

SOT-23 Plastic-Encapsulate MOSFETS

TF2341

TF2341 P-Channel 20-V(D-S) MOSFET

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | I_D |
|---------------|-----------------|-------|
| -20V | 0.050Ω@-4.5V | -4.1A |
| | 0.070Ω@-2.5V | |

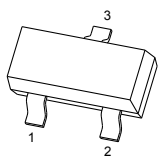
General FEATURE

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

APPLICATION


- Load Switch for Portable Devices
- DC/DC Converter

SOT-23



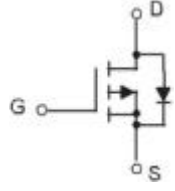
1.GATE
2.SOURCE
3.DRAIN

MARKING



*w: week code

Equivalent Circuit



Maximum ratings ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|--|-----------------|-----------|-----------------------------|
| Drain-Source Voltage | V_{DS} | -20 | V |
| Gate-Source Voltage | V_{GS} | ±12 | |
| Continuous Drain Current | I_D | -4.1 | A |
| Pulsed Drain Current | I_{DM} | -15 | |
| Continuous Source-Drain Diode Current | I_S | -1.4 | |
| Maximum Power Dissipation | P_D | 1.25 | W |
| Thermal Resistance from Junction to Ambient($t \leq 5s$) | $R_{\theta JA}$ | 125 | $^{\circ}\text{C}/\text{W}$ |
| Junction Temperature | T_J | 150 | $^{\circ}\text{C}$ |
| Storage Temperature | T_{stg} | -55 ~+150 | |



SOT-23 Plastic-Encapsulate MOSFETS

TF2341

MOSFET ELECTRICAL CHARACTERISTICS

T_a =25 °C unless otherwise specified

| Parameter | Symbol | Test Condition | Min | Typ | Max | Units |
|--|----------------------|---|------|-------|-------|-------|
| Static | | | | | | |
| Drain-source breakdown voltage | V _{(BR)DSS} | V _{GS} = 0V, I _D = -250μA | -20 | | | V |
| Gate-source threshold voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = -250μA | -0.5 | -0.7 | -1 | |
| Gate-source leakage | I _{GSS} | V _{DS} = 0V, V _{GS} = ±12V | | | ±100 | nA |
| Zero gate voltage drain current | I _{DSS} | V _{DS} = -16V, V _{GS} = 0V | | | -1 | μA |
| Drain-source on-state resistance ^a | R _{DSON} | V _{GS} = -4.5V, I _D = -4.1A | | 0.045 | 0.050 | Ω |
| | | V _{GS} = -2.5V, I _D = -3.0A | | 0.065 | 0.070 | |
| Forward transconductance ^a | g _{fs} | V _{DS} = -5V, I _D = -2.0A | 6.0 | | | S |
| Dynamic^b | | | | | | |
| Input capacitance | C _{iss} | V _{DS} = -4V, V _{GS} = 0V, f = 1MHz | | 740 | | pF |
| Output capacitance | C _{oss} | | | 290 | | |
| Reverse transfer capacitance | C _{rss} | | | 190 | | |
| Total gate charge | Q _g | V _{DS} = -4V, V _{GS} = -4.5V, I _D = -4.1A | | 9.0 | | nC |
| Gate-source charge | Q _{gs} | | | 1.0 | | |
| Gate-drain charge | Q _{gd} | | | 2.5 | | |
| Turn-on delay time | t _{d(on)} | V _{DD} = -4V, I _D = -3.3A, R _L = -1.2Ω, V _{GEN} = -4.5V, R _g = 1Ω | | 12.0 | | ns |
| Rise time | t _r | | | 35.0 | | |
| Turn-off delay time | t _{d(off)} | | | 30.0 | | |
| Fall time | t _f | | | 10.0 | | |
| Drain-source body diode characteristics | | | | | | |
| Continuous source-drain diode current | I _S | T _C = 25°C | | | -1.4 | A |
| Pulse diode forward current ^a | I _{SM} | | | | -10 | |
| Body diode voltage | V _{SD} | I _S = -1.4A | | -0.8 | -1.2 | V |

Notes :

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

b. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics

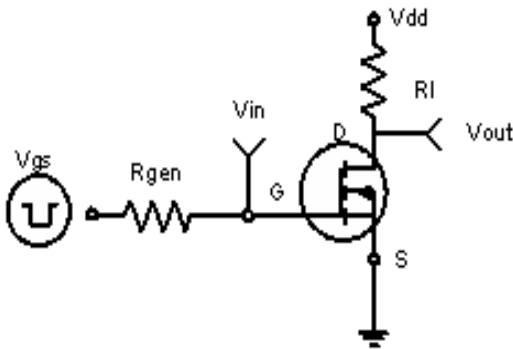


Figure 1: Switching Test Circuit

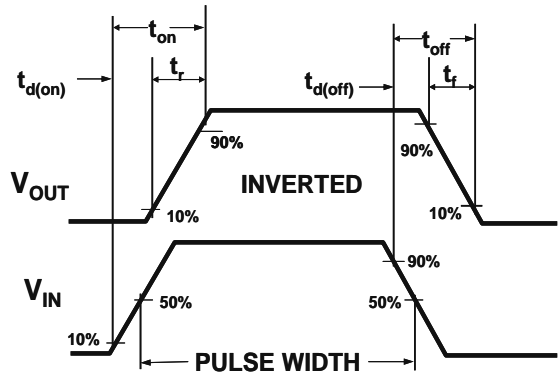


Figure 2: Switching Waveforms

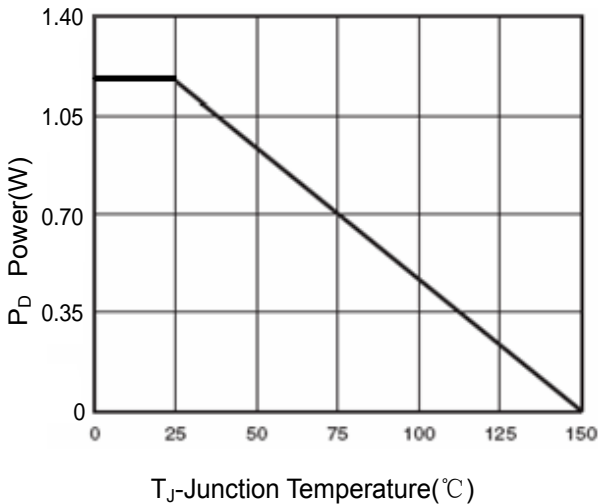


Figure 3 Power Dissipation

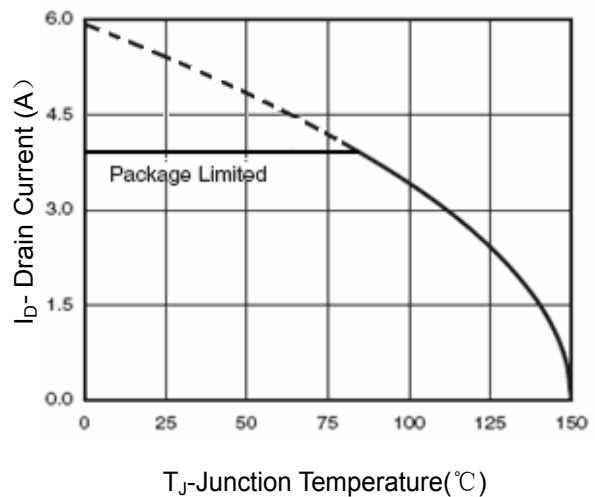


Figure 4 Drain Current

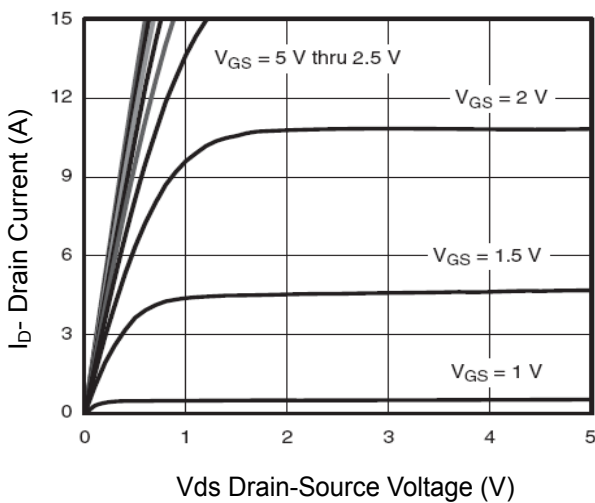


Figure 5 Output Characteristics

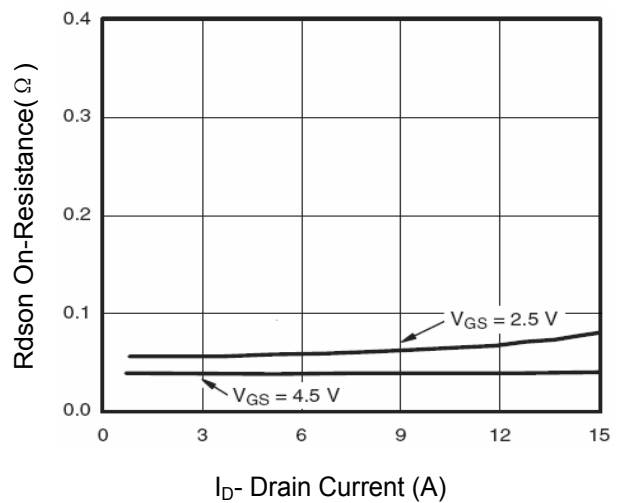
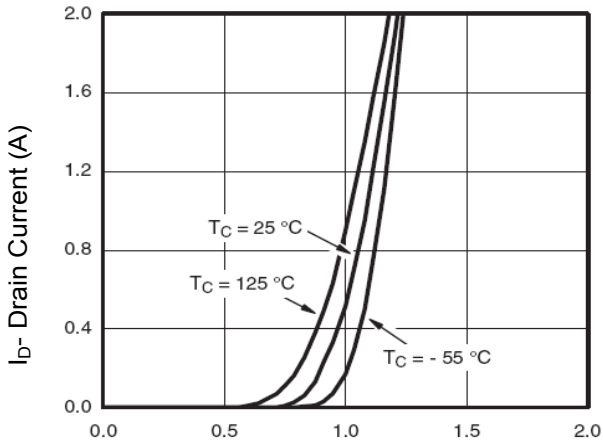
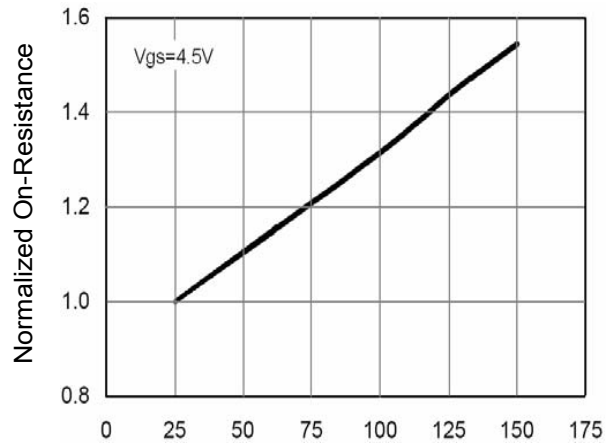


Figure 6 Drain-Source On-Resistance



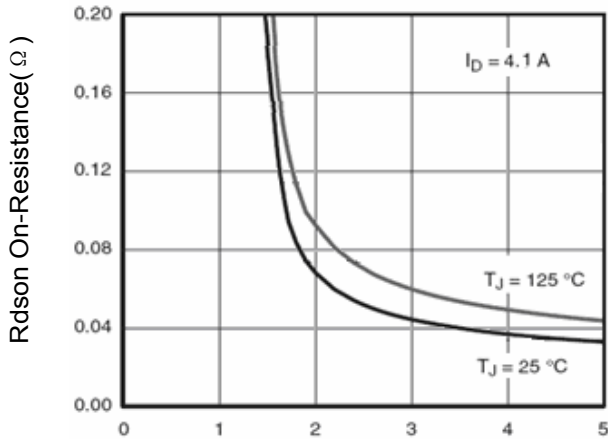
V_{GS} Gate-Source Voltage (V)

Figure 7 Transfer Characteristics



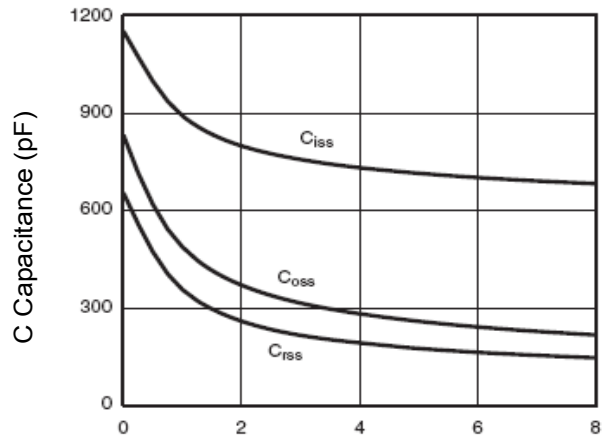
T_J -Junction Temperature(°C)

Figure 8 Drain-Source On-Resistance



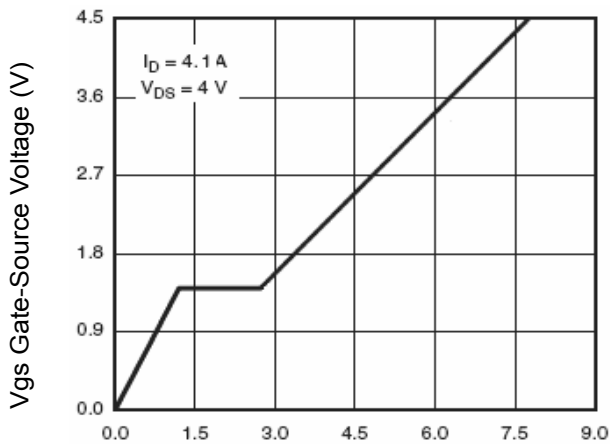
V_{GS} Gate-Source Voltage (V)

Figure 9 $R_{DS(on)}$ vs V_{GS}



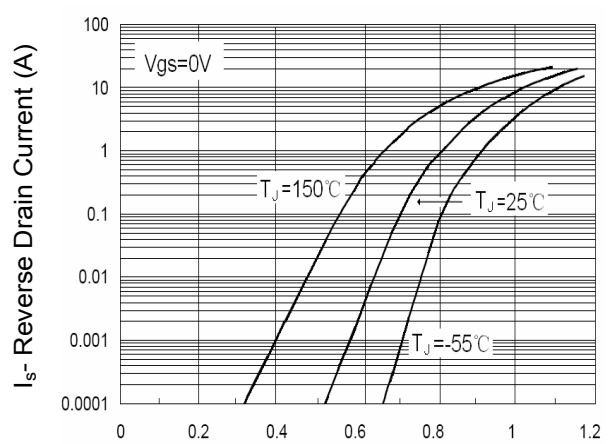
V_{DS} Drain-Source Voltage (V)

Figure 10 Capacitance vs V_{DS}



Q_g Gate Charge (nC)

Figure 11 Gate Charge



V_{SD} Source-Drain Voltage (V)

Figure 12 Source- Drain Diode Forward

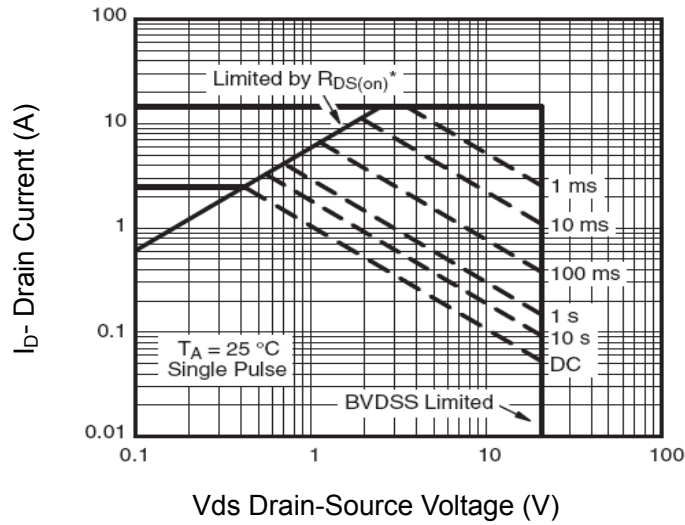


Figure 13 Safe Operation Area

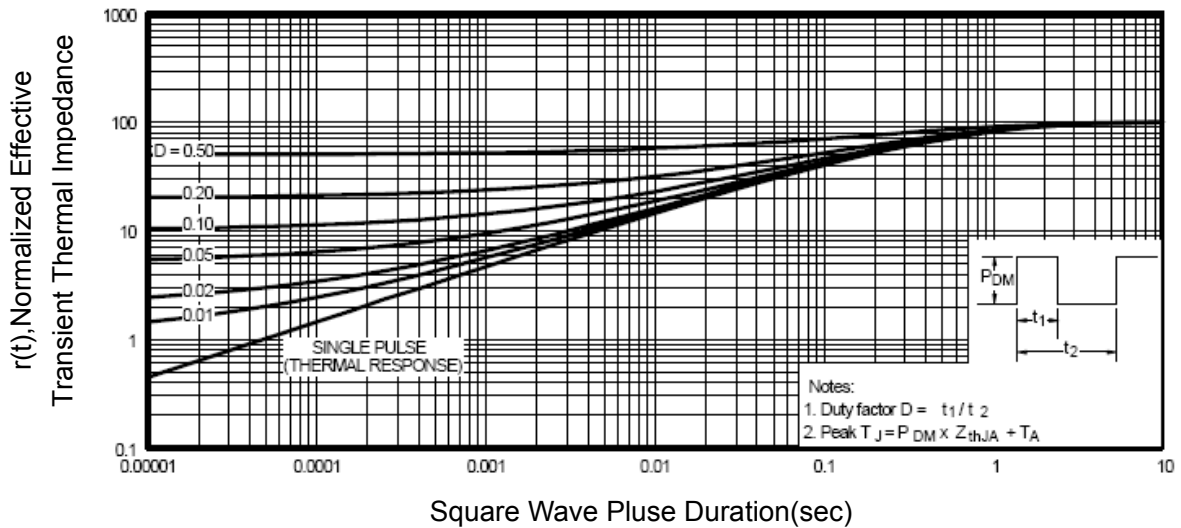
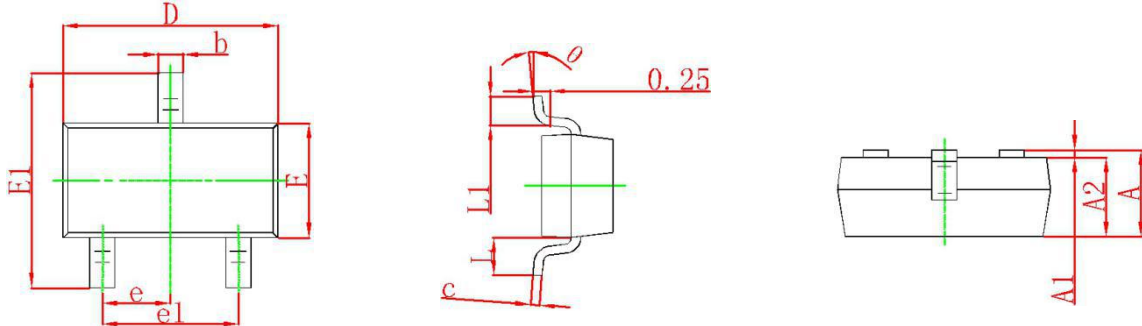


Figure 14 Normalized Maximum Transient Thermal Impedance

SOT-23 Plastic-Encapsulate MOSFETS

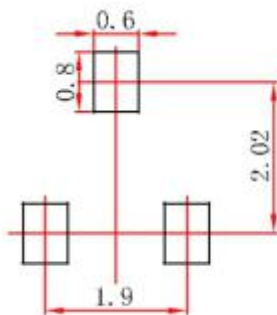
TF2341

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: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.