

P-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☑ Surface-mounted package
- ☑ Advanced trench cell design
- ☑ Extremely low threshold voltage

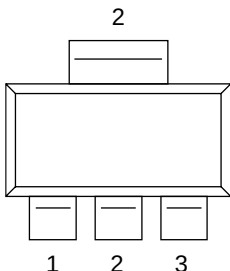
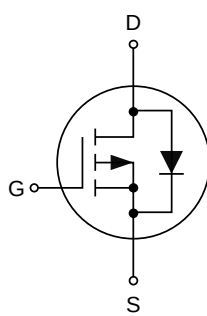
1.2 Applications

- ☑ Portable appliances
- ☑ Battery management
- ☑ High speed switch
- ☑ Low power DC to DC Converter

1.3 Quick reference

- ☑ $BV \geq -100\text{ V}$
- ☑ $R_{DS(ON)} \leq 492\text{ m}\Omega @ V_{GS} = -10\text{ V}$
- ☑ $P_{tot} \leq 1.95\text{ W}$
- ☑ $R_{DS(ON)} \leq 576\text{ m}\Omega @ V_{GS} = -4.5\text{ V}$
- ☑ $I_D \leq -1.34\text{ A}$

2. Pin Description

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

Top View
SOT-223-3L

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_A=25^{\circ}\text{C}$	-	-100	V
V_{GS}	Gate-Source Voltage	$T_A=25^{\circ}\text{C}$	-	± 20	V
I_D^*	Drain Current	$T_A=25^{\circ}\text{C}, V_{GS}=-10\text{V}$	-	-1.34	A
		$T_A=100^{\circ}\text{C}, V_{GS}=-10\text{V}$	-	-0.85	A
$I_{DM}^{*,**}$	Pulsed Drain Current	$T_A=25^{\circ}\text{C}, V_{GS}=-10\text{V}$	-	-5.37	A
P_{tot}^*	Total Power Dissipation	$T_A=25^{\circ}\text{C}$	-	1.95	W
		$T_A=100^{\circ}\text{C}$	-	0.33	W
T_{stg}	Storage Temperature		-55	150	$^{\circ}\text{C}$
T_J	Junction Temperature		-	150	$^{\circ}\text{C}$
I_S	Diode Forward Current	$T_A=25^{\circ}\text{C}$	-	-1.34	A
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient		-	64	$^{\circ}\text{C/W}$

Notes:

- * Surface Mounted on 1 in² pad area, $t \leq 10$ sec
- ** Pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$
- *** Limited by bonding wire

4. Marking Information

Product Name	Marking
KJ500P10R	500P10 YWWXXX YWWXXX: Date Code

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ500P10R	SOT-223-3L	-	-	1000	

Note: KUAIJIEXIN defines “Green” as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC/JEDEC J-STD-020C)

6. Electrical Characteristics (T_A=25°C Unless Otherwise Noted)

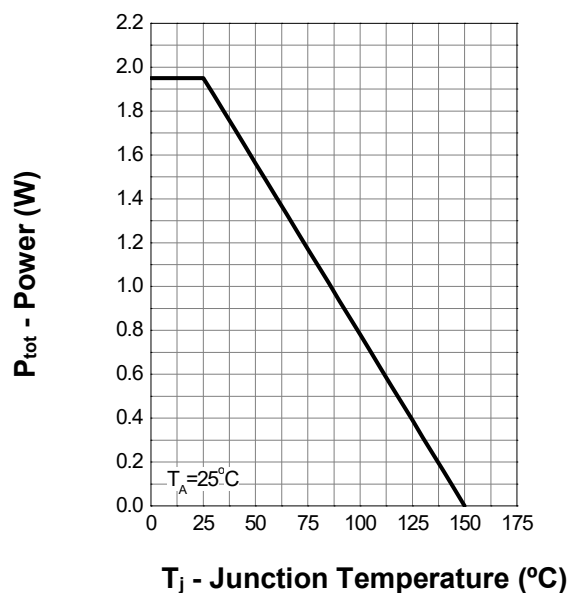
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _D =-250 μA	-100	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250 μA	-1	-	-2	V
I _{DSS}	Drain Leakage Current	V _{DS} =-80 V, V _{GS} =0 V	-	-	-1	μA
I _{GSS}	Gate Leakage Current	V _{DS} =0 V, V _{GS} =±20 V	-	-	±100	nA
R _{DS(ON)} ^a	On-State Resistance	V _{GS} =-10 V, I _D =-1 A	-	410	492	mΩ
		V _{GS} =-4.5 V, I _D =-0.5 A	-	443	576	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =-1 A, V _{GS} =0 V	-	-	-1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} =-1 A dI _{SD} /dt=100 A/μs	-	18	-	ns
Q _{rr}	Reverse Recovery Charge		-	14	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =-50 V Frequency=1 MHz	-	462	-	pF
C _{oss}	Output Capacitance		-	17	-	
C _{rss}	Reverse Transfer Capacitance		-	20	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =-50 V, V _{GEN} =-10 V R _G =3.9 Ω, R _L =50 Ω I _{DS} =-1 A	-	4.8	-	ns
t _r	Turn-on Rise Time		-	3.3	-	
t _{d(off)}	Turn-off Delay Time		-	55	-	
t _f	Turn-off Fall Time		-	26	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =-50 V, V _{GS} =-4.5 V I _{DS} =-1 A	-	10	-	nC
Q _{gs}	Gate-Source Charge		-	1.9	-	
Q _{gd}	Gate-Drain Charge		-	1.2	-	

Notes:

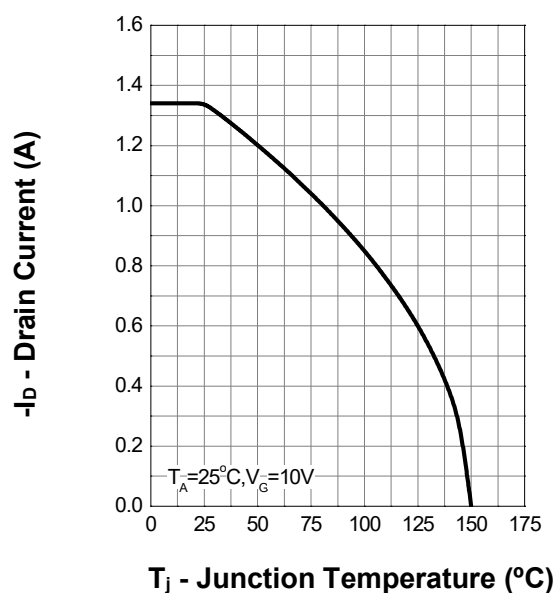
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%
- Guaranteed by design, not subject to production testing

7. Typical Characteristics

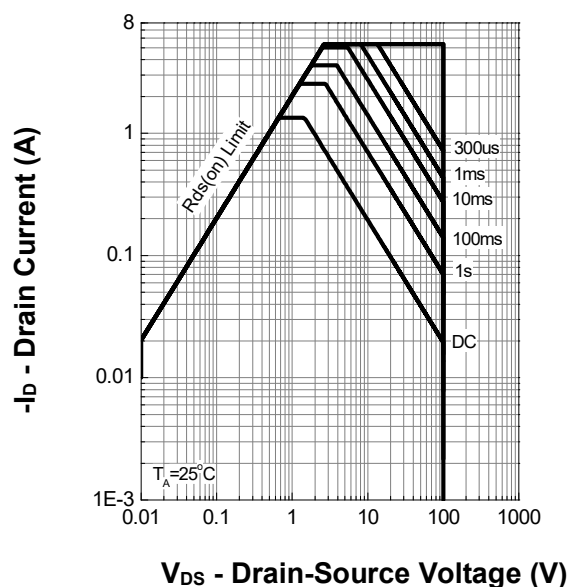
Power Dissipation



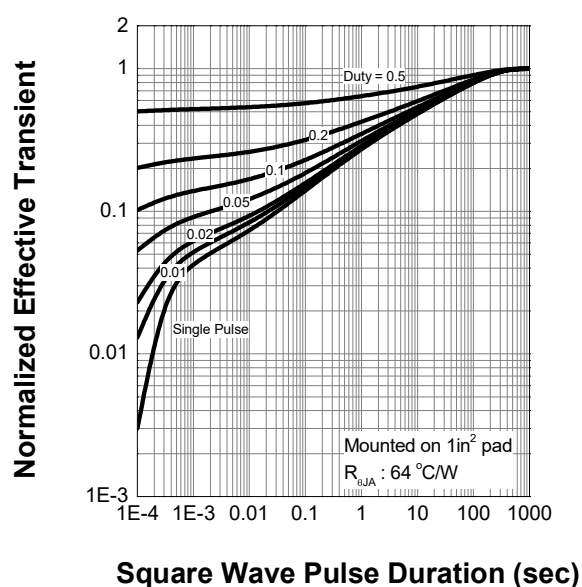
Current Capability



Safe Operation Area

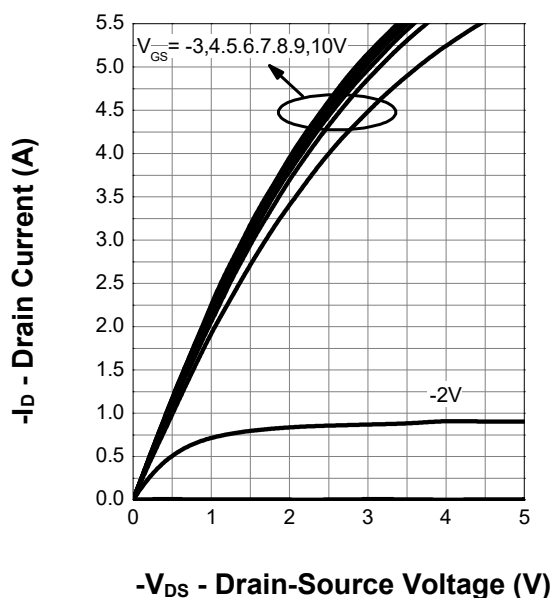


Thermal Transient Impedance

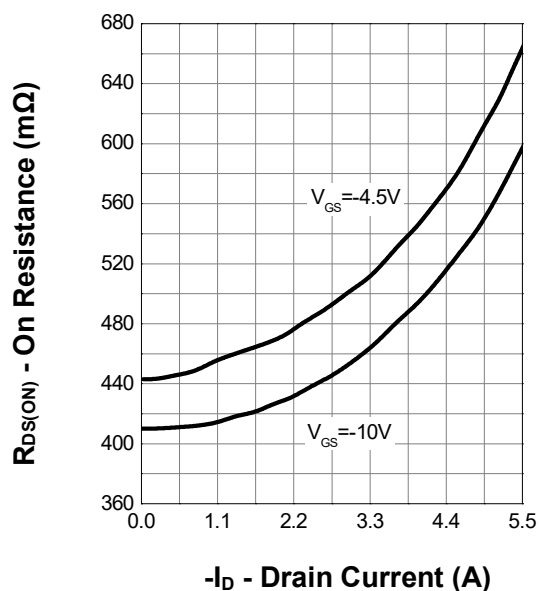


7. Typical Characteristics (cont.)

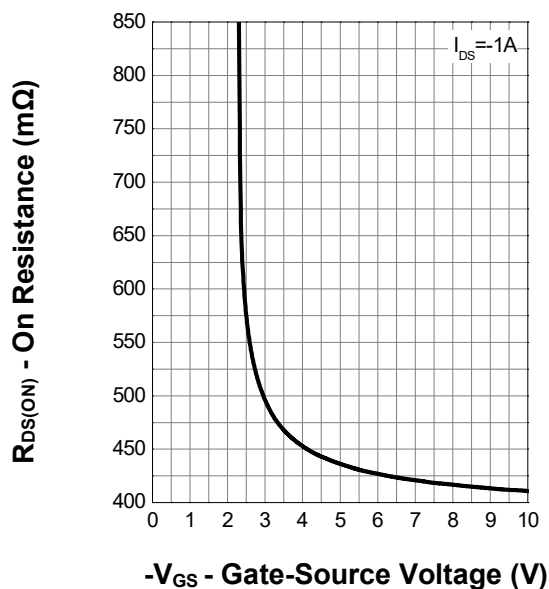
Output Characteristics



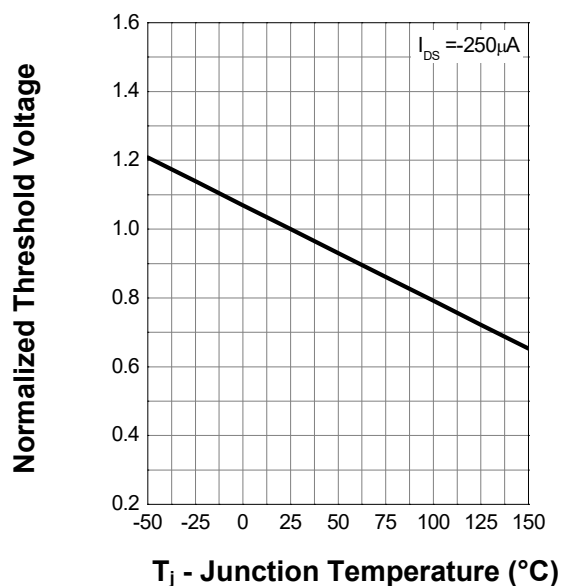
Drain-Source On Resistance



Transfer Characteristics

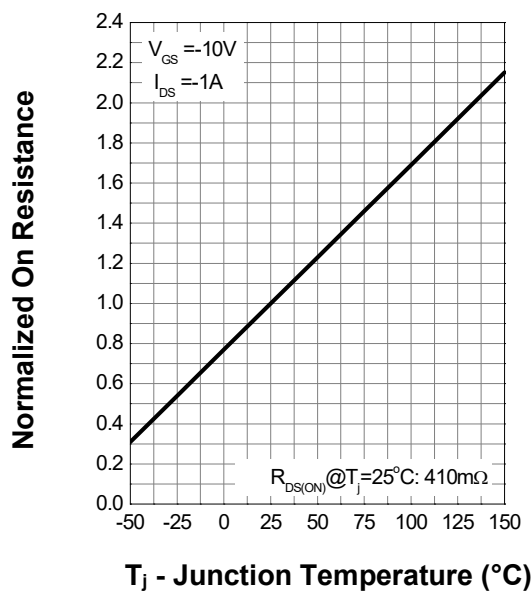


Normalized Threshold Voltage

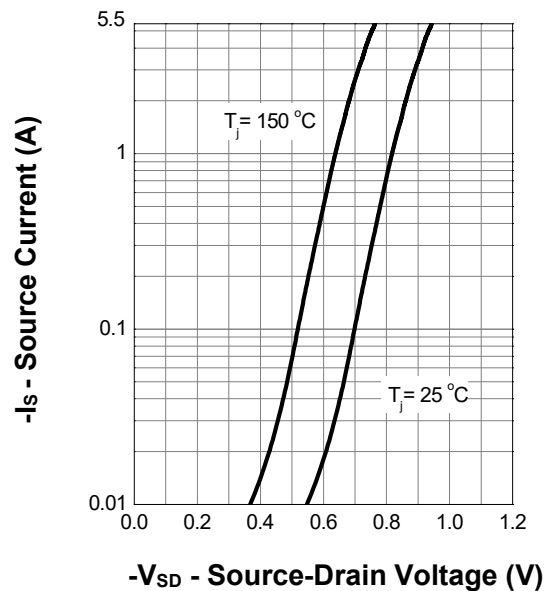


7. Typical Characteristics (cont.)

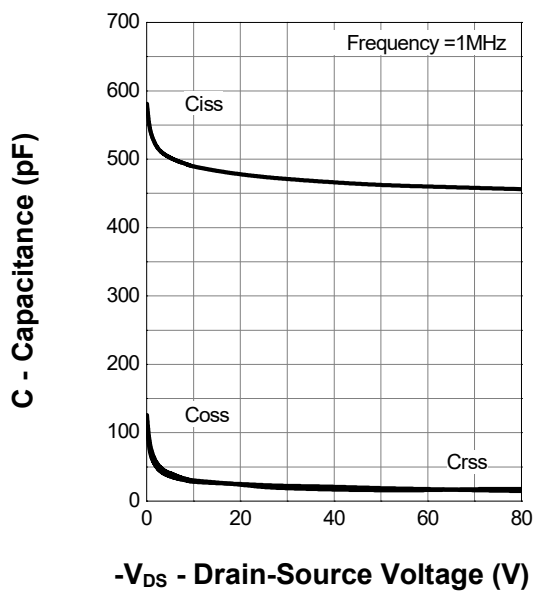
Normalized On Resistance



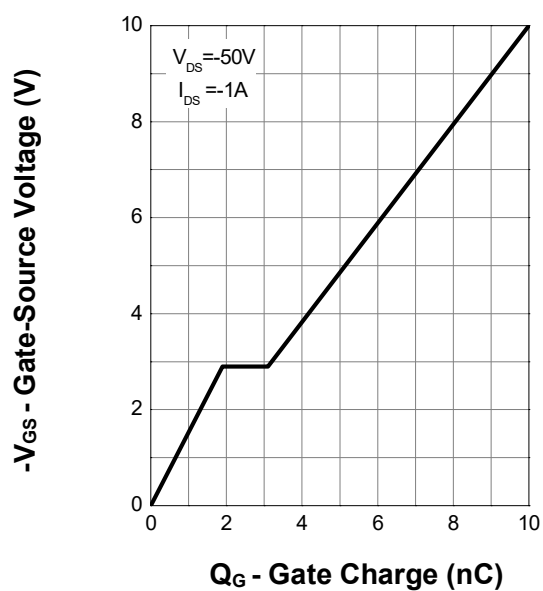
Current Diode Forward



Capacitance

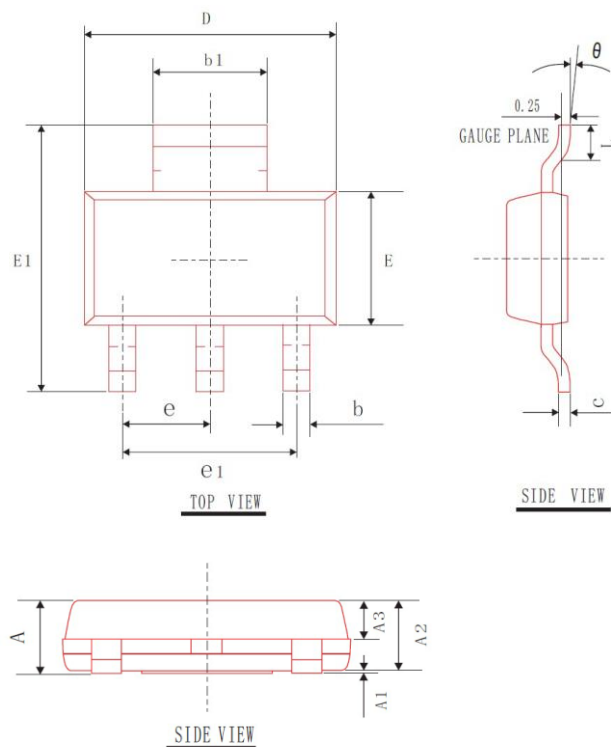


Gate Charge



8. Package Dimensions

SOT-223-3L Package



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	-	1.80
A1	0.00	0.10
A2	1.50	1.70
A3	0.85	0.95
b	0.66	0.80
b1	2.96	3.10
c	0.25	0.35
D	6.30	6.70
E	3.30	3.70
E1	6.80	7.20
e1	4.40	4.80
L	0.90	1.15
θ	0°	10°
e	2.30 BSC	