



TO-252
(DPAK)



Pin Definition:

1. Gate
2. Drain
3. Source

PRODUCT SUMMARY

| V_{DS} (V) | $R_{DS(on)}$ (m Ω) | I_D (A) |
|--------------|----------------------------|-----------|
| -60 | 170 @ $V_{GS} = -10V$ | -5 |
| | 220 @ $V_{GS} = -4.5V$ | -2 |

Features

- Advance Trench Process Technology
- High Density Cell Design for Ultra Low On-resistance

Application

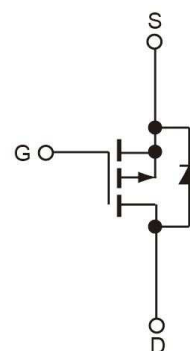
- Load Switch
- PA Switch

Ordering Information

| Part No. | Package | Packing |
|----------------|---------|--------------------|
| TSM10P06CP ROG | TO-252 | 2.5Kpcs / 13" Reel |

Note: "G" denote for Halogen Free Product

Block Diagram



P-Channel MOSFET

Absolute Maximum Rating ($T_A = 25^\circ C$ unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|---|----------------|--------------|------------|
| Drain-Source Voltage | V_{DS} | -60 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current | I_D | -10 | A |
| Pulsed Drain Current | I_{DM} | -20 | A |
| Continuous Source Current (Diode Conduction) ^{a,b} | I_S | -10 | A |
| Single Pulse Avalanche Energy (Note 2) | E_{AS} | 5 | mJ |
| Avalanche Current | I_{AS} | -10 | A |
| Total Power Dissipation @ $T_C=25C$ | P_{DTOT} | 37 | W |
| Operating Junction Temperature | T_J | +150 | $^\circ C$ |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | - 55 to +150 | $^\circ C$ |

Thermal Performance

| Parameter | Symbol | Limit | Unit |
|--|-----------------|-------|--------------|
| Junction to Case Thermal Resistance | $R_{\theta JC}$ | 4 | $^\circ C/W$ |
| Junction to Ambient Thermal Resistance (PCB mounted) | $R_{\theta JA}$ | 70 | $^\circ C/W$ |

Notes:

- a. Pulse width limited by the Maximum junction temperature
- b. Surface Mounted on FR4 Board, $t \leq 10$ sec.

Electrical Specifications (Ta = 25°C unless otherwise noted)

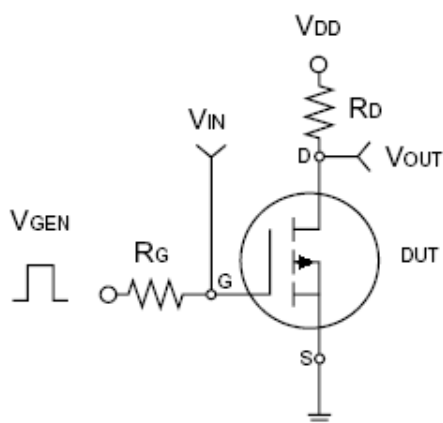
| Parameter | Conditions | Symbol | Min | Typ | Max | Unit |
|-------------------------------------|---|--------------|-----|-------|-----------|------------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | $V_{GS} = 0V, I_D = 250\mu A$ | BV_{DSS} | -60 | -- | -- | V |
| Gate Threshold Voltage | $V_{DS} = V_{GS}, I_D = 250\mu A$ | $V_{GS(TH)}$ | -1 | -- | -- | V |
| Gate Body Leakage | $V_{GS} = \pm 20V, V_{DS} = 0V$ | I_{GSS} | -- | -- | ± 100 | nA |
| Zero Gate Voltage Drain Current | $V_{DS} = -60V, V_{GS} = 0V$ | I_{DSS} | -- | -- | -1 | μA |
| On-State Drain Current ^a | $V_{DS} = -5V, V_{GS} = -10V$ | $I_{D(ON)}$ | -10 | -- | -- | A |
| Drain-Source On-State Resistance | $V_{GS} = -10V, I_D = -5A$ | $R_{DS(ON)}$ | -- | 130 | 170 | m Ω |
| | $V_{GS} = -4.5V, I_D = -2A$ | | -- | 170 | 220 | |
| Forward Transconductance | $V_{DS} = -15V, I_D = -3.5A$ | g_{fs} | -- | 6 | -- | S |
| Diode Forward Voltage | $I_S = -2.5A, V_{GS} = 0V$ | V_{SD} | -- | -1.25 | -1.5 | V |
| Dynamic | | | | | | |
| Total Gate Charge | $V_{DS} = -15V, I_D = -3.5A,$ $V_{GS} = -10V$ | Q_g | -- | 6 | -- | nC |
| Gate-Source Charge | | Q_{gs} | -- | 1.7 | -- | |
| Gate-Drain Charge | | Q_{gd} | -- | 1.5 | -- | |
| Input Capacitance | $V_{DS} = -30V, V_{GS} = 0V,$ $f = 1.0MHz$ | C_{iss} | -- | 540 | -- | pF |
| Output Capacitance | | C_{oss} | -- | 60 | -- | |
| Reverse Transfer Capacitance | | C_{rss} | -- | 30 | -- | |
| Switching | | | | | | |
| Turn-On Delay Time | $V_{DD} = -15V, R_L = 15\Omega,$ $I_D = -1A, V_{GEN} = -10V,$ $R_G = 6\Omega$ | $t_{d(on)}$ | -- | 7 | -- | nS |
| Turn-On Rise Time | | t_r | -- | 9 | -- | |
| Turn-Off Delay Time | | $t_{d(off)}$ | -- | 19 | -- | |
| Turn-Off Fall Time | | t_f | -- | 4 | -- | |

Notes 1: Pulse test: $PW \leq 300\mu S$, duty cycle $\leq 2\%$

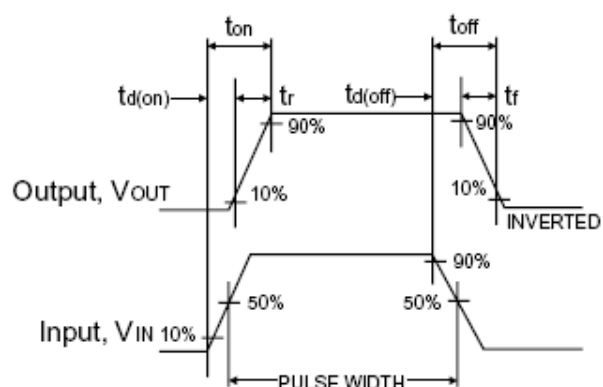
Notes 2: $L=0.1mH$,

Notes 3: For DESIGN AID ONLY, not subject to production testing.

Notes 4: Switching time is essentially independent of operating temperature.

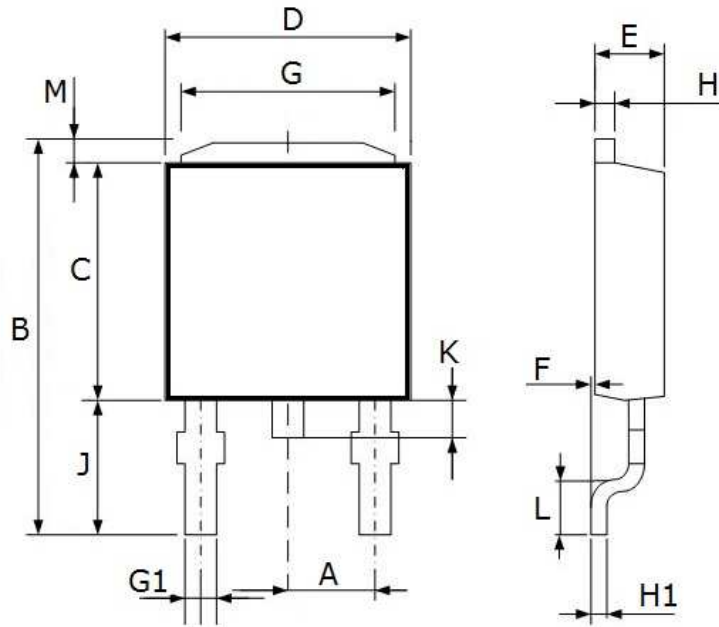


Switching Test Circuit



Switchin Waveforms

TO-252 Mechanical Drawing



| TO-252 DIMENSION | | | | |
|------------------|-------------|-------|-----------|-------|
| DIM | MILLIMETERS | | INCHES | |
| | MIN | MAX | MIN | MAX |
| A | 2.30 BSC | | 0.090 BSC | |
| B | 10.20 | 10.80 | 0.402 | 0.425 |
| C | 5.30 | 5.70 | 0.209 | 0.224 |
| D | 6.30 | 6.70 | 0.248 | 0.264 |
| E | 2.10 | 2.50 | 0.083 | 0.098 |
| F | 0.00 | 0.20 | 0.000 | 0.008 |
| G | 4.80 | 5.20 | 0.189 | 0.205 |
| G1 | 0.40 | 0.80 | 0.016 | 0.031 |
| H | 0.40 | 0.60 | 0.016 | 0.024 |
| H1 | 0.35 | 0.65 | 0.014 | 0.026 |
| J | 3.35 | 3.65 | 0.132 | 0.144 |
| K | 0.50 | 1.10 | 0.020 | 0.043 |
| L | 0.90 | 1.50 | 0.035 | 0.059 |
| M | 1.30 | 1.70 | 0.051 | 0.067 |

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