

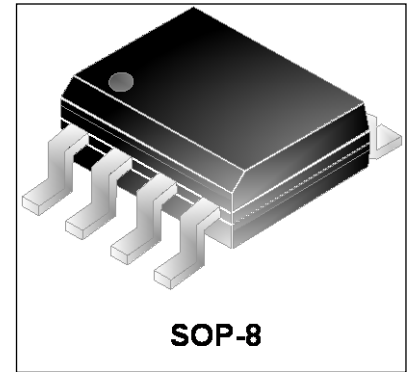
WEOS61089-17HN

Order code: WEOS61089-17HN

Thyristor Programmable Overvoltage Protector

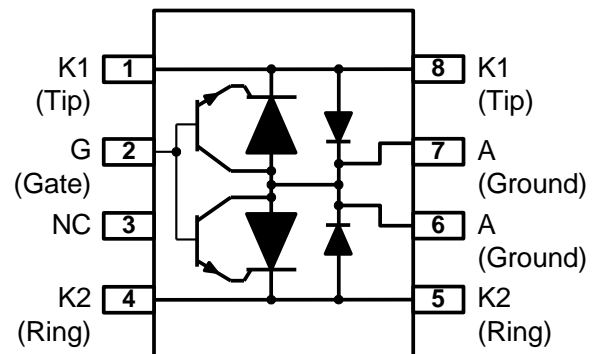
Features

- Dual programmable transient suppressor.
- Wide negative firing voltage range:
 $V_{GKRM} = -167V$ max.
- Low dynamic switching voltage:
 V_{FRM} and $V_{GK(BD)}$
- Low gate triggering current:
 $I_{GT} = 5mA$ max
- Peak pulse current:
 $I_{PP} = 100A$ for 10/1000us 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 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 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)
2/10 μs	2/10 μs	500
10/700 μs	5/310 μs	150
10/1000 μs	10/1000 μs	100

'1089 TEST CLAUSE AND TEST #	60 Hz power fault time	Required peak current (A)
4.5.13 Second-Level 2	0.5s	6.5
4.5.13 Second-Level 2	1s	4.6
4.5.13 Second-Level 2	5s	2.3
4.5.13 Second-Level 1	30s	1.3
4.5.13 Second-Level 1	900s	0.73

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
I_{PP}	Non-repetitive peak on-state pulse current		
	10/1000 μs	100	A
	2/10 μs	500	
5/310 μs	150		
I_{TSM}	Non repetitive surge peak on-state current (sinusoidal) 60Hz		A
	0.5s	6.5	
	1s	4.6	
	5s	2.3	
	30s	1.3	
900s	0.73		
V_{DRM}	Maximum voltage LINE/GROUND	-170	V
V_{GKRM}	Maximum voltage GATE/LINE	-167	
T_A	Operating free-air temperature range	-40~85	°C
T_{STG}	Storage temperature range	-40~150	
T_J	Junction temperature	-40~150	
T_L	Maximum lead temperature for soldering during 10S	260	
$R_{TH(j-a)}$	Junction to ambient	120	°C/W

Electrical Characteristics ($T_{amb}=25^{\circ}\text{C}$)

Symbol	Parameter
I_D	Off-state current
I_H	Holding current
$V_{(BO)}$	Breakover voltage
V_F	Forward voltage
V_{FRM}	Peak forward recovery voltage
$V_{GK(BO)}$	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

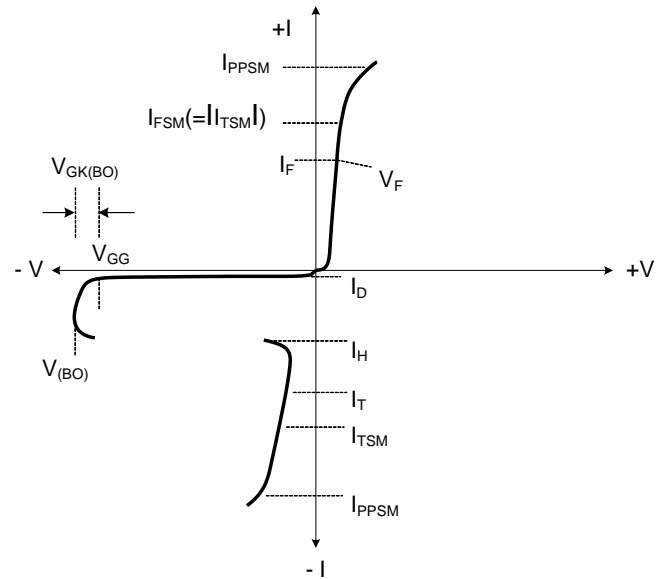


Figure 1. Voltage-Current Characteristic
Unless Otherwise Noted, All Voltages are Referenced to the Anode

Parameters Related to The Diode

($T_{amb}=25^{\circ}\text{C}$)

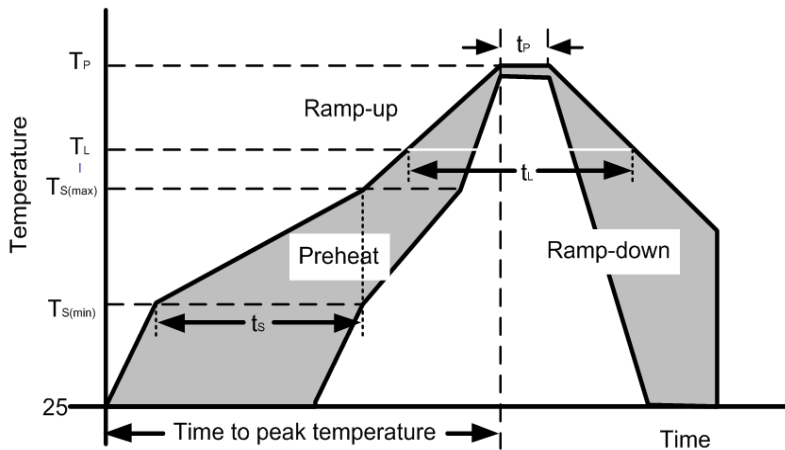
Parameter	Test conditions	Min.	Typ.	Max.	Unit.
V_F forward voltage	$I_F=5\text{A}$, $t_w=200\mu\text{s}$			3	V
V_{FRM} peak forward recovery voltage	$2/10\mu\text{s}$, $I_T=100\text{A}$, $R_s=50\Omega$, $V_{GG}=-100\text{V}$, $C_G=220\text{nF}$			10	V

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

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	$2/10\mu\text{s}$, $I_T=-200\text{A}$, $R_s=50\Omega$, $V_{GG}=-100\text{V}$, $C_G=220\text{nF}$			-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	$I_T=-3\text{A}$, $t_p(g)\geq 20\mu\text{s}$, $V_{GG}=-100\text{V}$			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
Q_{GS} gate switching charge	$1.2/50\mu\text{s}$, $I_T=-53\text{A}$, $R_s=47\Omega$, $V_{GG}=-100\text{V}$, $C_G=220\text{nF}$		0.1		μC
C_{KA} cathode-anode off-state capacitance	$f=1\text{MHz}$, $V_d=1\text{V}$, $I_G=0$	$V_D=-3\text{V}$		100	pF
		$V_D=-48\text{V}$		50	pF

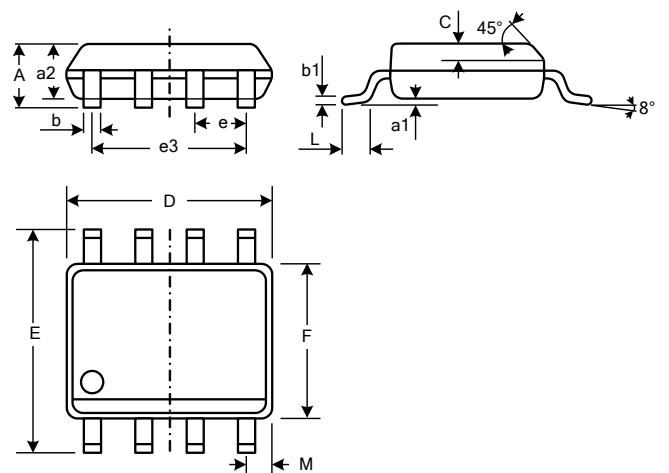
Soldering Parameters

Reflow Condition		Pb – Free assembly
Pre Heat	Temperature Min ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (min to max) (t_s)	60 – 190 secs
Average ramp up rate (Liquidus Temp) (T_L) to peak		5°C/second max
$T_{s(max)}$ to T_L —Ramp-up Rate		5°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Temperature (t_L)	60 – 150 seconds
Peak Temperature (T_P)		260+0/-5 °C
Time within actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		5°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		280°C

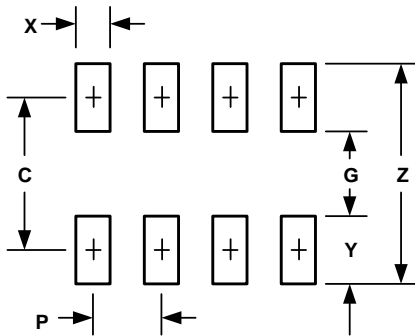


Product Dimensions

Ref. (mm)	Min.	Typ.	Max.
A	1.45	1.50	1.75
a1	0.10		0.25
a2	1.35		1.55
b	0.35		0.48
b1	0.17		0.25
C		0.50	
D	4.80		5.00
E	5.80		6.20
e		1.27	
e3		3.81	
F	3.80		4.00
L	0.40		1.27
M	0.50		0.60



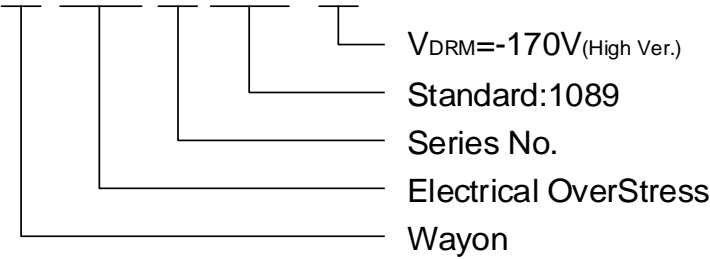
Solder Pad Layout



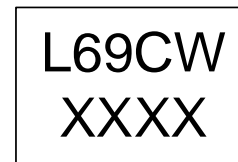
DIMENSIONS		
DIM	INCHES	MILLIMETERS
C	0.205	5.21
G	0.118	3.00
P	0.050	1.27
X	0.024	0.61
Y	0.087	2.21
Z	0.291	7.39

Part Numbering System and Marking

W EOS 6 1089 -17HN



MARKING:



Package Information

Tape & Real: 2500 pcs.

Contact Information

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