PROGRAMMABLE OVERVOLTAGE PROTECTOR

DESCRIPTION:

The ALPSVG170D is a Dual Programmable transient suppressor designed to protect against over voltages on the transmission equipment. Over voltages can be caused by lightning, AC power contact and induction. Dynamic protection performance is specified under typical international surge waveforms from Telcordia GR-1089-CORE, ITU-T K.44 and YD/T 950.

FEATURES:

- Dual Programmable transient suppressor
- Wide negative firing voltage range: V_{GKRM}= -167V max
- Low dynamic switching voltage: V_{FRM} and $V_{GK(BO)}$
- Low gate triggering current: I_{GT}=5mA max
- Peak pulse current: I_{PP}=30A for 10/1000µs surge
- Holding current: I_H=150mA min

APPLICATIONS:

- T-1/E-1, ISDN, and xDSL transmission equipment
- Telecommunications infrastructure
- PBX's and other switches
- Set-top box
- VoIP

MAXIMUM RATINGS

MAXIMUM RATINGS @ T_A = 25 °C unless otherwise specified			
PARAMETER	**SYMBOL**	**RATINGS**	**UNIT**
Non-repetitive peak impulse current [1, 2] 10/1000µS (Telcordia GR-1089-CORE) 5/310µS (ITU-T K.20, K.21, K.45, K.44 wave shape 10/700s) 2/10µS (Telcordia GR-1089-CORE)	I_{PPSM}	 30 40 120	A
Non-repetitive peak on-state current, 50 Hz / 60 Hz [1, 2, 3] 0.5s 1s 5s 30s 900s	I_{TSM}	 6.5 4.5 2.4 1.3 0.72	A
Repetitive peak off-state voltage, V_{GK} = 0	V_{DRM}	-170	V
Repetitive peak gate-cathode voltage, V_{KA} = 0	V_{GKRM}	-167	V
Operating free-air temperature range	T_A	-40 to +85	°C
Operating Junction Temperature	T_J	-40 to +150	°C
Storage Temperature Range	T_{STG}	-40 to +150	°C
Maximum lead temperature for soldering during 10s	T_L	260	°C
Junction to free air thermal resistance [4]	$R_{\theta JA}$	120	°C/W

Note:

1. Initially the device must be in thermal equilibrium with T_J = 25 °C. The surge may be repeated after the device returns to its initial conditions.
2. The rated current values may be applied to either of the Line to Ground terminal pairs. Additionally, both terminal pairs may have their rated current values applied simultaneously (in this case the Ground terminal current will be twice the rated current value of a single terminal pair.
3. Values for V_{GG} = -100 V
4. EIA/JESD51-3 PCB, EIA/JESD51-2 environment, PTOT = 1.7 W

ELECTRICAL CHARACTERISTICS @ TA = 25 °C unless otherwise specified

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP.	MAX	UNIT
Forward Voltage	I_F=5A, t_W=200µs	V_F			3	V
Peak forward recovery voltage	2/10µs, I_F=100A, R_S=50Ω, di/dt=80A/µs[5]	V_{FRM}			10	V
Off-state current	V_D=-170V, V_{GK}=0 T_J=25°C T_J=85°C	I_D			-5 -50	µA
Breakover voltage	2/10µs, I_{TM}=-100A, R_s=50Ω, di/dt=-80A/µs, V_{GG}=-100V	$V_{(BO)}$			-112	V
Holding current	I_T=-1A, di/dt=1A/ms, V_{GG}=-100V	I_H	-150			mA
Gate reverse current	V_{GG}=V_{GK}=-167V, V_{KA}=0 T_J=25°C T_J=85°C	I_{GKS}			-5 -50	µA
Gate trigger current	I_T=-3A, tp(g)≥20µs, V_{GG}=-100V	I_{GT}			5	mA
Gate-Cathode trigger voltage	I_T=-3A, tp(g)≥20µs, V_{GG}=-100V	V_{GT}			2.5	V
Anode-cathode offstate capacitance	F=1MHz, V_d=1V, I_G=0 [6] V_D=-3V V_D=-48V	C_{AK}			110 55	pF

TYPICAL DEVICE RATING AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

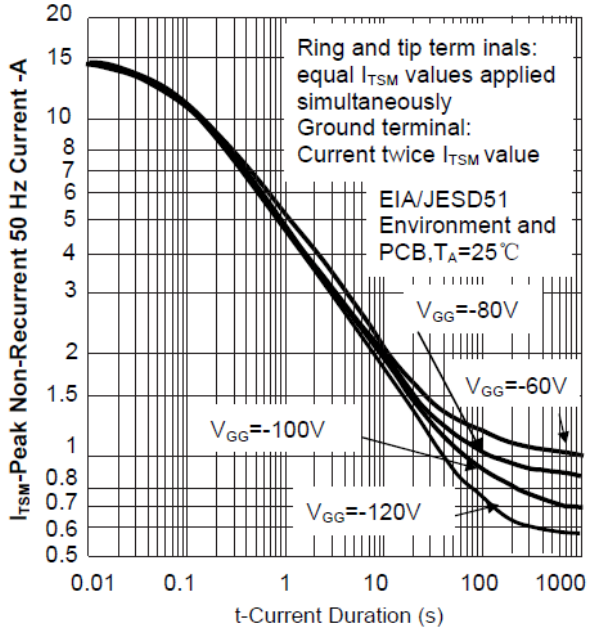


Fig.1 NON-REPETITIVE PEAK ON-STATE CURRENT VS CURRENT DURATION

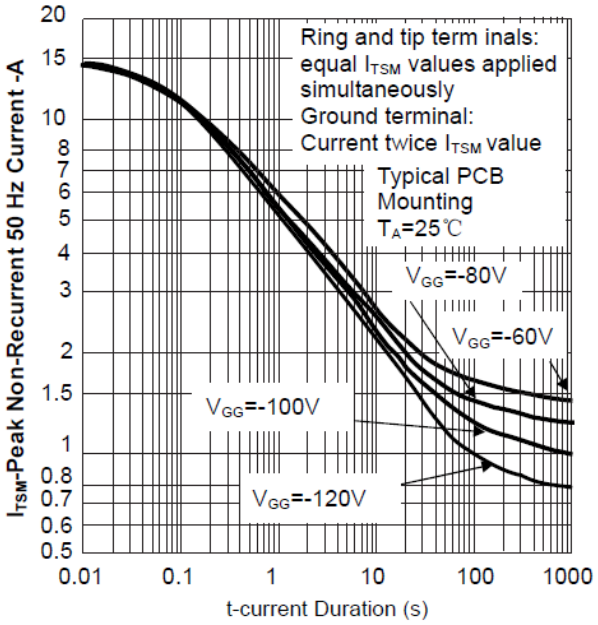
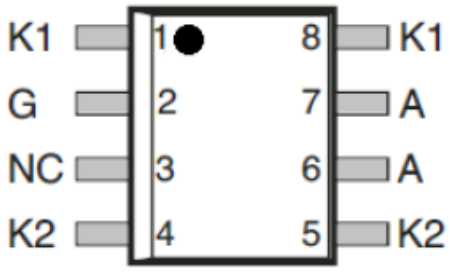
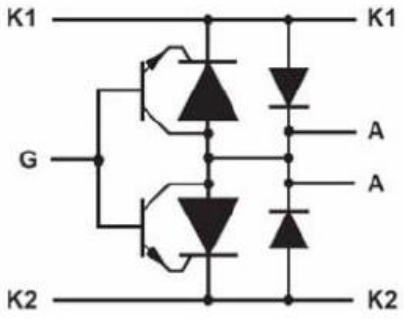


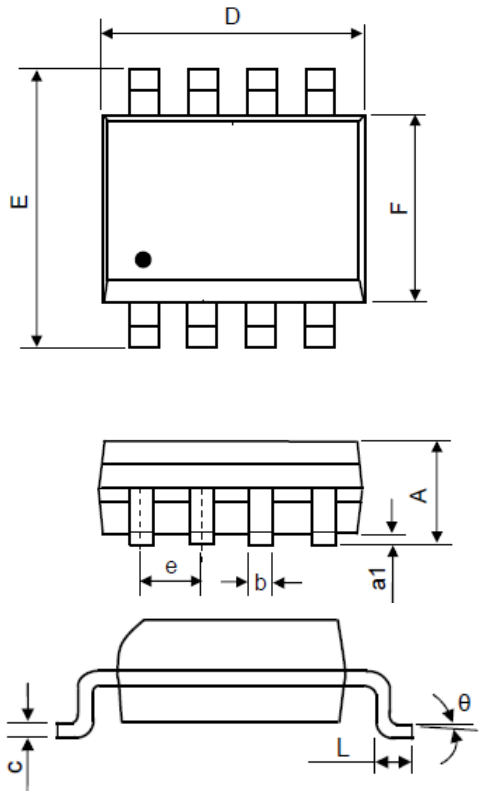
Fig.2 TYPICAL NON-REPETITIVE PEAK ON-STATE CURRENT VS CURRENT DURATION

PINNING INFORMATION

SIMPLIFIED OUTLINE	SCHEMATIC DIAGRAM
	

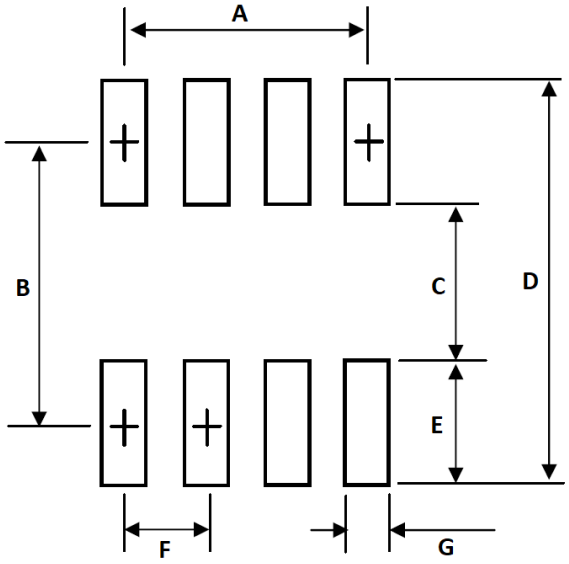
PACKAGE INFORMATION

SOP-8



OUTLINE DIMENSIONS		
SYMBOL	MILLIMETERS	
	MIN	MAX
A	1.35	1.75
a1	0.10	0.25
D	4.80	5.20
E	5.80	6.20
F	3.80	4.00
b	0.33	0.51
e	1.27BSC	
c	0.17	0.25
L	0.40	1.27
θ	0°	8°

SUGGESTED SOLDER PAD LAYOUT



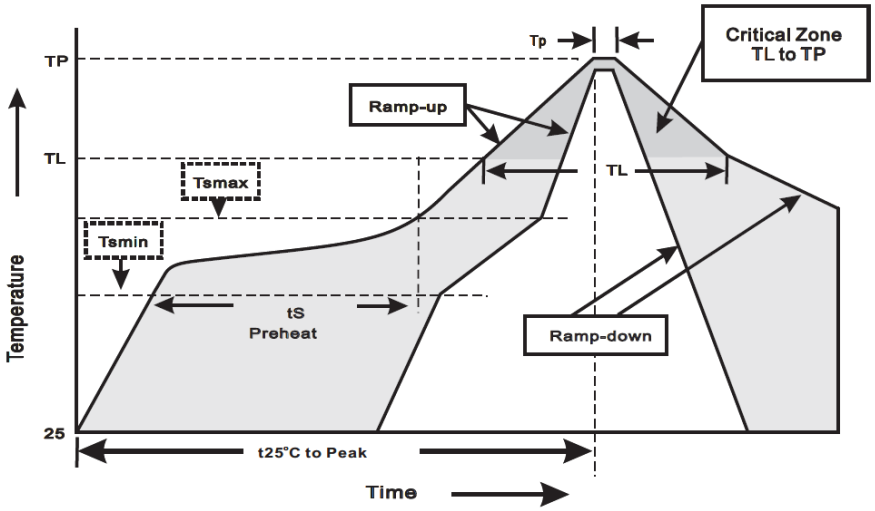
OUTLINE DIMENSIONS	
SYMBOL	MILLIMETERS
A	3.81
B	5.20
C	3.00
D	7.40
E	2.20
F	1.27
G	0.60

Note:
1. Controlling dimension: in millimeters.
2. General tolerance: ±0.05mm
3. The pad layout is for reference purposes only.

SOLDERING PARAMETERS

SUGGESTED THERMAL PROFILES FOR SOLDERING PROCESSES

1. Storage environment: Temperature=5 °C~40 °C Humidity=55% ±25%
2. Reflow soldering of surface-mount devices



3. Reflow soldering

PROFILE FEATURE	SOLDERING CONDITION
Average ramp-up rate (T_L to T_P)	<3 °C/sec
Preheat - Temperature Min (T_{smin}) - Temperature Max (T_{smax}) - Time (min to max) (t_s)	 150 °C 200 °C 60 ~ 120 sec
T_{smax} to T_L - Ramp-upRate	 <3 °C/sec
Time maintained above: - Temperature (T_L) - Time(tL)	 217 °C 60 ~ 260 sec
Peak Temperature (T_P)	255 °C-0/+5 °C
Time within 5 °C of actual Peak Temperature(tP)	10 ~ 30 sec
Ramp-down Rate	<6 °C/sec
Time 25 °C to Peak Temperature	<6 minutes

CUSTOMER NOTE:

DISCLAIMER

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2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

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