# BLM8G0710S-45AB; BLM8G0710S-45ABG

LDMOS 2-stage power MMIC

Rev. 3 — 15 October 2015

AMPLEON

Product data sheet

## 1. Product profile

### 1.1 General description

The BLM8G0710S-45AB(G) is a dual section, asymmetric, 2-stage power MMIC using Ampleon's state of the art GEN8 LDMOS technology. This multiband device is perfectly suited as small cell final stage in Doherty configuration, or as general purpose driver in the 700 MHz to 1000 MHz frequency range. Available in gull wing or straight lead outline.

**Table 1. Performance**

*Typical RF performance at $T_{case}$ = 25 °C. Test signal: 3GPP test model 1; 64 DPCH; PAR = 9.9 dB at 0.01% probability on CCDF; specified in a class-AB production circuit.*

| Test signal | f | $I_{Dq1}$ [1] | $I_{Dq2}$ [1] | $V_{DS}$ | $P_{L(AV)}$ | $G_p$ | $\eta_D$ | $ACPR_{5M}$ |
|---|---|---|---|---|---|---|---|---|
| | (MHz) | (mA) | (mA) | (V) | (W) | (dB) | (%) | (dBc) |
| single carrier W-CDMA | | | | | | | | |
| carrier section | 957.5 | 30 | 120 | 28 | 3 | 34.7 | 26 | –41.5 |
| peaking section | 957.5 | 60 | 240 | 28 | 6 | 34.7 | 26 | –40 |

[1] $I_{Dq1}$ represents driver stage; $I_{Dq2}$ represents final stage.

### 1.2 Features and benefits

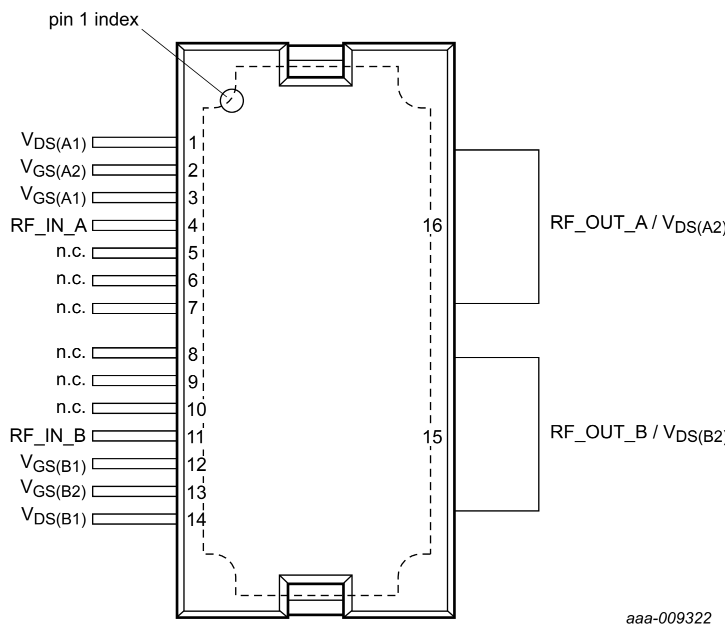
- Designed for broadband operation (frequency 700 MHz to 1000 MHz)
- High section-to-section isolation enabling multiple combinations
- High Doherty efficiency thanks to 2 : 1 asymmetry
- Integrated temperature compensated bias
- Biasing of individual stages is externally accessible
- Integrated ESD protection
- Excellent thermal stability
- High power gain
- On-chip matching for ease of use
- Compliant to Directive 2002/95/EC, regarding restriction of hazardous substances (RoHS)

### 1.3 Applications

- RF power MMIC for W-CDMA base stations in the 700 MHz to 1000 MHz frequency range. Possible circuit topologies are the following as also depicted in Section 8.1:
  - Asymmetric final stage in Doherty configuration
  - Asymmetric driver for high power Doherty amplifier

# 2. Pinning information

## 2.1 Pinning




Transparent top view

The exposed backside of the package is the ground terminal of the device.

**Fig 1. Pin configuration**

## 2.2 Pin description

**Table 2. Pin description**

| Symbol | Pin | Description |
|---|---|---|
| $V_{DS(A1)}$ | 1 | drain-source voltage of carrier section, driver stage (A1) |
| $V_{GS(A2)}$ | 2 | gate-source voltage of carrier section, final stage (A2) |
| $V_{GS(A1)}$ | 3 | gate-source voltage of carrier section, driver stage (A1) |
| RF_IN_A | 4 | RF input carrier section (A) |
| n.c. | 5 | not connected |
| n.c. | 6 | not connected |
| n.c. | 7 | not connected |
| n.c. | 8 | not connected |
| n.c. | 9 | not connected |
| n.c. | 10 | not connected |
| RF_IN_B | 11 | RF input peaking section (B) |
| $V_{GS(B1)}$ | 12 | gate-source voltage of peaking section, driver stage (B1) |
| $V_{GS(B2)}$ | 13 | gate-source voltage of peaking section, final stage (B2) |
| $V_{DS(B1)}$ | 14 | drain-source voltage of peaking section, driver stage (B1) |

**Table 2. Pin description** *...continued*

| Symbol | Pin | Description |
|---|---|---|
| RF_OUT_B/$V_{DS(B2)}$ | 15 | RF output peaking section (B) / drain-source voltage of peaking section, final stage (B2) |
| RF_OUT_A/$V_{DS(A2)}$ | 16 | RF output carrier section (A) / drain-source voltage of carrier section, final stage (A2) |
| GND | flange | RF ground |

## 3. Ordering information

**Table 3. Ordering information**

| Type number | Package | | |
|---|---|---|---|
| | Name | Description | Version |
| BLM8G0710S-45AB | HSOP16F | plastic, heatsink small outline package; 16 leads(flat) | SOT1211-2 |
| BLM8G0710S-45ABG | HSOP16 | plastic, heatsink small outline package; 16 leads | SOT1212-2 |

## 4. Block diagram

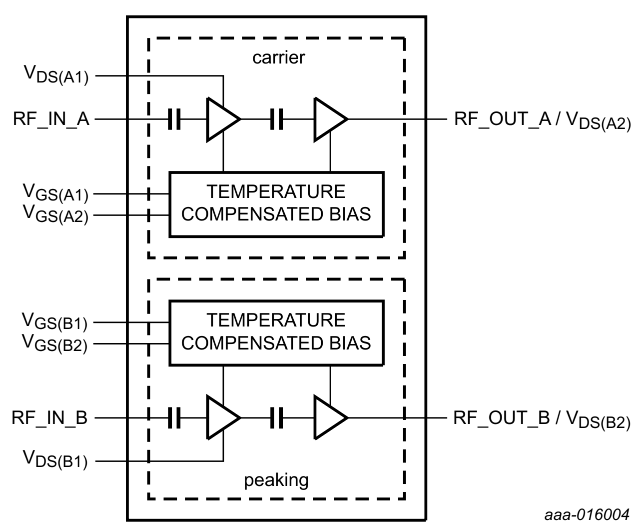



**Fig 2. Block diagram**

## 5. 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 | [1] | - | 225 | °C |
| $T_{case}$ | case temperature | | - | 150 | °C |

[1] Continuous use at maximum temperature will affect the reliability. For details refer to the online MTF calculator.

# 6. Thermal characteristics

**Table 5. Thermal characteristics**

| Symbol | Parameter | Conditions | | Value | Unit |
|---|---|---|---|---|---|
| **Carrier section** | | | | | |
| $R_{th(j-c)}$ | thermal resistance from junction to case | final stage; $T_{case}$ = 90 °C; $P_L$ = 1.26 W | [1] | 3 | K/W |
| | | driver stage; $T_{case}$ = 90 °C; $P_L$ = 1.26 W | [1] | 10.6 | K/W |
| **Peaking section** | | | | | |
| $R_{th(j-c)}$ | thermal resistance from junction to case | final stage; $T_{case}$ = 90 °C; $P_L$ = 2.51 W | [1] | 1.8 | K/W |
| | | driver stage; $T_{case}$ = 90 °C; $P_L$ = 2.51 W | [1] | 7.3 | K/W |

[1] When operated with a CW signal.

# 7. Characteristics

**Table 6. DC characteristics**

*$T_{case}$ = 25 °C; per section unless otherwise specified.*

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| **Carrier section** | | | | | | | |
| Final stage | | | | | | | |
| $V_{(BR)DSS}$ | drain-source breakdown voltage | $V_{GS}$ = 0 V; $I_D$ = 241.3 μA | | 65 | - | - | V |
| $V_{GSq}$ | gate-source quiescent voltage | $V_{DS}$ = 28 V; $I_D$ = 120 mA | | 1.5 | 2 | 2.7 | V |
| | | $V_{DS}$ = 28 V; $I_D$ = 120 mA | [1] | 1.7 | 2.65 | 3.6 | V |
| $\Delta I_{Dq}/\Delta T$ | quiescent drain current variation with temperature | –40 °C ≤ $T_{case}$ ≤ +85 °C | | - | ±0.5 | - | % |
| $I_{DSS}$ | drain leakage current | $V_{GS}$ = 0 V; $V_{DS}$ = 28 V | | - | - | 1.4 | μA |
| $I_{DSX}$ | drain cut-off current | $V_{GS}$ = 5.65 V; $V_{DS}$ = 10 V | | - | 4.2 | - | A |
| $I_{GSS}$ | gate leakage current | $V_{GS}$ = 1.0 V; $V_{DS}$ = 0 V | | - | - | 140 | nA |
| Driver stage | | | | | | | |
| $V_{(BR)DSS}$ | drain-source breakdown voltage | $V_{GS}$ = 0 V; $I_D$ = 60.3 μA | | 65 | - | - | V |
| $V_{GSq}$ | gate-source quiescent voltage | $V_{DS}$ = 28 V; $I_D$ = 30 mA | | 1.5 | 2.1 | 2.7 | V |
| | | $V_{DS}$ = 28 V; $I_D$ = 30 mA | [2] | 1.7 | 2.65 | 3.6 | V |
| $\Delta I_{Dq}/\Delta T$ | quiescent drain current variation with temperature | –40 °C ≤ $T_{case}$ ≤ +85 °C | | - | ±0.5 | - | % |
| $I_{DSS}$ | drain leakage current | $V_{GS}$ = 0 V; $V_{DS}$ = 28 V | | - | - | 1.4 | μA |
| $I_{DSX}$ | drain cut-off current | $V_{GS}$ = 5.65 V; $V_{DS}$ = 10 V | | - | 1.05 | - | A |
| $I_{GSS}$ | gate leakage current | $V_{GS}$ = 1.0 V; $V_{DS}$ = 0 V | | - | - | 140 | nA |
| **Peaking section** | | | | | | | |
| Final stage | | | | | | | |
| $V_{(BR)DSS}$ | drain-source breakdown voltage | $V_{GS}$ = 0 V; $I_D$ = 482.6 μA | | 65 | - | - | V |
| $V_{GSq}$ | gate-source quiescent voltage | $V_{DS}$ = 28 V; $I_D$ = 240 mA | | 1.5 | 2 | 2.7 | V |
| | | $V_{DS}$ = 28 V; $I_D$ = 240 mA | [1] | 1.7 | 2.65 | 3.6 | V |
| $\Delta I_{Dq}/\Delta T$ | quiescent drain current variation with temperature | –40 °C ≤ $T_{case}$ ≤ +85 °C | | - | ±1 | - | % |
| $I_{DSS}$ | drain leakage current | $V_{GS}$ = 0 V; $V_{DS}$ = 28 V | | - | - | 1.4 | μA |
| $I_{DSX}$ | drain cut-off current | $V_{GS}$ = 5.65 V; $V_{DS}$ = 10 V | | - | 8.3 | - | A |
| $I_{GSS}$ | gate leakage current | $V_{GS}$ = 1.0 V; $V_{DS}$ = 0 V | | - | - | 140 | nA |

**Table 6. DC characteristics** *…continued*

*$T_{case}$ = 25 °C; per section unless otherwise specified.*

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Driver stage | | | | | | |
| $V_{(BR)DSS}$ | drain-source breakdown voltage | $V_{GS}$ = 0 V; $I_D$ = 120.6 μA | 65 | - | - | V |
| $V_{GSq}$ | gate-source quiescent voltage | $V_{DS}$ = 28 V; $I_D$ = 60 mA | 1.5 | 2 | 2.7 | V |
| | | $V_{DS}$ = 28 V; $I_D$ = 60 mA [2] | 1.7 | 2.65 | 3.6 | V |
| $\Delta I_{Dq}/\Delta T$ | quiescent drain current variation with temperature | −40 °C ≤ $T_{case}$ ≤ +85 °C | - | ±1 | - | % |
| $I_{DSS}$ | drain leakage current | $V_{GS}$ = 0 V; $V_{DS}$ = 28 V | - | - | 1.4 | μA |
| $I_{DSX}$ | drain cut-off current | $V_{GS}$ = 5.65 V; $V_{DS}$ = 10 V | - | 2.1 | - | A |
| $I_{GSS}$ | gate leakage current | $V_{GS}$ = 1.0 V; $V_{DS}$ = 0 V | - | - | 140 | nA |

[1] In production circuit with 1.3 kΩ gate feed resistor.

[2] In production circuit with 1.2 kΩ gate feed resistor.

**Table 7. RF Characteristics**

*Typical RF performance at $T_{case}$ = 25 °C; $V_{DS}$ = 28 V; $I_{Dq1}$ = 30 mA (carrier section, driver stage); $I_{Dq2}$ = 120 mA (carrier section, final stage); $P_{L(AV)}$ = 3 W (carrier section); $I_{Dq1}$ = 60 mA (peaking section, driver stage); $I_{Dq2}$ = 240 mA (peaking section, final stage); $P_{L(AV)}$ = 6 W (peaking section) unless otherwise specified, measured in an Ampleon straight lead production circuit.*

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Carrier section** | | | | | | |
| Test signal: single carrier W-CDMA [1] | | | | | | |
| $G_p$ | power gain | f = 730.5 MHz | - | 35.3 | - | dB |
| | | f = 957.5 MHz | 33.2 | 34.7 | 36.2 | dB |
| $\eta_D$ | drain efficiency | f = 730.5 MHz | - | 23.4 | - | % |
| | | f = 957.5 MHz | 21 | 26 | - | % |
| $RL_{in}$ | input return loss | f = 957.5 MHz | - | −19 | −10 | dB |
| $ACPR_{5M}$ | adjacent channel power ratio (5 MHz) | f = 730.5 MHz | - | −38.5 | - | dBc |
| | | f = 957.5 MHz | - | −41.5 | −36.5 | dBc |
| $PAR_O$ | output peak-to-average ratio | f = 730.5 MHz | - | 8.1 | - | dB |
| | | f = 957.5 MHz | 7.1 | 8.4 | - | dB |
| **Peaking section** | | | | | | |
| Test signal: single carrier W-CDMA [1] | | | | | | |
| $G_p$ | power gain | f = 730.5 MHz | - | 35.6 | - | dB |
| | | f = 957.5 MHz | 33.2 | 34.7 | 36.2 | dB |
| $\eta_D$ | drain efficiency | f = 730.5 MHz | - | 23.4 | - | % |
| | | f = 957.5 MHz | 21 | 26 | - | % |
| $RL_{in}$ | input return loss | f = 957.5 MHz | - | −17 | −10 | dB |
| $ACPR_{5M}$ | adjacent channel power ratio (5 MHz) | f = 730.5 MHz | - | −39.5 | - | dBc |
| | | f = 957.5 MHz | - | −40 | −34.5 | dBc |
| $PAR_O$ | output peak-to-average ratio | f = 730.5 MHz | - | 8 | - | dB |
| | | f = 957.5 MHz | 6.7 | 8 | - | dB |

**Table 7. RF Characteristics** *...continued*

*Typical RF performance at $T_{case}$ = 25 °C; $V_{DS}$ = 28 V; $I_{Dq1}$ = 30 mA (carrier section, driver stage); $I_{Dq2}$ = 120 mA (carrier section, final stage); $P_{L(AV)}$ = 3 W (carrier section); $I_{Dq1}$ = 60 mA (peaking section, driver stage); $I_{Dq2}$ = 240 mA (peaking section, final stage); $P_{L(AV)}$ = 6 W (peaking section) unless otherwise specified, measured in an Ampleon straight lead production circuit.*

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Test signal: CW [2] | | | | | | |
| $\Delta\varphi_{s21}$ | phase response difference | normalized; between sections | –10 | - | +10 | deg |
| $\Delta\|s_{21}\|^2$ | insertion power gain difference | normalized; between sections | –0.5 | - | +0.5 | dB |

[1] 3GPP test model 1; 64 DPCH; PAR = 9.9 dB at 0.01% probability on CCDF.

[2] f = 957.5 MHz.

## 8. Application information

**Table 8. Doherty typical performance**

*Test signal: 1-tone CW; RF performance at $T_{case}$ = 25 °C; $V_{DS}$ = 28 V; $I_{Dq1}$ = 130 mA (carrier section, final stage); $I_{Dq2}$ = 4 mA (peaking section, final stage); unless otherwise specified, measured in an Ampleon, f = 925 MHz to 960 MHz, Doherty application circuit (see Figure 3 and Figure 4).*

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $P_{L(3dB)}$ | output power at 3 dB gain compression | f = 942.5 MHz; 1-tone pulsed CW (10 % duty cycle) | - | 63.9 | - | W |
| $\eta_D$ | drain efficiency | at 9 dB OBO ($P_L$ = 8.3 W); f = 942.5 MHz; 1-tone pulsed CW (10 % duty cycle) | - | 44.7 | - | % |
| $G_p$ | power gain | $P_{L(AV)}$ = 8.3 W; f = 942.5 MHz | - | 28.5 | - | dB |
| $B_{video}$ | video bandwidth | $P_{L(AV)}$ = 4 W; f = 942.5 MHz; 2-tone CW | - | 150 | - | MHz |
| $G_{flat}$ | gain flatness | $P_{L(AV)}$ = 8.3 W | - | 0.7 | - | dB |
| K | Rollett stability factor | $T_{case}$ = –40 °C; f = 0.1 GHz to 3 GHz [1] | - | >1 | - | |

[1] For carrier and peaking sections (S-parameters measured with load-pull jig).

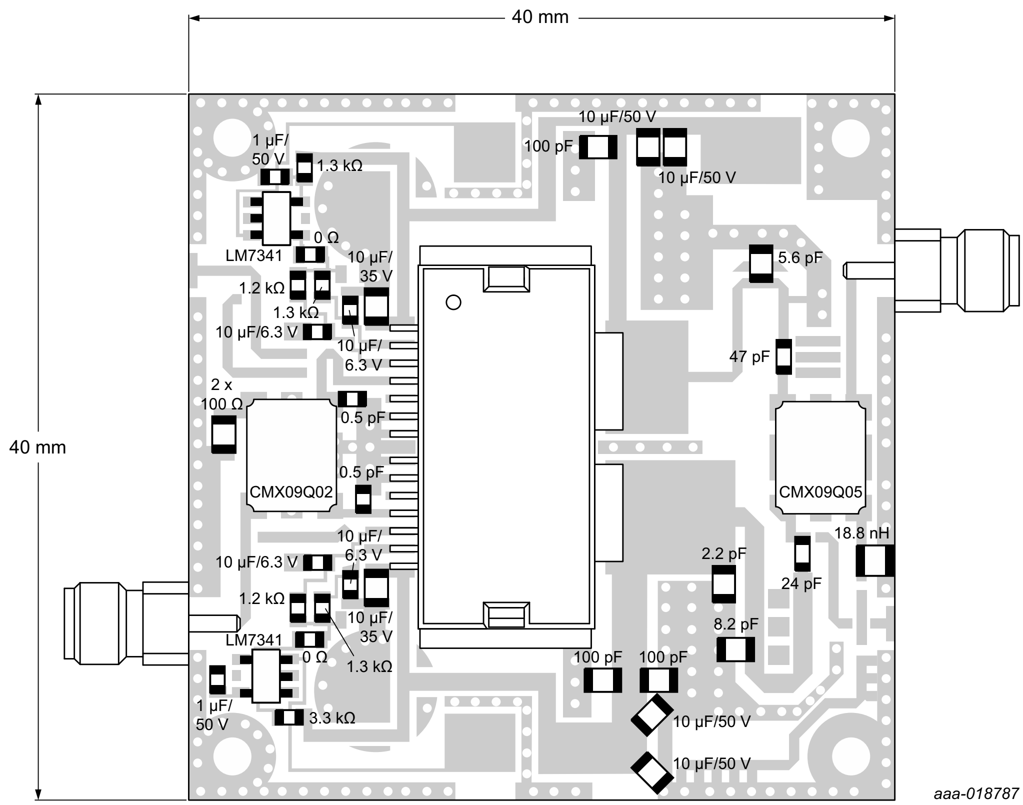



**Fig 3. Component layout**

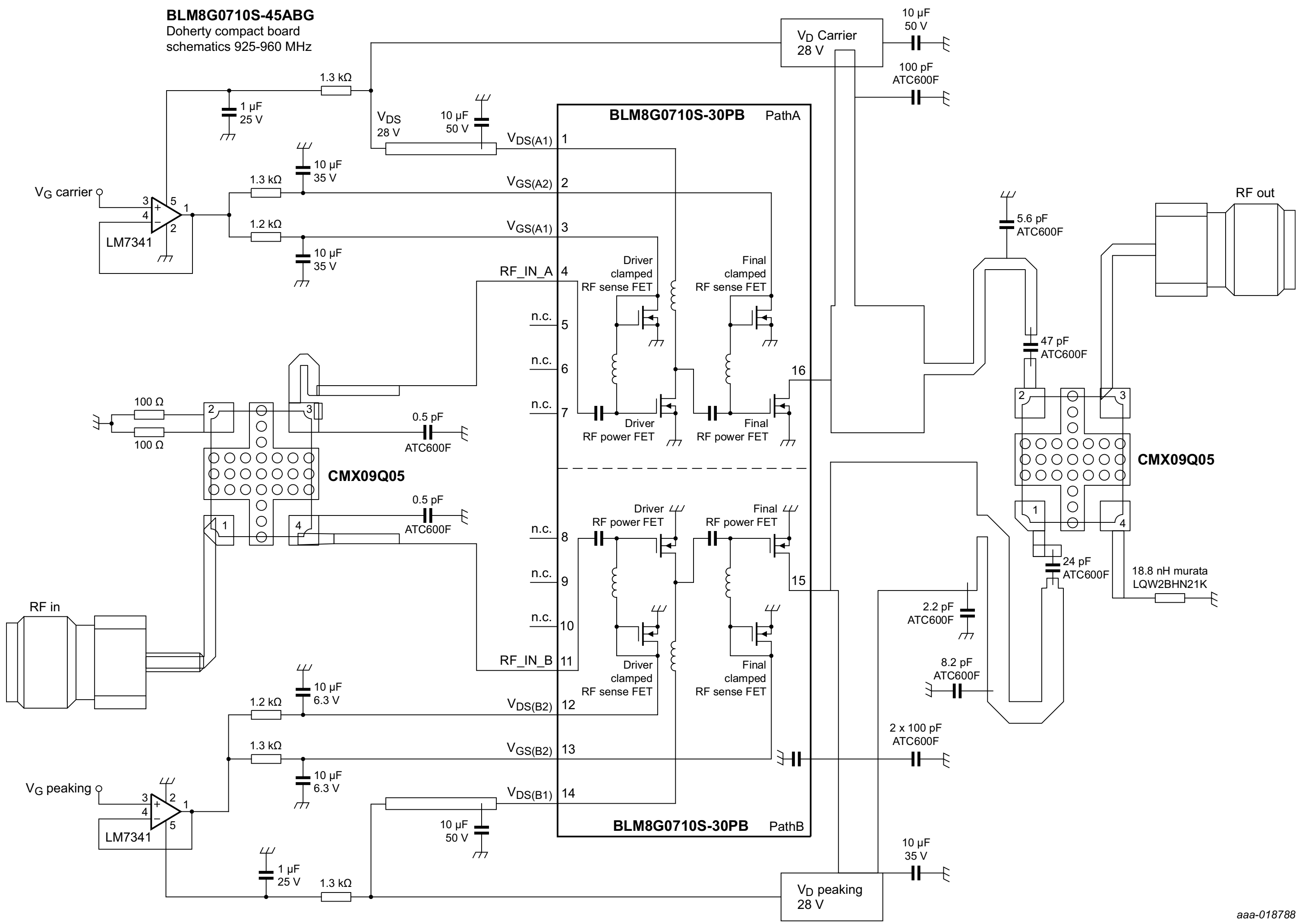



Fig 4. Electrical schematic

## 8.1 Possible circuit topologies

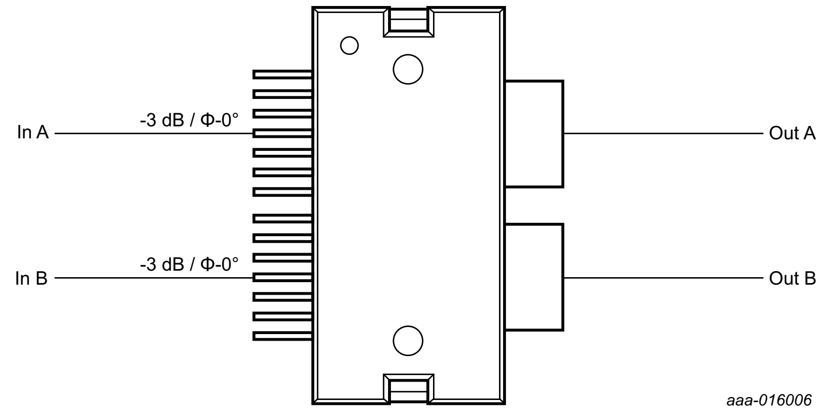



**Fig 5. Dual section**

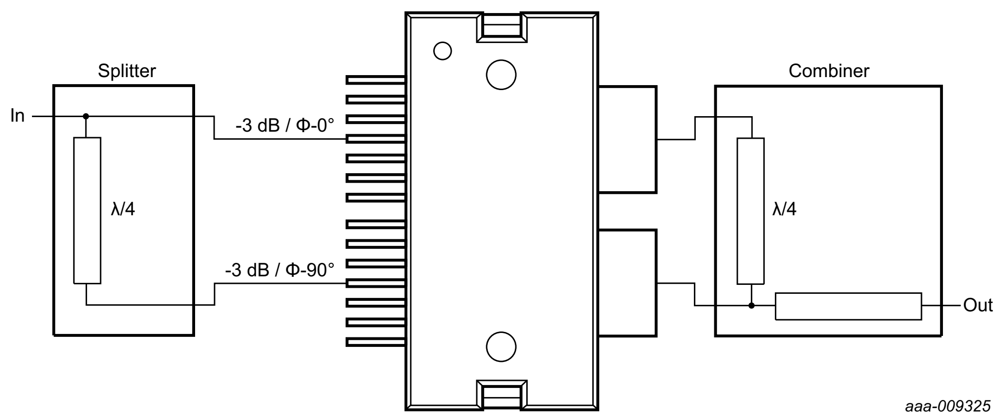



**Fig 6. Doherty**

## 8.2 Ruggedness in class-AB operation

The BLM8G0710S-45AB and BLM8G0710S-45ABG are capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: f = 840 MHz; $V_{DS}$ = 32 V; $I_{Dq1}$ = 40 mA (carrier section, driver stage); $I_{Dq2}$ = 120 mA (carrier section, final stage); $I_{Dq1}$ = 60 mA (peaking section, driver stage); $I_{Dq2}$ = 240 mA (peaking section, final stage); $P_i$ = 13 dBm (carrier section); $P_i$ = 14 dBm (peaking section). $P_i$ is measured at CW and corresponding to $P_{L(3dB)}$ under $Z_S$ = 50 Ω load.

## 8.3 Impedance information

**Table 9. Typical impedance**

*Measured load-pull data at 3 dB gain compression point; test signal: pulsed CW; $T_{case}$ = 25 °C; $V_{DS}$ = 28 V; $t_p$ = 100 μs; δ = 10 %; $Z_S$ = 50 Ω; $I_{Dq1}$ = 30 mA (carrier section, driver stage); $I_{Dq2}$ = 120 mA (carrier section, final stage); $I_{Dq1}$ = 60 mA (peaking section, driver stage); $I_{Dq2}$ = 240 mA (peaking section, final stage). Typical values unless otherwise specified.*

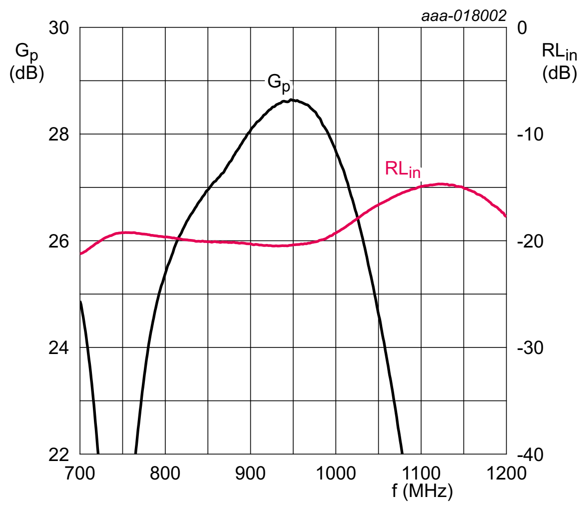
| f | tuned for maximum output power | | | | | tuned for maximum power added efficiency | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $Z_L$ | $G_{p(max)}$ | $P_L$ | $\eta_{add}$ | AM-PM conversion | $Z_L$ | $G_{p(max)}$ | $P_L$ | $\eta_{add}$ | AM-PM conversion |
| (MHz) | (Ω) | (dB) | (W) | (%) | (deg) | (Ω) | (dB) | (W) | (%) | (deg) |
| **Carrier section** | | | | | | | | | | |
| BLM8G0710S-45AB | | | | | | | | | | |
| 700 | 6.2 + j3.6 | 33.9 | 44.8 | 56.4 | −8.5 | 9.2 + j8.5 | 35.5 | 43.5 | 67.3 | −10.7 |
| 720 | 6.2 + j3.7 | 34 | 44.8 | 56.8 | −8 | 8.8 + j9.6 | 35.7 | 43 | 67 | −11 |
| 740 | 6.3 + j3.6 | 33.9 | 44.8 | 57.2 | −7.2 | 8.5 + j8.7 | 35.4 | 43.3 | 66.7 | −9.7 |
| 760 | 6.3 + j3.5 | 33.8 | 44.8 | 57.4 | −6.1 | 9.4 + j8.4 | 35.3 | 43.3 | 66.7 | −7.3 |
| 780 | 6.2 + j3.5 | 33.6 | 44.8 | 57.7 | −6.2 | 8.4 + j8.5 | 35.1 | 43.2 | 66.1 | −8.2 |
| 800 | 6.2 + j2.8 | 33.4 | 44.9 | 56.3 | −5 | 9.2 + j8.5 | 35.1 | 43.2 | 65.4 | −6.1 |
| 820 | 6.3 + j2.9 | 33.3 | 44.8 | 56.8 | −5.7 | 8.7 + j6.8 | 34.6 | 43.7 | 65.1 | −6.3 |
| 840 | 6.8 + j2.2 | 33.1 | 44.9 | 56.5 | −4.1 | 7.9 + j6.9 | 34.6 | 43.7 | 65.1 | −6.2 |
| 860 | 7.4 + j1.7 | 33.1 | 44.8 | 56.2 | −4 | 7.9 + j6.8 | 34.5 | 43.7 | 64.5 | −6.2 |
| 880 | 7.4 + j1.7 | 33.1 | 44.8 | 56.2 | −3.3 | 7.8 + j6.8 | 34.5 | 43.6 | 64 | −5.3 |
| 900 | 7.2 + j0.9 | 32.9 | 44.8 | 54.3 | −3.4 | 7.8 + j6.8 | 34.6 | 43.5 | 63.8 | −5.2 |
| 920 | 7.3 + j0.9 | 32.9 | 44.7 | 54.2 | −2.7 | 8.1 + j7.8 | 34.8 | 43.1 | 63.1 | −3.9 |
| 940 | 8.1 + j0.7 | 33.2 | 44.7 | 55.2 | −2 | 8.3 + j5.9 | 34.6 | 43.7 | 62.4 | −2.8 |
| 960 | 7.2 + j0.9 | 33.2 | 44.6 | 53.4 | −2.4 | 8.7 + j6.7 | 34.8 | 43.3 | 61.8 | −1.9 |
| 980 | 8.0 + j0.8 | 33.4 | 44.7 | 55.1 | −2 | 8.6 + j6.8 | 34.8 | 43.3 | 62.1 | −1.5 |
| BLM8G0710S-45ABG | | | | | | | | | | |
| 700 | 6.4 + j3.1 | 34.4 | 44.4 | 55.3 | −8.8 | 8.5 + j8.5 | 36.1 | 42.9 | 65.8 | −12.7 |
| 720 | 6.3 + j3.4 | 34.6 | 44.4 | 56.6 | −8.3 | 8.9 + j8.8 | 36.1 | 42.8 | 66.8 | −11 |
| 740 | 6.5 + j2.6 | 34.4 | 44.5 | 55.5 | −7.6 | 8.3 + j8.2 | 36 | 42.9 | 65.4 | −10.9 |
| 760 | 7.4 + j1.8 | 34.2 | 44.5 | 55.9 | −6 | 8.8 + j8.7 | 35.9 | 42.6 | 65.1 | −9.2 |
| 780 | 6.5 + j1.6 | 33.6 | 44.5 | 53.1 | −5.5 | 7.3 + j8.1 | 35.5 | 42.7 | 64.2 | −10.2 |
| 800 | 7.1 + j1.3 | 33.6 | 44.7 | 55.7 | −4.8 | 7.1 + j8.0 | 35.5 | 42.8 | 64.9 | −9.7 |
| 820 | 6.4 + j1.2 | 33.3 | 44.7 | 54.2 | −4.8 | 8.3 + j8.2 | 35.3 | 42.6 | 64 | −6.9 |
| 840 | 7.0 + j0.8 | 33.3 | 44.7 | 55 | −4.7 | 8.1 + j8.1 | 35.3 | 42.5 | 63.5 | −7 |
| 860 | 7.5 + j0.5 | 33.3 | 44.6 | 54.7 | −4.4 | 8.4 + j7.1 | 35.1 | 42.9 | 63.4 | −6 |
| 880 | 7.4 + j0.7 | 33.4 | 44.5 | 54.6 | −4.3 | 8.2 + j7.4 | 35.3 | 42.7 | 62.3 | −6 |
| 900 | 8.2 + j0.3 | 33.6 | 44.4 | 54.8 | −2.9 | 8.0 + j7.2 | 35.4 | 42.6 | 62.1 | −4.9 |
| 920 | 7.4 + j0.1 | 33.4 | 44.5 | 53.8 | −2.8 | 7.3 + j6.3 | 35.3 | 42.9 | 61.8 | −5.4 |
| 940 | 8.0 + j0.1 | 33.5 | 44.4 | 53.9 | −2.4 | 6.8 + j6.5 | 35.4 | 42.6 | 60.9 | −5.7 |
| 960 | 7.9 − j0.6 | 33.5 | 44.3 | 52.4 | −2 | 7.0 + j6.9 | 35.8 | 42.4 | 60.5 | −4.2 |
| 980 | 7.7 − j0.5 | 33.7 | 44.4 | 53 | −1.6 | 7.1 + j6.3 | 35.5 | 42.6 | 61.3 | −3 |

**Table 9. Typical impedance** *…continued*

*Measured load-pull data at 3 dB gain compression point; test signal: pulsed CW; $T_{case}$ = 25 °C; $V_{DS}$ = 28 V; $t_p$ = 100 μs; δ = 10 %; $Z_S$ = 50 Ω; $I_{Dq1}$ = 30 mA (carrier section, driver stage); $I_{Dq2}$ = 120 mA (carrier section, final stage); $I_{Dq1}$ = 60 mA (peaking section, driver stage); $I_{Dq2}$ = 240 mA (peaking section, final stage). Typical values unless otherwise specified.*

| f | tuned for maximum output power | | | | | tuned for maximum power added efficiency | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $Z_L$ | $G_{p(max)}$ | $P_L$ | $\eta_{add}$ | AM-PM conversion | $Z_L$ | $G_{p(max)}$ | $P_L$ | $\eta_{add}$ | AM-PM conversion |
| (MHz) | (Ω) | (dB) | (W) | (%) | (deg) | (Ω) | (dB) | (W) | (%) | (deg) |
| **Peaking section** | | | | | | | | | | |
| BLM8G0710S-45AB | | | | | | | | | | |
| 700 | 3.0 + j2.1 | 36.1 | 47.2 | 55.1 | 2.4 | 4.2 + j5.2 | 37.6 | 45.3 | 65.7 | −1.5 |
| 720 | 3.0 + j1.7 | 35.9 | 47.3 | 53.4 | 2.5 | 4.4 + j5.0 | 37.8 | 45.4 | 64.6 | −1 |
| 740 | 3.0 + j1.7 | 35.8 | 47.4 | 54.8 | 3 | 4.2 + j4.5 | 37.5 | 45.7 | 64.7 | −0.2 |
| 760 | 3.0 + j1.3 | 35.4 | 47.4 | 53.5 | 3 | 4.1 + j4.8 | 37.2 | 45.4 | 64.3 | −0.9 |
| 780 | 3.3 + j1.3 | 35.3 | 47.5 | 55 | 2.4 | 4.0 + j4.4 | 37 | 45.7 | 63.7 | −1.3 |
| 800 | 3.2 + j0.9 | 35.2 | 47.5 | 53.8 | 3.1 | 3.9 + j4.2 | 37 | 45.8 | 64 | −1 |
| 820 | 3.3 + j1.0 | 35 | 47.5 | 54.9 | 2.4 | 4.1 + j3.8 | 36.7 | 46 | 63.6 | −0.1 |
| 840 | 3.4 + j0.5 | 34.8 | 47.5 | 53.2 | 2.3 | 3.8 + j4.0 | 36.8 | 45.7 | 63.4 | −1.3 |
| 860 | 3.5 + j0.5 | 34.7 | 47.5 | 53.8 | 2.1 | 3.8 + j3.8 | 36.7 | 45.7 | 63.1 | −1.2 |
| 880 | 3.4 + j0.4 | 34.8 | 47.4 | 53.2 | 1.8 | 4.0 + j3.5 | 36.7 | 45.9 | 63.1 | −0.3 |
| 900 | 3.4 + j0.3 | 34.7 | 47.4 | 53.4 | 2.1 | 3.7 + j3.6 | 36.8 | 45.7 | 63 | −0.9 |
| 920 | 3.4 + j0.4 | 34.7 | 47.4 | 54.4 | 1.4 | 3.8 + j3.7 | 36.8 | 45.5 | 63 | −0.5 |
| 940 | 3.5 + j0.0 | 34.5 | 47.3 | 52.9 | 1.1 | 3.5 + j3.2 | 36.6 | 45.7 | 62.3 | −0.5 |
| 960 | 3.5 − j0.1 | 34.2 | 47.3 | 52.7 | 1.3 | 3.5 + j3.1 | 36.4 | 45.7 | 62 | −0.3 |
| 980 | 3.5 − j0.1 | 34.2 | 47.3 | 53.9 | 0.4 | 3.4 + j2.8 | 36.2 | 45.8 | 62.2 | −1 |
| BLM8G0710S-45ABG | | | | | | | | | | |
| 700 | 3.0 + j0.6 | 36.3 | 47.5 | 55.1 | 0.3 | 4.5 + j3.6 | 37.7 | 45.8 | 66.1 | −3.2 |
| 720 | 3.0 + j0.6 | 36.4 | 47.5 | 55.6 | 0.6 | 4.4 + j3.1 | 37.7 | 46.1 | 65.7 | −2.2 |
| 740 | 2.9 + j0.3 | 35.9 | 47.6 | 54.6 | 1.9 | 4.1 + j3.4 | 37.3 | 45.8 | 65.4 | −2 |
| 760 | 3.0 + j0.2 | 35.6 | 47.7 | 56 | 0.6 | 4.4 + j2.8 | 37 | 46.1 | 65.1 | −2.2 |
| 780 | 3.3 − j0.1 | 35.5 | 47.7 | 55.9 | 0.9 | 4.3 + j2.9 | 37 | 46 | 64.7 | −2.9 |
| 800 | 3.3 − j0.5 | 35.4 | 47.7 | 54.4 | 0.8 | 3.9 + j2.6 | 37 | 46.1 | 64.4 | −3.2 |
| 820 | 3.3 − j0.5 | 35.8 | 47.7 | 55.2 | 1.3 | 4.1 + j2.3 | 37.3 | 46.2 | 64 | −1.8 |
| 840 | 3.3 − j0.5 | 35.5 | 47.6 | 55.4 | 1.3 | 4.1 + j2.1 | 36.6 | 46.3 | 63.7 | −1.3 |
| 860 | 3.5 − j0.9 | 34.5 | 47.7 | 54.9 | 0.6 | 3.8 + j2.0 | 35.9 | 46.3 | 63.7 | −2.5 |
| 880 | 3.4 − j1.0 | 34.7 | 47.6 | 54.2 | −0.1 | 3.6 + j2.0 | 36.4 | 46.1 | 63.1 | −3.2 |
| 900 | 3.4 − j1.2 | 34.8 | 47.6 | 54.2 | 0 | 3.7 + j1.8 | 36.5 | 46.1 | 63.3 | −2.7 |
| 920 | 3.4 − j1.1 | 35 | 47.6 | 55.4 | −0.4 | 3.7 + j1.8 | 36.6 | 45.9 | 63.2 | −1.9 |
| 940 | 3.5 − j1.4 | 34.7 | 47.5 | 54.7 | −0.3 | 3.8 + j1.6 | 36.4 | 46 | 62.8 | −1.2 |
| 960 | 3.5 − j1.6 | 34.4 | 47.5 | 54.9 | −0.4 | 3.5 + j1.3 | 36.1 | 46 | 62.8 | −2.2 |
| 980 | 3.2 − j1.6 | 33.9 | 47.5 | 54.6 | −2.1 | 3.5 + j1.0 | 35.7 | 46.2 | 63.1 | −2.5 |

## 8.4 Graphs

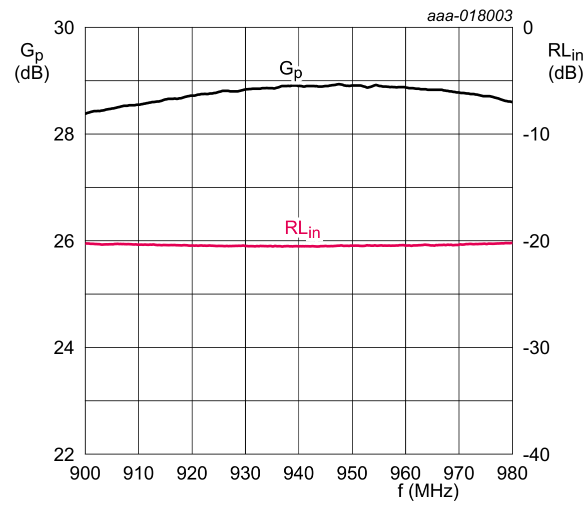



$T_{case}$ = 25 °C; $V_{DS}$ = 28 V; $I_{Dq}$ = 130 mA (carrier section); $I_{Dq}$ = 4 mA (peaking section); $P_L$ = 1.25 W.

(1) magnitude of $G_p$

(2) magnitude of $RL_{in}$

**Fig 7. Wideband power gain and input return loss as function of frequency; typical values**

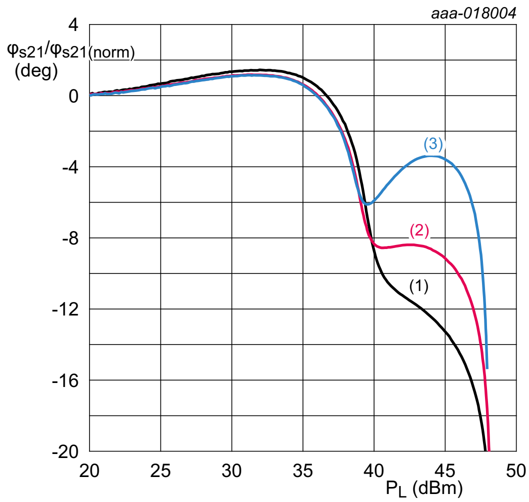



$T_{case}$ = 25 °C; $V_{DS}$ = 28 V; $I_{Dq}$ = 130 mA (carrier section); $I_{Dq}$ = 4 mA (peaking section); $P_L$ = 1.25 W.

(1) magnitude of $G_p$

(2) magnitude of $RL_{in}$

**Fig 8. In-band power gain and input return loss as function of frequency; typical values**



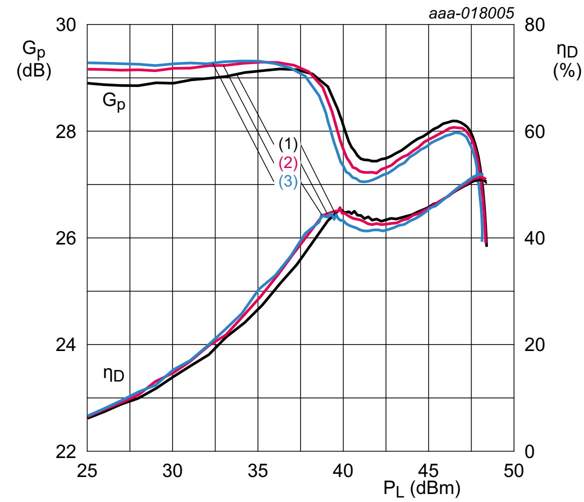

$T_{case}$ = 25 °C; $V_{DS}$ = 28 V; $I_{Dq}$ = 130 mA (carrier section); $I_{Dq}$ = 4 mA (peaking section).

(1) f = 925 MHz

(2) f = 942.5 MHz

(3) f = 960 MHz

**Fig 9. Normalized phase response as a function of output power; typical values**



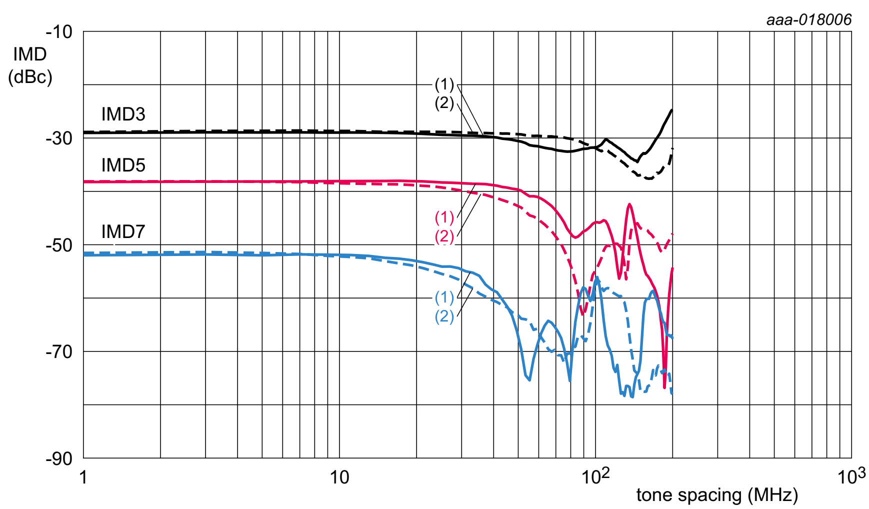

$T_{case}$ = 25 °C; $V_{DS}$ = 28 V; $I_{Dq}$ = 130 mA (carrier section); $I_{Dq}$ = 4 mA (peaking section); 1-tone pulsed CW (δ = 10 %).

(1) f = 925 MHz

(2) f = 942.5 MHz

(3) f = 960 MHz

**Fig 10. Power gain and drain efficiency as function of output power; typical values**

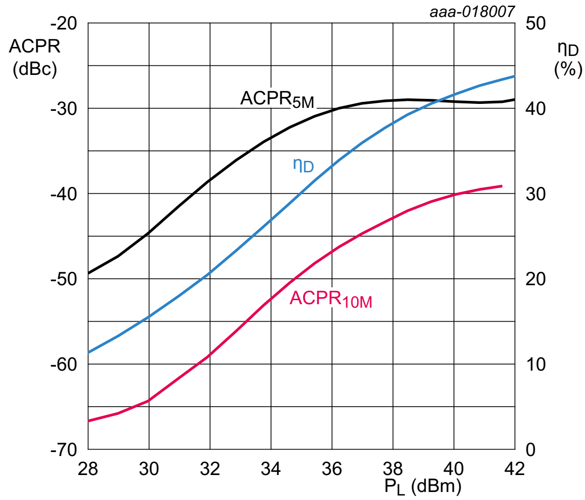



$T_{case}$ = 25 °C; $V_{DS}$ = 28 V; $I_{Dq}$ = 130 mA (carrier section); $I_{Dq}$ = 4 mA (peaking section); f = 942.5 MHz.

(1) IMD low

(2) IMD high

**Fig 11. Intermodulation distortion as a function of tone spacing; typical values**

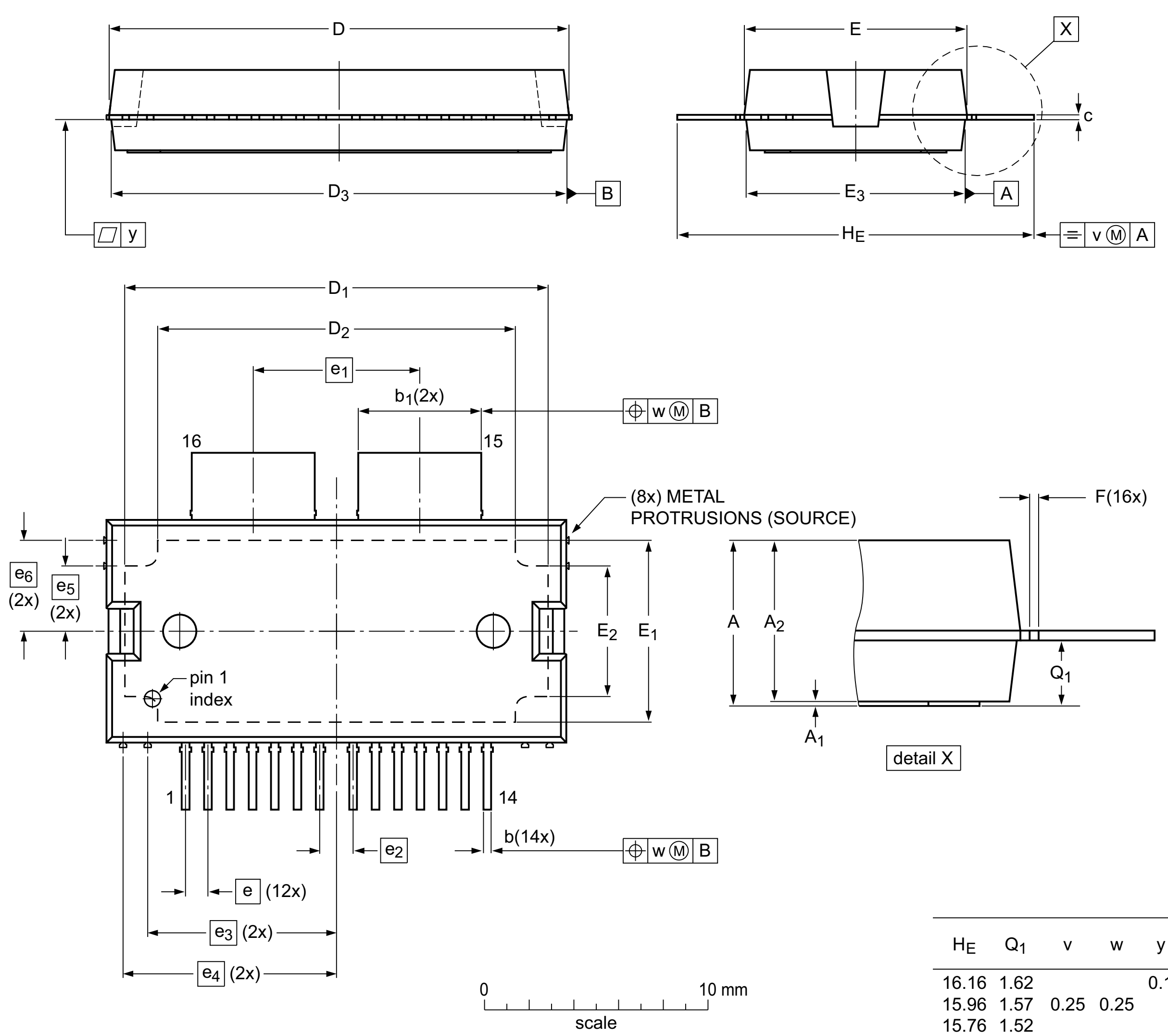



$T_{case}$ = 25 °C; $V_{DS}$ = 28 V; $I_{Dq}$ = 130 mA (carrier section); $I_{Dq}$ = 4 mA (peaking section): f = 942.5 MHz; single carrier W-CDMA; test model 1; PAR = 9.9 dB at 0.01 % probability on CCDF.

**Fig 12. Adjacent channel power ratio and drain efficiency as function of output power; typical values**

## 9. Package outline

**HSOP16F: plastic, heatsink small outline package; 16 leads(flat)** **SOT1211-2**




| $H_E$ | $Q_1$ | v | w | y |
|---|---|---|---|---|
| 16.16 | 1.62 | | | 0.1 |
| 15.96 | 1.57 | 0.25 | 0.25 | |
| 15.76 | 1.52 | | | |

Dimensions (mm are the original dimensions)

| Unit | | A | $A_1$ | $A_2$ | b | $b_1$ | c | D(1) | $D_1$ | $D_2$ | $D_3$ | E(1) | $E_1$ | $E_2$ | $E_3$ | e | $e_1$ | $e_2$ | $e_3$ | $e_4$ | $e_5$ | $e_6$ | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | max | 3.9 | 0.2 | 3.65 | 0.40 | 5.55 | 0.27 | 20.62 | 19.00 | 16.05 | 20.44 | 10.01 | 8.18 | 5.89 | 9.83 | | | | | | | | |
| | nom | | 0.1 | 3.60 | 0.35 | 5.50 | 0.22 | 20.57 | 18.95 | 16.00 | 20.39 | 9.96 | 8.13 | 5.84 | 9.78 | 1.0 | 7.45 | 1.5 | 8.45 | 9.55 | 2.97 | 4.07 | 0.2 |
| | min | | 0 | 3.55 | 0.30 | 5.45 | 0.17 | 20.52 | 18.90 | 15.95 | 20.34 | 9.91 | 8.08 | 5.79 | 9.73 | | | | | | | | |

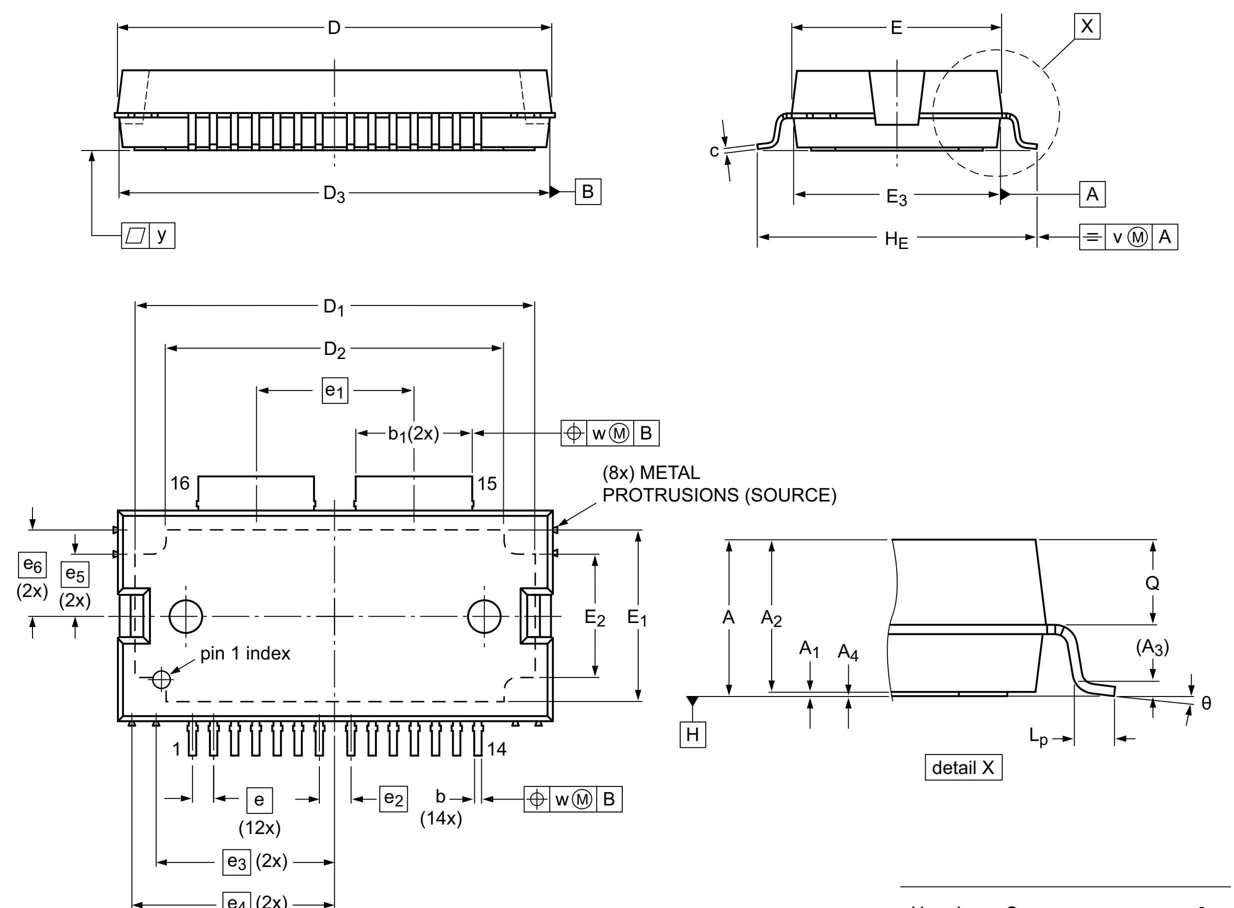
Note
1. Package body dimensions “D and “E do not include mold and metal protrusions. Allowable protrusion is 0.25 mm per side.
2. Lead width dimensions “b and “ $b_1$ do not include dambar protrusions. Allowable dambar protrusion is 0.25 mm in total per lead.

*sot1211-2_po*

| Outline version | References | | | | European projection | Issue date |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT1211-2 | | | | | | ~~15-01-12~~<br>15-06-09 |

**Fig 13. Package outline SOT1211-2 (HSOP16F)**

**HSOP16: plastic, heatsink small outline package; 16 leads** **SOT1212-2**




| $H_E$ | $L_p$ | Q | v | w | y | θ |
|---|---|---|---|---|---|---|
| 13.5 | 1.10 | 2.07 | | | 0.1 | 7° |
| 13.2 | 0.95 | 2.02 | 0.25 | 0.25 | | 3° |
| 12.9 | 0.80 | 1.97 | | | | 0° |

0 10 mm
scale

Dimensions (mm are the original dimensions)

| Unit | | A | $A_1$ | $A_2$ | $A_3$ | $A_4$ | b | $b_1$ | c | $D^{(1)}$ | $D_1$ | $D_2$ | $D_3$ | $E^{(1)}$ | $E_1$ | $E_2$ | $E_3$ | e | $e_1$ | $e_2$ | $e_3$ | $e_4$ | $e_5$ | $e_6$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | max | 3.9 | 0.2 | 3.65 | | 0.06 | 0.40 | 5.55 | 0.27 | 20.62 | 19.00 | 16.05 | 20.44 | 10.01 | 8.18 | 5.89 | 9.83 | | | | | | | |
| | nom | | 0.1 | 3.60 | 0.35 | 0 | 0.35 | 5.50 | 0.22 | 20.57 | 18.95 | 16.00 | 20.39 | 9.96 | 8.13 | 5.84 | 9.78 | 1.0 | 7.45 | 1.5 | 8.45 | 9.55 | 2.97 | 4.07 |
| | min | | 0 | 3.55 | | -0.02 | 0.30 | 5.45 | 0.17 | 20.52 | 18.90 | 15.95 | 20.34 | 9.91 | 8.08 | 5.79 | 9.73 | | | | | | | |

Note
1. Package body dimensions “D" and `'E" do not include mold and metal protrusions. Allowable protrusion is 0.25 mm per side.
2. Lead width dimensions `'b" and `'b1" do not include dambar protrusions. Allowable dambar protrusion is 0.25 mm in total per lead.
3. Dimension $A_4$ is measured with respect to bottom of the heatsink DATUM H. Positive value means that the bottom of the heatsink is higher than the bottom of the lead.

*sot1212-2_po*

| Outline version | References | | | | European projection | Issue date |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT1212-2 | | | | | | ~~15-01-14~~ 15-06-09 |

**Fig 14. Package outline SOT1212-2 (HSOP16)**

## 10. 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.

## 11. Abbreviations

**Table 10. Abbreviations**

| Acronym | Description |
|---|---|
| AM | Amplitude Modulation |
| 3GPP | 3rd Generation Partnership Project |
| CCDF | Complementary Cumulative Distribution Function |
| CW | Continuous Wave |
| DPCH | Dedicated Physical CHannel |
| ESD | ElectroStatic Discharge |
| GEN8 | Eighth Generation |
| LDMOS | Laterally Diffused Metal Oxide Semiconductor |
| MMIC | Monolithic Microwave Integrated Circuit |
| MTF | Median Time to Failure |
| OBO | Output Back Off |
| PAR | Peak-to-Average Ratio |
| PM | Phase Modulation |
| VSWR | Voltage Standing-Wave Ratio |
| W-CDMA | Wideband Code Division Multiple Access |

## 12. Revision history

**Table 11. Revision history**

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| BLM8G0710S-45AB_S-45ABG v.3 | 20151015 | Product data sheet | - | BLM8G0710S-45AB_ S-45ABG#2 |
| Modifications: | • Table 1 on page 1: table updated<br>• Table 5 on page 4: table updated<br>• Table 6 on page 4: table updated<br>• Table 7 on page 5: table updated<br>• Table 8 on page 6: table updated<br>• Section 8.2 on page 9: section updated<br>• Table 9 on page 10: table updated<br>• Figure 10 on page 13: figure updated<br>• Figure 11 on page 13: notes updated<br>• Figure 12 on page 14: notes updated | | | |
| BLM8G0710S-45AB_S-45ABG#2 | 20150901 | Objective data sheet | - | BLM8G0710S-45AB_ S-45ABG v.1 |
| Modifications: | • The format of this document has been redesigned to comply with the new identity guidelines of Ampleon<br>• Legal texts have been adapted to the new company name where appropriate | | | |
| BLM8G0710S-45AB_S-45ABG v.1 | 20150820 | Objective data sheet | - | - |

# 13. Legal information

## 13.1 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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.ampleon.com.

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**Date of release: 15 October 2015**

**Document identifier: BLM8G0710S-45AB_S-45ABG**