

DESCRIPTION

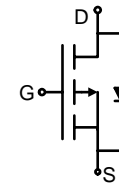
The FTK3401 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch or in PWM applications.

GENERAL FEATURES

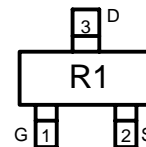
- $V_{DS} = -30V, I_D = -4.2A$
 $R_{DS(ON)} < 90m\Omega @ V_{GS} = -2.5V$
 $R_{DS(ON)} < 75m\Omega @ V_{GS} = -4.5V$
 $R_{DS(ON)} < 65m\Omega @ V_{GS} = -10V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

Application

- PWM applications
- Load switch
- Power management



Schematic diagram



Marking and pin Assignment



SOT-23 top view

PACKAGE MARKING AND ORDERING INFORMATION

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity |
|----------------|----------|----------------|-----------|------------|------------|
| R1 | FTK 3401 | SOT23 | Ø180mm | 8 mm | 3000 units |

ABSOLUTE MAXIMUM RATINGS(TA=25°C unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|---|----------------|------------|------|
| Drain-Source Voltage | V_{DS} | -30 | V |
| Gate-Source Voltage | V_{GS} | ±12 | V |
| Drain Current-Continuous@ Current-Pulsed (Note 1) | I_D | -4.2 | A |
| | I_{DM} | -30 | A |
| Maximum Power Dissipation | P_D | 1 | W |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55 To 150 | °C |

THERMAL CHARACTERISTICS

| | | | |
|--|-----------------|----|------|
| Thermal Resistance, Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 90 | °C/W |
|--|-----------------|----|------|

ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|------------------------------------|--------------|--------------------------------|------|-----|------|------|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=-250\mu A$ | -30 | | | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=-24V, V_{GS}=0V$ | | | -1 | μA |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS}=\pm 12V, V_{DS}=0V$ | | | ±100 | nA |
| ON CHARACTERISTICS (Note 3) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=-250\mu A$ | -0.7 | | -1.3 | V |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}=-10V, I_D=-4.2A$ | | 42 | 65 | mΩ |
| | | $V_{GS}=-4.5V, I_D=-4A$ | | 53 | 75 | |
| | | $V_{GS}=-2.5V, I_D=-1A$ | | 80 | 90 | |
| Forward Transconductance | g_{FS} | $V_{DS}=-5V, I_D=-5A$ | 7 | 11 | | S |

| DYNAMIC CHARACTERISTICS (Note4) | | | | | | |
|------------------------------------|--------------|--|--|-------|------|----|
| Input Capacitance | C_{iss} | $V_{DS}=-15V, V_{GS}=0V,$ $F=1.0MHz$ | | 955 | | PF |
| Output Capacitance | C_{oss} | | | 115 | | PF |
| Reverse Transfer Capacitance | C_{rss} | | | 75 | | PF |
| SWITCHING CHARACTERISTICS (Note 4) | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}=-15V, I_D=-3.2A$ $V_{GS}=-10V, R_{GEN}=6\Omega$ | | 6.3 | | nS |
| Turn-on Rise Time | t_r | | | 3.2 | | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 38.5 | | nS |
| Turn-Off Fall Time | t_f | | | 12 | | nS |
| Total Gate Charge | Q_g | $V_{DS}=-15V, I_D=-4A, V_{GS}=-4.5V$ | | 9.4 | | nC |
| Gate-Source Charge | Q_{gs} | | | 2 | | nC |
| Gate-Drain Charge | Q_{gd} | | | 3 | | nC |
| DRAIN-SOURCE DIODE CHARACTERISTICS | | | | | | |
| Diode Forward Voltage (Note 3) | V_{SD} | $V_{GS}=0V, I_S=-1A$ | | -0.75 | -1 | V |
| Diode Forward Current (Note 2) | I_S | | | | -2.2 | A |

NOTES:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production testing.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

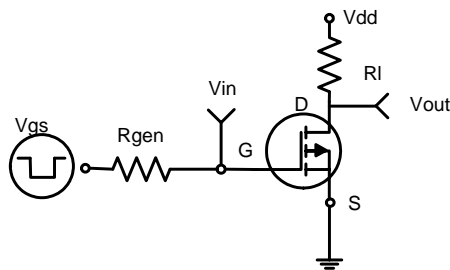


Figure1:Switching Test Circuit

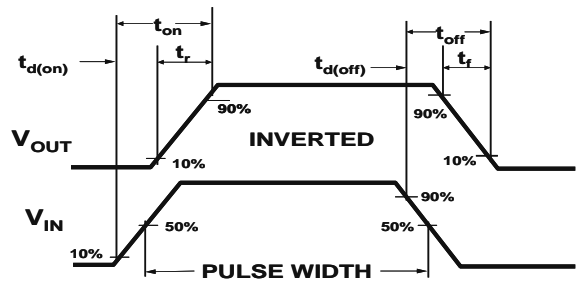


Figure 2:Switching Waveforms

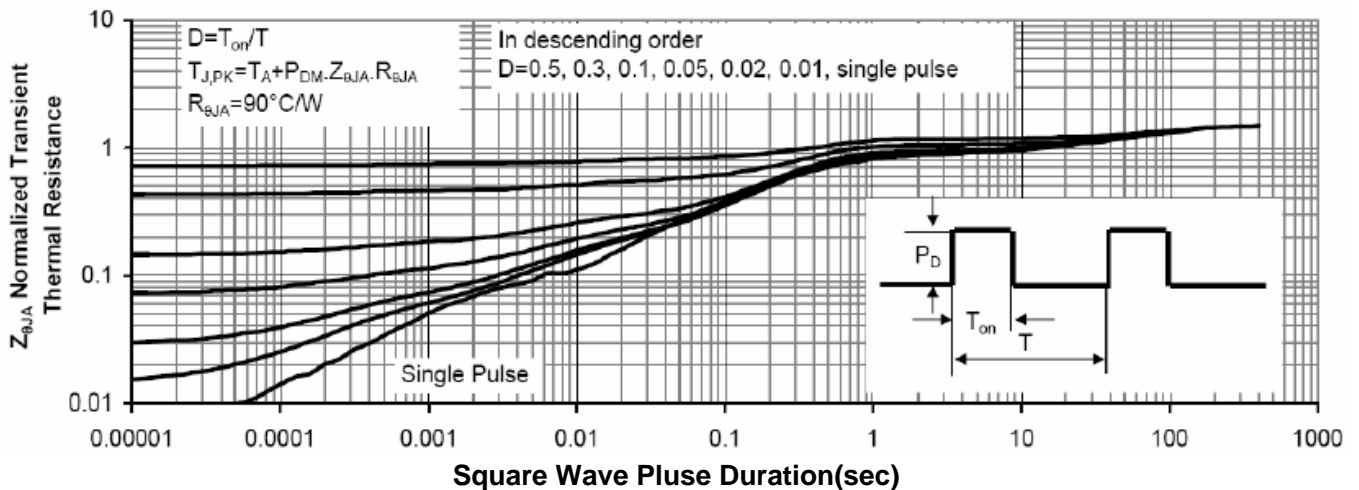
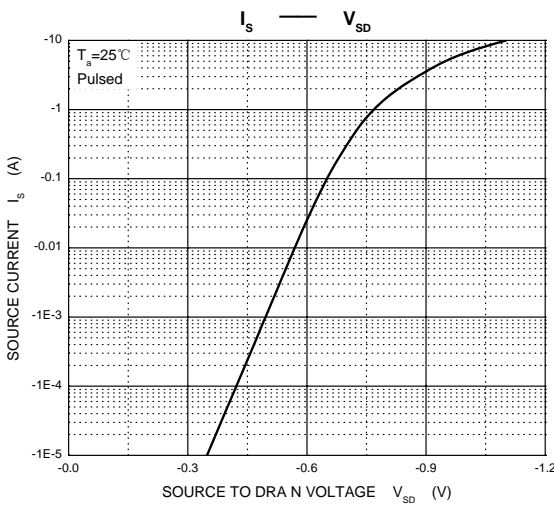
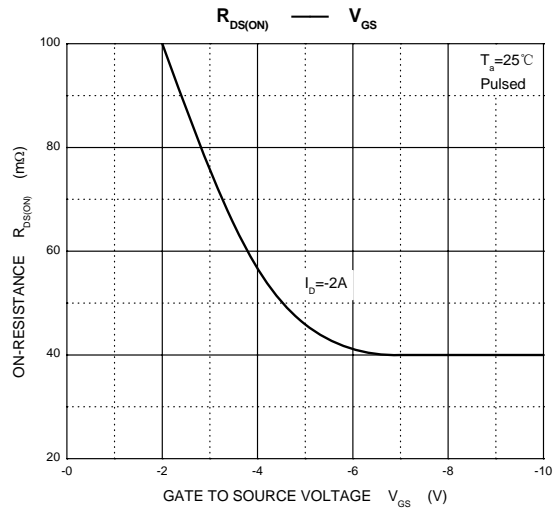
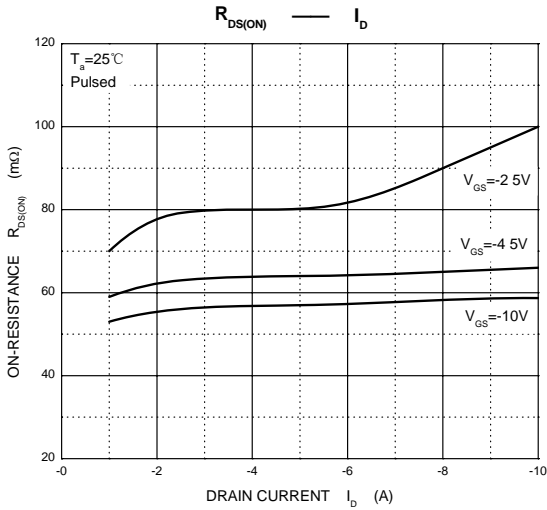
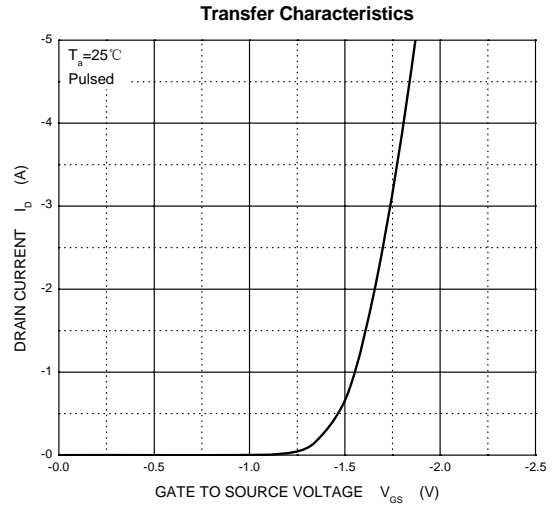
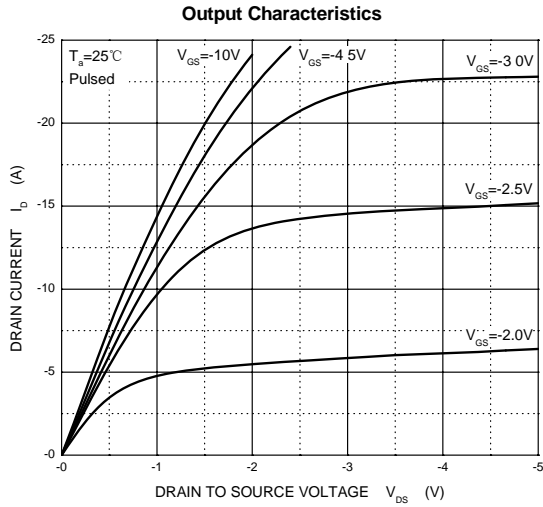


Figure 3: Normalized Maximum Transient Thermal Impedance

Typical Characteristics



SOT23 PACKAGE INFORMATION

Dimensions in Millimeters (UNIT:mm)

