# CMD840/CMU840

500V N-Channel MOSFET

## General Description

The 840 ueses advanced Manufacturing of high pressure MOSFET process， can provide excellent RDS(ON). These devices are well suited for high efficiency switched mode power supplies, active power factor correction based on half bridge topology.

## Product Summary

| BVDSS | RDSON | ID |
|---|---|---|
| 500V | 1.2Ω | 8A |

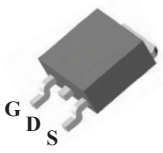
## Applications

- Adapter
- Switched Mode Power Supplies (SMPS)
- Uninterruptible Power Supply (UPS)

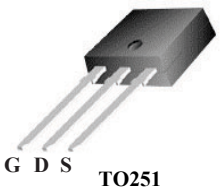
## Features

- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

## TO252 / TO251 Pin Configuration




TO252
CMD840

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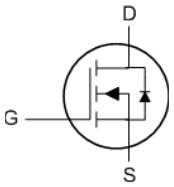


## Absolute Maximum Ratings

$T_C$ = 25℃ unless otherwise noted

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{DSS}$ | Drain-Source Voltage | 500 | V |
| $I_D$ | Drain Current - Continuous ($T_C$ = 25℃) | 8 | A |
| | - Continuous ($T_C$ = 100℃) | 5 | A |
| $I_{DM}$ | Drain Current - Pulsed [a] | 32 | A |
| $V_{GSS}$ | Gate-Source Voltage | ± 30 | V |
| $E_{AS}$ | Single Pulsed Avalanche Energy [b] | 280 | mJ |
| dv/dt | Peak Diode Recovery dv/dt [c] | 4.5 | V/ns |
| $P_D$ | Power Dissipation ($T_C$ = 25℃) | 100 | W |
| $T_J$, $T_{STG}$ | Operating and Storage Temperature Range | -55 to +150 | ℃ |
| $T_L$ | Maximum lead temperature for soldering purposes, 1/8 from case for 5 seconds | 300 | ℃ |

## Thermal Characteristics

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $R_{\theta JC}$ | Thermal Resistance, Junction-to-Case Max. | 0.9 | ℃/W |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient Max. | 62.5 | ℃/W |

## Electrical Characteristic

$T_C$ = 25℃ unless otherwise noted

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$ = 0 V, $I_D$ = 250 μA | 500 | -- | -- | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$ = 500 V, $V_{GS}$ = 0 V | -- | -- | 1 | μA |
| | | $V_{DS}$ = 400 V, $T_C$ = 125℃ | -- | -- | 10 | |
| $I_{GSSF}$ | Gate-Body Leakage Current, Forward | $V_{GS}$ = 30 V, $V_{DS}$ = 0 V | -- | -- | 100 | nA |
| $I_{GSSR}$ | Gate-Body Leakage Current, Reverse | $V_{GS}$ = -30 V, $V_{DS}$ = 0 V | -- | -- | -100 | nA |
| **On Characteristics** | | | | | | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$ = $V_{GS}$, $I_D$ = 250 μA | 2.0 | -- | 4.0 | V |
| $R_{DS(on)}$ | Static Drain-Source On-Resistance | $V_{GS}$ = 10 V, $I_D$ = 3.25A | -- | -- | 1.2 | Ω |
| $g_{FS}$ | Forward Transconductance | $V_{DS}$ = 10 V, $I_D$ = 5A | -- | 10 | -- | S |
| **Dynamic Characteristics** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$ = 25 V<br>$V_{GS}$ = 0 V<br>f = 1.0 MHz | -- | 1400 | -- | pF |
| $C_{oss}$ | Output Capacitance | | -- | 210 | -- | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | -- | 80 | -- | pF |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DD}$ = 250 V<br>$I_D$ = 8A d,e<br>$R_G$ = 25Ω | -- | 15 | -- | ns |
| $t_r$ | Turn-On Rise Time | | -- | 62 | -- | ns |
| $t_{d(off)}$ | Turn-Off Delay Time | | -- | 93 | -- | ns |
| $t_f$ | Turn-Off Fall Time | | -- | 48 | -- | ns |
| $Q_g$ | Total Gate Charge | $V_{DS}$ = 400 V<br>$I_D$ = 8A d,e<br>$V_{GS}$ = 10 V | -- | 26 | -- | nC |
| $Q_{gs}$ | Gate-Source Charge | | -- | 4 | -- | nC |
| $Q_{gd}$ | Gate-Drain Charge | | -- | 13 | -- | nC |
| **Drain-Source Diode Characteristics and Maximum Ratings** | | | | | | |
| $I_S$ | Maximum Continuous Drain-Source Diode Forward Current | | -- | -- | 8 | A |
| $I_{SM}$ | Maximum Pulsed Drain-Source Diode Forward Current | | -- | -- | 32 | A |
| $V_{SD}$ | Drain-Source Diode Forward Voltage | $V_{GS}$ = 0 V, $I_S$ = 3A | -- | -- | 1.4 | V |
| $t_{rr}$ | Reverse Recovery Time | $V_{GS}$ = 0 V, $I_S$ = 8A<br>dI /dt = 100 A/μs d | -- | 340 | -- | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | -- | 3 | -- | μC |

Notes:

a.Repetitive Rating: Pulse width limited by maximum junction temperature

b.L=5mH, $I_{AS}$=10.6A, $V_{DD}$=50V, $V_G$=10V,Starting $T_J$=25℃

c.$I_{SD}$≤8.0A, di/dt ≤ 200A/us, $V_{DD}$ ≤ $BV_{DSS}$, Starting $T_J$ = 25℃

d.Pulse Test: Pulse width ≤ 300us, Duty Cycle ≤ 2%

e.Essentially Independent of Operating Temperature Typical Characteristics