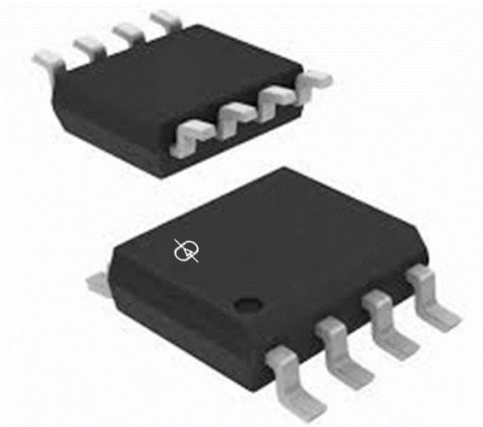
PROGRAMMABLE OVERVOLTAGE PROTECTOR

DESCRIPTION:



The ALPSVG170Q is especially designed for short loop system. It can be independent tracking overvoltage protection for two SLICs (Subscriber Line Interface Circuit). Positive over voltages are clipped to common by forward conduction of this device antiparallel diode. Negative over voltages are initially clipped close to the SLIC negative supply by emitter follower action of this buffer transistor.

FEATURES:

- Dual voltage-programmable protector
- Supports battery voltages down to -167 V
- Low gate triggering current 5 mA max.
- High holding current 150 mA min.
- Specified 2/10 limiting voltage
- ESD Immunity (HBM): JESD22 Class 3B, ≥8KV
- MLS: Lever 1 - unlimited

APPLICATIONS:

- Wireless In the Local Loop (WILL)
- Fibre In The Loop (FITL)
- Digital Added Main Line, Pair Gain (DAML)
- Small Office Home Office (SOHO)
- Integrated Services Digital Network – Terminal Adaptors (ISDN-TA)

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
Non repetitive peak gate current, 1/2µs pulse, cathodes commoned	I_{GSM}	40	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

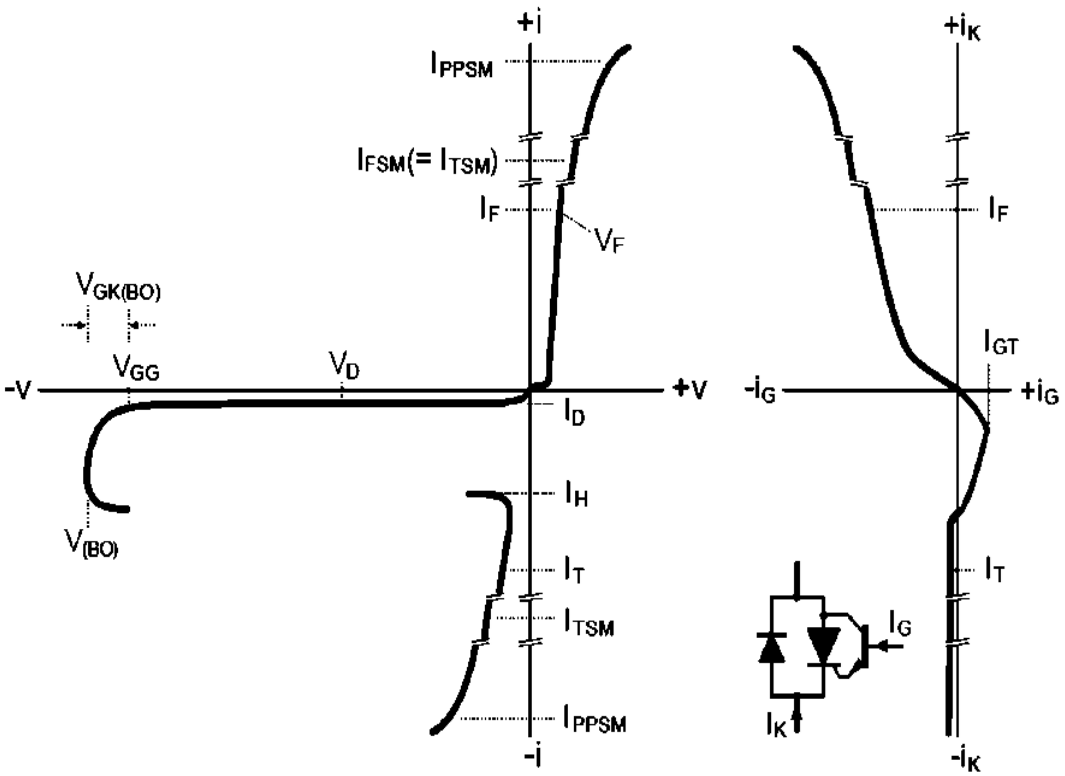
Note:
1. Initially the device must be in thermal equilibrium with T_J = 25 °C. The surge may be repeated after the device returns to its initial conditions.
2. The rated current values may be applied to either of the Line to Ground terminal pairs. Additionally, both terminal pairs may have their rated 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

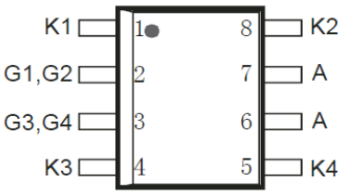
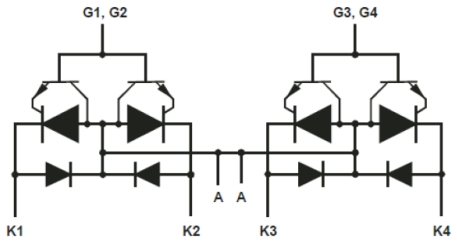
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP.	MAX	UNIT
Forward Voltage	I_F=5A, t_W=200µs	V_F			3	V
Ramp peak forward recovery voltage	di/dt=±10A/µs, dv/dt≦±100V/µs maximum ramp value=±10A, T_J=25°C	V_{FRM}			5	V
Impulse peak forward recovery voltage	2/10µs, I_{TM}=-27A, R_S=50Ω, di/dt=27A/µs	V_{FRM}			12	V
Off-state current	V_D=V_{DRM}, V_{GK}=0 T_J=25℃	I_D			-5	µA
Ramp Breakover voltage	di/dt=±10A/µs, dv/dt≦±100V/µs, V_{GG}=-100V maximum ramp value=±10A, T_J=25°C	$V_{(BO)}$			-112	V
Impulse breakover voltage	2/10µs, I_{TM}=-27A, R_s=50Ω, di/dt=-27A/µs, V_{GG}=-100V	$V_{(BO)}$			-115	V
Gate-cathode impulse breakover voltage	2/10µs, I_{TM}=-27A, R_s=50Ω, di/dt=-27A/µs, V_{GG}=-100V	$V_{GK(BO)}$			15	V
Holding current	I_T=-1A, di/dt=1A/ms, V_{GG}=-100V	I_H	-150			mA
Gate reverse current	V_{GG}=V_{GK}=V_{GKRM}, V_{KA}=0 T_J=25℃	I_{GKS}			-5	µA
Gate trigger current	I_T=-3A, $t_{p(g)}$≥20µs, V_{GG}=-100V T_J=25℃	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 V_D=-3V V_D=-48V	C_{AK}			100 55	pF

PARAMETER MEASUREMENT INFORMATION

Parameter	Symbol
Off-state current	I_D
Holding current	I_H
Breakover voltage	$V_{(BO)}$
Forward voltage	V_F
Peak forward recovery voltage	V_{FRM}
Gate-cathode impulse breakover voltage	$V_{GK(BD)}$
Gate reverse current	I_{GKS}
Gate trigger current	I_{GT}
Gate-cathode trigger voltage	V_{GT}
Cathode-anode off-state capacitance	C_{KA}

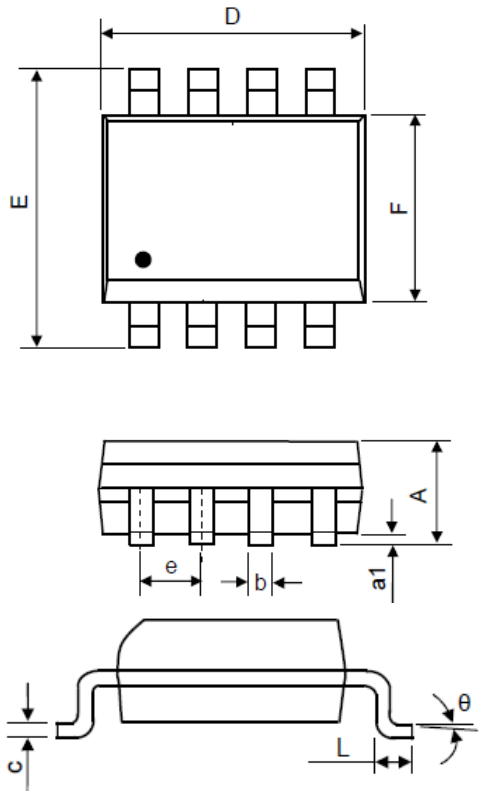


PINNING INFORMATION

PIN CONFIGURATION	SIMPLIFIED OUTLINE	SCHEMATIC DIAGRAM
K1, K3, K4, K2 - Connect to subscriber lines (Tip/Ring) G1, G2, G3, G4 - Connect to battery (Reference Voltage) A - Connect ground		

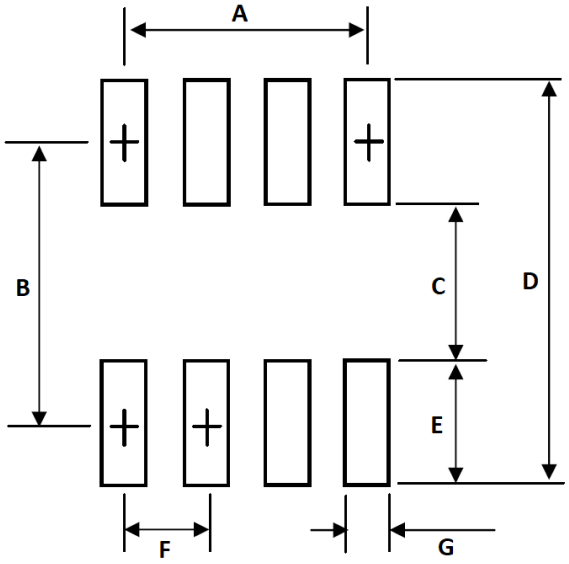
PACKAGE INFORMATION

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



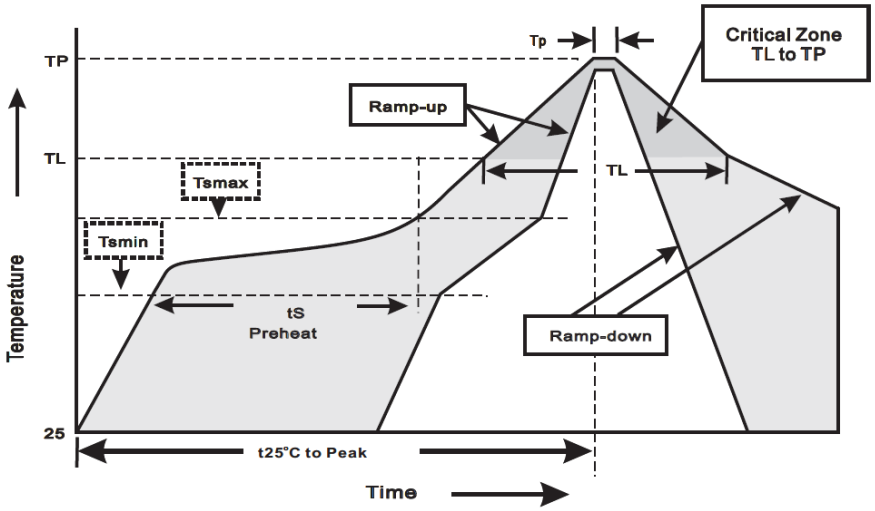
OUTLINE DIMENSIONS	
SYMBOL	MILLIMETERS
A	3.81
B	5.20
C	3.00
D	7.40
E	2.20
F	1.27
G	0.60

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

The product information and the selection guide facilitates the selection of the ALPINESEMI™'s Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review the Data sheet(s) so as to confirm that the Device(s) meets functionality parameters for your application. The information furnished on the Data Sheet and the ALPINESEMI™'s Web Site is believed to be accurate and reliable at the time of preparation of this document. ALPINESEMI™ however, does not assume any inaccuracies that may arise when the components are mounted and removed. Furthermore, ALPINESEMI™ does not assume liability whatsoever, arising out of the application or the use of any of ALPINESEMI™'s product(s). Neither, does it convey any license under its patent rights nor the rights of others. These products are not guaranteed for use in life saving/support appliances or systems. ALPINESEMI™'s customers using these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and ALPINESEMI™ will not be responsible in any way(s) for any damage(s) resulting from such use.

Please check the website **www.alpinesemi.com** for continues updates and revision of datasheets.

DESIGN CHANGES: ALPINESEMI™ strives for continuous improvement and reserves the right to change the specifications of its products without prior notice. ALPINESEMI™ reserves the right to discontinue product lines without prior notice. Any product selection is a recommendation based on best understanding of such product(s) by our engineers. However, buyers are advised to rely on their own judgment for such selection of the products.

ALPINESEMI™ makes no warranty, representation or guarantee regarding the suitability of its products for any particular applications. Neither does ALPINESEMI™ assume any liability arising out of the applications nor the use of such products. ALPINESEMI™ specifically disclaims all liabilities either consequential or incidental.

All logos and information provided in the datasheets are for reference only. Any registered and/or trademark/logos belonging to respective companies be the property of those companies. ALPINESEMI™ extends the courtesy to them, if any of the information found in its datasheet.

Component Disposal Instructions

1. ALPINESEMI™ Semiconductor Devices are RoHS compliant and hence customers are requested to dispose as per the prevailing Environmental Legislation put forth in their specific country.

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

ALPINESEMI

sales@alpinesemi.com
www.alpinesemi.com