

## Features

- ESD Protected Up To 2KV (HBM)
- Trench MV MOSFET Technology
- Moisture Sensitivity Level 1
- 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

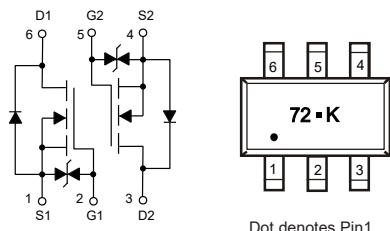
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature: -55°C to +150°C
- Thermal Resistance: 416°C/W Junction to Ambient<sup>(Note2)</sup>

| Parameter                                   |                      | Symbol          | Rating | Unit |
|---------------------------------------------|----------------------|-----------------|--------|------|
| Drain-Source Voltage                        |                      | V <sub>DS</sub> | 60     | V    |
| Gate-Source Voltage                         |                      | V <sub>GS</sub> | ±20    | V    |
| Continuous Drain Current                    | T <sub>A</sub> =25°C | I <sub>D</sub>  | 340    | mA   |
|                                             | T <sub>A</sub> =70°C |                 | 272    |      |
| Pulsed Drain Current <sup>(Note 3)</sup>    |                      | I <sub>DM</sub> | 1.36   | A    |
| Total Power Dissipation <sup>(Note 4)</sup> |                      | P <sub>D</sub>  | 300    | mW   |

Note:

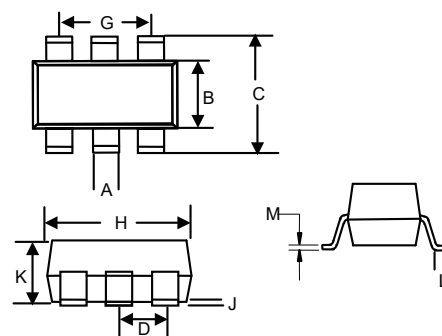
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ .
3. Repetitive rating; pulse width limited by max. junction temperature.
4.  $P_D$  is based on max. junction temperature, using junction-ambient thermal resistance.

## Internal Structure and Marking Code



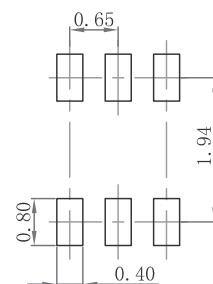
# DUAL N-CHANNEL MOSFET

## SOT-363



| DIM | INCHES |       | MM    |      | NOTE |
|-----|--------|-------|-------|------|------|
|     | MIN    | MAX   | MIN   | MAX  |      |
| A   | 0.006  | 0.014 | 0.15  | 0.35 |      |
| B   | 0.045  | 0.053 | 1.15  | 1.35 |      |
| C   | 0.079  | 0.096 | 2.00  | 2.45 |      |
| D   | 0.026  |       | 0.65  |      | TYP. |
| G   | 0.047  | 0.055 | 1.20  | 1.40 |      |
| H   | 0.071  | 0.087 | 1.80  | 2.20 |      |
| J   | -----  | 0.004 | ----- | 0.10 |      |
| K   | 0.031  | 0.043 | 0.80  | 1.10 |      |
| L   | 0.010  | 0.018 | 0.26  | 0.46 |      |
| M   | 0.003  | 0.006 | 0.08  | 0.15 |      |

### SUGGESTED SOLDER PAD LAYOUT

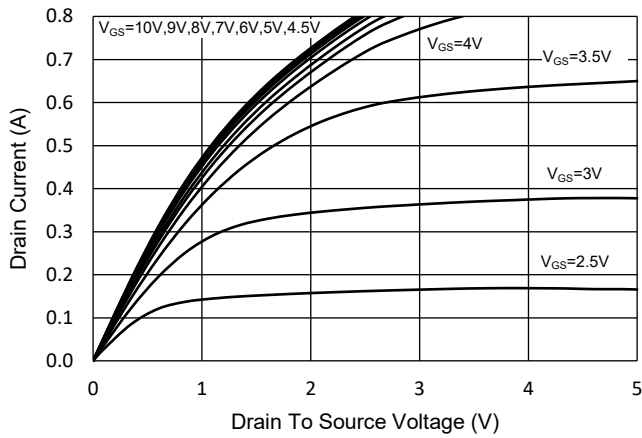


**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

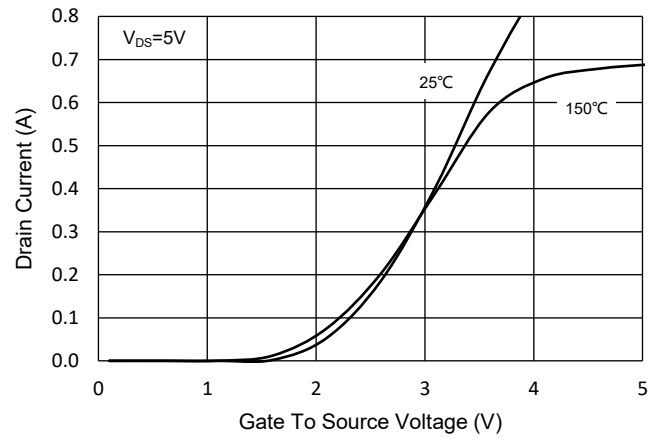
| Parameter                       | Symbol               | Test conditions                                                                         | Min | Typ  | Max  | Unit |
|---------------------------------|----------------------|-----------------------------------------------------------------------------------------|-----|------|------|------|
| Static Characteristics          |                      |                                                                                         |     |      |      |      |
| Drain-Source Breakdown Voltage  | V <sub>(BR)DSS</sub> | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                              | 60  |      |      | V    |
| Gate-Threshold Voltage          | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =1mA                                  | 1.0 | 1.5  | 2.5  | V    |
| Zero Gate Voltage Drain Current | I <sub>DSS</sub>     | V <sub>DS</sub> =48V, V <sub>GS</sub> =0V                                               |     |      | 1    | μA   |
| Gate-Body Leakage Current       | I <sub>GSS</sub>     | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                                              |     |      | ±10  | μA   |
| Drain-Source On-Resistance      | R <sub>DS(on)</sub>  | V <sub>GS</sub> =10V, I <sub>D</sub> =500mA                                             |     | 2.1  | 3    | Ω    |
|                                 |                      | V <sub>GS</sub> =4.5V, I <sub>D</sub> =200mA                                            |     | 2.2  | 4    |      |
| Forward Transconductance        | g <sub>FS</sub>      | V <sub>DS</sub> =5V, I <sub>D</sub> =300mA                                              |     | 300  |      | mS   |
| Gate Resistance                 | R <sub>g</sub>       | f=1 MHz, Open drain                                                                     |     | 130  |      | Ω    |
| Diode Characteristics           |                      |                                                                                         |     |      |      |      |
| Continuous Body Diode Current   | I <sub>S</sub>       |                                                                                         |     |      | 0.34 | A    |
| Diode Forward Voltage           | V <sub>SD</sub>      | V <sub>GS</sub> =0V, I <sub>S</sub> =300mA                                              |     |      | 1.3  | V    |
| Reverse Recovery Time           | t <sub>rr</sub>      | I <sub>F</sub> =300mA, dI <sub>F</sub> /dt=100A/μs                                      |     | 11   |      | ns   |
| Reverse Recovery Charge         | Q <sub>rr</sub>      |                                                                                         |     | 2.6  |      | nC   |
| Dynamic Characteristics         |                      |                                                                                         |     |      |      |      |
| Input Capacitance               | C <sub>iss</sub>     | V <sub>DS</sub> =10V,V <sub>GS</sub> =0V,f=1MHz                                         |     | 16   |      | pF   |
| Output Capacitance              | C <sub>oss</sub>     |                                                                                         |     | 4.4  |      |      |
| Reverse Transfer Capacitance    | C <sub>rss</sub>     |                                                                                         |     | 3    |      |      |
| Total Gate Charge               | Q <sub>g</sub>       | V <sub>DS</sub> =30V,V <sub>GS</sub> =10V,I <sub>D</sub> =300mA                         |     | 0.88 |      | nC   |
| Gate-Source Charge              | Q <sub>gs</sub>      |                                                                                         |     | 0.15 |      |      |
| Gate-Drain Charge               | Q <sub>gd</sub>      |                                                                                         |     | 0.25 |      |      |
| Turn-On Delay Time              | t <sub>d(on)</sub>   | V <sub>DD</sub> =30V,V <sub>GS</sub> =10V,<br>R <sub>G</sub> =50Ω, R <sub>L</sub> =250Ω |     | 3    |      | ns   |
| Turn-On Rise Time               | t <sub>r</sub>       |                                                                                         |     | 4    |      |      |
| Turn-Off Delay Time             | t <sub>d(off)</sub>  |                                                                                         |     | 11   |      |      |
| Turn-Off Fall Time              | t <sub>f</sub>       |                                                                                         |     | 31   |      |      |

## Curve Characteristics

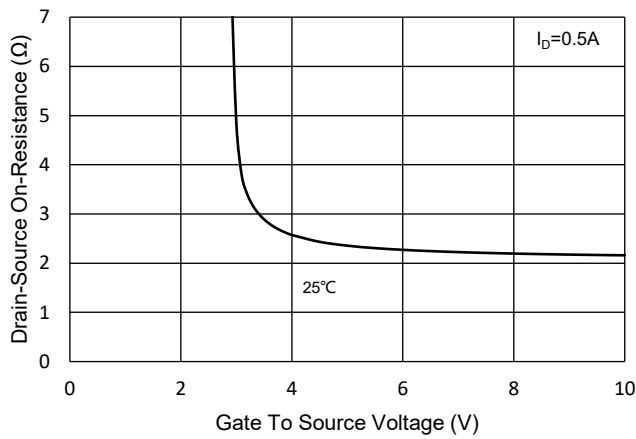
**Fig.1 - Typical Output Characteristics**



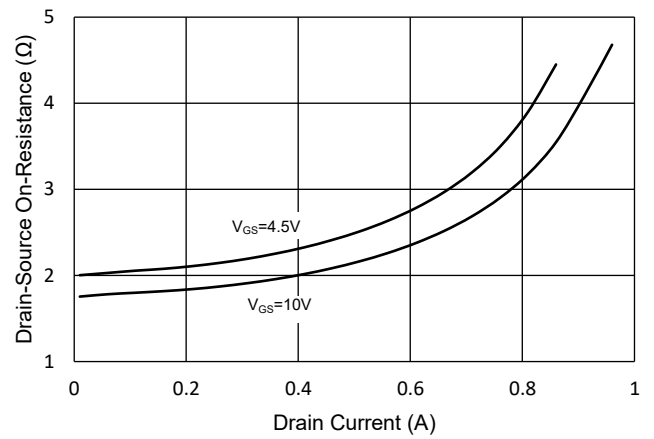
**Fig.2 - Transfer Characteristic**



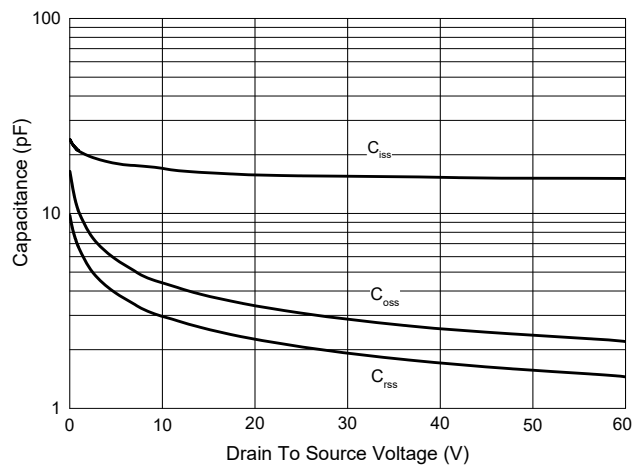
**Fig.3 -  $R_{DS(ON)}$  -  $V_{GS}$**



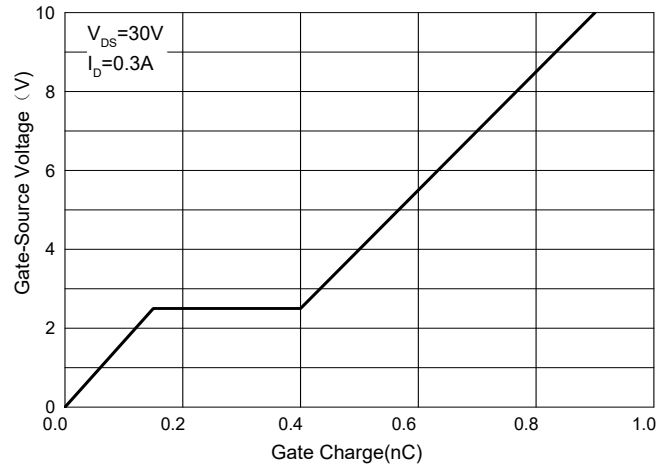
**Fig.4 -  $R_{DS(ON)}$  -  $I_D$**



**Fig.5 - Capacitance Characteristics**

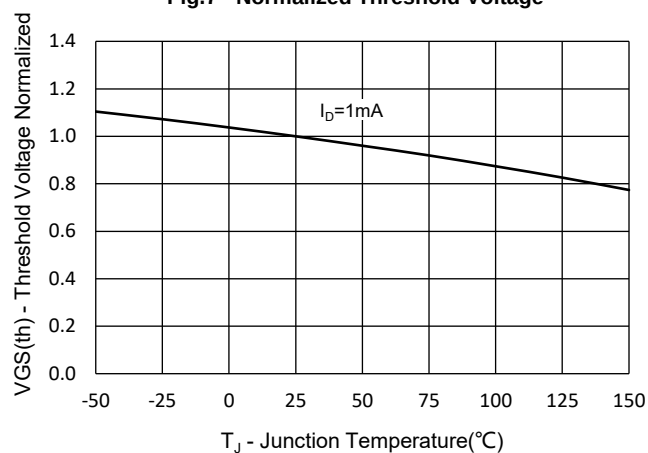


**Fig.6 - Gate Charge**

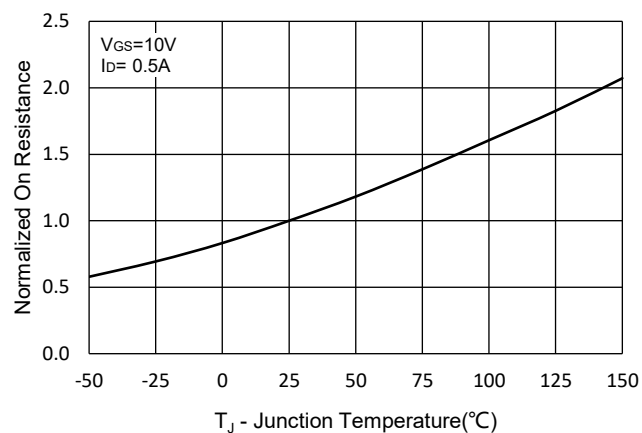


## Curve Characteristics

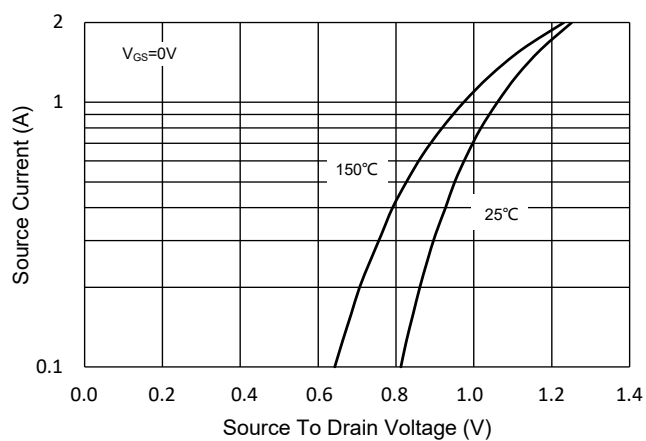
**Fig.7 - Normalized Threshold Voltage**



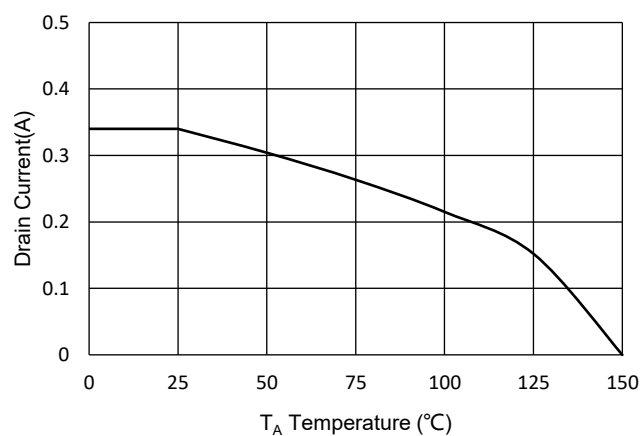
**Fig.8 - Normalized On Resistance Characteristics**



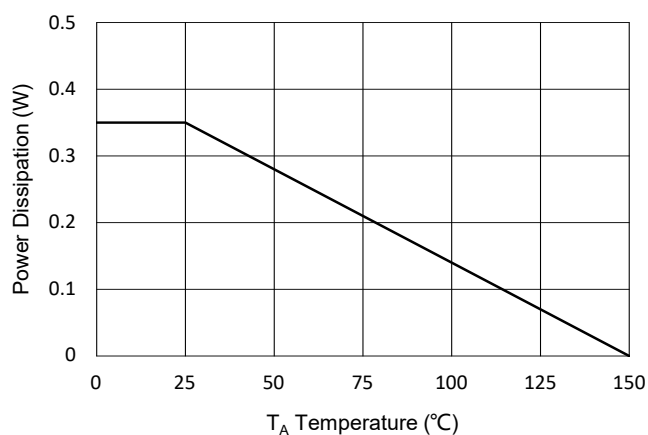
**Fig.9 -  $I_S$  -  $V_{SD}$**



**Fig.10 - Drain Current**



**Fig.11 - PD Dissipation**



## Curve Characteristics

Fig.12 - Safe Operation Area

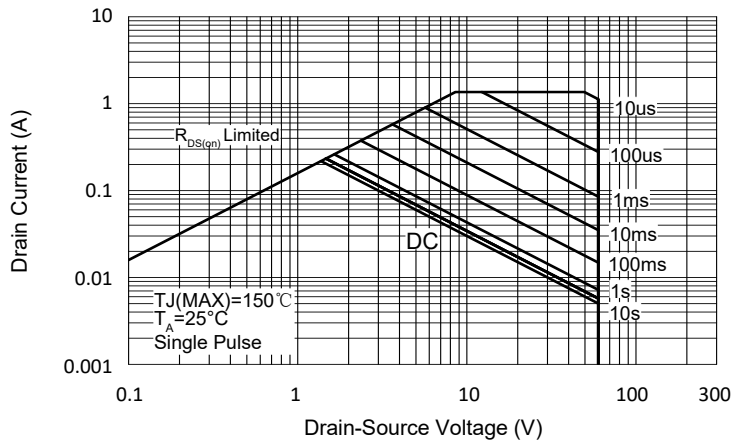
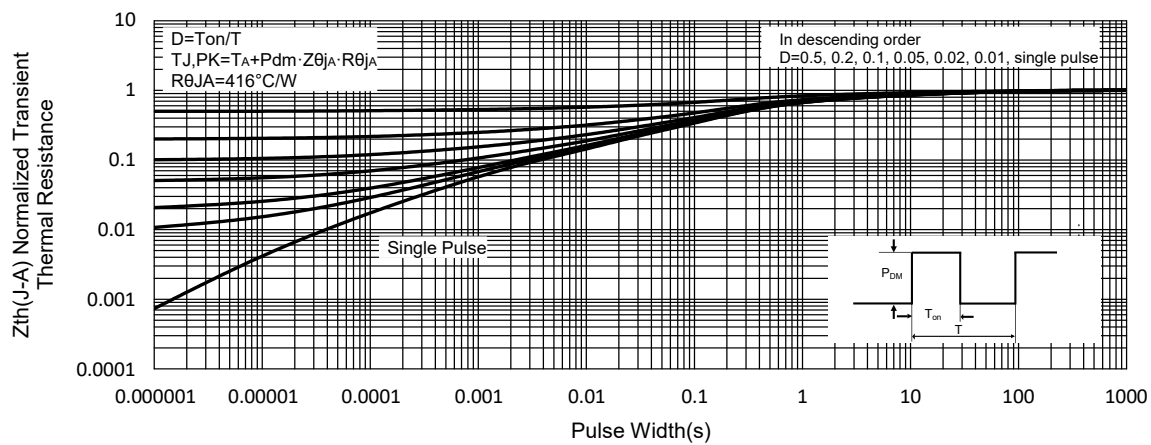


Fig.13 - Normalized Transient Thermal Impedance



## Ordering Information

| Device           | Packing                |
|------------------|------------------------|
| Part Number-TP   | Tape&Reel: 3Kpcs/Reel  |
| Part Number-13P  | Tape&Reel: 10Kpcs/Reel |
| Part Number-TPQ2 | Tape&Reel:3Kpcs/Reel   |

For packaging details, go to our website at <https://www.mccsemi.com/pdf/ProductPackaging/SOT-363%20Package.pdf>

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