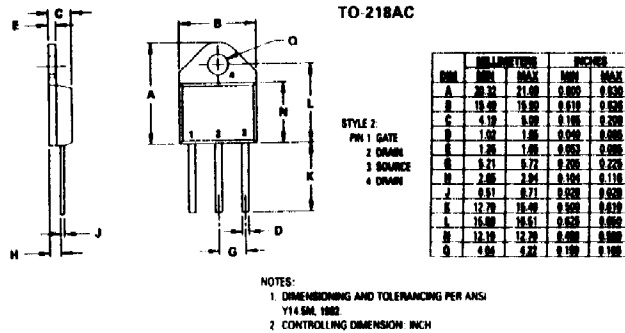


MTM15N20
Power Field Effect Transistor
N-Channel Enhancement-Mode
Silicon Gate TMOS



MAXIMUM RATINGS

| Rating | Symbol | MTH or MTM | | Unit |
|---|-----------------------------------|-------------|--|-------|
| | | 15N20 | | |
| Drain-Source Voltage | V _{DSS} | 200 | | Vdc |
| Drain-Gate Voltage (R _{GS} = 1 MΩ) | V _{DGR} | 200 | | Vdc |
| Gate-Source Voltage | V _{GS} | ± 20 | | Vdc |
| Continuous | V _{GSM} | ± 40 | | Vpk |
| Non-repetitive (t _p ≤ 50 μs) | | | | |
| Drain Current — Continuous | I _D | 15 | | Adc |
| — Pulsed | I _{DM} | 80 | | |
| Total Power Dissipation @ T _C = 25°C | P _D | 150 | | Watts |
| Derate above 25°C | | 1.2 | | W/°C |
| Operating and Storage Temperature Range | T _J , T _{stg} | - 65 to 150 | | °C |

THERMAL CHARACTERISTICS

| | | | |
|---|------------------|------|------|
| Thermal Resistance — Junction to Case | R _{θJC} | 0.83 | °C/W |
| — Junction to Ambient | R _{θJA} | 30 | |
| Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 5 seconds | T _L | 275 | °C |

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

OFF CHARACTERISTICS

| | | | | |
|---|----------------------|-----|-----|------|
| Drain-Source Breakdown Voltage (V _{GS} = 0, I _D = 0.25 mA) MTH15N20, MTM15N20 | V _{(BR)DSS} | 200 | — | Vdc |
| Zero Gate Voltage Drain Current (V _{DS} = Rated V _{DSS} , V _{GS} = 0) (T _J = 125°C) | I _{DSS} | — | 10 | μAdc |
| Gate-Body Leakage Current, Forward (V _{GSF} = 20 Vdc, V _{DS} = 0) | I _{GSSF} | — | 100 | nAdc |
| Gate-Body Leakage Current, Reverse (V _{GSR} = 20 Vdc, V _{DS} = 0) | I _{GSSR} | — | 100 | nAdc |



NJ Semi-Cond reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Cond is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Cond assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Cond encourages customers to verify that datasheets are current before placing orders.

ELECTRICAL CHARACTERISTICS — continued (T_C = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

ON CHARACTERISTICS*

| | | | | |
|---|---------------------|----------|----------|------|
| Gate Threshold Voltage (V _{DS} = V _{GS} , I _D = 1 mA) T _J = 100°C | V _{GS(th)} | 2 1.5 | 4.5 4 | Vdc |
| Static Drain-Source On-Resistance (V _{GS} = 10 Vdc, I _D = 7.5 Adc) | r _{DS(on)} | — | 0.16 | Ohm |
| Drain-Source On-Voltage (V _{GS} = 10 V) (I _D = 15 Adc) (I _D = 7.5 Adc, T _J = 100°C) | V _{DS(on)} | — — | 3 2.4 | Vdc |
| Forward Transconductance (V _{DS} = 15 V, I _D = 7.5 A) | g _{FS} | 4 | — | mhos |

DYNAMIC CHARACTERISTICS

| | | | | | |
|------------------------------|---|------------------|---|------|----|
| Input Capacitance | (V _{DS} = 25 V, V _{GS} = 0, f = 1 MHz) | C _{iss} | — | 2000 | pF |
| Output Capacitance | | C _{OSS} | — | 700 | |
| Reverse Transfer Capacitance | | C _{rss} | — | 200 | |

SWITCHING CHARACTERISTICS* (T_J = 100°C)

| | | | | | |
|---------------------|---|---------------------|----------|-----|----|
| Turn-On Delay Time | (V _{DD} = 25 V, I _D = 0.5 Rated I _D R _{gen} = 50 ohms) See Figures 13 and 14 | t _{d(on)} | — | 60 | ns |
| Rise Time | | t _r | — | 300 | |
| Turn-Off Delay Time | | t _{d(off)} | — | 220 | |
| Fall Time | | t _f | — | 250 | |
| Total Gate Charge | (V _{DS} = 0.8 Rated V _{DSS} , I _D = Rated I _D , V _{GS} = 10 V) See Figure 12 | Q _g | 60 (Typ) | 75 | nC |
| Gate-Source Charge | | Q _{gs} | 35 (Typ) | — | |
| Gate-Drain Charge | | Q _{gd} | 25 (Typ) | — | |

SOURCE DRAIN DIODE CHARACTERISTICS*

| | | | | | |
|-----------------------|--|-----------------|-----------------------------|-----|-----|
| Forward On-Voltage | (I _S = Rated I _D V _{GS} = 0) | V _{SD} | 1.5 (Typ) | 2.1 | Vdc |
| Forward Turn-On Time | | t _{on} | Limited by stray inductance | | |
| Reverse Recovery Time | | t _{rr} | 450 (Typ) | — | ns |

INTERNAL PACKAGE INDUCTANCE (TO-204)

| | | | | |
|--|----------------|------------|---|----|
| Internal Drain Inductance (Measured from the contact screw on the header closer to the source pin and the center of the die) | L _D | 5 (Typ) | — | nH |
| Internal Source Inductance (Measured from the source pin, 0.25" from the package to the source bond pad) | L _S | 12.5 (Typ) | — | |

INTERNAL PACKAGE INDUCTANCE (TO-218)

| | | | | |
|--|----------------|--------------------|--------|----|
| Internal Drain Inductance (Measured from screw on tab to center of die) (Measured from the drain lead 0.25" from package to center of die) | L _D | 4 (Typ) 5 (Typ) | — — | nH |
| Internal Source Inductance (Measured from the source lead 0.25" from package to center of die) | L _S | 10 (Typ) | — | |

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