

60V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

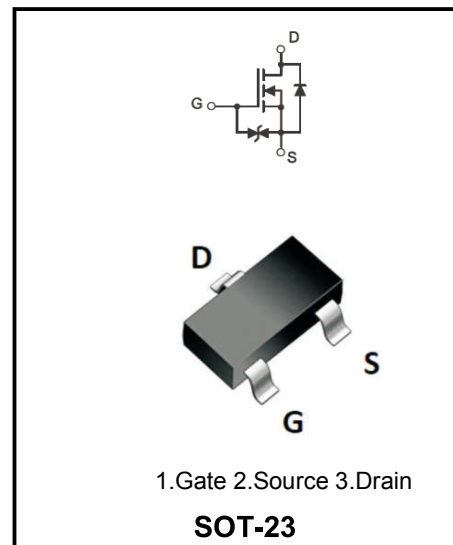
I_D	340mA
V_{DSS}	60V
R_{DS(on)}-typ(@V_{GS}=10V)	<2.7Ω(Typ:0.9Ω)
R_{DS(on)}-typ(@V_{GS}=4.5V)	<3.0Ω(Typ:1.1Ω)

FEATURES

- ♦High density cell design for low R_{DS(on)}.
- ♦Voltage controlled small signal switch.
- ♦Rugged and reliable.
- ♦High saturation current capability.
- ♦ESD protected
- ♦Load Switch for Portable Devices.
- ♦DC/DC Converter.

Mechanical Data

- ♦SOT-23 Small Outline Plastic Package.
- ♦Epoxy UL: 94V-0.
- ♦Mounting Position: Any.



Marking Code	
2N7002AK	NJ

Maximum Ratings & Thermal Characteristics

(Ratings at 25°C ambient temperature unless otherwise specified.)

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V _{DS}	60	V
Gate - Source Voltage	V _{GS}	±20	V
Continuous drain current	I _D	340	mA
Power Dissipation	P _D	350	mW
Operating Temperature Range	T _J	150	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C
Thermal Resistance, Junction--Ambient	R _{θJA}	357	°C/W

Electrical Characteristics

(Ratings at 25°C ambient temperature unless otherwise specified).

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	60	-	-	V
Gate-Source Threshold Voltage*	$V_{DS}=V_{GS}, I_D=1mA$	$V_{GS(th)}$	1	1.3	2.5	V
Gate-body Leakage	$V_{DS}=0V, V_{GS}=\pm 20V,$	I_{GSS1}	-	-	± 10	μA
	$V_{DS}=0V, V_{GS}=\pm 10V$	I_{GSS}	-	-	± 200	nA
	$V_{DS}=0V, V_{GS}=\pm 5V$	I_{GSS}	-	-	± 100	nA
Drain-Source Leakage Current	$V_{DS}=48V, V_{GS}=0V$	I_{DSS}	-	-	1	μA
Drain-source on-state resistance*	$V_{GS}=10V, I_D=500mA$	$R_{DS(on)}$	-	0.9	2.7	Ω
	$V_{GS}=4.5V, I_D=200mA$		-	1.1	3.0	
Drain-Source Diode Forward Voltage	$I_S=300mA, V_{GS}=0V$	V_{SD}	-	-	1.5	V
Input Capacitance**	$V_{DS}=10V$ $V_{GS}=0V$ $f=1MHz$	C_{iss}	-	-	40	pF
Output Capacitance**		C_{oss}	-	-	30	
Reverse Transfer Capacitance**		C_{rss}	-	-	10	
Turn-On Delay Time**	$V_{DD}=50V, R_L=250\Omega, V_{GS}=10V$ $, R_G=50\Omega, R_{GS}=50\Omega,$	$t_{d(on)}$	-	-	10	ns
Turn-Off Delay Time**		$t_{d(off)}$	-	-	15	
Reverse recovery Time**	$V_{GS}=0V, I_S=300mA, V_R=25V,$ $dI_S/dt=-100A/\mu s$	T_{rr}	-	30	-	
Gate-Source Breakdown Voltage	$I_{GS}=\pm 1mA$ (Open Drain)	BV_{GSO}	± 21.5	-	± 30	V

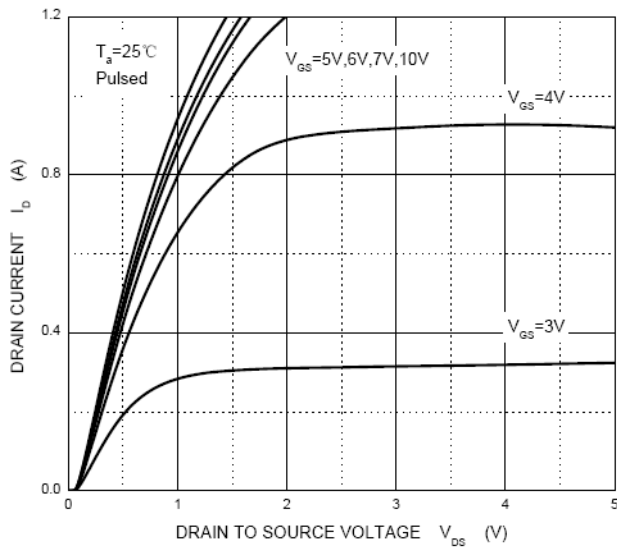
Notes :

*Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

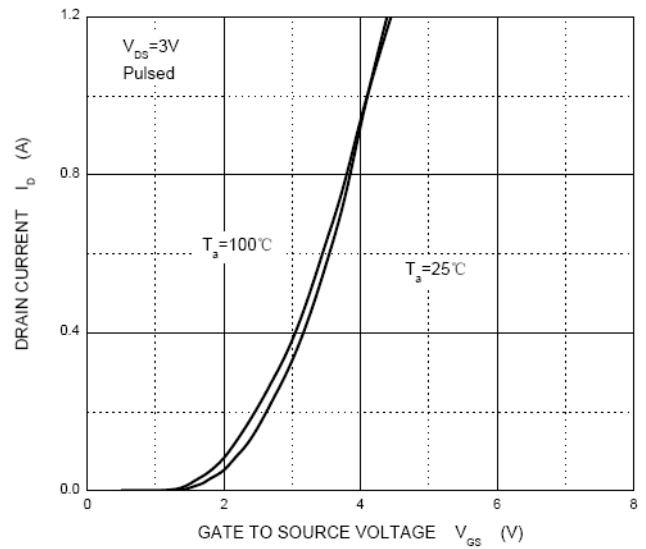
**These parameters have no way to verify

Typical characteristics

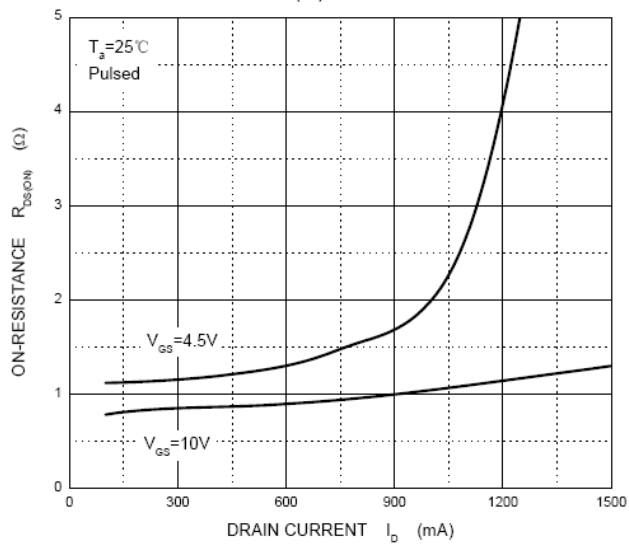
Output Characteristics



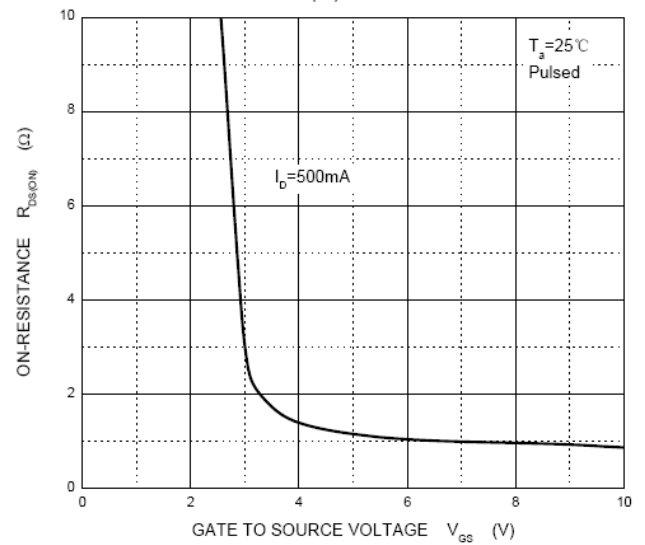
Transfer Characteristics



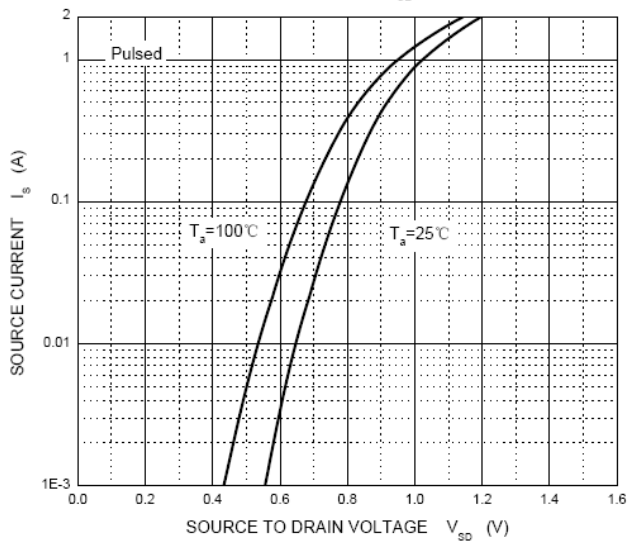
$R_{DS(ON)}$ — I_D



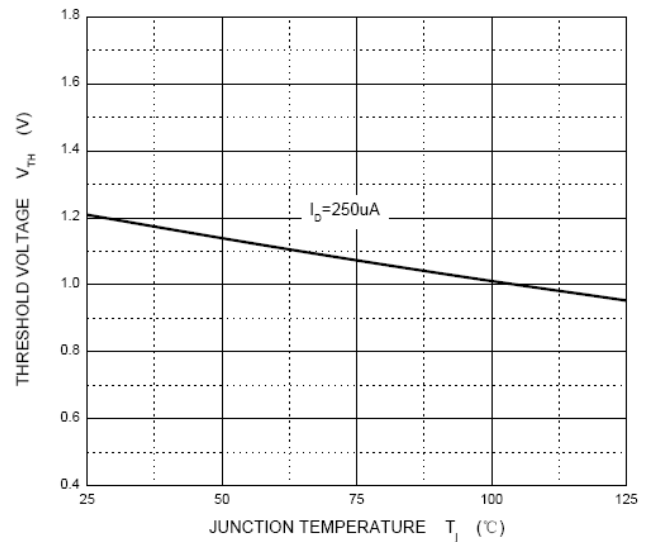
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



Threshold Voltage



Ordering information

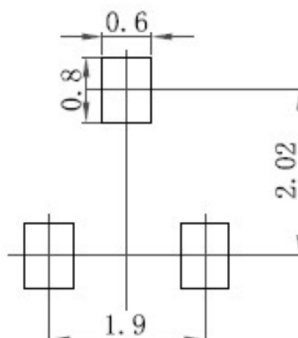
Package	Packing Description	Base Quantity	Packing Quantity
SOT-23	Tape/Reel, 7" reel	3000pcs/Reel	24000PCS/Box 120000PCS/Carton

Package Dimensions

SOT-23

Dim.	Millimeter (mm)		mil	
	Min.	Max.	Min.	Max.
A	0.9	1.15	35	45
A1	0.1		3.9	
bp	0.38	0.48	15	19
C	0.09	0.15	3.54	5.9
D	2.8	3.0	110	118
E	1.2	1.4	47	55
E	1.9		75	
E1	0.95		37	
HE	2.1	2.55	83	100
Lp	0.15	0.45	5.9	18
Q	0.45	0.55	18	22
v	0.2		7.9	
W	0.1		4	

The recommended mounting pad size



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