

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

- Surface mount package
- Excellent $R_{DS(ON)}$, low gate charge
- High power and current handling capability

Applications

- PWM applications
- Load switch

Quick reference

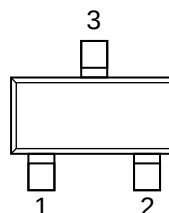
- $V_{DS} = 100V$
- $I_D = 2.0A$
- $R_{DS(ON)} \leq 200m\Omega @ V_{GS}=10V$ (Type: 180m Ω)
- $R_{DS(ON)} \leq 215m\Omega @ V_{GS}=4.5V$ (Type: 190m Ω)

Pin Description

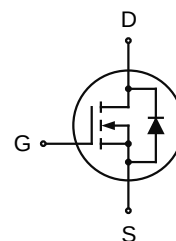
Pin	Description
1	Gate(G)
2	Source(S)
3	Drain(D)

Simplified Outline

Symbol



Top View
SOT-23



Package Marking and Ordering Information

Product Name	Package	Marking	Reel size	Tape width	Quantity
KJ2N10S	SOT-23	2N10	7"	8 mm	3000

2. Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	100	V
Gate-source voltage		V_{GS}	± 20	V
Continuous drain current ($T_J = 150^\circ C$) ^a	$T_A = 25^\circ C$	I_D	2.0	A
	$T_A = 70^\circ C$		1.6	
Pulsed drain current ^b		I_{DM}	8	
Power dissipation ^a	$T_A = 25^\circ C$	P_D	0.72	W
	$T_A = 70^\circ C$		0.46	
Operating junction and storage temperature range		T_J, T_{stg}	-55~150	$^\circ C$

3. Thermal Characteristics

Parameter		Symbol	Typ	Max	Unit
Maximum Junction to Ambient ^a	$t \leq 10s$	$R_{\theta JA}$	120	145	°C/W
	Steady-State		140	175	
Maximum Junction to Foot	Steady-State	$R_{\theta JC}$	62	78	

Notes

- a. Surface mounted on 1" x 1" FR4 board.
 b. Pulse width limited by maximum junction temperature.

4. Electrical Characteristics ($T_A=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	100	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =80V, V _{GS} =0V	-	-	1	μA
Gate-body leakage	I _{GSS}	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.2	1.7	2.5	V
Drain-source on-state resistance ^a	R _{DS(ON)}	V _{GS} =10V, I _D =2A	-	180	200	mΩ
		V _{GS} =4.5V, I _D =1.6A	-	190	215	
Forward transconductance ^a	g _{fs}	V _{DS} =5V, I _D =1A	-	33	-	S
Dynamic Characteristics ^b						
Input capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V F=1.0MHz	-	265	-	pF
Output capacitance	C _{oss}		-	31	-	
Reverse transfer capacitance	C _{rss}		-	12	-	
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =50V V _{GS} =10V R _L =30Ω R _{GEN} =6Ω	-	6	-	ns
Turn-on Rise Time	t _r		-	7.2	-	
Turn-off Delay Time	t _{d(off)}		-	12	-	
Turn-off Fall Time	t _f		-	4	-	
Total Gate Charge	Q _g	V _{DS} =50V, I _D =2A V _{GS} =10V	-	5.8	-	nC
Gate-Source Charge	Q _{gs}		-	1.3	-	
Gate-Drain Charge	Q _{gd}		-	1.1	-	
Drain-source Diode Characteristics						
Diode forward voltage	V _{SD}	V _{GS} =0V, I _S =1A	-	0.72	1.2	V

Notes

- a. Pulse test: Pulse width $\leq 300 \mu s$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.

5. Typical Characteristics

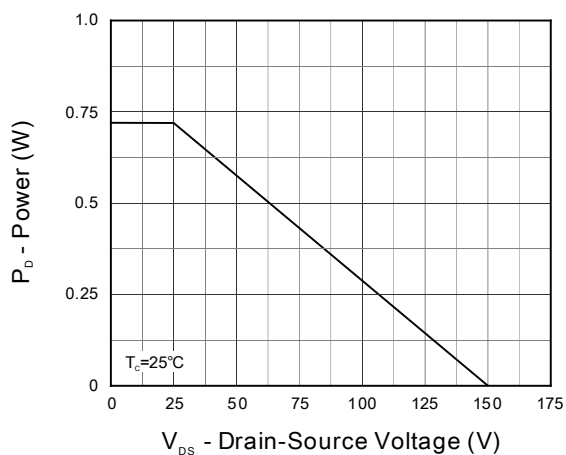


Figure 1. Output Characteristics

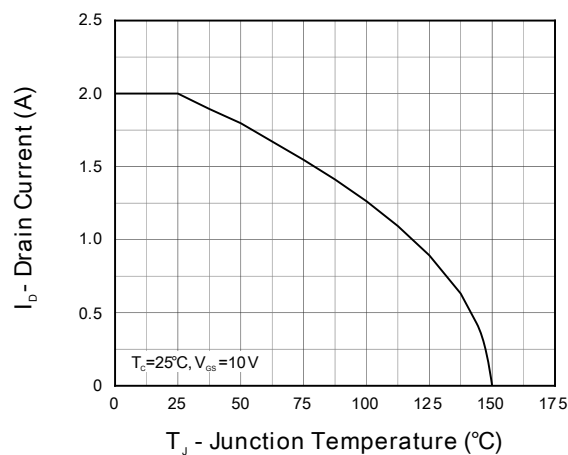


Figure 2. Current Capability

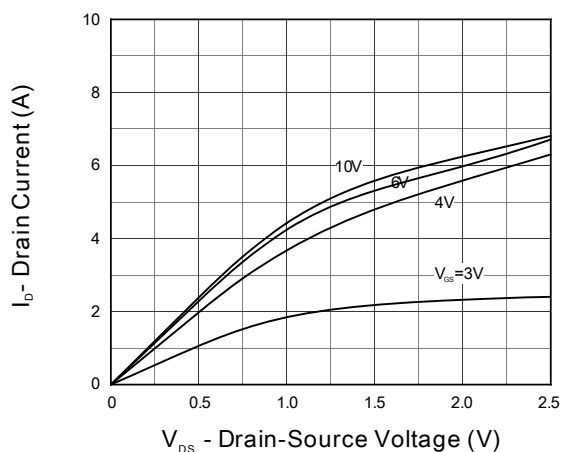


Figure 3. Output Characteristics

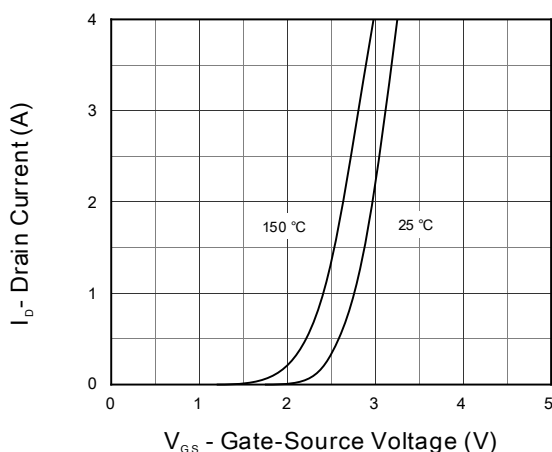


Figure 4. On Resistance

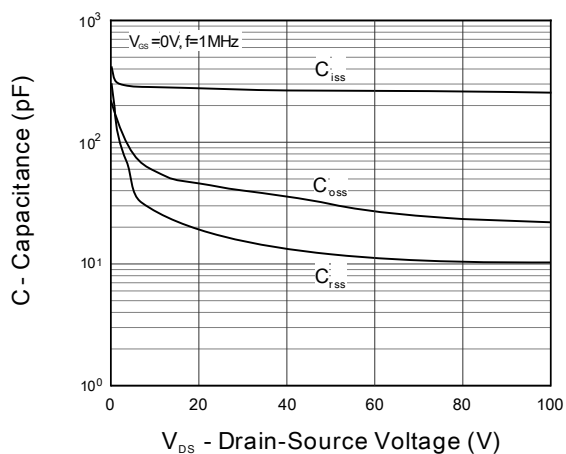


Figure 5. Capacitance

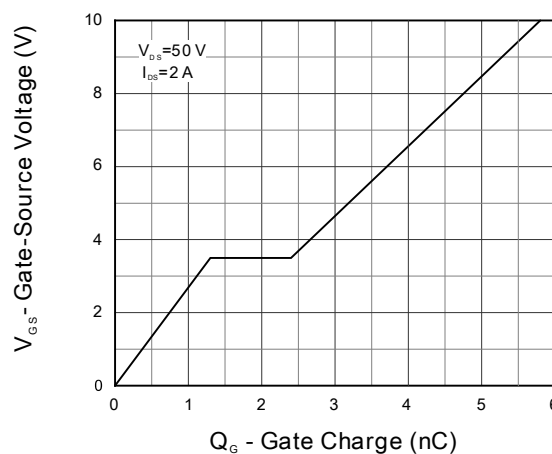
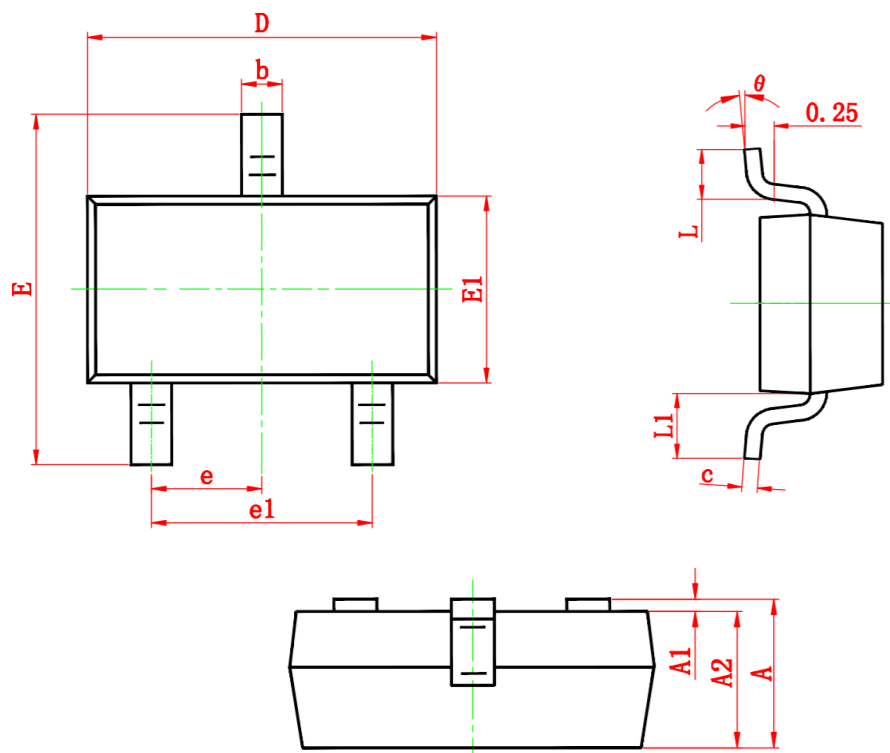


Figure 6. Gate Charge

6. Package Mechanical Data

SOT-23 Package



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	2.250	2.550	0.089	0.100
E1	1.200	1.400	0.047	0.055
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.300	0.500	0.012	0.020
L1	0.550 REF.		0.022 REF.	
θ	0°	8°	0°	8°