

Single Line TVS Diode for ESD

FEATURES

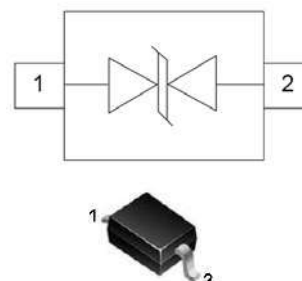
- 350 Watts peak pulse power ($t_p=8/20 \mu s$)
- Protects one I/O or power line
- Low clamping voltage
- Working voltage: 3.3V, 5V, 8V, 12V, 15V, 24V, 36V
- Low leakage current
- Solid-state silicon avalanche technology

APPLICATIONS

- Cell Phone Handsets and Accessories
- Microprocessor based equipment
- Portable Instrumentation

ORDERING INFORMATION

Type No.	Marking	Package Code
KWSD033C	3C	SOD-323
KWSD05C	5C	SOD-323
KWSD08C	8C	SOD-323
KWSD12C	AC	SOD-323
KWSD15C	BC	SOD-323
KWSD24C	CC	SOD-323
KWSD36C	T	SOD-323



SOD-323

MAXIMUM RATING @ $T_a=25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Limits	Unit
Peak pulse power($t_p=8/20\mu s$)	P_{pk}	350	W
Peak pulse current($t_p=8/20\mu s$)	I_{pp}	24	A
ESD voltage(HBM waveform per IEC 6100-4-2)	V_{pp}	30	kV
Lead soldering temperature	T_L	260 (10 sec.)	$^\circ\text{C}$
Operating temperature	T_j	-55 to +125	$^\circ\text{C}$
Storage temperature	T_{STG}	-55 to +150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

KWSD033C TVS for 3.3V Lines

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Reverse stand-off voltage	V_{RWM}			3.3	V	
Reverse breakdown voltage	$V_{(BR)R}$	4			V	$I_R=1mA$
Clamping voltage	V_C			9.8 14.5	V	$I_{PP}=5A, t_p=8/20\mu s$ $I_{PP}=24A, t_p=8/20\mu s$
Reverse leakage current	I_R			10	μA	$V_{RWM}=3.3V$
Junction Capacitance	C_J		40	80	pF	$V_R=0V, f=1MHz$

KWSD05C TVS for 5V Lines

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Reverse stand-off voltage	V_{RWM}			5	V	
Reverse breakdown voltage	$V_{(BR)R}$	6			V	$I_R=1mA$
Clamping voltage	V_C			9.8 14.5	V	$I_{PP}=5A, t_p=8/20\mu s$ $I_{PP}=24A, t_p=8/20\mu s$
Reverse leakage current	I_R			10	μA	$V_{RWM}=5V$
Junction Capacitance	C_J		40	50	pF	$V_R=0V, f=1MHz$

ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

KWSD08C TVS for 8V Lines

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Reverse stand-off voltage	V_{RWM}			8	V	
Reverse breakdown voltage	$V_{(BR)R}$	9.0			V	$I_R=1mA$
Clamping voltage	V_C			14.5 19.0	V	$I_{PP}=5A, t_p=8/20\mu s$ $I_{PP}=20A, t_p=8/20\mu s$
Reverse leakage current	I_R			10	μA	$V_{RWM}=8V$
Junction Capacitance	C_J		40	50	pF	$V_R=0V, f=1MHz$

KWSD12C TVS for 12V Lines

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Reverse stand-off voltage	V_{RWM}			12	V	
Reverse breakdown voltage	$V_{(BR)R}$	13.3			V	$I_R=1mA$
Clamping voltage	V_C			19 24	V	$I_{PP}=5A, t_p=8/20\mu s$ $I_{PP}=15A, t_p=8/20\mu s$
Reverse leakage current	I_R			1	μA	$V_{RWM}=12V$
Junction Capacitance	C_J		25	30	pF	$V_R=0V, f=1MHz$

KWSD15C TVS for 15V Lines

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Reverse stand-off voltage	V_{RWM}			15	V	
Reverse breakdown voltage	$V_{(BR)R}$	16.7			V	$I_R=1mA$
Clamping voltage	V_C			24 29	V	$I_{PP}=5A, t_p=8/20\mu s$ $I_{PP}=12A, t_p=8/20\mu s$
Reverse leakage current	I_R			1	μA	$V_{RWM}=15V$
Junction Capacitance	C_J		25	30	pF	$V_R=0V, f=1MHz$

KWSD24C TVS for 24V Lines

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Reverse stand-off voltage	V_{RWM}			24	V	
Reverse breakdown voltage	$V_{(BR)R}$	26.7			V	$I_R=1mA$
Clamping voltage	V_C			40 44	V	$I_{PP}=5A, t_p=8/20\mu s$ $I_{PP}=8A, t_p=8/20\mu s$
Reverse leakage current	I_R			1	μA	$V_{RWM}=24V$
Junction Capacitance	C_J		20	25	pF	$V_R=0V, f=1MHz$

KWSD24C TVS for 24V Lines

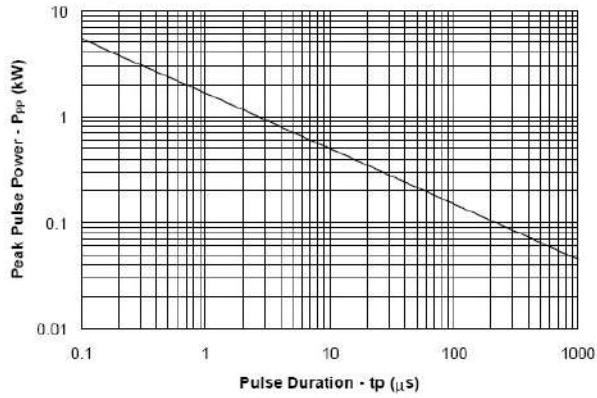
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Reverse stand-off voltage	V_{RWM}			24	V	
Reverse breakdown voltage	$V_{(BR)R}$	26.7			V	$I_R=1mA$
Clamping voltage	V_C			40 44	V	$I_{PP}=5A, t_p=8/20\mu s$ $I_{PP}=8A, t_p=8/20\mu s$
Reverse leakage current	I_R			1	μA	$V_{RWM}=24V$
Junction Capacitance	C_J		20	25	pF	$V_R=0V, f=1MHz$

KWSD36C TVS for 36V Lines

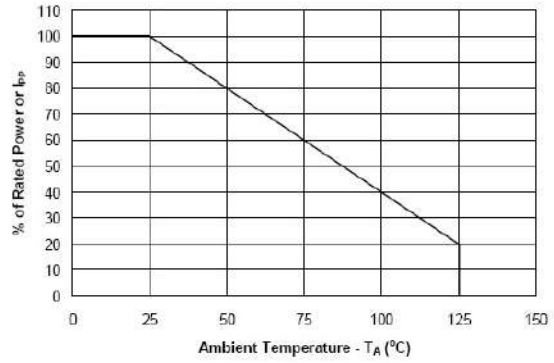
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Reverse stand-off voltage	V_{RWM}			36	V	
Reverse breakdown voltage	$V_{(BR)R}$	39.6			V	$I_R=1mA$
Clamping voltage	V_C			62 80	V	$I_{PP}=1A, t_p=8/20\mu s$ $I_{PP}=3A, t_p=8/20\mu s$
Reverse leakage current	I_R			1	μA	$V_{RWM}=36V$
Junction Capacitance	C_J		20	25	pF	$V_R=0V, f=1MHz$

TYPICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

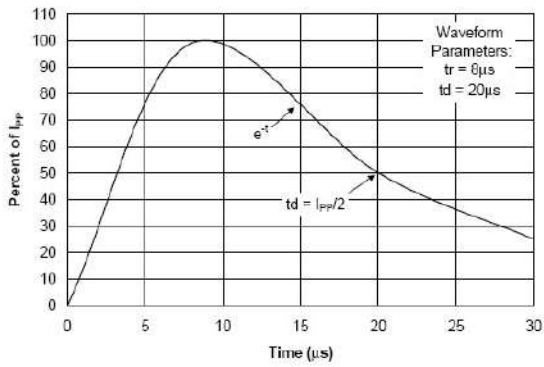
Non-Repetitive Peak Pulse Power vs. Pulse Time



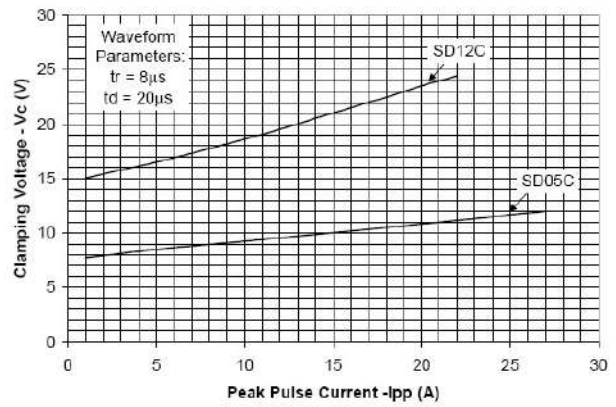
Power Derating Curve



Pulse Waveform



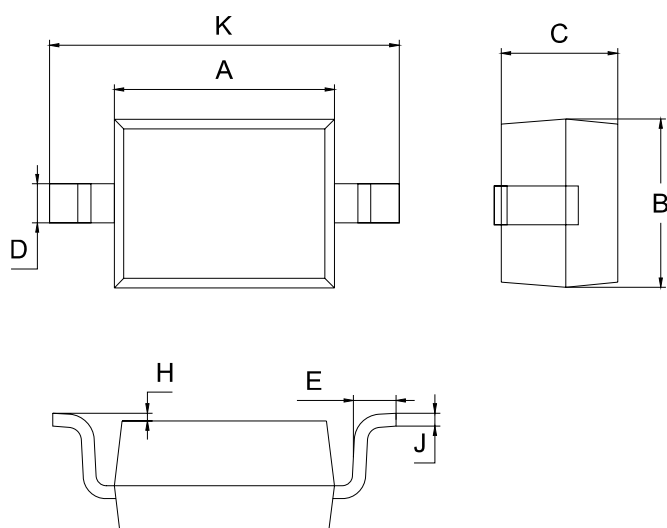
Clamping Voltage vs. Peak Pulse Current



PACKAGE OUTLINE

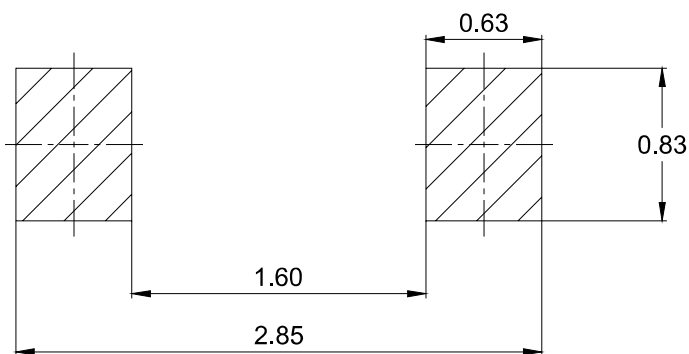
Plastic surface mounted package

SOD-323



SOD-323		
Dim	Min	Max
A	1.60	1.80
B	1.20	1.40
C	0.9 Max	
D	0.30 Typical	
E	0.22	0.42
H	0.02	0.1
J	0.1 Typical	
K	2.55	2.75
All Dimensions in mm		

SOLDERING FOOTPRINT



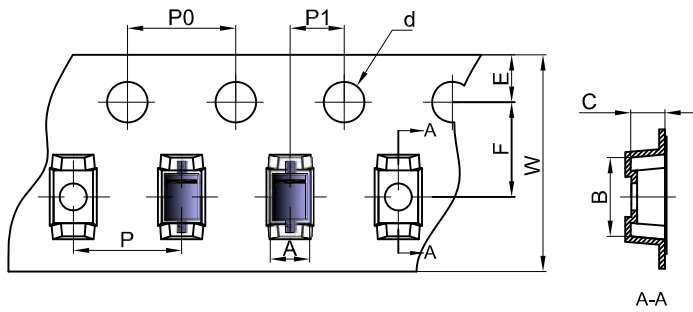
Unit : mm

PACKAGE INFORMATION

Device	Package	Shipping
KWSD03C-KWSD36C	SOD-323	3000/Tape&Reel

SOD-323 Tape and Reel

SOD-323 Embossed Carrier Tape

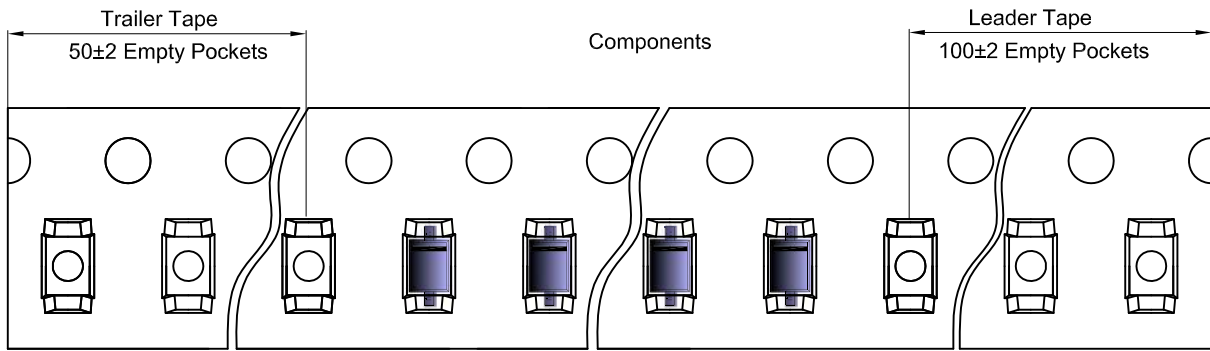


Packaging Description:
 SOD-323 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. 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 is made of polystyrene plastic (anti-static coated).

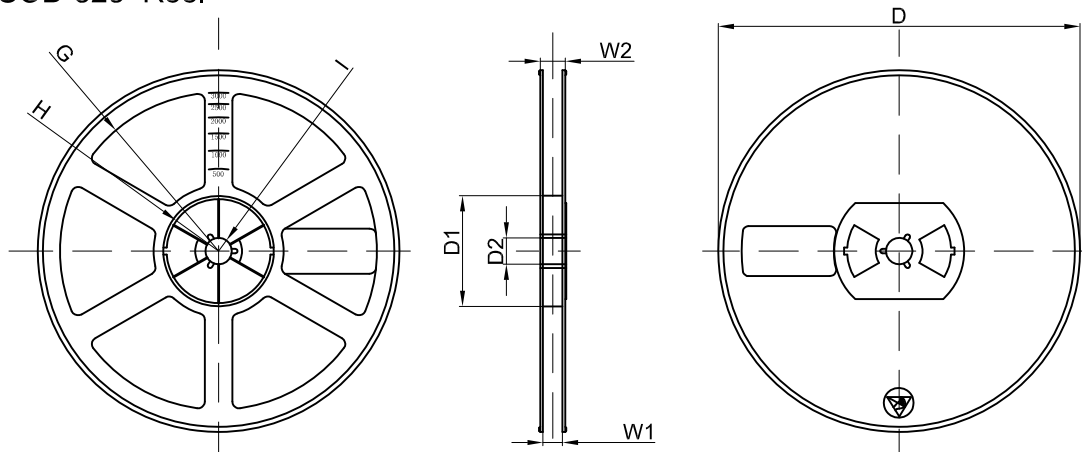
Dimensions are in millimeter

Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOD-323	1.48	3.3	1.25	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOD-323 Tape Leader and Trailer



SOD-323 Reel



Dimensions are in millimeter

Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	45,000 pcs	203×203×195	180,000 pcs	438×438×220	