SM6HT

High temperature Transil™ for automotive applications

Features

- High performance TRANSIL designed to fit high temperature environment like automotive applications
- High reliability planar technology
- High performance in voltage regulation mode
- Very low leakage current:
- I_R max. = 5 µA @ T_{amb} = 150° C
- Peak pulse power: 600 W (10/1000 µs)
- Fast response time
- Unidirectional type
- Low clamping factor

SMB
(JEDEC DO-214AA)

Description

This high performance Transil series has been designed to fit high temperature environment such as automotive applications, using surface mount technology.

These devices are using high reliability planar technology resulting in high performances in voltage regulation mode and low leakage current at high temperature.

Order codes

Part number	Marking
SM6HT24A	EMB
SM6HT27A	EPB
SM6HT30A	ERB
SM6HT36A	EVB
SM6HT39A	EXB
SM6HT43A	EYB

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1 Characteristics

Table 1. Absolute maximum rating (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_{amb} = 50° C	6	W
I_{FSM}	Non repetitive surge peak forward current for unidirectional types	t_p = 10 ms T_j initial = T_{amb}	75	A
T_{stg} / T_j	Storage and operating junction temperature range		-65 to 175	°C
T_L	Maximum lead temperature for soldering during 10 s.		260	°C

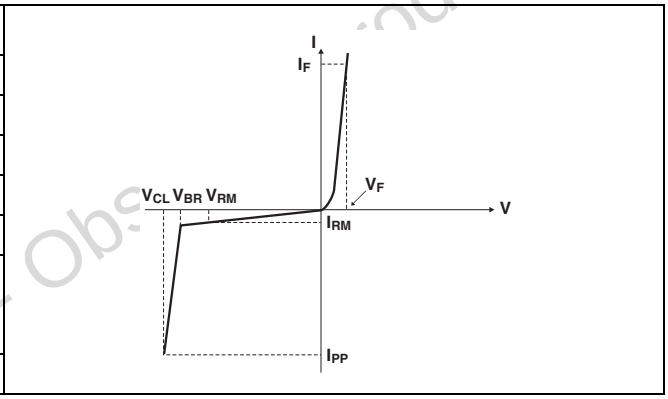
1. for a surge greater than the maximum values, the diode will fail in short circuit.

Table 2. Thermal resistances

Symbol	Parameter	Value	Unit
$R_{th(j-l)}$	Junction to leads	20	°C/W
$R_{th(j-a)}$	Junction to ambient on printed circuit on recommended pad layout	100	°C/W

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

Symbol	Parameter
V_{RM}	Stand-off voltage
V_{BR}	Breakdown voltage
V_{CL}	Clamping voltage
I_{RM}	Leakage current
I_{PP}	Peak pulse current
V_F	Forward voltage drop V_F < 3.5 V @ I_F = 50 A (pulse test: $t_p \leq 500$ µs)
I_Z	Continuous regulation current



Types	Marking	I_{RM} @ V_{BR}			V_{BR} @ I_R (1)				V_{CL} @ I_{PP}		αT (2)	I_Z @
		T_{amb}=25° C	T_{amb}=150° C						10/1000 µs			T_{amb}=50°C
		max	max		min	nom	max		max		max	max
		µA	µA	V	V	V	V	mA	V	A	10^{-4}/°C	mA
SM6HT24A	EMB	2	5	20.5	22.8	24	25.2	1	33.2	18.0	9.4	50
SM6HT27A	EPB			23.1	25.7	27	28.4		37.5	16.0	9.6	44
SM6HT30A	ERB			25.6	28.5	30	31.5		41.5	14.5	9.7	40
SM6HT36A	EVB			30.8	34.2	36	37.8		49.9	12.0	9.9	33
SM6HT39A	EXB			33.3	37.1	39	41.0		53.9	11.1	10.0	20
SM6HT43A	EYB			36.8	40.9	43	45.2		59.3	10.1	10.1	28

1. Pulse test: t_p < 50 ms
2. $\Delta V_{BR} = \alpha T \times (T_{amb} - 25) \times V_{BR}$ (25° C)

Figure 1. Peak power dissipation versus initial junction temperature

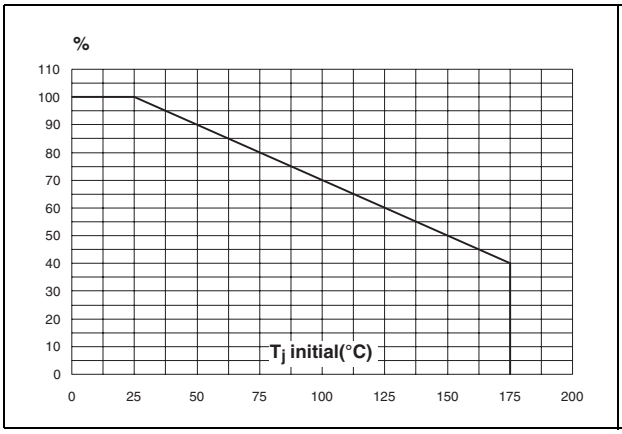


Figure 2. Continuous power dissipation versus ambient temperature

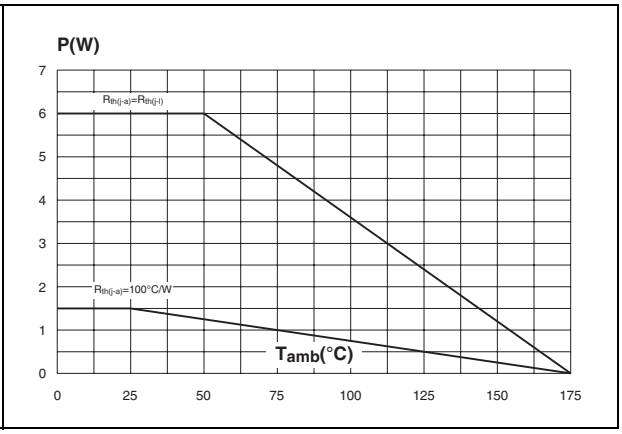


Figure 3. Peak pulse power versus exponential pulse duration (T_j initial = 25° C)

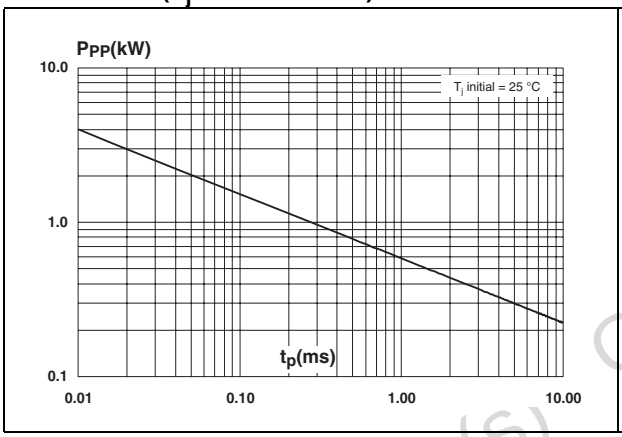


Figure 4. Clamping voltage versus peak pulse current (T_j initial = 25° C)

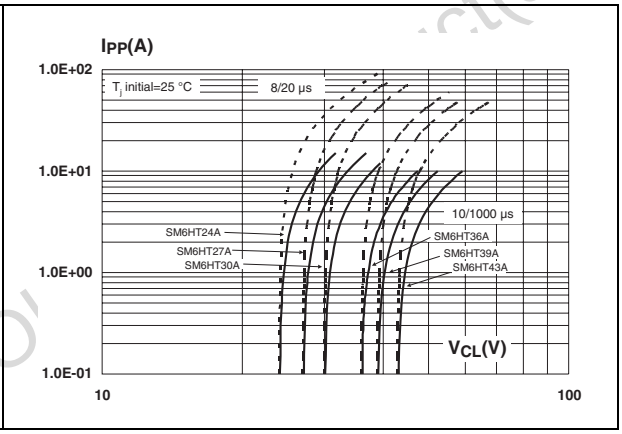


Figure 5. Junction capacitance versus reverse applied voltage (typical values)

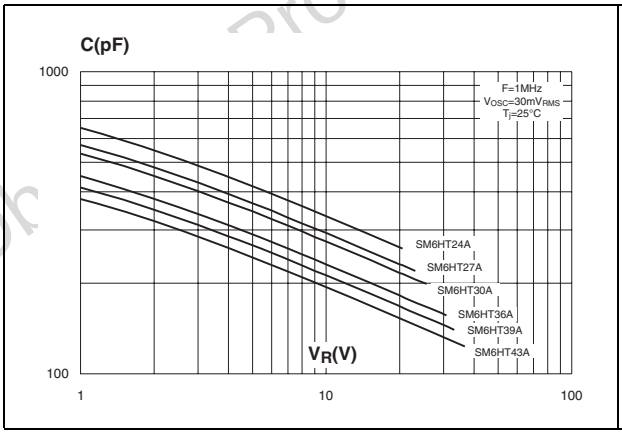


Figure 6. Peak forward voltage drop versus peak forward current (typical values)

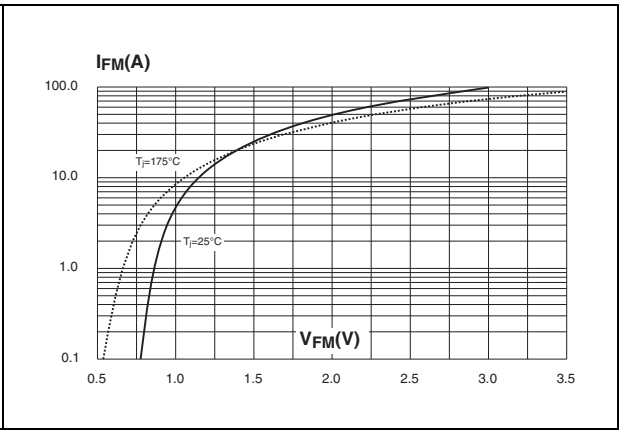


Figure 7. Variation of thermal impedance junction to ambient versus pulse duration (Printed circuit board FR4 with recommended pad layout)

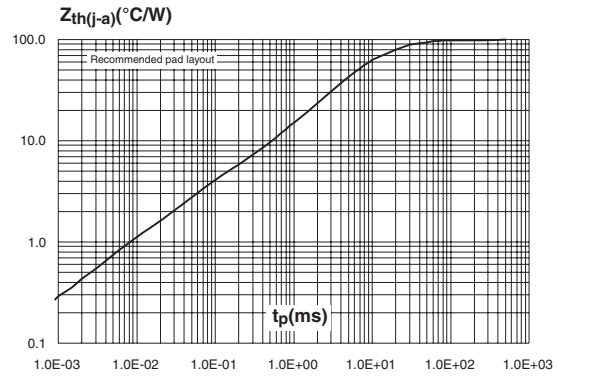


Figure 8. Thermal resistance junction to ambient versus copper surface under each lead (printed circuit board FR4, e_{Cu} = 35 µm)

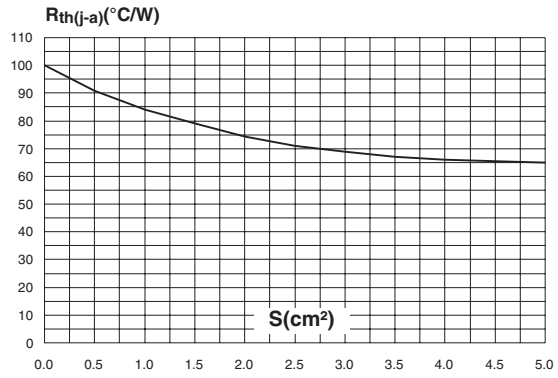
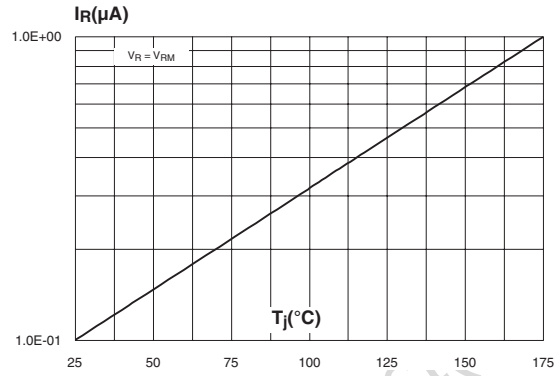
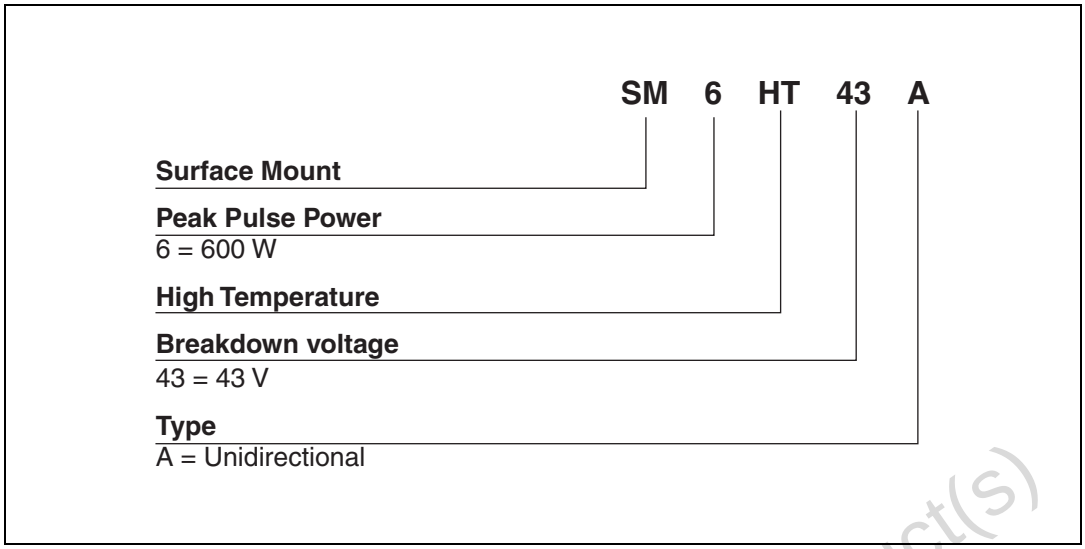


Figure 9. Variation of leakage current versus junction temperature (typical values)



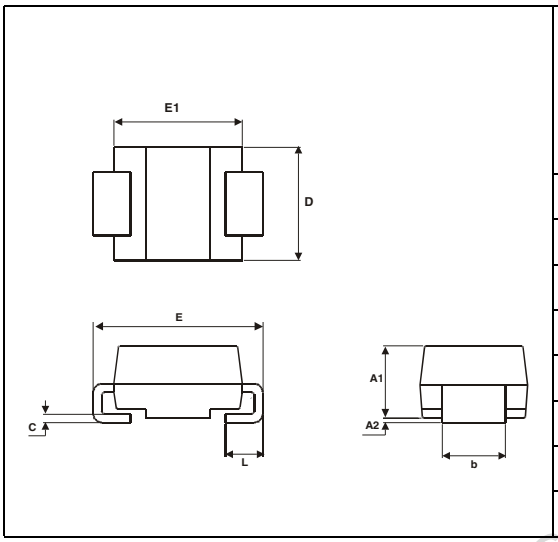
2 Order information scheme



3 Package information

- Case: JEDEC DO-214AA 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

Table 4. SMB 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	1.95	2.20	0.077	0.087
c	0.15	0.40	0.006	0.016
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
D	3.30	3.95	0.130	0.156
L	0.75	1.50	0.030	0.059

Figure 10. SMB footprint dimensions

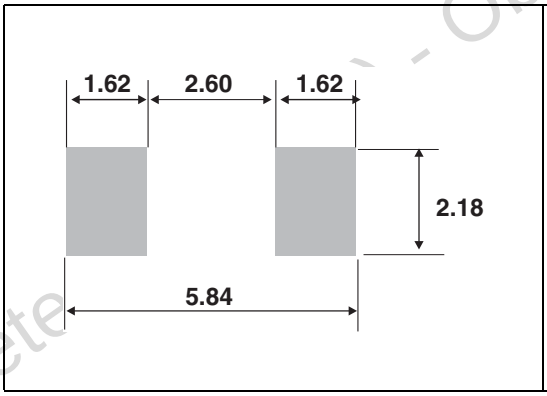
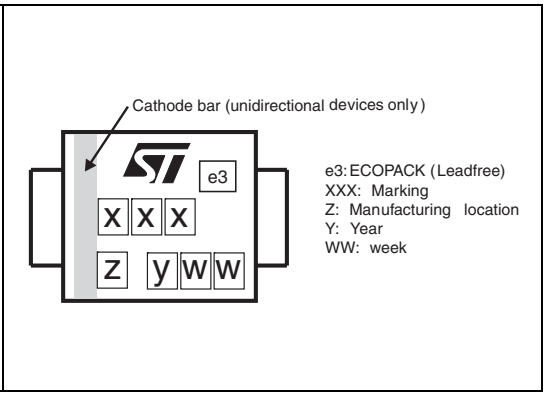


Figure 11. Marking information



4 Ordering information

Part number	Marking	Package	Weight	Base qty	Delivery mode
SM6HT24A	EMB	SMB	0.12 g	5000	Tape and reel
SM6HT27A	EPB				
SM6HT30A	ERB				
SM6HT36A	EVB				
SM6HT39A	EXB				
SM6HT43A	EYB				

5 Revision history

Date	Revision	Changes
Apr-1999	4A	Last release.
26-Jan-2005	5	Figure 9 on page 4: leakage current improved.
18-Mar-2005	6	Table 3: Electrical characteristics (T_{amb} = 25° C) on page 2: V_F specification added.
21-Mar-2007	7	*Table 1 on page 2*: Power dissipation upgraded from 5 W to 6 W. *Table 3 on page 2*: I_Z max parameter added. *Figure 2 on page 3*: Updated for 6 W power dissipation.

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