

CDMSJ22029-650

N-CHANNEL
SUPER JUNCTION MOSFET
29 AMP, 650 VOLT



TO-220FP CASE

Central
Semiconductor

www.centalsemi.com

DESCRIPTION:

The CENTRAL SEMICONDUCTOR CDMSJ22029-650 is a high current, 650 Volt N-Channel power MOSFET designed for high voltage, fast switching applications such as Power Factor Correction (PFC), and power chargers. This MOSFET combines high voltage capability with low $r_{DS(ON)}$, low threshold voltage and low gate charge.

**MARKING: CDMSJ
29-650**

APPLICATIONS:

- Power Factor Correction
- TV Power
- UPS
- PD Charger
- Adapter

FEATURES:

- High voltage capability ($V_{DS}=650V$)
- Low gate charge ($Q_{GS}=11nC$)
- Low $r_{DS(ON)}$ (0.13Ω)

MAXIMUM RATINGS: ($T_C=25^\circ C$)

Drain-Source Voltage
Gate-Source Voltage
Continuous Drain Current
Continuous Drain Current ($T_C=100^\circ C$)
Pulsed Drain Current
Diode Forward Current
Power Dissipation
Power Dissipation ($T_C=100^\circ C$)
Operating and Storage Junction Temperature

SYMBOL

V_{DS} 650
 V_{GS} 30
 I_D 29
 I_D 17.7
 I_{DM} 63
 I_S 29
 P_D 33
 P_D 14
 T_J, T_{stg} -55 to +150

UNITS

V
V
A
A
A
A
W
W
 $^\circ C$

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

| SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNITS |
|--------------|------------------------------------|-----|-----|-----|------------|
| BV_{DSS} | $V_{GS}=0V, I_D=250\mu A$ | 650 | 730 | | V |
| $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 2 | 3.0 | 4 | V |
| $R_{DS(on)}$ | $V_{GS}=10V, I_D=10.8A$ (Note 1) | | 113 | 130 | m Ω |
| I_{DSS} | $V_{DS}=650V, V_{GS}=0V$ | | | 1.0 | μA |
| I_{GSS} | $V_{GS}=30V, V_{DS}=0V$ | | | 100 | nA |
| I_{GSSR} | $V_{GS}=30V, V_{DS}=0V$ | | | 100 | nA |
| gfs | $V_{DS}=20V, I_D=21.5A$ | | 23 | | S |
| Q_g | $V_{DS}=520V, I_D=22A, V_{GS}=10V$ | | 51 | | nC |
| Q_{gs} | $V_{DS}=520V, I_D=22A, V_{GS}=10V$ | | 11 | | nC |

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

| SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNITS |
|--------------|---|-----|------|-----|---------------|
| Q_{gd} | $V_{DS}=520\text{V}$, $I_D=22\text{A}$, $V_{GS}=10\text{V}$ | | 20 | | nC |
| C_{iss} | $V_{DS}=400\text{V}$, $V_{GS}=0\text{V}$, $f=250\text{kHz}$ | | 1920 | | pF |
| C_{oss} | $V_{DS}=400\text{V}$, $V_{GS}=0\text{V}$, $f=250\text{kHz}$ | | 61 | | pF |
| C_{rss} | $V_{DS}=400\text{V}$, $V_{GS}=0\text{V}$, $f=250\text{kHz}$ | | 8 | | pF |
| $C_{o(er)}$ | $V_{DS}=0\text{V}$ to 400V , $V_{GS}=0\text{V}$, $f=250\text{kHz}$ | | 84 | | pF |
| $t_{d(on)}$ | $V_{DD}=325\text{V}$, $I_D=22\text{A}$, $V_{GS}=10\text{V}$, $R_G=25\Omega$ | | 62 | | ns |
| t_r | $V_{DD}=325\text{V}$, $I_D=22\text{A}$, $V_{GS}=10\text{V}$, $R_G=25\Omega$ | | 79 | | ns |
| $t_{d(off)}$ | $V_{DD}=325\text{V}$, $I_D=22\text{A}$, $V_{GS}=10\text{V}$, $R_G=25\Omega$ | | 201 | | ns |
| t_f | $V_{DD}=325\text{V}$, $I_D=22\text{A}$, $V_{GS}=10\text{V}$, $R_G=25\Omega$ | | 77 | | ns |
| R_g | $f=1.0\text{MHz}$ | | 2.2 | | Ω |
| V_{SD} | $I_S=21.6\text{A}$, $V_{GS}=0\text{V}$ | | 0.89 | 1.5 | V |
| Q_{rr} | $I_S=21.6\text{A}$, $di/dt=100\text{A}/\mu\text{s}$ | | 6.6 | | μC |
| t_{rr} | $I_S=21.6\text{A}$, $di/dt=100\text{A}/\mu\text{s}$ | | 413 | | ns |

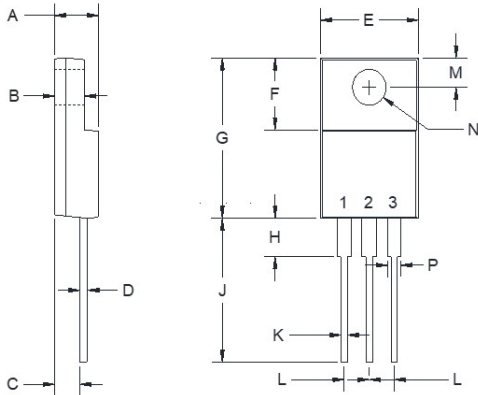
Note 1: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

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TO-220FP CASE - MECHANICAL OUTLINE



R5

| 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 | - | 0.177 | - | 4.50 |
| J | 0.503 | 0.543 | 12.78 | 13.80 |
| K | 0.020 | 0.035 | 0.50 | 0.90 |
| L | 0.100 | | 2.54 | |
| M | 0.100 | 0.140 | 2.55 | 3.55 |
| N (DIA) | 0.116 | 0.134 | 2.95 | 3.40 |
| P | 0.039 | 0.058 | 1.00 | 1.47 |

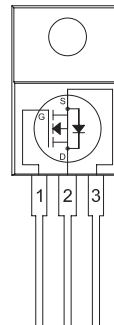
TO-220FP (REV: R5)

LEAD CODE:

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

**MARKING CODE: CDMSJ
29-650**

PIN CONFIGURATION



R2 (1-November 2023)

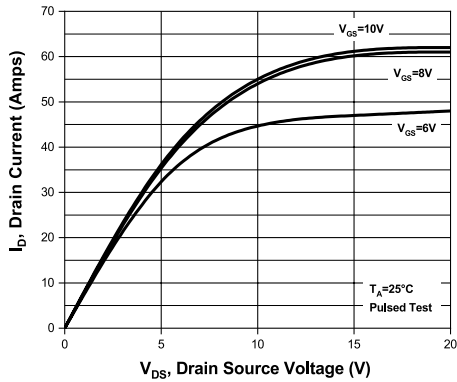
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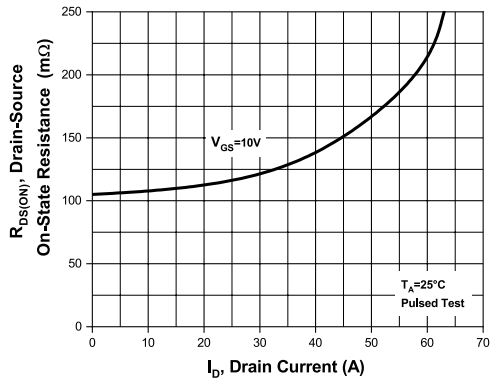


TYPICAL ELECTRICAL CHARACTERISTICS

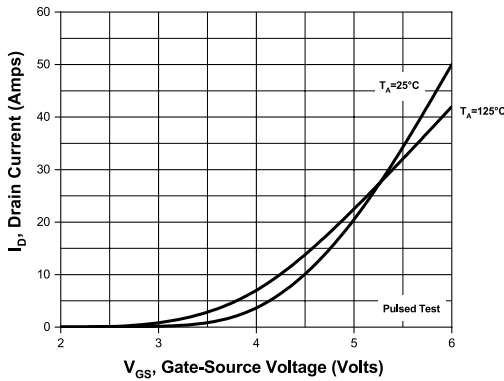
Typical Output Characteristics



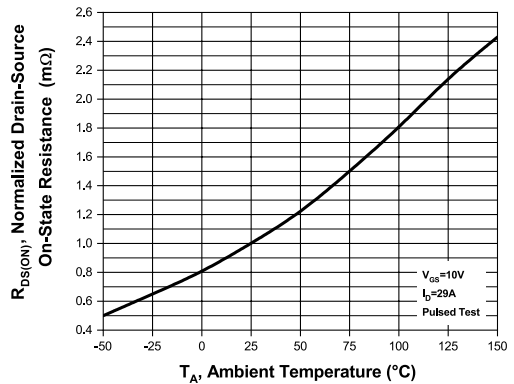
Drain Source On Resistance



Transfer Characteristics



Drain Source Temperature Coefficient

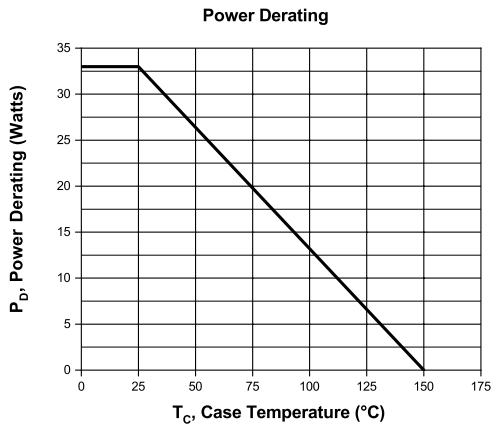
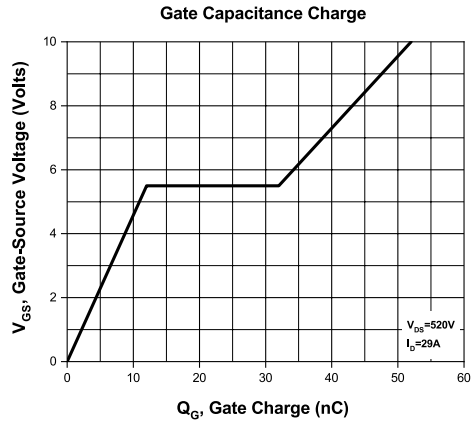
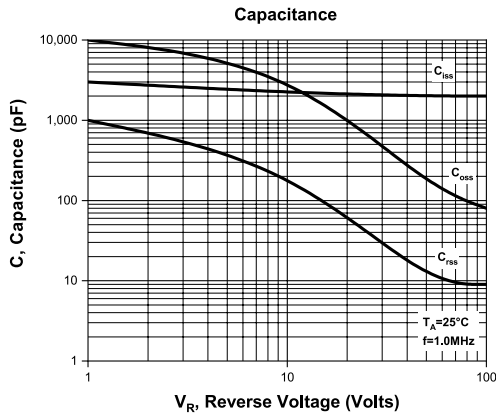


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TYPICAL ELECTRICAL CHARACTERISTICS



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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