

P-Channel Enhancement Mode MOSFET

1. Product Information

Features

- Advanced trench technology
- Excellent $R_{DS(ON)}$
- Low gate charge

Applications

- Brushless motor
- Load switch
- Uninterruptible power supply

Quick reference

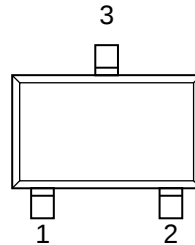
- $V_{DS} = -150V$
- $I_D = -2.7A$
- $R_{DS(ON)} \leq 780m\Omega$ @ $V_{GS} = -10V$ (Type: 620m Ω)

Pin Description

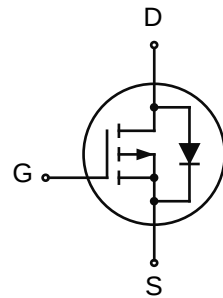
Pin	Description
1	Gate(G)
2	Source(S)
3	Drain(D)

Simplified Outline

Symbol



Top View
SOT23-3L



Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape Width	Quantity
KJ2P15A	SOT23-3L	2P15 XXXXYY	XXXXYY: Date Code	-	3000

2. Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage	-150	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D @T _A =25°C	Continuous Drain Current, V_{GS} @-10V ¹	-2.7	A
I_D @T _A =70°C	Continuous Drain Current, V_{GS} @-10V ¹	-1.8	A
I_{DM}	Pulsed Drain Current ²	-8.5	A
P_D	Power Dissipation ⁴	2	W
I_{AS}	Avalanche Current	5	A
E_{AS}	Single Pulse Avalanche Energy ³	56.5	mJ
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient, Steady-State ¹	125	°C/W
$R_{\theta JC}$	Thermal Resistance from Junction to Case, Steady-State ¹	40	°C/W
T _J , T _{STG}	Operating Junction and Storage Temperature Range	-55~150	°C

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} =0V, I _D =-250μA	-150	-168	-	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-120V, V _{GS} =0V, T _J =25°C	-	-	1	μA
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-120V, V _{GS} =0V, T _J =85°C	-	-	30	μA
I _{GSS}	Gate-Source Leakage Current	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
V _{GS(th)}	Gate-Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-2.0	-3.0	-4.0	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =-1A	-	620	780	mΩ
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} =-6V, I _D =-0.5A	-	700	980	mΩ
R _G	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	-	12	-	Ω
Q _g	Total Gate Charge	V _{DS} =-75V, V _{GS} =-10V, I _D =-1A	-	10.8	-	nC
Q _{gs}	Gate-Source Charge		-	3.1	-	
Q _{gd}	Gate-Drain Charge		-	2.2	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =-30V, I _D =-1A, V _{GS} =-10V, R _G =6Ω	-	21	-	ns
t _r	Turn-on Rise Time		-	16	-	
t _{d(off)}	Turn-off Delay Time		-	40	-	
t _f	Turn-off Fall Time		-	18	-	
C _{iss}	Input Capacitance	V _{DS} =-75V, V _{GS} =0V, f=1MHz	-	706	-	pF
C _{oss}	Output Capacitance		-	23	-	
C _{rss}	Reverse Transfer Capacitance		-	13	-	

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper
2. The data tested by pulsed , pulse width ≤ 300μs , duty cycle ≤ 2%
3. The power dissipation is limited by 150°C junction temperature
4. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation

4. Typical Characteristics

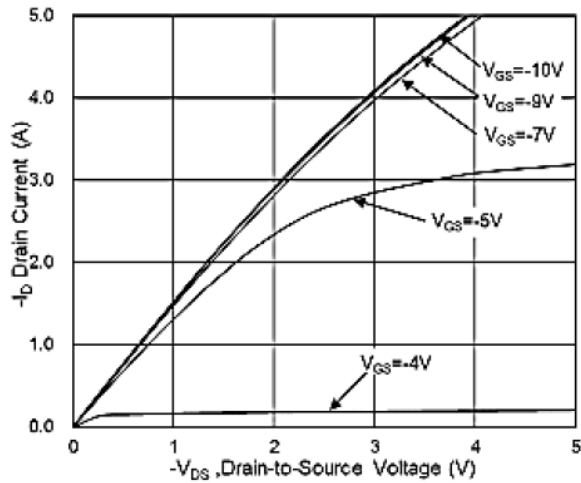


Fig.1 Typical Output Characteristics

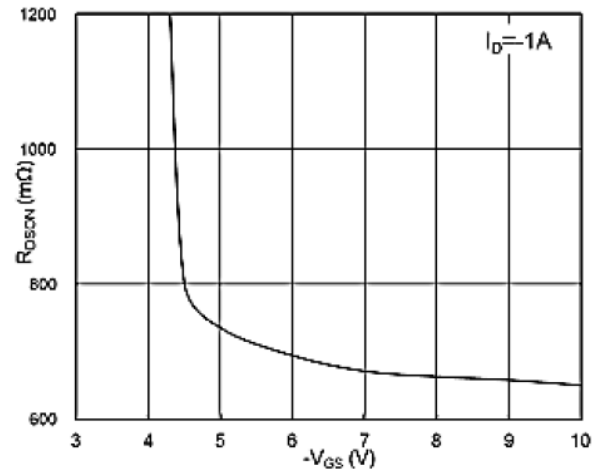


Fig.2 On-Resistance vs G-S Voltage

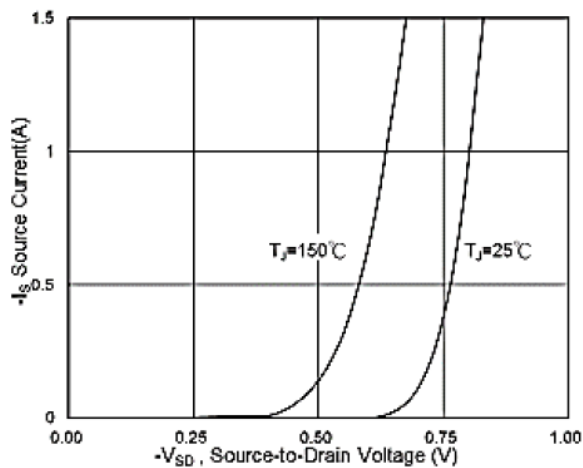


Fig.3 Source Drain Forward Characteristics

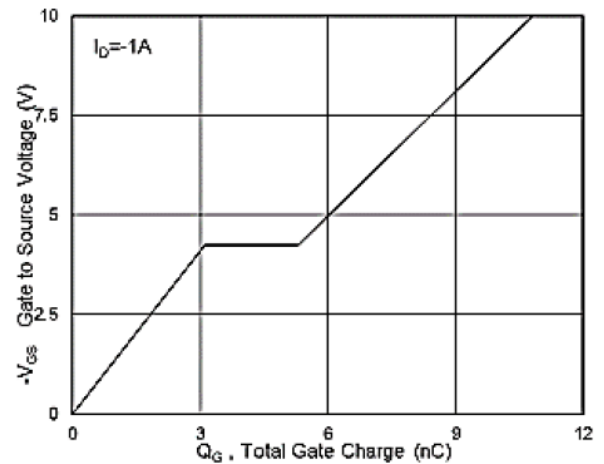


Fig.4 Gate-Charge Characteristics

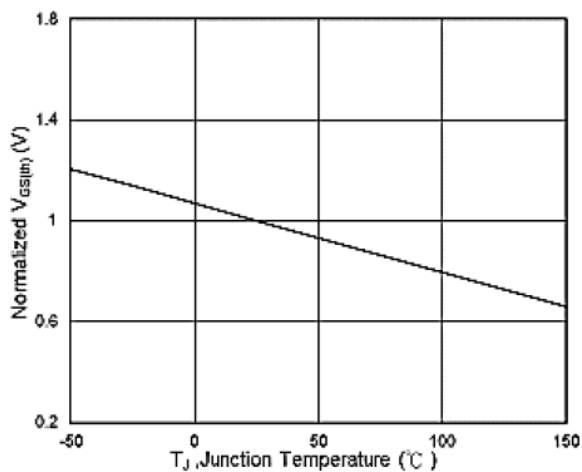


Fig.5 Normalized $V_{GS(th)}$ vs T_J

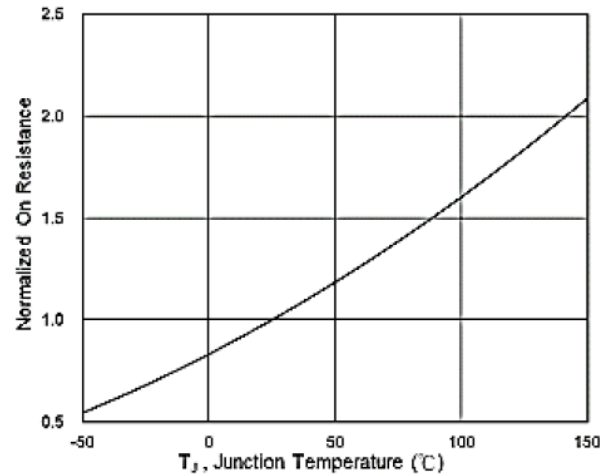


Fig.6 Normalized $R_{DS(on)}$ vs T_J

4. Typical Characteristics

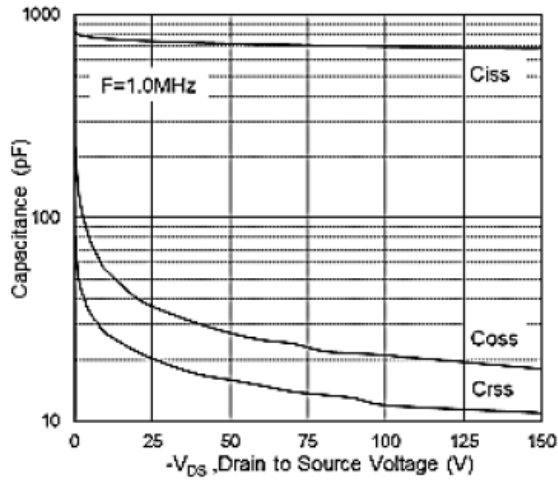


Fig.7 Capacitance

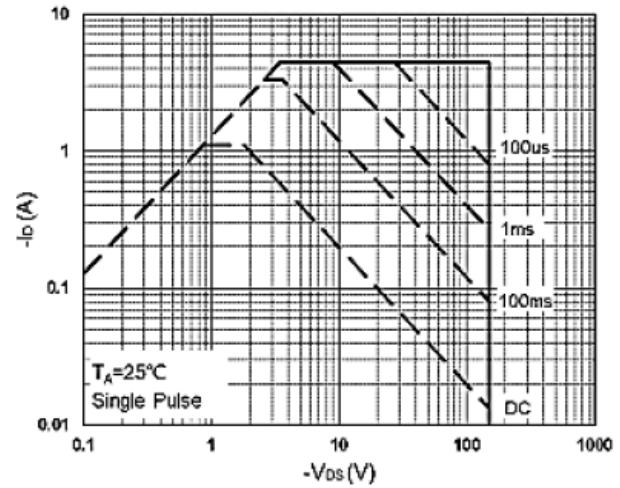


Fig.8 Safe Operating Area

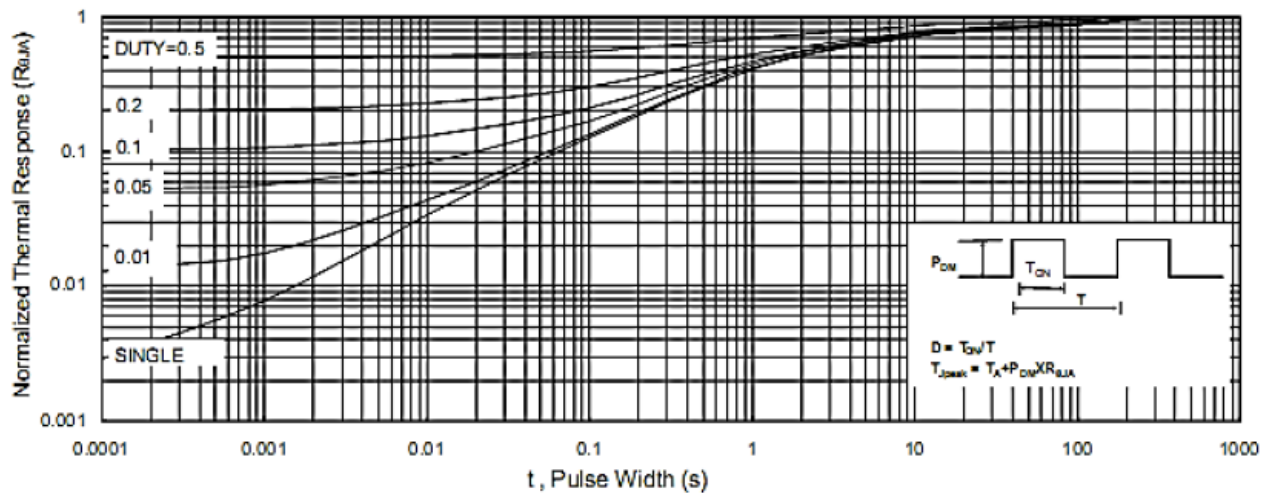


Fig.9 Normalized Maximum Transient Thermal Impedance

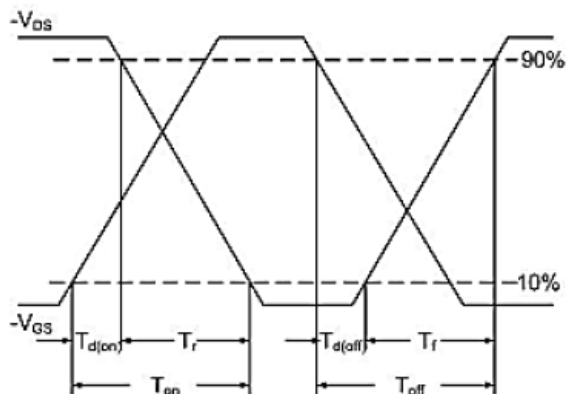


Fig.10 Switching Time Waveform

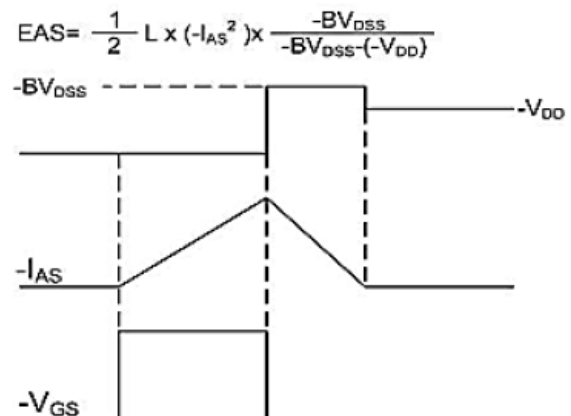
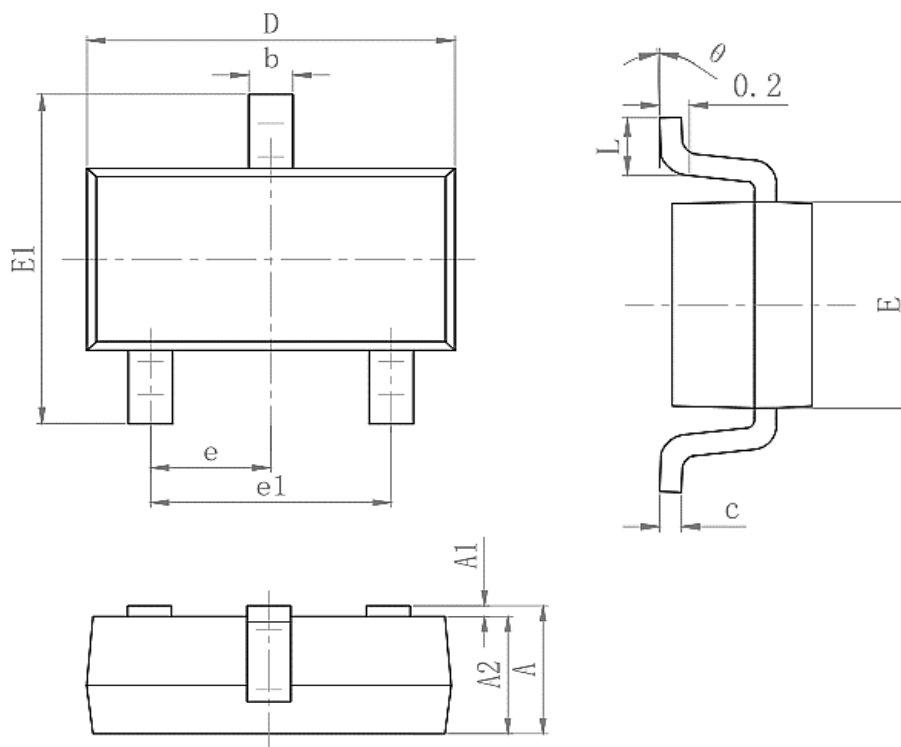


Fig.11 Unclamped Inductive Waveform

5. Package Dimensions

SOT23-3L Package



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.25	0.45
c	0.100	0.200
D	2.820	3.020
E	1.5	1.7
E1	2.650	2.950
e	0.950(BSC)	
e1	1.800	2.000
L	0.300	0.500
θ	0°	8°