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1N5610 1N5611 1N5612, 1N5613

### **Features**

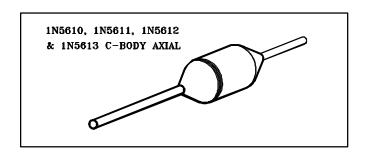
- 1500 Watts for 1 ms Pulse Power Capability
- Small Physical Size
- Designed for MIL-STD-704A Applications

POWER ZENER RECTIFIER JAN, JANTX, JANTXV

> TRANSIENT SUPPRESSOR DIODE

# **Description**

Zener diodes with a high surge capability qualified to MIL-S-19500/434



## Absolute Maximum Ratings (@ 25°C unless noted)

	<u>1N5610</u>	<u>1N5611</u>	<u>1N5612</u>	<u>1N5613</u>
Forward Surge Current,	200 A	200 A	200 A	200 A
Zener Surge Current, @ 25C	32.0 A	24.0 A	19.0 A	5.7 A
Zener Surge Current @ 150C	5.5 A	4.8 A	3.2 A	1.0 A
Storage and Operating Temperature	-65C to + 175C			
Zener Voltage	See Electrical C	Characteristics		
Surge Power	See Graphs			

## Electrical Characteristics (T = 25°C unless otherwise noted)

DEVICE TYPE	Min. Zener Voltage δ Vz @ 1Ma	Max. Zener Voltage λ Vz @ Is		MAX. Reverse Leakage Current I <sub>R</sub> @ V <sub>R</sub>		MAX. Forward V ξ @ 100 A	Typical Temp. Coefficient
	Volts	Volts	Amps	μА	Volts	Volts	%/°C
1N5610*	33.0	47.5	32.0	5.0	30.5	4.8	.093
1N5611*	43.7	63.5	24.0	5.0	40.3	4.8	.094
1N5612*	54.0	78.5	19.0	5.0	49.0	4.8	.096
1N5613*	191	265	5.7	5.0	175	4.8	.100

NOTES: \* Available as JAN, JANTX and JANTXV

- δ Duration of applied current ≤300 ms, Duty cycle ≤2%.
- $\lambda$  Use a pulse which decays exponentially to 50 % of peak value during 1 ms. (See " Pulse Waveform " graph).
- $\xi$  Peak Sinusoidal surge current of 8.3 ms duration, non repetitive



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# **Applications**

Voltage transients can be suppressed with series elements, shunt elements or a combination of both. These elements may be passive or active. For low & medium power applications, a series resistor & zener clamp offer several attractive features:

- 1. Simplicity of design.
- 2. High reliability.
- 3. Fast response time.

The 1N5610 series will suppress the following transients (defined by MIL-S-704A) without using any series limiting resistance; (except as noted in line #3 below)

- 1. All 600 V transients (category 1 in chart below).
- 2. All 80 V transients except those generated by the main voltage regulator (category 2 in chart below).
- 3. Over-voltage transients from the main voltage regulator (category 3 in chart below) will be suppressed if:
  - a. A 20 ohm series limiting resistor is used, or-
  - b. No series resistance is used & the zener is protected within 500 μs, using (for example) an SCR crowbar.

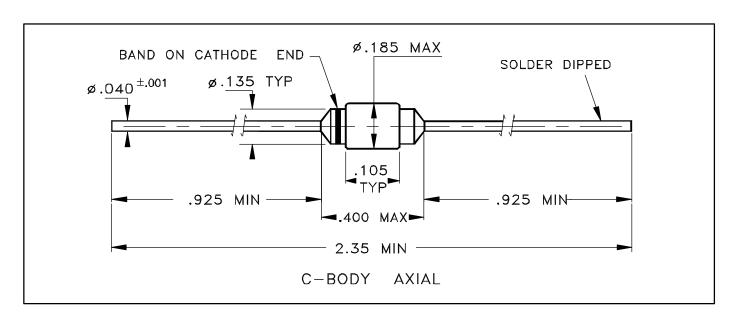
The above statements are based on the source impedances & dv/dt characteristics as given in ARINC\* spec# 413; entitled "Guidance for Aircraft Electrical Power Utilization & Transient Protection. This report further defines MIL-STD-704A in regard to large aircraft electrical systems.

These surge suppressors are useful in a varierty of other applications where semiconductor devices must function in an environment subject to extremely high, but short term surges.

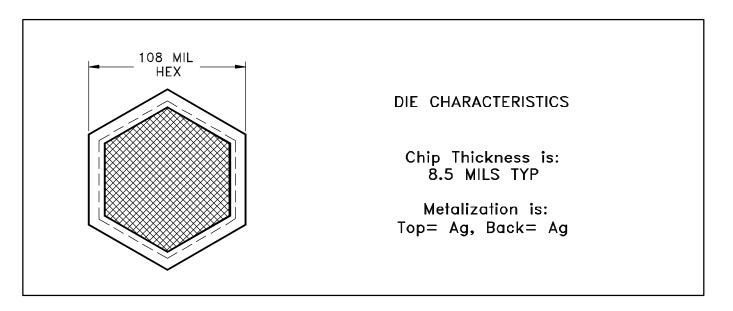
\* ARINC stands for Aeronautical Radio Incorporated; Annapolis, Maryland 21401

Cate- gory #	Source of Trans.	Max. Ampli- tude	Duration of Trans.	Min. Imped- ance	dv over dt
1	Induc- tive Swtchg	600 V	≤10 μs	50 ohm	
2	BUS Switch- ing	80 V	≤10 ms	15 ohm	
3	Main Volt. Reg.	80 V	≥10 ms	0.2 ohm	50V/ms





#### **DEVICE OUTLINE**



DIE OUTLINE



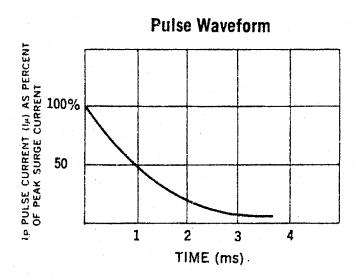


FIGURE 1

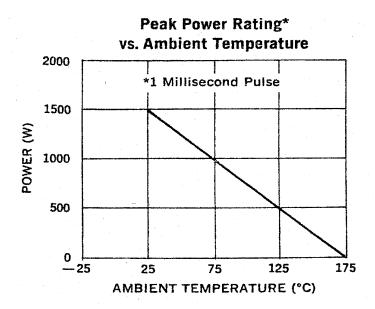


FIGURE 2



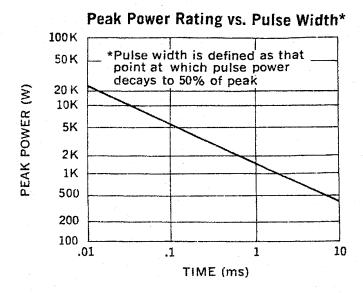


FIGURE 3