

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ Low gate charge

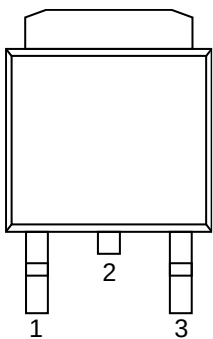
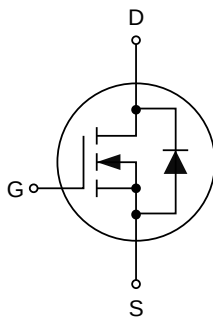
1.2 Applications

- ☒ Battery protection
- ☒ Uninterruptible power supply
- ☒ General purpose applications

1.3 Quick reference

- ☒ $BV \geq 30\text{ V}$
- ☒ $P_{tot} \leq 55\text{ W}$
- ☒ $I_D \leq 60\text{ A}$
- ☒ $R_{DS(ON)} \leq 8.5\text{ m}\Omega @ V_{GS} = 10\text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate		
2	Drain		
3	Source		
		Top View TO-252	

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C=25^{\circ}\text{C}$	-	30	V
V_{GS}	Gate-Source Voltage	$T_C=25^{\circ}\text{C}$	-	± 20	V
I_D^*	Continuous Drain Current	$T_C=25^{\circ}\text{C}$, $V_{GS}=10\text{ V}$ (Silicon limit)	-	80	A
		$T_C=25^{\circ}\text{C}$, $V_{GS}=10\text{ V}$ (Package limit)	-	60	
		$T_C=100^{\circ}\text{C}$, $V_{GS}=10\text{ V}$ (Silicon limit)	-	38	
$I_{DM}^{*, **, ***}$	Pulsed Drain Current	$T_C=25^{\circ}\text{C}$, $V_{GS}=10\text{ V}$	-	180	A
E_{AS}	Avalanche Energy, Single Pulse	$L=0.5\text{ mH}$, $R_g=25\ \Omega$	-	120	mJ
P_{tot}^*	Total Power Dissipation	$T_C=25^{\circ}\text{C}$	-	55	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range		-55	150	$^{\circ}\text{C}$
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient		-	50	$^{\circ}\text{C/W}$
$R_{\theta JC}^*$	Thermal Resistance-Junction to Case		-	2.2	$^{\circ}\text{C/W}$

Notes:

- * Pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
- ** Mounted on PCB of 1 in² pad area.
- *** Mounted on large heat sink.

4. Marking Information

Product Name	Marking
KJ3060K	3060K YWWXXX YWW: Date Code

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ3060K	TO-252	13"	16 mm	2500

Note: KUAJIEXIN 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_C=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 _{DS} =250 μA	30	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 μA	1.0	-	2.5	V
I _{DSS}	Zero Gate Voltage Source Current	V _{DS} =30 V, V _{GS} =0 V	-	-	1	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20 V, V _{DS} =0 V	-	-	±100	nA
R _{DS(ON)} ^a	Drain-Source On-State Resistance	V _{GS} =10 V, I _{DS} =20 A	-	6.8	8.5	mΩ
g _{fs}	Transconductance	V _{DS} =15 V, I _{DS} =20 A	20	-	-	S
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =20 A, V _{GS} =0 V	-	0.85	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =20 A, dI _{SD} /dt=300 A/μs	-	24	-	ns
Q _{rr}	Reverse Recovery Charge		-	52	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =15 V, Frequency=1 MHz	-	1177	-	pF
C _{oss}	Output Capacitance		-	177	-	
C _{rss}	Reverse Transfer Capacitance		-	131	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =30 V, V _{GEN} =10 V, R _L =2.5 Ω, I _{DS} =20 A	-	10	-	ns
t _r	Turn-on Rise Time		-	27	-	
t _{d(off)}	Turn-off Delay Time		-	35	-	
t _f	Turn-off Fall Time		-	9	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =15 V, V _{GS} =10 V, I _{DS} =20 A	-	52	-	nC
Q _{gs}	Gate-Source Charge		-	9.6	-	
Q _{gd}	Gate-Drain Charge		-	9.9	-	

Notes:

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

7. Typical Characteristics

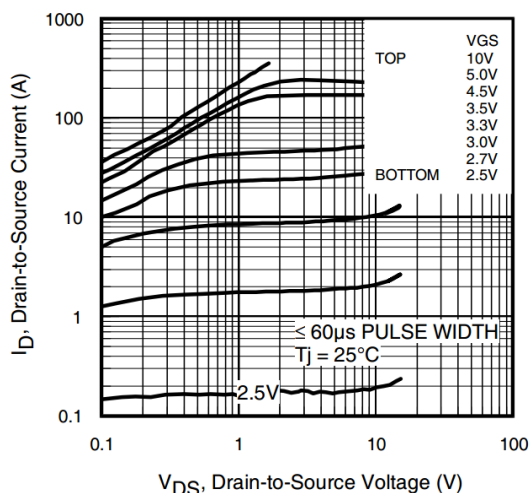


Figure 1. Typ. Output Characteristics

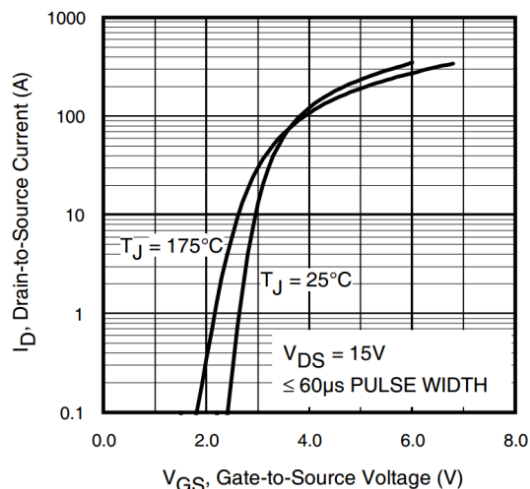


Figure 2. Transfer Characteristics (Junction Temperature)

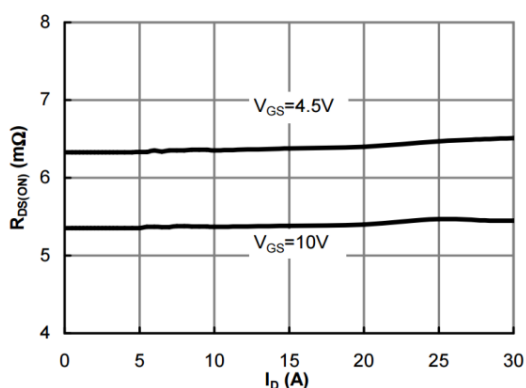


Figure 3. On-Resistance vs. Drain Current and Gate Voltage Figure

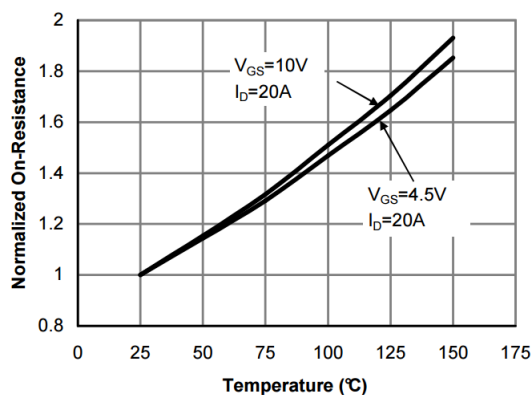


Figure 4. On-Resistance vs. Junction Temperature

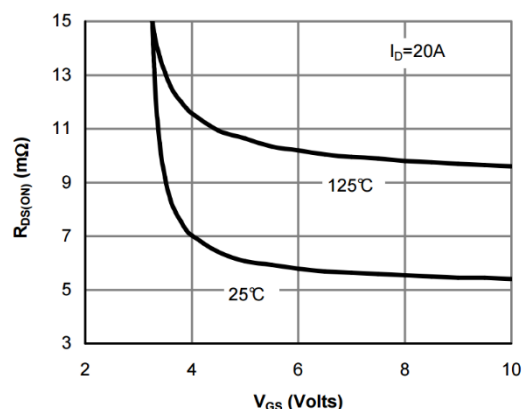


Figure 5. On-Resistance vs. Gate-Source Voltage (Junction Temperature)

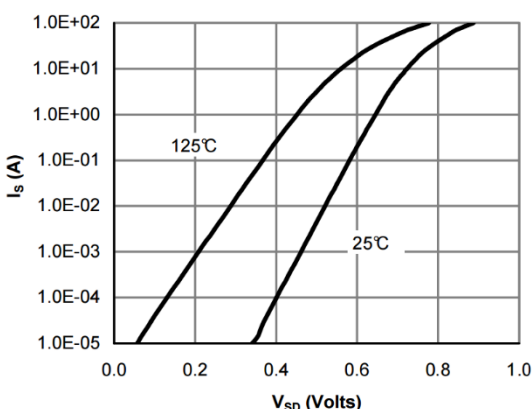


Figure 6. Body-Diode Characteristics (Junction Temperature)

7. Typical Characteristics (cont.)

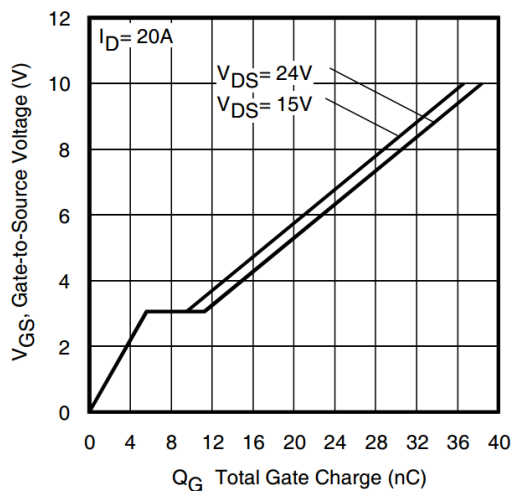


Figure 7. Gate-Charge Characteristics

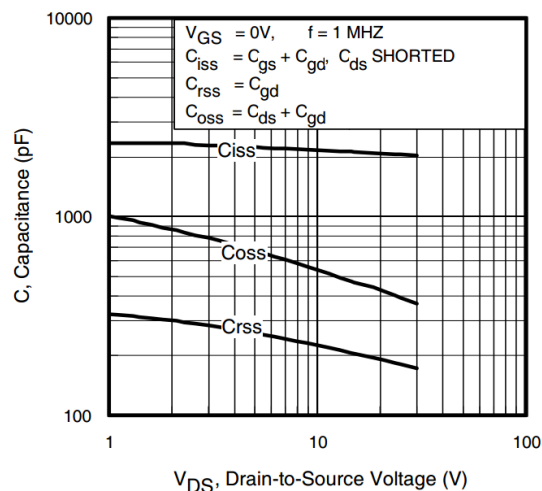


Figure 8. Capacitance Characteristics

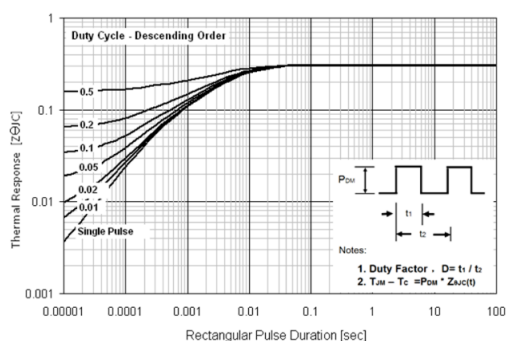


Figure 9: Normalized Maximum Transient Thermal Impedance (R_{thJC})

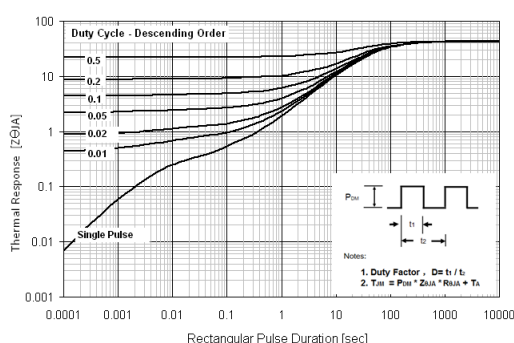
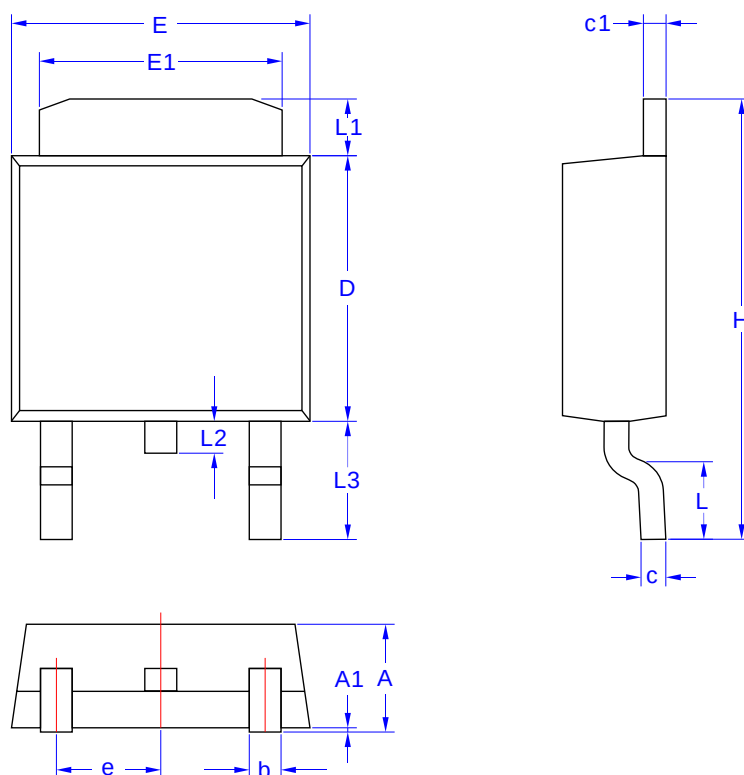


Figure 10: Normalized Maximum Transient Thermal Impedance (R_{thJA})

8. Package Dimensions

TO-252 Package



Symbol	Dimensions in Millimeters	
	MIN	MAX
A	2.19	2.38
A1	0.02	0.13
b	0.55	0.85
c	0.40	0.60
c1	0.40	0.60
D	5.30	6.40
E	6.35	6.80
E1	5.20	5.50
e	2.30 BCS	
L	1.00	1.80
L1	0.70	1.80
L2	0.70 BCS	
L3	2.40	2.80
H	9.20	10.40