

**Features**

- Trench Power LV MOSFET Technology
- Excellent Package for Good Heat Dissipation
- Moisture Sensitivity Level 1
- Halogen Free."Green"Device<sup>(Note1)</sup>
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

**Maximum Ratings**

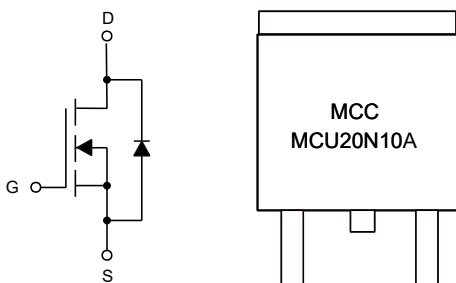
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 40°C/W Junction to Ambient<sup>(Note 2)</sup>
- Thermal Resistance: 2.7°C/W Junction to Case

| Parameter                                   | Symbol          | Rating                | Unit |
|---|-----------------|-----------------------|------|
| Drain-Source Voltage                        | V <sub>DS</sub> | 100                   | V    |
| Gate-Source Voltage                         | V <sub>GS</sub> | ±20                   | V    |
| Continuous Drain Current                    | I <sub>D</sub>  | T <sub>C</sub> =25°C  | 20   |
|   |                 | T <sub>C</sub> =100°C | 12.6 |
| Pulsed Drain Current <sup>(Note 3)</sup>    | I <sub>DM</sub> | 80                    | A    |
| Total Power Dissipation <sup>(Note 4)</sup> | P <sub>D</sub>  | 47                    | W    |
| Avalanche Energy <sup>(Note 5)</sup>        | E <sub>AS</sub> | 16                    | mJ   |

Note:

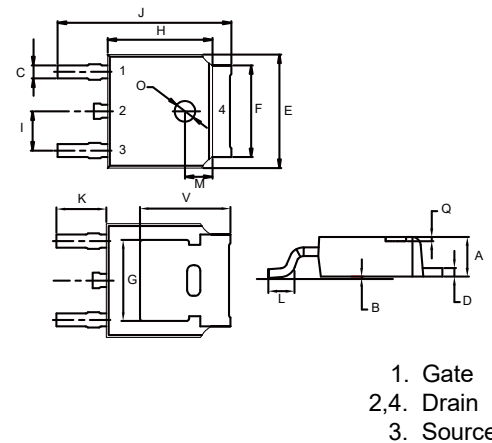
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of R<sub>θJA</sub> is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25°C.
3. Repetitive rating; pulse width limited by max. junction temperature.
4. P<sub>D</sub> is based on max. junction temperature, using junction-case thermal resistance.
5. T<sub>J</sub>=25°C, V<sub>DD</sub>=50V, V<sub>GS</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH.

**Symbolic Representation**



**N-CHANNEL MOSFET**

**DPAK(TO-252)**



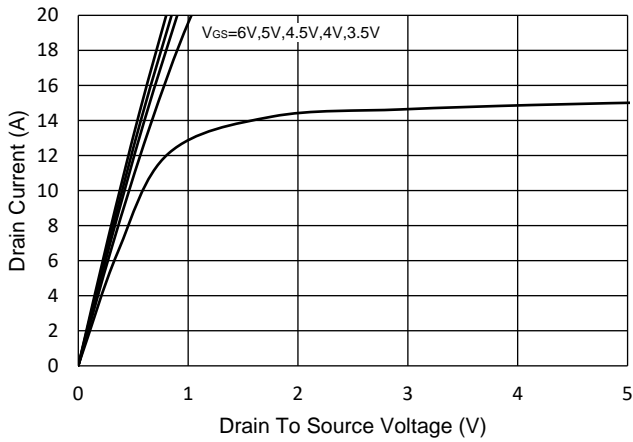
| DIM | DIMENSIONS |       |      |       | NOTE |
|-----|------------|-------|------|-------|------|
|     | INCHES     |       | MM   |       |      |
|     | MIN        | MAX   | MIN  | MAX   |      |
| A   | 0.087      | 0.094 | 2.20 | 2.40  |      |
| B   | 0.000      | 0.005 | 0.00 | 0.13  |      |
| 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)**

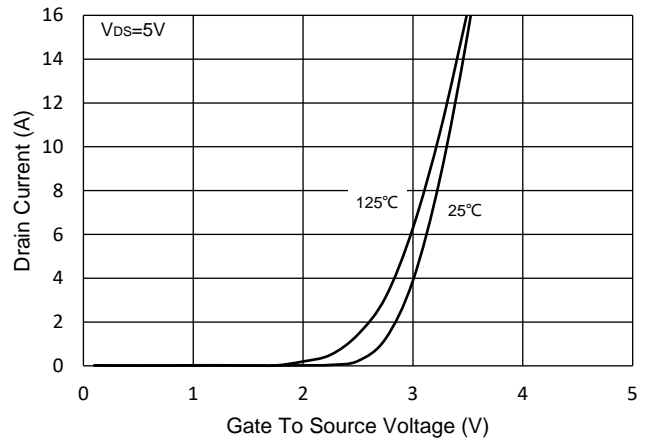
| Parameter                       | Symbol        | Test Conditions                                  | Min | Typ  | Max       | Unit       |
|---------------------------------|---------------|--|-----|------|-----------|------------|
| <b>Static Characteristics</b>   |               |  |     |      |           |            |
| 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         | $\mu A$    |
| Gate-Threshold Voltage          | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=250\mu A$                    | 1.2 | 1.8  | 2.5       | V          |
| Drain-Source On-Resistance      | $R_{DS(on)}$  | $V_{GS}=10V, I_D=10A$                            |     | 35   | 45        | m $\Omega$ |
|                                 |               | $V_{GS}=4.5V, I_D=8A$                            |     | 40   | 60        |            |
| Gate Resistance                 | $R_g$         | f=1MHz, Open drain                               |     | 0.7  |           | $\Omega$   |
| <b>Diode Characteristics</b>    |               |  |     |      |           |            |
| Continuous Body Diode Current   | $I_S$         |  |     |      | 20        | A          |
| Diode Forward Voltage           | $V_{SD}$      | $V_{GS}=0V, I_S=10A$                             |     |      | 1.2       | V          |
| Reverse Recovery Time           | $t_{rr}$      | $I_F=20A, di/dt=100A/\mu s$                      |     | 46   |           | ns         |
| Reverse Recovery Charge         | $Q_{rr}$      |  |     | 75   |           | nC         |
| <b>Dynamic Characteristics</b>  |               |  |     |      |           |            |
| Input Capacitance               | $C_{iss}$     | $V_{DS}=50V, V_{GS}=0V, f=1MHz$                  |     | 2258 |           | pF         |
| Output Capacitance              | $C_{oss}$     |  |     | 62   |           |            |
| Reverse Transfer Capacitance    | $C_{rss}$     |  |     | 54   |           |            |
| Total Gate Charge               | $Q_g$         | $V_{DS}=50V, V_{GS}=10V, I_D=4.5A$               |     | 40   |           | nC         |
| Gate-Source Charge              | $Q_{gs}$      |  |     | 6.9  |           |            |
| Gate-Drain Charge               | $Q_{gd}$      |  |     | 8.6  |           |            |
| Turn-On Delay Time              | $t_{d(on)}$   | $V_{GS}=10V, V_{DD}=50V, R_G=2.2\Omega, I_D=10A$ |     | 10.5 |           | ns         |
| Turn-On Rise Time               | $t_r$         |  |     | 30   |           |            |
| Turn-Off Delay Time             | $t_{d(off)}$  |  |     | 30   |           |            |
| Turn-Off Fall Time              | $t_f$         |  |     | 3.3  |           |            |

## Curve Characteristics

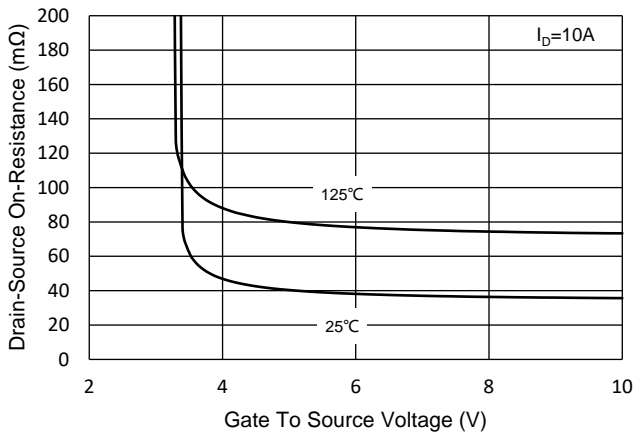
**Fig. 1 - Typical Output Characteristics**



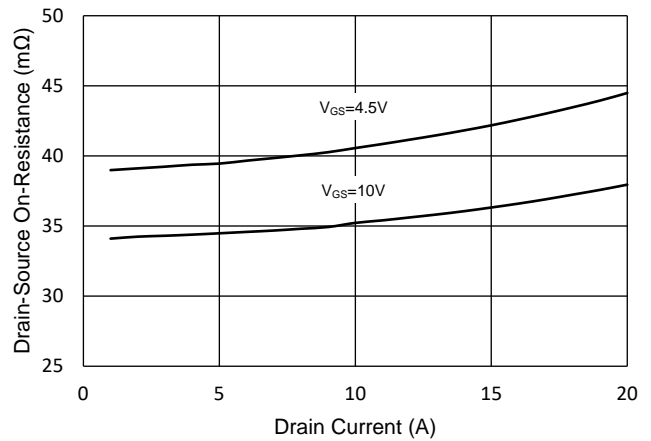
**Fig.2 - Transfer Characteristic**



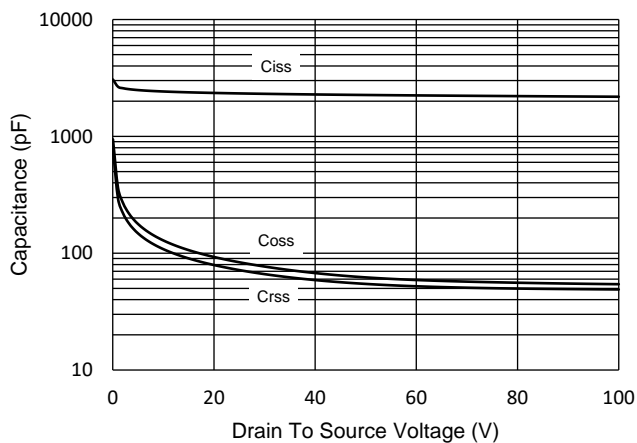
**Fig.3 -  $R_{DS(ON)}$  -  $V_{GS}$**



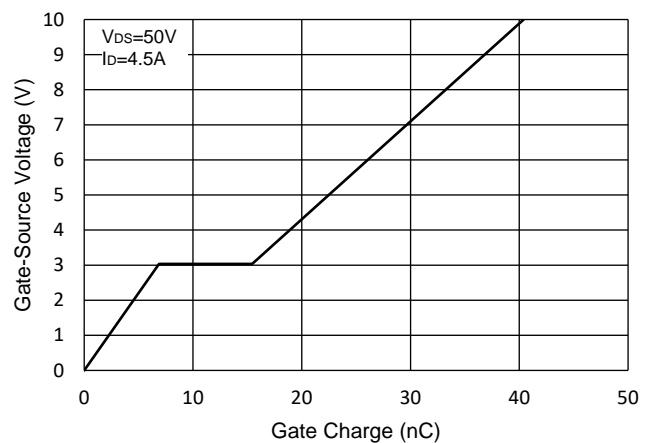
**Fig.4 -  $R_{DS(ON)}$  -  $I_D$**



**Fig.5 - Capacitance Characteristics**



**Fig.6 - Gate Charge**



Curve Characteristics

Fig.7 - Normalized Threshold Voltage

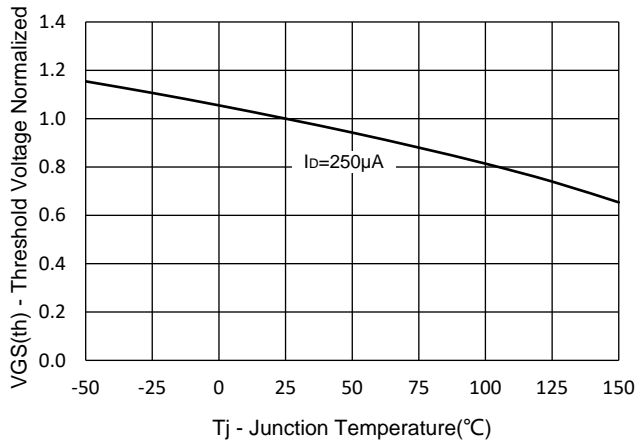


Fig.8 - Normalized On Resistance Characteristics

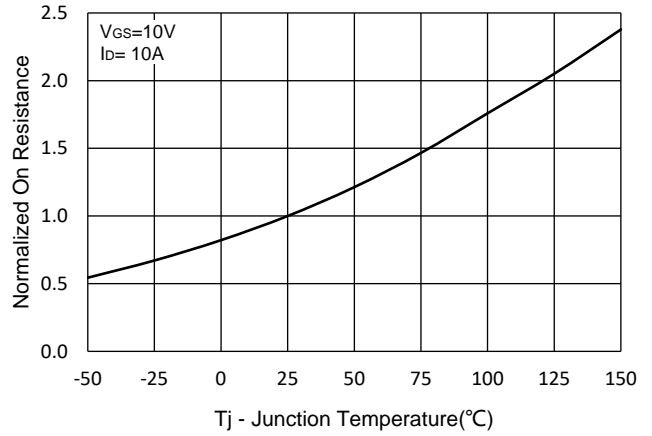


Fig.9 - I<sub>S</sub> - V<sub>SD</sub>

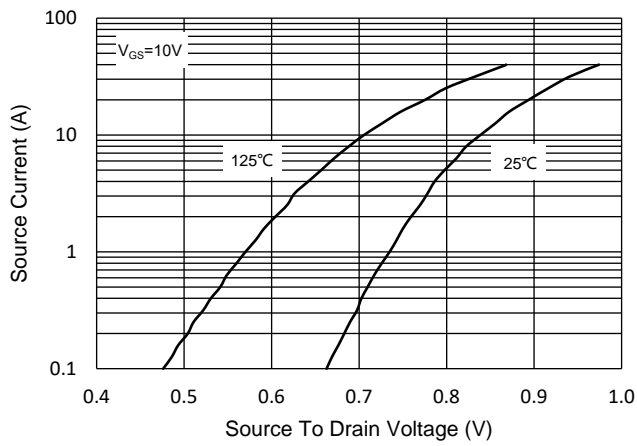


Fig.10 - Drain Current

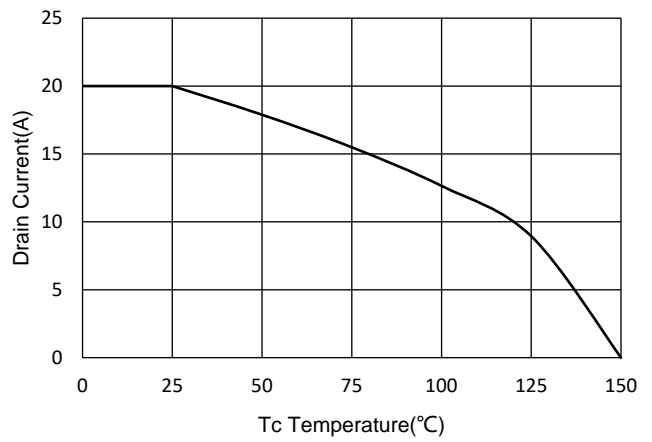
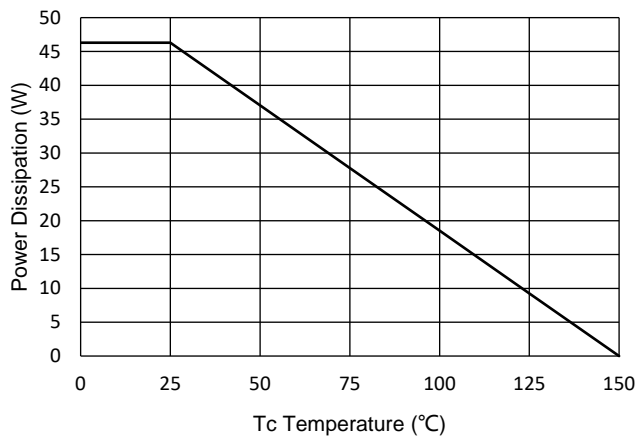


Fig.11 - PD Dissipation



Curve Characteristics

Fig.12 - Safe Operation Area

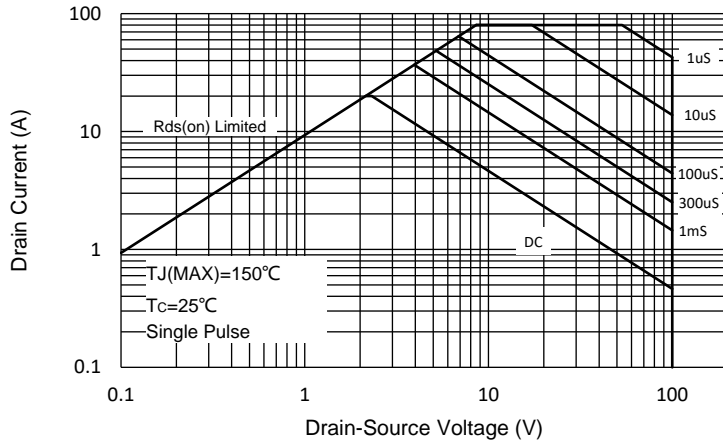
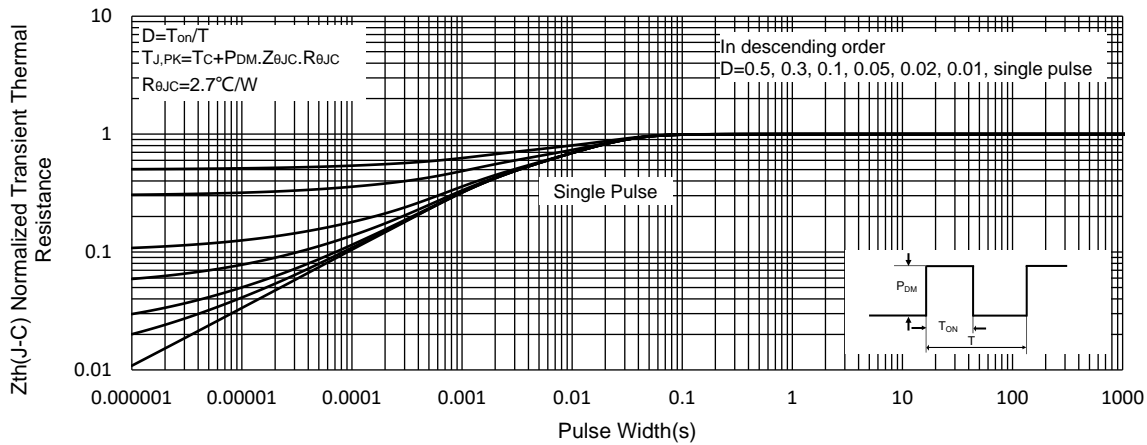


Fig.13 - Normalized Transient Thermal Impedance



## Ordering Information

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

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