

CDM7-650

**SURFACE MOUNT SILICON
N-CHANNEL
MEDIUM POWER MOSFET
7.0 AMP, 650 VOLT**



www.centrasemi.com

DESCRIPTION:

The CENTRAL SEMICONDUCTOR CDM7-650 is a 650 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: FULL PART NUMBER



DPAK CASE

APPLICATIONS:

- Power Factor Correction
- Alternative energy inverters
- Solid state lighting

FEATURES:

- High voltage capability ($V_{DS}=650V$)
- Low gate charge ($Q_{GS}=5.0nC$)
- Low $r_{DS(ON)}$ (1.35Ω)

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

| | SYMBOL | | UNITS |
|---|----------------|-------------|--------------|
| Drain-Source Voltage | V_{DS} | 650 | V |
| Gate-Source Voltage | V_{GS} | 30 | V |
| Continuous Drain Current (Steady State) | I_D | 7.0 | A |
| Maximum Pulsed Drain Current, $t_p=10\mu s$ | I_{DM} | 28 | A |
| Continuous Source Current (Body Diode) | I_S | 7.0 | A |
| Maximum Pulsed Source Current (Body Diode) | I_{SM} | 28 | A |
| Single Pulse Avalanche Energy (Note 1) | E_{AS} | 435 | mJ |
| Power Dissipation | P_D | 1.12 | W |
| Power Dissipation ($T_C=25^\circ C$) | P_D | 140 | W |
| Operating and Storage Junction Temperature | T_J, T_{stg} | -55 to +150 | $^\circ C$ |
| Thermal Resistance | θ_{JC} | 0.89 | $^\circ C/W$ |
| Thermal Resistance | θ_{JA} | 110 | $^\circ C/W$ |

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

| SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNITS |
|----------------------|----------------------------------|-----|------|-----|----------|
| I_{GSSF}, I_{GSSR} | $V_{GS}=30V, V_{DS}=0$ | | 10 | 100 | nA |
| I_{DSS} | $V_{DS}=650V, V_{GS}=0$ | | 0.03 | 1.0 | μA |
| BV_{DSS} | $V_{GS}=0, I_D=250\mu A$ | 650 | | | V |
| $V_{GS(th)}$ | $V_{GS}=V_{DS}, I_D=250\mu A$ | 2.0 | 2.88 | 4.0 | V |
| V_{SD} | $V_{GS}=0, I_S=7.0A$ | | 0.88 | 1.4 | V |
| $r_{DS(ON)}$ | $V_{GS}=10V, I_D=3.5A$ | | 1.35 | 1.5 | Ω |
| C_{rss} | $V_{DS}=25V, V_{GS}=0, f=1.0MHz$ | | 0.8 | | pF |
| C_{iss} | $V_{DS}=25V, V_{GS}=0, f=1.0MHz$ | | 754 | | pF |
| C_{oss} | $V_{DS}=25V, V_{GS}=0, f=1.0MHz$ | | 97 | | pF |

Notes: (1) $L=30mH, I_{AS}=5.25A, V_{DD}=50V, R_G=25\Omega, \text{Initial } T_J=25^\circ C$

R2 (2-July 2014)

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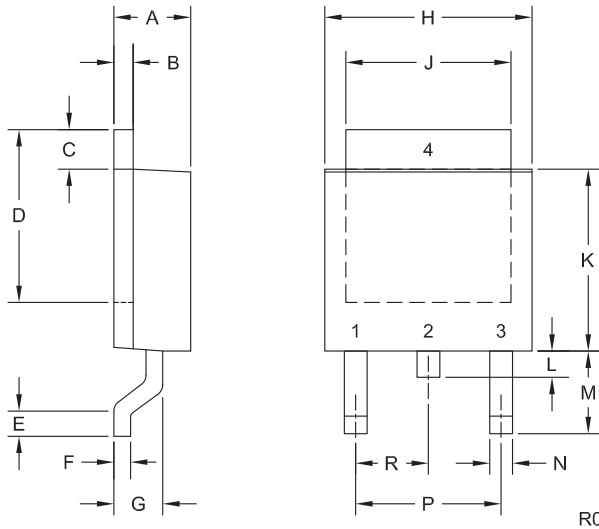


ELECTRICAL CHARACTERISTICS - Continued: ($T_A=25^\circ\text{C}$ unless otherwise noted)

| SYMBOL | TEST CONDITIONS | TYP | UNITS |
|---------------------|---|------|---------------|
| $Q_{g(\text{tot})}$ | $V_{DS}=520\text{V}, V_{GS}=10\text{V}, I_D=7.0\text{A}$ (Note 2) | 16.8 | nC |
| Q_{gs} | $V_{DS}=520\text{V}, V_{GS}=10\text{V}, I_D=7.0\text{A}$ (Note 2) | 5.0 | nC |
| Q_{gd} | $V_{DS}=520\text{V}, V_{GS}=10\text{V}, I_D=7.0\text{A}$ (Note 2) | 6.0 | nC |
| t_d | $V_{DD}=325\text{V}, I_D=7.0\text{A}, R_G=25\Omega$ (Note 2) | 14 | ns |
| t_r | $V_{DD}=325\text{V}, I_D=7.0\text{A}, R_G=25\Omega$ (Note 2) | 28 | ns |
| t_s | $V_{DD}=325\text{V}, I_D=7.0\text{A}, R_G=25\Omega$ (Note 2) | 38 | ns |
| t_f | $V_{DD}=325\text{V}, I_D=7.0\text{A}, R_G=25\Omega$ (Note 2) | 28 | ns |
| t_{rr} | $V_{GS}=0, I_S=7.0\text{A}, di/dt=100\text{A}/\mu\text{s}$ (Note 2) | 493 | ns |
| Q_{rr} | $V_{GS}=0, I_S=7.0\text{A}, di/dt=100\text{A}/\mu\text{s}$ (Note 2) | 2.99 | μC |

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

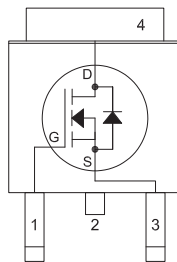
DPAK CASE - MECHANICAL OUTLINE



| SYMBOL | INCHES | | MILLIMETERS | |
|--------|--------|-------|-------------|------|
| | MIN | MAX | MIN | MAX |
| A | 0.083 | 0.108 | 2.10 | 2.75 |
| B | 0.016 | 0.032 | 0.40 | 0.81 |
| C | 0.035 | 0.063 | 0.89 | 1.60 |
| D | 0.203 | 0.228 | 5.15 | 5.79 |
| E | 0.020 | - | 0.51 | - |
| F | 0.018 | 0.024 | 0.45 | 0.60 |
| G | 0.051 | 0.071 | 1.30 | 1.80 |
| H | 0.248 | 0.268 | 6.30 | 6.81 |
| J | 0.197 | 0.217 | 5.00 | 5.50 |
| K | 0.209 | 0.245 | 5.30 | 6.22 |
| L | 0.025 | 0.040 | 0.64 | 1.02 |
| M | 0.090 | 0.115 | 2.30 | 2.91 |
| N | 0.012 | 0.045 | 0.30 | 1.14 |
| P | 0.180 | | 4.60 | |
| R | 0.090 | | 2.30 | |

DPAK (REV: R0)

PIN CONFIGURATION



LEAD CODE:

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

Pin 2 is common to the tab (4)

MARKING: FULL PART NUMBER

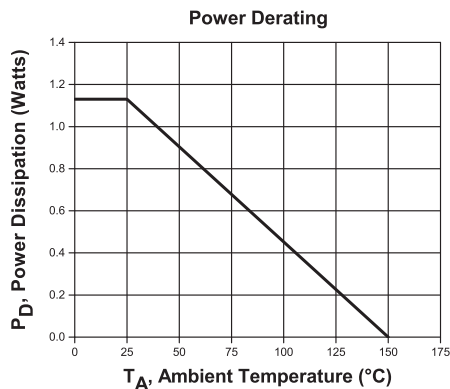
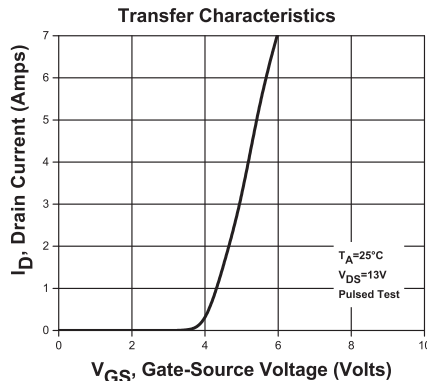
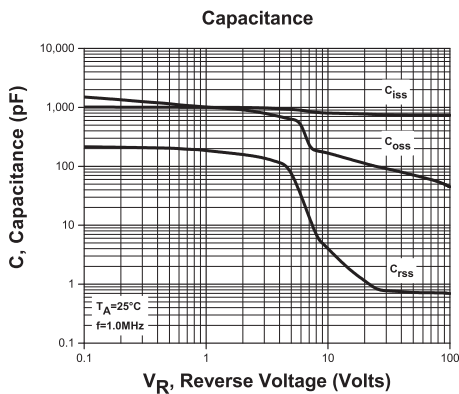
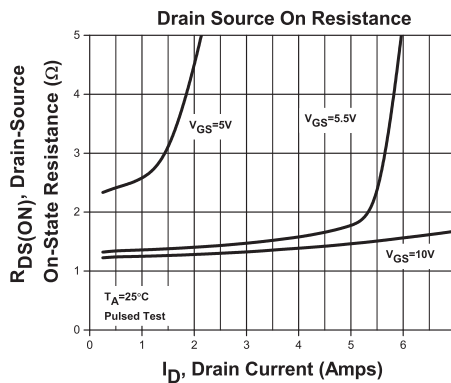
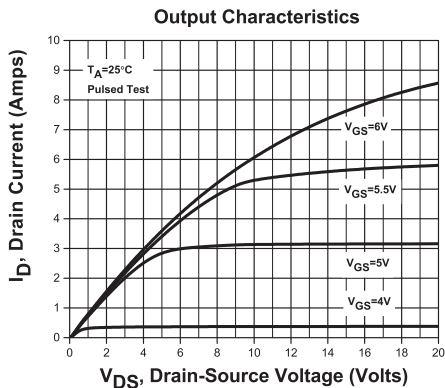
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TYPICAL ELECTRICAL CHARACTERISTICS



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OUTSTANDING SUPPORT AND SUPERIOR SERVICES



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

DESIGNER SUPPORT/SERVICES

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

- Free quick ship samples (2nd 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

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).

CONTACT US

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