2N7007

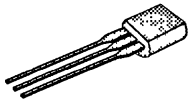
Siliconix incorporated

N-Channel Enhancement-Mode MOS Transistor

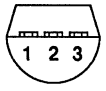
PRODUCT SUMMARY

$V_{(BR)DSS}$ (V)	$r_{DS(ON)}$ (Ω)	I_D (A)	PACKAGE
240	45	0.065	TO-92

TO-92



BOTTOM VIEW



1 SOURCE
2 GATE
3 DRAIN

Performance Curves: **VNDN24** (See Section 7)

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	2N7007	UNITS
Drain-Source Voltage		V_{DS}	240	V
Gate-Source Voltage		V_{GS}	±40	
Continuous Drain Current	T_C = 25°C	I_D	0.065	A
	T_C = 100°C		0.041	
Pulsed Drain Current[1]		I_{DM}	0.260	
Power Dissipation	T_C = 25°C	P_D	0.4	W
	T_C = 100°C		0.16	
Operating Junction Temperature		T_j	-55 to 150	°C
Storage Temperature		T_{stg}	-55 to 150	
Lead Temperature (1/16" from case for 10 seconds)		T_L	300	

THERMAL RESISTANCE

THERMAL RESISTANCE	SYMBOL	2N7007	UNITS
Junction-to-Ambient	R_{thJA}	312.5	°C/W

[1]Pulse width limited by maximum junction temperature

ELECTRICAL CHARACTERISTICS[1]			LIMITS			
				2N7007		
PARAMETER	SYMBOL	TEST CONDITIONS	TYP[2]	MIN	MAX	UNIT
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 100 µA	270	240		V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 0.25 mA	1.85	1	2.5	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V	±1		±10	nA
		V_{DS} = 0 V, V_{GS} = ±20 V, T_C = 125°C	±5			nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0 V, V_{DS} = 120 V	0.001		0.1	µA
		V_{GS} = 0 V, V_{DS} = 120 V, T_C = 125°C	0.6		1	µA
On-State Drain Current[3]	$I_{D(ON)}$	V_{DS} = 20 V, V_{GS} = 4.5 V	100	50		mA
		V_{DS} = 20 V, V_{GS} = 10 V	170	150		mA
Drain-Source On-Resistance[3]	$r_{DS(ON)}$	V_{GS} = 4.5 V, I_D = 20 mA	40		45	Ω
		V_{GS} = 4.5 V, I_D = 20 mA, T_C = 125°C	80		85	Ω
		V_{GS} = 10 V, I_D = 50 mA	35		45	Ω
		V_{GS} = 10 V, I_D = 50 mA, T_C = 125°C	75		85	Ω
Drain-Source On-Voltage[3]	$V_{DS(ON)}$	V_{GS} = 4.5 V, I_D = 20 mA	0.8		0.9	V
		V_{GS} = 10 V, I_D = 50 mA	1.75		2.25	V
		V_{GS} = 10 V, I_D = 50 mA, [4]T_C = 125°C	3.75		4.25	V
Forward Transconductance[3]	g_{fs}	V_{DS} = 10 V, I_D = 50 mA, f = 1 kHz	50	30		mS
Common Source Output Conductance[3,4]	g_{OS}	V_{DS} = 10 V, I_D = 50 mA	10			µS
DYNAMIC						
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = 0 V, f = 1 MHz	15		30	pF
Output Capacitance	C_{oss}		4		15	pF
Reverse Transfer Capacitance	C_{rss}		1		10	pF
SWITCHING						
Turn-On Time	t_{ON}	V_{DD} = 60 V, R_L = 1.2 kΩ, I_D = 50 mA, V_{GEN} = 10 V, R_G = 25 Ω (Switching time is essentially independent of operating temperature)	7		30	ns
Turn-Off Time	t_{OFF}		18		20	ns

NOTES: 1. T_C = 25 °C unless otherwise noted.
2. For design aid only, not subject to production testing.
3. Pulse test; PW = 80 µs, duty cycle ≤ 1%.
4. This parameter not registered with JEDEC.