1 Characteristics

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

Symbol	Parameter		Value	Unit
P_{PP}	Peak pulse power dissipation (1)	T_j initial = T_{amb}	600	W
P	Power dissipation on infinite heatsink	T_{lead} = 55 °C	6	W
I_{FSM}	Non repetitive surge peak forward current for unidirectional types	t_p = 10 ms T_j initial = T_{amb}	60	A
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 resistance

Symbol	Parameter	Value	Unit
$R_{th\ (j-l)}$	Junction to leads	20	°C/W

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

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

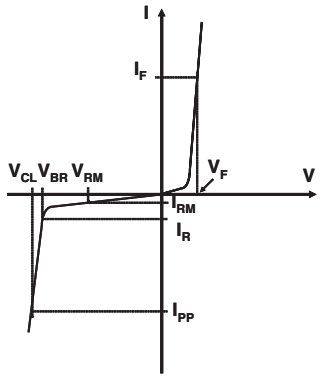


Table 4. Electrical characteristics - values (T_{amb} = 25 °C)

Type	I_{RM} max@V_{RM}			V_{BR} @I_R(1)				V_{CL} @I_{PP} 10/1000 µs		R_D(2) 10/1000 µs	V_{CL} @I_{PP} 8/20 µs		R_D(2) 8/20 µs	αT(3)
	25 °C	85 °C		min	typ	max		max			max			max
	µA (Max)		V	V			mA	V	A	Ω	V	A	Ω	10-4/°C
SMA6F5.0A	10	50	5.0	6.40	6.74	7.07	10	9.2	68	0.029	13.4	298	0.021	5.7
SMA6F12AVCL	0.2	1	12	13.2	13.7	14.3	1	18.5	31	0.135	22.9	157	0.055	7.8
SMA6F13A	0.2	1	13	14.4	15.2	15.9	1	20.4	29	0.154	23.9	147	0.054	8.3

1. Pulse test: t_p <50ms.
2. To calculate maximum clamping voltage at other surge currents, use the following formula
   $V_{CLmax} = R_D \times I_{PP} + V_{BRmax}$
3. To calculate V_{BR} versus junction temperature, use the following formula:

   V_{BR} @ T_j = V_{BR} @ 25 °C x (1 + αT x (T_j - 25))

Figure 1. Definition of I_{pp} pulse

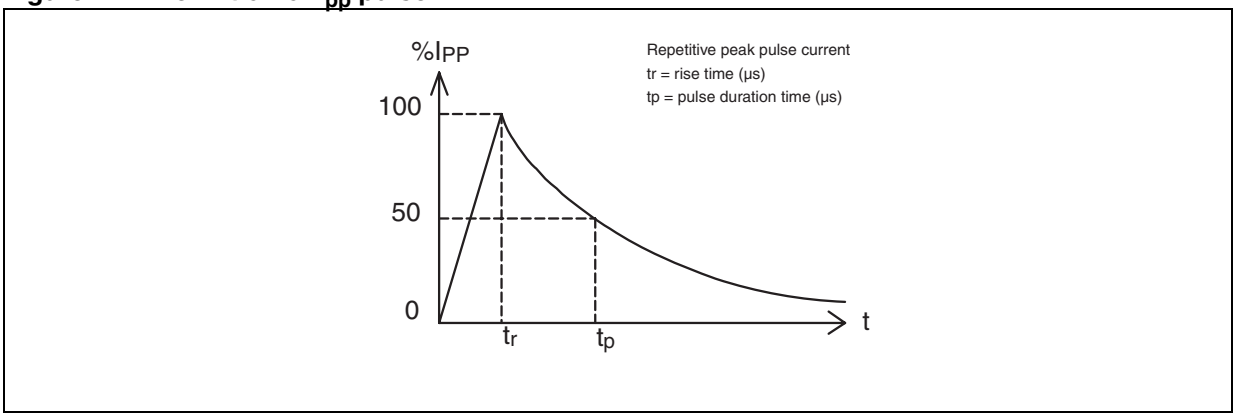


Figure 2. Relative peak power dissipation versus initial junction temperature

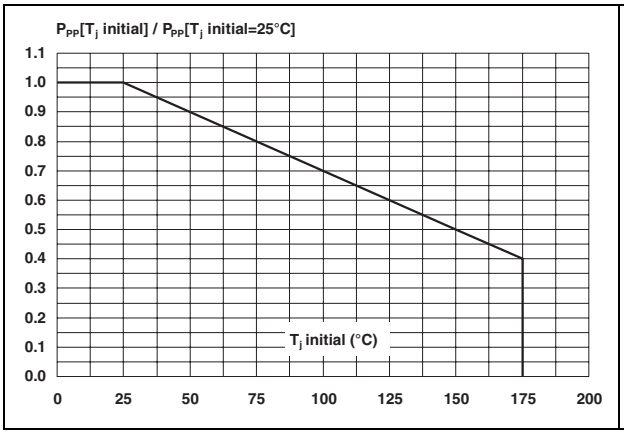


Figure 3. Peak pulse power versus exponential pulse duration (T_j initial = 25 °C)

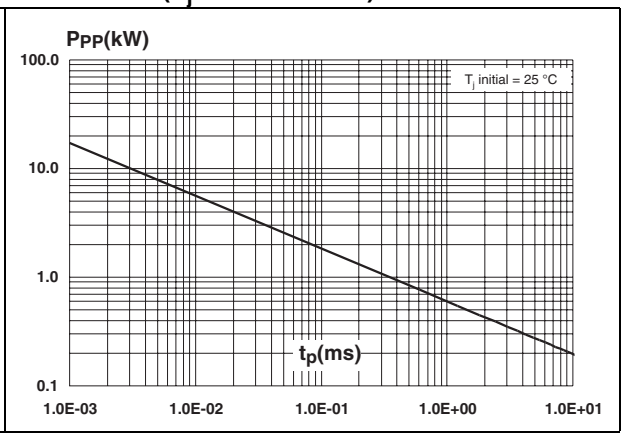


Figure 4. Clamping voltage versus peak pulse current (exponential waveform, maximum values)

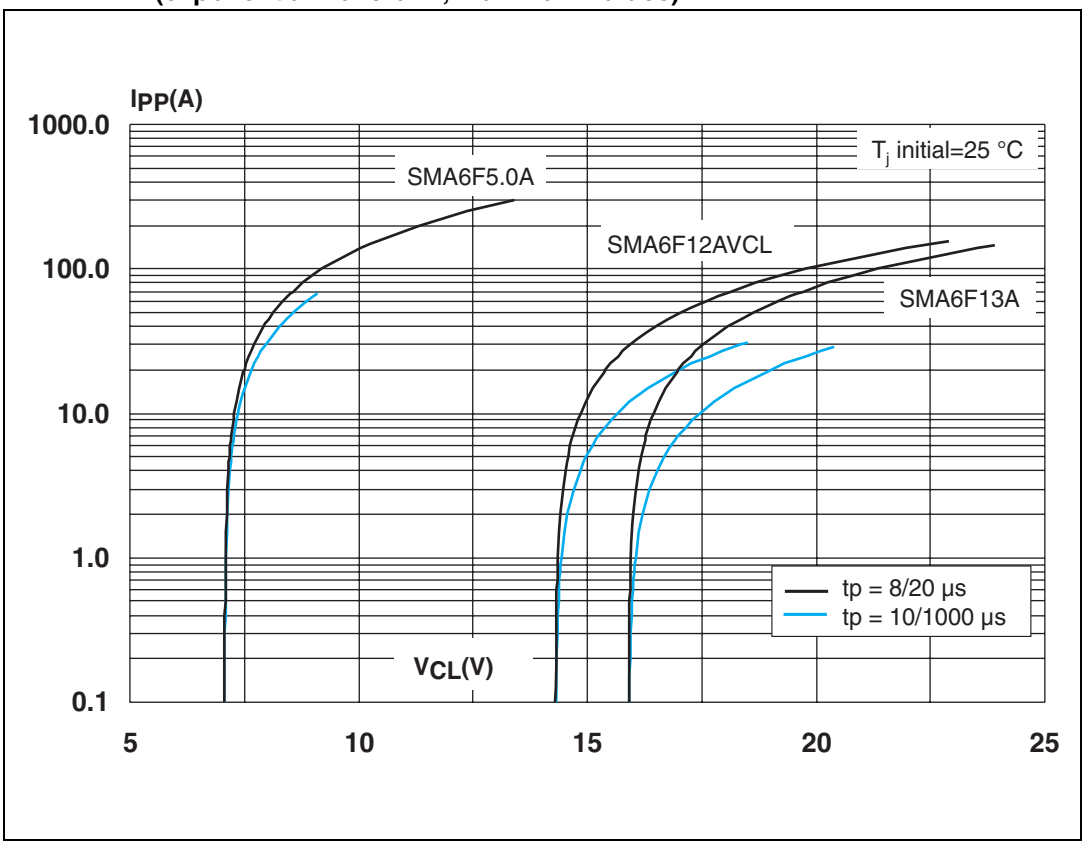


Figure 5. Junction capacitance versus reverse applied voltage (typical values)

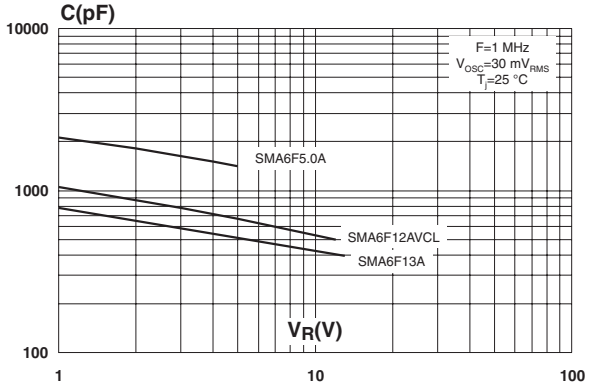


Figure 6. Peak forward voltage drop versus peak forward current (typical values)

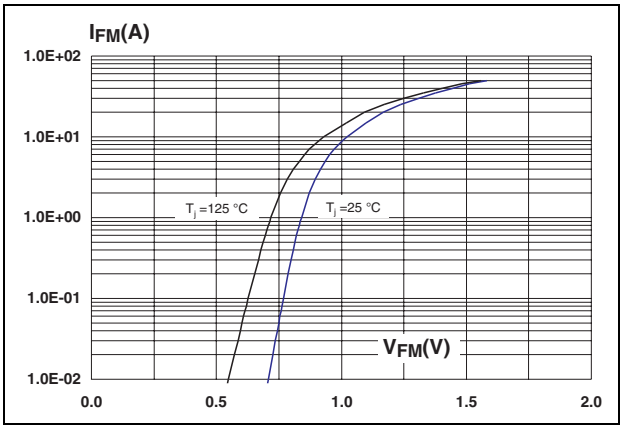


Figure 7. Relative variation of thermal impedance junction to ambient versus pulse duration

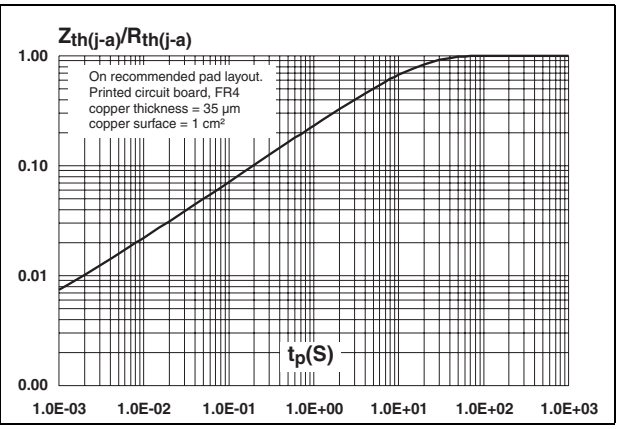


Figure 8. Thermal resistance junction to ambient versus copper surface under each lead

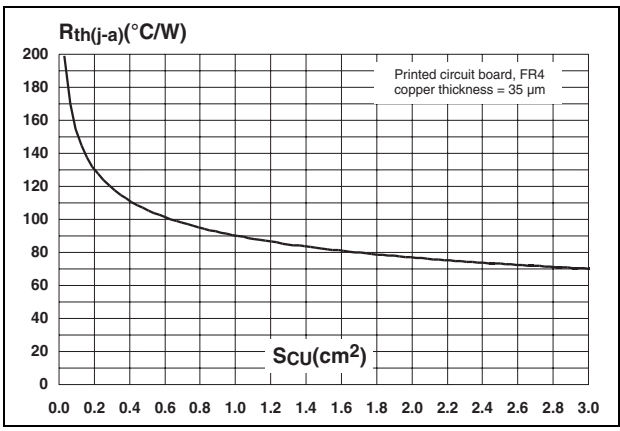
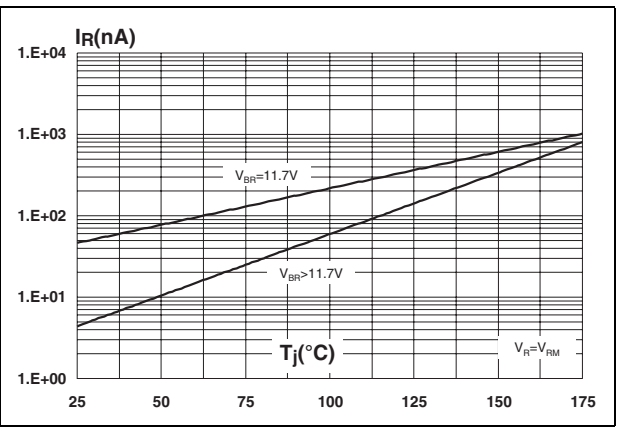
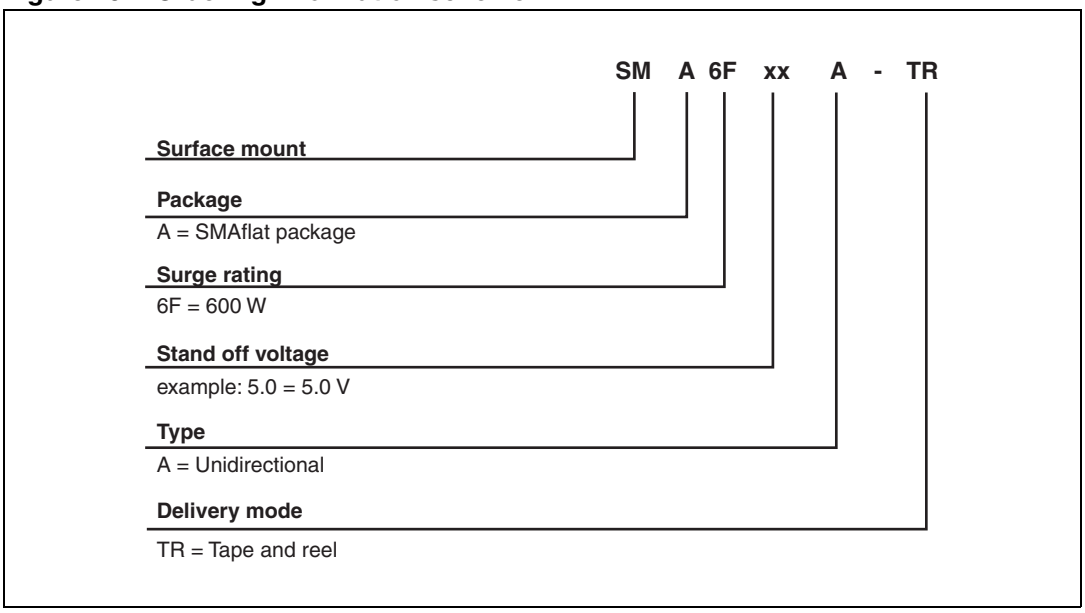


Figure 9. Leakage current versus junction temperature (typical values)



2 Ordering information scheme

Figure 10. Ordering information scheme

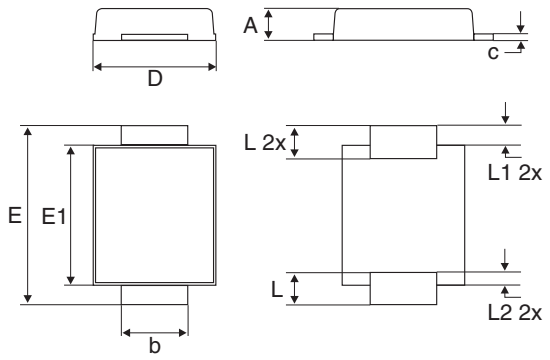


3 Package information

- Case: JEDEC DO-221AC molded plastic over Planar junction
- Terminals: Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity: Band indicates cathode
- Flammability: Epoxy 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 5. SMAflat (non exposed pad) dimensions



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90		1.10	0.035		0.043
b	1.25		1.65	0.049		0.065
c	0.15		0.40	0.006		0.016
D	2.25		2.95	0.088		0.116
E	4.80		5.60	0.189		0.220
E1	3.95		4.60	0.156		0.181
L	0.75		1.50	0.030		0.059
L1		0.50			0.019	
L2		0.50			0.019	

Figure 11. SMAflat footprint dimensions

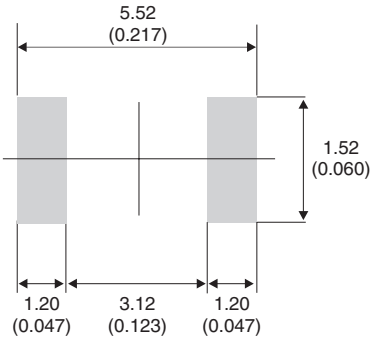
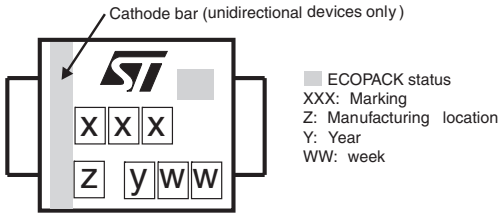


Figure 12. Marking information



4 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
SMA6F5.0A-TR	SUA	SMAflat	0.035 g	10000	Tape and reel
SMA6F12AVCL	SUJ				
SMA6F13A-TR	SUG				

For the latest information on available order codes see the product pages on www.st.com.

5 Revision history

Table 7. Document revision history

Date	Revision	Changes
04-Sep-2008	1	First issue.
01-Sep-2011	2	Updated order code in *Table 6*.

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