BLF6G10-45

Power LDMOS transistor

Rev. 4 — 1 September 2015

AMPLEON

Product data sheet

1. Product profile

1.1 General description

45 W LDMOS power transistor for base station applications at frequencies from 700 MHz to 1000 MHz.

Table 1. Typical performance

RF performance at T_{case} = 25 °C in a common source class-AB production test circuit.

Mode of operation	f	V_{DS}	$P_{L(AV)}$	G_p	η_D	ACPR
	(MHz)	(V)	(W)	(dB)	(%)	(dBc)
2-carrier W-CDMA	920 to 960	28	1.0	22.5	7.8	−48.5[1]

[1] Test signal: 3GPP; test model 1; 64 DPCH; PAR = 7.5 dB at 0.01 % probability on CCDF per carrier; carrier spacing 5 MHz.

CAUTION

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

1.2 Features and benefits

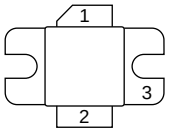
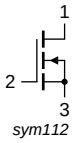
- Typical 2-carrier W-CDMA performance at frequencies of 920 MHz and 960 MHz, a supply voltage of 28 V and an I_{Dq} of 350 mA:
  - Average output power = 1.0 W
  - Gain = 22.5 dB
  - Efficiency = 7.8 %
  - ACPR = −48.5 dBc
- Easy power control
- Integrated ESD protection
- Excellent ruggedness
- High efficiency
- Excellent thermal stability
- Designed for broadband operation (700 MHz to 1000 MHz)
- Internally matched for ease of use
- 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 700 MHz to 1000 MHz frequency range.

2. Pinning information

Table 2. Pinning

Pin	Description		Simplified outline	Symbol
1	drain			
2	gate			
3	source	[1]		

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[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLF6G10-45	-	flanged ceramic package; 2 mounting holes; 2 leads	SOT608A

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	+13	V
I_D	drain current		-	13	A
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
$R_{th(j\text{-}case)}$	thermal resistance from junction to case	T_{case} = 80 °C; P_L = 12.5 W	1.7	K/W

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6. Characteristics

Table 6. Characteristics

T_j = 25 °C per section; unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	V_{GS} = 0 V; I_D = 0.5 mA	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	V_{DS} = 10 V; I_D = 72 mA	1.35	1.9	2.35	V
V_{GSq}	gate-source quiescent voltage	V_{DS} = 28 V; I_D = 430 mA	1.7	2.15	2.7	V
I_{DSS}	drain leakage current	V_{GS} = 0 V; V_{DS} = 28 V	-	-	1.4	μA
I_{DSX}	drain cut-off current	V_{GS} = $V_{GS(th)}$ + 3.75 V; V_{DS} = 10 V	-	12.5	-	A
I_{GSS}	gate leakage current	V_{GS} = 11 V; V_{DS} = 0 V	-	-	140	nA
g_{fs}	forward transconductance	V_{DS} = 10 V; I_D = 3.6 A	-	5	-	S
$R_{DS(on)}$	drain-source on-state resistance	V_{GS} = $V_{GS(th)}$ + 3.75 V; I_D = 2.52 A	-	0.2	-	Ω

7. Application information

Table 7. Application information

Mode of operation: 2-carrier W-CDMA; PAR 7.5 dB at 0.01 % probability on CCDF; 3GPP test model 1; 1-64 PDPCH; f_1 = 922.5 MHz; f_2 = 927.5 MHz; f_3 = 952.5 MHz; f_4 = 957.5 MHz; RF performance at V_{DS} = 28 V; I_{Dq} = 350 mA; T_{case} = 25 °C; unless otherwise specified; in a class-AB production test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
G_p	power gain	$P_{L(AV)}$ = 1.0 W	21	22.5	23.9	dB
RL_{in}	input return loss	$P_{L(AV)}$ = 1.0 W	8	13	-	dB
η_D	drain efficiency	$P_{L(AV)}$ = 1.0 W	6.9	7.8	-	%
ACPR	adjacent channel power ratio	$P_{L(AV)}$ = 1.0 W	-	–48.5	–45.5	dBc

7.1 Ruggedness in class-AB operation

The BLF6G10-45 is capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: V_{DS} = 28 V; I_{Dq} = 350 mA; P_L = 35 W (CW); f = 960 MHz.

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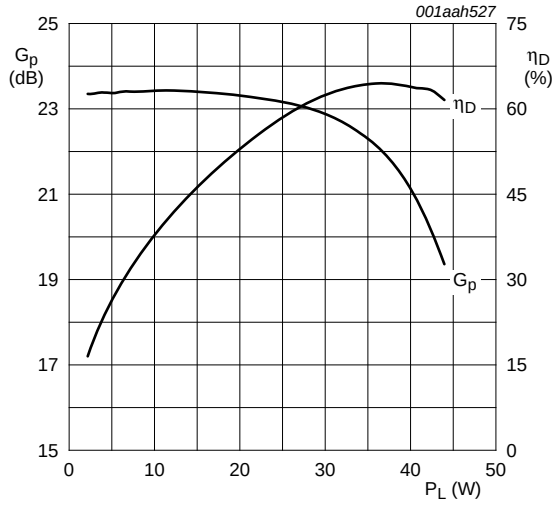
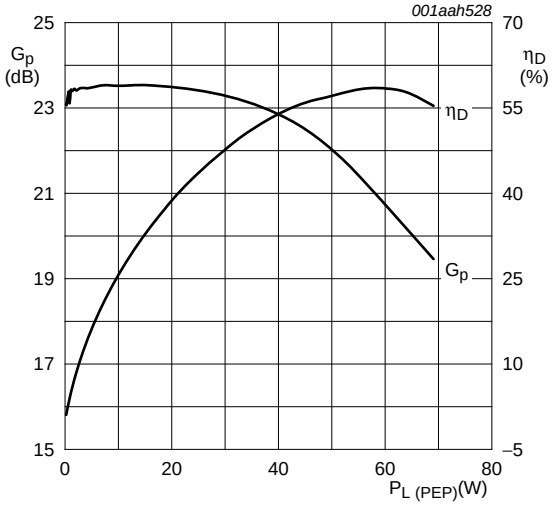


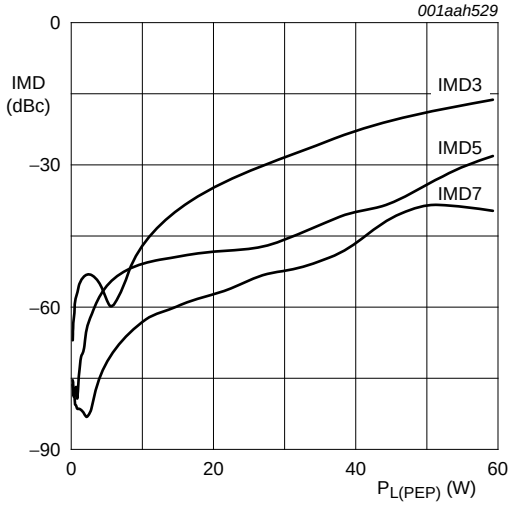
V_{DS} = 28 V; I_{Dq} = 350 mA; f = 960 MHz.

Fig 1. One-tone CW power gain and drain efficiency as functions of load power; typical values



V_{DS} = 28 V; I_{Dq} = 350 mA; f_1 = 960 MHz; f_2 = 960.1 MHz.

Fig 2. Two-tone CW power gain and drain efficiency as functions of peak envelope load power; typical values



V_{DS} = 28 V; I_{Dq} = 350 mA; f_1 = 960 MHz; f_2 = 960.1 MHz.

Fig 3. Intermodulation distortion as a function of peak envelope load power; typical values

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