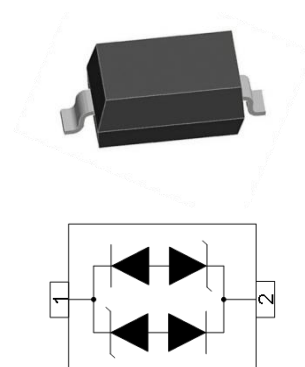


Descriptions

The UP3.5P323CXXP01 series has been specifically designed to protect sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other voltage induced transient events. Excellent clamping capability, low leakage, and fast response time provide best in class protection on designs that are exposed to ESD for board level.

Features

- ◆ 350W peak pulse power ($t_p = 8/20\mu s$)
- ◆ IEC 61000-4-2 (ESD): $\pm 30KV$ (Contact), $\pm 30KV$ (Air)
- ◆ IEC 61000-4-4 (EFT): 40A ($t_p = 5/50ns$)
- ◆ Low clamping voltage
- ◆ Working voltages: 3.3V, 5V, 8V, 12V, 15V, 24V
- ◆ Low leakage current
- ◆ Protecting one bi-directional line
- ◆ SOD-323 surface mount package
- ◆ Solid-state silicon avalanche technology
- ◆ Solder reflow temperature: Pure Tin-Sn, 260-270°C
- ◆ Plastic package has underwriters laboratory flammability 94V-0
- ◆ Meet Lead Free/RoHS compliant
- ◆ Meet MSL level1, per J-STD-020



Applications

- ◆ Cellular Handsets and Accessories
- ◆ Personal Digital Assistants (PDA's)
- ◆ Notebooks & Handhelds
- ◆ Portable Instrumentation etc.

Dimensions (SOD-323)

Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.80	1.10	0.031	0.043
A1	-	0.20	-	0.008
b	0.25	0.40	0.010	0.016
C	0.000	0.18	0.000	0.007
D	1.40	1.80	0.055	0.071
E	1.15	1.45	0.045	0.057
HE	2.30	2.90	0.091	0.110
L	0.08	-	0.003	-

Maximum Ratings ($T_A=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power ($t_p = 8/20\mu\text{s}$)	P_{PPM}	350	W
ESD voltage (Contact discharge)	V_{ESD}	± 30	KV
ESD voltage (Air discharge)		± 30	
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 ($T_A=25^{\circ}\text{C}$, unless otherwise noted)

UP3.5P323C03P01						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}	-	-	-	3.3	V
Reverse breakdown voltage	V_{BR}	$I_T=1\text{mA}$	4	-	-	V
Reverse leakage current	I_R	$V_{RWM}=3.3\text{V}$	-	-	2	μA
Clamping voltage ($t_p=8/20\mu\text{s}$)	V_C	$I_{PP}=1\text{A}$	-	-	7	V
Clamping voltage ($t_p=8/20\mu\text{s}$)	V_C	$I_{PP}=19\text{A}$	-	-	18.5	V
Junction capacitance	C_J	$V_R=0\text{V}$, $f=1\text{MHz}$	-	0.8	-	pF

UP3.5P323C05P01

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}	-	-	-	5	V
Reverse breakdown voltage	V_{BR}	$I_T=1mA$	6.2	-	-	V
Reverse leakage current	I_R	$V_{RWM}=5V$	-	-	1	μA
Clamping voltage ($t_p=8/20\mu s$)	V_C	$I_{PP}=1A$	-	-	9.8	V
Clamping voltage ($t_p=8/20\mu s$)	V_C	$I_{PP}=16A$	-	-	20	V
Junction capacitance	C_J	$V_R=0V, f=1MHz$	-	0.95	-	pF

UP3.5P323C08P01

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}	-	-	-	8	V
Reverse breakdown voltage	V_{BR}	$I_T=1mA$	8.5	-	-	V
Reverse leakage current	I_R	$V_{RWM}=8V$	-	-	1	μA
Clamping voltage ($t_p=8/20\mu s$)	V_C	$I_{PP}=8A$	-	-	18	V
Clamping voltage ($t_p=8/20\mu s$)	V_C	$I_{PP}=18A$	-	-	24.2	V
Junction capacitance	C_J	$V_R=0V, f=1MHz$	-	0.8	-	pF

UP3.5P323C12P01

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}	-	-	-	12	V
Reverse breakdown voltage	V_{BR}	$I_T=1mA$	13.3	-	-	V
Reverse leakage current	I_R	$V_{RWM}=12V$	-	-	1	μA
Clamping voltage ($t_p=8/20\mu s$)	V_C	$I_{PP}=1A$	-	-	19	V
Clamping voltage ($t_p=8/20\mu s$)	V_C	$I_{PP}=6A$	-	-	24	V
Clamping voltage ($t_p=8/20\mu s$)	V_C	$I_{PP}=12A$	-	-	28.6	V
Junction capacitance	C_J	$V_R=0V, f=1MHz$	-	0.8	-	pF

UP3.5P323C15P01

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}	-	-	-	15	V
Reverse breakdown voltage	V_{BR}	$I_T=1mA$	16.7	-	-	V
Reverse leakage current	I_R	$V_{RWM}=15V$	-	-	1	μA
Clamping voltage (tp=8/20 μs)	V_C	$I_{PP}=1A$	-	-	24	V
Clamping voltage (tp=8/20 μs)	V_C	$I_{PP}=5A$	-	-	29.0	V
Clamping voltage (tp=8/20 μs)	V_C	$I_{PP}=10A$	-	-	31.8	V
Junction capacitance	C_J	$V_R=0V, f=1MHz$	-	0.8	-	pF

UP3.5P323C24P01

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}	-	-	-	24	V
Reverse breakdown voltage	V_{BR}	$I_T=1.0mA$	26.7	-	-	V
Reverse leakage current	I_R	$V_{RWM}=24V$	-	-	1	μA
Clamping voltage (tp=8/20 μs)	V_C	$I_{PP}=1A$	-	-	43	V
Clamping voltage (tp=8/20 μs)	V_C	$I_{PP}=3A$	-	-	45	V
Clamping voltage (tp=8/20 μs)	V_C	$I_{PP}=6A$	-	-	56	V
Junction capacitance	C_J	$V_R=0V, f=1MHz$	-	0.8	-	pF

Typical Characteristic Curves (TA=25°C, unless otherwise noted)

Figure 1. Pulse Waveform

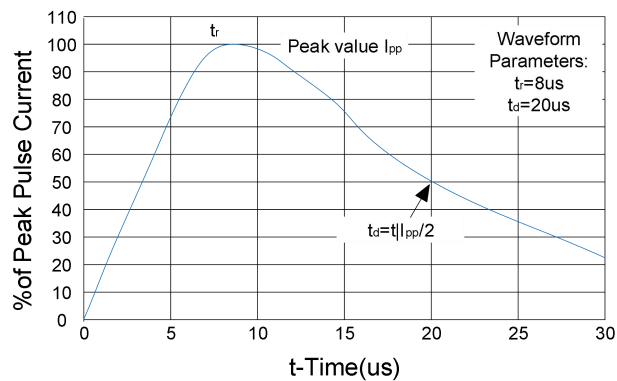


Figure 2. Pulse Derating Curve

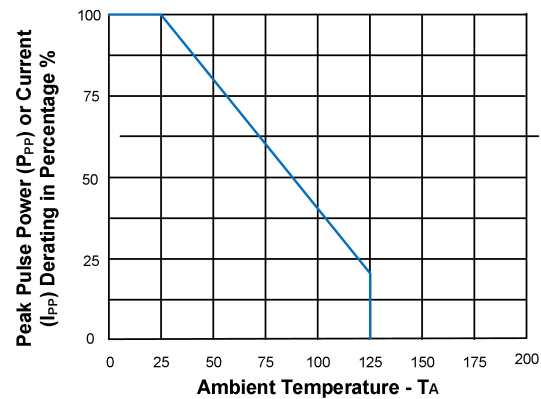


Figure 3. Typical Junction Capacitance

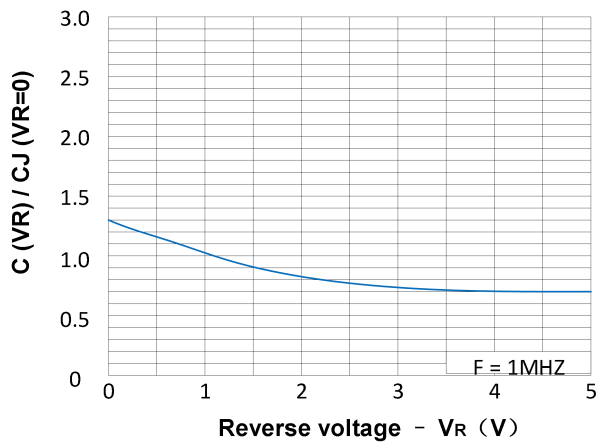
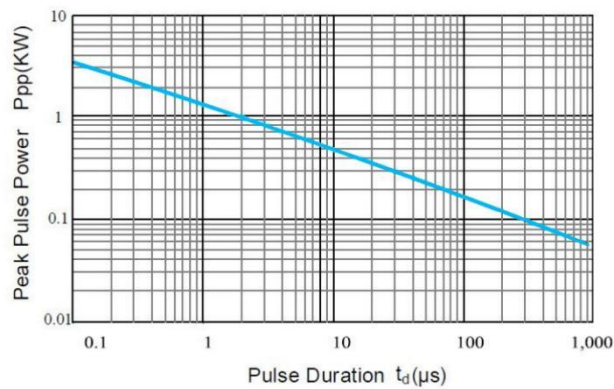
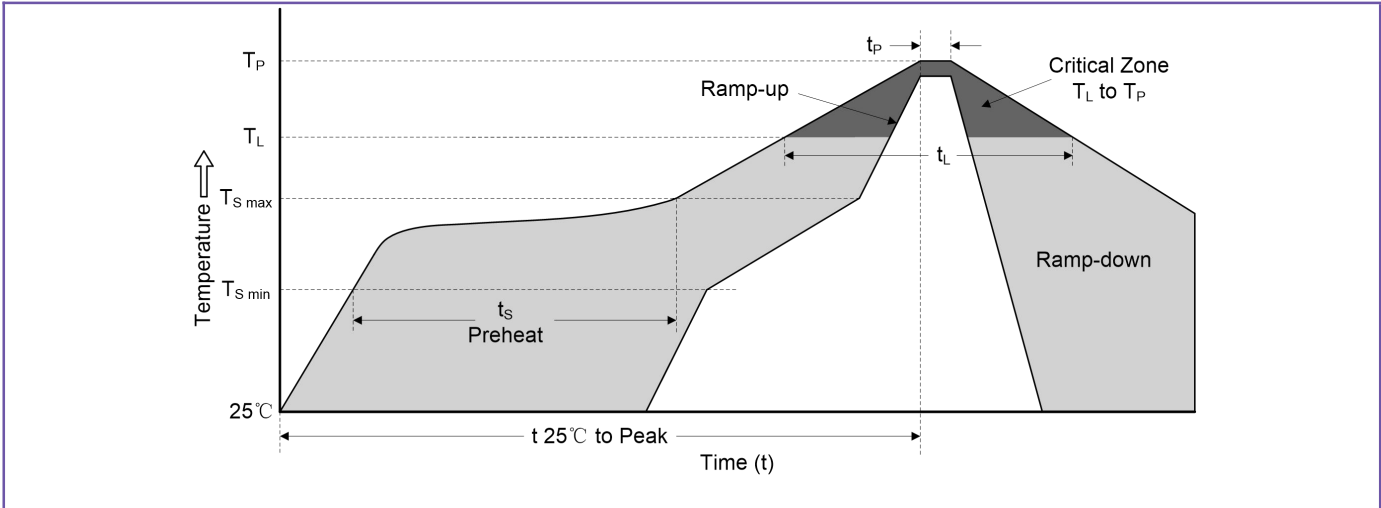


Figure 4. V_C vs. I_{PP}



Reflow Soldering Parameters



Reflow Condition		Lead-free Assembly
Preheat	-Temperature Min ($T_{S\ min}$)	150°C
	-Temperature Max ($T_{S\ max}$)	200°C
	-Time (min to max) (t_s)	60-180 seconds
Average ramp-up rate (T_L to T_P)		3°C/second max.
$T_{S\ max}$ to T_L -Ramp-up Rate		3°C/second max.
Reflow	-Temperature (T_L) (Liquidus)	217°C
	-Time (min to max) (t_s)	60-150 seconds
Peak Temperature (T_P)		260(+0/-5)°C
Time within 5°C of actual Peak Temperature (t_P)		20-40 seconds
Ramp-down Rate		6°C/second max.
Time 25°C to Peak Temperature(T_P)		8 minutes max.
Do not exceed		260°C

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