

Automotive Electrical Overvoltage Transient Suppressors Leded - > ATH series

Description

Overvoltage transient suppressors are designed for applications requiring a low voltage rectifier with reverse avalanche characteristics for use as reverse power transient suppressors. Developed to suppress transients in the automotive system, these devices operate in reverse mode as power avalanche rectifier and will protect electronic equipment from overvoltage conditions

Features

- Halogen-Free
- RoHS compliant
- Glass passivated junction for reliability
- Patented construction
- Suitable for standard ISO 7637-2 or ISO16750-2;
- Fast response time
- Excellent clamping capability
- Low incremental surge resistance
- Plastic package has Underwriters Laboratory Flammability classification 94V-O
- Matte Tin Lead-free plated

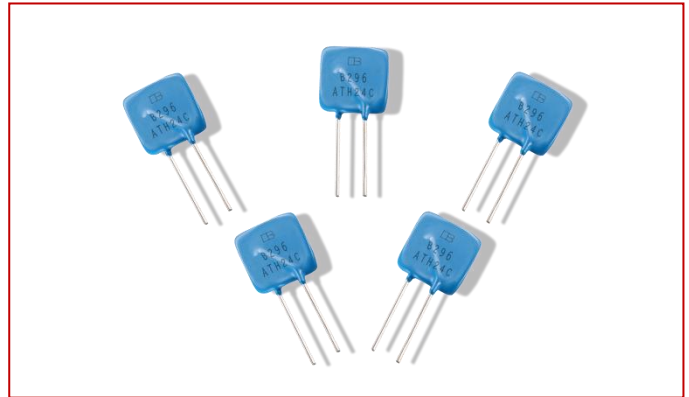
Applications

Designed to protect sensitive electronics from:

- Inductive Load Switching
- Alternator Load Dump
- GPS navigation systems

Test background

This test is a simulation of load dump transient, occurring in the event of a discharged battery being disconnected while the alternator is generating charging current and with other loads remaining on the alternator circuit at this moment; the load dump amplitude depends on the alternator speed and on the level of the alternator field excitation at the moment the battery is disconnected. In most new alternators, the load dump amplitude is suppressed (clamped) by the addition of the limiting diodes.



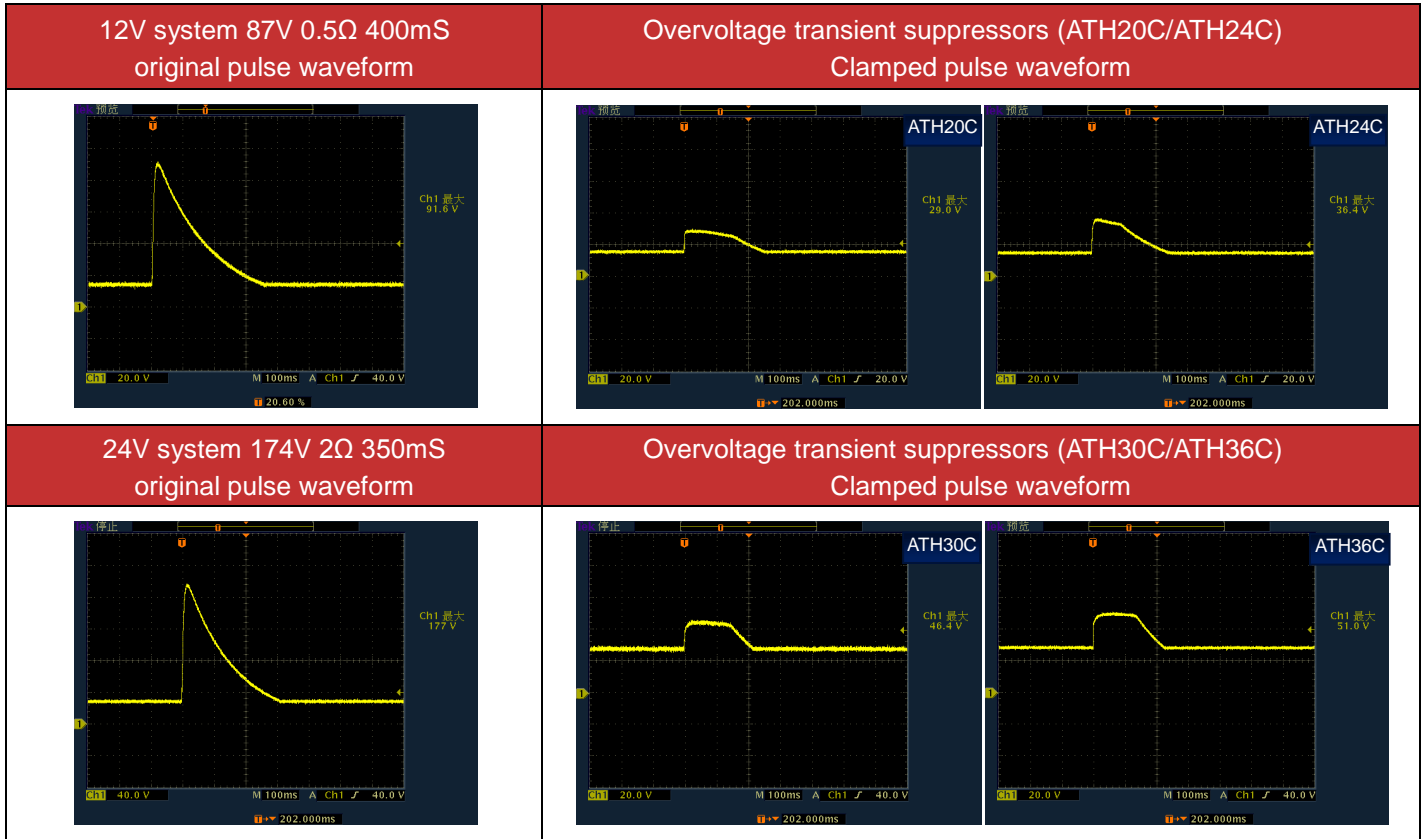
Maximum Ratings and Thermal Characteristics (T_A=25 °C unless otherwise noted)

Parameter	Symbol	Value	Unit
10ms×400ms 12V system 87V 0.5Ω	E _{typ.}	8553	J
10ms×400ms 12V system 87V 1Ω		4277	
10ms×350ms 24V system 174V 1Ω		14987	
10ms×350ms 24V system 174V 2Ω		7493	
ATH series 8×20μs waveform	P _{PPM}	150	KW
ATH series 10×1000μs waveform		15	
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-50 to 150	°C
Typical Thermal Resistance Junction to lead	R _{uJL}	8.0	°C/W
Typical Thermal Resistance Junction to Ambient	R _{uJA}	40	°C/W
Note: 10*1000μs peak pulse current refer to electrical Characteristics table.			

Test parameters

Parameter	12V system	24V system
U _s	65V to 87V	123V to 174V
R _i	0.5Ω to 4Ω	1Ω to 8Ω
t _d	40ms to 400ms	100ms to 350ms
t _r	(10 ⁰⁻⁵) ms	
Note	Pulse waveform see figure 1, figure 2.	

ISO 7637-2 2004 5a Waveform Simulation Test



Electrical Characteristics (T_A=25°C unless otherwise noted)

Part Number (Bi)	Breakdown Voltage @I _T		Test Current I _T (mA)	Reverse Stand-Off Voltage V _{RWM} (V)	Reverse Leakage @ V _{RWM} I _R (μA)	Maximum Clamping Voltage @IPP V _c (V)	Peak Pulse Current I _{pp} (A)
	V _{BR MIN.} (V)	V _{BR MAX.} (V)					
ATH16C	17.0	20.0	5.0	16.0	10.0	28.0	540
ATH20C	21.0	25.0	5.0	20.0	10.0	34.0	450
ATH24C	25.0	30.0	5.0	24.0	10.0	40.0	400
ATH30C	33.0	38.0	5.0	30.0	10.0	51.0	350
ATH36C	38.0	45.0	5.0	36.0	10.0	59.0	300

Part Number (Bi)	Suitable ISO 7637-2 2004 5a test waveform									
	Maximum Clamping Voltage V _c (V)	Voltage level				Resistance Level				
		87V 400mS	174V 350mS	0.5Ω	1Ω	2Ω	4Ω	8Ω		
ATH16C	28.0	×	--	×	×	×	×	×	×	
ATH20C	33.0	×	--	×	×	×	×	×	×	
ATH24C	39.0	×	--	×	×	×	×	×	×	
ATH30C	50.0	--	×	--	--	×	×	×	×	
ATH36C	57.0	--	×	--	--	×	×	×	×	

Note: 'x' representatives meets this test condition;

Ratings and Characteristic Curves ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Figure 1. (Pulse 5a)without centralized load dump suppression

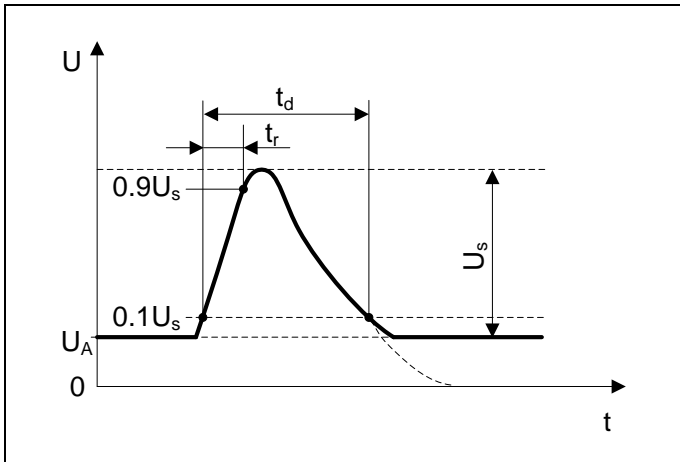


Figure 2. (Pulse 5b)with centralized load dump suppression

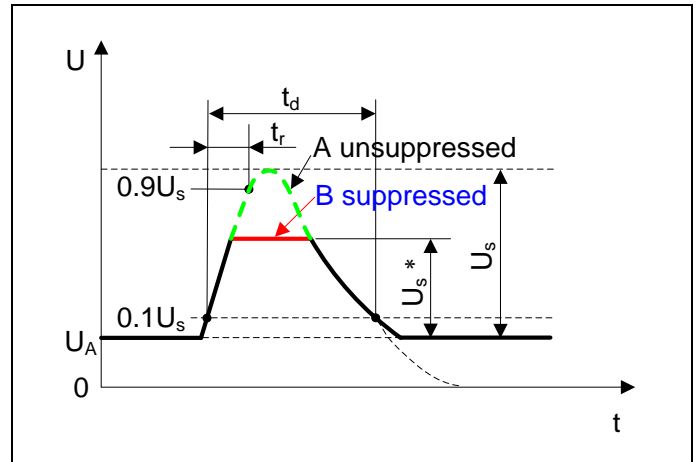


Figure 3. Pulse Derating Curve

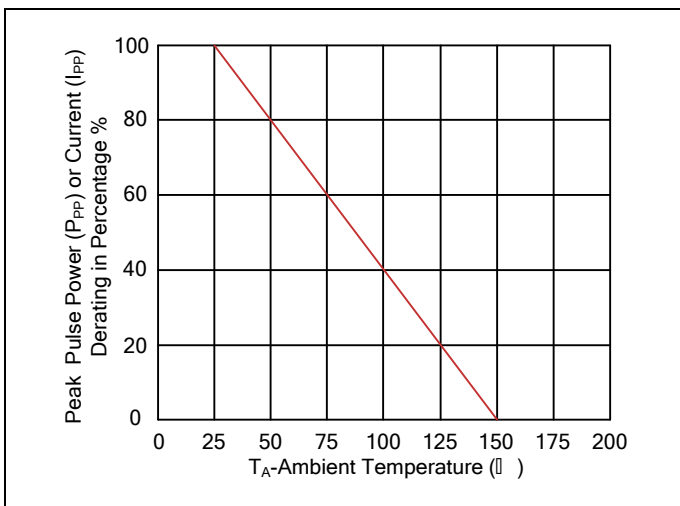


Figure 4. Peak Pulse Power Rating Curve

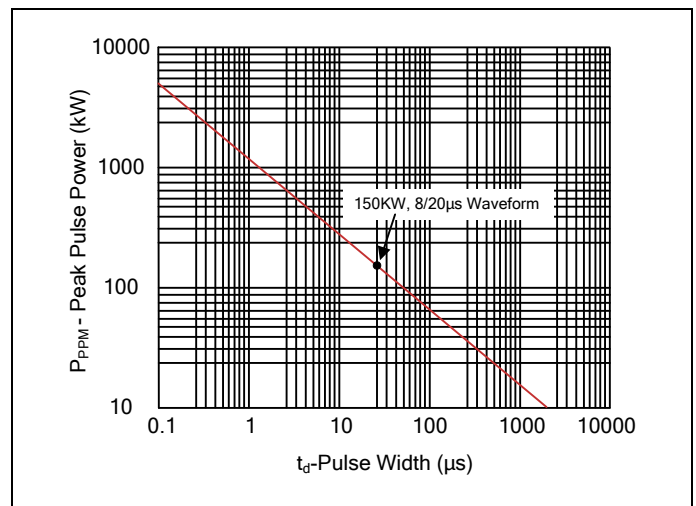


Figure 5. I-V Curve Characteristics

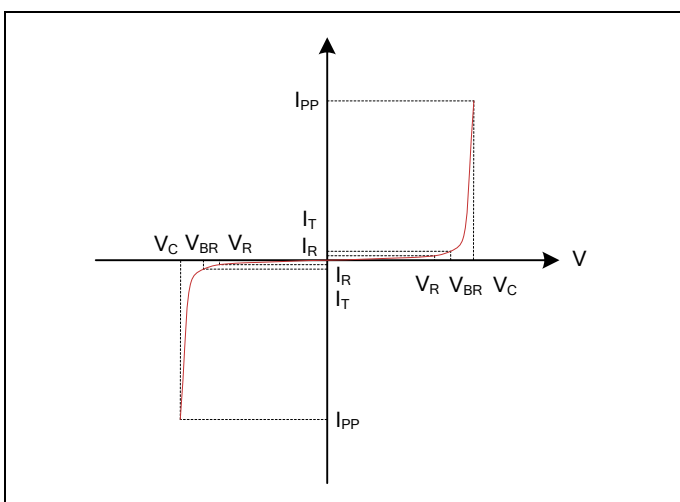
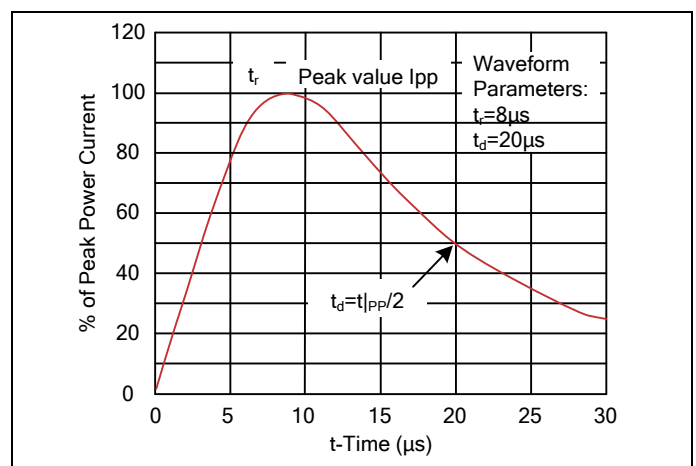
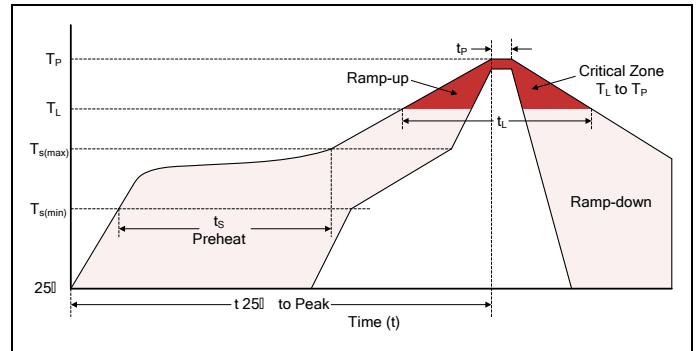


Figure 6. Pulse Waveform



Soldering Parameters

Reflow Condition		Lead-free assembly
Pre Heat	- 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 (Liquidus Temp (T_L) to peak)		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		280°C



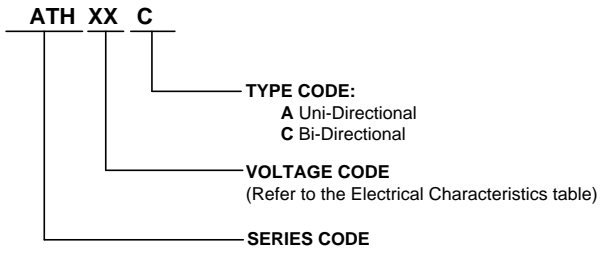
Flow/Wave Soldering (Solder Dipping)

Peak Temperature:	265°C
Dipping Time:	10 seconds
Soldering:	1 time

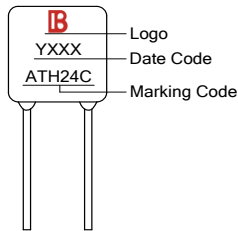
Dimensions

	ATH Series			
	Items	Millimeters		Inches
	Min.	Max.	Min.	Max.
D	-	13.00	-	0.512
H	-	15.5.00	-	0.610
T		6.00		0.23
L	10.0			0.393
K		3.00		0.118
F	7.5±0.8		0.3±0.33	
d	0.8±0.1		0.0314±0.004	

Part Numbering System



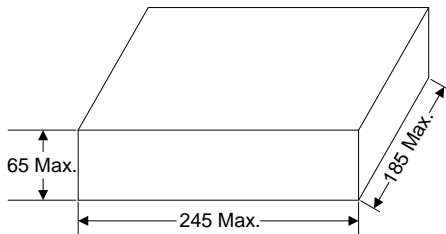
Part Marking System



Packaging

ATH series

Bulk



200pcs/box

Note: We will always keep the technical specification updates, to customers provide with better products