

ANTREX Electronics

Electronic Components Sourcing Information

Product Reference Information

Part Number:	PSMN008-75P,127
Manufacturer:	NXP USA Inc.
Package:	Please confirm with sales
Availability:	Please confirm with sales

Product Page:

<https://antrexco.com/product/details/nxp-usa-inc/psmn008-75p-127.html>

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Note:

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.

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Kind regards,

Team Nexperia

PSMN008-75P

N-channel TrenchMOS SiliconMAX standard level FET

Rev. 04 — 10 December 2009

Product data sheet

1. Product profile

1.1 General description

SiliconMAX standard level N-channel enhancement mode Field-Effect Transistor (FET) in a plastic package using TrenchMOS technology. This product is designed and qualified for use in computing, communications, consumer and industrial applications only.

1.2 Features and benefits

- Higher operating power due to low thermal resistance
- Low conduction losses due to low on-state resistance
- Rated for avalanche ruggedness
- Suitable for high frequency applications due to fast switching characteristics

1.3 Applications

- DC-to-DC convertors
- Uninterruptible power supplies

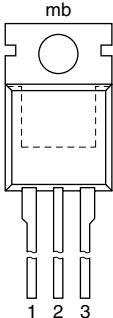
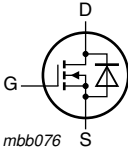
1.4 Quick reference data

Table 1. Quick reference

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{DS}	drain-source voltage	$T_j \geq 25\text{ °C}$; $T_j \leq 175\text{ °C}$	-	-	75	V
I_D	drain current	$T_{mb} = 25\text{ °C}$; $V_{GS} = 10\text{ V}$; see Figure 1 and 3	-	-	75	A
P_{tot}	total power dissipation	$T_{mb} = 25\text{ °C}$; see Figure 2	-	-	230	W
Dynamic characteristics						
Q_{GD}	gate-drain charge	$V_{GS} = 10\text{ V}$; $I_D = 75\text{ A}$; $V_{DS} = 60\text{ V}$; $T_j = 25\text{ °C}$; see Figure 11	-	50	-	nC
Static characteristics						
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = 10\text{ V}$; $I_D = 25\text{ A}$; $T_j = 25\text{ °C}$; see Figure 9 and 10	-	6.5	8.5	mΩ

2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	G	gate		
2	D	drain		
3	S	source		
mb	D	mounting base; connected to drain		

SOT78 (TO-220AB)

3. Ordering information

Table 3. Ordering information

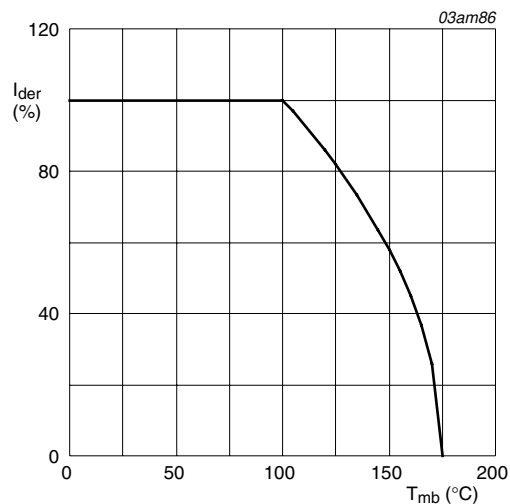
Type number	Package		
	Name	Description	Version
PSMN008-75P	TO-220AB	plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB	SOT78

4. Limiting values

Table 4. Limiting values

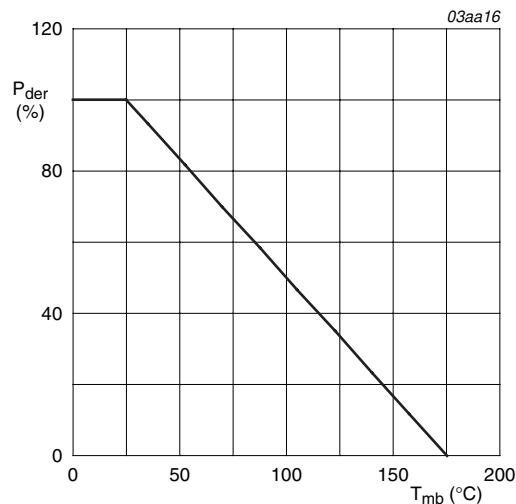
In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	drain-source voltage	$T_j \geq 25\text{ °C}$; $T_j \leq 175\text{ °C}$	-	75	V
V_{DGR}	drain-gate voltage	$T_j \leq 175\text{ °C}$; $T_j \geq 25\text{ °C}$; $R_{GS} = 20\text{ }\Omega$	-	75	V
V_{GS}	gate-source voltage		-20	20	V
I_D	drain current	$V_{GS} = 10\text{ V}$; $T_{mb} = 100\text{ °C}$; see Figure 1	-	75	A
		$V_{GS} = 10\text{ V}$; $T_{mb} = 25\text{ °C}$; see Figure 1 and 3	-	75	A
I_{DM}	peak drain current	$t_p \leq 10\text{ }\mu\text{s}$; pulsed; $T_{mb} = 25\text{ °C}$; see Figure 1 and 3	-	240	A
P_{tot}	total power dissipation	$T_{mb} = 25\text{ °C}$; see Figure 2	-	230	W
T_{stg}	storage temperature		-55	175	°C
T_j	junction temperature		-55	175	°C
Source-drain diode					
I_S	source current	$T_{mb} = 25\text{ °C}$	-	75	A
I_{SM}	peak source current	$t_p \leq 10\text{ }\mu\text{s}$; pulsed; $T_{mb} = 25\text{ °C}$	-	240	A
Avalanche ruggedness					
$E_{DS(AL)S}$	non-repetitive drain-source avalanche energy	$V_{GS} = 10\text{ V}$; $T_{j(\text{init})} = 25\text{ °C}$; $I_D = 63\text{ A}$; $V_{sup} \leq 15\text{ V}$; unclamped; $R_{GS} = 50\text{ }\Omega$; $t_p = 0.129\text{ ms}$	-	395	mJ



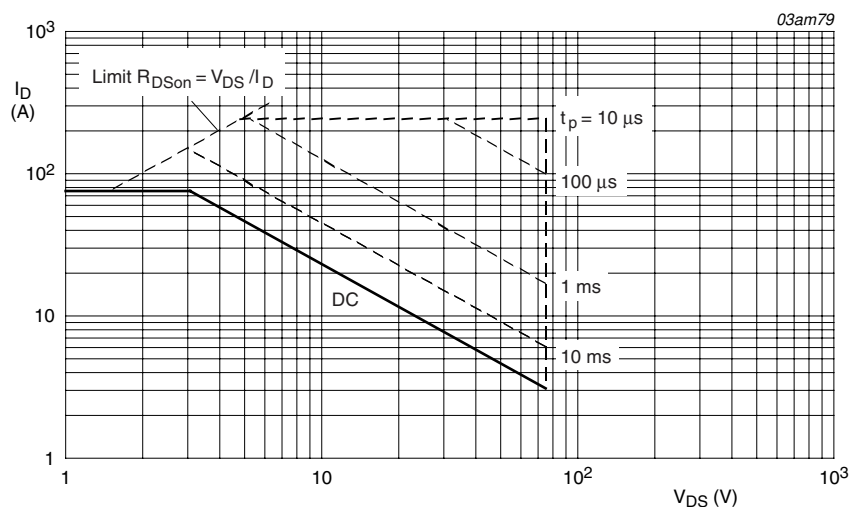
$$I_{der} = \frac{I_D}{I_{D(25^\circ\text{C})}} \times 100\%$$

Fig 1. Normalized continuous drain current as a function of mounting base temperature



$$P_{der} = \frac{P_{tot}}{P_{tot(25^\circ\text{C})}} \times 100\%$$

Fig 2. Normalized total power dissipation as a function of mounting base temperature



$T_{mb} = 25^\circ\text{C}; I_{DM}$ is single pulse

Fig 3. Safe operating area; continuous and peak drain currents as a function of drain-source voltage

5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	see Figure 4	-	-	0.65	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	vertical in still air	-	60	-	K/W

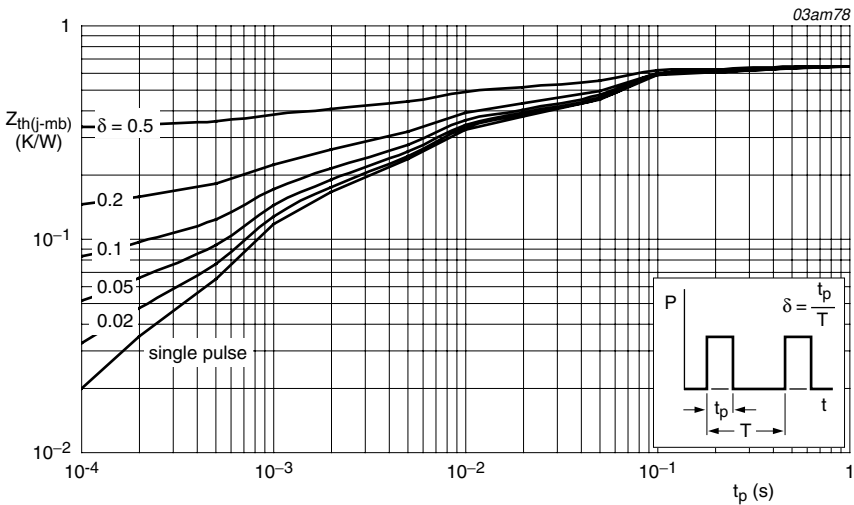


Fig 4. Transient thermal impedance from junction to mounting base as a function of pulse duration

6. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V _{(BR)DSS}	drain-source breakdown voltage	I _D = 250 μA; V _{GS} = 0 V; T _j = 25 °C	75	90	-	V
V _{GS(th)}	gate-source threshold voltage	I _D = 1 mA; V _{DS} = V _{GS} ; T _j = -55 °C; see Figure 8	-	-	4.4	V
		I _D = 1 mA; V _{DS} = V _{GS} ; T _j = 175 °C; see Figure 8	1	-	-	V
		I _D = 1 mA; V _{DS} = V _{GS} ; T _j = 25 °C; see Figure 8	2	3	4	V
I _{DSS}	drain leakage current	V _{DS} = 75 V; V _{GS} = 0 V; T _j = 25 °C	-	0.05	10	μA
		V _{DS} = 75 V; V _{GS} = 0 V; T _j = 175 °C	-	-	500	μA
I _{GSS}	gate leakage current	V _{GS} = 20 V; V _{DS} = 0 V; T _j = 25 °C	-	4	100	nA
		V _{GS} = -20 V; V _{DS} = 0 V; T _j = 25 °C	-	4	100	nA
R _{DSon}	drain-source on-state resistance	V _{GS} = 10 V; I _D = 25 A; T _j = 175 °C; see Figure 9 and 10	-	-	20	mΩ
		V _{GS} = 10 V; I _D = 25 A; T _j = 25 °C; see Figure 9 and 10	-	6.5	8.5	mΩ
Dynamic characteristics						
Q _{G(tot)}	total gate charge	I _D = 75 A; V _{DS} = 60 V; V _{GS} = 10 V; T _j = 25 °C; see Figure 11	-	122.8	-	nC
Q _{GS}	gate-source charge		-	21	-	nC
Q _{GD}	gate-drain charge		-	50	-	nC
C _{iss}	input capacitance	V _{DS} = 25 V; V _{GS} = 0 V; f = 1 MHz; T _j = 25 °C; see Figure 12	-	5260	-	pF
C _{oss}	output capacitance		-	525	-	pF
C _{rss}	reverse transfer capacitance		-	420	-	pF
t _{d(on)}	turn-on delay time	V _{DS} = 38 V; R _L = 1.5 Ω; V _{GS} = 10 V; R _{G(ext)} = 10 Ω; T _j = 25 °C	-	18	-	ns
t _r	rise time		-	55	-	ns
t _{d(off)}	turn-off delay time		-	88	-	ns
t _f	fall time		-	80	-	ns
Source-drain diode						
V _{SD}	source-drain voltage	I _S = 25 A; V _{GS} = 0 V; T _j = 25 °C; see Figure 13	-	0.84	1.2	V
t _{rr}	reverse recovery time	I _S = 5 A; dI _S /dt = -100 A/μs; V _{GS} = 0 V; V _{DS} = 30 V; T _j = 25 °C	-	70	-	ns
Q _r	recovered charge		-	100	-	nC

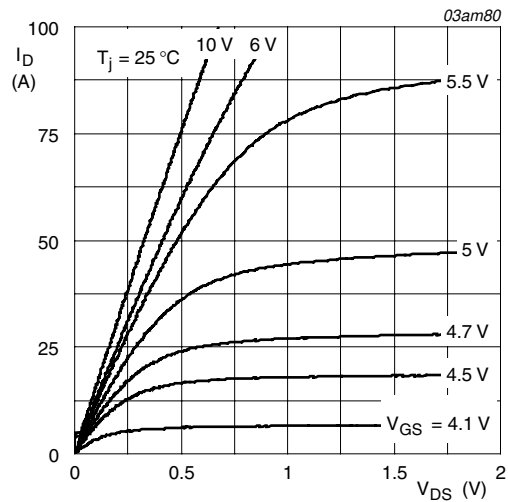


Fig 5. Output characteristics: drain current as a function of drain-source voltage; typical values

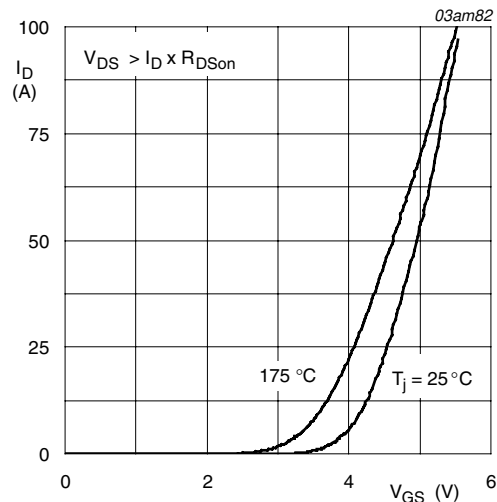


Fig 6. Transfer characteristics: drain current as a function of gate-source voltage; typical values

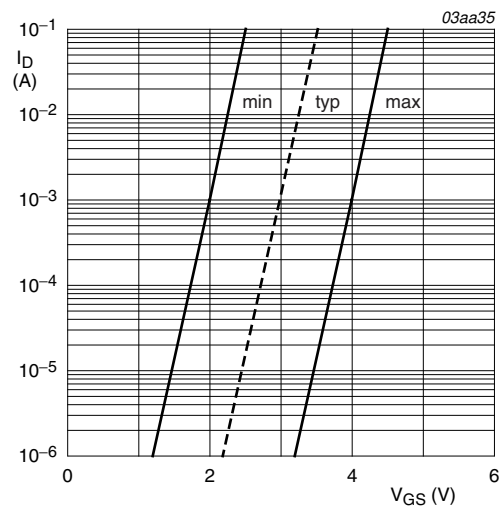


Fig 7. Sub-threshold drain current as a function of gate-source voltage

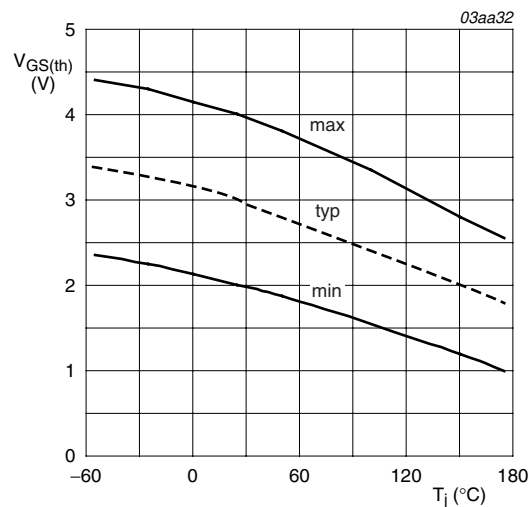


Fig 8. Gate-source threshold voltage as a function of junction temperature

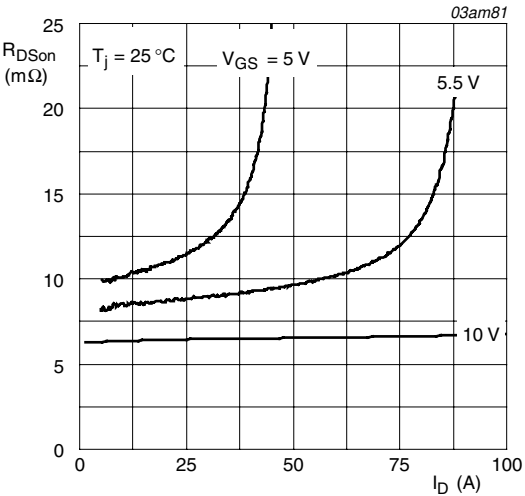


Fig 9. Drain-source on-state resistance as a function of drain current; typical values

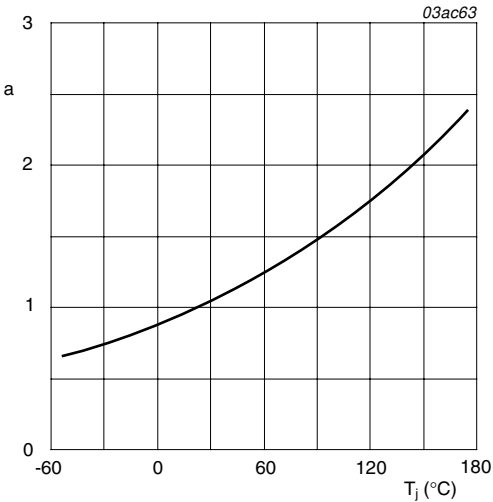


Fig 10. Normalized drain-source on-state resistance factor as a function of junction temperature

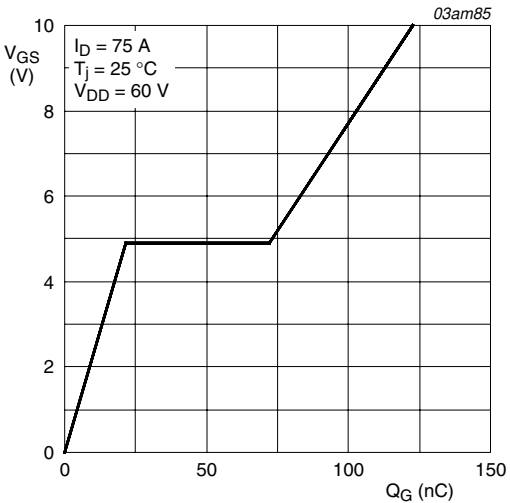


Fig 11. Gate-source voltage as a function of gate charge; typical values

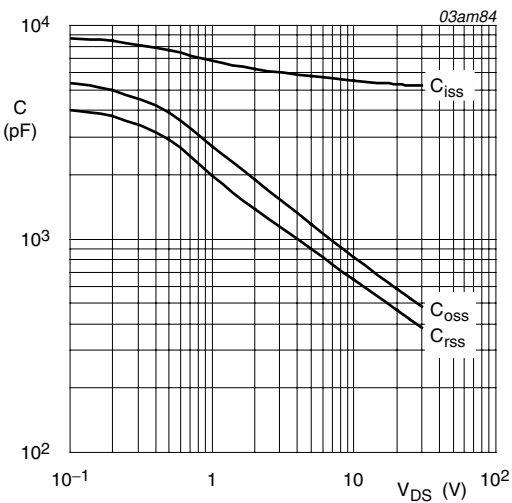
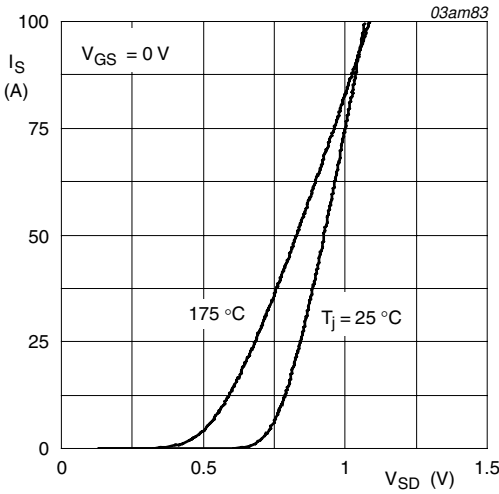


Fig 12. Input, output and reverse transfer capacitances as a function of drain-source voltage; typical values



$T_J = 25^\circ\text{C}$ and $175^\circ\text{C}; V_{GS} = 0\text{ V}$

Fig 13. Source current as a function of source-drain voltage; typical values

7. Package outline

Plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB

SOT78

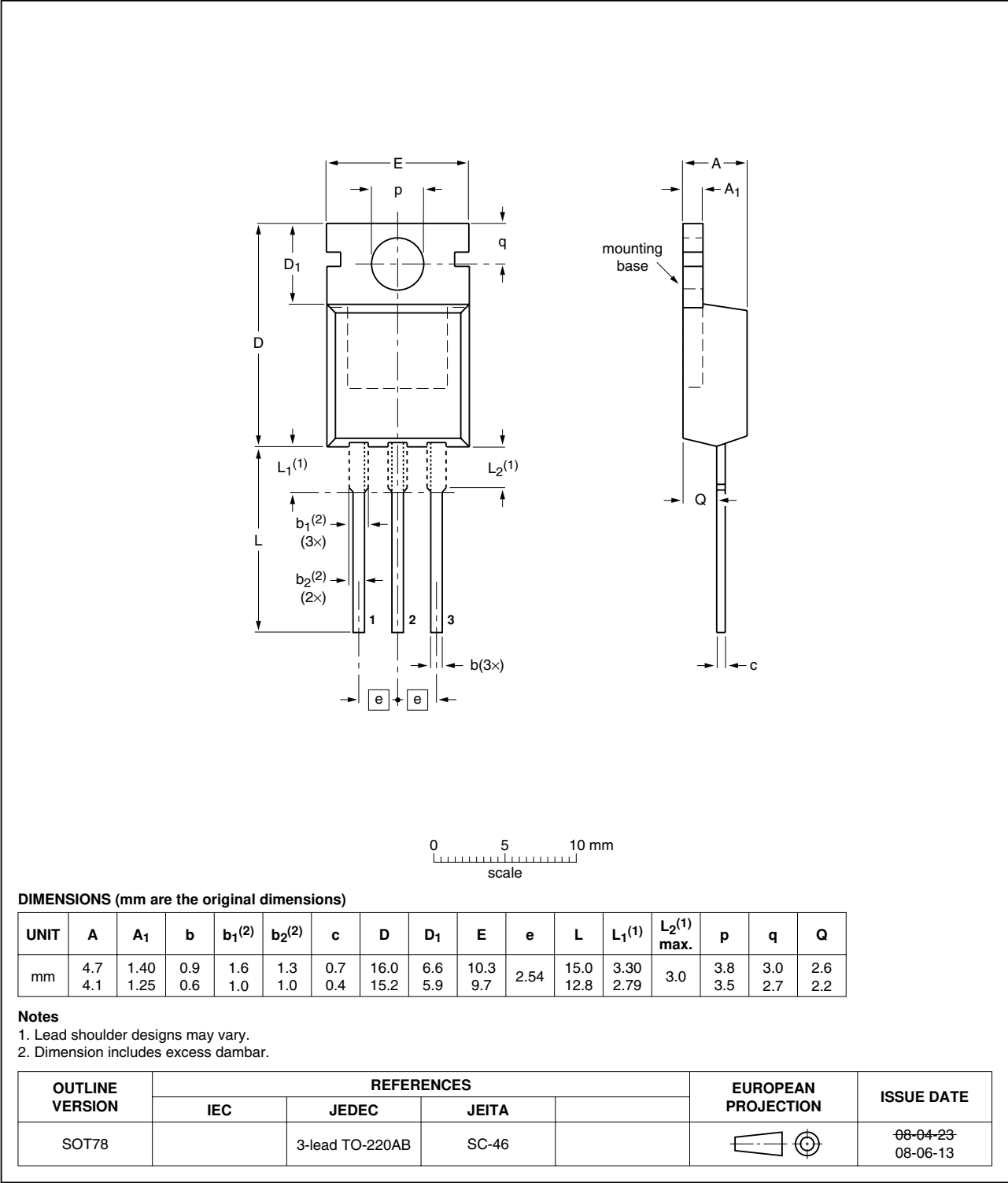


Fig 14. Package outline SOT78 (TO-220AB)

8. Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PSMN008-75P_4	20091210	Product data sheet	-	PSMN008_75P_75B-03
Modifications:	• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been adapted to the new company name where appropriate. • Type number PSMN008-75P separated from data sheet PSMN008_75P_75B-03.			
PSMN008_75P_75B-03 (9397 750 12545)	20040108	Product data	-	PSMN008_75P_75B-02
PSMN008_75P_75B-02 (9397 750 11416)	20030711	Product data	-	PSMN008_75P_75B-01
PSMN008_75P_75B-01 (9397 750 07495)	20000918	Product data	-	-

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".

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