

### Features

- Split Gate Trench MOSFET Technology
- Low  $R_{DS(on)}$  & FOM
- Excellent Stability and Uniformity
- Extremely Low Switching Loss
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

### Maximum Ratings

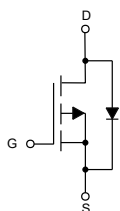
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 50°C/W Junction to Ambient<sup>(Note1)</sup>
- Thermal Resistance: 1.75°C/W Junction to Case

| Parameter                               | Symbol   | Rating            | Unit  |
|---|----------|-------------------|-------|
| Drain-Source Voltage                    | $V_{DS}$ | -100              | V     |
| Gate-Source Voltage                     | $V_{GS}$ | ±20               | V     |
| Continuous Drain Current                | $I_D$    | $T_C=25^\circ C$  | -18 A |
|   |          | $T_C=100^\circ C$ | -12 A |
| Pulsed Drain Current <sup>(Note2)</sup> | $I_{DM}$ | -72               | A     |
| Avalanche Energy <sup>(Note3)</sup>     | $E_{AS}$ | 100               | mJ    |
| Total Power Dissipation                 | $P_D$    | 70                | W     |

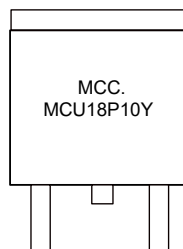
Note:

1. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ C$ .
2. Pulse Test: Pulse Width ≤ 300µs, Duty Cycle ≤ 2%.
3.  $T_J=25^\circ C$ ,  $V_{DD}=-50V$ ,  $V_G=-10V$ ,  $L=0.5mH$ ,  $R_g=25\Omega$ .

MCU18P10Y

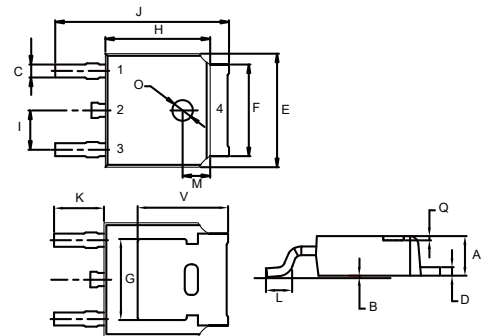


1. GATE
2. DRAIN
3. SOURCE
4. DRAIN



## P-CHANNEL MOSFET

### DPAK



| DIM | INCHES |       | MM   |       | NOTE |
|-----|--------|-------|------|-------|------|
|     | MIN    | MAX   | MIN  | MAX   |      |
| A   | 0.087  | 0.094 | 2.20 | 2.40  |      |
| B   | 0.000  | 0.005 | 0.00 | 0.13  |      |
| C   | 0.026  | 0.034 | 0.66 | 0.86  |      |
| D   | 0.018  | 0.023 | 0.46 | 0.58  |      |
| E   | 0.256  | 0.264 | 6.50 | 6.70  |      |
| F   | 0.201  | 0.215 | 5.10 | 5.46  |      |
| G   | 0.190  |       | 4.83 |       | TYP. |
| H   | 0.236  | 0.244 | 6.00 | 6.20  |      |
| I   | 0.086  | 0.094 | 2.18 | 2.39  |      |
| J   | 0.386  | 0.409 | 9.80 | 10.40 |      |
| K   | 0.114  |       | 2.90 |       | TYP. |
| L   | 0.055  | 0.067 | 1.40 | 1.70  |      |
| M   | 0.063  |       | 1.60 |       | TYP. |
| O   | 0.043  | 0.051 | 1.10 | 1.30  |      |
| Q   | 0.000  | 0.012 | 0.00 | 0.30  |      |
| V   | 0.211  |       | 5.35 |       | TYP. |

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

| Parameter                       | Symbol        | Test Conditions  | Min  | Typ  | Max       | Unit       |
|---------------------------------|---------------|--|------|------|-----------|------------|
| <b>Static Characteristics</b>   |               |  |      |      |           |            |
| Drain-Source Breakdown Voltage  | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=-250\mu A$                                     | -100 |      |           | V          |
| Gate-Source Leakage Current     | $I_{GSS}$     | $V_{DS}=0V, V_{GS}=\pm 20V$                                    |      |      | $\pm 100$ | nA         |
| Zero Gate Voltage Drain Current | $I_{DSS}$     | $V_{DS}=-100V, V_{GS}=0V$                                      |      |      | -1        | $\mu A$    |
|                                 |               | $V_{DS}=-100V, V_{GS}=0V, T_J=55^\circ C$                      |      |      | -5        | $\mu A$    |
| Gate-Threshold Voltage          | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=-250\mu A$                                 | -1   | -1.8 | -2.5      | V          |
| Drain-Source On-Resistance      | $R_{DS(on)}$  | $V_{GS}=-10V, I_D=-10A$  |      | 90   | 110       | m $\Omega$ |
|                                 |               | $V_{GS}=-4.5V, I_D=-5A$  |      | 100  | 130       | m $\Omega$ |
| Gate Resistance                 | $R_g$         | F=1 MHz, Open drain  |      | 11   |           | $\Omega$   |
| <b>Diode Characteristics</b>    |               |  |      |      |           |            |
| Continuous Body Diode Current   | $I_S$         |  |      |      | -18       | A          |
| Diode Forward Voltage           | $V_{SD}$      | $V_{GS}=0V, I_S=-10A$  |      |      | -1.5      | V          |
| Reverse Recovery Time           | $t_{rr}$      | $I_S=-5A, di/dt=100A/\mu s$                                    |      | 70   |           | ns         |
| Reverse Recovery Charge         | $Q_{rr}$      |  |      | 140  |           | nC         |
| <b>Dynamic Characteristics</b>  |               |  |      |      |           |            |
| Input Capacitance               | $C_{iss}$     | $V_{DS}=-80V, V_{GS}=0V, f=1MHz$                               |      | 1050 |           | pF         |
| Output Capacitance              | $C_{oss}$     |  |      | 97   |           |            |
| Reverse Transfer Capacitance    | $C_{rss}$     |  |      | 18   |           |            |
| Total Gate Charge               | $Q_g$         | $V_{DS}=-50V, V_{GS}=-10V, I_D=-5A$                            |      | 20   |           | nC         |
| Gate-Source Charge              | $Q_{gs}$      |  |      | 3.9  |           |            |
| Gate-Drain Charge               | $Q_{gd}$      |  |      | 4.3  |           |            |
| Turn-On Delay Time              | $t_{d(on)}$   | $V_{GS}=-10V, V_{DD}=-50V, R_L=2.5\Omega$<br>$R_{GEN}=6\Omega$ |      | 10   |           | ns         |
| Turn-On Rise Time               | $t_r$         |  |      | 30   |           |            |
| Turn-Off Delay Time             | $t_{d(off)}$  |  |      | 77   |           |            |
| Turn-Off Fall Time              | $t_f$         |  |      | 81   |           |            |

## Curve Characteristics

Fig. 1 - Typical Output Characteristics

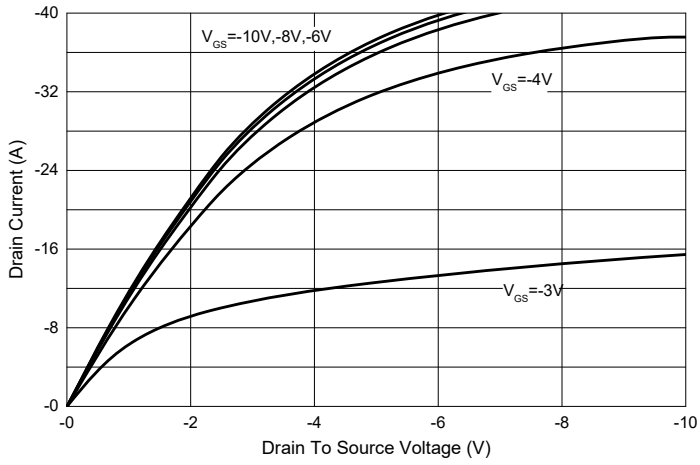


Fig. 2 - Transfer Characteristics

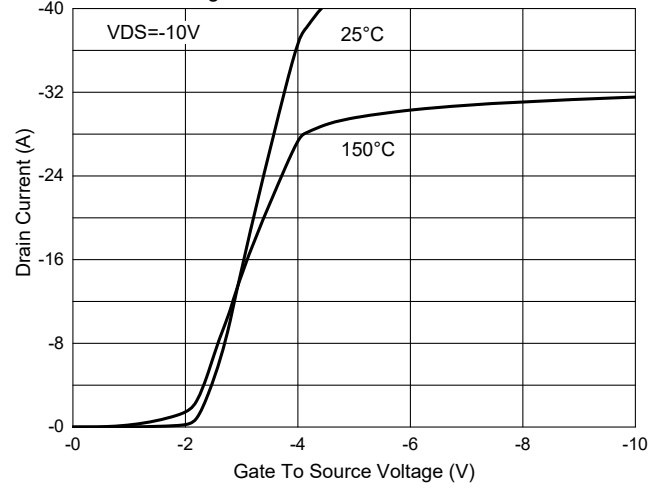


Fig. 3 -  $R_{DS(ON)} - V_{GS}$

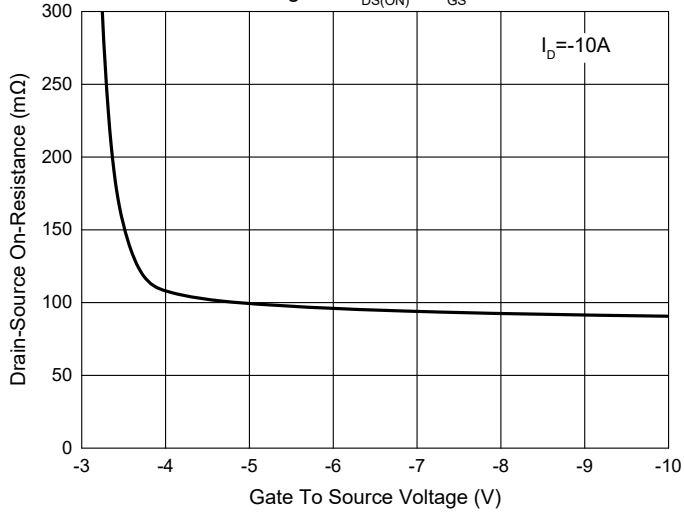


Fig. 4 - Normalized On Resistance Characteristics

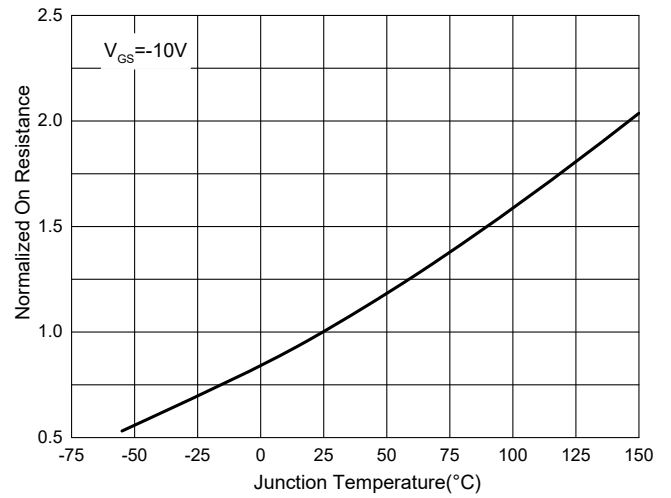


Fig. 5 - Capacitance Characteristics

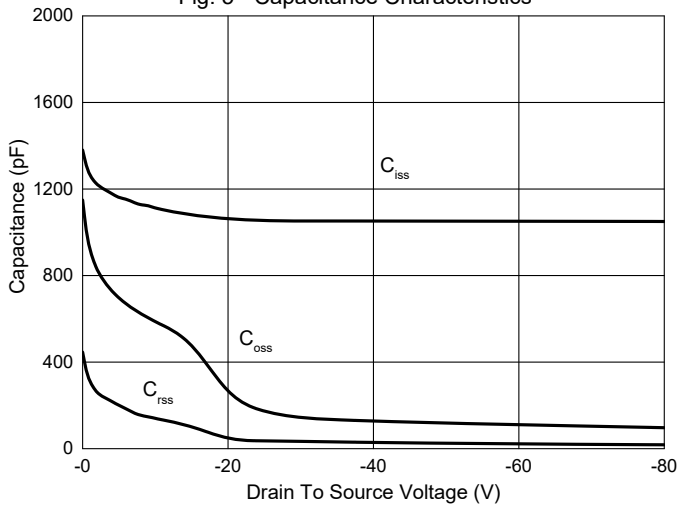
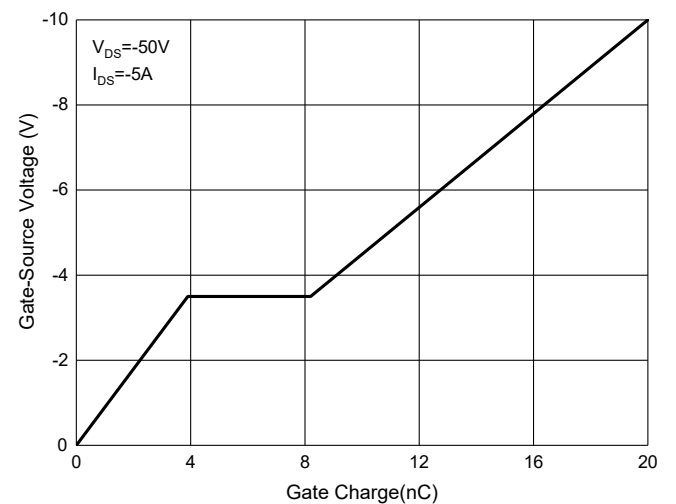
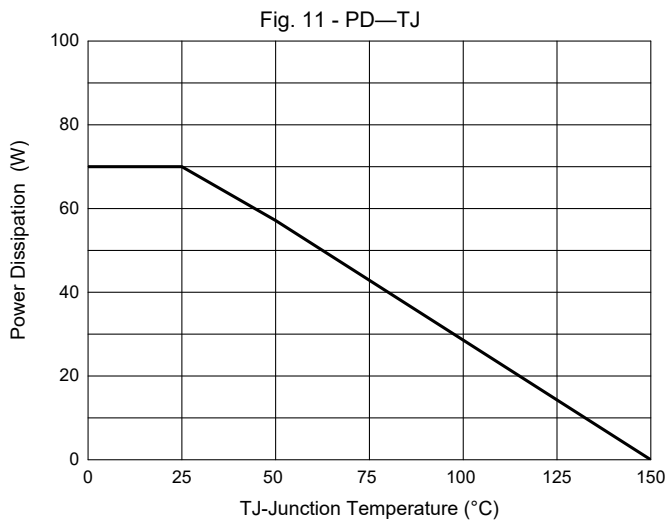
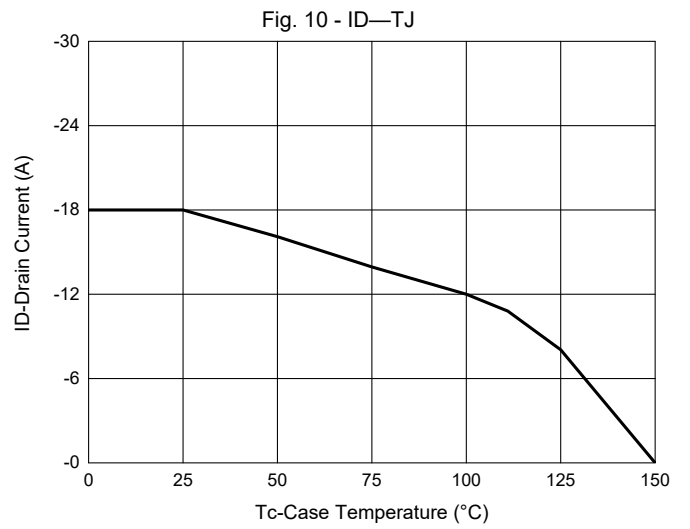
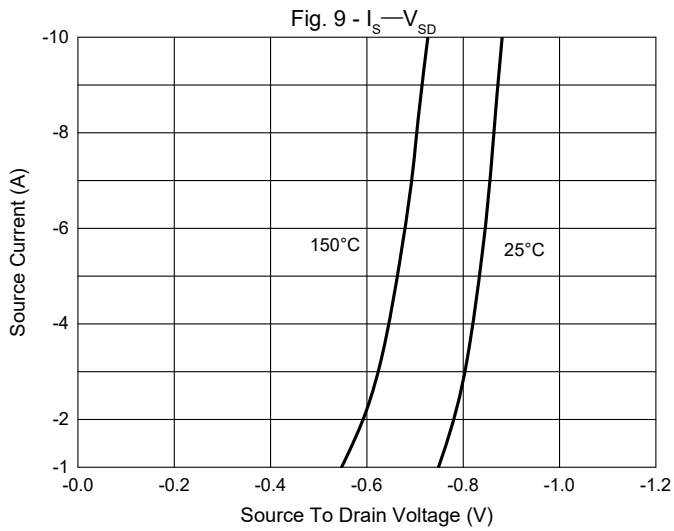
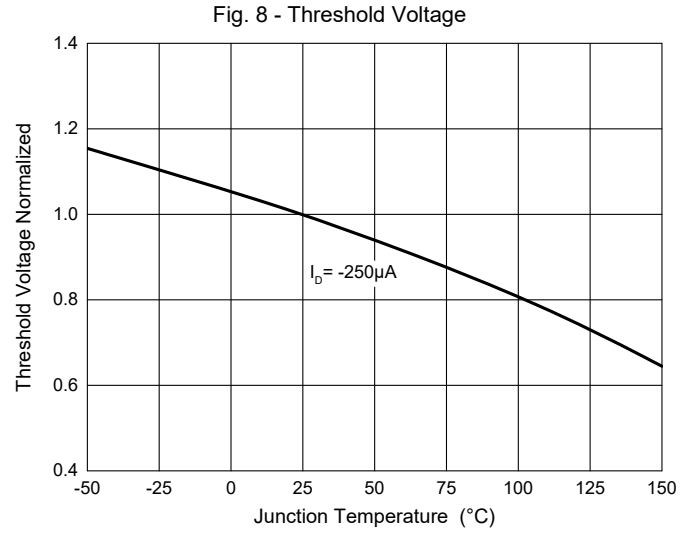
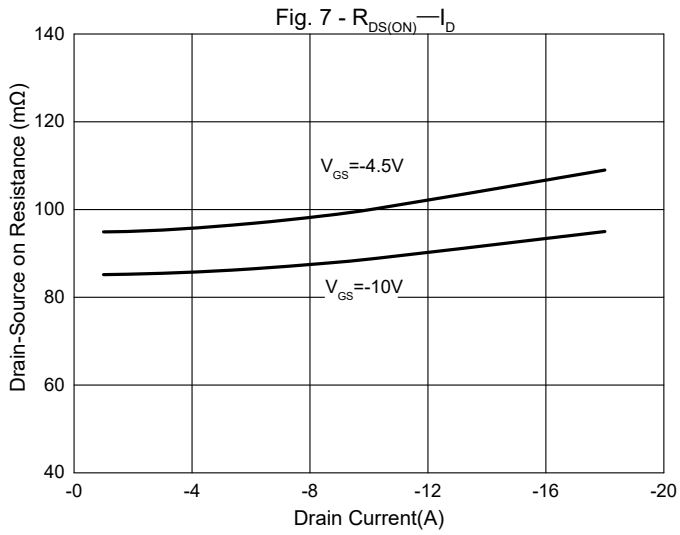


Fig. 6 - Gate Charge



Curve Characteristics



## Curve Characteristics

Fig. 12 - Safe Operation Area

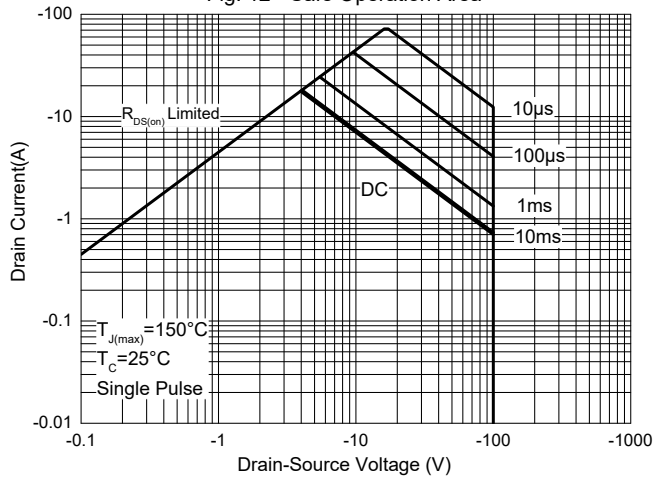
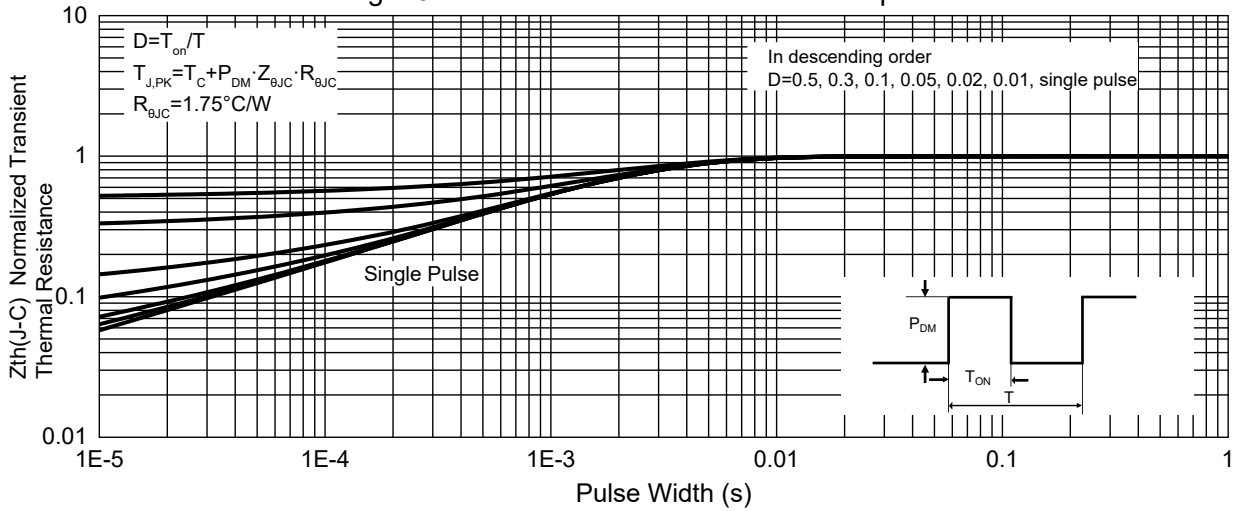


Fig. 13 - Normalized Transient Thermal Impedance



## Ordering Information

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

Note : Adding "-HF" Suffix for Halogen Free, eg. Part Number-TP-HF

## Revision History

| Datasheet status      | Version No | Release date | Update content |
|-----------------------|------------|--------------|----------------|
| New product datasheet | Rev4-1     | 20230102     |                |

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