

## Features

- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note 1)
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

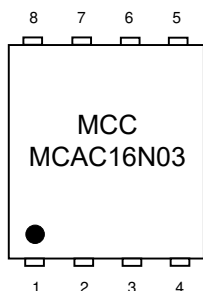
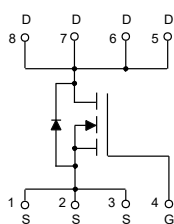
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 4.2°C/W Junction to Case (Note 2)

| Parameter                              | Symbol   | Rating                  | Unit |
|--|----------|-------------------------|------|
| Drain-Source Voltage                   | $V_{DS}$ | 30                      | V    |
| Gate-Source Voltage                    | $V_{GS}$ | $\pm 20$                | V    |
| Continuous Drain Current               | $I_D$    | $T_C=25^\circ\text{C}$  | 16   |
|  |          | $T_C=100^\circ\text{C}$ | 11   |
| Pulsed Drain Current (Note 3)          | $I_{DM}$ | 50                      | A    |
| Single Pulse Avalanche Energy (Note 4) | $E_{AS}$ | 70                      | mJ   |
| Total Power Dissipation                | $P_D$    | 30                      | W    |

### Note:

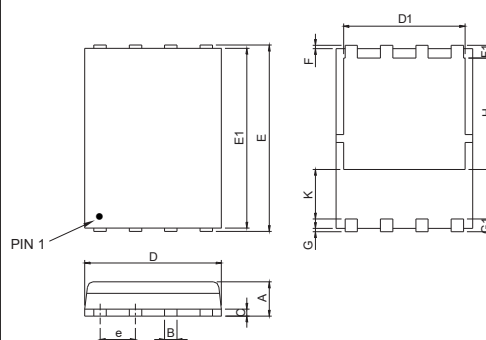
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Width Limited by Maximum Junction Temperature.
4. EAS Condition:  $T_J=25^\circ\text{C}, V_{DD}=15\text{V}, V_G=10\text{V}, L=0.1\text{mH}, R_G=25\Omega$ .

## Internal Structure and Marking Code



# N-CHANNEL MOSFET

## DFN5060-8L



| DIM | DIMENSIONS |       |       |       | NOTE |
|-----|------------|-------|-------|-------|------|
|     | INCHES     |       | MM    |       |      |
|     | MIN        | MAX   | MIN   | MAX   |      |
| A   | 0.035      | 0.047 | 0.90  | 1.20  |      |
| B   | 0.012      | 0.020 | 0.30  | 0.51  |      |
| C   | 0.007      | 0.010 | 0.19  | 0.25  |      |
| D   | 0.189      | 0.209 | 4.80  | 5.30  |      |
| D1  | 0.157      | 0.173 | 4.00  | 4.40  |      |
| E   | 0.232      | 0.244 | 5.90  | 6.20  |      |
| E1  | 0.217      | 0.228 | 5.50  | 5.80  |      |
| e   | 0.050      |       | 1.27  |       | TYP. |
| F   | 0.002      | 0.012 | 0.05  | 0.30  |      |
| F1  | 0.014      | 0.030 | 0.35  | 0.75  |      |
| G   | 0.002      | 0.012 | 0.05  | 0.30  |      |
| G1  | 0.014      | 0.030 | 0.35  | 0.75  |      |
| H   | 0.131      | 0.154 | 3.34  | 3.90  |      |
| K   | 0.030      | ----- | 0.762 | ----- |      |

**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

| Parameter   | Symbol        | Test Conditions  | Min | Typ  | Max       | Unit       |
|---|---------------|--|-----|------|-----------|------------|
| <b>Static Characteristics</b>                     |               |  |     |      |           |            |
| Drain-Source Breakdown Voltage                    | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$  | 30  | 36   |           | V          |
| Gate-Source Leakage Current                       | $I_{GSS}$     | $V_{DS}=0V, V_{GS}=\pm 20V$  |     |      | $\pm 100$ | nA         |
| Zero Gate Voltage Drain Current                   | $I_{DSS}$     | $V_{DS}=30V, V_{GS}=0V$  |     |      | 1         | $\mu A$    |
| Gate-Threshold Voltage <sup>(Note 5)</sup>        | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=250\mu A$  | 1   | 1.6  | 3         | V          |
| Drain-Source On-Resistance <sup>(Note 5)</sup>    | $R_{DS(on)}$  | $V_{GS}=10V, I_D=10A$  |     | 7    | 9         | m $\Omega$ |
|   |               | $V_{GS}=4.5V, I_D=10A$   |     | 10.5 | 14        |            |
| Forward Transconductance <sup>(Note 5)</sup>      | $g_{FS}$      | $V_{DS}=5V, I_D=8A$  | 15  |      |           | S          |
| <b>Dynamic Characteristics<sup>(Note 6)</sup></b> |               |  |     |      |           |            |
| Input Capacitance                                 | $C_{iss}$     | $V_{DS}=15V, V_{GS}=0V, f=1MHz$                                      |     | 1530 |           | pF         |
| Output Capacitance                                | $C_{oss}$     |  |     | 250  |           |            |
| Reverse Transfer Capacitance                      | $C_{rss}$     |  |     | 198  |           |            |
| Total Gate Charge                                 | $Q_g$         | $V_{DS}=15V, V_{GS}=10V, I_D=9A$                                     |     | 15   |           | nC         |
| Gate-Source Charge                                | $Q_{gs}$      |  |     | 3    |           |            |
| Gate-Drain Charge                                 | $Q_{gd}$      |  |     | 4.5  |           |            |
| Turn-On Delay Time                                | $t_{d(on)}$   | $V_{DD}=15V, I_D=10A$<br>$V_{GS}=10V, R_{GEN}=1.8\Omega$             |     | 10   |           | ns         |
| Turn-On Rise Time                                 | $t_r$         |  |     | 8    |           |            |
| Turn-Off Delay Time                               | $t_{d(off)}$  |  |     | 30   |           |            |
| Turn-Off Fall Time                                | $t_f$         |  |     | 5    |           |            |
| <b>Drain-Source Body Diode Characteristics</b>    |               |  |     |      |           |            |
| Continuous Body Diode Current                     | $I_S$         |  |     |      | 25        | A          |
| Body Diode Voltage <sup>(Note 5)</sup>            | $V_{SD}$      | $I_{SD}=10A, V_{GS}=0V$  |     | 0.85 | 1.2       | V          |
| Reverse Recovery Time                             | $t_{rr}$      | $T_J=25^\circ C, I_F=10A$<br>$di/dt=100A/\mu s$                      |     | 22   | 35        | ns         |
| Reverse Recovery Charge                           | $Q_{rr}$      |  |     | 12   | 20        | nC         |
| Forward Turn-On Time                              | $t_{on}$      | Intrinsic Turn-On Time is Negligible (Turn-On is Dominated by LS+LD) |     |      |           |            |

Note 5. Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

6. Guaranteed by Design, Not Subject to Production Testing.

**Curve Characteristics**

Fig. 1 - Output Characteristics

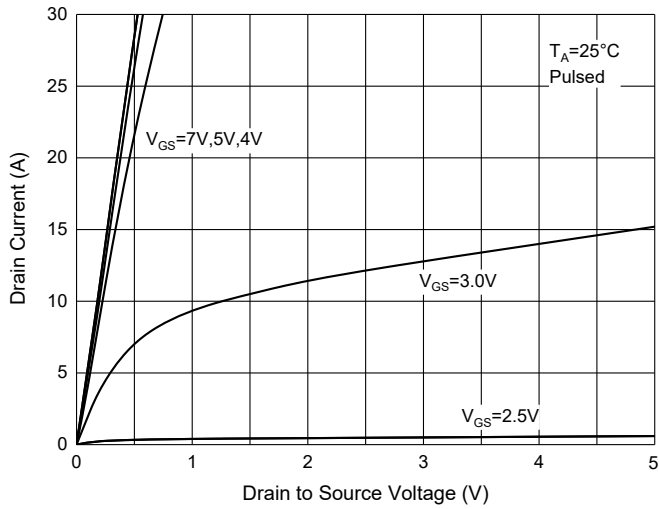


Fig. 2 - Transfer Characteristics

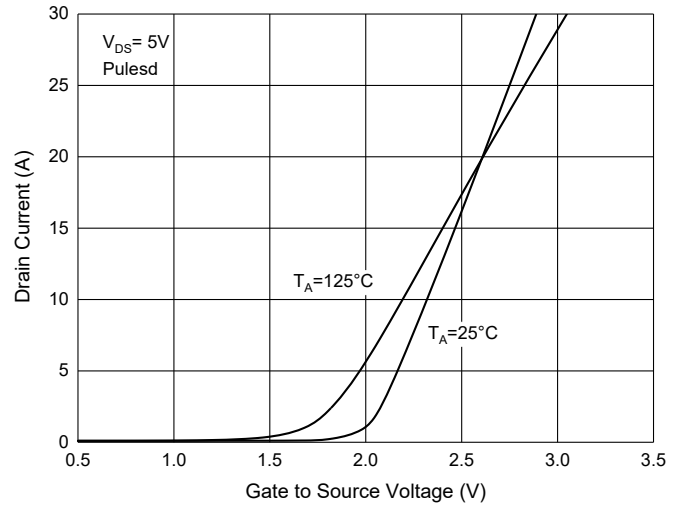


Fig. 3 -  $R_{DS(ON)} - I_D$

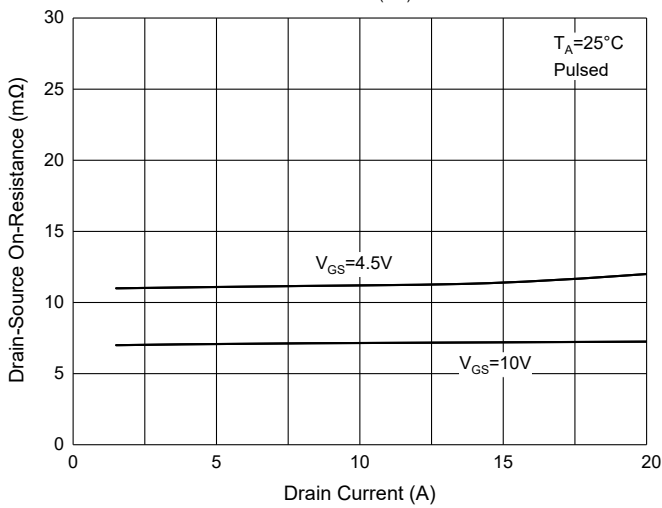


Fig. 4 -  $I_S - V_{SD}$

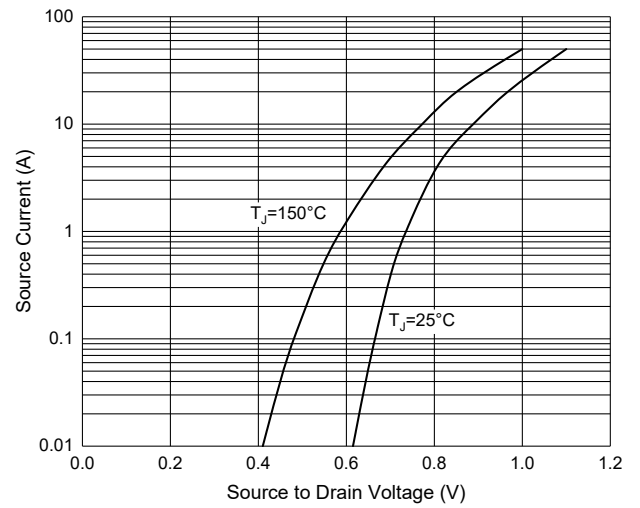


Fig. 5 -  $R_{DS(ON)} - \text{Temperature}$

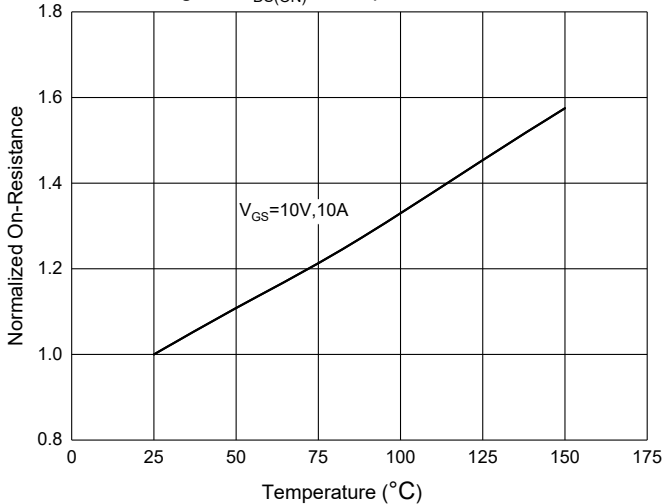
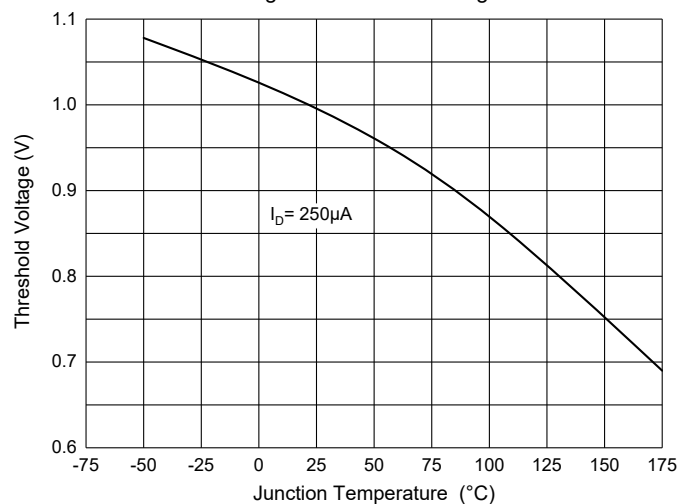


Fig. 6 - Threshold Voltage



## Ordering Information

| Device         | Packing                 |
|----------------|-------------------------|
| Part Number-TP | Tape&Reel: 2.5Kpcs/Reel |

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