

2N7001

N-Channel Enhancement-Mode MOS Transistor

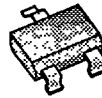
Siliconix
incorporated

T-35-25

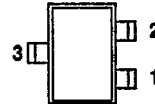
PRODUCT SUMMARY

$V_{(BR)DSS}$ (V)	$r_{DS(ON)}$ (Ω)	I_D (A)	PACKAGE
240	45	0.045	SOT-23

SOT-23



TOP VIEW



1 GATE
2 SOURCE
3 DRAIN

Performance Curves: VNDN24 (See Section 7)

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	2N7001	UNITS
Drain-Source Voltage		V_{DS}	240	V
Gate-Source Voltage		V_{GS}	± 40	
Continuous Drain Current	$T_C = 25^\circ\text{C}$	I_D	0.045	A
	$T_C = 100^\circ\text{C}$		0.029	
Pulsed Drain Current ¹		I_{DM}	0.21	
Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	200	mW
	$T_C = 100^\circ\text{C}$		80	
Operating Junction Temperature		T_J	-55 to 150	$^\circ\text{C}$
Storage Temperature		T_{stg}	-55 to 150	
Lead Temperature (1/16" from case for 10 seconds)		T_L	300	

THERMAL RESISTANCE

THERMAL RESISTANCE	SYMBOL	2N7001	UNITS
Junction-to-Ambient	R_{thJA}	625	$^\circ\text{C}/\text{W}$

¹Pulse width limited by maximum junction temperature



T-35-25

2N7001

ELECTRICAL CHARACTERISTICS ¹				LIMITS		
PARAMETER	SYMBOL	TEST CONDITIONS	TYP ²	2N7001		UNIT
				MIN	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 100\ \mu\text{A}$	270	240		V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 0.25\ \text{mA}$	1.85	1	2.5	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}$ $V_{GS} = \pm 20\ \text{V}$ ⁴ $T_C = 125^\circ\text{C}$	± 1 ± 5		± 10	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0\ \text{V}$ $V_{DS} = 120\ \text{V}$ $V_{DS} = 120\ \text{V}, T_C = 125^\circ\text{C}$	0.001 0.5		0.1 1	μA
On-State Drain Current ³	$I_{D(ON)}$	$V_{DS} = 10\ \text{V}, V_{GS} = 10\ \text{V}$	750	100		mA
Drain-Source On-Resistance ³	$r_{DS(ON)}$	$V_{GS} = 10\ \text{V}, I_D = 50\ \text{mA}$	35		85	Ω
		⁴ $V_{GS} = 4.5\ \text{V}$ $I_D = 20\ \text{mA}$ $T_C = 125^\circ\text{C}$	40 80		45 85	
Drain-Source On-Voltage ³	$V_{DS(ON)}$	$V_{GS} = 10\ \text{V}, I_D = 50\ \text{mA}$	1.75		2.25	V
		⁴ $V_{GS} = 4.5\ \text{V}$ $I_D = 20\ \text{mA}$ $T_C = 125^\circ\text{C}$	0.8 1.6		0.9 1.7	
Forward Transconductance ³	g_{FS}	$V_{DS} = 10\ \text{V}, I_D = 50\ \text{mA}$	80	30		mS
Common Source Output Conductance ^{3,4}	g_{OS}		10			μS
DYNAMIC						
Input Capacitance	C_{iss}	$V_{DS} = 25\ \text{V}$ $V_{GS} = 0\ \text{V}$ $f = 1\ \text{MHz}$	15		30	pF
Output Capacitance	C_{oss}		4		15	
Reverse Transfer Capacitance	C_{rss}		1		10	
SWITCHING						
Turn-On Time	t_{ON}	$V_{DD} = 60\ \text{V}, R_L = 1.2\ \text{k}\Omega$ $I_D = 50\ \text{mA}, V_{GEN} = 10\ \text{V}$ $R_G = 25\ \Omega$	7		30	ns
Turn-Off Time	t_{OFF}	(Switching time is essentially independent of operating temperature)	18		20	

- NOTES: 1. $T_C = 25^\circ\text{C}$ unless otherwise noted.
 2. For design aid only, not subject to production testing.
 3. Pulse test; $PW = 80\ \mu\text{s}$, duty cycle $\leq 1\%$.
 4. This parameter not registered with JEDEC.

6