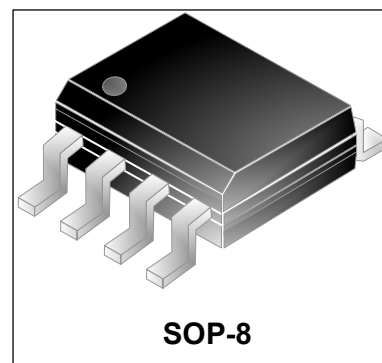


Thyristor Programmable Overvoltage Protector

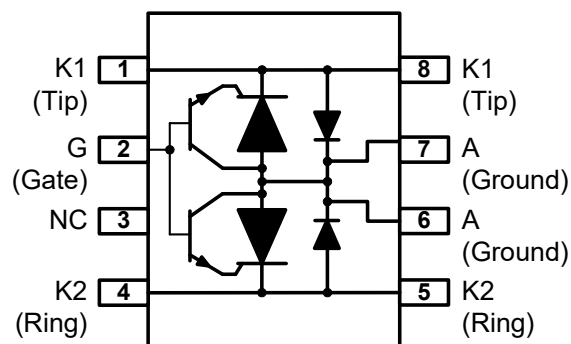
Features

- 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 10/1000 μs surge
- Holding current:
 $I_H = 150mA$ min.



Description

This device has been especially designed to protect subscriber line card interfaces (SLIC) against transient over-voltages. Positive overloads are clipped with two diodes. Negative surges are suppressed by two 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 configuration ensures reliable protection, eliminating the overvoltage introduced by the parasitic inductances of the wiring (Ldi/dt), especially for very fast transients.



Complies with The Following Standards

YD/T 950-1998
ITU-T K.20, K21
FCC part 68
GR-1089-CORE

Voltage waveform (μs)	Current waveform (μs)	Required peak current (A)
2/10μs	2/10μs	120
1.2/50μs	8/20μs	100
10/700μs	5/310μs	40
10/1000μs	10/1000μs	30

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
I _{PP}	Non-repetitive peak on-state pulse current		
	10/1000μs	30	A
	5/310μs	40	
	8/20μs	100	
I _{TSM}	Non repetitive surge peak on-state current (sinusoidal) 60Hz		
	0.5s	6.5	A
	1s	4.6	
	5s	2.3	
	30s	1.3	
V _{DRM} V _{GKRM}	Maximum voltage LINE/GROUND	-170	V
	Maximum voltage GATE/LINE	-167	
T _{STG}	Storage temperature range	-40~150	°C
T _J	Junction temperature	-40~150	
T _L	Maximum lead temperature for soldering during 10S	260	
R _{θJA}	Junction to ambient	120	°C/W

Electrical Characteristics (T_A=25°C)

Symbol	Parameter
I _D	Off-state current
I _H	Holding current
V _(BO)	Breakdown voltage
V _F	Forward voltage
V _{FRM}	Peak forward recovery voltage
V _{GK(BO)}	Gate-cathode impulse breakdown voltage
I _{GKS}	Gate reverse current
I _{GT}	Gate trigger current
V _{GT}	Gate-cathode trigger voltage
C _{KA}	Cathode-anode off-state capacitance

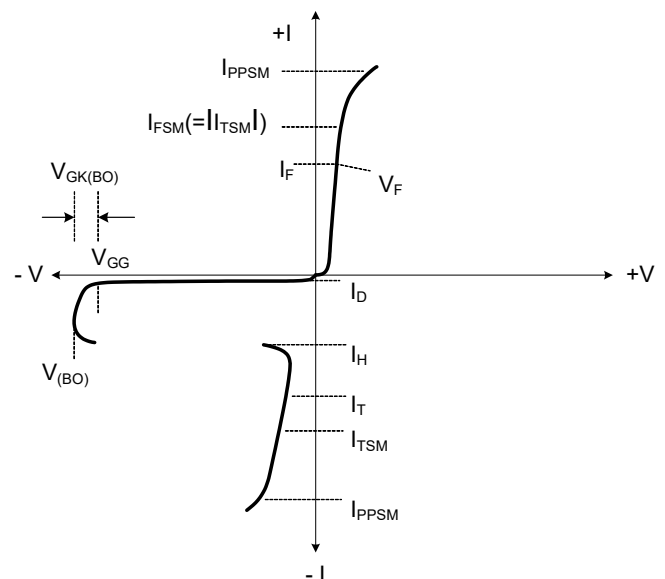


Figure 1. Voltage-Current Characteristic
Unless Otherwise Noted, All Voltages are Referenced to the Anode

Parameters Related to The Diode ($T_A=25^\circ\text{C}$)

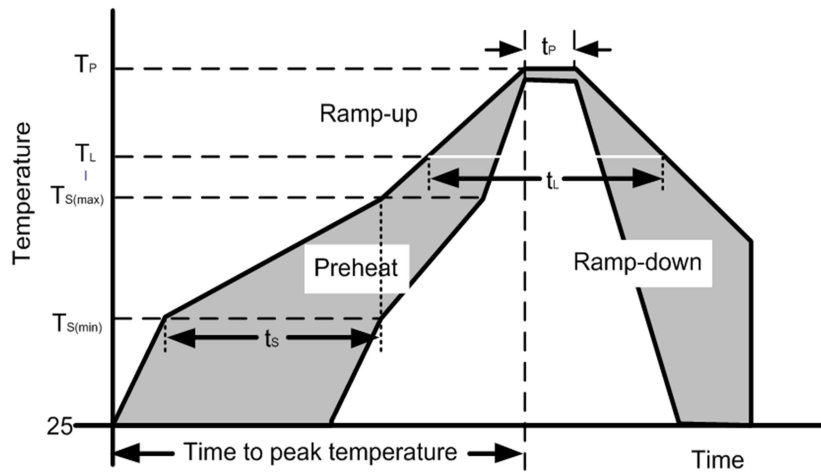
Parameter	Test conditions	Min.	Typ.	Max.	Unit.
V_F forward voltage	$I_F=5\text{A}$, $t_w=200\mu\text{s}$			3	V
V_{FRM} peak forward recovery voltage	$2/10\mu\text{s}$, $I_F=100\text{A}$, $R_s=50\Omega$, $V_{GG}=-100\text{V}$, $C_G=220\text{nF}$			10	V

Parameters Related to The Protection Thyristor ($T_A=25^\circ\text{C}$)

Parameter	Test conditions	Min.	Typ.	Max.	Unit.
I_D off-state current	$V_D=-170\text{V}$, $V_{GK}=0$	$T_J=25^\circ\text{C}$		-5	μA
		$T_J=85^\circ\text{C}$		-50	μA
V_{BO} breakover voltage	$2/10\mu\text{s}$, $I_T=-100\text{A}$, $R_s=50\Omega$, $V_{GG}=-100\text{V}$, $C_G=220\text{nF}$			-112	V
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
		$T_J=85^\circ\text{C}$		-50	μA
I_{GT} gate trigger current	$I_T=-3\text{A}$, $tp(g)\geq 20\mu\text{s}$, $V_{GG}=-100\text{V}$			5	mA
V_{GT} gate trigger voltage	$I_T=-3\text{A}$, $tp(g)\geq 20\mu\text{s}$, $V_{GG}=-100\text{V}$			2.5	V
C_{KA} cathode-anode off-state capacitance	$f=1\text{MHz}$, $V_d=1\text{V}$, $I_G=0$	$V_D=-3\text{V}$		95	pF
		$V_D=-48\text{V}$		45	pF

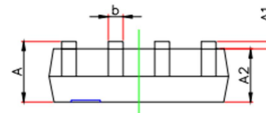
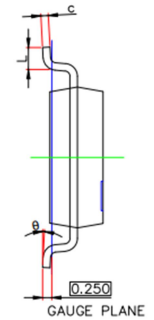
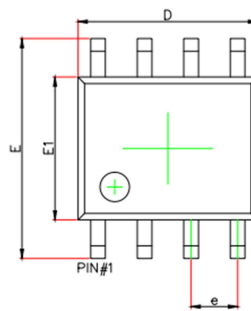
Soldering Parameters

Reflow Condition		
Pre Heat	Temperature Min ($T_{s(\text{min})}$)	150°C
	Temperature Max ($T_{s(\text{max})}$)	200°C
	Time (min to max) (t_s)	60 – 190 s
Average ramp up rate (Liquidus Temp) (T_L) to peak		3°C/s max
$T_{s(\text{max})}$ to T_L —Ramp-up Rate		3°C/s max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Temperature (t_L)	60 – 150 s
Peak Temperature (T_P)		260+0/-5 °C
Time within actual peak Temperature (t_p)		20 – 40 s
Ramp-down Rate		5°C/s max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		260°C



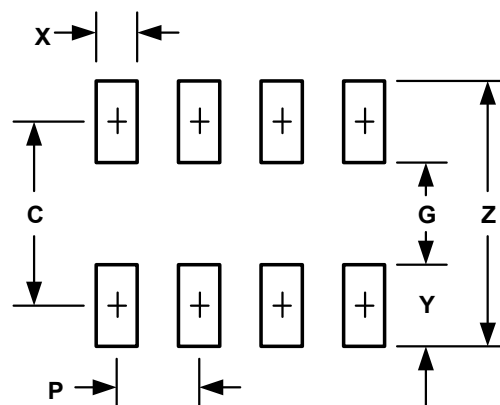
Product Dimensions

Ref.(mm)	Min.	Typ.	Max.
A	1.35		1.75
A1	0.10		0.25
A2	1.35		1.65
b	0.33		0.51
c	0.17		0.25
D	4.80		5.00
E	5.80		6.20
e		1.27	
E1	3.80		4.00
L	0.40		1.27
θ	0°		8°



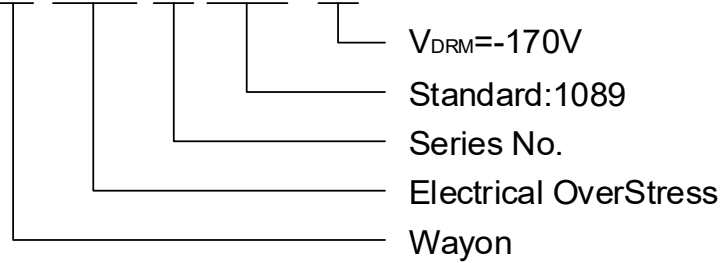
Solder pad layout

DIMENSIONS		
DIM	INCHES	MILLIMETERS
C	0.205	5.21
G	0.118	3.00
P	0.050	1.27
X	0.024	0.61
Y	0.087	2.21
Z	0.291	7.39

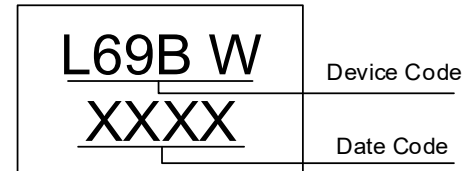


Part Numbering System and Marking

W EOS 6 1089-17F



MARKING:



Package Information

Package Type	Description	Quantity (pcs)
SOP8	Tape & Reel	4000

Contact Information

No.1001, Shiwan(7) Road, Pudong District, Shanghai, P.R.China.201207

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WAYON website: <http://www.way-on.com>

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 The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.
 Users should verify actual device performance in their specific applications.*

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