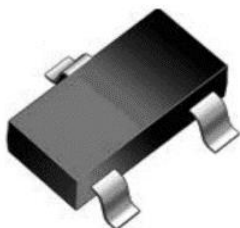


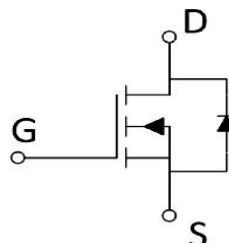
## -12V<sub>DS</sub> P-Channel Enhancement Mode MOSFET

### Features

- $V_{DS}=-12V, I_D=-4A$
- $R_{DS(ON)}=45m\Omega$  (TYP.)  $V_{GS}=4.5V$
- Reliable and Rugged
- Avalanche Rated
- Low On-Resistance



### SOT-23



### Applications

- Portable device
- Switch switching
- Load Switch
- Power management in portable/desktop PCs
- DC/DC conversion



### Ordering Information

| Device    | Package |         | Marking | Package Qty. |
|-----------|---------|---------|---------|--------------|
| DTS2305AD | SOT-23  | Pb-Free | S5      | 3000pcs/Reel |

### Absolute Maximum Ratings (T<sub>C</sub>=25°C, unless otherwise noted)

| Parameter                                        | Symbol                           | Value   | Unit |
|--------------------------------------------------|----------------------------------|---------|------|
| Drain-Source Voltage (V <sub>GS</sub> =0V)       | V <sub>DS</sub>                  | -12     | V    |
| Gate-Source Voltage (V <sub>GS</sub> =0V,static) | V <sub>GS</sub>                  | ±8      | V    |
| Continuous Drain Current (T <sub>C</sub> =25°C)  | I <sub>D</sub>                   | -4      | A    |
| Pulsed Drain Current                             | I <sub>s</sub>                   | 0.8     | A    |
| Maximum Power Dissipation                        | P <sub>D</sub>                   | 0.4     | W    |
| Operating,Storage Temperature Range              | T <sub>J</sub> ,T <sub>STG</sub> | -55~150 | °C   |

### Thermal Characteristics

| Parameter                              | Symbol           | Min. | Typ. | Max. | Unit |
|----------------------------------------|------------------|------|------|------|------|
| Thermal Resistance,Junction-to-Case    | R <sub>θJC</sub> | -    | 60   | -    | °C/W |
| Thermal Resistance,Junction-to-Ambient | R <sub>θJA</sub> | -    | 125  | -    | °C/W |

## Electrical Characteristics

| Parameter                        | Symbol       | Test Conditions               | Min. | Typ. | Max.      | Unit       |
|----------------------------------|--------------|-------------------------------|------|------|-----------|------------|
| Drain-Source Breakdown Voltage   | $BV_{DSS}$   | $V_{GS}=0V, I_D=250\mu A$     | -12  | -    | -         | V          |
| Zero Gate Voltage Drain Current  | $I_{DSS}$    | $V_{DS}=24V, V_{GS}=0V$       | -    | -    | 1         | $\mu A$    |
| Gate -Source Leakage Current     | $I_{GSS}$    | $V_{GS}=\pm 12V, V_{DS}=0V$   | -    | -    | $\pm 100$ | nA         |
| Gate Threshold Voltage           | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.4  | 0.7  | 1         | V          |
| Drain-Source On-stage Resistance | $R_{DS(ON)}$ | $V_{GS}=4.5V, I_D=3.5A$       | -    | 30   | 50        | m $\Omega$ |
|                                  |              | $V_{GS}=2.5V, I_D=5A$         | -    | 40   | 70        |            |

## Dynamic Characteristics

| Parameter                    | Symbol       | Test Conditions                                                  | Min. | Typ. | Max. | Unit     |
|------------------------------|--------------|------------------------------------------------------------------|------|------|------|----------|
| Input capacitance            | $C_{iss}$    | $V_{DS}=15V$<br>$V_{GS}=0V$<br>$f=1MHz$                          | -    | 740  | -    | pF       |
| Output capacitance           | $C_{oss}$    |                                                                  | -    | 290  | -    |          |
| Reverse transfer capacitance | $C_{rss}$    |                                                                  | -    | 190  | -    |          |
| Gate Resistance              | $R_g$        | $f=1MHz$                                                         | -    | 7    | -    | $\Omega$ |
| Total Gate Charge            | $Q_g$        | $V_{DS}=15V$<br>$V_{GS}=4.5V$<br>$I_D=5.8A$                      | -    | 7.8  | -    | nC       |
| Gate Source Charge           | $Q_{gs}$     |                                                                  | -    | 4.5  | -    |          |
| Gate Drain Charge            | $Q_{gd}$     |                                                                  | -    | 1.2  | -    |          |
| Turn-on delay Time           | $t_{d(on)}$  | $V_{GS}=10V$<br>$V_{DS}=15V$<br>$R_L=2.7\Omega$<br>$R_G=3\Omega$ | -    | 13   | -    | ns       |
| Rise time                    | $t_r$        |                                                                  | -    | 35   | -    |          |
| Turn-off delay Time          | $t_{d(off)}$ |                                                                  | -    | 32   | -    |          |
| Fall time                    | $t_f$        |                                                                  | -    | 10   | -    |          |

## Reverse Diode Characteristics

| Parameter                  | Symbol   | Test Conditions        | Min. | Typ. | Max. | Unit |
|----------------------------|----------|------------------------|------|------|------|------|
| Body Diode Forward Voltage | $V_{SD}$ | $V_{GS}=0V, I_{SD}=1A$ | -    | 0.8  | 1.2  | V    |

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