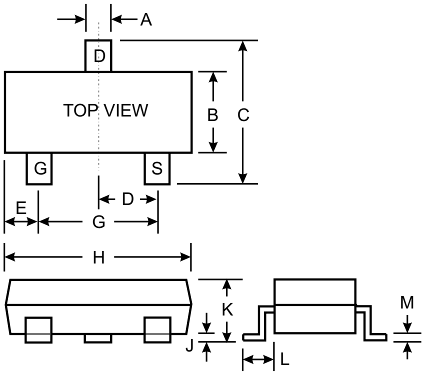
DIODES
INCORPORATED

2N7002-01

N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

Features

- Low On-Resistance: $R_{DS(ON)}$
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage



SOT-23		
Dim	**Min**	**Max**
A	0.37	0.51
B	1.19	1.40
C	2.10	2.50
D	0.89	1.05
E	0.45	0.61
G	1.78	2.05
H	2.65	3.05
J	0.013	0.15
K	0.89	1.10
L	0.45	0.61
M	0.076	0.178
All Dimensions in mm		

Mechanical Data

- Case: SOT-23, Molded Plastic
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking: K7A
- Weight: 0.008 grams (approx.)

Maximum Ratings

@ T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Units
Drain-Source Voltage	V_{DSS}	60	V
Drain-Gate Voltage $R_{GS} \leq 1.0M\Omega$	V_{DGR}	60	V
Gate-Source Voltage Continuous Pulsed	V_{GSS}	±20 ±40	V
Drain Current (Note 1) Continuous Continuous @ 100°C Pulsed	I_D	115 73 800	mA
Total Power Dissipation (Note 1) Derating above T_A = 25°C	P_d	200 1.60	mW mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	625	K/W
Operating and Storage Temperature Range	T_j, T_{STG}	-55 to +150	°C

Note: 1. Valid provided that terminals are kept at specified ambient temperature.
2. Pulse width ≤ 300µs, duty cycle ≤ 2%.

Electrical Characteristics

@ $T_A = 25°C$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 2)						
Drain-Source Breakdown Voltage	BV_{DSS}	60	70	—	V	$V_{GS} = 0V$, $I_D = 10\mu A$
Zero Gate Voltage Drain Current @ $T_C = 25°C$ @ $T_C = 125°C$	I_{DSS}	—	—	1.0 500	µA	$V_{DS} = 60V$, $V_{GS} = 0V$
Gate-Body Leakage	I_{GSS}	—	—	±10	nA	$V_{GS} = \pm 20V$, $V_{DS} = 0V$
ON CHARACTERISTICS (Note 2)						
Gate Threshold Voltage	$V_{GS(th)}$	1.0	—	2.0	V	$V_{DS} = V_{GS}$, $I_D = -250\mu A$
Static Drain-Source On-Resistance @ $T_j = 25°C$ @ $T_j = 125°C$	$R_{DS\ (ON)}$	—	3.2 4.4	7.5 13.5	Ω	$V_{GS} = 5.0V$, $I_D = 0.05A$ $V_{GS} = 10V$, $I_D = 0.5A$
On-State Drain Current	$I_{D(ON)}$	—	1.0	0.5	A	$V_{GS} = 10V$, $V_{DS} = 7.5V$
Forward Transconductance	g_{FS}	80	—	—	mS	$V_{DS} = 10V$, $I_D = 0.2A$
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	—	22	50	pF	$V_{DS} = 25V$, $V_{GS} = 0V$ f = 1.0MHz
Output Capacitance	C_{oss}	—	11	25	pF	
Reverse Transfer Capacitance	C_{rss}	—	2.0	5.0	pF	
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{D(ON)}$	—	7.0	20	ns	$V_{DD} = 30V$, $I_D = 0.2A$, $R_L = 150\Omega$, $V_{GEN} = 10V$, $R_{GEN} = 25\Omega$
Turn-Off Delay Time	$t_{D(OFF)}$	—	11	20	ns	

Note: 1. Valid provided that terminals are kept at specified ambient temperature.
2. Pulse width ≤ 300µs, duty cycle ≤ 2%.

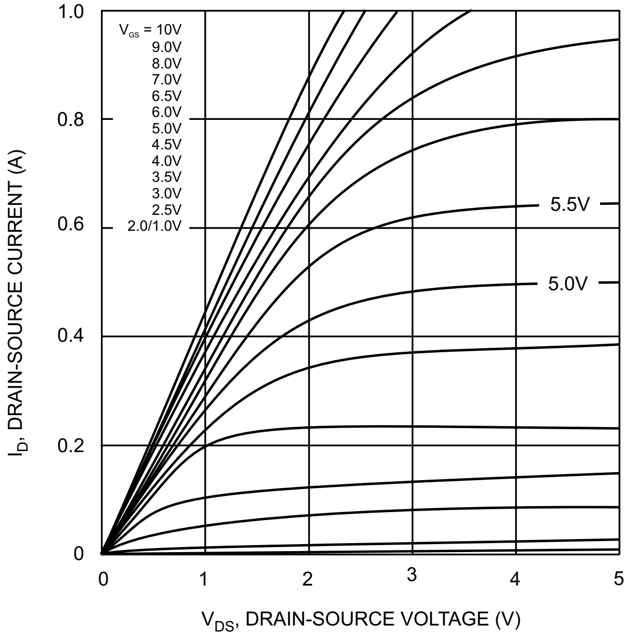


Fig. 1 On-Region Characteristics

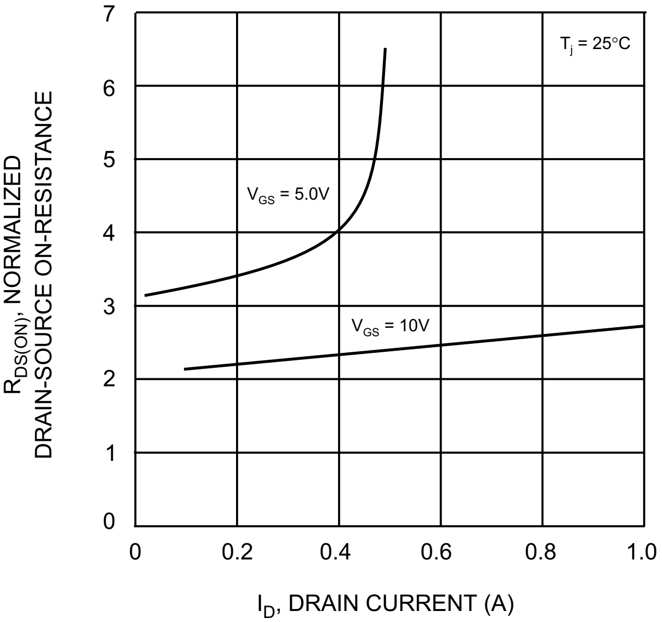


Fig. 2 On-Resistance vs Drain Current

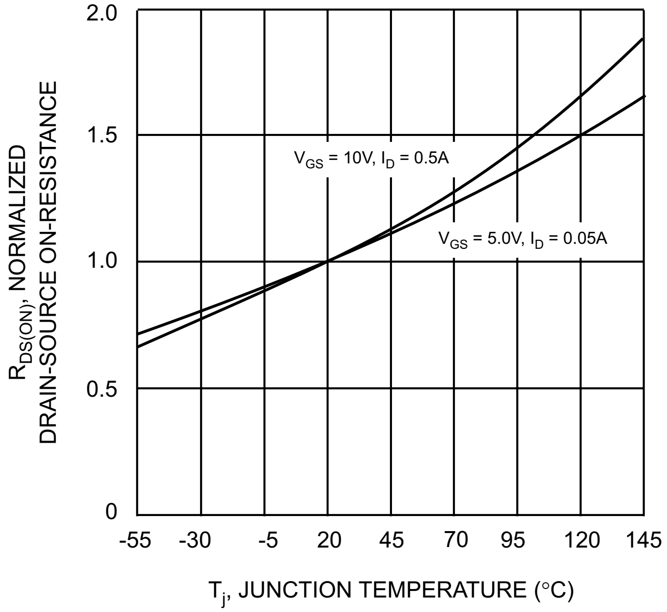


Fig. 3 On-Resistance vs Junction Temperature

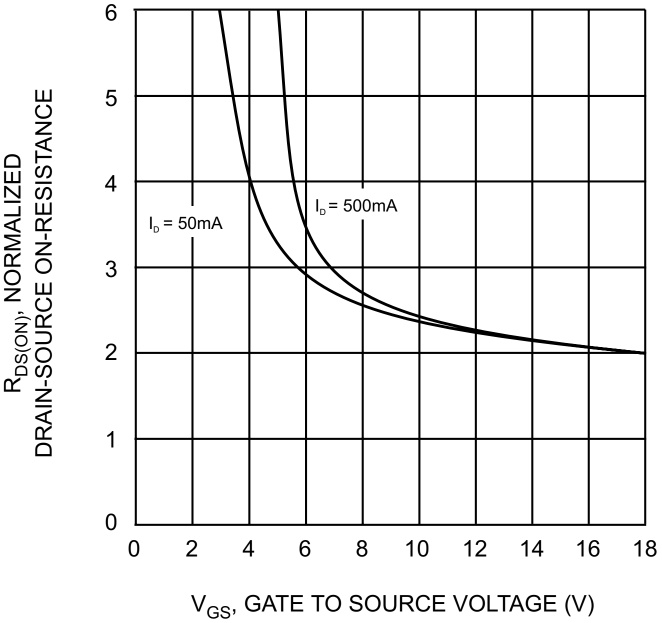


Fig. 4 On-Resistance vs. Gate-Source Voltage