EN: This Datasheet is presented by the manufacturer.

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1N5908
SM5908

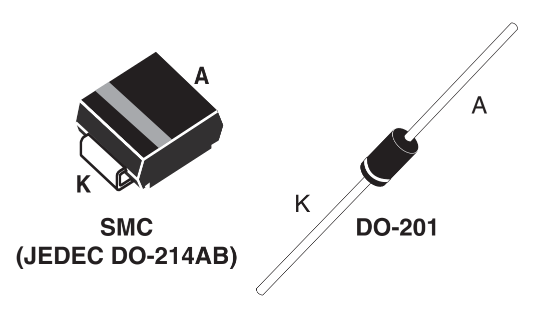
Transil™

Features

- Peak pulse power:
  - 1500 W (10/1000 µs)
- Stand off voltage: 5 V
- Unidirectional
- Operating $T_{j\,max}$: 175 °C
- High power capability at $T_{j\,max}$:
  - 1500 W (10/1000 µs)
- JEDEC registered package outline

Complies with the following standards

- IEC 61000-4-2 level 4:
  - 15 kV (air discharge)
  - 8 kV (contact discharge)
- IEC 61000-4-5
- MIL STD 883G, method 3015-7 Class 3B
  - 25 kV HBM (human body model)
- Resin meets UL 94, V0
- MIL-STD-750, method 2026 solderability
- EIA STD RS-481 and IEC 60286-3 packing
- IPC 7531 footprint



Description

This Transil series has been designed to protect sensitive equipment against electrostatic discharges according to IEC 61000-4-2, and MIL STD 883, method 3015, and electrical over stress according to IEC 61000-4-4 and 5. These devices are more generally used against surges below 1500 W (10/1000 µs).

The Planar technology makes it compatible with high-end equipment and SMPS where low leakage current and high junction temperature are required to provide reliability and stability over time.

They are packaged in SMC (SMC footprint in accordance with IPC 7531 standard) and DO-201.

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1 Characteristics

Table 1. Absolute maximum ratings (T_{amb} = 25 °C)

Symbol	Parameter		Value	Unit
P_{PP}	Peak pulse power dissipation (1)	T_j initial = T_{amb}	1500	W
T_{stg}	Storage temperature range		-65 to +175	° C
T_j	Operating junction temperature range		-55 to +175	° C
T_L	Maximum lead temperature for soldering during 10 s.		260	° C

1. For a surge greater than the maximum values, the diode will fail in short-circuit.

Table 2. Thermal resistances

Symbol	Parameter		Value	Unit
$R_{th(j-l)}$	Junction to leads	SMC	15	° C/W
		DO-201	20	
$R_{th(j-a)}$	Junction to ambient on printed circuit on recommended pad layout	SMC	90	
	Junction to ambient	DO-201	75	

Figure 1. Electrical characteristics - definitions

Symbol	Parameter
V_{RM}	Stand-off voltage
V_{BR}	Breakdown voltage
V_{CL}	Clamping voltage
I_{RM}	Leakage current @ V_{RM}
I_{PP}	Peak pulse current
αT	Voltage temperature coefficient
V_F	Forward voltage drop
R_D	Dynamic resistance

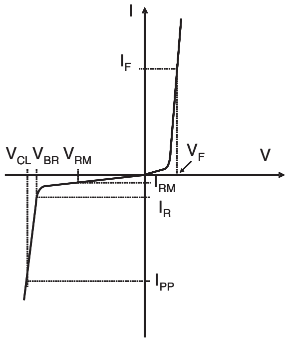


Figure 2. Pulse definition for electrical characteristics

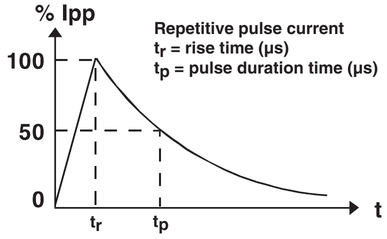


Table 3. Electrical characteristics - parameter values (T_{amb} = 25 °C)

Order code	I_{RM} @V_{RM}		V_{BR} @I_R (1)		V_{CL} @I_{PP}, 10/1000 µs		V_{CL} @I_{PP}, 10/1000 µs		V_{CL} @I_{PP}, 10/1000 µs		αT (2)	C
	max		min		max		max		max		max	typ
	µA	V	V	mA	V	A(3)	V	A(3)	V	A(3)	10-4/ °C	pF
1N5908	300	5	6	1	7.6	30	8	60	8.5	120	5.7	9500
SM5908												

1. Pulse tes: t_p < 50 ms
2. To calculate V_{BR} or V_{CL} versus junction temperature, use the following formulas:
   V_{BR} @ $T_J = V_{BR}$ @ 25°C x (1 + αT x (T_J – 25))
   V_{CL} @ $T_J = V_{CL}$ @ 25°C x (1 + αT x (T_J – 25))
3. Surge capability given for both directions

Figure 3. Peak pulse power dissipation versus initial junction temperature

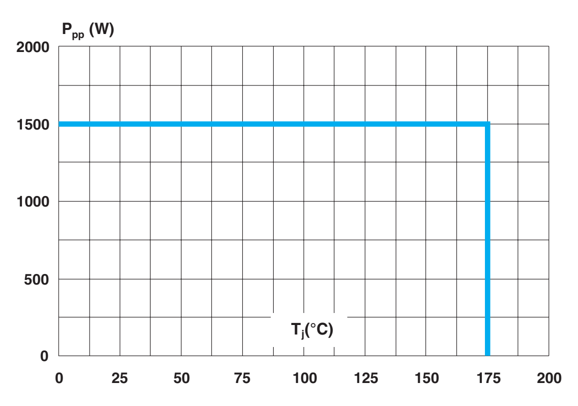


Figure 4. Peak pulse power versus exponential pulse duration (T_j initial = 25 °C)

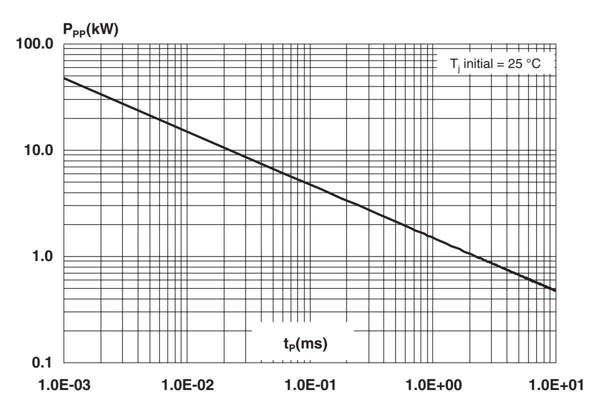


Figure 5. Clamping voltage versus peak pulse current (exponential waveform, typical values)

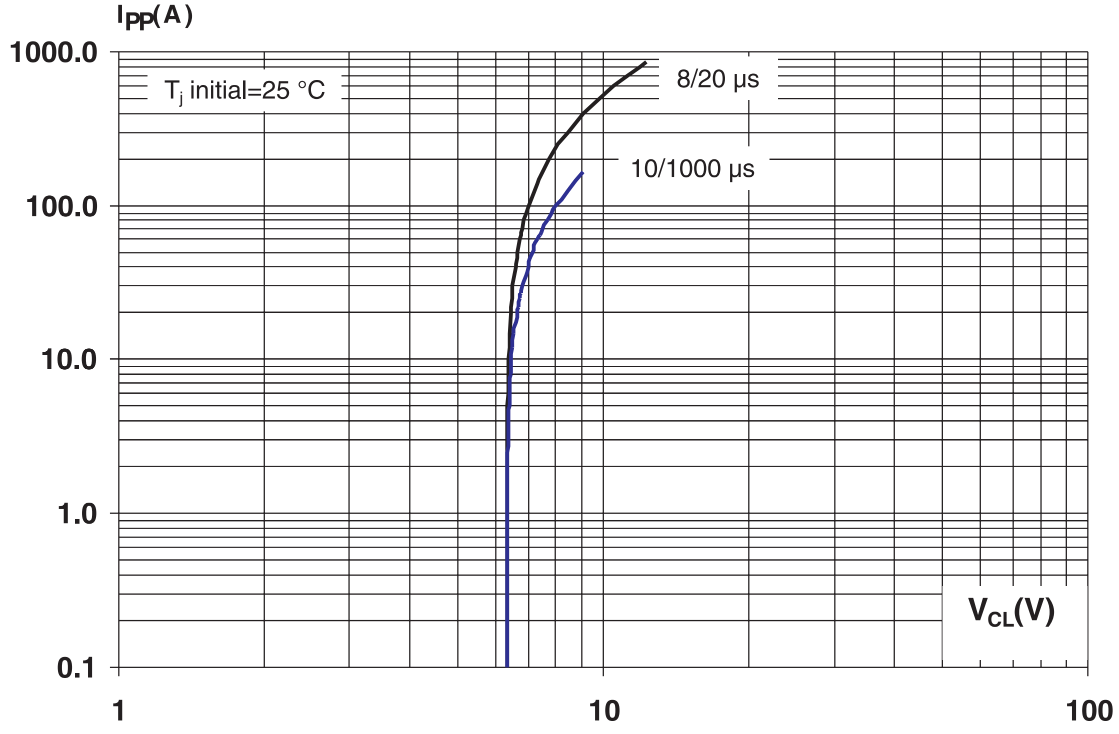


Figure 6. Junction capacitance versus reverse applied voltage (typical values)

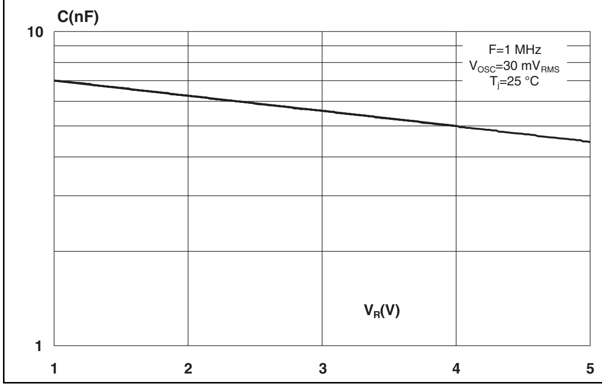


Figure 7. Peak forward voltage drop versus peak forward current (typical values)

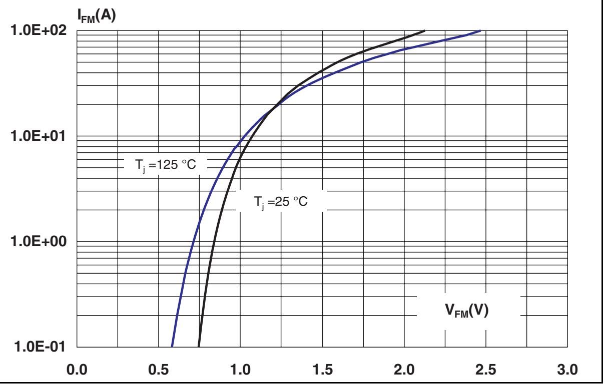


Figure 8. Relative variation of thermal impedance, junction to ambient, versus pulse duration (SMC)

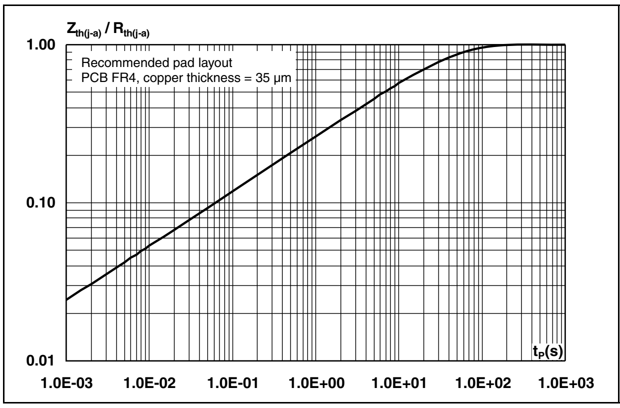


Figure 9. Relative variation of thermal impedance, junction to ambient, versus pulse duration (DO-201)

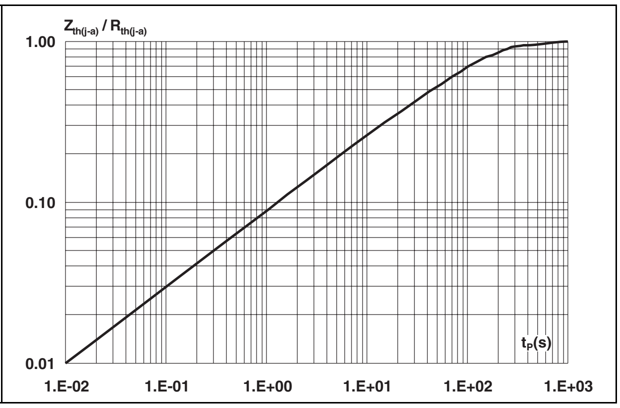


Figure 10. Thermal resistance junction to ambient versus copper surface under each lead (SMC)

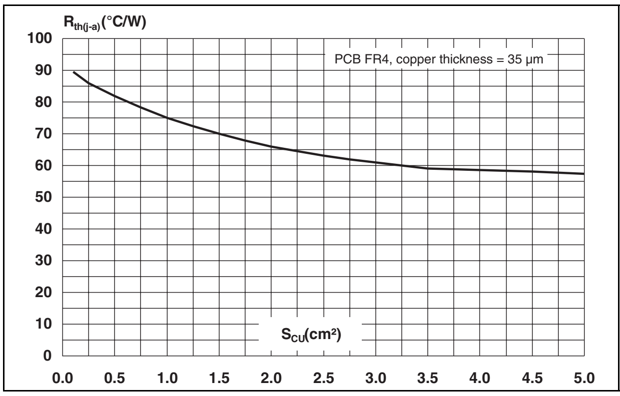
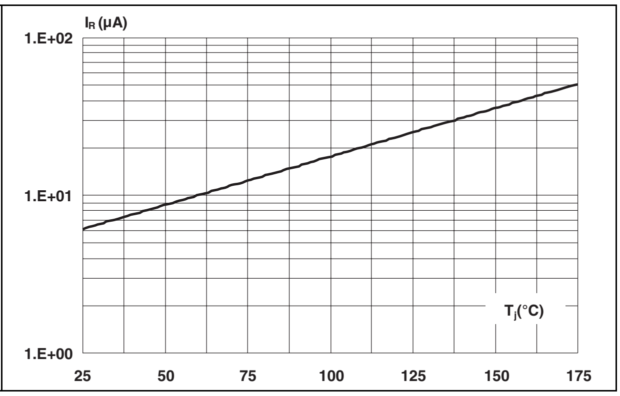


Figure 11. Leakage current versus junction temperature (typical values)

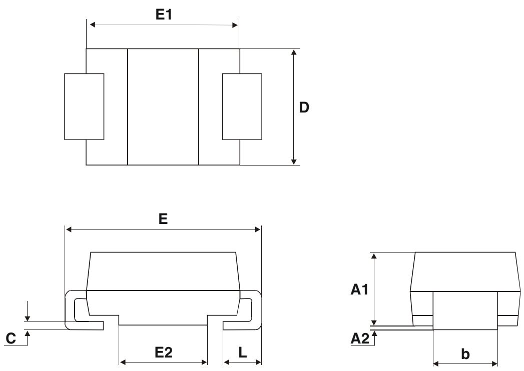


2 Package information

- Case: JEDEC DO-214AB molded plastic over planar junction
- Terminals: solder plated, solderable per MIL-STD-750, Method 2026
- Polarity: for unidirectional types the band indicates cathode
- Flammability: epoxy is rated UL94V-0
- RoHS package

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Table 4. SMC dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b	2.90	3.2	0.114	0.126
c	0.15	0.41	0.006	0.016
E	7.75	8.15	0.305	0.321
E1	6.60	7.15	0.260	0.281
E2	4.40	4.70	0.173	0.185
D	5.55	6.25	0.218	0.246
L	0.75	1.60	0.030	0.063

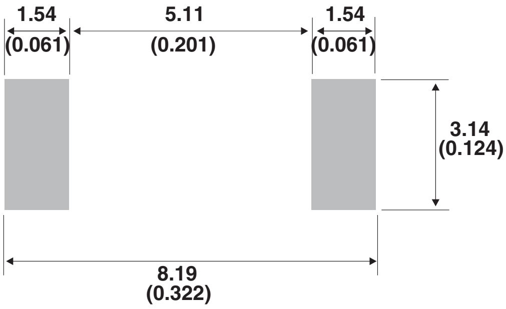


Figure 12. SMC footprint dimensions mm (inches)

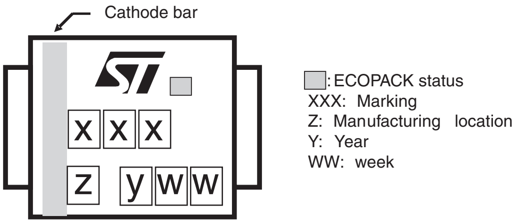


Figure 13. SMC marking layout[1]

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1. Marking layout can vary according to assembly location.

Table 5. DO-201 Dimensions

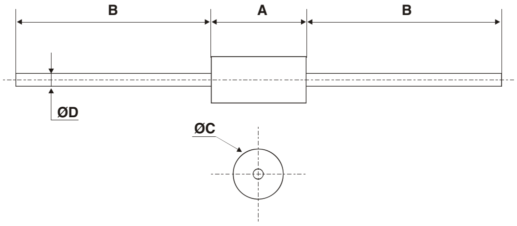
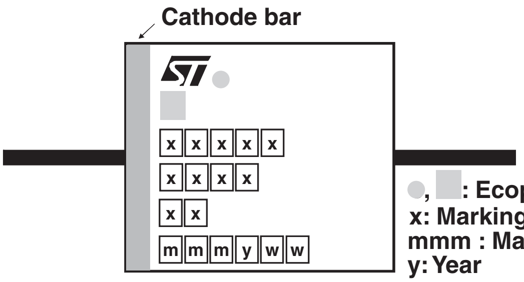
	Ref.	Dimensions			
		Millimeters		Inches	
		Min.	Max.	Min.	Max.
	A	8.5	9.5	0.335	0.374
	B	25.4		1	
	Ø C	4.8	5.3	0.189	0.209
	Ø D	0.96	1.06	0.038	0.042

Table 6. DO-201 marking layout



●, ▨: Ecopack status
x: Marking
mmm : Manufacturing location
y: Year
ww: week

3 Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
SM5908	MDC	SMC	0.25 g	2500	Tape and reel
1N5908	1N5908	DO-201	0.9 g	600	Ammopack

4 Revision history

02-Jul

Table 8. Document revision history

Date	Revision	Changes
Aug-1999	2A	Previous release
20-Sep-2011	3	Added cathode bands. Added standards compliance statements. Updated *Description*. Updated *Table 1* and *Table 2*. Updated Figures *3* through *11*. Updated *Section 2: Package information*.

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