FTD2014

## Load Switching Applications

## Features

- Low ON resistance.
- 2.5 V drive
- Mounting height 1.1 mm .
- Composite type, facilitating high-density mounting.


## Specifications

Absolute Maximum Ratings at $\mathrm{Ta}=25^{\circ} \mathrm{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
| :---: | :---: | :---: | :---: | :---: |
| Drain-to-Source Voltage | $\mathrm{V}_{\text {DSS }}$ |  | 20 | V |
| Gate-to-Source Voltage | $\mathrm{V}_{\text {GSS }}$ |  | $\pm 10$ | V |
| Drain Current (DC) | ID |  | 4 | A |
| Drain Current (pulse) | IDP | PW $\leq 10 \mu \mathrm{~s}$, duty cycle $\leq 1 \%$ | 20 | A |
| Allowable Power Dissipation | $\mathrm{P}_{\mathrm{D}}$ | Mounted on a ceramic board ( $1000 \mathrm{~mm}^{2} \times 0.8 \mathrm{~mm}$ ) 1 unit | 0.8 | W |
| Total Dissipation | $\mathrm{P}_{\text {T }}$ | Mounted on a ceramic board ( $1000 \mathrm{~mm}^{2} \times 0.8 \mathrm{~mm}$ ) | 1.3 | W |
| Channel Temperature | Tch |  | 150 | ${ }^{\circ} \mathrm{C}$ |
| Storage Temperature | Tstg |  | -55 to +150 | C |

Electrical Characteristics at $\mathrm{Ta}=25^{\circ} \mathrm{C}$

| Parameter | Symbol | Conditions | Ratings |  |  | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | min | typ | max |  |
| Drain-to-Source Breakdown Voltage | $\mathrm{V}_{(\mathrm{BR}) \mathrm{DSS}}$ | $\mathrm{I}_{\mathrm{D}}=1 \mathrm{~mA}, \mathrm{~V}_{\mathrm{GS}}=0$ | 20 |  |  | V |
| Zero-Gate Voltage Drain Current | IDSS | $\mathrm{V}_{\mathrm{DS}}=20 \mathrm{~V}, \mathrm{~V}_{\mathrm{GS}}=0$ |  |  | 1 | $\mu \mathrm{A}$ |
| Gate-to-Source Leakage Current | IGSS | $\mathrm{V}_{\mathrm{GS}}= \pm 8 \mathrm{~V}, \mathrm{~V}_{\mathrm{DS}}=0$ |  |  | $\pm 10$ | $\mu \mathrm{A}$ |
| Cutoff Voltage | $\mathrm{V}_{\mathrm{GS}}$ (off) | $\mathrm{V}_{\mathrm{DS}}=10 \mathrm{~V}, \mathrm{I}_{\mathrm{D}}=1 \mathrm{~mA}$ | 0.4 |  | 1.3 | V |
| Forward Transfer Admittance | \| yfs | | $\mathrm{V}_{\mathrm{DS}}=10 \mathrm{~V}, \mathrm{I}_{\mathrm{D}}=4 \mathrm{~A}$ | 7 | 10 |  | S |
| Static Drain-to-Source On-State Resistance | $\mathrm{R}_{\mathrm{DS} \text { (on) }}{ }^{1}$ | ${ }^{\mathrm{I}} \mathrm{D}=4 \mathrm{~A}, \mathrm{~V}_{\mathrm{GS}}=4 \mathrm{~V}$ |  | 32 | 42 | $\mathrm{m} \Omega$ |
|  | $\mathrm{R}_{\mathrm{DS} \text { (on) }}{ }^{2}$ | $\mathrm{I}_{\mathrm{D}}=2 \mathrm{~A}, \mathrm{~V}_{\mathrm{GS}}=2.5 \mathrm{~V}$ |  | 42 | 59 | $\mathrm{m} \Omega$ |
| Input Capacitance | Ciss | $\mathrm{V}_{\mathrm{DS}}=10 \mathrm{~V}, \mathrm{f}=1 \mathrm{MHz}$ |  | 700 |  | pF |
| Output Capacitance | Coss | $\mathrm{V}_{\mathrm{DS}}=10 \mathrm{~V}, \mathrm{f}=1 \mathrm{MHz}$ |  | 200 |  | pF |
| Reverse Transfer Capacitance | Crss | $\mathrm{V}_{\mathrm{DS}}=10 \mathrm{~V}, \mathrm{f}=1 \mathrm{MHz}$ |  | 150 |  | pF |

Marking : D2014

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## Package Dimensions

unit:mm
2155A


Continued from preceding page.

| Parameter | Symbol | Conditions | Ratings |  |  | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | min | typ | max |  |
| Turn-ON Delay Time | $\mathrm{t}_{\mathrm{d}(\mathrm{on})}$ | See Specified Test Circuit |  | 14 |  | ns |
| Rise Time | $\mathrm{t}_{\mathrm{r}}$ | See Specified Test Circuit |  | 130 |  | ns |
| Turn-OFF Delay Time | $\mathrm{t}_{\mathrm{d} \text { (off) }}$ | See Specified Test Circuit |  | 83 |  | ns |
| Fall Time | $\mathrm{tf}_{f}$ | See Specified Test Circuit |  | 110 |  | ns |
| Total Gate Charge | Qg | $\mathrm{V}_{\mathrm{DS}}=10 \mathrm{~V}, \mathrm{~V}_{\mathrm{GS}}=10 \mathrm{~V}, \mathrm{I}_{\mathrm{D}}=4 \mathrm{~A}$ |  | 24 |  | nC |
| Gate-to-Source Charge | Qgs |  |  | 1.4 |  | nC |
| Gate-to-Drain "Miller" Charge | Qgd |  |  | 3.2 |  | nC |
| Diode Forward Voltage | $\mathrm{V}_{\text {SD }}$ | $\mathrm{I}_{\mathrm{S}}=4 \mathrm{~A}, \mathrm{~V}_{\mathrm{GS}}=0$ |  | 0.85 | 1.2 | V |

## Switching Time Test Circuit



Electrical Connection





RDS(on) - Ta


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