

60V N-Channel Fast Switching MOSFET

General Description

The CMC06106NL is the high cell density trenched N-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications.

The CMC06106NL meets the RoHS and Green Product requirement with full function reliability approved.

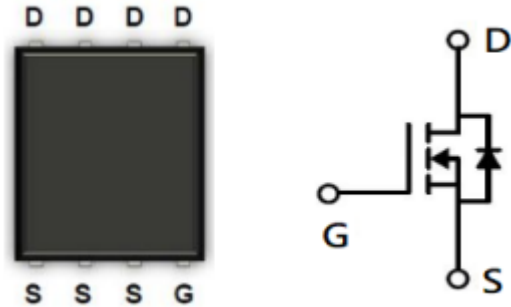
Product Summary

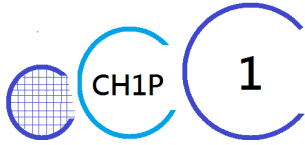
| Item | Typical Value | Unit |
|--------------------------------------|---------------|------------|
| V_{DS} | 60 | V |
| $R_{DS(on)}$ @ $V_{GS} = 10V$ (Typ.) | 5.2 | m Ω |
| I_D | 80 | A |

Features

- Advanced Trench MOS Technology
- Low Gate Charge
- 100% EAS Guaranteed
- Low $R_{DS(on)}$
- Green Device Available

PRPAK5x6 Pin Description





preliminary

CMC06106NL-56

Absolute Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Value | Units |
|--|---------------|------------|------------------|
| Drain-Source Voltage | V_{DS} | 60 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current, $T_C = 25^\circ\text{C}$ | I_D | 80 | A |
| Single Pulse UIS Capability, 0.5mH | E_{AS} | 92.5 | mJ |
| Pulsed Drain Current | I_{DM} | 300 | A |
| Total Power Dissipation | P_D | 54.3 | W |
| Junction Temperature Maximum | T_{JMAX} | 150 | $^\circ\text{C}$ |
| Storage Temperature | $T_{Storage}$ | -55 to 150 | $^\circ\text{C}$ |

Thermal Characteristics

| Parameter | Symbol | Value | Units |
|-------------------------------------|-----------------|-------|---------------------------|
| Thermal Resistance Junction-Ambient | $R_{\theta JA}$ | 55 | $^\circ\text{C}/\text{W}$ |

Electrical Characteristics

| Static ($T_J=25^{\circ}\text{C}$ unless otherwise specified) | | | | | | |
|--|--------------|--|------|------|-----------|------------|
| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS} = 0V, I_D = 250\mu A$ | 60 | --- | --- | V |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS} = \pm 20V, V_{DS} = 0V$ | --- | --- | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 48V, V_{GS} = 0V$ | --- | --- | 1 | μA |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 20A$ | --- | 4.4 | 5.2 | m Ω |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 1.2 | --- | 2.3 | V |
| Diode Forward Voltage | V_{SD} | $I_S = 1A, V_{GS} = 0V$ | --- | --- | 1.2 | V |
| Continuous Source Current | I_S | $V_{GS} = 0V, V_{DS} \text{Open}, f=1\text{MHz}$ | --- | --- | 80 | A |
| Dynamic ($T_J=25^{\circ}\text{C}$ unless otherwise specified) | | | | | | |
| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
| Input Capacitance | C_{iss} | $V_{GS} = 0V, V_{DS} = 30V, f = 1\text{MHz}$ | --- | 1625 | --- | pF |
| Output Capacitance | C_{oss} | | --- | 438 | --- | |
| Reverse Transfer Capacitance | C_{rss} | | --- | 25 | --- | |
| Total Gate Charge | Q_g | $V_{DS} = 30V, I_D = 20A, V_{GS} = 10V$ | --- | 33.4 | --- | nC |
| Gate-Source Charge | Q_{gs} | | --- | 5.8 | --- | |
| Gate-Drain Charge | Q_{gd} | | --- | 7.9 | --- | |
| Turn-on delay time | $T_{d(on)}$ | $V_{DD} = 30V, I_D = 20A, V_{GS} = 10V, R_G=3.0\Omega$ | --- | 7.5 | --- | nS |
| Rise time | T_r | | --- | 6 | --- | |
| Turn-off delay time | $T_{d(off)}$ | | --- | 29 | --- | |
| Fall time | T_f | | --- | 7.5 | --- | |

Typical Characteristics

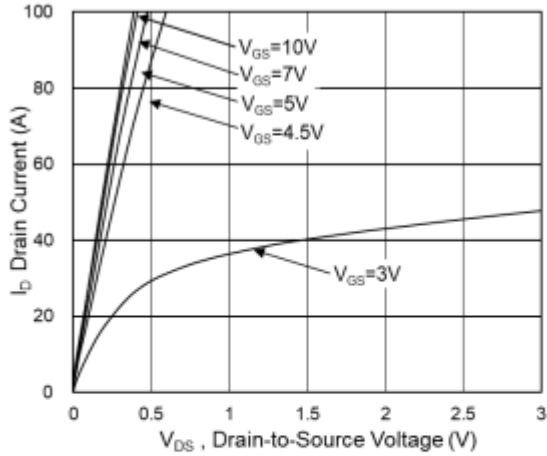


Fig.1 Typical Output Characteristics

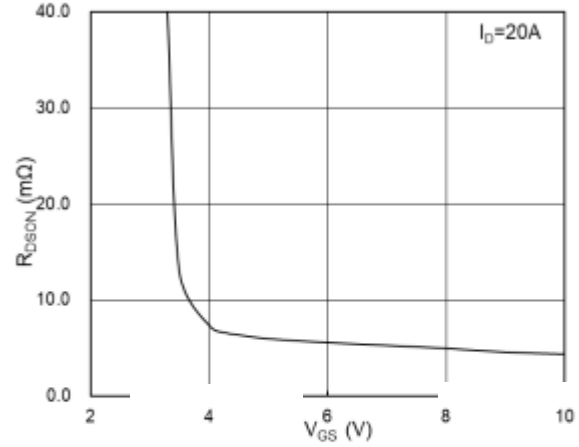


Fig.2 On-Resistance vs G-S Voltage

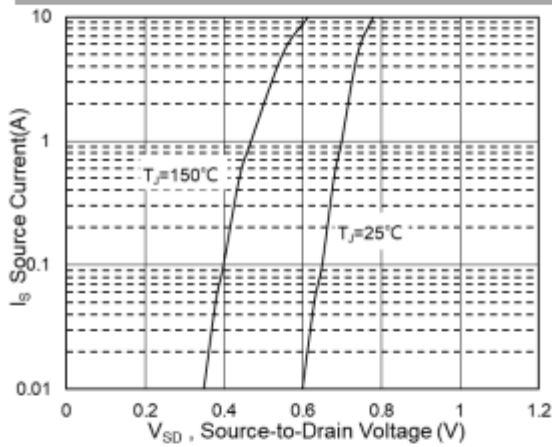


Fig.3 Source Drain Forward Characteristics

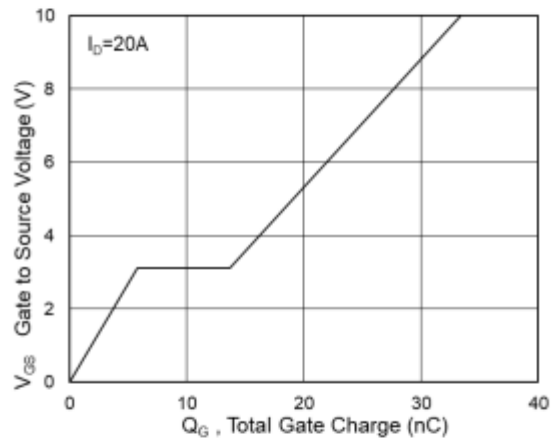


Fig.4 Gate-Charge Characteristics

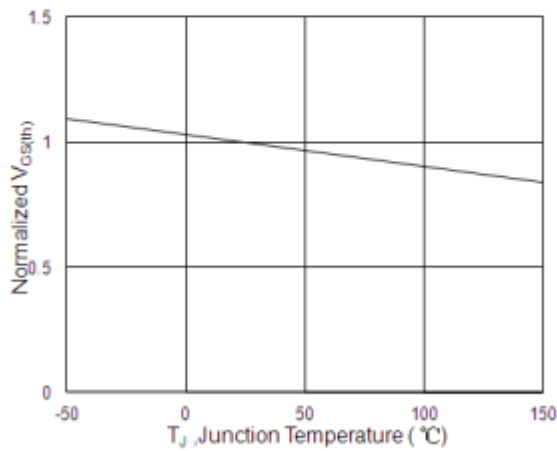


Fig.5 Normalized $V_{GS(th)}$ vs T_J

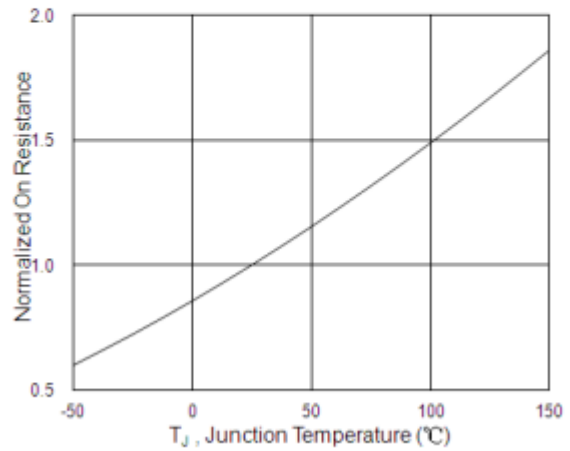


Fig.6 Normalized $R_{DS(on)}$ vs T_J

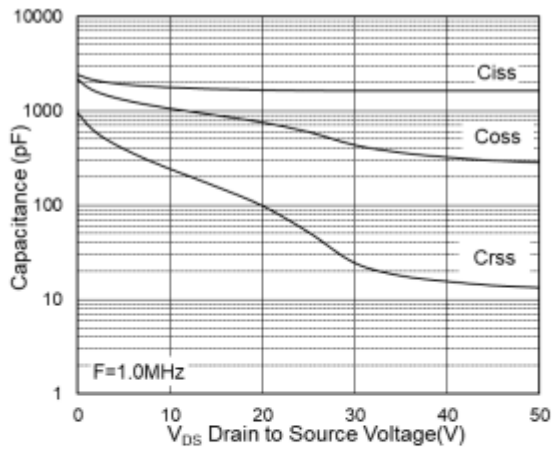


Fig.7 Capacitance

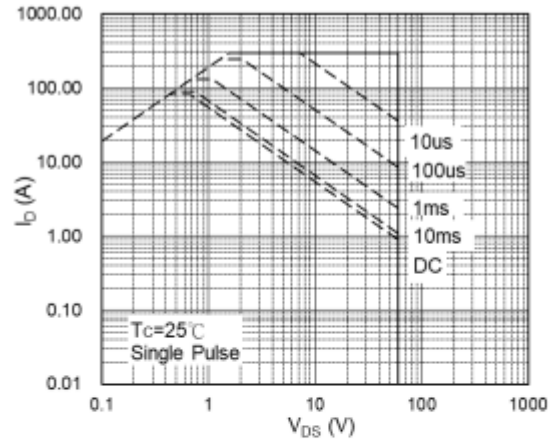


Fig.8 Safe Operating Area

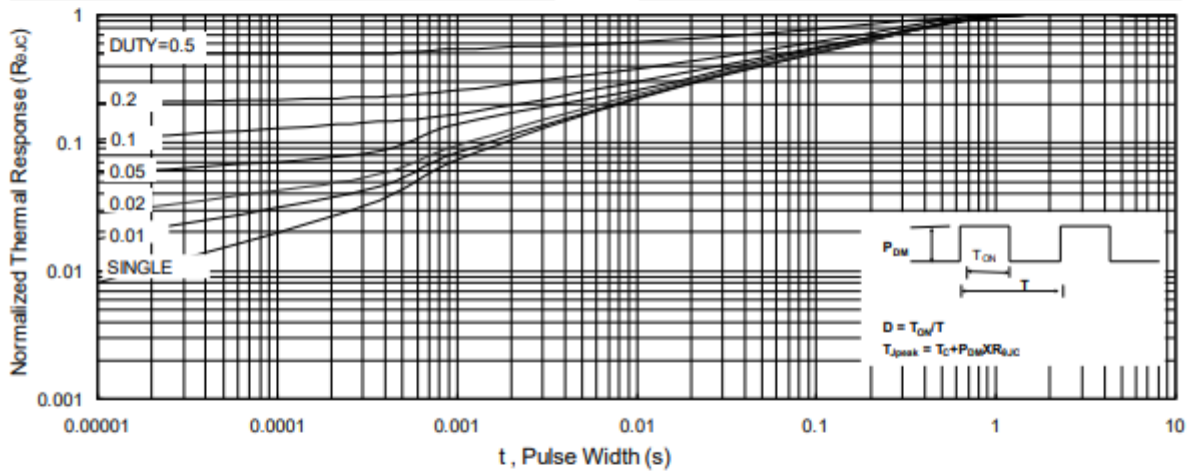


Fig.9 Normalized Maximum Transient Thermal Impedance

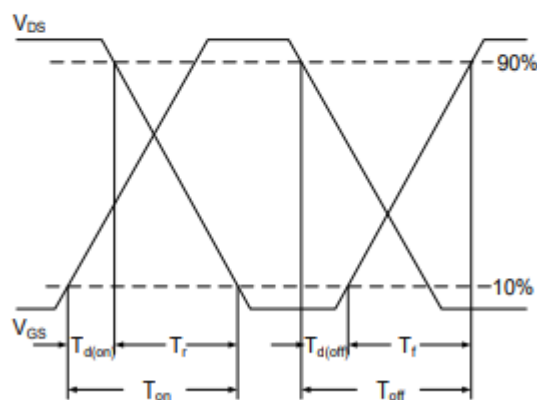


Fig.10 Switching Time Waveform

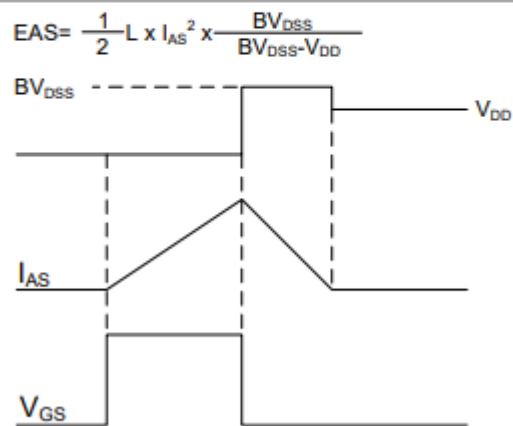
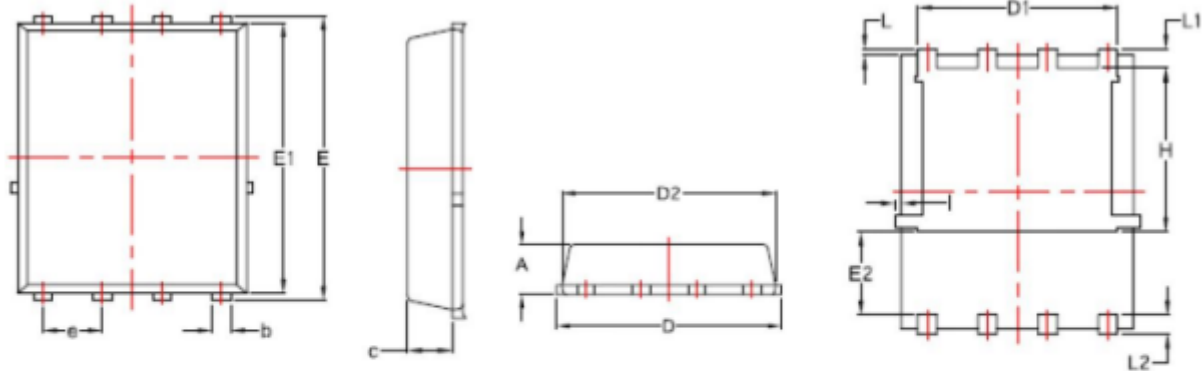


Fig.11 Unclamped Inductive Switching Waveform

PRPAK5x6 Package Outline


| SYMBOL | MIN | NOM | MAX |
|--------|----------|------|-------|
| A | 0.90 | ---- | 1.20 |
| b | 0.30 | ---- | 0.51 |
| c | 0.60 | ---- | 1.046 |
| D | 4.80 | ---- | 5.45 |
| D1 | 4.11 | ---- | 4.31 |
| D2 | 4.80 | ---- | 5.20 |
| E | 5.90 | ---- | 6.35 |
| E1 | 5.65 | ---- | 6.06 |
| E2 | 1.10 | ---- | ---- |
| e | 1.27 BSC | | |
| L | 0.05 | ---- | 0.25 |
| L1 | 0.38 | ---- | 0.61 |
| L2 | 0.30 | ---- | 0.71 |
| H | 3.30 | ---- | 3.92 |
| I | ---- | ---- | 0.18 |

Unit: mm

Land Pattern (Only for Reference)

Unit: mm

