P61089L

Dual Programmable Thyristor Transient Voltage Suppressor

版本号
202207-A

Description

This device has been especially designed to protect 2 new high voltage,as well as classical SLICs,against transient overvoltages.Positive overvoltages are clamped by 2 diodes.Negative surges are suppressed by 2 thyristors,their breakdown voltage being referenced to –VBAT through the gate.This component presents a very low gate triggering current in order to reduce the current consumption on printed circuit board the firing phase.This devices are not subject to aging and provide a fail safe mode in short circuit for a better protection.Pic 1 and pic 2 are the device symbol and the package.

Features and Benefits

- Dual Voltage-Tracking Protectors
- wide negative pressure range:V_{MGL}=-167V_{MAX}
- low dynamic switching voltage:$V_{FP}$and V_{DGL}
- low gate triggering current :I_{GT}=7mA_{Max}
- Peak Pulse Current:I_{PP}=50A (10/700μs)
- high Holding current :I_H≥150mA

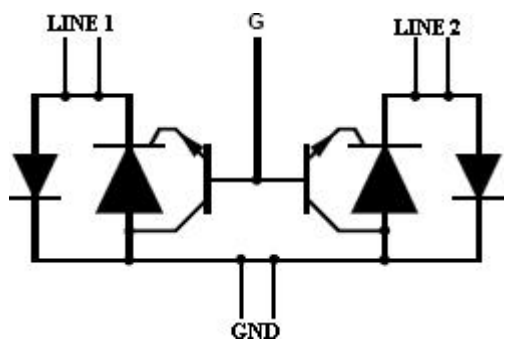
Application field

P61089L are designed to protect communication equipment such as SPC exchanger from damaging overvoltage transients in the second level.

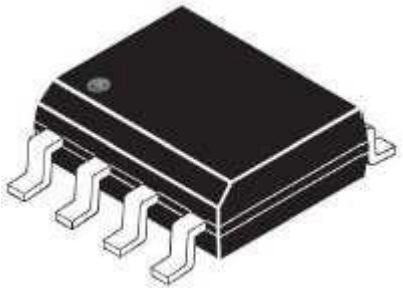
Characteristic parameters

symbol	Rated value	unit
V_{MGL}	-167	V
I_{PP}(10/700μs)	50	A
I_H	150	mA

Package :SOP-8



Pic.1 Device equivalent structure



Pic.2 Device type SOP-8

Electrical Parameters

Standard

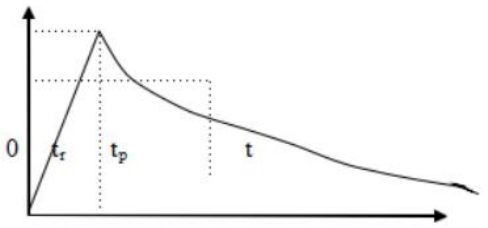
type	Wave shape		ITSP
ITU-T K.20/21and K.45	voltage	10/700μs	50A
	current	5/310μs	

Electrical characteristics

● Absolute maximum ratings T_a = 25℃unless otherwise noted

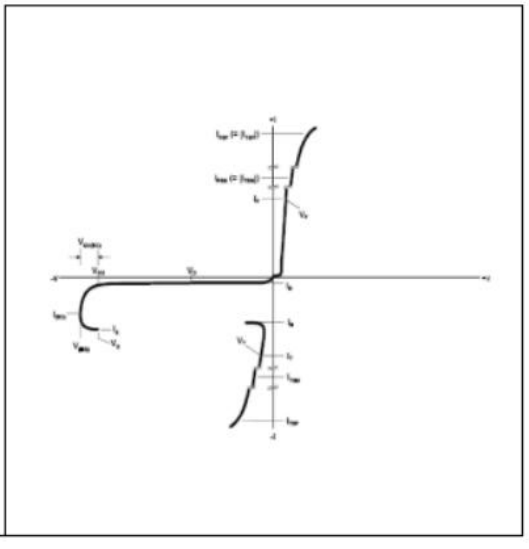
symbol	parameters		value	unit
V_{PP}/I_{PP}	Peak pulse voltage /current (tip.1)	10/700μs	2000	V
		5/310μs	50	A
I_{TSM}	Non repetitive peak pulse Current(F=60Hz)	t_p=500ms	6.5	A
		t=1s	4.6	
I_{GSM}	Maximum gate current (half sinusoidtp=10ms)		2	A
V_{MLG}	Line-ground maximum voltage		-170	V
V_{MGL}	Gate-line maximum voltage		-167	V
T_{stg}	Storage Temperature Range		-55~150	℃
T_j	maximum temperature		150	℃
T_L	maximum sustainable temperature of solder in 10 seconds		260	℃

tip.1：pulse form：
5/310μs t_r=5μs t_P=310μs 100%I_{PP}



● V-I characteristic curve（T_a = 25℃）

symbol	parameters
I_{GT}	Gate trigger current
I_H	Holding current
I_{RM}	Line-ground reverse leakage current
I_{RG}	Gate-line reverse leakage current
V_{RM}	Line-ground reverse voltage
V_F	Line-ground voltage
V_{GT}	gate trigger voltage
V_{FP}	Line-ground peak voltage
V_{DGL}	Gate-line dynamic switching voltage
V_{GATE}	Gate-ground voltage
V_{LG}	Line-ground voltage
C	Line-ground off state capacitance



Electrical Parameters

Absolute maximum ratings T_a= 25℃unless otherwise noted

● **Line-ground diode parameters**

symbol	Test conditions	Max.	unit
V_F	I_F=5A，t_P=500μs	3	V
V_{FP}	10/700μs 1.5kV R_P=10Ω (tip. 1)	5	V

tip.1:V_{FP} refers to test circuit 2，R_P is the protective resistance mounted on the card

● **thyristor parameters**(T_a=25℃)

symbol	Test conditions	Min.	Max.	unit
I_{GT}	V_{GND}/L_{INE}=-100V	0.1	7	mA
I_H	V_{GATE}=-100V	150		mA
V_{GT}	Same to I_{GT}		2.5	V
I_{RG}	T_C=25℃ V_{RG}=-170V		5	μA
	T_C=70℃ V_{RG}=-170V		50	
V_{DGL}	V_{GATE}=-100V (TIP.3) 10/700μs 1.5kV R_P=10Ω		10	V

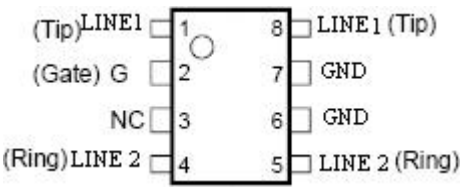
Tip.2:see holding current (I_H)at test circuit 2;
Tip.3:see V_{DGL} at test circuit 1，Don't make records if fluctuation time is less than 50ns.

● thyristor and diode parameters

Symbol	Test conditions	Max.	unit
I_{RM}	T_C=25℃ VGATE/LINE=-1V V_{RM}=-167	5	μA
	T_C=70℃ VGATE/LINE=-1V V_{RM}= -167	50	μA
C	V_R=-3V F=150KHz	100	pF
	V_R=-48V F=150KHz	50	pF

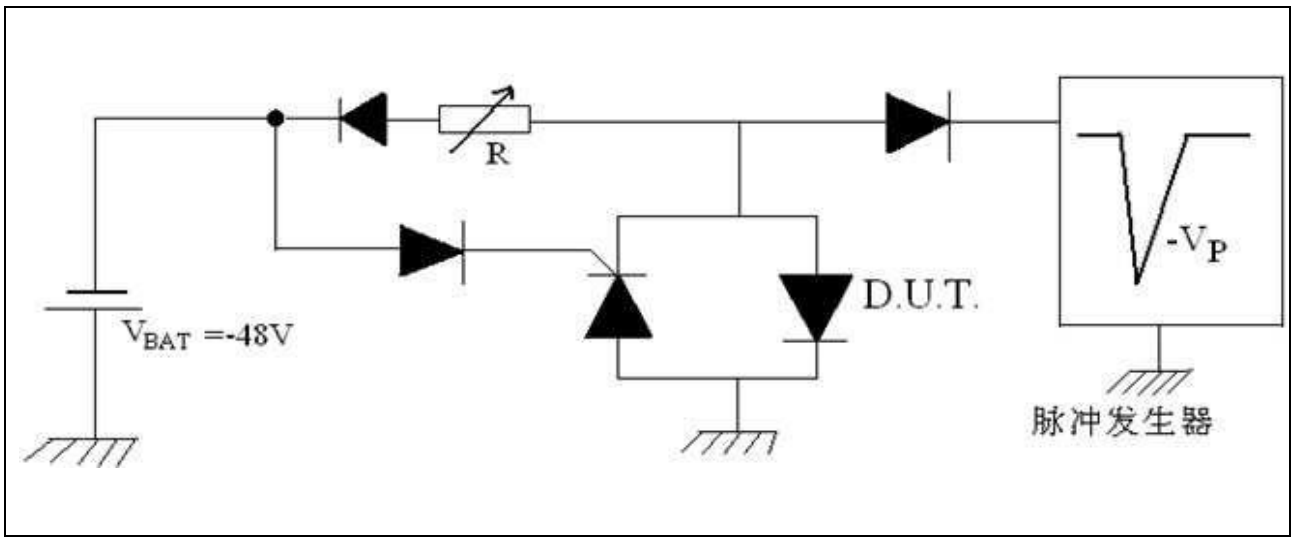
● **Attention**

For eliminate the overvoltage from the line Parasitic induction,especially at the high speed and short moment signal, we make TIP and RING across the device.



■Test method and circuit

● Holding current test circuit(test circuit1)



This is a “Conducting-cutoff”test.The test circuit can ascertain the size of holding current.

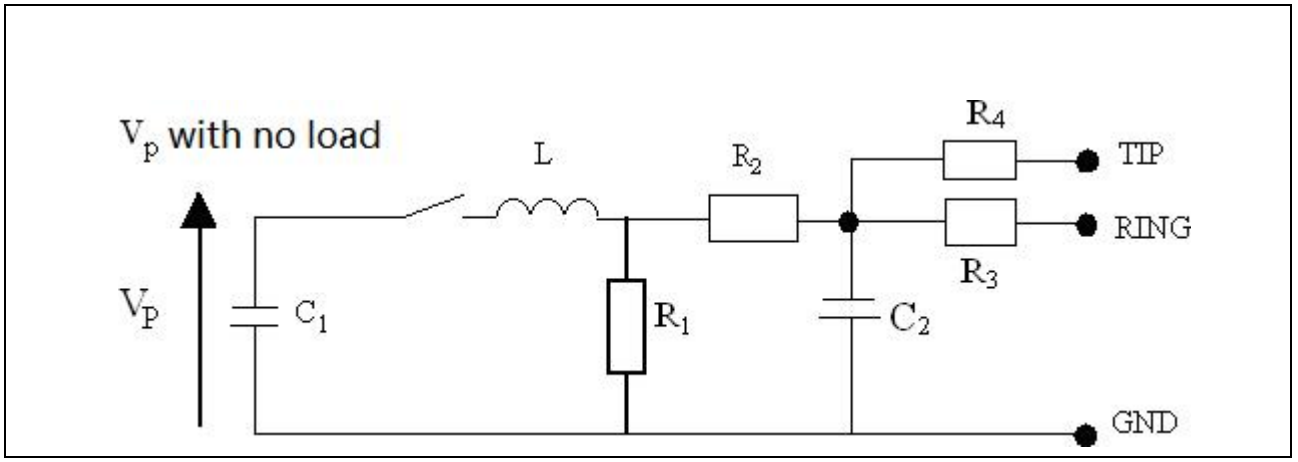
Test method :

① short out DUT， regulating current in I_H range;

② slet I_{PP}=10A， 10/1000μs surge current triggers DUT;

③ DUT must return to the off-state in 50ms.and

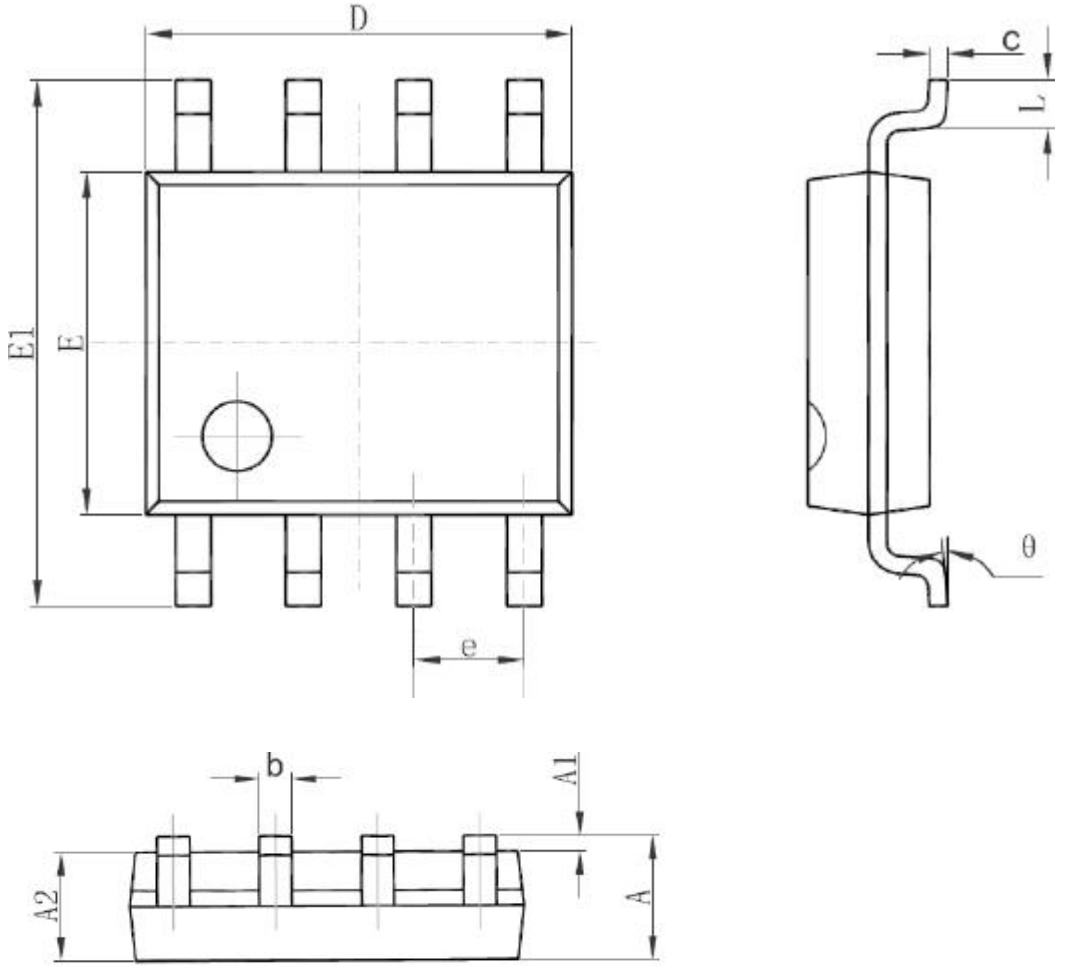
● V_{FP} and V_{DGL} test circuit2



Plue(us)		V_P	C_1	C_2	L	R_1	R_2	R_3	R_4	I_{PP}	R_P
t_r	t_p	(V)	(uF)	(uF)	(uH)	(Ω)	(Ω)	(Ω)	(Ω)	(A)	(Ω)
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 size

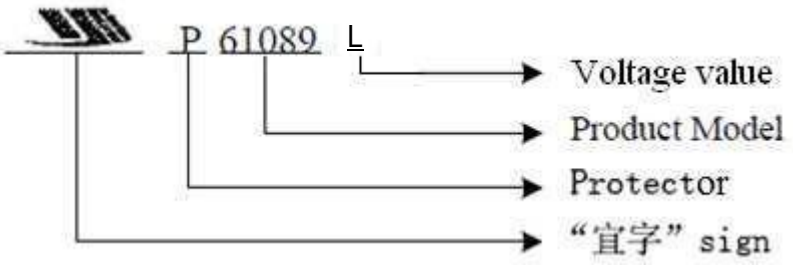
■ Appearance size SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

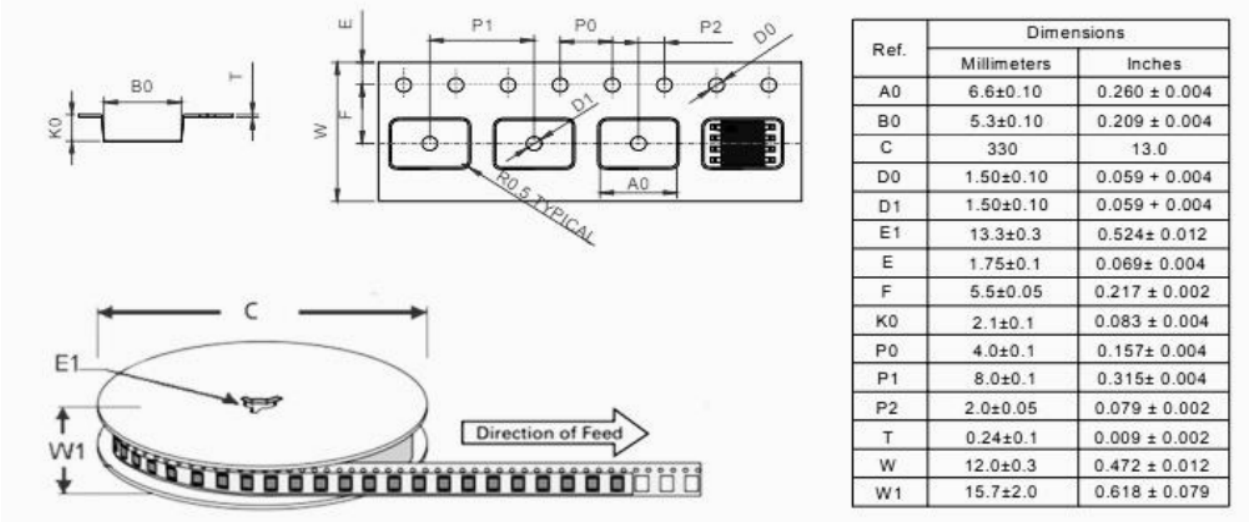
Marking

Naming Rule



XXYY:XX means year，YY means week.

■ Package Information



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

Package Type	Quantity
SOP-8	4000

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