



PJM7002KNSA

Single N-Channel Power MOSFET

Features

- The PJM7002KNSA uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge.
- Fast switching
- Low gate charge and $R_{DS(ON)}$
- Low reverse transfer capacitances
- 100% single pulse avalanche energy test

● $V_{DSS}=60V$

$I_D=0.3A$

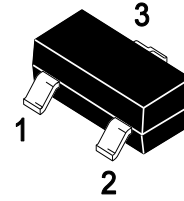
$P_D=0.35W$

$R_{DS(ON)(TYP)}=1\Omega$

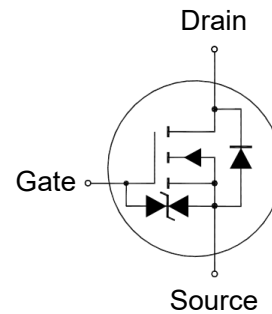
Applications

- PWM applications
- Load switch
- Power management

SOT-23



1. Gate 2.Source 3.Drain



Absolute Maximum Ratings ($T_C=25^\circ C$ unless otherwise stated)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	60	V
I_D	Continuous Drain Current	0.3	A
	Continuous Drain Current $T_C=100^\circ C$	0.19	A
I_{DM}^{a1}	Pulsed Drain Current	0.9	A
V_{GS}	Gate-to-Source Voltage	± 20	V
$V_{ESD}(G-S)$	Gate source ESD (HBM-C= 100pF, $R=1.5k\Omega$)	2000	V
dv/dt^{a2}	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	0.35	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150 , -55 to 150	$^\circ C$
T_L	Maximum Temperature for Soldering	300	$^\circ C$

a1 : Repetitive rating; pulse width limited by maximum junction temperature

a2 : $I_{SD}=0.3A, di/dt \leq 100A/\mu s, V_{DD} \leq BV_{DS}$, Start $T_J=25^\circ C$



Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
Off Characteristics						
V_{DSS}	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	60	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	Bvdss Temperature Coefficient	$I_D=-250\mu A, \text{Reference } 25^\circ\text{C}$	--	0.1	--	$V/^\circ\text{C}$
I_{DSS}	Drain to Source Leakage Current	$V_{DS}=60, V_{GS}=0V, T_a=25^\circ\text{C}$	--	--	1	μA
		$V_{DS}=48V, V_{GS}=0V, T_a=125^\circ\text{C}$	--	--	250	
$I_{GSS(F)}$	Gate to Source Forward Leakage	$V_{GS}=+20V$	--	--	1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	$V_{GS}=-20V$	--	--	-1	μA
On Characteristics						
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=10V, I_D=0.5A$	--	1	1.8	Ω
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=4.5V, I_D=0.3A$	--	1.2	2.2	Ω
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.7	2.5	V
Pulse width $t_p \leq 380\mu s, \delta \leq 2\%$						
Dynamic Characteristics						
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=0.2A$	0.1	5.0	--	S
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=15V$ $f=1.0\text{MHz}$	--	20	--	pF
C_{oss}	Output Capacitance		--	12	--	
C_{rss}	Reverse Transfer Capacitance		--	4.4	--	
Resistive Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	$I_D=0.2A, V_{DD}=15V$ $V_{GS}=10V,$ $R_G=3.0\Omega$	--	10	--	ns
t_r	Rise Time		--	45	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	15	--	
t_f	Fall Time		--	10	--	
Q_g	Total Gate Charge	$I_D=0.3A, V_{DD}=15V, V_{GS}=10V$	--	1.7	--	nC
Q_{gs}	Gate to Source Charge		--	0.9	--	
Q_{gd}	Gate to Drain (" Miller ")Charge		--	1.3	--	
Source-Drain Diode Characteristics						
I_{SD}	Continuous Source Current (Body Diode)		--	--	0.3	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	0.9	A
V_{SD}	Diode Forward Voltage	$I_S=0.3A, V_{GS}=0V$	--	--	1.5	V
t_{rr}	Reverse Recovery Time	$I_S=0.3A, T_J=25^\circ\text{C}$ $di_F/dt=100A/\mu s, V_{GS}=0V$	--	40	--	ns
Q_{rr}	Reverse Recovery Charge		--	120	--	nC
Pulse width $t_p \leq 380\mu s, \delta \leq 2\%$						

Symbol	Parameter	Typ.	Units
$R_{\theta JA}$	Junction-to-Ambient	350	$^\circ\text{C/W}$



Typical Characteristic Curves

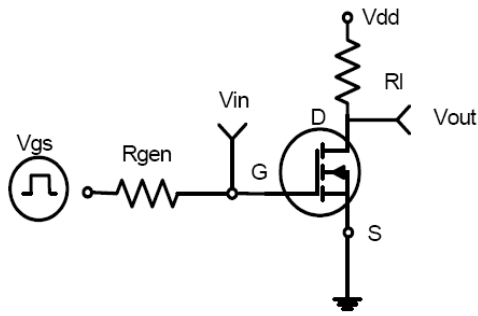


Figure 1: Switching Test Circuit

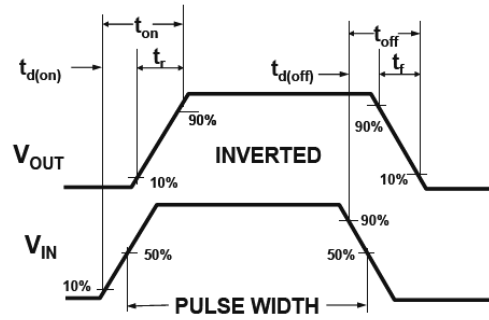


Figure 2: Switching Waveforms

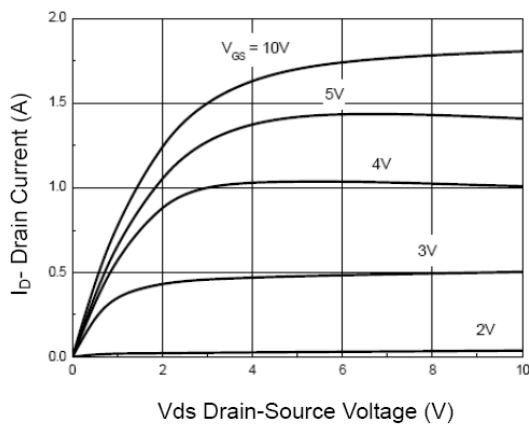


Figure 3 Output Characteristics

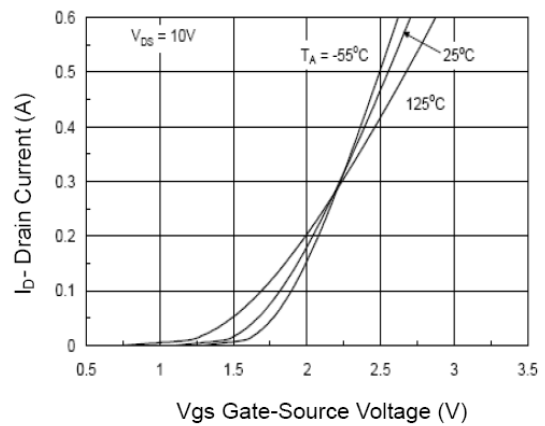


Figure 4 Transfer Characteristics

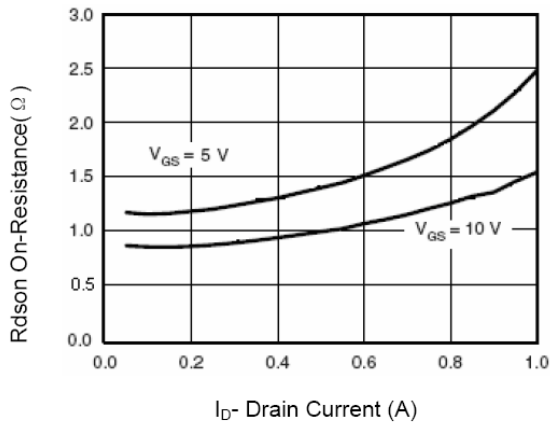


Figure 5 Drain-Source On-Resistance

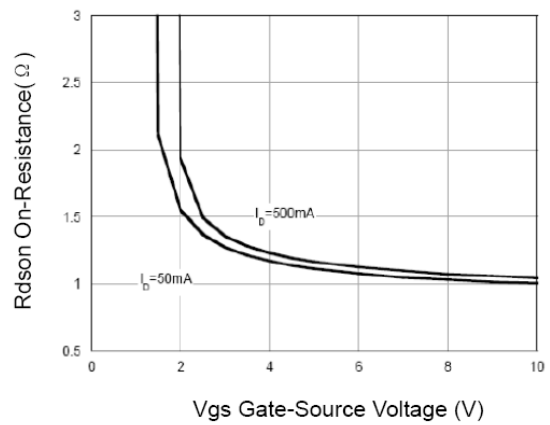


Figure 6 Rds(on) vs Vgs

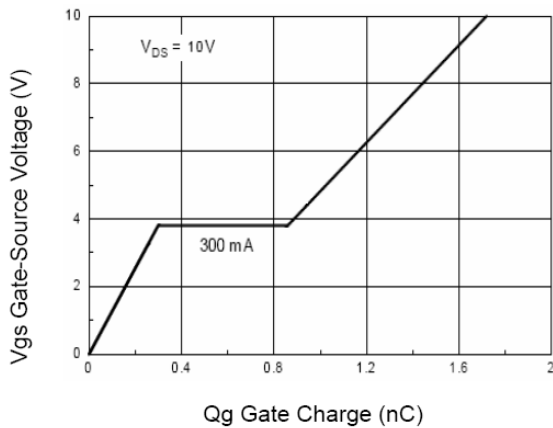


Figure 7 Gate Charge

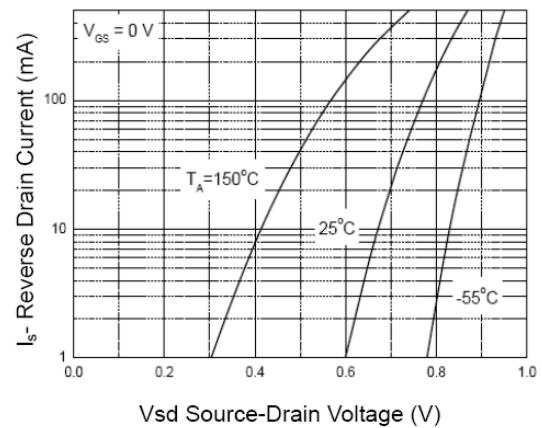


Figure 8 Source-Drain Diode Forward

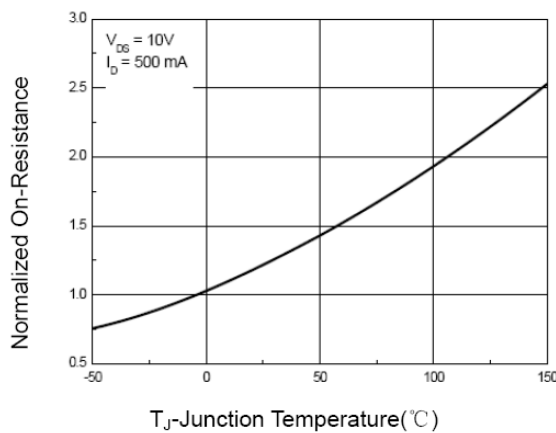


Figure 9 Drain-Source On-Resistance

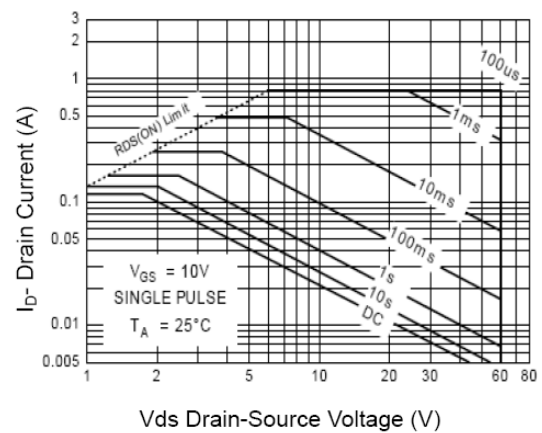


Figure 10 Safe Operation Area

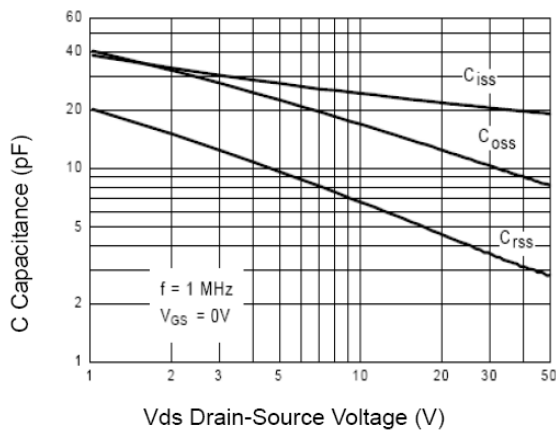


Figure 11 Capacitance vs Vds

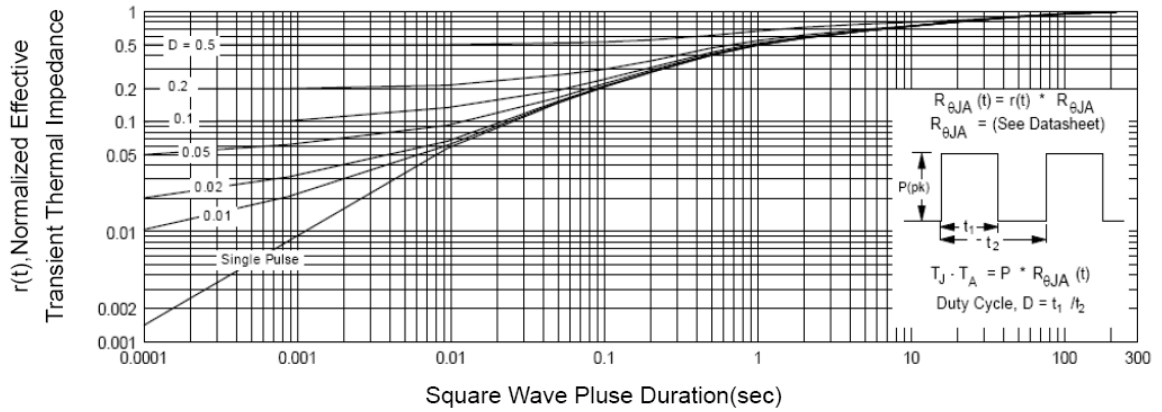
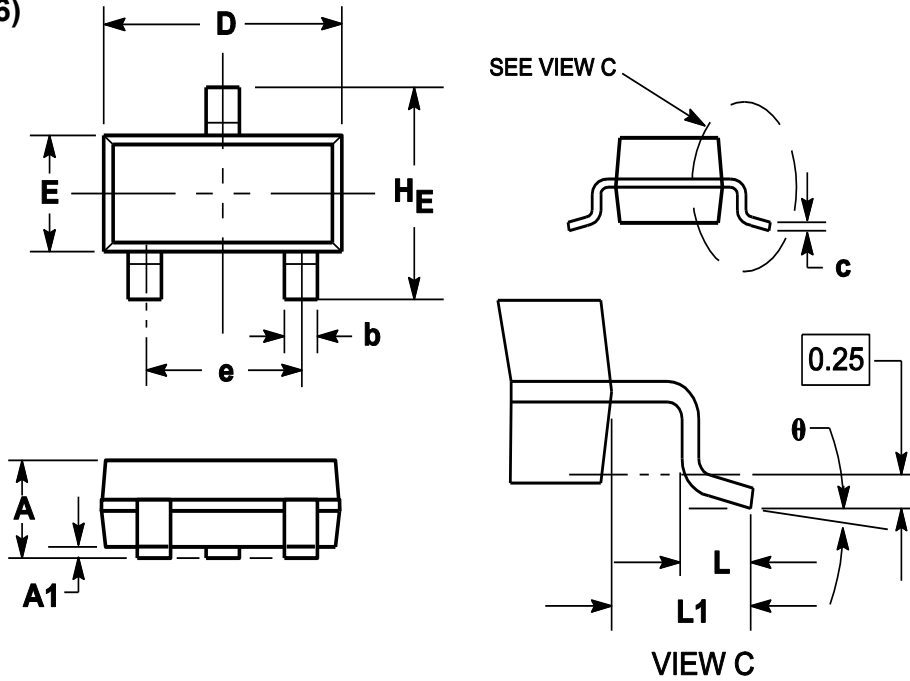


Figure 12 Normalized Maximum Transient Thermal Impedance

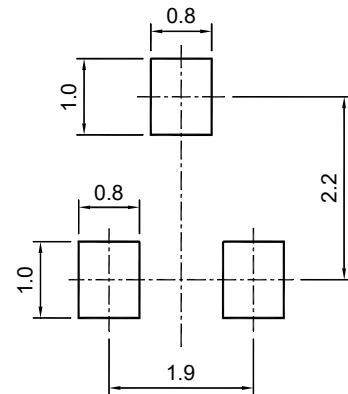


Package Outline

SOT-23 (TO-236)



Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.900	1.025	1.150
A1	0.000	0.050	0.100
b	0.300	0.400	0.500
c	0.080	0.115	0.150
D	2.800	2.900	3.000
E	1.200	1.300	1.400
HE	2.250	2.400	2.550
e	1.800	1.900	2.000
L1	0.550REF		
L	0.300		0.500
θ	0°		8°



SOT-23 (TO-236)
Recommended soldering pad

Ordering information

Device	Package	Shipping
PJM7002KNSA	SOT-23	3000/Reel&Tape(7inch)