

BLF2425M7L250P; BLF2425M7LS250P

Power LDMOS transistor

Rev. 5 — 1 September 2015

AMPLEON

Product data sheet

1. Product profile

1.1 General description

250 W LDMOS power transistor for Industrial, Scientific and Medical (ISM) applications at frequencies from 2400 MHz to 2500 MHz.

The BLF2425M7L250P and BLF2425M7LS250P are designed for high-power CW applications and are assembled in high performance ceramic packages, available in eared and earless versions

Table 1. Typical performance

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

Test signal	f (MHz)	V _{DS} (V)	P _{L(AV)} (W)	G _p (dB)	η _D (%)
CW	2450	28	250	15	51

1.2 Features and benefits

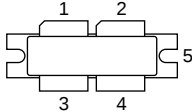
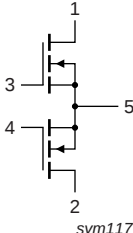
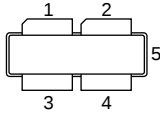
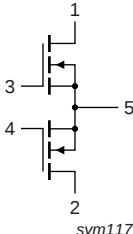
- High efficiency
- Easy power control
- Excellent ruggedness
- Excellent thermal stability
- Integrated ESD protection
- Designed for broadband operation (2400 MHz to 2500 MHz)
- Internally matched
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

1.3 Applications

- RF power amplifiers for CW applications in the 2400 MHz to 2500 MHz frequency range such as ISM and industrial heating.

2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
BLF2425M7L250P (SOT539A)			
1	drain1		
2	drain2		
3	gate1		
4	gate2		
5	source		
BLF2425M7LS250P (SOT539B)			
1	drain1		
2	drain2		
3	gate1		
4	gate2		
5	source		

[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLF2425M7L250P	-	flanged balanced ceramic package; 2 mounting holes; 4 leads	SOT539A
BLF2425M7LS250P	-	earless flanged balanced ceramic package; 4 leads	SOT539B

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
T_j	junction temperature		-	225	°C

5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-case)}$	thermal resistance from junction to case	$T_{case} = 80\text{ °C}; P_L = 250\text{ W}$	0.19	K/W

6. Characteristics

Table 6. DC characteristics

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0\text{ V}; I_D = 2.2\text{ mA}$	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}; I_D = 220\text{ mA}$	1.5	1.9	2.3	V
I_{DSS}	drain leakage current	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}$	-	-	3	μA
I_{DSX}	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; V_{DS} = 10\text{ V}$	-	39	-	A
I_{GSS}	gate leakage current	$V_{GS} = 11\text{ V}; V_{DS} = 0\text{ V}$	-	-	300	nA
g_{fs}	forward transconductance	$V_{DS} = 10\text{ V}; I_D = 11\text{ A}$	-	16	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; I_D = 7.7\text{ A}$	-	0.08	-	Ω

Table 7. RF characteristics

Test signal: CW at 2450 MHz; RF performance at $V_{DS} = 28\text{ V}; I_{Dq} = 20\text{ mA}; T_{case} = 25\text{ °C}$; unless otherwise specified; in a class-AB production test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
G_p	power gain	$P_L = 250\text{ W}$	14	15	-	dB
RL_{in}	input return loss	$P_L = 250\text{ W}$	-	-18	-10	dB
η_D	drain efficiency	$P_L = 250\text{ W}$	46	51	-	%

7. Test information

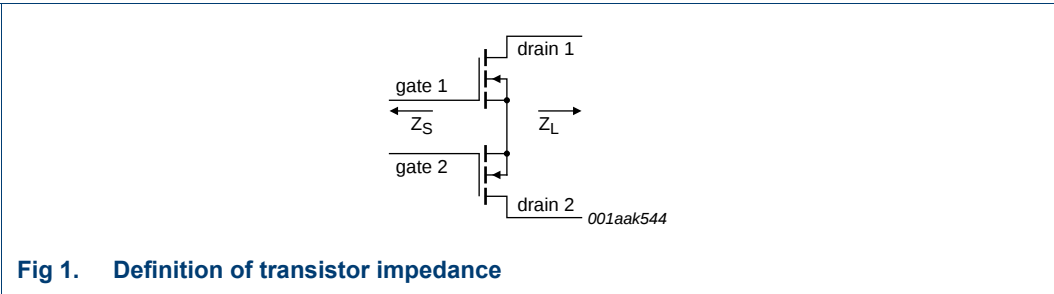
7.1 Ruggedness in class-AB operation

The BLF2425M7L250P and BLF2425M7LS250P are capable of withstanding a load mismatch corresponding to $VSWR = 10 : 1$ through all phases under the following conditions: $V_{DS} = 28\text{ V}; I_{Dq} = 20\text{ mA}; P_L = 250\text{ W}$ (CW); $f = 2450\text{ MHz}$.

7.2 Impedance information

Table 8. Typical impedance
Measured load-pull data half device. Typical values unless otherwise specified. $I_{DQ} = 20\text{ mA}$; $V_{DS} = 28\text{ V}$. Z_S and Z_L defined in Figure 1.

f (MHz)	Z_S (Ω)	Z_L (Ω)
2400	2.3 – 6.3j	3.8 – 2.7j
2450	3.3 – 6.0j	2.5 – 2.9j
2500	4.1 – 6.0j	3.3 – 2.3j



7.3 Test circuit

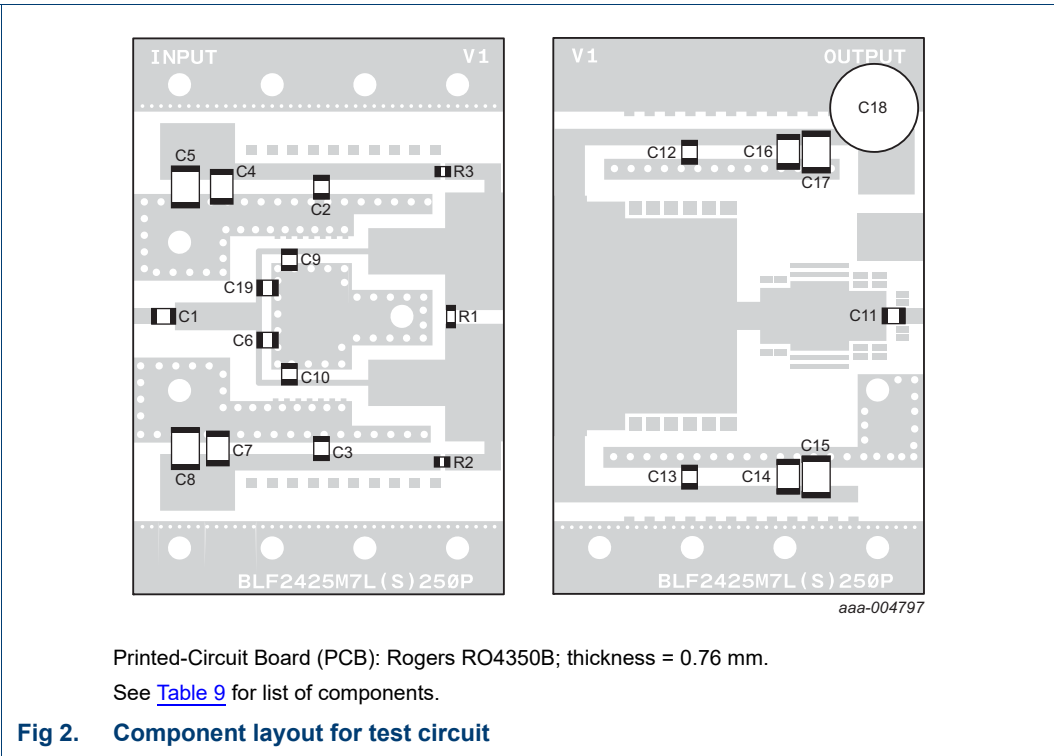
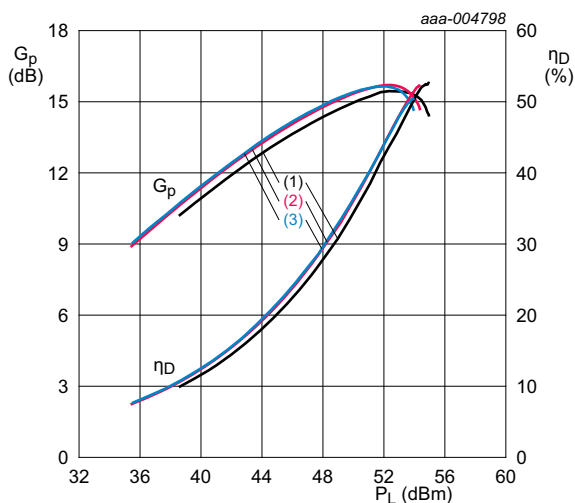


Table 9. List of components

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

Component	Description	Value	Remarks
C1, C2, C3, C11, C12, C13	multilayer ceramic chip capacitor	36 pF	ATC800B
C4, C7, C14, C16	SMD capacitor	470 nF, 50 V	
C5, C8, C15, C17	SMD capacitor	10 μ F, 50 V	
C6, C19	multilayer ceramic chip capacitor	1.4 pF	ATC100B
C9, C10	multilayer ceramic chip capacitor	1.8 pF	ATC100B
C18	electrolytic capacitor	470 μ F, 63 V	
R1	resistor	9.1 Ω	SMD 0805
R2, R3	resistor	5.1 Ω	SMD 0805

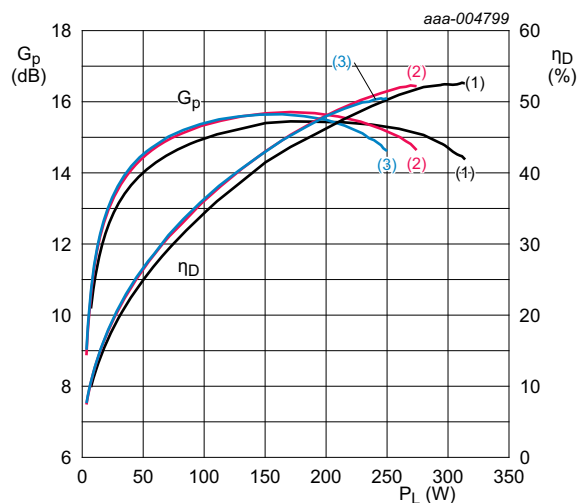
7.4 Graphical data



$V_{DS} = 28$ V; $I_{Dq} = 20$ mA.

- (1) $f = 2400$ MHz
- (2) $f = 2450$ MHz
- (3) $f = 2500$ MHz

Fig 3. Power gain and drain efficiency as function of load power; typical values



$V_{DS} = 28$ V; $I_{Dq} = 20$ mA.

- (1) $f = 2400$ MHz
- (2) $f = 2450$ MHz
- (3) $f = 2500$ MHz

Fig 4. Power gain and drain efficiency as function of load power; typical values

8. Package outline

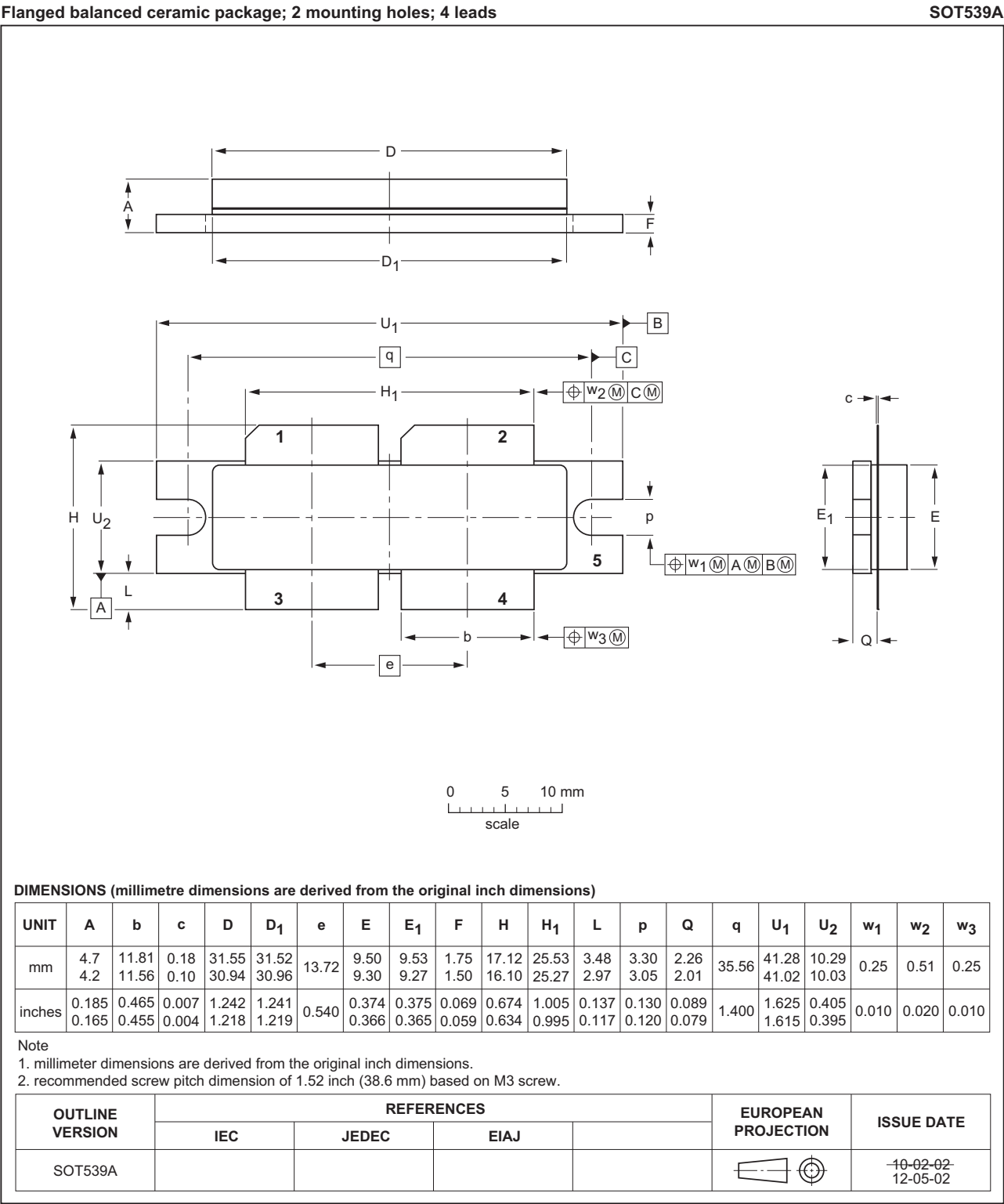
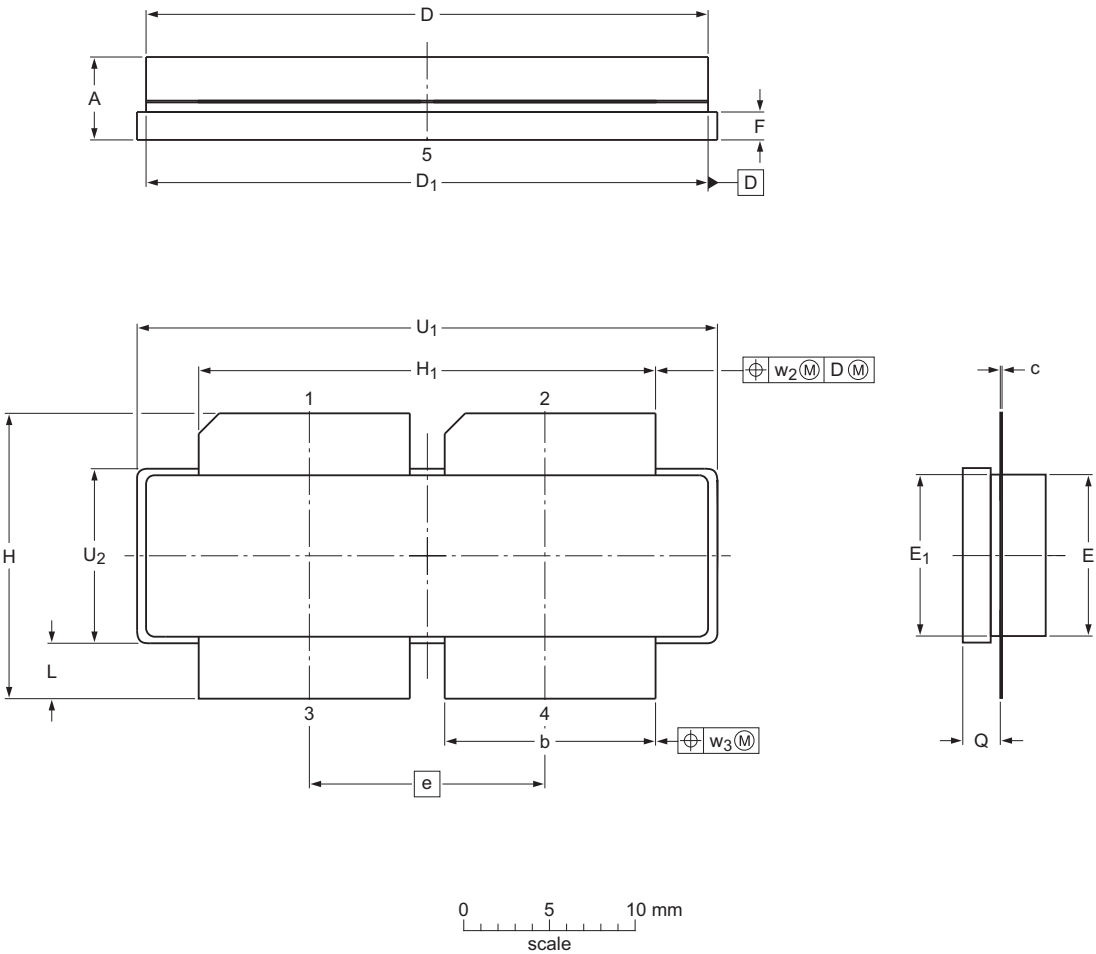


Fig 5. Package outline SOT539A

Earless flanged balanced ceramic package; 4 leads

SOT539B



Dimensions																	
Unit ⁽¹⁾	A	b	c	D	D ₁	E	E ₁	e	F	H	H ₁	L	Q	U ₁	U ₂	w ₂	w ₃
mm	max	4.7	11.81	0.18	31.55	31.52	9.5	9.53	1.75	17.12	25.53	3.48	2.26	32.39	10.29	0.25	0.25
	nom							13.72									
inches	max	0.185	0.465	0.007	1.242	1.241	0.374	0.375	0.069	0.674	1.005	0.137	0.089	1.275	0.405	0.01	0.01
	nom							0.54									
	min	0.165	0.455	0.004	1.218	1.219	0.366	0.365	0.059	0.634	0.995	0.117	0.079	1.265	0.395		

Note 1. millimeter dimensions are derived from the original inch dimensions. sot539b_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT539B						12-05-02 13-05-24

Fig 6. Package outline SOT539B

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
CW	Continuous Wave
ESD	ElectroStatic Discharge
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
SMD	Surface Mounted Device
VSWR	Voltage Standing-Wave Ratio

11. Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLF2425M7L250P_2425M7LS250P#5	20150901	Product data sheet	-	BLF2425M7L250P_2425M7LS250P v.4
Modifications:	- The format of this document has been redesigned to comply with the new identity guidelines of Ampleon. - Legal texts have been adapted to the new company name where appropriate.			
BLF2425M7L250P_2425M7LS250P v.4	20130712	Product data sheet	-	BLF2425M7L250P_2425M7LS250P v.3
BLF2425M7L250P_2425M7LS250P v.3	20130226	Product data sheet	-	BLF2425M7L250P_2425M7LS250P v.2
BLF2425M7L250P_2425M7LS250P v.2	20120906	Objective data sheet	-	BLF2425M7L250P_2425M7LS250P v.1
BLF2425M7L250P_2425M7LS250P v.1	20110718	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.

[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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Date of release: 1 September 2015

Document identifier: BLF2425M7L250P_2425M7LS250P#5