

CDM2205-800FP

SILICON  
N-CHANNEL POWER MOSFET  
5.0 AMP, 800 VOLT



TO-220FP CASE



www.centrasemi.com

**DESCRIPTION:**

The CENTRAL SEMICONDUCTOR CDM2205-800FP is an 800 volt N-Channel MOSFET designed for high voltage, fast switching applications such as Power Factor Correction (PFC), lighting and power inverters. This MOSFET combines high voltage capability with low  $r_{DS(ON)}$ , low threshold voltage, and low gate charge for optimal efficiency.

**MARKING CODE: CDM05-800FP**

**APPLICATIONS:**

- Power Factor Correction
- Alternative energy inverters
- Solid State Lighting

**FEATURES:**

- High voltage capability ( $V_{DS}=800V$ )
- Low gate charge ( $Q_{g(tot)}=17.4nC$  TYP)
- Low  $r_{DS(ON)}$  ( $2.2\Omega$  TYP)

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

|                                             | SYMBOL         |             | UNITS        |
|---------------------------------------------|----------------|-------------|--------------|
| Drain-Source Voltage                        | $V_{DS}$       | 800         | V            |
| Gate-Source Voltage                         | $V_{GS}$       | 30          | V            |
| Continuous Drain Current (Steady State)     | $I_D$          | 5.0         | A            |
| Maximum Pulsed Drain Current, $t_p=10\mu s$ | $I_{DM}$       | 20          | A            |
| Continuous Source Current (Body Diode)      | $I_S$          | 5.0         | A            |
| Maximum Pulsed Source Current (Body Diode)  | $I_{SM}$       | 20          | A            |
| Single Pulse Avalanche Energy (Note 1)      | $E_{AS}$       | 323         | mJ           |
| Power Dissipation                           | $P_D$          | 48          | W            |
| Operating and Storage Junction Temperature  | $T_J, T_{stg}$ | -55 to +150 | $^\circ C$   |
| Thermal Resistance                          | $\theta_{JC}$  | 2.6         | $^\circ C/W$ |
| Thermal Resistance                          | $\theta_{JA}$  | 120         | $^\circ C/W$ |

Note 1:  $L=30mH$ ,  $I_{AS}=4.5A$ ,  $V_{DD}=60V$ ,  $R_G=25\Omega$ , Initial  $T_J=25^\circ C$

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

| SYMBOL               | TEST CONDITIONS                  | MIN | TYP | MAX | UNITS    |
|----------------------|----------------------------------|-----|-----|-----|----------|
| $I_{GSSS}, I_{GSSR}$ | $V_{GS}=30V, V_{DS}=0$           |     |     | 100 | nA       |
| $I_{DSS}$            | $V_{DS}=800V, V_{GS}=0$          |     |     | 1.0 | $\mu A$  |
| $BV_{DSS}$           | $V_{GS}=0, I_D=250\mu A$         | 800 |     |     | V        |
| $V_{GS(th)}$         | $V_{GS}=V_{DS}, I_D=250\mu A$    | 2.0 | 3.0 | 4.0 | V        |
| $V_{SD}$             | $V_{GS}=0, I_S=5.0A$             |     | 0.9 | 1.4 | V        |
| $r_{DS(ON)}$         | $V_{GS}=10V, I_D=2.5A$           |     | 2.2 | 2.7 | $\Omega$ |
| $C_{rss}$            | $V_{DS}=25V, V_{GS}=0, f=1.0MHz$ |     | 2.8 |     | pF       |
| $C_{iss}$            | $V_{DS}=25V, V_{GS}=0, f=1.0MHz$ |     | 705 |     | pF       |
| $C_{oss}$            | $V_{DS}=25V, V_{GS}=0, f=1.0MHz$ |     | 72  |     | pF       |

R3 (19-August 2015)

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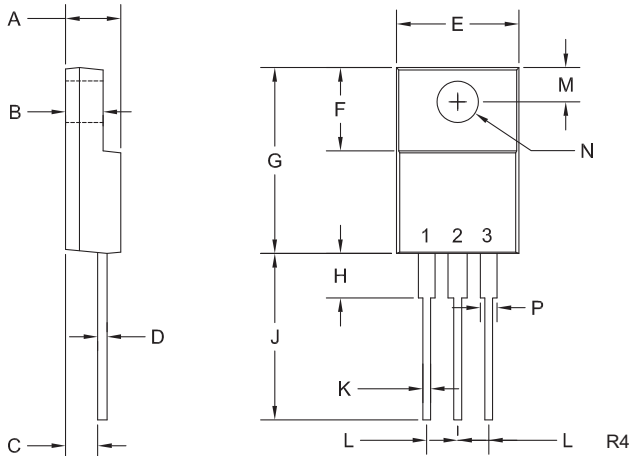


**ELECTRICAL CHARACTERISTICS - Continued:** ( $T_C=25^{\circ}\text{C}$  unless otherwise noted)

| SYMBOL              | TEST CONDITIONS                                                           | TYP  | UNITS         |
|---------------------|---------------------------------------------------------------------------|------|---------------|
| $Q_{g(\text{tot})}$ | $V_{DS}=640\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=5.0\text{A}$ (Note 2)   | 17.4 | nC            |
| $Q_{gs}$            | $V_{DS}=640\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=5.0\text{A}$ (Note 2)   | 3.70 | nC            |
| $Q_{gd}$            | $V_{DS}=640\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=5.0\text{A}$ (Note 2)   | 7.88 | nC            |
| $t_{d(\text{on})}$  | $V_{DD}=400\text{V}$ , $I_D=5.0\text{A}$ , $R_G=25\Omega$ (Note 2)        | 13   | ns            |
| $t_r$               | $V_{DD}=400\text{V}$ , $I_D=5.0\text{A}$ , $R_G=25\Omega$ (Note 2)        | 27   | ns            |
| $t_{d(\text{off})}$ | $V_{DD}=400\text{V}$ , $I_D=5.0\text{A}$ , $R_G=25\Omega$ (Note 2)        | 44   | ns            |
| $t_f$               | $V_{DD}=400\text{V}$ , $I_D=5.0\text{A}$ , $R_G=25\Omega$ (Note 2)        | 30   | ns            |
| $t_{rr}$            | $V_{GS}=0$ , $I_S=5.0\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$ (Note 2) | 549  | ns            |
| $Q_{rr}$            | $V_{GS}=0$ , $I_S=5.0\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$ (Note 2) | 2.95 | $\mu\text{C}$ |

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

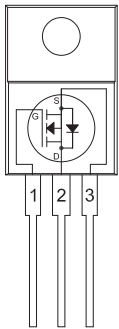
**TO-220FP CASE - MECHANICAL OUTLINE**



| SYMBOL  | 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: CDM05-800FP**

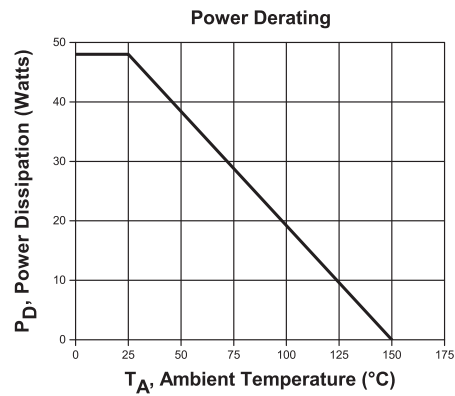
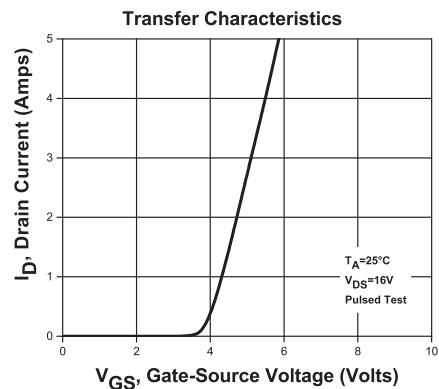
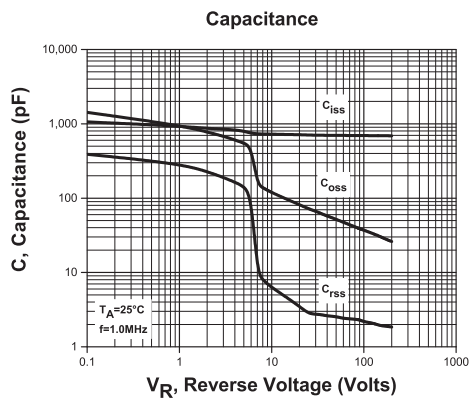
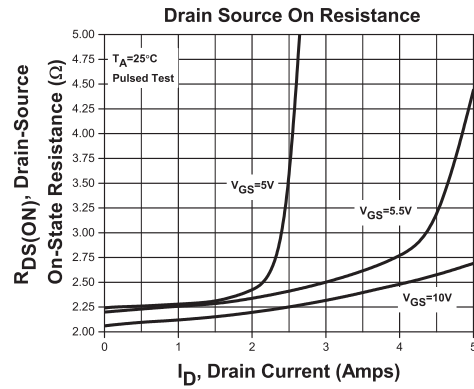
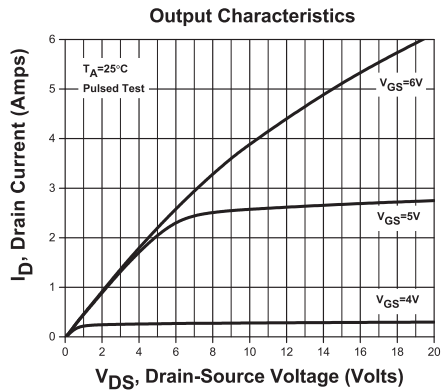
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### TYPICAL ELECTRICAL CHARACTERISTICS



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