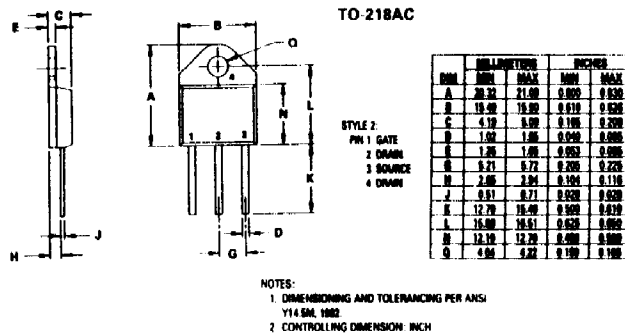


**MTM15N20**  
**Power Field Effect Transistor**  
**N-Channel Enhancement-Mode**  
**Silicon Gate TMOS**



**MAXIMUM RATINGS**

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

**THERMAL CHARACTERISTICS**

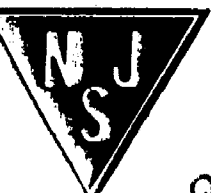
Thermal Resistance — Junction to Case	R <sub>θJC</sub>	0.83	°C/W
— Junction to Ambient	R <sub>θJA</sub>	30	
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 5 seconds	T <sub>L</sub>	275	°C

**ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted)**

Characteristic	Symbol	Min	Max	Unit
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**OFF CHARACTERISTICS**

Drain-Source Breakdown Voltage (V <sub>GS</sub> = 0, I <sub>D</sub> = 0.25 mA) MTH15N20, MTM15N20	V <sub>(BR)DSS</sub>	200	—	Vdc
Zero Gate Voltage Drain Current (V <sub>DS</sub> = Rated V <sub>DSS</sub> , V <sub>GS</sub> = 0) (T <sub>J</sub> = 125°C)	I <sub>DSS</sub>	—	10	μAdc
Gate-Body Leakage Current, Forward (V <sub>GSF</sub> = 20 Vdc, V <sub>DS</sub> = 0)	I <sub>GSSF</sub>	—	100	nAdc
Gate-Body Leakage Current, Reverse (V <sub>GSR</sub> = 20 Vdc, V <sub>DS</sub> = 0)	I <sub>GSSR</sub>	—	100	nAdc



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

**ELECTRICAL CHARACTERISTICS — continued** ( $T_C = 25^\circ\text{C}$  unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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**ON CHARACTERISTICS\***

Gate Threshold Voltage ( $V_{DS} = V_{GS}$ , $I_D = 1\text{ mA}$ ) $T_J = 100^\circ\text{C}$	$V_{GS(th)}$	2 1.5	4.5 4	Vdc
Static Drain-Source On-Resistance ( $V_{GS} = 10\text{ Vdc}$ , $I_D = 7.5\text{ Adc}$ )	$r_{DS(on)}$	—	0.16	Ohm
Drain-Source On-Voltage ( $V_{GS} = 10\text{ V}$ ) ( $I_D = 15\text{ Adc}$ ) ( $I_D = 7.5\text{ Adc}$ , $T_J = 100^\circ\text{C}$ )	$V_{DS(on)}$	— —	3 2.4	Vdc
Forward Transconductance ( $V_{DS} = 15\text{ V}$ , $I_D = 7.5\text{ A}$ )	$g_{FS}$	4	—	mhos

**DYNAMIC CHARACTERISTICS**

Input Capacitance	$(V_{DS} = 25\text{ V}$ , $V_{GS} = 0$ , $f = 1\text{ MHz}$ )	$C_{iss}$	—	2000	pF
Output Capacitance		$C_{oss}$	—	700	
Reverse Transfer Capacitance		$C_{rss}$	—	200	

**SWITCHING CHARACTERISTICS\* ( $T_J = 100^\circ\text{C}$ )**

Turn-On Delay Time	$(V_{DD} = 25\text{ V}$ , $I_D = 0.5\text{ Rated } I_D$ $R_{gen} = 50\text{ ohms}$ 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	$(V_{DS} = 0.8\text{ Rated } V_{DSS}$ , $I_D = \text{Rated } I_D$ , $V_{GS} = 10\text{ V}$ ) 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	$(I_S = \text{Rated } I_D$ $V_{GS} = 0$ )	$V_{SD}$	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  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .