CDM22010-650

SILICON
N-CHANNEL POWER MOSFET
10 AMP, 650 VOLT

TO-220 CASE

Central Semiconductor

www.centralsemi.com

DESCRIPTION:

The CENTRAL SEMICONDUCTOR CDM22010-650 is a high current, 650 Volt N-Channel power 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.

MARKING CODE: CDM10-650

APPLICATIONS:

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

FEATURES:

- High voltage capability (V_{DS}=650V)
- Low gate charge (Q_{gs}=8.0nC)
- Low $r_{DS(ON)}$ (0.88Ω)

MAXIMUM RATINGS: (T_A=25°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	10	A
Maximum Pulsed Drain Current, tp=10μs	I_{DM}	40	A
Continuous Source Current (Body Diode)	I_S	10	A
Maximum Pulsed Source Current (Body Diode)	I_{SM}	40	A
Single Pulse Avalanche Energy (Note 1)	E_{AS}	608	mJ
Power Dissipation	P_D	2.0	W
Power Dissipation (T_C=25°C)	P_D	156	W
Operating and Storage Junction Temperature	T_J, T_{stg}	-55 to +150	°C
Thermal Resistance	Θ_{JC}	0.8	°C/W
Thermal Resistance	Θ_{JA}	62.5	°C/W

Note 1: L=30mH, I_{AS}=6.2A, V_{DD}=50V, R_G=25Ω, Initial T_J=25°C

ELECTRICAL CHARACTERISTICS: (T_A=25°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=250μA	650			V
$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA	2.0	2.8	4.0	V
V_{SD}	V_{GS}=0, I_S=10A		0.9	1.4	V
$r_{DS(ON)}$	V_{GS}=10V, I_D=5.0A		0.88	1.0	Ω
C_{rss}	V_{DS}=25V, V_{GS}=0, f=1.0MHz		4.0		pF
C_{iss}	V_{DS}=25V, V_{GS}=0, f=1.0MHz		1200		pF
C_{oss}	V_{DS}=25V, V_{GS}=0, f=1.0MHz		140		pF

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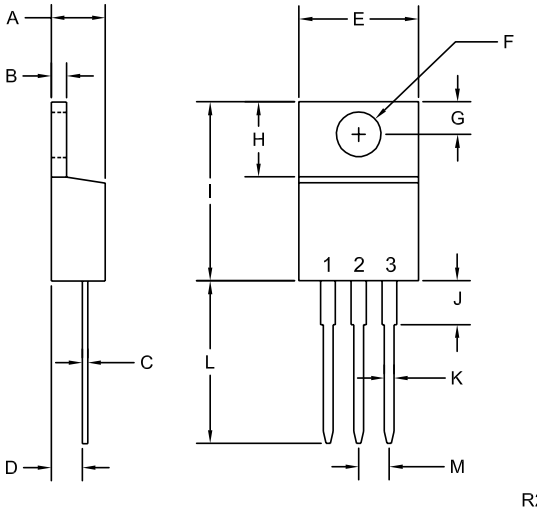
ELECTRICAL CHARACTERISTICS - Continued: (T_A=25°C unless otherwise noted)

SYMBOL	TEST CONDITIONS	TYP	UNITS
$Q_{g(tot)}$	V_{DS}=520V, V_{GS}=10V, I_D=10A (Note 2)	20	nC
Q_{gs}	V_{DS}=520V, V_{GS}=10V, I_D=10A (Note 2)	8.0	nC
Q_{gd}	V_{DS}=520V, V_{GS}=10V, I_D=10A (Note 2)	7.0	nC
t_d	V_{DD}=325V, I_D=10A, R_G=25Ω (Note 2)	40	ns
t_r	V_{DD}=325V, I_D=10A, R_G=25Ω (Note 2)	74	ns
t_s	V_{DD}=325V, I_D=10A, R_G=25Ω (Note 2)	52	ns
t_f	V_{DD}=325V, I_D=10A, R_G=25Ω (Note 2)	35	ns
t_{rr}	V_{GS}=0, I_S=10A, di/dt=100A/μs (Note 2)	570	ns
Q_{rr}	V_{GS}=0, I_S=10A, di/dt=100A/μs (Note 2)	4.7	μC

Note 2: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

TO-220 CASE - MECHANICAL OUTLINE

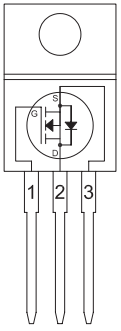


R2

DIMENSIONS				
	INCHES		MILLIMETERS	
SYMBOL	MIN	MAX	MIN	MAX
A	0.170	0.190	4.31	4.82
B	0.045	0.055	1.15	1.39
C	0.013	0.026	0.33	0.65
D	0.083	0.107	2.10	2.72
E	0.394	0.417	10.01	10.60
F (DIA)	0.140	0.157	3.55	4.00
G	0.100	0.118	2.54	3.00
H	0.230	0.270	5.85	6.85
I	0.560	0.625	14.23	15.87
J	-	0.250	-	6.35
K	0.025	0.038	0.64	0.96
L	0.500	0.579	12.70	14.70
M	0.090	0.110	2.29	2.79

TO-220 (REV: R2)

PIN CONFIGURATION



LEAD CODE:
1) Gate
2) Drain
3) Source
Tab) Drain

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CDM22010-650

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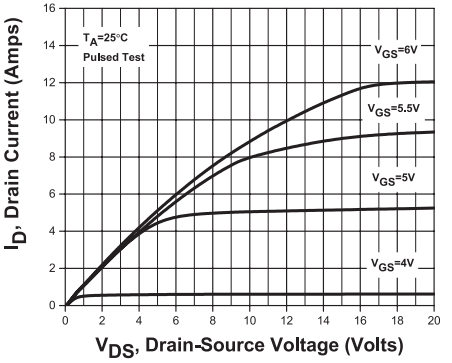
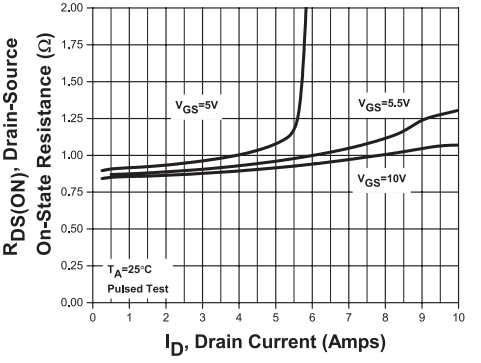
TYPICAL ELECTRICAL CHARACTERISTICS

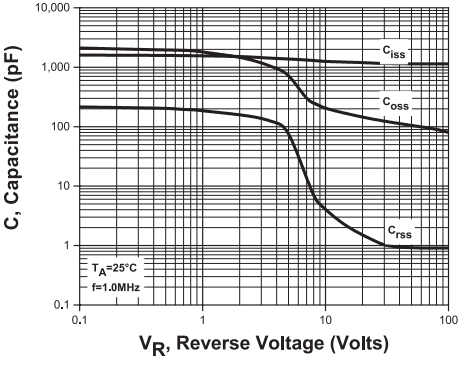
Output Characteristics



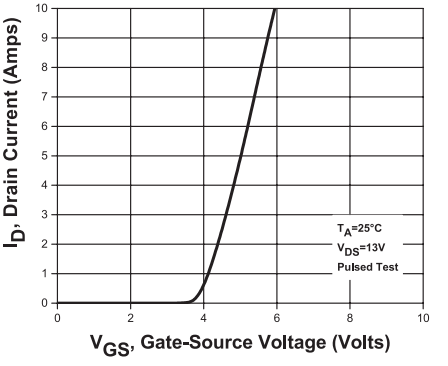
Drain Source On Resistance



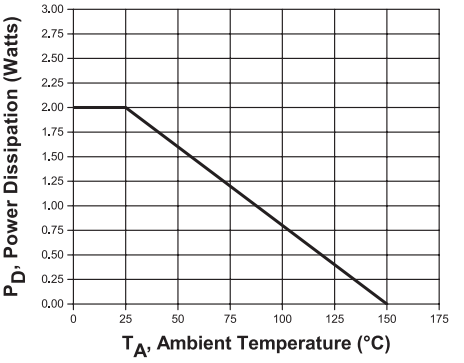
Capacitance



Transfer Characteristics



Power Derating



R2 (20-July 2023)

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

Corporate Headquarters & Customer Support Team

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www.centralsemi.com/wwreps

Worldwide Distributors:
www.centralsemi.com/wwdistributors

https://www.centralsemi.com

Product End of Life Notification

PDN ID:	PDN01263
Notification Date:	9/06/23
Last Buy Date:	Stock Only
Last Shipment Date	Stock Only

Please be advised that Central Semiconductor must immediately discontinue the product(s) listed in the attached PDN notice. Orders can only be accepted for products with available inventory on hand.

You may have purchased one or more of the products listed. Please do not hesitate to contact your local Central Semiconductor sales representative with any questions or needs you may have. Central regrets any inconvenience this may cause.

Sincerely,

Central Semiconductor, LLC

https://www.centralsemi.com

Product End of Life Notification

PDN ID:	PDN01263
Notification Date:	9/06/23
Last Buy Date:	Stock Only
Last Shipment Date	Stock Only

Summary:The following devices in the TO-220 case are discontinued and now classified as End of Life (EOL).

Although Central Semiconductor makes every effort to continue to produce devices that have been proclaimed EOL (End of Life) by other manufacturers, it is an accepted industry practice to discontinue certain devices when customer demand falls below a minimum level of sustainability. Accordingly, the following product(s) have been transitioned to End of Life status as part of Central's ongoing Product Portfolio Management. Any replacement products are noted below. The effective date for placing last purchase orders will be six (6) months from the date of this notice and twelve (12) months from the notice date for final shipments, and minimum order quantities may apply. The last purchase and shipment dates may be extended if inventory is available.

*** All Plating types (PBFREE,TIN/LEAD) for each item listed are included in this notice.**

Central Part Number	Suggested Replacement
CDM22010-650	N/A
CDM22010-650 SL	N/A
CDM2209-900FP SL	N/A
CR15U-06S SL	N/A

Central would be happy to assist you by providing additional information or technical data to help locate an alternate source if we have no replacement available. If you would like assistance, please visit https://my.centralsemi.com/submit-inquiry?type=ER to submit an online inquiry.