

BLF6H10L-160; BLF6H10LS-160

Power LDMOS transistor

Rev. 1 — 10 February 2012

Objective data sheet

1. Product profile

1.1 General description

A 160 W LDMOS RF power transistor for base station applications. The transistor can deliver 160 W from HF to 1 GHz. The excellent ruggedness and broadband performance of this device makes it ideal for base station applications.

Table 1. Typical performance

RF performance at $V_{DS} = 50$ V in a common-source Class-AB test circuit.

Test signal	f (MHz)	I_{DQ} (mA)	V_{DS} (V)	$P_{L(AV)}$ (W)	G_p (dB)	η_D (%)	ACPR (dBc)
2-carrier W-CDMA	729 to 960	600	50	38	20	27	-32 ^[1]

[1] Test signal: 3GPP; test model 1; 64 DPCH; PAR = 8.4 dB at 0.01% probability on CCDF.

1.2 Features and benefits

- Integrated ESD protection
- Excellent ruggedness
- High power gain
- High efficiency
- Excellent reliability
- Easy power control
- Low R_{th} providing excellent thermal stability
- Low output capacitance for wideband performance in Doherty applications
- Designed for low memory effects providing excellent digital pre-distortion capability
- No internal matching for broadband applications
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

1.3 Applications

- RF power applications for GSM, GSM EDGE, W-CDMA, CDMA base stations and multi carrier applications in the 700 MHz to 1000 MHz frequency range



2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
BLF6H10L-160 (SOT467C)			
1	drain		 sym112
2	gate		
3	source		
BLF6H10LS-160 (SOT467B)			
1	drain		 sym112
2	gate		
3	source		

[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLF6H10L-160	-	flanged LDMOST ceramic package; 2 mounting holes; 2 leads	SOT467C
BLF6H10LS-160	-	earless LDMOST ceramic package; 2 leads	SOT467B

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		-	104	V
V_{GS}	gate-source voltage		-0.5	+13	V
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
$R_{th(j-c)}$	thermal resistance from junction to case	$T_{case} = 80\text{ °C}$; $P_{L(AV)} = 70\text{ W}$	[1]	0.95 K/W

[1] $R_{th(j-c)}$ is measured under RF conditions.

6. Characteristics

Table 6. DC characteristics

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

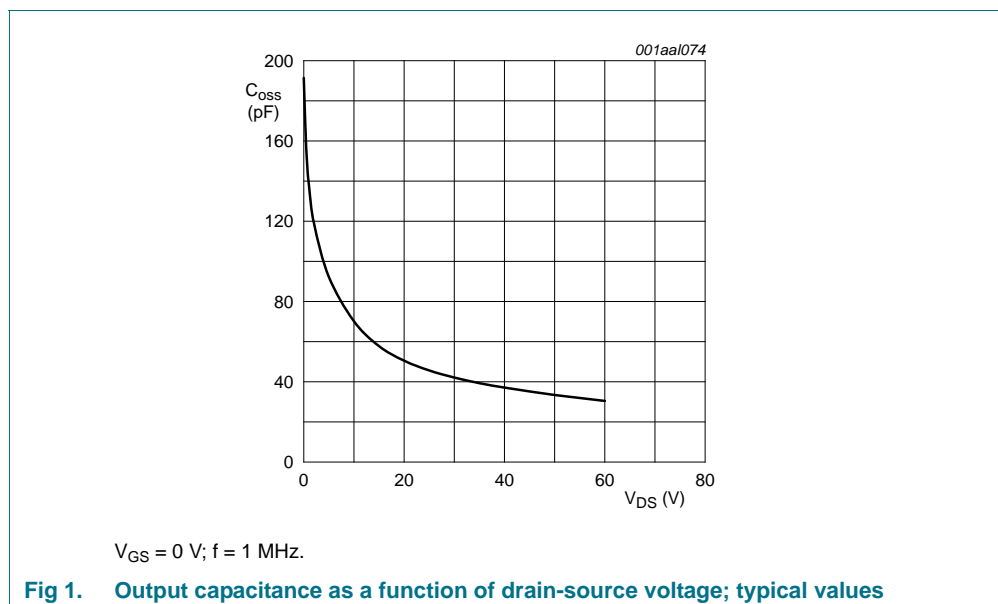
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0\text{ V}; I_D = 1.35\text{ mA}$	[1]	104	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}; I_D = 135\text{ mA}$	[1]	1.4	2.4	V
I_{DSS}	drain leakage current	$V_{GS} = 0\text{ V}; V_{DS} = 50\text{ V}$	-	-	1.4	μA
I_{DSX}	drain cut-off current	$V_{GS} = V_{GSth} + 3.75\text{ V}; V_{DS} = 10\text{ V}$	-	21	-	A
I_{GSS}	gate leakage current	$V_{GS} = 10\text{ V}; V_{DS} = 0\text{ V}$	-	-	140	nA
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GSth} + 3.75\text{ V}; I_D = 4.5\text{ A}$	[1]	210	-	$\text{m}\Omega$
C_{iss}	input capacitance	$V_{GS} = 0\text{ V}; V_{DS} = 50\text{ V}; f = 1\text{ MHz}$	-	100	-	pF
C_{oss}	output capacitance	$V_{GS} = 0\text{ V}; V_{DS} = 50\text{ V}; f = 1\text{ MHz}$	-	33.5	-	pF
C_{rss}	reverse transfer capacitance	$V_{GS} = 0\text{ V}; V_{DS} = 50\text{ V}; f = 1\text{ MHz}$	-	1	-	pF

[1] I_D is the drain current.

Table 7. RF characteristics

$T_h = 25\text{ }^\circ\text{C}$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
2-carrier W-CDMA						
V_{DS}	drain-source voltage		-	50	-	V
I_{Dq}	quiescent drain current		-	600	-	mA
$P_{L(AV)}$	average output power		-	38	-	W
G_p	power gain		-	20	-	dB
η_D	drain efficiency		-	27	-	%
ACPR	adjacent channel power ratio		-	-32	-	dBc



7. Application information

7.1 Ruggedness in class-AB operation

The BLF6H10L-160 and BLF6H10LS-160 are capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: $V_{DS} = 50$ V; $f = 860$ MHz at rated power. Ruggedness is measured in the application circuit.

7.2 Impedance information

Table 8. Typical impedance
Simulated Z_S and Z_L test circuit impedances.

f (MHz)	Z_S (Ω)	Z_L (Ω)
925	$1.0 - j0.39$	$2.2 + j0.55$
942	$1.0 - j0.50$	$2.2 + j0.45$
960	$1.0 - j0.58$	$2.2 + j0.47$

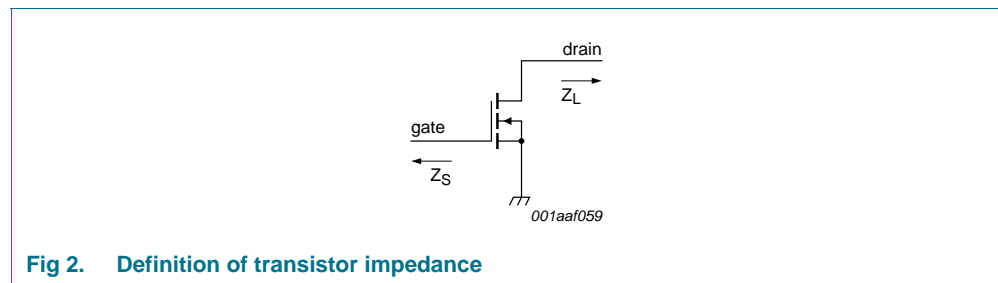


Fig 2. Definition of transistor impedance

8. Package outline

Flanged LDMOST ceramic package; 2 mounting holes; 2 leads

SOT467C

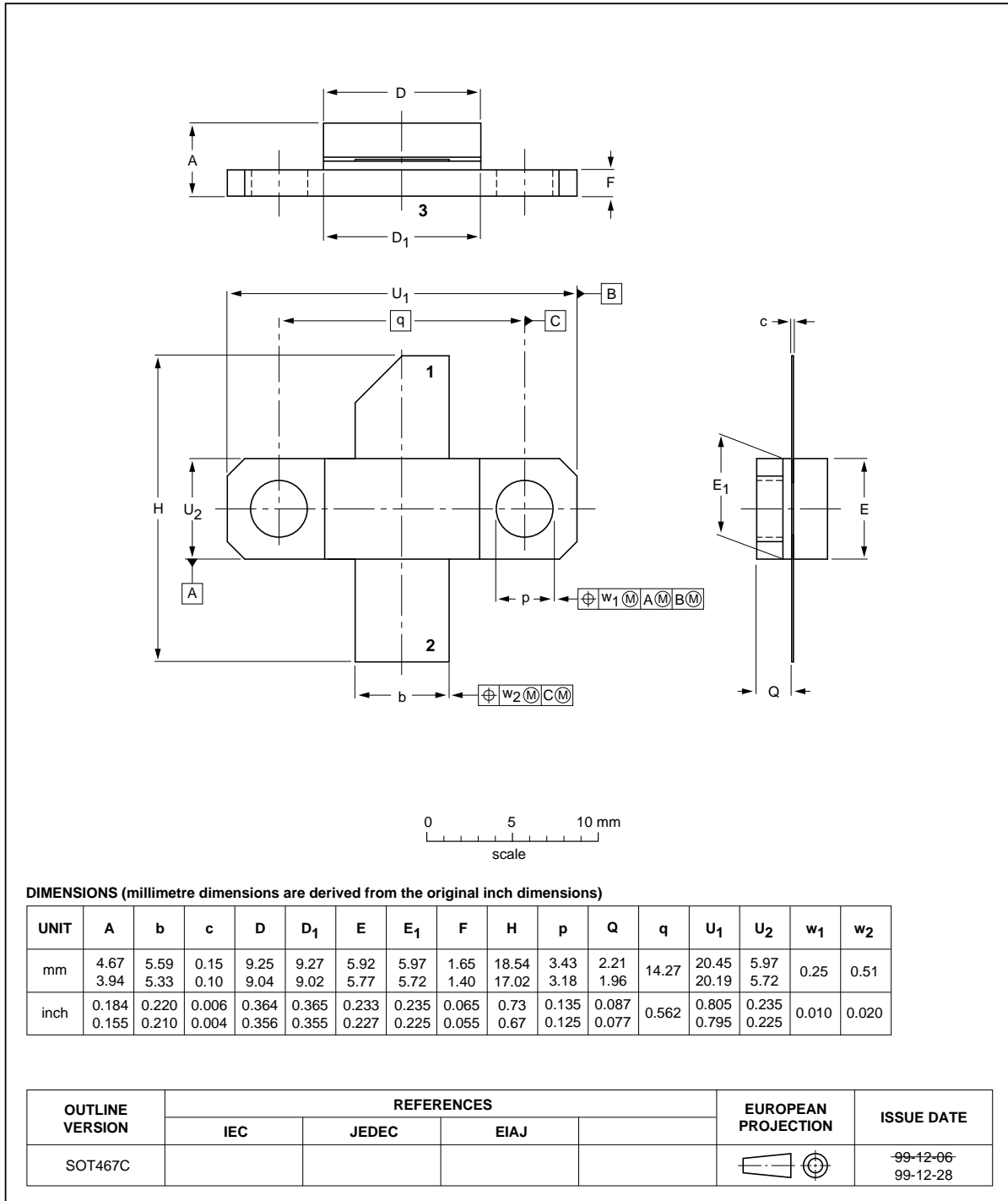


Fig 3. Package outline SOT467C

Earless LDMOST ceramic package; 2 leads

SOT467B

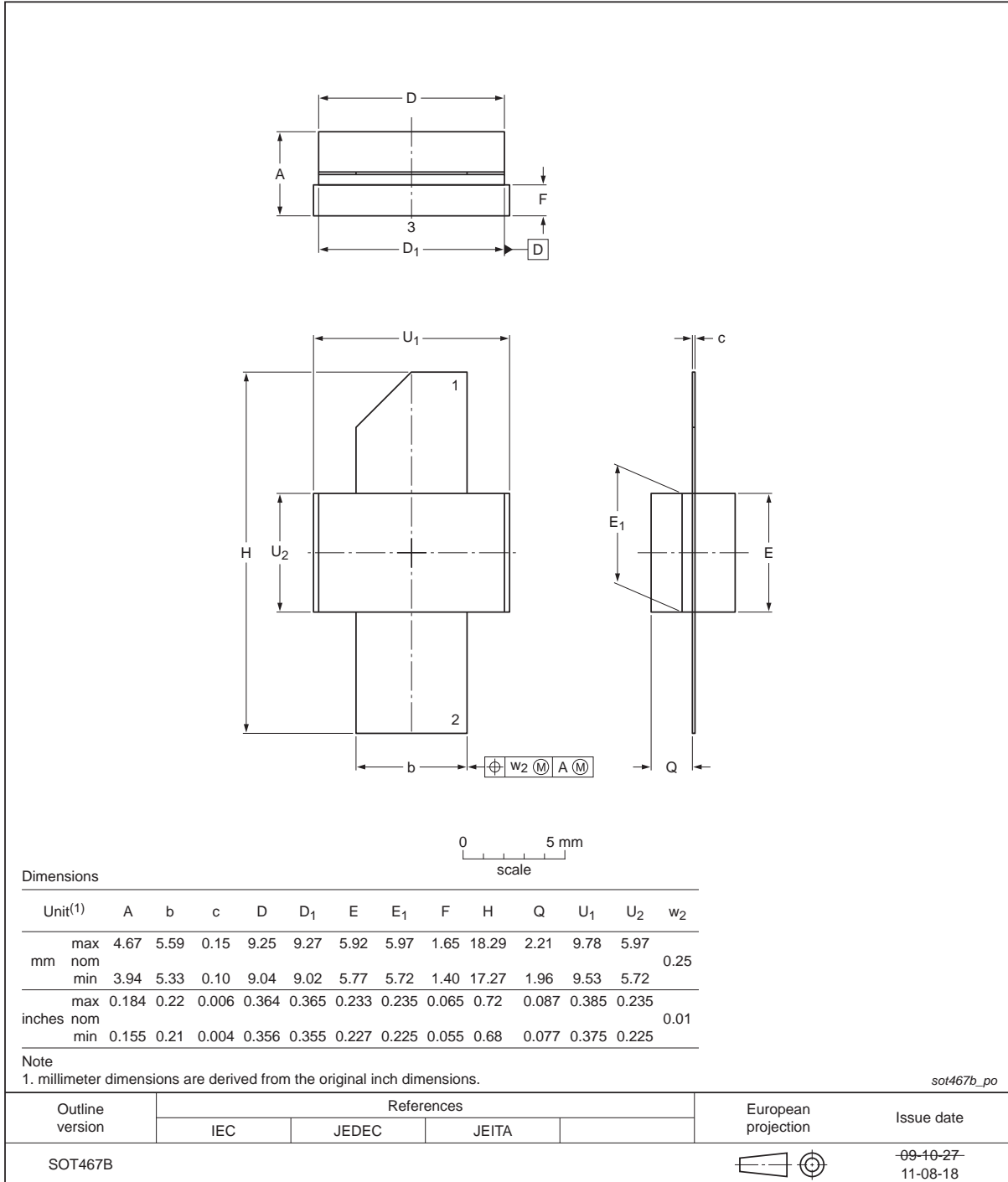


Fig 4. Package outline SOT467B

9. Handling information

CAUTION



This device is sensitive to ElectroStatic Discharge (ESD). Therefore care should be taken during transport and handling.

10. Abbreviations

Table 9. Abbreviations

Acronym	Description
3GPP	3rd Generation Partnership Project
CDMA	Code Division Multiple Access
CCDF	Complementary Cumulative Distribution Function
DPCH	Dedicated Physical CHannel
EDGE	Enhanced Data rates for GSM Evolution
GSM	Global System for Mobile Communications
HF	High Frequency
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
LDMOST	Laterally Diffused Metal-Oxide Semiconductor Transistor
PAR	Peak-to-Average power Ratio
RF	Radio Frequency
VSWR	Voltage Standing-Wave Ratio
W-CDMA	Wideband Code Division Multiple Access

11. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLF6H10L-160_6H10LS-160 v.1	20120210	Objective data sheet	-	-

12. Legal information

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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.
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