

CDM22011-600LRFP

N-CHANNEL  
LR POWER MOSFET  
11 AMP, 600 VOLT

ULTRAMOS™



TO-220FP CASE

**Central**  
Semiconductor Corp.

www.centrasemi.com

**DESCRIPTION:**

The CENTRAL SEMICONDUCTOR CDM22011-600LRFP is a 600 volt N-Channel MOSFET designed for high voltage, fast switching applications such as Power Factor Correction (PFC), lighting and power inverters. This UltraMOS™ MOSFET combines high voltage capability with ultra low  $r_{DS(ON)}$ , low threshold voltage, and low gate charge for optimal efficiency.

**MARKING CODE: CDM11-600LR**

**APPLICATIONS:**

- Power Factor Correction
- Alternative energy inverters
- Solid State Lighting (SSL)

**FEATURES:**

- High voltage capability ( $V_{DS}=600V$ )
- Low gate charge ( $Q_{GS}=4.45nC$  TYP)
- Ultra low  $r_{DS(ON)}$  ( $0.3\Omega$  TYP)

**MAXIMUM RATINGS:** ( $T_C=25^\circ C$  unless otherwise noted)

|   | SYMBOL         |             | UNITS        |
|---|----------------|-------------|--------------|
| Drain-Source Voltage                        | $V_{DS}$       | 600         | V            |
| Gate-Source Voltage                         | $V_{GS}$       | 30          | V            |
| Continuous Drain Current (Steady State)     | $I_D$          | 11          | A            |
| Maximum Pulsed Drain Current, $t_p=10\mu s$ | $I_{DM}$       | 44          | A            |
| Continuous Source Current (Body Diode)      | $I_S$          | 11          | A            |
| Maximum Pulsed Source Current (Body Diode)  | $I_{SM}$       | 44          | A            |
| Single Pulse Avalanche Energy (Note 1)      | $E_{AS}$       | 280         | mJ           |
| Power Dissipation                           | $P_D$          | 25          | W            |
| Operating and Storage Junction Temperature  | $T_J, T_{stg}$ | -55 to +150 | $^\circ C$   |
| Thermal Resistance                          | $\theta_{JC}$  | 5.0         | $^\circ C/W$ |
| Thermal Resistance                          | $\theta_{JA}$  | 120         | $^\circ C/W$ |

Note 1:  $L=30mH, I_{AS}=4.0A, V_{DD}=100V, R_G=25\Omega, \text{Initial } T_J=25^\circ C$

**ELECTRICAL CHARACTERISTICS:** ( $T_C=25^\circ C$  unless otherwise noted)

| SYMBOL               | TEST CONDITIONS                   | MIN | TYP   | MAX  | UNITS    |
|----------------------|-----------------------------------|-----|-------|------|----------|
| $I_{GSSF}, I_{GSSR}$ | $V_{GS}=30V, V_{DS}=0$            |     |       | 100  | nA       |
| $I_{DSS}$            | $V_{DS}=600V, V_{GS}=0$           |     | 0.047 | 1.0  | $\mu A$  |
| $BV_{DSS}$           | $V_{GS}=0, I_D=250\mu A$          | 600 |       |      | V        |
| $V_{GS(th)}$         | $V_{GS}=V_{DS}, I_D=250\mu A$     | 2.0 | 3.09  | 4.0  | V        |
| $V_{SD}$             | $V_{GS}=0, I_S=11A$               |     | 0.92  | 1.4  | V        |
| $r_{DS(ON)}$         | $V_{GS}=10V, I_D=5.5A$            |     | 0.30  | 0.36 | $\Omega$ |
| $C_{rss}$            | $V_{DS}=100V, V_{GS}=0, f=1.0MHz$ |     | 2.76  |      | pF       |
| $C_{iss}$            | $V_{DS}=100V, V_{GS}=0, f=1.0MHz$ |     | 763   |      | pF       |
| $C_{oss}$            | $V_{DS}=100V, V_{GS}=0, f=1.0MHz$ |     | 52    |      | pF       |

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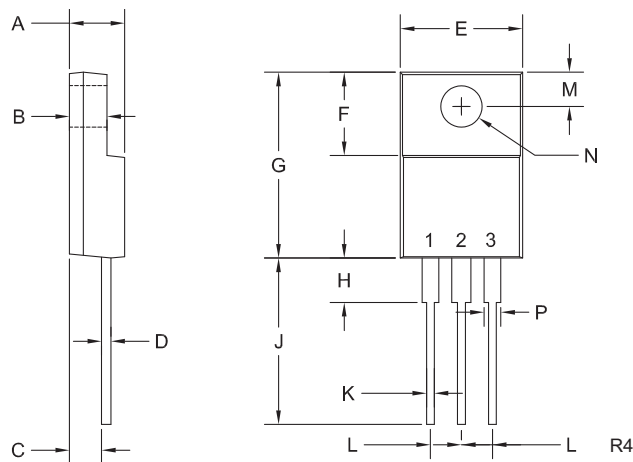


**ELECTRICAL CHARACTERISTICS - Continued:** ( $T_C=25^\circ\text{C}$  unless otherwise noted)

| SYMBOL              | TEST CONDITIONS   | TYP   | UNITS         |
|---------------------|---|-------|---------------|
| $Q_{g(\text{tot})}$ | $V_{DS}=480\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=11\text{A}$ (Note 2)                  | 23.05 | nC            |
| $Q_{gs}$            | $V_{DS}=480\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=11\text{A}$ (Note 2)                  | 4.45  | nC            |
| $Q_{gd}$            | $V_{DS}=480\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=11\text{A}$ (Note 2)                  | 11.31 | nC            |
| $t_{d(\text{on})}$  | $V_{DD}=300\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=11\text{A}$ , $R_G=25\Omega$ (Note 2) | 11    | ns            |
| $t_r$               | $V_{DD}=300\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=11\text{A}$ , $R_G=25\Omega$ (Note 2) | 27    | ns            |
| $t_{d(\text{off})}$ | $V_{DD}=300\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=11\text{A}$ , $R_G=25\Omega$ (Note 2) | 37    | ns            |
| $t_f$               | $V_{DD}=300\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=11\text{A}$ , $R_G=25\Omega$ (Note 2) | 23    | ns            |
| $t_{rr}$            | $V_{GS}=0$ , $I_S=11\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$ (Note 2)                | 315   | ns            |
| $Q_{rr}$            | $V_{GS}=0$ , $I_S=11\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$ (Note 2)                | 4.0   | $\mu\text{C}$ |

Note 2: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

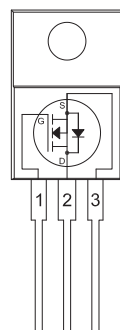
**TO-220FP CASE - MECHANICAL OUTLINE**



| SYMBOL  | DIMENSIONS |       |             |       |
|---------|------------|-------|-------------|-------|
|         | INCHES     |       | MILLIMETERS |       |
|         | MIN        | MAX   | MIN         | MAX   |
| A       | 0.165      | 0.202 | 4.20        | 5.12  |
| B       | 0.090      | 0.130 | 2.30        | 3.30  |
| C       | 0.098      | 0.122 | 2.50        | 3.10  |
| D       | -          | 0.031 | -           | 0.80  |
| E       | 0.382      | 0.418 | 9.70        | 10.63 |
| F       | 0.238      | 0.276 | 6.06        | 7.00  |
| G       | 0.583      | 0.640 | 14.80       | 16.25 |
| H       | -          | 0.161 | -           | 4.10  |
| J       | 0.506      | 0.543 | 12.85       | 13.80 |
| K       | 0.020      | 0.031 | 0.50        | 0.79  |
| L       | 0.100      |       | 2.54        |       |
| M       | 0.120      | 0.140 | 3.05        | 3.55  |
| N (DIA) | 0.116      | 0.134 | 2.95        | 3.40  |
| P       | 0.039      | 0.058 | 1.00        | 1.47  |

TO-220FP (REV: R4)

**PIN CONFIGURATION**



**LEAD CODE:**

- 1) Gate
- 2) Drain
- 3) Source

**MARKING CODE: CDM11-600LR**

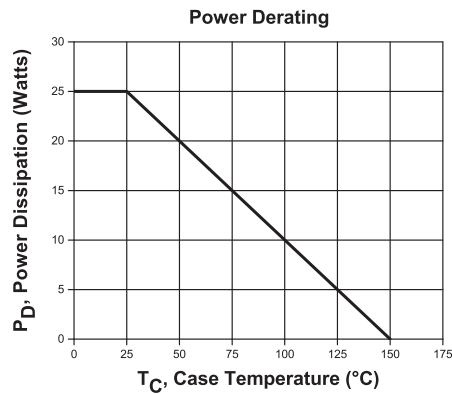
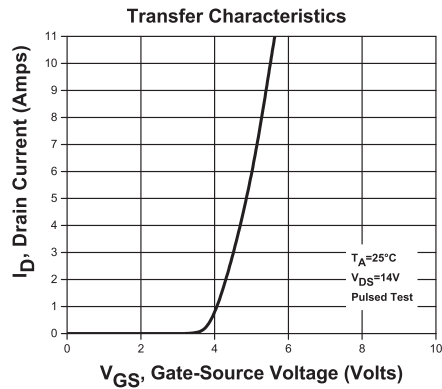
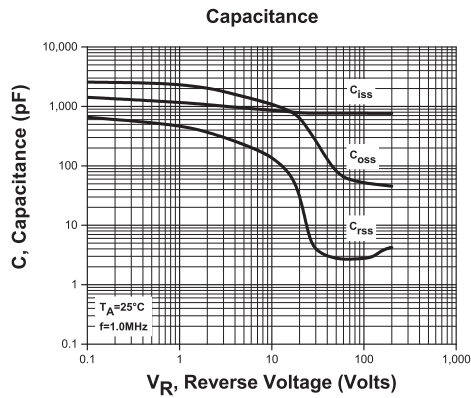
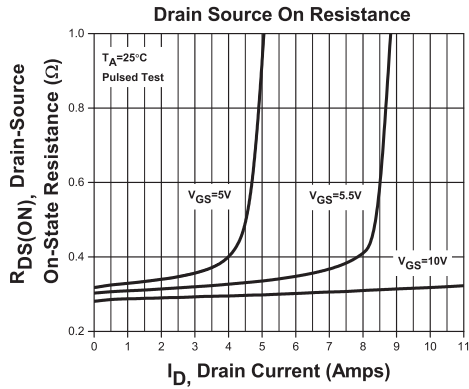
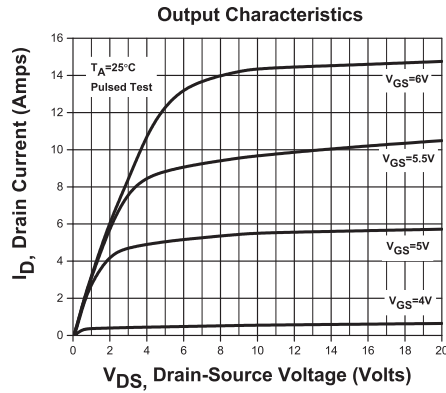
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### TYPICAL ELECTRICAL CHARACTERISTICS



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## OUTSTANDING SUPPORT AND SUPERIOR SERVICES



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### PRODUCT SUPPORT

Central's operations team provides the highest level of support to insure product is delivered on-time.

- Supply management (Customer portals)
- Inventory bonding
- Consolidated shipping options
- Custom bar coding for shipments
- Custom product packing

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### DESIGNER SUPPORT/SERVICES

Central's applications engineering team is ready to discuss your design challenges. Just ask.

- Free quick ship samples (2<sup>nd</sup> day air)
- Online technical data and parametric search
- SPICE models
- Custom electrical curves
- Environmental regulation compliance
- Customer specific screening
- Up-screening capabilities
- Special wafer diffusions
- PbSn plating options
- Package details
- Application notes
- Application and design sample kits
- Custom product and package development

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### REQUESTING PRODUCT PLATING

1. If requesting Tin/Lead plated devices, add the suffix "TIN/LEAD" to the part number when ordering (example: 2N2222A TIN/LEAD).
2. If requesting Lead (Pb) Free plated devices, add the suffix "PBFREE" to the part number when ordering (example: 2N2222A PBFREE).

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### CONTACT US

#### Corporate Headquarters & Customer Support Team

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