# BLF8G22LS-205V

**Power LDMOS transistor**

**Rev. 2 — 1 September 2015**

AMPLEON

**Product data sheet**

## 1. Product profile

### 1.1 General description

205 W LDMOS power transistor with improved video bandwidth for base station applications at frequencies from 2100 MHz to 2200 MHz.

**Table 1. Typical performance**

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

| Test signal | f | $I_{Dq}$ | $V_{DS}$ | $P_{L(AV)}$ | $G_p$ | $\eta_D$ | $ACPR_{5M}$ |
|---|---|---|---|---|---|---|---|
| | (MHz) | (mA) | (V) | (W) | (dB) | (%) | (dBc) |
| 1-carrier W-CDMA | 2110 to 2170 | 1500 | 28 | 50 | 18.3 | 32.5 | –32 [1] |

[1] Test signal: 3GPP test model 1; 64 DPCH; PAR = 7.2 dB at 0.01 % probability on CCDF.

### 1.2 Features and benefits

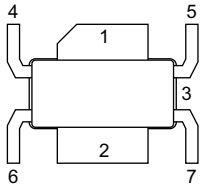
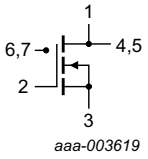
- Excellent ruggedness
- High efficiency
- Low thermal resistance providing excellent thermal stability
- Designed for broadband operation
- Lower output capacitance for improved performance in Doherty applications
- Designed for low memory effects providing excellent pre-distortability
- Internally matched for ease of use
- Integrated ESD protection
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

### 1.3 Applications

- RF power amplifiers for base stations and multi carrier applications in the 2100 MHz to 2200 MHz frequency range

## 2. Pinning information

**Table 2. Pinning**

| Pin | Description | Simplified outline | Graphic symbol |
|---|---|---|---|
| 1 | drain |  |  |
| 2 | gate | | |
| 3 | source [1] | | |
| 4 | decoupling lead | | |
| 5 | decoupling lead | | |
| 6 | n.c. | | |
| 7 | n.c. | | |



[1] Connected to flange.

## 3. Ordering information

**Table 3. Ordering information**

| Type number | Package | | |
|---|---|---|---|
| | Name | Description | Version |
| BLF8G22LS-205V | - | earless flanged LDMOST ceramic package; 6 leads | SOT1239B |

## 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 | [1] | - | 225 | °C |

[1] Continuous use at maximum temperature will affect the reliability, for details refer to the on-line MTF calculator.

## 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 °C; $P_L$ = 56 W; $V_{DS}$ = 28 V; $I_{Dq}$ = 1200 mA | 0.26 | K/W |


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# 6. Characteristics

**Table 6. DC characteristics**

*$T_j$ = 25 °C, unless otherwise specified.*

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $V_{(BR)DSS}$ | drain-source breakdown voltage | $V_{GS}$ = 0 V; $I_D$ = 3.3 mA | 65 | - | - | V |
| $V_{GS(th)}$ | gate-source threshold voltage | $V_{DS}$ = 10 V; $I_D$ = 330 mA | 1.5 | 1.9 | 2.3 | V |
| $V_{GSq}$ | gate-source quiescent voltage | $V_{DS}$ = 28 V; $I_D$ = 1650 mA | 1.7 | 2.1 | 2.5 | V |
| $I_{DSS}$ | drain leakage current | $V_{GS}$ = 0 V; $V_{DS}$ = 28 V | - | - | 3.6 | μA |
| $I_{DSX}$ | drain cut-off current | $V_{GS}$ = $V_{GS(th)}$ + 3.75 V; $V_{DS}$ = 10 V | - | 60 | - | A |
| $I_{GSS}$ | gate leakage current | $V_{GS}$ = 11 V; $V_{DS}$ = 0 V | - | - | 360 | nA |
| $g_{fs}$ | forward transconductance | $V_{DS}$ = 10 V; $I_D$ = 330 mA | - | 2.9 | - | S |
| $R_{DS(on)}$ | drain-source on-state resistance | $V_{GS}$ = $V_{GS(th)}$ + 3.75 V; $I_D$ = 11.6 A | - | 0.04 | - | Ω |

**Table 7. RF characteristics**

*Test signal: 1-carrier W-CDMA; PAR = 7.2 dB at 0.01 % probability on CCDF; 3GPP test model 1; 64 DPCH; $f_1$ = 2110 MHz; $f_2$ = 2170 MHz; RF performance at $V_{DS}$ = 28 V; $I_{Dq}$ = 1200 mA; $T_{case}$ = 25 °C; unless otherwise specified; in a production circuit.*

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $G_p$ | power gain | $P_{L(AV)}$ = 50.1 W | 17.1 | 18.3 | - | dB |
| $\eta_D$ | drain efficiency | $P_{L(AV)}$ = 50.1 W | 27.5 | 32.5 | - | % |
| $RL_{in}$ | input return loss | $P_{L(AV)}$ = 50.1 W | - | −10 | −6 | dB |
| ACPR | adjacent channel power ratio | $P_{L(AV)}$ = 50.1 W | - | −30 | −25 | dBc |

# 7. Test information

## 7.1 Ruggedness in Doherty operation

The BLF8G22LS-205V is capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: $V_{DS}$ = 28 V; $I_{Dq}$ = 1200 mA; $P_L$ = 140 W (W-CDMA); f = 2110 MHz.


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## 7.2 Impedance information

**Table 8. Typical impedance**

*Measured load-pull data; $I_{Dq}$ = 1800 mA; $V_{DS}$ = 28 V; typical values unless otherwise specified.*

| f | $Z_S$ [1] | $Z_L$ [1] | $P_L$ [2] | $\eta_D$ [2] | $G_p$ [2] |
|---|---|---|---|---|---|
| (MHz) | (Ω) | (Ω) | (W) | (%) | (dB) |
| **Maximum power load** | | | | | |
| 2110 | 1.80 – j4.05 | 1.2 – j2.75 | 56.00 | 56.61 | 15.57 |
| 2140 | 2.24 – j5.00 | 1.2 – j2.75 | 55.95 | 55.85 | 15.71 |
| 2170 | 2.90 – j4.50 | 1.2 – j2.75 | 55.88 | 56.05 | 16.03 |
| **Maximum drain efficiency load** | | | | | |
| 2110 | 1.80 – j4.05 | 1.60 – j1.34 | 54.08 | 65.84 | 18.12 |
| 2140 | 2.24 – j5.00 | 1.52 – j1.57 | 54.38 | 64.88 | 18.06 |
| 2170 | 2.90 – j4.50 | 1.41 – j1.77 | 54.58 | 64.24 | 18.08 |

[1] $Z_S$ and $Z_L$ defined in Figure 1.

[2] at 3 dB gain compression

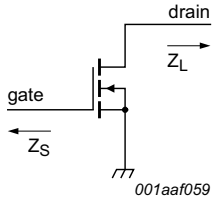


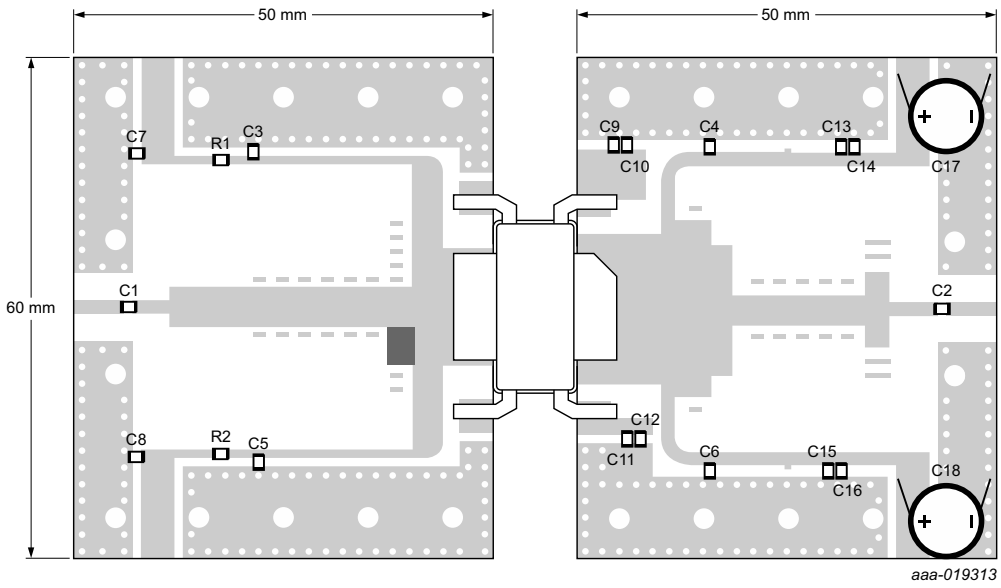

**Fig 1. Definition of transistor impedance**

## 7.3 VBW in a class-AB operation

The BLF8G22LS-205V shows 110 MHz (typical) video bandwidth in class-AB test circuit in 2140 MHz at $V_{DS}$ = 28 V; $I_{Dq}$ = 1500 mA.


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## 7.4 Test circuit




Printed-Circuit Board (PCB): Rogers RO4350B; thickness = 0.76 mm.

See Table 9 for a list of components.

**Fig 2. Component layout for test circuit**

**Table 9. List of components**

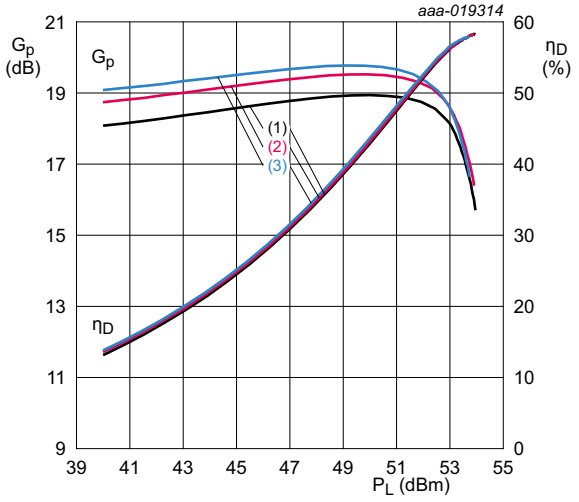
*See Figure 2 for component layout.*

| Component | Description | Value | Remarks |
|---|---|---|---|
| C1, C2, C3, C4, C5, C6 | multilayer ceramic chip capacitor | 20 pF | |
| C7, C8, C9, C10, C11, C12, C14, C16 | multilayer ceramic chip capacitor | 10 μF, 50 V | |
| C13, C15 | multilayer ceramic chip capacitor | 1 μF, 50 v | |
| C17, C18 | electrolytic capacitor | 2200 μF, 63 V | |
| R1, R2 | chip resistor | 5.1 Ω | |


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## 7.5 Graphical data

### 7.5.1 Pulsed CW




$V_{DS}$ = 28 V; $I_{Dq}$ = 1200 mA.

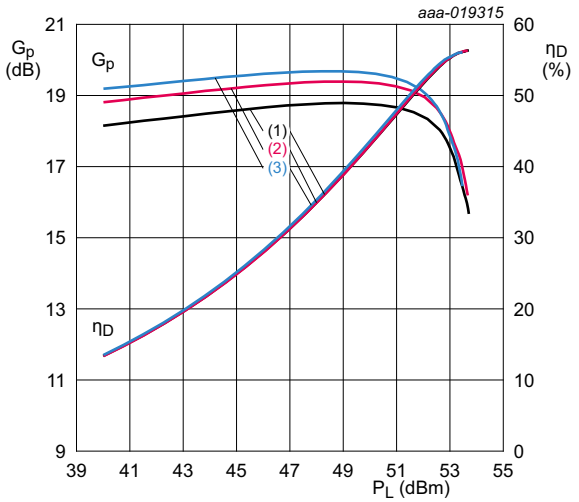
(1) f = 2110 MHz

(2) f = 2140 MHz

(3) f = 2170 MHz

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

### 7.5.2 CW




$V_{DS}$ = 28 V; $I_{Dq}$ = 1200 mA.

(1) f = 2110 MHz

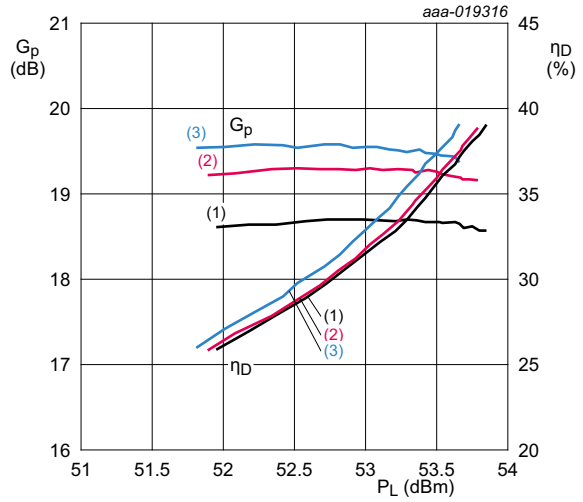
(2) f = 2140 MHz

(3) f = 2170 MHz

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


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### 7.5.3 1-Carrier W-CDMA



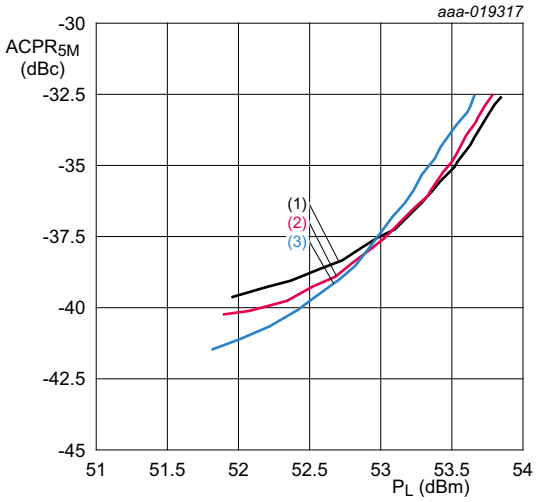

$V_{DS}$ = 28 V; $I_{Dq}$ = 1200 mA.

(1) f = 2110 MHz

(2) f = 2140 MHz

(3) f = 2170 MHz

**Fig 5. Power gain and drain efficiency as function of output power; typical values**



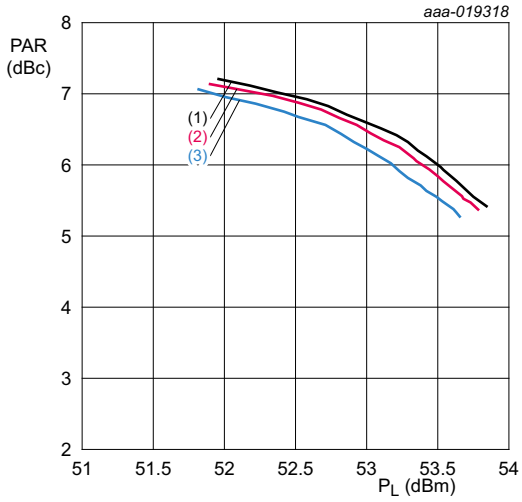

$V_{DS}$ = 28 V; $I_{Dq}$ = 1200 mA.

(1) f = 2110 MHz

(2) f = 2140 MHz

(3) f = 2170 MHz

**Fig 6. Adjacent channel power ratio (5 MHz) as a function of output power; typical values**




$V_{DS}$ = 28 V; $I_{Dq}$ = 1200 mA.

(1) f = 2110 MHz

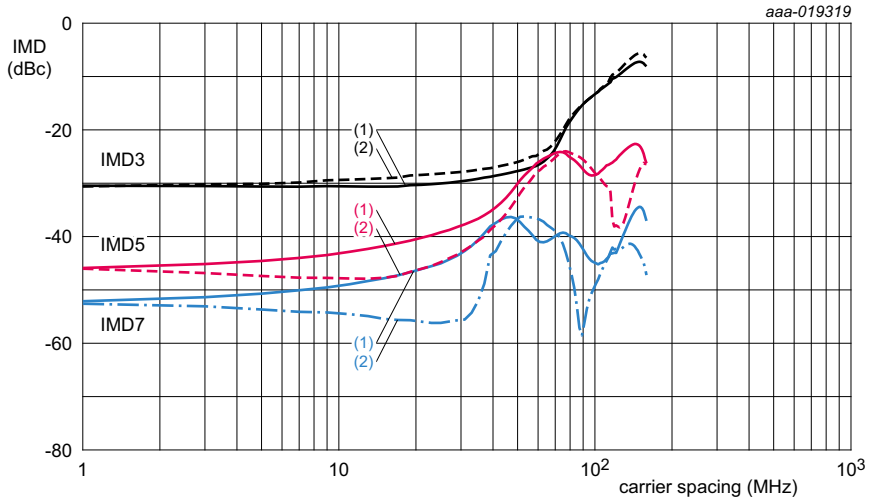
(2) f = 2140 MHz

(3) f = 2170 MHz

**Fig 7. Peak-to-average ratio as a function of output power; typical values**


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### 7.5.4 2-Tone VBW




$V_{DS}$ = 28 V; $I_{Dq}$ = 1200 mA.

(1) low

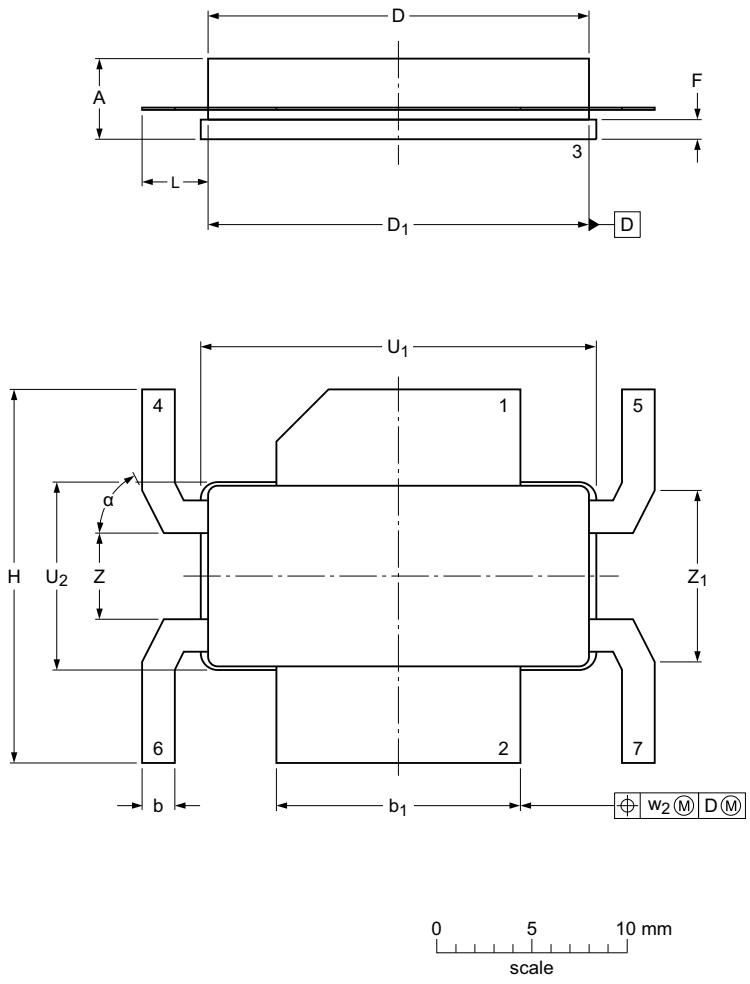
(2) high

**Fig 8. VBW capability in class-AB test circuit**


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# 8. Package outline

**Earless flanged LDMOST ceramic package; 6 leads** **SOT1239B**




Dimensions

| Unit[1] | | A | b | $b_1$ | c | D | $D_1$ | E | $E_1$ | F | H | L | Q | $U_1$ | $U_2$ | $w_2$ | Z | $Z_1$ | α |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | max | 4.75 | 1.83 | 12.83 | 0.20 | 20.02 | 19.96 | 9.53 | 9.53 | 1.14 | 19.94 | 3.56 | 1.70 | 20.70 | 9.91 | 0.51 | 4.60 | 9.53 | 64° |
| | nom | | | | | | | | | | | | | | | | | | |
| | min | 3.45 | 1.57 | 12.57 | 0.12 | 19.61 | 19.66 | 9.27 | 9.25 | 0.89 | 18.92 | 3.30 | 1.45 | 20.45 | 9.65 | | 4.32 | 8.71 | 60° |
| inches | max | 0.187 | 0.072 | 0.505 | 0.008 | 0.788 | 0.786 | 0.375 | 0.375 | 0.045 | 0.785 | 0.140 | 0.067 | 0.815 | 0.390 | 0.02 | 0.181 | 0.375 | 64° |
| | nom | | | | | | | | | | | | | | | | | | |
| | min | 0.136 | 0.062 | 0.495 | 0.005 | 0.772 | 0.774 | 0.365 | 0.364 | 0.035 | 0.745 | 0.130 | 0.057 | 0.805 | 0.380 | | 0.170 | 0.343 | 60° |

Note
1. Millimeter dimensions are derived from the original inch dimensions.

*sot1239b_po*

| Outline version | References | | | | European projection | Issue date |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT1239B | | | | | | ~~13-07-09~~ 13-10-28 |

**Fig 9. Package outline SOT1239B**


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## 9. Handling information

| CAUTION | |
|---|---|
|  | This device is sensitive to ElectroStatic Discharge (ESD). Observe precautions for handling electrostatic sensitive devices.<br>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 Partnership Project |
| CW | Continuous Wave |
| CCDF | Complementary Cumulative Distribution Function |
| DPCH | Dedicated Physical CHannel |
| ESD | ElectroStatic Discharge |
| LDMOS | Laterally Diffused Metal-Oxide Semiconductor |
| LDMOST | Laterally Diffused Metal-Oxide Semiconductor Transistor |
| MTF | Median Time to Failure |
| PAR | Peak-to-Average Ratio |
| 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 |
|---|---|---|---|---|
| BLF8G22LS-205V v.2 | 20150901 | Product data sheet | - | BLF8G22LS-205V 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 | | | |
| BLF8G22LS-205V v.1 | 20150901 | Product data sheet | - | - |


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

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ENTEGRECİ

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# Elektronik komponent tedarikinde Entegreci

Entegreci, Eskişehir merkezli, Türkiye geneline satış yapan bir elektronik komponent mağazasıdır. Entegreler (IC), mikrodenetleyiciler, transistörler, diyotlar, pasif elemanlar, konnektörler, modüller ve geliştirme kartları tek adetten seri üretim adetlerine kadar satılır. Ürün sayfalarında güncel stok durumunu, fiyatı ve datasheet bağlantısını bulabilirsiniz.

### Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

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### Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

**Kategorilere göz atın**

### Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

**Üreticileri görün**

### Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

**Teklif isteyin**

**www.entegreci.com** | **destek@entegreci.com** | **0850 305 90 34**

Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

Bu sayfa Entegreci tarafından eklenmiştir. Belgenin önceki sayfaları asıl yayıncısına aittir ve içeriği değiştirilmemiştir; en güncel sürüm için belgenin yayıncısına başvurun.