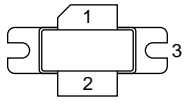
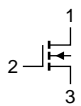


## 2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	drain		
2	gate		
3	source		

[1] Connected to flange.

## 3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLA0912-250R	-	flanged LDMOST ceramic package; 2 mounting holes; 2 leads	SOT502A

## 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		-	75	V
$V_{GS}$	gate-source voltage		-	$\pm 22$	V
$P_{tot}$	total power dissipation	$T_h \leq 25\text{ °C}$ ; $t_p = 50\text{ }\mu\text{s}$ ; $\delta = 2\text{ %}$	-	700	W
$T_{stg}$	storage temperature		-65	+150	°C
$T_j$	junction temperature		-	200	°C

## 5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$Z_{th(j-h)}$	transient thermal impedance from junction to heatsink	$T_h = 25\text{ °C}$	[1] 0.18	K/W

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

## 6. Characteristics

**Table 6. DC characteristics**

$T_j = 25\text{ }^{\circ}\text{C}$ ; per section unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0\text{ V}$ ; $I_D = 3\text{ mA}$	75	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}$ ; $I_D = 300\text{ mA}$	4	-	5	V
$I_{DSS}$	drain leakage current	$V_{GS} = 0\text{ V}$ ; $V_{DS} = 36\text{ V}$	-	-	1	$\mu\text{A}$
$I_{DSX}$	drain cut-off current	$V_{GS} = V_{GSth} + 9\text{ V}$ ; $V_{DS} = 10\text{ V}$	45	-	-	A
$I_{GSS}$	gate leakage current	$V_{GS} = 20\text{ V}$ ; $V_{DS} = 0\text{ V}$	-	-	1	$\mu\text{A}$
$g_{fs}$	forward transconductance	$V_{DS} = 10\text{ V}$ ; $I_D = 10\text{ A}$	-	9	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = 9\text{ V}$ ; $I_D = 10\text{ A}$	-	60	-	$\text{m}\Omega$

**Table 7. RF characteristics**

RF performance in common source class-AB circuit;  $T_h = 25\text{ }^{\circ}\text{C}$ ;  $Z_{th} = 0.15\text{ K/W}$ ; unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{DS}$	drain-source voltage		-	-	36	V
$f$	frequency		960	-	1215	MHz
$P_L$	output power	$t_p = 100\text{ }\mu\text{s}$ ; $\delta = 10\text{ }\%$	250	-	-	W
$G_p$	power gain	$P_L = 250\text{ W}$	12	13	-	dB
$\eta_D$	drain efficiency	$t_p = 100\text{ }\mu\text{s}$ ; $\delta = 10\text{ }\%$	40	50	-	%
$Z_{th(j-h)}$	transient thermal impedance from junction to heatsink	$t_p = 100\text{ }\mu\text{s}$ ; $\delta = 10\text{ }\%$	-	-	0.2	K/W
$T_h$	heatsink temperature		-55	-	+70	$^{\circ}\text{C}$
$P_{\text{droop(pulse)}}$	pulse droop power	$t_p = 100\text{ }\mu\text{s}$ ; $\delta = 10\text{ }\%$	-	0.1	0.5	dB
$\alpha_{\text{resp(sp)}}$	spurious response	$VSWR_{\text{load}} = 2 : 1$	-	-	-60	dBc
$t_r$	rise time		-	25	50	ns
$t_f$	fall time		-	6	25	ns

### 6.1 Ruggedness in class-AB operation

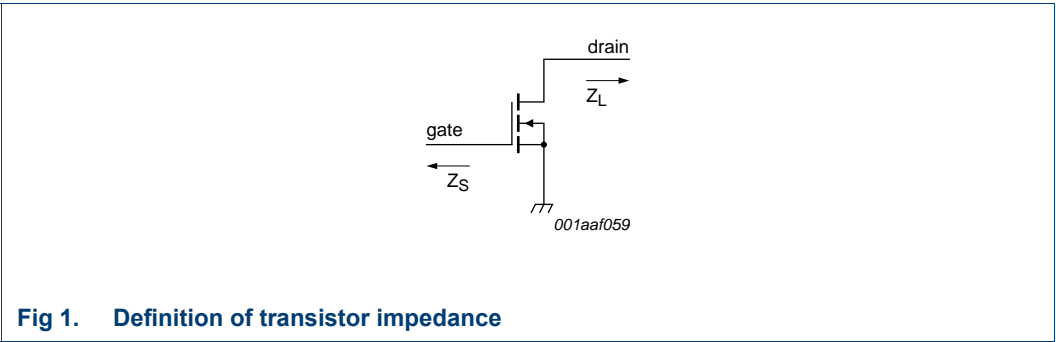
The BLA0912-250R is capable of withstanding a load mismatch corresponding to  $VSWR = 5 : 1$  through all phases under the following conditions:  $V_{DS} = 36\text{ V}$ ;  $f = 960\text{ MHz}$  to  $1215\text{ MHz}$  at rated load power.

7. Application information

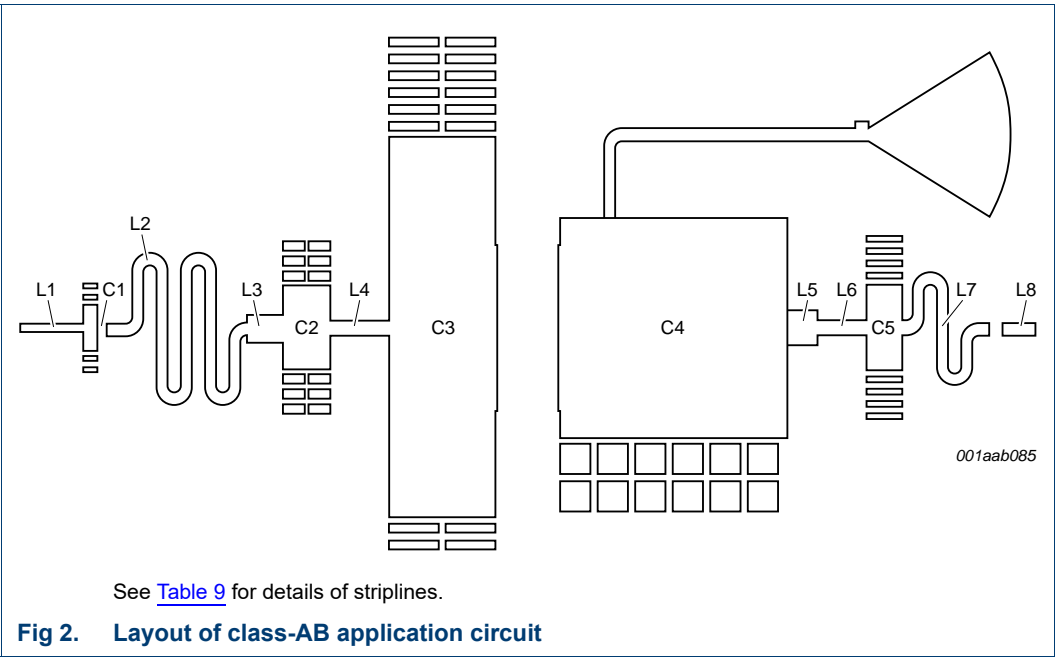
7.1 Impedance information

Table 8. Typical impedance  
Typical values per section unless otherwise specified.

f MHz	Z <sub>S</sub> Ω	Z <sub>L</sub> Ω
960	0.89 – j1.70	1.53 – j1.13
1030	1.37 – j1.23	1.47 – j0.99
1090	2.09 – j1.27	1.38 – j0.85
1140	2.40 – j1.97	1.30 – j0.71
1215	1.51 – j2.61	1.17 – j0.47



7.2 Application circuit



**Table 9. Layout details**

See [Figure 2](#).

Striplines are on a Rogers Duroid 6010 Printed-Circuit Board (PCB);  $\epsilon_r = 10.2$  F/m; thickness = 0.64 mm

Component	Description	Dimensions
<b>Input circuit</b>		
L1	stripline	5 mm × 0.8 mm
C1	stripline	1.2 mm × 3.5 mm
L2	stripline	capacitor pad: 1 mm × 1 mm (1×)
		curve: width 0.8 mm; angle 90°; radius 0.8 mm (10×)
		vertical: 3.9 mm × 0.8 mm (2×)
		vertical: 9.4 mm × 0.8 mm (3×)
		horizontal: 0.5 mm × 0.8 mm (4×)
L3	stripline	3 mm × 2 mm
C2	stripline	4 mm × 6.5 mm
L4	stripline	5 mm × 1 mm
C3	stripline	8.8 mm × 30 mm + 0.2 mm × 13 mm
<b>Output circuit</b>		
C4	stripline	0.2 mm × 13 mm + 19 mm × 17.1 mm
L5	stripline	2.5 mm × 2.3 mm
L6	stripline	4 mm × 1 mm
C5	stripline	3 mm × 6.6 mm
L7	stripline	curve: width 0.8 mm; angle 90°; radius 0.8 mm (6×)
		vertical: 2.2 mm × 0.8 mm (2×)
		vertical: 6 mm × 0.8 mm (1×)
		horizontal: 1 mm × 0.8 mm (2×)
L8	stripline	2.5 mm × 0.8 mm
1/4 $\lambda$ line	stripline	curve: width 1 mm; angle 90°; radius 0.8 mm
		vertical: 5 mm × 1 mm
		horizontal: 19 mm × 1 mm

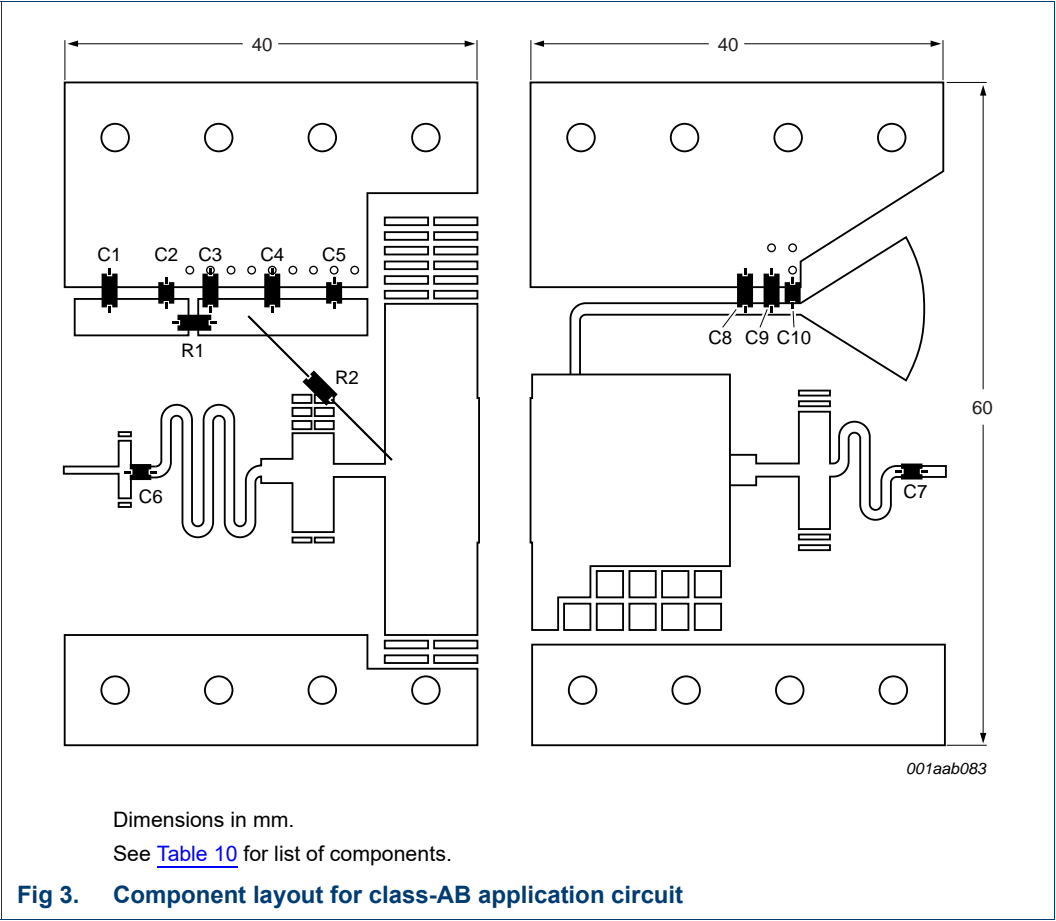


Table 10. List of components

See [Figure 3](#).

Component	Description	Value	Remarks
C1, C3, C9	multilayer ceramic chip capacitor	1 nF	[1]
C2, C6, C10	multilayer ceramic chip capacitor	22 pF	[2]
C4	tantalum SMD capacitor	47 $\mu$ F; 20 V	KEMET: T491D476M020AS
C5	multilayer ceramic chip capacitor	56 pF	[2]
C7	multilayer ceramic chip capacitor	47 pF	[2]
C8	tantalum SMD capacitor	22 $\mu$ F; 63 V	
R1	SMD resistor	51 $\Omega$	0805
R2	resistor	49.9 $\Omega$	

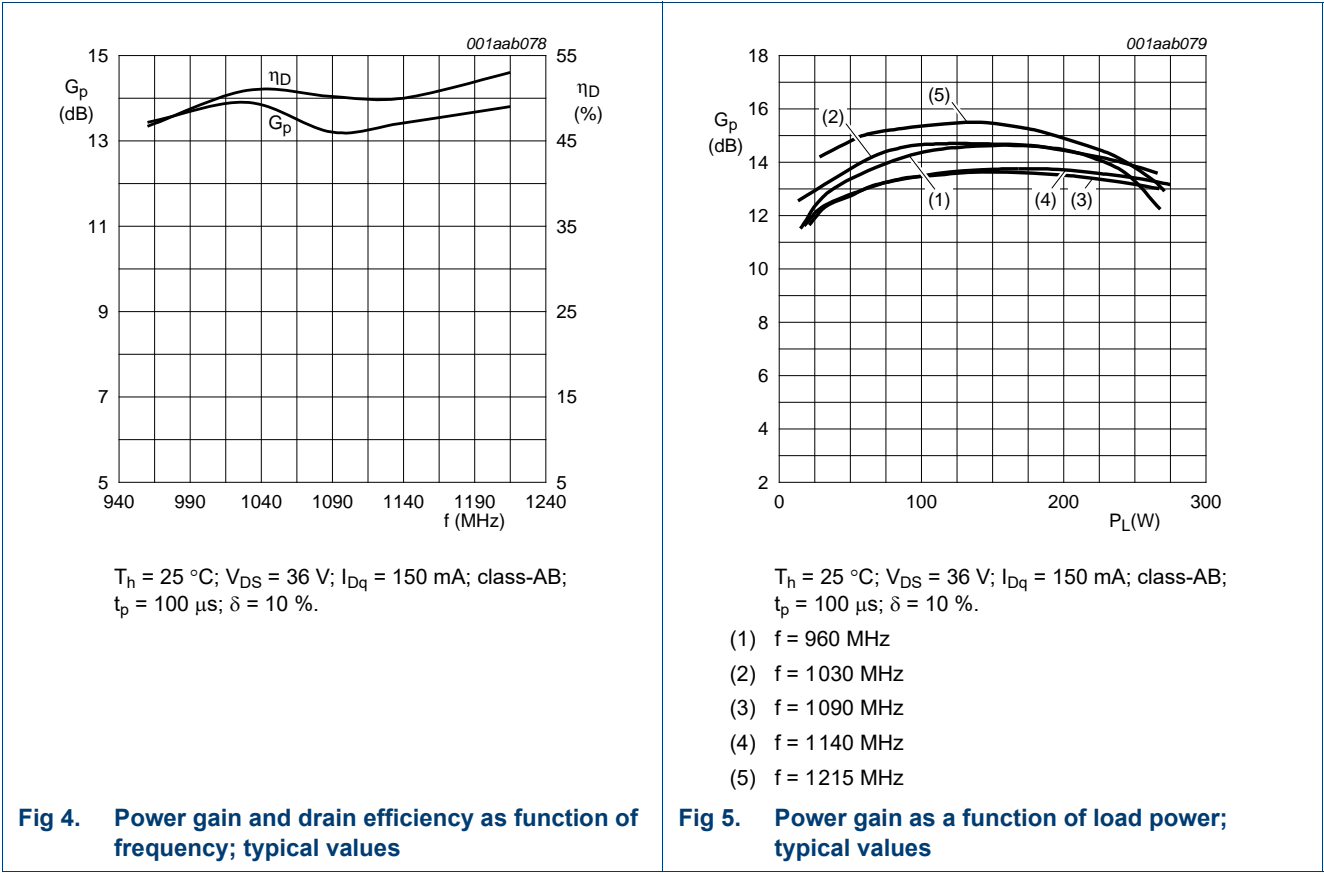
[1] American Technical Ceramics type 100B or capacitor of same quality.

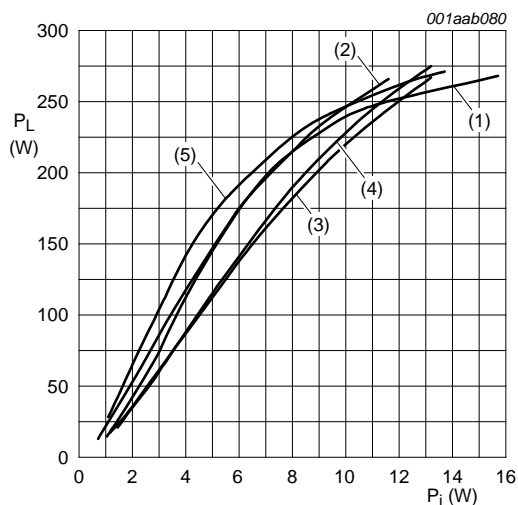
[2] American Technical Ceramics type 100A or capacitor of same quality.

8. Test information

8.1 RF performance

Typical RF performance measured in common source class-AB test circuit at  $P_L = 250\text{ W}$  and 960 MHz to 1215 MHz frequency band.  $T_h = 25\text{ }^\circ\text{C}$ ;  $Z_{th(j-h)} = 0.15\text{ K/W}$ ; unless otherwise specified.

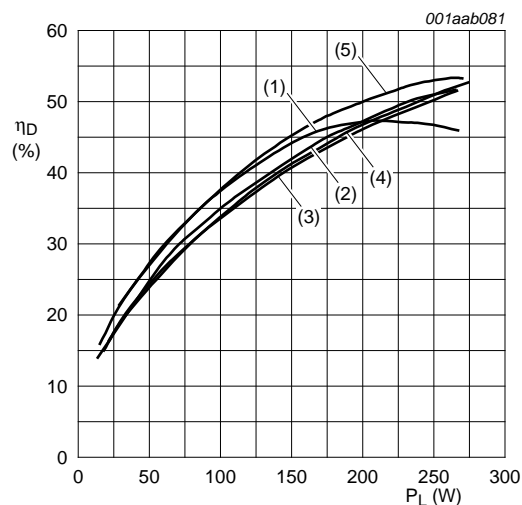




$T_h = 25\text{ }^{\circ}\text{C}$ ;  $V_{DS} = 36\text{ V}$ ;  $I_{DQ} = 150\text{ mA}$ ; class-AB;  
 $t_p = 100\text{ }\mu\text{s}$ ;  $\delta = 10\text{ }\%$ .

- (1)  $f = 960\text{ MHz}$
- (2)  $f = 1030\text{ MHz}$
- (3)  $f = 1090\text{ MHz}$
- (4)  $f = 1140\text{ MHz}$
- (5)  $f = 1215\text{ MHz}$

**Fig 6. Load power as a function of input power; typical values**



$T_h = 25\text{ }^{\circ}\text{C}$ ;  $V_{DS} = 36\text{ V}$ ;  $I_{DQ} = 150\text{ mA}$ ; class-AB;  
 $t_p = 100\text{ }\mu\text{s}$ ;  $\delta = 10\text{ }\%$ .

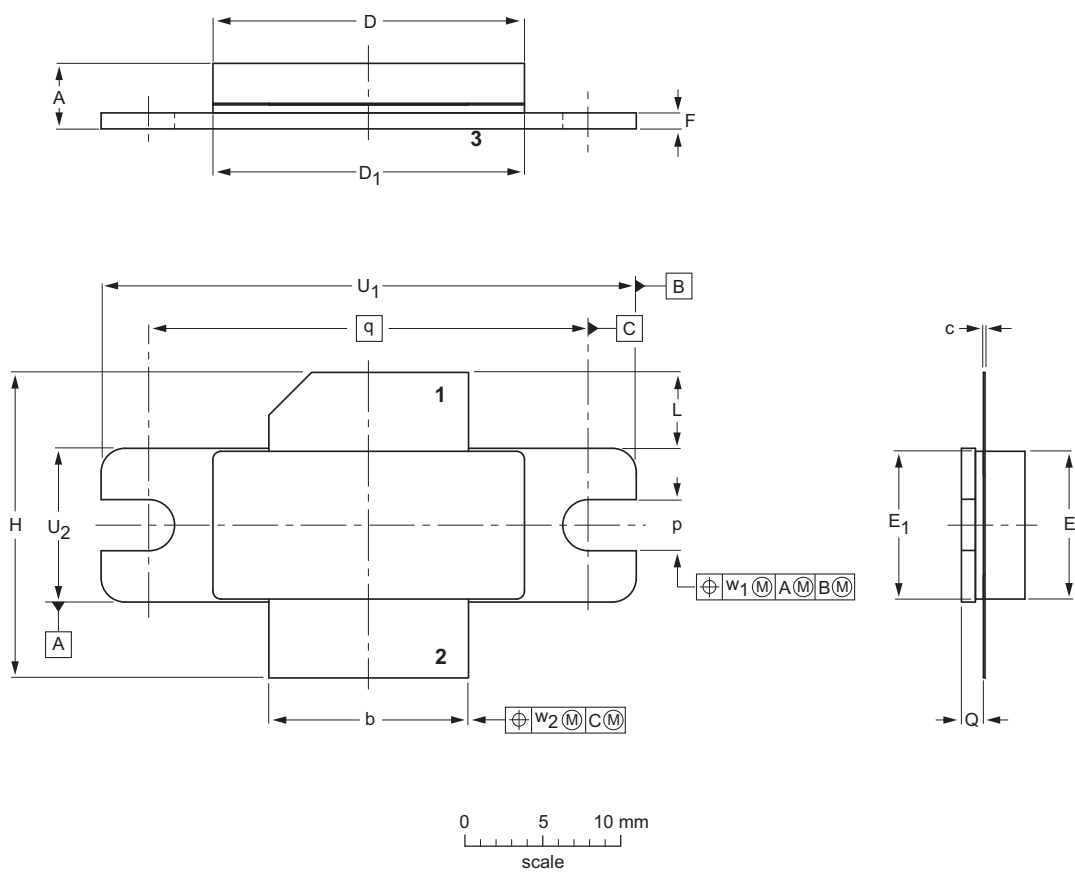
- (1)  $f = 960\text{ MHz}$
- (2)  $f = 1030\text{ MHz}$
- (3)  $f = 1090\text{ MHz}$
- (4)  $f = 1140\text{ MHz}$
- (5)  $f = 1215\text{ MHz}$

**Fig 7. Efficiency as a function of load power; typical values**

9. Package outline

Flanged ceramic package; 2 mounting holes; 2 leads

SOT502A



DIMENSIONS (millimetre dimensions are derived from the original inch dimensions)

UNIT	A	b	c	D	D <sub>1</sub>	E	E <sub>1</sub>	F	H	L	p	Q	q	U <sub>1</sub>	U <sub>2</sub>	w <sub>1</sub>	w <sub>2</sub>
mm	4.72 3.43	12.83 12.57	0.15 0.08	20.02 19.61	19.96 19.66	9.50 9.30	9.53 9.25	1.14 0.89	19.94 18.92	5.33 4.32	3.38 3.12	1.70 1.45	27.94 1.45	34.16 33.91	9.91 9.65	0.25	0.51
inches	0.186 0.135	0.505 0.495	0.006 0.003	0.788 0.772	0.786 0.774	0.374 0.366	0.375 0.364	0.045 0.035	0.785 0.745	0.210 0.170	0.133 0.123	0.067 0.057	1.100	1.345 1.335	0.390 0.380	0.01	0.02

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT502A						-03-01-10- 12-05-02

Fig 8. Package outline SOT502A



## 10. Abbreviations

Table 11. Abbreviations

Acronym	Description
DC	Direct Current
DME	Distance Measuring Equipment
JTIDS	Joint Tactical Information Distribution System
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
LDMOST	Laterally Diffused Metal-Oxide Semiconductor Transistor
Mode-S	Mode Select
RF	Radio Frequency
SMD	Surface Mounted Device
TACAN	TACTical Air Navigation
TCAS	Traffic Collision Avoidance System
VSWR	Voltage Standing-Wave Ratio

## 11. Revision history

Table 12. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLA0912-250R#4	20150901	Product data sheet	-	BLA0912-250R v.3
Modifications:	<ul style="list-style-type: none"> <li>The format of this document has been redesigned to comply with the new identity guidelines of Ampleon.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> </ul>			
BLA0912-250R v.3	20101201	Product data sheet	-	BLA0912-250R v.2
BLA0912-250R v.2	20101015	Product data sheet	-	BLA0912-250R v.1
BLA0912-250R v.1	20100303	Product data sheet	-	-

## 12. Legal information

### 12.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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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