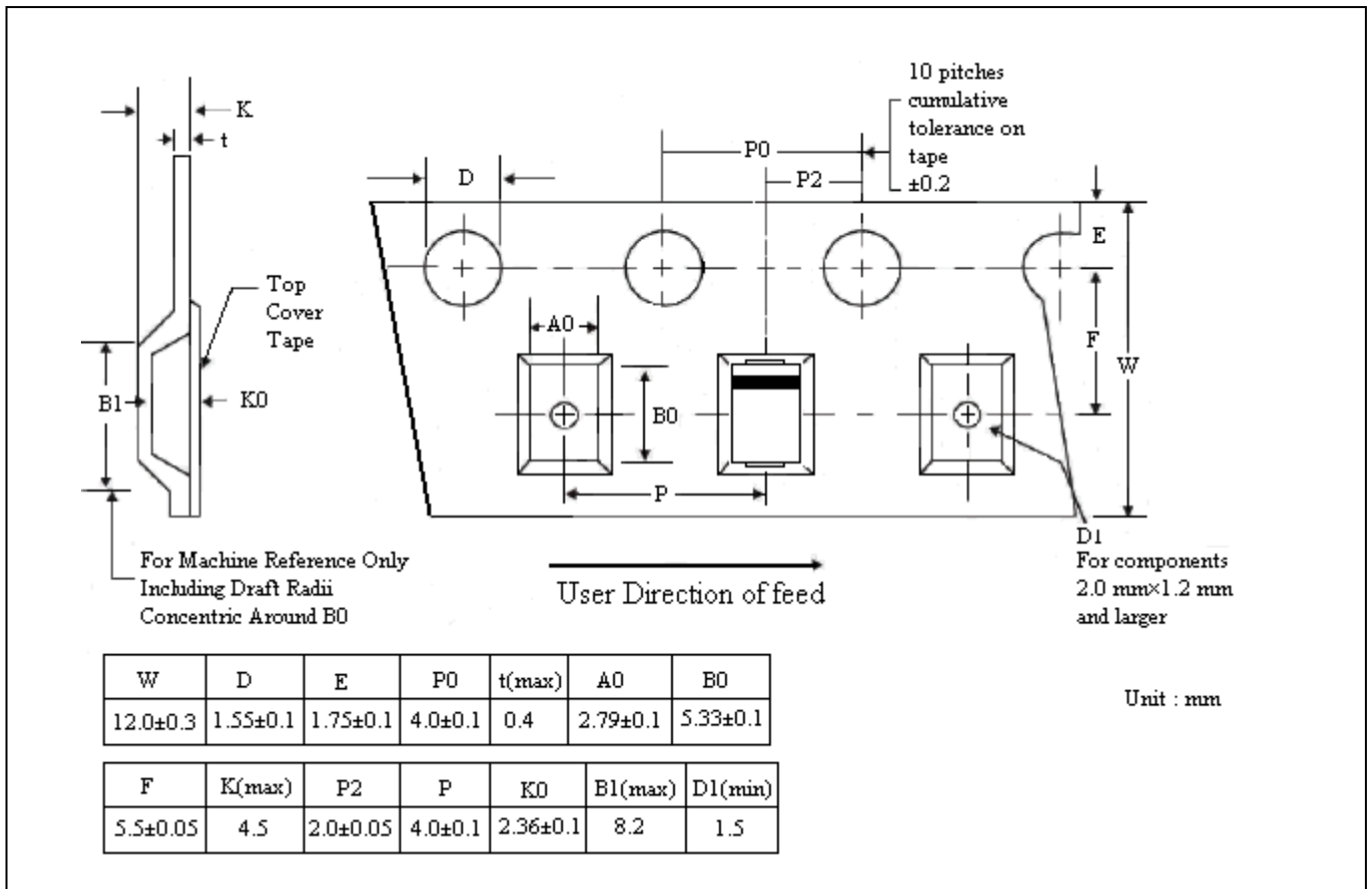
FIG.5- TYPICAL JUNCTION CAPACITANCE



Reel Dimension



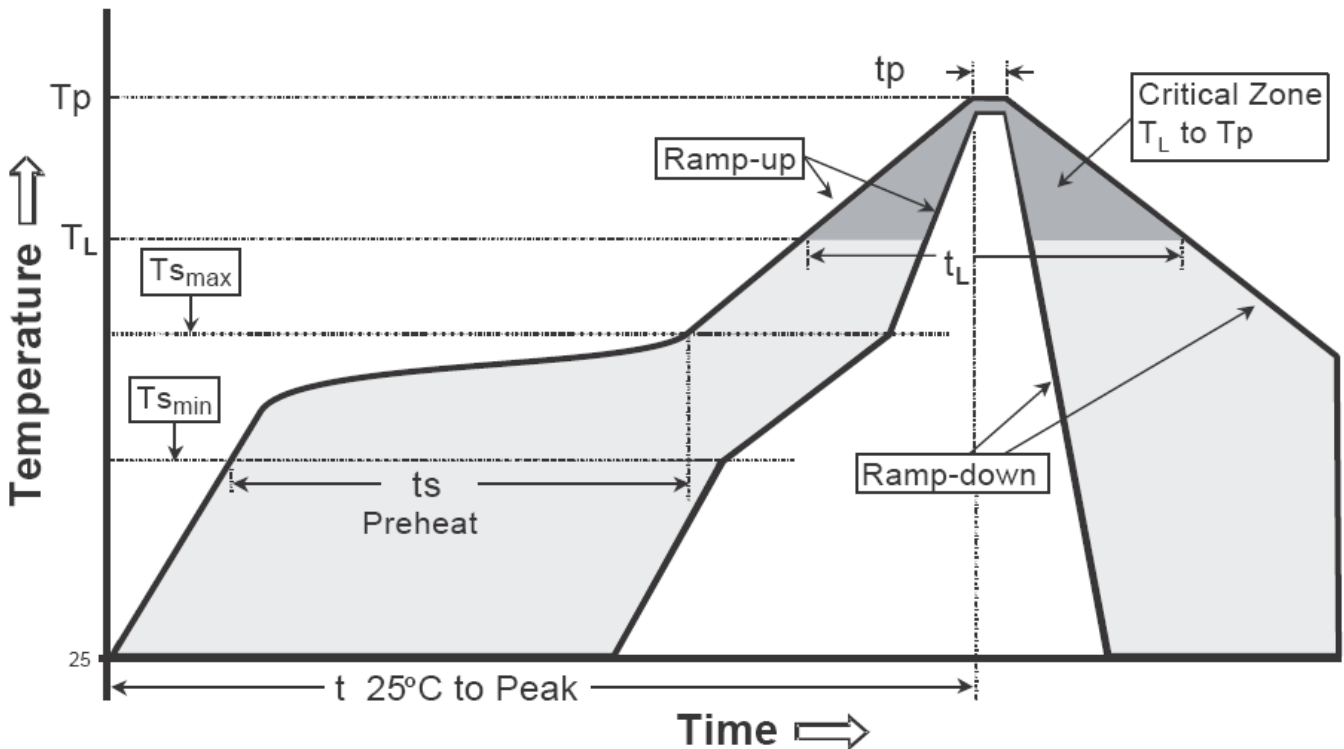
Carrier Tape Dimension



Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

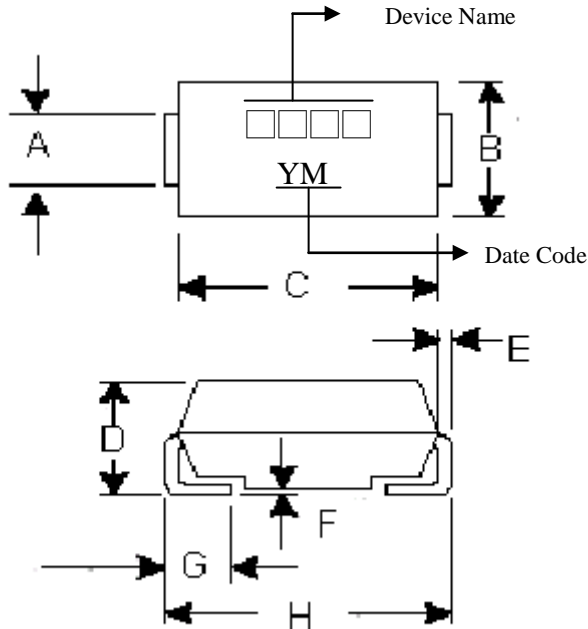
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T _{smax} to T _p)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T _{s min})	100°C	150°C
-Temperature Max(T _{s max})	150°C	200°C
-Time(ts min to ts max)	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T _L)	183°C	217°C
- Time (t _L)	60-150 seconds	60-150 seconds
Peak Temperature(T _p)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

SMA/DO-214AC Dimension



Marking :

Device	ES1A	ES1B	ES1C
Code	ES1A	ES1B	ES1C
Device	ES1D	ES1F	ES1G
Code	ES1D	ES1F	ES1G
Device	ES1J	ES1K	ES1M
Code	ES1J	ES1K	ES1M

SMA/DO-214AC Plastic
 Surface Mounted Package
 CYStek Package Code : SA

Date Code : Year Code + Month Code

Year Code :

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Code	9	A	B	C	D	E	F	G	H	J	K	0	1

Month Code :

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.052	0.062	1.32	1.60	E	0.006	0.012	0.15	0.31
B	0.098	0.114	2.50	2.90	F	0.002	0.008	0.05	0.20
C	0.154	0.181	3.90	4.60	G	0.030	0.060	0.76	1.52
D	0.067	0.091	1.70	2.30	H	0.188	0.208	4.80	5.28

- Notes :
- Controlling dimension : millimeters.
 - Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
 - If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material :

- Lead : Pure tin plated.
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0.

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