

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

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

Applications

Power Switching Application
Hard Switched and High Frequency Circuits
Uninterruptible Power Supply
Motor Control

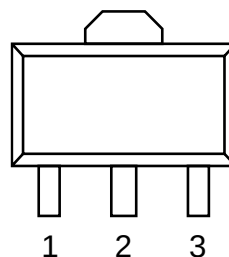
Quick reference

$V_{DS} = 100\text{ V}$
 $I_D = 5\text{ A}$
 $R_{DS(ON)} \leq 145\text{ m}\Omega$ @ $V_{GS}=10\text{ V}$ (Type: 115 m Ω)

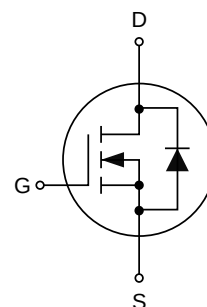
Pin Description

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

Simplified Outline



Symbol



Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape Width	Quantity
KJ5N10M	SOT-89	5N10M	-	-	1000

2. Absolute Maximum Ratings (T_A=25°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, $V_{GS}@10\text{ V}$	5	A
I_{DM}	Pulsed Drain Current ¹	21	A
P_D	Power Dissipation	2	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55~150	°C
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient ²	41.7	°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	110	-	V
V _{GS(th)}	Gate-Threshold Voltage	V _{DS} =V _{GS} , I _D =250 μA	1.0	1.8	3	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} =80 V, V _{GS} =0 V	-	-	800	nA
R _{DS(on)}	Drain-Source On-Resistance ²	V _{GS} =10 V, I _D =3 A	-	115	145	mΩ
g _{FS}	Forward Transconductance	V _{DS} =5 V, I _D =29 A	-	8	-	S
C _{iss}	Input Capacitance	V _{DS} =25 V, V _{GS} =0 V, f=1.0 MHz	-	210	-	pF
C _{oss}	Output Capacitance		-	30	-	
C _{rss}	Reverse Transfer Capacitance		-	14	-	
Q _g	Total Gate Charge	V _{DS} =50 V, V _{GS} =10 V, I _D =5 A	-	4.5	-	nC
Q _{gs}	Gate-Source Charge		-	1.5	-	
Q _{gd}	Gate-Drain Charge		-	1.2	-	
t _{d(on)}	Turn-on Delay Time	V _{DD} =50 V, V _{GS} =10 V, I _D =5 A, R _G =2.5 Ω, R _L =15 Ω	-	15	-	ns
t _r	Turn-on Rise Time		-	3.4	-	
t _{d(off)}	Turn-off Delay Time		-	21	-	
t _f	Turn-off Fall Time		-	3.1	-	
I _S	Continuous Source Current ²	V _{GS} =V _{DS} =0V, Force Current	-	-	5	A
V _{SD}	Diode Forward Voltage ³	V _{GS} =0V, I _S =6 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. Guaranteed by design, not subject to production

4. Typical Characteristics

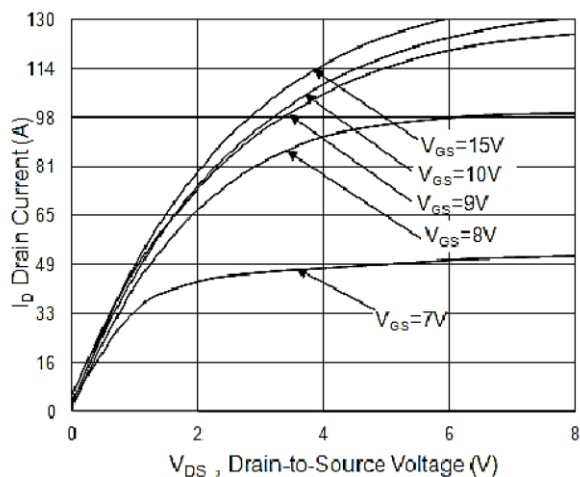


Fig.1 Typical Output Characteristics

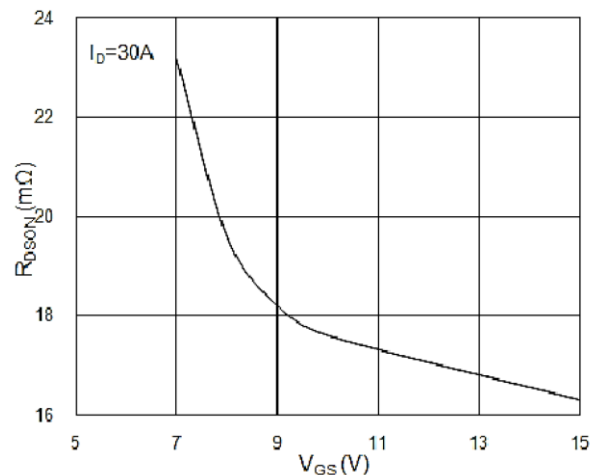


Fig.2 On-Resistance v.s Gate-Source

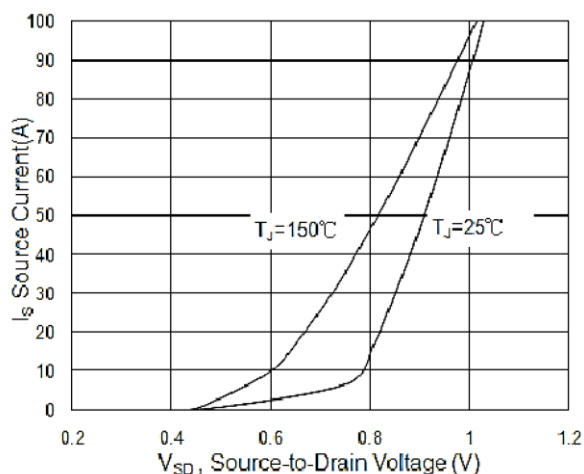


Fig.3 Forward Characteristics of Reverse

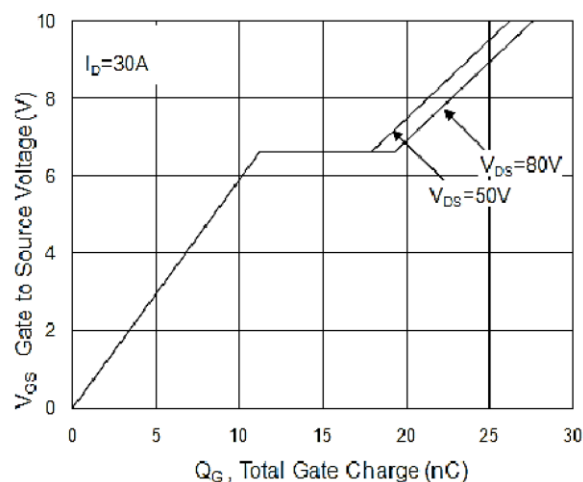


Fig.4 Gate-Charge Characteristics

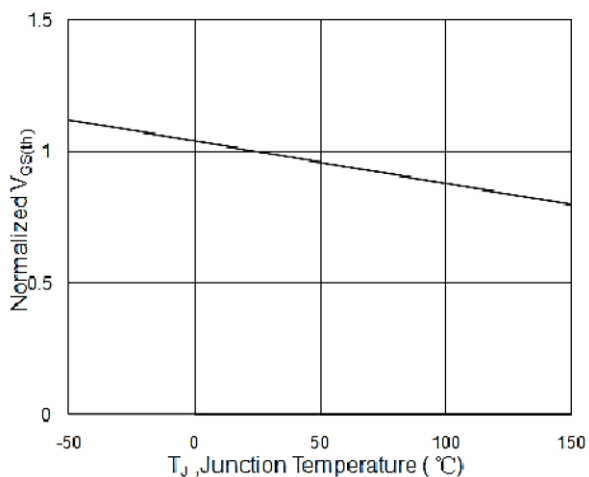


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

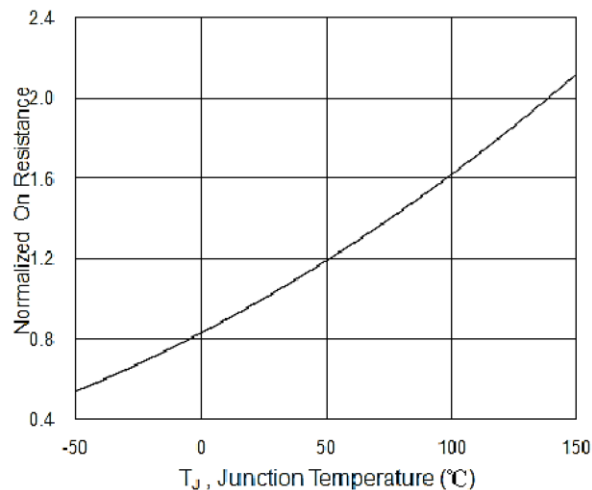


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

4. Typical Characteristics (Cont.)

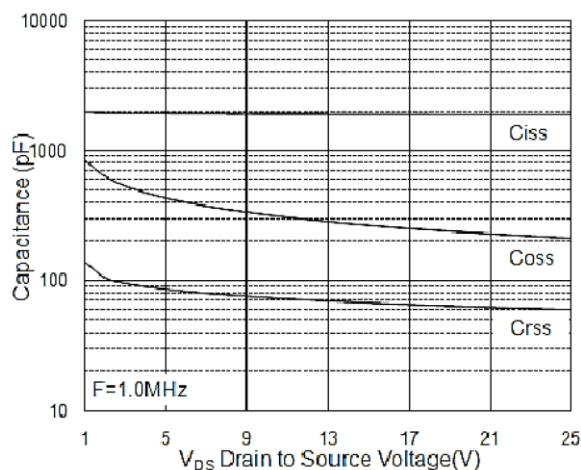


Fig.7 Capacitance

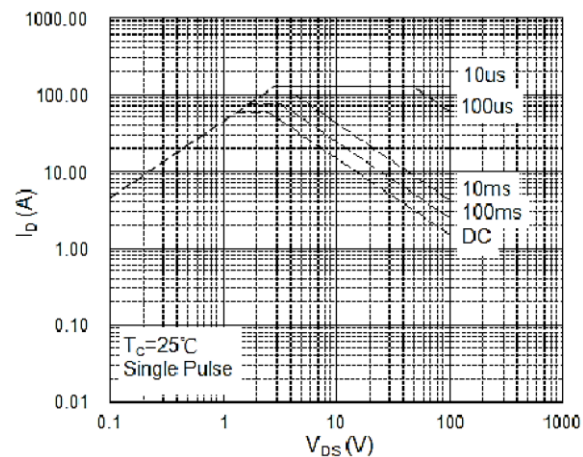


Fig.8 Safe Operating Area

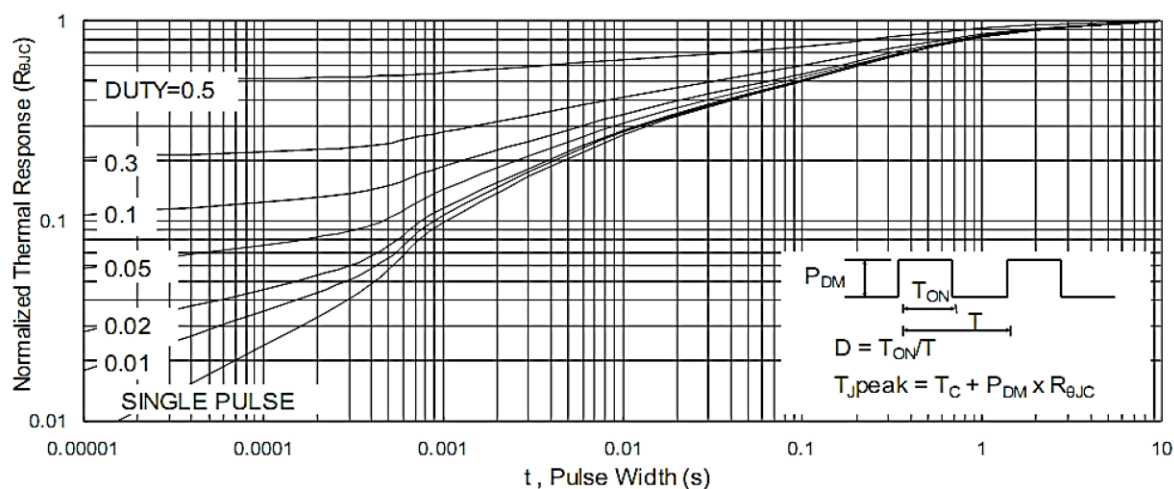


Fig.9 Normalized Maximum Transient Thermal Impedance

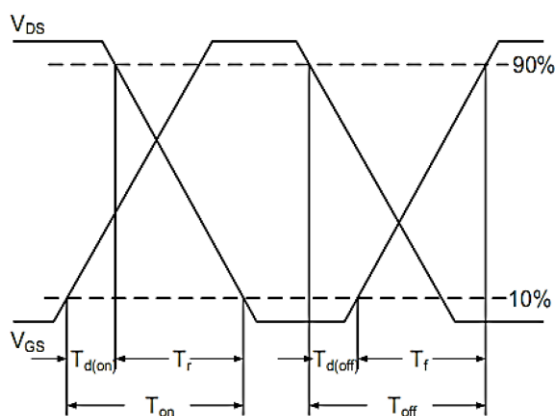


Fig.10 Switching Time Waveform

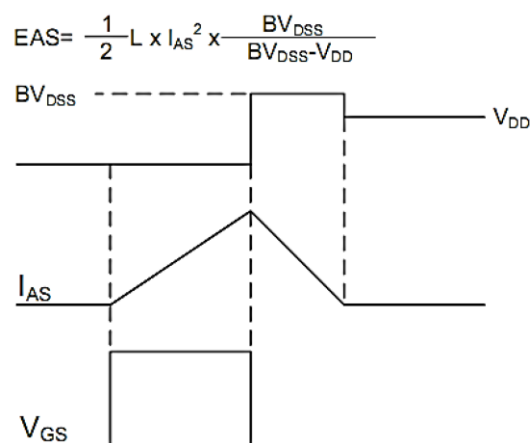
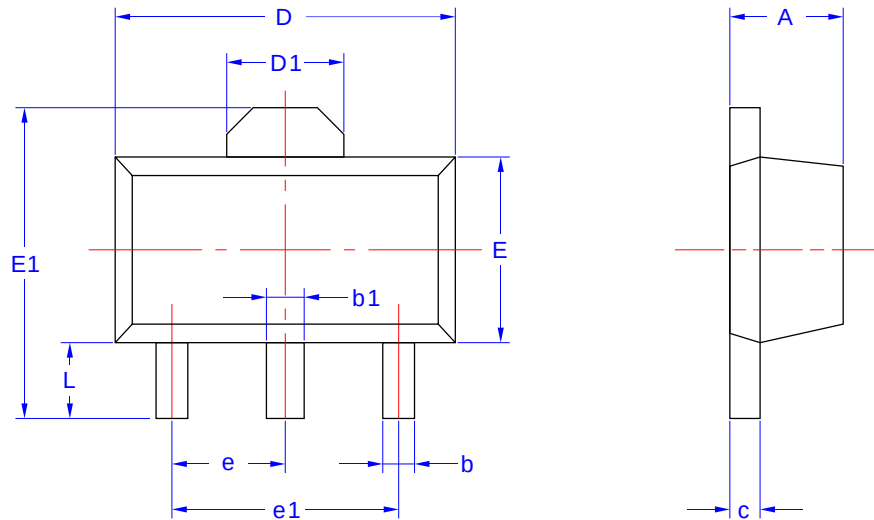


Fig.11 Unclamped Inductive Switching Waveform

5. Package Mechanical Data

SOT-89 Package



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min.	Max.	Min.	Max.
A	1.40	1.60	0.055	0.063
b	0.32	0.52	0.013	0.020
b1	0.40	0.58	0.016	0.023
c	0.35	0.44	0.014	0.017
D	4.40	4.60	0.173	0.181
D1	1.55 REF.		0.061 REF.	
E	2.30	2.60	0.091	0.102
E1	3.94	4.25	0.155	0.167
e	1.50 TYP.		0.060 TYP.	
e1	3.00 TYP.		0.118 TYP.	
L	0.90	1.20	0.035	0.047