

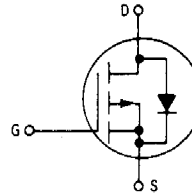
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Designer's Data Sheet
Power Field Effect Transistor
P-Channel Enhancement-Mode
Silicon Gate TMOS

These TMOS Power FETs are designed for medium voltage, high speed power switching applications such as switching regulators, converters, solenoid and relay drivers.

- Silicon Gate for Fast Switching Speeds — Switching Times Specified at 100°C
- Designer's Data — I_{DSS} , $V_{DS(on)}$, $V_{GS(th)}$ and SOA Specified at Elevated Temperature
- Rugged — SOA is Power Dissipation Limited
- Source-to-Drain Diode Characterized for Use With Inductive Loads



MTM12P05
MTM12P06
MTM12P08
MTM12P10
MTP12P05
MTP12P06
MTP12P08
MTP12P10

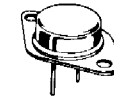
TMOS POWER FETs
12 AMPERES
 $r_{DS(on)} = 0.3 \text{ OHM}$
50, 60, 80 and 100 VOLTS

MAXIMUM RATINGS

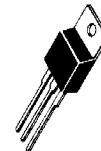
Rating	Symbol	MTM OR MTP				Unit
		12P05	12P06	12P08	12P10	
Drain-Source Voltage	V_{DSS}	50	60	80	100	Vdc
Drain-Gate Voltage ($R_{GS} = 1 \text{ M}\Omega$)	V_{DGR}	50	60	80	100	Vdc
Gate-Source Voltage — Continuous	V_{GS}	± 20				Vdc
— Non-repetitive ($t_p \leq 50 \mu s$)	V_{GSM}	± 40				Vpk
Drain Current	I_D I_{DM}	12				Adc
Continuous						
Pulsed		28				
Total Power Dissipation @ $T_C = 25^\circ C$	PD	75				Watts
Derate above 25°C		0.6				
Operating and Storage Temperature Range	T_J, T_{stg}	- 65 to 150				°C

THERMAL CHARACTERISTICS

Thermal Resistance	$R_{\theta JC}$	1.67	°C/W
Junction to Case			
Junction to Ambient			
	$R_{\theta JA}$	30	°C/W
TO-204			
		62.5	
TO-220			
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 5 seconds	T_L	275	°C



MTM12P05
MTM12P06
MTM12P08
MTM12P10
TO-204AA



MTP12P05
MTP12P06
MTP12P08
MTP12P10
TO-220AB



MTM/MTP12P05, 06, 08, 10

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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Drain-Source Breakdown Voltage (V _{GS} = 0, I _D = 0.25 mA)	MTM/MTP12P05 MTM/MTP12P06 MTM/MTP12P08 MTM/MTP12P10	V _{(BR)DSS}	50 60 80 100	—	V _{dc}
Zero Gate Voltage Drain Current (V _{DS} = Rated V _{DSS} , V _{GS} = 0) (V _{DS} = Rated V _{DSS} , V _{GS} = 0, T _J = 125°C)		I _{DSS}	— —	10 100	μA _{dc}
Gate-Body Leakage Current, Forward (V _{GSF} = 20 V _{dc} , V _{DS} = 0)		I _{GSSF}	—	100	nA _{dc}
Gate-Body Leakage Current, Reverse (V _{GSR} = 20 V _{dc} , V _{DS} = 0)		I _{GSSR}	—	100	nA _{dc}

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	V _{dc}
Static Drain-Source On-Resistance (V _{GS} = 10 V _{dc} , I _D = 6 A _{dc})		r _{DS(on)}	—	0.3	Ohm
Drain-Source On-Voltage (V _{GS} = 10 V) (I _D = 12 A _{dc}) (I _D = 6 A _{dc} , T _J = 100°C)		V _{DS(on)}	— —	4.2 3.8	V _{dc}
Forward Transconductance (V _{DS} = 15 V, I _D = 6 A)		g _{FS}	2	—	mhos

DYNAMIC CHARACTERISTICS

Input Capacitance	V _{DS} = 25 V, V _{GS} = 0, f = 1 MHz See Figure 10	C _{iss}	—	920	pF
Output Capacitance		C _{oss}	—	575	
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 12 and 13	t _{d(on)}	—	50	ns
Rise Time		t _r	—	150	
Turn-Off Delay Time		t _{d(off)}	—	150	
Fall Time		t _f	—	150	
Total Gate Charge	V _{DS} = 0.8 Rated V _{DSS} , I _D = Rated I _D , V _{GS} = 10 V See Figure 11	Q _g	33 (Typ)	50	nC
Gate-Source Charge		Q _{gs}	16 (Typ)	—	
Gate-Drain Charge		Q _{gd}	17 (Typ)	—	

SOURCE DRAIN DIODE CHARACTERISTICS*

Forward On-Voltage	I _S = Rated I _D V _{GS} = 0)	V _{SD}	4 (Typ)	5.5	V _{dc}
Forward Turn-On Time		t _{on}	Limited by stray inductance		
Reverse Recovery Time		t _{rr}	300 (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-220)

Internal Drain Inductance (Measured from the contact screw on tab to center of die) (Measured from the drain lead 0.25" from package to center of die)	L _d	3.5 (Typ) 4.5 (Typ)	—	nH
Internal Source Inductance (Measured from the source lead 0.25" from package to source bond pad.)	L _s	7.5 (Typ)	—	

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

