KJ12N25K

N-Channel Enhancement Mode MOSFET

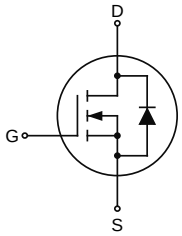
1. Product Information

1.1 Features

Surface-mounted package

Advanced trench cell design

Low gate charge

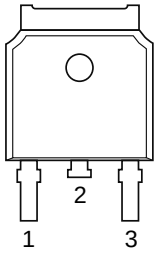


1.2 Applications

UPS

BLDC

PFC



Top View
TO-252

1.3 Quick reference

V_{DS} = 250 V

I_D = 10 A

P_D = 52 W

$R_{DS(ON)}$ ≤ 650 mΩ @V_{GS}=10 V (Type:500 mΩ)

2. Package Marking and Ordering Information

Product Name	Package	Marking	Reel size	Tape width	Quantity (pcs)
KJ12N25K	**TO-252**	**KJ12N25K**	**13"**	**16 mm**	**2500**

3. Absolute Maximum Ratings (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	250	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current (T_A=25℃)	10	A
I_{DM}	Pulsed Drain Current [1]	30	A
E_{AS}	Single Pulse Avalanche Energy [2]	25	mJ
P_D	Power Dissipation (T_C=25℃) [3]	52	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	–55 to 150	℃
$R_{\theta JA}$	Thermal Resistance, Junction-Ambient	62.5	℃/W
$R_{\theta JC}$	Thermal Resistance, Junction-Case	2.4	℃/W

4. Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0 V, I_{DS}=250 μA	250	-	-	V
Zero Gate Voltage Source Current	I_{DSS}	V_{DS}=250 V, V_{GS}=0 V	-	-	1	μA
Gate to Source Forward Leakage	I_{GSS}	V_{GS}=±20 V, V_{DS}=0 V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250 μA	2	3	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10 V, I_D=2.5 A	-	500	600	mΩ
Diode Characteristics						
Diode Forward Voltage	V_{SD}	I_{SD}=10 A, V_{GS}=0 V	-	-	1.2	V
Reverse Recovery Time	t_{rr}	I_{DS}=10A, V_{GS}=0 V dI_{SD}/dt=100 A/μs	-	89	-	ns
Reverse Recovery Charge	Q_{rr}		-	265	-	nC
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0 V, V_{DS}=75 V, Frequency=1 MHz	-	465	-	pF
Output Capacitance	C_{oss}		-	425	-	
Reverse Transfer Capacitance	C_{rss}		-	22	-	
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=100 V, V_{GEN}=10 V, R_G=6 Ω, I_{DS}=10 A	-	7.5	-	ns
Turn-on Rise Time	t_r		-	20	-	
Turn-off Delay Time	$t_{d(off)}$		-	12	-	
Turn-off Fall Time	t_f		-	27	-	
Gate Charge Characteristics						
Total Gate Charge	Q_g	V_{DS}=100 V, V_{GS}=10 V, I_{DS}=10 A	-	7.7	-	nC
Gate-Source Charge	Q_{gs}		-	1.2	-	
Gate-Drain Charge	Q_{gd}		-	4.5	-	

Notes:

1. Surface mounted on a 1 $inch^2$ FR-4 board with 2 OZ copper.

3. The EAS data shows Max. rating. I_{AS}=1A, L=10mH, R_G=25 Ω, V_{DD}=200 V, V_{GS}=10 V, Starting T_J=25℃.

2. Limited by 150℃ junction temperature.

4. Pulse Test: Pulse width ≤ 300 μs, Duty Cycle ≤ 1%.

5. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

7. Typical Characteristics

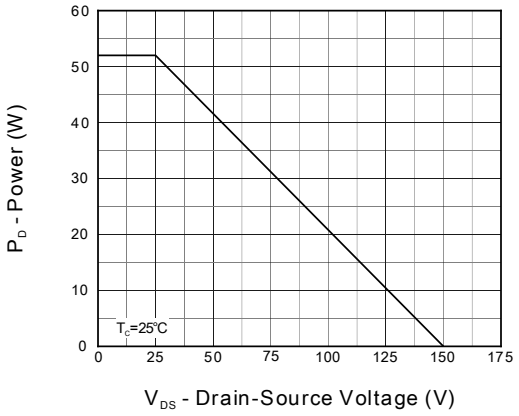


Figure 1. Output Characteristics

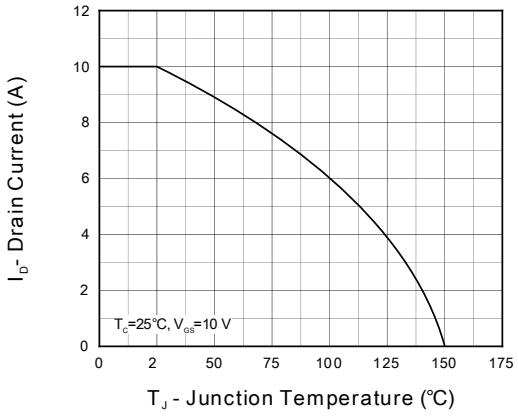


Figure 2. Current Capability

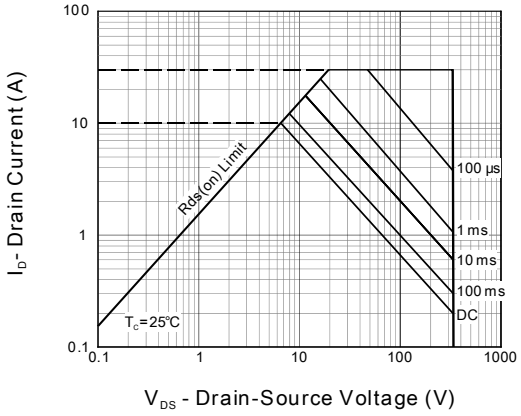


Figure 3. Safe Operation Area

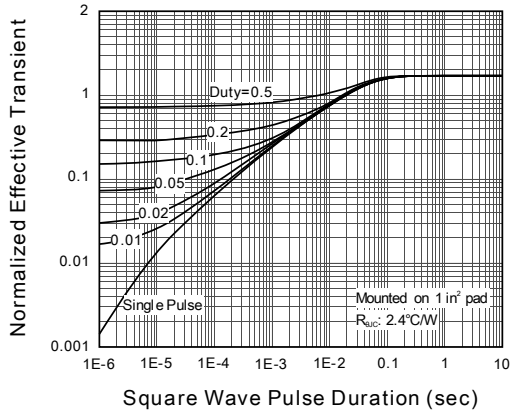


Figure 4. Transient Thermal Impedance

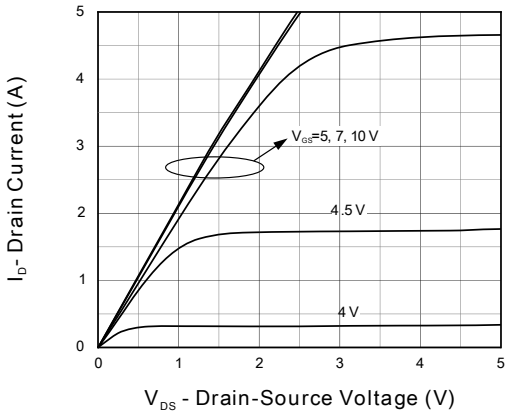


Figure 5. Output Characteristics

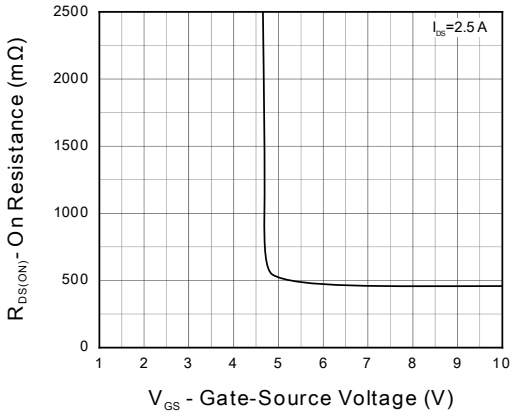


Figure 6. On Resistance

7. Typical Characteristics (cont.)

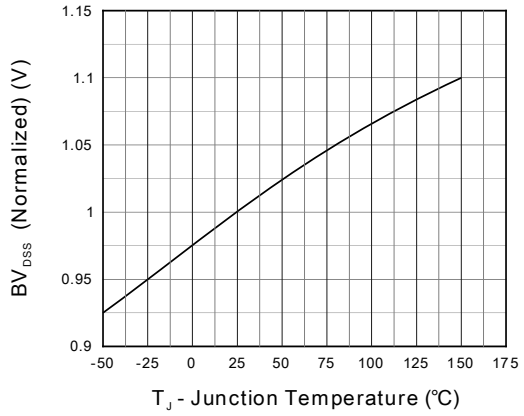


Figure 7. BV_{DSS} vs. T_J

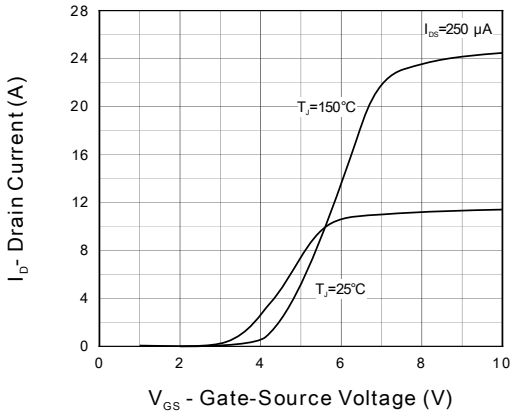


Figure 8. Transfer Characteristics

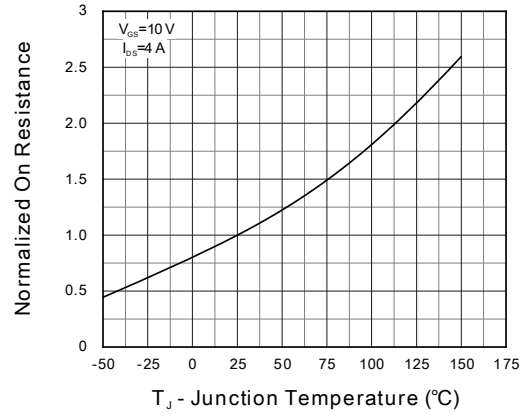


Figure 9. Normalized On Resistance

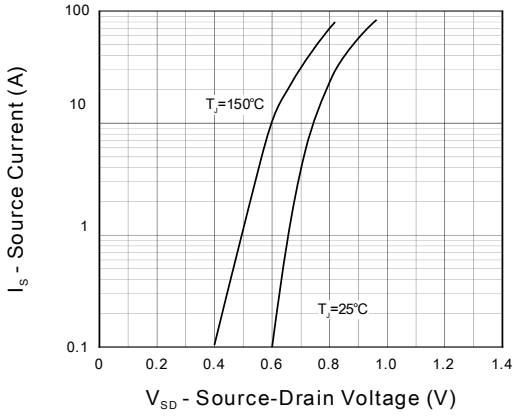


Figure 10. Diode Forward Current

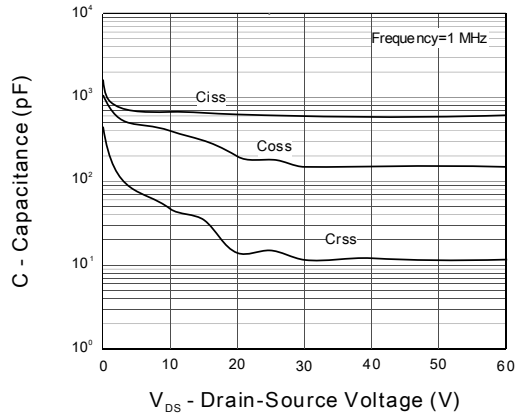


Figure 11. Capacitance

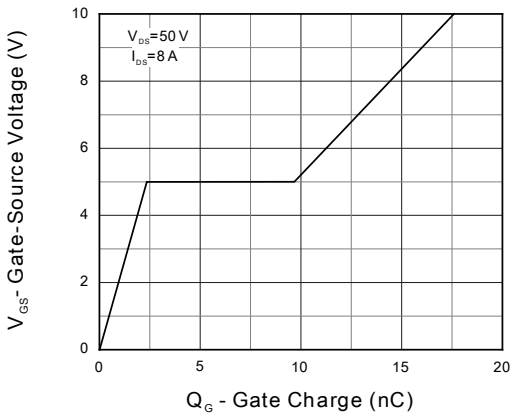
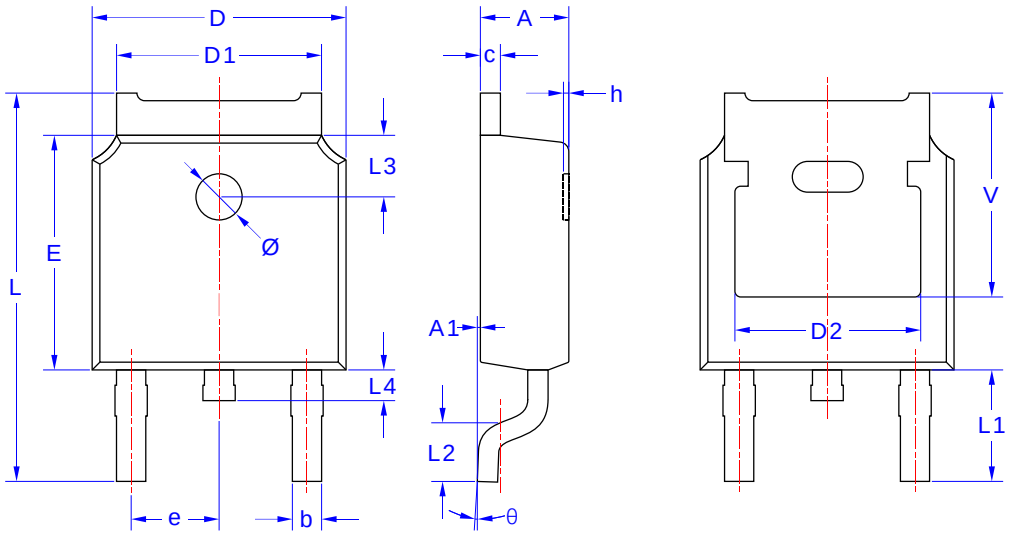


Figure 12. Gate Charge

8. Package Dimensions

TO-252 Package



Symbol	Dimensions in Millimeters	
	MIN	MAX
A	2.200	2.400
A1	0	0.127
b	0.660	0.860
c	0.460	0.580
D	6.500	6.700
D1	5.100	5.460
D2	4.830 REF.	
E	6.000	6.200
e	2.186	1.386
L	9.800	10.400
L1	2.900 REF.	
L2	1.400	1.700
L3	1.600 REF.	
L4	0.600	1.000
ø	1.100	1.300
θ	0°	8°
H	0	0.300
V	5.350 REF.	