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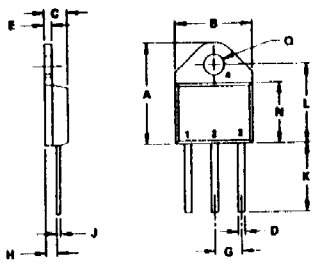
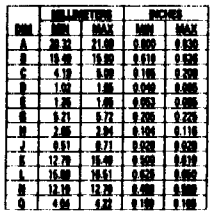
MTM15N20

Power Field Effect Transistor

N-Channel Enhancement-Mode
Silicon Gate TMOS



TO-218AC



STYLE 2:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

MAXIMUM RATINGS

Rating	Symbol	MTH or MTM 15N20	Unit
Drain-Source Voltage	V_{DSS}	200	Vdc
Drain-Gate Voltage (R_{GS} = 1 MΩ)	V_{DGR}	200	Vdc
Gate-Source Voltage Continuous Non-repetitive ($t_p \leq 50\ \mu s$)	 V_{GS} V_{GSM}	 ± 20 ± 40	 Vdc Vpk
Drain Current — Continuous — Pulsed	I_D I_{DM}	15 80	Adc
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	150 1.2	Watts W/°C
Operating and Storage Temperature Range	T_J, T_{stg}	− 65 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance — Junction to Case — Junction to Ambient	$R_{\theta JC}$ $R_{\theta JA}$	0.83 30	°C/W
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}	— —	10 100	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

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%.