MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

2N6784

Advance Information

Power Field Effect Transistor

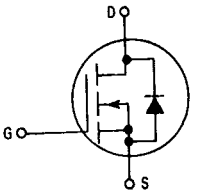
N-Channel Enhancement-Mode Silicon Gate TMOS

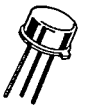
. . . designed for high voltage, high speed power switching applications such as switching regulators, converters, solenoids, relay drivers, inverters, choppers, audio amplifiers, and high energy pulse circuits.

- Silicon Gate for Fast Switching Speeds
- Low Drive Current Required
- Easy Paralleling
- No Second Breakdown
- Excellent Temperature Stability

TMOS™

N-CHANNEL
TMOS POWER FET
$r_{DS(on)}$ = 1.5 OHMS
200 VOLTS





CASE 79-05

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
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
Drain Current Continuous Pulsed	I_D I_{DM}	2.25 9	Adc
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	15 0.12	Watts W/°C
Operating and Storage Temperature Range	T_J, T_{stg}	−55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance — Junction to Case — Junction to Ambient	$R_{\theta JC}$ $R_{\theta JA}$	8.33 175	°C/W
Maximum Lead Temperature 1.6 mm from Case for 10 seconds	T_L	300	°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)	$V_{(BR)DSS}$	200	—	Vdc
Zero Gate Voltage Drain Current (V_{DS} = Rated V_{DSS}, V_{GS} = 0) (V_{DS} = 0.8 Rated V_{DSS}, V_{GS} = 0, T_J = 125°C)	I_{DSS}	— —	250 1000	μAdc

(continued)

This document contains information on a new product. Specifications and information herein are subject to change without notice.

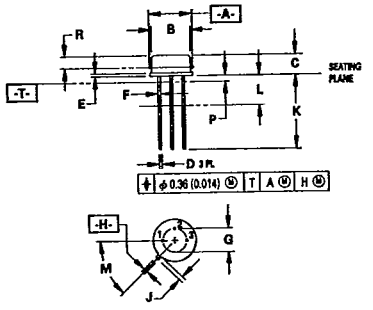
ELECTRICAL CHARACTERISTICS — continued (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Gate-Body Leakage Current, Forward (V_{GS} = 20 Vdc, V_{DS} = 0)		I_{GSSF}	—	100	nAdc
Gate-Body Leakage Current, Reverse (V_{GS} = −20 Vdc, V_{DS} = 0)		I_{GSSR}	—	−100	nAdc
ON CHARACTERISTICS*					
Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 0.5 mA)		$V_{GS(th)}$	2	4	Vdc
Static Drain-Source On-Resistance (V_{GS} = 10 Vdc, I_D = 1.5 Adc)	T_A = 25°C T_A = 125°C	$r_{DS(on)}$	— —	1.5 2.81	Ohms
Drain-Source On-Voltage (V_{GS} = 10 V) (I_D = 2.25 Adc)		$V_{DS(on)}$	—	3.37	Vdc
Forward Transconductance (V_{DS} = 5 V, I_D = 1.5 Adc)		g_{FS}	0.9	2.7	mhos
DYNAMIC CHARACTERISTICS					
Input Capacitance	(V_{DS} = 25 V, V_{GS} = 0, f = 1 MHz)	C_{iss}	60	200	pF
Output Capacitance		C_{oss}	20	80	
Reverse Transfer Capacitance		C_{rss}	5	25	
SWITCHING CHARACTERISTICS*					
Turn-On Delay Time	(V_{DD} ≈ 75 V, I_D = 1.5 A, R_{gen} = 50 ohms)	$t_{d(on)}$	—	15	ns
Rise Time		t_r	—	20	
Turn-Off Delay Time		$t_{d(off)}$	—	30	
Fall Time		t_f	—	20	
SOURCE DRAIN DIODE CHARACTERISTICS*					
Diode Forward Voltage	(I_S = Rated $I_{D(on)}$ V_{GS} = 0)	V_{SD}	0.7	1.5	Vdc
Forward Turn-On Time		t_{on}	—	Negligible	ns
Reverse Recovery Time		t_{rr}	290 (Typ)	—	ns

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

OUTLINE DIMENSIONS

CASE 79-05



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION J MEASURED FROM DIMENSION A MAXIMUM.
4. DIMENSION B SHALL NOT VARY MORE THAN 0.25 (0.010) IN ZONE R. THIS ZONE CONTROLLED FOR AUTOMATIC HANDLING.
5. DIMENSION F APPLIES BETWEEN DIMENSION P AND L. DIMENSION D APPLIES BETWEEN DIMENSION L AND K MINIMUM. LEAD DIAMETER IS UNCONTROLLED IN DIMENSION P AND BEYOND DIMENSION K MINIMUM.

STYLE 6:
PIN 1. SOURCE
2. GATE
3. DRAIN
(CASE)

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	9.02	9.29	0.355	0.366
B	8.01	8.50	0.315	0.335
C	4.20	4.57	0.165	0.180
D	0.44	0.53	0.017	0.021
E	0.44	0.88	0.017	0.035
F	0.41	0.48	0.016	0.019
G	5.08 BSC		0.200 BSC	
H	0.72	0.86	0.028	0.034
J	0.74	1.01	0.029	0.040
K	12.70	19.05	0.500	0.750
L	6.35	—	0.250	—
M	45° BSC		45° BSC	
P	—	1.27	—	0.050
R	2.54	—	0.100	—