

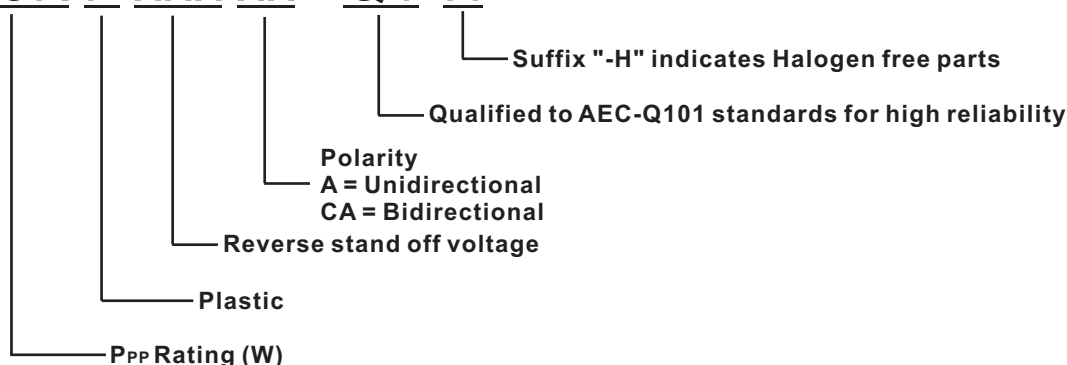
ASM7.5KP-Q1 SERIES

List

List.....	1
Package outline.....	2
Features.....	2
Mechanical data.....	2
Maximum ratings	2
Electrical characteristics.....	3
Rating and characteristic curves.....	4
Pinning information.....	5
Marking.....	5
Suggested solder pad layout.....	5
Packing information.....	6
Reel packing and tube packing.....	7
Suggested thermal profiles for soldering processes.....	7
High reliability test capabilities.....	8

Part Nomenclature

ASM7.5K P xxx xx - Q1-H



ASM7.5KP-Q1 SERIES

7.5kW Surface Mount Unidirectional and Bidirectional Transient Voltage Suppressors 10V- 48V

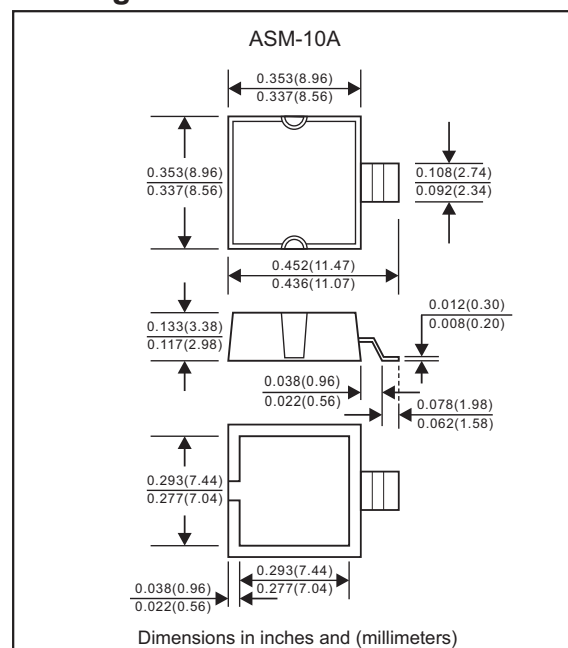
Features

- Available in both unidirectional and bidirectional construction (bidirectional with CA suffix)
- High-reliable, with wafer fabrication and assembly lot traceability
- Low profile surface mount package
- Low incremental surge resistance
- Suppresses transients up to 7500W @ 10/1000 μ s
- Moisture classification is Level 1 with no dry pack required per IPC/JEDEC J-STD-020
- Clamping (0 volts to V(BR) min) Unidirectional <100ps
Bidirectional <5ns
- RoHS compliant (2011/65/EU) devices available
- Lead-free parts meet RoHS requirements
- Qualified to AEC-Q101 standards for high reliability
- Suffix "-H" indicates Halogen free parts, ex. ASM7.5KP10A-Q1-H

Mechanical data

- Epoxy : Epoxy, meets UL94V-0
- Case : Molded plastic, ASM-10A
- Lead : Tin/lead or matte-tin (fully RoHS compliant) plating
- Mounting Position : Any
- Weight : Approximated 0.73 gram

Package outline



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

Parameter	Conditions	Symbol	Value	Unit
Peak pulse power	at 10/1000 μ s ,Note 2	PPp	7500	W
Forward surge current	Note 3	IFSM	500	A
Rated average power dissipation	$T_A=25^{\circ}\text{C}$	PM(AV)	2.5 ⁽¹⁾	W
Typical thermal resistance junction-to-ambient	Note 1	R θ JA	50	$^{\circ}\text{C/W}$
Typical thermal resistance junction-to-case		R θ JC	1.5	$^{\circ}\text{C/W}$
Operating junction temperature range		TJ	-55 to +150	$^{\circ}\text{C}$
Storage temperature range		TSTG	-55 to +150	$^{\circ}\text{C}$

Notes 1: When mounted on FR-4 PC board with recommended mounting pad (see pad layout)

2: Also see figures 1 and 2. With impulse repetition rate (duty factor) of 0.05% or less

3: At 8.3 ms half-sine wave (unidirectional devices only)

Electrical characteristics (at $T_A = 25^\circ\text{C}$ unless otherwise noted)

Part No. (Uni)	Part No. (Bi)	Reverse Stand-off Voltage	Breakdown Voltage @ I_T		Test Current	Maximum Clamping Voltage @ I_{PP}		Maximum Reverse Leakage Current	Marking Code	
		V_{RWM}	V_{BR} Min	V_{BR} Max	I_T	V_C	I_{PP}	$I_R @ V_{RWM}$		
		Volts	Volts	Volts	mA	Volts	A	μA	Uni	Bi
ASM7.5KP10A-Q1	ASM7.5KP10CA-Q1	10	11.1	12.3	5.0	17.0	441.1	15	ASM7.5KP10A	ASM7.5KP10CA
ASM7.5KP11A-Q1	ASM7.5KP11CA-Q1	11	12.2	13.5	5.0	18.2	412.0	10	ASM7.5KP11A	ASM7.5KP11CA
ASM7.5KP12A-Q1	ASM7.5KP12CA-Q1	12	13.3	14.7	5.0	19.9	376.8	10	ASM7.5KP12A	ASM7.5KP12CA
ASM7.5KP13A-Q1	ASM7.5KP13CA-Q1	13	14.4	15.9	5.0	21.5	348.8	10	ASM7.5KP13A	ASM7.5KP13CA
ASM7.5KP14A-Q1	ASM7.5KP14CA-Q1	14	15.6	17.2	5.0	23.2	323.2	10	ASM7.5KP14A	ASM7.5KP14CA
ASM7.5KP15A-Q1	ASM7.5KP15CA-Q1	15	16.7	18.5	5.0	24.4	307.3	10	ASM7.5KP15A	ASM7.5KP15CA
ASM7.5KP16A-Q1	ASM7.5KP16CA-Q1	16	17.8	19.7	5.0	26.0	288.4	10	ASM7.5KP16A	ASM7.5KP16CA
ASM7.5KP17A-Q1	ASM7.5KP17CA-Q1	17	18.9	20.9	5.0	27.6	271.7	10	ASM7.5KP17A	ASM7.5KP17CA
ASM7.5KP18A-Q1	ASM7.5KP18CA-Q1	18	20.0	22.1	5.0	29.2	256.8	10	ASM7.5KP18A	ASM7.5KP18CA
ASM7.5KP20A-Q1	ASM7.5KP20CA-Q1	20	22.2	24.5	5.0	32.4	231.4	10	ASM7.5KP20A	ASM7.5KP20CA
ASM7.5KP22A-Q1	ASM7.5KP22CA-Q1	22	24.4	26.9	5.0	35.5	211.2	10	ASM7.5KP22A	ASM7.5KP22CA
ASM7.5KP24A-Q1	ASM7.5KP24CA-Q1	24	26.7	29.5	5.0	38.9	192.8	10	ASM7.5KP24A	ASM7.5KP24CA
ASM7.5KP26A-Q1	ASM7.5KP26CA-Q1	26	28.9	31.9	5.0	42.1	178.1	10	ASM7.5KP26A	ASM7.5KP26CA
ASM7.5KP28A-Q1	ASM7.5KP28CA-Q1	28	31.1	34.4	5.0	45.4	165.1	10	ASM7.5KP28A	ASM7.5KP28CA
ASM7.5KP30A-Q1	ASM7.5KP30CA-Q1	30	33.3	36.8	5.0	48.4	154.9	10	ASM7.5KP30A	ASM7.5KP30CA
ASM7.5KP33A-Q1	ASM7.5KP33CA-Q1	33	36.7	40.6	5.0	53.3	140.7	10	ASM7.5KP33A	ASM7.5KP33CA
ASM7.5KP36A-Q1	ASM7.5KP36CA-Q1	36	40.0	44.2	5.0	58.1	129.0	10	ASM7.5KP36A	ASM7.5KP36CA
ASM7.5KP40A-Q1	ASM7.5KP40CA-Q1	40	44.4	49.1	5.0	64.5	116.2	10	ASM7.5KP40A	ASM7.5KP40CA
ASM7.5KP43A-Q1	ASM7.5KP43CA-Q1	43	47.8	52.8	5.0	69.4	108.0	10	ASM7.5KP43A	ASM7.5KP43CA
ASM7.5KP45A-Q1	ASM7.5KP45CA-Q1	45	50.0	55.3	5.0	72.7	103.1	10	ASM7.5KP45A	ASM7.5KP45CA
ASM7.5KP48A-Q1	ASM7.5KP48CA-Q1	48	53.3	58.9	5.0	77.4	96.8	10	ASM7.5KP48A	ASM7.5KP48CA

Rating and characteristic curves (ASM7.5KP-Q1 SERIES)

FIGURE 1
Peak Pulse Power vs. Pulse Time
(to 50% of exponentially decaying pulse)

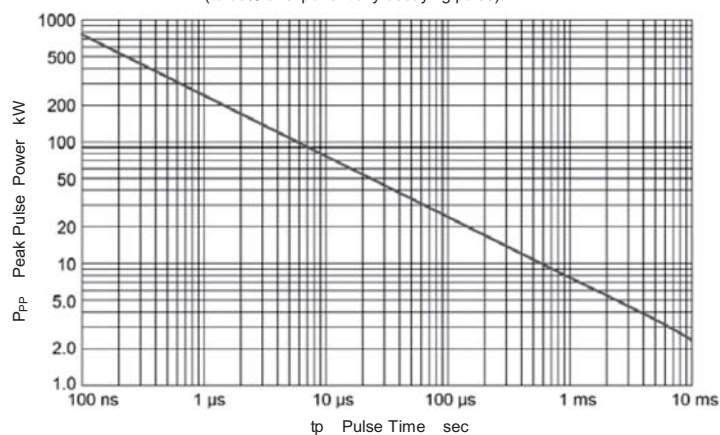


FIGURE 2
Pulse Waveform

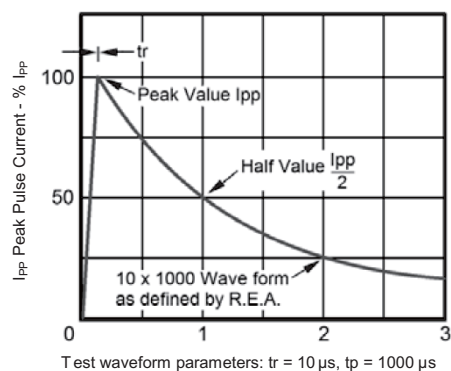
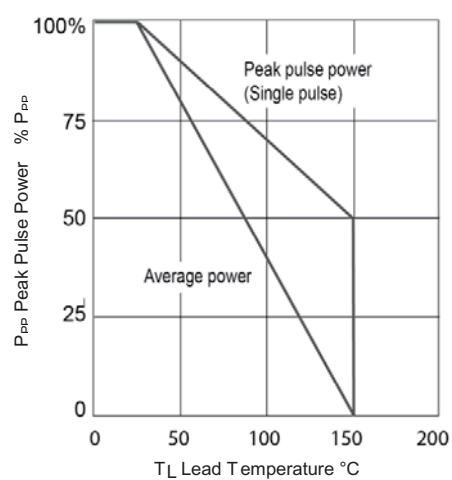
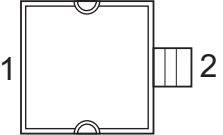
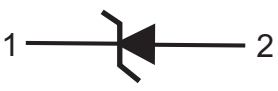
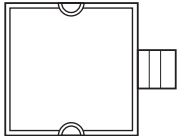


FIGURE 3
Derating Curve

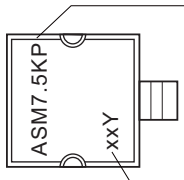


ASM7.5KP-Q1 SERIES

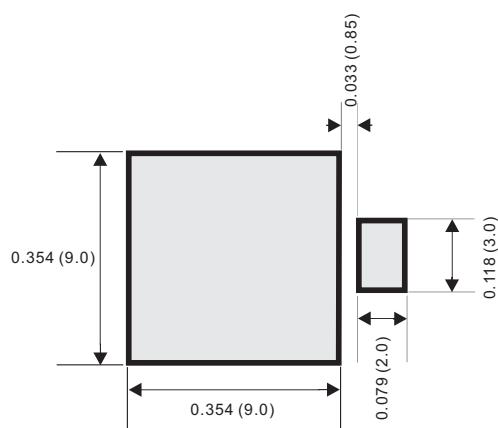
Pinning information

Pin	Simplified outline	Symbol
Uni-Directional Pin1 cathode Pin2 anode		
Bi-Directional		

Marking

Type number	Example
ASM7.5KP-Q1 SERIES	 Marking code (see page 3) xx = Reverse stand-off voltage, V_{RWM} Y= "A" Unidirectional or "CA" Bidirectional

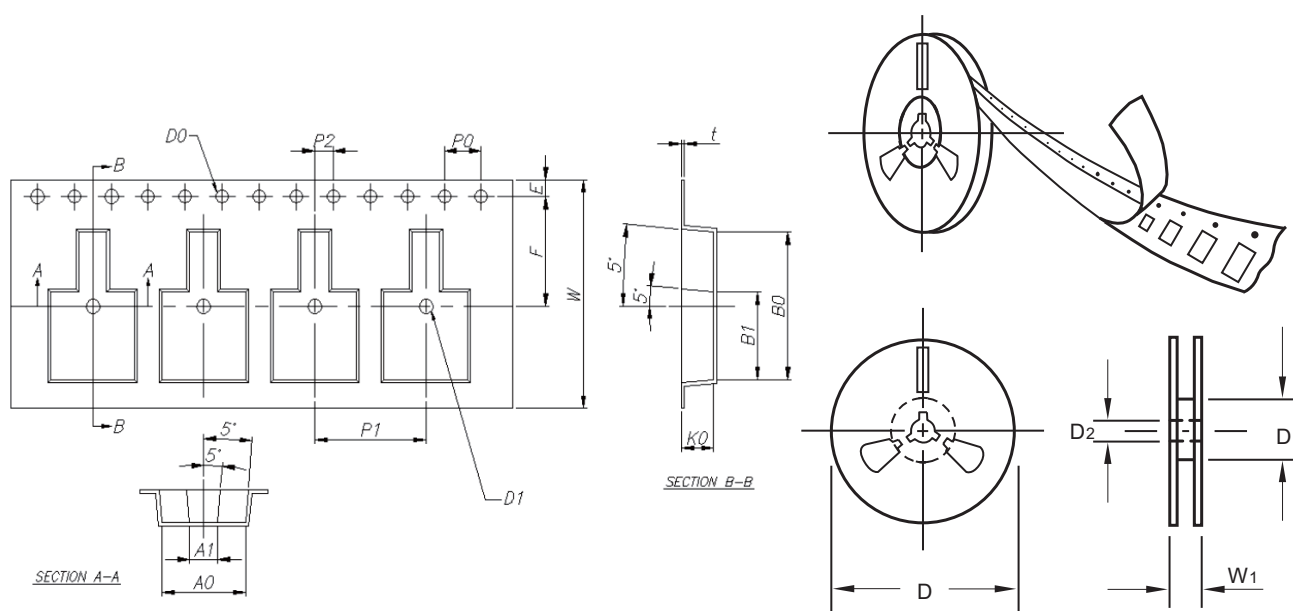
Suggested solder pad layout



Dimensions in inches and (millimeters)

ASM7.5KP-Q1 SERIES

Packing information



Item	Symbol	Tolerance	ASM-10A
Carrier width	A0	0.1	9.10
	A1	0.1	3.03
Carrier length	B0	0.1	15.5
	B1	0.1	9.36
Carrier depth	K0	0.1	3.46
Sprocket hole	D0	0.1	1.50
13" Reel outside diameter	D	2.0	330.00
13" Reel inner diameter	D1	min	50.00
7" Reel outside diameter	D	2.0	-
7" Reel inner diameter	D1	min	-
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	11.5
Punch hole pitch	P1	0.1	12.0
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P2	0.1	2.00
Overall tape thickness	t	0.05	0.35
Tape width	W	0.3	24.00
Reel width	W1	1.0	30.00

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

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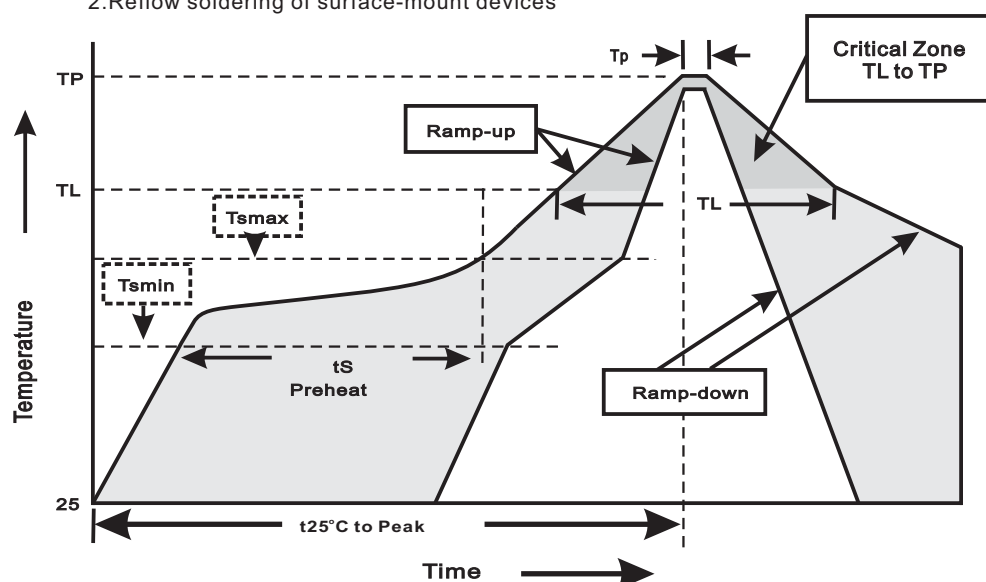
Reel packing and tube packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)
ASM-10A	13"	1,500	12.0	3,000	335*335*38	330	350*330*360	24,000

PACKAGE	TUBE (pcs)	TUBE SIZE (m/m)	CARTON SIZE (m/m)	CARTON (pcs)
ASM-10A	50	455*16.1*3.8	485*160*135	7,000

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T _L to T _P)	<3°C/sec
Preheat -Temperature Min(T _{smIn}) -Temperature Max(T _{smax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smax} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 60~260sec
Peak Temperature(T _P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t _P)	10~30sec
Ramp-down Rate	<3°C/sec
Time 25°C to Peak Temperature	<6minutes

ASM7.5KP-Q1 SERIES

High reliability test capabilities

Item Test	Conditions	Reference
1. MSL Preconditioning	24hr bake@125°C+168hrs@85°C /85%RH+3xIR@260°C+1flux immersion+alcohol+DI H2O rinse	JESD22-A113
2. High Temperature Reverse Bias	V _{BR} =V _{BR} Nom*80% (T _j max=150°C) Test Duration:1000hrs	JESD22-A108
3. High Temperature Storage Life	T _a =125°C Test Duration:1000hrs	JESD22 A-103
4. Temperature Cycle	-55°C(15min) to 150°C(15min) Test Cycles:1000cycles	JESD22 A-104
5. Autoclave	P=2atm T _a =121°C RH=100% Test Duration:96hrs	JESD22 A-102
6. Solderability	245±5°C for 5sec	J-STD-002
7. Moisture Resistance	T _a =85°C/85% Relative humidity Test Duration:1000hrs	MIL-STD-750E METHOD 1021.2
8. Resistance To Solder Heat	260±5°C for 10sec	JESD22 B-106
9. High Temperature High Humidity Reverse Bias	T _a =85°C, 85%RH, with device reverse biased at 80% of rated breakdown voltage up to a maximum of 100V or limit of chamber Test Duration:1000hrs	JESD22-A101