

P-Channel Enhancement Mode MOSFET

1. Product Information

Features

Advanced Trench Technology
Excellent $R_{DS(ON)}$ and Low gate charge

Applications

Power Management Switches
Brushless Motor
Uninterruptible Power Supply

Quick reference

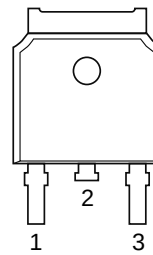
$V_{DS} = -150\text{ V}$
 $I_D = -25\text{ A}$
 $R_{DS(ON)} \leq 175\text{ m}\Omega$ @ $V_{GS} = -10\text{ V}$ (Type: 130 m Ω)

Pin Description

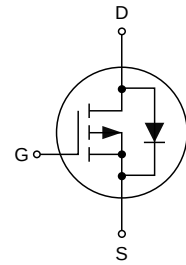
Pin	Description
1	Gate (G)
2	Drain (D)
3	Source (S)

Simplified Outline

Symbol



Top View
TO-252



Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape Width	Quantity
KJ25P15K	TO-252	KJ25P15K	13 inches	16 mm	2500

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

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage	-150	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current, $V_{GS} = 10\text{ V}$, $T_A = 25^\circ\text{C}$ ¹	-25	A
	Continuous Drain Current, $V_{GS} = 10\text{ V}$, $T_A = 70^\circ\text{C}$ ¹	-15	A
I_{DM}	Pulsed Drain Current ²	-90	A
E_{AS}	Single Pulse Avalanche Energy ³	250	mJ
I_{AS}	Avalanche Current	-19	A
P_D	Power Dissipation, $T_A = 25^\circ\text{C}$ ⁴	104	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	62.5	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	1.9	$^\circ\text{C/W}$

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _D =-250 μA	-150	-175	-	V
V _{GS(th)}	Gate-Threshold Voltage	V _{DS} =V _{GS} , I _D =250 μA	-2.0	-3.0	-4.0	V
I _{GSS}	Gate-Source Current	V _{DS} =0 V, V _{GS} =±20 V	-	-	±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-150 V, V _{GS} =0 V	-	-	1	μA
R _{DS(ON)}	Drain-Source On-Resistance ²	V _{GS} =-10 V, I _D =-10 A	-	130	175	mΩ
g _{FS}	Forward Transconductance	V _{GS} =-15 V, I _D =-10 A	-	8	-	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =-75 V, f=1.0 MHz	-	719	-	pF
C _{oss}	Output Capacitance		-	148	-	
C _{rss}	Reverse Transfer Capacitance		-	7	-	
R _G	Gate Resistance	V _{GS} =0 V, V _{DS} =0 V, f=1.0 MHz	1	2.6	4.5	Ω
t _{d(on)}	Turn-on Delay Time	V _{DD} =-75 V, I _D =-10 A, V _{GS} =-10 V, R _{GEN} =1 Ω, R _L =7.5 Ω	-	10	-	ns
t _r	Turn-on Rise Time		-	6	-	
t _{d(off)}	Turn-off Delay Time		-	18	-	
t _f	Turn-off Fall Time		-	6	-	
Gate Charge Characteristics ⁶						
Q _g	Total Gate Charge	V _{GS} =-10 V, V _{DS} =-75 V, I _D =-10 A	-	14.6	-	nC
Q _{gs}	Gate-Source Charge		-	4.8	-	
Q _{gd}	Gate-Drain Charge		-	4.5	-	
Diode Characteristics ⁶						
I _S	Maximum Continuous Drain-Source Diode Forward Current	T _C =25°C	-	-	-16	A
I _{SM}	Pulse Diode Forward Current		-	-	-30	V
V _{SD}	Body Diode Voltage ²	I _{SD} =-5 A, V _{GS} =0 V	-	-0.83	-1.2	V
t _{rr}	Body Diode Reverse Recovery Time	I _F =-10 A, di/dt=100 A/μs	-	62	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	180	-	nC

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2 OZ copper.
2. The data tested by pulsed, pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
3. The EAS data shows Max. rating. The test condition is $V_{DD}=-50\text{ V}$, $V_{GS}=-10\text{ V}$, $L=0.1\text{ mH}$, $I_{AS}=-10\text{ A}$.
4. The power dissipation is limited by 150°C junction temperature.
5. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.
6. Guaranteed by design, not subject to production testing.

4. Typical Characteristics

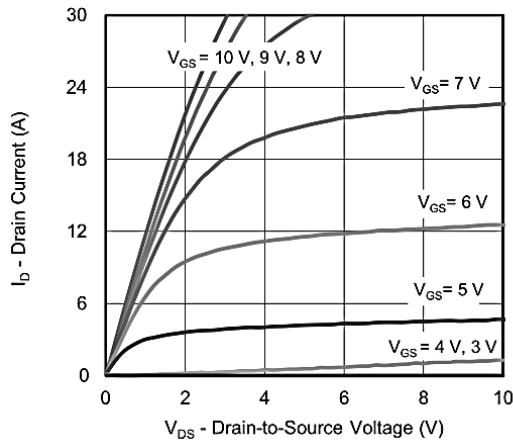


Fig 1. Output Characteristics

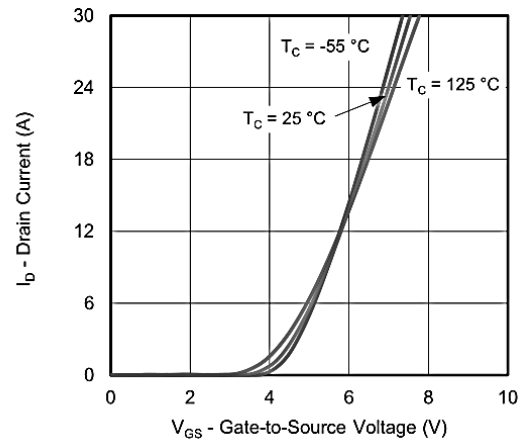


Fig 2. Transfer Characteristics

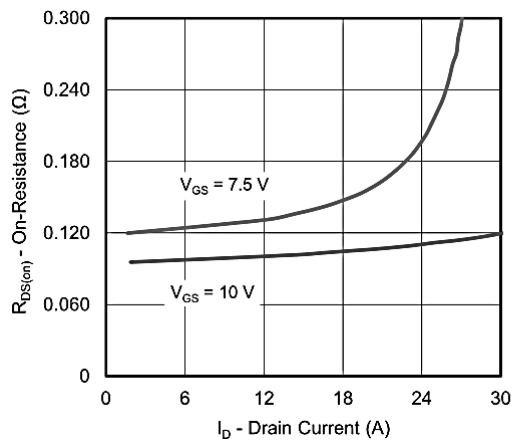


Fig 3. On-Resistance vs. Drain Current and Gate Voltage

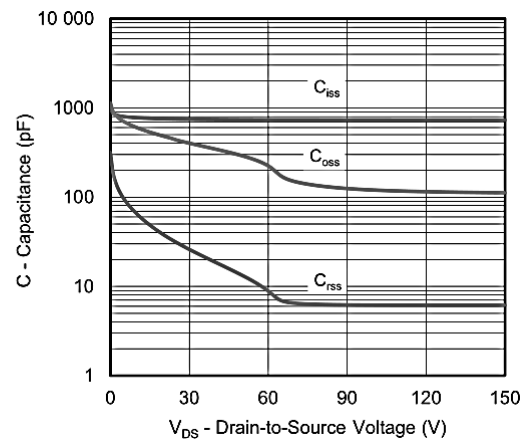


Fig 4. Capacitance

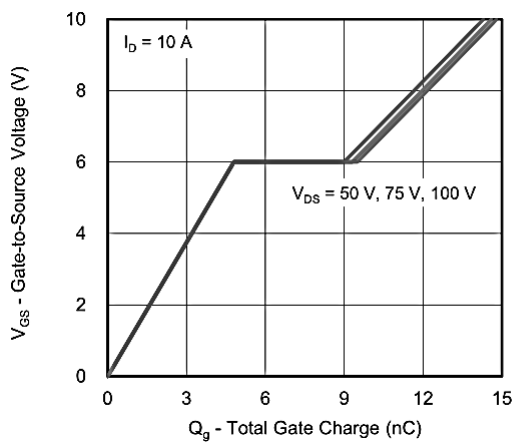


Fig 5. Gate Charge

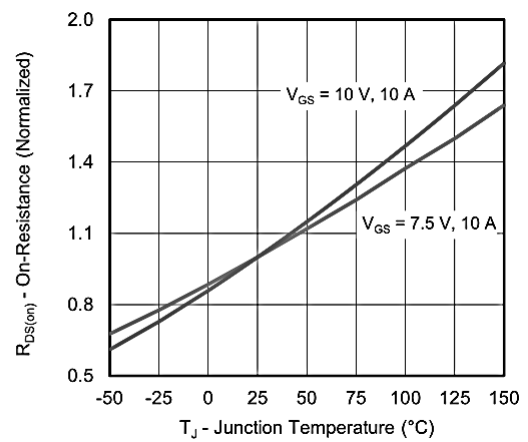


Fig 6. On-Resistance vs. Junction Temperature

4. Typical Characteristics (Cont.)

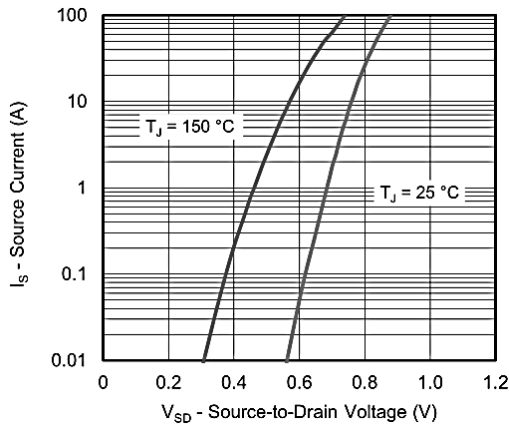


Fig 7. Source-Drain Diode Forward Voltage

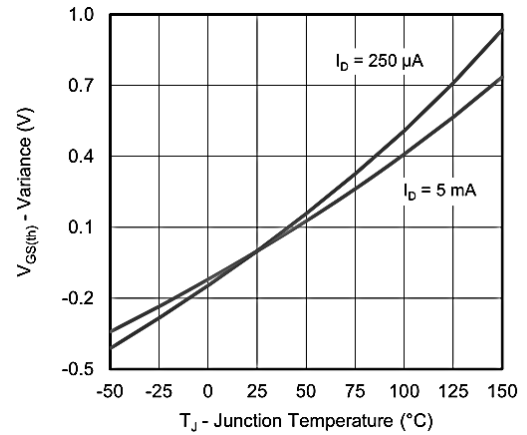


Fig 8. On-Resistance vs. V_{GS}

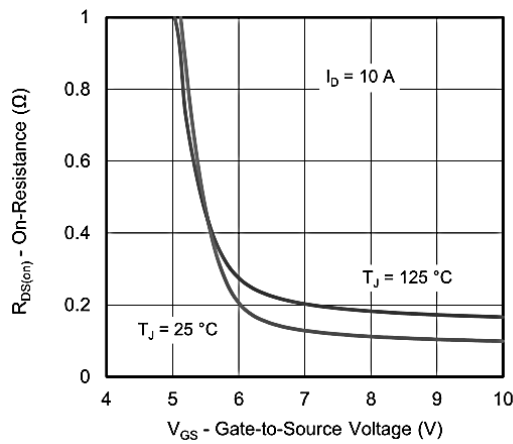


Fig 9. Transfer Characteristics

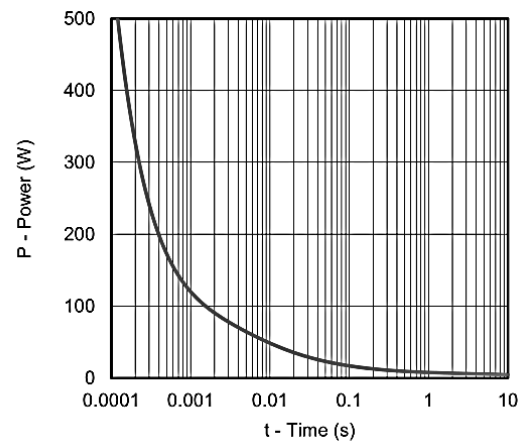


Fig 10. Single Pulse Power, Junction-to-Ambient

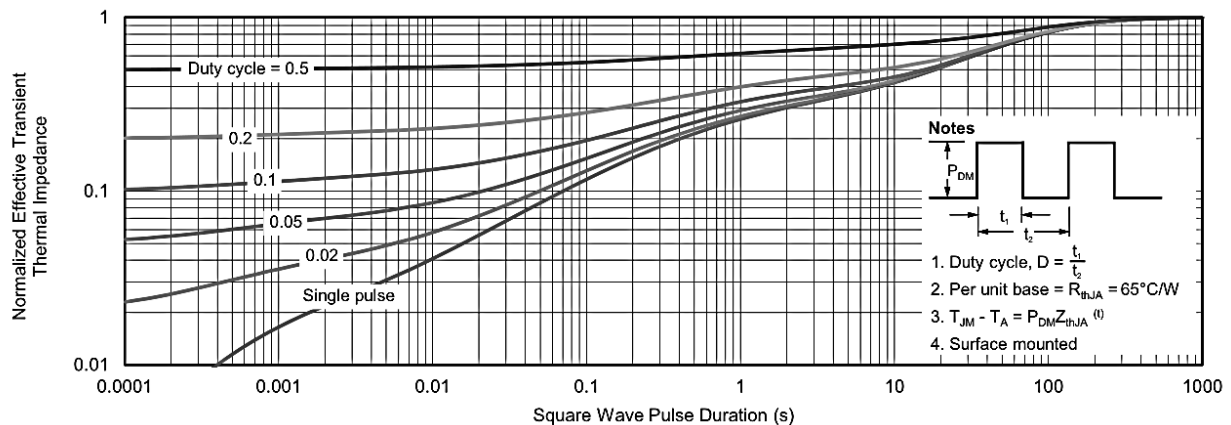
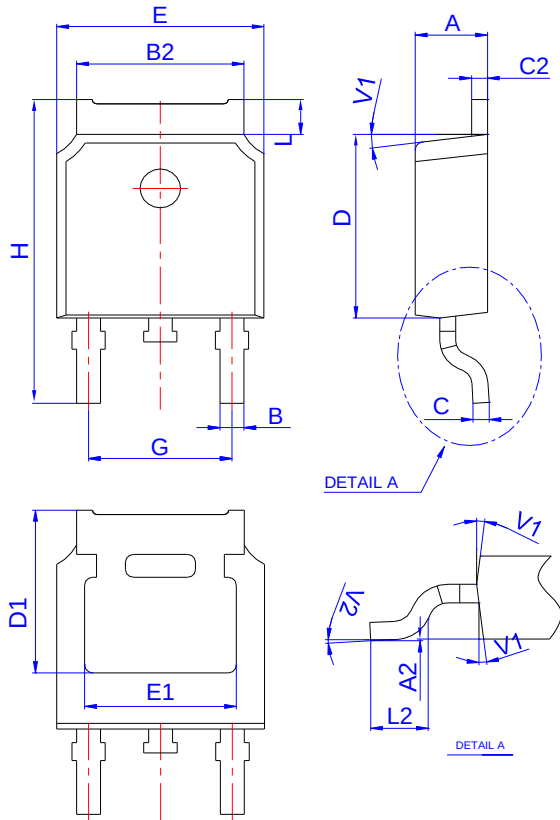


Fig 10. Normalized Thermal Transient Impedance, Junction-to-Ambient

5. Package Mechanical Data

TO-252 Package



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°