

## Features

- Trench Power MV MOSFET Technology
- Moisture Sensitivity Level 3
- Halogen Free. "Green" Device (Note1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

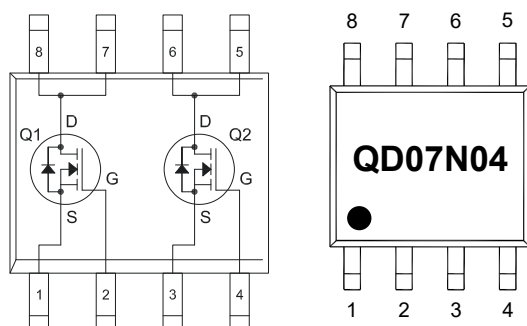
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 60°C/W Junction to Ambient (Note2)

| Parameter                             |                       | Symbol          | Rating | Unit |
|---------------------------------------|-----------------------|-----------------|--------|------|
| Drain-Source Voltage                  |                       | V <sub>DS</sub> | 40     | V    |
| Gate-Source Voltage                   |                       | V <sub>GS</sub> | ±20    | V    |
| Continuous Drain Current              | T <sub>A</sub> =25°C  | I <sub>D</sub>  | 7      | A    |
|                                       | T <sub>A</sub> =100°C |                 | 4.4    |      |
| Pulsed Drain Current (Note3)          |                       | I <sub>DM</sub> | 28     | A    |
| Total Power Dissipation(Note4)        |                       | P <sub>D</sub>  | 2.1    | W    |
| Single Pulsed Avalanche Energy(Note5) |                       | E <sub>AS</sub> | 14     | mJ   |

Note:

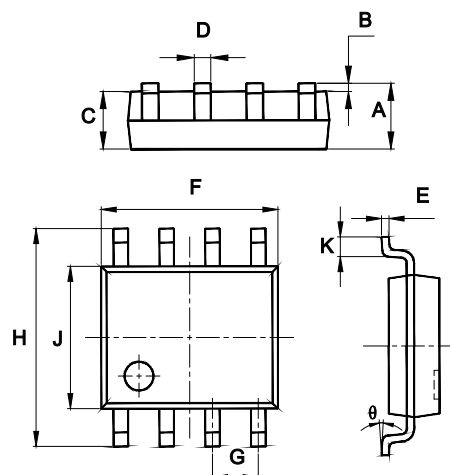
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ\text{C}$ .
3. Repetitive rating; pulse width limited by max. junction temperature.
4.  $P_D$  is based on max. junction temperature, using junction to ambient thermal resistance.
5.  $T_J = 25^\circ\text{C}$ ,  $V_{DD} = 40\text{V}$ ,  $V_{GS} = 10\text{V}$ ,  $L = 0.5\text{mH}$

## Internal Structure and Marking Code



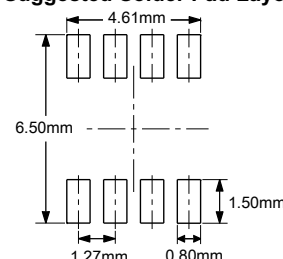
# Dual N-CHANNEL MOSFET

## SOP-8



| DIMENSIONS |        |       |       |      |      |
|------------|--------|-------|-------|------|------|
| DIM        | INCHES |       | MM    |      | NOTE |
|            | MIN    | MAX   | MIN   | MAX  |      |
| A          | 0.053  | 0.069 | 1.35  | 1.75 |      |
| B          | 0.004  | 0.010 | 0.10  | 0.25 |      |
| C          | 0.053  | 0.061 | 1.35  | 1.55 |      |
| D          | 0.013  | 0.020 | 0.33  | 0.51 |      |
| E          | 0.007  | 0.010 | 0.17  | 0.25 |      |
| F          | 0.185  | 0.200 | 4.70  | 5.10 |      |
| G          | 0.050  |       | 1.270 |      | TYP. |
| H          | 0.228  | 0.244 | 5.80  | 6.20 |      |
| J          | 0.150  | 0.157 | 3.80  | 4.00 |      |
| K          | 0.016  | 0.050 | 0.40  | 1.27 |      |
| theta      | 0°     | 8°    | 0°    | 8°   |      |

## Suggested Solder Pad Layout



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

| Parameter                       | Symbol               | Test Conditions                                                                          | Min | Typ | Max  | Unit |
|---------------------------------|----------------------|------------------------------------------------------------------------------------------|-----|-----|------|------|
| Static Characteristics          |                      |                                                                                          |     |     |      |      |
| Drain-Source Breakdown Voltage  | V <sub>(BR)DSS</sub> | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                               | 40  |     |      | V    |
| Gate-Source Leakage Current     | I <sub>GSS</sub>     | V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V                                               |     |     | ±100 | nA   |
| Zero Gate Voltage Drain Current | I <sub>DSS</sub>     | V <sub>DS</sub> =40V, V <sub>GS</sub> =0V                                                |     |     | 1    | μA   |
| Gate-Threshold Voltage          | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                 | 1   | 1.5 | 2.5  | V    |
| Drain-Source On-Resistance      | R <sub>DS(on)</sub>  | V <sub>GS</sub> =10V, I <sub>D</sub> =7A                                                 |     | 25  | 32   | mΩ   |
|                                 |                      | V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A                                                |     | 35  | 50   |      |
| Gate Resistance                 | R <sub>g</sub>       | F=1 MHz, Open drain                                                                      |     | 2   |      | Ω    |
| Forward Transconductance        | g <sub>fs</sub>      | V <sub>DS</sub> =5V,I <sub>D</sub> =3.5A                                                 |     | 9   |      | ms   |
| Diode Characteristics           |                      |                                                                                          |     |     |      |      |
| Continuous Body Diode Current   | I <sub>S</sub>       |                                                                                          |     |     | 7    | A    |
| Diode Forward Voltage           | V <sub>SD</sub>      | V <sub>GS</sub> =0V, I <sub>S</sub> =7A                                                  |     |     | 1.2  | V    |
| Reverse Recovery Time           | t <sub>rr</sub>      | I <sub>F</sub> =7A, di/dt=100A/us                                                        |     | 26  |      | ns   |
| Reverse Recovery Charge         | Q <sub>rr</sub>      |                                                                                          |     | 19  |      | nC   |
| Dynamic Characteristics         |                      |                                                                                          |     |     |      |      |
| Input Capacitance               | C <sub>iss</sub>     | V <sub>DS</sub> =20V,V <sub>GS</sub> =0V,f=1MHz                                          |     | 390 |      | pF   |
| Output Capacitance              | C <sub>oss</sub>     |                                                                                          |     | 50  |      |      |
| Reverse Transfer Capacitance    | C <sub>rss</sub>     |                                                                                          |     | 40  |      |      |
| Total Gate Charge               | Q <sub>g</sub>       | V <sub>DS</sub> =20V,V <sub>GS</sub> =10V,I <sub>D</sub> =7A                             |     | 11  |      | nC   |
| Gate-Source Charge              | Q <sub>gs</sub>      |                                                                                          |     | 3.1 |      |      |
| Gate-Drain Charge               | Q <sub>gd</sub>      |                                                                                          |     | 3   |      |      |
| Turn-On Delay Time              | t <sub>d(on)</sub>   | V <sub>GS</sub> =10V,V <sub>DD</sub> =20V,<br>I <sub>D</sub> =7A, R <sub>GEN</sub> =2.2Ω |     | 6   |      | ns   |
| Turn-On Rise Time               | t <sub>r</sub>       |                                                                                          |     | 20  |      |      |
| Turn-Off Delay Time             | t <sub>d(off)</sub>  |                                                                                          |     | 12  |      |      |
| Turn-Off Fall Time              | t <sub>f</sub>       |                                                                                          |     | 2   |      |      |

## Curve Characteristics

Fig. 1 - Typical Output Characteristics

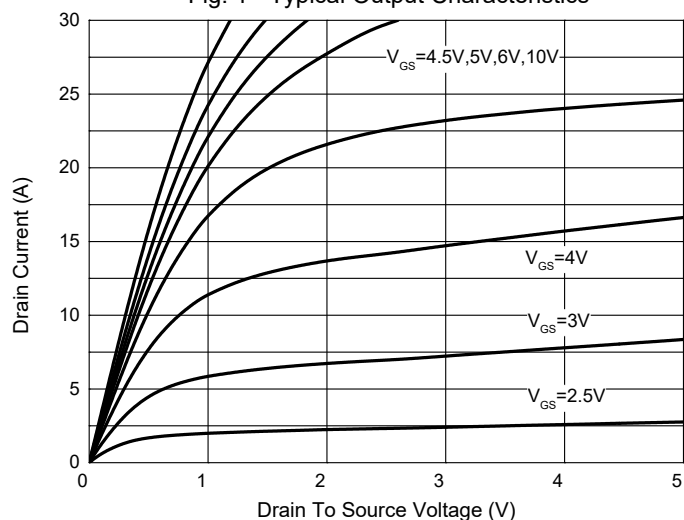


Fig. 2 - Transfer Characteristics

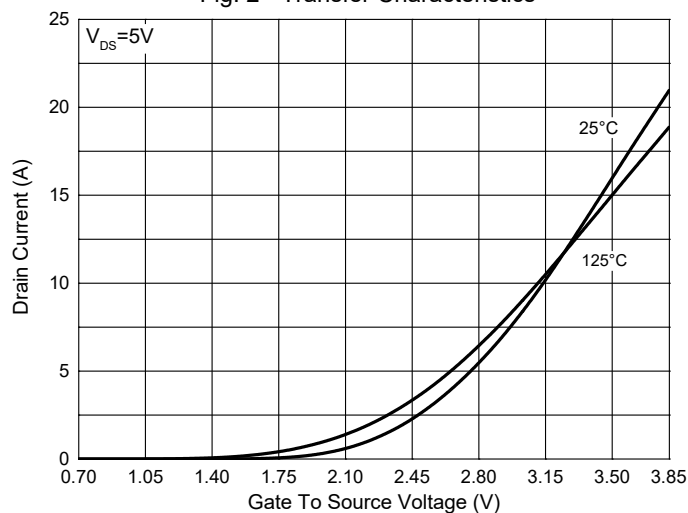


Fig. 3 -  $R_{DS(ON)}-V_{GS}$

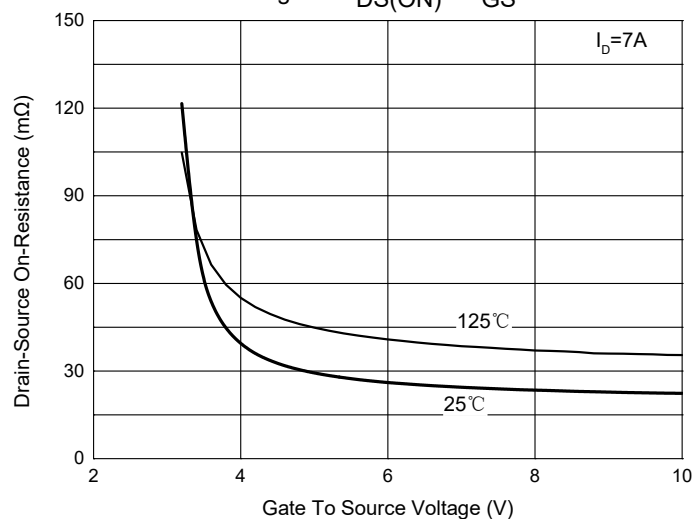


Fig. 4 -  $R_{DS(ON)}-I_D$

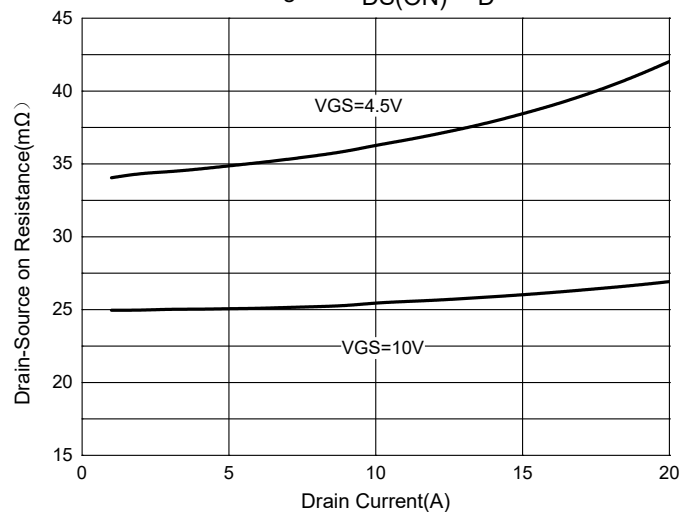


Fig. 5 - Capacitance Characteristics

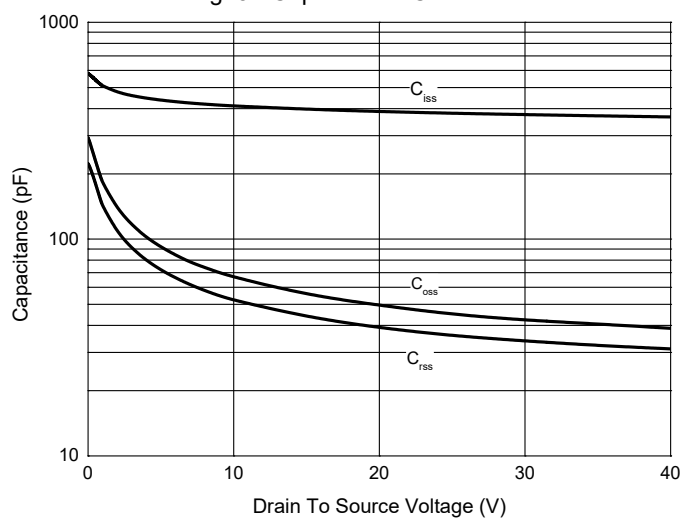
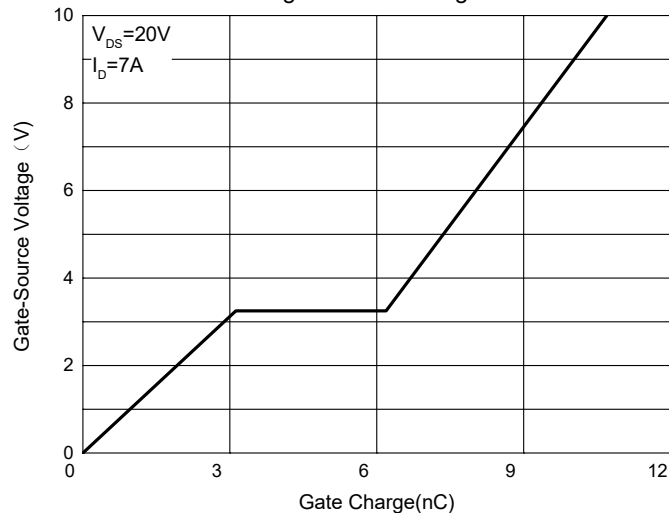


Fig. 6 - Gate Charge



## Curve Characteristics

Fig. 7 - Normalized Threshold Voltage

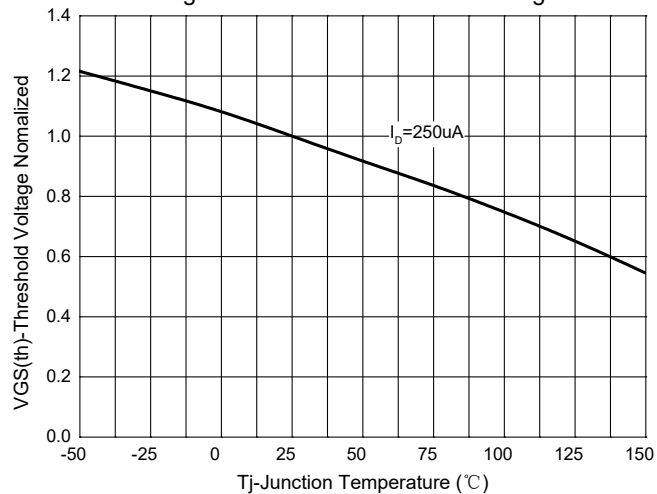


Fig.8-Normalized On Resistance Characteristics

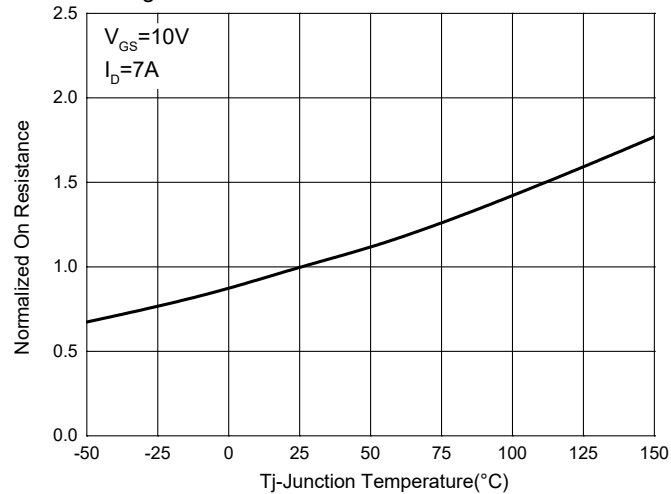


Fig.9 -  $I_S - V_{SD}$

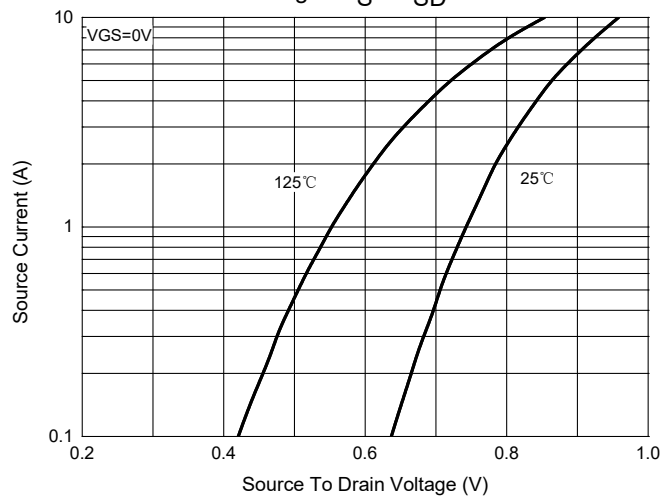


Fig. 10 - Drain Current

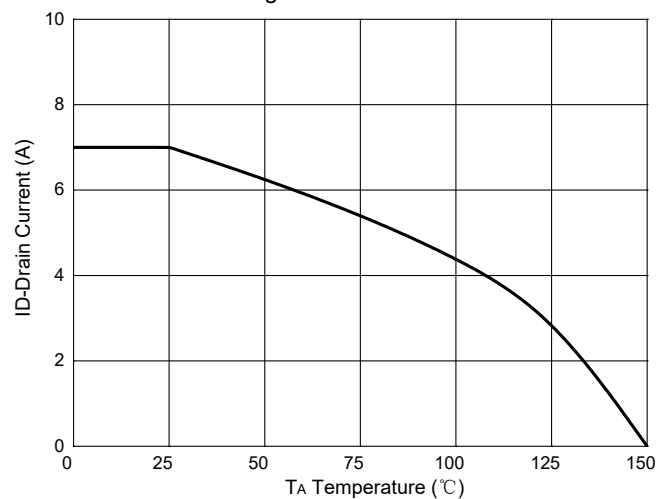
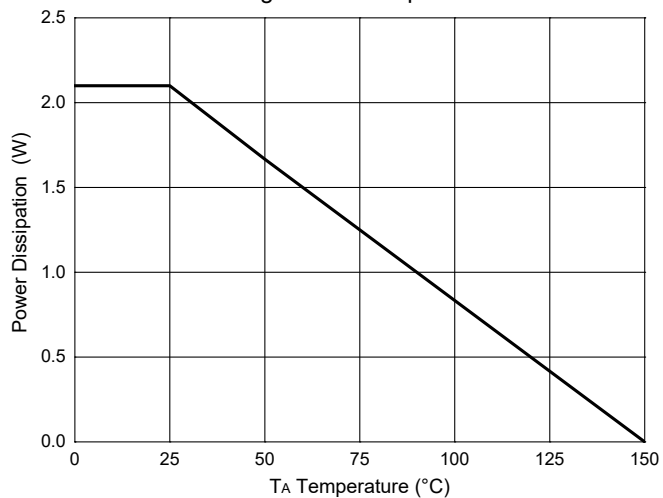


Fig.11-PD Dissipation



## Curve Characteristics

Fig. 12 - Safe Operation Area

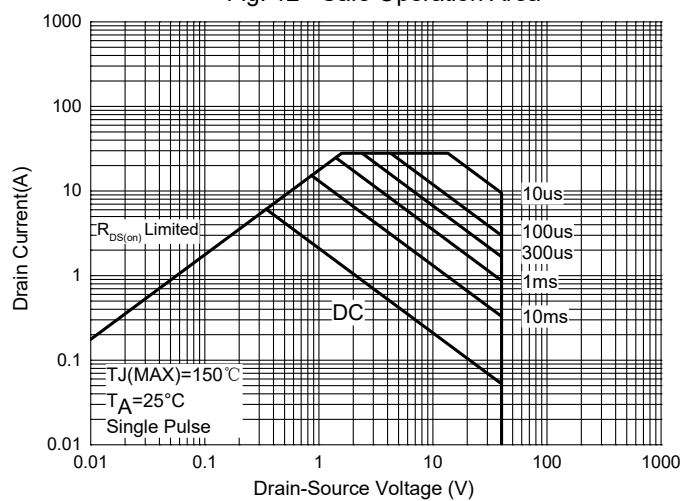
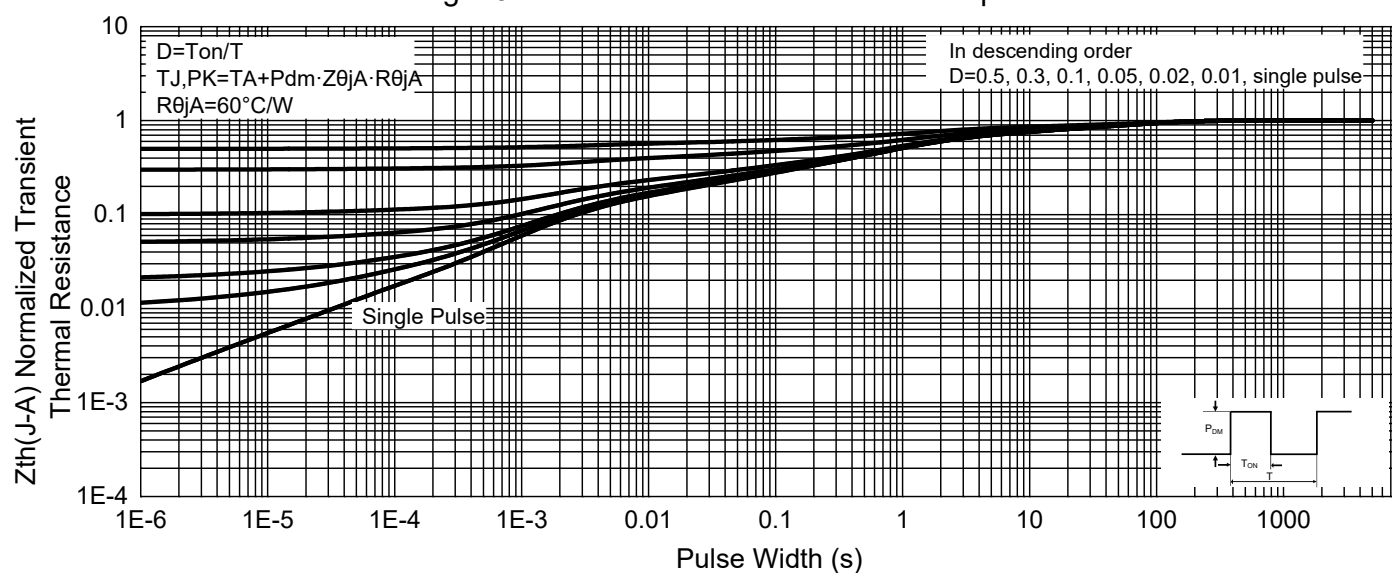


Fig. 13 - Normalized Transient Thermal Impedance



## Ordering Information

| Device         | Packing               |
|----------------|-----------------------|
| Part Number-TP | Tape&Reel: 4Kpcs/Reel |

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