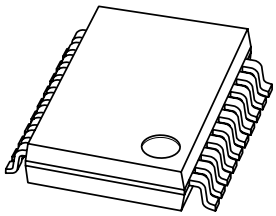
DATA SHEET



PESD5V2S18U
ESD protection array

Product specification

2003 Apr 28

Philips
Semiconductors

PHILIPS

ESD protection array PESD5V2S18U

FEATURES

- Uni-directional ESD protection of up to 18 lines
- Maximum peak reverse power: P_{PP} = 100 W at t_p = 8/20 μs
- Low clamping voltage: V_{CL} = 12 V max. at I_{ZSM} = 10 A
- Low leakage current: I_R = 100 nA typ. at V_{RWM} = 5.2 V
- IEC 61000-4-2, level 4 (ESD); 15 kV (air) and 8 kV (contact).

APPLICATIONS

- Printer parallel ports
- Computers and peripherals
- Communication systems.

DESCRIPTION

Monolithic ESD protection device designed to protect up to 18 transmission or data lines from the damage caused by electrostatic discharge (ESD) and surge pulses.

PINNING

PIN	DESCRIPTION
1 to 5	cathode (k1 to k5)
6 and 16	common anode (a1; a2)
7 to 15	cathode (k6 to k14)
17 to 20	cathode (k15 to k18)

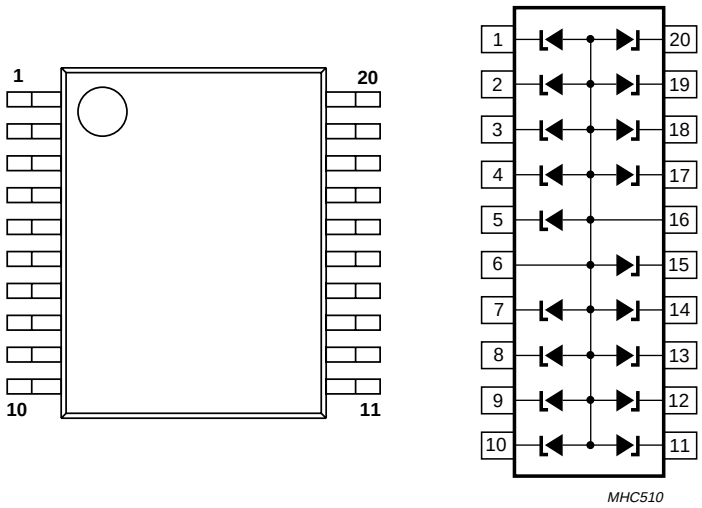


Fig.1 Simplified outline (SSOP20; SOT339-1) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{PP}	non-repetitive peak reverse current	t_p = 8/20 μs	–	10	A
P_{PP}	non-repetitive peak reverse power dissipation	t_p = 8/20 μs	–	100	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–65	+150	°C
	electrostatic discharge voltage	IEC 61000-4-2 (contact discharge)	30	–	kV
		HBM MIL-Std 883	10	–	kV

ESD standards compliance

IEC 61000-4-2, level 4 (ESD)	>15 kV (air); >8 kV (contact)
HBM MIL-Std 883, class 3	>4 kV

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	one or more diodes loaded	135	K/W

Note

1. Refer to SOT339-1 standard mounting conditions.

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{RWM}	crest working reverse voltage		–	–	5.2	V
I_R	reverse current	V_{RWM} = 5.2 V	–	0.1	1	µA
V_{CL}	clamping voltage	I_{ZSM} = 3 A; t_p = 8/20 µs; see Fig.5	–	–	8	V
		I_{ZSM} = 10 A; t_p = 8/20 µs; see Fig.5	–	–	12	V
V_{BR}	breakdown voltage	I_Z = 5 mA	6.4	6.8	7.2	V
r_{diff}	differential resistance	I_Z = 1 mA	–	–	40	Ω
		I_Z = 5 mA	–	–	8	Ω
C_d	diode capacitance	V_R = 0; f = 1 MHz; see Fig.4	–	100	–	pF

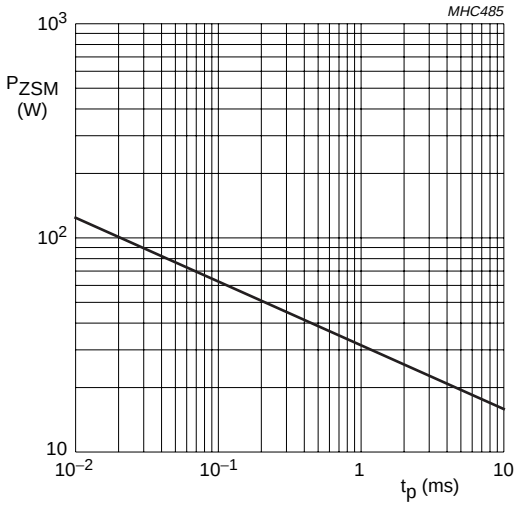


Fig.2 Maximum non-repetitive peak reverse power as a function of pulse duration.

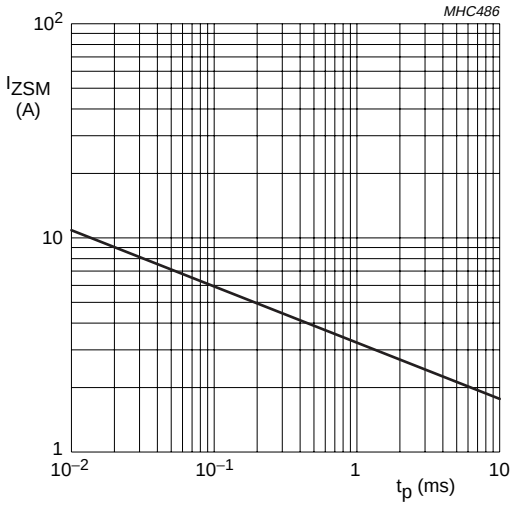
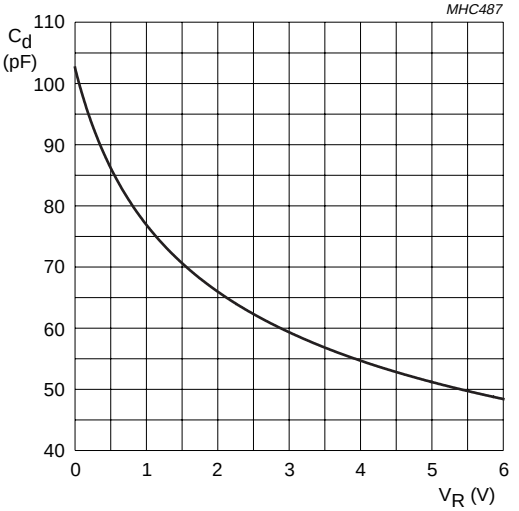
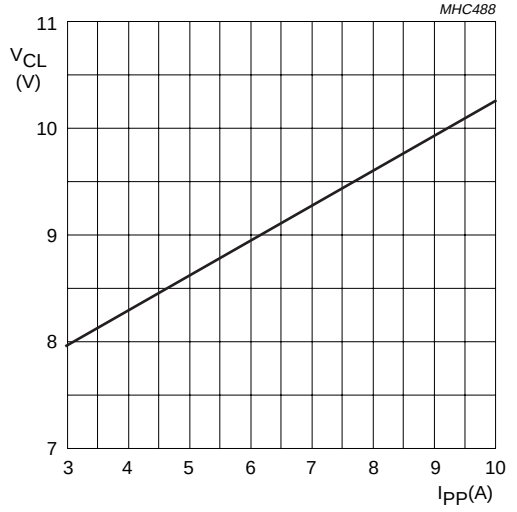


Fig.3 Maximum non-repetitive peak reverse current as a function of pulse duration.



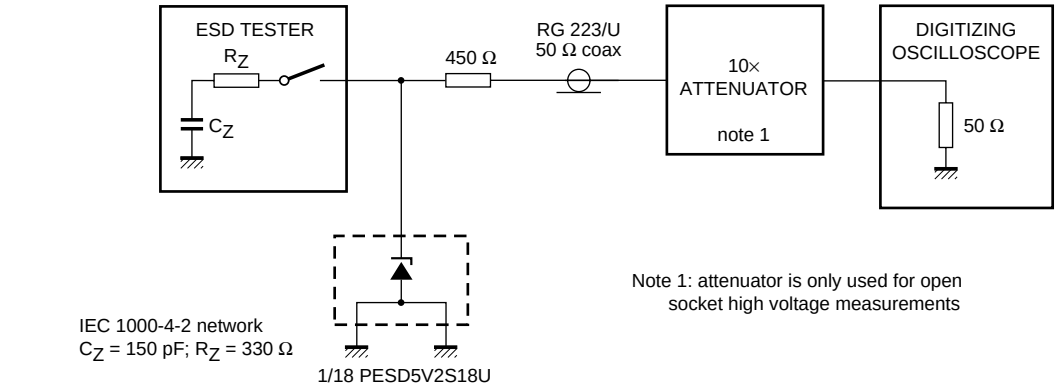
f = 1 MHz; T_{amb} = 25 °C

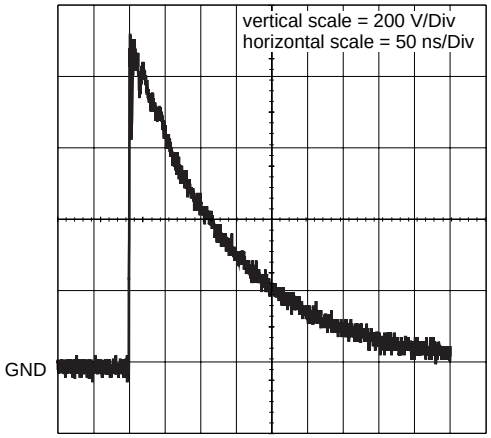
Fig.4 Diode capacitance as a function of reverse voltage; typical values.



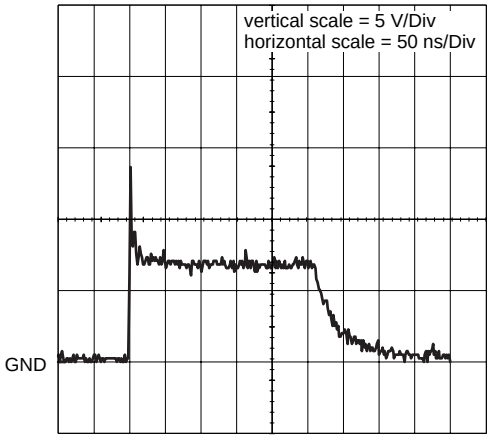
t_p = 8/20 μs

Fig.5 Clamping voltage as a function of peak reverse pulse current; typical values.

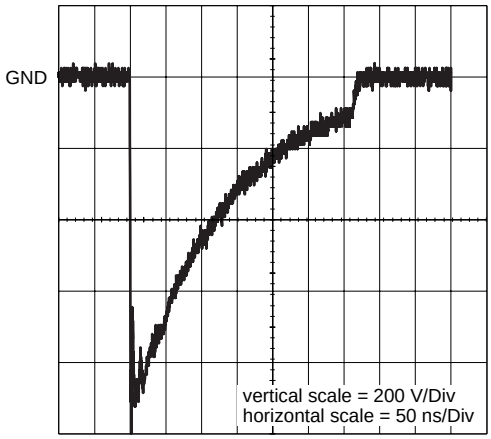




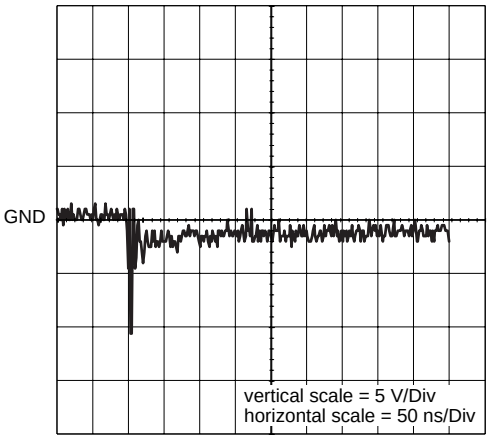
unclamped +1 kV ESD voltage waveform
(IEC 1000–4–2 network)



clamped +1 kV ESD voltage waveform
(IEC 1000–4–2 network)



unclamped –1 kV ESD voltage waveform
(IEC 1000–4–2 network)



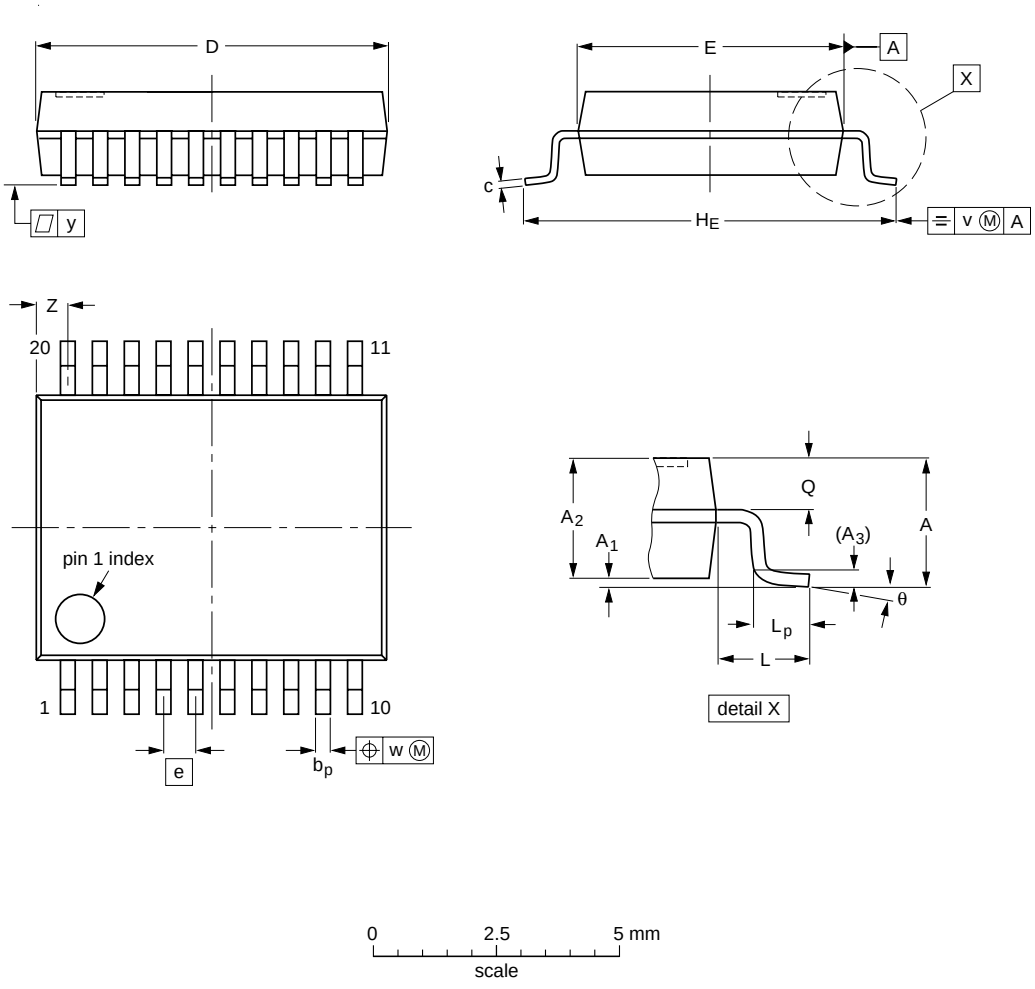
clamped –1 kV ESD voltage waveform
(IEC 1000–4–2 network)

MHC489

Fig.6 ESD clamping test set-up and waveforms.

PACKAGE OUTLINE

SSOP20: plastic shrink small outline package; 20 leads; body width 5.3 mm **SOT339-1**



DIMENSIONS (mm are the original dimensions)

UNIT	A max.	A_1	A_2	A_3	b_p	c	$D^{(1)}$	$E^{(1)}$	e	H_E	L	L_p	Q	v	w	y	$Z^{(1)}$	θ
mm	2	0.21 0.05	1.80 1.65	0.25	0.38 0.25	0.20 0.09	7.4 7.0	5.4 5.2	0.65	7.9 7.6	1.25	1.03 0.63	0.9 0.7	0.2	0.13	0.1	0.9 0.5	8^o 0^o

Note

1. Plastic or metal protrusions of 0.2 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT339-1		MO-150				~~99-12-27~~ 03-02-19

DATA SHEET STATUS

LEVEL	DATA SHEET STATUS(1)	PRODUCT STATUS(2)(3)	DEFINITION
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

Notes

1. Please consult the most recently issued data sheet before initiating or completing a design.
2. The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL http://www.semiconductors.philips.com.
3. For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

DEFINITIONS

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

Application information — Applications that are described herein for any of these products are for illustrative purposes only. Philips Semiconductors make no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

DISCLAIMERS

Life support applications — These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips Semiconductors customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips Semiconductors for any damages resulting from such application.

Right to make changes — Philips Semiconductors reserves the right to make changes in the products - including circuits, standard cells, and/or software - described or contained herein in order to improve design and/or performance. When the product is in full production (status ‘Production’), relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN). Philips Semiconductors assumes no responsibility or liability for the use of any of these products, conveys no licence or title under any patent, copyright, or mask work right to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified.

Philips Semiconductors – a worldwide company

Contact information

For additional information please visit **http://www.semiconductors.philips.com**. Fax: **+31 40 27 24825**
For sales offices addresses send e-mail to: **sales.addresses@www.semiconductors.philips.com**.

Printed in The Netherlands 613514/01/pp8 Date of release: 2003 Apr 28 Document order number: 9397 750 10889

Let's make things better.

Philips
Semiconductors

PHILIPS