

## Electrostatic Discharged Protection Devices (ESD) Data Sheet

### Description

The SJD12A(C)XXL01 series are designed to protect voltage sensitive components from high voltage, high energy transients. Excellent clamping capability, high surge capability, low zener impedance and fast response time. Because of its small size, it is ideal for use in cellular phones, portable device, business machines, power supplies and many other industrial/consumer applications.



Contact :  $\pm 8\text{kV}$   
Air :  $\pm 15\text{kV}$

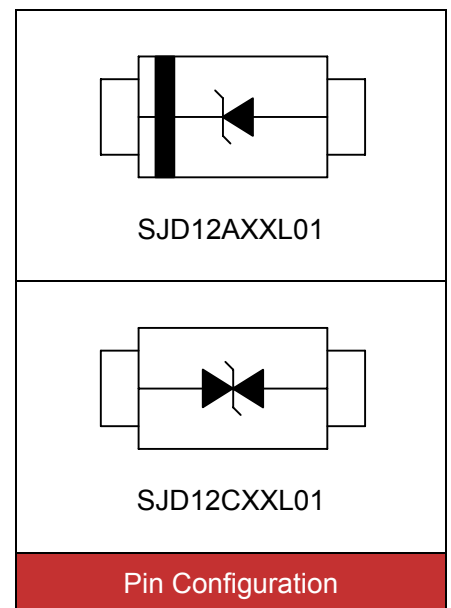


### Features

- IEC61000-4-2 ESD 15KV Air, 8KV contact compliance
- SOD-123S surface mount package
- Protects one I/O line
- Peak power dissipation of 1000W under 8/20 $\mu\text{s}$  waveform
- Working voltage: 5V~170V
- Low leakage current
- Solid-state silicon avalanche technology
- Lead Free/RoHS compliant
- Solder reflow temperature: Pure Tin-Sn, 260~270 $^{\circ}\text{C}$
- Flammability rating UL 94V-0
- Meets MSL level 1, per J-STD-020

### Applications

- Personal digital assistants (PDA)
- Cellular handsets & Accessories
- Portable devices
- Portable instrumentation
- Handhelds and notebooks
- Digital cameras



### Maximum Ratings

Rating	Symbol	Value	Unit
Peak pulse power (tp=10/1000 $\mu\text{s}$ waveform)	$P_{PP}$	200	W
Peak pulse power (tp=8/20 $\mu\text{s}$ waveform)	$P_{PP}$	1000	W
ESD voltage (Contact discharge)	$V_{ESD}$	$\pm 8$	kV
ESD voltage (Air discharge)		$\pm 15$	
Storage & operating temperature range	$T_{STG}, T_J$	-55~+150	$^{\circ}\text{C}$

**Electrical Characteristics ( $T_J=25^{\circ}\text{C}$ )**

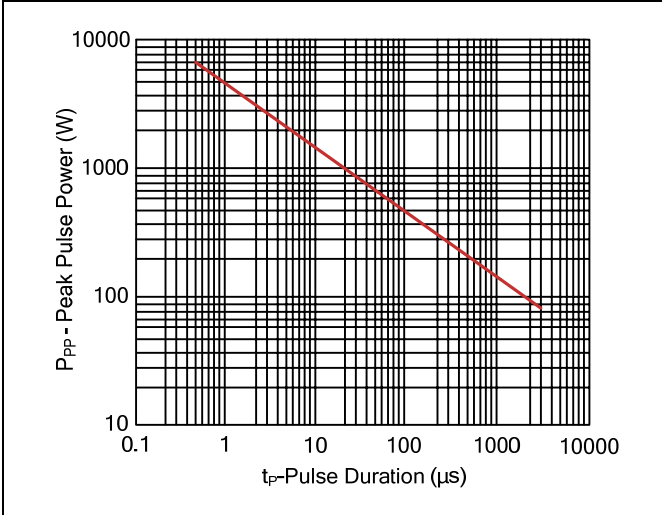
Part Number	Device Marking Code		Reverse Stand-Off Voltage $V_{RWM}(V)$	Breakdown Voltage @ $I_T$		Test Current $I_T(mA)$	Maximum Clamping Voltage @ $I_{PP}$ $V_C(V)$	Peak Pulse Current $I_{PP}(A)$	Reverse Leakage @ $V_{RWM}$ $I_R(\mu A)$
	UNI	BI		$V_{BR\ MIN.}(V)$	$V_{BR\ MAX.}(V)$				
SJD12A(C)05L01	KE	AE	5.0	6.40	7.00	10	9.2	21.8	800
SJD12A(C)06L01	KG	AG	6.0	6.67	7.37	10	10.3	19.4	800
SJD12A(C)6.5L01	KK	AK	6.5	7.22	7.98	10	11.2	17.9	500
SJD12A(C)07L01	KM	AM	7.0	7.78	8.60	10	12.0	16.7	200
SJD12A(C)7.5L01	KP	AP	7.5	8.33	9.21	1	12.9	15.5	100
SJD12A(C)08L01	KR	AR	8.0	8.89	9.83	1	13.6	14.7	50
SJD12A(C)8.5L01	KT	AT	8.5	9.44	10.40	1	14.4	13.9	20
SJD12A(C)09L01	KV	AV	9.0	10.00	11.10	1	15.4	13.0	10
SJD12A(C)10L01	KX	AX	10.0	11.10	12.30	1	17.0	11.8	5
SJD12A(C)11L01	KZ	AZ	11.0	12.20	13.50	1	18.2	11.0	3
SJD12A(C)12L01	LE	BE	12.0	13.30	14.70	1	19.9	10.1	1
SJD12A(C)13L01	LG	BG	13.0	14.40	15.90	1	21.5	9.3	1
SJD12A(C)14L01	LK	BK	14.0	15.60	17.20	1	23.2	8.6	1
SJD12A(C)15L01	LM	BM	15.0	16.70	18.50	1	24.4	8.2	1
SJD12A(C)16L01	LP	BP	16.0	17.80	19.70	1	26.0	7.7	1
SJD12A(C)17L01	LR	BR	17.0	18.90	20.90	1	27.6	7.3	1
SJD12A(C)18L01	LT	BT	18.0	20.00	22.10	1	29.2	6.9	1
SJD12A(C)20L01	LV	BV	20.0	22.20	24.50	1	32.4	6.2	1
SJD12A(C)22L01	LX	BX	22.0	24.40	26.90	1	35.5	5.7	1
SJD12A(C)24L01	LZ	BZ	24.0	26.70	29.50	1	38.9	5.2	1
SJD12A(C)26L01	ME	CE	26.0	28.90	31.90	1	42.1	4.8	1
SJD12A(C)28L01	MG	CG	28.0	31.10	34.40	1	45.4	4.4	1
SJD12A(C)30L01	MK	CK	30.0	33.30	36.80	1	48.4	4.2	1
SJD12A(C)33L01	MM	CM	33.0	36.70	40.60	1	53.3	3.8	1
SJD12A(C)36L01	MP	CP	36.0	40.00	44.20	1	58.1	3.5	1
SJD12A(C)40L01	MR	CR	40.0	44.40	49.10	1	64.5	3.1	1
SJD12A(C)43L01	MT	CT	43.0	47.80	52.80	1	69.4	2.9	1

**Electrical Characteristics ( $T_J=25^{\circ}\text{C}$ )**

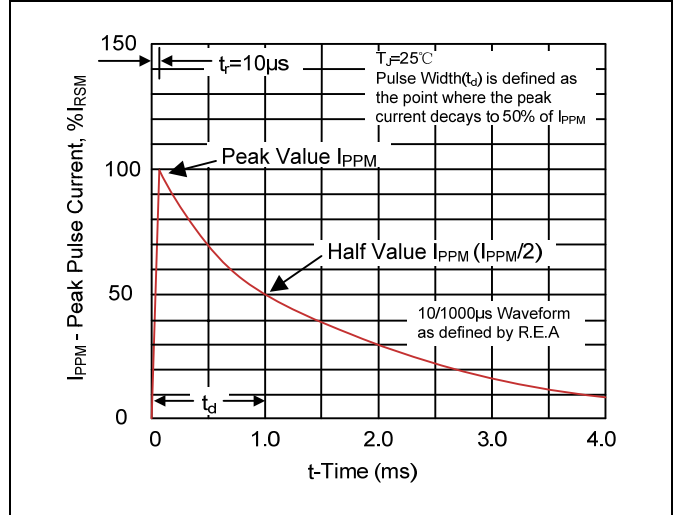
Part Number	Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @ $I_T$		Test Current	Maximum Clamping Voltage @ $I_{PP}$	Peak Pulse Current	Reverse Leakage @ $V_{RWM}$
	UNI	BI	$V_{RWM}(V)$	$V_{BR\ MIN.}(V)$	$V_{BR\ MAX.}(V)$	$I_T(mA)$	$V_C(V)$	$I_{PP}(A)$	$I_R(\mu A)$
SJD12A(C)45L01	MV	CV	45.0	50.00	55.30	1	72.7	2.8	1
SJD12A(C)48L01	MX	CX	48.0	53.30	58.90	1	77.4	2.6	1
SJD12A(C)51L01	MZ	CZ	51.0	56.70	62.70	1	82.4	2.5	1
SJD12A(C)54L01	NE	DE	54.0	60.00	66.30	1	87.1	2.3	1
SJD12A(C)58L01	NG	DG	58.0	64.40	71.20	1	93.6	2.3	1
SJD12A(C)60L01	NK	DK	60.0	66.70	73.70	1	96.8	2.1	1
SJD12A(C)64L01	NM	DM	64.0	71.10	78.60	1	103.0	2.0	1
SJD12A(C)70L01	NP	DP	70.0	77.80	86.00	1	113.0	1.8	1
SJD12A(C)75L01	NR	DR	75.0	83.30	92.10	1	121.0	1.7	1
SJD12A(C)78L01	NT	DT	78.0	86.70	95.80	1	126.0	1.6	1
SJD12A(C)85L01	NV	DV	85.0	94.40	104.00	1	137.0	1.5	1
SJD12A(C)90L01	NX	DX	90.0	100.00	111.00	1	146.0	1.4	1
SJD12A(C)100L01	NZ	DZ	100.0	111.00	123.00	1	162.0	1.3	1
SJD12A(C)110L01	PE	EE	110.0	122.00	135.00	1	177.0	1.2	1
SJD12A(C)120L01	PG	EG	120.0	133.00	147.00	1	193.0	1.1	1
SJD12A(C)130L01	PK	EK	130.0	144.00	159.00	1	209.0	1.0	1
SJD12A(C)150L01	PM	EM	150.0	167.00	185.00	1	243.0	0.8	1
SJD12A(C)160L01	PP	EP	160.0	178.00	197.00	1	259.0	0.8	1
SJD12A(C)170L01	PR	ER	170.0	189.00	209.00	1	275.0	0.8	1

**Typical Characteristics Curves**

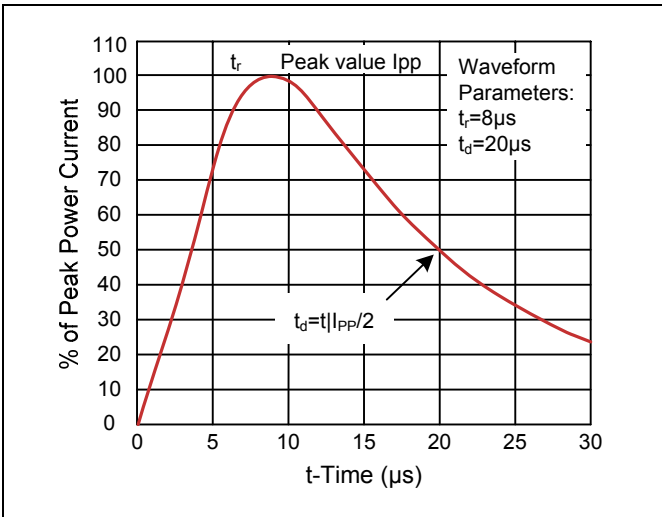
**Figure 1. Peak Pulse Power Rating Curve**



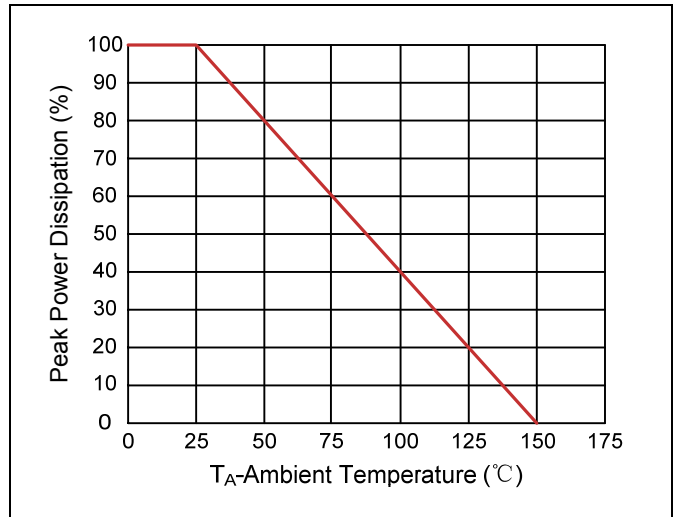
**Figure 2. 10/1000μs Pulse Waveforms**



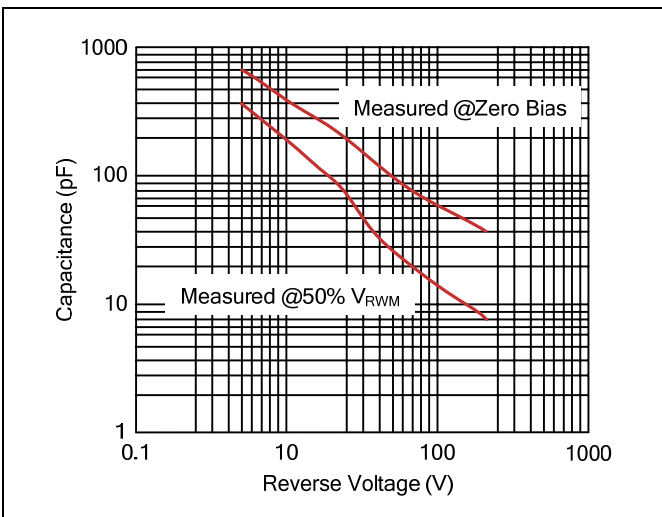
**Figure 3. 8/20μs Pulse Waveforms**



**Figure 4. Power Derating Curve**

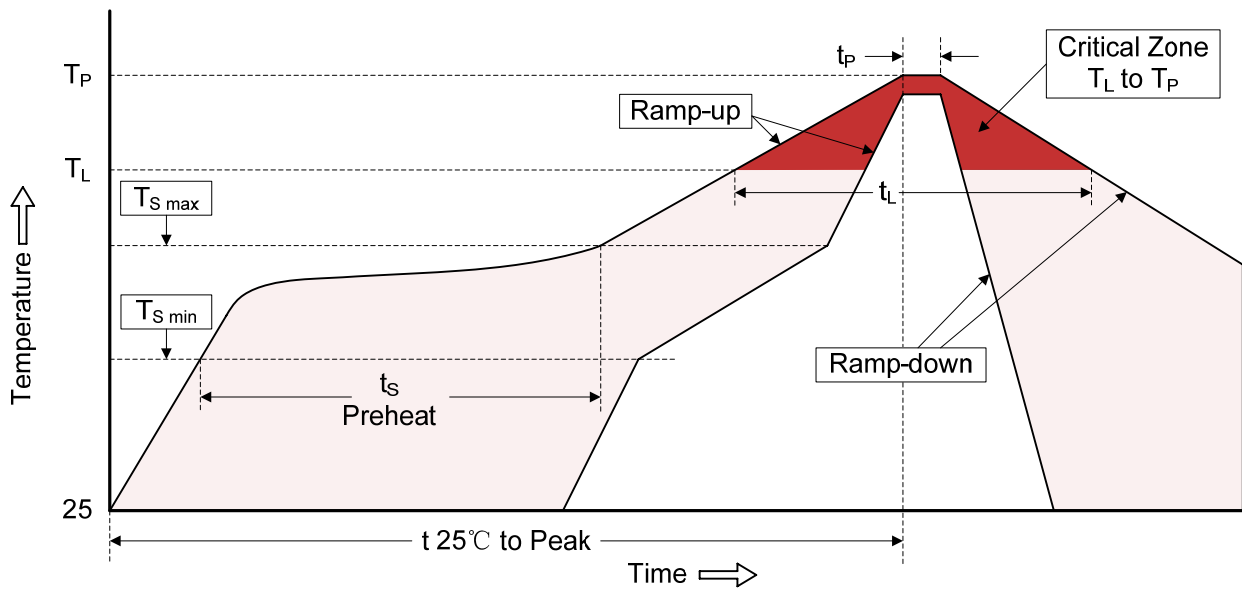


**Figure 5. Capacitance vs. Reverse Voltage**



**Recommended Soldering Conditions**

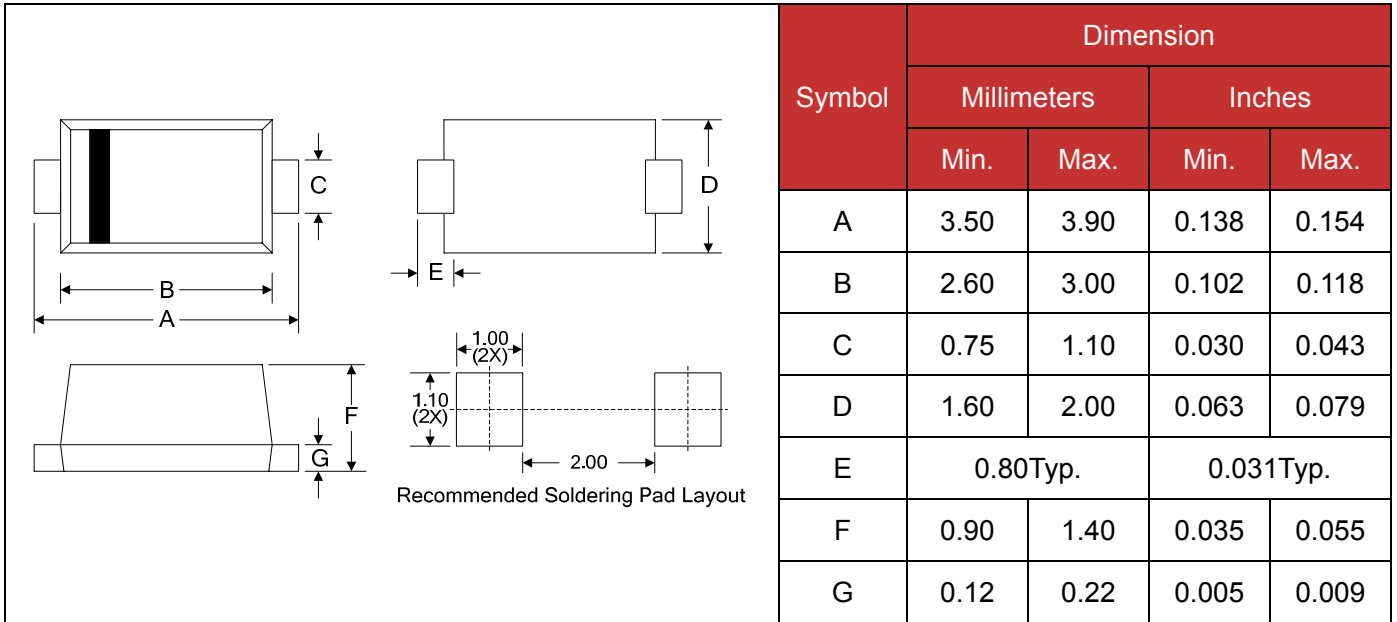
Reflow Soldering



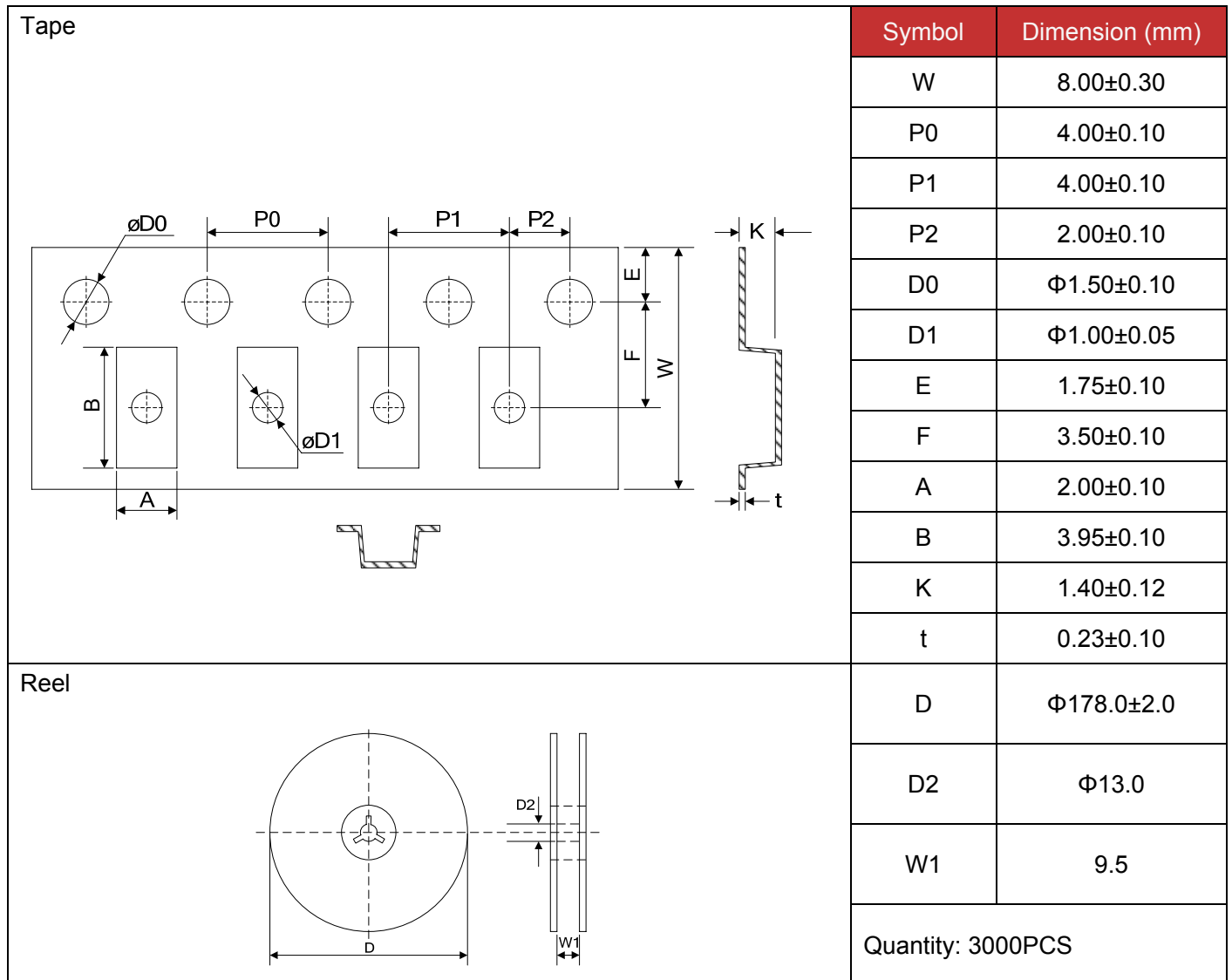
Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat -Temperature Min ( $T_{S\ min}$ ) -Temperature Max ( $T_{S\ max}$ ) -Time (min to max) ( $t_s$ )	150°C 200°C 60-180 seconds
$T_{S\ max}$ to $T_L$ -Ramp-up Rate	3°C/second max.
Time maintained above: -Temperature ( $T_L$ ) -Time ( $t_L$ )	217°C 60-150 seconds
Peak Temperature ( $T_P$ )	260°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	8 minutes max.

**Dimensions (SOD-123S)**



**Packaging**



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