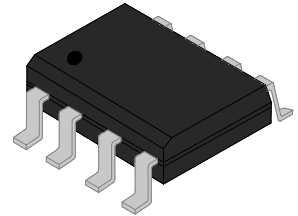




JIP61089S Dual Programmable Thyristor Transient Voltage Suppressor Rev.1.2

DESCRIPTION

JIP61089S is especially designed to protect monolithic SLIC (subscriber line interfaces circuits) against transient overvoltages. Positive overloads are clipped with 2 diodes. Negative surges are suppressed by 2 thyristors, their breakdown voltage being referenced to $-V_{BAT}$ through the gate. This component presents a very low gate triggering current (I_{GT}) in order to reduce the current consumption on printed circuit board during the firing phase. A particular attention has been given to the internal wire bonding. The “4-point” configuration ensures reliable protection, eliminating the overvoltage introduced by the parasitic inductances of the wiring (Ldi/dt), especially for very fast transients.



Device package type SOP-8

FEATURES

- ✧ Dual programmable transient suppressor.
- ✧ Wide negative firing voltage range: $V_{GKRM} = -167V$ max .
- ✧ Low dynamic switching voltage: V_{FRM} and $V_{GK(BD)}$.
- ✧ Low gate triggering current: $I_{GT} = 5mA$ max .
- ✧ Peak pulse current: $I_{PP} = 30A$ for 10/1000 μs surge .
- ✧ Holding current: $I_H = 150mA$ min.
- ✧ Moisture sensitivity level: Level 3.
- ✧ UL 497B item recognized. (File No.: E480698).
- ✧ IEC61000-4-2 (ESD) $\pm 30kV$ (air), $\pm 30kV$ (contact).

APPLICATION:

JIP61089S is designed to protect communication equipment such as SPC exchanger from being damaged by transient overvoltages at the second level.

TESTING STANDARDS

Type	Wave Sharp		V_{PP}/I_{PP}
ITU-T K.20/21 and K.45	Voltage	10/700 μs	2000V
	Current	5/310 μs	40A

Note 1 :The JIP61089S is intended to be used with a series combination of a 40 Ω or higher resistance and a suitable overcurrent protector. Power fault compliance requires the series overcurrent element to open-circuit or become high impedance. For equipment compliant to ITU-T recommendations K.20 or K.21 or K.45 only, the series resistor value is set by the coordination requirements. For coordination with a 400V limit GDT, a minimum series resistor value of 10 Ω is recommended.

ABSOLUTE MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$, RH=45%-75%, unless otherwise noted)

Parameter		Symbol	Value	Unit	
Storage temperature range		T_{STG}	-40 to +150	$^{\circ}\text{C}$	
Operating junction temperature		T_J	-40 to +150	$^{\circ}\text{C}$	
Operating free-air temperature range		T_A	-40 to +85	$^{\circ}\text{C}$	
Non-repetitive peak on-state pulse current					
10/1000 μs	(Telcordia (Bellcore) GR-1089-CORE, Issue 2, February)	I_{TSP}	30	A	
5/310 μs	(ITU-T K.20/21&K.45/44 open-circuit voltage 10/700 μs)		40		
1.2/50 μs	(Telcordia (Bellcore) GR-1089-CORE, Issue 2, February)		100		
Non-repetitive peak pulse voltage(10/700 μs)		V_{PP}	2000	V	
Non repetitive surge peak on-state current (sinusoidal) 60Hz		I_{TSM}	0.5s	6.5	A
			1s	4.6	
			5s	2.3	
			30s	1.3	
			900s	0.73	
Maximum voltage LINE/GROUND		V_{DRM}	-170	V	
Maximum voltage GATE/LINE		V_{GKRM}	-167	V	

Note 2: 5/310 μs means current wave, and its rise time is 5 μs , fall time is 310 μs .

10/700 μs means voltage wave, and its rise time is 10 μs , fall time is 700 μs .

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$)

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Parameters related to the diode						
V_F	Forward voltage	$I_F=5\text{A}$, $t_w=200\mu\text{s}$	-	-	3	V
V_{FRM}	Peak forward recovery voltage	$2/10\mu\text{s}$, $I_F=100\text{A}$, $R_s=50\Omega$, $di/dt=80\text{A}/\mu\text{s}$	-	-	10	V
Parameters related to the protection thyristor						
I_{DRM}	Off-state current	$V_{DRM}=-170\text{V}$, $V_{GK}=0\text{V}$	-	-	-5	μA
V_{BO}	Breakover voltage	$2/10\mu\text{s}$, $I_{TM}=-100\text{A}$, $R_s=50\Omega$, $di/dt=-80\text{A}/\mu\text{s}$, $V_{GG}=-100\text{V}$	-	-	-112	V

ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$, continued)

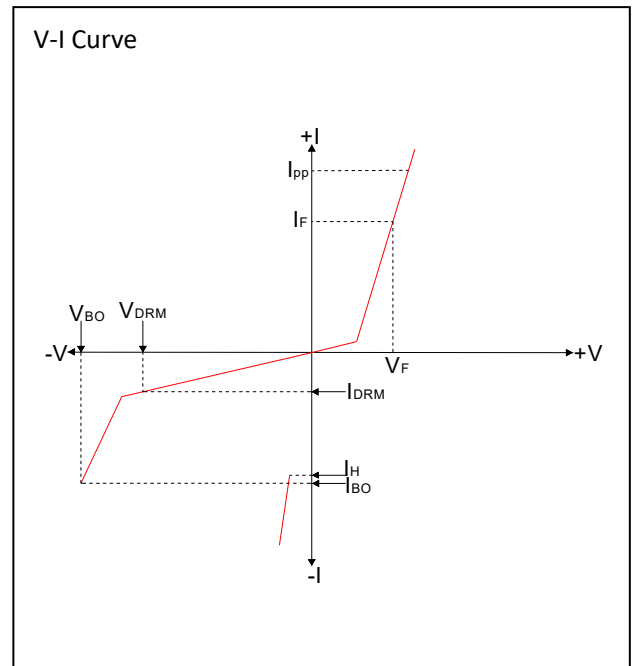
Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
I_H	Holding current	$I_T=-1\text{A}$, $di/dt=1\text{A/ms}$, $V_{GG}=-100\text{V}$	-150	-	-	mA
I_{GKS}	Gate reverse current	$V_{GG}=V_{GK}=-167\text{V}$, $V_{KA}=0$, $T_J=25^\circ\text{C}$	-	-	-5	μA
I_{GT}	Gate trigger current	$I_T=-3\text{A}$, $t_P(g)\geq 20\mu\text{s}$, $V_{GG}=-100\text{V}$	-	-	5	mA
V_{GT}	Gate trigger voltage	$I_T=-3\text{A}$, $t_P(g)\geq 20\mu\text{s}$, $V_{GG}=-100\text{V}$	-	-	2.5	V
C_{AK}	Anode-cathode off-state capacitance	$f=1\text{MHz}$, $V_d=1\text{V}$, $I_G=0\text{A}$, $V_D=-3\text{V}$	-	-	70	pF

RECOMMENDED OPERATING CONDITIONS ($T_A=25^\circ\text{C}$)

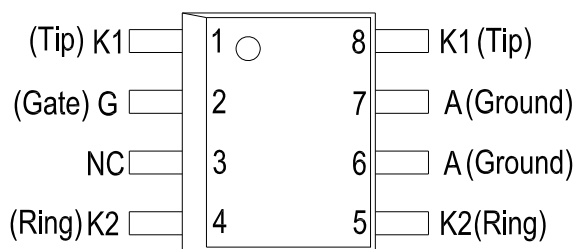
Component		Value			Unit
		Min.	Typ.	Max.	
C_G	Gate decoupling capacitor	100	220	-	nF
R_S	Resistor for GR-1089-CORE first-level surge survival	25	-	-	Ω
	Resistor for GR-1089-CORE first-level and second-level surge survival	40	-	-	Ω
	Resistor for GR-1089-CORE intra-building port surge survival	8	-	-	Ω
	Resistor for K.20,K.21 and K.45 coordination with a 400V primary protector	10	-	-	Ω

ELECTERICAL CAHRACTERISTIC

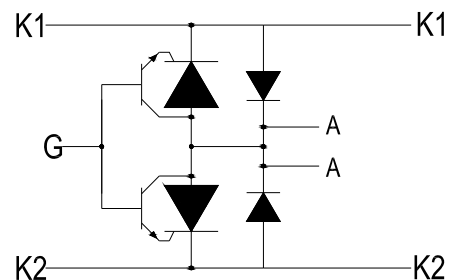
Symbol	Parameters
I_{DRM}	Off-state current
I_H	Holding current
V_{BO}	Breakover voltage
V_F	Forward voltage
V_{FRM}	Peak forward recovery voltage
$V_{GK(BD)}$	Gate-cathode impulse breakover voltage
I_{GKS}	Gate reverse current
I_{GT}	Gate trigger current
V_{GT}	Gate-cathode trigger voltage
C_{KA}	Cathode-anode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



SOP PACKAGE TOP VIEW AND DEVICE SYMBOL

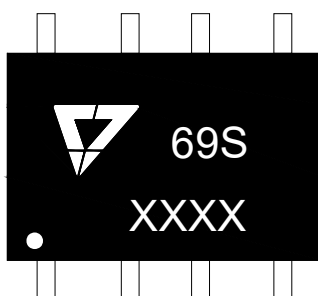


Package (Top view)



Device symbol

MARKING



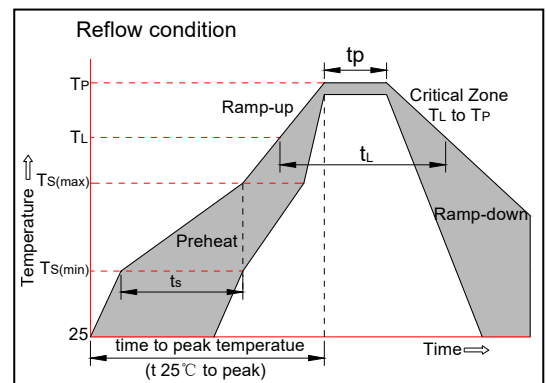
69S: Device marking code
 XXXX: Date of manufacture

ORDERING INFORMATION

J	IP	61089	S
JieJie Microelectronics CO. , Ltd		Chip code	
Integrated protection device		Product number	

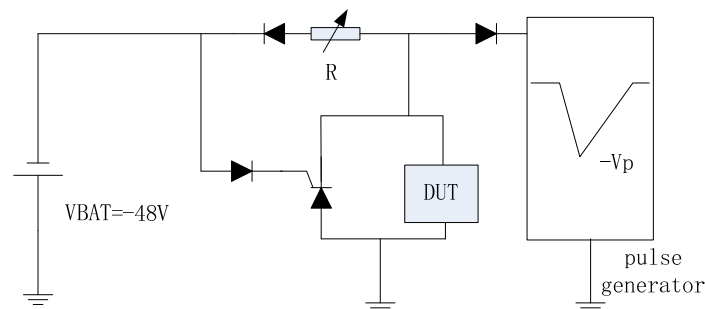
SOLDERING PARAMETERS

Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (t_s)	60-180 secs.
Average ramp up rate (Liquidus Temp (T_L)to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L)(Liquidus)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_p)		30secs.Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_p)		8 min. Max
Do not exceed		+260°C



TEST METHOD AND CIRCUIT

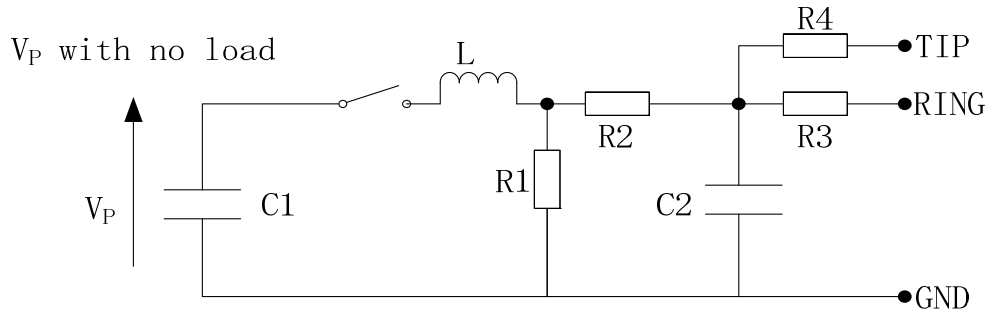
Holding current test circuit (test circuit 1)



This is a conduction-cutoff test. The test circuit can ascertain the size of holding current.
 Test method :

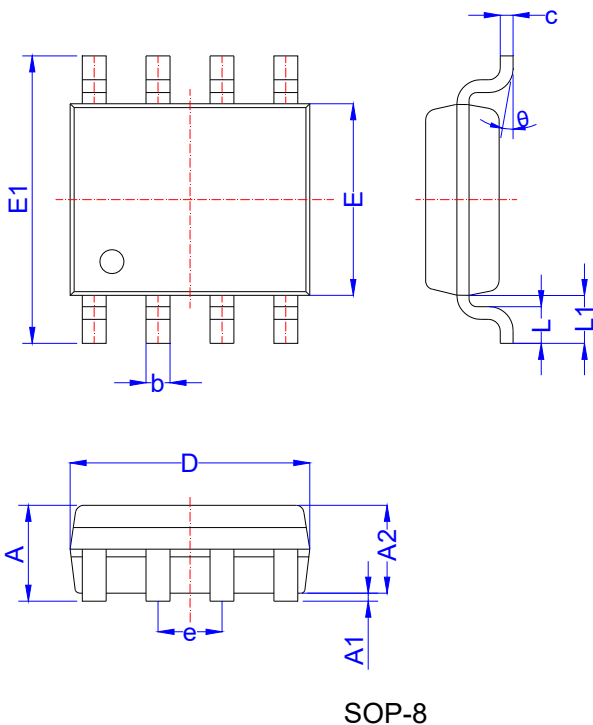
1. Short out DUT, regulating current in I_H range;
2. Triggering DUT with $I_{PP}=10A$, 10/1000 μs surge current;
3. DUT needs to return to the off-state in the maximum 50ms.

V_{FP} and V_{DGL} test circuit(test circuit 2)



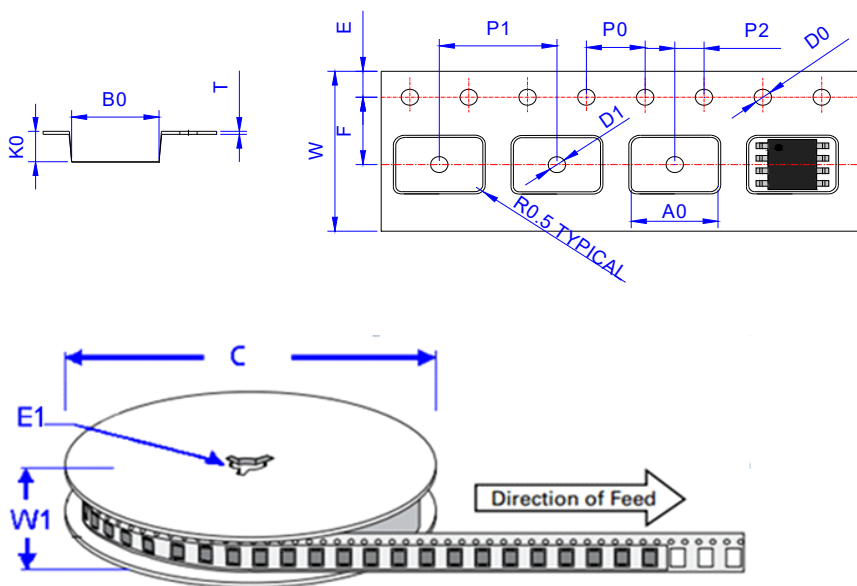
Pulse(μs)		V _P (V)	C1 (μF)	C2 (nF)	L (μH)	R1 (Ω)	R2 (Ω)	R3 (Ω)	R4 (Ω)	I _{PP} (A)	R _P (Ω)
T _{rise}	T _{fall}										
10	700	1500	20	200	0	50	15	25	25	30	10
1.2	50	1500	1	33	0	76	13	25	25	30	10
2	10	2500	10	0	1.1	1.3	0	3	3	38	62

PACKAGE MECHANICAL DATA



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	1.35		1.70	0.053		0.067
A1	0.04		0.18	0.002		0.007
A2	1.30		1.55	0.051		0.061
b	0.31		0.51	0.012		0.020
c	0.16		0.26	0.006		0.010
D	4.65		5.10	0.183		0.201
E	3.70		4.10	0.146		0.161
E1	5.80		6.20	0.228		0.244
e	1.14	1.27	1.40	0.045	0.050	0.055
L	0.40		0.77	0.016		0.030
L1	0.825		1.225	0.032		0.048
theta	0°		8°	0°		8°

TAPE AND REEL SPECIFICATION-SOP-8



Ref.	Dimensions	
	Millimeters	Inches
A0	6.6±0.10	0.260 ± 0.004
B0	5.3±0.10	0.209 ± 0.004
C	330	13.0
D0	1.50±0.10	0.059 + 0.004
D1	1.50±0.10	0.059 + 0.004
E1	13.3±0.3	0.524± 0.012
E	1.75±0.1	0.069± 0.004
F	5.5±0.05	0.217 ± 0.002
K0	2.1±0.1	0.083 ± 0.004
P0	4.0±0.1	0.157± 0.004
P1	8.0±0.1	0.315± 0.004
P2	2.0±0.05	0.079 ± 0.002
T	0.24±0.1	0.009 ± 0.002
W	12.0±0.3	0.472 ± 0.012
W1	15.7±2.0	0.618 ± 0.079

PART No.	UNIT WEIGHT (g/PCS) typ.	REEL (PCS)	PER CARTON (PCS)	DESCRIPTION
JIP61089S	0.077	4,000	64,000	13 inch reel pack


JieJie products are not designed for, and shall not be used for, any purpose (including, without limitation, automotive, military, aerospace, medical, life-saving, life-sustaining or nuclear facility applications, devices intended for surgical implant into the body, or any other application in which the failure or lack of desired operation of the product may result in personal injury, death, or property damage) other than those expressly set forth in applicable JieJie product documentation. Warranties granted by JieJie shall be deemed void for products used for any purpose not expressly set forth in applicable JieJie documentation. JieJie shall not be liable for any claims or damages arising out of products used in applications not expressly intended by JieJie as set forth in applicable JieJie documentation. The sale and use of JieJie products is subject to JieJie terms and conditions of sale, unless otherwise agreed by JieJie.

Information furnished in this document is believed to be accurate and reliable. However, Jiangsu JieJie Microelectronics Co., Ltd. assumes no responsibility for the consequences of use without consideration for such information nor use beyond it.

Information mentioned in this document is subject to change without notice, apart from that when an agreement is signed, Jiangsu JieJie complies with the agreement.

Products and information provided in this document have no infringement of patents. Jiangsu JieJie assumes no responsibility for any infringement of other rights of third parties which may result from the use of such products and information.

This document is the 1.2nd version which is made in 23-Sep.-2025. This document supersedes and replaces all information previously supplied.

 is a registered trademark of Jiangsu JieJie Microelectronics Co., Ltd.

Copyright ©2025 Jiangsu JieJie Microelectronics Co., Ltd. Printed All rights reserved.