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Dear Customer,

On 7 February 2017 the former NXP Standard Product business became a new company with the tradename **Nexperia**. Nexperia is an industry leading supplier of Discrete, Logic and PowerMOS semiconductors with its focus on the automotive, industrial, computing, consumer and wearable application markets

In data sheets and application notes which still contain NXP or Philips Semiconductors references, use the references to Nexperia, as shown below.

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Kind regards,

Team Nexperia

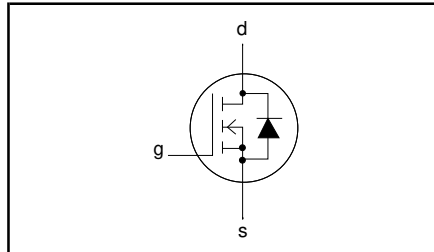
# N-channel TrenchMOS™ transistor Logic level FET

**BSS123**

## FEATURES

- 'Trench' technology
- Extremely fast switching
- Logic level compatible
- Subminiature surface mounting package

## SYMBOL



## QUICK REFERENCE DATA

$V_{DSS} = 100\text{ V}$
$I_D = 150\text{ mA}$
$R_{DS(ON)} \leq 6\ \Omega (V_{GS} = 10\text{ V})$

## GENERAL DESCRIPTION

N-channel enhancement mode field-effect transistor in a plastic envelope using 'trench' technology.

### Applications:-

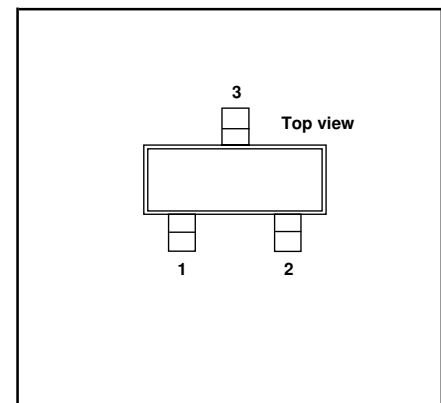
- Relay driver
- High-speed line driver
- Telephone ringer

The BSS123 is supplied in the SOT23 subminiature surface mounting package.

## PINNING

PIN	DESCRIPTION
1	gate
2	source
3	drain

## SOT23



## LIMITING VALUES

Limiting values in accordance with the Absolute Maximum System (IEC 134)

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{DSS}$	Drain-source voltage	$T_j = 25\text{ °C to }150\text{ °C}$	-	100	V
$V_{DGR}$	Drain-gate voltage	$T_j = 25\text{ °C to }150\text{ °C}; R_{GS} = 20\text{ k}\Omega$	-	100	V
$V_{GS}$	Gate-source voltage		-	$\pm 20$	V
$I_D$	Continuous drain current	$T_a = 25\text{ °C}$	-	150	mA
$I_{DM}$	Pulsed drain current	$T_a = 25\text{ °C}$	-	600	mA
$P_D$	Total power dissipation	$T_a = 25\text{ °C}$	-	0.25	W
$T_j, T_{stg}$	Operating junction and storage temperature		- 55	150	°C

## THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
$R_{th\text{-}j\text{-}a}$	Thermal resistance junction to ambient	surface mounted on FR4 board	500	-	K/W

# N-channel TrenchMOS™ transistor

## Logic level FET

BSS123

### ELECTRICAL CHARACTERISTICS

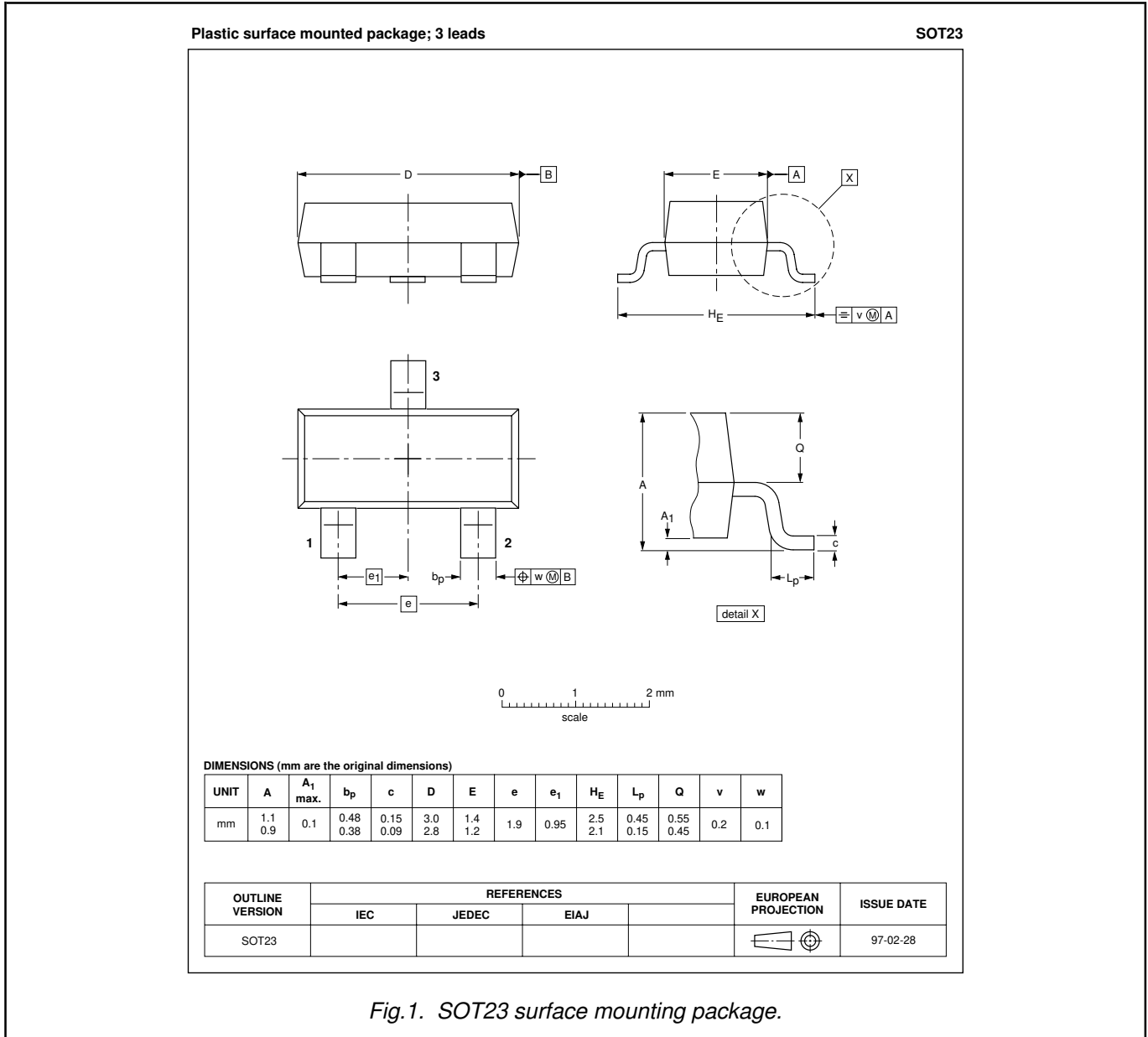
$T_j = 25^\circ\text{C}$  unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)DSS}$	Drain-source breakdown voltage	$V_{GS} = 0\text{ V}; I_D = 10\ \mu\text{A}$	100	130	-	V
$V_{GS(TO)}$	Gate threshold voltage	$V_{DS} = V_{GS}; I_D = 1\ \text{mA}$	1	2	2.8	V
$R_{DS(ON)}$	Drain-source on-state resistance	$V_{GS} = 10\ \text{V}; I_D = 120\ \text{mA}$	-	3.5	6	$\Omega$
$g_{fs}$	Forward transconductance	$V_{DS} = 25\ \text{V}; I_D = 120\ \text{mA}$	-	350	-	mS
$I_{DSS}$	Zero gate voltage drain current	$V_{DS} = 60\ \text{V}; V_{GS} = 0\ \text{V}$	-	10	100	nA
$I_{GSS}$	Gate source leakage current	$V_{GS} = \pm 20\ \text{V}; V_{DS} = 0\ \text{V}$	-	10	100	nA
$t_{on}$	Turn-on time	$V_{DD} = 50\ \text{V}; R_D = 250\ \Omega; V_{GS} = 10\ \text{V}; R_G = 50\ \Omega; \text{Resistive load}$	-	3	10	ns
$t_{off}$	Turn-off time		-	12	20	ns
$C_{iss}$	Input capacitance	$V_{GS} = 0\ \text{V}; V_{DS} = 25\ \text{V}; f = 1\ \text{MHz}$	-	23	40	pF
$C_{oss}$	Output capacitance		-	6	25	pF
$C_{rss}$	Feedback capacitance		-	4	10	pF

N-channel TrenchMOS™ transistor  
Logic level FET

BSS123

MECHANICAL DATA



**Notes**

1. This product is supplied in anti-static packaging. The gate-source input must be protected against static discharge during transport or handling.
2. Refer to SMD Footprint Design and Soldering Guidelines, Data Handbook SC18.
3. Epoxy meets UL94 V0 at 1/8".

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### DEFINITIONS

<b>Data sheet status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
<b>Limiting values</b>	
Limiting values are given in accordance with the Absolute Maximum Rating System (IEC 134). 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 this specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	
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