

UPG1069B

Dual Programmable Transient Voltage Suppressor

This device has been especially designed to protect 2 new high voltage, as well as classical SLICs, against transient over-voltages.

Positive over-voltages are clamped by 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.

This devices are not subject to ageing and provide a fail safe mode in short circuit for a better protection. UPG are used to help equipment to meet various standards such as UL1950, IEC950 / CSA C22.2, UL 1459 and FCC part68.

Features

- Dual line programmable transient voltage suppressor
- Wide negative firing voltage range:
 $V_{MGL} = -155V$
- Low dynamic switching voltages: V_{FP} and V_{DGL}
- Low gate triggering current: $I_{GT} = 5 \text{ mA max}$
- Peak pulse current: $I_{PP} = 30 \text{ A (10/1000 s)}$
- Holding current: $I_H > 150 \text{ mA}$
- Solid-state silicon technology
- Meets MSL 1 Requirements
- ROHS compliant
- Weight : 0.08 gram(approx.).



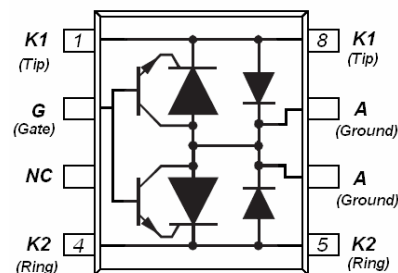
SOP-8

Main applications

- T-1/E-1, ISDN, and xDSL transmission equipment
- Telecommunications infrastructure
- PBX's and other switches
- Set-top box
- VoIP

Protection solution to meet

- TIA-968-A/TIA-968-B
- ITU K.20/21 Enhanced Level*/Basic Level
- GR 1089 Inter-building*/Intra-building
- IEC 61000-4-5
- YD/T 1082
- YD/T 993
- YD/T 950



Ordering Information

Device	Qty per Reel	Reel Size
UPG1069B	2500	13 Inch

Maximum ratings (T_{amb}=25°C Unless Otherwise Specified)			
Parameter	Symbol	Value	Unit
Repetitive peak off-state voltage, V _{GK} =0 UPG1069B	V _{DRM}	-170	V
Repetitive peak gate-cathode voltage, V _{KA} =0 UPG1069B	V _{GKRM}	-170	V
Non-repetitive peak on-state current 10/1000 us (Telcordia(Bellcore)Gr-1089-CORE.Issue 2.February 1999,Section4) 5/320 us (ITU-T K.20, K.21& K.45, K.44 open-circuit voltage wave shape 10/700us) 1.2/50 us (Telcordia(Bellcore)Gr-1089-CORE.Issue 2.February 1999,Section4) 2/10 us (Telcordia(Bellcore)Gr-1089-CORE.Issue 2.February 1999,Section4)	I _{PPSM}	30 40 100 120	A
Non-repetitive peak on-state current. V _{GG} =-75V 50Hz to 60Hz 0.1 s 1 s 5 s 300 s 900 s	I _{TSM}	11 4.8 2.7 0.95 0.93	A
Lead Soldering Temperature	T _L	260 (10 sec.)	°C
Operating Temperature Range	T _J	-40 ~ 85	°C
Storage Temperature Range	T _{STG}	-55 ~ 150	°C
Lead Solder Temperature – Maximum (10 Second Duration)	T _L	260	°C
Junction To ambient	R _{θ JA}	170	°C/W

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

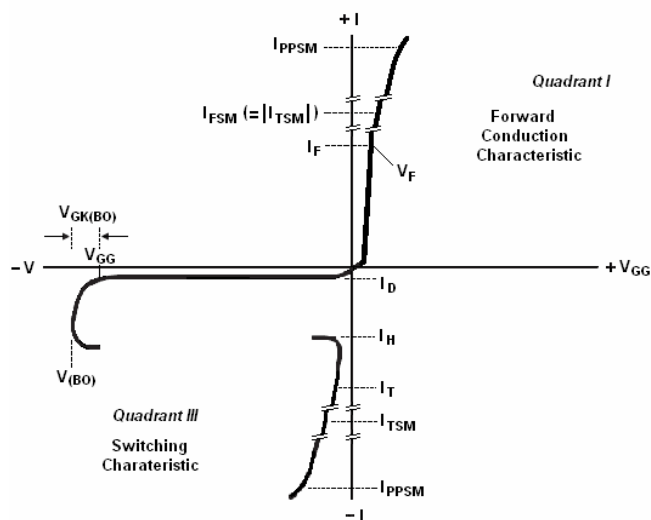
*Other voltages may be available upon request.

1. Nonrepetitive current pulse, per Figure 1.

Electrical characteristics (Tamb=25°C Unless Otherwise Specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
I _D	Off-state current	V _D =V _{DRM} , V _{GK} =0 T _J =25 °C			-5	μA
		T _J =85 °C			-50	μA
V _(BO)	Breakover voltage	2/10us, I _{PP} = -56A, R _S = 45Ω, V _{GG} = -48V, C _G = 220nF		-57		V
		2/10us, I _{PP} = -100A, R _S = 50Ω, V _{GG} = -48V, C _G = 220nF		-60		
		1.2/50us, I _{PP} = -53A, R _S = 47Ω, V _{GG} = -48V, C _G = 220nF		-60		
		1.2/50us, I _{PP} = -96A, R _S = 52Ω, V _{GG} = -48V, C _G = 220nF		-64		
V _{GK(BO)}	Gate-cathode impulse Breakover voltage	2/10us, I _{PP} = -56A, R _S = 45Ω, V _{GG} = -48V, C _G = 220nF		9		V
		2/10us, I _{PP} = -100A, R _S = 50Ω, V _{GG} = -48V, C _G = 220nF		12		
		1.2/50us, I _{PP} = -53A, R _S = 47Ω, V _{GG} = -48V, C _G = 220nF		12		
		1.2/50us, I _{PP} = -96A, R _S = 52Ω, V _{GG} = -48V, C _G = 220nF		16		
V _F	Forward voltage	I _F = 5 A, T _w = 200 us			3	V
V _{FRM}	Peak forward recovery voltage	2/10us, I _{PP} = -56A, R _S = 45Ω, V _{GG} = -48V, C _G = 220nF		6		V
		2/10us, I _{PP} = -100A, R _S = 50Ω, V _{GG} = -48V, C _G = 220nF		8		
		1.2/50us, I _{PP} = -53A, R _S = 47Ω, V _{GG} = -48V, C _G = 220nF		8		
		1.2/50us, I _{PP} = -96A, R _S = 52Ω, V _{GG} = -48V, C _G = 220nF		12		
I _H	Holding current	I _T = -1 A, di/dt = 1A/ms, V _{GG} = -48 V	-150			mA
I _{GKS}	Gate reverse current	V _{GG} = V _{GK} = V _{GKRM} , V _{KA} = 0 T _J =25 °C			-5	μA
		T _J =85 °C			-50	μA
I _{GT}	Gate trigger current	I _T = -3 A, t _{p(g)} ≥ 20 us, V _{GG} = -48V			5	mA
V _{GT}	Gate-cathode trigger voltage	I _T = -3 A, t _{p(g)} ≥ 20 us, V _{GG} = -48V			2.5	V
Q _{GS}	Gate switching charge	1.2/50us, I _{PP} = -53A, R _S = 47Ω, V _{GG} = -48V, C _G = 220nF		0.1		uC
C _{KA}	Cathode-anode off-State capacitance	F=1 M HZ, V _d =1V, I _G =0 V _D = -3 V			100	pF
		V _D = -48 V			50	pF

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

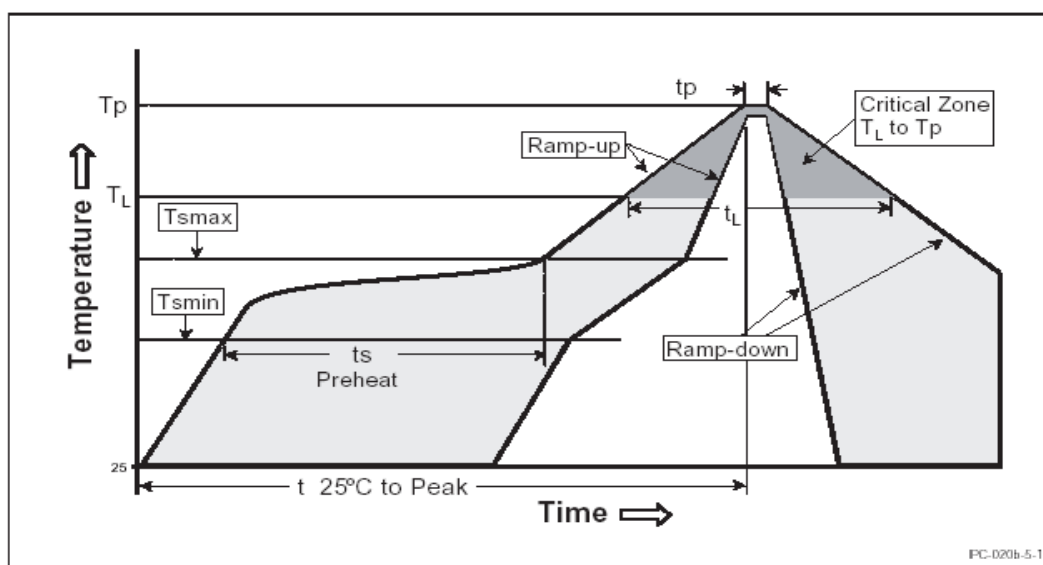


Recommended Soldering(Reflow soldering)

Soldering Method :

- Wave soldering : 260°C, 10 Sec. max
- Reflow soldering : 260°C, 30 Sec. max
- Hand soldering : 350°C, 3 Sec. max

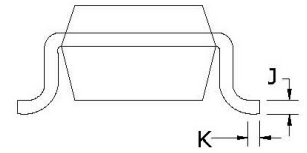
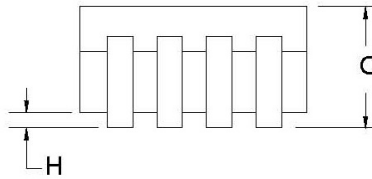
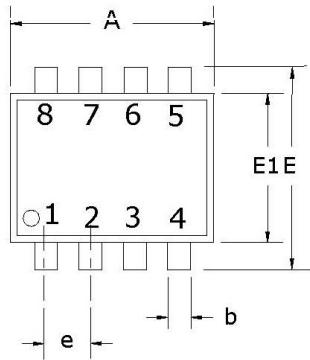
Recommended Reflow Soldering Curve



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)	60-180 seconds
Average Ramp-up Rate (Liquidus Temp (T_L) to peak)		3°C/second max
T_s (max) to T_L -Ramp-up Rate		5°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (t_L)	60-150 seconds
Peak Temperature (T_p)		260 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (t_p)		10-30 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (t 25°C to peak)		8 minutes max
Do not exceed		260°C

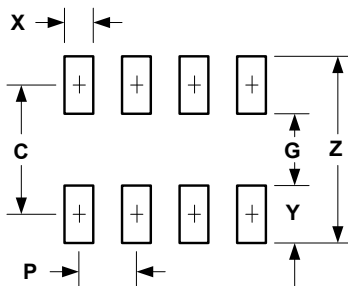
Package Information

SOP-8



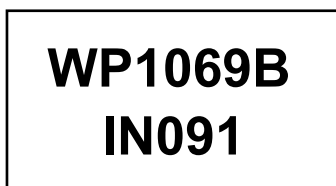
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.80	5.00	0.189	0.197
E	6.00(BSC)		0.236(BSC)	
E1	3.80	4.00	0.150	0.157
b	0.35	0.49	0.014	0.019
C	1.35	1.79	0.054	0.068
J	0.18	0.25	0.007	0.009
e	1.27(BSC)		0.05(BSC)	
K	0.40	1.25	0.016	0.049
H	0.10	0.25	0.004	0.008

Marking Information



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

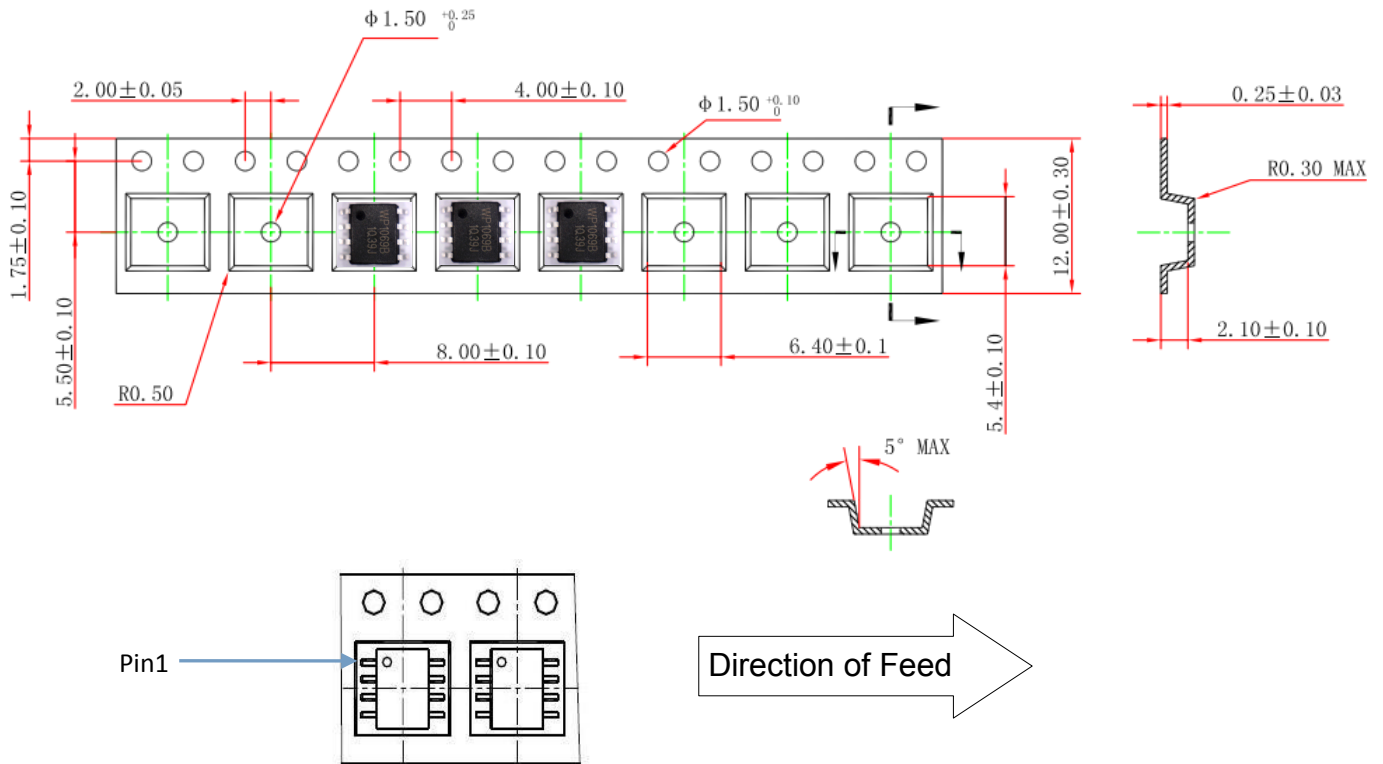
Marking Code Information :



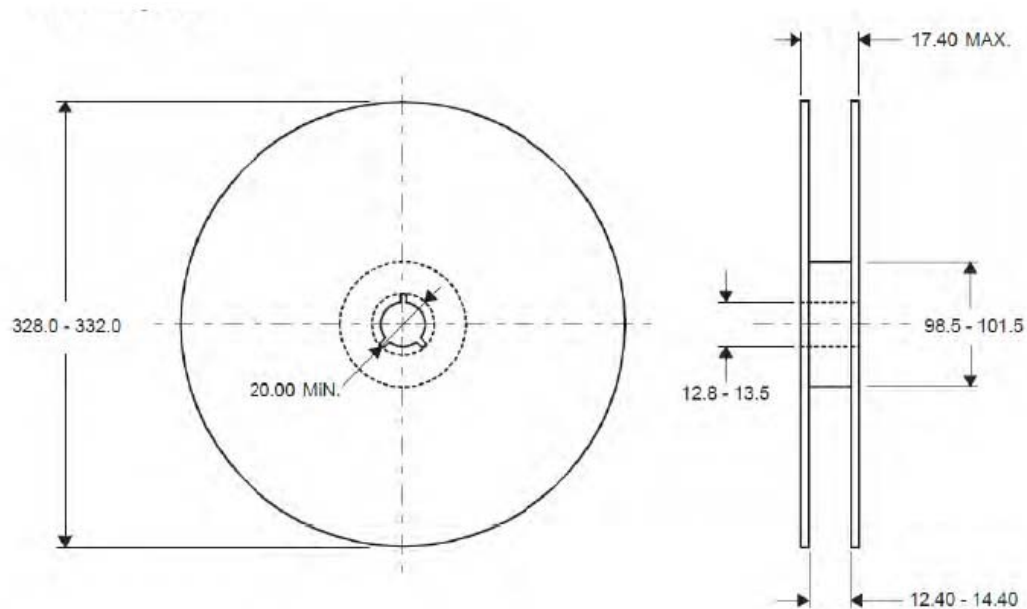
WP1069B : Marking Code

IN091 : Lot Number

SOP8 Embossed Carrier Tape



SOP8 Reel



DIMENSIONS ARE: MILLIMETERS

Qty per Reel : 2500 pcs