

CDM22012-800LRFP

N-CHANNEL  
LR POWER MOSFET  
12 AMP, 800 VOLT



www.centrasemi.com

**DESCRIPTION:**

The CENTRAL SEMICONDUCTOR CDM22012-800LRFP 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 ultra low  $r_{DS(ON)}$ , low threshold voltage, and low gate charge for optimal efficiency.

**MARKING CODE: CDM12-800LR**



TO-220FP CASE

**APPLICATIONS:**

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

**FEATURES:**

- High voltage capability ( $V_{DS}=800V$ )
- Low gate charge ( $Q_{gs}=7.6nC$  TYP)
- Ultra low  $r_{DS(ON)}$  ( $0.37\Omega$  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)	$I_D$	12	A
Continuous Drain Current ( $T_C=100^\circ C$ Steady State)	$I_D$	7.7	A
Maximum Pulsed Drain Current, $t_p=10\mu s$	$I_{DM}$	48	A
Continuous Source Current (Body Diode)	$I_S$	12	A
Maximum Pulsed Source Current (Body Diode)	$I_{SM}$	48	A
Single Pulse Avalanche Energy (Note 1)	$E_{AS}$	702	mJ
Power Dissipation	$P_D$	40	W
Operating and Storage Junction Temperature	$T_J, T_{stg}$	-55 to +150	$^\circ C$
Thermal Resistance	$\theta_{JC}$	3.13	$^\circ C/W$
Thermal Resistance	$\theta_{JA}$	62.5	$^\circ C/W$

Note 1:  $L=79mH, I_{AS}=4.0A, V_{DD}=100V, R_G=25\Omega, \text{Initial } T_J=25^\circ C$

**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
$I_{DSS}$	$V_{DS}=800V, V_{GS}=0$			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		4.0	V
$V_{SD}$	$V_{GS}=0, I_S=12A$			1.4	V
$r_{DS(ON)}$	$V_{GS}=10V, I_D=6.0A$		0.37	0.45	$\Omega$
$C_{rss}$	$V_{DS}=100V, V_{GS}=0, f=1.0MHz$		9.5		pF
$C_{iss}$	$V_{DS}=100V, V_{GS}=0, f=1.0MHz$		1,090		pF
$C_{oss}$	$V_{DS}=100V, V_{GS}=0, f=1.0MHz$		55.2		pF

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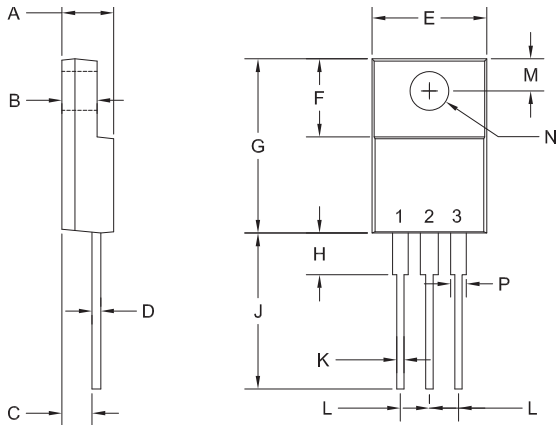


**ELECTRICAL CHARACTERISTICS - Continued:** ( $T_C=25^\circ\text{C}$  unless otherwise noted)

SYMBOL	TEST CONDITIONS	TYP	UNITS
$Q_{g(\text{tot})}$	$V_{DD}=640\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=12\text{A}$ (Note 2)	52.4	nC
$Q_{gs}$	$V_{DD}=640\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=12\text{A}$ (Note 2)	7.6	nC
$Q_{gd}$	$V_{DD}=640\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=12\text{A}$ (Note 2)	31.4	nC
$t_{d(\text{on})}$	$V_{DD}=400\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=12\text{A}$ , $R_G=24\Omega$ (Note 2)	21.1	ns
$t_r$	$V_{DD}=400\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=12\text{A}$ , $R_G=24\Omega$ (Note 2)	44.8	ns
$t_{d(\text{off})}$	$V_{DD}=400\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=12\text{A}$ , $R_G=24\Omega$ (Note 2)	171.2	ns
$t_f$	$V_{DD}=400\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=12\text{A}$ , $R_G=24\Omega$ (Note 2)	42.5	ns
$t_{rr}$	$V_{GS}=0$ , $I_S=12\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$ (Note 2)	430	ns
$Q_{rr}$	$V_{GS}=0$ , $I_S=12\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$ (Note 2)	6.5	$\mu\text{C}$

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

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

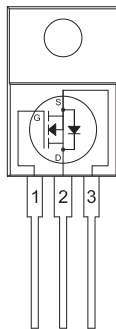


SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.165	0.202	4.20	5.12
B	0.090	0.130	2.30	3.30
C	0.098	0.122	2.50	3.10
D	-	0.031	-	0.80
E	0.382	0.418	9.70	10.63
F	0.238	0.276	6.06	7.00
G	0.583	0.640	14.80	16.25
H	-	0.161	-	4.10
J	0.506	0.543	12.85	13.80
K	0.020	0.031	0.50	0.79
L	0.100		2.54	
M	0.120	0.140	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)

R4

**PIN CONFIGURATION**



**LEAD CODE:**

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

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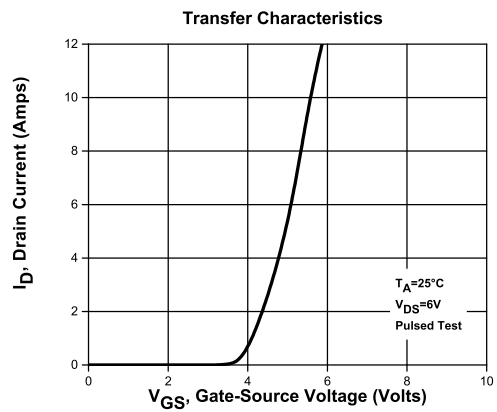
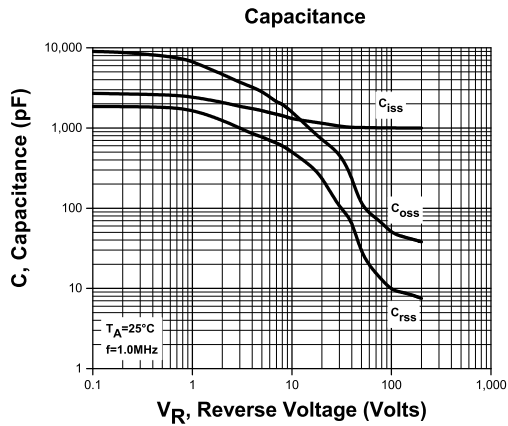
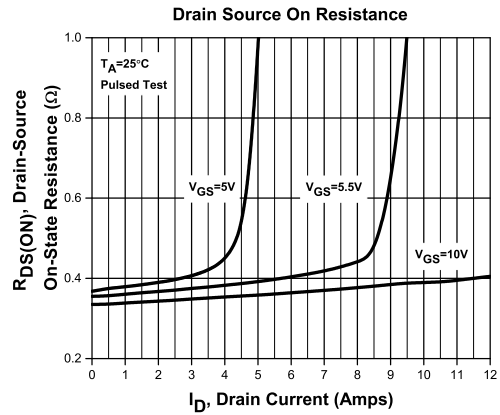
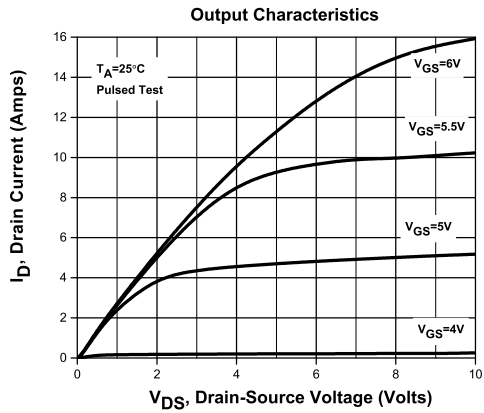
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### TYPICAL ELECTRICAL CHARACTERISTICS



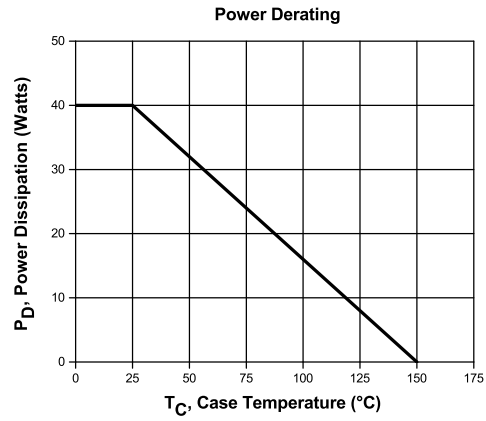
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### TYPICAL ELECTRICAL CHARACTERISTICS



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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

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