

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

Excellent $R_{DS(ON)}$ and Low Gate Charge
Advanced Trench Technology

Applications

Power management
Load switch
DC/DC converter

Quick reference

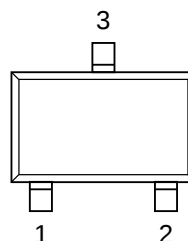
$V_{DS} = 100\text{ V}$
 $I_D = 6\text{ A}$
 $R_{DS(ON)} \leq 100\text{ m}\Omega$ @ $V_{GS}=10\text{ V}$ (Type: 88 m Ω)

Pin Description

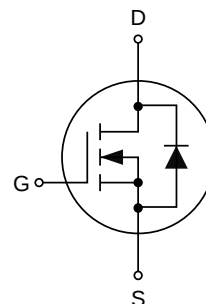
Pin	Description
1	Gate(G)
2	Drain(D)
3	Source(S)

Simplified Outline

Symbol



Top View
SOT23-3L



Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape Width	Quantity
KJ6N10A	SOT23-3	6N10A	7"	8 mm	3000

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

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current, $V_{GS}@10\text{ V}$, $T_A=25^\circ\text{C}$	6	A
I_D	Drain Current, $V_{GS}@10\text{ V}$, $T_A=100^\circ\text{C}$	4.2	A
I_{DM}	Pulsed Drain Current ¹	24	A
P_D	Power Dissipation	2.4	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55~150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient ²	62.5	$^\circ\text{C/W}$

3. Electrical Characteristics (T_A=25°C, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _D =250 μA	100	108	-	V
V _{GS(th)}	Gate-Threshold Voltage	V _{DS} =V _{GS} , I _D =250 μA	1.0	1.5	2.5	V
I _{GSS}	Gate-Body Leakage Current	V _{DS} =0 V, V _{GS} =±20 V	-	-	±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =100 V, V _{GS} =0 V	-	-	1	μA
R _{DS(on)}	Drain-Source On-Resistance ²	V _{GS} =10 V, I _D =3 A	-	88	100	mΩ
		V _{GS} =4.5 V, I _D =3 A	-	100	134	mΩ
C _{iss}	Input Capacitance	V _{DS} =25 V, V _{GS} =0 V, f=1.0 MHz	-	850	-	pF
C _{oss}	Output Capacitance		-	40	-	
C _{rss}	Reverse Transfer Capacitance		-	12	-	
Q _g	Total Gate Charge	V _{DS} =50 V, V _{GS} =10 V, I _D =3 A	-	20	-	nC
Q _{gs}	Gate-Source Charge		-	3	-	
Q _{gd}	Gate-Drain Charge		-	4	-	
t _{d(on)}	Turn-on Delay Time	V _{DD} =50 V, V _{GS} =10 V, I _D =3 A, R _G =2.5 Ω	-	6	-	ns
t _r	Turn-on Rise Time		-	7.5	-	
t _{d(off)}	Turn-off Delay Time		-	20	-	
t _f	Turn-off Fall Time		-	3	-	
I _S	Continuous Source Current ²	V _{GS} =V _{DS} =0V, Force Current	-	-	6	A
V _{SD}	Diode Forward Voltage ³	V _{GS} =0V, I _S =3 A	-	-	1.2	V

Notes:

1. Pulse width limited by maximum junction temperature.
2. The data tested by surface mounted on a 1 inch² FR-4 board, t ≤ 10 sec.
3. The data tested by pulsed, pulse width ≤ 300 μs, duty cycle ≤ 2%.

4. Typical Characteristics

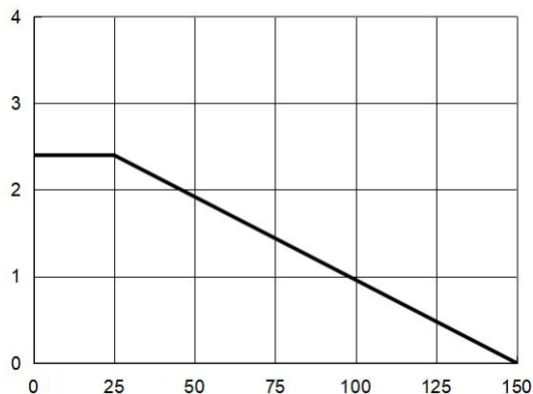


Figure 1. Power Dissipation

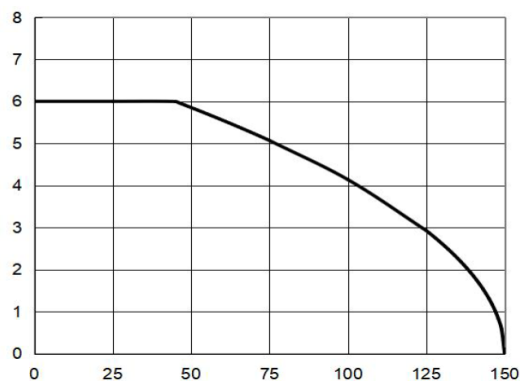


Figure 2. Drain Current

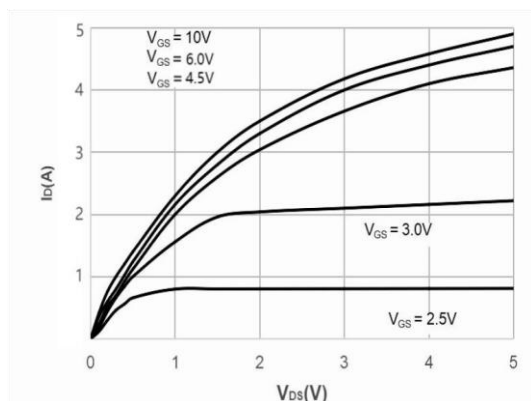


Figure 3. Output Characteristics

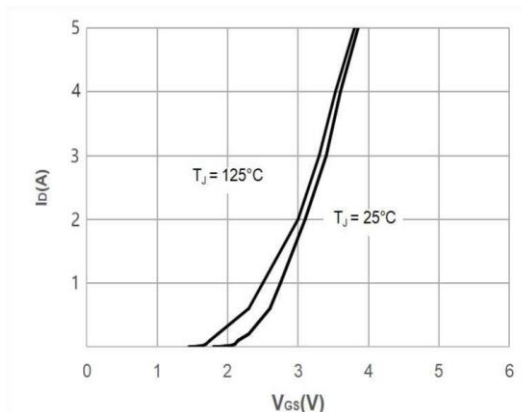


Figure 4. Transfer Characteristics

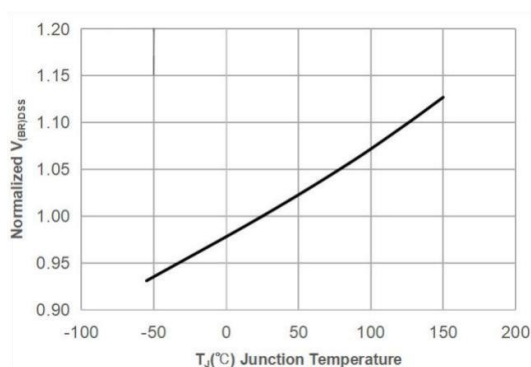


Figure 5. BVDSS vs Junction Temperature

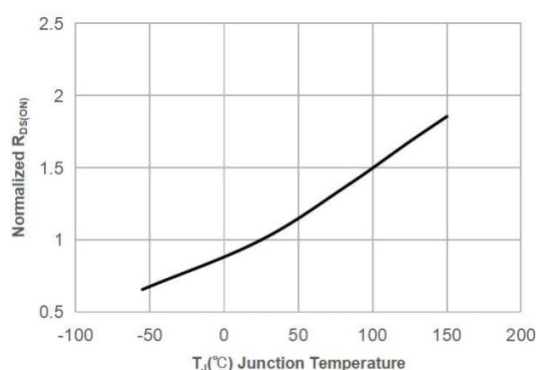


Figure 6. RDS(ON) vs Junction Temperature

4. Typical Characteristics (cont.)

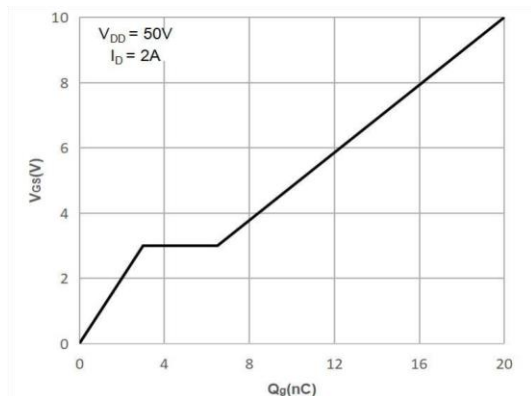


Figure 7. Gate Charge Waveforms

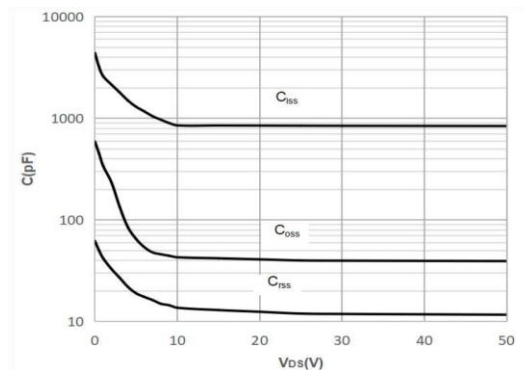


Figure 8. Capacitance

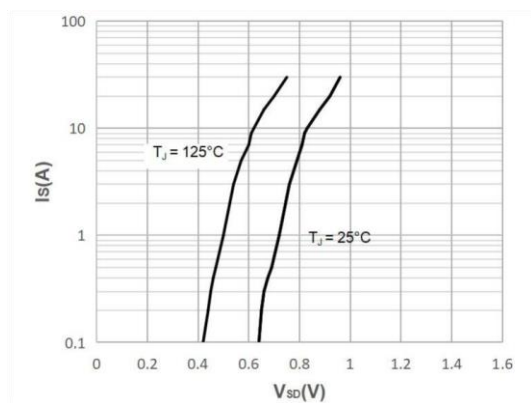


Figure 9. Body-Diode Characteristics

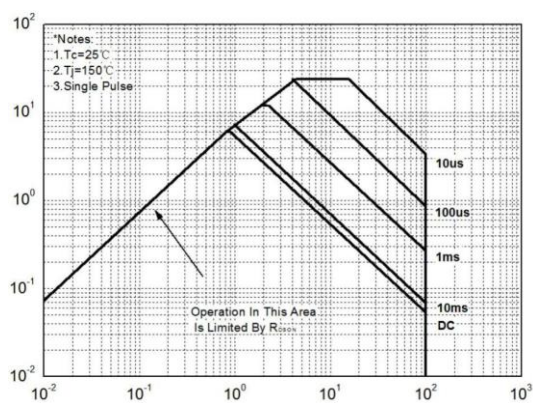
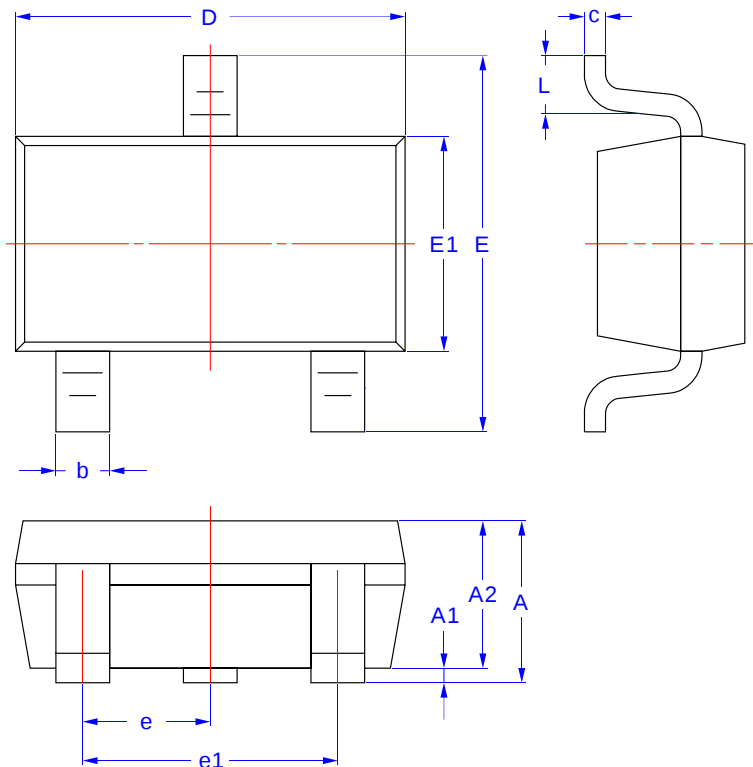


Figure 10. Maximum Safe Operating Area

5. Package Mechanical Data

SOT23-3L Package



Symbol	Dimensions in Millimeters	
	MIN	MAX
A	1.00	1.45
A1	0.00	0.15
A2	1.00	1.30
D	2.70	3.10
E	2.60	3.00
E1	1.50	1.70
c	0.08	0.25
b	0.30	0.50
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60