

CDM7-650

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



**DPAK CASE**



[www.centrasemi.com](http://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**

**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  $r_{DS(ON)}$  ( $1.35\Omega$ )

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

	<b>SYMBOL</b>		<b>UNITS</b>
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	$\theta_{JC}$	0.89	$^\circ C/W$
Thermal Resistance	$\theta_{JA}$	110	$^\circ C/W$

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

<b>SYMBOL</b>	<b>TEST CONDITIONS</b>	<b>MIN</b>	<b>TYP</b>	<b>MAX</b>	<b>UNITS</b>
$I_{GSSF}, I_{GSSR}$	$V_{GS}=30V, V_{DS}=0$		10	100	nA
$I_{DSS}$	$V_{DS}=650V, V_{GS}=0$		0.03	1.0	$\mu A$
$BV_{DSS}$	$V_{GS}=0, I_D=250\mu A$	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	$\Omega$
$C_{rss}$	$V_{DS}=25V, V_{GS}=0, f=1.0MHz$		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)  $L=30mH, I_{AS}=5.25A, V_{DD}=50V, R_G=25\Omega, \text{Initial } T_J=25^\circ C$

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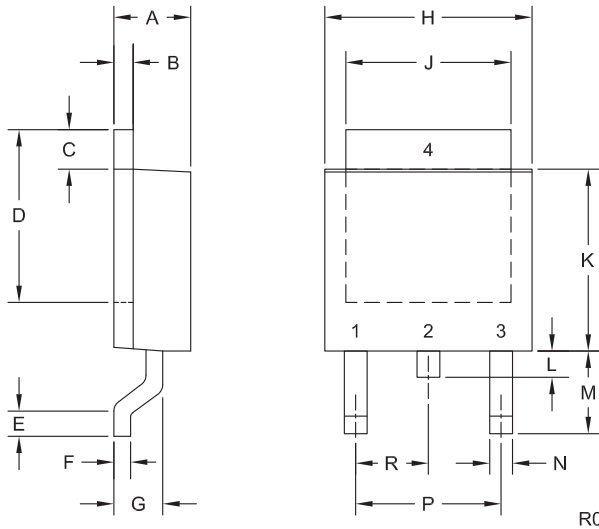


**ELECTRICAL CHARACTERISTICS - Continued:** ( $T_A=25^\circ\text{C}$  unless otherwise noted)

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	$\mu\text{C}$

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

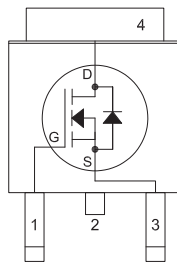
**DPAK CASE - MECHANICAL OUTLINE**



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**

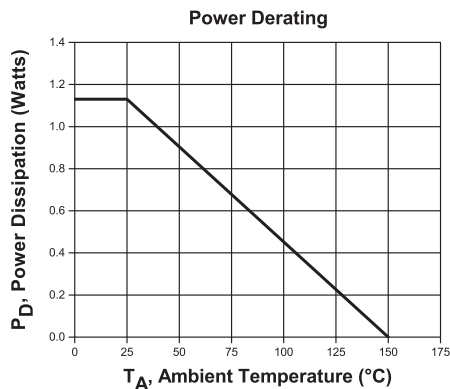
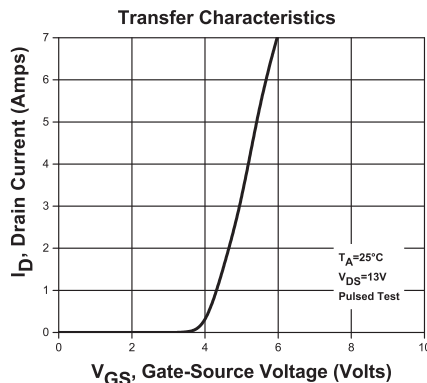
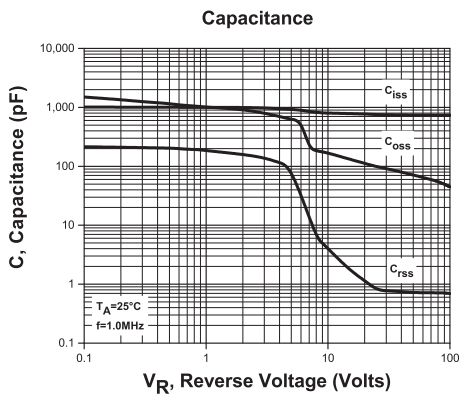
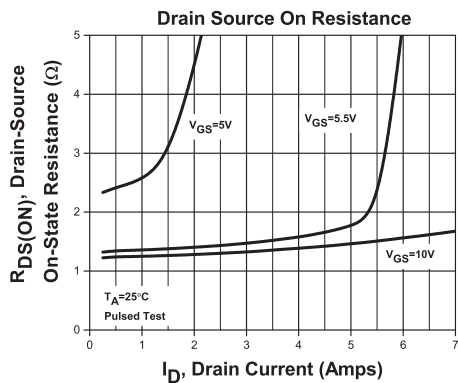
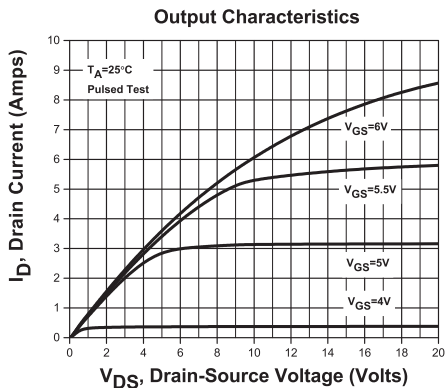
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**TYPICAL ELECTRICAL CHARACTERISTICS**



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## OUTSTANDING SUPPORT AND SUPERIOR SERVICES



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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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