

MS7N60

N-Channel Enhancement Mode Power MOSFET

Description

The MS7N60 is a N-channel enhancement-mode MOSFET, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness. The TO-220AB package is universally preferred for all commercial-industrial applications

Features

- Low On Resistance
- Simple Drive Requirement
- Low Gate Charge
- Fast Switching Characteristic
- RoHS compliant package

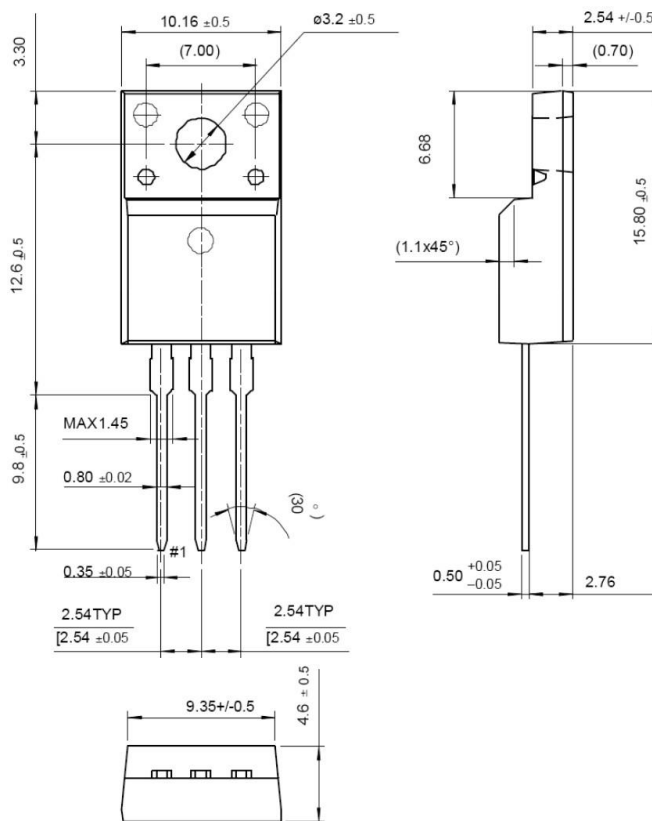
Application

- Adapter
- Switching Mode Power Supply

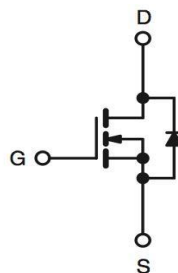
Package type : TO-220AB

Packing & Order Information

50/Tube ; 1,000/Box



Graphic symbol



**RoHS
COMPLIANT**

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings (Tc=25°C unless otherwise specified)

| Symbol | Parameter | Value | Unit |
|------------------|--------------------------------------|-------|------|
| V _{DSS} | Drain-Source Voltage | 600 | V |
| V _{GS} | Gate-Source Voltage | ±30 | V |
| I _D | Drain Current -Continuous (TC=25°C) | 7.0 | A |
| | Drain Current -Continuous (TC=100°C) | 4.4 | A |
| I _{DM} | Drain Current Pulsed | 28 | A |
| I _{AR} | Avalanche Current | 7.0 | V |
| E _{AS} | Single Pulsed Avalanche Energy | 187 | mJ |
| E _{AR} | Repetitive Avalanche Energy | 7.0 | mJ |
| dv/dt | Peak Diode Recovery dv/dt | 4.4 | V/ns |

- Drain current limited by maximum junction temperature

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Absolute Maximum Ratings (Tc=25°C unless otherwise specified)

| Symbol | Parameter | Value | Unit |
|------------------|--|-------------|------|
| T _L | Maximum Temperature for Soldering @ Lead at 0.125 in(0.318mm) from case for 10 seconds | 300 | °C |
| T _{PKG} | Maximum Temperature for Soldering @ Package Body for 10 seconds | 260 | °C |
| P _D | Total Power Dissipation(@TC = 25 °C) 44 W | 44 | W |
| | Derating Factor above 25 °C | 0.35 | W/°C |
| T _{STG} | Operating and Storage Temperature | -55 to +150 | °C |
| T _J | Storage Temperature | 150 | °C |

Note:

1. Repetitive rating; pulse width limited by maximum junction temperature.
2. I_{AS}≤7A, V_{DD}=50V, L=7mH, V_G=10V, starting T_J=+25°C.
3. I_{SD}≤7A, di/dt≤200A/μs, V_{DD}≤B_VD_{SS}, starting T_J=+25°C.

Thermal Characteristics

| Symbol | Parameter | Min. | Typ. | Max. | Units |
|------------------|---|------|------|------|-------|
| R _{θJC} | Thermal Resistance, Junction-to-Case | -- | -- | 1.25 | °C/W |
| R _{θJA} | Thermal Resistance, Junction-to-Ambient | -- | -- | 62.5 | |

Static Characteristics

| Symbol | Parameter | Test Conditions | Min | Typ. | Max. | Units |
|--|---|---|-----|------|---------|-------|
| B _V D _{SS} | Drain-Source Breakdown Voltage | V _{GS} = 0 V , I _D = 250μA | 600 | -- | -- | V |
| ΔB _V D _{SS} /ΔT _J | Breakdown Voltage Temperature Coefficient | I _D = 250μA, Referenced to 25°C | -- | 0.60 | -- | V/°C |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} = V _{GS} , I _D = 250 uA | 2.0 | -- | 4.0 | V |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} = 600 V , V _{GS} = 0 V V _{DS} = 480 V , T _C = 125°C | -- | -- | 1 10 | uA |
| I _{GSS} | Gate-Body Leakage, Forward | V _{GS} = ±30 | -- | -- | ±100 | nA |
| R _{DS(ON)} | Static Drain-Source On-state Resistance | V _{GS} = -10 V , I _D = 3.5 V | -- | 1.08 | 1.2 | Ω |

Dynamic Characteristics

| Symbol | Parameter | Test Conditions | Min | Typ. | Max. | Units |
|------------------|------------------------------|--|-----|------|------|-------|
| C _{ISS} | Input Capacitance | V _{DS} =25V, V _{GS} =0V, f=1.0MHz | -- | 1332 | -- | pF |
| C _{OSS} | Output Capacitance | | -- | 114 | -- | pF |
| C _{RSS} | Reverse Transfer Capacitance | | -- | 61 | -- | pF |

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| Dynamic Characteristics | | | | | | |
|-------------------------|-----------------------------------|--|-----|------|------|-------|
| Symbol | Parameter | Test Conditions | Min | Typ. | Max. | Units |
| $t_{d(on)}$ | Turn-On Time | $V_{DS} = 300\text{ V}, I_D = 6\text{ A},$ $V_{GS} = 10\text{ V}, R_G = 25\ \Omega$ | -- | 14.2 | -- | ns |
| t_r | Rise Time | | -- | 40 | -- | ns |
| $t_{d(off)}$ | Turn-Off Delay Time | | -- | 31.5 | -- | ns |
| t_f | Fall Time | | -- | 32.3 | -- | ns |
| Q_g | Total Gate Charge | $V_{DS} = 300\text{ V}, I_D = 6\text{ A},$ $V_{GS} = 10\text{ V}$ | -- | 37 | -- | nC |
| Q_{gs} | Gate-Source Charge | | -- | 6.0 | -- | nC |
| Q_{gd} | Gate-Drain Charge (Miller Charge) | | -- | 17.9 | -- | nC |

| Source-Drain Diode | | | | | | |
|--------------------|-----------|--|-----|-------|------|-------|
| Symbol | Parameter | Test Conditions | Min | Typ. | Max. | Units |
| I_S | | $V_D = V_G = 0,$ $V_S = 1.3\text{ V}$ | -- | -- | 7.0 | A |
| I_{SM} | | | -- | -- | 28 | |
| V_{SD} | | $I_S = 7\text{ A}, V_{GS} = 0\text{ V}$ | -- | -- | 1.5 | V |
| t_{rr} | | $I_S = 6\text{ A}, V_{GS} = 0\text{ V}$ $diF/dt = 100\text{ A}/\mu\text{s}$ | -- | 504.9 | -- | ns |
| Q_{rr} | | | -- | 47.59 | -- | uC |

*Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

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