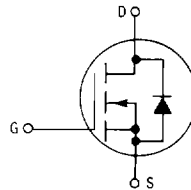


Advance Information
Small-Signal
Field Effect Transistor
N-Channel Enhancement-Mode
Silicon Gate TMOS

This TMOS FET is designed for high-speed switching applications such as line drivers, relay drivers, CMOS logic, or microprocessor interface applications.

- General Purpose Switch
- Hybrid Assemblies
- Surface Mount Package
- Available in 8 mm Tape and Reel



2N7002

N-CHANNEL
SMALL-SIGNAL
TMOS FET
 $r_{DS(on)} = 7.5 \text{ OHM}$
60 VOLTS



CASE 318-02
SOT-23
(TO-236AA)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	60	Vdc
Drain-Gate Voltage ($R_{GS} = 1 \text{ M}\Omega$)	V_{DGR}	60	Vdc
Drain Current — Continuous — Pulsed (2)	I_D I_{DM}	± 115 ± 75 ± 800	mA
Gate-Source Voltage	V_{GS}	± 40	Vdc
Total Power Dissipation Derate above 25°C ambient	P_D	200 80 0.16	mW mW/°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	625	°C/W
Operating and Storage Temperature Range	T_J	-55 to +150	°C
Lead Temperature	T_L	300	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage ($V_{GS} = 0, I_D = 10 \mu\text{A}$)	$V_{(BR)DSS}$	60	—	—	Vdc
Zero Gate Voltage Drain Current ($V_{GS} = 0, V_{DS} = 60 \text{ V}$) $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$	I_{DSS}	—	—	1 500	μA_{dc}
Gate-Body Leakage Current Forward ($V_{GS} = 20 \text{ Vdc}$)	I_{GSSF}	—	—	100	nAcc
Gate-Body Leakage Current Reverse ($V_{GS} = -20 \text{ Vdc}$)	I_{GSSR}	—	—	-100	nAcc

(1) The Power Dissipation of the package may result in a lower continuous drain current.
 (2) Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2\%$.

(cont nued)

2N7002

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

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS*					
Gate Threshold Voltage (V _{DS} = V _{GS} , I _D = 250 μA)	V _{GS(th)}	1	—	2.5	V _{dc}
On-State Drain Current (V _{DS} ≥ 2 V _{DS(on)} , V _{GS} = 10 V)	I _{D(on)}	500	—	—	mA
Static Drain-Source On-State Voltage (V _{GS} = 10 V, I _D = 500 mA) (V _{GS} = 5 V, I _D = 50 mA)	V _{DS(on)}	—	—	3.75 1.5	V _{dc}
Static Drain-Source On-State Resistance (V _{GS} = 10 V, I _D = 500 mA) T _C = 25°C (V _{GS} = 10 V, I _D = 500 mA) T _C = 100°C (V _{GS} = 5 V, I _D = 50 mA) T _C = 25°C (V _{GS} = 5 V, I _D = 50 mA) T _C = 100°C	r _{DS(on)}	—	—	7.5 13.5 7.5 13.5	Ohms
Forward Transconductance (V _{DS} ≥ 2 V _{DS(on)} , I _D = 200 mA)	g _{FS}	80	—	—	mmhos

DYNAMIC CHARACTERISTICS

Input Capacitance (V _{DS} = 25 V, V _{GS} = 0, f = 1 MHz)	C _{iss}	—	—	50	pF
Output Capacitance (V _{DS} = 25 V, V _{GS} = 0, f = 1 MHz)	C _{oss}	—	—	25	pF
Reverse Transfer Capacitance (V _{DS} = 25 V, V _{GS} = 0, f = 1 MHz)	C _{rss}	—	—	5	pF

SWITCHING CHARACTERISTICS*

Turn-On Delay Time (V _{DD} = 30 V, I _D ≅ 200 mA, R _G = 25 Ω, R _L = 150 Ω)	t _{d(on)}	—	—	20	ns
Turn-Off Delay Time	t _{d(off)}	—	—	20	ns

BODY-DRAIN DIODE RATINGS

Diode Forward On-Voltage (I _S = 11.5 mA, V _{GS} = 0 V)	V _{SD}	—	—	-1.5	V
Source Current Continuous (Body Diode)	I _S	—	—	-115	mA
Source Current Pulsed	I _{SM}	—	—	-800	mA

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

OUTLINE DIMENSIONS

