

N-Channel Enhancement Mode MOSFET

TDM3510

DESCRIPTION

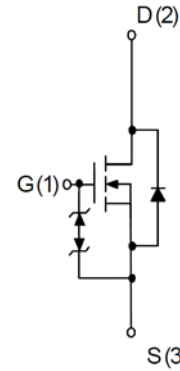
The TDM3510 uses advanced trench technology to provide excellent RDS(ON) and low gate charge. This device is suitable for use as a load switch or in PWM applications.

GENERAL FEATURES

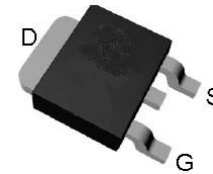
- RDS(ON) < 15.6mΩ @ VGS=4.5V
RDS(ON) < 10.2mΩ @ VGS=10V
- High Power and current handling capability
- Lead free product is available
- Surface Mount Package

Application

- PWM applications
- Load switch
- Power management



N-Channel MOSFET



Top View of TO-252-2

泰德半导体--提供样品, 技术支持 手机13418601901 QQ409545144

ABSOLUTE MAXIMUM RATINGS($T_A=25^{\circ}C$ unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|---|----------------------------|------------|-------------|
| Drain-Source Voltage | V_{DS} | 40 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Drain Current @ Continuous | $I_D (T_C=25^{\circ}C)$ | 43 | A |
| | $I_D (T_C=100^{\circ}C)$ | 28 | A |
| Drain Current @ Current-Pulsed (Note 1) | $I_{DM} (T_C=25^{\circ}C)$ | 60 | A |
| Maximum Power Dissipation | $P_D(T_C=25^{\circ}C)$ | 27 | W |
| | $P_D(T_C=100^{\circ}C)$ | 11 | W |
| Drain Current @ Continuous | $I_D (T_A=25^{\circ}C)$ | 12 | A |
| | $I_D (T_A=70^{\circ}C)$ | 9 | A |
| Maximum Power Dissipation | $P_D(T_A=25^{\circ}C)$ | 2 | W |
| | $P_D(T_A=70^{\circ}C)$ | 1.2 | W |
| Maximum Operating Junction Temperature | T_J | 150 | $^{\circ}C$ |
| Storage Temperature Range | T_{STG} | -55 To 150 | $^{\circ}C$ |

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ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

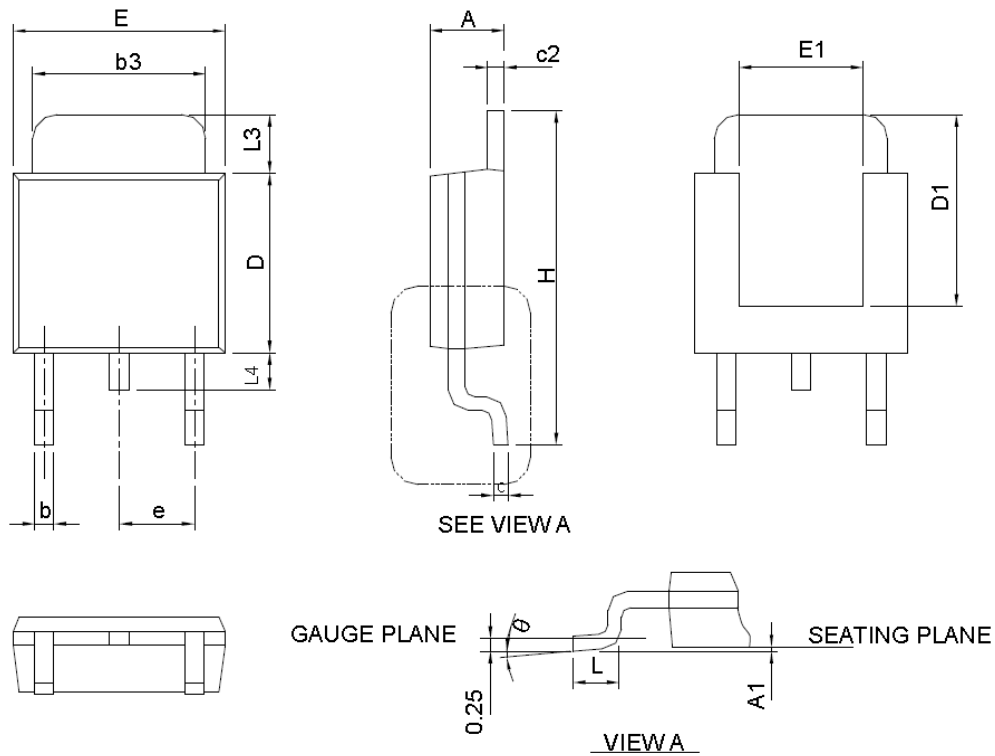
| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|--------------|--|-----|------|----------|-----------|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=250\mu A$ | 40 | - | - | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=24V, V_{GS}=0V$ | - | - | 1 | μA |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V$ | - | - | ± 10 | μA |
| ON CHARACTERISTICS (Note 2) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 1.4 | 1.8 | 2.5 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}=4.5V, I_D=8A$ | - | 13 | 15.6 | $m\Omega$ |
| | | $V_{GS}=10V, I_D=15A$ | - | 9.7 | 10.2 | $m\Omega$ |
| | | $T_J=100^{\circ} C$ | - | 12.8 | - | $m\Omega$ |
| DYNAMIC CHARACTERISTICS (Note4) | | | | | | |
| Gate Resistance | R_G | $V_{DS}=0V, V_{GS}=0V, F=1.0MHz$ | - | 1.7 | - | Ω |
| Input Capacitance | C_{iss} | $V_{DS}=20V, V_{GS}=0V, F=1.0MHz$ | - | 700 | - | PF |
| Output Capacitance | C_{oss} | | - | 190 | - | PF |
| Reverse Transfer Capacitance | C_{rss} | | - | 32 | - | PF |
| SWITCHING CHARACTERISTICS (Note 3) | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DS}=20V, R_L=20\Omega, V_{GEN}=10V, R_G=6\Omega, I_D=1A$ | - | 10 | - | nS |
| Turn-on Rise Time | t_r | | - | 6.6 | - | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 18 | - | nS |
| Turn-Off Fall Time | t_f | | - | 12 | - | nS |
| Total Gate Charge | Q_g | $V_{DS}=20V, I_D=15A, V_{GS}=10V$ | - | 5.1 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 2.9 | - | nC |
| Gate-Drain Charge | Q_{gd} | | - | 1.1 | - | nC |
| Body Diode Reverse Recovery Time | T_{rr} | $I_F=5A, di/dt=100A/\mu s$ | - | 18.8 | - | nS |
| Body Diode Reverse Recovery Charge | Q_{rr} | | - | 4.5 | - | nC |
| DRAIN-SOURCE DIODE CHARACTERISTICS | | | | | | |
| Diode Forward Voltage (Note 2) | V_{SD} | $V_{GS}=0V, I_S=10A$ | - | 0.8 | 1.1 | V |

NOTES:

1. Pulse width limited by max. junction temperature.
2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
3. Guaranteed by design, not subject to production testing

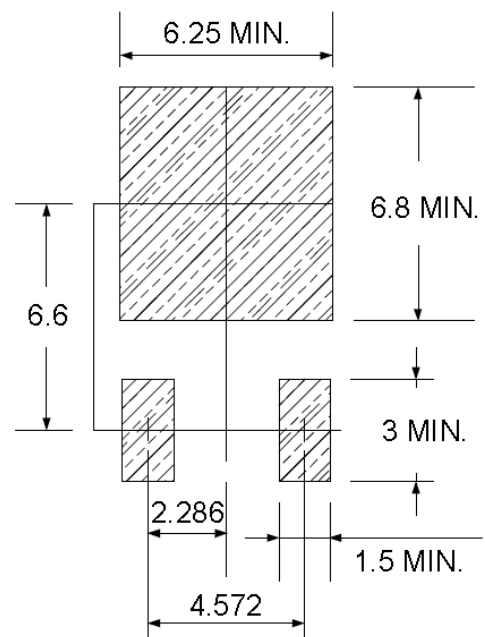
Package Information

TO252-2 Package



| DIMENSIONS | TO-252-2 | | | |
|------------|-------------|-------|-----------|-------|
| | MILLIMETERS | | INCHES | |
| | MIN. | MAX. | MIN. | MAX. |
| A | 2.18 | 2.39 | 0.086 | 0.094 |
| A1 | - | 0.13 | - | 0.005 |
| b | 0.50 | 0.89 | 0.020 | 0.035 |
| b3 | 4.95 | 5.46 | 0.195 | 0.215 |
| c | 0.46 | 0.61 | 0.018 | 0.024 |
| c2 | 0.46 | 0.89 | 0.018 | 0.035 |
| D | 5.33 | 6.22 | 0.210 | 0.245 |
| D1 | 4.57 | 6.00 | 0.180 | 0.236 |
| E | 6.35 | 6.73 | 0.250 | 0.265 |
| E1 | 3.81 | 6.00 | 0.150 | 0.236 |
| e | 2.29 BSC | | 0.090 BSC | |
| H | 9.40 | 10.41 | 0.370 | 0.410 |
| L | 0.90 | 1.78 | 0.035 | 0.070 |
| L3 | 0.89 | 2.03 | 0.035 | 0.080 |
| L4 | - | 1.02 | - | 0.040 |
| θ | 0° | 8° | 0° | 8° |

RECOMMENDED LAND PATTERN



UNIT: mm

Design Notes