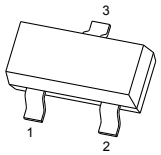
# SOT-23 Plastic-Encapsulate MOSFETS

**TF3407**

## TF3407 P-Channel 30-V(D-S) MOSFET

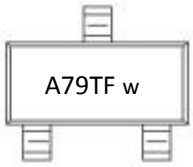
| $V_{(BR)DSS}$ | $R_{DS(on)}$TYP | $I_D$ |
|---|---|---|
| -30V | 0.046Ω@-10V | -4.1A |
| | 0.058Ω@-4.5V | |

**SOT-23**



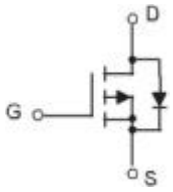

1.GATE
2.SOURCE
3.DRAIN

**MARKING**




*w：week code

**Equivalent Circuit**




### General FEATURE

- TrenchFET Power MOSFET
- Lead free product is acquired
- Surface mount package

### APPLICATION

- Load Switch for Portable Devices
- DC/DC Converter

### Maximum ratings ($T_a$=25℃ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | -30 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | |
| Continuous Drain Current | $I_D$ | -4.1 | A |
| Pulsed Drain Current | $I_{DM}$ | -20 | |
| Maximum Power Dissipation | $P_D$ | 1.4 | W |
| Thermal Resistance from Junction to Ambient(t ≤5s) | $R_{\theta JA}$ | 84 | ℃/W |
| Junction Temperature | $T_J$ | 150 | ℃ |
| Storage Temperature | $T_{stg}$ | -55 ~+150 | |

# SOT-23 Plastic-Encapsulate MOSFETS

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## MOSFET ELECTRICAL CHARACTERISTICS

**$T_a$ =25 ℃ unless otherwise specified**

| Parameter | Symbol | Test Condition | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Static characteristics** | | | | | | |
| Drain-source breakdown voltage | $BV_{DSS}$ | $V_{GS}$ = 0V, $I_D$ =-250μA | -30 | | | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ =-24V,$V_{GS}$ = 0V | | | -1 | μA |
| Gate-source leakage current | $I_{GSS}$ | $V_{GS}$ =±20V, $V_{DS}$ = 0V | | | ±100 | nA |
| Drain-source on-resistance (note a) | $R_{DS(on)}$ | $V_{GS}$ =-10V, $I_D$ =-4.1A | | 46 | 52 | mΩ |
| | | $V_{GS}$ =-4.5V, $I_D$ =-3A | | 58 | 70 | mΩ |
| Forward tranconductance (note a) | $g_{FS}$ | $V_{DS}$ =-5V, $I_D$ =-4.1A | 5.5 | | | S |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =-250μA | -1 | -1.4 | -3 | V |
| Diode forward voltage (note a) | $V_{SD}$ | $I_S$=-1A,$V_{GS}$=0V | | | -1 | V |
| **Dynamic characteristics** (note b) | | | | | | |
| Input capacitance | $C_{iss}$ | $V_{DS}$ =-15V,$V_{GS}$ =0V,f =1MHz | | 700 | | pF |
| Output capacitance | $C_{oss}$ | | | 120 | | pF |
| Reverse transfer capacitance | $C_{rss}$ | | | 75 | | pF |
| **Switching Characteristics** (note b) | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{GS}$=-10V,$V_{DS}$=-15V, $R_L$=3.6Ω,$R_{GEN}$=3Ω | | 9.0 | | ns |
| Turn-on rise time | $t_r$ | | | 5.0 | | ns |
| Turn-off delay time | $t_{d(off)}$ | | | 28.2 | | ns |
| Turn-off fall time | $t_f$ | | | 13.5 | | ns |

**Notes:**

a.Pulse Test : Pulse Width < 300μs, Duty Cycle ≤2%.

b.These parameters have no way to verify.

## Typical Electrical and Thermal Characteristics

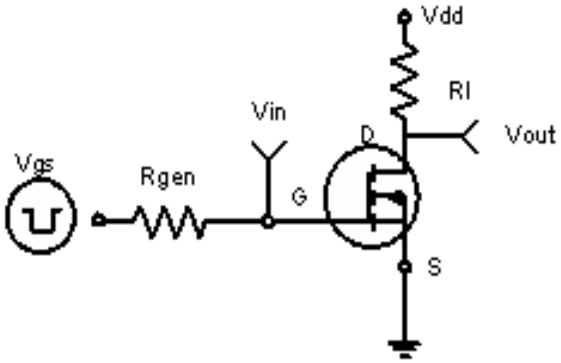



**Figure 1:Switching Test Circuit**

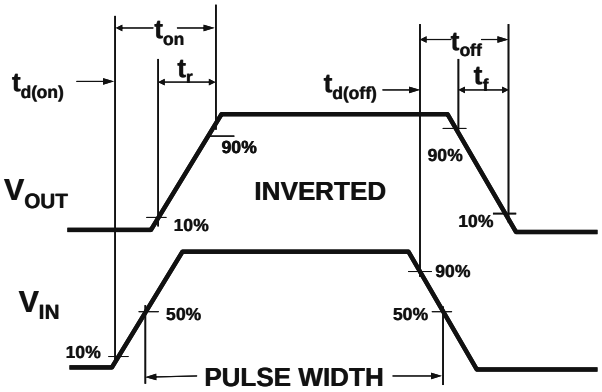
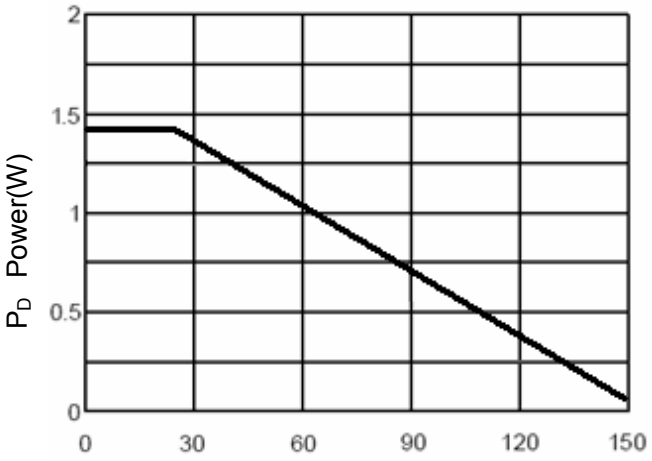
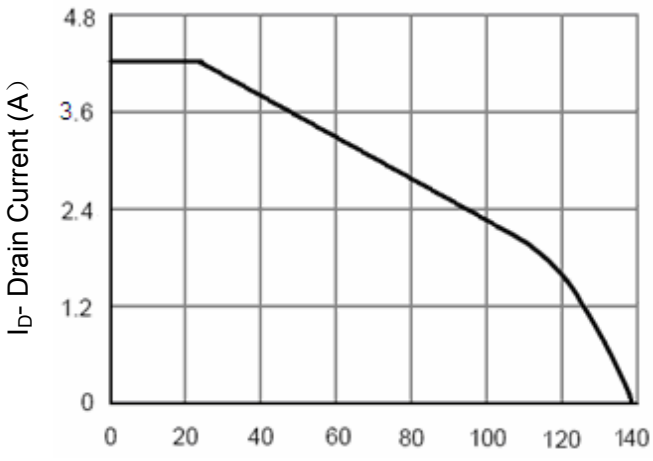



**Figure 2:Switching Waveforms**



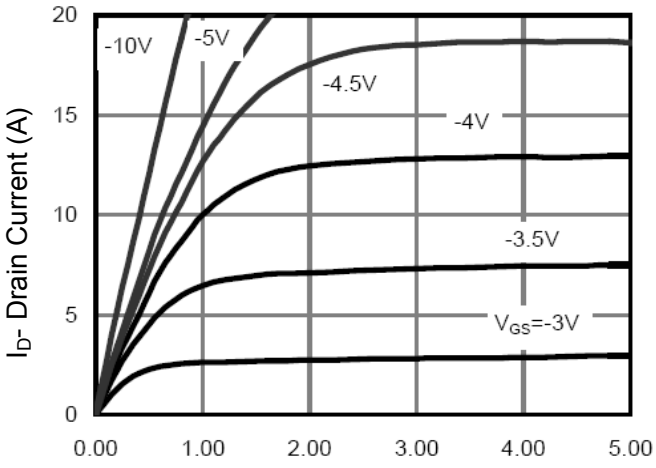

TJ-Junction Temperature(℃)

**Figure 3 Power Dissipation**



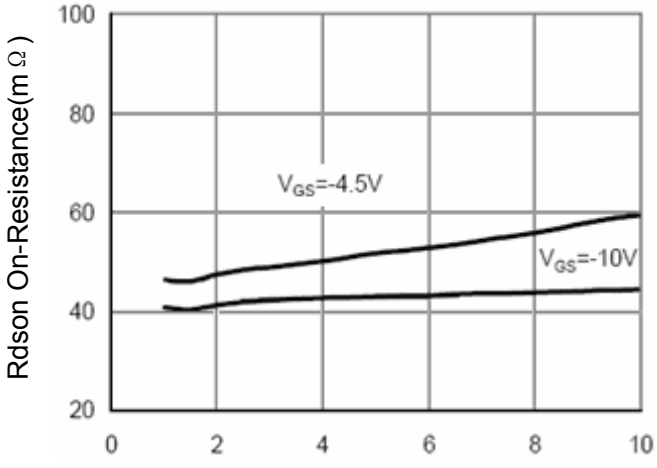

TJ-Junction Temperature(℃)

**Figure 4 Drain Current**




Vds Drain-Source Voltage (V)

**Figure 5 Output Characteristics**




ID- Drain Current (A)

**Figure 6 Drain-Source On-Resistance**

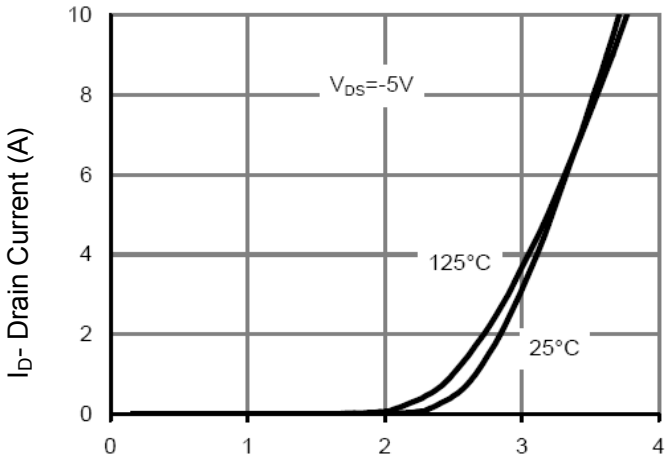



**Figure 7 Transfer Characteristics**

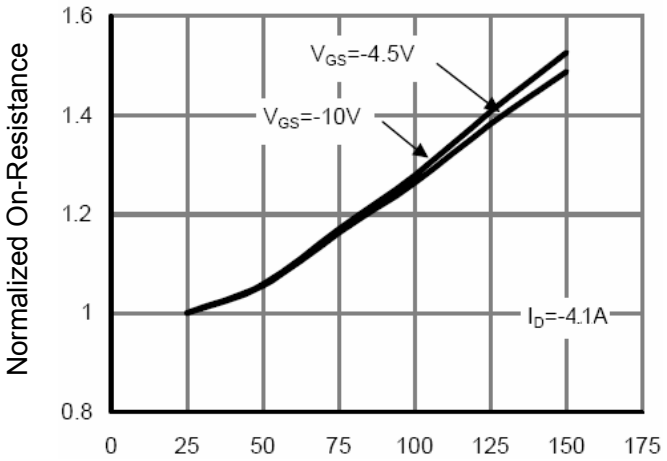



**Figure 8 Drain-Source On-Resistance**

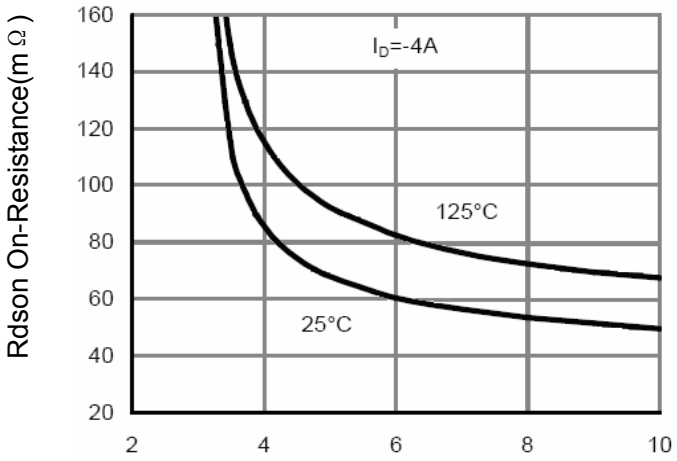



**Figure 9 Rdson vs Vgs**

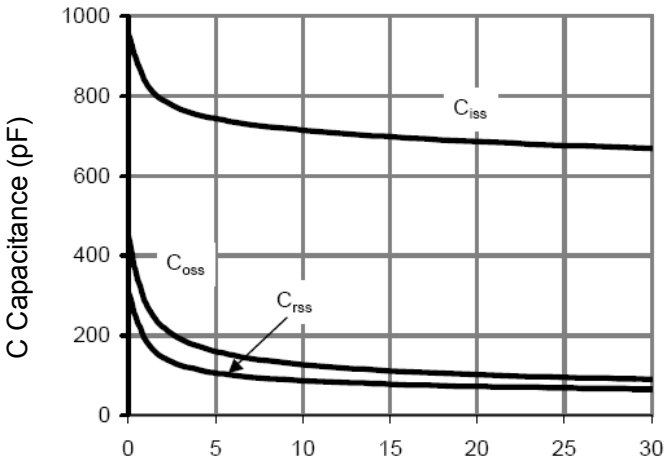



**Figure 10 Capacitance vs Vds**

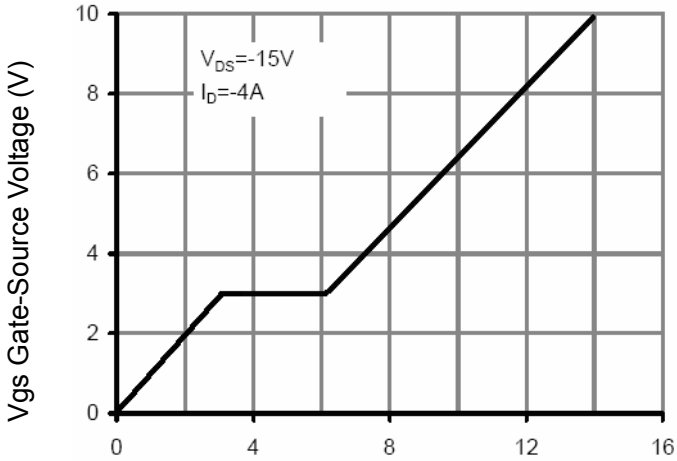



**Figure 11 Gate Charge**

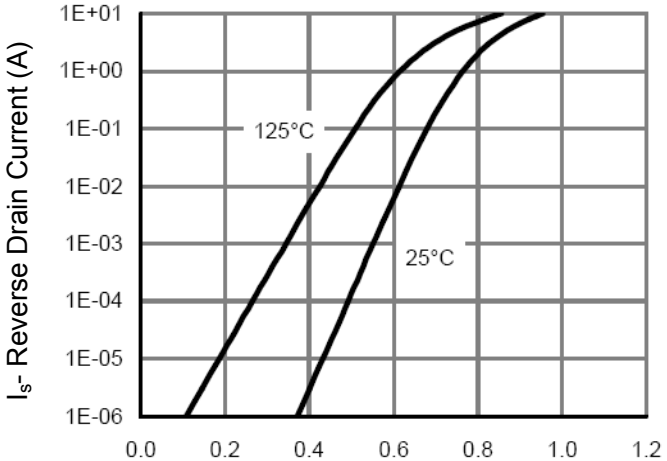



**Figure 12 Source- Drain Diode Forward**

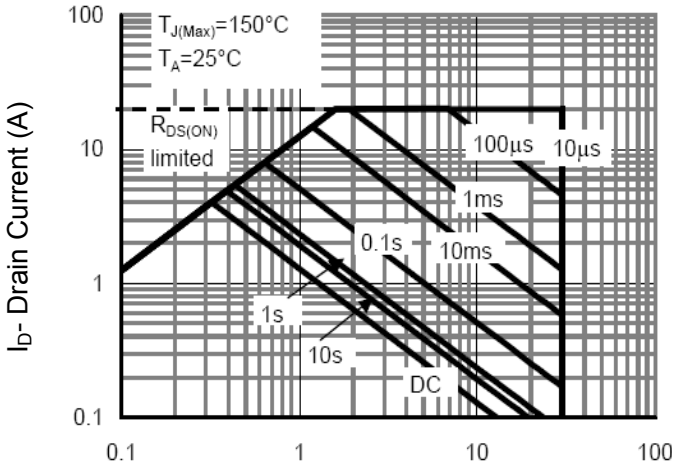



**Figure 13 Safe Operation Area**

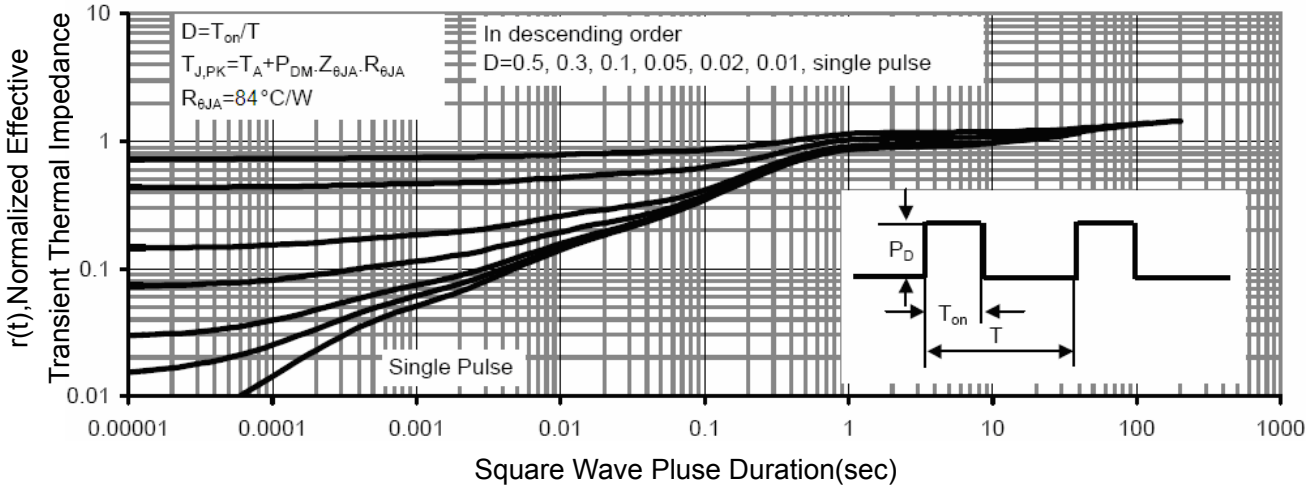



**Figure 14 Normalized Maximum Transient Thermal Impedance**

# SOT-23 Plastic-Encapsulate MOSFETS

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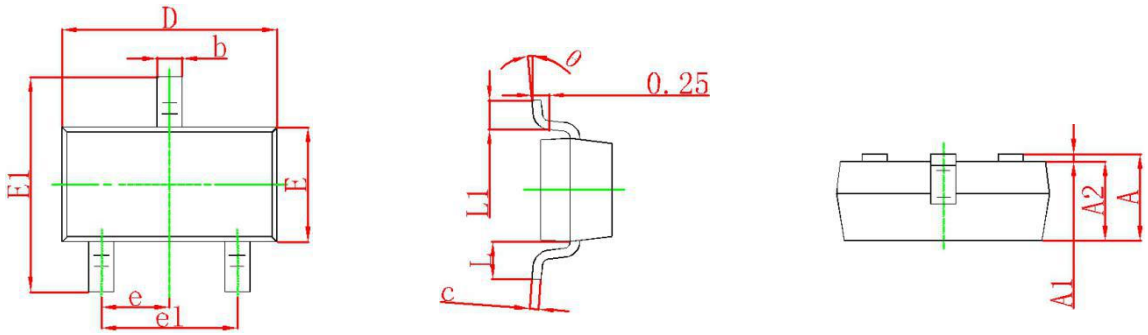
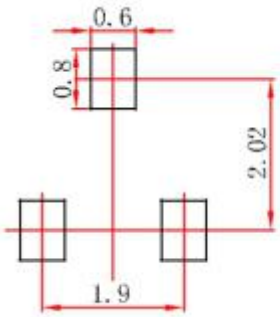
## SOT-23 Package Outline Dimensions




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP | | 0.037 TYP | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF | | 0.022 REF | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 8° |

## SOT-23 Suggested Pad Layout




Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.