



TSM3441

-20V P-Channel Enhancement-Mode MOSFET

SOT-26



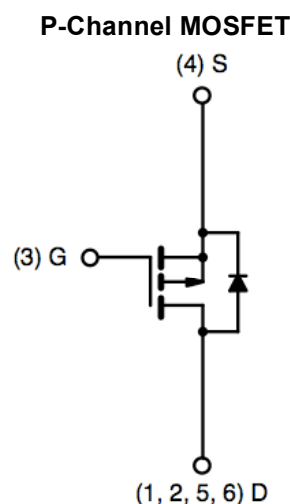
Pin assignment:
 1. Drain 6. Drain
 2. Drain 5. Drain
 3. Gate 4. Source

$V_{DS} = -20V$
 $R_{DS(on)}, V_{GS} @ -4.5V, I_{DS} @ -3A = 100m\Omega$
 $R_{DS(on)}, V_{GS} @ -2.5V, I_{DS} @ -2.0A = 150m\Omega$

Features

- ◇ Advanced trench process technology
- ◇ High density cell design for ultra low on-resistance
- ◇ Fully Characterized Avalanche Voltage and Current
- ◇ Improved Shoot-Through FOM

Block Diagram



Ordering Information

| Part No. | Packing | Package |
|------------|-------------------------------|---------|
| TSM3441CX6 | Tape & Reel 3,000/per reel | SOT-26 |

Absolute Maximum Rating (Ta = 25 °C unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|--|----------------|--------------|------|
| Drain-Source Voltage | V_{DS} | -20V | V |
| Gate-Source Voltage | V_{GS} | ±8 | V |
| Continuous Drain Current, | I_D | -3 | A |
| Pulsed Drain Current, | I_{DM} | -10 | A |
| Maximum Power Dissipation | P_D | Ta = 25 °C | 2 |
| | | Ta = 70 °C | 1.3 |
| Operating Junction Temperature | T_J | +150 | °C |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | - 55 to +150 | °C |

Thermal Performance

| Parameter | Symbol | Limit | Unit |
|--|-----------------|-------|------|
| Junction to Foot (Drain) Thermal Resistance | $R_{\theta jf}$ | 30 | °C/W |
| Junction to Ambient Thermal Resistance (PCB mounted) | $R_{\theta ja}$ | 50 | °C/W |

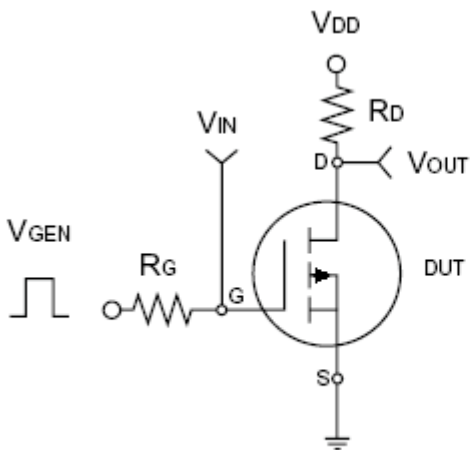
Note: Surface mounted on FR4 board $t \leq 10$ sec.

Electrical Characteristics

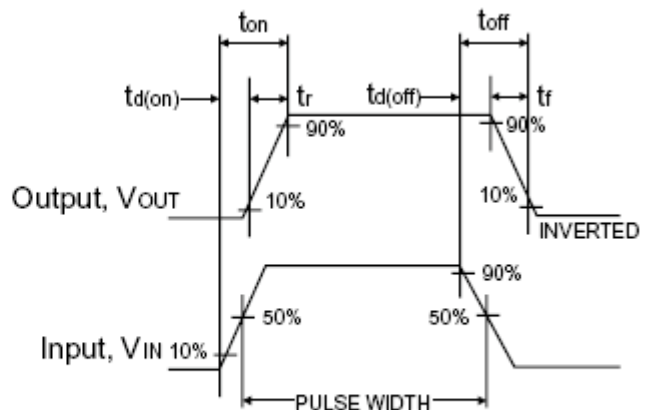
(Ta = 25 °C unless otherwise noted)

| Parameter | Conditions | Symbol | Min | Typ | Max | Unit |
|----------------------------------|--|--------------|-------|------|------|------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | $V_{GS} = 0V, I_D = -250\mu A$ | BV_{DSS} | -20 | -- | -- | V |
| Drain-Source On-State Resistance | $V_{GS} = -4.5V, I_D = -3A$ | $R_{DS(ON)}$ | -- | 80 | 100 | mΩ |
| Drain-Source On-State Resistance | $V_{GS} = -2.5V, I_D = -2.0A$ | $R_{DS(ON)}$ | -- | 112 | 150 | |
| Gate Threshold Voltage | $V_{DS} = V_{GS}, I_D = -250\mu A$ | $V_{GS(TH)}$ | -0.45 | -- | -- | V |
| Zero Gate Voltage Drain Current | $V_{DS} = -16V, V_{GS} = 0V$ | I_{DSS} | -- | -- | -1.0 | μA |
| Gate Body Leakage | $V_{GS} = \pm 8V, V_{DS} = 0V$ | I_{GSS} | -- | -- | ±100 | nA |
| On-State Drain Current | $V_{DS} \geq -10V, V_{GS} = -5V$ | $I_{D(ON)}$ | -6 | -- | -- | A |
| Forward Transconductance | $V_{DS} = -5V, I_D = -3A$ | g_{fs} | -- | 6.5 | -- | S |
| Dynamic | | | | | | |
| Total Gate Charge | $V_{DS} = -6V, I_D = -3A,$ $V_{GS} = -4.5V$ | Q_g | -- | 5.4 | 10 | nC |
| Gate-Source Charge | | Q_{gs} | -- | 0.8 | -- | |
| Gate-Drain Charge | | Q_{gd} | -- | 1.1 | -- | |
| Turn-On Delay Time | $V_{DD} = -6V, R_L = 6\Omega,$ $I_D = -1A, V_{GEN} = -4.5V,$ $R_G = 6\Omega$ | $t_{d(on)}$ | -- | 5 | 25 | nS |
| Turn-On Rise Time | | t_r | -- | 19 | 60 | |
| Turn-Off Delay Time | | $t_{d(off)}$ | -- | 95 | 110 | |
| Turn-Off Fall Time | | t_f | -- | 65 | 80 | |
| Input Capacitance | $V_{DS} = -6V, V_{GS} = 0V,$ $f = 1.0MHz$ | C_{iss} | -- | 447 | -- | pF |
| Output Capacitance | | C_{oss} | -- | 127 | -- | |
| Reverse Transfer Capacitance | | C_{rss} | -- | 80 | -- | |
| Source-Drain Diode | | | | | | |
| Max. Diode Forward Current | | I_S | -- | -- | -1.6 | A |
| Diode Forward Voltage | $I_S = -1.6A, V_{GS} = 0V$ | V_{SD} | -- | -0.8 | -1.2 | V |

Note : pulse test: pulse width $\leq 300\mu S$, duty cycle $\leq 2\%$

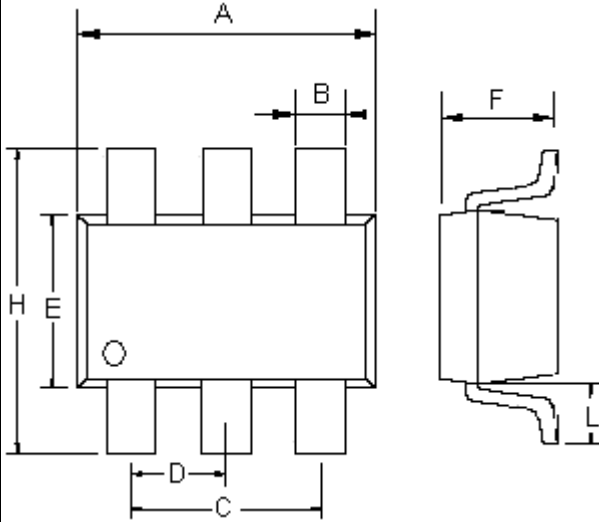


Switching Test Circuit



Switchin Waveforms

SOT-26 Mechanical Drawing



| SOT-26 DIMENSION | | | | |
|------------------|-------------|------|------------|-------|
| DIM | MILLIMETERS | | INCHES | |
| | MIN | MAX | MIN | MAX |
| A | 2.70 | 3.00 | 0.106 | 0.118 |
| B | 0.25 | 0.50 | 0.010 | 0.020 |
| C | 1.90(typ) | | 0.075(typ) | |
| D | 0.95(typ) | | 0.037(typ) | |
| E | 1.50 | 1.70 | 0.059 | 0.067 |
| F | 1.05 | 1.35 | 0.041 | 0.053 |
| H | 2.60 | 3.00 | 0.102 | 0.118 |
| L | 0.60(typ) | | 0.024(typ) | |