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Thank you for your cooperation and understanding,

Ampleon

# L-band radar LDMOS transistor

# BLL1214-250

### FEATURES

- High power gain
- Easy power control
- Excellent ruggedness
- Source on mounting base eliminates DC isolators, reducing common mode inductance.

### APPLICATIONS

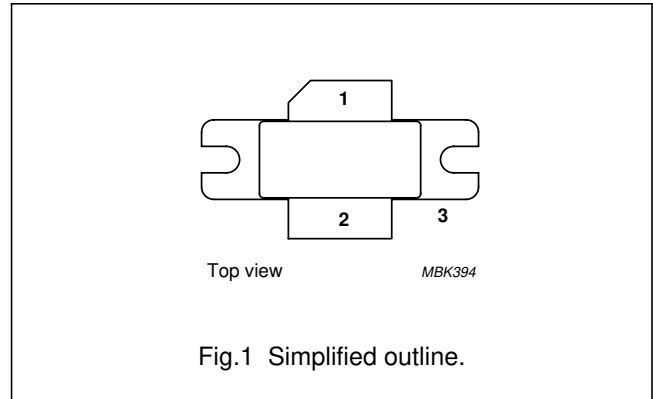
- L-band radar applications in the 1200 to 1400 MHz frequency range.

### DESCRIPTION

Silicon N-channel enhancement mode lateral D-MOS transistor encapsulated in a 2-lead flange package (SOT502A) with a ceramic cap. The common source is connected to the flange.

### PINNING - SOT502A

PIN	DESCRIPTION
1	drain
2	gate
3	source, connected to flange



### QUICK REFERENCE DATA

RF performance at  $T_h = 25\text{ °C}$  in a common source test circuit.

MODE OF OPERATION	f (MHz)	$V_{DS}$ (V)	$I_{DQ}$ (mA)	$P_L$ (W)	$G_p$ (dB)	$\eta_D$ (%)	pulse droop (dB)	$t_r$ (ns)	$t_f$ (ns)
Pulsed class-AB; $t_p = 1\text{ ms}$ ; $\delta = 10\%$	1200 to 1400	36	150	250	>12	>42	<0.6	<100	<100

### LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{DS}$	drain-source voltage		–	75	V
$V_{GS}$	gate-source voltage		–	$\pm 22$	V
$P_{tot}$	total power dissipation	$T_h \leq 70\text{ °C}$ ; $t_p = 1\text{ ms}$ ; $\delta = 10\%$	–	400	W
$T_{stg}$	storage temperature		–65	150	°C
$T_j$	junction temperature		–	200	°C

### CAUTION

This product is supplied in anti-static packing to prevent damage caused by electrostatic discharge during transport and handling. For further information, refer to Philips specs.: SNW-EQ-608, SNW-FQ-302A and SNW-FQ-302B.

## L-band radar LDMOS transistor

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## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$Z_{th\ j-h}$	thermal impedance from junction to heatsink	$T_h = 25\text{ °C}$ , note 1	0.17	K/W
$Z_{th\ j-h}$	thermal impedance from junction to heatsink	$T_h = 25\text{ °C}$ , note 2	0.32	K/W

## Notes

1. Thermal resistance is determined under RF operating conditions;  $t_p = 100\ \mu\text{s}$ ,  $\delta = 10\%$ .
2. Thermal resistance is determined under RF operating conditions;  $t_p = 1\ \text{ms}$ ,  $\delta = 10\%$ .

## CHARACTERISTICS

$T_j = 25\text{ °C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0$ ; $I_D = 3\ \text{mA}$	75	–	–	V
$V_{GSth}$	gate-source threshold voltage	$V_{DS} = 10\ \text{V}$ ; $I_D = 300\ \text{mA}$	4	–	5	V
$I_{DSS}$	drain-source leakage current	$V_{GS} = 0$ ; $V_{DS} = 36\ \text{V}$	–	–	1	$\mu\text{A}$
$I_{DSX}$	on-state drain current	$V_{GS} = V_{GSth} + 9\ \text{V}$ ; $V_{DS} = 10\ \text{V}$	45	–	–	A
$I_{GSS}$	gate leakage current	$V_{GS} = \pm 20\ \text{V}$ ; $V_{DS} = 0$	–	–	1	$\mu\text{A}$
$g_{fs}$	forward transconductance	$V_{DS} = 10\ \text{V}$ ; $I_D = 10\ \text{A}$	–	9	–	S
$R_{DSon}$	drain-source on-state resistance	$V_{GS} = 9\ \text{V}$ ; $I_D = 10\ \text{A}$	–	60	–	$\text{m}\Omega$

## APPLICATION INFORMATION

RF performance in a common source class-AB circuit.  $T_h = 25\text{ °C}$ ;  $Z_{th\ mb-h} = 0.25\ \text{K/W}$ , unless otherwise specified.

MODE OF OPERATION	f (MHz)	$V_{DS}$ (V)	$I_{DQ}$ (mA)	$P_L$ (W)	$G_p$ (dB)	$\eta_D$ (%)	pulse droop (dB)	$t_r$ (ns)	$t_f$ (ns)
Pulsed class-AB; $t_p = 1\ \text{ms}$ ; $\delta = 10\%$	1200 to 1400	36	150	250	>12	>42	<0.6	<100	<100

## Ruggedness in class-AB operation

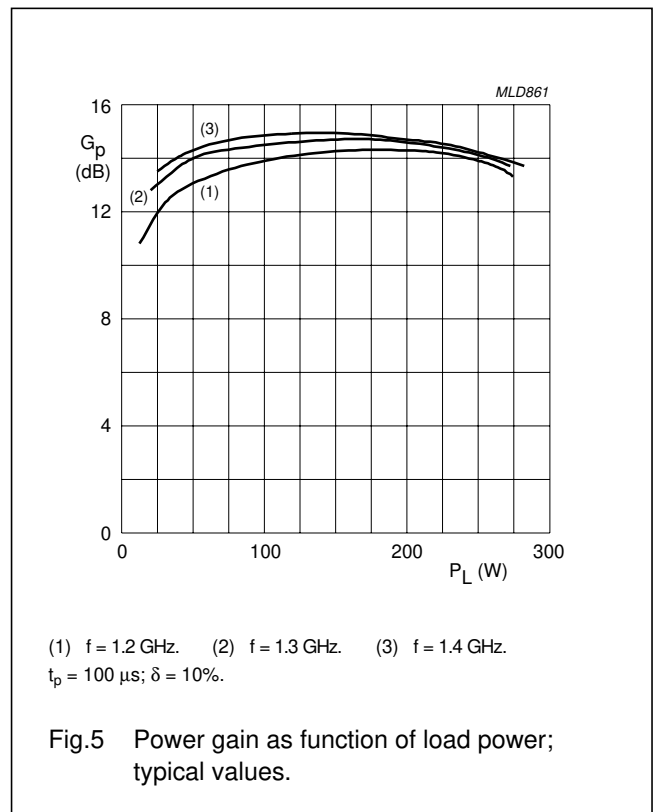
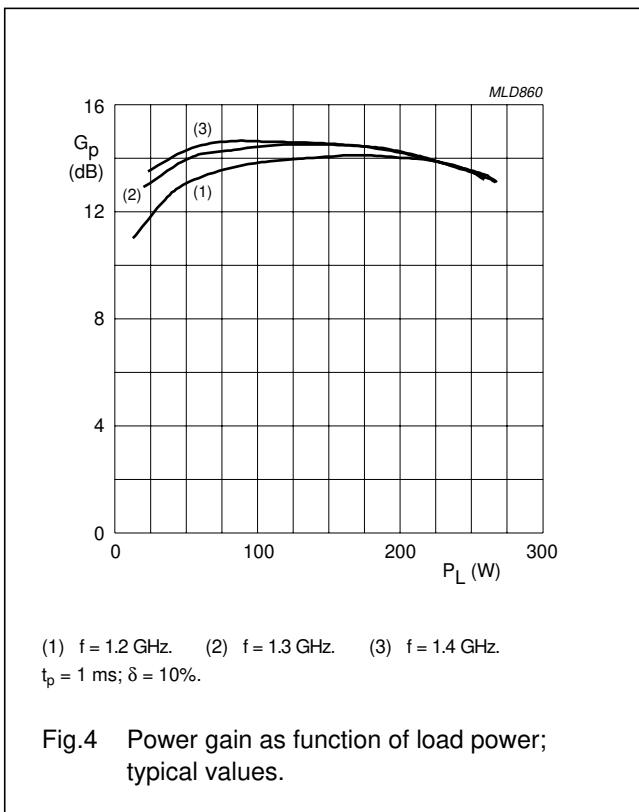
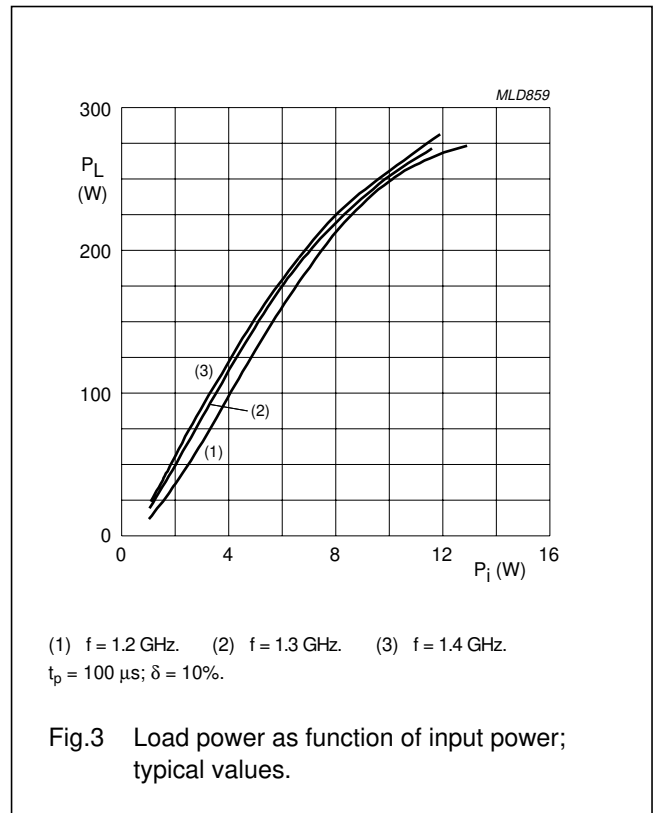
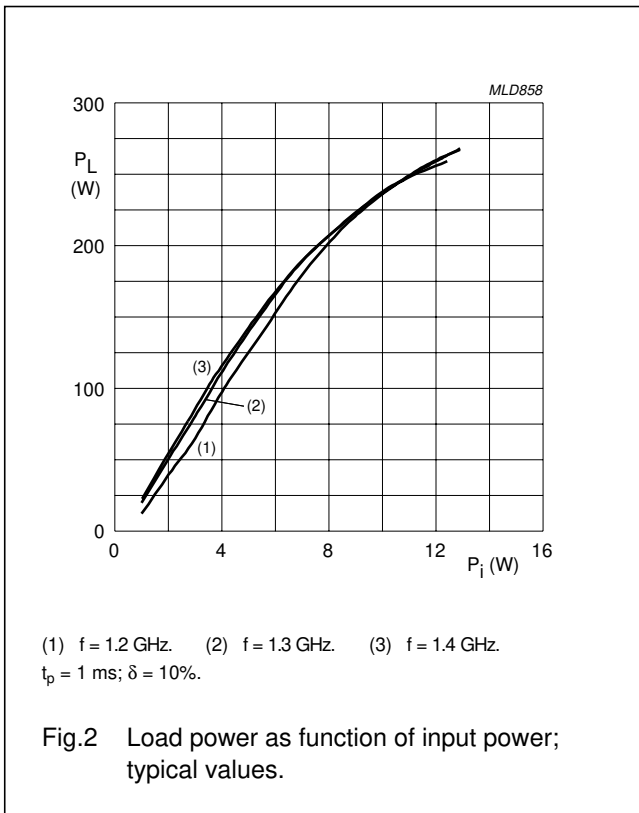
The BLL1214-250 is capable of withstanding a load mismatch corresponding to  $V_{SWR} = 3 : 1$  through all phases under the following conditions:  $V_{DS} = 36\ \text{V}$ ; frequency from 1200 MHz to 1400 MHz at rated load power.

## Typical impedance

FREQUENCY (GHZ)	$Z_S$ ( $\Omega$ )	$Z_L$ ( $\Omega$ )
1.20	$1.3 - j\ 2.8$	$1.1 - j\ 0.9$
1.25	$1.9 - j\ 2.9$	$1.0 - j\ 0.5$
1.30	$4.6 - j\ 2.9$	$0.8 - j\ 0.2$
1.35	$5.7 - j\ 0.3$	$0.7 - j\ 0.3$
1.40	$2.7 - j\ 1.8$	$0.6 - j\ 0.4$

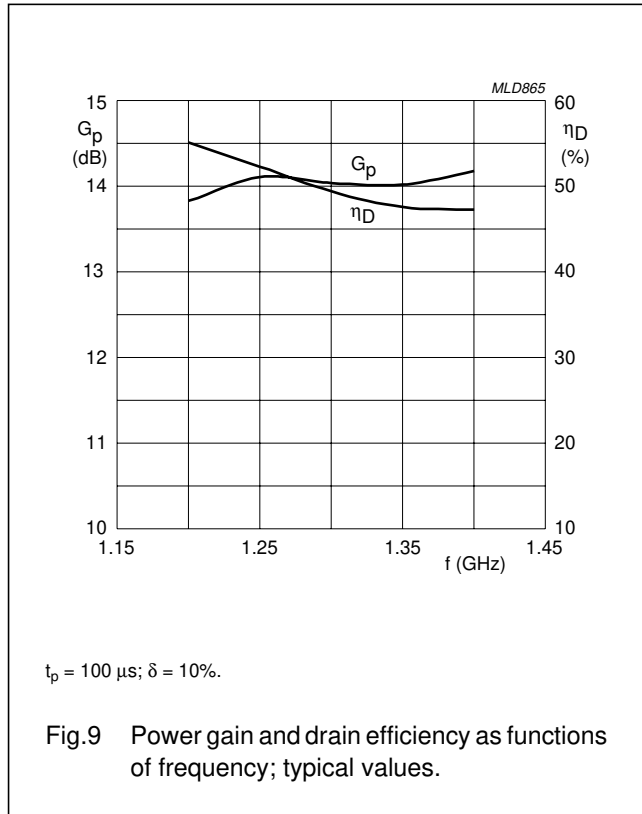
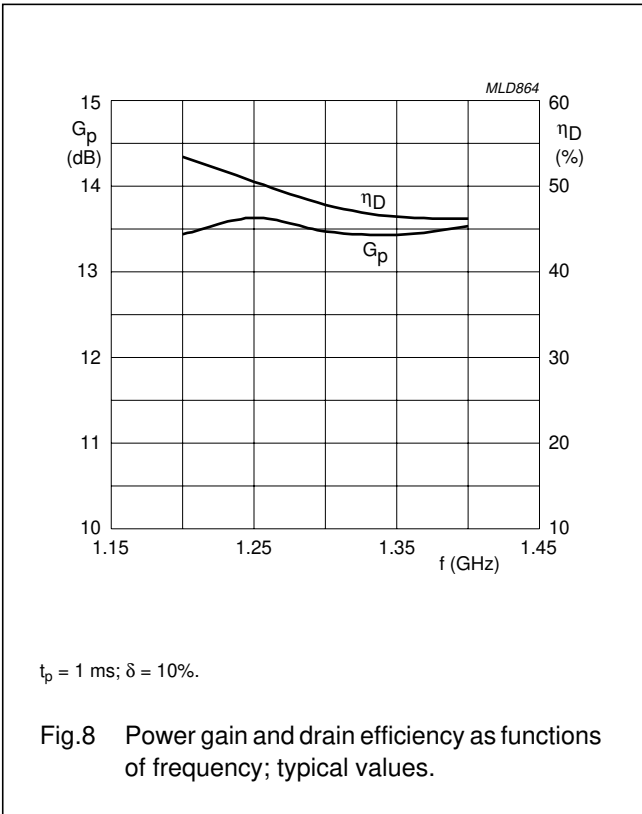
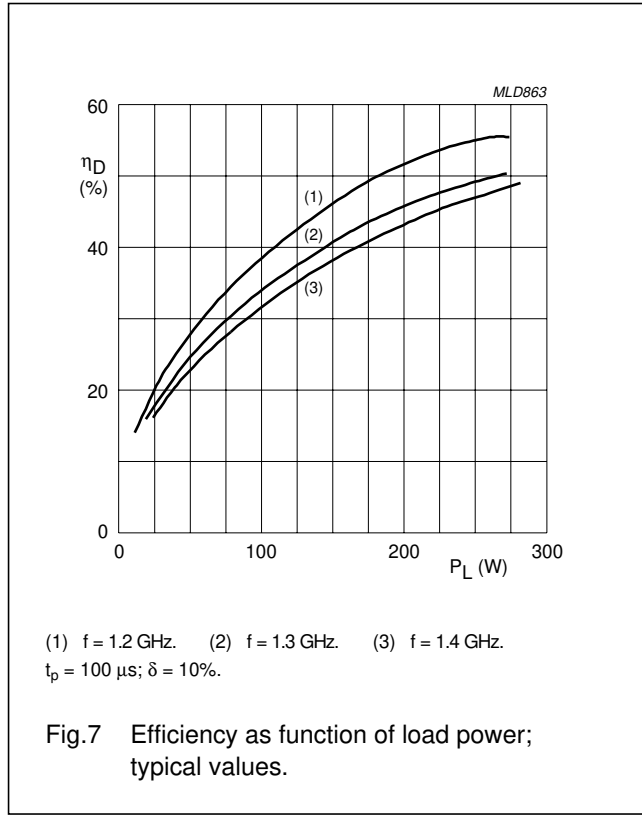
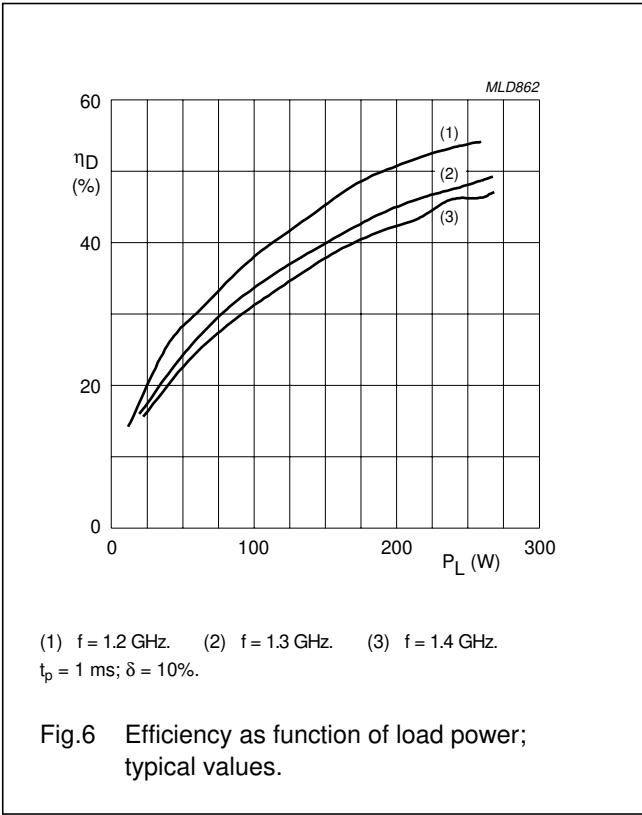
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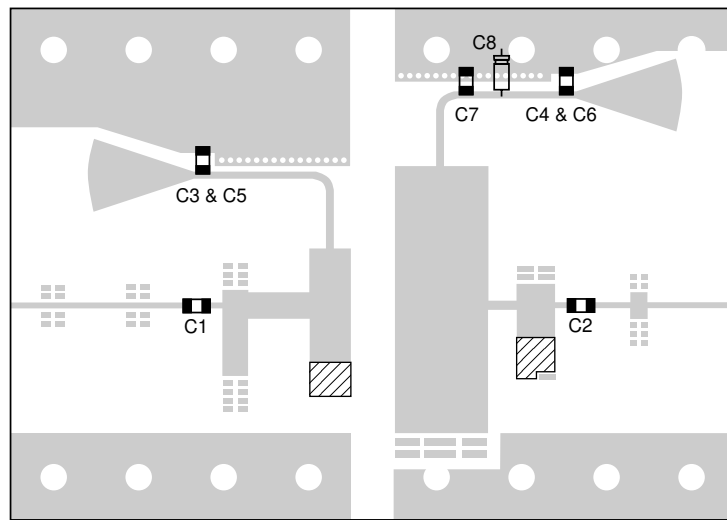
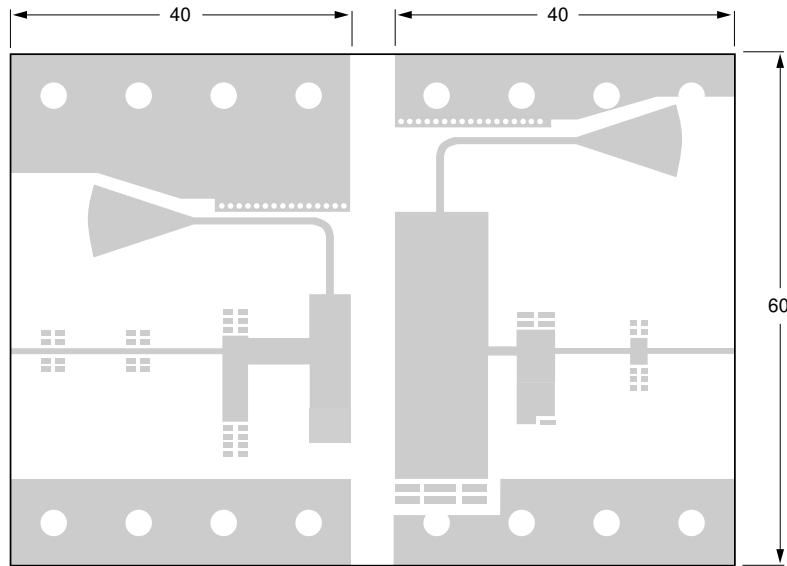
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L-band radar LDMOS transistor

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MLD866

Dimensions in mm.

Hatched area indicates standard tuning.

The components are situated on one side of the copper-clad Rogers Duroid 6010 printed-circuit board ( $\epsilon_r = 10.2$ , thickness = 0.64 mm).

The other side is unetched and serves as a ground plane.

Fig.10 Component layout.

## L-band radar LDMOS transistor

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**List of components** (see Fig.10)

<b>COMPONENT</b>	<b>DESCRIPTION</b>	<b>VALUE</b>	<b>CATALOGUE NO.</b>
C1, C3	capacitor	39 pF	ATC100A
C2, C4	capacitor	47 pF	ATC100A
C5, C6	capacitor	20 nF	ATC200B
C7	capacitor	36 pF	ATC200B
C8	electrolytic capacitor	100 $\mu$ F; 100 V	



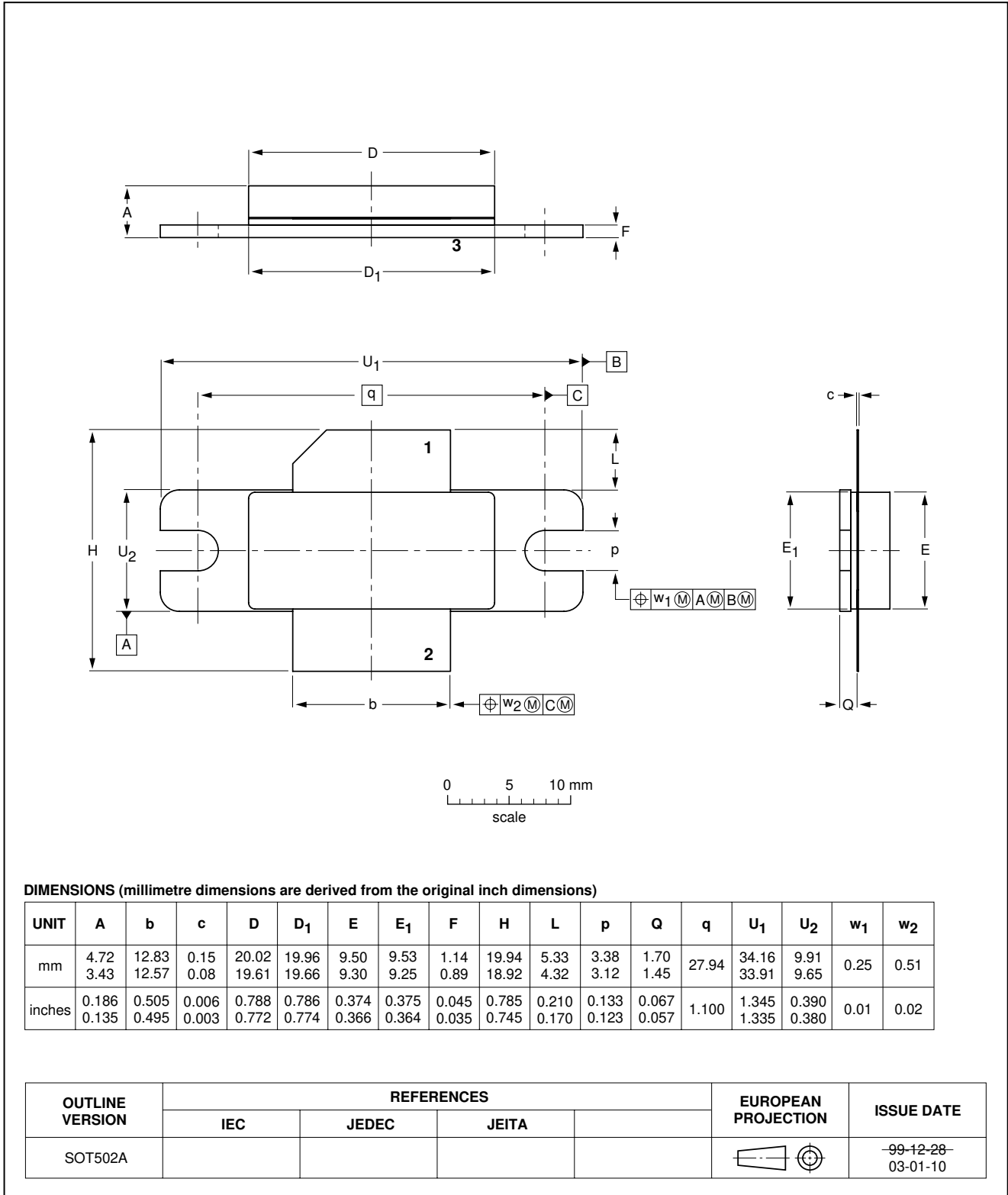
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PACKAGE OUTLINE

Flanged LDMOST ceramic package; 2 mounting holes; 2 leads

SOT502A



## L-band radar LDMOS transistor

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## DATA SHEET STATUS

LEVEL	DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)(3)</sup>	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.
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