## Description

CM1602 is the N-Channel enhancement mode power field effect transistors with high cell density, trench technology. This high density process and design have been optimized switching performance and especially tailored to minimize on-state resistance.

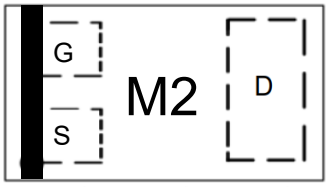
## Applications

- Cellular Handsets and Accessories
- Personal Digital Assistants
- Portable Instrumentation
- Load switch

## Features

- $V_{DS}$: 20V
- $I_D$: 0.9A
- $R_{DS_{ON}}$ ($@V_{GS}$=4.5V) : < 250mΩ
- $R_{DS_{ON}}$ ($@V_{GS}$=2.5V) : < 350mΩ
- High density cell design for extremely low $R_{DS_{ON}}$
- Excellent on-resistance and DC current capability

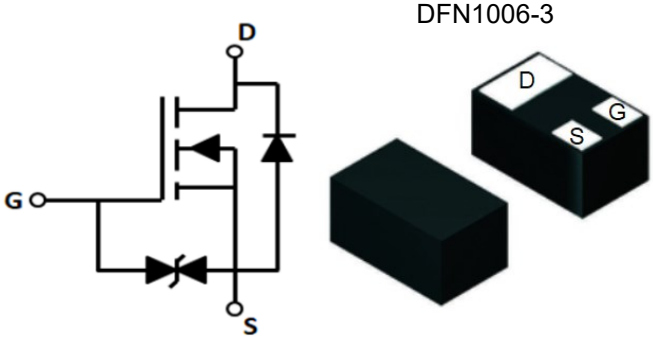
## Marking Information




Device Code = M2

## Equivalent Circuit and Pin Configuration

DFN1006-3




## Ordering Information

| Part Number | Packaging | Reel Size |
|---|---|---|
| CM1602 | 10000/Tape & Reel | 7 inch |

## Absolute Maximum Ratings ($T_A$=25 ℃ unless otherwise noted)

| Parameter | | Symbol | Maximum | Unit |
|---|---|---|---|---|
| Drain-source Voltage | | $V_{DS}$ | 20 | V |
| Gate-source Voltage | | $V_{GS}$ | ±10 | V |
| Continuous Drain Current | $T_A$=25°C , t≤5s | $I_D$ | 1 | A |
| | $T_A$=25°C , Steady State | | 0. 9 | A |
| | $T_A$=75°C ,Steady State | | 0.69 | A |
| Pulsed Drain Current[1] | | $I_{DM}$ | 4.0 | A |
| Total Power Dissipation @ $T_A$=25°C [2] | t≤5s | $P_D$ | 430 | mW |
| | Steady State | | 340 | |
| Thermal Resistance Junction-to-Ambient [2] | @t≤5s | $R_{\theta JA}$ | 294 | °C/W |
| Thermal Resistance Junction-to-Ambient [2] | @Steady State | | 366 | |
| Junction and Storage Temperature Range | | $T_J$,$T_{STG}$ | -55 to +150 | °C |

## Electrical Characteristics ($T_J$=25 ℃ unless otherwise noted)

| Parameter | Symbol | Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Static Parameter** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V,$I_D$=250μA | 20 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=20V,$V_{GS}$=0V,$T_C$=25°C | | | 1 | μA |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$=±10V,$V_{DS}$=0V | | | ±10 | uA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_D$=250μA | 0.35 | 0.75 | 1.1 | V |
| Static Drain-Source on-Resistance | $R_{DS(on)}$ | $V_{GS}$=4.5V,$I_D$=0.5A | | 170 | 250 | mΩ |
| | | $V_{GS}$=2.5V,$I_D$=0.3A | | 225 | 350 | |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=0.9A,$V_{GS}$=0V | | | 1.2 | V |
| Maximum Body-Diode Continuous Current | $I_S$ | | | | 0.9 | A |
| **Dynamic Parameters** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=16V,$V_{GS}$=0V,f=1MHz | | 46 | | pF |
| Output Capacitance | $C_{oss}$ | | | 9 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 5 | | |
| **Switching Parameters** | | | | | | |
| Turn-on Delay Time | $t_{D(on)}$ | $V_{GS}$=4.5V,$V_{DD}$=10V, $I_D$=0.5A,$R_{GEN}$=10Ω | | 6.7 | | ns |
| Turn-on Rise Time | $t_r$ | | | 4.8 | | |
| Turn-off Delay Time | $t_{D(off)}$ | | | 17.3 | | |
| Turn-off Fall Time | $t_f$ | | | 7.4 | | |

Noted: (1) Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.

(2) Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for drain 6cm$^2$.

## Typical Performance Characteristics

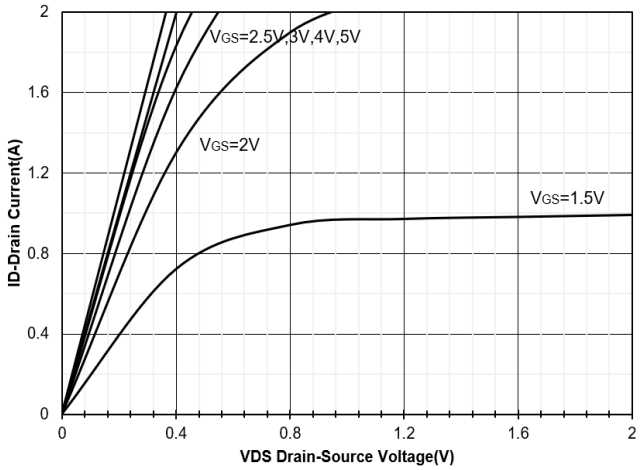



Figure 1. Output Characteristics

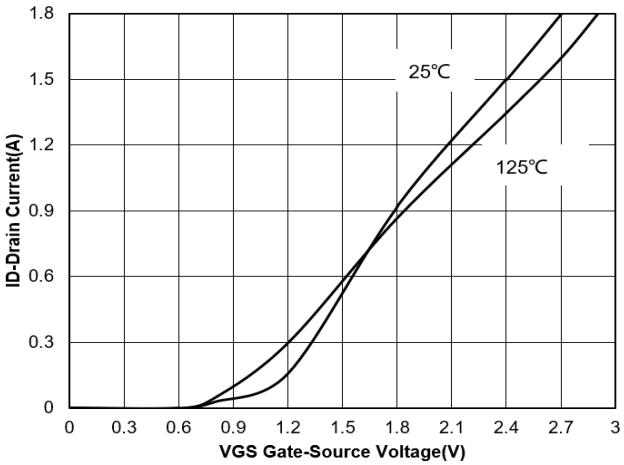



Figure 2. Transfer Characteristics

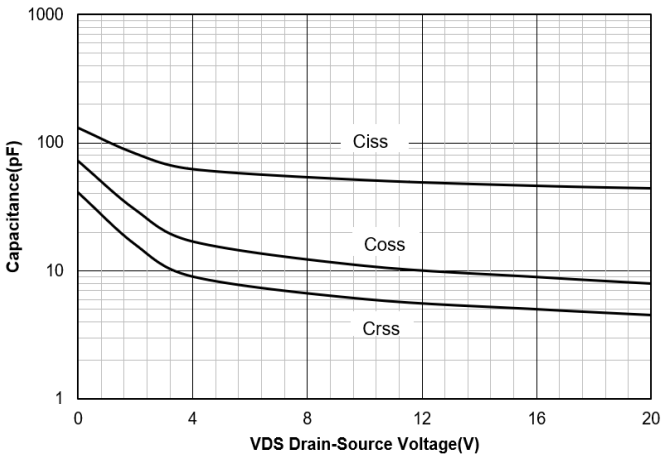



Figure 3. Capacitance Characteristics

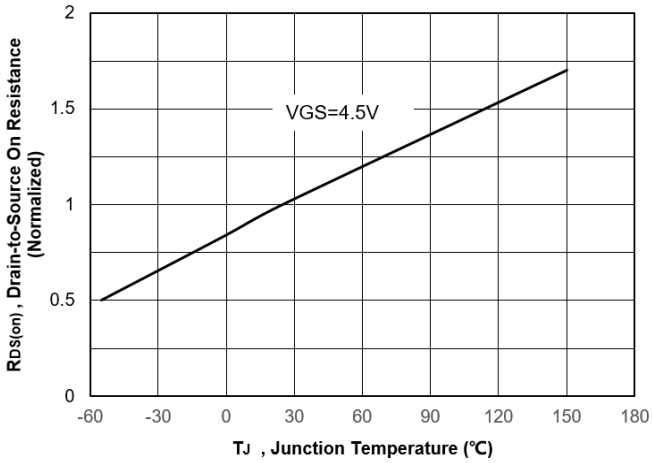



Figure 4. Normalized On-Resistance Vs. Temperature

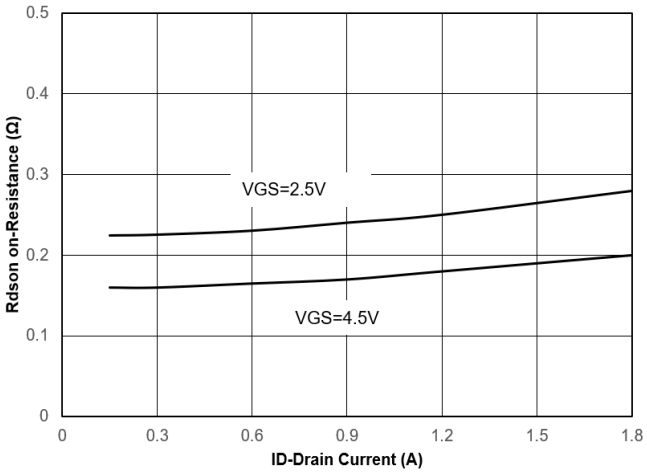



Figure 5. Drain-Source on Resistance

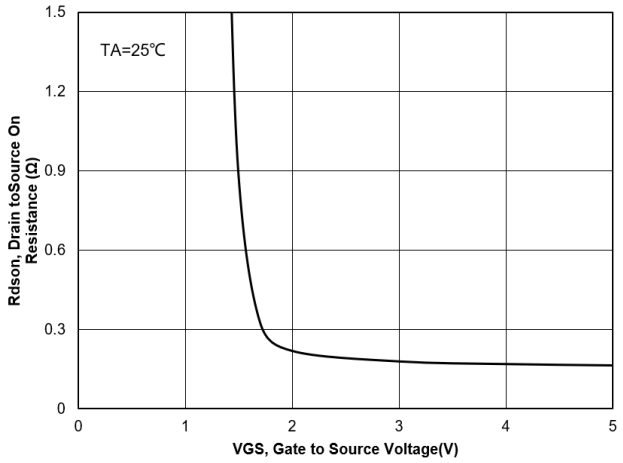



Figure 6. Typical Drain to Source ON Resistance VS Gate Voltage and Drain Current

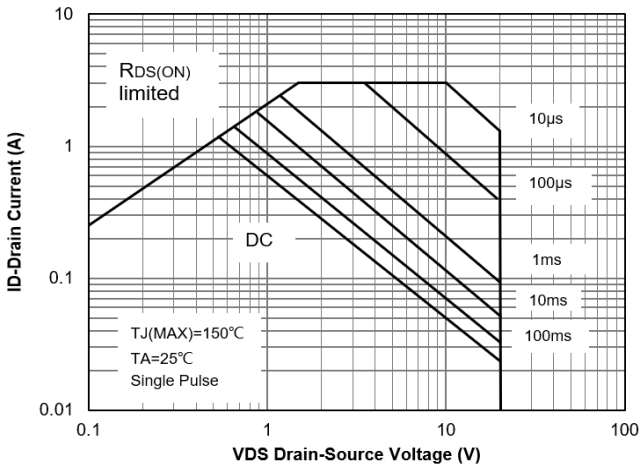



Figure 7. Safe Operation Area

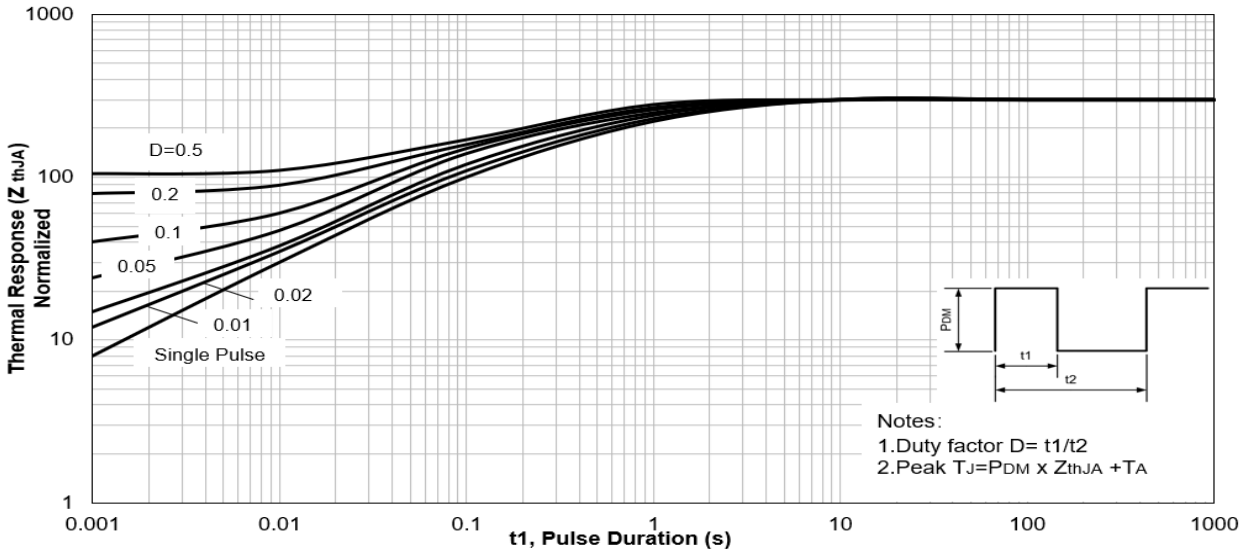



Figure 8. Maximum Effective Transient Thermal Impedance ,Junction-to-Ambient

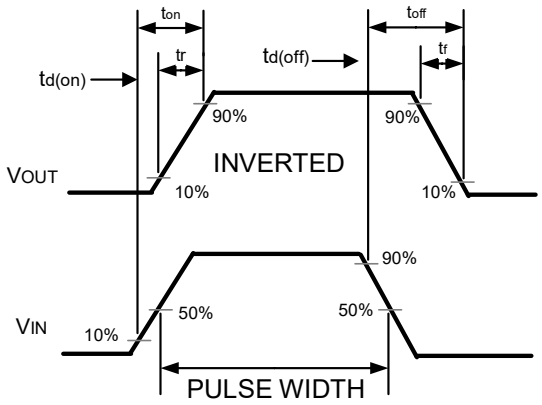
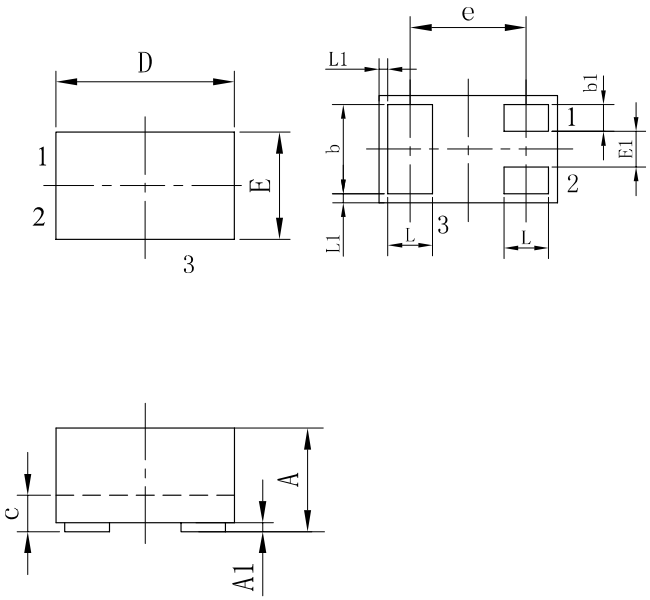


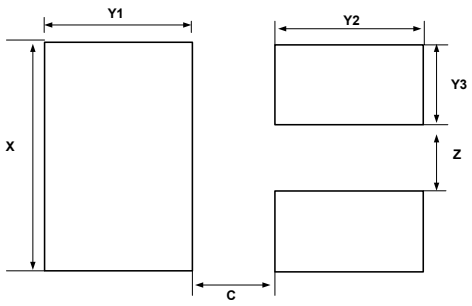

Figure 9. Switching wave

## DFN1006-3 Package Outline Drawing




| SYM | DIMENSIONS | | | | | |
|---|---|---|---|---|---|---|
| | MILLIMETERS | | | INCHES | | |
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.45 | 0.50 | 0.55 | 0.018 | 0.020 | 0.022 |
| A1 | 0.00 | 0.02 | 0.05 | 0.000 | 0.001 | 0.002 |
| b | 0.45 | 0.50 | 0.55 | 0.018 | 0.020 | 0.022 |
| b1 | 0.10 | 0.15 | 0.20 | 0.004 | 0.006 | 0.008 |
| c | 0.12 | 0.15 | 0.18 | 0.005 | 0.006 | 0.007 |
| D | 0.95 | 1.00 | 1.05 | 0.037 | 0.039 | 0.041 |
| e | 0.65 BSC | | | 0.026 BSC | | |
| E | 0.55 | 0.60 | 0.65 | 0.022 | 0.024 | 0.026 |
| E1 | 0.15 | 0.20 | 0.25 | 0.006 | 0.008 | 0.010 |
| L | 0.20 | 0.25 | 0.30 | 0.008 | 0.010 | 0.012 |
| L1 | 0.05 REF | | | 0.0002 REF | | |

## Suggested Land Pattern




| SYM | DIMENSIONS | |
|---|---|---|
| | MILLIMETERS | INCHES |
| C | 0.25 | 0.010 |
| X | 0.65 | 0.024 |
| Y1 | 0.50 | 0.020 |
| Y2 | 0.50 | 0.020 |
| Y3 | 0.25 | 0.010 |
| Z | 0.20 | 0.008 |

## Contact Information

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