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BLF8G27LS-150V; BLF8G27LS-150GV Power LDMOS transistor Rev. 4 – 1 September 2015

AMPLEON Product data sheet

Product profile 1.

1.1 General description

150W LDMOS power transistor with improved video bandwidth for base station applications at frequencies from 2500 MHz to 2700 MHz.

Table 1. **Typical performance**

Typical RF performance at $T_{case} = 25 \ ^{\circ}C$ in a common source class-AB production test circuit.

Test signal	f	l _{Dq}	V _{DS}	P _{L(AV)}	G _p	η _D	ACPR₅ _M
	(MHz)	(mA)	(V)	(W)	(dB)	(%)	(dBc)
2-carrier W-CDMA	2600 to 2700	1300	28	45	18	30	-30 <mark>[1]</mark>

[1] 3GPP test model 1; 64 DPCH; PAR = 8.4 dB at 0.01 % probability on CCDF; carrier spacing 5 MHz. Channel bandwidth is 3.84 MHz.

1.2 Features and benefits

- Excellent ruggedness
- High efficiency
- Low R_{th} providing excellent thermal stability
- Decoupling leads to enable improved video bandwidth (60 MHz typical)
- Lower output capacitance for improved performance in Doherty applications
- Designed for low memory effects providing excellent digital pre-distortion capability
- Internally matched for ease of use
- Integrated ESD protection
- Design optimized for gull-wing
- 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 2500 MHz to 2700 MHz frequency range

Power LDMOS transistor

2. Pinning information

Pin	Description	Simplified outline	Graphic symbol
BLF8G27	LS-150V (SOT1244B)		
1	drain		
2	gate		$6.7 \rightarrow 1 \downarrow 4.5$
3	source [1		
4	decoupling lead	3	2
5	decoupling lead		aaa-003619
6	n.c.		
7	n.c.	6 2 7	
BLF8G27	LS-150GV (SOT1244C)		
1	drain		
2	gate		$6.7 \rightarrow 1 \downarrow 4.5$
3	source [1		
4	decoupling lead		2
5	decoupling lead		aaa-003619
6	n.c.	- 6 2 7 3	
7	n.c.		

[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Packag	Package		
	Name	Description	Version	
BLF8G27LS-150V	-	earless flanged ceramic package; 6 leads	SOT1244B	
BLF8G27LS-150GV	-	earless flanged ceramic package; 6 leads	SOT1244C	

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
T _{stg}	storage temperature		-65	+150	°C
Tj	junction temperature		<u>[1]</u> _	225	°C

[1] Continuous use at maximum temperature will affect the reliability.

5. Thermal characteristics

Table 5.	Thermal characteristics			
Symbol	Parameter	Conditions	Тур	Unit
R _{th(j-c)}	thermal resistance from junction to case	T_{case} = 80 °C; P_{L} = 45 W	0.30	K/W

6. Characteristics

Table 6. DC characteristics

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

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V _{(BR)DSS}	drain-source breakdown voltage	V _{GS} = 0 V; I _D = 2.16 mA	65	-	-	V
V _{GS(th)}	gate-source threshold voltage	V_{DS} = 10 V; I _D = 216 mA	1.5	1.9	2.3	V
I _{DSS}	drain leakage current	V_{GS} = 0 V; V_{DS} = 28 V	-	-	4.5	μA
I _{DSX}	drain cut-off current	$\label{eq:VGS} \begin{array}{l} V_{\mathrm{GS}} = V_{\mathrm{GS}(\mathrm{th})} + 3.75 \ V; \\ V_{\mathrm{DS}} = 10 \ V \end{array}$	-	40	-	A
I _{GSS}	gate leakage current	V_{GS} = 11 V; V_{DS} = 0 V	-	-	450	nA
g _{fs}	forward transconductance	V _{DS} = 10 V; I _D = 10.8 A	-	16	-	S
R _{DS(on)}	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75 V;$ I _D = 7.56 A	-	0.06	-	Ω

Table 7. RF characteristics

Test signal: 2-carrier W-CDMA, 3GPP test model; 64 DPCH; PAR = 8.4 dB at 0.01 % probability on the CCDF, carrier spacing 5 MHz; $f_1 = 2602.5$ MHz; $f_2 = 2607.5$ MHz; $f_3 = 2692.5$ MHz; $f_4 = 2697.5$ MHz; RF performance at $V_{DS} = 28$ V; $I_{Dq} = 1300$ mA; $T_{case} = 25$ °C; unless otherwise specified; in a class-AB production test circuit.

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
G _p	power gain	P _{L(AV)} = 45 W	16.8	18	-	dB
RL _{in}	input return loss	P _{L(AV)} = 45 W	-	-10	-7	dB
η_D	drain efficiency	P _{L(AV)} = 45 W	26	30	-	%
$ACPR_{5M}$	adjacent channel power ratio (5 MHz)	P _{L(AV)} = 45 W	-	-30	-26	dBc

7. Test information

7.1 Ruggedness in class-AB operation

The BLF8G27LS-150V and BLF8G27LS-150GV are capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: V_{DS} = 28 V; I_{Dq} = 1300 mA; P_L = 150 W (CW); f = 2600 MHz.

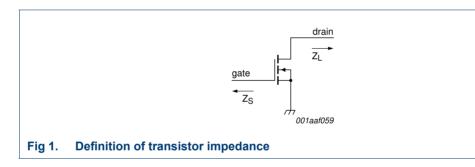
7.2 Impedance information

Table 8.Typical impedance

Measured load-pull data; $I_{Dq} = 1300 \text{ mA}$; $V_{DS} = 28 \text{ V}$.

f	Z _S [1]	Z _L [1]
(MHz)	(Ω)	(Ω)
BLF8G27LS-150V		
2500	0.70 – j3.50	2.68 – j1.86
2600	1.10 – j4.40	2.86 – j2.03
2700	2.00 - j4.90	3.27 – j1.87
BLF8G27LS-150GV		
2500	1.00 – j5.70	2.35 – j4.04
2600	1.50 – j6.90	2.52 – j4.32
2700	2.10 – j8.00	3.21 – j4.36

[1] Z_S and Z_L defined in Figure 1.



BLF8G27LS-150V_8G27LS-150GV#4

Power LDMOS transistor

7.3 Test circuit

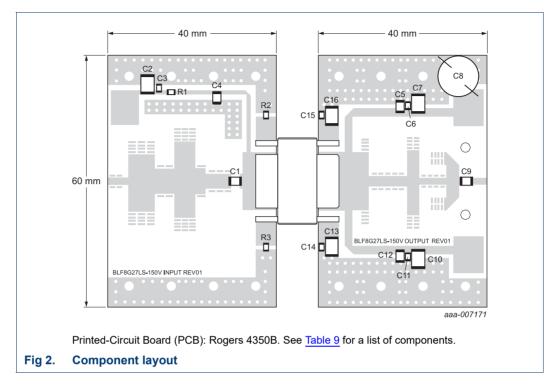


Table 9. List of components

See <u>Figure 2</u> for component layout.

The used PCB material is Rogers RO4350B with a thickness of 0.76 mm.

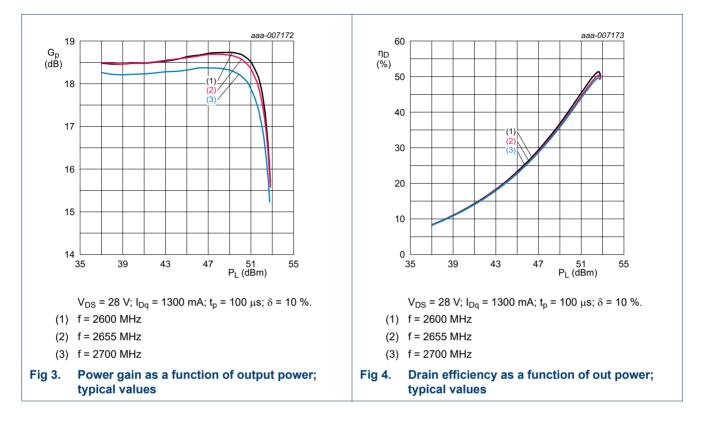
Component	Description	Value	Remarks
C1	multilayer ceramic chip capacitor	0.7 μF	[1] ATC800B
C2	multilayer ceramic chip capacitor	1 μF	2 Murata
C3	multilayer ceramic chip capacitor	100 nF	2 Murata
C4, C5, C9, C12	multilayer ceramic chip capacitor	24 pF	[1] ATC800B
C6, C11, C14, C15	multilayer ceramic chip capacitor	220 nF	2 Murata
C7, C10, C13, C16	multilayer ceramic chip capacitor	4.7 μF, 50 V	2 Murata
C8	electrolytic capacitor	> 470 µF, 63 V	
R1	chip resistor	4.7 Ω , 1 % tolerance	SMD 1206
R2, R3	chip resistor	0 Ω	SMD 1206

[1] American Technical Ceramics type 800B or capacitor of same quality.

[2] Murata or capacitor of same quality.

7.4 Graphical data

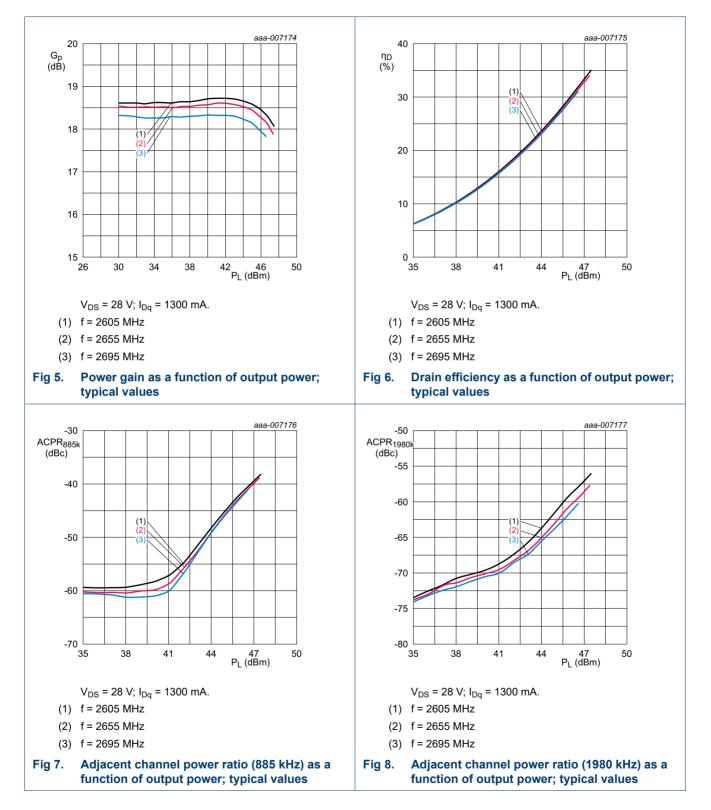
7.4.1 Pulsed CW



BLF8G27LS-150(G)V

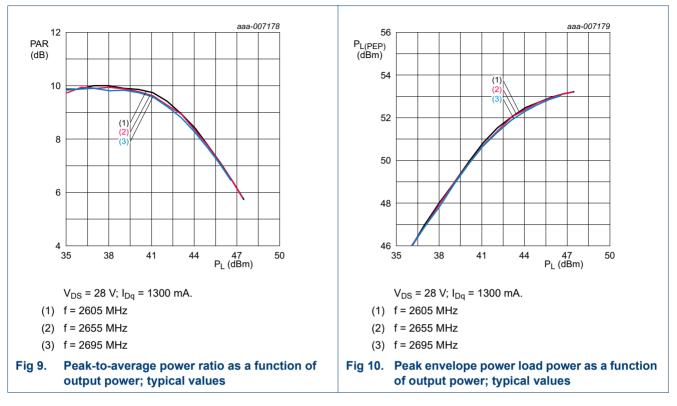
Power LDMOS transistor

7.4.2 IS-95

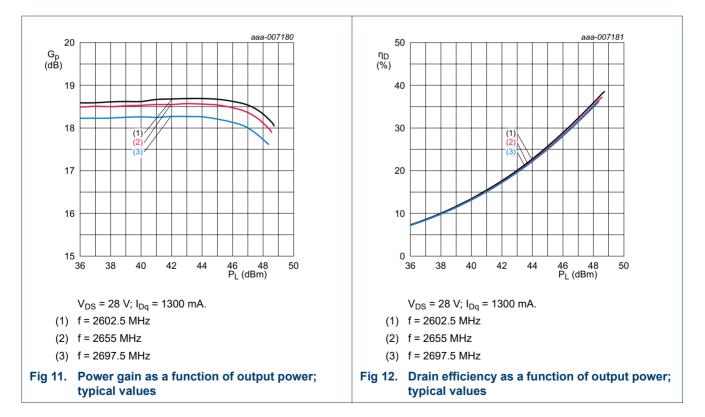


BLF8G27LS-150(G)V

Power LDMOS transistor

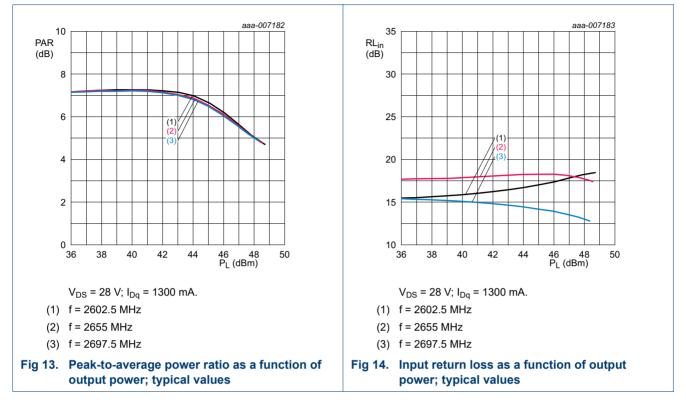


7.4.3 1-Carrier W-CDMA

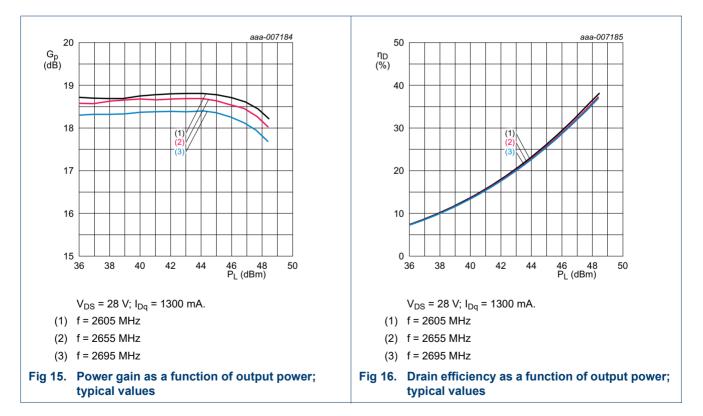


BLF8G27LS-150(G)V

Power LDMOS transistor

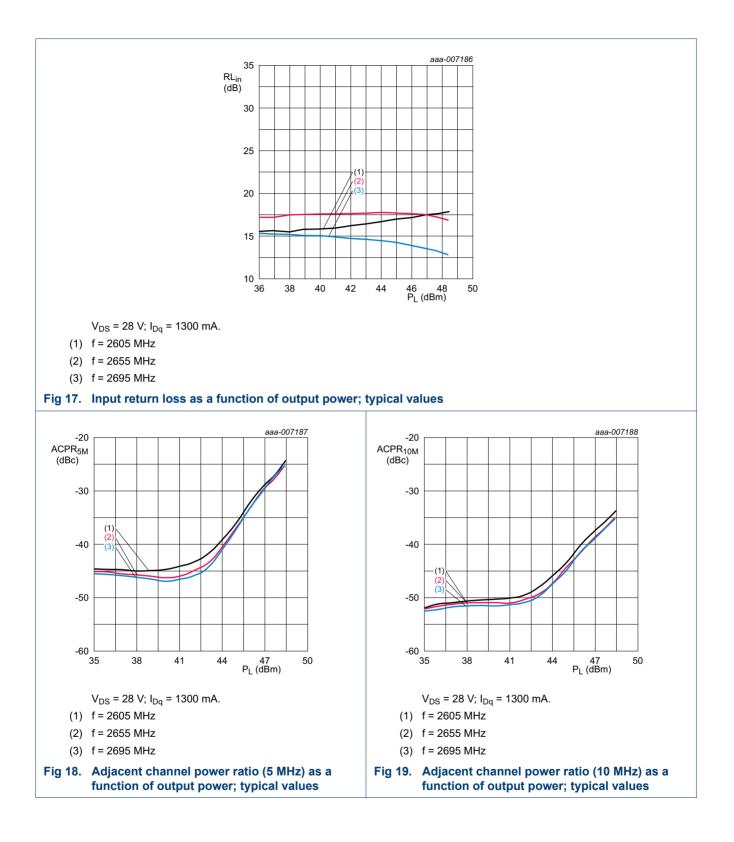


7.4.4 2-Carrier W-CDMA



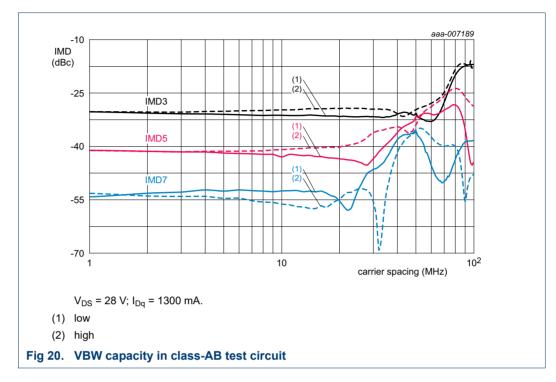
BLF8G27LS-150(G)V

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7.4.5 2-Tone VBW



BLF8G27LS-150V_8G27LS-150GV#4

Product data sheet

BLF8G27LS-150(G)V

Power LDMOS transistor

8. Package outline

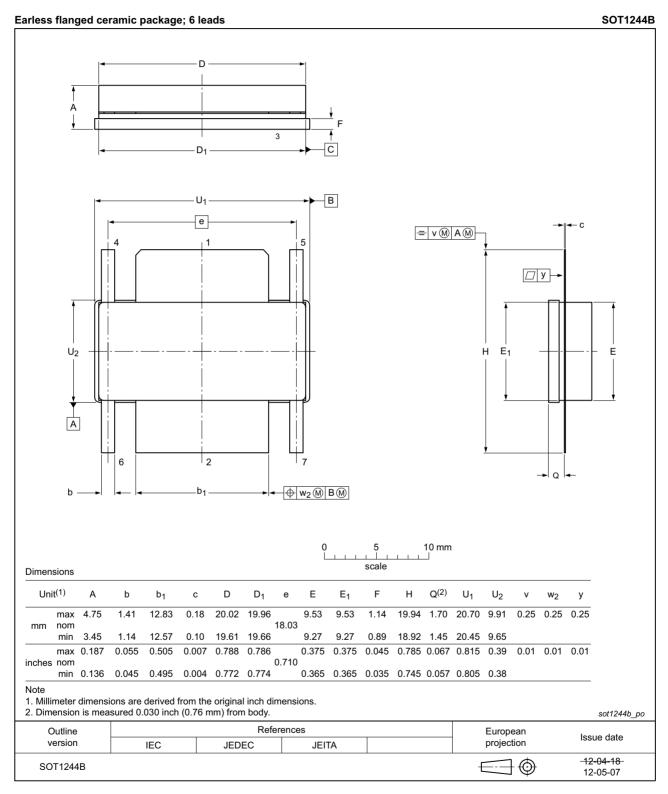


Fig 21. Package outline SOT1244B

BLF8G27LS-150V_8G27LS-150GV#4

BLF8G27LS-150(G)V

Power LDMOS transistor

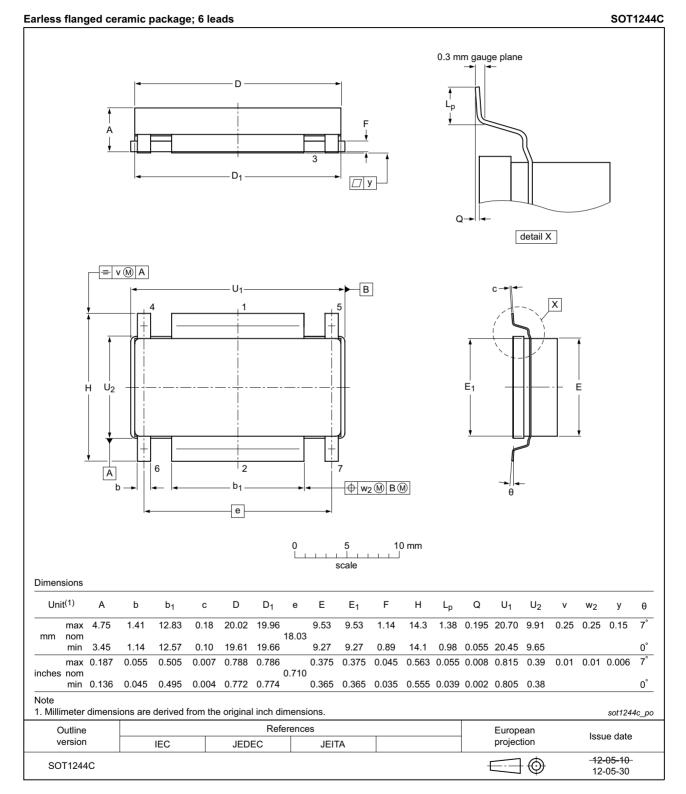


Fig 22. Package outline SOT1244C

BLF8G27LS-150(G)V

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
IS-95	Interim Standard 95
LDMOS	Laterally Diffused Metal Oxide Semiconductor
PAR	Peak-to-Average Ratio
SMD	Surface Mounted Device
VBW	Video BandWidth
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
BLF8G27LS-150V_8G27LS-150GV#4	20150901	Product data sheet		BLF8G27LS-150V_ 8G27LS-150GV v.3
Modifications:	• The format of this document has been redesigned to comply with the neitidentity guidelines of Ampleon.			
	 Legal texts have been adapted to the new company name where appropriate. 			ame where
BLF8G27LS-150V_8G27LS-150GV v.3	20130626	Product data sheet	-	BLF8G27LS-150V_ 8G27LS-150GV v.2
BLF8G27LS-150V_8G27LS-150GV v.2	20130422	Objective data sheet	-	BLF8G27LS-150V_ 8G27LS-150GV v.1
BLF8G27LS-150V_8G27LS-150GV v.1	20130129	Objective data sheet	-	-

12. Legal information

12.1 Data sheet status

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.	
Product [short] data sheet	Production	This document contains the product specification.	

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[2] The term 'short data sheet' is explained in section "Definitions".

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BLF8G27LS-150V_8G27LS-150GV#4

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14. Contents

1	Product profile	1
1.1	General description	1
1.2	Features and benefits	1
1.3	Applications	1
2	Pinning information	2
3	Ordering information	2
4	Limiting values	2
5	Thermal characteristics	3
6	Characteristics	3
7	Test information	3
7.1	Ruggedness in class-AB operation	3
7.2	Impedance information	4
7.3	Test circuit	5
7.4	Graphical data	
7.4.1	Pulsed CW	6
7.4.2	IS-95	
7.4.3	1-Carrier W-CDMA	-
7.4.4	2-Carrier W-CDMA	
7.4.5	2-Tone VBW	11
8	Package outline	12
9	Handling information	14
10	Abbreviations	14
11	Revision history	14
12	Legal information	15
12.1		15
12.2	Definitions	15
12.3	Disclaimers	15
12.4	Trademarks	16
13	Contact information	16
14	Contents	17

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