



LCDP1511D

Application Specific Discretes
A.S.D.TM

DUAL LINE PROGRAMMABLE TRANSIENT
VOLTAGE SUPPRESSOR FOR SLIC PROTECTION

PRELIMINARY DATASHEET

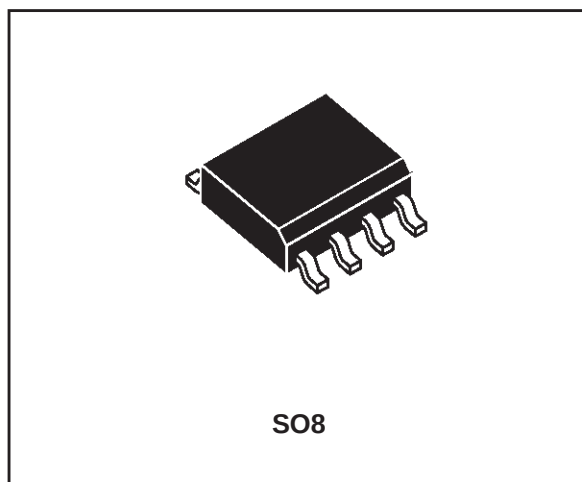
FEATURES

- Dual line programmable transient suppressor
- Wide negative firing voltage range : $V_{MGL} = -80V$
- Low dynamic switching voltages : V_{FP} and V_{DGL}
- Low gate triggering current : $I_{GT} = 5mA$ max
- Peak pulse current : $I_{PP} = 10 A$ (10/1000 μs)
- Holding current : $I_H > 150 mA$

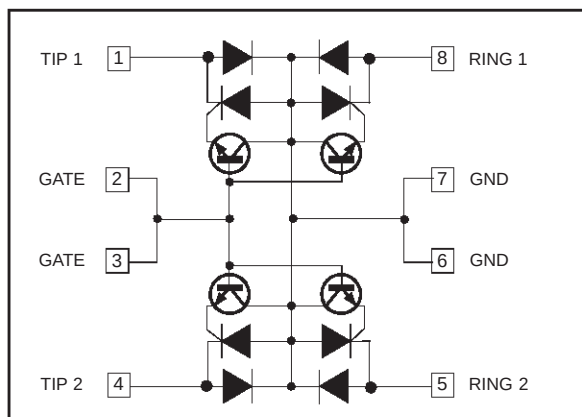
DESCRIPTION

The LCDP1511D is a dual line protector which protects subscriber line interface circuits (SLIC) against transient overvoltages.

Positive overvoltages are clamped with diodes towards GND, while negative overvoltages are suppressed by thyristors connected to GND. The breakdown voltage of the thyristors is determined by the voltage applied to the gate, generally $-V_{bat}$.



FUNCTIONAL DIAGRAM



COMPLIES WITH THE FOLLOWING STANDARDS:	Peak Surge Voltage (V)	Voltage Waveform (μs)	Current Waveform (μs)	Admissible I_{pp} (A)	Necessary Resistor (Ω)
ITU-T K20	1000	10/700	5/310	12	45
VDE0433	2000	10/700	5/310	12	130
VDE0878	1500	1.2/50	1/20	40	-
IEC1000-4-5	level 2 level 2	10/700 1.2/50	5/310 8/20	12 25	45 -
FCC Part 68	1500 800	10/160 10/560	10/160 10/560	15 11	92.5 65
BELLCORE NWT-001089-CORE	2500 1000	2/10 10/1000	2/10 10/1000	50 10	45 90

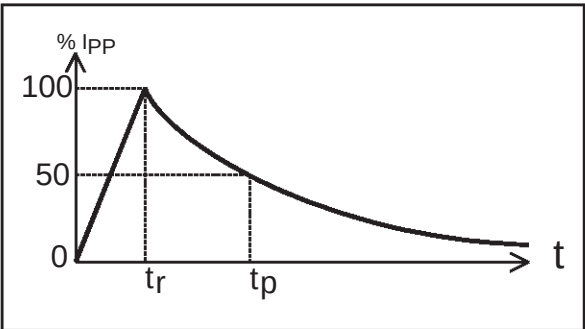
LCDP1511D

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25°C).

Symbol	Parameter		Value	Unit
I _{PP}	Peak pulse current (see note1)	10/1000μs 5/310μs 2/10μs	10 12 50	A
I _{FSM}	Non repetitive surge peak on-state current (see note2)	t _p = 10ms t _p = 1s	5 3.5	A
V _{MLG} V _{MGL}	Maximum voltage LINE/GND Maximum voltage GATE/LINE		80 80	V
T _{stg}	Storage temperature range		- 55 to + 150	°C
T _L	Lead temperature for soldering during 10s		260	°C

Note 1: Pulse waveform
10 / 1000 μs tr = 10 μs tp = 1000 μs
5 / 310 μs tr = 5 μs tp = 310 μs
2 / 10 μs tr = 2 μs tp = 10 μs

Note 2 : Maximum current flowing through the 4 wires together.

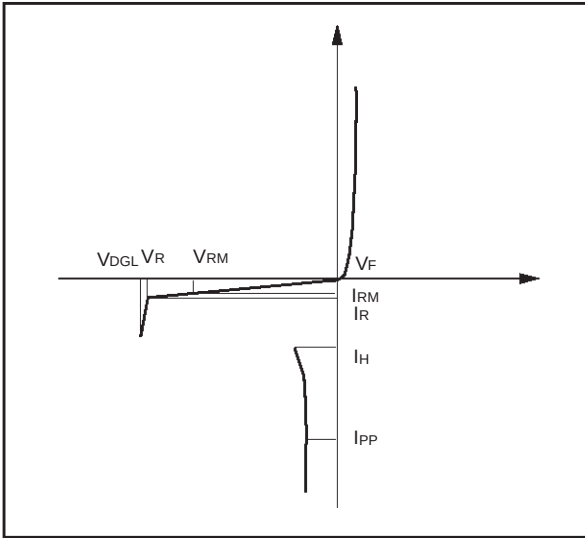


THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
R _{th} (j-a)	Junction to ambient	170	°C/W

ELECTRICAL CHARACTERISTICS (T_{amb} = 25°C)

Symbol	Parameter
I _{GT}	Gate triggering current
I _H	Holding current
I _{RM}	Reverse leakage current LINE / GND
I _{RG}	Reverse leakage current GATE / LINE
V _{RM}	Reverse voltage LINE / GND
V _{GT}	Gate triggering voltage
V _F	Forward drop voltage LINE / GND
V _{FP}	Peak forward voltage
V _{DGL}	Dynamic switching voltage GATE / LINE
V _{GATE}	GATE / GND voltage
V _{RG}	Reverse voltage GATE / LINE
C	Capacitance LINE / GND



PARAMETERS RELATED TO THE DIODE LINE / GND ($T_{amb} = 25^{\circ}\text{C}$)

Symbol	Test conditions	Max	Unit
V_F	Square pulse : $t_p = 500\mu\text{s}$ $I_F = 1\text{A}$	2	V
V_{FP} (note 1)	10/700μs 1kV $R_p = 60\Omega$ $I_{PP} = 10\text{A}$ 1.2/50μs 1.5kV $R_p = 60\Omega$ $I_{PP} = 15\text{A}$ 2/10μs 2.5kV $R_p = 245\Omega$ $I_{PP} = 10\text{A}$	5 10 20	V

note 1 : see test circuit for V_{FP} , R_p is the protection resistor located on the line card

PARAMETERS RELATED TO THE PROTECTION THYRISTOR ($T_{amb} = 25^{\circ}\text{C}$)

Symbol	Test conditions	Min	Max	Unit
I _{GT}	V _{GND} / LINE = -48V		5	mA
I _H	V _{GATE} = -48V (see note 2)	150		mA
V _{GT}	at I _{GT}		2.5	V
I _{RG}	V _{RG} = -75V		5	μA
V _{DGL}	V _{GATE} = -48V (see note 3)			
	10/700μs 1kV R _P = 60Ω I _{PP} = 10A		7	V
	1.2/50μs 1.5kV R _P = 60Ω I _{PP} = 15A		15	
	2/10μs 2.5kV R _P =245Ω I _{PP} = 10A		20	

note 2 : see functional holding current test circuit

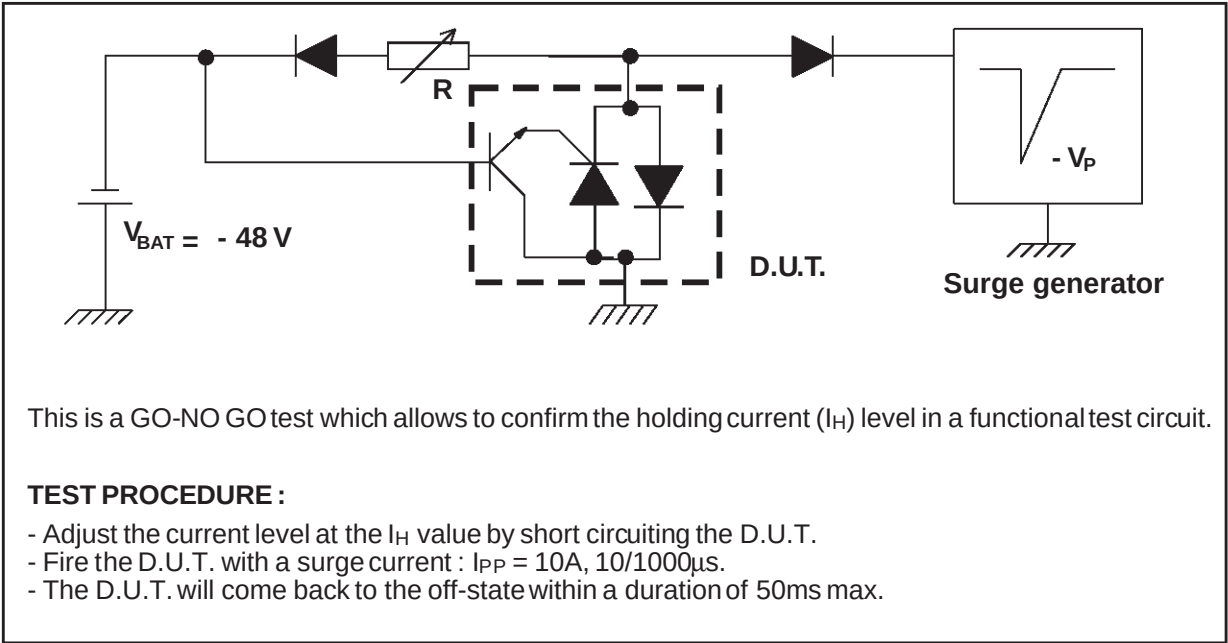
note 3 : See test circuit for V_{DGL}

The oscillations with a time duration lower than 50ns are not taken into account

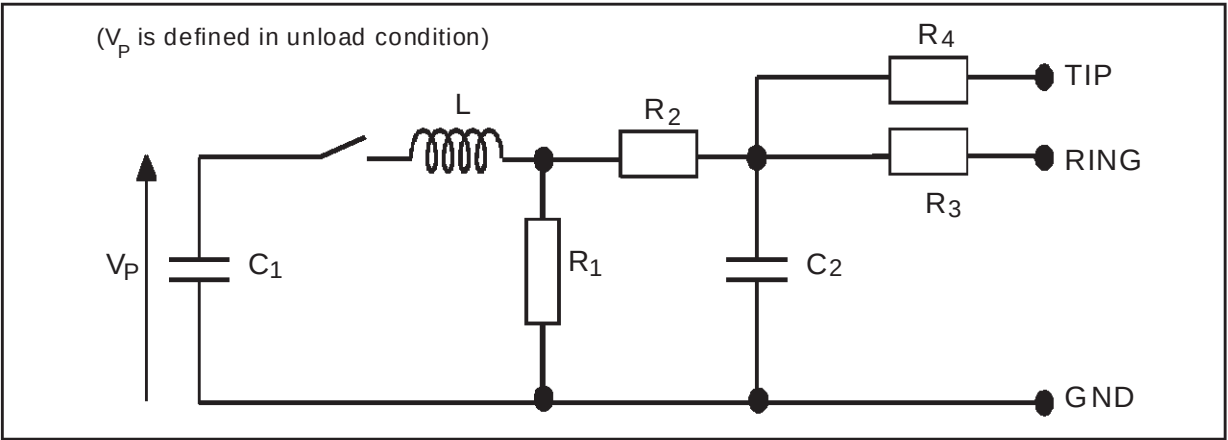
PARAMETERS RELATED TO LINE / GND ($T_{amb} = 25^{\circ}\text{C}$)

Symbol	Test conditions	Max	Unit
I_{RM}	$V_{GATE / LINE} = -1\text{V}$ $V_{RM} = -75\text{V}$	5	μA
C	$V_R = -3\text{V}$ $F = 1\text{MHz}$ $V_R = -48\text{V}$ $F = 1\text{MHz}$	200 100	pf

FUNCTIONAL HOLDING CURRENT (I_H) TEST CIRCUIT : GO-NO GO TEST

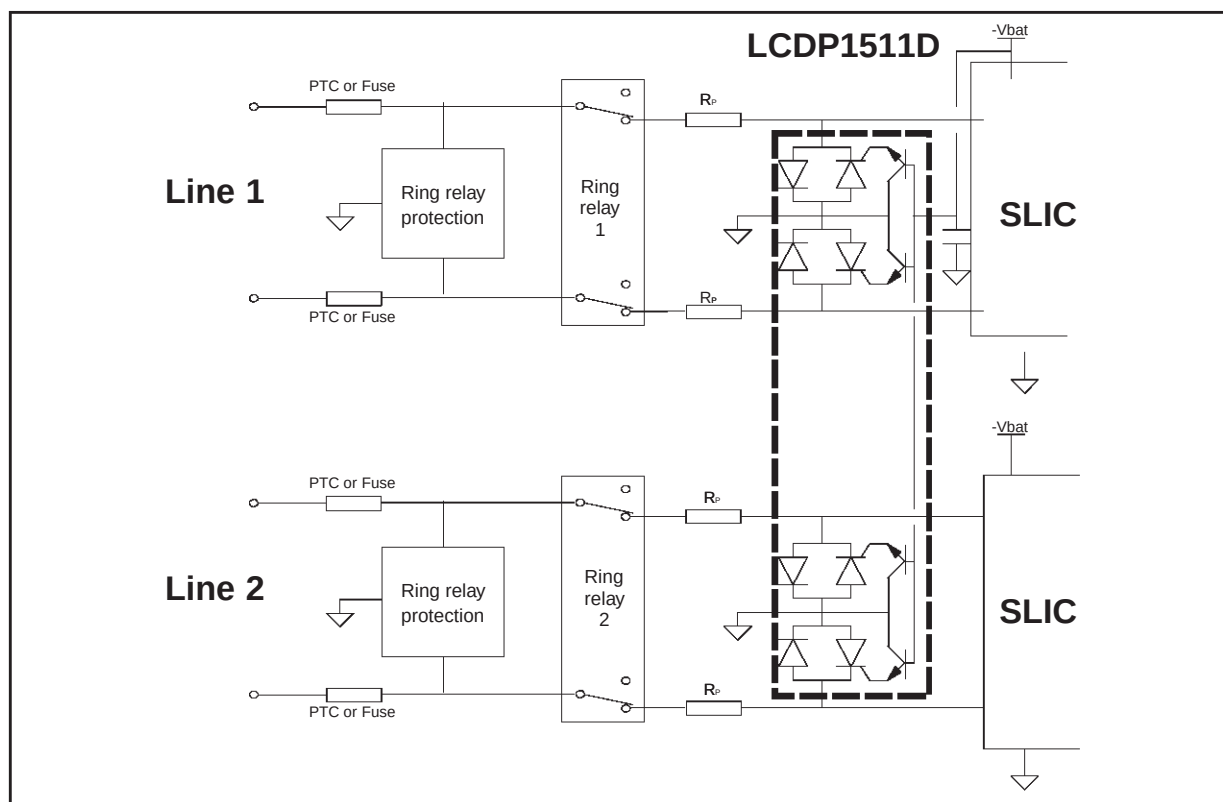


TEST CIRCUIT FOR V_{FP} AND V_{DGL} PARAMETERS

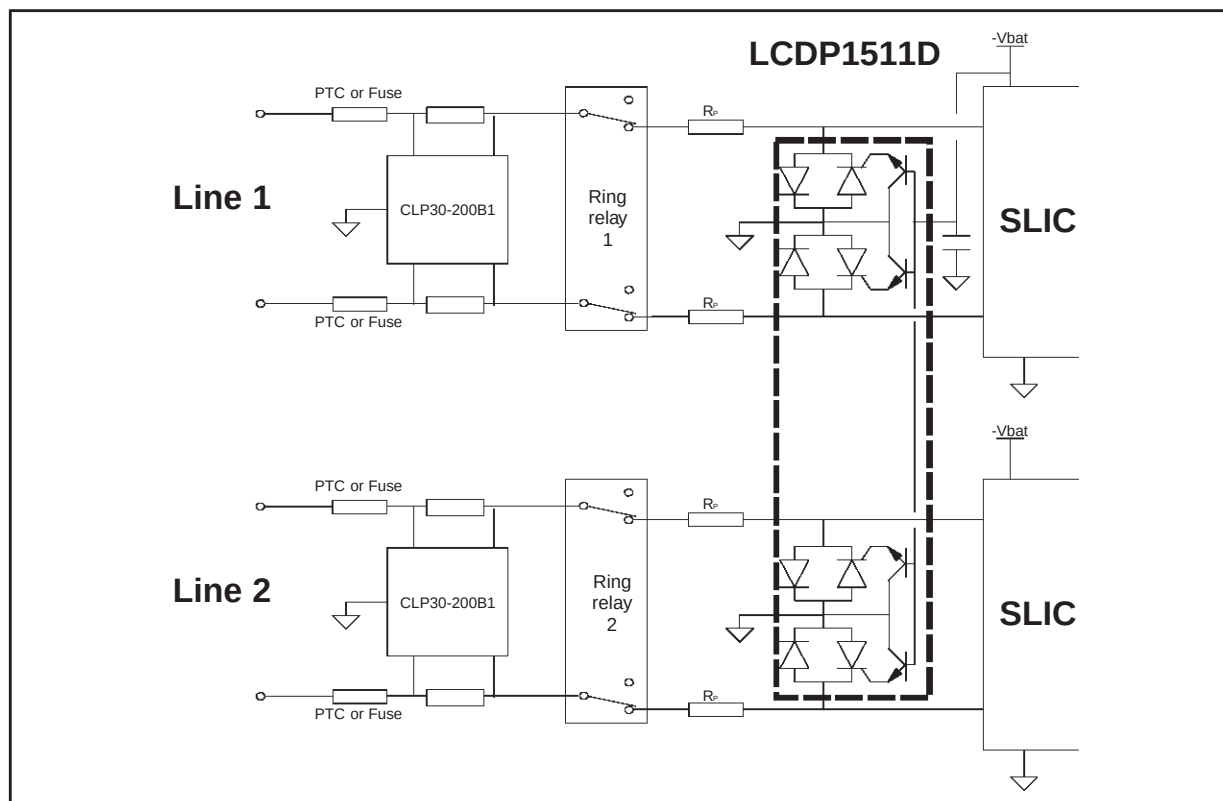


Pulse (μs)		V_P	C_1	C_2	L	R_1	R_2	R_3	R_4	I_{PP}	R_p
t_r	t_p	(V)	(μF)	(nF)	(μH)	(Ω)	(Ω)	(Ω)	(Ω)	(A)	(Ω)
10	700	1000	20	200	0	50	15	25	25	10	60
1.2	50	1500	1	33	0	76	13	25	25	15	60
2	10	2500	10	0	1.1	1.3	0	3	3	10	245

APPLICATION CIRCUIT: PABX line protection

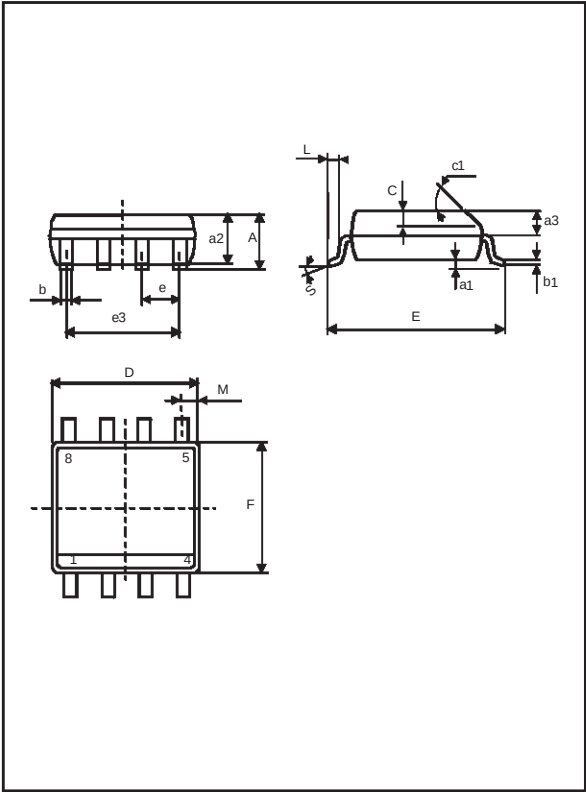


APPLICATION CIRCUIT: Line Card protection



LCDP1511D

PACKAGE MECHANICAL DATA
SO8 (Plastic)



REF.	DIMENSIONS					
	Millimetres			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.75			0.069
a1	0.1		0.25	0.004		0.010
a2			1.65			0.065
a3	0.65		0.85	0.025		0.033
b	0.35		0.48	0.014		0.019
b1	0.19		0.25	0.007		0.010
C	0.25	0.50	0.50	0.010		0.020
c1	45° (typ)					
D	4.8		5.0	0.189		0.197
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.15		0.157
L	0.4		1.27	0.016		0.050
M			0.6			0.024
S	8° (max)					

Ordre code	Marking	Package	Weight	Base qty	Delivery mode
LCDP1511D	LCDP15	SO8	0.077 g	100	Tube
LCDP1511DRL	LCDP15	SO8	0.077 g	2500	Tape & reel

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