

P-Channel Enhancement Mode MOSFET

1. Product Information

Features

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

Applications

- Power Management Switches
- DC/DC Converters

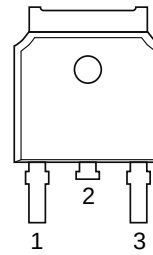
Quick reference

- $V_{DS} = -100\text{ V}$
- $I_D = -35\text{ A}$
- $R_{DS(ON)} \leq 50\text{ m}\Omega @ V_{GS} = -10\text{ V}$ (Type: 35 m Ω)
- $R_{DS(ON)} \leq 65\text{ m}\Omega @ V_{GS} = -4.5\text{ V}$ (Type: 45 m Ω)

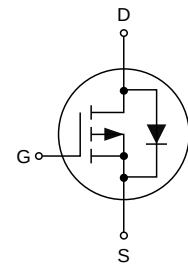
Pin Description

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

Simplified Outline	Symbol
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Top View
TO-252



Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape Width	Quantity
KJ35P10K	TO-252	KJ35P10K	-	-	2500

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	Continuous Drain Current, $V_{GS} = 10\text{ V}$, $T_A = 25^\circ\text{C}$ ¹	-35	A
	Continuous Drain Current, $V_{GS} = 10\text{ V}$, $T_A = 100^\circ\text{C}$ ¹	-27	A
I_{DM}	Pulsed Drain Current ²	-120	A
I_S	Continuous Source Current (Diode Conduction) ¹	-35	A
E_{AS}	Single Pulse Avalanche Energy ³	289	mJ
P_D	Power Dissipation, $T_A = 25^\circ\text{C}$ ¹	104	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55~150	$^\circ\text{C}$
$R_{\theta JA}$	Maximum Junction- Ambient, $\leq 10\text{ s}$ ¹	62	$^\circ\text{C/W}$
$R_{\theta JC}$	Maximum Junction-Foot, Steady-State	1.2	$^\circ\text{C/W}$

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	-	-	V
ΔBV _{DSS} /ΔT _J	Breakdown Voltage Temperature Coefficient	I _D =-250 μA, Referenced to 25°C	-	60	200	mV/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-100 V, V _{GS} =0 V	-	-	1	μA
I _{GSS}	Gate-body Leakage current	V _{DS} =0 V, V _{GS} =±20 V	-	-	±100	nA
V _{GS(th)}	Gate-Threshold Voltage	V _{DS} =V _{GS} , I _D =250 μA	-1.5	-2.0	-2.5	V
ΔV _{GS(th)} /ΔT _J	Gate Threshold Voltage Temperature Coefficient	I _D =-250 μA, Referenced to 25°C	-	-6	-	mV/°C
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} =-10 V, I _D =-15 A	-	35	50	mΩ
		V _{GS} =-4.5 V, I _D =-10 A	-	45	65	
g _{FS}	Forward Transconductance	V _{GS} =-15 V, I _D =-10 A	5	-	-	S
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =-25 V, f=1.0 MHz	-	4440	-	pF
C _{oss}	Output Capacitance		-	233	-	
C _{rss}	Reverse Transfer Capacitance		-	180	-	
R _G	Gate Resistance	V _{GS} =0 V, V _{DS} =0 V, f=1.0 MHz	-	12	-	Ω
t _{d(on)}	Turn-on Delay Time	V _{DS} =-50 V, I _D =-15 A, V _{GS} =-10 V, R _{GEN} =9 Ω	-	9.8	-	ns
t _r	Turn-on Rise Time		-	41	-	
t _{d(off)}	Turn-off Delay Time		-	258	-	
t _f	Turn-off Fall Time		-	90	-	
Q _g	Total Gate Charge	V _{GS} =-10 V, V _{DD} =-50 V, I _D =-15 A	-	80	-	nC
Q _{gs}	Gate-Source Charge		-	10	-	
Q _{gd}	Gate-Drain Charge		-	15	-	
I _S	Maximum Continuous Drain-Source Diode Forward Current		-	-	-35	A
V _{SD}	Diode Forward Voltage	I _{SD} =-10 A, V _{GS} =0 V	-	-	-1.4	V

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board.
2. Pulse width limited by maximum junction temperature.
2. The E_{AS} data shows Max. rating. T_J=25°C, V_{DD}=-50 V, V_G=-10 V, L=0.5 mH, R_G=25 Ω.

4. Typical Characteristics

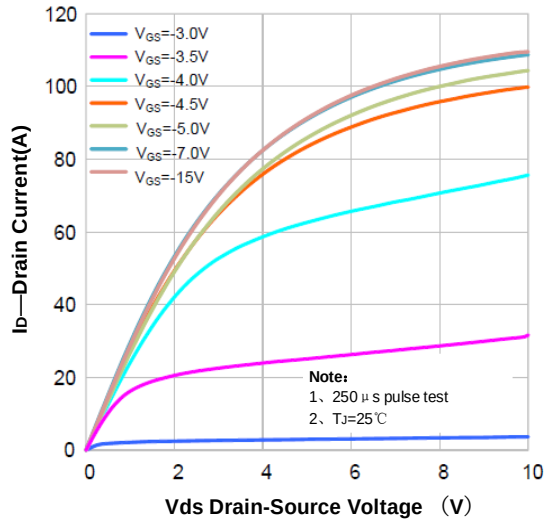


Figure 1 Output Characteristics

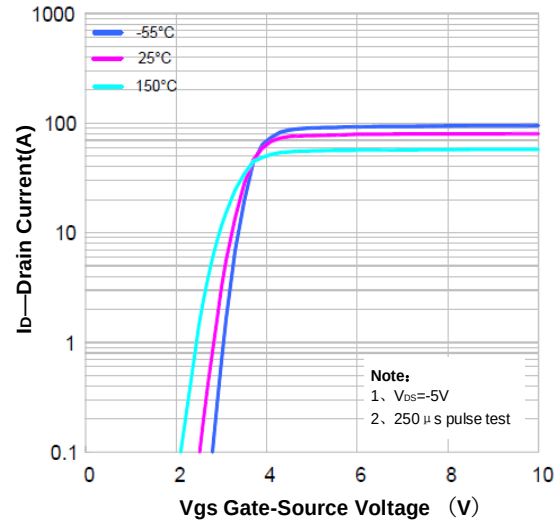


Figure 2 Transfer Characteristics

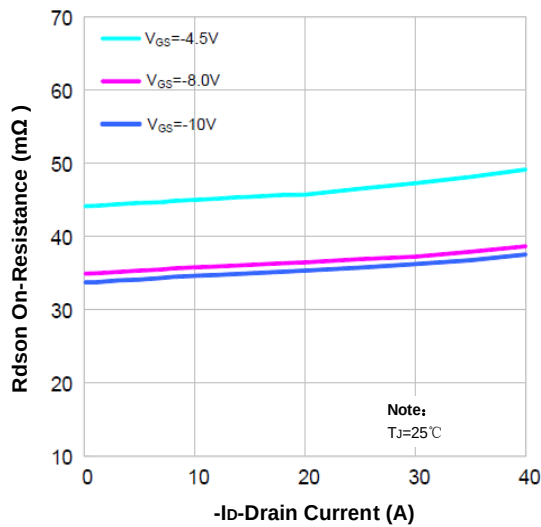


Figure 3 $R_{DS(on)}$ -Drain Current

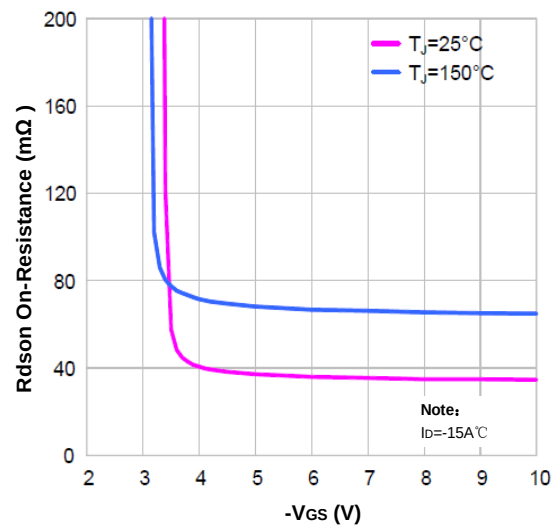


Figure 4 $R_{DS(on)}$ - V_{GS} Voltage

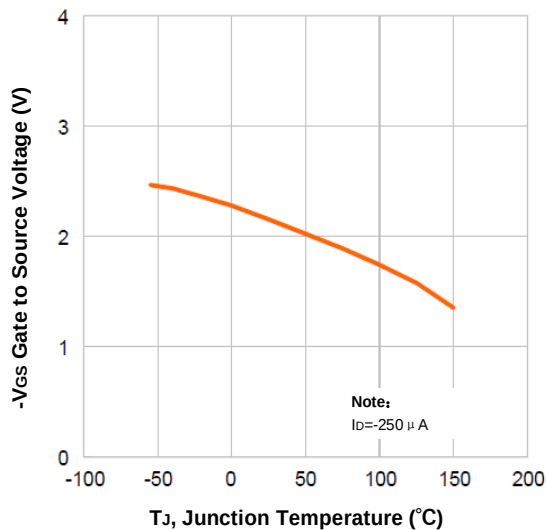


Figure 5 Normalized $V_{GS(th)}$ vs. T_J

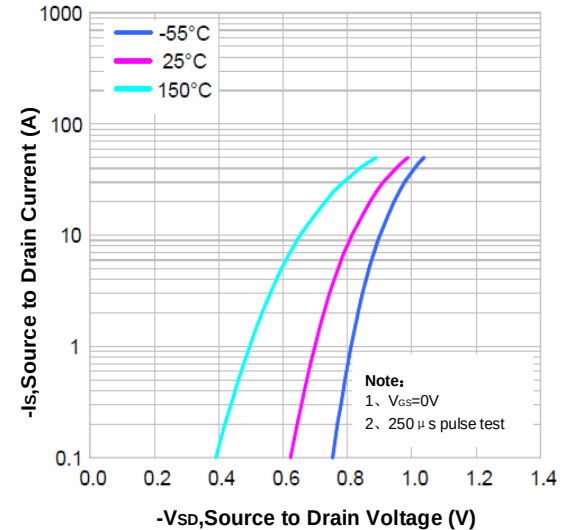


Figure 6 Source to Drain Voltage (V)

4. Typical Characteristics (Cont.)

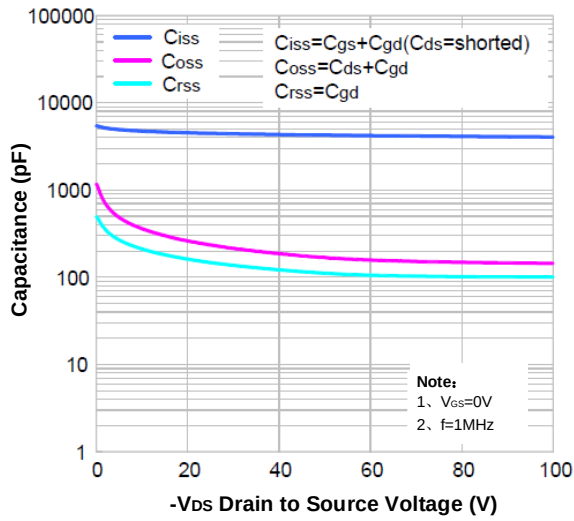


Figure 7 Capacitance

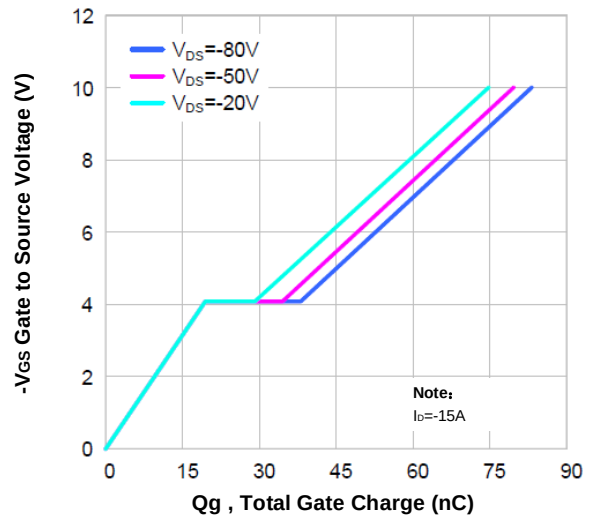


Figure 8 Gate-Charge Characteristics

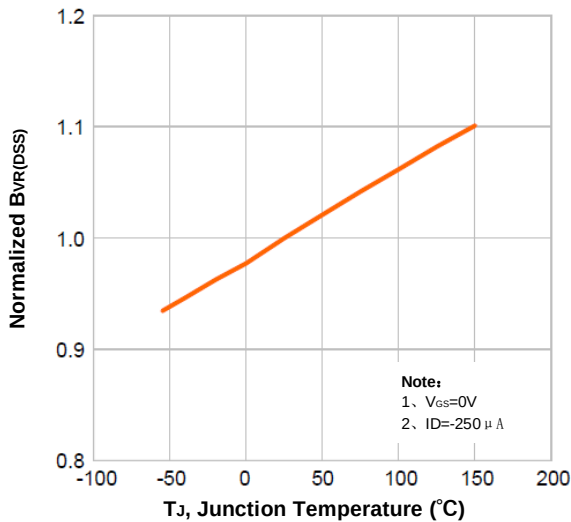


Figure 9 Normalized BVRDSS vs. Tj

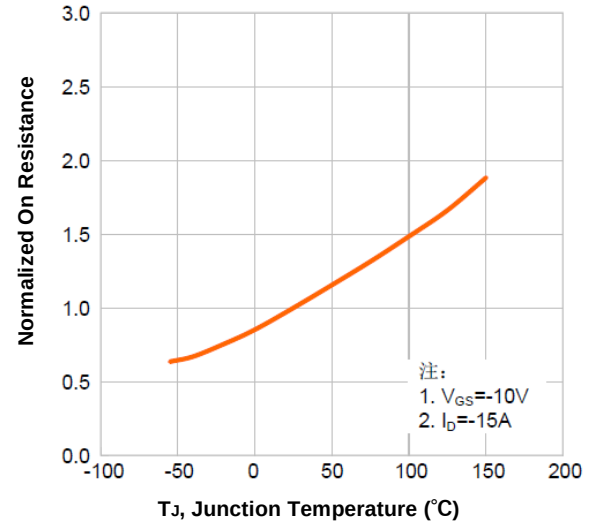


Figure 10 Normalized $R_{DS(on)}$ vs. Tj

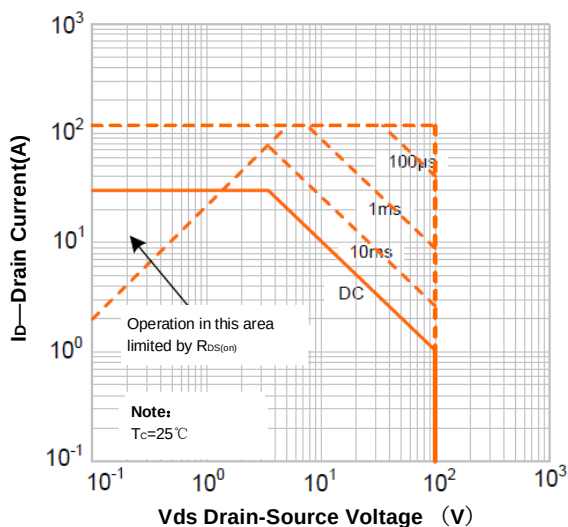


Figure 11 Safe Operation Area

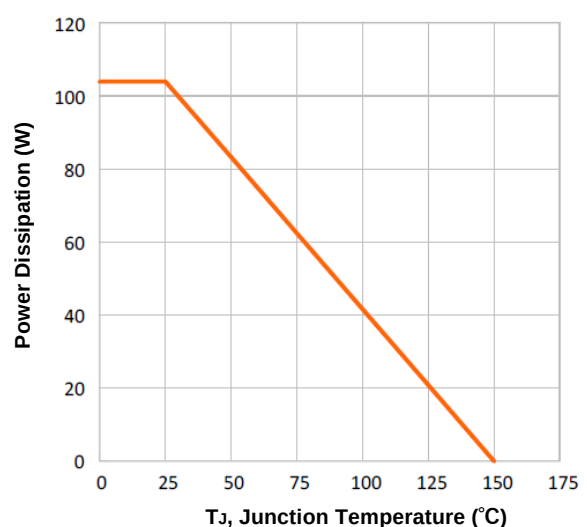
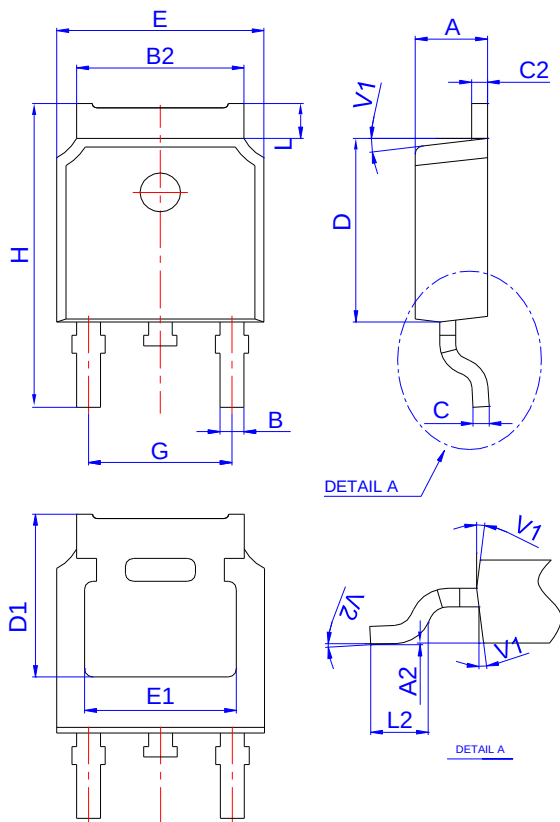


Figure 12 Power De-rating

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°