SMTYF

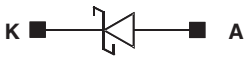
Low forward voltage TVS Transky™

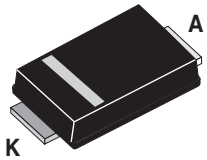
Features

- High peak pulse power:
  - 600 W (10/1000 µs)
  - 4000 W (8/20 µs)
- Stand-off voltage 5 or 12 V
- Low forward voltage: 0.48 V @ 0.85 A @ 25 °C
- Low clamping factor V_{CL}/V_{BR}
- Fast response time
- Very thin package (1.0 mm overall component height)
- ECOPACK2® halogen-free package

Complies with the following standards:

- IEC 61000-4-2 level 4:
  - 15 kV (air discharge)
  - 8 kV (contact discharge)
- MIL STD 883E- Method 3015-7: class 3C
  - Human body model





Unidirectional

SMAflat

Description

The Transky is designed specifically for portable equipment and miniaturized electronic devices subject to ESD transient overvoltages.

The Transky combines the performance of a Transil™ or TVS (transient voltage supressor) and low forward voltage Schottky diode in a monolithic structure.

TM: Transky is a trademark of STMicroelectronics.

TM: Transil is a trademark of STMicroelectronics.

1 Characteristics

Table 1. Absolute ratings (limiting values at 25 °C, unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{PP}	IEC 61000-4-2 standard	Air discharge Contact discharge	15 8	kV
P_{PP}	Peak pulse power dissipation(1)	$T_{j\ initial} = T_{amb}$	600	W
I_{FSM}	Non repetitive surge peak forward current	t_p = 10 ms $T_j = T_{initial} = T_{amb}$	25	A
T_{stg}	Storage temperature range		-65 to +175	°C
Tj	Operating junction temperature range		-40 to +175	°C

1. 10/1000 µs pulse waveform

Table 2. Thermal resistance

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

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

Symbol	Parameter
V_{BR}	Breakdown voltage
I_{RM}	Leakage current @ V_{RM}
V_{RM}	Stand-off voltage
V_{CL}	Clamping voltage
R_d	Dynamic resistance
I_{PP}	Peak pulse current
C	Capacitance

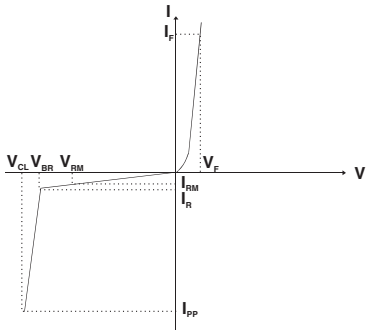


Table 4. Electrical characteristics - values (T_{amb} = 25 °C)

Type	V_F max (I_F = 0.85 A)	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
	V	µA (max)		V	V			mA	V	A	Ω	V	A	Ω	10-4/°C
SMTYF5.0A	0.48	10	500	5	6.40	6.74	7.07	10	9.2	68	0.029	13.4	298	0.021	5.7
SMTYF12A	0.48	20	1200	12	13.2	13.7	14.3	1	18.5	31	0.129	22.9	157	0.055	7.8

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 Ipp pulse

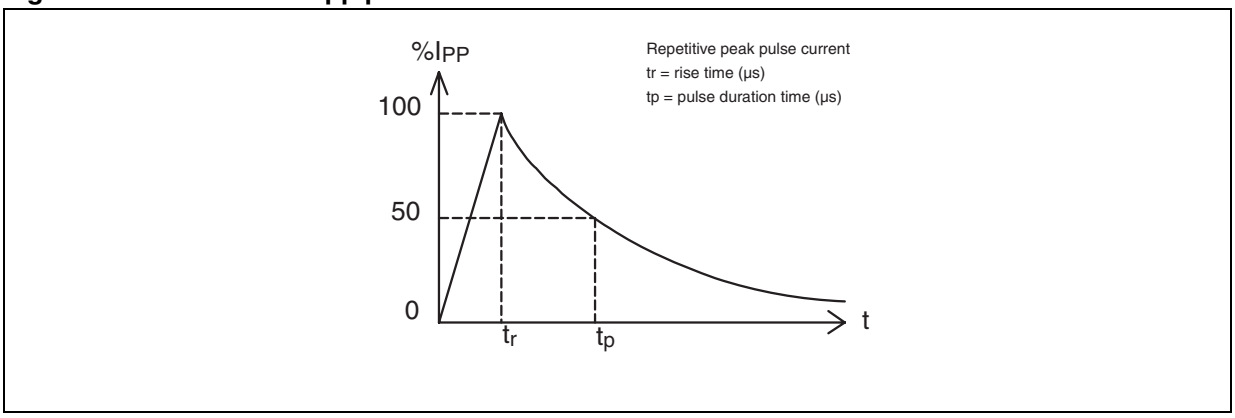


Figure 2. Relative peak power dissipation versus initial junction temperature

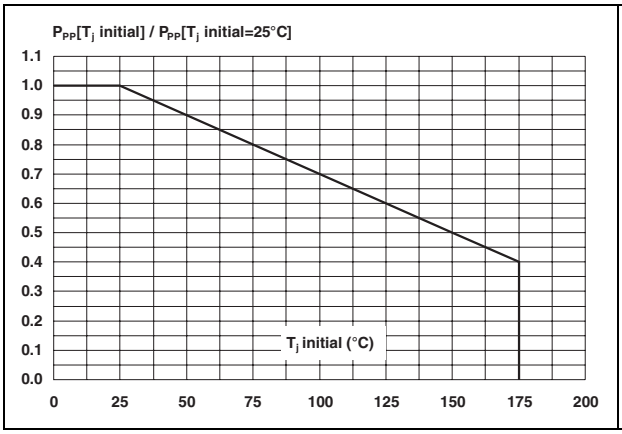


Figure 3. Peak pulse power versus exponential pulse duration (T_j initial = 25 °C)

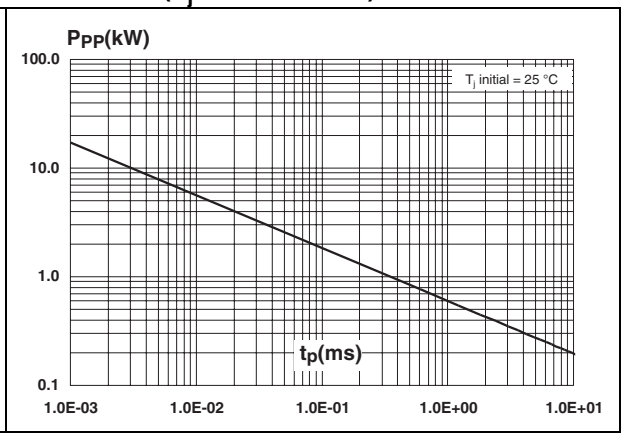


Figure 4. Clamping voltage versus peak pulse current (exponential waveform, maximum values)

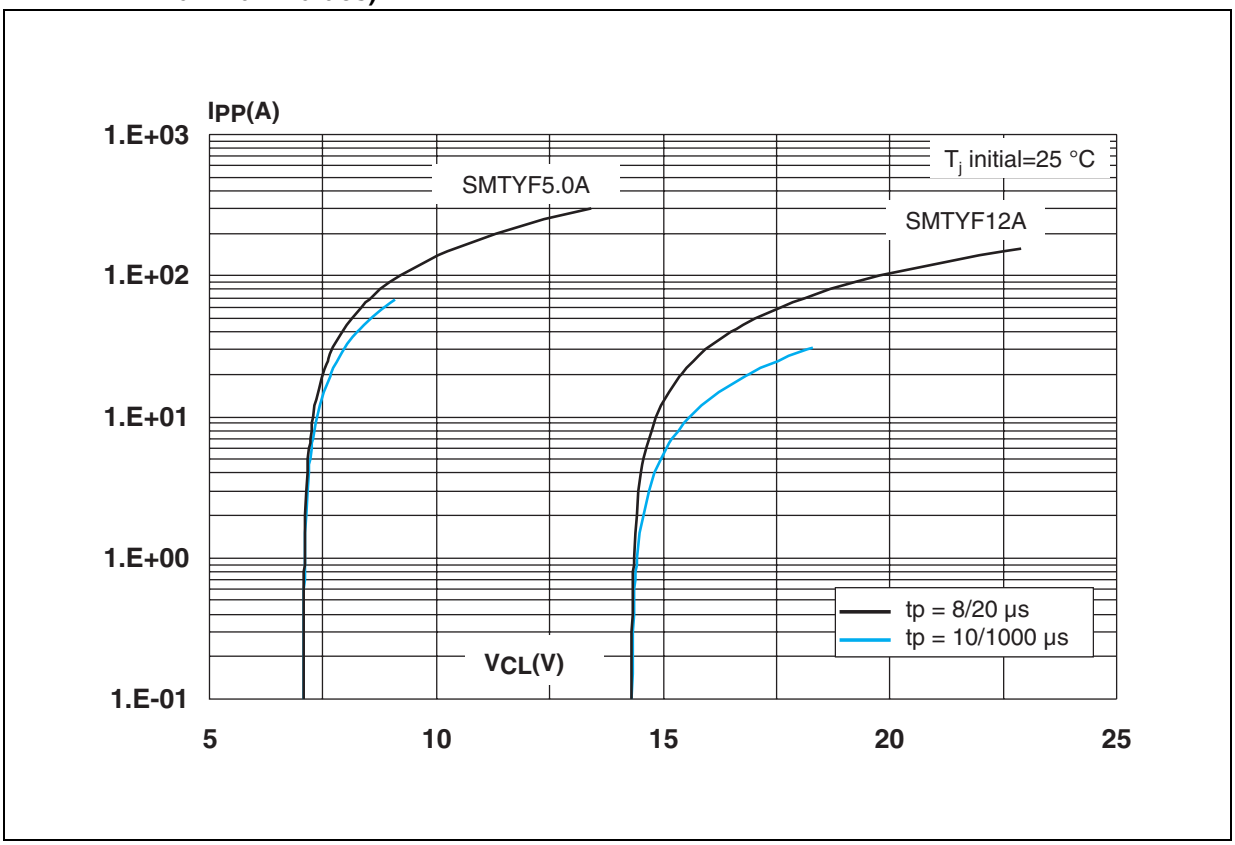


Figure 5. Junction capacitance versus reverse applied voltage (typical values)

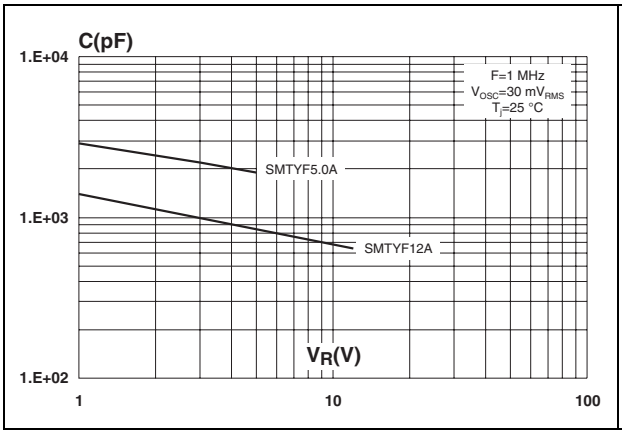


Figure 6. Forward voltage drop versus forward current (typical values)

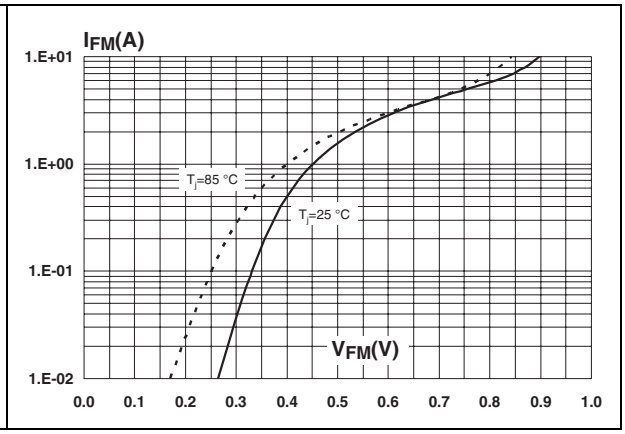


Figure 7. Average power dissipation versus ambient temperature

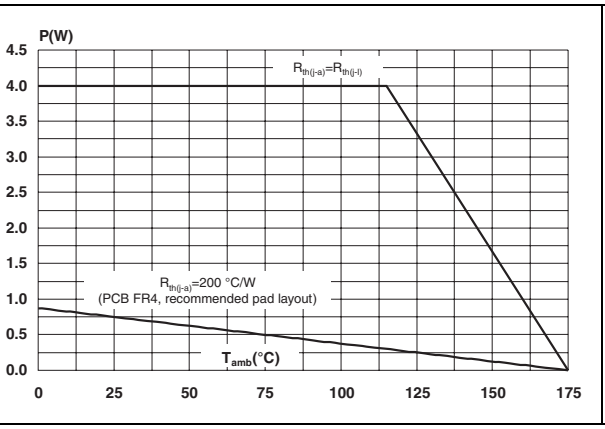


Figure 8. Relative variation of thermal impedance junction to ambient versus pulse duration (printed ciruit board FR4, S_{Cu} = 1 cm^2)

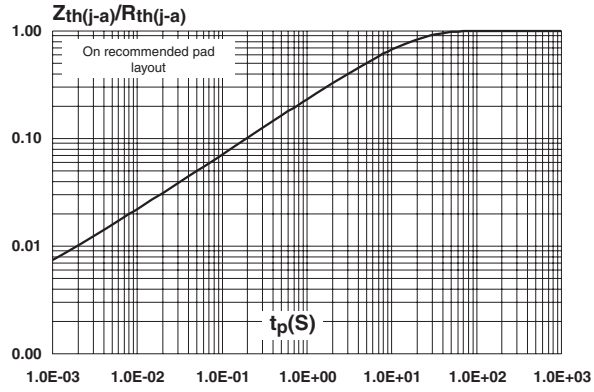


Figure 9. Thermal resistance junction to ambient versus copper surface under each lead (printed circuit board FR4, copper thickness = 35 µm)

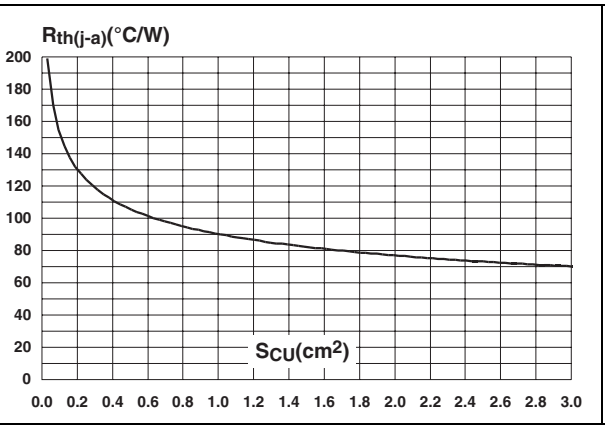
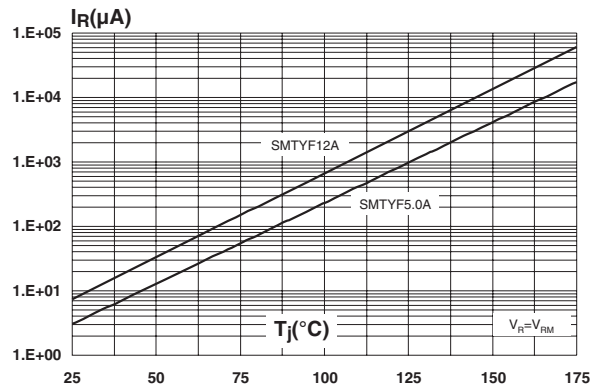


Figure 10. Leakage current versus junction temperature (typical values)

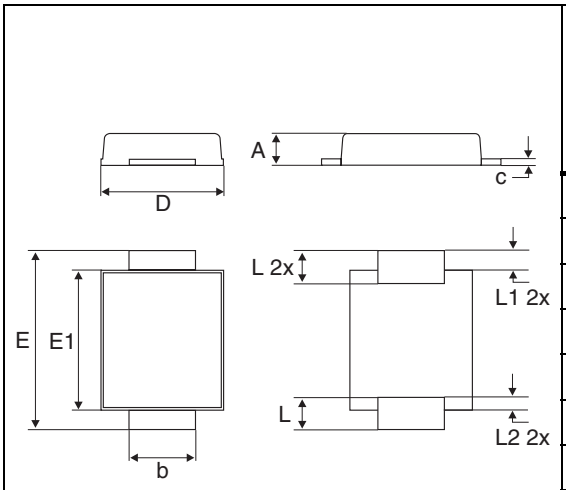


2 Package information

- 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 ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at *www.st.com*.

Table 5. SMAflat 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 optimized for SMAflat(1)

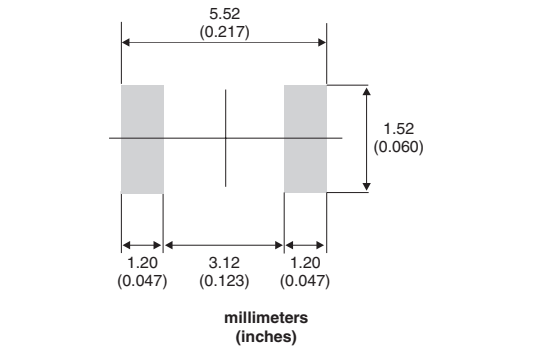
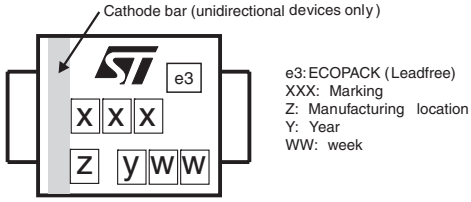


Figure 12. Marking information



1. SMA footprint may also be used.

3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
SMTYF5.0A	YF5.0	SMAflat	0.035 g	10 000	Tape and reel
SMTYF12A	YF12				

4 Revision history

Table 7. Document revision history

Date	Revision	Description of changes
04-Sep-2008	1	First issue

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