

# BLF8G10LS-270

Power LDMOS transistor

Rev. 1 — 17 August 2012

Product data sheet

## 1. Product profile

### 1.1 General description

270 W LDMOS power transistor for base station applications at frequencies from 820 MHz to 960 MHz.

**Table 1. Typical performance**

Typical RF performance at  $T_{case} = 25\text{ °C}$  in a common source class-AB production test circuit, tested on straight lead device.

Test signal	f (MHz)	$I_{Dq}$ (mA)	$V_{DS}$ (V)	$P_{L(AV)}$ (W)	$G_p$ (dB)	$\eta_D$ (%)	ACPR <sub>5M</sub> (dBc)
2-carrier W-CDMA	920 to 960	2000	28	67	18.5	33	-35 <sup>[1]</sup>

[1] 3GPP test model 1; 64 DPCH; PAR = 8.4 dB at 0.01 % probability on CCDF; 10 MHz spacing.

### 1.2 Features and benefits

- Excellent ruggedness
- High efficiency
- Low  $R_{th}$  providing excellent thermal stability
- Designed for broadband operation (820 MHz to 960 MHz)
- Lower output capacitance for improved performance in Doherty applications
- Designed for low memory effects providing excellent pre-distortability
- Internally matched for ease of use
- Integrated ESD protection
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

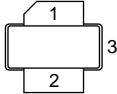
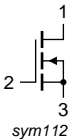
### 1.3 Applications

- RF power amplifiers for W-CDMA base stations and multi carrier applications in the 820 MHz to 960 MHz frequency range



## 2. Pinning information

**Table 2. Pinning**

Pin	Description	Simplified outline	Graphic symbol
1	drain		 sym112
2	gate		
3	source <a href="#">[1]</a>		

[1] Connected to flange.

## 3. Ordering information

**Table 3. Ordering information**

Type number	Package		
	Name	Description	Version
BLF8G10LS-270	-	earless flanged ceramic package; 2 leads	SOT502B

## 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		-	65	V
$V_{GS}$	gate-source voltage		-0.5	+11	V
$T_{stg}$	storage temperature		-65	+150	°C
$T_j$	junction temperature		-	225	°C

## 5. Thermal characteristics

**Table 5. Thermal characteristics**

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-c)}$	thermal resistance from junction to case	$T_{case} = 80\text{ °C}; P_L = 67\text{ W (CW)}$	0.264	K/W

## 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	$V_{GS} = 0\text{ V}$ ; $I_D = 4.5\text{ mA}$	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}$ ; $I_D = 450\text{ mA}$	1.5	1.8	2.3	V
$I_{DSS}$	drain leakage current	$V_{GS} = 0\text{ V}$ ; $V_{DS} = 28\text{ V}$	-	-	4.2	$\mu\text{A}$
$I_{DSX}$	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V}$ ; $V_{DS} = 10\text{ V}$	-	81.3	-	A
$I_{GSS}$	gate leakage current	$V_{GS} = 11\text{ V}$ ; $V_{DS} = 0\text{ V}$	-	-	420	nA
$g_{fs}$	forward transconductance	$V_{DS} = 10\text{ V}$ ; $I_D = 450\text{ mA}$	-	3.91	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}$ ; $I_D = 15.75\text{ A}$	-	0.0418	-	$\Omega$

**Table 7. RF characteristics**

Test signal: 2-carrier W-CDMA; PAR = 8.4 dB at 0.01 % probability on the CCDF; carrier spacing 10 MHz; 3GPP test model 1; 1-64 DPCH;  $f_1 = 922.5\text{ MHz}$ ;  $f_2 = 932.5\text{ MHz}$ ;  $f_3 = 947.5\text{ MHz}$ ;  $f_4 = 957.5\text{ MHz}$ ; RF performance at  $V_{DS} = 28\text{ V}$ ;  $I_{Dq} = 2000\text{ mA}$ ;  $T_{case} = 25\text{ }^\circ\text{C}$ ; unless otherwise specified; in a class-AB production test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$G_p$	power gain	$P_{L(AV)} = 67\text{ W}$	17.3	18.5	-	dB
$RL_{in}$	input return loss	$P_{L(AV)} = 67\text{ W}$	-	-14	-10	dB
$\eta_D$	drain efficiency	$P_{L(AV)} = 67\text{ W}$	28.0	33	-	%
$ACPR_{5M}$	adjacent channel power ratio (5 MHz)	$P_{L(AV)} = 67\text{ W}$	-	-35	-30	dBc

## 7. Test information

### 7.1 Ruggedness in class-AB operation

The BLF8G10LS-270 is capable to withstand a load mismatch corresponding to  $VSWR = 10 : 1$  through all phases under the following conditions:  $V_{DS} = 28\text{ V}$ ;  $I_{Dq} = 2000\text{ mA}$ ;  $P_L = 270\text{ W}$ ;  $f = 820\text{ MHz}$ ;  $f = 869\text{ MHz}$ ;  $f = 920\text{ MHz}$ ;  $f = 960\text{ MHz}$ .

7.2 Impedance information

Table 8. Typical impedance  
 $I_{DQ} = 2700 \text{ mA}$ ; main transistor  $V_{DS} = 28 \text{ V}$ .

f (MHz)	$Z_S$ <sup>[1]</sup> ( $\Omega$ )	$Z_L$ <sup>[1]</sup> ( $\Omega$ )
820	1.58 – j1.96	1.29 – j1.95
869	1.84 – j2.70	1.12 – j1.83
881	1.78 – j2.94	1.12 – j1.84
894	1.90 – j3.08	1.12 – j1.84
920	2.06 – j2.50	1.04 – j1.13
940	2.10 – j2.90	1.04 – j1.13
960	2.56 – j2.65	1.00 – j1.22

[1]  $Z_S$  and  $Z_L$  defined in Figure 1.

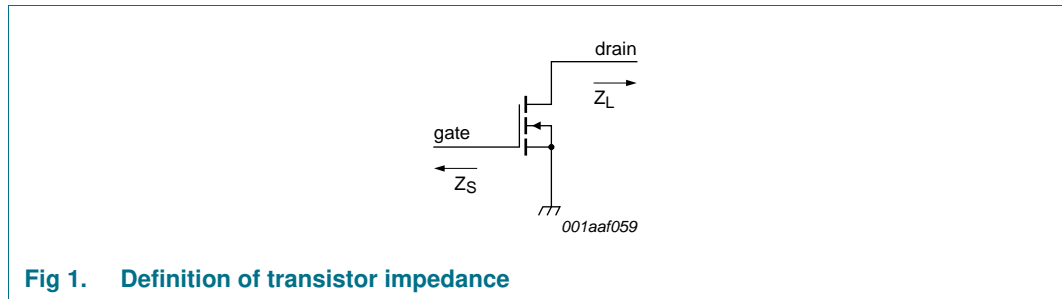


Fig 1. Definition of transistor impedance

7.3 Test circuit information

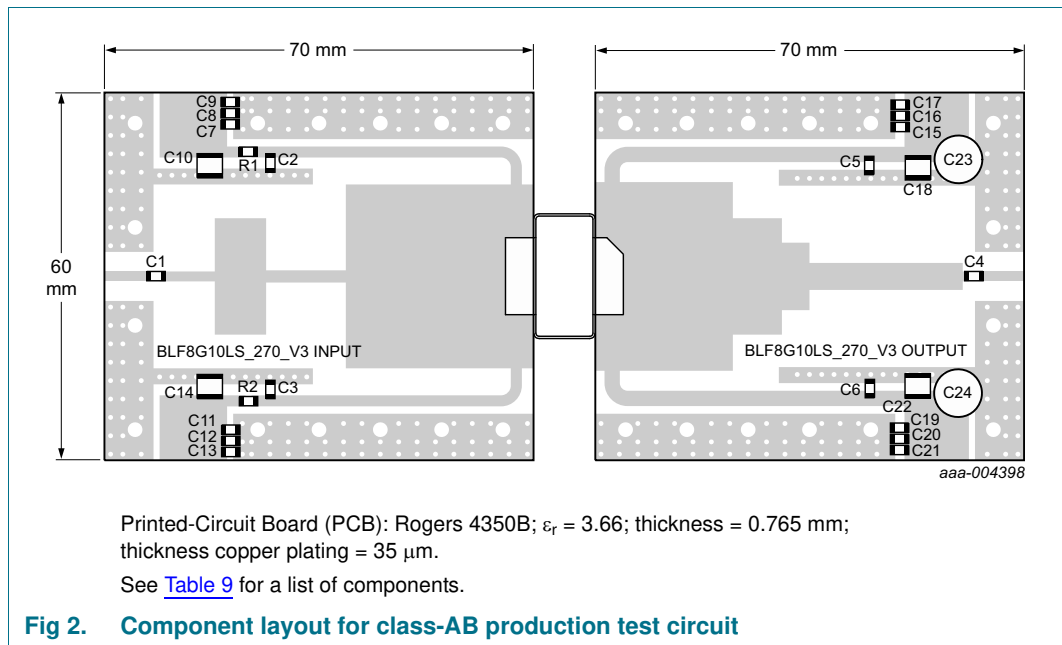


Fig 2. Component layout for class-AB production test circuit

**Table 9. List of components**

For test circuit see [Figure 2](#).

Component	Description	Value	Remarks
C1, C4	multilayer ceramic chip capacitor	47 pF	[1] ATC100B
C2, C3, C5, C6	multilayer ceramic chip capacitor	45 pF	[1] ATC100B
C7, C11, C15, C19	multilayer ceramic chip capacitor	0.01 $\mu$ F	[2] Murata
C8, C12, C16, C20	multilayer ceramic chip capacitor	0.1 $\mu$ F	[2] Murata
C9, C13, C17, C21	multilayer ceramic chip capacitor	1 $\mu$ F	[2] Murata
C10, C14, C18, C22	multilayer ceramic chip capacitor	4.7 $\mu$ F	[2] Murata
C23, C24	electrolytic capacitor	470 $\mu$ F, 63 V	
R1, R2	chip resistor	9.1 $\Omega$	[3] Vishay Dale 0805

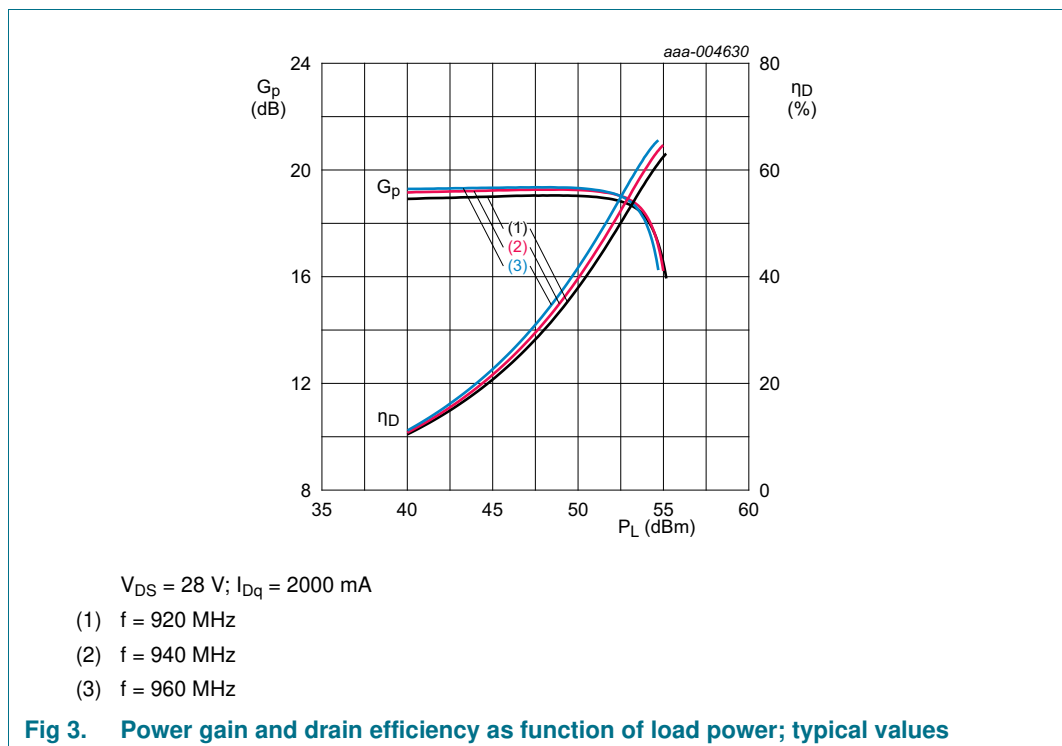
[1] American Technical Ceramics type 100B or capacitor of same quality.

[2] Murata or capacitor of same quality.

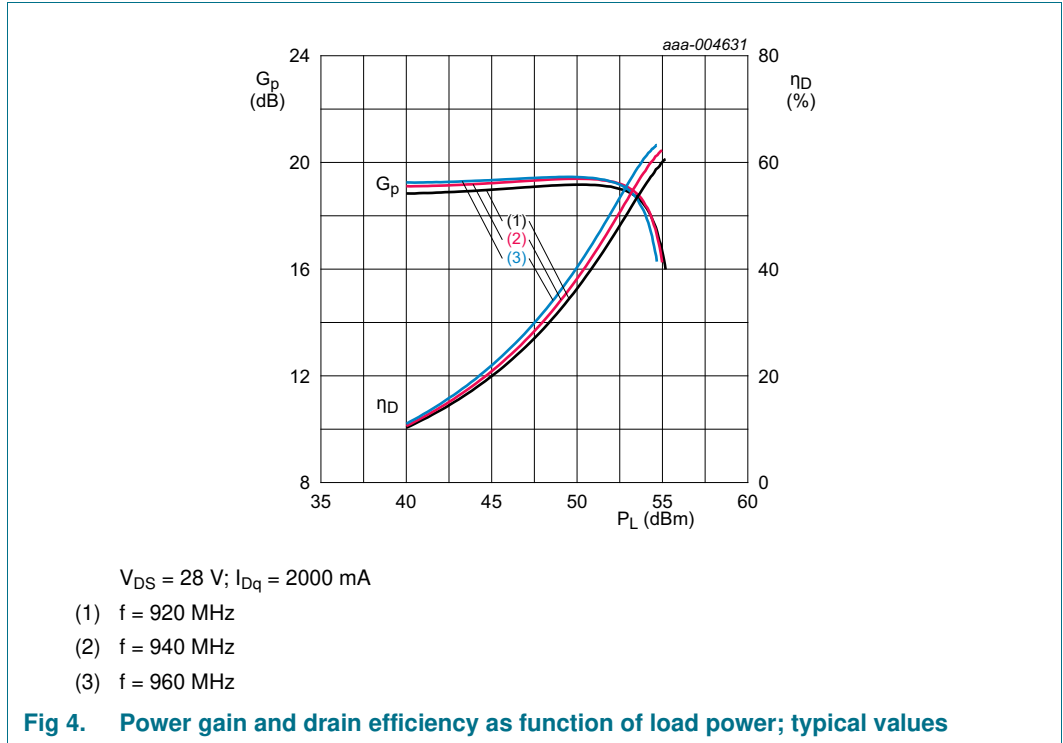
[3] Vishay Dale resistor of same quality.

## 7.4 Graphical data

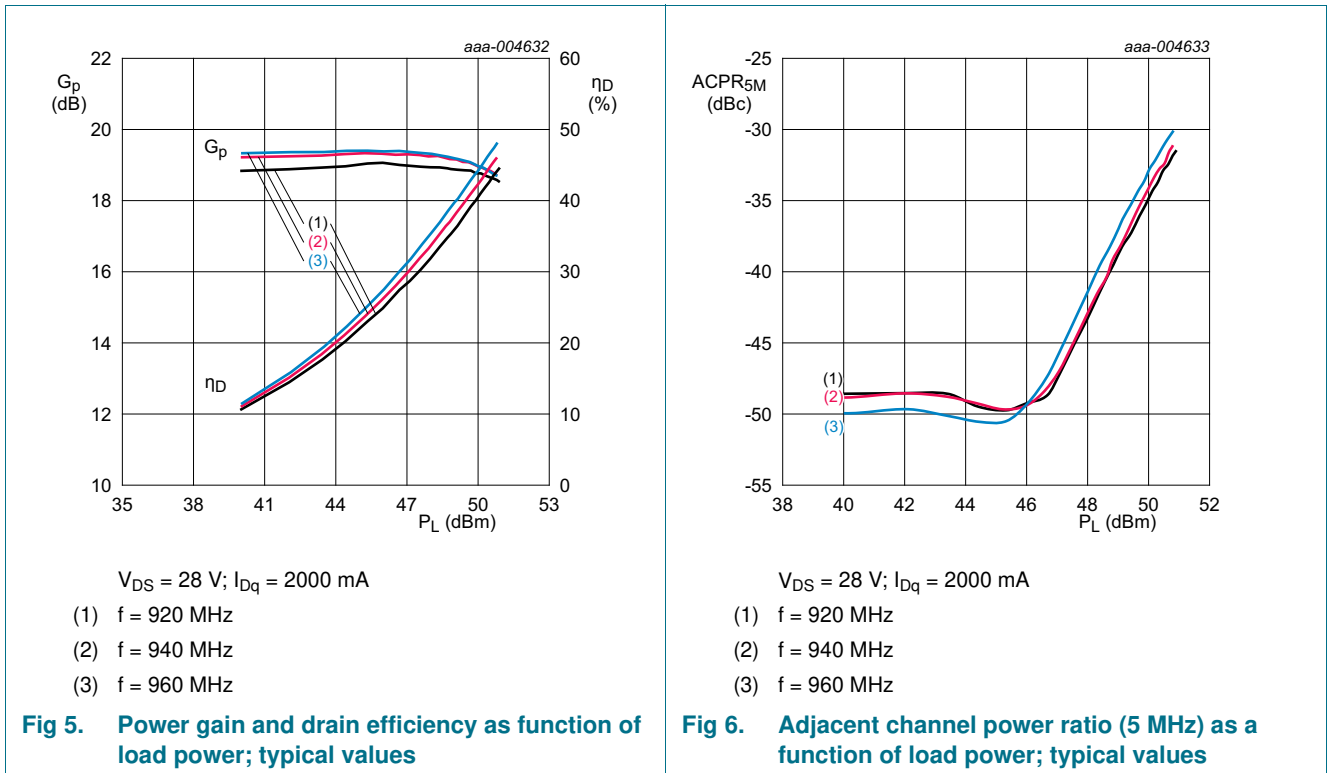
### 7.4.1 CW

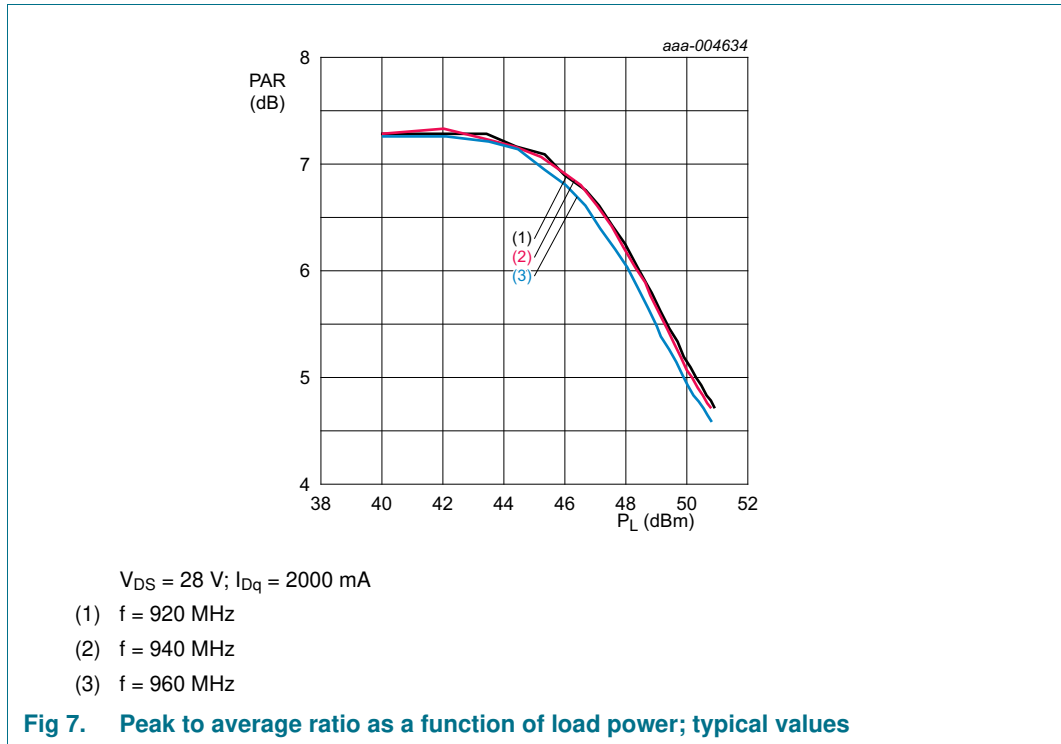


7.4.2 CW pulsed

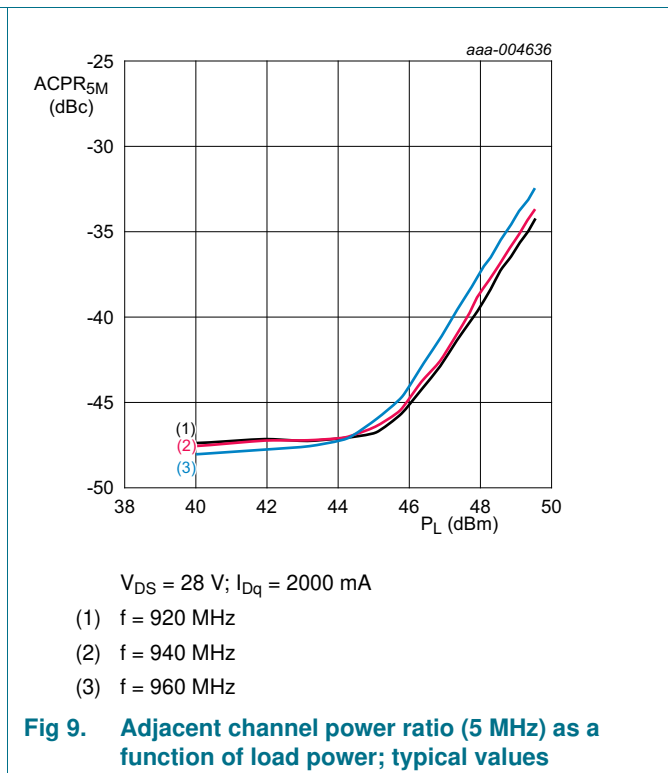
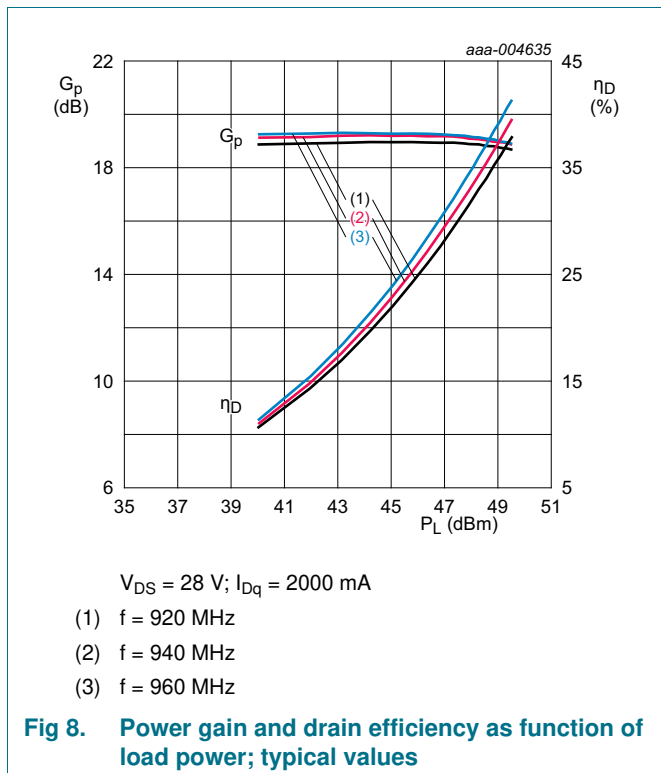


7.4.3 1-Carrier W-CDMA





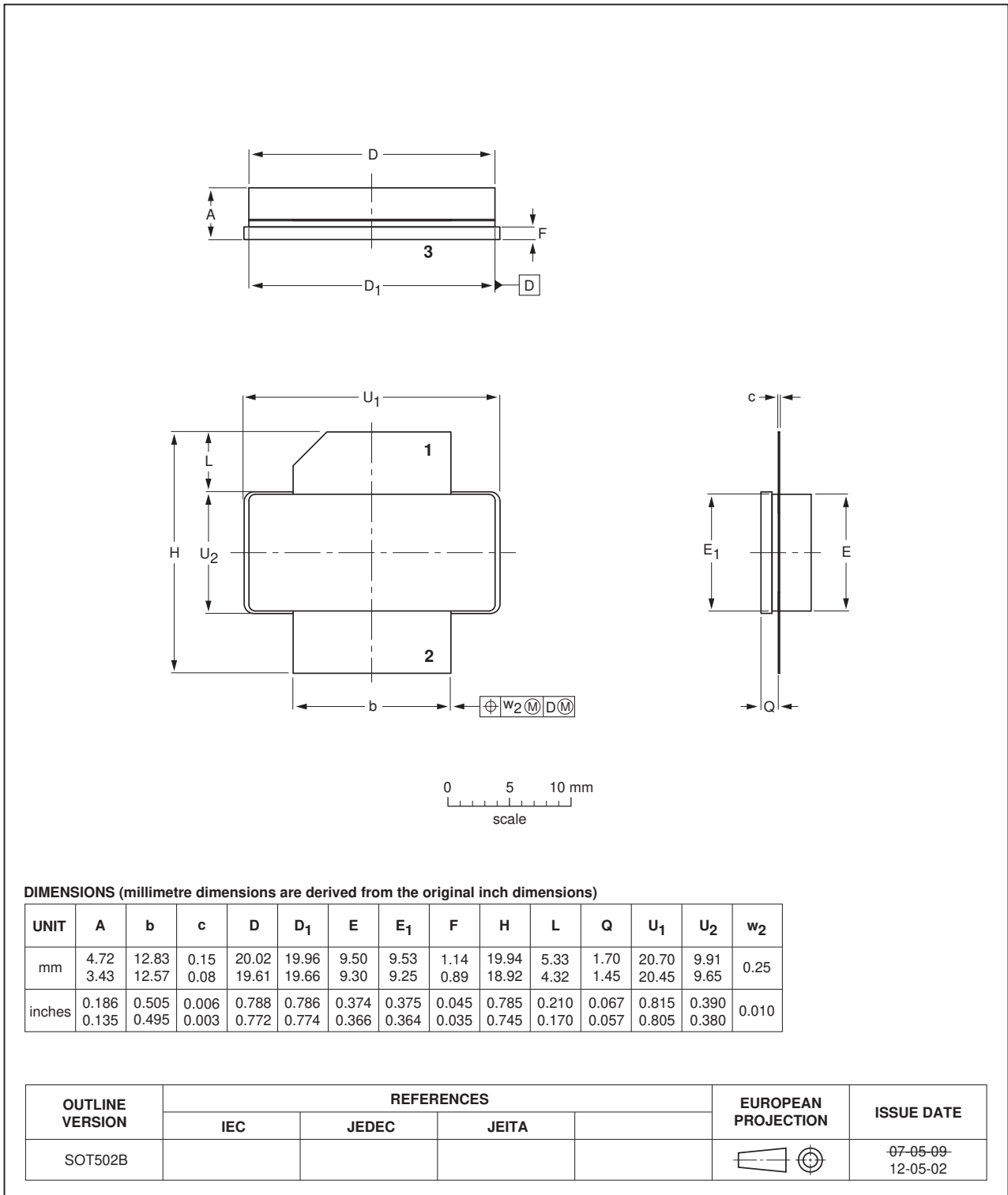
7.4.4 2-Carrier W-CDMA



**8. Package outline**

Earless flanged ceramic package; 2 leads

SOT502B



**Fig 10. Package outline SOT502B**



## 9. Handling information

### CAUTION



This device is sensitive to ElectroStatic Discharge (ESD). Observe precautions for handling electrostatic sensitive devices.

Such precautions are described in the *ANSI/ESD S20.20*, *IEC/ST 61340-5*, *JESD625-A* or equivalent standards.

## 10. Abbreviations

**Table 10. Abbreviations**

Acronym	Description
3GPP	3rd Generation Partnership Project
CCDF	Complementary Cumulative Distribution Function
CW	Continuous Wave
DPCH	Dedicated Physical Channel
ESD	ElectroStatic Discharge
LDMOS	Laterally Diffused Metal Oxide Semiconductor
PAR	Peak-to-Average Ratio
VSWR	Voltage Standing Wave Ratio
W-CDMA	Wideband Code Division Multiple Access

## 11. Revision history

**Table 11. Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLF8G10LS-270 v.1	20120817	Product data sheet	-	-

## 12. Legal information

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