

BUK9832-55A

N-channel TrenchMOS logic level FET Rev. 02 — 1 June 2010

Product data sheet

Product profile

1.1 General description

Logic level N-channel enhancement mode Field-Effect Transistor (FET) in a plastic package using TrenchMOS technology. This product has been designed and qualified to the appropriate AEC standard for use in automotive critical applications.

1.2 Features and benefits

- Low conduction losses due to low on-state resistance
- Q101 compliant

Suitable for logic level gate drive sources

1.3 Applications

- 12 V and 24 V loads
- Automotive and general purpose power switching
- Motors, lamps and solenoids

1.4 Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
Cyllibol	i arameter		141111	ıур	IVIAA	Oilit
V_{DS}	drain-source voltage	$T_j \ge 25 \text{ °C}; T_j \le 150 \text{ °C}$	-	-	55	V
I _D	drain current	$V_{GS} = 5 \text{ V}; T_{sp} = 25 \text{ °C};$ see <u>Figure 1</u> ; see <u>Figure 3</u>	-	-	12	Α
P _{tot}	total power dissipation	T _{sp} = 25 °C; see <u>Figure 2</u>	-	-	8	W
Static chara	acteristics					
R _{DSon}	drain-source on-state	$V_{GS} = 4.5 \text{ V}; I_D = 8 \text{ A};$ $T_j = 25 \text{ °C}$	-	-	36	mΩ
	resistance	$V_{GS} = 10 \text{ V}; I_D = 8 \text{ A}; T_j = 25 \text{ °C}$	-	25	29	mΩ
		$V_{GS} = 5 \text{ V}; I_D = 8 \text{ A}; T_j = 25 \text{ °C};$ see <u>Figure 12</u> ; see <u>Figure 13</u>	-	27	32	mΩ
Avalanche	ruggedness					
E _{DS(AL)S}	non-repetitive drain-source avalanche energy	I_D = 10 A; $V_{sup} \le 55$ V; R_{GS} = 50 Ω ; V_{GS} = 5 V; $T_{j(init)}$ = 25 °C; unclamped	-	-	100	mJ



2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	G	gate		
2	D	drain	4	D
3	S	source		
4	D	drain	☐ ₁ ☐ ₂ ☐ ₃ SOT223 (SC-73)	mbb076 S

3. Ordering information

Table 3. Ordering information

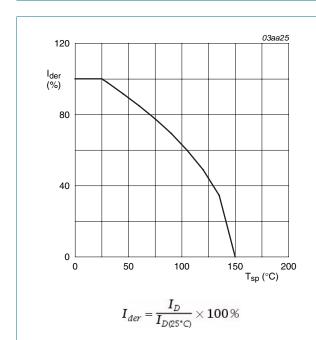
Type number	Package		
	Name	Description	Version
BUK9832-55A	SC-73	plastic surface-mounted package with increased heatsink; 4 leads	SOT223

Limiting values

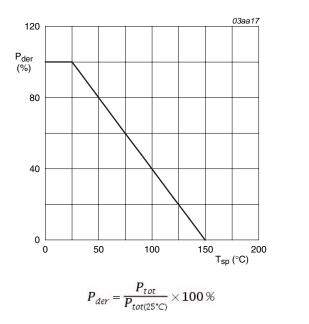
Limiting values Table 4.

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

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V_{DS}	drain-source voltage	T _j ≥ 25 °C; T _j ≤ 150 °C	-	-	55	V
V_{DGR}	drain-gate voltage	$R_{GS} = 20 \text{ k}\Omega$	-	-	55	V
V _{GS}	gate-source voltage		-10	-	10	V
I _D	drain current	T_{sp} = 25 °C; V_{GS} = 5 V; see <u>Figure 1</u> ; see <u>Figure 3</u>	-	-	12	Α
		$T_{sp} = 100 ^{\circ}\text{C}$; $V_{GS} = 5 ^{\circ}\text{V}$; see Figure 1	-	-	7	Α
I _{DM}	peak drain current	$T_{sp} = 25 \text{ °C}; t_p \le 10 \mu\text{s}; \text{ pulsed};$ see Figure 3	-	-	47	Α
P _{tot}	total power dissipation	T _{sp} = 25 °C; see <u>Figure 2</u>	-	-	8	W
T _{stg}	storage temperature		-55	-	150	°C
T _j	junction temperature		-55	-	150	°C
V_{GSM}	peak gate-source voltage	pulsed; $t_p \le 50 \mu s$	-15	-	15	V
Source-drain	diode					
Is	source current	T _{sp} = 25 °C	-	-	12	Α
I _{SM}	peak source current	$t_p \le 10 \mu\text{s}; \text{ pulsed}; T_{sp} = 25 ^{\circ}\text{C}$	-	-	47	Α
Avalanche rug	ggedness					
E _{DS(AL)S}	non-repetitive drain-source avalanche energy	I_D = 10 A; $V_{sup} \le$ 55 V; R_{GS} = 50 Ω; V_{GS} = 5 V; $T_{j(init)}$ = 25 °C; unclamped	-	-	100	mJ



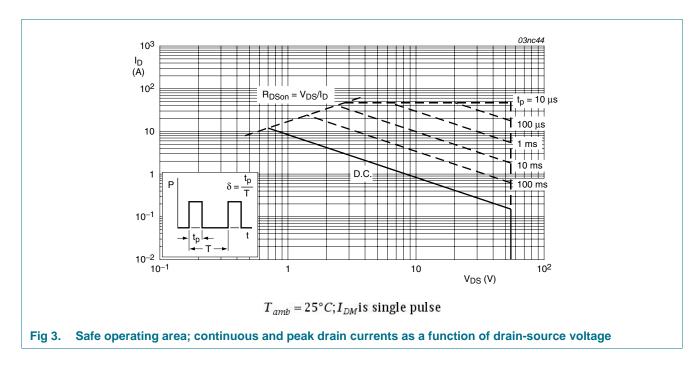
Normalized continuous drain current as a function of solder point temperature



Normalized total power dissipation as a function of solder point temperature

BUK9832-55A

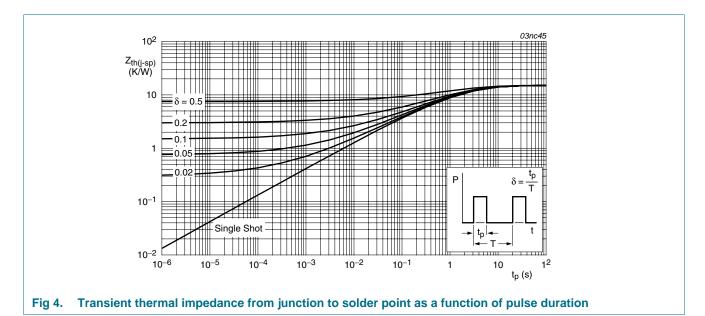
All information provided in this document is subject to legal disclaimers.



5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
R _{th(j-sp)}	thermal resistance from junction to solder point		-	-	15	K/W
R _{th(j-a)}	thermal resistance from junction to ambient	see <u>Figure 4</u>	-	70	-	K/W



6. Characteristics

Table 6. Characteristics

Table 6.	Characteristics					
Symbol	Parameter	Conditions	Min	Тур	Max	Unit
Static cha	aracteristics					
V _{(BR)DSS} drain-source breakdown voltage	$I_D = 0.25 \text{ mA}; V_{GS} = 0 \text{ V}; T_j = -55 \text{ °C}$	50	-	-	V	
	breakdown voltage	$I_D = 0.25 \text{ mA}; V_{GS} = 0 \text{ V}; T_j = 25 \text{ °C}$	55	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$I_D = 1$ mA; $V_{DS} = V_{GS}$; $T_j = 25$ °C; see Figure 11	1	1.5	2	V
		I_D = 1 mA; V_{DS} = V_{GS} ; T_j = -55 °C; see Figure 11	-	-	2.3	V
		$I_D = 1$ mA; $V_{DS} = V_{GS}$; $T_j = 150$ °C; see Figure 11	0.6	-	-	V
I _{DSS}	drain leakage current	$V_{DS} = 55 \text{ V}; V_{GS} = 0 \text{ V}; T_j = 150 \text{ °C}$	-	-	500	μΑ
		$V_{DS} = 55 \text{ V}; V_{GS} = 0 \text{ V}; T_j = 25 \text{ °C}$	-	0.05	10	μΑ
I _{GSS}	gate leakage current	$V_{DS} = 0 \text{ V}; V_{GS} = 10 \text{ V}; T_j = 25 \text{ °C}$	-	2	100	nΑ
		$V_{DS} = 0 \text{ V}; V_{GS} = -10 \text{ V}; T_j = 25 \text{ °C}$	-	2	100	nΑ
R _{DSon}	drain-source on-state resistance	$V_{GS} = 4.5 \text{ V}; I_D = 8 \text{ A}; T_j = 25 \text{ °C}$	-	-	36	mΩ
		$V_{GS} = 5 \text{ V}$; $I_D = 8 \text{ A}$; $T_j = 150 \text{ °C}$; see Figure 12; see Figure 13	-	-	59	mΩ
		$V_{GS} = 10 \text{ V}; I_D = 8 \text{ A}; T_j = 25 \text{ °C}$	-	25	29	mΩ
		$V_{GS} = 5 \text{ V}$; $I_D = 8 \text{ A}$; $T_j = 25 \text{ °C}$; see <u>Figure 12</u> ; see <u>Figure 13</u>	-	27	32	mΩ
Dynamic	characteristics					
C _{iss}	input capacitance	$V_{GS} = 0 \text{ V}; V_{DS} = 25 \text{ V}; f = 1 \text{ MHz};$	-	1195	1594	pF
C _{oss}	output capacitance	$T_j = 25 ^{\circ}\text{C}$; see Figure 14	-	212	254	pF
C _{rss}	reverse transfer capacitance		-	144	198	pF
t _{d(on)}	turn-on delay time	$V_{DS} = 30 \text{ V}; R_L = 1.2 \Omega; V_{GS} = 5 \text{ V};$	-	14	-	ns
t _r	rise time	$R_{G(ext)} = 10 \Omega; T_j = 25 °C$	-	125	-	ns
t _{d(off)}	turn-off delay time		-	64	-	ns
t _f	fall time		-	68	-	ns
Source-d	rain diode					
V_{SD}	source-drain voltage	$I_S = 18 \text{ A}; V_{GS} = 0 \text{ V}; T_j = 25 ^{\circ}\text{C};$ see <u>Figure 15</u>	-	0.85	1.2	V
t _{rr}	reverse recovery time	$I_S = 20 \text{ A}; dI_S/dt = -100 \text{ A/}\mu\text{s};$	-	51	-	ns
Q _r	recovered charge	$V_{GS} = -10 \text{ V}; V_{DS} = 30 \text{ V}; T_j = 25 \text{ °C}$	-	80	-	nC

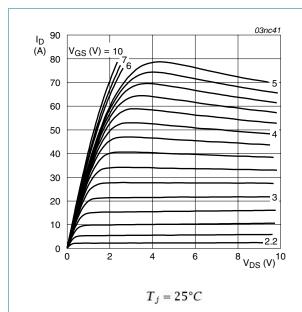


Fig 5. Output characteristics: drain current as a function of drain-source voltage; typical values

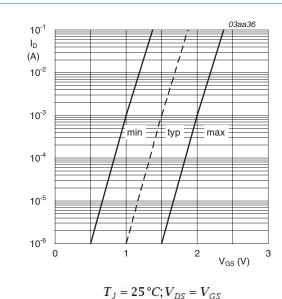
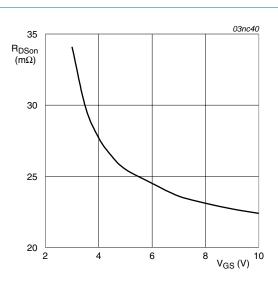
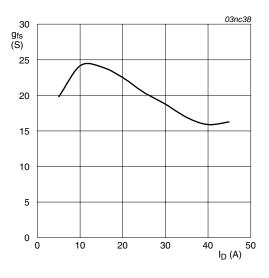


Fig 7. Sub-threshold drain current as a function of gate-source voltage



 $T_j = 25^{\circ}C; I_D = 15A$

Fig 6. Drain-source on-state resistance as a function of gate-source voltage; typical values



 $T_j = 25^{\circ}C; V_{DS} = 25V$

Fig 8. Forward transconductance as a function of drain current; typical values

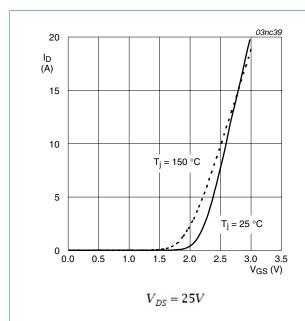


Fig 9. Transfer characteristics: drain current as a function of gate-source voltage; typical values

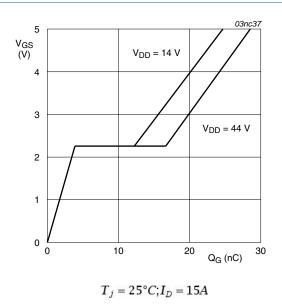


Fig 10. Gate-source voltage as a function of turn-on gate charge; typical values

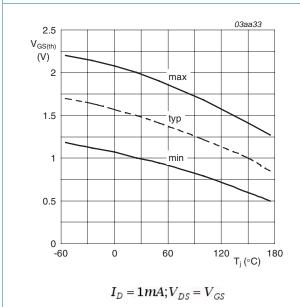


Fig 11. Gate-source threshold voltage as a function of junction temperature

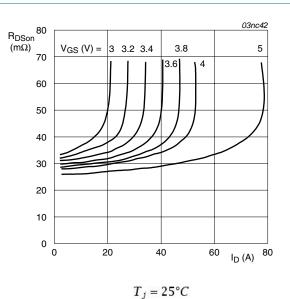


Fig 12. Drain-source on-state resistance as a function of drain current; typical values

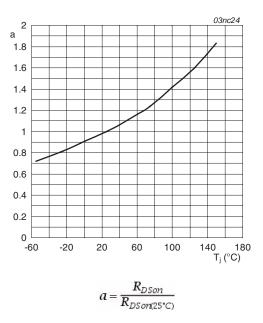


Fig 13. Normalized drain source on-state resistance factor as a function of junction temperature

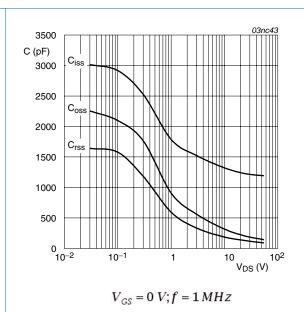


Fig 14. Input, output and reverse transfer capacitances as a function of drain-source voltage; typical values

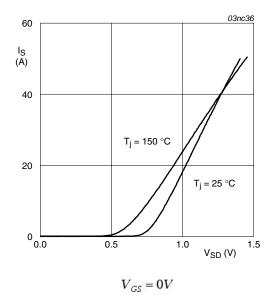


Fig 15. Reverse diode current as a function of reverse diode voltage; typical value

7. Package outline

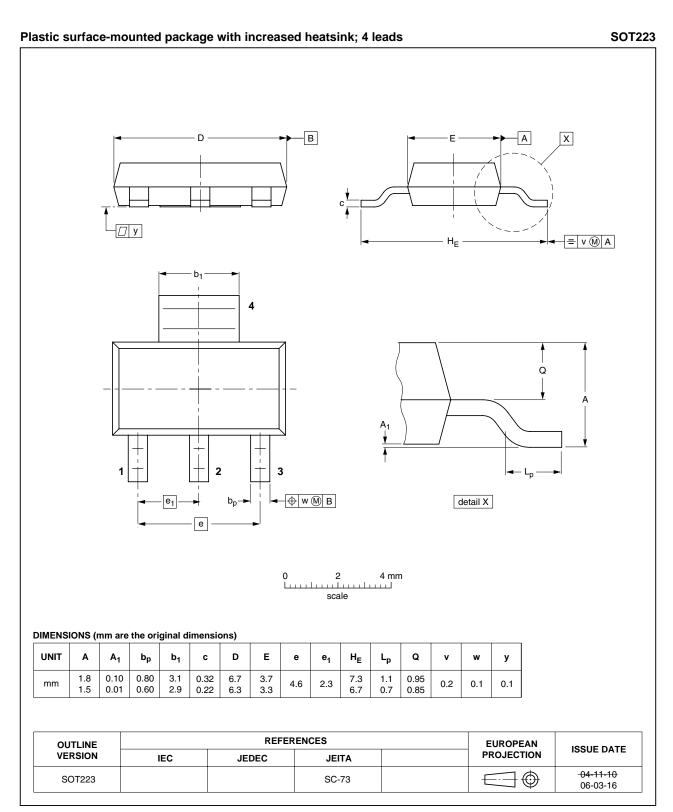


Fig 16. Package outline SOT223 (SC-73)

BUK9832-55A

Revision history

Table 7. **Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes
BUK9832-55A v.2	20100601	Product data sheet	-	BUK9832-55A-01
Modifications:	 The format of this data sheet has been redesigned to comply with the new identity guideline of NXP Semiconductors. Legal texts have been adapted to the new company name where appropriate. 			, ,
BUK9832-55A-01 (9397 750 07734)	20010131	Product specification	-	-

9. Legal information

9.1 Data sheet status

Document status[1][2]	Product status[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
- [3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nexperia.com.

9.2 Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. Nexperia does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local Nexperia sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

Product specification — The information and data provided in a Product data sheet shall define the specification of the product as agreed between Nexperia and its customer, unless Nexperia and customer have explicitly agreed otherwise in writing. In no event however, shall an agreement be valid in which the Nexperia product is deemed to offer functions and qualities beyond those described in the Product data sheet.

9.3 Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, Nexperia does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

In no event shall Nexperia be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory.

Notwithstanding any damages that customer might incur for any reason whatsoever, Nexperia's aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the *Terms and conditions of commercial sale* of Nexperia.

Right to make changes — Nexperia reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use in automotive applications — This Nexperia product has been qualified for use in automotive applications. The product is not designed, authorized or warranted to be suitable for use in medical, military, aircraft, space or life support equipment, nor in applications where failure or malfunction of a Nexperia product can reasonably be expected to result in personal injury, death or severe property or environmental damage. Nexperia accepts no liability for inclusion and/or use of Nexperia products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

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

Nexperia does not accept any liability related to any default, damage, costs or problem which is based on a weakness or default in the customer application/use or the application/use of customer's third party customer(s) (hereinafter both referred to as "Application"). It is customer's sole responsibility to check whether the Nexperia product is suitable and fit for the Application planned. Customer has to do all necessary testing for the Application in order to avoid a default of the Application and the product. Nexperia does not accept any liability in this respect.

Quick reference data — The Quick reference data is an extract of the product data given in the Limiting values and Characteristics sections of this document, and as such is not complete, exhaustive or legally binding. Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) will cause permanent damage to the device. Limiting values are stress ratings only and (proper) operation of the device at these or any other conditions above those given in the Recommended operating conditions section (if present) or the Characteristics sections of this document is not warranted. Constant or repeated exposure to limiting values will permanently and irreversibly affect the quality and reliability of the device.

Terms and conditions of commercial sale — Nexperia

products are sold subject to the general terms and conditions of commercial sale, as published at http://www.nexperia.com/profile/terms, unless otherwise agreed in a valid written individual agreement. In case an individual agreement is concluded only the terms and conditions of the respective agreement shall apply. Nexperia hereby expressly objects to applying the customer's general terms and conditions with regard to the purchase of Nexperia products by customer.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

BUK9832-55A

All information provided in this document is subject to legal disclaimers.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from national authorities.

10. Contact information

For more information, please visit: http://www.nexperia.com

For sales office addresses, please send an email to: salesaddresses@nexperia.com

BUK9832-55A

Nexperia

N-channel TrenchMOS logic level FET

11. Contents

1	Product profile
1.1	General description
1.2	Features and benefits1
1.3	Applications
1.4	Quick reference data1
2	Pinning information2
3	Ordering information2
4	Limiting values3
5	Thermal characteristics4
6	Characteristics5
7	Package outline9
8	Revision history10
9	Legal information11
9.1	Data sheet status
9.2	Definitions11
9.3	Disclaimers
9.4	Trademarks12
10	Contact information12

ПОСТАВКА ЭЛЕКТРОННЫХ КОМПОНЕНТОВ

многоканальный

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001 Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

Данный компонент на территории Российской Федерации Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

http://moschip.ru/get-element

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г. Москва, ул. Щербаковская д. 3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru moschip.ru_6 moschip.ru_4 moschip.ru_9