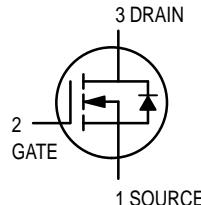


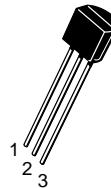
TMOS FET Transistor

N-Channel — Enhancement



2N7000

Motorola Preferred Device



CASE 29-11, STYLE 22
TO-92 (TO-226AA)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain Source Voltage	V_{DSS}	60	Vdc
Drain-Gate Voltage ($R_{GS} = 1.0 \text{ M}\Omega$)	V_{DGR}	60	Vdc
Gate-Source Voltage — Continuous — Non-repetitive ($t_p \leq 50 \mu\text{s}$)	V_{GS} V_{GSM}	± 20 ± 40	Vdc Vpk
Drain Current Continuous Pulsed	I_D I_{DM}	200 500	mAdc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	350 2.8	mW mW/ $^\circ\text{C}$
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	357	$^\circ\text{C}/\text{W}$
Maximum Lead Temperature for Soldering Purposes, 1/16" from case for 10 seconds	T_L	300	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Drain-Source Breakdown Voltage ($V_{GS} = 0$, $I_D = 10 \mu\text{Adc}$)	$V_{(BR)DSS}$	60	—	Vdc
Zero Gate Voltage Drain Current ($V_{DS} = 48 \text{ Vdc}$, $V_{GS} = 0$) ($V_{DS} = 48 \text{ Vdc}$, $V_{GS} = 0$, $T_J = 125^\circ\text{C}$)	I_{DSS}	— —	1.0 1.0	μAdc mAdc
Gate-Body Leakage Current, Forward ($V_{GSF} = 15 \text{ Vdc}$, $V_{DS} = 0$)	I_{GSSF}	—	-10	nAdc

ON CHARACTERISTICS(1)

Gate Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = 1.0 \text{ mAdc}$)	$V_{GS(\text{th})}$	0.8	3.0	Vdc
Static Drain-Source On-Resistance ($V_{GS} = 10 \text{ Vdc}$, $I_D = 0.5 \text{ Adc}$) ($V_{GS} = 4.5 \text{ Vdc}$, $I_D = 75 \text{ mAdc}$)	$r_{DS(\text{on})}$	— —	5.0 6.0	Ohm
Drain-Source On-Voltage ($V_{GS} = 10 \text{ Vdc}$, $I_D = 0.5 \text{ Adc}$) ($V_{GS} = 4.5 \text{ Vdc}$, $I_D = 75 \text{ mAdc}$)	$V_{DS(\text{on})}$	— —	2.5 0.45	Vdc

1. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

Preferred devices are Motorola recommended choices for future use and best overall value.

REV 4

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

Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS(1) (continued)				
On-State Drain Current ($V_{GS} = 4.5 \text{ Vdc}$, $V_{DS} = 10 \text{ Vdc}$)	$I_{d(on)}$	75	—	mA dc
Forward Transconductance ($V_{DS} = 10 \text{ Vdc}$, $I_D = 200 \text{ mA dc}$)	g_{fs}	100	—	μmhos

DYNAMIC CHARACTERISTICS

Input Capacitance	$(V_{DS} = 25 \text{ V}, V_{GS} = 0, f = 1.0 \text{ MHz})$	C_{iss}	—	60	pF
Output Capacitance		C_{oss}	—	25	
Reverse Transfer Capacitance		C_{rss}	—	5.0	

SWITCHING CHARACTERISTICS(1)

Turn-On Delay Time	$(V_{DD} = 15 \text{ V}, I_D = 500 \text{ mA}, R_G = 25 \Omega, R_L = 30 \Omega, V_{gen} = 10 \text{ V})$	t_{on}	—	10	ns
Turn-Off Delay Time		t_{off}	—	10	

1. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

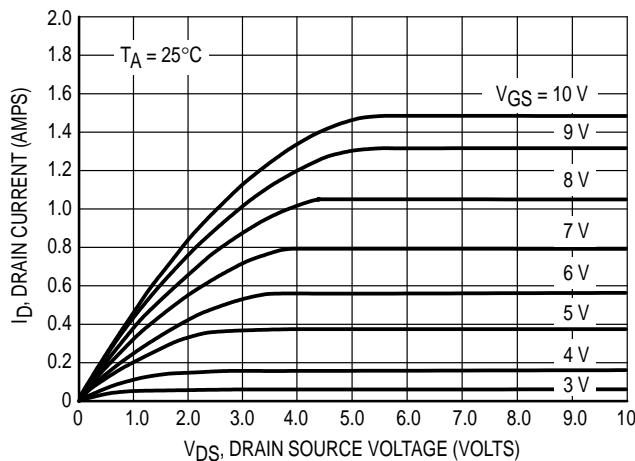


Figure 1. Ohmic Region

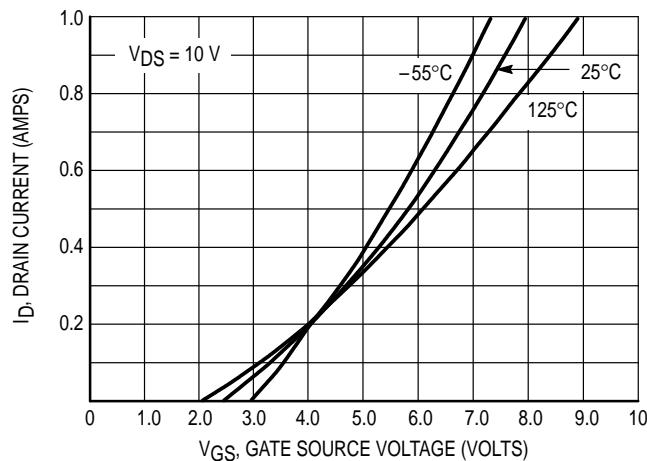


Figure 2. Transfer Characteristics

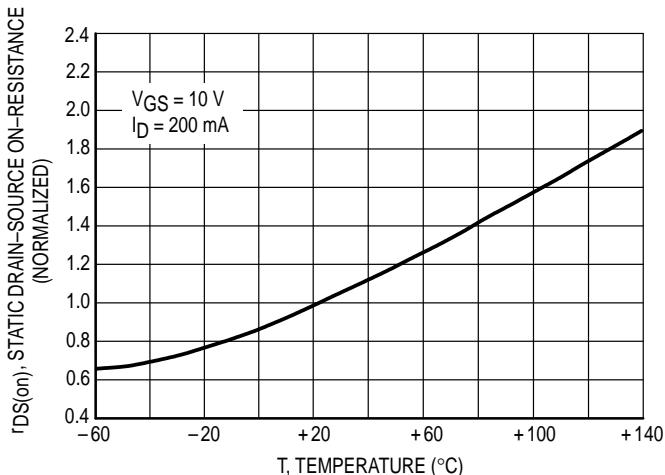


Figure 3. Temperature versus Static Drain-Source On-Resistance

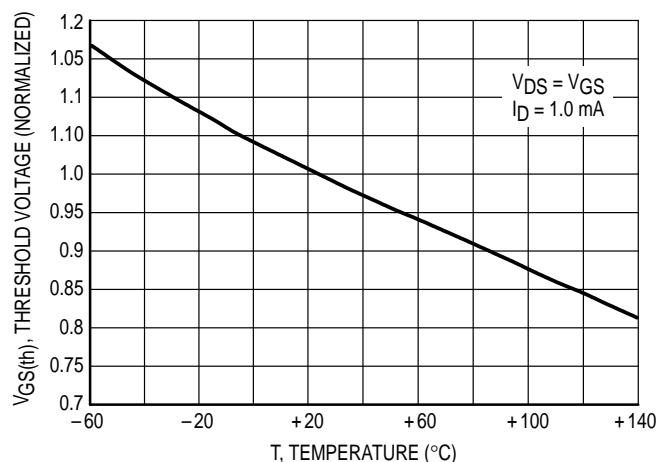
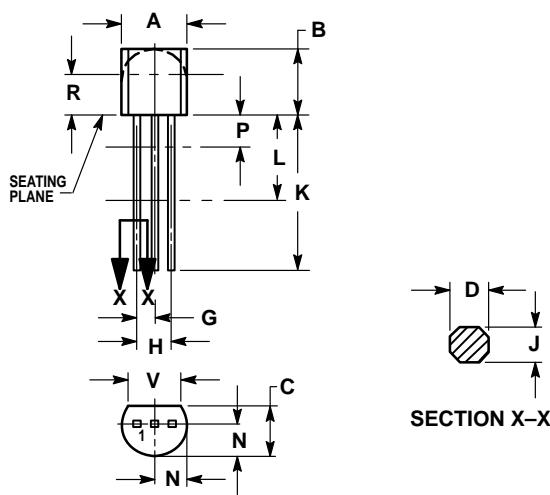


Figure 4. Temperature versus Gate Threshold Voltage

PACKAGE DIMENSIONS



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	—	12.70	—
L	0.250	—	6.35	—
N	0.080	0.105	2.04	2.66
P	—	0.100	—	2.54
R	0.115	—	2.93	—
V	0.135	—	3.43	—

CASE 029-11
(TO-226AA)
ISSUE AJ

STYLE 22:
PIN 1. SOURCE
2. GATE
3. DRAIN

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